RCA VICTOR
SERVICE DATA

VOLUME VI
1950

RADIO RECEIVERS

PHONOGRAPHS

TELEVISION

RADIO CORPORATION OF AMERICA
RCA Victor Division Harrison, N. J., U. S. A.

RCA VICTOR

SERVICE DATA

- TELEVISION RECEIVERS
- RADIO RECEIVERS
- PHONOGRAPHS

This volume is a compilation of Service Data previously issued for the year 1950 with the latest changes and corrections.

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First Edition—First Printing

Printed in U. S. A.

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
HARRISON, N. J., U. S. A.

INDEX

The page numbers given in the index below refer to the number at the top of the pages. The numbers which are found in the text and at the bottom of some pages refer only to that particular Service Data.

The regular Service Data will be found on the pages indicated by **bold face numbers (1, 2, 3, etc.)**, supplementary data is indicated by light face numbers.

RADIOS AND PHONOGRAPHS

RECORD CHANGERS

TELEVISION

TELEVISION (Cont.)

7 REASONS WHY....

1 YOU CASH IN ON RCA'S REPUTATION

When you display the RCA emblem in your window or within your shop, you gain immediate recognition from your customers. They recognize RCA as "World leader in radio . . . first in television."

2 YOU'RE POSITIVE OF RCA'S QUALITY AND ACCURACY

When you service an RCA Victor home instrument with RCA tubes or components, you're *sure* that they're right. They are identical twins of the tubes and parts originally used, and may have actually been manufactured at the same time. All the engineered quality and high standards of the original parts are exactly duplicated, electrically and mechanically.

3 YOU BUILD A LOCAL NAME AS AN RCA SERVICE DEALER

RCA cartons in your shop identify you in your neighborhood as a source for genuine RCA tubes and components, and for genuine RCA Victor replacement parts. Customers will count on you to return their RCA Victor instruments to their *original* high performance standards.

4 YOU PROTECT YOUR REPUTATION

When something goes wrong with a set you service, your customer places the blame squarely with you, not the distributor or the manufacturer of the "almost as good" part you installed. Every call-back means lost time and money, and a dissatisfied customer rarely returns. You *protect* your reputation when you use genuine RCA quality parts. You make more than a sale . . . you win a customer, who will learn to depend upon you for all his service needs.

5 YOU ARE ENABLED TO SERVICE ANY RCA VICTOR SET

RCA stocks over 40,000 different parts. The majority of replacement parts for RCA Victor instruments are maintained in stock for at least 10 years. Thus, you're sure of obtaining genuine RCA parts to fit RCA Victor instruments.

6 YOU ORDER RCA PARTS WITH SPEED AND EASE

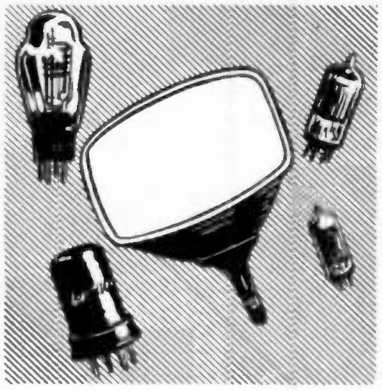
Your RCA distributor carries an adequate supply of RCA parts, or he can obtain them promptly from RCA's conveniently located warehouses. Factory availability means that you can repair RCA Victor Instruments old and new, with a minimum of effort, and with the assurance that original performance standards will be duplicated.

7 RCA LEADS THE WAY.. IN RESEARCH AND PERFORMANCE

At RCA's famed laboratories in Princeton, N. J., intensive research and analysis result in continuous technical advances in electronics. The benefits of the advances are passed along to you in new and improved products.

For The Complete Line of RCA Products

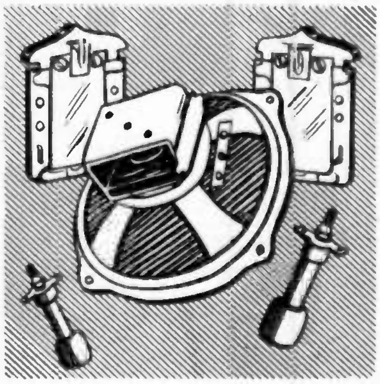
. . You Lead The Way With RCA



. . . IN RECEIVING TUBES AND KINESCOPES

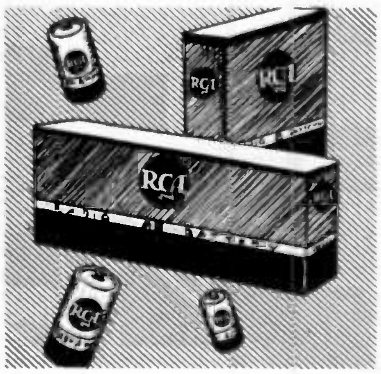
RCA Electron Tubes and Kinescopes are produced under superior quality controls . . . tested and re-tested before they are released. The RCA brand on any tube is your assurance that it is the exact twin of the tube used in the original RCA Victor instrument.

The RCA brand has top consumer preference. Point out the RCA emblem and you quickly gain the confidence and acceptance of your trade. Today, more than ever before, dependable quality is a primary requirement for electron tubes in every application—television, AM, FM, communications and industry. Identify yourself with the leader in the field . . . RCA.



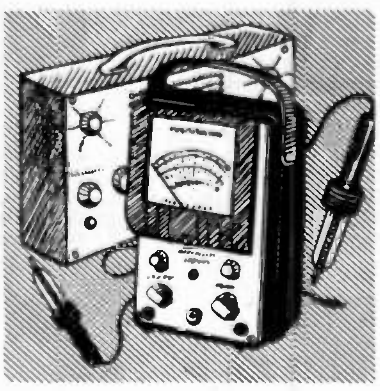
. . . IN ELECTRONIC COMPONENTS AND SERVICE PARTS

RCA electronic components are scientifically designed and ruggedly constructed to meet your replacement needs. Each component is the result of RCA's pioneering work in the field of electronics, and is built to actual set-tested designs. Developed by famed electronic engineers, RCA components and service parts are designed specifically to work with the tubes and circuits used in the top electronic instruments in the field. You can always depend upon RCA parts, engineered by America's leading manufacturer of electronic components—RCA.



. . . IN BATTERIES

RCA provides a complete line of highest quality dry batteries — radio-engineered for extra hours of dependable service. RCA is "The *Radio Battery* for the *Radio Trade*." You're sure of an adequate supply when you need it, because RCA production is geared to coincide with peak seasonal demands. RCA Batteries cover 99% of radio battery demand. The standard flashlight dry cell is sealed-in-steel, to keep it fresh on your shelves, virtually leakproof and moisture-proof. Every cell is aged and individually tested. Exacting laboratory tests prove that RCA Batteries exceed the average of competitive brands. For long life and peak performance, insist upon RCA batteries.



. . . IN TEST EQUIPMENT

More than anything else, the test equipment in the serviceman's shop is the key to his future and his reputation. Any compromise with quality can mean the difference between accurate, dependable analysis, and constant call backs with consequent loss of time, money, and reputation. Test equipment provides the serviceman with a standard upon which he bases all his decisions. That's why the quality of his test equipment must be superior.

RCA Test Equipment is the standard of dependability used in the manufacture of all RCA Victor Home Instruments, where quality and accuracy are the keynote. The RCA equipment you use to test a receiver is very often the very same equipment used to manufacture that receiver. That's why you can depend upon RCA test equipment.

Accurate, dependable, versatile, economical, attractive . . . these are the qualities that make RCA Test Equipment the best your money can buy.

. . . See Your Local RCA Distributor

INDEX (Continued)

1943-1949 SERVICE DATA LISTING

The Service Data listed below will be found in the 1943-1946, 1947-1948 or the 1949 Bound Volumes of RCA Victor Service Data. Supplementary information is designated with an "S" as a prefix to the bound volume designation.

INDEX TO CHASSIS NO'S

Identification numbers beginning with R (RC, RS, etc.) are used with all radios and some television receivers. Identification numbers beginning with K (KCS, KRS, etc.) are used exclusively with television.

RADIO CHASSIS

Chassis No.	*Model*
RK-117	711V1, 711V2, 711V3, R-F/I-F Chassis
RK-117A	641TV, 8TV41 Radio R-F/I-F Chassis
RK-121	612V1, 612V3, 612V4, R-F/I-F Chassis
RK-121A	648 PTK, 648PV Radio R-F/I-F Chassis
RK-121C	8V151, R-F/I-F Chassis
RK-135	8TR29, 8TK29 Radio Section
RK-135A	8TR29, 8TK29, 8TK320 Radio Section
RK-135C	9TW309 Radio Section
RK-135D	TA128, TA129, TA169 Radio Section
RC-315B	86T6
RC-315C	5Q1
RC-318	8M
RC-319	87K2, 87T2
RC-319B	U-106
RC-320	8M1
RC-320A	8M2
RC-321	8M3
RC-321A	8M4
RC-323	95T, 95T1
RC-325C	5Q2
RC-325D	5Q2X
RC-331	HF-8, HF-8A
RC-331A	HF-6
RC-331B	U-134, U-134A
RC-331C	U-132
RC-332	94X
RC-333	94BK, 94BT
RC-333A	94BT6
RC-333B	94BT1, 94BK1
RC-333C	94BT61
RC-335	911K
RC-335A	98K
RC-335B	99K
RC-335C	11Q4, 11QK
RC-335D	U-126, U-128
RC-335E	11QU
RC-335F	910KG
RC-335H	99T
RC-335K	U-129
RC-335KR	U-30
RC-336	8QB, 8QBK Tuner Unit
RC-337	8Q1 Tuner Unit
RC-337A	8Q4 Tuner Unit
RC-337B	10Q1 Tuner Unit
RC-338	12Q4, 12QK Tuner Unit
RC-338A	12QU Tuner Unit
RC-339	HF-1
RC-340	94X-1, 94X-2
RC-341	U-111
RC-341C	U-112
RC-345C	95X-1
RC-345D	95X
RC-345E	95XL
RC-345F	95XLW
RC-345H	U-104
RC-348	95T5
RC-348A	96T
RC-348C	96E
RC-348D	96T1
RC-348E	U-115
RC-348F	95T5LW
RC-348H	U-123 (1 band)
RC-348J	U-121
RC-348L	U-127E
RC-349	97X
RC-350	9X to 9X-4
RC-350A	9X-6, 9X-11 to 9X-14
RC-351	96K, 96T2
RC-351A	97E, 97KG, 97T
RC-351B	96K2, 96T3
RC-351C	U-124
RC-351D	U-122E
RC-351E	U-119
RC-351F	97K
RC-351K	97K2, 97T2
RC-351L	96E2, 96K5, 96K6, 96T7
RC-352	98EY, 98X, 98YG
RC-352A	97Y
RC-352B	UY-122E
RC-352C	UY-124
RC-352D	98T2
RC-354	U-130
RC-354A	HF-4
RC-354B	HF-2
RC-357	9M1
RC-357A	9M2
RC-357J	M-50
RC-357K	M-60
RC-366	5Q4
RC-381	95X-11
RC-381A	95X-6
RC-386	U-125
RC-386A	98K2, 98T
RC-386B	U-25, U-26
RC-390	94BK2, 94BT2
RC-392	96BK6, 96BT6 Tuner Unit
RC-394	M-70 Tuner Unit
RC-396	5Q5, 5Q55, 5Q56
RC-396B	5Q8
RC-396D	5Q12
RC-396E	5Q12A
RC-399	96T4, 96T5
RC-399A	96T6
RC-400	96X-1 to 96X-4
RC-400A	96X-11 to 96X-14
RC-401	9TX-1 to 9TX-5
RC-403	9TX-21, 9TX-22
RC-403A	9TX-23
RC-404A	U-8
RC-405	9TX-31
RC-405A	9TX-32
RC-405B	9TX-33
RC-405C	40X-30
RC-405D	40X-31
RC-406	5X5-W
RC-406A	5X5-1
RC-407	94BP-1 Series (94BP-61, -62, -64, -66, -80, -81)
RC-407B	94BP-1 (2nd Prod.) (94BP-61, -62, -64, -66)
RC-408	BT-40
RC-408A	BT-42
RC-408C	BK-42
RC-410	94BP4, -B, -C, -R
RC-414	6QU
RC-414A	6Q7
RC-414B	6Q8, 6QK8
RC-414C	U-50
RC-415	K-60
RC-415A	K-80
RC-415B	K-60 (Loop), K-62
RC-415C	K-80 (Loop), K-81, K-82
RC-415D	K-80 (Loop)
RC-416	T-64, T-65
RC-416A	T-80
RC-418	T-55, T-55-S, T-56
RC-418A	K-50
RC-418B	U-10
RC-421	U-123 (2 bands)
RC-425	T-60
RC-425A	U-12
RC-425D	T-62
RC-427	TRK-12 Radio Tuner Unit
RC-427A	TRK-9 Radio Tuner Unit
RC-427F	TRK-120 Radio Tuner Unit
RC-427G	TRK-90 Radio Tuner Unit
RC-429	TRK-5 Radio Tuner Unit
RC-435	9TX-50, 9TX-50M
RC-435A	45E, 45E-M, 45E-W
RC-436	40X-50 to 40X-57
RC-440	4QB
RC-440A	4QB4
RC-441	6Q1
RC-441A	6Q4
RC-442	6Q4X
RC-443	8Q2
RC-443B	8QU5-C, 8QU5-M
RC-444	9Q1
RC-444A	9QK
RC-449	BK-41, BT-41
RC-453	40X-52, 40X-55 (2nd Prod.)
RC-454	9TX-50, 9TX-50M (2nd Prod.)
RC-455	BP-55, -56, -85
RC-456	46X-11, 46X-12
RC-456A	46X-13
RC-457	45X-1, 45X-2
RC-457A	45X-1, 45X-2 (2nd Prod.)
RC-457D	45X-5, 45X-6
RC-457E	45X-3, 45X-4
RC-459	45X-11, 45X-12
RC-459A	45X-13
RC-459B	46X-1, 46X-2
RC-459C	46X-3
RC-459D	45X-11, 45X-12 (2nd Prod.)
RC-459E	45X-13 (2nd Prod.)
RC-459F	46X-1, 46X-2 (2nd Prod.)
RC-459H	46X-3 (2nd Prod.)
RC-459J	45X-111, 45X-112, Radiola 510
RC-459K	45X-113
RC-459L	45X
RC-459M	45X-16, 45X-17
RC-459T	45X-11, 45X-12 (3rd Prod.)
RC-461	46X-24
RC-461A	46X-23
RC-461B	46X-21
RC-462	15X
RC-462A	16X-1, 16X-2, 36X
RC-462B	16X-3
RC-462C	16X-4
RC-464	Radiola 500, 501
RC-464A	Radiola 511
RC-464B	Radiola 512, 513
RC-465	Radiola P-5
RC-465A	Radiola P-5
RC-472F	T-63
RC-473A	X-55
RC-474D	X-60
RC-476	K-105
RC-477	5Q5 (2nd Prod.), Q18
RC-477A	5Q6
RC-477B	5Q8 (2nd Prod.)
RC-477C	5Q66
RC-478	9Q4
RC-478A	7Q4
RC-478B	7QK4
RC-482B	U-9
RC-482C	U-9 (2nd Prod.)
RC-486B	U-44 Tuner Unit
RC-486C	U-45 Tuner Unit
RC-490	96X-5
RC-496	7QB, 7QBK Tuner Unit
RC-497	K-50 (2nd Prod.)
RC-498	U-20

INDEX TO CHASSIS NO'S (Continued)

RADIO CHASSIS (Continued)

Chassis No.	Model
RC-498A	U-40
RC-498B	U-42 Tuner Unit
RC-498E	U-43
RC-498F	K-61
RC-501	U-46 Tuner Unit
RC-501A	K-130 Tuner Unit
RC-502	7Q4X
RC-507	Q22, Q22A, Q32, Q121 (EM)
RC-507A	Q25
RC-507B	QK23
RC-507C	QU2C
RC-507D	QU2M
RC-507F	QU3C
RC-507H	QU3M
RC-507J	Q26
RC-507K	Q27
RC-507L	QU52C
RC-507N	QU52M
RC-507U	Q121 (PM)
RC-508	Q24
RC-509	16T4
RC-509A	16T3
RC-509B	16T2
RC-509C	16K
RC-509F	16T4 (2nd Prod.)
RC-509H	16T3 (2nd Prod.)
RC-509J	16T2 (2nd Prod.)
RC-511	18T
RC-512	17K
RC-512A	19K
RC-513	110K, 110K2
RC-513A	111K
RC-514	Q20, Q21
RC-517	V-100
RC-517C	V-105
RC-517F	Radiola R-560P
RC-517H	V-135
RC-517J	Radiola R-566P
RC-518	V-300 Tuner Unit
RC-518A	V-301, V-302 Tuner Unit
RC-519	V-200
RC-521	V-205
RC-521B	V-405
RC-522	V-201
RC-523	V-170
RC-524	V-102
RC-525	14BT-1
RC-525A	14BT-2
RC-525B	14BK
RC-526	15BT
RC-527	15BP-1, -2, -4, -6
RC-527A	15BP-3, -5
RC-527C	15BP-7
RC-527D	25BP
RC-529	QB2
RC-529A	QB1, QB11, QB12 Tuner Unit
RC-529D	QB6
RC-529H	QB9 Tuner Unit
RC-530	QU5 Tuner Unit
RC-531	Q44
RC-538B	Q30
RC-538C	Q31
RC-539	Q33
RC-539D	QB-3
RC-539E	Q34
RC-540	V-101
RC-541C	45X18
RC-544	BP-10
RC-547	VHR-207
RC-547A	VHR-407
RC-548	VHR-202
RC-551	QU7, QU8 Tuner Unit
RC-555	VHR-307 Tuner Unit
RC-559	26BP
RC-561	Q-16
RC-561A	Q-17
RC-561C	Q-16E
RC-563A	QB5, QB55
RC-563B	Q12
RC-563C	Q12
RC-563D	Q12
RC-563E	Q11
RC-563F	Q11
RC-563K	QB55X
RC-564	V-215, V-221
RC-564A	V-219
RC-564B	V-225
RC-566	Q14, Q15
RC-566A	QU56C, QU56M
RC-566B	Q14E, Q15E
RC-567	27K
RC-568	QU51C, QU51M
RC-568A	QU55
RC-568B	QU61
RC-569	28T
RC-570	29K
RC-570C	29K2
RC-570D	29K2 (2nd Prod.)
RC-571	211K
RC-572A	V-140
RC-573	V-209
RC-573A	V-210
RC-574	VHR-212
RC-582	V175
RC-585	Q36
RC-589	54B1
RC-589A	54B2
RC-589B	54B3
RC-589D	54B1-N
RC-589U	54B1 2nd Prod.
RC-589UA	54B2 2nd Prod.
RC-589UB	54B3 2nd Prod.
RC-589UE	54B6
RC-592	Q23
RC-594C	Q10, Q10A, Q10-2, Q10A-2, Q10-3, Q110
RC-594D	Radiola 61-6, 61-7
RC-601	Q122 (EM)
RC-601A	Q122X (EM)
RC-601B	7QV5, QU68
RC-601D	Q122 (PM)
RC-601E	Q122X (PM)
RC-602	Q109
RC-602A	Q109X
RC-602B	QU62
RC-604	58V, 58AV
RC-605	59V1, 59AV1
RC-606	67V1, 67AV1
RC-606C	67V1, 67AV1 2nd Prod., 77V2
RC-607	QB60
RC-608	68R1, 68R2, 68R3, 68R4
RC-610	610V1, 610V2
RC-610A	730TV1 Radio Section
RC-610B	730TV2 Radio Section
RC-610C	610V1, 610V2 2nd Prod.
RC-612	QB-13 Tuner Unit
RC-613A	710V2
RC-614	9Q53
RC-614C	9QV5 R-F/I-F Chassis
RC-615	77V1, 8V7
RC-616	8V112
RC-616A	8V91
RC-616B	8TV321 Radio Section
RC-616C	8TV323 Radio Section
RC-616F	8V112 2nd Prod.
RC-616H	8V91 2nd Prod.
RC-616J	8TV321 2nd Prod. Radio Section
RC-616K	8TV323 2nd Prod. Radio Section
RC-616N	9TW333 Radio Section
RC-617A	9TW390 Radio Chassis
RC-618	8V90
RC-618A	8V90 2nd Prod.
RC-618B	9W101, 9W103
RC-618C	9W105
RC-618D	9W102
RC-620A	4QV8C R-F/I-F Chassis
RC-622	9W106, A106
RC-1000	16X11
RC-1000A	16X13
RC-1000B	16X14
RC-1000C	Radiola 515
RC-1001	10X
RC-1001A	11X1
RC-1001B	12X, 12X2
RC-1001B	10X (2nd Prod.)
RC-1001C	12AX, 12AX2, 35X, Radiola 516, 517, 522
RC-1001D	14X, 14X2
RC-1001E	14AX, 14AX2, 34X, Radiola 526, 527
RC-1002	28X
RC-1002A	28X5
RC-1003	1X, 1X2, 25X
RC-1003A	1AX, 1AX2
RC-1003B	Radiola 510 (2nd Prod.), 511 (2nd Prod.)
RC-1003C	55X
RC-1003D	Radiola 510 (3rd Prod.), 520
RC-1004A	25BT2
RC-1004B	25BK, 25BT3
RC-1004D	Radiola B-52
RC-1004E	55F, 65F
RC-1004F	24BT1, 24BT2
RC-1004H	Radiola B-50
RC-1011	15X (2nd Prod.), 36X (2nd Prod.) 56X, 56X2, 56X3, Radiola 61-1, 61-2, 61-3
RC-1011A	56X, 56X2, 56X3, Radiola 61-1, 61-2, 61-3 2nd Prod.
RC-1011B	56X, 56X2, 56X3, Radiola 61-1, 61-2, 61-3 3rd Prod.
RC-1013	6X2
RC-1014	26X1
RC-1014A	26X3, Radiola 515 (2nd Prod.)
RC-1014B	26X4
RC-1017	55U, 55AU
RC-1017A	65U, 65AU, 65U-1, Radiola 62-1
RC-1017B	65U, 65AU (50 cycle)
RC-1020	25BP (2nd Prod.)
RC-1020B	Radiola P-5 (2nd Prod.)
RC-1022	34X (2nd Prod.)
RC-1022A	12X (2nd Prod.), 35X (2nd Prod.),Radiola 522 (2nd Prod.)
RC-1023	56X5, Radiola 61-5
RC-1023A	56X11
RC-1023B	56X10, Radiola 61-10, Postone (PX) 61-10
RC-1023C	Radiola 61-10 2nd Prod.
RC-1034	65X1, 65X2, 65X8, 65X9, Radiola 61-8, 61-9
RC-1035	QU72, QU72A
RC-1037	64F1, 64F2
RC-1037A	64F3
RC-1037B	8F43
RC-1038	66X1, 66X2
RC-1038A	66X3, 66X7, 66X8, 66X9
RC-1040	66BX (3Q4 output)
RC-1040A	66BX (3V4 output)
RC-1040B	66BX (Selenium rect.)
RC-1040C	8BX6, 8BX65
RC-1040D	8BX6 2nd Prod.
RC-1044	Q103, Q103A, Q103-2, Q103A-2
RC-1044A	Q103X, Q103AX, Q103X-2, Q103AX-2
RC-1045	65BR9, Radiola R65BR9
RC-1046	66X12
RC-1046A	66X11
RC-1046B	66X13

INDEX TO CHASSIS NO'S (Continued)

RADIO CHASSIS (Cont.)

Chassis No.	Model
RC-1046C	66X11 2nd Prod.
RC-1046D	66X12 2nd Prod.
RC-1046E	66X13 2nd Prod.
RC-1047	54B5
RC-1050	75X11, 75X12
RC-1050A	75X11, 75X12 2nd Prod., 75X14, 75X15
RC-1050B	75X11 3rd Prod., 75X14 2nd Prod., 75X16, 75X17, 75X18, 75X19
RC-1053	5Q21, 5Q22, 5Q27
RC-1053A	5Q21 2nd Prod. (117 v.)
RC-1053B	5Q21 2nd Prod. (234 v.)
RC-1053C	Q521 (117 v.)
RC-1053D	Q521 (234 v.)
RC-1054	5Q31
RC-1054A	6Q33
RC-1054B	6Q33X
RC-1054C	6QU3
RC-1054D	6QV3
RC-1054E	5Q31X
RC-1054F	6QU3Y
RC-1055	7Q51 (PM)
RC-1055C	7Q51 (EM)
RC-1055D	7Q51X
RC-1057A	77U
RC-1057B	9Y7
RC-1058	Radiola 76ZX11, 76ZX12
RC-1058A	Radiola 76ZX11, 76ZX12 2nd Prod.
RC-1059	8BX5, 8BX54, 8BX55
RC-1059A	8BX5, 8BX54, 8BX55 2nd Prod.
RC-1059B	9BX5
RC-1059C	9BX5 2nd Prod.
RC-1060	8R71, 8R74, 8R75
RC-1060A	8R72, 8R76
RC-1061	8X681, 8X682
RC-1063A	Radiola 75ZU
RC-1063B	Radiola 75ZU 2nd Prod.
RC-1064	65X1, 65X2, Radiola 61-8, 61-9 2nd Prod., 8X53
RC-1065	8X541, 8X544, 8X545
RC-1065A	8X542, 8X546, 8X547
RC-1065B	8X541, 8X544, 8X545 2nd Prod.
RC-1065C	8X542, 8X546, 8X547 2nd Prod.
RC-1065F	8X541, 8X544, 8X545 3rd Prod.
RC-1065H	8X542, 8X546, 8X547 3rd Prod.
RC-1065J	8X541 4th Prod.
RC-1065K	8X542, 8X547 4th Prod.
RC-1065L	8X541 5th Prod.
RC-1065M	8X542, 8X547 5th Prod.
RC-1066	8X521
RC-1066A	8X522
RC-1067	6QP3
RC-1067A	QP63
RC-1068	9BX56
RC-1069	8B41
RC-1069A	8B42
RC-1069B	8B43
RC-1069C	8B46
RC-1070	8X71, 8X72
RC-1070A	X711
RC-1071	4QB3
RC-1071A	4QB3X
RC-1072	5QA5
RC-1077	9Y51
RC-1077A	9Y510
RC-1077B	9Y511
RC-1077C	9Y510 2nd Prod.
RC-1079	9X571
RC-1079A	9X572
RC-1079B	9X561
RC-1079C	9X562
RC-1079D	9W51
RC-1079E	9X571 2nd Prod.
RC-1079F	9X572 2nd Prod.
RC-1080	9X641
RC-1080A	9X642
RC-1082	BX6
RC-1082A	BX6 2nd Prod.
RC-1084A	9W78, A78
RC-1085	9X651
RC-1085A	9X652
RC-1087	A55
RC-1088	BX55
RC-1088A	BX57
RC-1088B	BX55 2nd Prod.
RC-1088C	BX57 2nd Prod.
RC-1089B	X551
RC-1089C	X552
RC-1090	2T81, 6T84 Radio Chassis
RC-1092	6T86, 6T87, 9T89, Radio Chassis
RC-1092A	7T143, Radio Chassis 2nd Prod.
RC-1094	A-82
RC-1095	A-91
RC-1095A	45-W-9
RC-1096	A-101, A-108
RC-1096A	45-W-10
RC-1096B	A-101, A-108 2nd Prod.
RC-1096C	45-W-10 2nd Prod.
RC-1098	B-411
RC-1098A	B-411 2nd Prod.
RC-1100	Q520 (117V.)
RC-1100A	Q520 (234V.)
RC-1101	QB421

AUDIO AMP. AND POWER UNITS

Chassis No.	Model
RA-79	9EY31, 9EY32
RS-77	R-98
RS-79B	CV-9 Electrifier
RS-83-1	PSU-8A
RS-83-2	PSU-8B
RS-83-3	PSU-8C
RS-83A-1	PSU-10A
RS-83A-2	PSU-10B
RS-83A-3	PSU-10C
RS-83C	CV-110 Electrifier
RS-83E	TRK-9, TRK-12, TRK-90, TRK-120 Radio Power Unit
RS-84	R-91
RS-85	PSU-8E
RS-85A	PSU-10E
RS-86	R-89
RS-89	CV-9X Electrifier
RS-89A	TRK-5 Radio Power Unit
RS-89B	U-42 Power Unit
RS-90	VA-21
RS-91A	O-50
RS-91B	R-60
RS-92	M-70 Power Unit
RS-94A	OSC-22
RS-95	CV-111 Electrifier
RS-98	CV-40 Electrifier
RS-102A	U-44 Power Unit
RS-102B	U-46 Power Unit
RS-102C	K-130 Power Unit
RS-102D	U-45 Power Unit
RS-102E	V-300, V-301, V-302 Power Unit
RS-110	QU5 Power Unit
RS-111	CV-112 Electrifier
RS-111A	CV-112X Electrifier
RS-112	QU8 Power Unit
RS-112A	QU7 Power Unit
RS-114A	VHR-307 Power Unit
RS-115	QB1, QB11, QB12, QB13, 6V. Power Unit
RS-115B	QB9 Power Unit
RS-119	R-56
RS-123	612V1, 612V3, 612V4, 711V1, 711V2, 711V3 Audio Amp. & Power Supply
RS-123A	641TV, 648PTK, 8TV41 Audio Amp. & Power Supply
RS-123B	648PV Audio Amp. & Power Supply
RS-123C	741PCS, 8PCS41, 9PC41 Audio Amp. & Power Supply
RS-123D	8V151 Audio Amp. & Power Supply
RS-126	66E, 66ED, 66E-1
RS-127	63E, 63EM
RS-130	9QV5 Power Unit
RS-130A	4QV8C Power Unit
RS-132	9EY3, 9EY3M, 9EY35, 9EY36, 45-EY
RS-132A	9EY35, 9EY36, 45-EY
RS-132C	QEY3
RS-132F	45-EY, 45-EY-1
RS-132H	45-EY-15
RS-136	45-EY-3
RS-136A	45-EY-3
RS-136C	45-EY-3
RS-138A	45-EY-2
RS-138H	45-EY-2
RS-1000	CV-42 Electrifier
RS-1001	CV-45 Electrifier

INDEX TO CHASSIS NO'S (Continued)

TELEVISION CHASSIS

Chassis No.	Model
KC-3	TT-5
KC-3A	TRK-5 TV Chassis
KC-3B	TT-5 (50 cy.)
KC-3C	TRK-5 (50 cy.) TV Chassis
KC-4	TRK-12 TV Tuner
KC-4A	TRK-9 TV Tuner
KC-4B	TRK-12 (50 cy.) TV Tuner
KC-4C	TRK-9 (50 cy.) TV Tuner
KC-4F	TRK-120 TV Tuner
KC-4H	TRK-90 TV Tuner
KC-4J	TRK-120 (50 cy.) TV Tuner
KCS-20A	630TS
KCS-20B	630TCS
KCS-20C	630TS (50 cy.)
KCS-20D	630TCS (50 cy.)
KCS-20J	8TS30
KCS-20K	8TS30 (50 cy.)
KCS-21	621TS
KCS-24	648PTK TV R-F/I-F Chassis
KCS-24A	648PV TV R-F/I-F Chassis
KCS-24B	741PCS, 8PCS41 R-F/I-F Chassis
KCS-24C	8PCS41, 9PC41 R-F/I-F Chassis
KCS-24D	9PC41 R-F/I-F Chassis
KCS-25A	641TV TV Chassis
KCS-25C	641TV (50 cy.) TV Chassis
KCS-25D	8TV41 TV Chassis
KCS-25E	8TV41 (50 cy.) TV Chassis
KCS-26-1	721TS
KCS-26-2	721TS (50 cy.)
KCS-26A-1	721TCS
KCS-26A-2	721TCS (50 cy.)
KCS-27-1	730TV1, 730TV2 TV Chassis
KCS-27-2	730TV1, 730TV2 (50 cy.) TV Chassis
KCS-28	8T241, 8T243, 8T244, 9T240
KCS-28A	9T240
KCS-28B	9TC240
KCS-28C	9T246
KCS-29	8T270, 9T270
KCS-29A	8TC270, 8TC271
KCS-29C	9TC272, 9TC275
KCS-30	8TV321, 8TV323, 9TW333 TV Chassis
KCS-31	S1000, 9TW390 TV Chassis
KCS-32	8TR29
KCS-32A	8TK29
KCS-32B	8TR29
KCS-32C	8TK29
KCS-33A	8TK320
KCS-34	9TC247, 9TC249
KCS-34B	TC124, TC125, TC127, 9TC245, 9TC247, 9TC249
KCS-34C	T120, T121
KCS-38	T100, 9T246
KCS-38C	9T256
KCS-40	T164
KCS-40A	TC165, TC166, TC167, TC168
KCS-40B	6T72
KCS-41	9TW309
KCS-41A	TA129
KCS-42A	TA128
KCS-43	TA169
KCS-45	2T51
KCS-45A	2T60
KCS-46	2T81
KCS-47	6T53, 6T54
KCS-47T	6T53, 6T54
KCS-47A	6T64, 6T65, 6T71, 6T74, 6T75, 6T76
KCS-47AT	6T64, 6T65, 6T71, 6T74, 6T75, 6T76
KCS-48	6T84, 6T86, 6T87
KCS-48T	6T84, 6T86, 6T87
KCS-49	9T57
KCS-49T	9T57
KCS-49A	9T77, 9T79
KCS-49AT	9T77, 9T79
KCS-60	9T89
KCS-60T	9T89
KK-7	TRK-12 TV Power Unit
KK-7A	TRK-9 TV Power Unit
KK-7D	TRK-12 (50 cy.) TV Power Unit
KK-7E	TRK-9 (50 cy.) TV Power Unit
KK-7F	TRK-120 TV Power Unit
KK-7J	TRK-90 TV Power Unit
KK-7H	TRK-120 (50 cy.) TV Power Unit
KRS-20	648PTK, 648PV Horiz. Defl. Chassis
KRS-20A	741PCS, 8PCS41 Horiz. Defl. Chassis
KRS-20B	8PCS41, 9PC41 Horiz. Defl. Chassis
KRS-21	648PTK, 648PV TV Power Supply
KRS-21A	741PCS, 8PCS41, 9PC41, TV Power Supply

MODEL vs. RECORD CHANGER (1943 to 1950)

Model	Record Changer
A55	RP 168 & 960282-1
A78	RP 168 & 960282-1
A-82	RP 168 or RP 190-2 & 960282-4 or -5
A-91	RP 168 or RP 190-2 & 960284-1 or -2
A-101	RP 190-2 & 960282-4 or -5 or 960284-1 or -2
A-106	RP 168 & 960285-1
A-108	RP 168 or RP 190-2 & 960284-1 or -2
QJY	RP 168
QEY3	RP 168
QU61	960001-4
QU62	960001-4
QU68	960001-4
S1000	RP 168 & 960285-1
TA128	RP 168 & 960282-1
TA129	RP 168 & 960282-1
TA169	RP 168 & 960285-1
2T81	RP 168 or RP 190-2 & 960282-4 or -5
4QV8C	RP 168 & 960282-2
6QU3	RP 178-3
6QU3Y	RP 169
6QV3	RP 178-3
6T84	RP 168 or RP 190-2 & 960282-4 or -5 or 960284-1 or -2
6T86	RP 168 or RP 190-2 & 960284-4 or -5
6T87	RP 168 or RP 190-2 & 960284-1 or -2
7QV5	960001-4
8TV41	RP 177A
8TV321	RP 178
8TV323	RP 178
8V7	RP 178
8V90	RP 178
8V91	RP 178
8V112	RP 178
8V151	RP 177B
9EY3	RP 168
9EY31	RP 168
9EY32	RP 168
9EY35	RP 168
9EY35U	RP 168
9EY36	RP 168
9EY36U	RP 168
9JY	RP 168
9QV5	RP 168 & 960282-2
9T89	RP 168 or RP 190-2 & 960284-1 or -2
9TW309	RP 168 & RP 178
9TW333	RP 168 & RP 178
9TW390	RP 168 & RP 177B
9W51	RP 168
9W78	RP 168 & RP 178
9W101	RP 168
9W102	RP 168
9W103	RP 168
9W105	RP 168 & RP 178
9W106	RP 168 & RP 178
9Y7	RP 168
9Y51	RP 168
9Y510	RP 190-1
9Y511	RP 168
45-EY	RP 168
45-EY-1	RP 168
45-EY-2	RP 190
45-EY-3	RP 190-1 or RP 190-3
45-EY-15	RP 168
45-J	RP 168
45-J-2	RP 190-1
45-J-3	RP 193
45-W-9	RP 190-2
45-W-10	RP 190-2
55U, 55AU	960015
58V, 58AV	960001-1
59V1, 59AV1	960001-2
Rad. 62-1	960260-2
65U, 65AU	960260-2
65U-1	960260-2
67V1, 67AV1	960260-1
Rad. 75ZU	RP 178 or 960276
77U	RP 178
77V1	960260-1
77V2	960260-1
610V1	960001-5 or -6 or RP 177
610V2	960001-5 or -6 or RP 177
612V1	RP 176A or RP 176B
612V3	RP 176 or RP 176A
612V4	RP 176 or RP 176A
641TV	960001-4 or -6
648PV	RP 176
710V2	RP 177 or RP 177A
730TV1	RP 177 or RP 177A
730TV2	RP 177 or RP 177A
711V1	960001-5
711V2	960001-5
711V3	960001-5

SUPPLEMENTARY INFORMATION (RADIOS AND RECORD PLAYERS)

RP-168 Series and RP-190 Series Record Changers

Pickup Cartridges:

The following is a listing of pickup cartridges used in RP-168 and RP-190 Series 45 r.p.m. record changers.

RMP 128-1 Stock No. 74067

Crystal pickup—replaceable sapphire stylus Stock No. 74068—"Normal range".

RMP 128-2 Stock No. 74625

Crystal pickup—replaceable sapphire stylus Stock No. 74818—"wide range".

RMP 128-4 Stock No. 75575

Crystal pickup—replaceable sapphire stylus Stock No. 75770—"wide range".

RMP 128-5 Special Order

Crystal pickup—replaceable osmium stylus (special order) —"normal range". Use RMP 128-1 for replacement.

RMP 136-1 Stock No. 75476

Crystal pickup—fixed osmium stylus—"normal range". Use RMP 128-1 for replacement.

Stock No. 74666

Variable reluctance pickup—replaceable diamond stylus Stock No. 74622. Not directly interchangeable with any other pickup. Used on Model CP-5203.

Stock No. 74984

Ceramic pickup—"normal range"—replaceable osmium stylus Stock No. 74985. Used on Models QJY and QEY3. (RP-168 Series only).

Stock No. 76297

Ceramic pickup—"normal range"—replaceable osmium stylus Stock No. 74985. Used on Models QJY2, QEY4 and QEY5. Counterbalance spring must be changed to Stock No. 74060 when center mounting holes are used.

Stock No. S-5578

Ceramic pickup—"normal range"—fixed osmium stylus. Used on Models 9QV5 and 4QV8C. Not directly interchangeable with any other pickup.

"Wide Range" vs "Normal Range": The "normal range" pickups have a greater output in the middle audio frequencies. The "wide range" pickups are more "flat" and have a greater output in the high audio frequencies. All of the above pickup cartridges are directly interchangeable except as noted.

Use of Variable Reluctance Pickups:

The most common difficulty encountered in attempting the substitution of variable reluctance pickups in place of crystal pickups is excessive hum.

This hum is primarily due to induction from the magnetic field of the drive motor. A crystal pickup is unaffected by this magnetic field. The output of variable reluctance pickups, being much lower than crystal pickups, must be provided with greater amplification (usually with a pre-amplifier) to obtain the equivalent output from the speaker. The hum is also amplified.

Shielding must be provided and can be accomplished by either of two methods.

1. Shielding of the motor with a metal box preferably of .020" steel. An inner box of non-magnetic metal will provide additional shielding. NOTE: When such a box shield is added, it will also raise the impedance of the motor and reduce its torque. To overcome this difficulty, it will be necessary to raise the voltage applied to the motor. The power consumption of the motor should be measured before and after adding such a box shield.
2. Addition of a steel plate approx. ⅛" thick between the mechanism and the motorboard.

There are several other matters which must be given attention.

1. In most all applications, a pre-amplifier must be used to provide amplification and equalization. A variable reluctance pickup is lower in output and impedance than a crystal pickup.
2. The pickup arm must be changed to accommodate the difference in mounting centers.
3. The counterbalance spring must provide the correct stylus force (approx. 5 grams).

One version of the RP-168 record changer was manufactured using a variable reluctance pickup and a shielded motor. Replacement parts are listed in RP-168 Series Service Data.

RP 168 Series Record Changer

Polarized Motor:

On some instruments the connection of the power leads of the motor should not be reversed. The leads are color coded and reversed leads may introduce objectionable hum. The record changer mechanisms using this motor are labeled RP 168B-6 or RP 168D-2 and are used with Models 45-EY and 45-EY-1.

Replacement motors (Stock No. 74071) may not be color coded and in such cases it will be necessary to determine the correct connection by trial.

Models 9X561, 9X562, 9X571, 9X572

Substitute Speakers:

Several speakers have been used as a substitute for the originally listed speakers for the above models. Each speaker requires a different replacement cone as listed below.

Speaker No.	Cone No.	Speaker No.	Cone No.
92586-2W	74758	92586-4W	75759
92586-4F	75999	92586-5W	75024

Complete 92586-2 speaker available as Stock No. 74679.

Complete 92586-4 speaker available as Stock No. 74664.

Complete 92586-5 speaker available as Stock No. 76393.

45EY-3 (RS-136C)

Service Data:

Late production of Model 45-EY-3 uses chassis stamped RS-136C. This chassis is identical to chassis RS-136A except for the speaker. In RS-136C the speaker is rim mounted and in RS-136A it is pot mounted.

Replacement Parts:

CHASSIS ASSEMBLIES

Stock No.	RS-136C
	Identical to RS-136A except:
76408	Bracket—Speaker mounting brackets complete with screws (1 set)
	SPEAKER ASSEMBLY
	922258-5
76407	Speaker—4" x 6" PM speaker complete with cone and voice coil

X551, X552 (RC 1089B, RC 1089C)

Change in Volume Control:

The volume control used in initial production was 500,000 ohms. This has been changed to a 1 megohm control.

Change in Parts List:

CHASSIS ASSEMBLIES

Add:

75985 Control—Volume control (1 megohm) and power switch (R5, S1)

MISCELLANEOUS

Delete:

74340 Nut—

Add:

72765 Nut—Speed nut to attach foot (4 req'd)

TELEVISION SUPPLEMENTARY INFORMATION

MODELS T100, T120, TC124, TC125, TC127, TA128, TA129 DEFLECTION CHANGES

Two Types of Yokes:

Current production of 10 and 12 inch television receivers are employing two different types of deflection yokes. One yoke is the older type which had an iron wire wrap core. The new type yoke has a powdered iron core. The two yokes are easily identified in that the older iron wire wrap yoke has a cardboard outer housing, while the new powdered iron yoke has a moulded bakelite housing.

The two yokes are not directly interchangeable for while the iron wire wrap yoke will work in the circuit designed for the powdered iron core yoke, the powdered iron yoke should not be employed in the circuit designed for the iron wire yoke unless suitable circuit modifications are made.

In order to reduce to a minimum, the amount of field confusion, the replacement parts department will stock only the iron wire wrap yokes so that field modifications of older sets will not be necessary when replacing yokes.

In receivers employing the "ELECTRONIC MAGNIFIER" deflection circuit, R181 was 470K for the iron wire wrap yokes. This value has been changed to 220K as a compromise value for both types of yokes.

Early T100 and T120 receivers with straight deflection systems employed a 1 meg resistor for R181 when the iron wire wrap yoke was used. Later some were built using a 150K resistor which gave more width and high voltage with the wire wrap yoke. When the powdered iron yoke is employed, R181 should not be less than 470K (which gives greatest width) nor higher than 1 meg. (which gives the best linearity). A 470K resistor is now being used in production as a compromise which is suitable for either type yoke.

Vertical Non-Linearity:

T120 receivers employing the powdered iron core yokes have another modification necessary to prevent poor vertical linearity, this showed up as cramping at the bottom of the picture. The non-linearity was corrected by raising the vertical oscillator plate voltage by changes in the B boost filter as shown in Figure 1. This change also prevents the formation of an extremely bright spot on the screen immediately after the set is turned off. If C146B develops excessive leakage it will cause the picture to be cramped at the bottom.

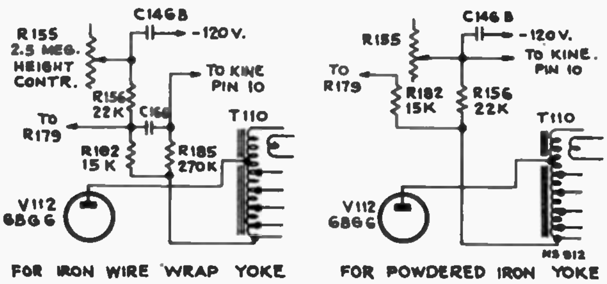


Figure 1—B Filter Connections

Raster Ringing:

In most cases, the iron wire wrap yoke type 201D3 will be supplied under stock numbers 71420 and 74262. In the 201D3 yoke, the 56 mmf. capacitor across a portion of the horizontal deflection coil is connected across yoke terminals 1 and 2. Before installing the yoke, check the schematic of the receiver in which the yoke is to be installed. Some models require that the capacitor be between terminals 1 and 2, and other models specify between terminals 2 and 3. In the latter case, the capacitor must be reconnected. Failure to connect the capacitor properly will result in bad raster ringing. Except for the connection of the capacitor, the type 201D3 is an exact duplicate of the iron wire wrap yokes used in production.

If excessive raster ringing occurs on the left side of the picture of current 10" and 12" receivers, and the yoke capacitor is correctly connected, and the circuit appears otherwise normal, then remove the yoke red lead from terminal 4 of T110 and reconnect it to terminal 5. This reduces the ring at the possible slight expense of linearity. This modification is applicable to regular and electronic magnifier deflection systems.

If raster ringing occurs near the center or right side of the raster it may be caused by mis-adjustment of the Linearity Control Coil. Proper coil adjustment is best made by turning the core counter-clockwise all the way and then clockwise until the ring just moves off the right side of the picture. Normally the core stud is just about flush with the outside of the chassis. This adjustment is applicable to both the regular deflection system and to the electronic magnifier systems.

On receivers with electronic magnifier deflection system, if the raster rings on the left side with the picture in the normal size, it may help to change the RC network (C178, R188) in parallel with the series width coil from 10K and 330 mmf to 5K and 470 mmf.

Poor Vertical Sync:

Reports from the field show that in a few cases this has been caused by Capacitor C-136 (cathode by-pass V-108). In some cases this capacitor had broken loose from ground.

Some vertical oscillator transformers marked 274011 with too high a "Q" caused a white condition at the top of the picture and possible instability of sync. The cure was to lower the transformer "Q" by connecting a 1 meg. resistor across the green and yellow transformer leads.

Unstable Horizontal Sync. (Wavy Picture)

It has been reported from the field, that in a few cases this is caused by the wrong values of C-135, R-144 and R-217.

Part	Correct Value
C-135	.01 mfd.
R-144	4700 ohm
R-217	2700 ohm

ALIGNMENT HINT FOR R-F UNITS

During alignment of the r-f unit, it is often advantageous to have a sweep width of 15 mc. or more when adjusting the high channels. This permits seeing the entire skirts of the curve and makes it easier to see the effects of the various adjustments. When using RCA type WR59A sweep generator, additional sweep width may be obtained by removing the sweep case back and shorting out resistors R14 and R16. After this, the front panel sweep width control still operates as before, except that more sweep width is available on the high channels.

The WR59A should be turned ON and OFF by means of the front panel control. If the sweep was turned off by disconnecting the power plug or by means of a bench master switch, but the sweep power switch was left on and in the maximum sweep width position, then the sweep modulator may overshoot and hit stationary parts when the power is reapplied.

KRK-8 R-F UNIT ALIGNMENT

It is suggested that the F-M trap adjustment (L203) be adjusted to minimum inductance (slug out) so that the effects of this trap, which is capable of being tuned to Channels 5 or 6, will not adversely affect the response of these channels during alignment.

USE OF WR39A & WR39B TELEVISION CALIBRATORS

In some instances it may be difficult to hear the heterodyne beat between the variable oscillator and the crystal standard in subject instruments, particularly at the high frequencies.

If the audio system of the receiver under test is in good condition, it is suggested that an audio lead can be run from the head phone jack of the calibrator to the "high" side of the volume control of the television receiver, thus utilizing the additional audio amplification available in the TV chassis.

PRODUCTION CHANGES IN KRK5 AND KRK7 R-F UNITS

In some units a 1.5 mmf. capacitor has been added in parallel with C22 since that capacitor was running on the low capacity side of its tolerance and causing the high pass input filter to cut off at too high a frequency, thus putting a tilt in the channel 2 r-f response.

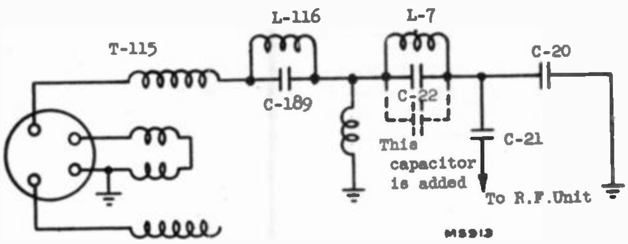


Figure 2—R-F Unit High Pass Input Filter

In some units, the capacitor C20 (18 mmf. ceramic) has been replaced by a small trimmer (7-35 mmf.) as shown in Figure 3. This capacitor was set at the factory at 18 mmf. and should not be adjusted in the field. If it is ever necessary to replace the trimmer, use the fixed ceramic capacitor specified in the replacement parts list.

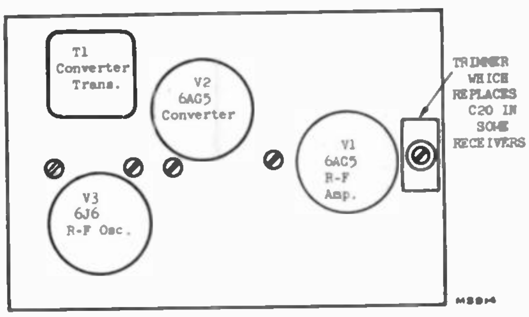


Figure 3—Top View of R-F Unit

BARKHAUSEN OSCILLATION

The usual effects of Barkhausen oscillation make themselves evident by producing one or more dark, sharply defined vertical lines on the left side of the picture or raster. These lines vary in width and/or intensity from one channel to another and from one brightness level to another. They are usually more apparent on the higher frequency channels and at low brightness settings. In the worst cases, these oscillations tend to upset horizontal synchronization. In the mild cases, they usually annoy the customer more than they do the set.

The only tube in the set that could cause this interference is the 6BG6G since it is the only one that has a positive grid to plate potential at any time. The critical voltages are reached just about the time the tube calls for deflection of the beam to the right hand side of the raster. This happens when the spot is about one third the way across horizontally.

Following are a few solutions to the problem:

1. Change the drive control setting.
2. Replace the 6BG6G with another. (The tube being replaced will probably operate satisfactorily in some other chassis.)
3. Change antenna or antenna lead-in placement.

The first method is critical with respect to line voltage and should be adjusted to give satisfactory operation on all available channels at any line voltage encountered.

The installations using either a built-in antenna or an indoor antenna are often subject to an undue amount of pickup because of their location. The lead-in, if draped near the high voltage compartment can also cause trouble. The solution for this type of trouble is obvious.

If a severe case of Barkhausen oscillation is encountered, and all normal methods have been unsuccessful in eliminating this trouble, a last resort which is usually successful is the installation of an ion trap magnet of any type over the 6BG6 tube. The position of this magnet should be adjusted to eliminate the oscillation.

BROADCAST INTERFERENCE IN KRK5 AND KRK7 R-F UNITS

In some cases where a television receiver is in operation on a weak signal but near a strong AM station, interference has been experienced. To cure, insert a 100 mmf. capacitor between the high side of T115 and L116, as shown in Figure 4.

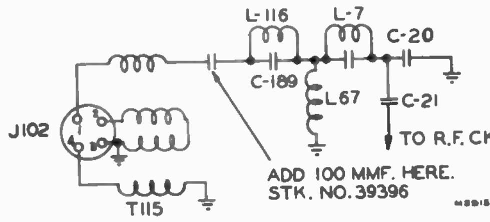


Figure 4—Partial Schematic of R-F Unit

In severe cases of BC interference, it is recommended that a coil such as L80 in KRK-2 r-f units be inserted from terminal #1 of J102 to ground.

DETENT BACKLASH— TV R-F UNITS

This particular trouble is easily recognized, and is generally more pronounced on the high frequency channels than on the lower frequency channels. If the fine tuning control requires different positions of adjustment when the detent is switched clockwise to a channel when compared to switching counter-clockwise to the same channel, there is backlash between the detent shaft and the oscillator switch rotor.

In severe cases, this play can result in oscillator drift due to rotor movement. In order to make the detent shaft fit the oscillator switch rotor more accurately, it is convenient to apply any quick-drying cement to the detent shaft, building it up. In unusual cases, more than one coat may be necessary. If too much thickness is built up, it may be sanded or filed to the required thickness.

MODEL KRK-8 AND KRK-8B R-F TUNERS

The KRK-8 tuner is used in 12½" TV models, and the KRK-8B tuner is used in 16" and 19" models. The only difference between these two units is the front shield plate and the four insulating washers used in mounting this plate.

These four insulating washers are very important for satisfactory performance of this tuner. A resonant circuit exists between the R-F tuner chassis and the outer shield box. The frequency of this resonance is controlled in design by the use of insulating washers of different thicknesses. In the KRK-8 tuner, these four washers are round—Stock #73466. In the KRK-8B tuner, the washers are hex shaped—Stock #75607.

If the R-F tuner is removed for service, the correct washers must be used when the unit is reinstalled.

HORIZONTAL OSCILLATOR RADIATION

Investigation of a number of horizontal oscillation radiation complaints has indicated that almost all of the radiation is from the power lines associated with the television receiver.

The simplest method for reducing or eliminating this objectionable interference is the installation of a good quality ac line filter on the TV set (such as Tobe Filterette, Type 1176). It is very important that a good ground connection be employed with a filter of this type.

TELEVISION PROTECTION FEATURE

Underwriters' laboratories have insisted that additional protection be provided in television receivers by adding a 100,000 ohm resistor from one side of the 110 volt a-c line to the chassis. This will parallel one of the capacitors presently connected from each side of the a-c line to the chassis.

On installations incorporating the neon lamp type lightning arrestor, the addition of this resistor may be sufficient to cause one of the neon lamps to glow. Of course, this would result in a loss of signal. If this occurs, it is merely necessary to reverse the power plug. The customer should be so instructed in order to avoid replacement of the line plug in its incorrect position.

TELEVISION INTERFERENCE, CAUSES & RECOMMENDED CURES

Type Of Interference	Character Of Interference	Cause	Suggested Remedies
FM	Diagonal bars or herringbone crosshatch in pix. FM sound in television sound.	FM station on image of low channel television station. FM signal overloading r-f unit creating harmonic in receiver which falls on highband television channel Second harmonic of FM transmitter falling on a high band television channel	Adjust FM trap to attenuate FM signal. Also use stub at the receiver cut for the fundamental of the FM station. Vary orientation of television antenna to reduce FM pickup. Second harmonic radiation must be suppressed at transmitter. Orient television antenna to reduce harmonic pickup.
Adjacent Channel Interference	Undesired Station causing blanking out of desired station or causing wind-shield wiper effect.	Inadequate receiver selectivity. Attempting to receive stations beyond their service area.	Align the receiver with special attention to the adjacent channel traps. Install additional adjacent channel traps. Use antenna with good front to back ratio, if applicable, or orient antenna to minimize adjacent channel pickup.
Co-channel Interference	Horizontal bars moving up and down through pix. In some cases the sound may be garbled.	Two stations operating on same channel. Customer located so as to receive signals from both stations.	Use antenna with good front to back ratio on that particular channel if stations are in opposite directions. Orient antenna for best results. "Venetian Blind" condition largely corrected by off-set carrier operation of stations.
Amateur	Cross hatch, horizontal or diagonal bars in picture. In instances of extreme interference pix may be reversed (negative) or pix may be blocked out with no visible beat pattern. Sound in television sound	Pickup of fundamental, harmonic or parasitic frequencies from amateur transmitter. Overload of television r-f unit, from fundamental of amateur transmitter.	If 28 mc interference is picked up in i-f then shield i-f's. If 28 mc interference "leaks" through KRK2 r-f unit, readjust adjacent channel sound trap to reject 28 mc interference. Install a good high pass filter as close to receiver input as possible (directly on head end unit) with short ground connection. With KRK8, avoid use of 72 ohm co-ax transmission line. If interference is definitely due to harmonics or parasitics, arrange with Amateur for reduction of spurious signals -e.g., Frequency multiply in low power stages, shield transmitter, and install low pass filter in transmitter antenna transmission line.
Interchannel	Diagonal bars in picture or undesired pix super-imposed on picture	Double conversion or oscillator harmonic conversions	Adjust FM trap Install stub cut to interfering frequency. Orient antenna to reduce interference.
Diathermy R-F Heating Equipment	Herringbone pattern on pix, also appears as heavy black horizontal bars across picture	Pickup of fundamental, harmonic or parasitic radiations from diathermy equipment.	Same approaches as for radio amateur interference Have owner employ reliable technician to eliminate harmonic or spurious radiations.
Ignition	Horizontal streak across pix - Noise in sound - Possible loss of sync.	Mostly due to weak signal being received from television station.	Use outside antenna to get good signal. Locate antenna away from streets or sources of interference. Use co-ax or twin-ex transmission line.
Horizontal Oscillator Radiation	Causes heterdyne whistle in AM Broadcast radio receiver	Harmonics of 15KC horizontal osc. of television receiver beating with broadcast band signals.	Try to secure stronger signal from radio station, by better radio antenna. Separate television and radio sets by as much distance as possible. Use interference filter on power line at television chassis. Put earth ground on chassis. Shield television chassis.
Sound & Pix I-F Harmonics In Picture	Herringbone pattern on pix if caused by sound i-f harmonics or bars if caused by picture i-f harmonics	Harmonics of sound or picture i-f's getting back into r-f unit.	Lead dress around sound and pix i-f's critical. Defective by pass capacitors. Use outdoor antenna. Keep lead-in away from last i-f stages. Shift i-f frequencies slightly. See RCA Television Supplement No. 2.

MODELS T164, TC165, TC166, TC167, TC168

Insufficient Width:

A. INSUFFICIENT WIDTH, KEYSTONE RASTER, ARCING, ETC.

Generally, this condition is caused by the dress of the leads to terminals 1 and 3 of the horizontal yoke. Shorting of these leads to turns of the horizontal yoke winding will account for a small horizontal raster, and the voltage difference between the turns will account for the arcing.

In cases of insufficient width on these models, the following changes which were made during production, should be checked:

1. Remove R167, 5600 ohm, 1 watt resistor, which is in parallel with L111, the horizontal linearity coil.
2. Install a 4.7 mmf. high voltage capacitor (RCA Part #75646) from Terminal #2 of T110 to +250 volt. This connection should be made at junction of fuse F101 and red lead on terminal board in H.V. compartment. The leads of this capacitor must be protected for their entire length by spaghetti and should be dressed away from the high voltage transformer, the 6BG6 tube, and the back cover of the H.V. compartment.

B. NO HORIZONTAL DEFLECTION

In some cases the leads of the horizontal section will make contact with the vertical section of the yoke. Under this condition there will be no horizontal deflection.

There is also a possibility that the saran, or insulating material, between sections will break down resulting in arcing and no horizontal deflection.

Since the majority of yoke defects are improper lead dress, the repair can often be effected in the field. The following is a logical approach:

Remove the yoke plug from the chassis and make a resistance check to possibly determine the defective section or sections:

NORMAL READINGS AT PLUG P106

Pin 4 to Pin 8—Measures approximately 40 ohms
Pin 1 to Pin 2—Measures approximately 3 ohms
Pin 1 to Pin 8—Measures infinity
Pin 4 to Pin 2—Measures infinity

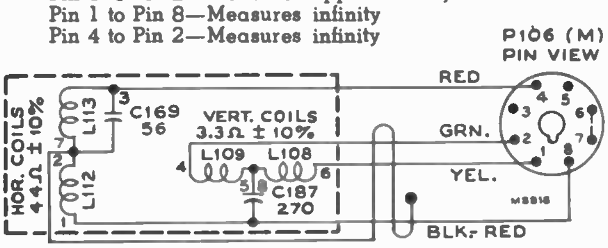


Figure 5—Yoke Connections to P106

If low resistance readings can be changed by squeezing the bakelite cap of the yoke, this is an indication that lead dress is at fault.

To clear a short, use a long probe and change the lead dress until the resistance readings are normal. Check the lead dress on yoke terminals 1 and 3 first.

If the resistance check is normal and the yoke is still defective, then connect the yoke plug, but do not insert the kine. Turn the receiver on and visually note the location of the arc. Once the location of the improper lead dress is determined, clear as before until the arcing condition does not exist. This type of trouble is of course not indicated by a resistance test, but is apparent only by the arcing condition due to the proximity of the wires.

The majority of failures are due to lead dress as pointed out above, however, one should not overlook the possibility of defective yoke capacitors and improperly soldered connections.

Production Change:

To correct a condition of grid blocking due to high frequency oscillations in the audio circuit of some chassis, the following changes were made early during the production of these receivers.

1. C202, C181, and the blue wire are to be removed from pin 6 of V120 socket and relocated on the vacant lug on the terminal board on the chassis side apron.
2. The other end of C181 is to be removed from pin 2 of V120 socket and connected to the center lug on the above mentioned terminal board.
3. C186 was changed from its former connection at C170-B to tie instead at pin 4 of V120 socket.

To reduce regenerative tendencies of the video amplifier at minimum setting of the contrast control:

1. R220 was changed in value from 12,000 ohms to 10,000 ohms.

"Kinky Raster"

Some of the KCS40, KCS40A chassis used in the above models produce non-linear raster edges, caused by capacity coupling of 60 and 120 cycle harmonic components that appear on these edges due to the order of the windings in the power transformer.

Non-linear edges on the raster edge can be corrected by adding a .002 mf. 1600 volt oil-filled capacitor (Stk. #73817) connected from terminal 6 (red and green lead) of V115 socket to chassis ground. Production is now adding this capacitor to compensate for this condition.

All chassis having this capacitor added will be marked by red paint on the top of the power transformer.

All power transformers marked with a yellow spot on the top will not require this modification.

The schematic for these models will show this capacitor dotted in place, but with no symbol assigned.

Extension Cables:

The yoke, focus coil and kinescope are fastened to the cabinet in the T164 series receivers and not to the chassis as in all previous models.

When the chassis is removed from the cabinet for service, it will be necessary to "unplug" the yoke and focus coil. With either of these two components out of the circuit, the receiver cannot be operated because of the +B disconnect incorporated in each plug.

In order to operate the receiver, removed from the chassis, it will be necessary to use extension cables to connect the yoke and focus coil.

If it is necessary to have the audio system of the receiver connected and operating during servicing, it will also be necessary to use an extension cable to connect the speaker. In the above models the output transformer is mounted on the speaker frame, and if the speaker is disconnected, the lead supplying +B to the audio output tubes is broken, making the audio amplifier inactive.

Figure 6 describes how these extension cables can be made, also stock numbers of plugs and connectors used.

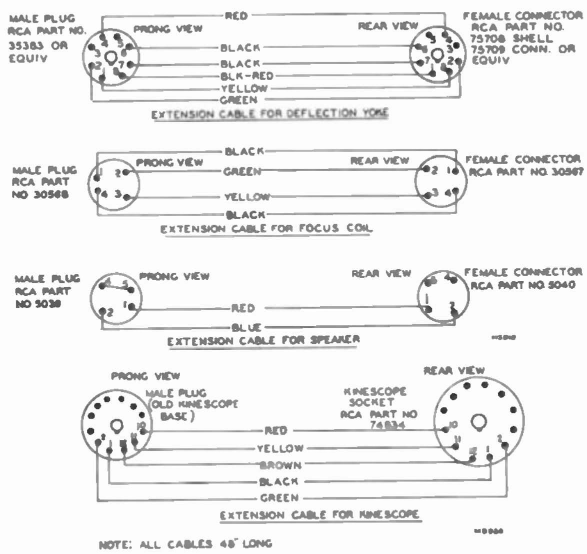


Figure 6—Extension Cables for T164 Series Receivers

60 CYCLE BUZZ IN SOUND OF TELEVISION RECEIVERS

This interference appeared on 8T270, 9T270, 9T246, T121 and 9TC245 series receivers when operated in strong signal areas.

There are several modifications which will cure this difficulty. These modifications have been made in production on T100, T120, TC124, T164, TA128, TA129 and TA169 series receivers. These modifications are listed below.

RECEIVERS USING ALL 6AG5 TUBES IN PICTURE I-F:

1. Replace 6AG5 tube in first picture i-f with others until one is found to cure condition.
   (6AG5 tubes which have an abnormally sharp grid cut-off characteristic will cause a buzz in sound. A tube removed for this trouble is not necessarily defective, but can be used in either the 2nd or 4th picture i-f where fixed bias is applied.)
2. Ground test connection in r-f unit (R-13, 100K).
3. Check all filter capacitors in the AGC circuit for wrong connections and also see that they are in good working condition.

RECEIVERS USING 6BA6 TUBES IN 1ST & 3RD PICTURE I-F:

1. Change 3rd picture i-f tube bias. Disconnect R110-L117 and C113 from their present tie point (junction R135 and C190) and reconnect them to the adjacent tie point of the junction of C197 and R136.
   NOTE: A greater AGC control of the r-f stage and 1st picture i-f amplifier is obtained by this change. This change was made in production of the 1949 models and also is used in the current models. In fringe areas, a slight reduction in sound may be encountered with this bias change. However, picture sensitivity will not be affected. In order to improve sound and if no buzz is encountered the bias can be changed to the original point.
2. Ground test connection (R13, 100K) in r-f unit.
3. Change R136 from 6800 ohms to 10K.
4. Check all filter capacitors in AGC circuit for correct connection and also to see if they are in good working condition.

I-F HARMONIC INTERFERENCE

This interference has appeared in a number of television receivers. The following discussion applies specifically to Models T100, T120 and T164 and in general to other models using KRK5 series or KRK7 R-F units which may have differing component identification.

Although all the affected receivers employ KRK5 or KRK7 R-F units, the interference is not the fault of the R-F unit.

Sound I-F Interference:

In some instances harmonics created in the sound i-f find their way back into the receiver input circuits and create interference. The sound i-f third harmonic falls into channel 3, the fourth harmonic falls into channel 6, the ninth harmonic falls into channel 9 and the tenth harmonic falls into channel 13. These may be identified by removing the second sound i-f tube to see if the interference disappears. If it does, then the harmonics are created in the sound i-f stage or in the discriminator. The following information may be helpful in eliminating or reducing such interference.

The ground wire running from pin #2 of the second i-f socket, which runs approximately an inch and a half to a lance towards the rear of the chassis, should be dressed away from pin #1 of this socket, and as far as possible towards Terminal B of T112. This will cause the wire to run a curve rather than a straight line and may require a slight lengthening of the ground lead.

Carefully check the i-f and discriminator transformer shield cans and wiring. The shield cans should be tight in place and well grounded to the chassis. In order to insure a good ground of these shield cans, it may be desirable to place some solder on the chassis where the can contacts the chassis so that the can may be pulled into the solder when clamped in place.

Carefully check the lead dress in the discriminator stage, particularly the leads connected to the discriminator transformer, making sure that they conform to all lead dress information contained in the service notes for the instrument involved.

Make sure that all by-pass capacitor leads in the sound i-f system are as short as possible and that the capacitor itself is dressed close to the chassis.

Make certain that the antenna lead-in from the terminal board on the rear of the cabinet to the r-f tuner input is dressed away from the chassis so as not to cause any unbalanced condition to the receiver input.

The normal discriminator wiring is from pin #1 of the 6AL5 to the tube socket shield, then to pin #6 and from pin #6 to ground. Disconnect the wire from ground to pin #6 and ground pin #1 separately with as short a lead as possible. In some instruments now in production, a zinc discriminator shield can is being used. This can is soldered directly to the chassis.

Picture I-F Interference:

In some instances harmonics created in the picture i-f find their way back into the receiver input circuits and create interference in the picture. The interference takes the form of a beat pattern which varies with fine tuning adjustment. In general, the more sensitive the receiver, the more susceptible it is to this sort of interference.

With the 21.25 mc. sound i-f and 25.75 mc. pix i-f system currently in use, the third pix i-f harmonic falls into channel 5 and the eighth pix i-f harmonic falls into channel 12. If such interference is experienced, it may be reduced by the following steps:

Check the antenna transformer T115, also L67. Check the antenna transmission line for continuity. If any of the above are defective, the interference may be severe.

Shield the fourth picture i-f and video amplifier tubes.

Dress the antenna lead from the r-f unit to the cabinet terminal board as far from the chassis as possible.

The wire leading from L102 and T106 to R120 must lie tight on the chassis.

The 10 mmf. pix detector by-pass capacitor should be wired between terminal C of T106 and pin 7 of the V105 socket with the shortest possible lead lengths and should be dressed down close to the chassis and away from other wiring.

The peaking coil, L103, should lie not over 1/4 inch off the chassis with the shortest possible leads and should be dressed away from other wiring.

The 1500 mmf. by-pass capacitor C193 which goes from plus B to ground at the end of R118 must be in good condition.

The filters on the r-f unit bias and plus B supplies (C132, R112, C192, R214, etc.) must be in good condition.

A few receivers have been found to suffer harmonic interference due to a peculiar fault in the 1500 mmf. bypass capacitors. These capacitors check normal at all frequencies up to 150 mc. but exhibit a higher resistance above this point. Therefore, these capacitors will work satisfactorily in i-f positions but show up defective when used to by-pass high frequencies such as are found in the r-f unit or harmonics of the sound and picture i-f's. Therefore, in such cases it would be wise to check C7, C9, C13, C17, C18, C19, C125, C132, C176, C177, and C192.

A weak 12AU7 (V106) may aggravate the harmonic interference by causing a reduction of AGC voltage.

In general, it is easier from a design standpoint to eliminate low order sound harmonics from the sound circuit than harmonics of higher order from the r-f channels, such as the tenth, etc., since bypass capacitors and ground returns are more effective at the lower frequencies. Likewise, it is more difficult to bypass picture i-f harmonics than sound i-f harmonics, since the impedance of the picture circuits is relatively low compared to that of the sound circuits.

Receivers using BUILT-IN antennas, or having the transmission line draped around the cabinet, are more susceptible to this type of interference. During the installation of a television receiver, this type of interference can be reduced by obtaining as strong a signal from the antenna as possible, and adjusting the AGC control to supply a lower peak voltage to the detector. Thus a higher ratio between TV signal and the i-f harmonic is obtained.

As a last resort, the receiver may be aligned to different i-f frequencies. This has the effect of pushing the interference into other channels. The attached chart shows 5 different i-f frequencies and the interferences that might be encountered in each. Harmonics that fall more than 0.5 mc. below the picture carrier should not cause interference and hence are not listed.

RECEIVER I-F FREQUENCY	MAY HAVE INTERFERENCE ON CHANNEL	CAUSED BY	POSITION OF HARMONIC WITH RELATION TO STATION PIX CARRIER
20.75 mc Sound i-f 25.25 mc Pix i-f 19.25 mc Adj. Chan. Pix 26.75 mc Adj. Chan. Snd.	Channel 7 Channel 11 Channel 3 Channel 6 Channel 9 Channel 12	7th Pix i-f harmonic 8th Pix i-f harmonic 3rd Sound i-f harmonic 4th Sound i-f harmonic 9th Sound i-f harmonic 10th Sound i-f harmonic	1.5 mc above 2.75 mc above 1.0 mc above .25 mc below .50 mc below 2.25 mc above
21.25 mc Sound i-f 25.75 mc Pix i-f 19.75 mc Adj. Chan. Pix 27.25 mc Adj. Chan. Snd.	Channel 5 Channel 12 Channel 3 Channel 6 Channel 13	3rd Pix i-f harmonic 8th Pix i-f harmonic 3rd Sound i-f harmonic 4th Sound i-f harmonic 10th Sound i-f harmonic	0 mc. .75 mc above 2.5 mc above 1.75 mc above 1.25 mc above
21.75 mc Sound i-f 26.25 mc Pix i-f 20.25 mc Adj. Chan. Pix 27.75 mc Adj. Chan. Snd.	Channel 5 Channel 8 Channel 6 Channel 10	3rd Pix i-f harmonic 7th Pix i-f harmonic 4th Sound i-f harmonic 9th Sound i-f harmonic	1.5 mc above 2.5 mc above 3.75 mc above 2.5 mc above
21.9 mc Sound i-f 26.4 mc Pix i-f 20.4 mc Adj. Chan. Pix 27.9 mc Adj. Chan. Snd.	Channel 5 Channel 13 Channel 7	3rd Pix i-f harmonic 8th Pix i-f harmonic 8th Sound i-f harmonic	1.9 mc above .05 mc below .05 mc below
22.1 mc Sound i-f 26.6 mc Pix i-f 20.6 mc Adj. Chan. Pix 28.1 mc Adj. Chan. Snd.	Channel 5 Channel 13 Channel 7 Channel 11	3rd Pix i-f harmonic 8th Pix i-f harmonic 8th Sound i-f harmonic 9th Sound i-f harmonic	2.25 mc above 1.5 mc above 1.5 mc above .25 mc below

CO-AX TO BALANCED LINE MATCHING NETWORK

In some locations it may be necessary to use 72 ohm co-ax transmission line between antenna and receiver because of reflection or interference pick-up. Current line receivers are provided with a 72 ohm co-ax input in addition to the usual 300 ohm input. Early receivers employing KRK-2 series r-f units are provided only with 300 ohm balanced input. To connect the co-ax to these early receivers, construct a network as shown in Figure 7. The matching section should be one electrical half wave-length long for the picture carrier of the weakest signal received.

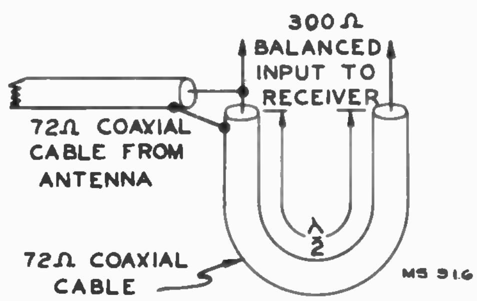


Figure 7—Co-Ax to Balanced Line Matching Network

MODELS TA169 AND S1000

Hum On Phono Operation:

Several of the above instruments have been found to have excessive hum when using the 960285 record changer (78/33⅓ r.p.m.) and require the following modifications of the record changer.

Add a jumper of .016· tinned bus wire 1⅝" long from terminal of black pickup lead to pickup mounting screw. The silver colored terminal pin of pickup is ground on "low" side and should be connected to the black lead and jumper. The black lead terminal must be removed from the pickup during the soldering to avoid damaging the pickup by excess heat.

CORONA INTERFERENCE— 19" MODELS

An interference pattern consisting of narrow vertical bars at the left-hand side of the raster, may be the result of internal corona, or arcing, within the 4.7 mmfd. capacitor (C198) located in the plate circuit of the horizontal sweep output tube.

This interference may be mistaken for Barkhausen oscillation, but none of the normal Barkhausen preventive methods such as adjusting the drive, placing a magnet over the 6BG6, etc., will be effective in eliminating the interference.

If such a condition is encountered, the capacitor should be replaced.

T101 DEFECTIVE IN MODELS T120, T121, TC124, TC125, TC127

In some cases, in the above listed receivers, it was found difficult to obtain proper response from T1 and T101 during alignment. The difficulties are usually caused by reversed slugs in T101 The trap (top) slug should be between ⅝ to 1" in length (depending on the vendor) and the input (bottom) slug should be about ½" long. On some sets the two slugs might have been switched around which will not permit sufficient adjustment on the over-coupled tuning. Both slugs may be removed for examination from the top of the transformer. The short slug should be put in first in re-assembly.

SUBSTITUTE 12" P.M. SPEAKERS

Television instruments have used 12" P.M. speakers supplied by several vendors. The speaker cones are not interchangeable. The following is a listing of 12" P.M. speakers and their associated replacement cones which have been used in 1950 television instruments.

Speaker No.	Cone No.	Speaker No.	Cone No.
92569-5K	75642	92569-9W	74901
92569-5W	74901	92569-10B	75875
92569-6W	74901	92569-10W	74901
92569-7B	75875	92569-11B	75875
92569-7K	75642	92569-11K	75642
92569-7W	74901	92569-11R	76121
92569-8W	74901	92569-11W	74901
92569-9B	75875	92569-12W	75682

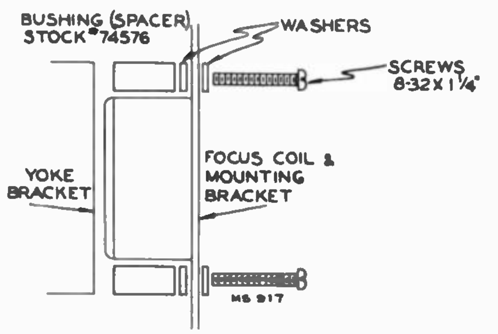
MODELS T120, TC124, TC125, TC127

Picture Corner Shadows:

If it is impossible to remove kinescope shadows by the prescribed method (see service notes) of adjusting the focus coil and ion trap magnet, then make the following test:—

1. Remove the two focus coil mounting screws (8-32 x ⅜") and reverse the focus coil and temporarily replace it in a position adjacent to the deflection yoke as shown in Figure 10.
2. Install the ion trap magnet and kinescope tube socket in a normal manner.
3. With the receiver turned on, adjust the ion trap magnet for the brightest raster on the screen.
4. Position the focus coil physically, and determine if the focus coil in the reversed position corrects the shadow condition. A slight readjustment of the ion trap magnet may be necessary.

If the above test indicates that the focus coil in a reversed position is the desired position, then the following mounting modification is recommended. See Figure 8 below for details.



MATERIAL LIST

Quan.	Description
2	Spacer—Insulating bushing, Stock No. 74576
2	Screw—#8-32 x 1¾"
2	Washer—¾" O.D., 1/16" thick, hole to clear #8-32 screw

Figure 8 Focus Coil Mounting Modification

EM-PM FOCUS COIL TROUBLES

In some cases, trouble has been experienced with EM-PM focus coils. These difficulties show up as inability to reach focus with the focus control.

If everything is operating properly, the overall focus and focus regulation is much better with the new coil than with the straight EM type.

The troubles with the PM-EM coil can be summarized as being one or more of the following:—

1. Incorrect placement of the coil on the kine' neck.
2. Too much PM.
3. Too little PM.
4. Polarity of the EM winding reversed in color code and/or hookup.

The normal placement of the coil is with the front plane of the coil approximately one quarter of an inch behind the back cover of the yoke. Moving the coil back on the kine' will, in effect, be the same as reducing the total flux of the coil. Some cases of too much PM can be thus corrected. In a few such cases, the correct focus was obtained at the sacrifice of loading spring tension. It is suggested that washers be used to bush up the springs if they are too loose when the correct focus is obtained. Under no circumstances should the EM portion of the coil be reversed to compensate for too much PM. Doing this will eventually run the PM down to zero and make the coil useless along with producing a service call every week or so.

(It may appear that an "aiding" flux might gradually increase the PM flux. Such is not the case because the PM material is magnetized to a greater density than the EM portion).

Polarity may be checked by the following method:

1. Get as good a focus as possible with the coil up against the yoke. Note the voltage across the EM winding.
2. Move the coil as far to the rear as possible and turn the focus control so that Condition 2 approximates Condition 1 in appearance. Note the voltage across the EM winding.

The voltage across the EM winding should be higher in Condition 2 than in Condition 1.

(The effects of magnetism are minimized as the coil is moved to the rear so that more magnetism must be supplied.

If Condition 2 reading is lower, or if no satisfactory comparison can be obtained by adjustment, then the EM winding is reversed and should be reconnected in the proper way.

A tag should be attached to the set to indicate a change if the color code is incorrect so that some future serviceman knows what has been done.

If position and polarity have been checked and it is discovered that there is too little PM, the entire coil must be replaced. The 6BG6 supply should not be reconnected to add to the focus current because it overloads the coil and the shunt potentiometer.

On some sets it will be found that by shorting the 10 ohm resistor, enough control is obtained. This should not be done since the focus potentiometer would be overloaded if the arm is set near the short circuit end. Moving the coil toward the rear will solve a problem of this type and still permit good focus with the 10 ohm resistor in the circuit.

2T51, 2T60, 2T81

THE FOLLOWING CHANGES ARE SUGGESTED IN THE EVENT ANY OF THE LISTED SERVICE PROBLEMS ARE ENCOUNTERED IN THE ABOVE MODELS:

1. **Noise in Sound—(Fringe Areas)**
   a. Add .01 mfd. capacitor (Stock #73960) in shunt with C190 with leads as short as possible.
   b. Add .0015 mfd. capacitor C199 (Stock #73598) from connection point of R192 on TV-Phono switch to ground. (Models 2T51 and 2T60 only.)
   c. Properly align sound I.F. and discriminator circuits.
   d. Thoroughly check 1500 mmf. "plug-in type" capacitors for open and leakage. (A number of these capacitors have been found in this condition and contribute to weak and noisy sound.)
   e. Check 6AU6 second sound I-F tube. Some of these tubes have been found to have remote cut-off characteristics and cause insufficient limiting in this circuit.

2. **Picture Bending (Top of Picture)**
   a. Change cathode resistor R136 of DC restorer tube to 560K.

   NOTE: This should only be done in strong signal areas where bending of the top of picture usually occurs. Changing this resistor in weak signal areas may decrease the noise immunity of the restorer circuit.

3. **Picture Bending (Bottom of Picture)**
   a. Change third picture I-F plate load resistor R115 from 3900 to 1800 ohms.
   b. Change fourth picture I-F plate load resistor R119 from 8200 to 18K ohms. Shunt this resistor with a 36 muh. peaking coil Stock #75299. It is important that this stock number coil be used because of its distributed capacity. Do not use any other 36 muh. coil.
   c. Retune the fourth picture I.F. (T104) to 22.5 mcs. Retune the fifth picture I.F. (L103) to 24.25 mcs.

   NOTE: It is important that I.F.'s be "peak" aligned so these two circuits will be tuned to the exact new frequencies before the overall I.F./R.F. response is "touched up" to obtain a good response curve.

4. **Overload of Receiver on Strong Signals**
   Several cases have been reported where L102 has been installed in reverse position. Wiring this I-F coil correctly has eliminated the trouble.

RCA VICTOR

Radio-Phonograph Combination

MODEL A55

Chassis No. RC-1087

— Mfr. No. 274 —

SERVICE DATA

— 1950 No. 10 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range ....540-1600 kc

Intermediate Frequency ....455 kc

Tube Complement
(1) RCA 12SA7 ....Converter
(2) RCA 12BA6 ............I.F. Amplifier
(3) RCA 12SQ7............Det.—AVC.—A.F. Amp.
(4) RCA 50L6GT ....Output
(5) RCA 35Z5GT ....Rectifier

Power Supply Rating ....115 volts, 60 cycles, 50 watts

Loudspeaker
Type 92586-2 .... 8 in. P.M.
Voice coil impedance ....3.2 ohms at 400 cycles

Tuning Drive Ratio ....12½:1 (6¼ turns of knob)

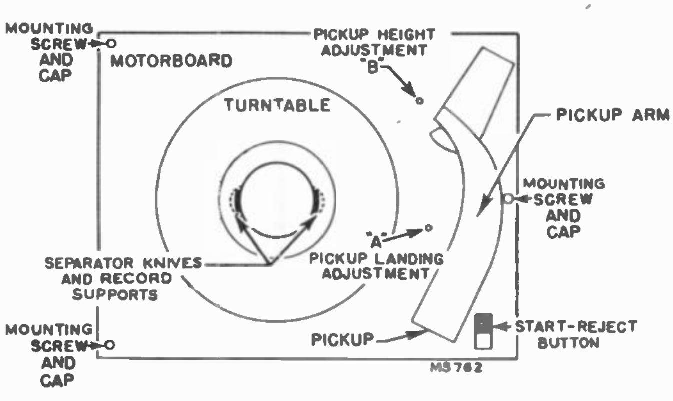
Dial Lamps (2) ....Type No. 1490, 3.2 volts, .16 amp.

Power Output
Maximum 1.5 watts   Undistorted 1 watt

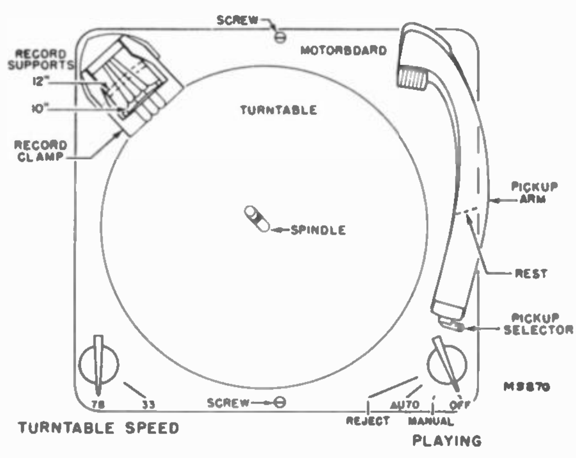
Weight ....67 lbs.

Cabinet Dimensions
Height 29⅛"   Width 30⅜"   Depth 17"

Record Players (2)
RP 168 ....45 RPM
Record capacity ....up to ten RCA 7 in fine groove
960282-1 .... 78 or 33 1/3 RPM
Record capacity ....up to ten 12 in. or twelve 10 in.



Top View—45 R.P.M. Record Changer



Top View—78/33⅓ R.P.M. Record Changer

REFER TO RP 168 SERIES SERVICE DATA FOR INFORMATION ON 45 R.P.M. RECORD CHANGER

REFER TO 960282 SERVICE DATA FOR INFORMATION ON 78/33⅓ R.P.M. RECORD CHANGER

A85

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

Signal Generator.—For all alignment operations, connect the low side of the signal generator to the receiver chassis and keep the output as low as possible to avoid AVC action.

It may be desirable to use an isolation transformer (117v./117v.) for the receiver if the signal generator is also a.c. operated.

Steps	Connect high side of sig. gen. to—	Adjust sig. gen. to—	Turn radio dial to—	Adjust for max. output—
1	Converter grid (pin #8 of 12SA7) thru a .1 mf. capacitor	455 kc	Quiet point near 1600 kc	T2 top & bottom 2nd I.F.
2				T1 top & bottom 1st I.F.
3	Repeat Steps 1 and 2 using alternate loading*			
4	Short wire placed near loop for radiated signal	1620 kc	Gang fully open	C6 (osc.)
5		1400 kc	1400 kc signal	C3 (ant.)
6		600 kc	600 kc signal	L 2 (osc.) (rock gang)
7	Repeat Steps 4, 5 and 6			

* Alternate loading involves the use of a 22,000 ohm resistor to load the plate winding while the grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 22,000 ohm resistor after T2 and T1 have been aligned.

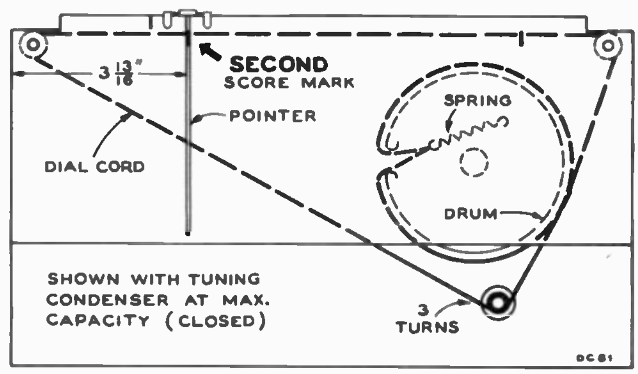
NOTE: If "alternate loading" is not used during I-F alignment, it may result in non-symmetrical response. This is due to the characteristics of the I-F transformers used in this chassis.

Dial Pointer Position

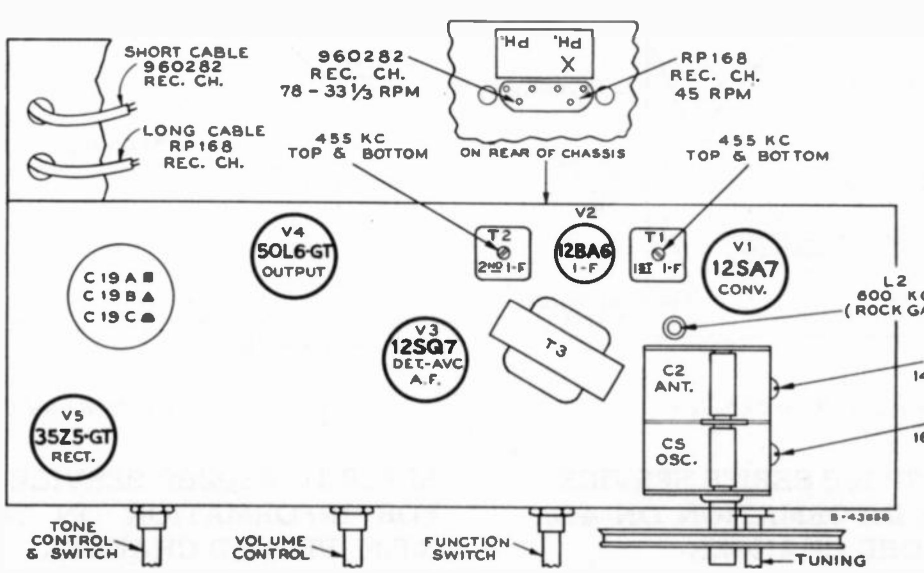
With the tuning condenser fully meshed, set the dial pointer to the SECOND score mark from the left hand edge of the dial back plate.

Lead Dress

1. Dress all heater leads down to chassis and as far as possible from all audio grid and plate winding.
2. Dress power cord to side apron and away from tone control.
3. Dress capacitor C22 down to chassis and keep leads as short as possible.
4. Dress pilot light leads and phono. power cables to side apron and away from tone control.
5. Dress phono. A.C. leads on function switch away from all other terminals and run leads directly through to front apron.
6. Dress output transformer leads down to chassis.
7. Dress C20 away from chassis and wire with as short leads as possible.
8. Dress excess loop leads away from tubes and clear of gang condenser.
9. Dress lead from tone control to S-1 terminal #7 along chassis base and front apron.

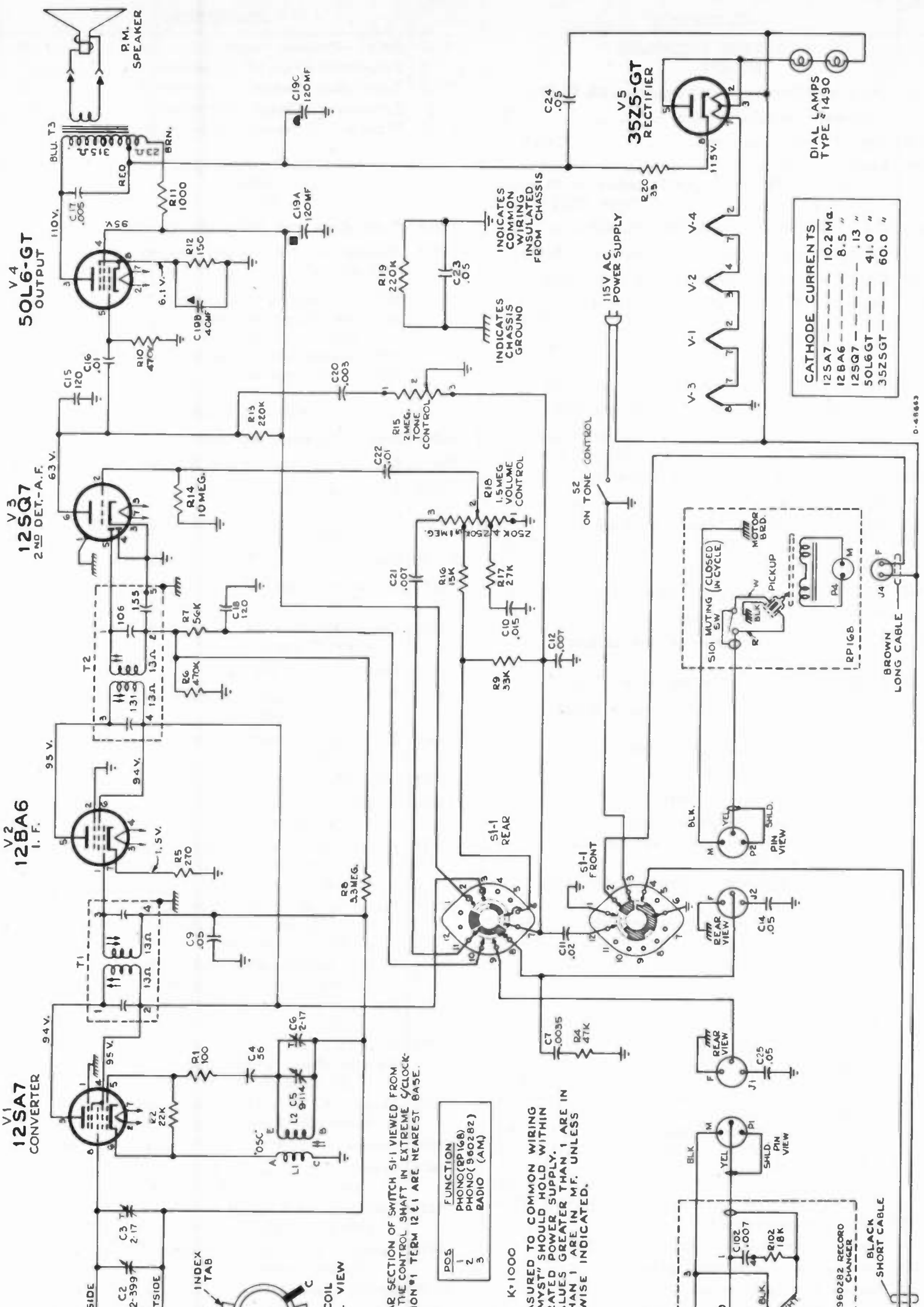


Dial-Indicator and Drive Mechanism



Tube and Trimmer Locations

A55



SCHEMATIC DIAGRAM

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1087
74763	Capacitor—Variable tuning capacitor, C2, C3, C5, C6
71924	Capacitor—Ceramic, 56 mmf. C4
39630	Capacitor—Mica, 120 mmf. C15, C18
74678	Capacitor—Electrolytic, comprising 2 sections of 120 mfd., 150 volts and 1 section of 40 mfd., 25 volts C19A, C19B, C19C
70603	Capacitor—Tubular, paper, .003 mfd., 400 volts C20
70604	Capacitor—Tubular, paper, .0035 mfd., 400 volts....C7
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts ..C17
70608	Capacitor—Tubular, paper, .007 mfd., 400 volts C12, C21
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts, C16, C22
70572	Capacitor—Tubular, paper, .015 mfd., 400 volts ..C10
70611	Capacitor—Tubular, paper, .02 mfd., 400 volts C11
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts, C9, C14, C23, C24, C25
73935	Clip—Mounting clip for I.F. transformer
74448	Coil—Oscillator coil L1, L2
30868	Connector—2 contact female connector for motor cable J3, J4
71596	Control—Volume control R18
74761	Control—Tone control and power switch R15, S2
71457	Cord—Power cord and plug
†72953	Cord—Drive cord (approx. 48" overall length required.)
74838	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet to mount tuning capacitor.
74765	Indicator—Station selector indicator
71116	Lamp—Dial lamp—Type #1490
74766	Loop—Antenna loop assembly
72776	Pin—Contact pin for speaker lead
75047	Plate—Dial back plate complete with two (2) pulleys less dial
18469	Plate—Bakelite mounting plate for electrolytic capacitor
74767	Receptacle—Dual phono input receptacle J1, J2
74768	Resistor—Wire wound, 33 ohms, 1 watt R20
	Resistors—Fixed, composition:—
	100 ohms, ±20%, ½ watt R1
	150 ohms, ±10%, ½ watt R12
	270 ohms, ±10%, ½ watt R5
	1000 ohms, ±10%, 1 watt R11
	15,000 ohms, ±10%, ½ watt R16
	22,000 ohms, ±10%, ½ watt R2
	27,000 ohms, ±10%, ½ watt R17
	33,000 ohms, ±10%, ½ watt R9
	47,000 ohms, ±10%, ½ watt R4
	56,000 ohms, ±10%, ½ watt R7
	220,000 ohms, ±10%, ½ watt R13, R19
	470,000 ohms, ±10%, ½ watt R6, R10
	3.3 megohm, ±20%, ½ watt R8
	10 megohm, ±20%, ½ watt R14
74764	Shaft—Tuning knob shaft
73117	Socket—Tube socket, miniature for 12BA6
31251	Socket—Tube socket, octal wafer
74014	Socket—Dial lamp socket
74038	Spring—Drive cord tension spring
74762	Switch—Function switch S1
74918	Transformer—First I.F. transformer T1
73037	Transformer—Second I.F. transformer T2
74677	Transformer—Output transformer T3
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES 92586-2 RL 105C2
74758	Cone—Cone and voice coil assembly
74679	Speaker—8" P.M. speaker complete with cone and voice coil
	NOTE:—If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74205	Bezel—Dial bezel less dial
70608	Capacitor—Tubular, paper, .007 mfd., 400 volts ..C102
74298	Clamp—Dial clamp (2 req'd)
X3115	Cloth—Grille cloth for mahogany or walnut instruments
X3116	Cloth—Grille cloth for oak instruments
74192	Connector—3 contact male connector for pickup cables P1, P2
74581	Cover—Mounting screw cover—use with #74582 screw (3 req'd)
71910	Decal—Trade mark decal
74771	Decal—Control panel function decal for mahogany or walnut instruments
74772	Decal—Control panel function decal for oak instruments
74769	Dial—Glass dial scale
74206	Grommet—Rubber grommet to mount 960282 record changer
74931	Knob—Tuning control, volume control or tone control and power switch knob—maroon—for mahogany or walnut instruments
72824	Knob—Tuning control, volume control, function switch or tone control and power switch knob—brown—for oak instruments
74934	Knob—Function switch knob—maroon—for mahogany or walnut instruments
74208	Nut—Tee nut to mount RP 168 record changer (3 req'd)
74770	Pull—Door pull
	Resistor—Fixed, composition: 18,000 ohms, ±10%, ½ watt R102
74582	Screw—#8-32 x 1¾" special head screw to mount RP168 record changer (3 req'd)
74269	Screw—#8-32 x ¾" trimit head screw for door pull
74422	Spring—Conical spring to mount RP168 record changer—upper—L.H.—(2 req'd)
74421	Spring—Conical spring to mount RP168 record changer—upper—R.H.—(1 req'd)
74423	Spring—Conical spring to mount RP168 record changer—lower—(3 req'd)
30900	Spring—Retaining spring for knobs
75040	Spring—Mounting spring for 960282 record changer

†Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

AM-FM Radio Receiver

MODEL A78

Chassis No. RC-1084A

— Mfr. No. 274 —

SERVICE DATA

— 1950 No. 4 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Ranges

Standard Broadcast (AM) .... 540-1,600 kc.
Frequency Modulation (FM) .... 88-108 mc.

Intermediate Frequency .... AM—455 kc., FM—10.7 mc.

Tube Complement

(1) 6J6 .... Mixer and Oscillator
(2) 6BA6 .... I. F. Amplifier
(3) 6AU6 .... Driver
(4) 6AL5 .... Ratio Detector
(5) 6AV6 .... AM Det.—AVC—A. F. Amp.
(6) 6V6GT .... Output
(7) 6X5GT .... Rectifier

Power Supply Rating .... 115 volts, 60 cycles, 70 watts

Loudspeaker

Type 92569-9 .... 12 in. P.M.
Voice coil impedance at 400 cycles .... 3.2 ohms

Tuning Drive Ratio .... 18:1 (9 turns of knob)

Pilot Lamps (3) .... Type No. 51, 6-8 volts, 0.2 amp.

Power Output

Maximum .... 5 watts
Undistorted .... 2 watts

Cabinet Dimensions

Height .... 32" Width ...... 30½" Depth ...... 17¼"

Antennas:

This receiver has built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception.

Under average conditions the (FM) antenna will provide satisfactory reception. However, provision is made for the use of external antennas if desired—connect as indicated below:

FM Antenna: Connect the transmission line from an external FM dipole antenna to "FM" and "G" terminals. Remove the internal FM antenna wire from terminal "FM."

Record Player (2)

RP168 .... 45 RPM
960282-1 .... 78, 33⅓ RPM

For information on 45 RPM changer refer to RCA Victor RP168 Series Service Data

For information on 78, 33⅓ RPM changer refer to RCA Victor 960282-1 Series Service Data.

Circuit Description

The chassis used in these receivers have a 6J6 tube (V1) (twin triode), one section of which is used as mixer and the other section as oscillator. The FM antenna coil and the FM oscillator coil are placed in such position as to provide coupling between them. A section of the AM oscillator coil is connected in series with the mixer grid input when the range switch is in AM position.

Dual I-F transformers are used, each transformer containing both AM and FM windings. The I-F amplifier is V2 (6BA6).

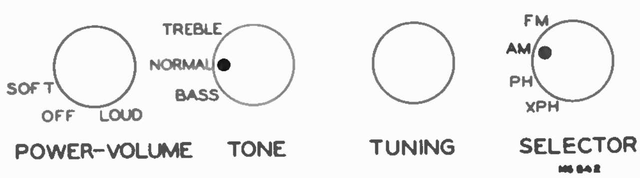
The range switch has four functions:

(1) Selection of AM, FM ranges or Phono.
(2) Selection of AVC supply voltages to be applied to the controlled tubes. Simple AVC is applied to the grids of V1 and V2 on AM. Delayed AVC is used on FM and is applied only to the grid of V2.
(3) Controls application of B+ voltage to the plate circuits of V1 (disconnected for PHONO operation).
(4) Controls audio input to volume control.

The driver V3 (6AU6) and ratio detector V4 (6AL5) circuits are similar to those used in other RCA Victor AM-FM receivers.

The audio voltage controlled by the volume control is amplified by V5 (6AV6) and V6 (6V6GT).

The rectifier V7 is type 6X5GT.



Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Oscilloscope Alignment:

The FM I. F. alignment may be checked using a sweep generator and an oscilloscope. Shunt terminals B and C of T4 with a 1200 ohm resistor. Connect the high side of the oscilloscope to term. C of T4 in series with a diode probe. Apply the output of the sweep generator (10.7 mc with ±250 kc sweep) to pin No. 1 of V2 (6BA6) in series with .01 mf., low side of the oscilloscope and sweep generator to chassis. This will show the response of T3.

To check the combined response of T2 and T3; connect the sweep generator to the antenna terminal board—high side to "FM" term. in series with 300 ohms and low side to "G" terminal. Oscilloscope connections as previously connected.

To check the ratio detector response; remove the 1200 ohm resistor previously used, connect the high side of the oscilloscope direct to term. No. 9 of S1, low side to chassis. Apply the output of the sweep generator to pin No. 1 of V3 (6AU6) in series with .01 mf. **Note:** It is difficult to observe marker signals in this step—center frequency and sweep width should be previously observed.

Critical Lead Dress

1. Short leads on C7.
2. Dress R27 away from switch and Pin 5 of V1.
3. Ground lead on Pin 2 of V2 & V3 should be down against chassis. Its length is critical.
4. A.V.C. lead from R26 to switch should be dressed against chassis and on front apron side of output transformer.
5. C43 should have short leads and color code end of capacitor should go to coil. Capacitor is to be cemented down with polystyrene cement the same time L2 is.
6. High side loop lead should be dressed away from tubes.
7. Lead from Pin 2 and V1 to terminal A of first dual I.F. transformer should be dressed against chassis.
8. Wire C40 directly between gang condenser and Pin 1 of V1.
9. Keep all the F.M. leads as short as possible.
10. Dress lead from Pin 5 of V2 to terminal A of T3 down against chassis.
11. Dress resistor R15 near chassis base.
12. Dress all A.C. leads away from volume control.
13. Run lead from F.M. Terminal on the antenna terminal board to L2 tap around the can of T2 and away from V2.
14. The taps on L1 & L2 are critical.
15. The lead from R32 to terminal 10 of S1 should be dressed away from the output transformer, T5.
16. Dress C25 and C26 against chassis with the shortest lead length possible..
17. Coupling between pins 5 & 6 of VI, and the components attached, should be kept to a minimum.
18. Coupling between L1 & L2 should be adjusted to give the proper oscillator injection voltage to the mixer grid.

AM Alignment

RANGE SWITCH IN BC POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	C3 in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	AM windings.† T3 bottom core (sec.). T3 top core (pri.).
2				AM windings.† T2 top core (sec.). T2 bottom core (pri.).
3	"A" terminal of terminal board at rear of chassis in series with 220 mmf.	1400 kc.	1400 kc.	C13 osc. C4 ant.
4		600 kc.	600 kc.	L4 osc. (Rock gang.)
5	Repeat Steps 3 and 4.			

† Use alternate loading.

Alternate loading involves the use of a 47,000 ohm resistor to load the AM plate winding while the AM grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 47,000 ohm resistor after T3 and T2 have been aligned.

Oscillator frequency is above signal frequency on both AM and FM.

FM Alignment

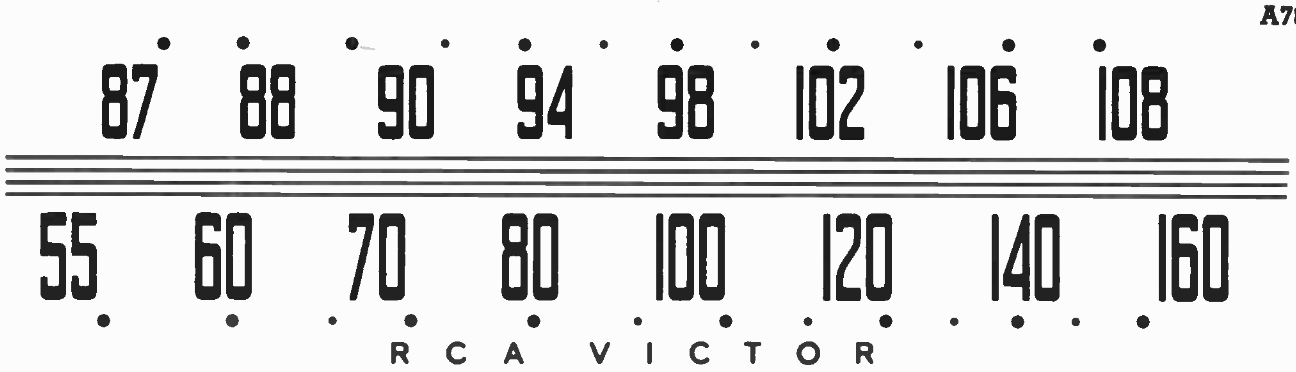
RANGE SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C33 and the common lead to chassis. Turn gang condenser to max. capacity (fully meshed).			
2	Pin 1 of 6AU6 in series with .01 mfd.	10.7 mc. modulated 30% 400 cycles AM (Approx. .05 volt).	Max. capacity (fully meshed)	T4 top core for max. d-c voltage across C33. T4 bottom core for min. audio output.*
3	FM ant. term in series with a 300 ohm resistor. (Remove ant. lead from "FM" term.)	10.7 mc. Adjust to provide 2 to 3 volts indication on VoltOhmyst during alignment.		FM windings.†† T3 top core (sec.). T3 bottom core (pri.).
4				FM windings.†† T2 top core (sec.). T2 bottom core (pri.).
5		106 mc.	106 mc.	L2 osc.** C2 ant. Set C2 at max. capacity while adjusting L2.
6		90 mc.	90 mc.	L1 ant.** (Rock gang.)
7	Repeat Steps 5 and 6 until further adjustment does not improve calibration.			

* Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

†† Align T3 and T2 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 47,000 ohm resistor and load the FM windings.

** L1 and L2 are adjustable by increasing or decreasing the spacing between turns.



Dial Scale Actual Size

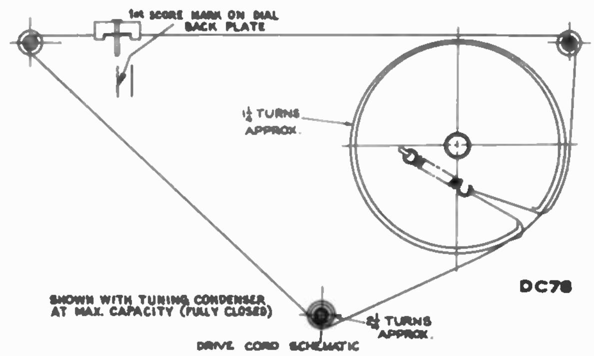
Substitute Record Changer:

In some instruments a late type RP 168 record changer is used. The mechanism is labeled RP 168D-1. The motorboard is a gold finish and has an "ON-OFF" switch.

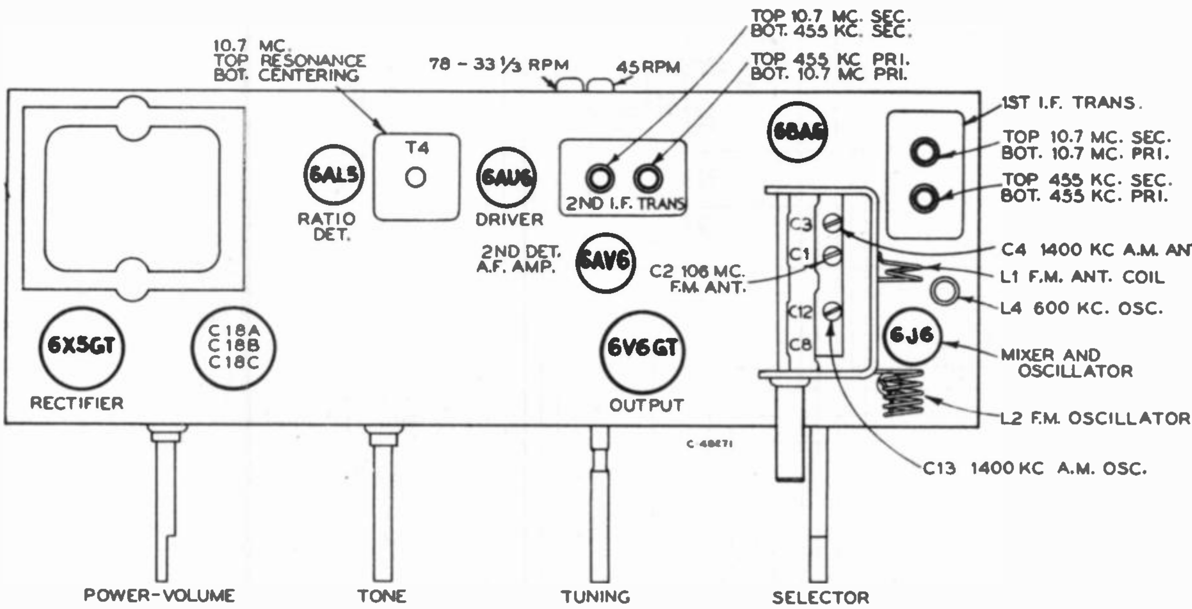
This changer is mounted on three rubber grommets instead of springs. Three #10 x 1.in. screws are used to retain the record changer and should be tightened only "finger tight."

The following items (not previously listed) are available as replacement parts:

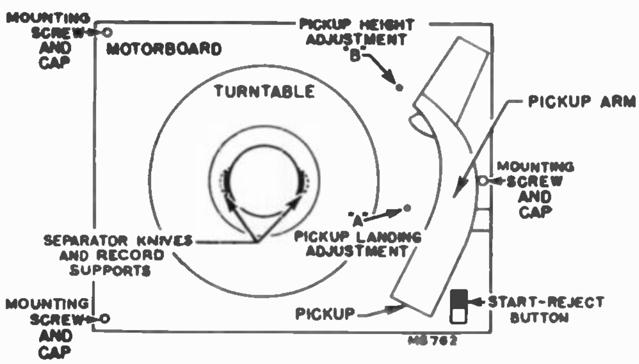
32875	Switch—"ON-OFF" switch for record changer
75652	Base—Record changer sub-base for mechanisms labeled RP 168D-1
75697	Grommet—Rubber grommet for mounting record changers having "T" nuts on under side of motorboard



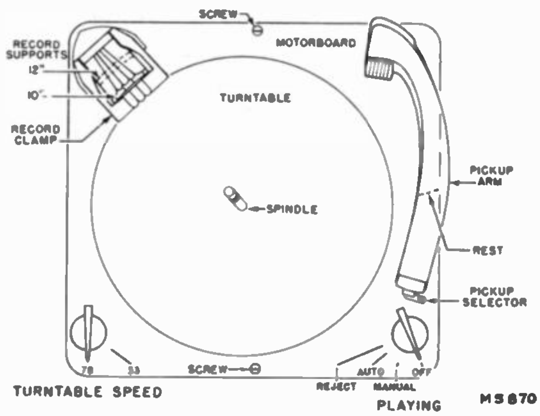
Dial Indicator and Drive Mechanism



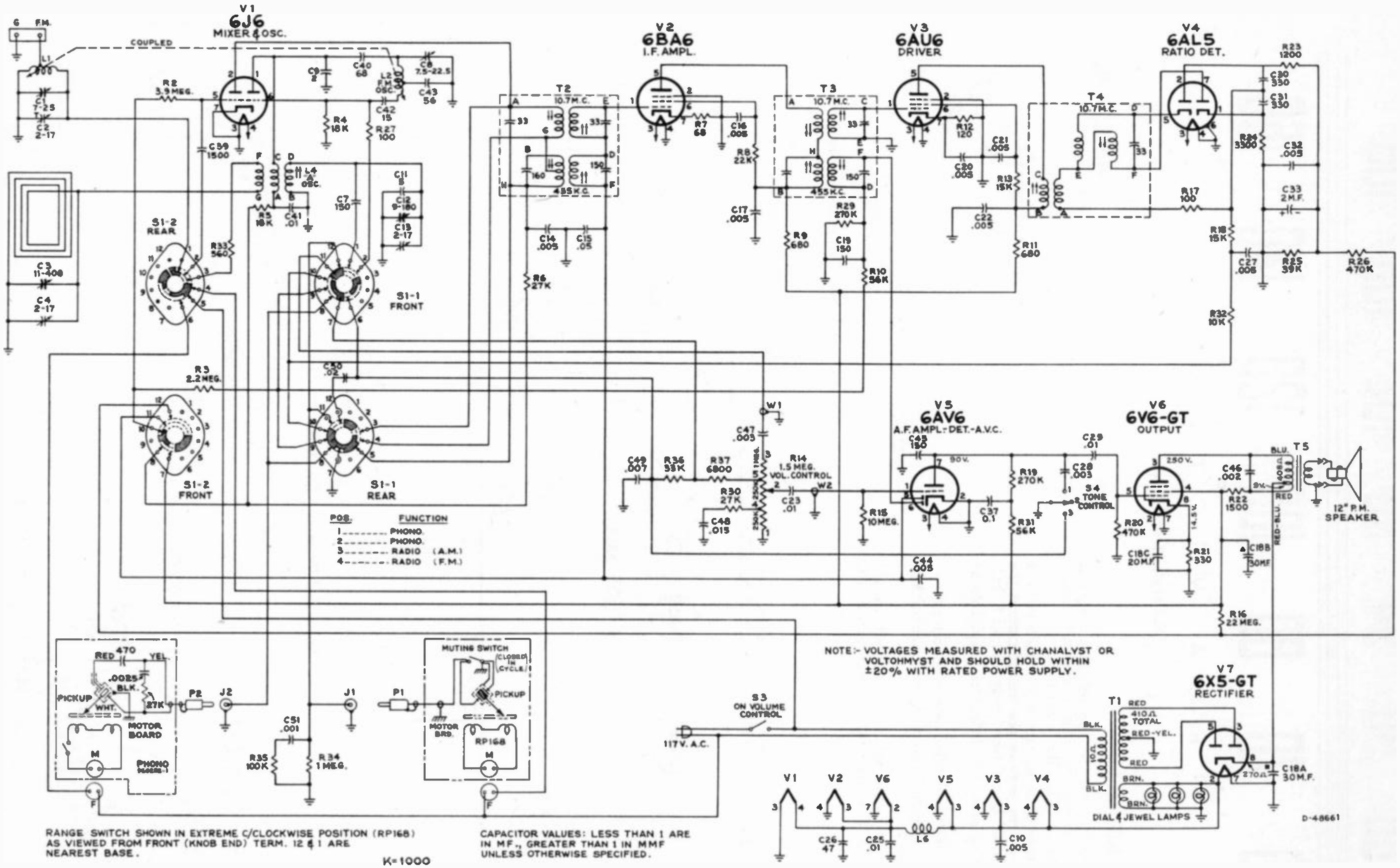
Tube and Trimmer Locations



Top View—45 R.P.M. Record Changer



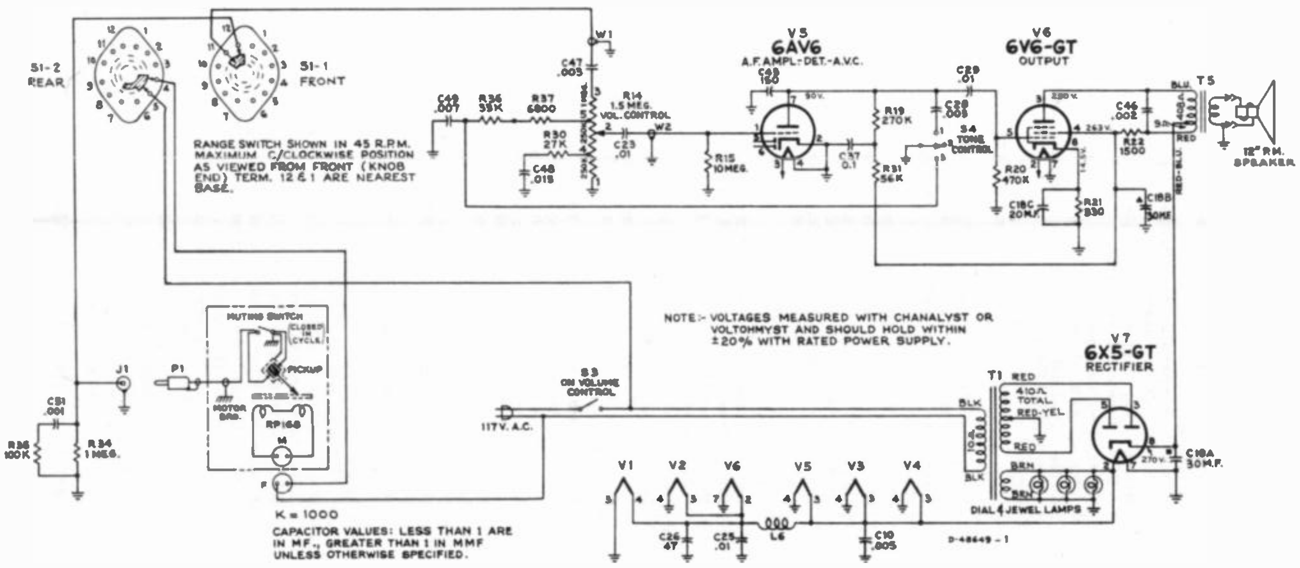
Top View—78/33⅓ R.P.M. Record Changer



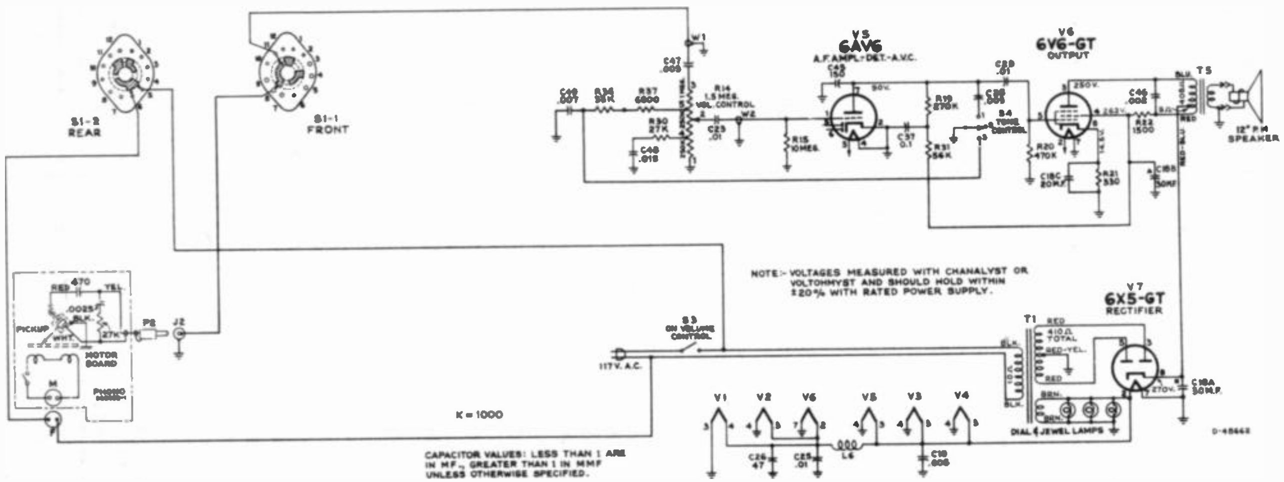
Complete Schematic Diagram

Substitute Speaker:

In some instruments a substitute speaker (stamped 92569-9B) has been used instead of the specified speaker (stamped 92569-9W RMA274 RL111-14). The cone and voice coil assembly for the substitute speaker is available as Stock No. 75875.



Simplified Schematic Diagram
45 RPM Phono



Simplified Schematic Diagram
33⅓, 78 RPM Phono

Voltage Chart

Tube	Type		Pin No.	"A"	"FM"	Phono
1	6J6	Plate Plate Grid Grid	1 2 6 5	108 94 -6.8 -3.0	106 109 -6.7 -2.5	— — — —
2	6BA6	Plate Screen Cathode Grid	5 6 7 1	185 110 0.75 -1.6	180 94 0.88 -0.5	— — — —
3	6AU6	Plate Screen Cathode	5 6 7	184 132 1.1	180 130 1.1	— — —
4	6AL5	—	—	—	—	—
5	6AV6	Plate Grid	7 1	74 -0.8	74 -0.8	90 —
6	6V6GT	Plate Screen Cathode	3 4 8	243 193 9.7	242 190 9.5	250 263 14.5
7	6X5GT	Cathode	8	250	250	270

Cathode Currents (MA)

Tube	Type		Pin No.	"A"	"FM"	Phono
1	6J6		7	8.6	8	—
2	6BA6		7	12	13	—
3	6AU6		7	13.5	13.5	—
4	6AL5		1 & 2	—	—	—
5	6AV6		2	0.3	0.3	0.55
6	6V6GT		8	28.2	27.6	44.5
7	6X5GT		8	63	62.2	45

Voltages and currents measured with tuning condenser closed and no signal input should hold within ±20% with rated line voltage.

Note: Plate voltage removed from 6J6 mixer and oscillator tube during "Phono" operation.

Model A78 is identical to Model 9W78 except Model A78 has a 78/33⅓ r.p.m. record changer instead of 78 r.p.m.

The simplified schematic diagrams for 9W78 in RCA Victor Bound Volume V also apply to Model A78.

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES **RC1084A**
73893	Board—"F. M." terminal board
73889	Capacitor—Variable tuning capacitor (C1, C2, C3, C4, C8, C12, C13)
73866	Capacitor—Ceramic, 2 mmf. (C9)
93056	Capacitor—Ceramic, 5 mmf. (C11)
39044	Capacitor—Ceramic, 15 mmf. (C42)
73372	Capacitor—Electrolytic comprising 1 section of 30 mfd., 350 volts, 1 section of 30 mfd., 300 volts and 1 section of 20 mfd., 25 volts (C18A, C18B, C18C)
39042	Capacitor—Ceramic, 47 mmf. (C26)
73867	Capacitor—Ceramic, 56 mmf. (C43)
33379	Capacitor—Ceramic, 68 mmf. (C40)
48125	Capacitor—Ceramic, 150 mmf. (C7, C19, C45)
39640	Capacitor—Mica, 330 mmf. (C30, C31)
73748	Capacitor—Ceramic, 1500 mmf. (C39)
73473	Capacitor—Ceramic, 5,000 mmf. (C44, C10)
73747	Capacitor—Electrolytic, 2mfd., 50 volts (C33)
73186	Capacitor—Tubular, paper, .001 mfd., 400 volts (C51)
71927	Capacitor—Tubular, paper, .002 mfd., 400 volts (C46)
72573	Capacitor—Tubular, paper, .003 mfd., 400 volts (C28, C47)
71926	Capacitor—Tubular, paper, .005 mfd., 200 volts (C20, C27, C32)
71553	Capacitor—Tubular, paper, .005 mfd., 400 volts (C14, C16, C17, C21, C22)
70608	Capacitor—Tubular, paper, .007 mfd., 400 volts (C49)
71923	Capacitor—Tubular, paper, .01 mfd., 200 volts (C23, C25)
71925	Capacitor—Tubular, paper, .01 mfd., 400 volts (C29, C41)
72120	Capacitor—Tubular, paper, .015 mfd., 200 volts (C48)
71928	Capacitor—Tubular, paper, .02 mfd., 200 volts (C50)
72596	Capacitor—Tubular, paper, .05 mfd., 200 volts (C15)
70617	Capacitor—Tubular, paper, 0.1 mfd., 400 volts (C37)
73744	Coil—Oscillator coil—A. M. (L4)
71942	Coil—Filament choke coil (L6)
73918	Coil—Antenna coil—F. M. (L1)
73916	Coil—Oscillator coil—F. M. (L2)
30868	Connector—2 contact female connector for motor cable
70342	Control—Volume control and power switch (B14, S3)
72953	Cord—Drive cord (approx. 48" overall)
74839	Fastener—Push fastener to mount R. F. shelf (4 required)
16058	Grommet—Rubber grommet to mount R. F. shelf (4 required)
73895	Indicator—Station selector indicator
11765	Lamp—Dial lamp—Mazda 51
74297	Plate—Dial back plate complete with 2 pulleys less dial
33514	Receptacle—Phono input socket—dual
52436	Resistor—Wire wound, 1500 ohms, 4 watts (R22)
	Resistor—Fixed, composition:—
	68 ohms, ±10%, ½ watt (R7)
	100 ohms, ±10%, ½ watt (R17, R27)
	120 ohms, ±10%, ½ watt (R12)
	330 ohms, ±10%, 1 watt (R21)
	560 ohms, ±10%, ½ watt (R33)
	680 ohms, ±20%, ½ watt (R9, R11)
	1200 ohms, ±5%, ½ watt (R23)
	3300 ohms, ±5%, ½ watt (R24)
	6800 ohms, ±10%, ½ watt (R37)
	10,000 ohms, ±10%, ½ watt (R32)
	15,000 ohms, ±10%, ½ watt (R13, R18)
	18,000 ohms, ±10%, ½ watt (R4)
	18,000 ohms, ±10%, 1 watt (R5)
	22,000 ohms, ±10%, ½ watt (R8)
	27,000 ohms, ±10%, ½ watt (R6, R30)
	33,000 ohms, ±10%, ½ watt (R36)
	39,000 ohms, ±10%, ½ watt (R25)
	56,000 ohms, ±10%, ½ watt (R31)
	56,000 ohms, ±10%, 1 watt (R10)
	100,000 ohms, ±10%, ½ watt (R35)
	270,000 ohms, ±10%, ½ watt (R19, R29)
	470,000 ohms, ±10%, ½ watt (R20, R26)
	1 megohm, ±10%, ½ watt (R34)
	2.2 megohms, ±20%, ½ watt (R3)
	3.9 megohms, ±10%, ½ watt (R2)
	10 megohms, ±20%, ½ watt (R15)
	22 megohms, ±20%, ½ watt (R16)
73894	Shaft—Tuning shaft
72516	Socket—Tube socket, 7 contact, miniature, for V4 and V5
73606	Socket—Tube socket, 7 contact, miniature, for V1, V2, and V3
31251	Socket—Tube socket, octal, wafer, for V6 and V7
31364	Socket—Lamp socket
74038	Spring—Drive cord tension spring
74202	Support—Polystyrene coil support complete with bracket
73891	Sw tch—Tcne control switch (S4)
74913	Switch—Selector switch (S1)
73415	Transformer—Output transformer (T5)
73743	Transformer—Ratio detector transformer (T4)
70127	Transformer—Power transformer 117v/60c (T1)
73745	Transformer—First I. F. transformer—dual (T2)
74019	Transformer—Second I. F. transformer—dual (T3)
33726	Washer—"C" washer for tuning shaft
73333	Washer—Insulating washer (extruded) for mounting output transformer (2 required)
73332	Washer—Insulating washer (flat) for mounting output transformer (2 required)
	SPEAKER ASSEMBLY **92569-9 RMA 274** **RL 111—14**
13867	Cap—Dust cap
74901	Cone and voice coil assembly
74974	Speaker—12" P. M. speaker (3.16 oz.) complete with cone and voice coil (3.2 ohms)
	NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
72555	Antenna—F.M. antenna
74205	Bezel—Dial scale bezel less dial
71599	Bracket—Pilot lamp bracket
74579	Bumper—Rubber bumper (black) for 45 RPM changer drawer for mahogany or walnut instruments (2 required)
74580	Bumper—Rubber bumper (white) for 45 RPM changer drawer for oak instruments
75041	Button—Plug button for shipping bolt holes in 33/78 RPM changer (2 required)
72437	Cable—Shielded pickup cable complete with pin plug for 45 RPM changer
74296	Cable—Shielded pickup cable complete with pin plug for 33/78 RPM changer
13103	Cap—Pilot lamp cap
39644	Capacitor—Mica, 470 mmf. (on 78, 33-1/3 RPM record changer)
70602	Capacitor—Tubular, paper, .0025 mfd. (on 78, 33-1/3 RPM record changer), 400 volts
71892	Catch—Bullet catch and strike for doors (2 required)
74298	Clamp—Dial clamp
X3046	Cloth—Grille cloth for mahogany or walnut instruments
X3047	Cloth—Grille cloth for oak instruments
30868	Connector—2 contact female connector for 33/78 RPM changer motor extension cable
30870	Connector—2 contact male connector for 33/78 RPM changer motor extension cable
74581	Cover—Mounting screw cover for 45 RPM changer (3 required)
74273	Decal—Trade mark decal (Victrola)
71768	Decal—Trade mark decal (RCA Victor)
74915	Decal—Control function decal for mahogany or walnut instruments
74916	Decal—Control function decal for oak instruments
74203	Dial—Glass dial scale
74838	Grommet—Power cord strain relief grommet (1 set)
74206	Grommet—Rubber grommet to mount 33/78 RPM changer (4 required)
74308	Hinge—Cabinet door hinges (1 set)
74931	Knob—Volume control or tuning control knob—maroon—for mahogany or walnut instruments
74934	Knob—Tone control switch or selector switch knob—maroon—for mahogany or walnut instruments
72824	Knob—Control knob—brown—for oak instruments
73896	Loop—Antenna loop complete
74730	Nail—Decorative nail for grille
74208	Nut—Tee nut to mounting 45 RPM changer (3 required)
74914	Pull—Door pull
	Resistor—Fixed, composition, 27,000 ohms (on 78, 33-1/3 RPM record changer) ±10%, ½ watt
74582	Screw—#8-32 x 1¾" special screw for mounting 45 RPM changer (3 required)
74113	Screw—#8-32 x 1" trimit head screw for door pull
74835	Slide—Slide mechanism for 45 RPM changer carriage
74736	Slide—Slide mechanism for 33/78 RPM changer carriage
30900	Spring—Retaining spring for knobs
74421	Spring—Conical spring for mounting 45 RPM changer—upper—R.H. (1 required)
74422	Spring—Conical spring for mounting 45 RPM changer—upper—L.H. (2 required)
74423	Spring—Conical spring for mounting 45 RPM changer—lower (3 required)
75040	Spring—Conical spring to mount 33/78 RPM changer (4 required)
72936	Stop—Door stop

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

AM Radio-Phonograph Combination

Model A-82

Chassis No. RC 1094

Service Data

— 1950 No. 21 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Tuning Range . . . . . 540-1600 kc
Intermediate Frequency . . . . . 455 kc
Tube Complement
1. RCA-6BA6 . . . . . R.F. Amplifier
2. RCA-6BE6 . . . . . Converter
3. RCA-6BA6 . . . . . I.F. Amplifier
4. RCA-6AV6 . . . . . Det.—1st Audio—A.V.C.
5. RCA-6C4 . . . . . Phase inverter
6. RCA-6V6GT . . . . . Output
7. RCA-6V6GT . . . . . Output
8. RCA-5Y3GT . . . . . Rectifier

Dial Lamps (2) . . . . . Type No. 51, 6-8 volts, 0.2 amps.
Jewel Lamp . . . . . Type No. 51, 6-8 volts, 0.2 amps.
Tuning Drive Ratio . . . . . 9:1 (4½ turns of knob)
Power Supply Rating . . . . . 115 volts, 60 cycles, 105 watts
Loudspeaker (92569-9)
Size and type . . . . . 12 in. P.M.
Voice coil impedance . . . . . 3.2 ohms at 400 cycles
Power Output
Undistorted . . . . . 9.5 watts
Power Output
Maximum . . . . . 10.5 watts
Cabinet Dimensions
Height 32⅛ in. Width 30¼ in. Depth 19¼ in.
Record Changer
(RP168) or (RP190-2)
Turntable Speed . . . . . 45 r.p.m.
Record Capacity . . . up to 10 RCA 7-in. fine groove records
Pickup . . . . . Crystal (medium output)
Record Changer (960282-4) or (960282-5)
Turntable Speed . . . . . 78/33⅓ r.p.m.
Record Capacity . . . . . Twelve 10-in. or Ten 12-in.
Pickup . . . . . Crystal

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-168 SERIES SERVICE DATA OR RP-190 SERIES SERVICE DATA FOR 45 R.P.M. AND MODEL 960282 SERVICE DATA FOR 78/33⅓ R.P.M.

Misalignment of the ball bearings in the carriage slides may cause the roll-out to have excessive drag. If this condition should exist exert a slight additional force in sliding the roll-out to its limit. This should automatically correct the condition.

Either roll-out is limited in travel by a stop pin at the back end of each slide. To remove roll-out carriage first remove the retaining spring and then the stop pins. Removing the connecting cable permits the roll-out to slide out from the front of the cabinet.

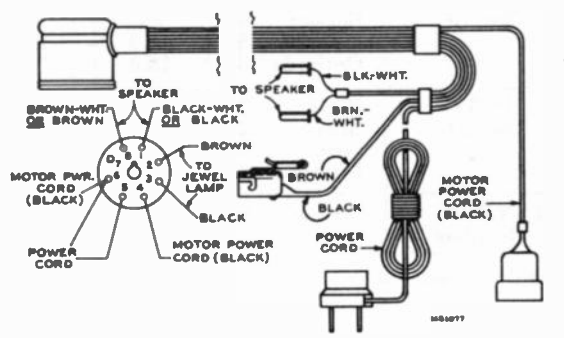


Fig. 1—Connecting Cable Diagram

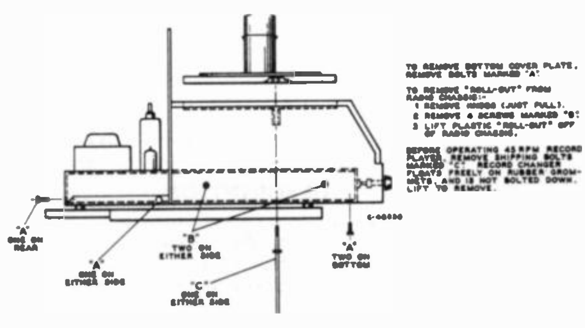


Fig. 2—Roll-out Assembly

Note: It is not necessary to remove the "roll-out" from the radio chassis when aligning the set. Having the "roll-out" fast to the chassis keeps the dial scale in place for dial calibration reference. Simply remove bottom cover as shown in Figure 2.

A-82

CRITICAL LEAD DRESS

1. Dress all A.C. leads at function switch away from audio terminals.
2. Dress phono and A.M. audio leads to function switch away from A.C. leads.
3. Dress all A.C. leads at volume control away from audio leads.
4. Dress R16 down next to chassis.
5. Dress R14 away from A.C. terminals on V.C.
6. Dress lead from top of V.C. to S1 front, terminal 7 down to chassis along front apron.
7. Dress C17 down to chassis and away from components to Pin 1 of V4.

Socket Voltages

Voltages measured with Chanalyst or VoltOhmyst and should hold within ±20% with rated line voltage. Tuning condenser closed—no signal input Volume Control Min.

Tube	Terminal	Voltage Phono	Voltage A.M.
V1 6BA6 R.F. Amp.	Plate 5	—	212
	Screen 6	—	100
	Cathode 7	—	1.23
	Grid 1	—	-.28
V2 6BE6 Converter	Plate 5	—	238
	Screen 6	—	88
	Grid 7	—	-.25
	Cathode 2	—	-7.2
V3 6BA6 I.F. Amp.	Plate 5	—	238
	Screen 6	—	125
	Cathode 7	—	4.2
	Grid 1	—	-.28
V4 6AV6 Det. A.F. Amp.	Plate 7	105	96
	Grid 1	-.9	-.93
V5 6C4 Inverter	Plate 1-5	122	99
	Grid 6	-18.9	-18.5
	Cathode 7	-12.2	-13
V6 6V6GT Output	Plate 3	299	305
	Screen 4	292	238
	Grid 5	-18.9	-18.5
	Cathode 8	-18.9	-18.4
V7 6V6GT Output	Plate 3	299	305
	Screen 4	292	238
	Grid 5	-18.9	-18.5
	Cathode 8	-18.9	-18.4
V8 5Y3GT Rectifier	Cathode 8	309	310
Total Current V8		69 ma.	66 ma.

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

Signal Generator.—For all alignment operations, connect the low side of the signal generator to the receiver chassis and keep the output as low as possible to avoid AVC action.

Dial Pointer Adjustment.—Rotate tuning condenser until the plates are fully closed. Adjust indicator pointer to the score mark at the left hand end of the dial.

Steps	Connect the high side of the test oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum output
1	Converter grid in series with a .01 mfd. cap. to Pin #7 of V2	455 kc	Min. cap.	Top and bottom of T1 and T2
2	Short piece of wire placed near loop for radiated signal	1620 kc	1620 kc	OSC-C1-2T
3		1400 kc	1400 kc	RF C1-1T ANT C1-3T
4		600 kc	600 kc	OSC coil L3 RF coil L2 Adj. simultaneously while rocking gang
5		Repeat steps 2, 3 and 4 for greatest sensitivity		

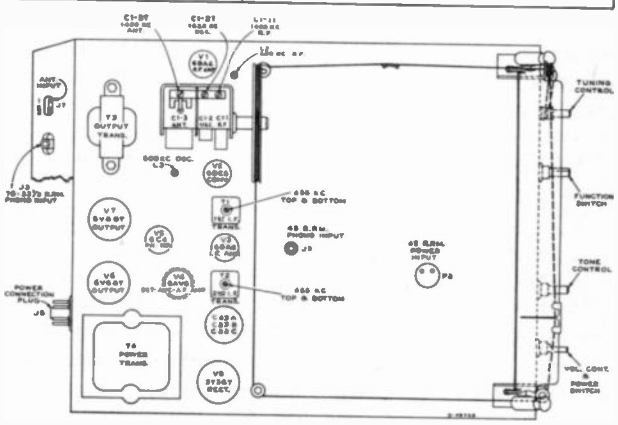


Fig. 3—Chassis Top View

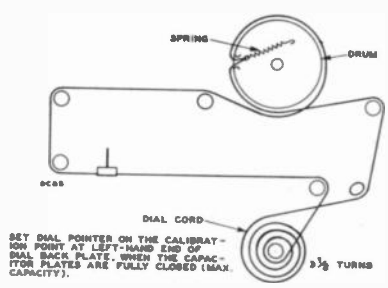


Fig. 4—Dial Drive

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	Chassis Assemblies RC 1094
75541	Bracket—Pulley bracket complete with drive cord pulley
75595	Capacitor—Variable tuning capacitor, complete with drive drum (C1-1, C1-2, C1-3)
39042	Capacitor—Ceramic, 47 mmf. (C6)
71924	Capacitor—Ceramic, 56 mmf. (C8)
39632	Capacitor—Mica, 150 mmf. (C2, C7, C16, C20)
73801	Capacitor—Tubular, paper, .001 mfd., 400 volts (C5)
71394	Capacitor—Tubular, paper, .0015 mfd., 600 volts (C10)
73851	Capacitor—Tubular, paper, oil impregnated, .0018 mfd., 1600 volts (C24)

STOCK No.	DESCRIPTION
73803	Capacitor—Tubular, paper, .002 mfd., 1000 volts (C21, C22)
70603	Capacitor—Tubular, paper, .003 mfd., 400 volts (C17)
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts (C3, C15)
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts (C4, C9, C13, C18)
73797	Capacitor—Tubular, paper, .015 mfd., 400 volts (C11)
58476	Capacitor—Tubular, paper, oil impregnated, .018 mfd., 400 volts (C12)
73562	Capacitor—Tubular, paper, .02 mfd., 400 volts (C19)

Continued on page 14.

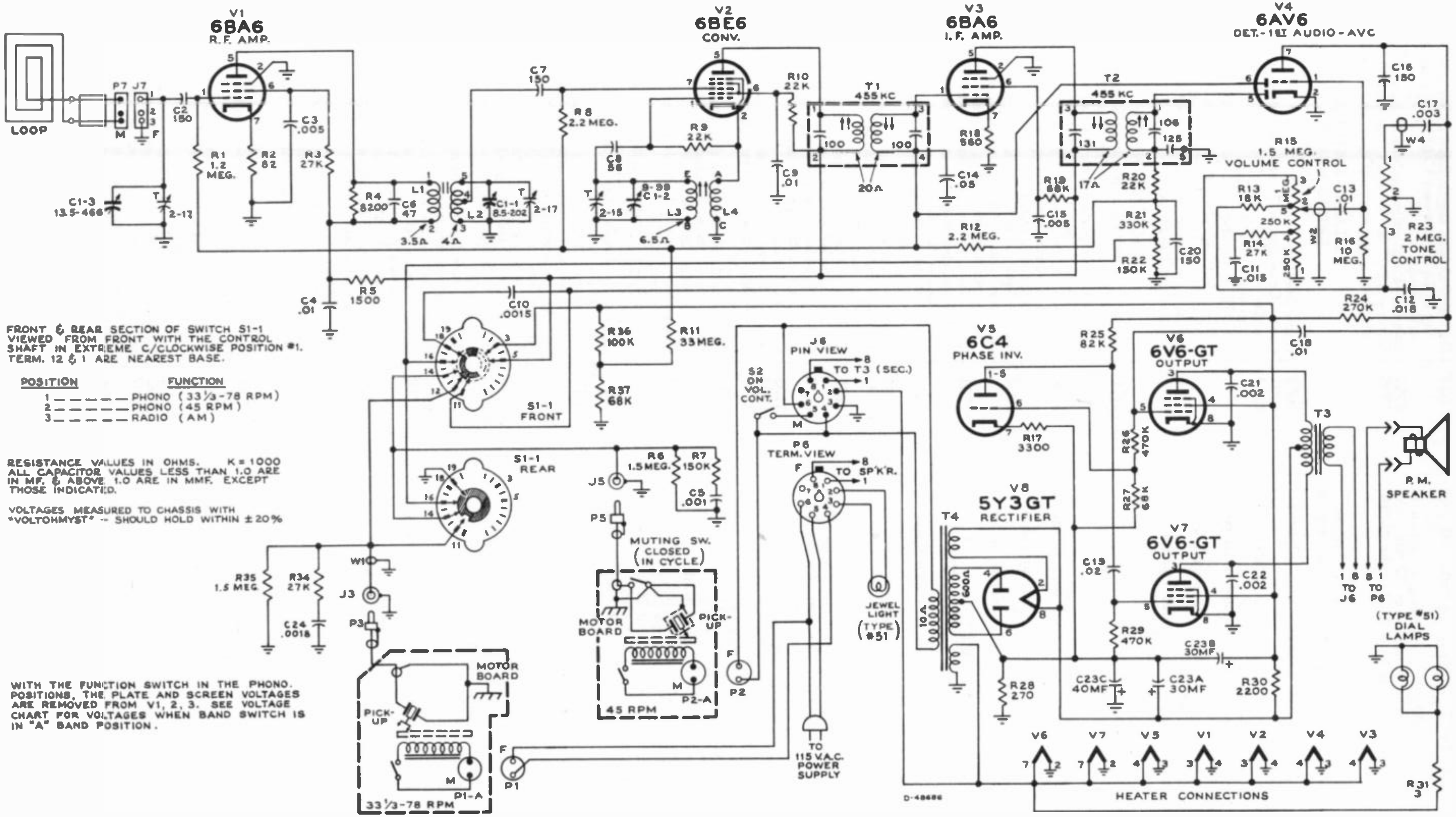


Fig. 5—Schematic Diagram

Substitute Speaker:

A substitute speaker (stamped 92569-9B) has been used in some instruments; it requires a different speaker cone than the one listed in A-82 Service Data.

Speaker 92569-9B uses Stock No. 75875 cone.

Speaker 92569-9W uses Stock No. 74901 cone.

REPLACEMENT PARTS (continued)

STOCK No.	DESCRIPTION
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts (C14)
72052	Capacitor—Electrolytic comprising 1 section of 30 mfd., 450 volts, 1 section of 30 mfd., 350 volts and 1 section of 40 mfd., 25 volts (C23A, C23B, C23C)
73935	Clip—Mounting clip for i-f transformer
75627	Clip—Clip for main cable—on rear of chassis
75596	Coil—R-F coil complete with adjusting screws (L1, L2)
73516	Coil—Oscillator coil complete with adjustable core (L3, L4)
35787	Connector—Single contact female connector for 33⅓/78 RPM changer input (J5)
75542	Connector—8 contact male connector for power input cable (J6)
75543	Connector—2 contact female connector for 45 RPM motor cable (P2)
74879	Connector—2 contact (polarized) female connector for antenna leads (J7)
33742	Connector—Single contact female connector for 45 RPM changer input (J3)
75537	Control—Volume control and power switch (R15, S2)
75538	Control—Tone control (R23)
†72953	Cord—Drive cord (approx. 60" over-all length required)
75547	Grommet—Rubber grommet to mount slides to bottom—rear (2 req'd)
75548	Grommet—Rubber grommet to mount slides to bottom—front (2 req'd)
11765	Lamp—Dial lamp—Mazda #51
75544	Nut—Rivnut to fasten screw for mounting chassis (4 req'd)
75535	Plate—Dial back plate complete with three (3) pulleys
18469	Plate—Bakelite mounting plate for electrolytic capacitor
75536	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R31)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R30)
	Resistor—Fixed, composition:—
	82 ohms, ±10%, ½ watt (R2)
	270 ohms, ±10%, 2 watts (R28)
	560 ohms, ±10%, ½ watt (R18)
	1500 ohms, ±20%, ½ watt (R5)
	3300 ohms, ±5%, ½ watt (R17)
	8200 ohms, ±10%, ½ watt (R4)
	18,000 ohms, ±10%, ½ watt (R13)
	22,000 ohms, ±10%, ½ watt (R9, R20)
	22,000 ohms, ±10%, 2 watts (R10)
	27,000 ohms, ±10%, ½ watt (R14, R34)
	27,000 ohms, ±10%, 1 watt (R3)
	68,000 ohms, ±10%, ½ watt (R19, R27, R37)
	82,000 ohms, ±10%, ½ watt (R25)
	100,000 ohms, ±10%, ½ watt (R36)
	150,000 ohms, ±10%, ½ watt (R7, R22)
	270,000 ohms, ±10%, ½ watt (R24)
	330,000 ohms, ±10%, ½ watt (R21)
	470,000 ohms, ±10%, ½ watt (R26, R29)
	1.5 megohm, ±10%, ½ watt (R6, R35)
	2.2 megohm, ±20%, ½ watt (R1, R8, R12)
	10 megohm, ±20%, ½ watt (R16)
	33 megohm, ±20%, ½ watt (R11)
75540	Shaft—Tuning knob shaft
73584	Shield—Tube shield
75546	Slide—Slide mechanism complete for radio chassis bottom
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
31364	Socket—Dial lamp socket
74038	Spring—Drive cord spring
75597	Switch—Function switch (S1-1)
75486	Transformer—First I-F transformer complete with adjustable cores (T1)
75487	Transformer—Second I-F transformer complete with adjustable cores (T2)
73636	Transformer—Output transformer (T3)
75566	Transformer—Power transformer 117 volts, 60 cycle (T4)
33726	Washer—"C" washer for tuning knob shaft
	RADIO ROLLOUT CARRIAGE
75598	Decal—Function decal for controls
75550	Dial—Polystyrene dial scale
75549	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM changer for mahogany and walnut instruments

STOCK No.	DESCRIPTION
75683	Frame—Moulded frame (light brown) for mounting radio chassis and 45 RPM changer for oak instruments
75551	Handle—Metal pullout handle for mounting frame
75555	Screw—#8-32 x ⅝" cross recessed pan head machine screw to mount radio chassis (4 req'd)
	SPEAKER ASSEMBLY 92569-9 RMA 274 RL 111—14
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly
74974	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms) NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
75706	Antenna—Antenna loop complete less cable
75898	Back—Back cover—maroon—for 33⅓/78 RPM changer compartment for mahogany or walnut instruments (assembled to rollout)
75899	Back—Back cover—light brown—for 33⅓/78 RPM changer compartment for oak instruments (assembled to rollout)
75900	Back—Back cover—maroon—for radio—45 RPM changer compartment for mahogany or walnut instruments (assembled to rollout)
75901	Back—Back cover—light brown—for radio—45 RPM changer compartment for oak instruments (assembled to rollout)
75694	Bracket—Stop bracket less rubber bumper for rollout compartments
71599	Bracket—Pilot lamp bracket
75696	Bumper—Rubber bumper for rollout compartment stop bracket
74296	Cable—Shielded pickup cable complete with pin plug for 33⅓/78 RPM changer (P3)
72437	Cable—Shielded pickup cable complete with pin plug for instruments using RP190-2 changer
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for cabinet doors
X3144	Cloth—Grille cloth for mahogany or walnut instruments
X3093	Cloth—Grille cloth for oak instruments
74882	Connector—2 contact (polarized) male connector for antenna loop cable (P7)
75709	Connector—8 contact female connector for main cable less shell (P6)
30868	Connector—2 contact female connector for 33⅓/78 RPM changer motor cable (P1)
75474	Connector—Single contact male connector for speaker (2 req'd)
30870	Connector—2 contact male connector for motor leads for instruments using RP190-2 changer
71984	Decal—Trade mark decal (RCA Victor)
74273	Decal—Trade mark decal (Victrola)
74838	Grommet—Power cord strain relief (1 set)
37396	Grommet—Rubber grommet for speaker mounting
75697	Grommet—Rubber grommet to mount 45 RPM changer
75551	Handle—Metal pullout handle for 33⅓/78 RPM changer compartment
74308	Hinge—Cabinet door hinge (1 set)
75712	Knob—Tuning control, tone control or volume control and power switch knob—maroon—for mahogany or walnut instruments
75713	Knob—Tuning control, tone control or volume control and power switch knob—tan—for oak instruments
75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75715	Knob—Function switch knob—tan—for oak instruments
11765	Lamp—Pilot lamp—Mazda #51
73634	Nut—Speed nut for speaker mounting screws
74276	Pull—Door pull
75907	Screw—#10-32 x 5¼" cross recessed round head (special shipping screws) screw to mount 45 RPM changer
74113	Screw—#8-32 x 1" trimit head screw for door pull
75708	Shell—Shell for 8 contact female connector
75546	Slide—Slide mechanism complete for 33⅓/78 RPM changer mounting frame
31364	Socket—Pilot lamp socket and load
74734	Spring—Retaining spring for knobs
75902	Spring—Suspension spring for main cable
72936	Stop—Cabinet door stop

†Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

AM-FM Radio-Phonograph Combination

MODEL A-91

Chassis No. RC 1095
Record Changers 960284 (78/33 1/3 r.p.m.)
RP 168 or RP 190-2 (45 r.p.m.)

SERVICE DATA

— 1950 No. 20 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-168 SERIES SERVICE DATA OR RP-190 SERIES SERVICE DATA FOR 45 R.P.M. AND MODEL 960284 SERVICE DATA FOR 78/33⅓ R.P.M.

Specifications

Tuning Range

Standard Broadcast (AM) .... 540-1,600 kc.
Frequency Modulation (FM) .... 88-108 mc.
Intermediate Frequencies ....AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6J6 ....Mixer and Oscillator
(2) RCA 6BA6 ....I-F Amplifier
(3) RCA 6AU6 ....Driver
(4) RCA 6AL5 ....Ratio Detector
(5) RCA 6AV6 ....AM Det.—AVC—A-F Amplifier
(6) RCA 6C4 ....Ph. Inv.
(7) RCA 6V6GT ....Output
(8) RCA 6V6GT ....Output
(9) RCA 5Y3GT ....Rectifier

Dial Lamps (2) ....Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp ....Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio ....10:1 (5 turns of knob)

Power Supply Rating ....115 volts, 60 cycles, 110 watts

Loudspeaker (92569-12W)

Size and type ....12 in. PM
Voice coil impedance ....3.2 ohms at 400 cycles

Power Output

(Radio) Undistorted 8 watts ....Maximum 9 watts
(Phono.) Undistorted 10 watts ....Maximum 11 watts

Weight ....90 lbs.

Cabinet Dimensions

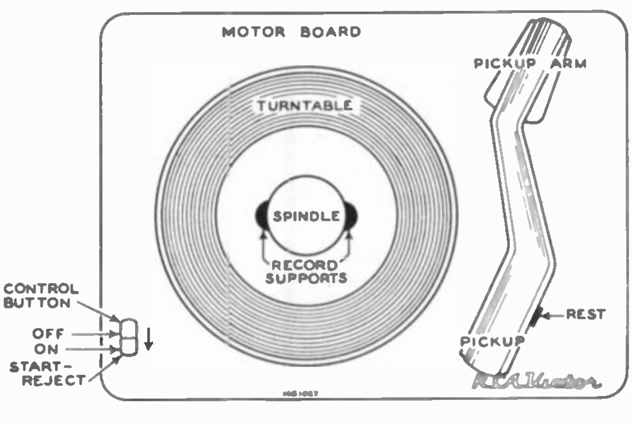
Height 32 in. Width 32 in. Depth 19¾ in.

Record Changer (RP 168 or RP 190-2)

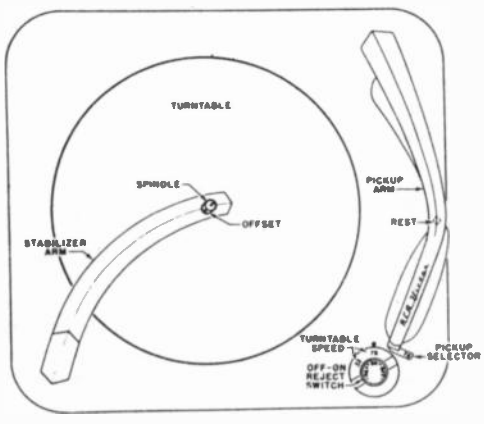
Turntable speed ....45 r.p.m.
Pickup {(RP 168—Stock No. 74625) (RP 190—Stock No. 75575)} ....Crystal

Record Changer (960284-1 or -2)

Turntable speed ....78 or 33⅓ r.p.m.
Pickup (Stock No. 75475) ....Crystal



Top View—RP190 Record Changer



Top View—960284 Record Changer

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Circuit Description

This instrument has a nine-tube (including rectifier) chassis which is very similar to those used in other RCA Victor radio-phonograph combinations designed for AM-FM reception.

The selector switch has five functions:

(1) Selection of tuning range.

(2) Selection and distribution of a.v.c. voltages.

(3) Application of B+ voltage to tubes V1, V2, and V3.

In "Phono 78/33" and "Phono 45" positions the B+ voltage is removed from tubes V1, V2 and V3.

(4) Selection of audio input applied to the volume control.

(5) Change in output tube bias.

In Radio positions R6 is in parallel with R42.

This receiver has built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception.

Provision is made for the use of external antennas if desired.

Critical Lead Dress

Note: The leads listed may not be critical in all receivers. However, by dressing the leads as specified, unusual difficulties will be minimized.

1. The 2.2 meg mixer grid resistor (R10) should have a minimum practicable amount of lead extending on the grid end.
2. The first A.M. and first F.M. I.F. plate leads should be dressed away from the range switch wafer.
3. The ground strap between the R.F. shelf and the main chassis should be well soldered and kept as short as practicable.
4. Arrange wiring to prevent the filament wire between the mixer (6J6) and 1st I.F. (6BA6) tubes from passing near either the mixer grid, or the A.V.C. wiring.
5. Dress filament wires away from all audio coupling condensers.
6. Dress A.C. power switch wires away from the audio coupling condenser (C20) which is wired to the volume control.
7. Dress the mixer grid coupling condenser (C7) away from the lugs on the front range switch wafer.
8. The 1st I.F. tube A.V.C. by-pass condenser (C16) should ground at the same point as the cathode neutralizing loop.
9. The driver tube plate and screen by-pass condensers (C27, C28) should ground at the same point as the neutralizing loop.
10. The mixer plate by-pass condenser (C15) should ground as close to the R.F. shelf ground strap as practicable.
11. The shielded audio leads connecting to the front function switch wafer should have a minimum of exposed lead on the function switch end.

AM Alignment

FUNCTION SWITCH IN AM POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for max. output
1	Stator of C1-4 in series with .01 mf.	455 kc.	Quiet point at low freq. end.	† Bottom (sec.) & top (pri.) cores of T4 † Top (sec.) & bottom (pri.) cores of T2
2	AM ant. terminal in series with 200 mmf.	1620 kc.	Extreme high freq. end.	C1-2 trimmer (osc.)
3		1400 kc.	1400 kc. signal	C1-4 trimmer (ant.)
4		600 kc.	600 kc. signal	L5 (osc.) Rock Gang
5	Repeat steps 2, 3 and 4			

† First peak T2 and T4 then starting with T4, use alternate loading. Connect a 47,000-ohm resistor across the primary to load the plate winding while the grid winding of the same transformer is being peaked. Then load the grid winding with the 47,000-ohm resistor while the plate winding is being peaked.

FM Alignment

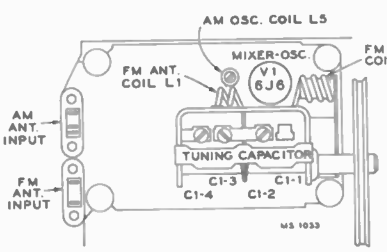
FUNCTION SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for max. output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C40 and the common lead to chassis. Adjust sig. gen. output to provide approx. —3 v. indication during alignment			
2	Pin #1 of 6 AU6 (V3) in series with .01 mf.	10.7 mc. AM modulated	—	Top of driver trans. T5 for max. d.c. voltage
3				† Bottom of driver trans. T5 for min. audio output
4	Repeat steps 2 and 3			
5	To FM antenna terminals thru 120 ohms in each side of line	10.7 mc.	low frequency end	* Top (sec.) and bottom (pri.) cores of T3 * Top (sec.) and bottom (pri.) cores of T1
6		90 mc.	90 mc.	** L8 (osc.)
7		106 mc.	106 mc.	C1-3 trimmer (ant.)
8		90 mc.	90 mc. signal	** L1 (ant.) Rock Gang
9	Repeat steps 7 and 8			

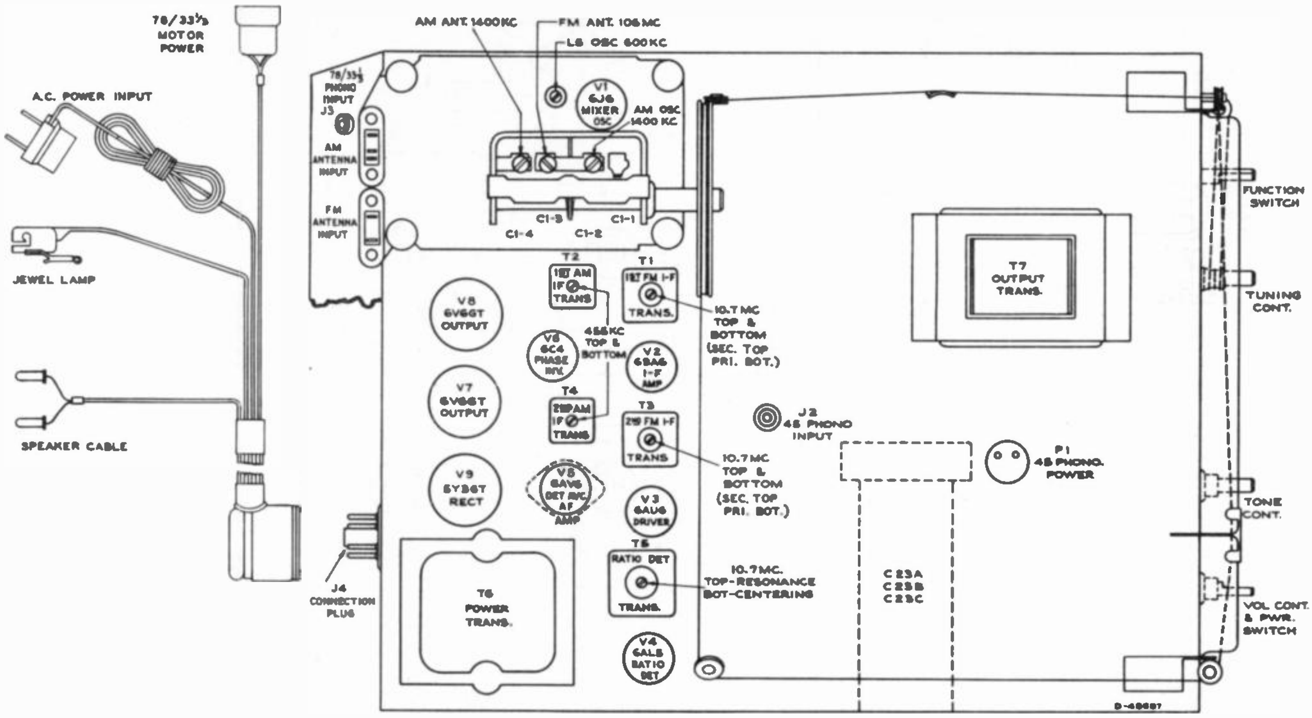
† Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

* Align T3 and T1 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 47,000 ohm resistor and load the FM windings.

** L1 and L8 are adjustable by increasing or decreasing the spacing between turns.



F. M. Coil Locations

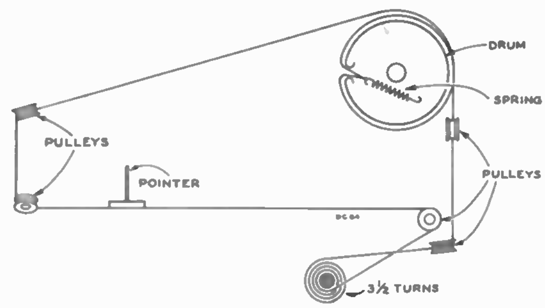


Tube and Trimmer Locations

Socket Voltages

Voltages measured to chassis with VoltOhmyst with no signal input and should hold within ±10% with 117-volt power supply.

Tube	Terminal		Voltage Phono	A.M.	F.M.
V1 6J6 Mixer and Oscillator	Plate	2	—	58	53
	Grid	5	—	−1.5	−1.3
	Plate	1	—	35	29
	Grid	6	—	−2.2	−2.0
V2 6BA6 I.F. Amp.	Plate	5	—	197	193
	Screen	6	—	112	104
	Cathode	7	—	0.67	0.77
	Grid	1	—	−1.2	−0.35
V3 6AU6 Driver	Plate	5	—	193	189
	Screen	6	—	125	123
	Cathode	7	—	1.1	1.1
V4 6AL5 Ratio Det.	——	—	—	—	—
V5 6AV6 A.F. Amp.	Plate	7	112	95	95
	Grid	1	−0.7	−0.7	−0.7
V6 6C4 Ph. Inv.	Plate	1–5	125	90	90
	Cathode	7	−12.2	−11	−11
	Grid	6	−19.2	−15.6	−15.6
V7 6V6GT or V8 Output	Plate	3	305	295	295
	Screen	4	299	214	212
	Grid	5	−19.2	−15.4	−15.4
V9 5Y3GT Rectifier	Filament	2	314	301	301



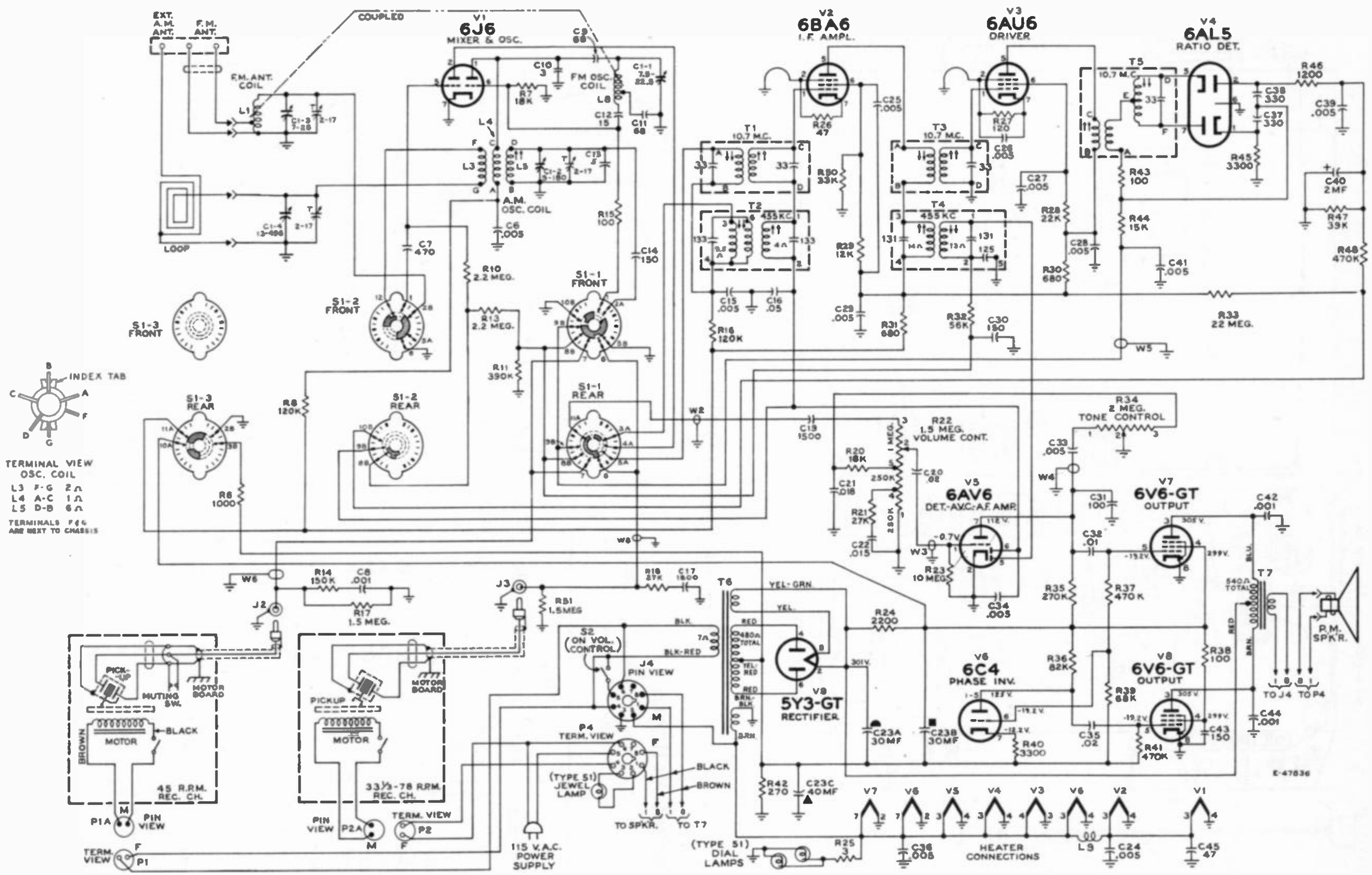
Dial Cord and Drive Assembly

Cathode Currents (Ma.)

Tube	Terminal	Phono	A.M.	F.M.
V1 6J6	7	—	2.8	2.8
V2 6BA6	7	—	16.6	16.5
V3 6AU6	7	—	9.4	9.3
V4 6AL5	1 & 5	—	—	—
V5 6AV6	2	0.8	0.5	0.5
V6 6C4	7	2.2	1.5	1.5
V7 6V6GT	8	35.6	18.6	18.5
V8 6V6GT	8	35.6	18.6	18.5
V9 5Y3GT	2	74.2	72.5	71.7

COMPLETE SCHEMATIC DIAGRAM

The cathode neutralizing loops of V2 (6BA6) and V3 (6AU6) are insulated wires approx. 2 in. long. Do not alter length.



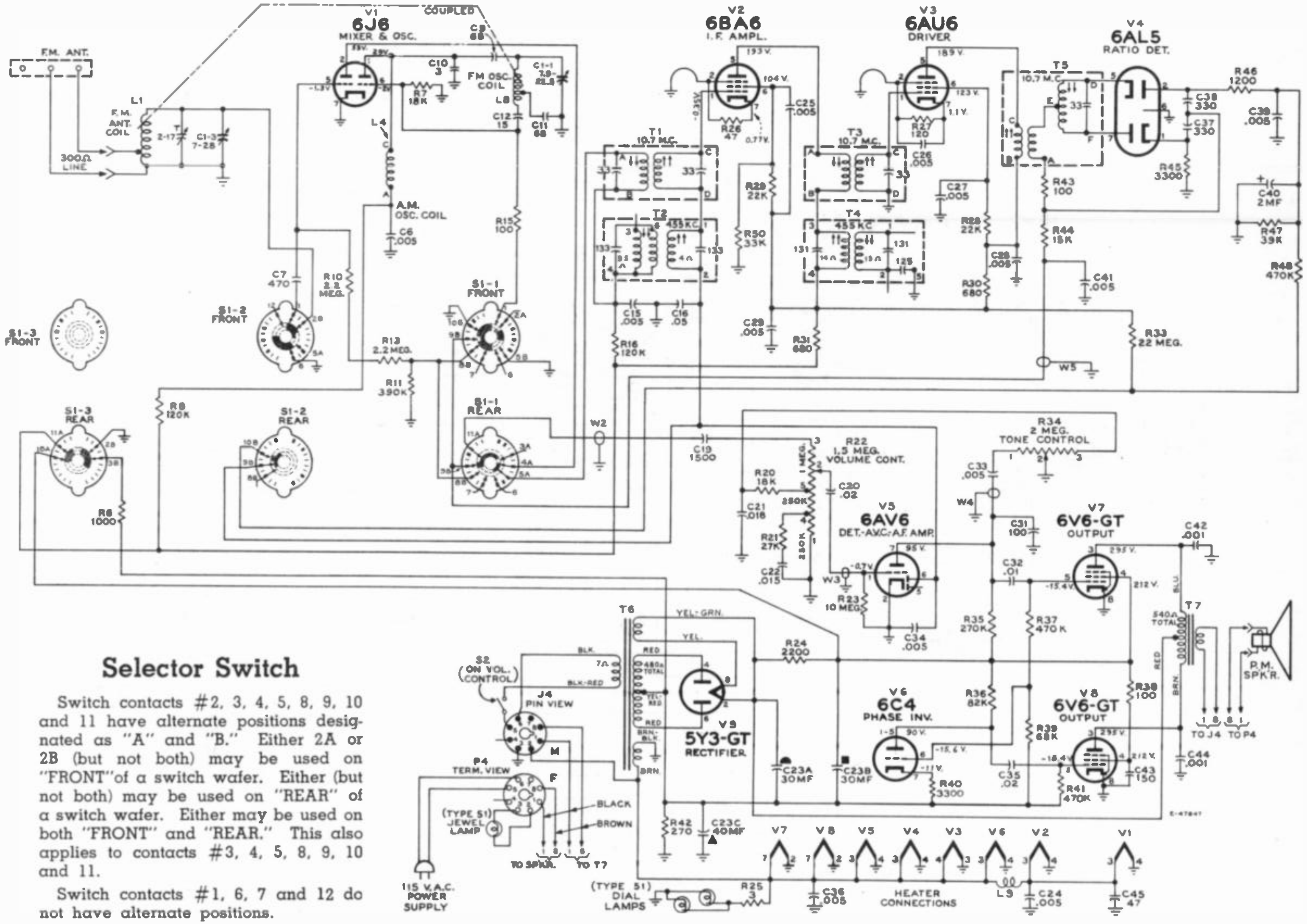
FUNCTION SWITCH VIEWED FROM FRONT AND SHOWN IN "PHONO 78/33" POSITION (MAX. C/CLOCKWISE)

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST AND NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117 VOLT POWER SUPPLY

RESISTANCE VALUES IN OHMS, K = 1000

CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED

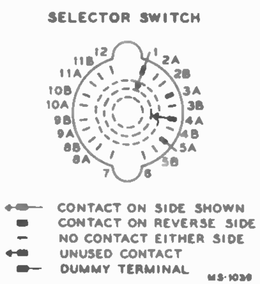
Complete Schematic Diagram



Selector Switch

Switch contacts #2, 3, 4, 5, 8, 9, 10 and 11 have alternate positions designated as "A" and "B." Either 2A or 2B (but not both) may be used on "FRONT" of a switch wafer. Either (but not both) may be used on "REAR" of a switch wafer. Either may be used on both "FRONT" and "REAR." This also applies to contacts #3, 4, 5, 8, 9, 10 and 11.

Switch contacts #1, 6, 7 and 12 do not have alternate positions.



FUNCTION SWITCH VIEWED FROM FRONT AND SHOWN IN "FM" POSITION (MAX. CLOCKWISE)

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST AND NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117 VOLT POWER SUPPLY

RESISTANCE VALUES IN OHMS, K = 1000

CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED

Simplified Schematic Diagram—"FM"

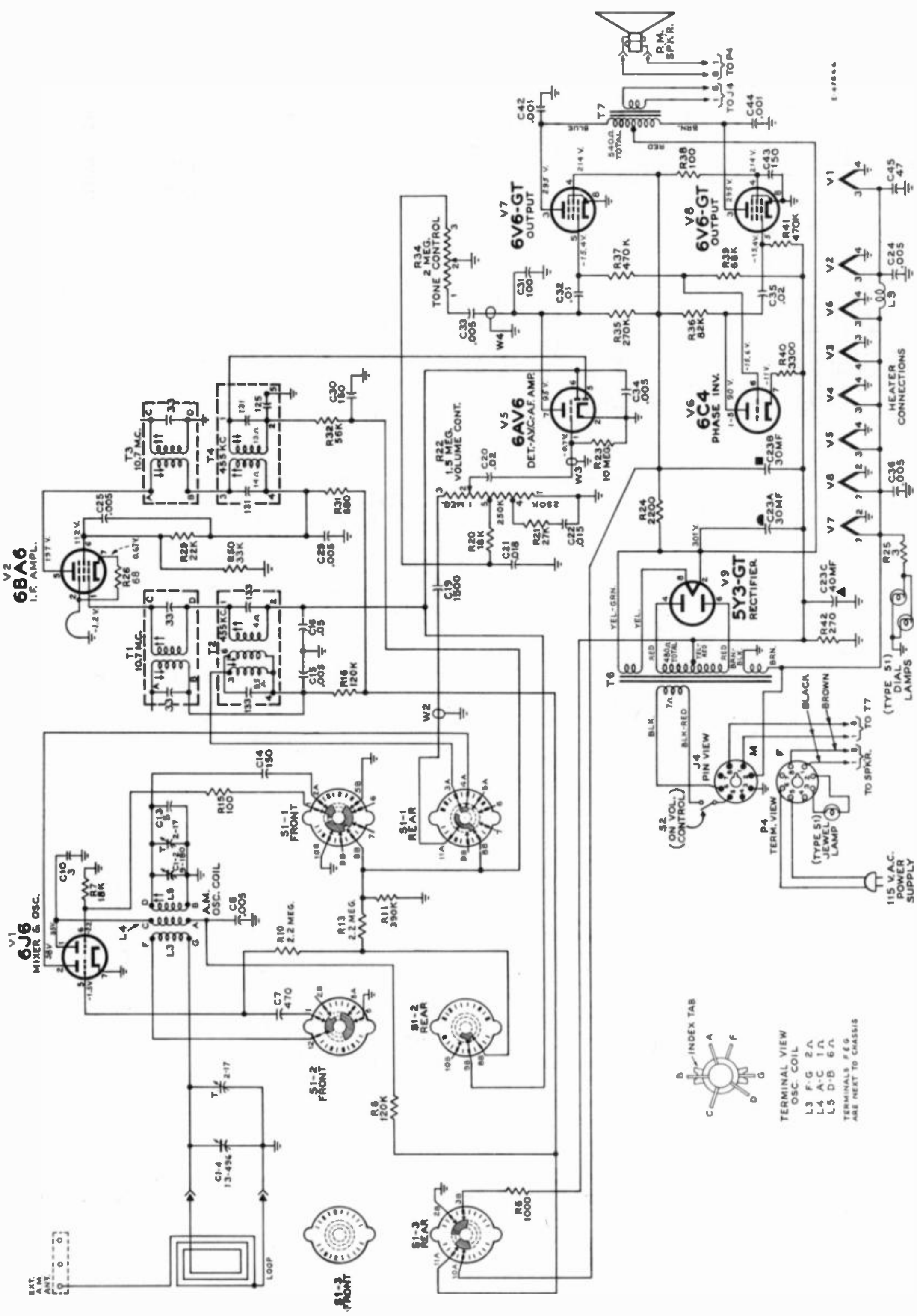
Addition to Parts List:

CHASSIS ASSEMBLIES

Add:

76423 Capacitor—Ceramic, 3 mmf. (C10)

SIMPLIFIED SCHEMATIC DIAGRAM—"AM"



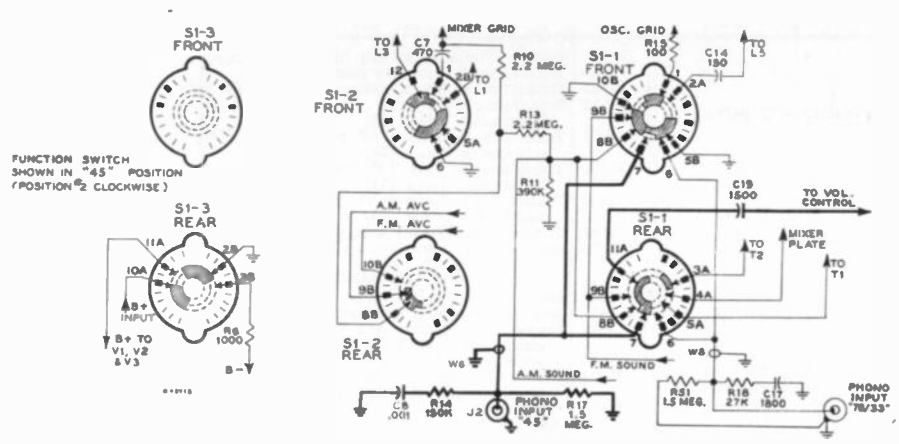
FUNCTION SWITCH VIEWED FROM FRONT AND SHOWN IN "AM" POSITION (#3 CLOCKWISE)

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST AND NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117 VOLT POWER SUPPLY

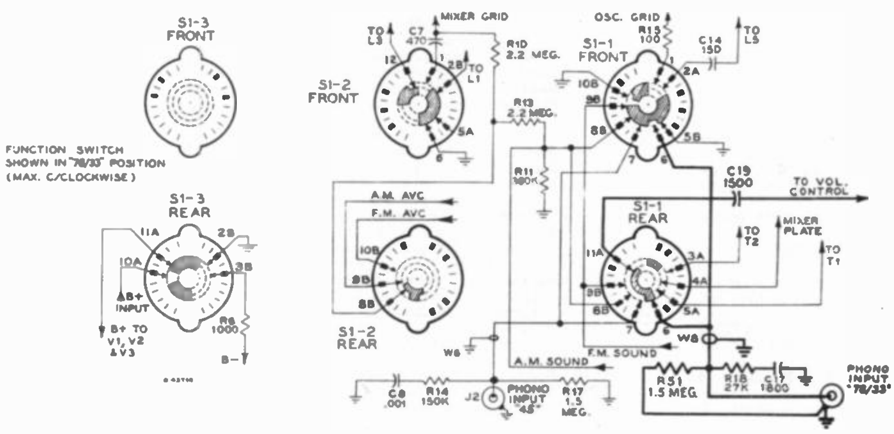
RESISTANCE VALUES IN OHMS, K = 1000

CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED

Simplified Schematic Diagram—"AM"



Switch Position Schematic Diagram—"Phono 45"



Switch Position Schematic Diagram—"Phono 78/33"

In "45" and "78/33" position the B+ supply voltage is disconnected in S1-3 which renders the mixer-oscillator, I. F. amplifier and driver tubes inoperative.

The bias resistor R6 (in parallel with R42 in AM and FM positions) is also disconnected in S1-3.

This results in higher grid, plate and screen voltages on the output tubes.

Record Changer Mounting

Each record changer is mounted in a roll-out carriage. The changer mechanisms are mounted on rubber grommets (45 r.p.m.) or springs (78/33 r.p.m.) and should be free floating.

Two shipping screws hold the 45 r.p.m. changer to its roll-out carriage. They are accessible from the under-side of the carriage and should be REMOVED at time of installation.

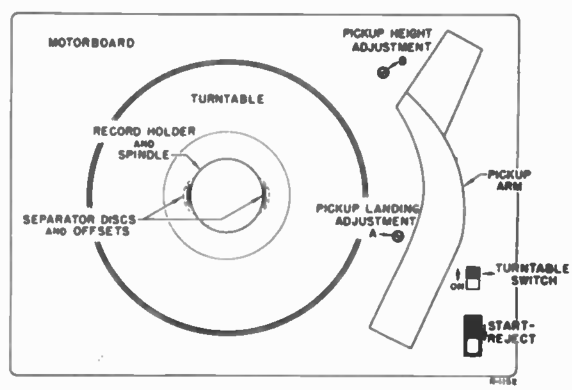
Two shipping screws hold the 78/33 r.p.m. changer to its roll-out carriage. They are accessible after the turntable is lifted off and should be LOOSENED at time of installation.

Roll-out Carriage Removal

Each roll-out carriage has two stop pins, (one at the back end of each slide) held in place by a retaining spring. To remove roll-out carriage, it is first necessary to pull the retaining springs out of the slides with a pair of long nose pliers, the stop pins are then easily removed. The roll-out carriage may then be removed from the front of the cabinet after disconnecting its connecting cables.

Roll-out Carriage Travel

The roll-out carriages have a normal movement limitation of approximately 10 inches. If a carriage does not have this amount of movement, it may be due to an obstruction or from slippage or creeping of the balls of the slide mechanism. Travel restriction due to slippage or creeping of balls in the slide mechanism can be corrected by exerting slightly greater pull until the normal travel limitation is reached. The carriage should then operate to its full travel with normal pull.



Top View—RP 168 Record Changer

Adjustments

1. PICKUP LANDING—Turn screw "A" slightly to right (clockwise) if landing is on music grooves, or to left if too near edge of record.

2. PICKUP HEIGHT—Turn screw "B" slightly to right (clockwise) if for change cycle pickup does not lift up from as many as ten records on turntable, or to left if when lifting, pickup hits records on spindle. Correct height is ¾" from turntable to pickup point at maximum.

A-91

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1095
75599	Capacitor—Variable tuning capacitor complete with drive drum (C1-1, C1-2, C1-3, C1-4)
75613	Capacitor—Ceramic, 5 mmf. (C13)
39044	Capacitor—Ceramic, 15 mmf. (C12)
75609	Capacitor—Ceramic, 47 mmf. (C45)
75612	Capacitor—Ceramic, 68 mmf. (C9, C11)
75437	Capacitor—Ceramic, 100 mmf. (C31)
75614	Capacitor—Ceramic, 150 mmf. (C14, C30, C43)
39640	Capacitor—Mica, 330 mmf. (C37, C38)
39644	Capacitor—Mica, 470 mmf. (C7)
75610	Capacitor—Ceramic, 1500 mmf. (C19)
74850	Capacitor—Ceramic, 1800 mmf. (C17)
73473	Capacitor—Ceramic, 5000 mmf. (C6, C15, C24, C25, C27, C28, C29, C34, C36)
73801	Capacitor—Tubular, paper, .001 mfd, 400 volts (C8)
70642	Capacitor—Tubular, paper, .001 mfd, 1000 volts (C42, C44)
71926	Capacitor—Tubular, paper, .005 mfd, 200 volts (C26, C39, C41)
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts (C33)
71925	Capacitor—Tubular, paper, .01 mfd, 400 volts (C32)
58476	Capacitor—Tubular, paper, oil impregnated, .018 mfd, 400 volts (C21)
72120	Capacitor—Tubular, paper, .015 mfd, 200 volts (C22)
74010	Capacitor—Tubular, paper, .02 mfd, 400 volts (C20, C35)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C16)
73747	Capacitor—Electrolytic, 2 mfd, 500 volts (C40)
72052	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 450 volts, 1 section of 30 mfd, 350 volts and 1 section of 40 mfd, 25 volts (C23A, C23B, C23C)
73935	Clip—Mounting clip for A-M, I-F transformers
75627	Clip—Clip for main cable—on rear of chassis
75569	Coil—Oscillator coil (A.M.) complete with adjustable screws
75617	Coil—Antenna coil—F-M (L1)
71942	Coil—Filament choke coil (L9)
74817	Coil—Oscillator coil—F-M (L8)
35787	Connector—Single contact female connector for pickup cables (J2, J3)
74879	Connector—2 contact female connector for antenna leads
75542	Connector—8 contact male connector for power input cable (J4)
75543	Connector—2 contact female connector for 45 RPM motor cable (P1)
70342	Control—Volume control and power switch (R22, S2)
75538	Control—Tone control (R34)
†72953	Cord—Drive cord (approx. 66" overall length required)
75564	Coupling—Spring coupling for function switch extension shaft
75556	Cover—Insulating cover for electrolytic capacitor #72052
74839	Fastener—Push fastener for mounting R-F shelf (4 required)
16058	Grommet—Rubber grommet for mounting R-F shelf (4 req'd)
75547	Grommet—Rubber grommet to mount slide mechanism to bottom—rear (2 req'd)
75548	Grommet—Rubber grommet to mount slide mechanism to bottom—front (2 req'd)
11765	Lamp—Dial lamp—Mazda #51
75544	Nut—Rivnut to fasten screw for mounting chassis (4 req'd)
18469	Plate—Bakelite mounting plate for electrolytic capacitor #72052
75535	Plate—Dial back plate complete with three (3) pulleys
75536	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R25)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R24)
	Resistor—Fixed, composition:—
	47 ohms, ±10%, ½ watt (R26)
	100 ohms, ±10%, ½ watt (R15, R38, R43)
	120 ohms, ±10%, ½ watt (R27)
	270 ohms, ±5%, 2 watts (R42)
	680 ohms, ±20%, ½ watt (R30)
	680 ohms, ±20%, 1 watt (R31)
	1000 ohms, ±10%, ½ watt (R6)
	1200 ohms, ±5%, ½ watt (R46)
	3300 ohms, ±5%, ½ watt (R40, R45)
	12,000 ohms, ±10%, 1 watt (R29)
	15,000 ohms, ±10%, ½ watt (R44)
	18,000 ohms, ±10%, ½ watt (R7, R20)
	22,000 ohms, ±10%, ½ watt (R28)
	27,000 ohms, ±10%, ½ watt (R18, R21)
	33,000 ohms, ±10%, ½ watt (R50)
	39,000 ohms, ±5%, ½ watt (R47)
	56,000 ohms, ±10%, ½ watt (R32)
	68,000 ohms, ±10%, ½ watt (R39)
	82,000 ohms, ±10%, ½ watt (R36)
	120,000 ohms, ±10%, ½ watt (R8, R16)
	150,000 ohms, ±10%, ½ watt (R14)
	270,000 ohms, ±10%, ½ watt (R35)
	390,000 ohms, ±10%, ½ watt (R11)
	470,000 ohms, ±10%, ½ watt (R37, R41, R48)
	1.5 megohm, ±10%, ½ watt (R17, R51)
	2.2 megohm, ±20%, ½ watt (R10, R13)
	10 megohm, ±20%, ½ watt (R23)
	22 megohm, ±20%, ½ watt (R33)
75540	Shaft—Tuning knob shaft
75565	Shaft—Extension shaft for function switch
73584	Shield—Tube shield for V5
75546	Slide—Slide mechanism complete for radio chassis bottom
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
74179	Socket—Tube socket, 7 pin, miniature for 6J6 tube only
31364	Socket—Dial lamp socket
75563	Spring—Retaining spring for function switch extension shaft
74038	Spring—Drive cord spring
74847	Support—Polystyrene support for F-M oscillator coil complete with mounting bracket
75600	Switch—Function switch (S1-1, S1-2, S1-3)
75557	Transformer—Output transformer (T7)
73743	Transformer—Radio detector transformer (T5)
75558	Transformer—First I-F transformer (A-M) complete with adjustable cores (T2)
73037	Transformer—Second I-F transformer (A-M) complete with adjustable cores (T4)
75559	Transformer—First I-F transformer (F-M) complete with adjustable cores (T1)
75560	Transformer—Second I-F transformer (F-M) complete with adjustable cores (T3)
75566	Transformer—Power transformer, 117 volt, 60 cycle (T6)
33726	Washer—"C" washer for tuning knob shaft
	RADIO ROLLOUT CARRIAGE
75601	Decal—Function decal for controls
75572	Dial—Polystyrene dial scale
75549	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM record changer—for mahogany or walnut instruments
75683	Frame—Moulded frame (light brown) for mounting radio chassis and 45 RPM record changer—for oak instruments
75551	Handle—Metal pullout handle for mounting frame
75555	Screw—#8-32 x ⅝" cross recessed pan head machine screw to mount radio chassis (4 req'd)
	SPEAKER ASSEMBLY
	Stamped 92569-12W
	RMA 274
	RL 111-A1
13867	Cap—Dust cap
75682	Cone—Cone and voice coil assembly (3.2 ohms)
75681	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms)
	NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
71864	Antenna—F-M antenna
75705	Antenna—Antenna loop complete less cable
75898	Back—Back cover—maroon—for 33⅓/78 RPM record changer compartment—for mahogany or walnut instruments (assembled to rollout)
75899	Back—Back cover—light brown—for 33⅓/78 RPM record changer compartment—for oak instruments (assembled to rollout)
75900	Back—Back cover—Maroon—for radio—45 RPM record changer compartment—for mahogany or walnut instruments (assembled to rollout)
75901	Back—Back cover—light brown—for radio—45 RPM record changer compartment—for oak instruments (assembled to rollout)
73680	Board—"A-F-N" terminal board
75694	Bracket—Step bracket less rubber bumper for record changer rollouts
71599	Bracket—Pilot lamp bracket
75696	Bumper—Rubber bumper for record changer rollout stop bracket
74296	Cable—Shielded pickup cable complete with pin plug for 33⅓/78 RPM record changer
72437	Cable—Shielded pickup cable complete with pin plug for 45 RPM record changer
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for cabinet doors
X3093	Cloth—Grille cloth for oak instruments
X3189	Cloth—Grille cloth for mahogany or walnut instruments
74882	Connector—2 contact (polarized) male connector for antenna loop cable
74752	Connector—2 contact male connector for FM antenna cable
75709	Connector—8 contact female connector for main cable
75474	Connector—Single contact male connector for speaker (2 req'd)
30868	Connector—2 contact female connector for 33⅓/78 RPM record changer motor leads
74273	Decal—Trade mark decal (Victrola)
71984	Decal—Trade mark decal (RCA Victor)
74838	Grommet—Power cord strain relief (1 set)
37396	Grommet—Rubber grommet for mounting speaker
75697	Grommet—Rubber grommet for mounting 45 RPM record changer
75551	Handle—Metal pullout handle for 33⅓/78 RPM record changer compartment
74308	Hinge—Cabinet door hinge (1 set)
75712	Knob—Tuning control, tone control or volume control and power switch knob—maroon—for mahogany or walnut instruments
75713	Knob—Tuning control, tone control or volume control and power switch knob—for oak instruments
75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75715	Knob—Function switch knob—tan—for oak instruments
11765	Lamp—Pilot lamp—Mazda #51
75917	Nail—Rosette head nail for grille (3 req'd)
75884	Nut—Speed nut for 33⅓/78 RPM record changer mounting screw
73634	Nut—Speed nut for speaker mounting screws
75916	Pull—Door pull
75907	Screw—#10-32 x 5¼" cross recessed round head special screw for mounting 45 RPM frame
75883	Screw—#10-24 x 2¼" round head machine screw for mounting 33⅓/78 RPM record changer
74279	Screw—#8-32 x ⅞" trimit head screw for door pull
75708	Shell—Shell for 8 contact female connector #75708
75546	Slide—Slide mechanism for 33⅓/78 RPM record mounting frame
31364	Socket—Pilot lamp socket and lead
74734	Spring—Retaining spring for knobs
75902	Spring—Suspension spring for main cable
72936	Stop—Cabinet door stop

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

† Stock No. 72953 is a reel containing 250 feet of cord.

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-190 SERIES SERVICE DATA FOR 45 R.P.M. AND MODEL 960282 SERVICE DATA FOR 78/33⅓ R.P.M.

RCA VICTOR

AM-FM Radio-Phonograph Combination

MODEL A-101

Chassis No. RC 1096
Record Changers 960282-4 or 5 (78/33 1/3 r. p. m.) and RP 190-2 (45 r.p.m.)

SERVICE DATA

— 1950 No. 31 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range

Standard Broadcast (AM)	540-1,600 kc.
Frequency Modulation (FM)	88-108 mc.
Intermediate Frequencies	AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6CB6	R-F Amplifier
(2) RCA 6J6	Mixer and Oscillator
(3) RCA 6BA6	I-F Amplifier
(4) RCA 6AU6	Driver
(5) RCA 6AL5	Ratio Detector
(6) RCA 6AV6	AM Det.—AVC—A-F Amplifier
(7) RCA 6C4	Ph. Inv.
(8) RCA 6V6GT	Output
(9) RCA 6V6GT	Output
(10) RCA 5Y3GT	Rectifier

Dial Lamps (2)	Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp	Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio	10:1 (5 turns of knob)
Power Supply Rating	115 volts, 60 cycles, 115 watts

Loudspeaker (92569-12W)

Size and type	12 in. PM
Voice coil impedance	3.2 ohms at 400 cycles

Power Output

(Radio) Undistorted 8 watts	Maximum 9 watts
(Phono.) Undistorted 10 watts	Maximum 11 watts

Weight ..... 97 lbs.

Cabinet Dimensions

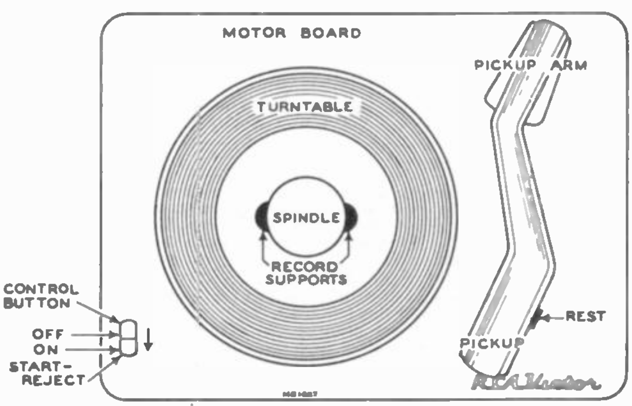
Height 32 in. Width 32 in. Depth 19¾ in.

Record Changer (RP-190-2)

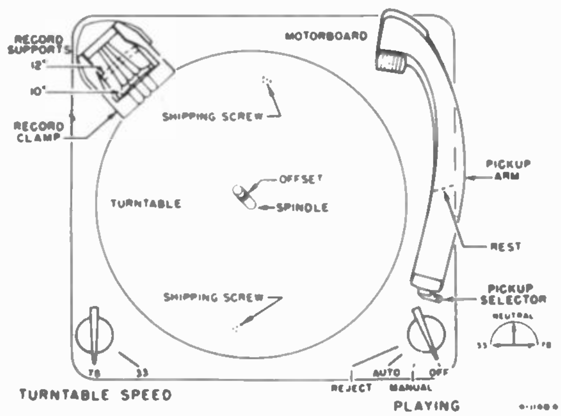
Turntable speed	45 r.p.m.
Pickup (RP-190—Stock No. 75575)	Crystal

Record Changer 960282-4 or 5

Turntable speed	78 or 33⅓ r.p.m.
Pickup (Stock No. 75475)	Crystal



Top View—RP-190 Record Changer



Top View—960282 Record Changer

The early production of Model A-101 used 960282-4 or -5 record changer. Late production uses 960284-1 or -2 record changer.

LATE PRODUCTION USES CHASSIS NO. RC-1096B. **SEE PAGE 31 FOR DETAILS.**

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Circuit Description

This instrument has a ten-tube (including rectifier) chassis which is very similar to those used in other RCA Victor radio-phonograph combinations designed for AM-FM reception.

The selector switch has five functions:

(1) Selection of tuning range.

(2) Selection and distribution of a.v.c. voltages.

(3) Application of B+ voltage to tubes.

In "Phono 78/33" and "Phono 45" positions the B+ voltage is removed from tubes V1, V2, V3 and V4.

(4) Selection of audio input applied to the volume control.

(5) Change in output tube bias.

In Radio positions R6 is in parallel with R42.

This receiver has built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception.

Provision is made for the use of external antennas if desired.

Critical Lead Dress

Note: The leads listed may not be critical in all receivers. However, by dressing the leads as specified, unusual difficulties will be minimized.

1. The 2.2 meg mixer grid resistor (R10) should have a minimum practicable amount of lead extending on the grid end.
2. The first A.M. and first F.M. I.F. plate leads should be dressed away from the range switch wafer.
3. The ground strap between the R.F. shelf and the main chassis should be well soldered and kept as short as practicable.
4. Arrange wiring to prevent the filament wire between the mixer (6J6) and 1st I.F. (6BA6) tubes from passing near either the mixer grid, or the A.V.C. wiring.
5. Dress filament wires away from all audio coupling condensers.
6. Dress A.C. power switch wires away from the audio coupling condenser (C20) which is wired to the volume control.
7. Dress the mixer grid coupling condenser (C7) away from the lugs on the front range switch wafer.
8. The 1st I.F. tube A.V.C. by-pass condenser (C16) should ground at the same point as the cathode neutralizing loop.
9. The driver tube plate and screen by-pass condensers (C27, C28) should ground at the same point as the neutralizing loop.
10. The mixer plate by-pass condenser (C15) should ground as close to the R.F. shelf ground strap as practicable.
11. The shielded audio leads connecting to the front function switch wafer should have a minimum of exposed lead on the function switch end.

AM Alignment

FUNCTION SWITCH IN AM POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for max. output
1	Stator of C1-4	455 KC	Quiet point at low freq. end.	† Bottom (sec.) & top (pri.) cores of T4 † Top (sec.) & bottom (pri.) cores of T2
2	AM ant. terminal thru 200 mmf.	1620 KC	Extreme high frequency end.	C1-2 trimmer (osc.)
3		1400 KC	1400 KC Signal	C1-4 trimmer (r. f.) C1-5 trimmer (ant.)
4		600 KC	600 KC Signal	‡ L5 (osc.) L7 (r. f.)
5	Repeat steps 2, 3 and 4			

† First peak T2 and T4 then starting with T4, use alternate loading. Connect a 47,000-ohm resistor across the primary to load the plate winding while the grid winding of the same transformer is being peaked. Then load the grid winding with the 47,000-ohm resistor while the plate winding is being peaked.

‡ With a 10,000-ohm resistor shunted across C1-4, peak the oscillator core L5, simultaneously "rocking" the gang condenser for maximum output. Then, remove the 10,000-ohm shunt resistor and peak L7 for maximum output.

FM Alignment

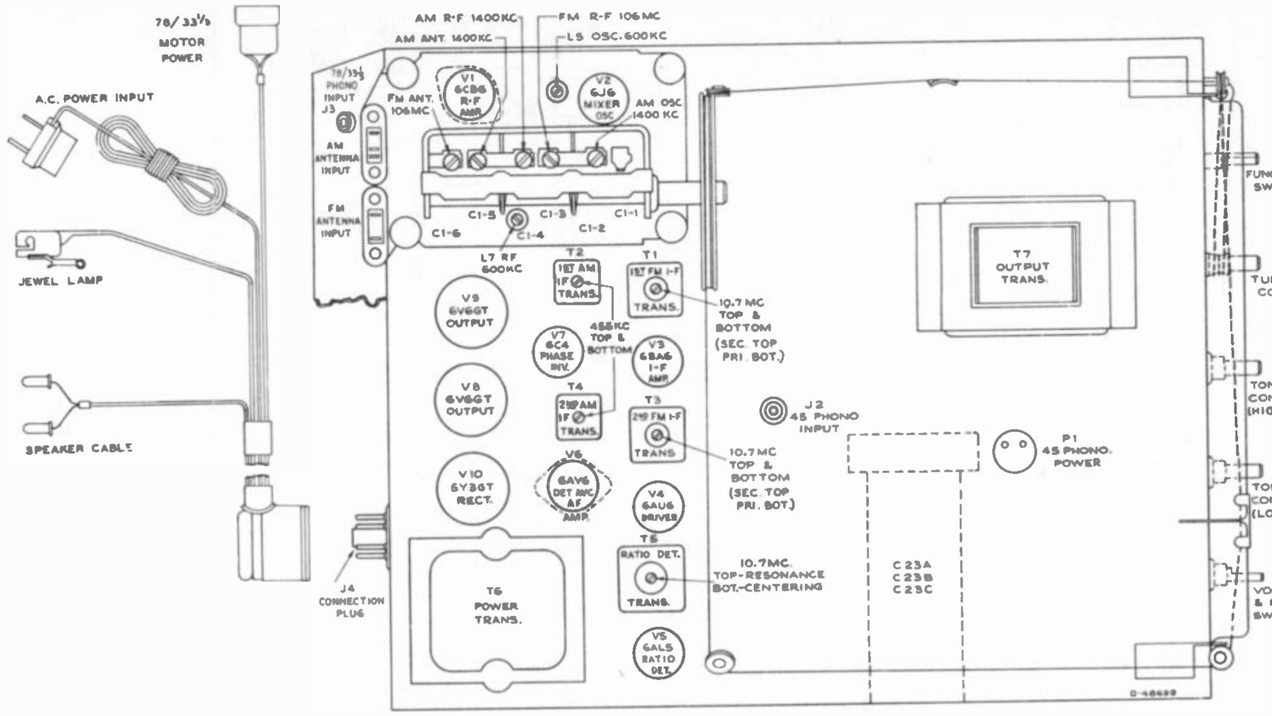
FUNCTION SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for max. output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C40 and the common lead to chassis. Adjust sig. gen. output to provide approx. —3 v. indication during alignment.			
2	Pin #1 of 6AU6 (V4) in series with .01 mf.	10.7 mc AM modulated	—	Top of driver trans. T5 for max. d-c voltage
3				† Bottom of driver trans. T5 for min. audio output
4	Repeat steps 2 and 3			
5	Thru 470 ohms to C1-3. Connect gnd. end of cable close to V2 cathode ground on r-f shelf	10.7 mc	88 mc	* Top (sec.) & bottom (pri.) cores of T3 * Top (sec.) & bottom (pri.) cores of T3
6	To FM antenna terminals thru 120 ohms in each side of line	90 mc	90 mc	L8 (osc.)
7		106 mc	106 mc Signal	C1-6 trimmer (ant.) and C1-3 trimmer (r. f.)
8		90 mc	90 mc Signal	L1 (ant.) and L2 (r. f.)
9	Repeat steps 6, 7 and 8			
10	Connect a sweep generator to the antenna terminals thru 120 ohms in each side of line. Connect an oscilloscope to junction of R44 and C41 to check response and linearity of FM band. Peak to peak separation should not be less than 180 kc.			

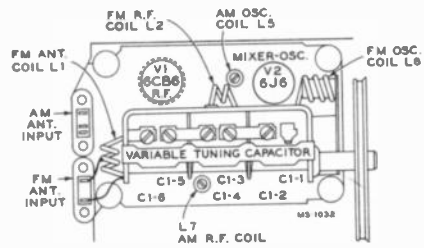
† Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

* Use a 680 ohm resistor to load the plate winding while the grid winding of the same trans. is being peaked. Then the grid winding is loaded with the 680 ohm resistor while the plate winding is being peaked. When windings are loaded, it is necessary to increase the 10.7 mc input to maintain the —3 volts indication.

L8, L1 and L2 are adjustable by increasing or decreasing the spacing between turns. Oscillator signal tracks above signal frequency.



Tube and Trimmer Locations

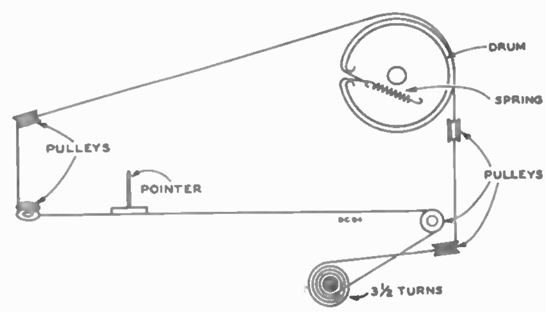


F. M. Coil Locations

Socket Voltages

Voltages measured with Chanalyst or VoltOhmyst and should hold within ±20% with rated line voltage. Tuning condenser closed—no signal input.

Tube	Terminal	Phono (Voltage)	A.M. (Voltage)	F.M. (Voltage)
V1 6CB6 R.F. Amp.	Plate 5	—	203	132
	Screen 6	—	48	39
	Cathode 2	—	0.2	0.2
	Grid 1	—	−1.1	−0.9
V2 6J6 Mixer and Osc.	Plate 2	—	55	51
	Grid 5	—	−1.4	−1.2
	Plate 1	—	33	27
	Grid 6	—	−2.1	−1.9
V3 6BA6 I.F. Amp.	Plate 5	—	192	188
	Screen 6	—	106	101
	Cathode 7	—	0.9	
	Grid 1	—	−1.1	−0.35
V4 6AU6 Driver	Plate 5	—	186	180
	Screen 6	—	122	120
	Cathode 7	—	1.05	1.07
V5 6AL5 Ratio Det.	—— ——	—	—	—
V6 6AV6 A.F. Amp.	Plate 7	112	94	94
	Grid 1	−0.7	−0.7	−0.7
V7 6C4 Ph. Inverter	Plate 1–5	125	87	85
	Grid 6	−19.2	−16	−16
	Cathode 7	−11.1	−11.4	−11.4
V8 6V6GT or Output V9	Plate 3	305	295	298
	Screen 4	299	208	204
	Grid 5	−19.2	−16	−16
V10 5Y3GT Rectifier	Filament 2	314	313	313



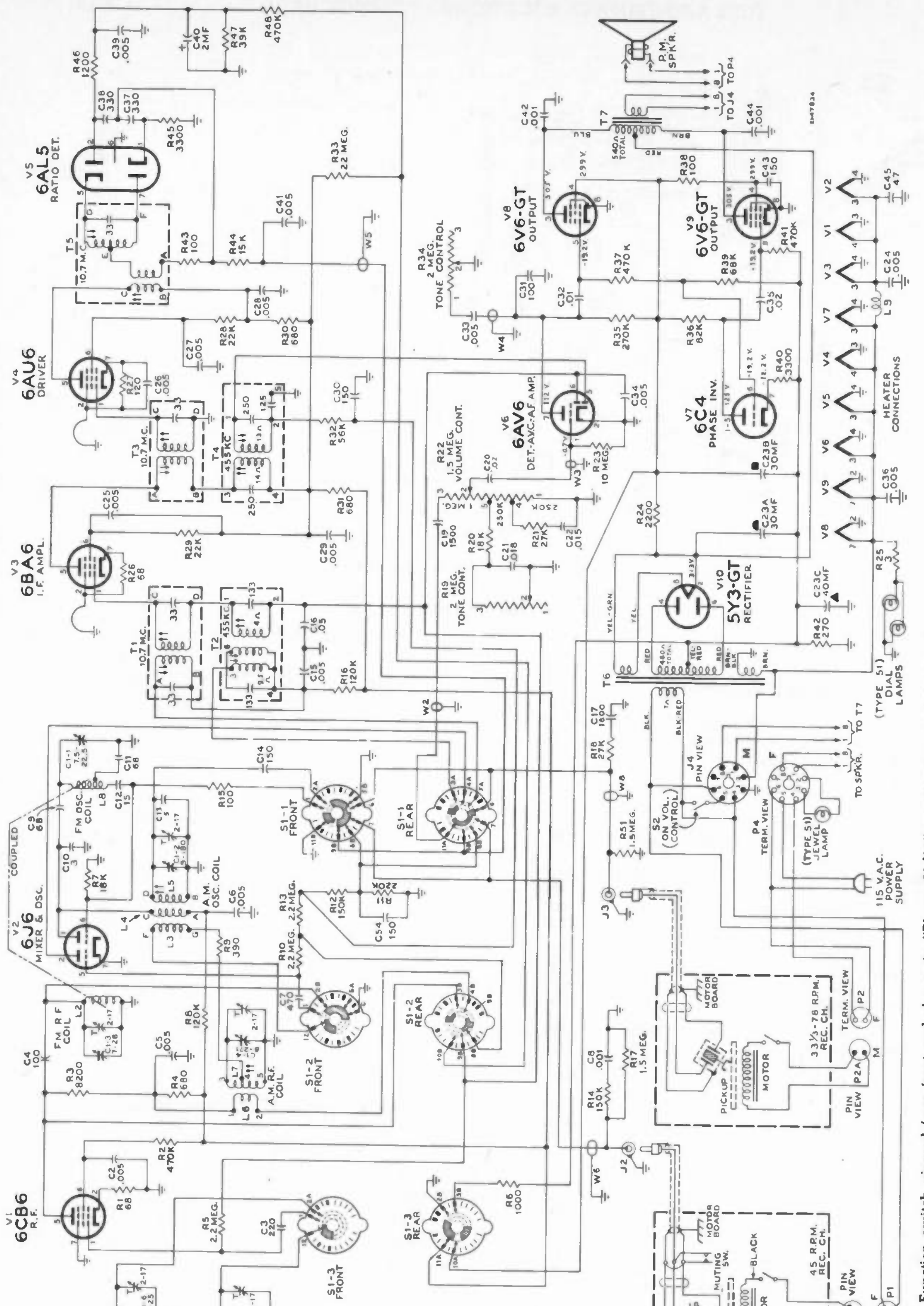
Dial Cord and Drive Assembly

Cathode Currents (Ma.)

Tube	Terminal	Phono	A.M.	F.M.
V1 6CB6	2	—	3	3
V2 6J6	7	—	2.6	2.6
V3 6BA6	7	—	13.2	14.7
V4 6AU6	7	—	9.3	9
V5 6AL5	1 & 5	—	—	—
V6 6AV6	2	0.8	0.5	0.5
V7 6C4	7	2.2	1.5	1.5
V8 6V6GT	8	35.6	17.8	17.7
V9 6V6GT	8	35.6	17.8	17.7
10 5Y3GT	2	74.2	73.6	74.2

COMPLETE SCHEMATIC DIAGRAM

The cathode neutralizing loops of V3 (6BA6) and V4 (6AU6) are insulated wires approx. 2 in. long. Do not alter length.



Function switch viewed from front and shown in "Phono 78/33" position (max. c/clockwise).

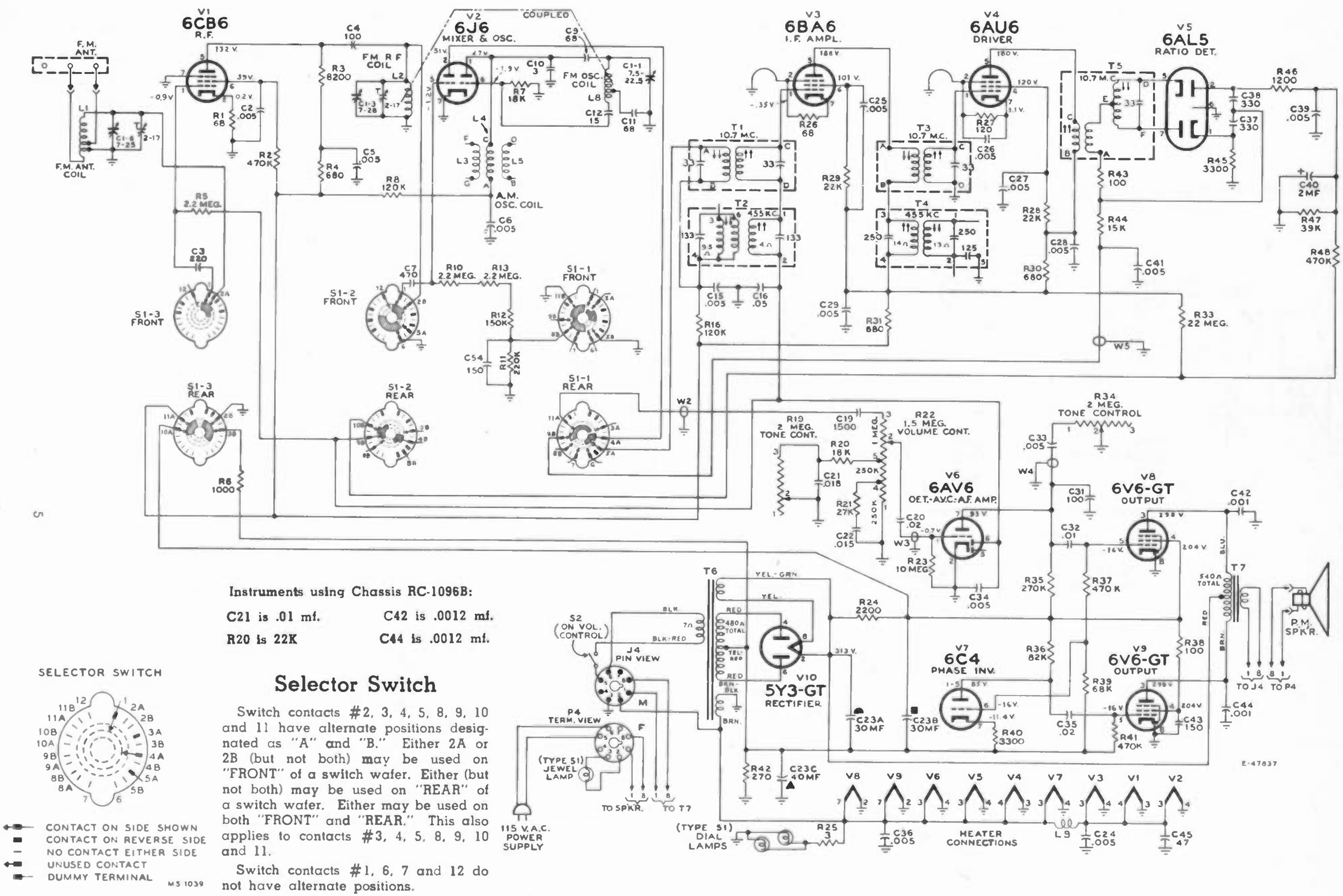
CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED.

RESISTANCE VALUES IN OHMS. K = 1000.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHYMST WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117-VOLT POWER SUPPLY.

Complete Schematic Diagram

SIMPLIFIED SCHEMATIC DIAGRAM—"FM"



Instruments using Chassis RC-1096B:

C21 is .01 mf.	**C42 is .0012 mf.**
R20 is 22K	**C44 is .0012 mf.**

Selector Switch

Switch contacts #2, 3, 4, 5, 8, 9, 10 and 11 have alternate positions designated as "A" and "B." Either 2A or 2B (but not both) may be used on "FRONT" of a switch wafer. Either (but not both) may be used on "REAR" of a switch wafer. Either may be used on both "FRONT" and "REAR." This also applies to contacts #3, 4, 5, 8, 9, 10 and 11.

Switch contacts #1, 6, 7 and 12 do not have alternate positions.

Function switch viewed from front and shown in "FM" position (max. clockwise).

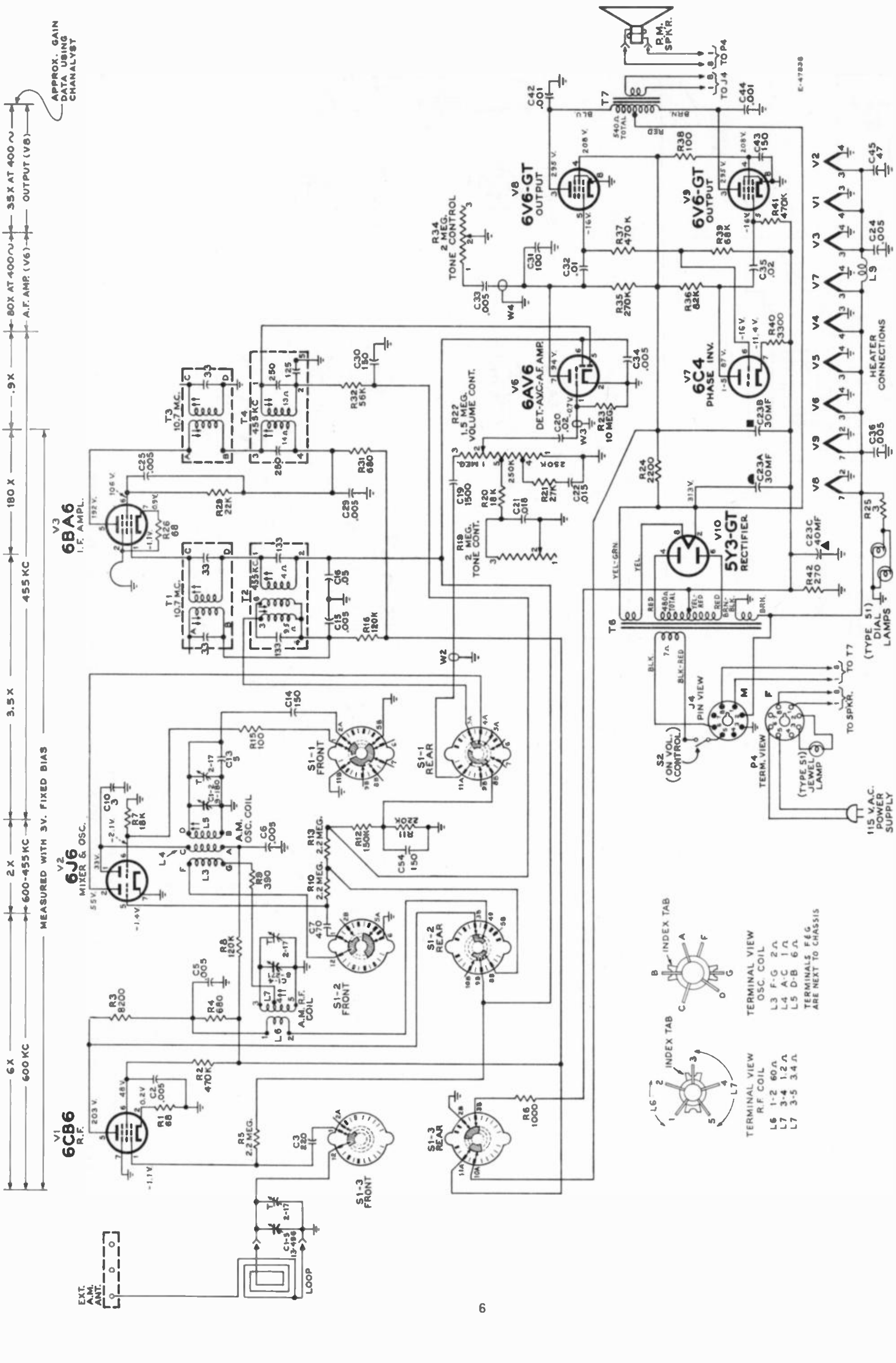
CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED.

RESISTANCE VALUES IN OHMS. K = 1000.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHYMST WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117-VOLT POWER SUPPLY.

Simplified Schematic Diagram—"FM"

SIMPLIFIED SCHEMATIC DIAGRAM—"AM"



Function switch viewed from front and shown in "AM" position (#3 clockwise).

CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED.

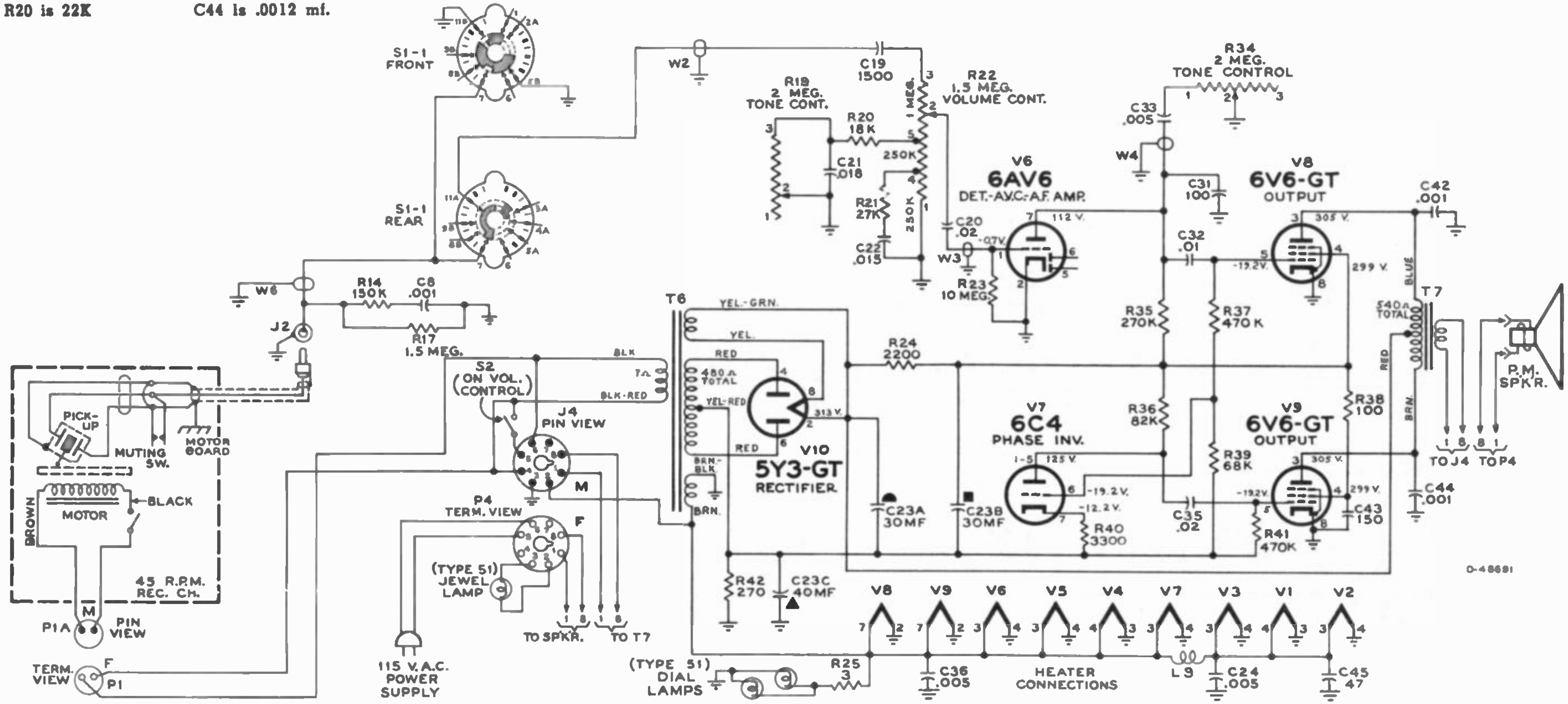
RESISTANCE VALUES IN OHMS. K = 1000.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHYMST WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117-VOLT POWER SUPPLY.

Simplified Schematic Diagram—"AM"

Instruments using Chassis RC-1096B:

C21 is .01 mf.	C42 is .0012 mf.
R20 is 22K	C44 is .0012 mf.



Note:

When the function switch is in "Phono 45" or "Phono 78/33" position the B+ supply voltage to tubes V1, V2, V3 and V4 is disconnected at switch section S1-3 rear. This results in higher plate and screen voltages on V6, V7, V8 and V9.

The bias resistor R6 (in parallel with R42 in AM and FM positions) is also disconnected at S1-3 rear. This results in higher grid bias voltage on V8 and V9.

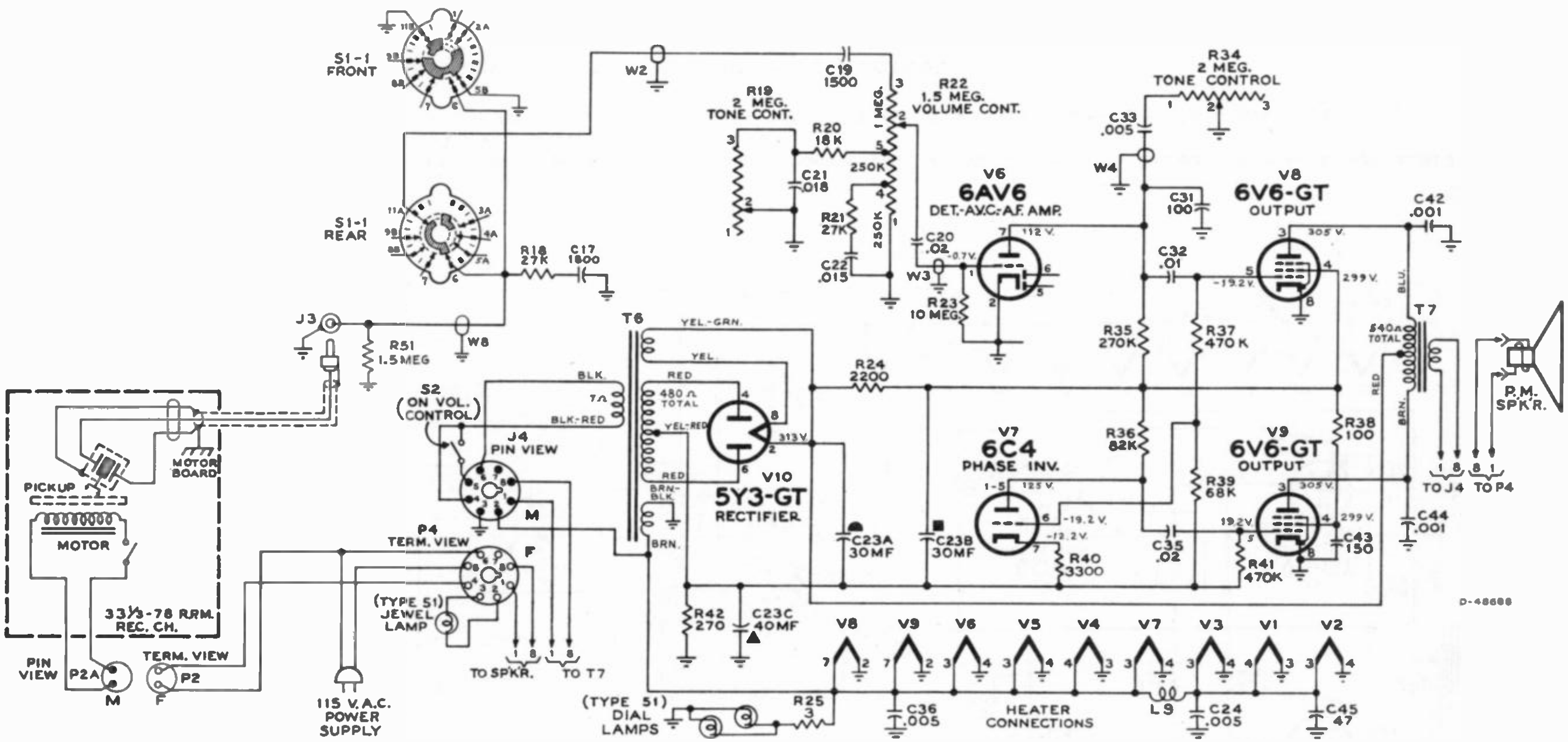
FUNCTION SWITCH VIEWED FROM FRONT AND SHOWN IN "PHONO 45" POSITION (#2 CLOCKWISE).

CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED.

RESISTANCE VALUES IN OHMS. K = 1000.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHYMST WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117-VOLT POWER SUPPLY.

Simplified Schematic Diagram—"Phono 45"



Note:

When the function switch is in "Phono 45" or "Phono 78/33" position the B+ supply voltage to tubes V1, V2, V3 and V4 is disconnected at switch section S1-3 rear. This results in higher plate and screen voltages on V6, V7, V8 and V9.

The bias resistor R6 (in parallel with R42 in AM and FM positions) is also disconnected at S1-3 rear. This results in higher grid bias voltage on V8 and V9.

FUNCTION SWITCH VIEWED FROM FRONT AND SHOWN IN "PHONO 78/33" POSITION (MAX. C/CLOCKWISE).

CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED.

RESISTANCE VALUES IN OHMS. K = 1000.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHYMST WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117-VOLT POWER SUPPLY.

Simplified Schematic Diagram—"Phono 78/33"

Record Changer Mounting

Each record changer is mounted in a roll-out carriage. The changer mechanisms are mounted on rubber grommets (45 r.p.m.) or springs (78/33 r.p.m.) and should be free floating.

Two shipping screws hold the 45 r.p.m. changer to its roll-out carriage. They are accessible from the under-side of the carriage and should be REMOVED at time of installation.

Two shipping screws hold the 78/33 r.p.m. changer to its roll-out carriage. They are accessible after the turntable is lifted off and should be LOOSENED at time of installation.

Roll-out Carriage Removal

Each roll-out carriage has two stop pins, (one at the back end of each slide) held in place by retaining spring. To remove roll-out carriage, it is first necessary to pull the retaining springs out of the slides with a pair of long nose pliers, the stop pins are then easily removed. The roll-out carriage may then be removed from the front of the cabinet after disconnecting its connecting cables.

Roll-out Carriage Travel

The roll-out carriages have a normal movement limitation of approximately 10 inches. If they do not have this amount of movement, it may be due to an obstruction or from slippage or creeping of the balls of the slide mechanism. Travel restriction due to slippage or creeping of balls in the slide mechanism can be corrected by exerting slightly greater pull until the normal travel limitation is reached. The carriage should then operate to its full travel with normal pull.

A-101, A-108 (RC-1096B) 45-W-10 (RC-1096C)

Service Data:

Chassis stamped RC-1096B and RC-1096C are the same as chassis stamped RC-1096 and RC-1096A respectively except for the value of C21, R20 in volume control circuit and C42, C44 in output tubes plate circuit.

	RC-1096	RC-1096A	RC-1096B & C
C21	.018	.015	.010 mf.
R20	18K	18K	22K ohms
C42	.001	.001	.0012 mf.
C44	.001	.001	.0012 mf.

Substitute Speaker:

Speakers stamped 971494-2 have been used as a substitute for speakers stamped 92569-12, but only with chassis stamped RC-1096B (A-101 and A-108) or RC-1096C (45-W-10). Speakers stamped 92569-12 can be used with any of the above chassis (RC-1096, -A, -B, or -C).

Addition to Parts List:

CHASSIS ASSEMBLIES

Add:

76423 Capacitor—Ceramic, 3 mmf. (C10)

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1096
75567	Capacitor—Variable tuning capacitor complete with drive drum (C1-1, C1-2, C1-3, C1-4, C1-5, C1-6)
75613	Capacitor—Ceramic, 5 mmf. (C13)
39396	Capacitor—Ceramic, 100 mmf. (C4)
75609	Capacitor—Ceramic, 47 mmf. (C45)
75612	Capacitor—Ceramic, 68 mmf. (C9, C11)
39396	Capacitor—Ceramic, 100 mmf. (C4)
75437	Capacitor—Ceramic, 100 mmf. (C31)
75614	Capacitor—Ceramic, 150 mmf. (C14, C30, C43, C54)
75611	Capacitor—Ceramic, 220 mmf. (C3)
39640	Capacitor—Mica, 330 mmf. (C37, C38)
39644	Capacitor—Mica, 470 mmf. (C7)
75610	Capacitor—Ceramic, 1500 mmf. (C19)
74850	Capacitor—Ceramic, 1800 mmf. (C17)
73473	Capacitor—Ceramic, 5000 mmf. (C2, C5, C6, C15, C24, C25, C27, C28, C29, C34, C36)
73801	Capacitor—Tubular, paper, .001 mfd, 400 volts (C8)
70642	Capacitor—Tubular, paper, .001 mfd, 1000 volts (C42, C44)
71926	Capacitor—Tubular, paper, .005 mfd, 200 volts (C26, C39, C41)
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts (C33)
71925	Capacitor—Tubular, paper, .01 mfd, 400 volts (C32)
72120	Capacitor—Tubular, paper, .015 mfd, 200 volts (C22)
58476	Capacitor—Tubular, paper, oil impregnated, .018 mfd, 400 volts (C21)
74010	Capacitor—Tubular, paper, .02 mfd, 400 volts (C20, C35)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C16)
73747	Capacitor—Electrolytic 2 mfd, 50 volts (C40)
72052	Capacitor—Electrolytic comprising 1 section of 30 mfd, 450 volts, 1 section of 30 mfd, 350 volts and 1 section of 40 mfd, 25 volts (C23A, C23B, C23C)
73935	Clip—Mounting clip for A-M, I-F transformers
75627	Clip—Clip for main cable—on rear of chassis
75569	Coil—Oscillator coil (A-M) complete with adjustable core (L3, L4, L5)
75570	Coil—R.F. coil complete with adjustable core (L6, L7)
71942	Coil—Filament choke coil (L9)
75615	Coil—Antenna coil—F-M (L1)
74815	Coil—R.F. coil—F-M (L2)
74817	Coil—Oscillator coil—F-M (L8)
35787	Connector—Single contact female connector for phono cables (J2, J3)
75542	Connector—8 contact male connector for power input cable (J4)
75543	Connector—2 contact female connector for 45 RPM motor cable (P1)
74879	Connector—2 contact female connector for antenna leads
75537	Control—Volume control and power switch (R22, S2)
75561	Control—Tone control—L.F. (R19)
75562	Control—Tone control—H.F. (R34)
†72953	Cord—Drive cord (approx. 66" overall length required)
75564	Coupling—Spring coupling for function switch extension shaft
75556	Cover—Insulating cover for electrolytic capacitor #72052
74839	Fastener—Push fastener for mounting R.F. shelf (4 req'd)
16058	Grommet—Rubber grommet for mounting R.F. shelf (4 req'd)
75547	Grommet—Rubber grommet to mount slide mechanism to bottom—rear (2 req'd)
75548	Grommet—Rubber grommet to mount slide mechanism to bottom—front (2 req'd)
11765	Lamp—Dial lamp—Mazda 51
75544	Nut—Rivnut to fasten screw for mounting chassis (4 req'd)
18469	Plate—Bakelite mounting plate for electrolytic capacitor #72052
75535	Plate—Dial back plate complete with three (3) pulleys
75536	Pointer—Station selector indicator
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R25)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R24)
	Resistor—Fixed, composition:—
	68 ohms, ±10%, ½ watt, (R1, R26)
	100 ohms, ±10%, ½ watt (R15, R38, R43)
	120 ohms, ±10%, ½ watt (R27)
	270 ohms, ±5%, 2 watts (R42)
	390 ohms, ±10%, ½ watt (R9)
	680 ohms, ±10%, ½ watt (R4)
	680 ohms, ±20%, ½ watt (R30, R31)
	1000 ohms, ±10%, ½ watt (R6)
	1200 ohms, ±5%, ½ watt (R46)
	3300 ohms, ±5%, ½ watt (R40, R45)
	8200 ohms, ±10%, 1 watt (R3)
	15,000 ohms, ±10%, ½ watt (R44)
	18,000 ohms, ±10%, ½ watt (R7, R20)
	22,000 ohms, ±10%, ½ watt (R28, R29)
	27,000 ohms, ±10%, ½ watt (R18, R21)

† Stock No. 72953 is a reel containing 250 feet of cord.

Replacement Parts—Concluded

STOCK NO.	DESCRIPTION
	39,000 ohms, ±5%, ½ watt (R47)
	56,000 ohms, ±10%, ½ watt (R32)
	68,000 ohms, ±10%, ½ watt (R39)
	82,000 ohms, ±10%, ½ watt (R36)
	120,000 ohms, ±10%, ½ watt (R8, R16)
	150,000 ohms, ±10%, ½ watt (R12, R14)
	220,000 ohms, ±20%, ½ watt (R11)
	270,000 ohms, ±10%, ½ watt (R35)
	470,000 ohms, ±10%, ½ watt (R2, R37, R41, R48)
	1.5 megohm, ±10%, ½ watt (R17, R51)
	2.2 megohm, ±20%, ½ watt (R5, R10, R13)
	10 megohm, ±20%, ½ watt (R23)
	22 megohm, ±20%, ½ watt (R33)
75540	Shaft—Tuning knob shaft
75565	Shaft—Extension shaft for function switch
73584	Shield—Tube shield for V1 and V6
75546	Slide—Slide mechanism complete for radio chassis bottom
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
74179	Socket—Tube socket, 7 pin, miniature for 6CB6 and 6J6 tubes only.
31364	Socket—Dial lamp socket
75563	Spring—Retaining spring for function switch extension shaft
74038	Spring—Drive cord spring
74847	Support—Polystyrene support for F-M oscillator coil complete with mounting bracket
75602	Switch—Function switch (S1-1, S1-2, S1-3)
75557	Transformer—Ouput transformer (T7)
73743	Transformer—Ratio detector transformer (T5)
75558	Transformer—First I-F transformer (A-M) complete with adjustable cores (T2)
73037	Transformer—Second I-F transformer (A-M) complete with adjustable cores (T4)
75559	Transformer—First I-F transformer (F-M) complete with adjustable cores (T1)
75560	Transformer—Second I-F transformer (F-M) complete with adjustable cores (T3)
75566	Transformer—Power transformer, 117 volts, 60 cycle (T6)
33726	Washer—"C" washer for tuning knob shaft
	RADIO ROLLOUT CARRIAGE
75603	Decal—Function decal for controls
75572	Dial—Polystyrene dial scale
75571	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM record changer—for mahogany or walnut instruments
75684	Frame—Moulded frame (light brown) for mounting radio chassis and 45 RPM record changer—for oak instruments
75551	Handle—Metal pullout handle for mounting frame.
75555	Screw—#8-32 x ⅝" cross recessed pan head machine screw to mount radio chassis (4 req'd)
	SPEAKER ASSEMBLY
	Stamped 92569—12W RMA 274
	RL 111-A1
13867	Cap—Dust cap
75682	Cone—Cone and voice coil assembly (3.2 ohms)
75681	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms)
	NOTE:—If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
71864	Antenna—F-M antenna
75705	Antenna—Antenna loop complete less cable
75898	Back—Back cover—maroon—for 33⅓/78 RPM record changer compartment—for mahogany or walnut instruments (assembled to rollout)
75901	Back—Back cover—light brown—for radio—45 RPM record changer compartment—for oak instruments (assembled to rollout)
75900	Back—Back cover—maroon—for radio—45 RPM record changer compartment—for mahogany or walnut instruments (assembled to rollout)
73680	Board—"A—F-M" terminal board
75694	Bracket—Stop bracket (less rubber bumper) for rollouts
71599	Bracket—Pilot lamp bracket
75696	Bumper—Rubber bumper for record changer rollout stop bracket
75919	Button—Rosette button for speaker grille
74296	Cable—Shielded pickup cable complete with pin plug for 33⅓/78 RPM record changer
72437	Cable—Shielded pickup cable complete with pin plug for 45 RPM record changer
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for cabinet door
X3189	Cloth—Grille cloth for mahogany or walnut instruments
X3093	Cloth—Grille cloth for oak instruments
74882	Connector—2 contact (polarized) male connector for antenna loop cable
74752	Connector—2 contact male connector for FM antenna terminal board cable
75709	Connector—8 contact female connector for main cable (less shell) (P4)
30868	Connector—2 contact female connector for 33⅓/78 RPM record changer motor cable (P2)
75474	Connector—Single contact male connector for speaker cable (2 req'd)
71984	Decal—Trade mark decal (RCA Victor)
74273	Decal—Trade mark decal (Victrola)
74838	Grommet—Power cord strain relief (1 set)
37396	Grommet—Rubber grommet for mounting speaker
75697	Grommet—Rubber grommet for mounting 45 RPM changer
75551	Handle—Metal pullout handle for 33⅓/78 RPM record changer mounting frame
74308	Hinge—Cabinet door hinge (1 set)
75712	Knob—Tuning control, tone control or volume control and power switch knob—maroon—for mahogany or walnut instruments
75713	Knob—Tuning control, tone control or volume control and power switch knob—tan—for oak instruments
75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75715	Knob—Function switch knob—tan—for oak instruments
11765	Lamp—Pilot lamp—Mazda #51
75917	Nail—Rosette headnail for grille (3 required)
73634	Nut—Speed nut for speaker mounting screw
75916	Pull—Door pull
74279	Screw—#8-32 x ⅞" trimit head screw for door pull
75708	Shell—Shell for 8 contact female connector #75709
75546	Slide—Slide mechanism for 33⅓/78 RPM record changer mounting frame
31364	Socket—Pilot lamp socket and lead
74734	Spring—Retaining spring for knobs
75902	Spring—Suspension spring for main cable
72936	Stop—Cabinet door stop

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

RCA VICTOR

AM-FM Radio-Phonograph Combination

MODEL A106

Chassis No. RC-622

— Mfg. No. 274 —

SERVICE DATA

— 1950 No. 5 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Antennas

This receiver has built-in antenna for standard broadcast (AM) and frequency modulation (FM) reception.

Provision is made for the use of an external antenna for FM reception if desired. To use external FM antenna — remove the built-in FM antenna lead from the "FM" terminals of the antenna terminal board. Connect the transmission line of an external FM dipole antenna to these two "FM" terminals.

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-168 SERIES SERVICE DATA FOR 45 R.P.M. AND MODEL 960285-1 SERVICE DATA for 78/33⅓ R.P.M.

Tuning Range

Standard Broadcast (AM)	540-1,600 kc.
Frequency Modulation (FM)	88-108 mc.
Intermediate Frequencies	AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6BJ6	R-F Amplifier
(2) RCA 6J6	Mixer and Oscillator
(3) RCA 6BA6	I-F Amplifier
(4) RCA 6AU6	Driver
(5) RCA 6AL5	Ratio Detector
(6) RCA 6AV6	AM Det.—AVC—A-F Amplifier
(7) RCA 6AV6	Ph. Inv.
(8) RCA 6V6GT	Output
(9) RCA 6V6GT	Output
(10) RCA 6X5GT	Rectifier

Dial Lamps (2)	Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp	Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio .... 18:1 (9 turns of knob)

Power Supply Rating .... 115 volts, 60 cycles, 90 watts

Loudspeaker (92569-6W)

Size and type	12 in. PM
Voice coil impedance	3.2 ohms at 400 cycles

Power Output

(Radio) Undistorted 5 watts	Maximum 6.4 watts
(Phono.) Undistorted 8 watts	Maximum 9 watts

Cabinet Dimensions

Height 31½ in. **Width 39¾ in.** **Depth 17½ in.**

Record Changer (RP-168)

Turntable speed	45 r.p.m.
Record capacity	Up to 10 RCA 7-in. fine groove records
Pickup	Crystal (medium output)

Record Changer (960285-1)

Turntable speed	78/33⅓ r.p.m.
Record capacity	Twelve 10-in., ten 12-in. or ten intermix
Pickup	Crystal

Circuit Description

This instrument has a ten-tube (including rectifier) chassis which is very similar to those used in other RCA Victor radio-phonograph combinations designed for AM-FM reception.

The selector switch has five functions:

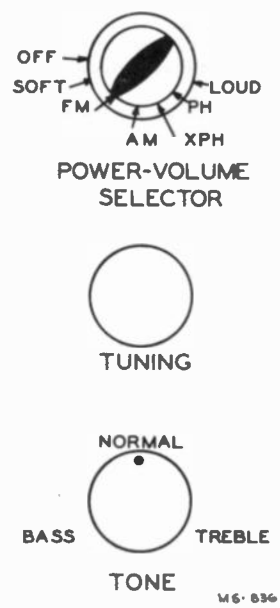
(1) Selection of tuning range.

(2) Selection and distribution of a.v.c. voltages.

(3) Application of B+ voltage to tubes V1, V2, V3 and V4.

(4) Selection of audio input applied to the volume control.

(5) Application of a.c. power to the record changer motors.



Operating Controls

CRITICAL LEAD DRESS

Note: The leads listed may not be critical in all receivers. However, by dressing the leads as specified, unusual difficulties will be minimized.

1. The plate lead of the second IF transformer should be dressed down against the chassis to obtain max. capacity between the lead and chassis. This lead is specified to be two inches long.
2. The "A" band RF transformer plate, and grid leads should be dressed so as to minimize coupling to the RF amplifier grid circuit, and kept close to chassis when possible.
3. The 2.2 meg. grid resistors connecting to the RF and mixer grids should have a minimum practicable amount of lead extending on the grid end. The leads should be cut off short on the grid end and long on the A.V.C. end.
4. The unshielded plate lead from the function switch to the 1st IF transformer should be dressed away from the switch wafer audio lugs as much as possible.
5. The ground strap between the RF shelf and chassis should be well soldered and kept as short as practicable. FM instability may be caused by having this ground strap too long, particularly when no input is connected to the FM antenna terminal.
6. The lead from the 2nd IF to the grid of the 6BA6 1st IF amplifier should be kept short, and dressed against the chassis as much as practicable.
7. The lead from the 2nd IF to the AM detector diode should be dressed to minimize coupling to the 6AV6 1st AF grid and kept close to chassis.
8. Leads from the volume control taps should be kept clear of all filament and output plate wires as in the wiring sample.
9. The loop cable when connected to the AM sec. gang stator should be dressed to have minimum capacity coupling to the stator lug on the RF section of gang condenser.
10. The oscillator coupling condenser C10 should be dressed to have minimum capacity to the mixer grid, Pin No. 5 on V2.
11. The shielding on the shielded lead from the volume control to the function switch should have the minimum practicable exposed wire at the function switch end.

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Oscilloscope Alignment:

The FM I-F alignment may be checked using a sweep generator and an oscilloscope. Shunt terminals B and C of T4 with a 1200 ohm resistor. Connect the high side of an oscilloscope to terminal C of T4 in series with a diode probe. Apply the output of the sweep generator (10.7 mc. with ±250 kc. sweep) to pin No. 1 of V3 (6BA6) in series with .01 mf. Low side of the oscilloscope and sweep generator to chassis. This will show the response of T3.

To check the combined response of T2 and T3: connect the sweep generator to the FM antenna terminals (remove FM antenna lead) in series with 300 ohms. Note: One FM terminal is grounded—it may be necessary to reverse the sweep generator connections. Oscilloscope connections remain as connected.

To check the ratio detector response: connect the high side of the oscilloscope direct to terminal No. 9 of S1, low side to chassis. Apply the output of the sweep generator to pin No. 1 of V4 (6AU6) in series with .01 mf. Driver plate circuit connected for normal operation (1200 ohm resistor removed). Note: It is difficult to observe marker signals in this step—center frequency and sweep width should be previously observed.

AM Alignment

RANGE SWITCH IN BC POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Pin No. 5 of V2 in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	AM windings.† T3 bottom core (sec.). T3 top core (pri.).
2				AM windings.† T2 top core (sec.). T2 bottom core (pri.).
3	Short wire placed near loop for radiated signal	1400 kc.	1400 kc.	C1-2T (osc.). C1-5T (ant.). C1-4T (rf.).
4		600 kc.	600 kc.	L8 (osc.) with 10,000 ohms resistor from RF stator to gnd. (rocking gang)
5				L5 (RF) with the 10,000 ohms removed.
6	Repeat steps 3, 4 and 5 until no improvement in sensitivity is obtained.			

† Use alternate loading.

Alternate loading involves the use of a 47,000 ohm resistor to load the AM plate winding while the AM grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 47,000 ohm resistor after T3 and T2 have been aligned.

Oscillator frequency is above signal frequency on both AM and FM.

FM Alignment

RANGE SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

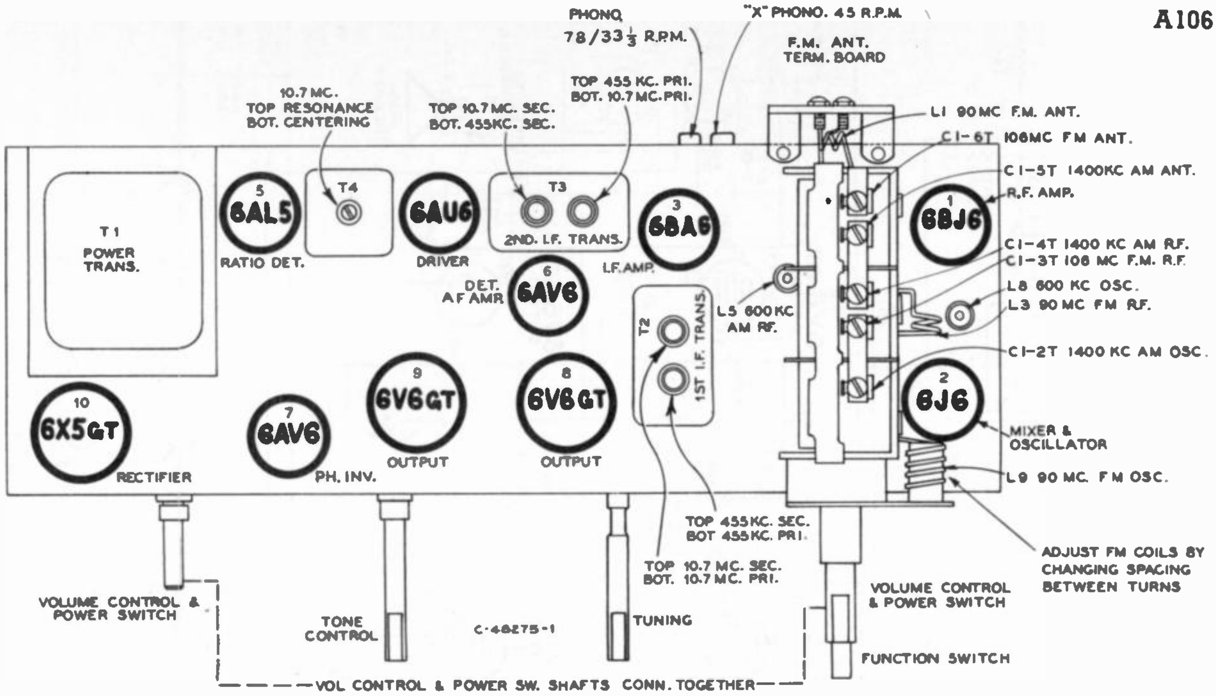
Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C42 and the common lead to chassis. Turn gang condenser to max. capacity (fully meshed). Volume Control max.			
2	Pin 1 of V4 6AU6 in series with 470 ohm resistor.	10.7 mc. modulated 30% 400 cycles AM (Approx. .05 volt).	Max. capacity (fully meshed).	T4 top core for max. d-c voltage across C42. T4 bottom core for min. audio output. *
3		10.7 mc. Adjust to provide about 4 volts indication on VoltOhmyst during alignment.		FM windings.†† T3 top core (sec.). T3 bottom core (pri.).
4				FM windings.†† T2 top core (sec.). T2 bottom core (pri.).
5	High and low side of signal gen. through two 120 ohm resistors. To ant. terminals.	90 mc.	90 mc.‡	L9 (osc.).**
6		106 mc.	106 mc.	C1-6T (ant.). C1-3T (rf.).
7		90 mc.	90 mc.	L1 (ant.).** L3 (rf.).**
8	Repeat steps 6 and 7 until no improvement in sensitivity is obtained.			

* Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

†† Align T3 and T2 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 47,000 ohm resistor and load the FM windings.

** L1, L3 and L9 are adjustable by increasing or decreasing the spacing between turns.

‡ After dial pointer has been set accurately on calibration point for "A" band (see dial indicator and drive drawing) tune receiver to 90 mc. on FM using dial scale as reference or use dial scale drawing on page 8.

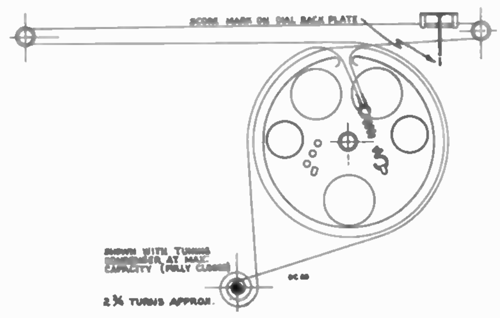


Tube and Trimmer Locations

Socket Voltages

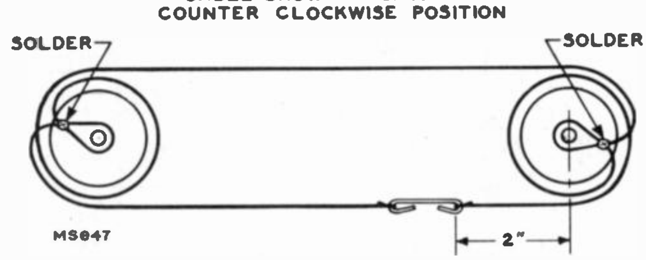
Voltages measured with Chanalyst or VoltOhmyst and should hold within ±20% with rated line voltage. Tuning condenser closed—no signal input.

Tube	Terminal	Voltage Phono	Voltage A.M.	Voltage F.M.
V1 6BJ6 R.F. Amp.	Plate 5	—	185	110
	Screen 6	—	120	100
	Cathode 2	—	0.8	0.8
	Grid 1	-0.9	-0.0	-0.6
V2 6J6 Mixer and Osc.	Plate 1	—	73	80
	Grid 6	-1.07	-2	-3.4
	Plate 2	—	56	56
	Grid 5	-0.54	-5.4	-3.6
V3 6BA6 I.F. Amp.	Plate 5	—	180	178
	Screen 6	—	115	111
	Cathode 7	—	0.9	0.9
	Grid 1	-0.95	-1.1	-.75
V4 6AU6 Driver	Plate 5	—	174	175
	Screen 6	—	125	175
	Cathode 7	—	0.9	0.9
V5 6AL5 Ratio Det.	—— —	—	—	—
V6 6AV6 A.F. Amp.	Plate 7	97	85	80
	Grid 1	-.72	-.75	-0.75
V7 6AV6 Inverter	Plate 7	140	110	110
	Grid 1	-18.7	-17.8	-17.3
	Cathode 2	-18	-17	-16.6
V8 6V6GT Output	Plate 3	262	270	270
	Screen 4	262	190	190
	Grid 5	-18	-17	-16
V9 6V6GT Output	Plate 3	262	270	270
	Screen 4	262	190	190
	Grid 5	-18	-17	-16
V10 6X5GT Rectifier	Cathode 8	271	275	275



Dial Indicator and Drive Mechanism

CABLE SHOWN IN EXTREME COUNTER CLOCKWISE POSITION

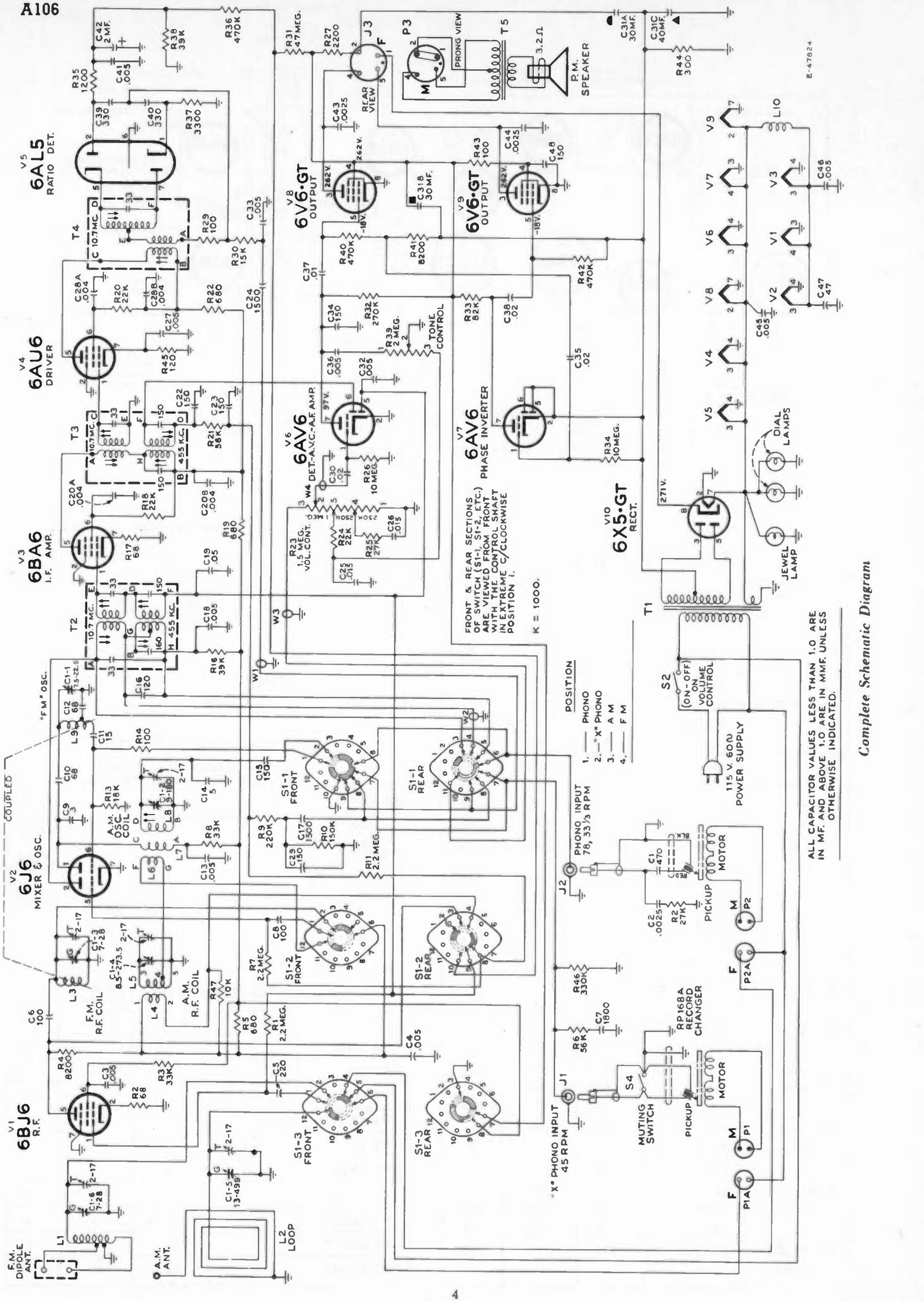


Volume Control Drive Mechanism

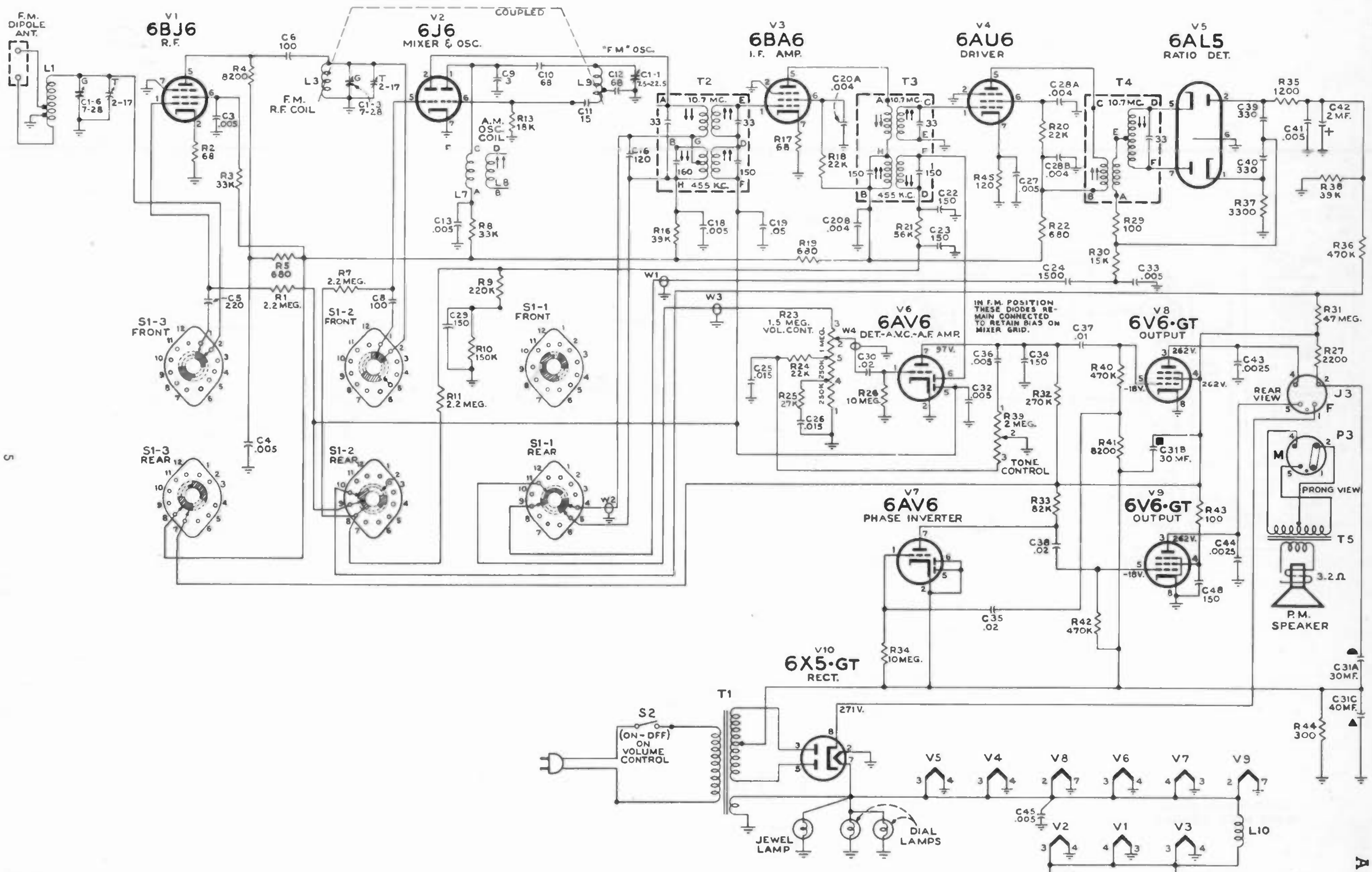
Cathode Currents (MA)

Tube	Terminal	Phono	A.M.	F.M.
V1 6BJ6	2	—	11.1	11.4
V2 6J6	7	—	6.8	6.6
V3 6BA6	7	—	13.1	13.7
V4 6AU6	7	—	8.2	8.1
V5 6AL5	1 & 5	—	—	—
V6 6AV6	2	0.68	.44	.43
V7 6AV6	2	1.7	1.4	1.35
V8 6V6GT	8	33	11.2	11
V9 6V6GT	8	33	11	11
V10 6X5GT	8	66	63	63

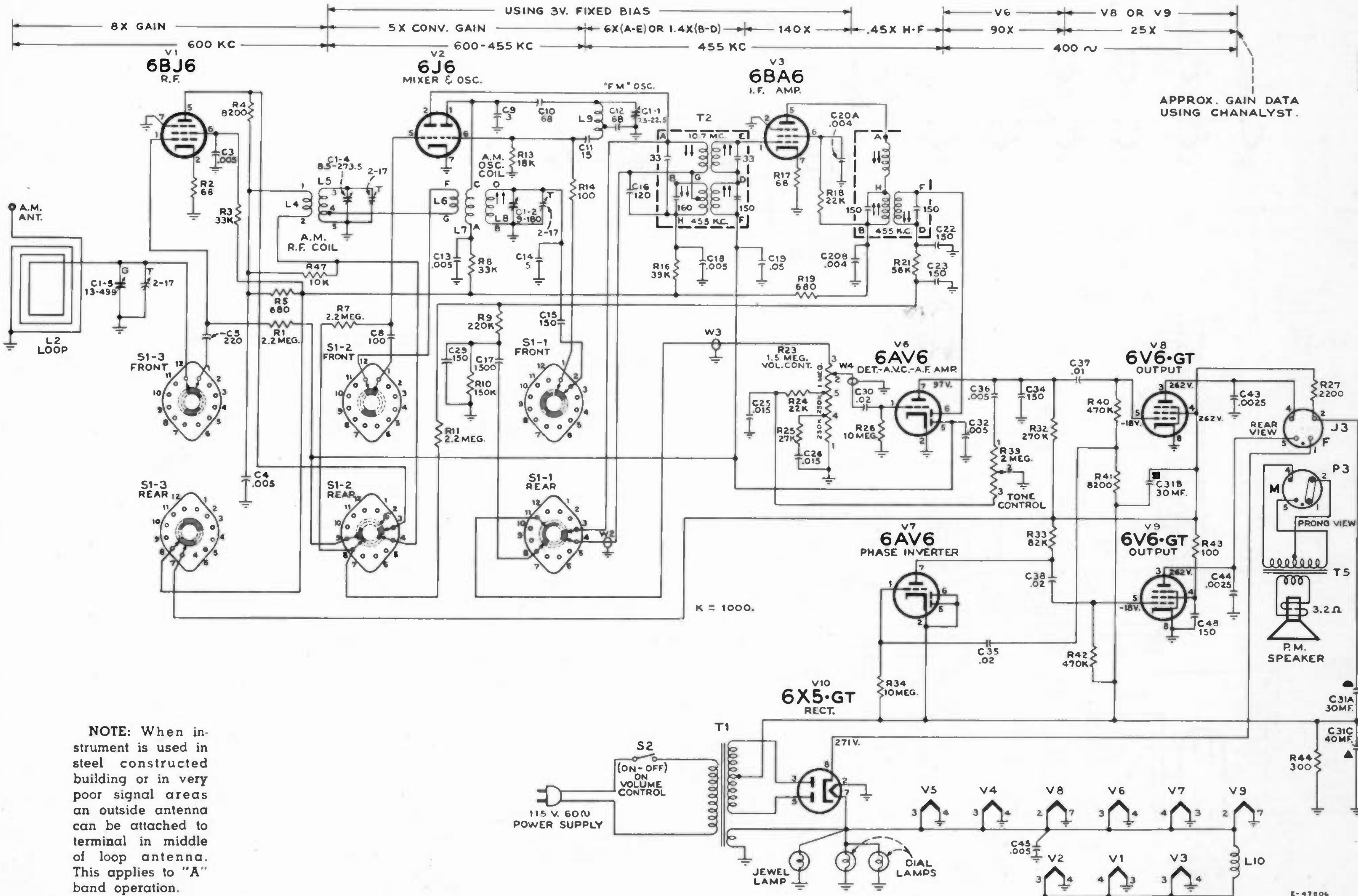
A106



Complete Schematic Diagram

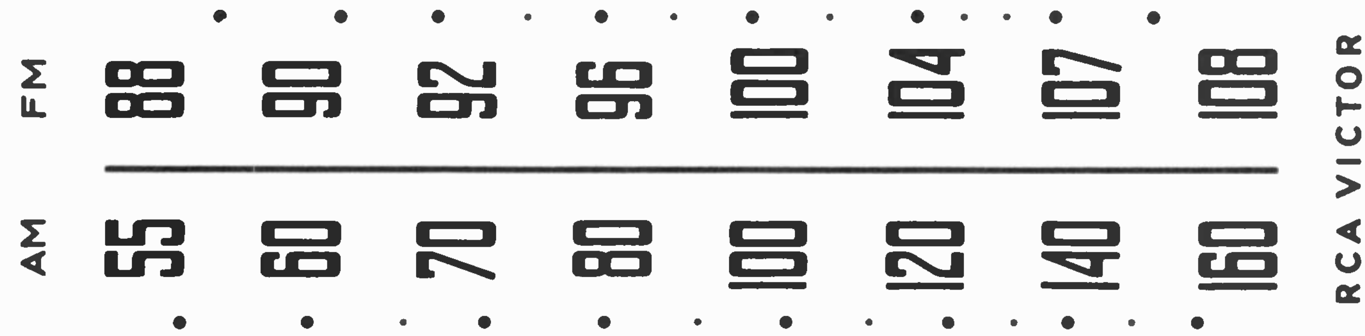


Simplified Schematic Diagram "FM" Position



NOTE: When instrument is used in steel constructed building or in very poor signal areas an outside antenna can be attached to terminal in middle of loop antenna. This applies to "A" band operation.

Simplified Schematic Diagram "AM" Position



Dial Scale (Actual Size)

The dial scale drawing shown is a full size reproduction. It can be used as a reference in alignment procedure.

SHIPPING SCREWS

The radio chassis of these instruments is secured to the cabinet with shipping screws (painted red) which, together with spacing strips, should be **REMOVED** at the time of installation.

The record changers are each mounted with three screws which should be **LOOSENED** at the time of installation.

On the RP-168 record changer decorative caps cover the mounting screws. Remove the caps for access to the screws.

REPLACEMENT PARTS

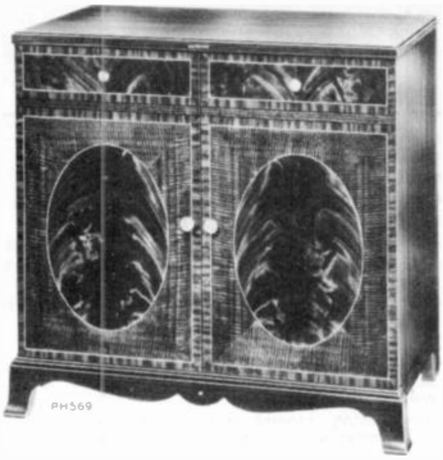
STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 622
*74848	Board—"F.M." terminal board
*74641	Cable—Flexible cable to operate volume control
*74849	Capacitor—Variable tuning capacitor (C1-1, 1-2, 1-3, 1-4, 1-5, 1-6)
73747	Capacitor—Electrolytic, 2 mmf., 50 volts (C42)
*74733	Capacitor—Ceramic, 3 mmf. (C9)
93056	Capacitor—Ceramic, 5 mmf. (C14)
39044	Capacitor—Ceramic, 15 mmf. (C11)
39042	Capacitor—Ceramic, 47 mmf. (C47)
33379	Capacitor—Ceramic, 68 mmf. (C10, C12)
39396	Capacitor—Ceramic, 100 mmf. (C6, C8)
71614	Capacitor—Ceramic, 120 mmf. (C16)
44704	Capacitor—Ceramic, 150 mmf. (C15, C22, C23, C34, C48)
48125	Capacitor—Ceramic, 150 mmf. (C29)
71920	Capacitor—Ceramic, 220 mmf. (C5)
39640	Capacitor—Mica, 330 mmf. (C39, C40)
74093	Capacitor—Ceramic, 1,500 mmf. (C17, C24)
*74850	Capacitor—Ceramic, 1,800 mmf. (C7)
74009	Capacitor—Ceramic, dual, 4,000 mmf. (C20A, C20B, C28A, C28B)
73473	Capacitor—Ceramic, 5,000 mmf. (C3, C4, C13, C18, C32, C46)
72052	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 450 volts, 1 section of 30 mfd, 350 volts and 1 section of 40 mfd, 25 volts (C31A, C31B, C31C)
71926	Capacitor—Tubular, paper, .005 mfd, 200 volts (C27, C33, C41, C45)
71553	Capacitor—Tubular, paper, .005 mfd, 400 volts (C36)
70644	Capacitor—Tubular, paper, .0025 mfd, 1,000 volts (C43, C44)
71925	Capacitor—Tubular, paper, .01 mfd, 400 volts (C37)
71928	Capacitor—Tubular, paper, .02 mfd, 200 volts (C30, C35)
73638	Capacitor—Tubular, paper, .02 mfd, 400 volts (C38)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C19)
72120	Capacitor—Tubular, paper, .015 mfd, 200 volts (C25, C26)
73744	Coil—Oscillator coil—A.M. (L6, L7, L8)
*74841	Coil—R.F. coil — A.M. — complete with adjustable core and stud (L4, L5)
*74815	Coil—R.F. coil—F.M. (L3)
*74816	Coil—Antenna coil—F.M. (L1)
*73817	Coil—Oscillator coil—F.M. (L9)
71942	Coil—Filament choke coil (L10)
5040	Connector—4 contact female connector for speaker cable (P3)
30868	Connector—2 contact female connector for motor cables (P2A)
*74837	Control—Tone control (R39)
74639	Control—Volume control and power switch (R23, S2)
72953	Cord—Drive cord (approx. 58" overall length)
*74839	Fastener—Push fastener to hold R.F. shelf assembly (4 required)
*74838	Grommet—Power cord strain relief grommet (1 set)
16058	Grommet—Rubber grommet for mounting R.F. shelf assembly (4 required)
72069	Grommet—Rubber grommet for rear mounting feet (2 required)
*73895	Indicator—Station selector indicator
74645	Nut—8-32 hex retainer nut between R.F. shelf and volume control knob
74297	Plate—Dial back plate complete with two (2) drive cord pulleys less dial
18469	Plate—Bakelite mounting plate for electrolytic
74640	Pulley—Pulley and hub assembly for volume control
33514	Receptacle—Phono input receptacle
73637	Resistor—Wire wound, 2,200 ohms, 5 watt (R27)
	Resistor—Fixed, composition:
	68 ohms, ±10%, ½ watt (R2, R17)
	100 ohms, ±5%, ½ watt (R29)
	100 ohms, ±10%, ½ watt (R14, R43)
	120 ohms, ±10%, ½ watt (R45)
	300 ohms, ±5%, 2 watt (R44)
	680 ohms, ±10%, ½ watt (R19)
	680 ohms, ±20%, ½ watt (R5, R22)
	1,200 ohms, ±5%, ½ watt (R35)
	3,300 ohms, ±5%, ½ watt (R37)
	8,200 ohms, ±10%, ½ watt (R41)
	8,200 ohms, ±10%, 1 watt (R4)
	10,000 ohms, ±10%, ½ watt (R47)

REPLACEMENT PARTS — Continued

STOCK No.	DESCRIPTION
	15,000 ohms, ±10%, ½ watt (R30)
	18,000 ohms, ±10%, ½ watt (R13)
	22,000 ohms, ±10%, ½ watt (R18, R20, R24)
	27,000 ohms, ±10%, ½ watt (R25)
	33,000 ohms, ±10%, ½ watt (R3, R8)
	39,000 ohms, ±5%, ½ watt (R38)
	39,000 ohms, ±10%, 1 watt (R16)
	56,000 ohms, ±10%, ½ watt (R6, R21)
	82,000 ohms, ±10%, ½ watt (R33)
	150,000 ohms, ±10%, ½ watt (R10)
	220,000 ohms, ±10%, ½ watt (R9)
	270,000 ohms, ±10%, ½ watt (R32)
	330,000 ohms, ±10%, ½ watt (R46)
	470,000 ohms, ±10%, ½ watt (R36, R40, R42)
	2.2 megohm, ±20%, ½ watt (R1, R7, R11)
	10 megohm, ±20%, ½ watt (R26, R34)
	47 megohm, ±20%, ½ watt (R31)
73894	Shaft—Tuning knob shaft
73584	Shield—Tube shield for V1
74646	Sleeve—Sleeve and pulley assembly for volume control knob
74179	Socket—Tube socket, 7 pin, miniature for V1, V2, V3, V4
73117	Socket—Tube socket, 7 pin, miniature for V5, V6, V7
31251	Socket—Tube socket, octal, wafer for V8, V9, V10
31364	Socket—Lamp socket
74038	Spring—Drive cord spring
*74847	Support—Polystyrene support for F.M. oscillator coil complete with mounting bracket
*74840	Switch—Selector switch (S1)
73743	Transformer—Ratio detector transformer (T4)
73745	Transformer—First I.F. transformer—dual (T2)
74019	Transformer—Second I.F. transformer—dual (T3)
73601	Transformer—Power transformer—117 volt, 60 cycle (T1)
33726	Washer—"C" washer for tuning shaft
	SPEAKER ASSEMBLIES
	92569-6W
	RL111-13
	RMA 274
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly
5039	Connector—4 contact male connector for speaker
74753	Speaker—12" P.M. speaker complete with cone and voice coil less plug and transformer
73636	Transformer—Output transformer
	NOTE: If stamping on speaker in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74844	Antenna—F.M. antenna
74205	Bezel—Dial scale bezel less dial
71599	Bracket—Pilot lamp bracket
74296	Cable—Shielded pickup cable complete with pin plug for 33/78 RPM changer
71105	Cable—Shielded, pickup cable complete with pin plug for 45 RPM changer
13103	Cap—Pilot lamp cap
39644	Capacitor—Mica, 470 mmf. (on 78/33⅓ RPM record changer)
70602	Capacitor—Tubular, paper, .0025 mfd (on 78/33⅓ RPM record changer), 400 volts
71892	Catch—Bullet catch and strike for doors (3 required)
73897	Clamp—Dial clamp (2 required)
X3057	Cloth—Grille cloth for mahogany or walnut instruments
X1649	Cloth—Grille cloth for blonde instruments
30868	Connector—2 contact female connector for motor cables
30870	Connector—2 contact male connector for motor cables
74581	Cover—Mounting screw cover for 45 RPM changer (3 required)
74853	Decal—Control function decal for mahogany or walnut instruments
74854	Decal—Control function decal for blonde instruments
74273	Decal—Trade mark decal (Victrola)
71984	Decal—Trade mark decal (RCA Victor)
74842	Dial—Glass dial scale
74851	Grille—Metal grille
11889	Grommet—Rubber grommet for front apron of chassis
74838	Grommet—Power cord strain relief grommet (1 set)
36610	Hinge—Door hinge (1 set) for radio compartment or R.H. record storage compartment
36817	Hinge—Door hinge (1 set) for L.H. record storage compartment
71821	Knob—Tuning control knob—maroon—for mahogany or walnut instruments
72824	Knob—Tuning control or tone control knob—brown—for blonde instruments
71822	Knob—Tone control knob—maroon—for mahogany or walnut instruments
73995	Knob—Volume control knob—brown—for blonde instruments
73994	Knob—Volume control knob—maroon—for mahogany or walnut instruments
73230	Knob—Selector switch knob—maroon—for mahogany or walnut instruments
73231	Knob—Selector switch knob—brown—for blonde instruments
11765	Lamp—Dial or pilot lamp—Mazda 51
74843	Loop—Antenna loop complete
74208	Nut—Tee nut to mount 45 RPM changer (3 required)
74852	Pull—Door pull for record changer drawers or radio compartment (5 required)
74451	Pull—Door pull for record storage compartments
	Resistor—Fixed, composition, 27,000 ohms (on 78, 33⅓ RPM record changer), ±10%, ½ watt
74582	Screw—No. 8-32 x 1¾" special head screw to mount 45 RPM changer (3 required)
74279	Screw—No. 8-32 x ⅞" trimit head screw for pull No. 74451
74269	Screw—No. 8-32 x ¾" trimit head screw for pull No. 74852
74835	Slide—Slide mechanism for 45 RPM changer drawer
74736	Slide—Slide mechanism for 33/78 RPM changer drawer
30900	Spring—Retaining spring for knobs No. 71821, 71822 and 71824
72845	Spring—Retaining spring for knobs No. 73994 and 73995
74421	Spring—Conical spring to mount 45 RPM changer—upper—R.H. (1 required)
74422	Spring—Conical spring to mount 45 RPM changer—upper—L.H. (2 required)
74423	Spring—Conical spring to mount 45 RPM changer—lower (3 required)
72936	Stop—Door stop for record storage compartments (2 required)
75146	Washer—"C" washer to mount 33/78 RPM changer (2 required)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR



AM-FM Radio-Phonograph Combination

MODEL A-108

Chassis No. RC 1096

Record Changers 960284 (78/33 1/3 r.p.m.)
RP 168 or RP 190-2 (45 r.p.m.)

SERVICE DATA

—1950 No. 19—

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-168 SERIES SERVICE DATA OR RP-190 SERIES SERVICE DATA FOR 45 R.P.M. AND MODEL 960284 SERVICE DATA FOR 78/33⅓ R.P.M.

Specifications

Tuning Range

Standard Broadcast (AM) .... 540-1,600 kc.
Frequency Modulation (FM) .... 88-108 mc.
Intermediate Frequencies .... AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6CB6 .... R-F Amplifier
(2) RCA 6J6 .... Mixer and Oscillator
(3) RCA 6BA6 .... I-F Amplifier
(4) RCA 6AU6 .... Driver
(5) RCA 6AL5 .... Ratio Detector
(6) RCA 6AV6 .... AM Det.—AVC—A-F Amplifier
(7) RCA 6C4 .... Ph. Inv.
(8) RCA 6V6GT .... Output
(9) RCA 6V6GT .... Output
(10) RCA 5Y3GT .... Rectifier

Dial Lamps (2) .... Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp .... Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio .... 10:1 (5 turns of knob)

Power Supply Rating .... 115 volts, 60 cycles, 115 watts

Loudspeaker (92569-12W)
Size and type .... 12 in. PM
Voice coil impedance .... 3.2 ohms at 400 cycles

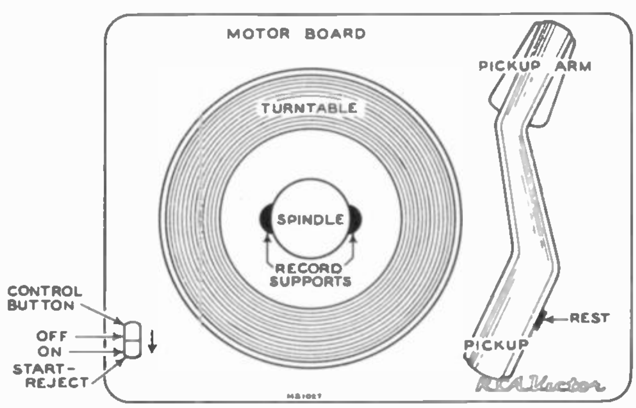
Power Output
(Radio) Undistorted 8 watts .... Maximum 9 watts
(Phono.) Undistorted 10 watts .... Maximum 11 watts

Weight .... 97 lbs.

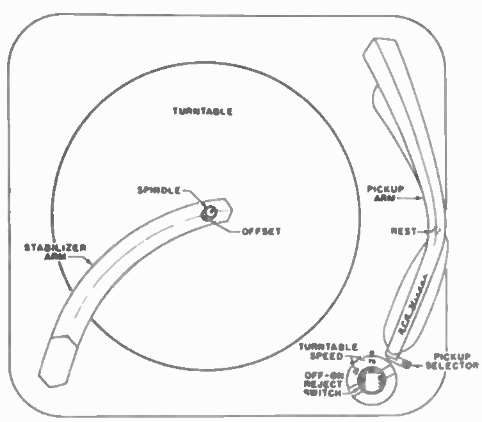
Cabinet Dimensions
Height 32⅛ in. Width 34½ in. Depth 19¾ in.

Record Changer (RP-168 or RP-190-2)
Turntable speed .... 45 r.p.m.
Pickup (RP-168—Stock No. 74625) (RP-190—Stock No. 75575) .... Crystal

Record Changer 960284-1 or -2)
Turntable speed .... 78 or 33⅓ r.p.m.
Pickup (Stock No. 75475) .... Crystal



Top View—RP-190 Record Changer



Top View—960284 Record Changer

REFER TO MODEL A-101 ON PAGE 23 FOR FURTHER INFORMATION. THE CHASSIS AND SPEAKER ARE IDENTICAL FOR BOTH MODELS.

A-108

Replacement Parts

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
	MISCELLANEOUS	75474	Connector—Single contact male connector for speaker cable (2 req'd)
71864	Antenna—F-M antenna	71894	Decal—Trade mark decal (RCA Victor)
75705	Antenna—Antenna loop complete less cable	74273	Decal—Trade mark decal (Victrola)
75898	Back—Back cover—maroon—for 33⅓/78 RPM record changer compartment—for mahogany or walnut instruments (assembled to rollout)	74838	Grommet—Power cord strain relief (1 set)
75899	Back—Back cover—light brown—for 33⅓/78 RPM record changer compartment—for oak instruments (assembled to rollout)	37396	Grommet—Rubber grommet for mounting speaker
75903	Back—Back cover—maroon—for radio—45 RPM record changer compartment—for mahogany or walnut instruments (assembled to rollout)	75697	Grommet—Rubber grommet for mounting 45 RPM changer
75904	Back—Back cover—light brown—for radio—45 RPM record changer compartment—for oak instruments (assembled to rollout)	75551	Handle—Metal pullout handle for 33⅓/78 RPM record changer mounting frame
73680	Board—"A—F-M" terminal board	74308	Hinge—Cabinet door hinge (1 set)
75694	Bracket—Stop bracket (less rubber bumper) for rollouts	75712	Knob—Tuning control, tone control or volume control and power switch knob—maroon—for mahogany or walnut instruments
71599	Bracket—Pilot lamp bracket	75713	Knob—Tuning control, tone control or volume control and power switch knob—tan—for oak instruments
75696	Bumper—Rubber bumper for record changer rollout stop bracket	75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75919	Button—Rosette button for speaker grille	75715	Knob—Function switch knob—tan—for oak instruments
74296	Cable—Shielded pickup cable complete with pin plug for 33⅓/78 RPM record changer	11765	Lamp—Pilot lamp—Mazda #51
72437	Cable—Shielded pickup cable complete with pin plug for 45 RPM record changer	75884	Nut—Speed nut for 33⅓/78 RPM record changer mounting screw
13103	Cap—Pilot lamp cap	73634	Nut—Speed nut for speaker mounting screw
71892	Catch—Bullet catch and strike for cabinet door	75438	Pull—Door pull for upper part of door
X3144	Cloth—Grille cloth for mahogany or walnut instruments	75918	Pull—Door pull for center of door
X3089	Cloth—Grille cloth for oak instruments	75907	Screw—#10-32 x 5¼" cross recessed round head special screw to mount 45 RPM record changer
74882	Connector—2 contact (polarized) male connector for antenna loop cable	75883	Screw—#10-24 x ½" round head machine screw for mounting 33⅓/78 RPM record changer
74752	Connector—2 contact male connector for FM antenna terminal board cable	75626	Screw—#8-32 x 1¼" trimit head screw for door pull.
75709	Connector—8 contact female connector for main cable (less shell) (P4)	75708	Shell—Shell for 8 contact female connector #75709
30868	Connector—2 contact female connector for 33⅓/78 RPM record changer motor cable (P2)	75546	Slide—Slide mechanism for 33⅓/78 RPM record changer mounting frame
		31364	Socket—Pilot lamp socket and lead
		74734	Spring—Retaining spring for knobs
		75902	Spring—Suspension spring for main cable
		72936	Stop——Cabinet door stop

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

REFER TO MODEL A-101 ON PAGE 23 FOR FURTHER INFORMATION. **THE CHASSIS AND SPEAKER ARE IDENTICAL FOR BOTH MODELS.**

RCA VICTOR

Battery Operated Personal Receiver

MODEL B-411

Chassis No. RC-1098 or RC-1098A

SERVICE DATA

— 1950 No. 24 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range .... 540-1600 kc
Intermediate Frequency .... 455 kc

Tube complement:
1. RCA 1R5 .... Converter
2. RCA 1U4 .... I.F. Amplifier
3. RCA 1U5 .... 2nd Det.-A.F. Amp.-A.V.C.
4. RCA 3V4 .... Output

Loudspeaker
Size and type .... 2" x 3" P.M.
Voice coil impedance .... 11¾ ohms at 1000 cycles

Batteries Required:

Type of Battery	Current Consumption	Approx. Life (Intermittent Service)
"A"—1.5 volt RCA VS 036 or VS 001	0.25 amp.	7 to 10 hrs.
"B"—67.5 volts RCA VS 016	8.45 ma.	40 to 60 hrs.

Power Output:
Undistorted .... .075 watt
Maximum .... 0.10 watt
Dimensions (over-all) .... 5⅛" x 7⅝" x 2⅛"
Weight (with batteries) .... slightly under 3 lbs.

Production Changes:

There are three types of case assemblies in use (two types are stocked) using two types of case backs (one type is stocked). SEE PAGE 4 FOR EXPLANATION OF CASE ASSEMBLY DIFFERENCES.

Two chassis have been used; RC-1098 has all individual resistors and capacitors, RC-1098A has two "Printed Circuit" units which replace ten individual resistors and capacitors.

Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1098, RC 1098A
75778	Antenna—Ferrite rod antenna (L1)
75783	Capacitor—Variable tuning capacitor (C1-1, C1-2)
73153	Capacitor—Ceramic, 4 mmf. (C5)
75784	Capacitor—Ceramic, 56 mmf. (C2, C7)
75785	Capacitor—Ceramic, 82 mmf. (C9, C10)
73960	Capacitor—Ceramic, 10,000 mmf. (C4)
73964	Capacitor—Electrolytic, 10 mfd., 70 volts (C15)
72792	Capacitor—Tubular, paper, .001 mfd., 200 volts (C12)
72315	Capacitor—Tubular, paper, .002 mfd., 200 volts (C11, C14)
73961	Capacitor—Tubular, paper, .003 mfd., 200 volts (C6)
71928	Capacitor—Tubular, paper, .02 mfd., 200 volts (C13)
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts (C8)
75781	Clip—"A" Battery mounting clip (negative)
75010	Clip—Output transformer mounting screw clip
75774	Coil—Oscillator coil complete with adjustable core (L2, L3)
75782	Contact—"A" Battery contact (positive)
75773	Control—Volume control and power switch (R6, S1)
37396	Grommet—Rubber grommet for antenna rod
75779	Knob—Volume control knob—less set screw (early type—does not have "ON" indication)
76321	Knob—Volume control knob—less set screw (late type—has "ON" indication)
75786	Lead—"B" battery lead complete with connector
76372	Plate—Four element "Printed Circuit" plate stamped 942660-1 (diode filter unit C7, C9, R4, R5)
76371	Plate—Six element "Printed Circuit" plate stamped 942659-1 (audio coupling unit C10, C12, R2, R7, R9, R10)
	Resistor—Fixed, composition:—
	390 ohms, ±10%, ½ watt (R11)
	1000 ohms, ±20%, ½ watt (R12)
	15,000 ohms, ±10%, ½ watt (R2)
	47,000 ohms, ±20%, ½ watt (R5)
	100,000 ohms, ±20%, ½ watt (R1)
	1 megohm, ±20%, ½ watt (R9)
	3.3 megohm, ±20%, ½ watt (R4, R10)
	4.7 megohm, ±20%, ½ watt (R3, R7)
	10 megohm, ±20%, ½ watt (R8)
70527	Screw—#6-32 x 3/16" socket head set screw for volume control knob
75780	Socket—Tube socket, 7 pin, miniature
75775	Transformer—First I-F transformer (T1)
75776	Transformer—Second I-F transformer (T2)
75777	Transformer—Output transformer (T3)
	SPEAKER ASSEMBLY 92523-4
76373	Speaker—2" x 3" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
75787	Back—Case back
75647	Case—Case assembly (front and back) complete with metal side trim, metal grille and emblem—less handle and links (early type—does not have "ON" indication opening)
76320	Case—Case assembly (front and back) complete with metal side trim, metal grille and emblem—less handle and links (late type has "ON" indication opening)
75651	Emblem—"RCA Victor" emblem
75648	Grille—Metal grille
75649	Handle—Carrying handle
75788	Knob—Dial knob less spring clip
75650	Link—Carrying handle link
75801	Screen—Crinoline screen (black) for case front
74734	Spring—Spring clip for dial knob

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

B-411

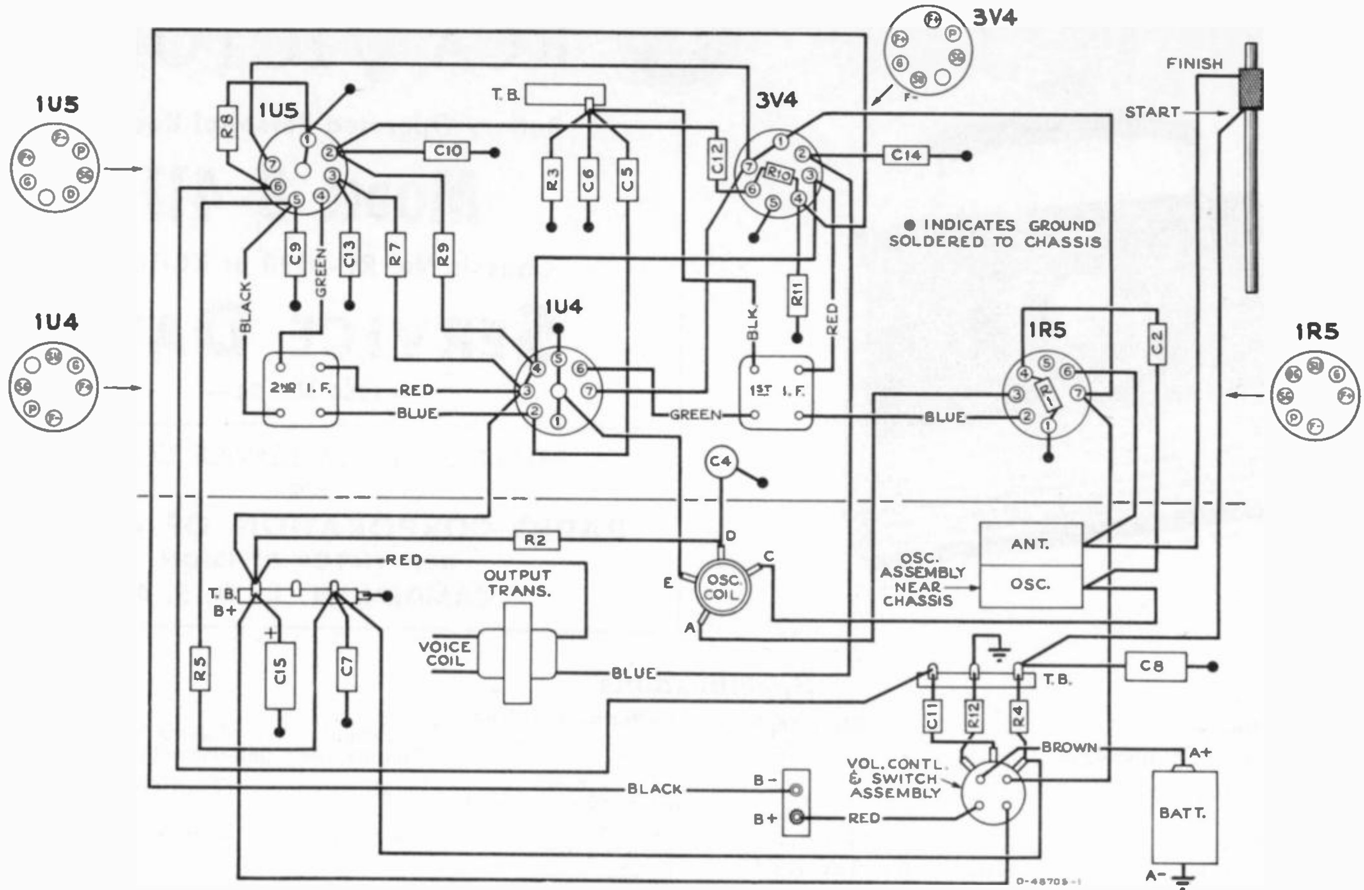


Fig. 1—Connection Diagram

In late production chassis:

"Printed Circuit" unit stamped 942659-1 replaces individual parts C10, C12, R2, R7, R9 and R10.
"Printed Circuit" unit stamped 942660-1 replaces individual parts C7, C9, R4 and R5.

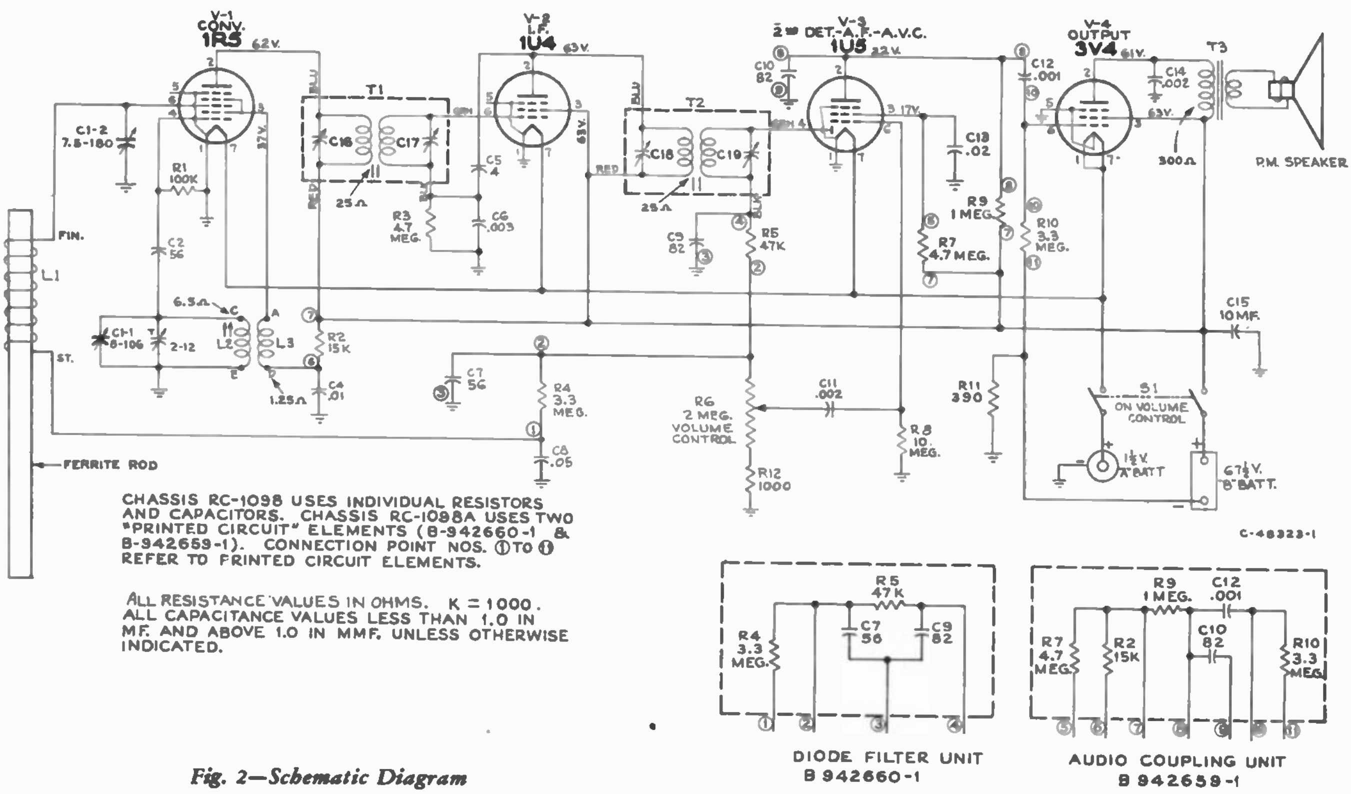


Fig. 2—Schematic Diagram

Alignment Procedure

Output Meter.—Connect meter from No. 2 terminal of V4 (plate of 3V4) to ground. Turn volume control to maximum position.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

Note:—The inductance of the antenna coil is adjusted by sliding the coil along the Ferrite rod. This ant. coil is supplied pre-adjusted and cemented to rod. This makes further adjustment unnecessary. However when replacing ant. assembly make certain that the coil end of the rod extends two inches beyond the tube shelf.

CRITICAL LEAD DRESS

1. Dress all I-F transformer leads down to base and push any excess lead back in can.
2. Black lead from 1st I-F should lay down against top of tube shelf with capacitor C6 over it.
3. Dress neutralizing capacitor C5 direct and above chassis base, avoid lead length.
4. Dress blue lead from volume control and green lead from terminal board near volume control down to base and under gang frame diagonally to termination.
5. Dress blue lead from output transformer under clamp on back of gang condenser and direct to terminal 2 of V4.
6. Adjust Ferrite antenna so that coil end of rod extends two inches beyond tube shelf.
7. Dress all bare wires, pigtail leads and non-insulated components to prevent shorts.

Steps	Connect the high side of test osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Connection lug of C1-2 located on rear of gang in series with .01 mf.	455 kc	Quiet point near 1600 kc	C18, C19 2nd I-F trans.
2				C16, C17 1st I-F trans.
		Repeat steps 1 and 2		
4	*Antenna coupling loop (Chassis in case)	1400 kc	14 Rock gang	C1-1T (osc.)
5		600 kc	60 Rock gang	L2 (osc.)
6		Repeat steps 4 and 5		

*Steps 4 and 5 require a coupling loop from the signal generator to feed a signal into the receiver ant. coil. This loop should be loosely coupled to the receiver antenna coil so as not to disturb the receiver ant. coil inductance.

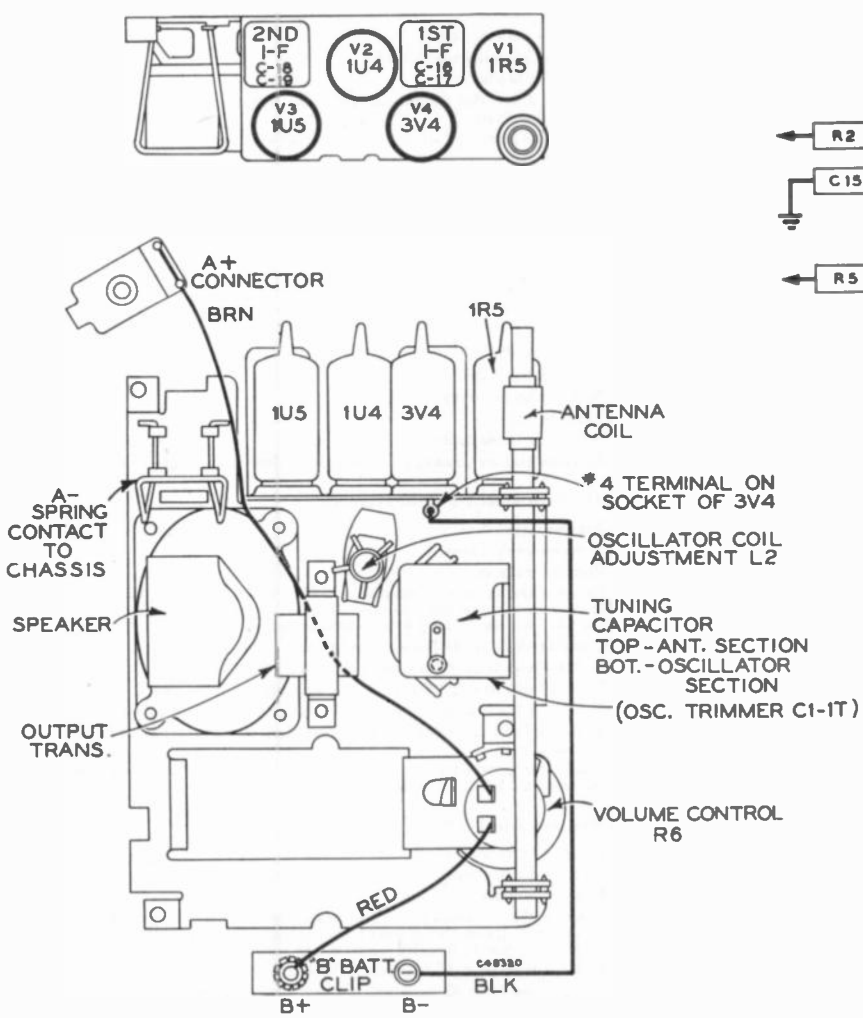


Fig. 3—Tube and Trimmer Locations

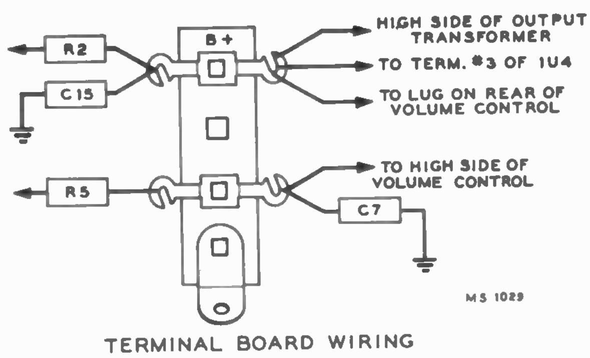
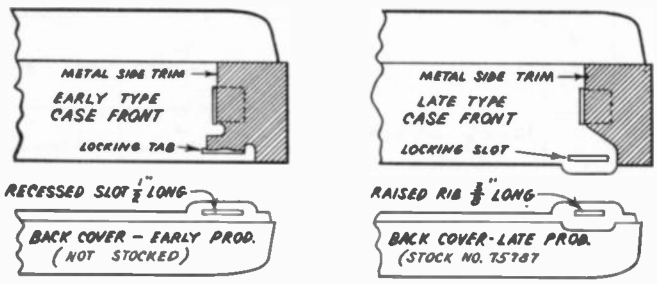


Fig. 4—Terminal Strip

CHANGES IN CASE ASSEMBLIES:

1. The original back (not stocked) had slots in the bottom edge which engaged with extension tabs of the metal trim of the case front.
2. Late production backs (Stock No. 75787) have molded lips on the bottom edge which fit into slots of the case front. When installing this back on early type case fronts, it will be necessary to break off the locking tabs on each side of the original trim strip.
3. The latest production of case assemblies (Stock No. 76320) have an "ON" indication opening in front of the volume control knob. Volume control knob (Stock No. 76321) is used with this case assembly.



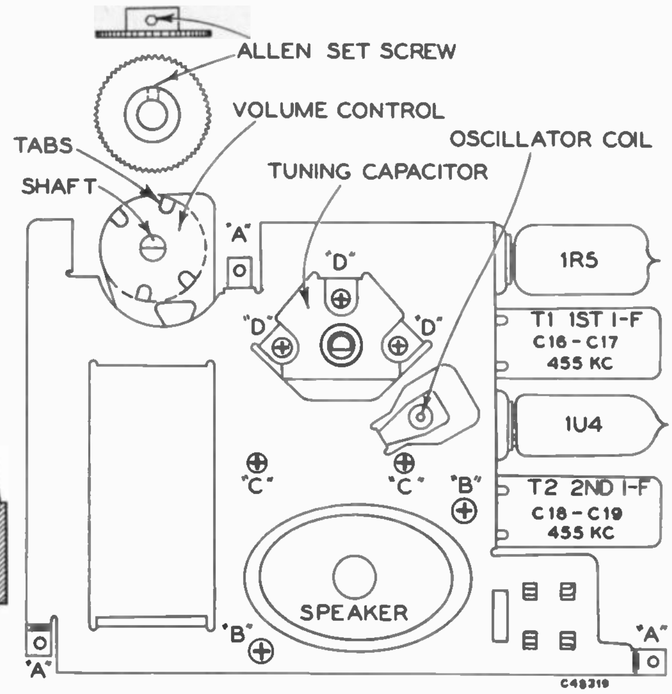


Fig. 5—Chassis assembly

REPLACEMENT OF COMPONENT PARTS

I. To Remove Back Cover

a. Depress top of case midway between the handle supports, until the top end of the back separates from the main case.
b. Pull the back cover back and up, thereby unhooking the retaining lugs in the bottom of the main case.

II. To Replace Batteries

a. Remove back cover.
b. Remove either or both "A" and "B" batteries as may be necessary. The "B" battery snap fasteners can best be removed by inserting a screwdriver under the snap fastener strip and prying upward.
c. The "A" battery can easily be removed by pulling back on the spring wire and lifting out.

III. To Remove Main Case

a. Remove front dial. (Just Pull).
b. Remove back cover.
c. Remove the three screws "A".
d. Remove "A+" clip (Squeeze and lift out of slot in case).
e. Grasp the assembly by the speaker housing and pull the bottom end of the chassis outward then down so the Volume Control knob clears the case.

IV. To Replace Front Metal Grille

a. Remove front dial.
b. Remove back cover.
c. Remove chassis.
d. Bend small tabs inside case and separate metal strips from cabinet.
e. Bend small tabs inside case and separate grille from cabinet. Insert new grille and bend tabs.
Note:—A black non-metallic screen is placed between the grille and the cabinet.

V. To Remove Handle

a. Remove handle by separating the square spring wire clips on each end of handle and lift out.

VI. To Remove Tubes

There is very little room in the cabinet so it is suggested the chassis be removed from the cabinet to replace tubes.

a. Remove front dial.
b. Remove back cover.
c. Remove chassis
d. Remove tubes.

VII. To Remove Speaker

a. Remove front dial.
b. Remove back cover.
c. Remove chassis from cabinet.
d. Unsolder voice coil leads.
e. Remove two screws "B" and lift speaker out.

VIII. To Remove Output Transformer

a. Remove front dial.
b. Remove back cover.
c. Remove chassis from cabinet.
d. Unsolder leads.
e. Remove two screws "C" and lift transformer out.

IX. To Remove Volume Control

a. Remove front dial.
b. Remove back cover.
c. Remove chassis from cabinet.
d. Unsolder leads.
e. Loosen Allen Set screw on Volume Control knob and remove knob. (Just Pull).
f. Bend tabs holding Volume Control to chassis and lift the Volume Control out.

X. To Remove Tuning Capacitor

a. Remove front dial.
b. Remove back cover.
c. Remove chassis from cabinet.
d. Unsolder leads to tuning capacitor.
e. Remove three screws "D" holding capacitor and lift out.

XI. To Remove Oscillator Coil

a. Remove front dial.
b. Remove back cover.
c. Remove chassis
d. Unsolder leads to coil.
e. Remove coil by unsnapping mounting clips from angle bracket.

XII. To Remove First I-F Transformer

a. Remove front dial.
b. Remove back cover.
c. Remove chassis.
d. Remove the mounting screws of both speaker and output transformer and move the speaker and transformer as found necessary for access to 1st I-F transformer leads.
e. Unsolder four leads from transformer.
   1. Blue lead from #2 terminal (Plate of 1R5 tube).
   2. Red lead from #3 terminal (Screen grid of 3V4 tube).
   3. Green lead from #6 terminal (Control grid of 1U4 tube).
   4. Black lead from lug on small terminal board on top of tube shelf.
f. Bend one mounting lug and unsolder the other lug from the chassis and lift the transformer out.

XIII. To Remove 2nd I-F Transformer

a. Remove front dial.
b. Remove back cover.
c. Remove chassis.
d. Remove the mounting bolts of both speaker and output transformer and move the speaker and transformer as found necessary for access to 2nd I-F transformer leads.
   1. Blue lead from #2 terminal (Plate of 1U4 tube).
   2. Red lead from #3 terminal (Screen grid of 1U4 tube).
   3. Green lead from #4 terminal (Diode of 1U5 tube).
   4. Black lead from #5 terminal (Dummy terminal of 1U5 tube).

Unsolder the tabs from the chassis and lift the transformer out.

RCA VICTOR

AC-DC-Battery Portable Receiver

MODEL BX6

Chassis No. RC-1082, RC-1082A

SERVICE DATA

—1950 No. 6—

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range............540-1,600 kc

Intermediate Frequency............455 kc

Power Supply Rating

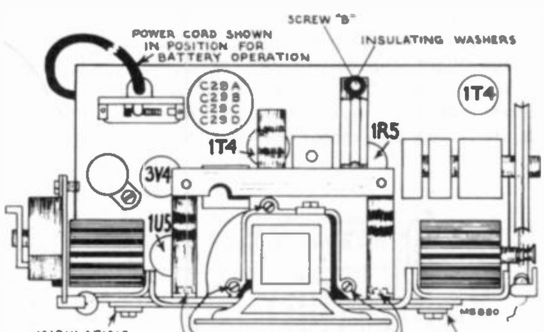
Power Line Operation
115 volts, d. c. or 50 to 60 cycles a. c............15 watts
or
Battery Operated............using RCA VS 019 Battery
(Average battery life—125 hrs. intermittent service)

Battery current............"A" 50 ma., "B" 13 ma.

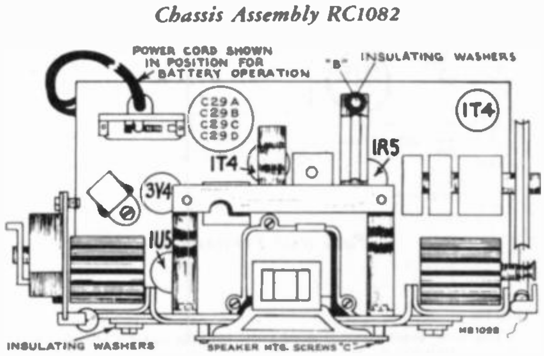
Tube Complement

(1) RCA 1T4............R.F. Amplifier
(2) RCA 1R5............Converter
(3) RCA 1T4............I.F.-Amplifier
(4) RCA 1U5............2nd Det.—AVC—1st A.F.
(5) RCA 3V4............Output

A selenium rectifier is used for "B" supply



Chassis Assembly RC1082



Chassis Assembly RC1082A

Weight (Approx.)
Without battery.......7 lbs. With battery.......10½ lbs.

Power Output
Undistorted............150 watt
Maximum............325 watt

Loudspeaker (92577-3W for RS1082)............4 in. P.M.

Loudspeaker (971495-2 for RS1082A)............4 in. P.M.

Voice coil impedance............3.2 ohms at 400 cycles

Cabinet Dimensions
Height.....10 in. Width.....13 in. Depth.....5½ in.

CAUTION.—

1. **Do not remove any tubes from the chassis with the set operating and the plug connected to the power line. Damage to tubes may result.**
2. **When cleaning the aluminum portion of the case use soap and water or cleaning fluid. Do not use abrasive cleansers.**

To Remove Chassis:

1. Loosen battery clamps, pull out battery and disconnect battery plug.
2. Unsolder the two loop antenna leads.
3. Remove the two large screws (under handle) in the top of the case (do not loosen small screws).
4. Lay receiver on table with face down.
5. Remove the two screws holding chassis to case sides.
6. The chassis may now be lifted from the case.

To Remove Speaker RC1082:

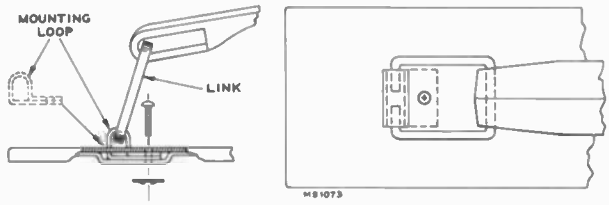
1. Remove chassis from case as described above.
2. Unsolder output transformer leads from speaker.
3. Un-hook dial cord tension spring.
4. Remove the two screws "B" holding dial bracket to chassis support bracket.
5. Remove the four screws holding dial bracket to chassis base.
6. Tilt dial bracket forward and remove three screws "A" holding speaker bracket to chassis base.

To Remove Speaker RC1082A:

1. Remove chassis from case as described above.
2. Unsolder output transformer leads from speaker.
3. Remove screws "C" and lift speaker out.

Insulating Washers:

The mounting bracket and dial frame are insulated from the chassis with insulating washers. This serves to insulate the case from the chassis. In servicing make certain that these washers are in place and properly positioned.



Link Support Assembly

To Replace Top Cover:

Assemble handle to cover and case front but do not tighten screws (small). Replace and tighten chassis mounting screws (large). Tighten the screws holding handle to top cover and case front.

To Remove Back of Cabinet on Instrument Using Chassis RS1082A:

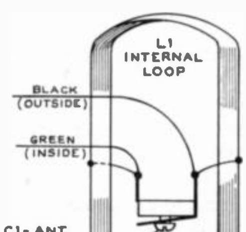
1. Remove top cover.
2. Bend out tabs on back cover.
3. Pull out hinge pins which extend into cabinet sides.

Power Line Operation:

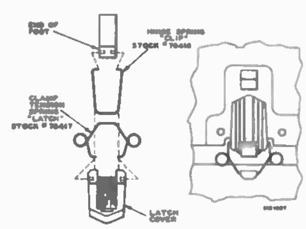
A power cord is stored in the fiber tube which is clamped above the chassis inside the cabinet. To open the cabinet, push the wire latch on the bottom of the case to the right, and lift the back cover up and off. Then pull the power cord plug out of the socket on the top of the chassis as shown, and take out and unroll the power cord. A slot in the bottom of the cabinet allows the closing of the cabinet with the power cord passing through. Replace the back cover with the cord extending through the slot and insert the plug into a convenient electrical outlet.

When returning to battery operation, be sure to replace the power plug in its socket inside the case with the cord stored in the fiber tube.

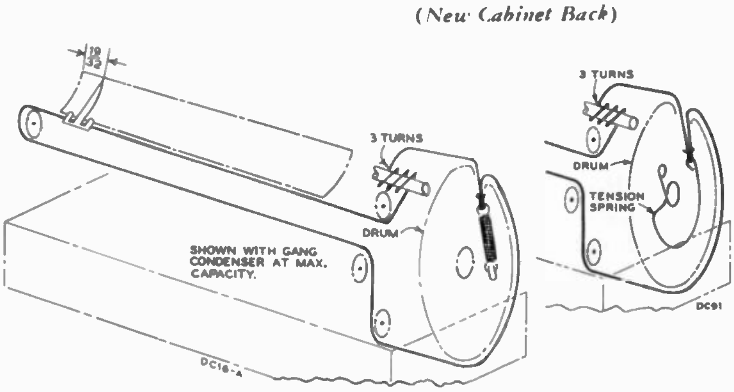
NOTE: If reception is not obtained on DC, reverse plug in outlet receptacle. This may also reduce hum on AC operation.



Loop Antenna



Cabinet Latch Assembly (New Cabinet Back)



Dial-Indicator and Drive Mechanism

Alignment Procedure

Output Meter Alignment—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

Test Oscillator—For all alignment operations, connect the low side of the test oscillator to the receiver chassis and keep the oscillator output as low as possible to avoid AVC action.

Battery operation of the receiver is preferable during alignment; on AC operation an isolation transformer (117v./117v.) may be necessary for the receiver if the test oscillator is also AC operated.

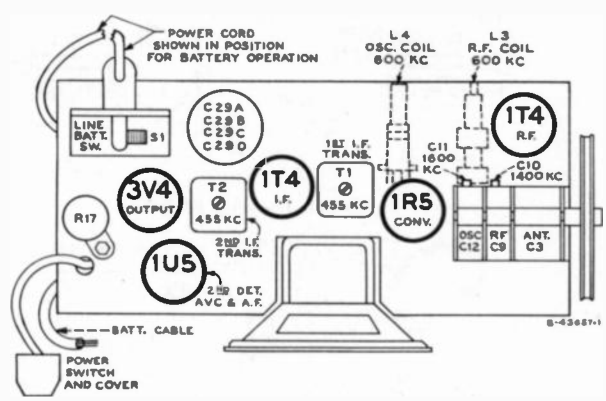
Calibration Scale—The calibrated dial scale is attached to the chassis. It can be used directly as a reference for alignment.

With the gang at full mesh set the dial pointer so that the pointer is 1/4" to the left of the 55 calibration on the dial scale.

Alignment Tabulation

Step	Connect High Side of Sig. Gen. to—	Sig. Gen. Output	Dial Pointer Setting	Adjust for Max. Output
1	Pin #6 of 1T4 I.F. Amplifier thru .005 mf.	455 kc	Quiet point near 1600 kc	2nd I.F. Trans. T2 Top & Bottom
2	Pin #6 of 1R5 Converter thru .005 mf.			1st I.F. Trans. T1 Top & Bottom
3	Replace bottom cover. Install chassis in case, connect loop and battery. Place "Dummy"* back cover on case.			
4	Short wire placed near loop for radiated signal	1600 kc	1600 kc	C11 (osc.)
5		1400 kc	1400 kc	C10 (r. f.) C1 (loop)
6		600 kc	600 kc	L4 (osc.) L3 (r. f.) Alternately while rocking gang
7	Repeat steps 4, 5, and 6			

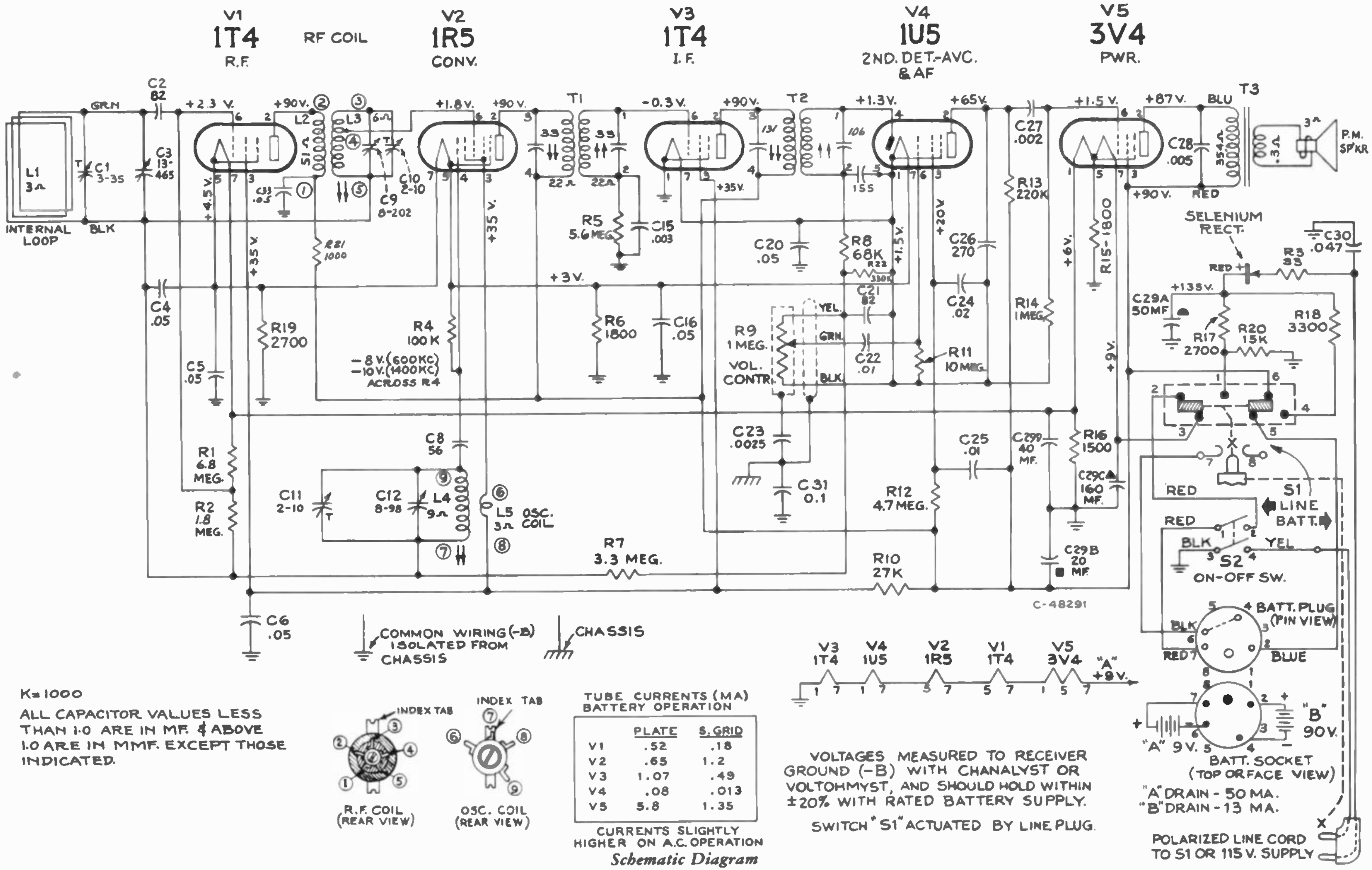
* A "dummy" back cover is one having holes provided to permit alignment with the cover in place. The battery and back cover affect loop alignment. The battery should be in place. If a "dummy" back cover is not available, an improvised cover should be made of sheet aluminum. It should not make contact with any metal portion of the case or chassis.



Tube and Trimmer Locations

NOTE:

The new semicircular dial cord tension spring shown at left is used on chassis RC1082A. However, this new spring can also be used on Chassis RC1082.



TUBE CURRENTS (MA) BATTERY OPERATION

	PLATE	S. GRID
V1	.52	.18
V2	.65	1.2
V3	1.07	.49
V4	.08	.013
V5	5.8	1.35

CURRENTS SLIGHTLY HIGHER ON A.C. OPERATION

Schematic Diagram

Critical Lead Dress

1. Dress all filament leads next to chassis.
2. Keep the leads short on the end of the three components, (R1, R2, C2) which connect to the grid terminal (#6) of the r.f. socket.
3. Dress tuning condenser leads direct and avoid excess lead length.
4. Dress loop leads away from tuning drum and battery.
5. Dress r.f. plate lead against chassis base.
6. Dress a.v.c. lead against chassis base.
7. Dress +B lead to output transformer against chassis base.
8. Dress 1st a.f. plate resistor (R13) up and away from other wiring.
9. Dress all leads away from the ballast resistor.
10. Dress ON-OFF switch leads clear of switch actuating lever and shutter.
11. Dress 1st a.f. grid resistor (R11) close to chassis.
12. Dress capacitor C4 in air between end apron and r.f. coil and away from selenium rectifier, with foil end to tuning condenser frame.

Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC1082, RC1082A
71044	Bracket—Power switch bracket complete with actuating lever less switch
71056	Bracket—Drive cord pulley bracket complete with pulley (volume control side)
74995	Bracket—Drive cord pulley bracket complete with two (2) pulleys
74991	Capacitor—Variable tuning capacitor complete with drum.................C1, C3, C9, C10, C11, C12
71924	Capacitor—Ceramic, 56 mmf...................C8
71514	Capacitor—Ceramic, 82 mmf..............C2, C21
73922	Capacitor—Ceramic, 270 mmf................C26
73113	Capacitor—Electrolytic comprising 1 section of 50 mfd., 150 volts, 1 section of 20 mfd., 150 volts, 1 section of 160 mfd., 25 volts, and 1 section of 40 mfd., 25 volts..............C29A, C29B, C29C, C29D
73803	Capacitor—Tubular, paper, .002 mfd., 400 volts.C27
73599	Capacitor—Tubular, paper, .0025 mfd., 400 volts.C23
70603	Capacitor—Tubular, paper, .003 mfd., 400 volts.C15
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts.C28
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts ...C22, C25
73562	Capacitor—Tubular, paper, .02 mfd., 400 volts.C24
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts...................................C30
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts ...C4, C5, C6, C16, C20, C33
73551	Capacitor—Tubular, paper, 0.1 mfd., 400 volts..C31
73935	Clip—Mounting clip for I.F. transformers
73114	Coil—Oscillator coil complete with adjustable core ...L4, L5
74992	Coil—R.F. coil complete with adjustable screw. L2, L3
71041	Connector—5 contact male connector for battery cable
71057	Control—Volume control.......................R9
†72953	Cord—Drive cord (approx. 38" overall length required)
70022	Cord—Power cord and plug
74998	Dial—Dial scale and window assembly
74838	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet to mount tuning capacitor (3 required)
71031	Holder—Power cord holder (fiber tube)
74994	Knob—Volume control knob (roller type) or tuning control knob (roller type)
18469	Plate—Bakelite mounting plate for electrolytic
73111	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley (removable)
74322	Rectifier—Selenium rectifier
73237	Resistor—Wire wound, 33 ohms, fuse type........R3
74319	Resistor—Wire wound, 2700 ohms, 7 watts.......R17
	Resistor—Fixed, composition:
503210	1000 ohms, ±10%, ½ watt....................R21
503215	1500 ohms, ±10%, ½ watt....................R16
503218	1800 ohms, ±10%, ½ watt................R6, R15
503227	2700 ohms, ±10%, ½ watt....................R19
513233	3300 ohms, ±10%, 1 watt....................R18
504315	15,000 ohms, ±20%, ½ watt..................R20
503327	27,000 ohms, ±10%, ½ watt..................R10
504368	68,000 ohms, ±20%, ½ watt..................R8
504410	100,000 ohms, ±20%, ½ watt.................R4
504422	220,000 ohms, ±20%, ½ watt.................R13
503433	330,000 ohms, ±10%, ½ watt.................R22
504510	1 megohm, ±20%, ½ watt....................R14
503518	1.8 megohm, ±10%, ½ watt...................R2
503533	3.3 megohm, ±10%, ½ watt...................R7
504547	4.7 megohm, ±20%, ½ watt...................R12
503556	5.6 megohm, ±10%, ½ watt...................R5
503568	6.8 megohm, ±10%, ½ watt...................R1
504610	10 megohm, ±20%, ½ watt...................R11
73122	Shaft—Tuning knob shaft
74996	Shield—End shield for dial—L.H.
74997	Shield—End shield for dial—R.H.
73117	Socket—Tube socket, 7 pin, miniature
76400	Spacer—Metal spacer and screw to mount speaker (1 set) (For use with speaker 971495-2)
76368	Spring—Dial cord spring (Semi-circular type)
30900	Spring—Retaining spring for knob
71039	Switch—"Line-Battery" change switch...........S1
71045	Switch—Power switch..........................S2
73129	Transformer—First I. F. transformer T1 (L6, L7, C13, C14)
73037	Transformer—Second I.F. transformer T2 (L8, L9, C17, C18, C19)
71047	Transformer—Output transformer...............T3
73332	Washer—Insulating washer (flat) for mounting base holder bracket (1 req'd) or dial support to chassis (4 req'd)
73333	Washer—Insulating washer (extruded) for mounting base holder bracket (1 req'd) or dial support to chassis (4 req'd)
71081	Washer—Spring washer to fasten removable drive cord pulley
	SPEAKER ASSEMBLY 971495-2 FOR RC1082A 92577-3W FOR RC1082
71059	Gasket—Speaker gasket (black tubing)
76402	Speaker—4" P. M. speaker complete with cone and voice coil (3.2 ohms) for RC1082A
73123	Speaker—4" P.M. speaker complete with cone and voice coil for RC1080
	MISCELLANEOUS
71079	Antenna—Antenna loop........................L1
71074	Arm—Shutter arm lever
76411	Back—Case back (for RC1082A)
74999	Back—Case back (for RC1082)
71073	Bracket—Bearing bracket for shutter arm lever
71070	Bracket—Mounting bracket for #71069 adjustable capacitor
71069	Capacitor—Adjustable trimmer, 3-35 mmf.
76399	Case—Case front complete with insulating strip, emblem and moulded supports (for RC1082A)
75006	Case—Case front complete with insulating strip and support feet—less shutter (for RC1082)
75001	Clip—Clip to hold battery
75005	Clip—"C" clip (threaded) for battery holder clip (2 req'd)
76412	Clip—"C" clip—part of case front—to secure case sides (for RC1082A)
75009	Clip—Clip to hold chassis to case (end plates) (2 req'd)
76414	Clip—"C" clip used with chassis mounting clip 75009
75010	Clip—"C" clip and screw for holding case together (two at top, two at bottom)
76416	Clip—Wire clip (hinge spring) for latch cover (for RC1082A)
75013	Clip—Spring clip with tab for fastening case front to case sides
71080	Clip—Case side spring clip
76415	Cover—Tenite latch cover (for RC1082A)
75011	Emblem—"RCA Victor" emblem
76418	Foot—Case foot and battery support (tenite) (for RC1082A)
75008	Foot—Case foot and battery support (for RC1082)
75016	Handle—Carrying handle
75004	Latch—Spring latch for back cover (RC1082)
75018	Link—Carrying handle link (2 req'd)
75003	Nut—Speed nut for carrying handle mounting screw (2 req'd)
76413	Pin—Case back hinge pin (for RC 1082A)
75015	Pin—Pivot pin for case shutter
75000	Plate—Case top plate
75017	Plate—Mounting plate for carrying handle (2 req'd)
71066	Screw—#8-32 x 5/16" cross recessed binder head screw to hold chassis to top plate (2 req'd)
75002	Screw—#4 x 3/8" cross recessed self-tapping round head screw to fasten carrying handle (2 req'd)
75014	Screw—#4 x ¼" pan head tapping screw for spring clip 75013 or capacitor bracket
75012	Side—Case side only—less pivot pin
71072	Spring—Case shutter compression spring
76417	Spring—Latch mechanism tension spring (for RC 1082A)
71071	Shutter—Case shutter
75007	Strip—Case front insulating strip complete with latch plate (for RC1082)
75008	Support—Moulded support foot for case (2 req'd) (for RC1082)
74353	Washer—Spring washer for shutter shafts

†Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

AC-DC-Battery Portable Receiver

MODEL BX55

Chassis No. RC-1088, RC-1088B

SERVICE DATA

— 1950 No. 7 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range ..... 540-1600 kc.
Intermediate Frequency ..... 455 kc.

Tube Complement
(1) RCA 1R5 ..... Converter
(2) RCA 1T4 ..... I. F. Amplifier
(3) RCA 1U5 ..... Det.—A.V.C.—A. F. Amp.
(4) RCA 3V4 ..... Output
A selenium rectifier is used

Power Supply Rating
Power Line Operation
115 volts, d. c. or 50 to 60 cycles a. c. ..... 18 watts
or
Battery Operated ..... VS 050 Battery
(Average life—100 hrs. intermittent service)

Loudspeaker (92577-3 or 971495-2)
Size and type ..... 4 in. P.M. dynamic
Voice coil impedance ..... 3.2 ohms at 400 cycles

Tuning Drive Ratio ..... 8:1 (4 turns of knob)

Power Output
Undistorted—170 milliwatts Maximum—350 milliwatts
(Output is slightly lower on battery operation)

Cabinet Dimensions
Height 8¼ in. Width 10¾ in. Depth 5 in.

Weight (Approx.)
5 lb. less battery 8 lb. 2 oz. with battery

AC-DC Operation

A power cord is stored inside the cabinet. To open the cabinet, pull backwards on the top of the cabinet back. It is secured by means of two spring clips and catches on the inside of the cabinet. Remove the plug of the power cord from its socket on the chassis and insert the plug into a convenient electrical power outlet. A notch in the right side of the cabinet allows the back to be closed with the cord passing through.

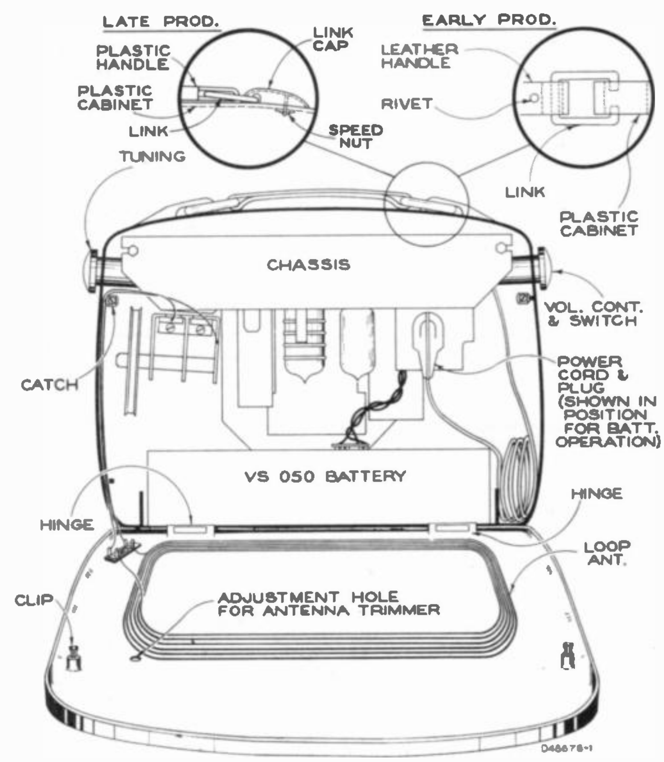
Notes: 1. Maximum performance is obtained with the battery in place. Receiver sensitivity will be lowered if the battery is not in place during AC-DC operation since the battery affects the loop inductance.

2. If reception is not obtained on DC, reverse plug in power outlet. On AC operation, reversal of the plug may reduce hum.

Battery Operation

Replace the power cord plug in the socket provided on the back of the chassis. Coil up the power cord and place it alongside of the battery. Make certain that it will not interfere with the tuning condenser.

Note: Make certain that the plug is fully inserted (base of plug touching chassis) to assure proper operation of the Batt-Line switch.



To Remove Carrying Handle

Early Type:
1. Remove rivets from handle (if present).
2. Turn link and slip out of handle and cabinet.

Late Type:
1. Remove speed nuts holding carrying handle link caps.
2. Remove link caps.
3. Turn link and slip out of handle and cabinet.

Cabinet Back and Hinges

The cabinet back and hinges may be readily detached from the cabinet. See back page for detailed instructions on their removal.

BX55

Alignment Procedure

Signal Generator.—For all alignment operations, connect the low side of the signal generator to the receiver chassis and keep the output as low as possible to avoid AVC action.

Battery operation of the receiver is preferable during alignment; on a. c. operation an isolation transformer (117v./117v.) may be necessary for the receiver if the signal generator is also a. c. operated.

Note: Battery must be in place for ant. alignment (step 6).

Dial Pointer Position.—With the tuning condenser fully meshed the center of the dial pointer should be in line with the score mark on the chassis.

Alignment Tabulation

Step	Connect high side of signal generator to—	Signal generator output	Dial pointer setting	Adjust for maximum output—
1	Disconnect loop—remove chassis—remove bottom plate, connect a 10,000 ohm resistor from C1-1 stator terminal to tuning condenser frame.			
2	Grid of 1T4 (pin No. 6) thru .01 mf. capacitor	455 kc	Quiet point near 1600 kc	T2 (top) 2nd. I-F trans.
3	Stator term. of C1-1 thru .01 mf. capacitor			T1 (top & bottom) 1st. I-F trans.
4	Remove the 10,000 ohm resistor. Replace bottom cover and install chassis in cabinet. Re-connect loop.			
5	Short wire placed near receiver (for radiated signal)	1620 kc	Tuning condenser fully open	C1-2 trimmer (osc.)
6		1300 kc	1300 kc signal	†C1-1 trimmer (ant.)

†With back closed. Trimmer is accessible thru hole in back.

NOTE:
The magnetite cores of T2 and T1 may not have visible adjusting screws. The cores have screwdriver slots to permit adjustment (use non-metallic screwdriver).

Critical Lead Dress

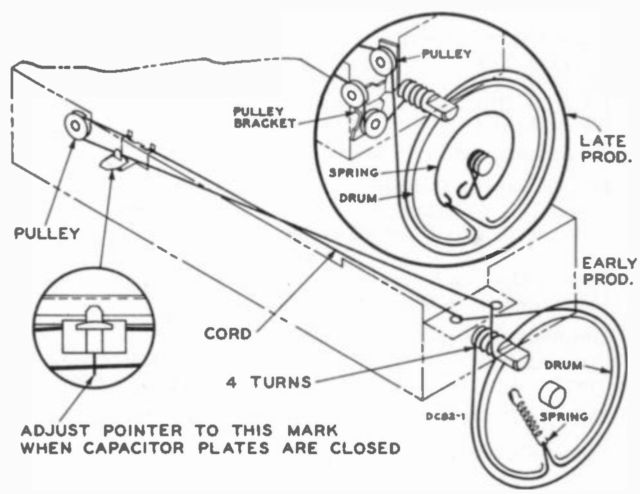
1. Dress antenna loop leads away from adjusting screws on tuning condenser.
2. Dress all capacitors against chassis base.
3. Dress oscillator coil away from chassis and bottom cover.
4. Dress output transformer primary leads against chassis.
5. Dress all leads and components away from selenium rectifier.
6. Dress loop antenna leads into recesses provided in the side of the cabinet. Leave slack at hinged edge of cabinet.

Note: This instrument is designed to be operated with a battery in position inside the cabinet. Reception will be below normal unless the battery is in its normal location.

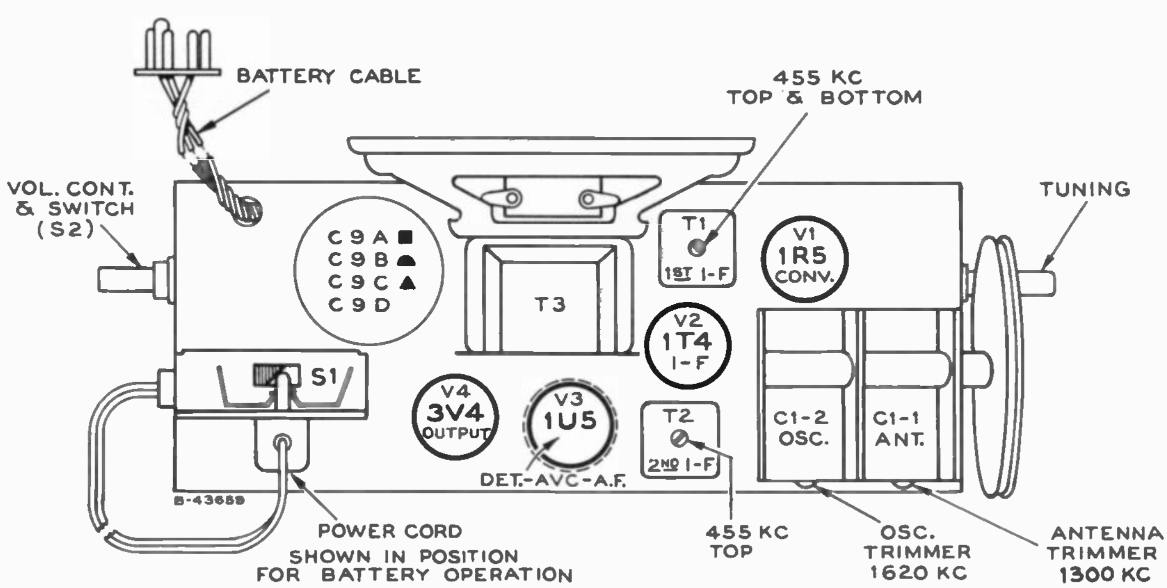
The position of the battery pack affects the loop inductance. Therefore, when the battery is removed, the loop inductance will change (increase) and the sensitivity will be slightly worse because of improper electrical tracking of the loop circuit with the heterodyne oscillator of the receiver.

CAUTION.—

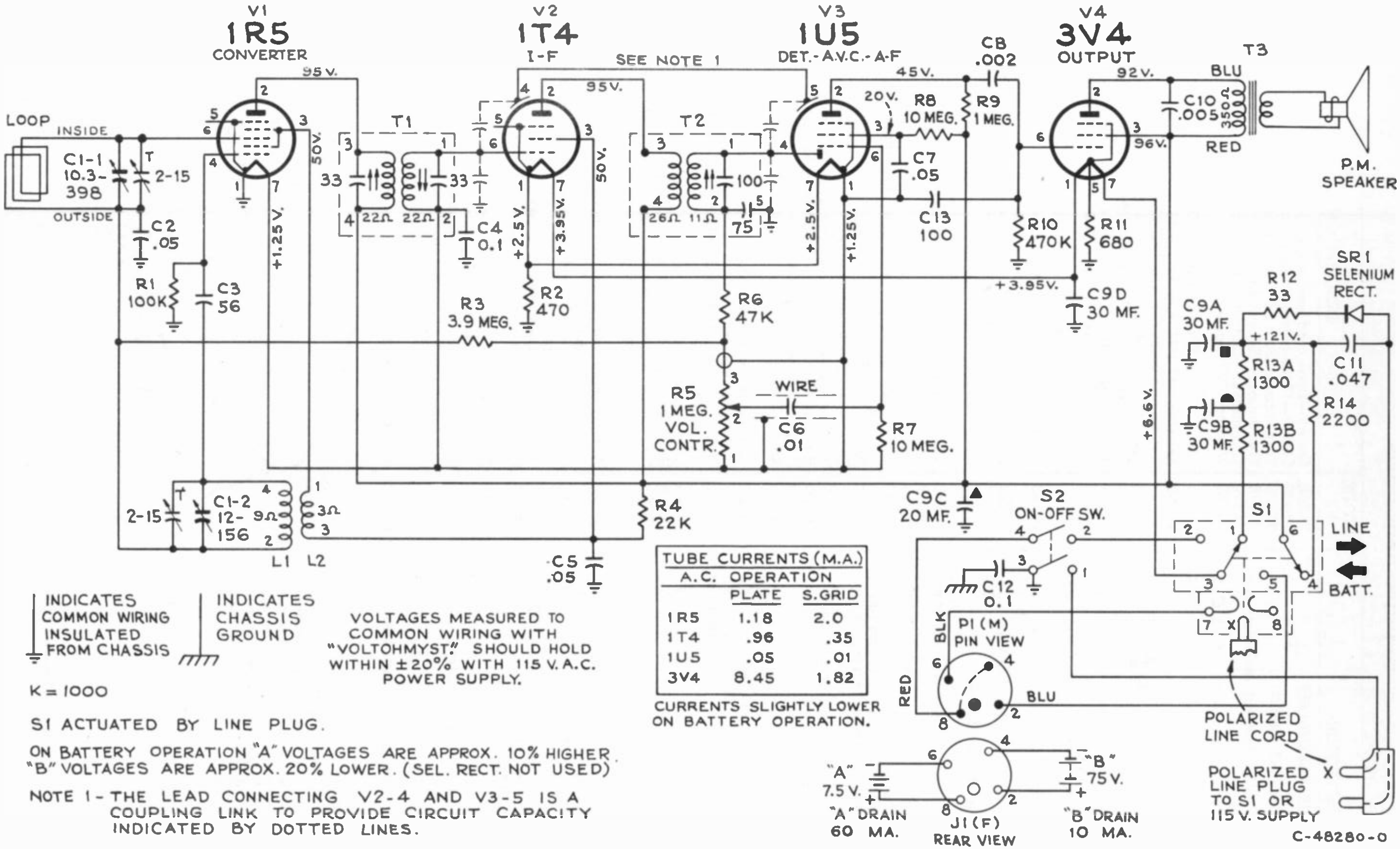
Do not remove any tubes from the chassis with the set operating and the plug connected to the power line. Damage to tubes may result.



Dial Indicator and Drive Mechanism



Tube and Trimmer Locations



INDICATES COMMON WIRING INSULATED FROM CHASSIS

INDICATES CHASSIS GROUND

VOLTAGES MEASURED TO COMMON WIRING WITH "VOLTOHMYST." SHOULD HOLD WITHIN ±20% WITH 115 V.A.C. POWER SUPPLY.

K = 1000

S1 ACTUATED BY LINE PLUG.

ON BATTERY OPERATION "A" VOLTAGES ARE APPROX. 10% HIGHER. "B" VOLTAGES ARE APPROX. 20% LOWER. (SEL. RECT. NOT USED)

NOTE 1 - THE LEAD CONNECTING V2-4 AND V3-5 IS A COUPLING LINK TO PROVIDE CIRCUIT CAPACITY INDICATED BY DOTTED LINES.

TUBE CURRENTS (M.A.) A.C. OPERATION	PLATE	S.GRID
1R5	1.18	2.0
1T4	.96	.35
1U5	.05	.01
3V4	8.45	1.82

CURRENTS SLIGHTLY LOWER ON BATTERY OPERATION.

SCHEMATIC DIAGRAM

Substitution of Capacitor:

In some instruments section 9D of the four section electrolytic capacitor C9A, C9B, C9C, C9D is not used. A separate 30 mf. capacitor is used instead. This was done because the electrolytic capacitors supplied by certain vendors had common coupling between sections which resulted in excessive hum.

Please note that the separate 30 mf. capacitor is used in place of and not in parallel with the 30 mf. section of the multiple capacitor.

The replacement parts stock of the four section capacitor (Stock No. 74774) has been found to be satisfactory and substitution of section C9D should not be necessary.

Lead Dress:

Capacitor C11 (.047 mf.) must be dressed away from the metal chassis and in such position that inserting the chassis into the case will not change its position.

The side of C11 which may short to chassis is the side which connects directly to the selenium rectifier. If this side contacts the chassis it will place the chassis at power line potential.

Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1088, RC 1088B
76404	Bracket—Drive cord pulley bracket including two pulleys (for RC-1088B)
74778	Capacitor—Variable tuning capacitor C1-1, C1-2
39622	Capacitor—Mica, 56 mmf. C3
39628	Capacitor—mica, 100 mmf. C13
74774	Capacitor—Electrolytic, comprising 2 sections of 30 mfd., 150 volts, 1 section of 20 mfd., 150 volts and 1 section of 30 mfd., 25 volts .. C9A, C9B, C9C, C9D
72315	Capacitor—Tubular, paper, .002 mfd., 200 volts .. C8
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts C10
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts ... C6
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts C11
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts .. C2, C5, C7
70617	Capacitor—Tubular, paper, 0.1 mfd., 400 volts .. C4, C12
73935	Clip—Mounting clip for I.F. transformer
74780	Coil—Oscillator coil L1, L2
73275	Connector—5 contact male connector for battery cable P1
73125	Control—Volume control and power switch ... R5, S2
71457	Cord—Power cord and plug
†72953	Cord—Drive cord (approx. 40" overall length req'd)
72283	Grommet—Rubber grommet to mount tuning capacitor (3 required)
74838	Grommet—Power cord strain relief grommet (1 set)
74776	Indicator—Station selector indicator
18469	Plate—Mounting plate for electrolytic capacitor
72602	Pulley—Drive cord pulley
74322	Rectifier—Selenium rectifier SR1
73237	Resistor—Wire wound (fuse type) 33 ohms R12
74777	Resistor—Voltage divider, dual, 1300 ohms, 3.5 watts R13A, R13B
	Resistor—Fixed, composition:—
	470 ohms, ±20%, 1/2 watt R2
	680 ohms, ±20%, 1/2 watt R11
	2200 ohms, ±10%, 1/2 watt R14
	22,000 ohms, ±20%, 1/2 watt R4
	47,000 ohms, ±20%, 1/2 watt R6
	100,000 ohms, ±20%, 1/2 watt R1
	470,000 ohms, ±20%, 1/2 watt R10
	1 megohm, ±20%, 1/2 watt R9
	3.9 megohm, ±10%, 1/2 watt R3
	10 megohm, ±20%, 1/2 watt R7, R8
74773	Shaft—Tuning knob shaft for RC-1088
76403	Shaft—Tuning knob shaft for RC-1088B
73103	Shield—Tube shield for 1U5 tube
73117	Socket—Tube socket, miniature
74038	Spring—Drive cord tension spring—coil type
76368	Spring—Drive cord tension spring—semi-circular type
71039	Switch—"Line-Battery" change switch S1
73129	Transformer—First I.F. transformer T1
74775	Transformer—Second I.F. transformer T2
74779	Transformer—Output transformer T3
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES
74165	Speaker—4" P.M. speaker (92577-3) complete with cone and voice coil—for RC-1088
76402	Speaker—4" P.M. speaker (971495-2) complete with cone and voice coil—for RC-1088B
76401	Spacer—Spacers (2) and screws (2) to mount 971495-2 speaker on RC-1088 (not required for RC-1088B)
	MISCELLANEOUS
75048	Back—Cabinet back complete with loop
74787	Board—Terminal board—2 contact
Y2220	Case—Cabinet front—less back, emblem, handle and dial—early type without holes for mounting link caps.
Y2327	Case—Cabinet front—less back, emblem, handle and dial—late type with holes for mounting link caps.
76282	Cap—Carrying handle link cap (2 required)
74339	Catch—Cabinet back catch (part of cabinet front)
74734	Clip—Spring clip for knob
74792	Clip—Striking clip for catch (part of cabinet back) (2 required)
74784	Dial—Metal dial scale
74782	Emblem—"RCA Victor" emblem
74785	Handle—Carrying handle (early type—leather)
76280	Handle—Carrying handle (late type—plastic)
74790	Hinge—Cabinet hinge (2 required)
74666	Knob—Tuning or volume control and power switch knob
74786	Link—Link for carrying handle—15/16" length (early type) (2 required)
76281	Link—Link for carrying handle—1 3/16" length (late type) (2 required)
74789	Loop—Antenna loop winding
74788	Nut—Speed nut to mount terminal board
73203	Nut—Speed nut to fasten dial, decorative plate and carrying handle link caps (6 required—2 for each purpose)
76279	Plate—Reinforcing plate for mounting chassis in cabinet (2 required)
75448	Rivet—Bevel pointed rivet for early type leather handle (2 required)
75435	Screen—Crinoline screen for speaker grille
74783	Plate—Decorative plate (satin finish) for cabinet (above dial)
74301	Screw—No. 8-32 x 3/8" pan head cross recessed screw for chassis mounting (2 required)
74791	Screw—No. 4 x 5/16" pan head cross recessed screw to fasten catch to cabinet front

†Stock No. 72953 is a reel which contains 250 ft. of cord.

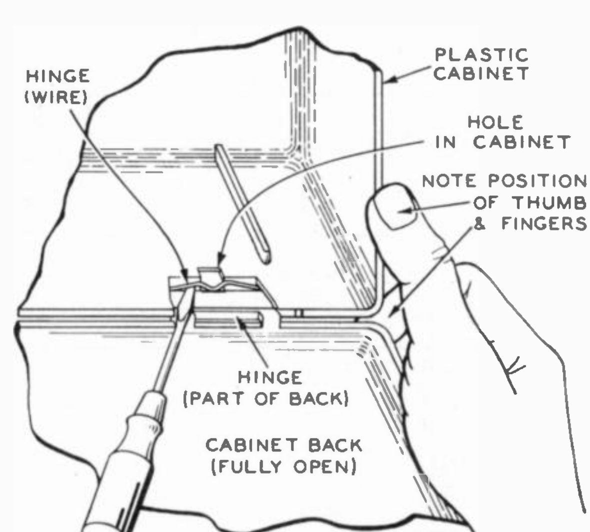
APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

To Remove Cabinet Back

Disconnect the loop antenna leads. With the back fully open, grip the cabinet as illustrated. Insert a screwdriver under one hinge and pry the center of the hinge out of the opening in the cabinet while maintaining pressure on the back with the fingers and on the cabinet with the thumb. Repeat this procedure with the other hinge. Pull the back straight to the rear using both hands.

To Remove Hinges

Remove back from cabinet as described above. Spread the hinge apart to remove it from the cabinet back.



Removal of Cabinet Back

RCA VICTOR

AC-DC-Battery Portable Receiver

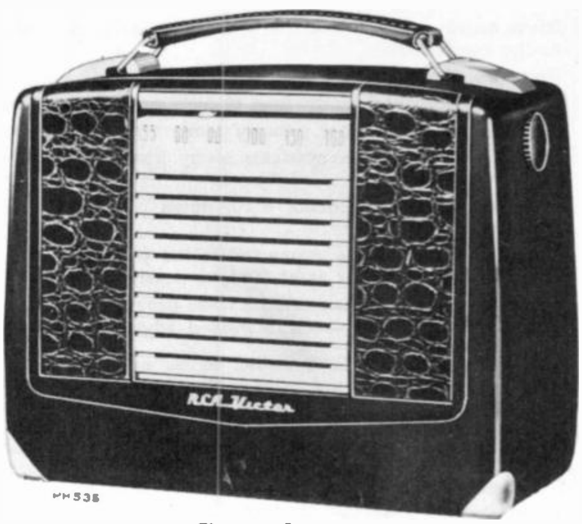
MODEL BX57

Chassis No. RC-1088A, RC-1088C

SERVICE DATA

—1950 No. 11—

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.



Specifications

Tuning Range .... 540-1600 kc.
Intermediate Frequency .... 455 kc.

Tube Complement
(1) RCA 1R5 .... Converter
(2) RCA 1U4 .... I. F. Amplifier
(3) RCA 1U5 .... Det.—A.V.C.—A. F. Amp.
(4) RCA 3V4 .... Output
A selenium rectifier is used

Power Supply Rating
Power Line Operation
115 volts, d. c. or 50 to 60 cycles a. c. .... 18 watts
or
Battery Operated .... VS 050 Battery
(Average life—100 hrs. intermittent service)

Loudspeaker (92577-3 or 971495-2)
Size and type .... 4 in. P.M. dynamic
Voice coil impedance .... 3.2 ohms at 400 cycles

Tuning Drive Ratio .... 8:1 (4 turns of knob)

Power Output
Undistorted—170 milliwatts   Maximum—350 milliwatts
(Output is slightly lower on battery operation)

Cabinet Dimensions
Height 8¼ in.   Width 10¾ in.   Depth 5 in.

Weight (Approx.)
5 lb. less battery   8 lb. 2 oz. with battery

AC-DC Operation

A power cord is stored inside the cabinet. To open the cabinet, pull backwards on the top of the cabinet back. It is secured by means of two spring clips and catches on the inside of the cabinet. Remove the plug of the power cord from its socket on the chassis and insert the plug into a convenient electrical power outlet. A notch in the right side of the cabinet allows the back to be closed with the cord passing through.

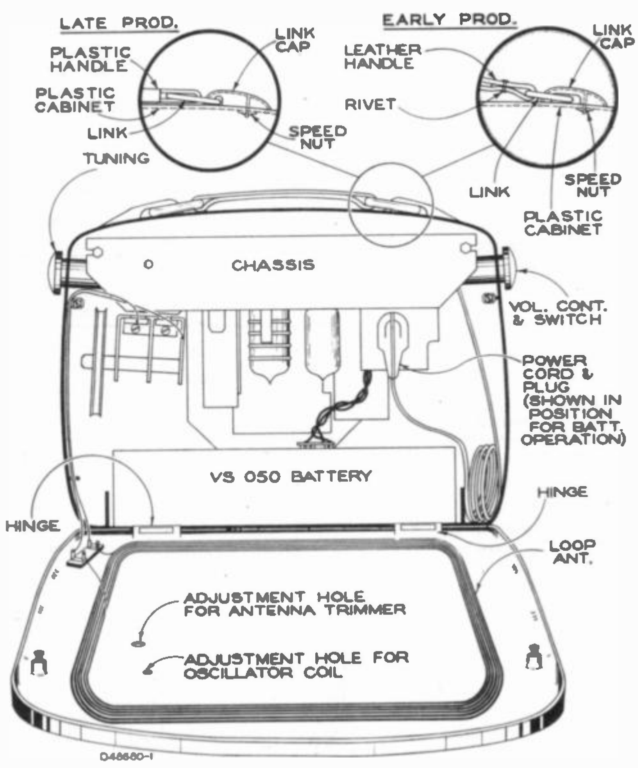
Notes: 1. Maximum performance is obtained with the battery in place. Receiver sensitivity will be lowered if the battery is not in place during AC-DC operation since the battery affects the loop inductance.

2. If reception is not obtained on DC, reverse plug in power outlet. On AC operation, reversal of the plug may reduce hum.

Battery Operation

Replace the power cord plug in the socket provided on the back of the chassis. Coil up the power cord and place it alongside of the battery. Make certain that it will not interfere with the tuning condenser.

Note: Make certain that the plug is fully inserted (base of plug touching chassis) to assure proper operation of the Batt-Line switch.



To Remove Carrying Handle

Early Type:
1. Remove rivets from handle (if present).
2. Turn link and slip out of handle and cabinet.

Late Type:
1. Remove speed nuts holding carrying handle link caps.
2. Remove link caps.
3. Turn link and slip out of handle and cabinet.

Cabinet Back and Hinges

The cabinet back and hinges may be readily detached from the cabinet. See back page for detailed instructions on their removal.

Alignment Procedure

Signal Generator—For all alignment operations, connect the low side of the signal generator to the receiver chassis and keep the output as low as possible to avoid AVC action.

Battery operation of the receiver is preferable during alignment; on a. c. operation an isolation transformer (117v./117v.) may be necessary for the receiver if the signal generator is also a. c. operated.

Note: Battery must be in place for ant. alignment (step 6).

Dial Pointer Position.—With the tuning condenser fully meshed the center of the dial pointer should be in line with the score mark on the chassis.

Alignment Tabulation

Step	Connect high side of signal generator to—	Signal generator output	Dial pointer setting	Adjust for maximum output—
1	Disconnect loop — remove chassis — remove bottom plate, connect a 10,000 ohm resistor from C1-1 stator terminal to tuning condenser frame.			
2	Grid of 1U4 (pin No. 6) thru .01 mf. capacitor	455 kc	Quiet point near 1600 kc	T2 (top & bottom) 2nd. I-F trans.
3	Stator term. of C1-1 thru .01 mf. capacitor			T1 (top & bottom) 1st. I-F trans.
4	Remove the 10,000 ohm resistor. Replace bottom cover and install chassis in cabinet. Re-connect loop.			
5	Short wire placed near receiver (for radiated signal)	1620 kc	Tuning condenser fully open	C1-2 trimmer (osc.)
6		1400 kc	1400 kc signal	†C1-1 trimmer (ant.)
7		600 kc	600 kc signal	†L1 (osc.) rock gang
8	Repeat steps 5 and 6.			

† With back closed. Trimmer is accessible thru hole in back.

NOTE:
The magnetite cores of T2 and T1 may not have visible adjusting screws. The cores have screwdriver slots to permit adjustment (use non-metallic screwdriver).

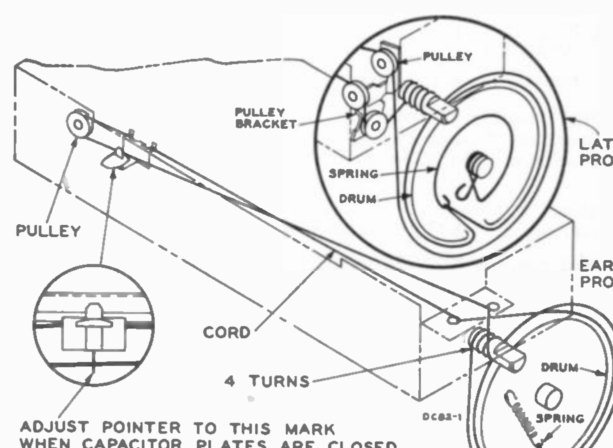
Critical Lead Dress

1. Dress antenna loop leads away from adjusting screws on tuning condenser.
2. Dress all capacitors against chassis base.
3. Dress oscillator coil away from chassis and bottom cover.
4. Dress output transformer primary leads against chassis.
5. Dress all leads and components away from selenium rectifier.
6. Dress the 4 mmf. capacitor (C15) down against the .003 mf. capacitor (C14).
7. Capacitor C15 must be connected to the plate terminal of the 1U4 socket with as short lead as possible.
8. Dress loop antenna leads into recesses provided in the side of the cabinet. Leave slack at hinged edge of cabinet.

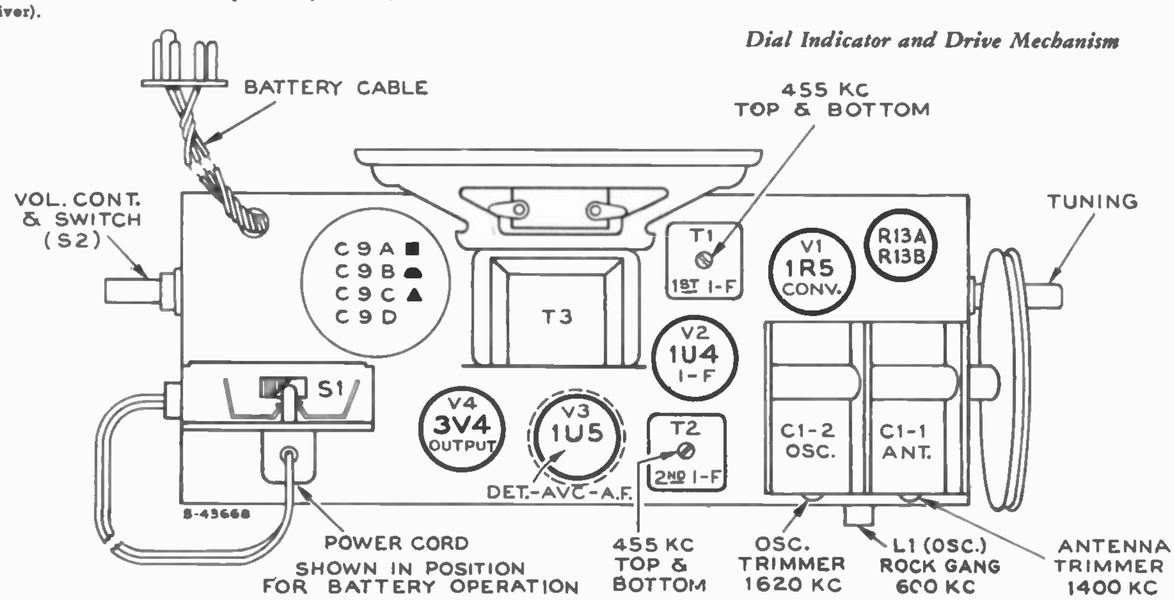
Note: This instrument is designed to be operated with a battery in position inside the cabinet. Reception will be below normal unless the battery is in its normal location.

The position of the battery pack affects the loop inductance. Therefore, when the battery is removed, the loop inductance will change (increase) and the sensitivity will be slightly worse because of improper electrical tracking of the loop circuit with the heterodyne oscillator of the receiver.

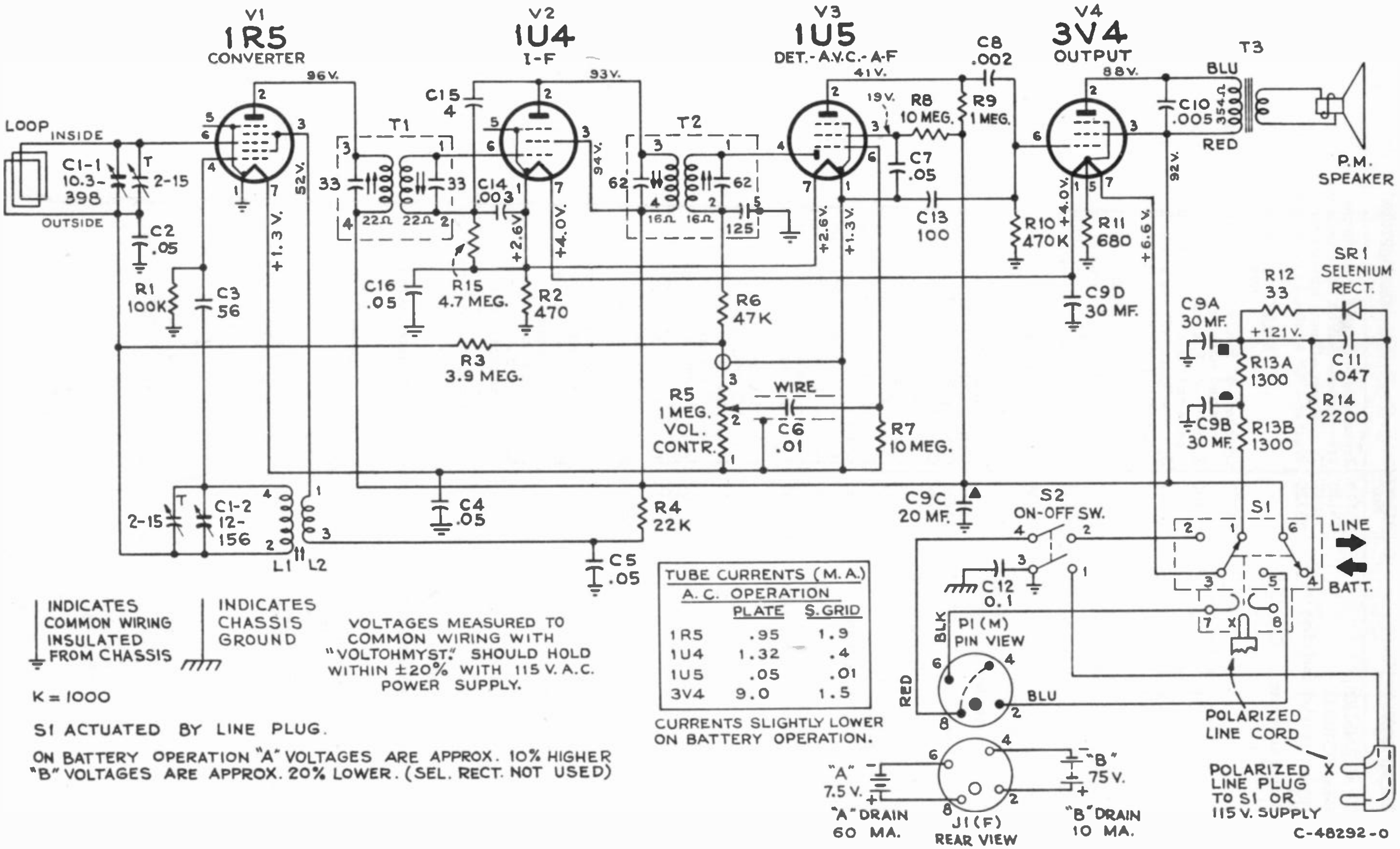
CAUTION.—
Do not remove any tubes from the chassis with the set operating and the plug connected to the power line. Damage to tubes may result.



Dial Indicator and Drive Mechanism



Tube and Trimmer Locations



SCHEMATIC DIAGRAM

Substitution of Capacitor:

In some instruments section 9D of the four section electrolytic capacitor C9A, C9B, C9C, C9D is not used. A separate 30 mf. capacitor is used instead. This was done because the electrolytic capacitors supplied by certain vendors had common coupling between sections which resulted in excessive hum.

Please note that the separate 30 mf. capacitor is used in place of and not in parallel with the 30 mf. section of the multiple capacitor.

The replacement parts stock of the four section capacitor (Stock No. 74774) has been found to be satisfactory and substitution of section C9D should not be necessary.

Lead Dress:

Capacitor C11 (.047 mf.) must be dressed away from the metal chassis and in such position that inserting the chassis into the case will not change its position.

The side of C11 which may short to chassis is the side which connects directly to the selenium rectifier. If this side contacts the chassis it will place the chassis at power line potential.

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC-1088A, RC-1088C
76404	Bracket—Drive cord pulley bracket including two pulleys (for RC-1088C)
75149	Capacitor—Variable tuning capacitor....C1-1, C1-2
73153	Capacitor—Ceramic, 4 mmf....................C15
39622	Capacitor—Mica, 56 mmf......................C3
39628	Capacitor—Mica, 100 mmf....................C13
74774	Capacitor—Electrolytic, comprising 2 sections of 30 mfd., 150 volts, 1 section of 20 mfd., 150 volts and 1 section of 30 mfd., 25 volts, C9A, C9B, C9C, C9D
72315	Capacitor—Tubular, paper, .002 mfd., 200 volts..C8
73961	Capacitor—Tubular, paper, .003 mfd., 200 volts.C14
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts.C10
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts..C6
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts..C11
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts, C2, C4, C5, C7, C16
70617	Capacitor—Tubular, paper, 0.1 mfd., 400 volts..C12
73935	Clip—Mounting clip for I.F. transformer
74405	Coil—Oscillator coil.........................L1, L2
73275	Connector—5 contact male connector for battery cable
73125	Control—Volume control and power switch..R5, S2
70022	Cord—Power cord and plug
†72953	Cord—Drive cord (approx. 40" overall length req'd)
72283	Grommet—Rubber grommet to mount tuning capacitor
74838	Grommet—Power cord strain relief grommet (1 set)
74776	Indicator—Station selector indicator
18469	Plate—Mounting plate for electrolytic capacitor
72602	Pulley—Drive cord pulley
74322	Rectifier—Selenium rectifier.....................SR1
73237	Resistor—Wire wound (fuse type) 33 ohms......R12
76006	Resistor—Wire wound, 2600 ohms tapped at 1300 ohms 6 watts...............................R13
	Resistors—Fixed, composition:-
	470 ohms, ±20%, ½ watt....................R2
	680 ohms, ±20%, ½ watt...................R11
	2200 ohms, ±10%, ½ watt..................R14
	22,000 ohms, ±20%, ½ watt.................R2
	47,000 ohms, ±20%, ½ watt.................R6
	100,000 ohms, ±20%, ½ watt................R1
	470,000 ohms, ±20%, ½ watt...............R10
	1 megohm, ±20%, ½ watt...................R9
	3.9 megohm, ±10%, ½ watt..................R3
	4.7 megohm, ±20%, ½ watt.................R15
	10 megohm, ±20%, ½ watt...............R7, R8
74773	Shaft—Tuning knob shaft for RC-1088A
76403	Shaft—Tuning knob shaft for RC-1088C
73103	Shield—Tube shield for 1U5 tube
73117	Socket—Tube socket, miniature
74038	Spring—Drive cord tension spring—coil type
76368	Spring—Drive cord tension spring—semi-circular type
71039	Switch—"Line-Battery" change switch...........S1
73129	Transformer—First I.F. transformer..............T1
73130	Transformer—Second I.F. transformer......... T2
71047	Transformer—Output transformer...............T3
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES 92577-3
74165	Speaker—4" P.M. speaker (92577-3) complete with cone and voice coil—for RC-1088A
76402	Speaker—4" P.M. speaker (971495-2) complete with cone and voice coil—for RC-1088C
76401	Spacer—Spacers(2) and screws(2) to mount 971495-2 speaker on RC-1088A (not required for RC-1088C)
	MISCELLANEOUS
75080	Back—Cabinet back complete with loop
74787	Board—Terminal board—2 contact
Y2227	Cabinet—Cabinet front including corners and link caps—less dial and plate
75156	Cap—Carrying handle link cap (2 required)—early type with wide slot for link
76405	Cap—Carrying handle link cap (2 required)—late type with narrow slot for links
74339	Catch—Cabinet back catch (part of cabinet front)
74734	Clip—Spring clip for knob
74792	Clip—Striking clip for catch (part of cabinet back) (2 required)
75153	Cover—Cabinet corner cover—L.H.
75154	Cover—Cabinet corner cover—R.H.
75157	Dial—Metal dial scale and bezel
74782	Emblem—"RCA Victor" emblem
75150	Handle—Carrying handle (early type—leather)
76280	Handle—Carrying handle (late type—plastic)
74790	Hinge—Cabinet hinge (2 required)
74781	Knob—Tuning or volume control and power switch knob
75151	Link—Link for carrying handle—1 5/16" length (early type) (2 required)
76281	Link—Link for carrying handle—1 3/16" length (late type) (2 required)
75152	Loop—Antenna loop winding
74788	Nut—Speed nut to mount terminal board
73203	Nut—Speed nut to fasten dial, corner covers, decorative plate or link caps
74783	Plate—Decorative plate (satin finish) for cabinet (above dial)
76279	Plate—Reinforcing plate for mounting chassis in cabinet (2 required)
75448	Rivet—Bevel pointed rivet for early type leather handle (2 required)
75435	Screen—Crinoline screen for speaker grille
74301	Screw—No. 8-32 x 3/8" pan head cross recessed screw for chassis mounting (2 required)
74791	Screw—No. 4 x 5/16" pan head cross recessed screw to fasten catch to cabinet front.

†Stock No. 72953 is a reel which contains 250 ft. of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Change in Resistor:

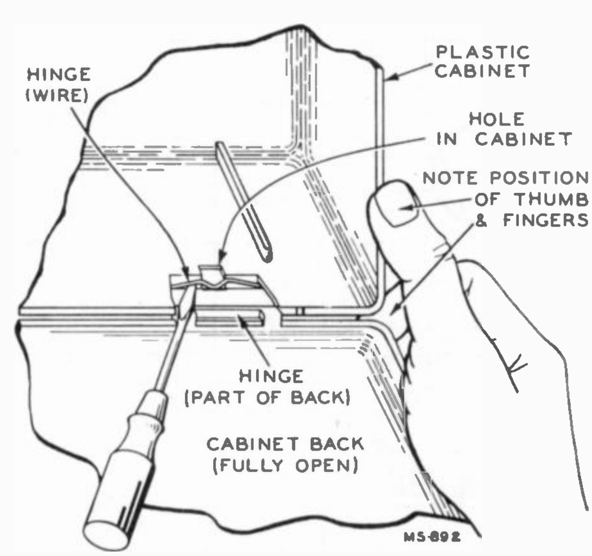
The 2600 ohm 6 watt resistor (R13) now being used in Model BX57 is of improved design. The original resistor was a ceramic type and the type now being used is a flat armored type. When the new type is used to replace the original type, it is necessary to drill a .120" diameter hole in the front apron of the chassis to accommodate a self-tapping screw for mounting purposes.

To Remove Cabinet Back

Disconnect the loop antenna leads. With the back fully open, grip the cabinet as illustrated. Insert a screwdriver under one hinge and pry the center of the hinge out of the opening in the cabinet while maintaining pressure on the back with the fingers and on the cabinet with the thumb. Repeat this procedure with the other hinge. Pull the back straight to the rear using both hands.

To Remove Hinges

Remove back from cabinet as described above. Spread the hinge apart to remove it from the cabinet back.



Removal of Cabinet Back

RCA VICTOR

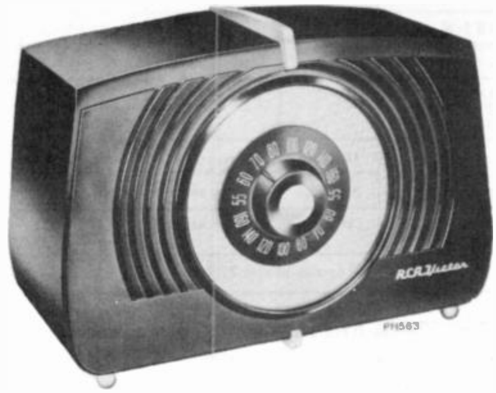
AC-DC Radio Receiver

MODELS X551, X552

Chassis No. RC-1089B RC-1089C

SERVICE DATA

— 1950 No. 15 —



X551 *Maroon* *X552* *Ivory*

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range	540-1600 kc
Intermediate Frequency	455 kc
Tube Complement	
(1) RCA 12BE6	Converter
(2) RCA 12BA6	I-F Amplifier
(3) RCA 12AV6	Det.—A.V.C.—A-F Amp.
(4) RCA 50L6GT	Output
(5) RCA 35W4	Rectifier
Power Supply Rating	
115 volts a.c., 50 to 60 cycles or d.c.	30 watts
Dial Lamps (2)	type 47, 6-8 volts, .15 amp.
Power Output	
Undistorted	1.25 watts
Maximum	1.5 watts
Loudspeaker (92577-1 or 92577-7)	
Size and type	4 in. PM
Voice coil impedance	3.2 ohms at 400 cycles
Cabinet Dimensions	Height 8⅝" Width 12¼" Depth 6"
Weight	6 lbs.

Replacement Parts

Stock No.	DESCRIPTION	
	CHASSIS ASSEMBLIES RC 1089B—Model X551 RC 1089C—Model X552	
75481	Back—Back cover and loop assembly (maroon) (Model X551)	
75604	Back—Back cover and loop assembly (ivory) (Model X552)	
75658	Bracket—Lamp bracket	
75484	Capacitor—Variable tuning capacitor	C1-1, C1-2
39624	Capacitor—Mica, 68 mmf.	C2
39632	Capacitor—Mica, 150 mmf.	C12
39642	Capacitor—Mica, 390 mmf.	C6
73500	Capacitor—Electrolytic comprising 1 section of 50 mfd., 150 volts and 1 section of 30 mfd., 150 volts	C9A, C9B
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts	C4, C7
73562	Capacitor—Tubular, paper, .02 mfd., 400 volts	C5
70613	Capacitor—Tubular, paper, .03 mfd., 400 volts	C8
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts	C3, C11
73551	Capacitor—Tubular, paper, 0.1 mfd., 400 volts	C10
73935	Clip—Mounting clip for i-f transformer	
75485	Coil—Oscillator coil complete with adjustable core	L1, L2
75482	Connector—Phono input connector less mounting bracket	J1
75483	Control—Volume control and power switch	R5, S1
70392	Cord—Power cord and plug	
72283	Grommet—Rubber grommet for variable tuning capacitor (3 req'd)	
74838	Grommet—Power cord strain relief grommets (1 set)	
	Resistor—Fixed, composition:—	
	47 ohms, ±20%, ½ watt	R13
	100 ohms, ±20%, ½ watt	R3
	150 ohms, ±20%, ½ watt	R9
	1200 ohms, ±10%, 1 watt	R10
	22,000 ohms, ±20%, ½ watt	R1
	47,000 ohms, ±20%, ½ watt	R12
	220,000 ohms, ±20%, ½ watt	R7
	470,000 ohms, ±20%, ½ watt	R8
	1 megohm, ±20%, ½ watt	R2
	3.3 megohm, ±20%, ½ watt	R4
	4.7 megohm, ±20%, ½ watt	R6
73584	Shield—Tube shield	
73117	Socket—Tube socket, 7 pin, miniature	
70827	Socket—Tube socket, octal	
74697	Socket—Pilot lamp socket	
75486	Transformer—First I-F transformer complete with adjustable cores	T1
75487	Transformer—Second I-F transformer complete with adjustable cores	T2
75488	Transformer—Output transformer	T3
	SPEAKER ASSEMBLIES 92577-1 or 92577-7	
74165	Speaker—4" P.M. speaker complete with cone and voice coil	
	MISCELLANEOUS	
Y2231	Cabinet—Plastic cabinet—maroon—complete with grille screen, dial markings, top and bottom decorative strips, feet and "Phono" decal (Model X551)	
Y2261	Cabinet—Plastic cabinet—ivory—complete with grille screen, dial markings, top and bottom decorative strips, feet and "Phono" decal (Model X552)	
75659	Cap—Pilot lamp cap	
75492	Decal—"Phono" decal	
74782	Emblem—"RCA Victor" emblem	
75495	Foot—Cabinet foot—(2 req'd)	
75493	Knob—Tuning control knob—maroon—(Model X551)	
75494	Knob—Volume control and power switch knob—maroon (Model X551)	
75605	Knob—Volume control and power switch knob—ivory (Model X552)	
75606	Knob—Tuning control knob—ivory— (Model X552)	
31480	Lamp—Pilot lamp—Mazda 47	
74336	Nut—Spring nut to attach top decorative strip to cabinet (2 req'd) or bottom decorative strip to cabinet (1 req'd)	
74340	Nut—Speed nut to attach foot	
75489	Screen—Grille screen	
74734	Spring—Retaining spring for knob	
75490	Strip—Decorative strip (gold) for cabinet top	
75491	Strip—Decorative strip (gold) for cabinet front bottom	

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Alignment Procedure

Test-Oscillator—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.
On a.c. operation an isolation transformer (115 v./115 v.) may be necessary for the receiver if the test oscillator is also a.c. operated.

Lead Dress

1. Dress all capacitors down against chassis.
2. Connect outside foil of all capacitors as indicated in schematic diagram.
3. Locate C9 in its mounting clip so that it butts against chassis.
4. Dress power cord leads away from R11.

Attachment of Record Player

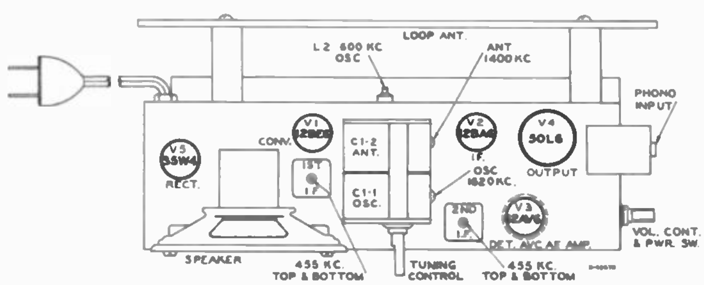
The audio output cable of the record player should be terminated with a pin plug.
Plug the cable into the receptacle which is accessible through the side of the cabinet.
Insertion of the cable plug into the receptacle removes radio signal from the volume control. The record player cable must be removed from the receptacle to permit radio operation.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	12BA6 I-F grid through .01 mfd. capacitor	455 kc	Quiet-point 1600 kc end of dial	T2 (top and bottom) 2nd I-F trans.
2	Stator of C1-2 through .01 mfd.			T1 (top and bottom) 1st I-F trans.
3	Short wire placed near loop to radiate signal	1620 kc	Min. cap.	osc. trimmer
4		1400 kc	1400 kc signal	ant. trimmer
5		600 kc	600 kc signal	L2 (osc.) Rock gang
6		Repeat steps 3, 4 and 5.		

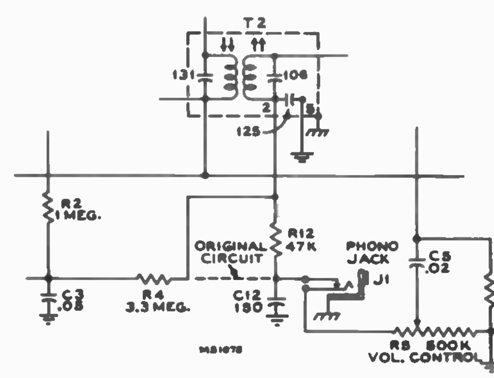
POWER SUPPLY POLARITY.—For operation on d.c., the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a.c., reversal of the plug may reduce hum.

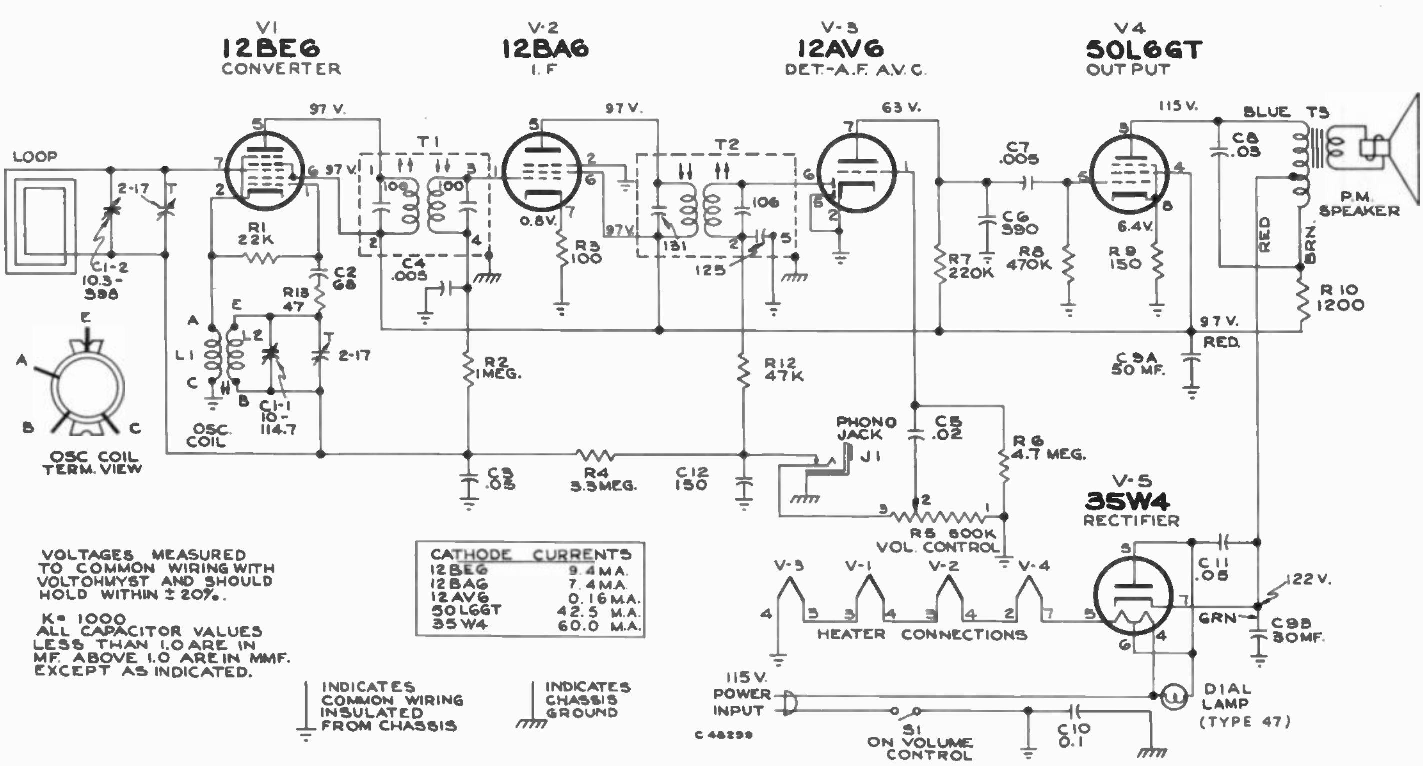
Change in Schematic Diagram:

Resistor R4 (3.3 meg. a.v.c. filter), previously connected to the junction of R12 (47K) and the phono jack (J1), is now connected to the junction of R12 and terminal #2 of the 2nd I-F transformer. The revised connection is illustrated below.



Tube and Trimmer Locations





Schematic Circuit Diagram

Change in Volume Control:

The volume control used in initial production was 500,000 ohms. This has been changed to a 1 megohm control.

RCA VICTOR

AM-FM Radio Receiver

MODEL X711

Chassis No. RC-1070A

SERVICE DATA

—1950 No. 17—

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Ranges

Standard Broadcast (AM) .... 540-1,600 kc.
Frequency Modulation (FM) .... 88-108 mc.

Intermediate Frequencies .... AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 19J6 .... Mixer and Oscillator
(2) RCA 6BJ6 .... I. F. Amplifier
(3) RCA 12AU6 .... Driver
(4) RCA 12AL5 .... Ratio Detector
(5) RCA 6AQ6 .... AM Det.—A. F. Amp.
(6) RCA 35C5 .... Output
(7) RCA 35W4 .... Rectifier

Dial Lamp .... Type No. 47, 6-8 volts, 0.15 amp.

Loudspeaker

Type 92572-4W .... 5 inch P.M.
Voice coil impedance .... 3.2 ohms at 400 cycles

Tuning Drive Ratio .... 11½:1 (5¾ turns of knob)

Power Supply Rating

115 volts d.c. or 50 to 60 cycles a.c. .... 30 watts

Power Output

Maximum .... 1.65 watts
Undistorted .... 1.0 watt

Cabinet Dimensions

Height......8⅜ in. Width......12⅞ in. Depth......7$\frac{5}{16}$ in.

Power Supply:

This instrument will operate on 115 volts d.c. or 50 to 60 cycles a.c.

If the receiver does not operate on d.c., reverse the power cord. On a.c., reversal of the cord may reduce hum or improve FM reception.

Antennas:

These receivers have built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception.

Under average conditions these antennas will provide satisfactory reception—however provision is made for the use of an external antenna for FM reception if desired.

To use external FM antenna:

1. Remove the wire from under the No. 2 terminal screw of the antenna terminal board. The bare end of this wire should be taped to prevent contact with the antenna terminal screws.
2. Connect the transmission line from an external FM dipole antenna to the No. 1 and No. 2 terminals of the antenna terminal board.

To use built-in FM antenna:

1. The wire extending thru the back of the cabinet must be connected to No. 2 terminal of the antenna terminal board.
2. The power cord should be fully extended and must not be coiled or hanked up.
3. Reversal of the line cord plug may improve reception.

DO NOT USE EXTERNAL GROUND.

CAUTION:

THE CHASSIS IS CONNECTED TO ONE SIDE OF THE POWER SUPPLY. Use caution to prevent contact with pipes, radiators, etc., when servicing with chassis removed from cabinet.

Control Knobs:

DO NOT ATTEMPT TO REMOVE THE CONTROL KNOBS FROM THE CABINET. The knobs have spring retainers on the inside of the cabinet to prevent their removal. The retainers are accessible only after the chassis has been removed from the cabinet.

Removal of Chassis:

1. Remove the four screws at the corners of the back cover—pull back cover off carefully—the power cord plug and socket at the bottom right-hand corner will pull apart but the antenna leads remain connected.
2. Unhook the dial cord from the pointer.
3. Remove the four screws which hold the chassis to the cabinet (two at sides of chassis base and two on dial cord pulley brackets above the chassis base).
4. Pull the chassis to the rear—the knobs will be retained with the cabinet.

If removal of the chassis is not necessary when servicing, the back cover may be placed on the supports molded into the upper part of the cabinet.

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Output Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhymst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations except as stated in the tabulation connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

CAUTION:

The chassis is connected to one side of the power supply. On a.c operation it is recommended that an isolation transformer (115 v./115 v.) be used for the receiver when servicing.

Oscilloscope Alignment:

The FM I. F. alignment may be checked using a sweep generator and an oscilloscope. Shunt terminals B and C of T3 with a 1,200 ohm resistor. Connect the high side of the oscilloscope to terminal C of T3 in series with a diode probe. Apply the output of the sweep generator (10.7 mc with ±250 kc. sweep) to pin No. 1 of V2 (6BJ6) in series with .01 mf. Low side of the oscilloscope and sweep generator to chassis. This will show the response of T2.

To check the combined response of T1 and T2; connect the sweep generator to the antenna terminal board—high side to No. 2 terminal in series with 300 ohms and low side to No. 1 terminal. Oscilloscope connections as previously connected.

To check the ratio detector response; connect the high side of the oscilloscope direct to terminal No. 5 of S1-1 rear, low side to chassis, apply the output of the sweep generator to pin No. 1 of V3 (12AU6) in series with .01 mf. Driver plate circuit connected for normal operation (1200 ohm resistor removed). Note: It is difficult to observe marker signals in this step—center frequency and sweep width should be previously observed.

Alignment Indicator:

The dial and dial back plate are not attached to the chassis. During alignment a substitute frequency indication must be used. We suggest attaching a paper clip to the dial drive cord so that its movement may be measured—refer to the "Dial Scale" illustration on page 5.

CRITICAL LEAD DRESS

1. All connections in the mixer-oscillator circuit are extremely critical both in regard to lead length and lead dress. Do not disturb unless necessary—make careful notation before servicing if it becomes necessary to disturb this wiring.
2. The ground lead from pin No. 2 of V3 (12AU6 Driver) is critical in length and must be dressed down against chassis.
3. Dress audio coupling capacitor C23 away from output transformer.
4. Dress diode filter unit away from alignment hole in T-2.
5. Dress grid lead of V3 (pin 1 of 12AU6) against chassis apron.
6. Dress plate lead of V1 (pin No. 2 of 19J6) against chassis.
7. Dress loop antenna leads so as to prevent contact with external antenna terminal board.
8. All ground connections to chassis should be restored to the original places of connection if disturbed.
9. Dress capacitor C13 down close to range switch so as to clear the projection on the bottom of the cabinet.
10. The FM ant. and osc. coils must be cemented to the coil support to prevent microphonic howl on FM. Amphenol No. 912 cement is recommended for this purpose. Amphenol No. 916 solvent is recommended as solvent if it becomes necessary to loosen the windings.

AM Alignment

RANGE SWITCH IN AM POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	AM ant. section (C3) of tuning cond. in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	AM windings.† T2 bottom core (sec.). T2 top core (pri.).
2				AM windings.† T1 top core (sec.). T1 bottom core (pri.).
3	Short wire placed near loop antenna for radiated signal.	1620 kc.	Extreme high frequency end.	C12 osc.
4		1400 kc.	1400 kc.	C4 ant.
5		600 kc.	600 kc.	L4 osc. (Rock gang.)
6	Repeat Steps 3, 4 and 5.			

†Use alternate loading.

Alternate loading involves the use of a 10,000 ohm resistor to load the AM plate winding while the AM grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 10,000 ohm resistor after T2 and T1 have been aligned.

Oscillator frequency is above signal frequency on both AM and FM.

FM Alignment

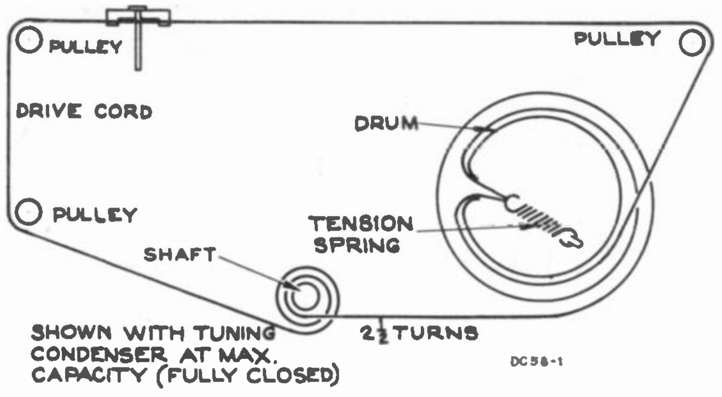
RANGE SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C32 and the common lead to chassis. Adjust sig. gen. output to provide approx.—3 v. indication during alignment.			
2	Pin 1 of 12AU6 in series with .01 mfd.	10.7 mc. modulated 30% 400 cycles AM.	Max. capacity (fully meshed).	T3 top core for max. d-c voltage across C32. T3 bottom core for min. audio output.*
3	No. 2 ant. term in series with a 300 ohm resistor. Connect low side to No. 1 terminal. (Remove ant. lead from No. 2 term.)			FM Windings.†† T2 top core (sec.). T2 bottom core (pri.).
4				FM Windings.†† T1 top core (sec.). T1 bottom core (pri.).
5		106 mc.	106 mc.	L1 osc.** C15 ant.
6		90 mc.	90 mc.	L5 ant.** (Rock gang.)
7	Repeat Steps 5 and 6 until further adjustment does not improve calibration.			

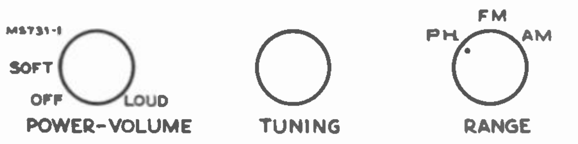
* Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

†† Align T2 and T1 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 10,000 ohm resistor and load the FM windings.

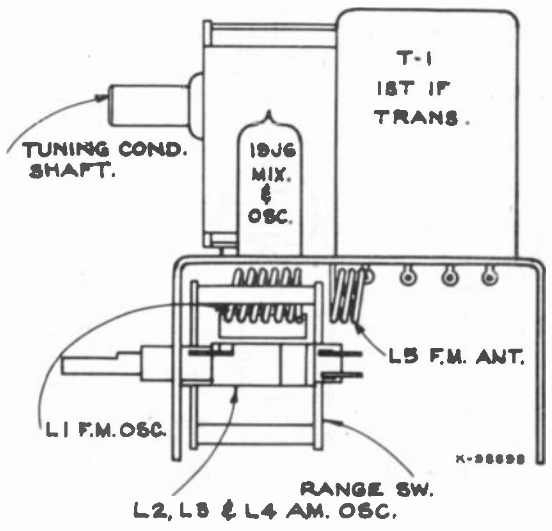
** L1 and L5 are adjustable by increasing or decreasing the spacing between turns.



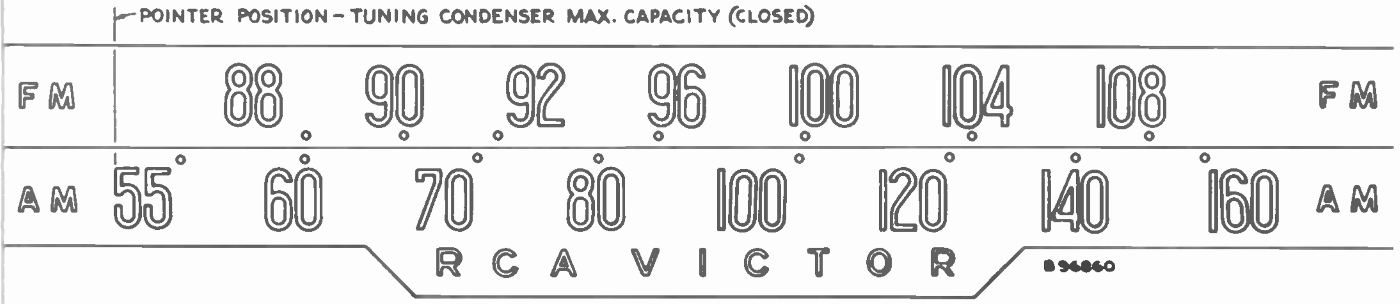
Dial Indicator and Drive Mechanism



Controls

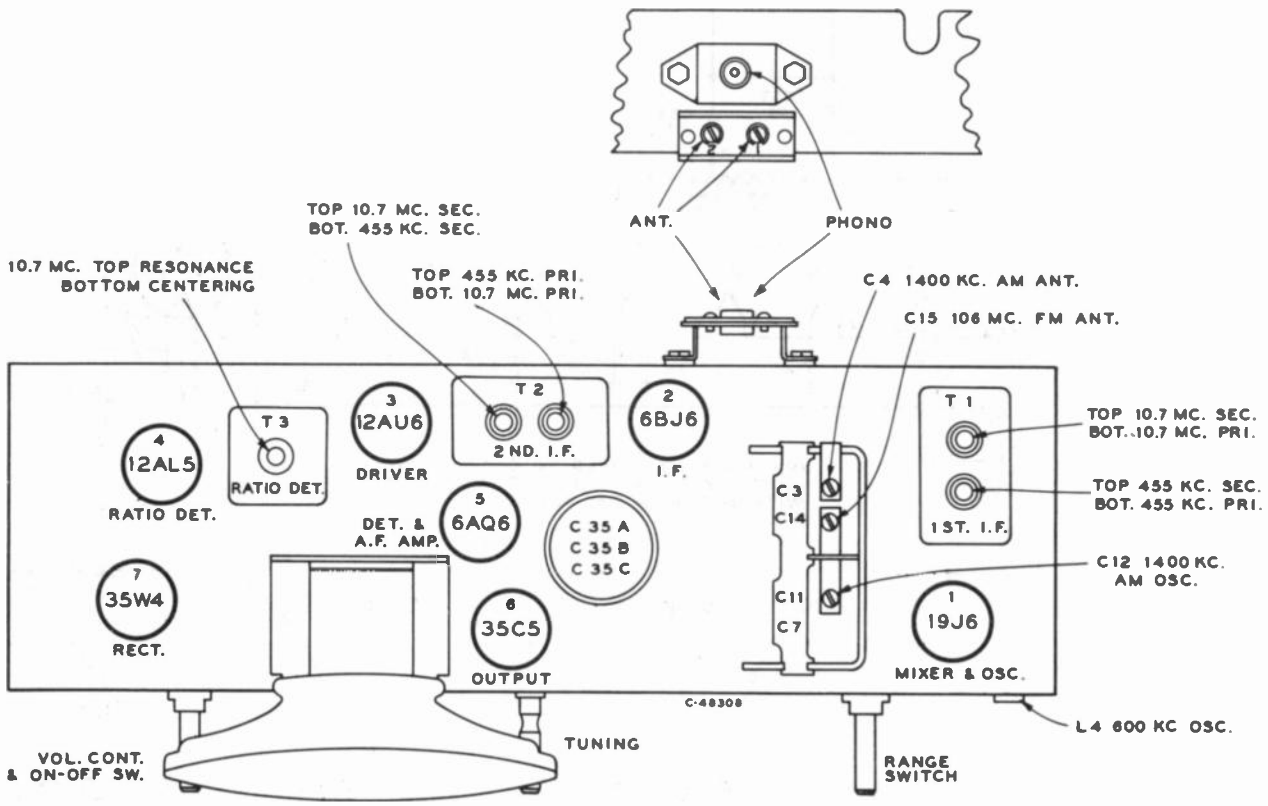


Ant. and Osc. Coil Locations (Side View)



Dial Scale

The dial scale drawing shown is a full size reproduction. It can be used as a reference in alignment procedure.



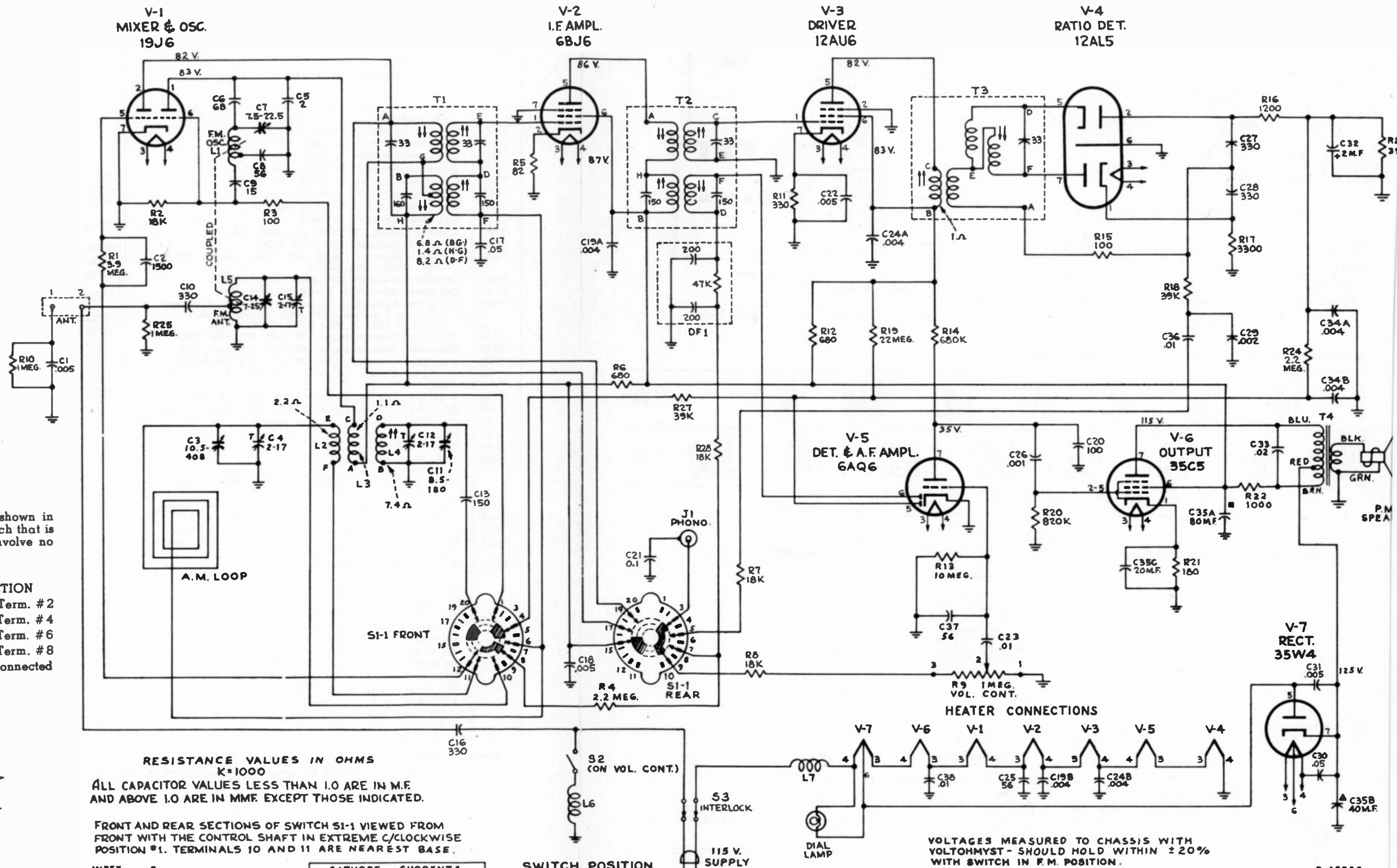
Tube and Trimmer Locations (Top View)

Replacement Parts

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1070A
73973	Capacitor—Variable tuning capacitor (C3, C4, C7, C11, C12, C14 C15)
73866	Capacitor—Ceramic, 2 mmf. (C5)
39044	Capacitor—Ceramic, 15 mmf. (C9)
73867	Capacitor—Ceramic, 56 mmf. (C8)
73499	Capacitor—Ceramic, 56 mmf. (C25, C37)
75612	Capacitor—Ceramic, 68 mmf. (C6)
39628	Capacitor—Mica, 100 mmf. (C20)
44202	Capacitor—Ceramic, 150 mmf. (C13)
75792	Capacitor—Ceramic, 330 mmf. (C10)
39640	Capacitor—Mica, 330 mmf. (C16, C27, C28)
71501	Capacitor—Ceramic, 1500 mmf. (C2)
74009	Capacitor—Ceramic, dual 4000 mmf. (C19A, C19B, C24A, C24B, C34A, C34B)
73473	Capacitor—Ceramic, 5000 mmf. (C1, C18, C31)
73747	Capacitor—Electrolytic, 2 mfd, 50 volts (C32)
73975	Capacitor—Electrolytic, comprising 1 section of 80 mfd, 150 volts, 1 section of 40 mfd, 150 volts and 1 section of 20 mfd, 25 volts (C35A, C35B, C35C)
73186	Capacitor—Tubular, paper, .001 mfd, 400 volts (C26)
73750	Capacitor—Tubular, paper, .002 mfd, 200 volts (C29)
71926	Capacitor—Tubular, paper, .005 mfd, 200 volts (C22)
71923	Capacitor—Tubular, paper, .01 mfd, 200 volts (C23, C36, C38)
74010	Capacitor—Tubular, paper, .02 mfd, 400 volts (C33)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C17, C30)
73551	Capacitor—Tubular, paper, 0.1 mfd, 400 volts (C21)
73744	Coil—Oscillator coil—A-M (L2, L3, L4)
74012	Coil—Oscillator coil—F-M (L1)
74013	Coil—Antenna coil—F-M (L5)
	Coil—Line choke coil (#18 gauge solid wire, 1/32" plastic insulation, standard hook-up wire, 10 turns, close wind) (L6, L7)
73981	Connector—2 contact male connector for power input
38406	Control—Volume control and power switch (R9, S2)
†72953	Cord—Drive cord (approx. 50" overall length required)
74011	Filter—Diode filter comprising 2 sections of 200 mmf. and 1 section of 47,000 ohms (DF-1)
72283	Grommet—Rubber grommet for mounting tuning capacitor (4 req'd)
	Resistors—Fixed, composition:—
	82 ohms, ±10%, ½ watt (R5)
	100 ohms, ±5%, ½ watt (R15)
	100 ohms, ±20%, ½ watt (R3)
	180 ohms, ±10%, ½ watt (R21)
	330 ohms, ±10%, ½ watt (R11)
	680 ohms, ±20%, ½ watt (R6, R12)
	1000 ohms, ±10%, 1 watt (R22)
	1200 ohms, ±5%, ½ watt (R16)
	3300 ohms, ±5%, ½ watt (R17)
	18,000 ohms, ±10%, ½ watt (R2, R7, R8, R28)
	39,000 ohms, ±5%, ½ watt (R23)
	39,000 ohms, ±10%, ½ watt (R18, R27)
	680,000 ohms, ±20%, ½ watt (R14)
	820,000 ohms, ±10%, ½ watt (R20)
	1 megohm, ±20%, ½ watt (R10, R25)
	2.2 megohm, ±20%, ½ watt (R4, R24)
	3.9 megohm, ±10%, ½ watt (R1)
	10 megohm, ±20%, ½ watt (R13)
	22 megohm, ±20%, ½ watt (R19)
73978	Shaft—Tuning knob shaft
74179	Socket—Tube socket, 7 pin, miniature for V1
73117	Socket—Tube socket, 7 pin, miniature for V2, V3, V4, V5, V6, V7
75790	Socket—Phono input socket and terminal board assembly (J1)
74014	Socket—Dial lamp socket
74038	Spring—Drive cord spring
73979	Support—Dial drive cord pulley support complete with two (2) pulleys—L. H.
73980	Support—Dial drive cord pulley support complete with pulley—R. H.
75789	Switch—Range switch (S1-1)
73745	Transformer—First I-F transformer—dual (T1)
73974	Transformer—Second I-F transformer—dual (T2)
73743	Transformer—Ratio detector transformer (T3)
73976	Transformer—Output transformer (T4)
33726	Washer—"C" washer for tuning knob shaft
75791	Washer—Insulating washer (shoulder type) for mounting phono input socket and terminal board assembly (2 req'd)
73332	Washer—Insulating washer (flat) for mounting phono input socket and terminal board assembly (2 req'd)
	SPEAKER ASSEMBLIES 92572-4
73900	Speaker—5" speaker complete with cone and voice coil
	MISCELLANEOUS
75793	Back—Cabinet back complete with power cord, connector and loop
75797	Bezel—Cabinet bezel and grille cloth assembly less "RCA Victor" emblem
Y2275	Cabinet—Maroon plastic cabinet
75795	Dial—Polystyrene dial scale
74782	Emblem—"RCA Victor" emblem
75794	Knob—Range switch knob—maroon
75885	Knob—Tuning control or volume control knob—maroon
31480	Lamp—Dial lamp—Mazda #47
72765	Nut—Speed nut for mounting dial
73989	Plate—Dial back plate
73991	Pointer—Station selector pointer
73992	Retainer—Knob retainer (knob to cabinet)
14270	Spring—Retaining spring for knobs (knob to shaft)

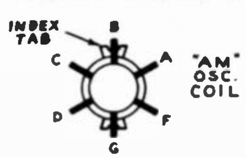
† Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



RESISTANCE VALUES IN OHMS
K=1000
ALL CAPACITOR VALUES LESS THAN 1.0 ARE IN M.F.
AND ABOVE 1.0 ARE IN MMF. EXCEPT THOSE INDICATED.

FRONT AND REAR SECTIONS OF SWITCH S1-1 VIEWED FROM FRONT WITH THE CONTROL SHAFT IN EXTREME C/CLOCKWISE POSITION #1. TERMINALS 10 AND 11 ARE NEAREST BASE.



	CATHODE A.M.	CURRENTS F.M.
1	6.4 M.A.	6.1 M.A.
2	6.4 M.A.	8.1 M.A.
3	4.4 M.A.	4.2 M.A.
4	—	—
5	.077 M.A.	.076 M.A.
6	.31 M.A.	.30 M.A.
7	49.5 M.A.	50 M.A.

SWITCH POSITION
1.---PHONO.
2.---F.M.
3.---A.M.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST - SHOULD HOLD WITHIN ±20% WITH SWITCH IN F.M. POSITION.

Schematic Diagram

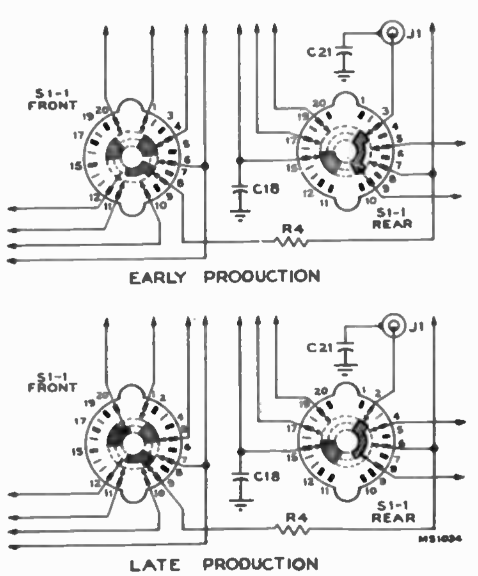
Change in Range Switch:

The initial production used a range switch as shown in X711 Service Data. Later production will use a switch that is slightly different. They are interchangeable and involve no change in replacement parts.

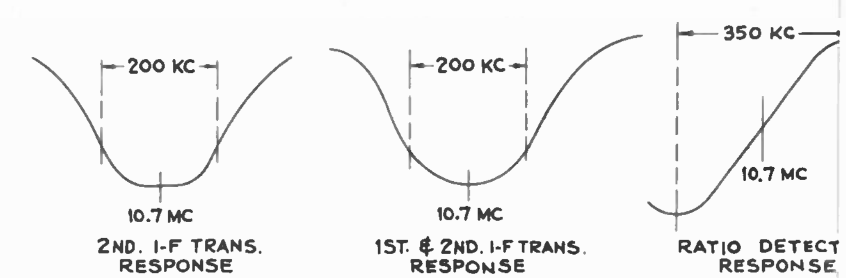
Wiring changes are as follows:

FRONT SECTION	REAR SECTION
*Term. #4 to Term. #5	Term. #3 to Term. #2
Term. #6 to Term. #7	Term. #5 to Term. #4
Term. #8 to Term. #9	Term. #7 to Term. #6
	Term. #9 to Term. #8

*(The lead which was connected to Term. #4 is now connected to Term. #5, etc.)



Range Switch Connections—X711



FM Response Curves

RCA VICTOR

Radio Phonograph Combination

MODEL 9Y510

Chassis No. RC 1077A

Record Changer RP 190-1

SERVICE DATA

— 1950 No. 18 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range .... 540-1600 kc

Intermediate Frequency .... 455 kc

Tube Complement

1. RCA-12BE6 .... Converter
2. RCA-12BA6 .... I-F Amplifier
3. RCA-12AV6 .... Det., AVC., A-F Amplifier
4. RCA-50L6GT .... Output
5. RCA-35W4 .... Rectifier

Power Supply Rating .... 115 volts, 60 cycles a.c., 60 watts

Dial Lamps (2) ...... Mazda type 1490, 3.2 volts, 0.16 amp.

Loudspeaker (92585-1)

Size and type .... 5" x 7" P.M.
Voice coil impedance .... 3.2 ohms at 400 cycles

Power Output

Undistorted .... 1 watt
Maximum .... 1.5 watts

Cabinet Dimensions

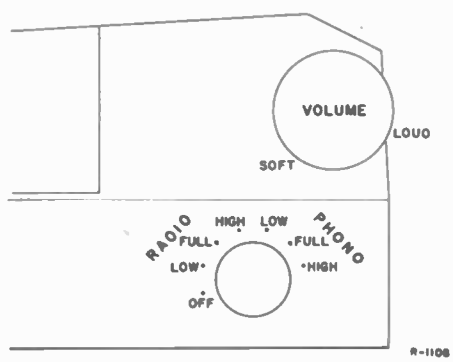
Height 7¾" Width 12⅜" Depth 14¼"

Tuning Drive Ratio .... 7½:1 (3¾ turns of knob)

Record Changer (RP 190-1)

Turntable speed .... 45 r.p.m.
Records used .... RCA—7 in. fine groove
Record capacity .... 12 records
Pickup (Stock No. 75476) .... Crystal (medium output)

FOR RECORD CHANGER SERVICE INFORMATION —REFER TO RP 190 SERIES SERVICE DATA



Controls—End View

Service Hints

The tubes and the dial lamps are accessible by removing the panel-in the front of the record changer compartment.

The chassis metal mounting plate should be flush against the front of the cabinet.

The position of the speaker is adjustable. When correctly positioned, it should set firmly against the front of the cabinet but with no undue strain on the speaker.

Chassis No. RC-1077C

Service Data:

Late production of Model 9Y510 uses chassis stamped RC-1077C. This chassis is identical to chassis stamped RC-1077A except for the following:

Speaker stamped 92585-3 is used instead of 92585-1. This speaker is rim mounted instead of pot mounted.

The tuning condenser shaft extends approx. ⅜" beyond the drive cord pulley instead of ¼". This permits the use of a new type of drive cord tension spring.

Replacement Parts:

Stock No.	CHASSIS ASSEMBLY RC-1077C
	Same as RC-1077A except:
76393	Bracket—Speaker mounting brackets and screws (1 set)
	If tuning condenser is replaced, use condenser and drive cord spring same as for RC-1077A
76368	Spring—Drive cord tension spring
	SPEAKER ASSEMBLY 92585-3
76394	Speaker—5" x 7" PM speaker complete with cone and voice coil

9Y510

Alignment Procedure

Output Meter—Connect meter across speaker voice coil. Turn volume control to maximum.

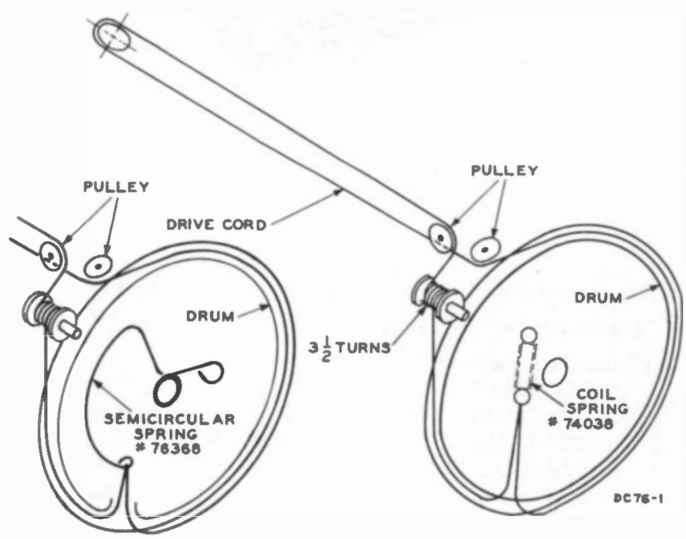
Test Oscillator—Connect low side of test oscillator to common wiring in series with a .1 mf. capacitor. If the test oscillator is a.c. operated it may be necessary to use an isolation transformer for the receiver during alignment and the low side of the test oscillator connected directly to common wiring at the electrolytic capacitor. Keep the oscillator output low to prevent a-v-c action.

Dial Pointer Adjustment—Rotate tuning condenser until the plates are fully open. Adjust indicator pointer to 1630 kc (extreme high frequency end of the scale).

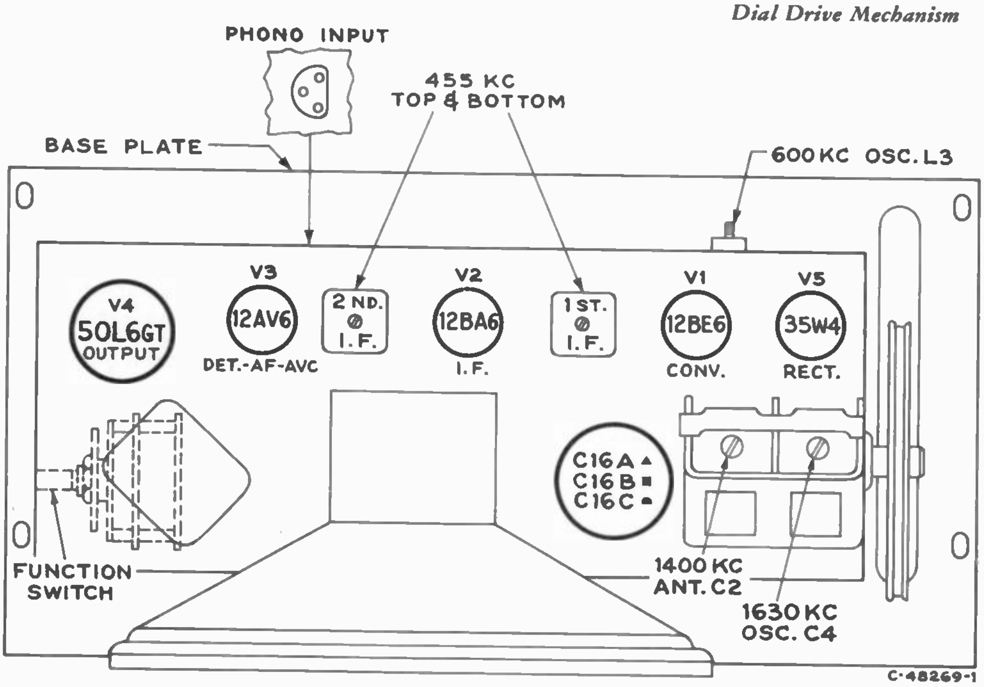
Steps	Connect the high side of test to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	I.F. grid, in series with .1 mfd.	455 kc	Quiet point 1,600 kc end of dial	Pri. & Sec. 2nd I.F. transformer
2	Converter grid in series with .1 mfd.			Pri. & Sec. 1st I.F. transformer
NOTE—ANTENNA LOOP AND RECORD CHANGER MUST BE IN CABINET FOR THE FOLLOWING				
3	Short wire placed near loop for radiated signal	1,630 kc	Extreme R. H. end (gang open)	1,630 KC trimmer (osc.)
4		1,400 kc	1,400 kc	1,400 KC trimmer (ant.)
5		600 kc	600 kc	Osc. Coil L3 Rock gang
6	Repeat steps 3, 4, & 5 if necessary			

LEAD DRESS

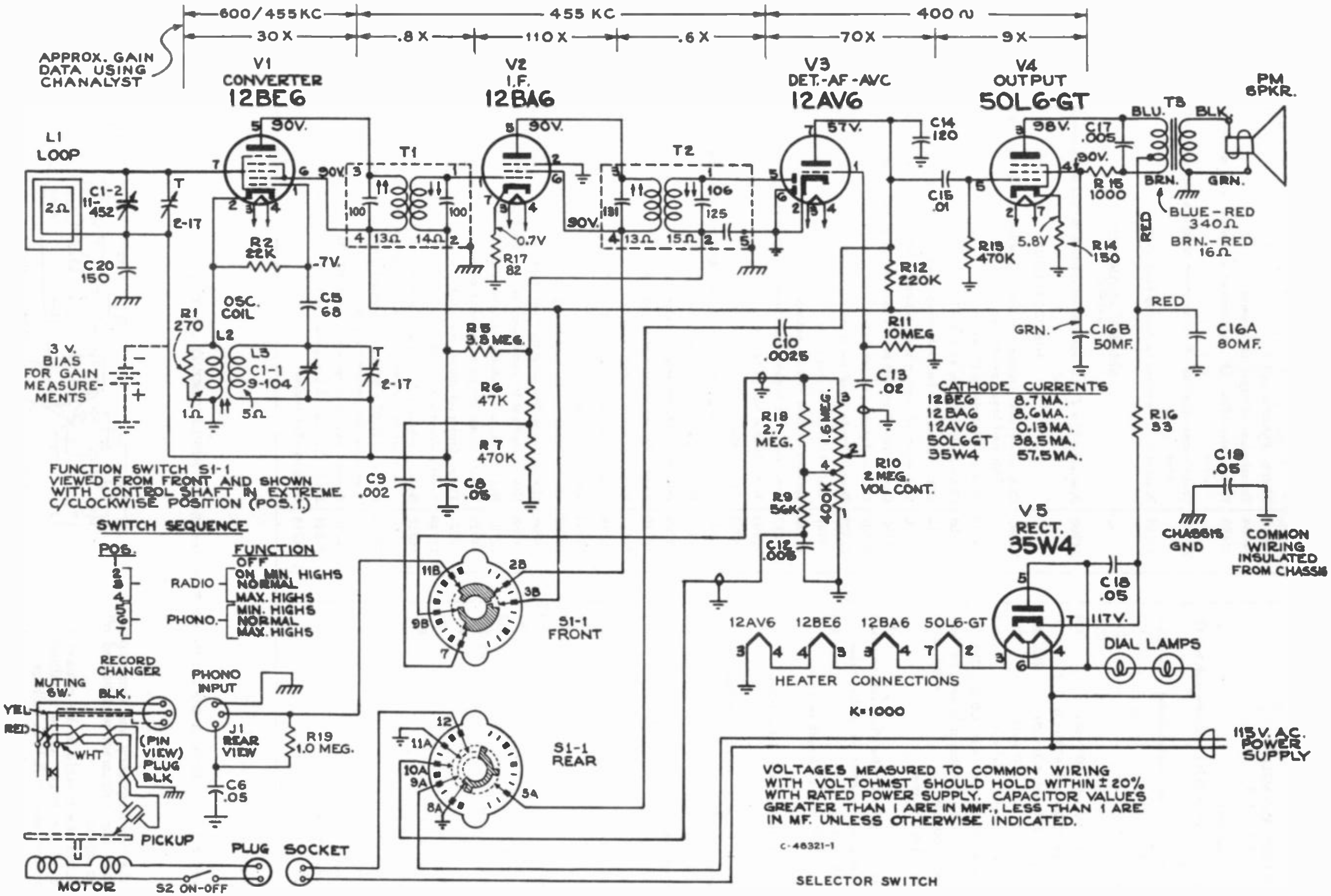
1. Dress all heater leads and pilot light leads down to chassis and as far as possible from all audio grid and plate wiring.
2. Dress all exposed leads away from each other and away from chassis to prevent short circuits.
3. Dress lead from R.F. section of gang to V1 pin 7 direct but away from chassis base to reduce capacity, also away from fuse resistor.
4. Dress lead from oscillator section of gang to oscillator coil direct but away from chassis base to reduce capacity.
5. Connect capacitor C20 with short leads between gang frame and mounting bracket.
6. Dress output transformer leads down to base.
7. Dress loop antenna leads away from gang plates and tubes.
8. Dress 33 ohm limiting resistor away from chassis.



Dial Drive Mechanism



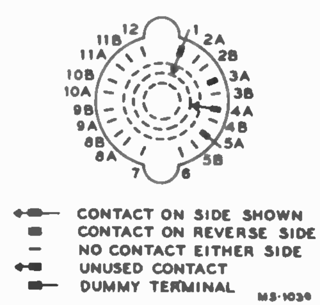
Tube and Trimmer Locations



Schematic Diagram

R19 was omitted in some chassis.

SELECTOR SWITCH



Selector Switch

Switch contacts Nos. 2, 3, 4, 5, 8, 9, 10 and 11 have alternate positions (designated as "A" and "B"). Either 2A or 2B (but not both) may be used on "FRONT" of a switch wafer. Either (but not both) may be used on "REAR" of a switch wafer. Either may be used on both "FRONT" and "REAR." This also applies to contacts Nos. 3, 4, 5, 8, 9, 10 and 11.

Switch contacts Nos. 1, 6, 7 and 12 do not have alternate positions.

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1077A
75909	Antenna—Antenna loop assembly L1
74705	Bracket—Drive cord pulley bracket (R.H.) complete with two (2) pulleys less long bracket.
74704	Capacitor—Variable tuning capacitor—less bracket. . C1-1, C1-2
39624	Capacitor—Mica, 68 mmf........ C5
39630	Capacitor—Mica, 120 mmf C14
39632	Capacitor—Mica, 150 mmf........ C20
73803	Capacitor—Tubular, paper, .002 mfd, 400 volts........ C9
73599	Capacitor—Tubular, paper, .0025 mfd, 400 volts........ C10
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts........ C12, C17
73561	Capacitor—Tubular, paper, .01 mfd., 200 volts........ C15
73562	Capacitor—Tubular, paper, .02 mfd., 400 volts........ C13
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts, C6, C8, C18, C19
75911	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts and 1 section of 50 mfd, 150 volts........ C16A, C16B
73935	Clip—Mounting clip for I.F. transformer
74448	Coil—Oscillator coil........ L2
36422	Connector—3 contact female connector for phono input cable, J1
30868	Connector—2 contact female connector for motor cable, P3
74702	Control—Volume control........ R10
†72953	Cord—Drive cord (approx. 49" over-all length required)
70392	Cord—Power cord and plug
74454	Gasket—Rubber gasket between speaker and cabinet
74838	Grommet—Strain relief grommet (1 set)
72283	Grommet—Rubber grommet to mount tuning capacitor
72602	Pulley—Drive cord pulley
72313	Resistor—Fuse type, 33 ohms........ R16
	Resistor—Fixed, composition:
	82 ohms, ±10%, ½ watt........ R17
	150 ohms, ±10%, ½ watt........ R14
	270 ohms, ±10%, ½ watt........ R1
	1000 ohms, ±10%, 1 watt........ R15
	22,000 ohms, ±20%, ½ watt........ R2
	47,000 ohms, ±20%, ½ watt........ R6
	56,000 ohms, ±10%, ½ watt........ R9
	220,000 ohms, ±20%, ½ watt........ R12
	470,000 ohms, ±20%, ½ watt........ R7, R13
	2.7 megohms, ±10%, ½ watt........ R18
	3.3 megohms, ±20%, ½ watt........ R5
	10 megohms, ±20%, ½ watt........ R11
74701	Shaft—Tuning knob shaft and pulley
73584	Shield—Tube shield for 12AV6
70827	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
72998	Socket—Dial lamp socket and lead
74038	Spring—Drive cord spring

STOCK NO.	DESCRIPTION
75910	Switch—Function switch........ S1-1
74654	Transformer—Output transformer........ T3
75486	Transformer—First I.F. transformer complete with adjustable cores........ T1
75487	Transformer—Second I.F. transformer complete with adjustable cores........ T2
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES 92585-1
74706	Speaker—5" x 7" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
Y2292	Cabinet—Plastic cabinet—maroon—less lid, lid support, metal grille and hinge assemblies
74713	Clamp—Dial clamp (2 req'd)
73508	Clip—Spring clip for knob #74710
75912	Clip—Spring clip for radio compartment back panel
30870	Connector—2 contact male connector for motor cable
74192	Connector—3 contact male connector for phono cable
74682	Decal—Function switch decal
74273	Decal—Trade mark decal (Victrola)
74722	Dial—Polystyrene dial scale
74782	Emblem—"RCA Victor" emblem
33317	Fastener—Push fastener for antenna loop mounting bracket
72894	Foot—Rubber foot (4 req'd)
74707	Grille—Metal grille
75697	Grommet—Rubber grommet for mounting record changer
75915	Hinge—Cabinet lid hinge (2 req'd)
74709	Indicator—Station selector indicator
74710	Knob—Volume control or tuning knob
74711	Knob—Function switch knob
71116	Lamp—Dial lamp—Type 1490
75914	Lid—Cabinet lid only
74717	Mask—End mask for dial (2 req'd)
74708	Motif—Decorative motif for front of cabinet
74788	Nut—Speed nut for radio compartment back panel clips
72765	Nut—Speed nut to fasten decorative motif
74715	Panel—Radio compartment back panel
74721	Plate—Dial back plate—less dial
73728	Screen—Ventilation screen
74716	Screw—#6-32 x ¼" cross recessed oval head machine screw for radio compartment back panel (3 req'd)
75913	Screw—#10-32 x ¾" cross recessed round head machine screw for mounting record changer
14270	Spring—Retaining spring for knob #74711
71824	Stud—Cabinet lid hinge stud and screw (2 req'd)
74714	Support—Lid support

† Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

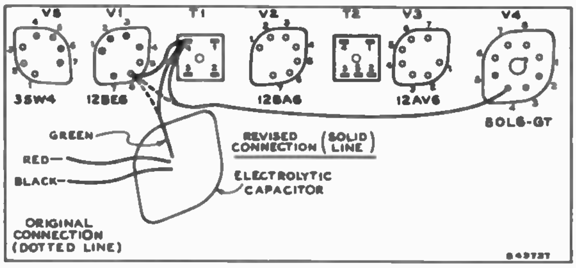
Change in Wiring:

Failure of operation at the low frequency end was experienced on some chassis when the instrument was turned off and subsequently turned on again.

Engineering has determined the trouble to be caused by high frequency oscillation of the mixer stage resulting in a blocking action due to an increase in A.V.C. voltage.

The following wiring change was made to eliminate the problem:

The electrolytic capacitor green lead and the red wire from pin 4 of 50L6 tube socket were changed from pin 6 of the 12BE6 (mixer) tube socket to pin 4 of the first I.F. transformer. This change did not alter the circuit but merely changed the connection points of the leads as illustrated below.



RCA VICTOR

THE CHASSIS USED IN MODEL 9Y511 DIFFERS FROM MODEL 9Y510 ONLY IN THE LOOP ANTENNA.
REFER TO MODEL 9Y510 FOR FURTHER INFORMATION.

Radio Phonograph combination

MODEL 9Y511

Chassis No. RC 1077B

Record Changer RP 168K-4

SERVICE DATA

—1950 No. 27—

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range .... 540-1600 kc

Intermediate Frequency .... 455 kc

Tube Complement
1. RCA-12BE6 .... Converter
2. RCA-12BA6 .... I-F Amplifier
3. RCA-12AV6 .... Det., AVC., A-F Amplifier
4. RCA-50L6GT .... Output
5. RCA-35W4 .... Rectifier

Power Supply Rating .... 115 volts, 60 cycles a.c., 60 watts

Dial Lamps (2) ...... Mazda type 1490, 3.2 volts, 0.16 amp.

Loudspeaker (92585-1)
Size and type .... 5" x 7" P.M.
Voice coil impedance .... 3.2 ohms at 400 cycles

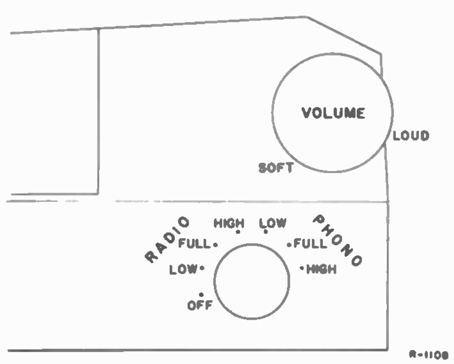
Power Output
Undistorted .... 1 watt
Maximum .... 1.5 watts

Cabinet Dimensions
Height 7¾"   Width 12⅜"   Depth 14¼"

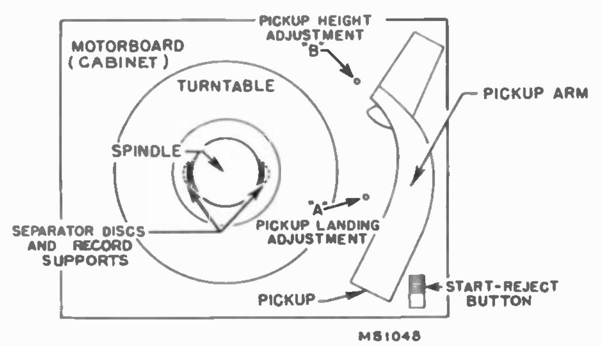
Tuning Drive Ratio .... 7½:1 (3¾ turns of knob)

Record Changer (RP 168K-4)
Turntable speed .... 45 r.p.m.
Records used .... RCA—7 in. fine groove
Record capacity .... Up to 10 records
Pickup (Stock No. 74068) .... Crystal (medium output)

FOR RECORD CHANGER SERVICE INFORMATION —REFER TO RP 168 SERIES SERVICE DATA



Controls—End View



Record Changer—Top View

Care of Stylus

The record changer stylus is protected by a permanent metal guard. LINT MAY COLLECT TO CLOG THE OPENING IN THE GUARD AT THE STYLUS POINT AND CAUSE POOR RECORD REPRODUCTION. This may require occasional cleaning of the guard opening—clean by carefully brushing with a small soft brush.

Service Hints

The tubes and the dial lamps are accessible by removing the panel in the front of the record changer compartment.

The chassis metal mounting plate should be flush against the front of the cabinet.

The position of the speaker is adjustable. When correctly positioned, it should set firmly against the front of the cabinet but with no undue strain on the speaker.

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES **RC 1077B**
74703	Antenna—Antenna loop assembly L1
74705	Bracket—Drive cord pulley bracket (R.H.) complete with two (2) pulleys less long bracket.
74704	Capacitor—Variable tuning capacitor—less bracket .. C1-1, C1-2
39624	Capacitor—Mica, 68 mmf C5
39630	Capacitor—Mica, 120 mmf C14
39632	Capacitor—Mica, 150 mmf C20
73803	Capacitor—Tubular, paper, .002 mfd, 400 volts C9
73599	Capacitor—Tubular, paper, .0025 mfd, 400 volts C10
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts C12, C17
73561	Capacitor—Tubular, paper, .01 mfd., 200 volts C15
73562	Capacitor—Tubular, paper, .02 mfd., 400 volts C13
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts, C6, C8, C18, C19
75911	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts and 1 section of 50 mfd, 150 volts C16A, C16B
73935	Clip—Mounting clip for I.F. transformer
74448	Coil—Oscillator coil L2
36422	Connector—3 contact female connector for phono input cable, J1
30868	Connector—2 contact female connector for motor cable, P3
74702	Control—Volume control R10
†72953	Cord—Drive cord (approx. 49" over-all length required)
70392	Cord—Power cord and plug
74454	Gasket—Rubber gasket between speaker and cabinet
74838	Grommet—Strain relief grommet (1 set)
72283	Grommet—Rubber grommet to mount tuning capacitor
72602	Pulley—Drive cord pulley
72313	Resistor—Fuse type, 33 ohms R16
	Resistor—Fixed, composition:
	82 ohms, ±10%, ½ watt R17
	150 ohms, ±10%, ½ watt R14
	270 ohms, ±10%, ½ watt R1
	1000 ohms, ±10%, 1 watt R15
	22,000 ohms, ±20%, ½ watt R2
	47,000 ohms, ±20%, ½ watt R6
	56,000 ohms, ±10%, ½ watt R9
	220,000 ohms, ±20%, ½ watt R12
	470,000 ohms, ±20%, ½ watt R7, R13
	1.0 megohm, ±10%, ½ watt R19
	2.7 megohms, ±10%, ½ watt R18
	3.3 megohms, ±20%, ½ watt R5
	10 megohms, ±20%, ½ watt R11
74701	Shaft—Tuning knob shaft and pulley
73584	Shield—Tube shield for 12AV6
70827	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
72998	Socket—Dial lamp socket and lead
74038	Spring—Drive cord spring
75910	Switch—Function switch S1-1
74654	Transformer—Output transformer T3
75486	Transformer—First I.F. transformer complete with adjustable cores T1
75487	Transformer—Second I.F. transformer complete with adjustable cores T2
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES **92585-1**
74706	Speaker—5" x 7" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
Y2137	Cabinet—Plastic cabinet—maroon—less lid, lid support, meta grille and hinge assemblies
74713	Clamp—Dial clamp (2 req'd)
73508	Clip—Spring clip for knob #74710
74719	Clip—Spring clip for radio compartment back panel
74192	Connector—3 contact male connector for phono cable
74682	Decal—Function switch decal
74273	Decal—Trade mark decal (Victrola)
74722	Dial—Polystyrene dial scale
74782	Emblem—"RCA Victor" emblem
72894	Foot—Rubber foot (4 req'd)
74707	Grille—Metal grille
72692	Hinge—Cabinet lid hinge (2 req'd)
74709	Indicator—Station selector indicator
74710	Knob—Volume control or tuning knob
74210	Knob—"Start-Reject" Knob
74711	Knob—Function switch knob
71116	Lamp—Dial lamp—Type 1490
74940	Lever—"Start-Reject" actuating lever
74720	Lid—Cabinet lid only
74717	Mask—End mask for dial (2 req'd)
74708	Motif—Decorative motif for front of cabinet
74623	Mounting—One set of hardware consisting of 3 rubber grommets, 3 flat washers, and 3 eyelets to mount record changer
74212	Nut—Speed nut for reject knob
74788	Nut—Speed nut for "Start-Reje t" actuating lever
72765	Nut—Speed nut to fasten motif (1 req'd) or to fasten dial (2 req'd)
74715	Panel—Radio compartment back panel
74721	Plate—Dial back plate—less dial
73728	Screen—Ventilation screen
74716	Screw—#6-32 x ¼" cross recessed oval head machine screw for radio compartment back panel (3 req'd)
76000	Screw—#6-32 x ¼" special head screw to mount hinges
74718	Spring—Return spring for "Start-Reject" actuating lever
14270	Spring—Retaining spring for knob #74711
71824	Stud—Cabinet lid hinge stud and screw (2 req'd)
74714	Support—Lid support

† Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

RCA VICTOR

Automatic Record Player

MODELS 45-EY, 45-EY-1, 45-EY-15

Chassis Nos. RS-132, RS-132A, RS-132F, RS-132H

SERVICE DATA

— 1950 No. 9 & No. 26 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

45-EY
Two-tone pickup arm

45-EY-1
Maroon pickup arm

45-EY-15

Model 45-EY uses Chassis No. RS-132, RS-132-A or RS-132-F.
Model 45-EY-1 uses Chassis No. RS-132-F.
Model 45-EY-15 uses Chassis No. RS-132-H.

FOR RECORD CHANGER SERVICE INFORMATION—REFER TO RP-168 SERIES SERVICE DATA.

Specifications

Tube Complement

1. RCA 12AV6 .... Amplifier
2. RCA 50C5 (in RS-132 or RS-132-A) .... Output
   RCA 50B5 (in RS-132-F or RS-132-H) .... Output
3. RCA 35W4 .... Rectifier

Loudspeaker (92577-6W)

Size and type .... 4 in. P.M.
Voice coil impedance .... 3.2 ohms at 400 cycles

Dimensions (overall)

Height, 7⅝" Width, 9$\frac{11}{16}$" Depth, 9⅝"

Power Supply Rating

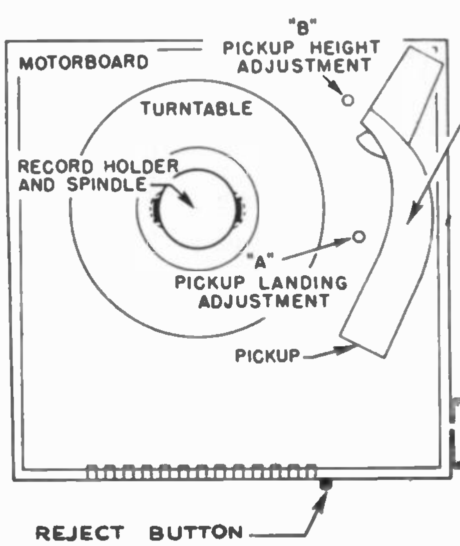
115 volts, 60 cycles A.C. .... 40 watts

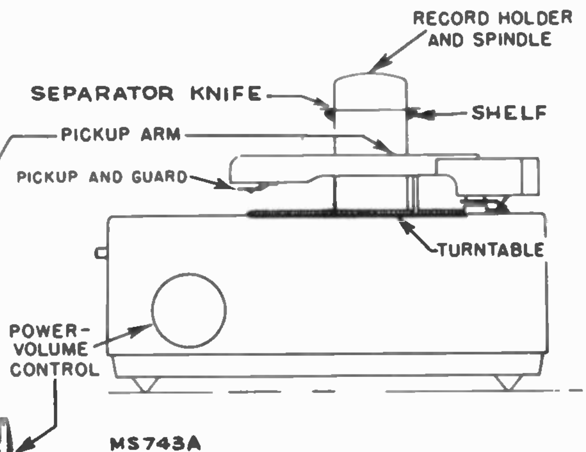
Power Output

Undistorted .... 1.0 watt Maximum .... 1.25 watts

Record Changer

Turntable speed .... 45 r.p.m.
Records used .... RCA 7 in. fine groove
Record capacity .... up to 10 records
Pickup .... Crystal (medium output)
Stock No. 74067 used with RS-132, RS-132-F or RS-132-H.
Stock No. 74625 used with RS-132-A.





Pickup Landing Adjustment "A"

The pickup point should land half-way between the outer edge of the record and the first music groove.

If the pickup lands inside the starting grooves—turn screw "A" slightly clockwise. If pickup lands outside the starting grooves—turn screw "A" slightly counterclockwise.

Pickup Height Adjustment "B"

During cycle the pickup arm must rise high enough to clear a stack of ten records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

If pickup does not clear a stack of ten records—turn screw "B" slightly clockwise. If pickup arm touches records on record supports—turn screw "B" slightly counterclockwise.

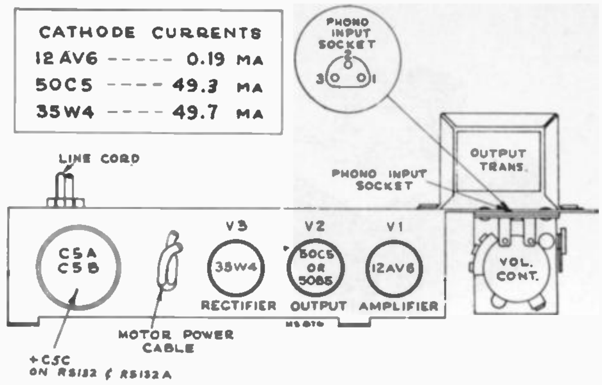
45-EY, 45-EY-1, 45-EY-15

Amplifier Chassis

Three different amplifier chassis have been used in Model 45-EY.

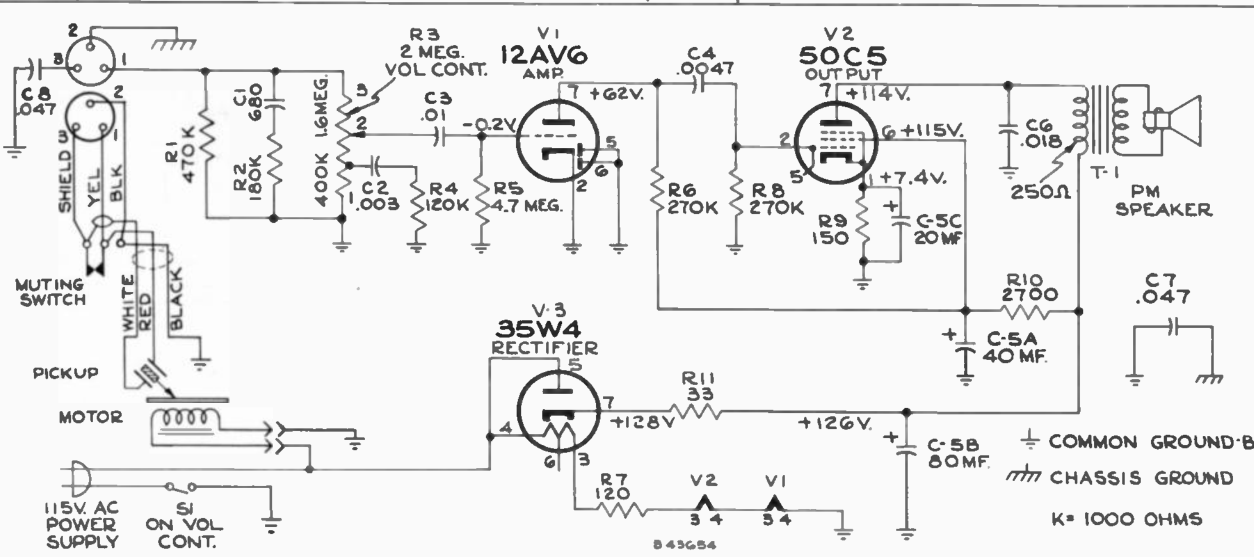
Chassis No. RS-132 and RS-132-A use a 50C5 output tube. Chassis No. RS-132-F uses a 50B5 output tube.

Crystal pickup Stock No. 74067 is used in instruments having chassis RS-132 or RS-132-F. Crystal pickup Stock No. 74625 is used in instruments having chassis RS-132-A.



REPLACEMENT PARTS (For instruments having amp. chassis marked RS-132)

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
	AMPLIFIER ASSEMBLIES RS-132	73117	Socket—Tube socket
		36422	Socket—3 contact socket for phono input cable
39648	Capacitor—Mica, 680 mmf. (C1)	72535	Transformer—Output transformer (T1)
73920	Capacitor—Moulded paper, .0047 mfd., 400 volts (C4)		**SPEAKER ASSEMBLIES**
73961	Capacitor—Tubular, .003 mfd., 200 volts (C2)		92577-6W—RL 108B4
71923	Capacitor—Tubular, .01 mfd., 200 volts (C3)		
58476	Capacitor—Moulded paper, .018 mfd., 400 volts (C6)		
73553	Capacitor—Moulded paper, .047 mfd., 400 volts (C7, C8)	74165	Speaker—4" P.M. speaker complete with cone and voice coil
72281	Capacitor—Electrolytic, comprising 1 section of 80 mfd., 150 volts; 1 section of 40 mfd., 150 volts; and 1 section of 20 mfd., 25 volts (C5A, C5B, C5C)		**MISCELLANEOUS**
		74135	Baffle—Speaker baffle
74133	Control—Volume control and power switch (R3, S1)	74793	Bottom—Cabinet bottom cover
28451	Cover—Insulating cover for electrolytic capacitor	74137	Bracket—Mounting bracket for reject button and shaft
73693	Grommet—Strain relief grommet (1 set) for power cord	74136	Bracket—Speaker mounting bracket
70391	Insulator—Phono input socket insulator	74138	Button—Reject button and shaft
30868	Plug—2 contact female plug for motor cable	Y2226	Cabinet—Plastic cabinet less bottom cover
73237	Resistor—Wire wound, 33 ohms, 150 ma. (R11)	74190	Cable—Shielded pickup cable complete with 3 prong male plug
72314	Resistor—Wire wound, 120 ohms, 5 watts (R7)	74193	Clamp—Spring clamp for reject button and shaft
	Resistor—Fixed, composition, 150 ohms ±10%, ½ watt (R9)	74782	Emblem—"RCA Victor" emblem
	Resistor—Fixed, composition, 2700 ohms ± 10%, ½ watt (R10)	74623	Hardware—Set of mounting parts consisting of 3 flat washers, 3 spacers and 3 rubber grommets to mount record changer
	Resistor—Fixed, composition, 120,000 ohms ±10%, ½ watt (R4)	74666	Knob—Power switch knob
	Resistor—Fixed, composition, 180,000 ohms ±10%, ½ watt (R2)	74192	Plug—3 prong male plug for pickup cable
	Resistor—Fixed, composition, 270,000 ohms ±10%, ½ watt (R6, R8)	74734	Spring—Retaining spring for knob
	Resistor—Fixed, composition, 470,000 ohms ±10%, ½ watt (R1)	74139	Spring—Reject button and shaft return spring (.203" dia. x 1½"—21" turns)
	Resistor—Fixed, composition, 4.7 megohms ±20%, ½ watt (R5)	2917	Washer—"C" washer for reject button and shaft



Schematic for amplifier marked RS-132

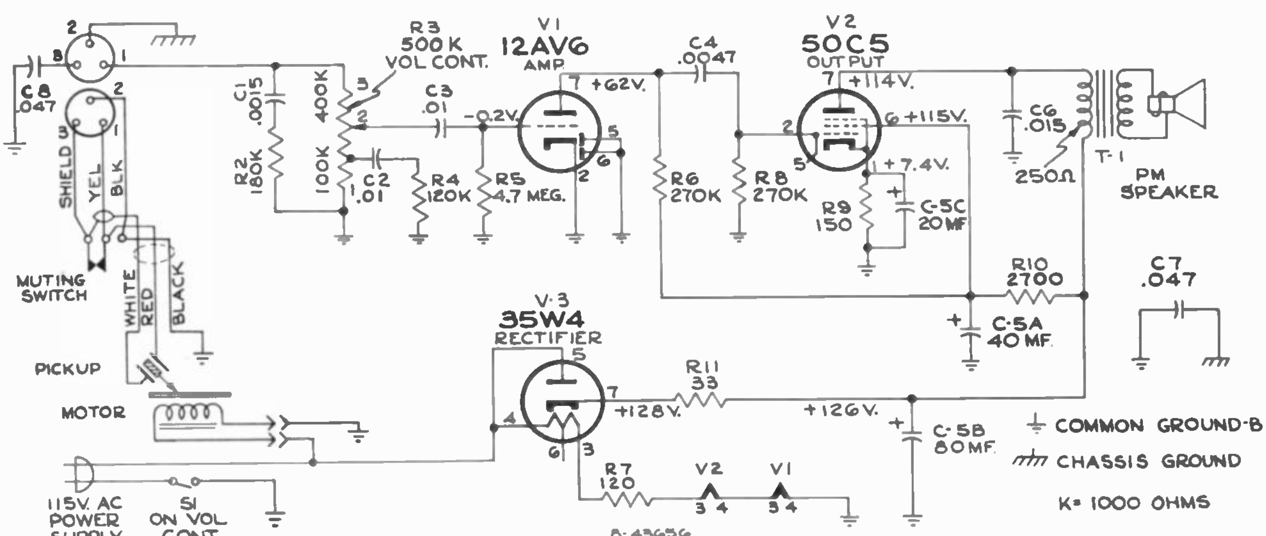
NOTE: Some amplifiers may have a .022 mfd. capacitor in place of .018 (C6)

REPLACEMENT PARTS (For instruments having amp. chassis marked RS-132-A)

STOCK No.	DESCRIPTION
	AMPLIFIER ASSEMBLIES RS-132-A
72281	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts; 1 section of 40 mfd., 150 volts; and 1 section of 20 mfd., 25 volts
71934	Capacitor—Tubular, paper, .0015 mfd., 600 volts (C1)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 600 volts (C4)
71923	Capacitor—Tubular, paper, .01 mfd., 200 volts (C2, C3)
73797	Capacitor—Tubular, paper, .015 mfd., 600 volts (C6)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C7, C8)
30868	Connector—2 contact female connector for motor cable
36422	Connector—3 contact female connector for phono cable
	Control—Volume control and power switch
28451	Cover—Insulating cover for electrolytic
73693	Grommet—Power cord strain relief grommet
28452	Plate—Mounting plate for electrolytic
73237	Resistor—Fuse type, 33 ohms (R11)
72314	Resistor—Wire wound, 120 ohms, 5 watts (R7)
	Resistor—Fixed, composition:—
	150 ohms, ±10%, ½ watt (R9)
	2700 ohms, ±10%, ½ watt (R10)
	27,000 ohms, ±10%, ½ watt (R4)
	180,000 ohms, ±10%, ½ watt (R2)
	270,000 ohms, ±10%, ½ watt (R6, R8)
	4.7 megohm, ±20%, ½ watt (R5)
73117	Socket—Tube socket
72535	Transformer—Output transformer

STOCK No.	DESCRIPTION
	SPEAKER ASSEMBLIES 92577-6W
74165	Speaker—4" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
74135	Baffle—Speaker baffle
74793	Bottom—Cabinet bottom cover
74136	Bracket—Speaker mounting bracket
74137	Bracket—Mounting bracket for reject button and shaft
74138	Button—Reject button and shaft
Y2226	Cabinet—Plastic cabinet less bottom cover
74190	Cable—Shielded pickup cable complete with 3 contact male plug
74193	Clamp—Spring clamp for reject button and shaft
74192	Connector—3 contact male connector for pickup cable
74782	Emblem—"RCA Victor" emblem
74623	Hardware—Set of mounting parts consisting of 3 flat washers, 3 eyelets and 3 rubber grommets to mount changer
74666	Knob—Power switch knob
74734	Spring—Retaining spring for knob
74139	Spring—Reject button and shaft return spring
2917	Washer—"C" washer for reject button and shaft

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



VOLTAGES MEASURED TO COMMON WIRING WITH "VOLTOHMYST". SHOULD HOLD WITHIN ± 20%

Schematic for amplifier marked RS-132A

Addition to Parts List:

AMPLIFIER ASSEMBLIES
RS 132A

38412 Control—Volume control and power switch (R3, S1)

To Remove Chassis

Remove the four screws at the corners of the bottom cover, separate the motor power plug and socket and remove the pickup cable from its socket on the amplifier chassis.

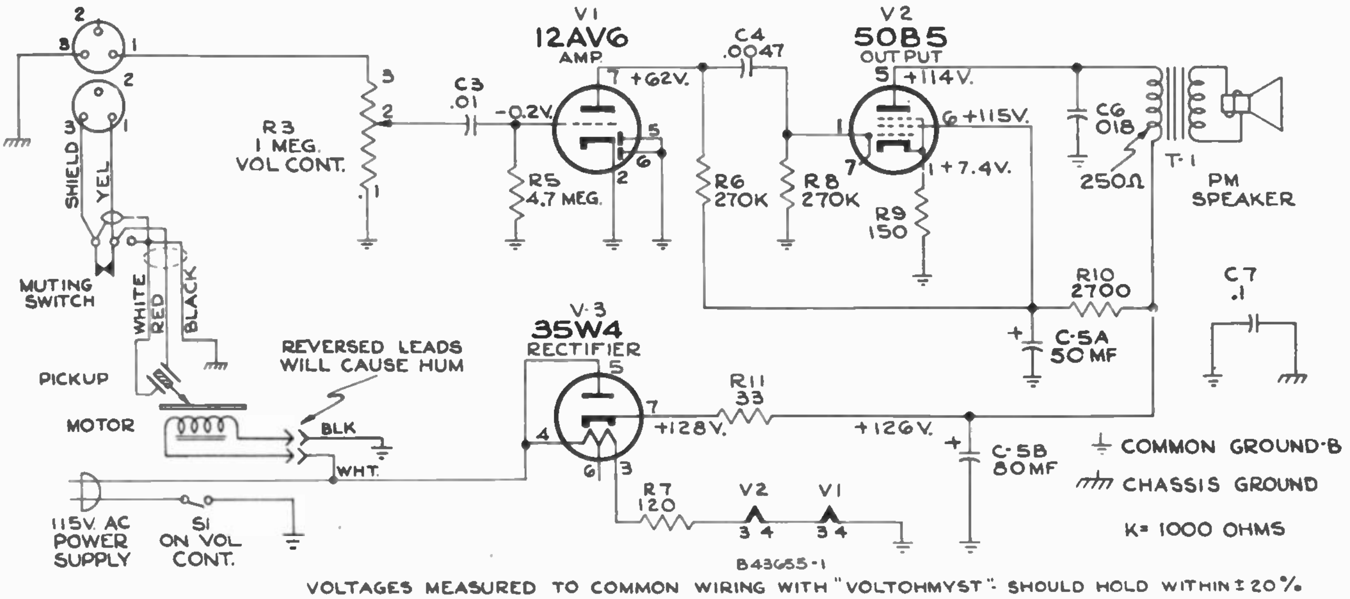
Elongated holes permit the speaker position to be adjusted. If the speaker should be replaced or its mounting bracket loosened, the speaker mounting bracket screws should not be tightened until after the bottom cover is assembled to the cabinet.

REPLACEMENT PARTS (For instruments having amp. chassis marked RS-132-F)

STOCK No.	DESCRIPTION
	AMPLIFIER ASSEMBLIES RS-132-F, RS-132-H
73520	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts and 1 section of 50 mfd., 150 volts (C5A, C5B)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 600 volts (C4)
71923	Capacitor—Tubular, paper, .01 mfd., 200 volts (C3)
58476	Capacitor—Tubular, paper, oil impregnated, .018 mfd., 400 volts (C6)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C7)
36422	Connector—3 contact female connector for phono cable (J1)
30868	Connector—2 contact female connector for motor cable (J2)
74101	Control—Volume control and power switch (R3, S1)
70392	Cord—Power cord and plug for 45-EY-15
28451	Cover—Insulating cover for electrolytic
73693	Grommet—Power cord strain relief grommet (1 set)
28452	Plate—Mounting plate for electrolytic
73237	Resistor—Fuse type, 33 ohms (R11)
72314	Resistor—Wire wound, 120 ohms, 5 watts (R7)
	Resistor—Fixed, composition:—
	150 ohms, ±10%, ½ watt (R9)
	2700 ohms, ±10%, ½ watt (R10)
	270,000 ohms, ±10%, ½ watt (R6, R8)
	4.7 megohm, ±20%, ½ watt (R5)
73117	Socket—Tube socket
72535	Transformer—Output transformer (T1)

STOCK No.	DESCRIPTION
	SPEAKER ASSEMBLIES 92577-6
74165	Speaker—4" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
74135	Baffle—Speaker baffle
74793	Bottom—Cabinet bottom cover for 45-EY and 45-EY-1
74134	Bottom—Cabinet bottom cover for 45-EY-15
74136	Bracket—Speaker mounting bracket
74137	Bracket—Mounting bracket for reject button and shaft
74138	Button—Reject button and shaft
Y2226	Cabinet—Plastic cabinet less bottom cover for 45-EY and 45-EY-1
Y2295	Cabinet—Plastic cabinet less bottom cover for 45-EY-15
74193	Clamp—Spring clamp for reject button and shaft
74192	Connector—3 contact male connector for pickup cable
74782	Emblem—"RCA Victor" emblem
74623	Hardware—Set of mounting parts consisting of 3 flat washers, 3 eyelets and 3 rubber grommets to mount changer
74666	Knob—Volume control and power switch knob for 45-EY and 45-EY-1
74667	Knob—Volume control and power switch knob for 45-EY-15
30868	Plug—Two contact female connector for motor cable
74734	Spring—Retaining spring for knob
74139	Spring—Reject button and shaft return spring
2917	Washer—"C" washer for reject button and shaft

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



Schematic Diagram—Chassis No. RS 132 F and RS 132 H

RCA VICTOR

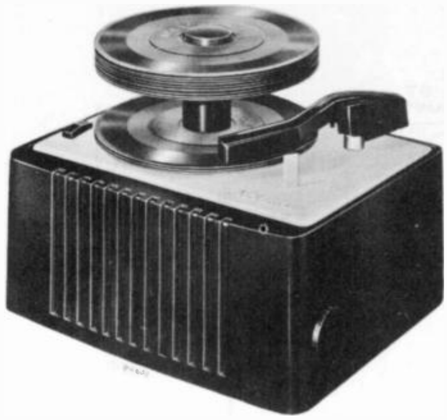
Automatic Record Player

MODEL 45-EY-2

Chassis Nos. RS-138A, RS-138 H

SERVICE DATA

— 1950 No. 33 —



PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

FOR RECORD CHANGER SERVICE INFORMATION — REFER TO RP-190 SERIES SERVICE DATA.

Specifications

Tube Complement

1. RCA 12AV6 .... Amplifier
2. RCA 50B5 .... Power amp. (Output)
3. RCA 35W4 .... Rectifier

Loudspeaker (922258-4)

Size and type .... 4x6" P.M.
Voice coil impedance .... 3.2 ohms at 400 cycles

Power Supply Rating

115 volts, 60 cycles A.C. .... 50 watts

Power Output

Undistorted .... 1.2 watts Maximum .... 1.5 watts

Dimensions (over-all)

Height, 8⅜"   Width, 10⅝"   Depth, 8⅝"

Record Changer RP-190-1

Turntable speed .... 45 r.p.m.
Records used .... RCA-Type 7-inch fine groove
Record capacity .... 12 records
Pickup, Crystal (medium output) .... Stock No. 75476

45-EY-2 (RS-138H)

Service Data:

Late production of Model 45-EY-2 uses chassis stamped RS-138H. This chassis is identical to chassis stamped RS-138A except for the speaker. In RS-138H the speaker is rim mounted and in RS-138A it is pot mounted.

Replacement Parts:

Stock No.	CHASSIS ASSEMBLY RS-138H Identical to RS-138A except:
76406	Bracket—Speaker mounting brackets complete with screws (1 set)
	SPEAKER ASSEMBLY 922258-5
76407	Speaker—4" x 6" PM speaker complete with cone and voice coil

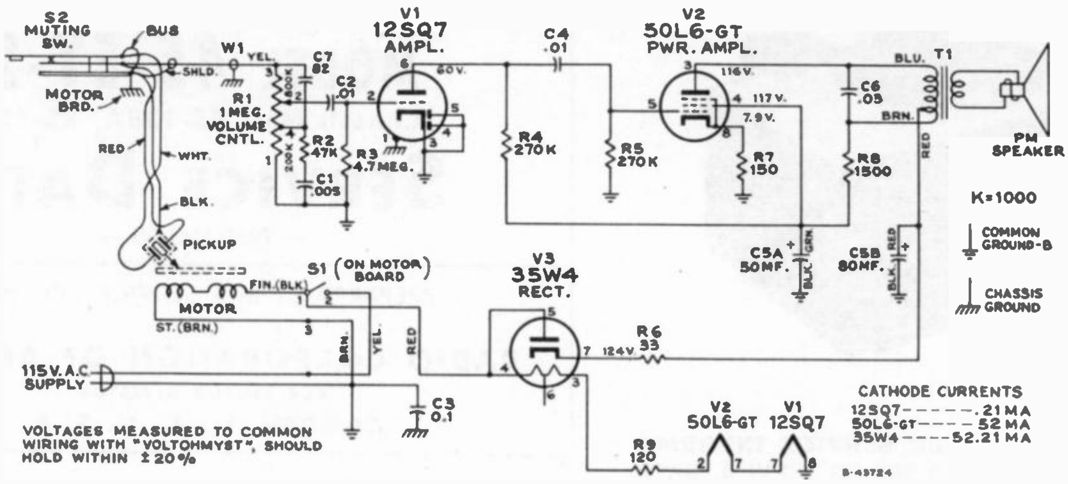
REPLACEMENT PARTS

STOCK No.	DESCRIPTION	
	AMPLIFIER ASSEMBLIES RS 138A	
76202	Baffle—Speaker baffle and grille cloth	
39626	Capacitor—Mica, 82 mmf.	C7
75980	Capacitor—Electrolytic comprising 1 section of 50 mfd, 150 volts, and 1 section of 80 mfd, 150 volts	C5A, C5B
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts	C1
73561	Capacitor—Tubular, paper, .01 mfd, 400 volts	C2, C4
70613	Capacitor—Tubular, paper, .03 mfd, 400 volts	C6
73551	Capacitor—Tubular, paper, 0.1 mfd, 400 volts	C3
76201	Control—Volume control	R1
70392	Cord—Power cord and plug	
74838	Grommet—Power cord strain relief (1 set)	
73693	Grommet—Output transformer leads strain relief	
73237	Resistor—Wire wound, 33 ohms, fuse type	R6
72314	Resistor—Wire wound, 120 ohms, 5 watts	R9
	Resistor—Fixed, composition:—	
	150 ohms, ±10%, ½ watt	R7
	1500 ohms, ±10%, ½ watt	R8
	47,000 ohms, ±10%, ½ watt	R2
	270,000 ohms, ±10%, ½ watt	R4, R5
	4.7 megohm, ±20%, ½ watt	R3

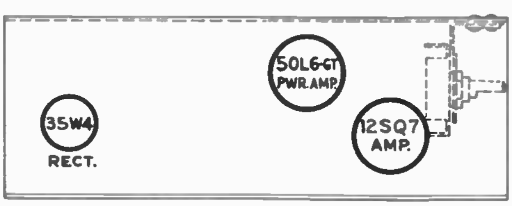
STOCK No.	DESCRIPTION	
73117	Socket—Tube socket, 7 pin, miniature	
70827	Socket—Tube socket, octal, wafer	
75939	Transformer—Output transformer	T1
	SPEAKER ASSEMBLIES 922258-4	
75979	Speaker—4" x 6" P.M. speaker complete with cone and voice coil	
	MISCELLANEOUS	
Y2325	Cabinet—Plastic cabinet—maroon—less bottom cover	
76203	Cover—Bottom cover for cabinet—burgundy—complete with feet	
75697	Grommet—Rubber grommet to mount changer mechanism (3 req'd)	
74666	Knob—Volume control knob	
76204	Screw—#10-32 x ⅞" round head machine screw to mount changer mechanism (3 req'd)	
76205	Screw—#6-32 x 5/16" hex washer head machine screw for securing bottom cover (4 req'd)	
74734	Spring—Spring clip for volume control knob	

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

45-EY-2



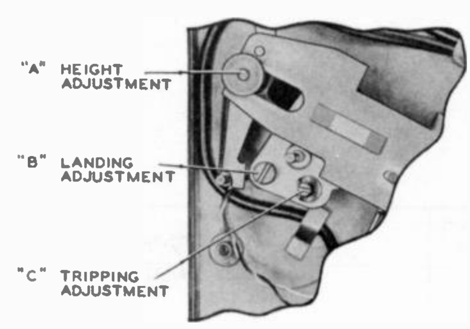
Schematic Diagram



Tube Locations

Critical Lead Dress

1. Dress all leads away from R6 and R9
2. Dress electrolytic capacitor away from R6 and R9
3. Dress filament leads down to chassis
4. Solder braid of W-1 such that it acts as a strain relief



Pickup Height Adjustment

Adjust knurled nut (A) until the distance (during change cycle) between the top of the turntable and the stylus point is approximately 1⅛".

Pickup Landing Adjustment

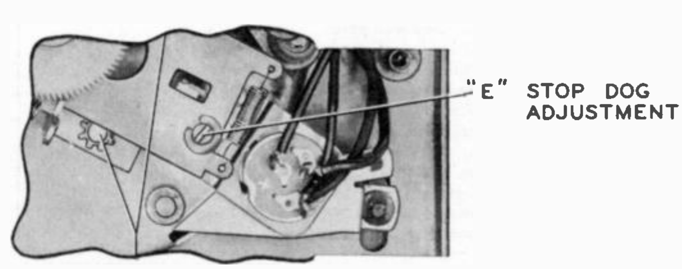
Adjust the screw driver landing adjustment stud "B" so the stylus lands 2⅜" ± 1/64" from the side of the center post.

Tripping Adjustment

Adjust the eccentric tripping stud (C) until the mechanism trips when the stylus is 1 19/32" from the side of the center post.

Stop Dog Adjustment

Turn the eccentric screw (E) until the record drops to the turntable without striking the pickup arm.



RCA VICTOR

Automatic Record Player

MODEL 45-EY-3

Chassis No. RS-136, RS-136A

SERVICE DATA

— 1950 No. 25 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

FOR RECORD CHANGER SERVICE INFORMATION — REFER TO RP-190 SERIES SERVICE DATA.

Specifications

The instrument incorporating amplifier RS-136 uses

Crystal RCA Stock No. 75476
Motor (special) 85 volt RCA Stock No. 75937

Tube Complement for RS-136

1. RCA 6SQ7 .... Amplifier
2. RCA 25L6-GT .... Output

The instrument incorporating amplifier RS-136A uses

Crystal RCA Stock No. 75476
Motor 115 volt RCA Stock No. 75760

Tube Complement for RS-136A

1. RCA 12SQ7 .... Amplifier
2. RCA 50L6-GT .... Output
3. RCA 35Z5-GT .... Rectifier

Loudspeaker (922258-4)

Size and type .... 4x6" P.M.
Voice coil impedance .... 3.2 ohms at 400 cycles

Power Supply Rating

RS-136, 115 volts, 60 cycles A.C. .... 45 watts
RS-136A, 115 volts, 60 cycles A.C. .... 50 watts

Power Output

Undistorted ...... 1.25 watts Maximum ...... 1.77 watts

Dimensions (over-all)

Height, 7⅝"   Width, 11½"   Depth, 12⅛"

Record Changer

{ RP-190-1 used with (RS-136A) amp.
{ RP-190-3 used with (RS-136) amp.

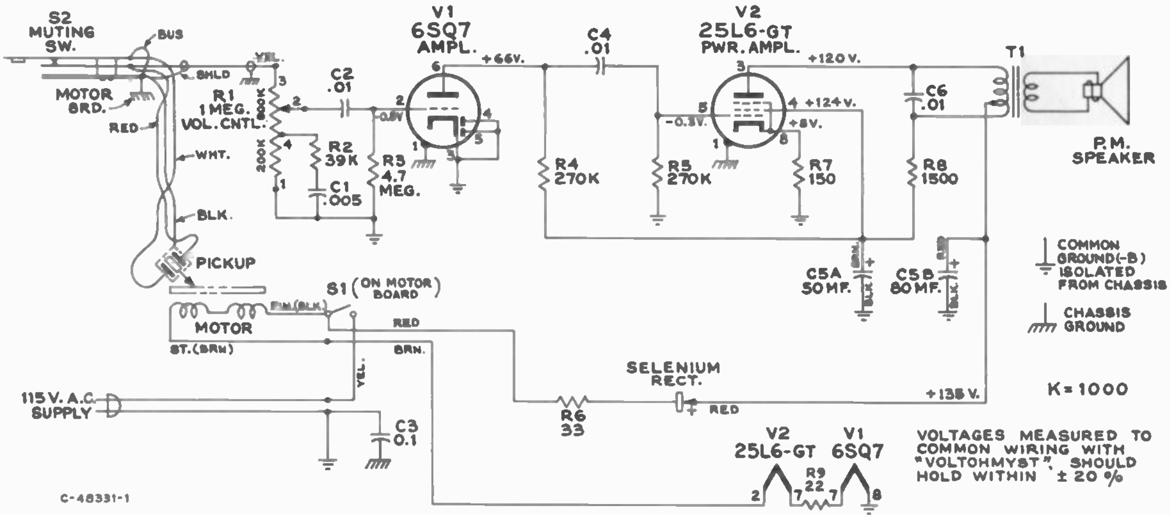
Turntable speed .... 45 r.p.m.
Records used .... RCA-Type 7-inch fine groove
Record capacity .... 12 records
Pickup .... Crystal (medium output)

REPLACEMENT PARTS

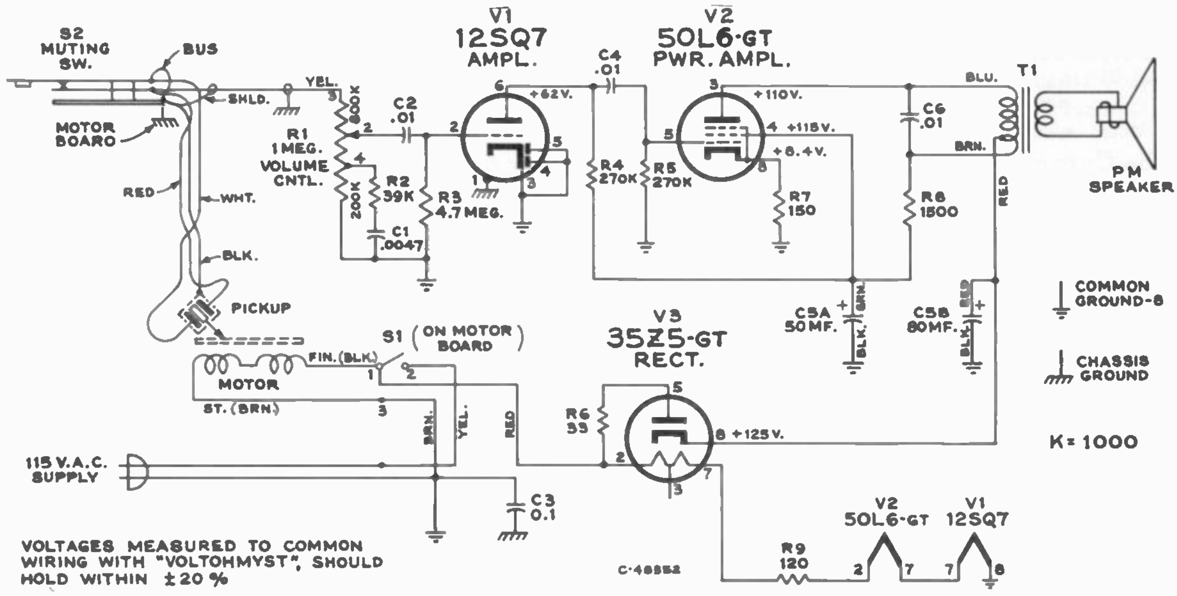
STOCK No.	DESCRIPTION
	AMPLIFIER ASSEMBLIES RS-136, RS-136A
75942	Baffle—Speaker baffle board and screen
75980	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts and 1 section of 50 mfd., 150 volts (C5A, C5B)
73920	Capacitor—Tubular, paper, .0047 mfd., 400 volts used in RS-136A, replacement in RS-136 also (C1)
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts (C2, C4, C6)
73551	Capacitor—Tubular, paper, 0.1 mfd., 400 volts (C3)
38407	Control—Volume control (R1)
70392	Cord—Power cord and plug
75476	Crystal—Cartridge complete with stylus for RP-190-1 & 3
75941	Grommet—Rubber grommet for motor and pickup leads protection
74838	Grommet—Power cord strain relief (1 set)
75940	Rectifier—Selenium rectifier
33378	Resistor—Wire wound, 22 ohms, 2 watts used in RS-136 (R9)
72314	Resistor—Wire wound, 120 ohms, 5 watts used in RS-136A only (R9)
73237	Resistor—Wire wound, 33 ohms, fuse type (R6)
	Resistor—Fixed, composition:— 150 ohms, ±10%, ½ watt (R7); 1500 ohms, ±10%, ½ watt (R8); 39,000 ohms, ±10%, ½ watt (R2); 270,000 ohms, ±10%, ½ watt (R4, R5); 4.7 megohm, ±20%, ½ watt (R3)
70827	Socket—Tube socket
75939	Transformer—Output transformer (T1)
	SPEAKER ASSEMBLIES 922258-4
75979	Speaker—4" x 6" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
75926	Case—Plastic case—maroon—complete with "RCA Victor" emblem less bottom cover, lid, "Victrola" decal, hinges, catch mechanism and striker plate

STOCK No.	DESCRIPTION
75948	Catch—Cabinet catch mechanism complete less striker plate
75954	Cover—Plastic bottom cover—maroon—for cabinet
74273	Decal—Trademark decal (Victrola)
74782	Emblem—"RCA Victor" emblem
75697	Grommet—Rubber grommet to mount record changer (3 req'd)
75956	Handle—Carrying handle—upper section only
75957	Handle—Carrying handle—bottom section only
75955	Hinge—Cabinet lid hinge (2 req'd)
75945	Knob—Volume control knob—maroon
75953	Lid—Plastic lid—maroon—for cabinet less "Victrola" decal and hinges
75958	Link—Carrying handle link (2 req'd)
75760	Motor—117 volts, 60 cycles for RP-190-1
75937	Motor—85 volts, 60 cycles for RP-190-3
74788	Nut—Speed nut to fasten ventilating screen (2 req'd)
75944	Plate—Mounting plate for carrying handle (2 req'd)
75949	Plate—Striker plate for catch mechanism
75913	Screw—#10-32 x ¾" round head machine screw to mount record changer (3 req'd)
75951	Screw—#4-40 x ¼" flat head machine screw to fasten catch mechanism (2 req'd) or striker plate (2 req'd) or hinge (4 req'd)
75952	Screw—#6-32 x 3/16" round head machine screw for lid support (4 req'd)
75959	Screw—#4 x 7/16" cross-recessed filister head screw to assembly carrying handle (4 req'd)
75930	Spacer—Metal spacer to mount record changer (3 req'd)
14270	Spring—Retaining spring for volume control knob
75946	Spring—Pickup arm hold-down spring
75978	Stud—Tapped stud for handle mounting plate for screw
75943	Support—Cabinet lid support
75947	Support—Plastic support—maroon—for lid support and power cord (located on inside of cabinet)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



Schematic Diagram RS-136



Schematic Diagram RS-136A

Pickup Height Adjustment

Adjust knurled nut (A) until the distance (during change cycle) between the top of the turntable and the stylus point is approximately 1⅛".

Pickup Landing Adjustment

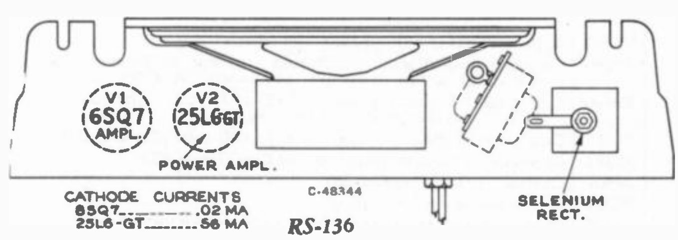
Adjust the screw driver landing adjustment stud "B" so the stylus lands 2⅝" ± 1/64" from the side of the center post.

Tripping Adjustment

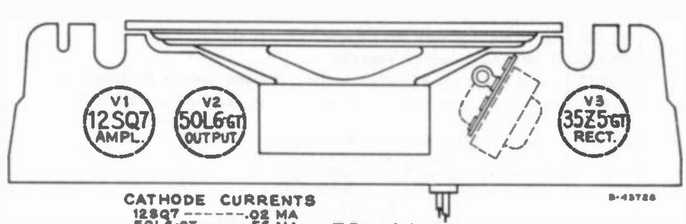
Adjust the eccentric tripping stud (C) until the mechanism trips when the stylus is 1 19/32" from the side of the center post.

Stop Dog Adjustment

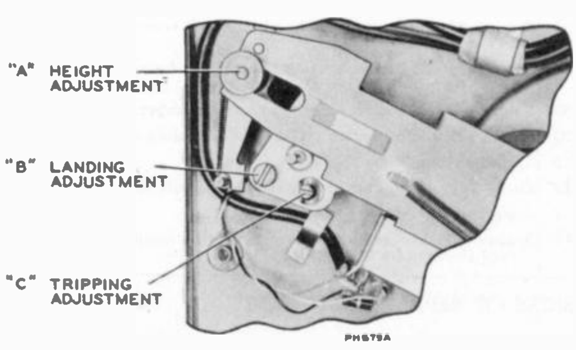
Turn the eccentric screw (E) until the record drops to the turntable without striking the pickup arm.

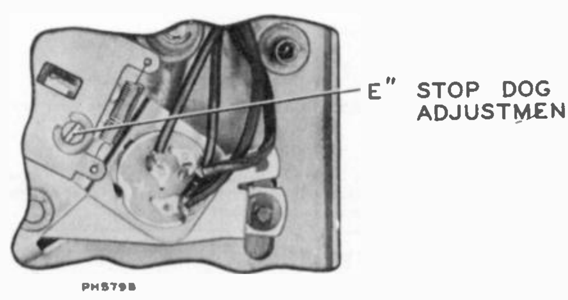


RS-136



RS-136A





RCA VICTOR

Record Changer Attachment

MODEL 45J

Mfr. No. 274

SERVICE DATA

— 1950 No. 8 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Record Changer (RP-168)

Turntable speed .... 45 r.p.m.
Records used .... RCA fine groove—7 in.
Record capacity .... Up to 10 records
Pickup RMP-128-1—Stock No. 74067.. Crystal (medium output)

Power Supply Rating

115 volts, 60 cycles A.C. .... 15 watts

Dimensions (overall)

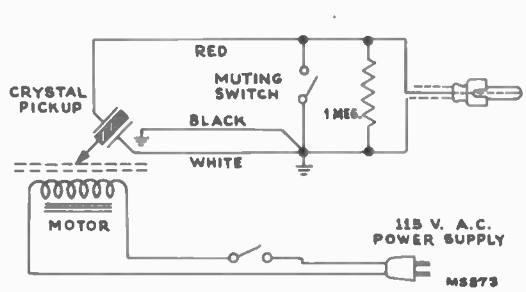
Height 6⅝"   Width 9⅛"   Depth 6⅞"

Record Separator

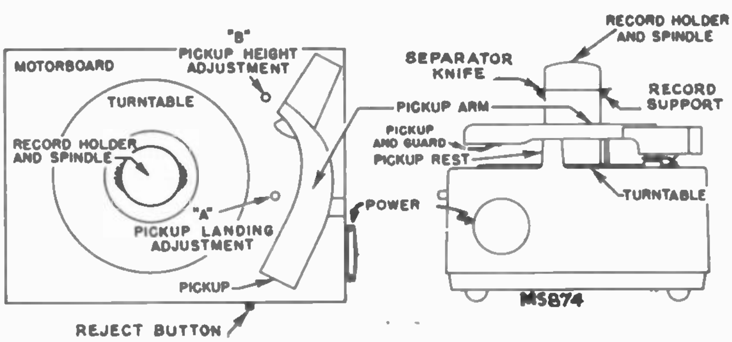
In the out of cycle position the record separator knives or discs are normally concealed inside the center post. During service, the position of the star wheel on the underside of the record changer may be accidentally shifted; this may cause the separator knives to be extended when they should be concealed.

If the separator knives are thus extended—turn the power on so that the turntable is revolving, gently press fingers against the extended knives until they disappear inside the center post—DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

Note: This holds true only to mechanisms having the circular, rotating knives.



Schematic Diagram



Top and Side Views

Record Changer Mounting

The cabinet is used as the motorboard of the record changer. The record changer is attached with three screws and bushings. THE PICKUP ARM MUST BE REMOVED BEFORE THE RECORD CHANGER CAN BE REMOVED—REFER TO RP-168 SERIES SERVICE DATA.

FOR RECORD CHANGER SERVICE INFORMATION—REFER TO RP-168 SERIES SERVICE DATA.

Pickup Landing Adjustment "A"

The pickup point should land half-way between the outer edge of the record and the first music groove.

If the pickup lands inside the starting grooves—turn screw "A" slightly clockwise. If pickup lands outside the starting grooves—turn screw "A" slightly counterclockwise.

Pickup Height Adjustment "B"

During cycle the pickup arm must rise high enough to clear a stack of eight records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

If pickup does not clear a stack of eight records—turn screw "B" slightly clockwise. If pickup arm touches records on record supports—turn screw "B" slightly counterclockwise.

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	MISCELLANEOUS
74097	Bottom—Cabinet bottom cover
74189	Bushing—Shoulder bushing to mount mechanism in cabinet (3 required)
74098	Button—Reject button
Y2151	Cabinet—Plastic cabinet less bottom cover
74296	Cable—Shielded pickup cable complete with pin plug
74674	Emblem—"RCA Victor" emblem
31051	Foot—Rubber foot (4 required)
73490	Knob—Power switch knob
——	Resistor—Fixed, composition: 1 megohm, ±10%, ½ watt
14270	Spring—Retaining spring for knob
74871	Switch—Power switch

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

Connecting Attachment to Radio Receivers

RCA Radios with Phono Jack

Plug male connector on the end of the "Phono" lead into the female connector on the receiver chassis. If set is provided with a phono switch, push or turn the "Phono" switch to "Phono" position, and operate the Record Changer Attachment according to instructions. If no switch is provided, use an external switch such as RCA Type No. 240X1, connecting it according to instructions for radios without a phono jack.

Radio-Phonograph Combinations

Most radio-phonograph combinations use resistors and/or capacitors for tone compensation in the phono input circuit.

Where unsatisfactory reproduction is obtained with Model 45J connected into the phono jack of such instruments, we suggest that Model 45J be connected as indicated for radios which do not have a phono jack. These compensation resistors and/or capacitors may also be removed from the chassis and connected on the existing record changer. This will permit record changer switching with the use of an RCA Type No. 202W1 Record Player Selector Switch.

RCA Type No. 202W1 Record Player Selector

This selector switch may be used for combined operation of two record players through one phono input jack. A choice of two types of input jacks and output cable plugs are provided.

Radios Without Phono Jack

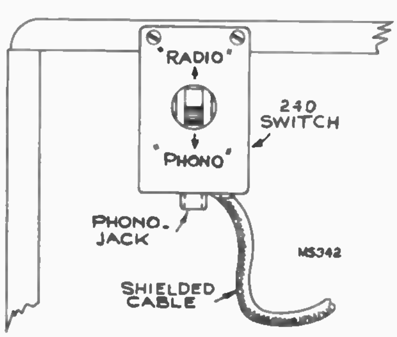
Methods of connecting the Record Changer Attachment to various types of audio systems are given in the accompanying text and illustrations. The data given requires that an RCA Type No. 240X1 (Formerly Stock No. 240) Radio-Phono switch be used for switching from radio to phonograph, as desired. For ease in connecting the "phono" lead to the switch, the male plug on the end of the lead matches the phono jack on the switch.

In general, the Record Changer Attachment must be used with radio receivers having at least two stages of high-gain audio amplification. The output of the Record Changer Attachment should be connected to the input of the first audio tube, and at the same time the output of the radio receiver portion of the chassis should be shorted or opened, to prevent radio signals being heard while the Record Changer Attachment is in operation.

Installation of Switch

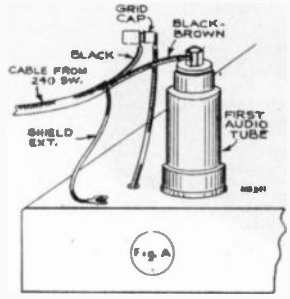
Fasten the bracket to the cabinet in such a position that the switch may be easily reached. For wooden cabinets, a suggested place is the upper rear edge of the cabinet. If the radio has a plastic cabinet, the bracket may be fastened to the chassis by self-tapping screws or soldering. **In the case of a.c.-d.c sets, the bracket should not be fastened to the chassis.** In such cases, a wooden block may be fastened to the chassis and the bracket screwed to the wooden block, care being exercised that there is no metallic path from the bracket to the chassis.

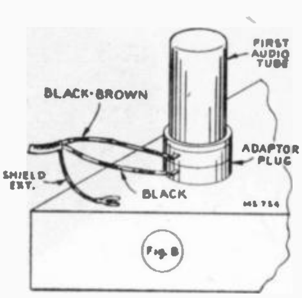
Connect the braided shield extension to the radio chassis by either soldering or placing the spade lug under a mounting screw.



On a.c.-d.c. sets it is necessary to isolate the cable shield from the chassis. This is best done by connecting the shield to the chassis through a .25 mfd. 300-volt condenser. Care should be taken that the shield braiding and switch bracket do not come in contact with the chassis.

If the common-negative wiring in the a.c.-d.c. set is isolated from the set chassis, connect the cable shield, through a .25 mfd. capacitor, to the common-negative wiring, and not to the chassis.





Note:

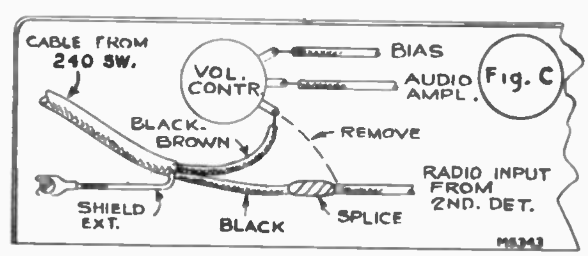
If attachment is connected to a radio set as shown in Fig. A & B, it will be necessary to substitute a volume control in place of the 1 meg. fixed resistor in Model 45J since few sets have a volume control following the first audio tube. Stock No. 74101 control (1 meg.) and switch is recommended.

For radio receivers in which the 1st-audio tube has a top grid cap—see Fig. A:

1. Disconnect the grid lead from the first audio tube.
2. Connect the cap on the black lead to the clip on the grid lead, as shown above.
3. Connect the clip on the black-brown lead to the grid cap at the top of the 1st-audio tube, bending the terminal if necessary to proper size for a metal tube cap.
4. Insert the plug on the end of the record player lead into the jack on the bracket.
5. Secure or position the connection cable assembly so that the cap and clip terminals are well separated from each other and other metal parts.

For radio receivers in which the 1st-audio tube is type 6SQ7, 6SR7, 12SQ7 or 12SR7—see Fig. B:

1. Use adaptor plug RCA Stock No. 37798.
2. Remove the 1st-audio tube.
3. Solder the switch leads to the adaptor plug terminals—black to bottom lug—black-brown to top lug.
4. Tape terminals to prevent short circuits when installed in set.
5. Insert the adaptor into the 1st-audio tube socket.
6. Insert the 1st-audio tube into the adaptor.
7. Insert the plug on the end of the record player lead into the jack on the bracket.



For other radio receivers in which the 1st-audio tube does not have a grid cap; connection to volume control input—see Fig. C.

1. Unsolder the lead from the volume control lug indicated in Fig. C. It is usually necessary to remove the chassis from the cabinet to do this.
2. Solder the black-brown lead (remove clip) to the lug disconnected in Step 1.
3. Solder the black lead (remove plug) to the lead disconnected in Step 1. Tape the joint to prevent short circuits.
4. Insert the plug on the end of the record player lead into the jack on the bracket.

RCA VICTOR

Record Changer Attachment

MODEL 45-J-2 SERVICE DATA

— 1950 No. 16 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

SPECIFICATIONS

Record Changer (RP190-1)

Turntable speed .... 45 r.p.m.
Records used .... RCA fine groove—7 in.
Record capacity .... 12 records
Pickup (Stock No. 75476) .... Crystal (medium output)

Power Supply Rating

115 volts, 60 cycles A.C. .... 15 watts

Dimensions (overall)

Height 7¼" Width 10½" Depth 7½"

FOR RECORD CHANGER SERVICE INFORMATION—REFER TO RP-190 SERIES SERVICE DATA.

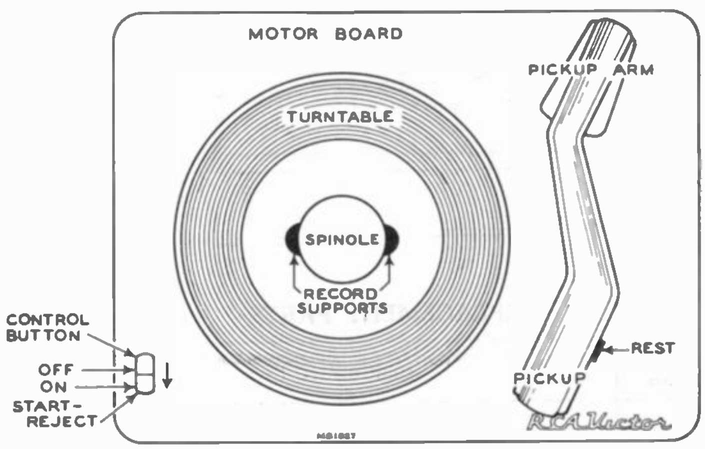


Figure 1—Top View

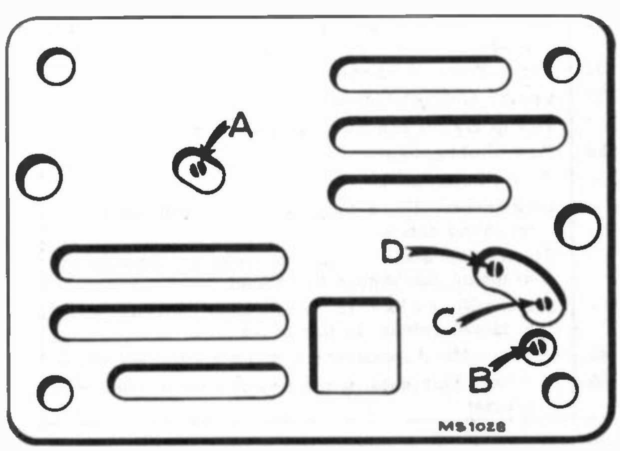


Figure 2—Bottom View

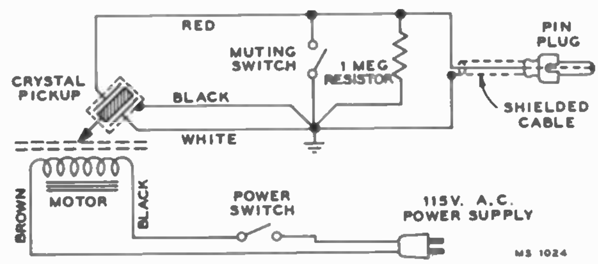


Figure 3—Schematic Diagram

ADJUSTMENTS

Adjustments may readily be made with a screw driver according to the following instructions (see Figure 2).

Record Dropping—If record does not drop automatically, turn screw "A" counterclockwise slightly, but not more than ¼ turn.

Pickup Height—If pickup lifts too high so as to strike records on spindle, turn screw "B" counterclockwise. If it fails to lift after playing last record, turn clockwise. (Pickup point should be approximately 1⅛" above turntable at maximum height during change cycle.)

Landing—If pickup lands too far in on record, turn screw "C" counterclockwise. If it fails to land in far enough on record, turn clockwise.

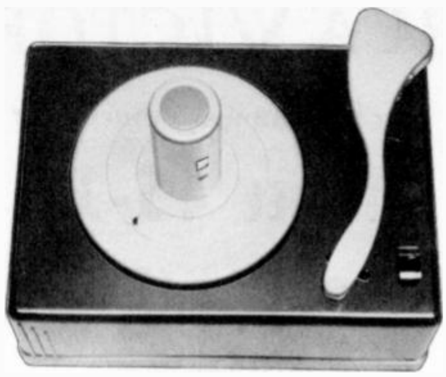
Tripping—If pickup lifts before reaching final record groove, turn screw "D" counterclockwise slightly. If pickup fails to lift, turn clockwise slightly.

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
Y2272	Cabinet—Plastic cabinet—maroon
74296	Cable—Shielded pickup cable complete with pin plug
70392	Cord—Power cord and plug
31051	Foot—Rubber foot (4 required)
——	Resistor—Fixed, composition; 1 megohm, ±10%, ½ watt

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

REFER TO MODEL 45J ON PAGE 82 FOR CONNECTION INSTRUCTIONS.



RCA VICTOR

Record Changer Attachment

MODEL 45-J-3

SERVICE DATA

— 1950 No. 30 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

FOR RECORD CHANGER SERVICE INFORMATION—REFER TO RP193-1 SERIES SERVICE DATA.

SPECIFICATIONS

Record Changer (RP193-1)

Turntable speed	45 r.p.m.
Records used	RCA Type fine groove—7 in.
Record capacity	12 records
Pickup—RCA Stock No. 76257	Crystal

Power Supply Rating

115 volts, 60 cycles A.C.	15 watts

Dimensions (overall)

Height 6⅝" Width 9⅝" Depth 7"

ADJUSTMENTS

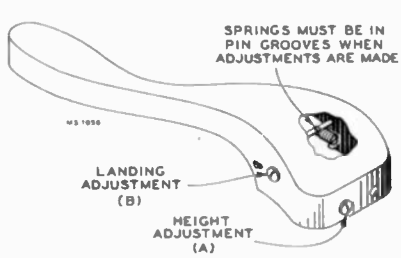
PICKUP LAND ADJUSTMENT

Loosen screw marked ("B") and slide the mounting bracket forward to move the landing point away from the centerpost, and back to move the landing point inward.

NOTE: Before making the adjustment, make certain the safety springs are in the pin grooves.

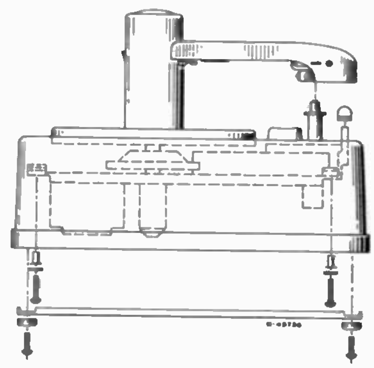
PICKUP ARM HEIGHT

Loosen the screw marked ("A") on back of the pickup arm and adjust so the pickup will clear a stack of twelve records. Raising the screw in the elongated hole raises the pickup arm, lowering the screw lowers the pickup arm.



Record Changer Mounting

The top part of the cabinet becomes the motor board in this instrument, so in order to remove the record changer assembly from the cabinet, it is first necessary to remove the control knob, pickup arm, bottom cover, then the three screws and bushing holding the sub-panel. The entire mechanism can then be lifted out through the bottom of the cabinet.



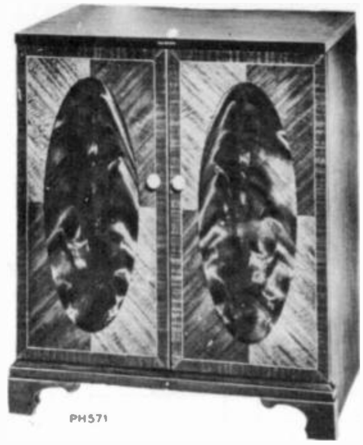
REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	MISCELLANEOUS Model 45-J-3
Y2326	Cabinet—Plastic cabinet complete with "RCA Victor" emblem
74296	Cable—Shielded pickup cable complete with pin plug
70392	Cord—Power cord and plug
76252	Cover—Cabinet bottom cover
76257	Pickup crystal complete including stylus
76253	Foot—Rubber foot
76251	Knob—Reject knob
——	Lockwasher—No. 8 lockwasher—internal teeth—for mounting screw
——	Screw—No. 8-32 x ¾" binder head machine screw to mount mechanism in cabinet
——	Screw—No. 8-32 x 7/16" binder head machine screw to mount cabinet bottom cover
76249	Spacer—Metal spacer to mount mechanism in cabinet
76250	Washer—Flat metal washer to mount mechanism in cabinet

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

REFER TO MODEL 45J ON PAGE 82 FOR CONNECTION INSTRUCTIONS.

RCA VICTOR



AM-FM Radio-Phonograph Combination

MODEL 45-W-9

Chassis No. RC 1095A
Record Changer RP 190-2

SERVICE DATA

—1950 No. 22—

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP 190 SERIES SERVICE DATA.

Specifications

Tuning Range

Standard Broadcast (AM) .... 540-1,600 kc.
Frequency Modulation (FM) .... 88-108 mc.
Intermediate Frequencies......... AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6J6 .... Mixer and Oscillator
(2) RCA 6BA6 .... I-F Amplifier
(3) RCA 6AU6 .... Driver
(4) RCA 6AL5 .... Ratio Detector
(5) RCA 6AV6 .... AM Det.—AVC—A-F Amplifier
(6) RCA 6C4 .... Ph. Inv.
(7) RCA 6V6GT .... Output
(8) RCA 6V6GT .... Output
(9) RCA 5Y3GT .... Rectifier

Dial Lamps (2)............... Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp................. Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio .... 10:1 (5 turns of knob)

Power Supply Rating .... 115 volts, 60 cycles, 95 watts

Loudspeaker (92569-12W)

Size and type .... 12 in. PM
Voice coil impedance .... 3.2 ohms at 400 cycles

Power Output

(Radio) Undistorted 8 watts .... Maximum 9 watts
(Phono) Undistorted 10 watts ....Maximum 11 watts

Cabinet Dimensions

Height 32 in. Width 29¼ in. Depth 19¾ in.
Weight .... 90 lbs.

Record Changer (RP 190-2)

Turntable speed .... 45 r.p.m.
Record capacity .... 12 RCA 7-in. fine groove records
Pickup (Stock No. 75575)............ Crystal (medium output)

Circuit Description

This instrument has a nine-tube (including rectifier) chassis which is very similar to those used in other RCA Victor radio-phonograph combinations designed for AM-FM reception.

The selector switch has five functions:

(1) Selection of tuning range.

(2) Selection and distribution of a.v.c. voltages.

(3) Application of B+ voltage to tubes V1, V2 and V3.

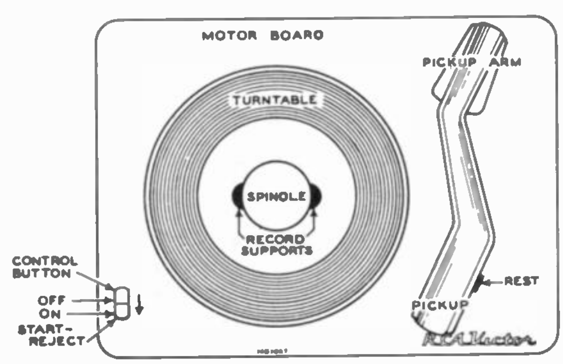
In "Phono" and "Aux." positions, the B+ voltage is removed from tubes V1, V2 and V3.

(4) Selection of audio input applied to the volume control.

(5) Change in output tube bias.

In "Radio" positions, R6 is in parallel with R42.

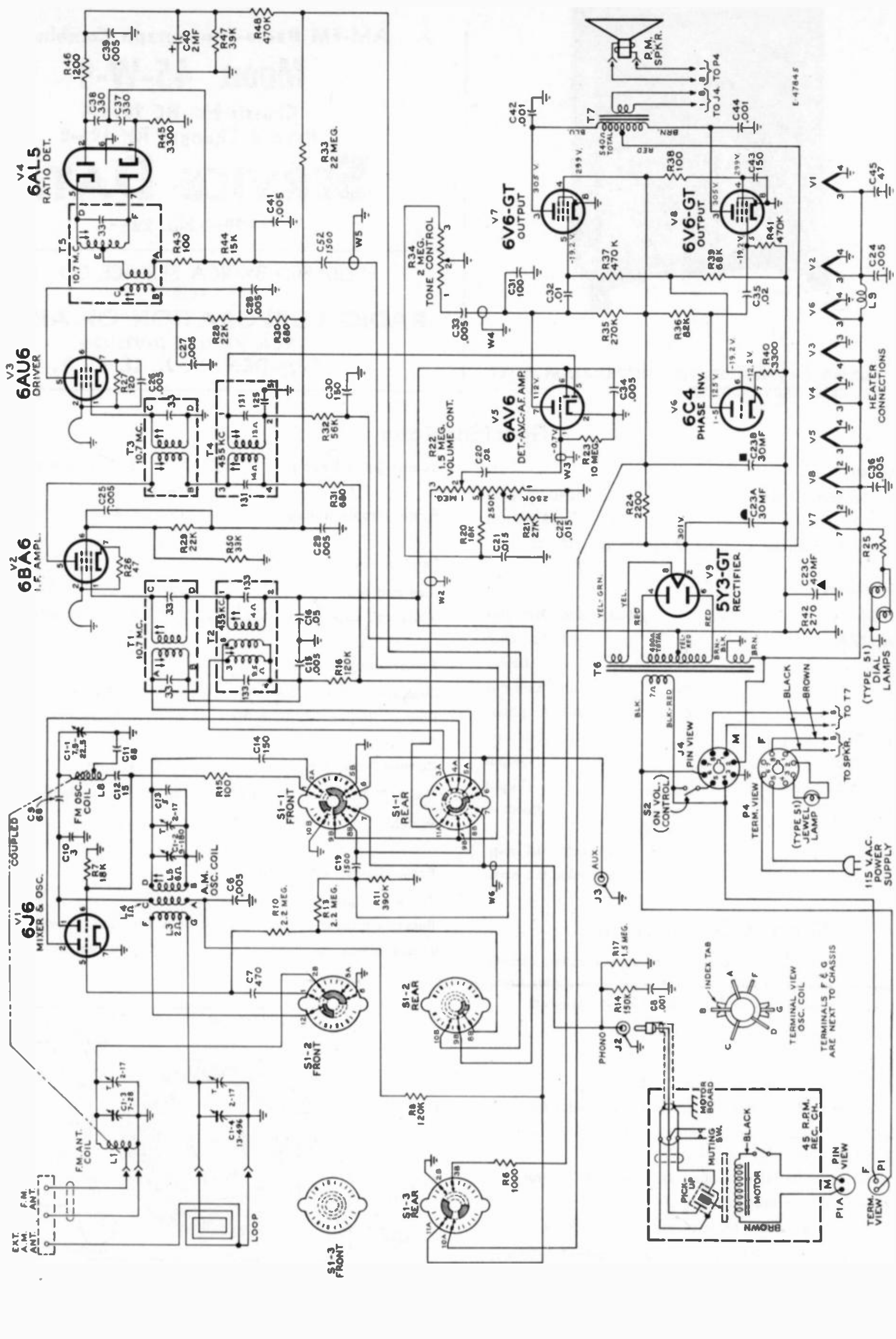
This receiver has built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception. Provision is made for the use of external antennas if desired.



Top View—RP 190 Record Changer

COMPLETE SCHEMATIC DIAGRAM

The cathode neutralizing loops of V2 (6BA6) and V3 (6AU6) are insulated wires approx. 2 in. long. Do not alter length.



FUNCTION SWITCH VIEWED FROM FRONT AND SHOWN IN "AUX" POSITION (MAX. COUNTERCLOCKWISE).
VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST AND NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±10% WITH 117 VOLT POWER SUPPLY.
CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED. RESISTANCE VALUES IN OHMS. K = 1000.

Complete Schematic Diagram

MODEL 45-W-9 vs. MODEL A-91

The chassis of Model 45-W-9 is very similar to the chassis used in Model A-91. Refer to Model A-91 on page 15 for further information.

Differences

Model A-91 has two resistors and a capacitor (R18, R51, C17) for 78/33-1/3 record player tone compensation. These are not used in Model 45-W-9. The "AUX" jack (J3) of Model 45-W-9 corresponds to the "78/33-1/3 Phono" jack of Model A-91.

Capacitor C19 is located in a different part of the circuit but serves the same purpose (isolation of AVC voltage from vol. control).

Capacitor C52 (FM sound circuit) is used in Model 45-W-9 only.

Addition to Parts List:

CHASSIS ASSEMBLIES

Add:

76423 Capacitor—Ceramic, 3 mmf. (C10)

In "Aux" and "Phono" positions the B+ supply voltage is disconnected in S1-3 which renders the mixer-oscillator, I.F. amplifier and driver tubes inoperative.

Record Changer Mounting

Two shipping screws hold the 45 r.p.m. changer to its roll-out carriage. They are accessible from the underside of the carriage and should be REMOVED at time of installation.

The record changer is mounted with rubber grommets in the carriage and should be free floating.

Roll-out Carriage Removal

The roll-out carriage has two stop pins (one at the back end of each slide), held in place by a retaining spring. To remove roll-out carriage, it is first necessary to pull the retaining springs out of the slides with a pair of long nose pliers, the stop pins are then easily removed. The roll-out carriage may then be removed from the front of the cabinet after disconnecting its connecting cables.

Roll-out Carriage Travel

The radio-45 r.p.m. carriage has a normal movement limitation of approximately 10 in. If the carriage does not have this amount of movement, it may be due to an obstruction or from slippage or creeping of the balls of the slide mechanism. Travel restriction due to slippage or creeping of balls in the slide mechanism can be corrected by exerting slightly greater pull until the normal travel limitation is reached. The carriage should then operate to its full travel with normal pull.

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1095A
75599	Capacitor—Variable tuning capacitor (C1-1, C1-2, C1-3, C1-4)
75613	Capacitor—Ceramic, 5 mmf. (C13)
39044	Capacitor—Ceramic, 15 mmf. (C12)
75609	Capacitor—Ceramic, 47 mmf. (C45)
75612	Capacitor—Ceramic, 68 mmf. (C9, C11)
75437	Capacitor—Ceramic, 100 mmf. (C31)
75614	Capacitor—Ceramic, 150 mmf. (C14, C30, C43)
39640	Capacitor—Mica, 330 mmf. (C37, C38)
39644	Capacitor—Mica, 470 mmf. (C7)
75610	Capacitor—Ceramic, 1,500 mmf. (C19, C52)
73473	Capacitor—Ceramic, 5,000 mmf. (C6, C15, C24, C25, C27, C28, C29, C34, C36)
73801	Capacitor—Tubular, paper, .001 mfd, 400 volts (C8)
70642	Capacitor—Tubular, paper, .001 mfd, 1,000 volts (C42, C44)
72490	Capacitor—Tubular, paper, .005 mfd, 200 volts (C26, C39, C41)
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts (C33)
71925	Capacitor—Tubular, paper, .01 mfd, 400 volts (C32)
72120	Capacitor—Tubular, paper, .015 mfd, 200 volts (C21, C22)
71928	Capacitor—Tubular, paper, .02 mfd, 100 volts (C20)
73638	Capacitor—Tubular, paper, .02 mfd, 400 volts (C35)
73553	Capacitor—Tubular, paper, .05 mfd, 200 volts (C16)
73747	Capacitor—Electrolytic, 2 mfd, 50 volts (C40)
72052	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 450 volts, 1 section of 30 mfd, 350 volts, and 1 section of 40 mfd, 25 volts (C23A, C23B, C23C)

STOCK No.	DESCRIPTION
73935	Clip—Mounting clip for A-M I-F transformers
75569	Coil—Oscillator coil (A-M) complete with adjustable core (L3, L4, L5)
71942	Coil—Filament choke coil (L9)
74817	Coil—Oscillator coil—F-M (L8)
75617	Coil—Antenna coil—F-M (L1)
35787	Connector—Single contact female connector for pick-up cables (J2, J3)
75542	Connector—8 contact male connector for power input cable (J4)
75543	Connector—2 contact female connector for record changer motor cable (P1)
74879	Connector—2 contact female connector for antenna leads
75537	Control—Volume control and power switch (R22, S2)
75538	Control—Tone control (R34)
†72953	Cord—Drive cord (approximately 66" overall length required)
75564	Coupling—Spring coupling for function switch extension shaft
75556	Cover—Insulating cover for electrolytic capacitor No. 72052
74839	Fastener—Push fastener for mounting R.F. shelf (4 required)
16058	Grommet—Rubber grommet for mounting R.F. shelf (4 required)
75547	Grommet—Rubber grommet to mount slide mechanism to bottom—rear (2 required)
75546	Grommet—Rubber grommet to mount slide mechanism to bottom—front (2 required)
11765	Lamp—Dial lamp—Mazda No. 51

†Stock No. 72953 is a reel containing 250 feet of cord.

REPLACEMENT PARTS — Continued

STOCK No.	DESCRIPTION
75544	Nut—Rivnut to fasten screw for mounting chassis (4 required)
18469	Plate—Bakelite mounting plate for electrolytic capacitor No. 72052
75535	Plate—Dial back plate complete with three (3) pulleys
75536	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R25)
73637	Resistor—Wire wound, 2,200 ohms, 5 watts (R24)
	Resistor—Fixed, composition:
	47 ohms, ±10%, ½ watt (R26)
	100 ohms, ±10%, ½ watt (R15, R38, R43)
	120 ohms, ±10%, ½ watt (R27)
	270 ohms, ±5%, 2 watts (R42)
	680 ohms, ±20%, ½ watt (R30)
	680 ohms, ±20%, 1 watt (R31)
	1,000 ohms, ±10%, ½ watt (R6)
	1,200 ohms, ±5%, ½ watt (R46)
	3,300 ohms, ±5%, ½ watt (R40, R45)
	12,000 ohms, ±10%, 1 watt (R29)
	15,000 ohms, ±10%, ½ watt (R44)
	18,000 ohms, ±10%, ½ watt (R7, R20)
	22,000 ohms, ±10%, ½ watt (R28)
	27,000 ohms, ±10%, ½ watt (R21)
	33,000 ohms, ±10%, ½ watt (R50)
	39,000 ohms, ±5%, ½ watt (R47)
	56,000 ohms, ±10%, ½ watt (R32)
	68,000 ohms, ±10%, ½ watt (R39)
	82,000 ohms, ±10%, ½ watt (R36)
	120,000 ohms, ±10%, ½ watt (R8, R16)
	150,000 ohms, ±10%, ½ watt (R14)
	270,000 ohms, ±10%, ½ watt (R35)
	390,000 ohms, ±10%, ½ watt (R11)
	470,000 ohms, ±10%, ½ watt (R37, R41, R48)
	1.5 megohm, ±10%, ½ watt (R17)
	2.2 megohm, ±20%, ½ watt (R10, R13)
	10 megohm, ±20%, ½ watt (R23)
	22 megohm, ±20%, ½ watt (R33)
75540	Shaft—Tuning knob shaft
75565	Shaft—Extension shaft for function switch
73584	Shield—Tube shield for V5
75546	Slide—Slide mechanism complete for radio chassis bottom
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
74179	Socket—Tube socket, 7 pin, miniature for 6J6 tube only
31364	Socket—Dial lamp socket
75563	Spring—Retaining spring for function switch extension shaft
74038	Spring—Drive cord spring
74847	Support—Polystyrene support for F-M oscillator coil complete with mounting bracket
75600	Switch—Function switch (S1-1, S1-2, S1-3)
75557	Transformer—Output transformer (T7)
73743	Transformer—Ratio detector transformer (T5)
75558	Transformer—First I-F transformer (A-M) complete with adjustable cores (T2)
73037	Transformer—Second I-F transformer (A-M) complete with adjustable cores (T4)
75559	Transformer—First I-F transformer (F-M) complete with adjustable cores (T1)
75560	Transformer—Second I-F transformer (F-M) complete with adjustable cores (T3)
75566	Transformer—Power transformer, 117 volts, 60 cycle (T6)
33726	Washer—"C" washer for tuning knob shaft
	RADIO ROLLOUT CARRIAGE
75895	Decal—Function decal for controls
75572	Dial—Polystyrene dial scale
75549	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM record changer—for mahogany or walnut instruments
75683	Frame—Moulded frame (light brown) for mounting radio chassis and 45 RPM record changer—for oak instruments
75551	Handle—Metal pullout handle for mounting frame
75555	Screw—No. 8-32 x ⅝" cross recessed pan head machine screw to mount radio chassis
	SPEAKER ASSEMBLY Stamped 92569-12W RMA 274 RL 111-A1
13867	Cap—Dust cap
75682	Cone—Cone and voice coil assembly (3.2 ohms)
75681	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms)
	NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
71864	Antenna—F-M antenna
75705	Antenna—Antenna loop complete, less cable
75900	Back—Back cover—maroon—for radio-phono compartment—for mahogany or walnut instruments (assembled to rollout)
75901	Back—Back cover—light brown—for radio-phono compartment—for oak instruments (assembled to rollout)
73680	Board—"A-F-M" terminal board
75694	Bracket—Stop bracket less rubber bumper for radio-phono compartment rollout
71599	Bracket—Pilot lamp bracket
75696	Bumper—Rubber bumper for rollout stop bracket
72437	Cable—Shielded pickup cable complete with pin plug
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for cabinet doors
X3144	Cloth—Grille cloth for mahogany or walnut instruments
X3089	Cloth—Grille cloth for oak instruments
74882	Connector—2 contact (polarized) male connector for AM loop cable
74752	Connector—2 contact male connector for FM antenna terminal board cable
75709	Connector—8 contact female connector for main cable (less shell) (P4)
75474	Connector—Single contact male connector for speaker (2 required)
30870	Connector—2 contact male connector for motor cable (P1A)
71984	Decal—Trade mark decal (RCA Victor)
74273	Decal—Trade mark decal (Victrola)
37396	Grommet—Rubber grommet for mounting speaker
74838	Grommet—Power cord strain relief (1 set)
75697	Grommet—Rubber grommet to mount record changer
74308	Hinge—Cabinet door hinge (1 set)
75712	Knob—Tuning control, tone control or volume control and power switch knob—maroon—for mahogany or walnut instruments
75713	Knob—Tuning control, tone control or volume control and power switch knob—tan—for oak instruments
75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75715	Knob—Function switch knob—tan—for oak instruments
11765	Lamp—Pilot lamp—Mazda No. 51
73634	Nut—Speed nut for speaker mounting screws
75908	Pull—Door pull
75907	Screw—No. 10-32 x 5¼" cross recessed round head screw (special) to mount rollout frame
75920	Screw—No. 10-24 x 1" trimit head screw for door pull
75708	Shell—Shell for 8 contact connector No. 75709
31364	Socket—Pilot lamp socket and lead
74734	Spring—Retaining spring for knobs
75902	Spring—Suspension spring for main cable
72936	Stop—Cabinet door stop

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-190 SERIES SERVICE DATA.

RCA VICTOR

AM-FM Radio-Phonograph Combination

MODEL 45-W-10

Chassis No. RC 1096A

Record Changer RP 190-2 (45 r.p.m.)

SERVICE DATA

—1950 No. 32—

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range

Standard Broadcast (AM) .... 540-1,600 kc.
Frequency Modulation (FM) .... 88-108 mc.
Intermediate Frequencies .... AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6CB6.......... R-F Amplifier
(2) RCA 6J6.......... Mixer and Oscillator
(3) RCA 6BA6.......... I-F Amplifier
(4) RCA 6AU6.......... Driver
(5) RCA 6AL5.......... Ratio Detector
(6) RCA 6AV6.......... AM Det.—AVC—A-F Amplifier
(7) RCA 6C4.......... Ph. Inv.
(8) RCA 6V6GT.......... Output
(9) RCA 6V6GT.......... Output
(10) RCA 5Y3GT.......... Rectifier

Dial Lamps (2).......... Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp .... Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio .... 10:1 (5 turns of knob)

Power Supply Rating .... 115 volts, 60 cycles, 115 watts

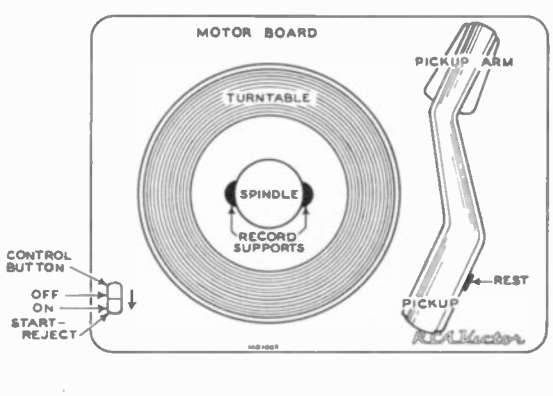
Loudspeaker (92569-12W)
Size and type .... 12 in. PM
Voice coil impedance .... 3.2 ohms at 400 cycles

Power Output
(Radio) Undistorted 8 watts.......... Maximum 9 watts
(Phono.) Undistorted 10 watts.......... Maximum 11 watts

Weight .... 97 lbs.

Cabinet Dimensions
Height 32 in. Width 29¼ in. Depth 19¾ in.

Record Changer (RP-190-2)
Turntable speed .... 45 r.p.m.
Pickup crystal .... Stock No. 75575



Top View—RP-190 Record Changer

A-101, A-108 (RC-1096B) 45-W-10 (RC-1096C)

Service Data:

Chassis stamped RC-1096B and RC-1096C are the same as chassis stamped RC-1096 and RC-1096A respectively except for the value of C21, R20 in volume control circuit and C42, C44 in output tubes plate circuit.

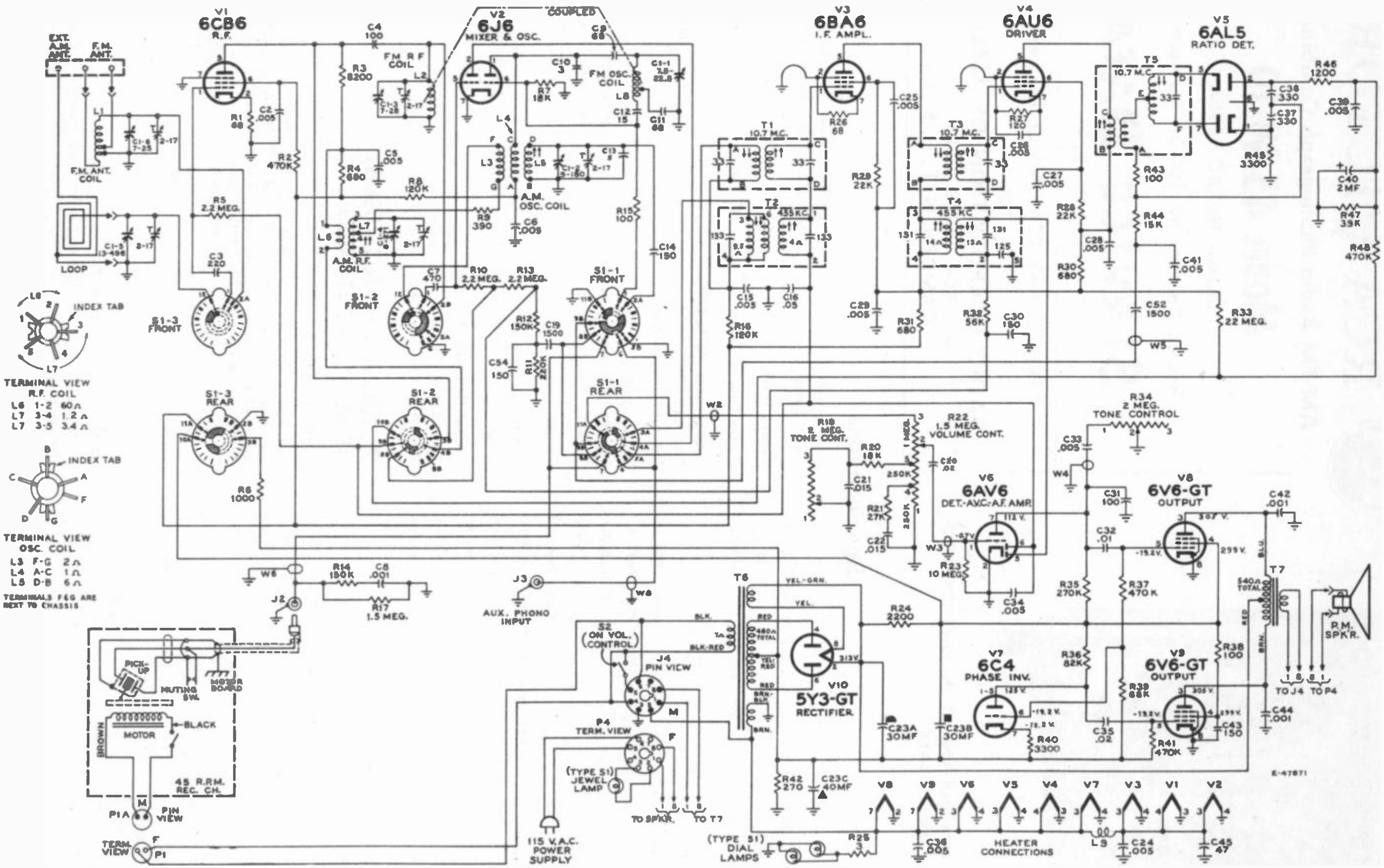
	RC-1096	RC-1096A	RC-1096B & C
C21	.018	.015	.010 mf.
R20	18K	18K	22K ohms
C42	.001	.001	.0012 mf.
C44	.001	.001	.0012 mf.

Substitute Speaker:

Speakers stamped 971494-2 have been used as a substitute for speakers stamped 92569-12, but only with chassis stamped RC-1096B (A-101 and A-108) or RC-1096C (45-W-10). Speakers stamped 92569-12 can be used with any of the above chassis (RC-1096, -A, -B, or -C).

COMPLETE SCHEMATIC DIAGRAM

The cathode neutralizing loops of V3 (6BA6) and V4 (6AU6) are insulated wires approx. 2 in. long. Do not alter length.



Function switch viewed from front and shown in "Phono Aux." position (max. c/clockwise).

CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED.

RESISTANCE VALUES IN OHMS. K = 1000.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117-VOLT POWER SUPPLY.

Complete Schematic Diagram

Record Changer Mounting

Each record changer is mounted in a roll-out carriage. The changer mechanisms are mounted on rubber grommets and should be free floating.

Two shipping screws hold the 45 r.p.m. changer to its roll-out carriage. They are accessible from the under-side of the carriage and should be REMOVED at time of installation.

Roll-out Carriage Removal

Each roll-out carriage has two stop pins, (one at the back end of each slide) held in place by a retaining spring. To remove roll-out carriage, it is first necessary to pull the retaining springs out of the slides with a pair of long nose pliers, the stop pins are then easily removed. The roll-out carriage may then be removed from the front of the cabinet after disconnecting its connecting cables.

Roll-out Carriage Travel

The roll-out carriages have a normal movement limitation of approximately 10 inches. If a carriage does not have this amount of movement, it may be due to an obstruction or from slippage or creeping of the balls of the slide mechanism. Travel restriction due to slippage or creeping of balls in the slide mechanism can be corrected by exerting slightly greater pull until the normal travel limitation is reached. The carriage should then operate to its full travel with normal pull.

Addition to Parts List:

CHASSIS ASSEMBLIES

Add:

76423 Capacitor—Ceramic, 3 mmf. (C10)

MODEL 45-W-10 vs. MODEL A-101

The chassis of Model 45-W-10 is very similar to the chassis used in Model A-101. Refer to Model A-101 on page 23 for further information.

Differences

Model A-101 has two resistors and a capacitor (R18, R51, C17) for 78/33-1/3 record player tone compensation. These are not used in Model 45-W-10. The "AUX" jack (J3) of Model 45-W-10 corresponds to the "78/33-1/3 Phono" jack of Model A-101.

Capacitor C19 is located in a different part of the circuit but serves the same purpose (isolation of AVC voltages from vol. control).

Capacitor C52 (FM sound circuit) is used in Model 45-W-10 only.

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES RC1096A
75567	Capacitor—Variable tuning capacitor (C1-1, C1-2, C1-3, C1-4, C1-5, C1-6)
75613	Capacitor—Ceramic, 5 mmf. (C13)
39044	Capacitor—Ceramic, 15 mmf. (C12)
75609	Capacitor—Ceramic, 47 mmf. (C45)
75612	Capacitor—Ceramic, 68 mmf. (C9, C11)
39396	Capacitor—Ceramic, 100 mmf. (C4)
75437	Capacitor—Ceramic, 100 mmf. (C31)
75614	Capacitor—Ceramic, 150 mmf. (C14, C30, C43, C54)
75611	Capacitor—Ceramic, 220 mmf. (C3)
39640	Capacitor—Mica, 330 mmf. (C37, C38)
39644	Capacitor—Mica, 470 mmf. (C7)
75610	Capacitor—Ceramic, 1500 mmf. (C19, C52)
73473	Capacitor—Ceramic, 5000 mmf. (C2, C5, C6, C15, C24, C25, C27, C28, C29, C34, C36)
73747	Capacitor—Electrolytic, 2 mfd, 50 volts (C40)
72052	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 450 volts, 1 section of 30 mfd, 350 volts, and 1 section of 40 mfd, 25 volts (C23A, C23B, C23C)
73801	Capacitor—Tubular, paper, .001 mfd, 400 volts (C8)
70642	Capacitor—Tubular, paper, .001 mfd, 1000 volts (C42, C44)
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts (C26, C33, C39, C41)
73561	Capacitor—Tubular, paper, .01 mfd, 400 volts (C32)
73797	Capacitor—Tubular, paper, .015 mfd, 400 volts (C21, C22)
71928	Capacitor—Tubular, paper, .02 mfd, 200 volts (C20)
73562	Capacitor—Tubular, paper, .02 mfd, 400 volts (C35)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C16)
73935	Clip—Mounting clip for A-M, I-F transformers
75569	Coil—Oscillator coil—A.M.—complete with adjustable screws (L3, L4, L5)
75570	Coil—R.F. coil—A.M.—complete with adjustable core (L6, L7)
71942	Coil—Filament choke coil (L9)
75615	Coil—Antenna coil—F-M (L1)
74815	Coil—R-F coil—F-M (L2)
74817	Coil—Oscillator coil—F-M (L8)
35787	Connector—Single contact female connector for phono cables (J2, J3)
75542	Connector—8 contact male connector for power input cable (J4)
75543	Connector—2 contact female connector for 45 RPM motor cable (P1)
74879	Connector—2 contact female connector for antenna leads
75537	Control—Volume control and power switch (R22, S2)
75561	Control—Tone control—L.F. (R19)
75562	Control—Tone control—H.F. (R34)
†72953	Cord—Drive cord (approx. 66" overall)
75564	Coupling—Spring coupling for function switch extension shaft
75556	Cover—Insulating cover for electrolytic

STOCK NO.	DESCRIPTION
74839	Fastener—Push fastener for mounting R.F. shelf (4 req'd)
16058	Grommet—Rubber grommet for mounting R.F. shelf (4 req'd)
75547	Grommet—Rubber grommet to mount slides to bottom—rear (2 req'd)
75548	Grommet—Rubber grommet to mount slides to bottom—front (2 req'd)
11765	Lamp—Dial lamp—Mazda #51
75544	Nut—Rivnut to fasten screw for mounting chassis (4 req'd)
18469	Plate—Bakelite mounting plate for elecrolytic
75535	Plate—Dial back plate complete with three (3) pulleys
75536	Pointer—Station selector indicator
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R25)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R24)
	Resistor—Fixed, composition:—
	68 ohms, ±10%, ½ watt (R1, R26)
	100 ohms, ±10%, ½ watt (R15, R39, R3)
	120 ohms, ±10%, ½ watt (R27)
	270 ohms, ±5%, 2 watts (R42)
	390 ohms, ±10%, ½ watt (R9)
	680 ohms, ±10%, ½ watt (R4)
	680 ohms, ±20%, ½ watt (R30, R31)
	1000 ohms, ±10%, ½ watt (R6)
	1200 ohms, ±5%, ½ watt (R46)
	3300 ohms, ±5%, ½ watt (R40, R45)
	8200 ohms, ±10%, 1 watt (R3)
	15,000 ohms, ±10%, ½ watt (R44)
	18,000 ohms, ±10%, ½ watt (R7, R20)
	22,000 ohms, ±10%, ½ watt (R28, R29)
	27,000 ohms, ±10%, ½ watt (R21)
	39,000 ohms, ±5%, ½ watt (R47)
	56,000 ohms, ±10%, ½ watt (R32)
	68,000 ohms, ±10%, ½ watt (R39)
	82,000 ohms, ±10%, ½ watt (R36)
	120,000 ohms, ±10%, ½ watt (R8, R16)
	150,000 ohms, ±10%, ½ watt (R12, R14)
	220,000 ohms, ±20%, ½ watt (R11)
	270,000 ohms, ±10%, ½ watt (R35)
	470,000 ohms, ±10%, ½ watt (R2, R37, R41, R48)
	1.5 megohm, ±10%, ½ watt (R17)
	2.2 megohm, ±20%, ½ watt (R5, R10, R13)
	10 megohm, ±20%, ½ watt (R23)
	22 megohm, ±20%, ½ watt (R33)
75540	Shaft—Tuning knob shaft
75565	Shaft—Extension shaft for function switch
73584	Shield—Tube shield
75546	Slide—Slide mechanism complete for radio chassis bottom
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
74179	Socket—Tube socket, 7 pin, miniature for 6BC6—6J6
31364	Socket—Dial lamp socket
75563	Spring—Retaining spring for function switch extension shaft

† Stock No. 72953 is a reel containing 250 feet of cord.

Replacement Parts—Concluded

STOCK NO.	DESCRIPTION
74038	Spring—Drive cord spring
74847	Support—Polystyrene support for F-M oscillator coil complete with mounting bracket
75602	Switch—Function switch (S1)
75557	Transformer—Output transformer (T7)
75566	Transformer—Power transformer, 117 volts/60 cycle (T6)
73743	Transformer—Ratio detector transformer (T5)
75558	Transformer—First I-F transformer (A.M.) complete with adjustable screws (T2)
73037	Transformer—Second I-F transformer (A.M.) complete with adjustable screws (T4)
75559	Transformer—First I-F transformer (F.M.) complete with adjustable screws (T1)
75560	Transformer—Second I-F transformer (F.M.) complete with adjustable screws (T3)
33726	Washer—"C" washer for tuning knob shaft
	ROLLOUT MECHANISM
76206	Decal—Control function decal
75572	Dial—Polystyrene dial scale
76161	Frame—Moulded frame—maroon—for mounting radio chassis and 45 RPM changer for mahogany or walnut instruments
76162	Frame—Moulded frame—light brown—for mounting radio chassis and 45 RPM changer for oak instruments
76165	Handle—Metal pullout handle for mounting frame
75555	Screw—#8-32 x 5/8" cross recessed pan head screw to mount radio chassis (4 req'd)
	SPEAKER ASSEMBLIES
	92569-12W
	RL 111A1
13867	Cap—Dust cap
75682	Cone—Cone complete with voice coil (3.2 ohms)
75681	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms)
	NOTE:—If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.

STOCK NO.	DESCRIPTION
	MISCELLANEOUS
71864	Antenna—F-M antenna
75705	Antenna—Antenna loop complete less cable
75900	Back—Back cover—maroon—for radio-phono compartment for mahogany or walnut instruments (assembled to rollout)
75901	Back—Back cover—light brown—for radio-phono compartment for oak instruments (assembled to rollout)
73680	Board—"A-F.M." terminal board
75694	Bracket—Stop bracket less rubber bumper for radio phono compartment rollout
71599	Bracket—Pilot lamp bracket
75696	Bumper—Rubber bumper for rollout stop bracket
72437	Cable—Shielded pickup cable complete with pin plug
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for cabinet doors
X3144	Cloth—Grille cloth for mahogany or walnut instruments
X3089	Cloth—Grille cloth for oak instruments
74882	Connector—2 contact (polarized) male connector for A-M antenna loop cable
75709	Connector—8 contact female connector less shell for main cable
75474	Connector—Single contact male connector for speaker (2 req'd)
74752	Connector—2 contact male connector for FM antenna terminal board cable
30870	Connector—2 contact male connector for AC power cable for 45 RPM changer
71984	Decal—Trade mark decal (RCA Victor)
74273	Decal—Trade mark decal (Victrola)
37396	Grommet—Rubber grommet for mounting speaker
74838	Grommet—Power cord strain relief (1 set)
75697	Grommet—Rubber grommet for mounting record changer (3 req'd)
74308	Hinge—Cabinet door hinge (1 set)
75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75715	Knob—Function switch knob—tan—for oak instruments
75712	Knob—Tuning control, tone control or volume control and power switch knob—maroon—for mahogany or walnut instruments
75713	Knob—Tuning control, tone control or volume control and power switch knob—tan—for oak instruments
11765	Lamp—Pilot lamp—Mazda #51
73634	Nut—Speed nut for speaker mounting screws
75908	Pull—Door pull
75920	Screw—#10-24 x 1" trimit head screw for door pull
75708	Shell—Shell for 8 contact female connector #75709
31364	Socket—Pilot lamp socket
74734	Spring—Retaining spring for knobs
75902	Spring—Suspension spring for main cable
72936	Stop—Cabinet door stop

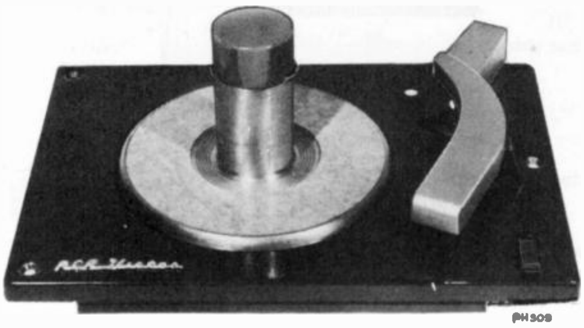
APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Two Types of Door Pulls:

Two different types of door pulls (fastened with different screws) have been used on this instrument. The parts list should be changed as indicated below.

Stock No.	MISCELLANEOUS
75980	Pull—Door pull (basket weave design)
75918	Pull—Door pull (leaf design)
75920	Screw—#10-24 x 1" trimit head screw for door pull #75908
75626	Screw—#8-32 x 1¼" trimit head screw for door pull #75918

RCA VICTOR



RP-168 Series

45 R.P.M. Automatic Record Changer

Mfr. No. 274

SERVICE DATA

—1949 No. 5—

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

TYPE AND MODEL IDENTIFICATION

The record changer mechanism may be used either with or without a metal motorboard. When a metal motorboard is not used, the instrument cabinet serves as the motorboard.

Two major changes have been made since the start of production. One change is the type of pickup arm rest, the original design used a visible rest on the motorboard or instrument cabinet which has been replaced by a rest on the sub-base. The other major change is in the record separators, the original type used rotating gear type of separators which were replaced by a push-out type of separators.

Many other changes have been made and there are differences in the color and finish of some parts when used with certain instruments. These changes did not necessarily involve a change in the identification applied to the bottom of the mechanism sub-base.

Five different pickups are in use: Two (2) crystal pickups, one (1) magnetic pickup and two (2) ceramic pickups. A listing of pickup vs. instrument model is given on page 14.

BECAUSE OF THE DIFFERENCES MENTIONED ABOVE, THE LABEL OR STAMPING ON THE SUB-BASE DOES NOT PROVIDE SUFFICIENT IDENTIFICATION FOR ORDERING REPLACEMENT PARTS.

Replacement parts should be ordered only by stock number. Refer to the illustrations and parts listings for identification.

The RP 168 Series record changer is used in the following instrument models:

RECORD PLAYER ATTACHMENTS
9JY, CP-5203, 45J, QJY

RECORD PLAYERS (without radio)
9EY3, 9EY31, 9EY32, 9EY35, 9EY36, 45EY, QEY3, 45EY1, 45EY15

RADIO-PHONOGRAPH COMBINATIONS
9QV5, 9W51, 9W78, 9W101, 9W102, 9W103, 9W105, 9W106, 9Y7, 9Y51, A55, A78, A106, A82, A91, A108, 9Y511, 4QV8C, 6QU3Y

RADIO-PHONOGRAPH-TELEVISION COMBINATIONS
9TW309, 9TW333, 9TW390, TA128, TA129, TA169, S1000
2T81, 6T84, 6T86, 6T87, 9T89

AUTOMATIC OPERATION

1. Place a stack of records over the center post, with the desired selections upward, the last record to be played on top.
2. Apply power to drive motor.
3. Push the "start-reject" knob to "start" and let go. The mechanism will automatically play in sequence one side of each record stacked on the separator shelves.
4. To reject a record being played push the "start-reject" knob.
5. At conclusion of playing and as the last record is being repeated, lift the pickup arm and place on its rest. Turn off the power to the drive motor.
6. Remove the stack of records by lifting them straight up.

SPECIFICATIONS

Turntable speed	45 r.p.m.
Records used	RCA seven-inch fine groove
Record capacity	Up to 10 records
Pickup force	5 grams
Stylus tip radius	.001 inch
Type of pickup	Ceramic, crystal or variable reluctance (magnetic)
Power supply	105-125 volts, 60 cycle, a.c.

(May be converted for use on 50 cycle power supply.)

CAUTION

1. Avoid handling the pickup arm when the mechanism is in cycle.
2. Do not use force to release a jam.
3. Do not try to remove the records on the turntable if the turntable is stopped in cycle.
4. Do not try to operate the mechanism if the separator knives protrude from the center post when the mechanism is out of cycle.

During service, the position of the star wheel on the underside of the record changer may be accidently shifted; this may cause the separator knives to be extended when they should be concealed.

If the separator knives are thus extended — turn the power on so that the turntable is revolving, push the "start-reject" knob and allow the mechanism to complete a change cycle. If the knives continue to be extended — while the turntable is still revolving, gently press fingers against the extended knives until they disappear inside the center post — DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

LUBRICATION

A light machine oil (SAE No. 10) should be used to oil the bearings of the drive motor.

On all bearing surfaces, excepting the motor bearings, Houghton STA-PUT No. 320, or equivalent, should be used. On all other sliding surfaces, STA-PUT No. 512, or equivalent, is recommended. STA-PUT can be purchased from E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia, Pa.

(Do not oil or grease record separator shelves.)

It is important that the drive motor spindle and the rubber tire on the idler wheel be kept clean and free from oil or grease, dirt, or any foreign material at all times. Carbon tetrachloride or naphtha is satisfactory for cleaning these parts.

CYCLE OF OPERATION

	Function	Explanation
	Place records over the center post and turn the power on	1. Records rest on separator shelves protruding from either side of the center post.
Operator	Push start-reject knob	1. Start-reject knob which is linked to start-reject slide (45A) moves trip pawl (37) into tripping position. 2. As the turntable rotates, the small projection (8A) (extending from the underside of the turntable) contacts end of trip pawl.
Automatic Cycle	Pickup arm rises	1. As the turntable continues to rotate it carries the trip pawl (37) along for a short distance. 2. The stud (37A) on trip pawl applies force against director lever (41) in opposition to tension spring (42). This force continues to be applied until the stud (41B) on the director lever has been forced through the slot and into the cycling cam (8B). 3. The end (41C) of the director lever extending below the motorboard moves away, allowing the muting switch (63) to close. 4. At the same time the stud (41A) pushes the pickup arm lift lever (35) which in turn raises the pickup arm.

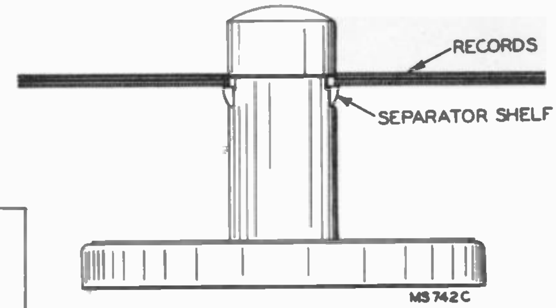


Figure 1.

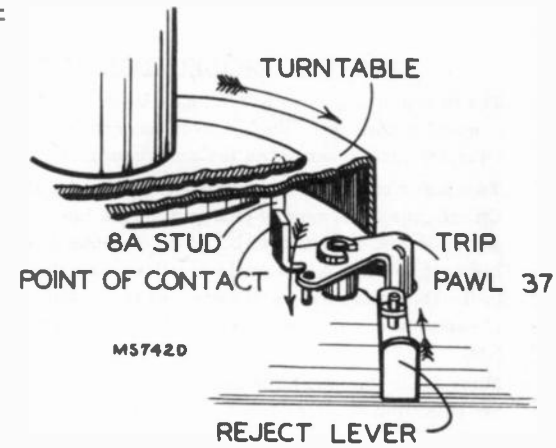


Figure 2.

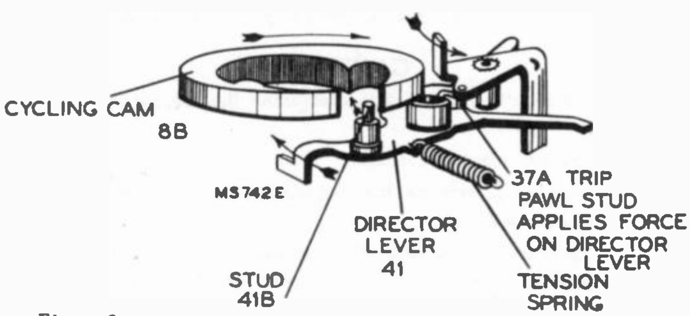


Figure 3.

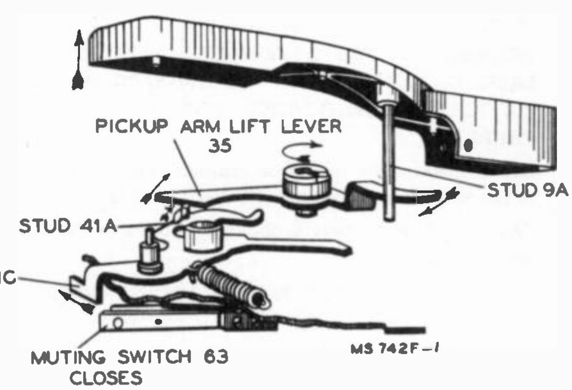


Figure 4.

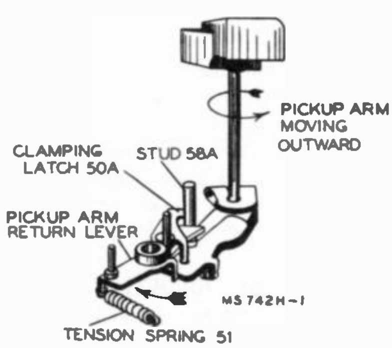
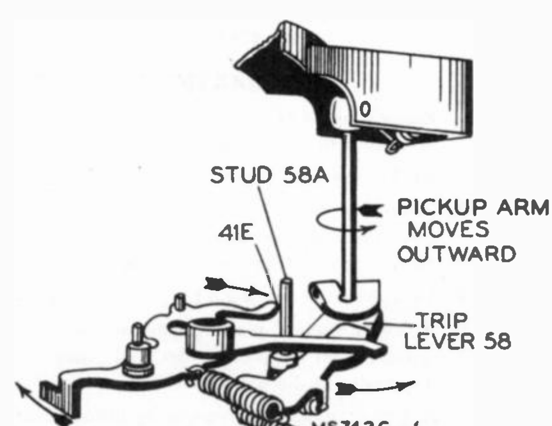


Figure 5.

	Function	Explanation
	Pickup arm moves out	1. The end (41E) of the director lever (41) contacts stud (58A) on trip lever (58), starting the pickup arm on its outward movement. 2. The stud (58A) on trip lever contacts pickup arm return lever (50), pushing it outward against the tension spring (51). 3. As the pickup arm reaches its outermost position, it is locked in position by the latch (50A) clamping the stud (58A) on the end of the pickup arm return lever.



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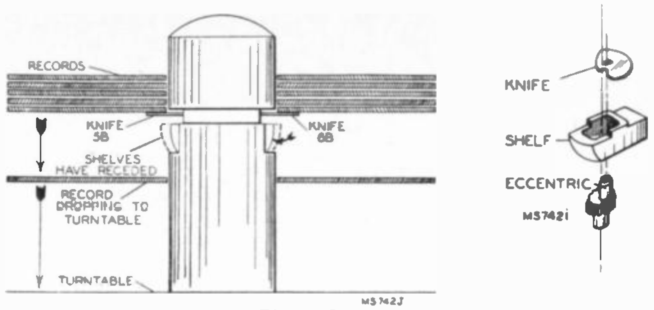

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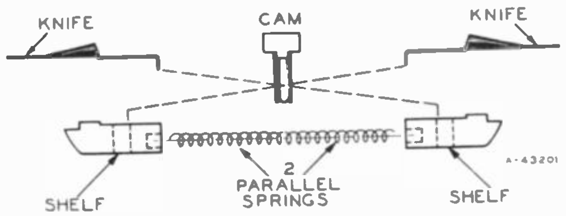
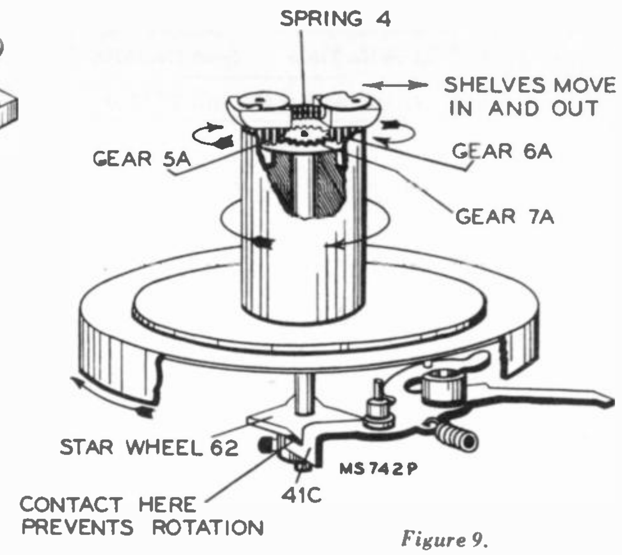


Figure 8.



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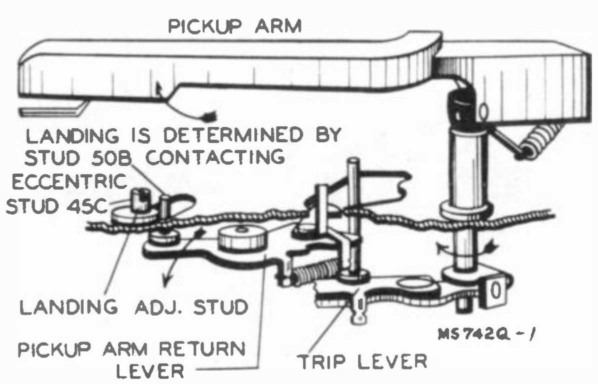

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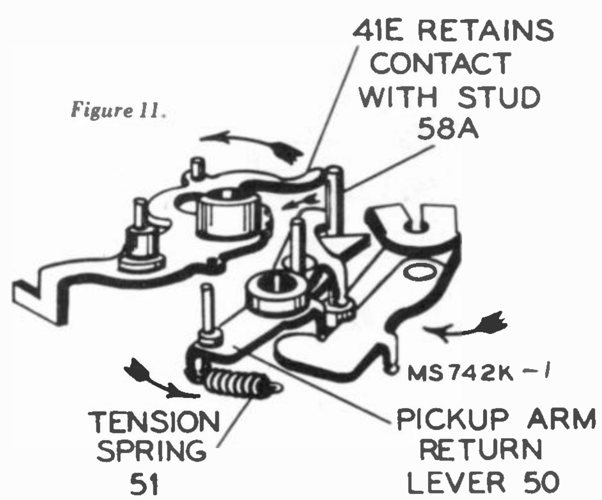


Figure 11.

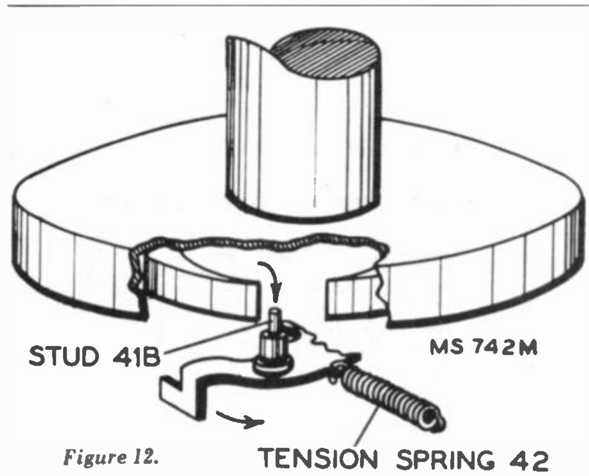


Figure 12.

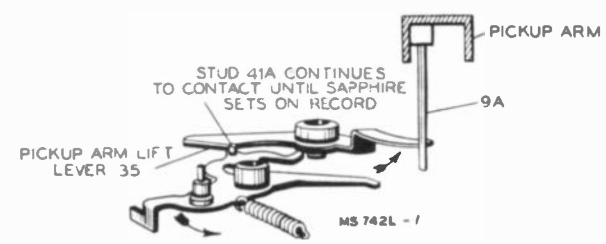


Figure 13.

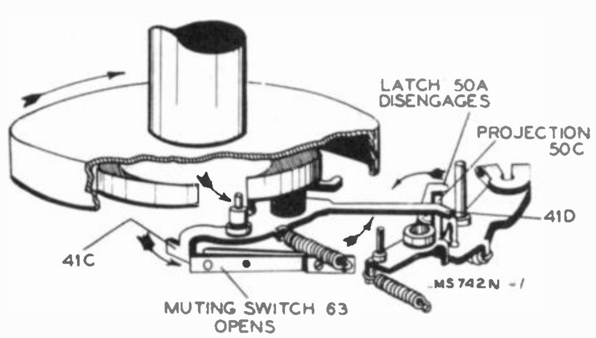


Figure 14.

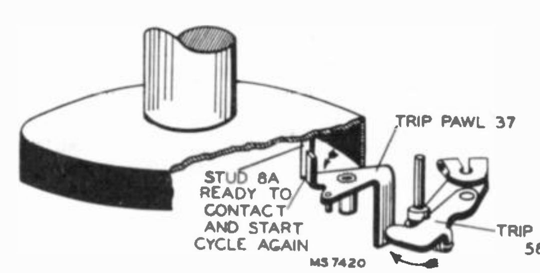


Figure 15.

Separator knives separate the lower record from the stack and allows the record to drop to the turntable

1. While the pickup arm is moving outward, the end (41C) of the director lever (41) extending below the motorboard, contacts and prevents the star wheel (62) from rotating.
2. Since the turntable continues to rotate and the star wheel and shaft remain stationary, the two small gears (5A and 6A) embedded in the upper section of the center post rotate around the gear (7A) on the upper end of the star wheel shaft (7).
3. The eccentric extending from the upper end of the two embedded gears turns in a slot in the separator shelves (5 and 6). This causes the shelves to move in against the tension of spring (4).

   A later type of record separators (knives and shelves), illustrated in Figure 8, are actuated by a cam at the top of the shaft. No gears are used. The cam pushes out on the knives which in turn pull in on the opposite shelves.
4. As the shelves recede the separator knives (5B and 6B), mounted above each separator shelf, separate the lower record of the stack and support the remaining records while the lower record drops to the turntable.

Pickup arm moves in for landing

1. As the director lever (41) continues to move toward the out of cycle position the end of the director lever (41E) retains contact with the stud (58A) on the trip lever (58). This contact stabilizes the inward movement of the pickup arm which is being pushed in by the pickup arm return lever (50).
2. The inward movement of the pickup arm is stopped directly above the landing position due to the stud (50B) on pickup arm return lever coming in contact with the eccentric stud (45C).

Sapphire is lowered to the record

1. The stud (41A) on director lever (41) continues to contact pickup arm elevating lever (35) and lowers the sapphire on the start of the record.
2. As the turntable completes one revolution, the stud (41B) on director lever is pulled through the slot in the cycling cam by the tension spring (42).
3. The end of the director lever (41D) contacts projection (50C) and unlatches the pickup arm return lever (50).
4. The end (41C) of the director lever below the motor board moves away from the star wheel and opens muting switch.

Playing of record is completed and mechanism starts change cycle

1. After the selection has been completed the sapphire moves into the tripping groove. At this time the trip lever (58) pushes the trip pawl (37) into position for engagement with the stud (8A) on the underside of the turntable.
2. This contact between stud (8A) and the trip pawl (37) starts another change cycle and the next record is moved into position for playing.

SERVICE HINTS

Care of Pickup

LINT MAY COLLECT TO CLOG THE OPENING IN THE GUARD AT THE STYLUS POINT AND CAUSE POOR RECORD REPRODUCTION. This may require occasional cleaning of the guard opening—clean by carefully brushing with a small soft brush.

Replacement of Stylus

Caution: Never bend the stylus support wire.

CRYSTAL PICKUPS (Stock Nos. 74067 and 74625)

Remove the two screws holding sapphire guard in place and remove the guard. Remove the small nut and washer on the threaded shaft of the sapphire holder and gently push the shaft through the hole in the armature shaft until the sapphire holder assembly comes free.

Extreme care should be used when loosening the nut so that the twisting motion does not break the crystal. Take hold of the lower end of the shaft with a pair of pliers while loosening or tightening the nut, being very careful so as not to strip the threads or break the crystal.

Insert threaded shaft of replacement sapphire holder through armature shaft and replace the washer and nut. Make sure that the sapphire is in the correct position.

Replace the sapphire guard, positioning it by means of the oversize screw slots. Make certain that the sapphire and its supporting wire are centered in the guard. Tighten the guard screws. Before using, check to see that the sapphire projects far enough beyond the guard so that the guard will not touch the record. If necessary, bend the guard a little.

VARIABLE RELUCTANCE PICKUP (Stock No. 74466)

To remove the stylus assembly, insert a bent paper clip or equivalent tool into the stylus stud pin socket at point "A." Press the assembly out from the cartridge with the tool as shown by the arrow in the illustration below.

To replace the stylus assembly, insert the stud pin into the recess "A," with the locating tab positioned above the locating slot "B" between the two pole pieces. Press assembly in firmly by applying pressure upon the stud pin at point "C" with a blunt tool. Care must be taken to press assembly only at point "C" so as not to damage or distort the stylus arm.

CERAMIC PICKUP (Stock No. 74984)

To remove stylus, insert the point of a knife blade between the stylus wire and the case. The stylus may be pried out of its rubber mounting with a twisting motion of the knife blade.

To replace stylus, push end of stylus wire down into its rubber mounting. Be certain that the stylus is centered in the groove of the pickup case.

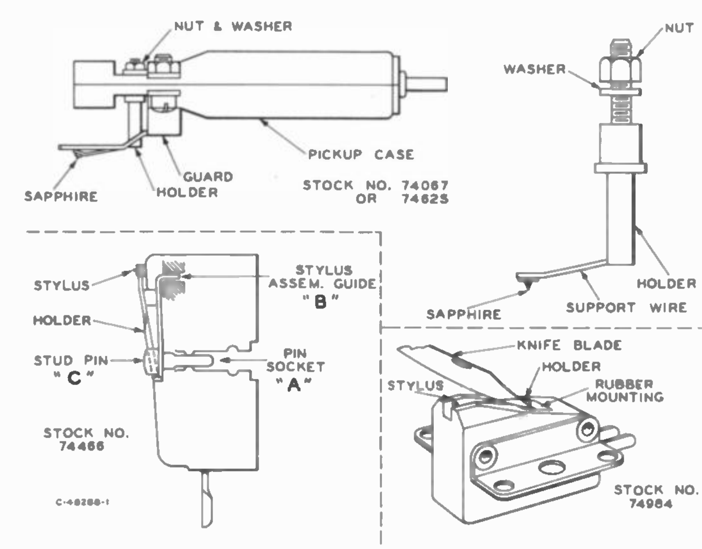


Figure 16—Stylus Replacement.

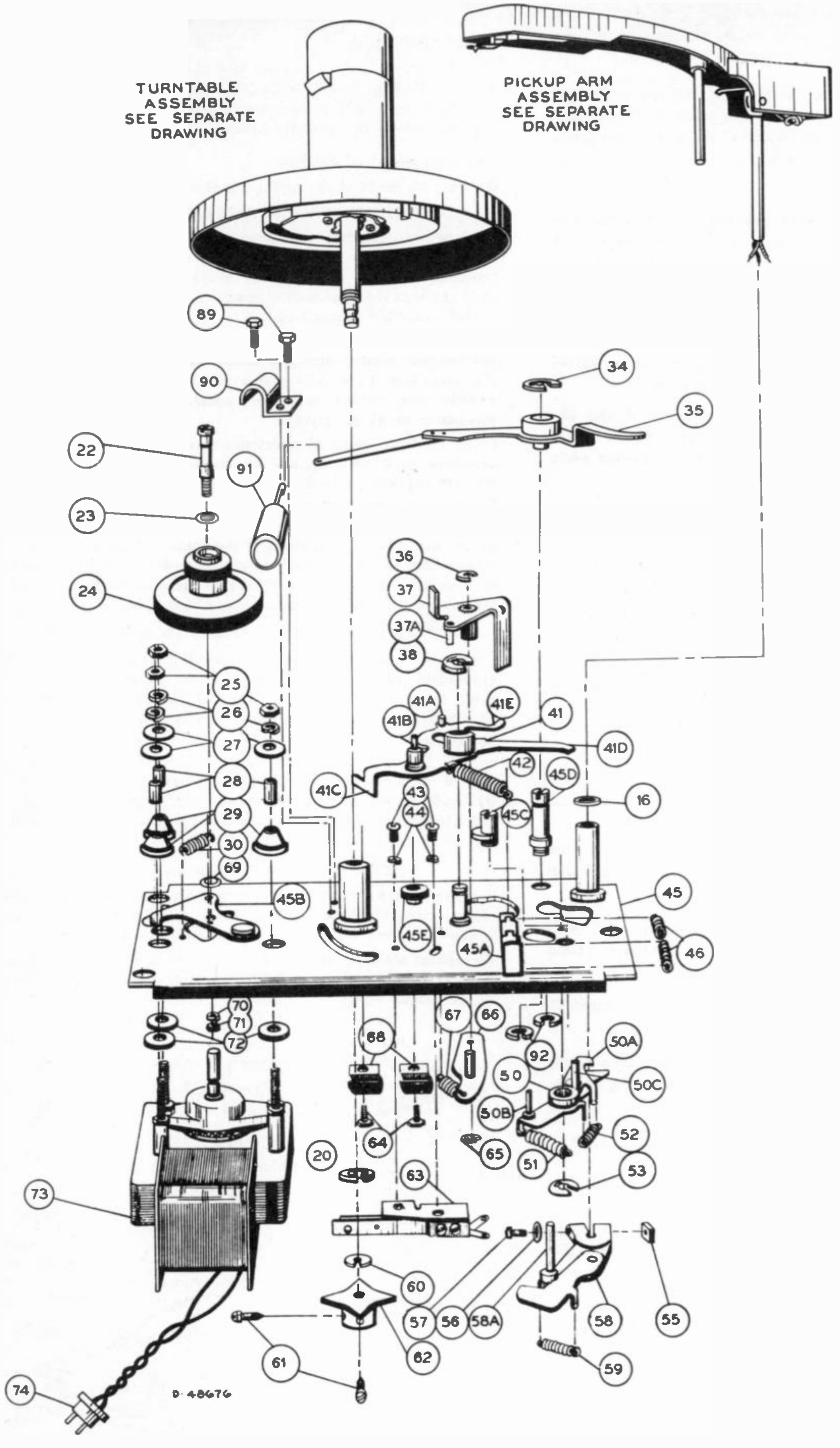


Figure 17—Exploded View of Sub-base Assembly.

45-EY	45-EY-1
Two tone arm	Maroon arm
Stock No. 75058	Stock No. 75996
OTHERWISE SAME AS TYPE II	

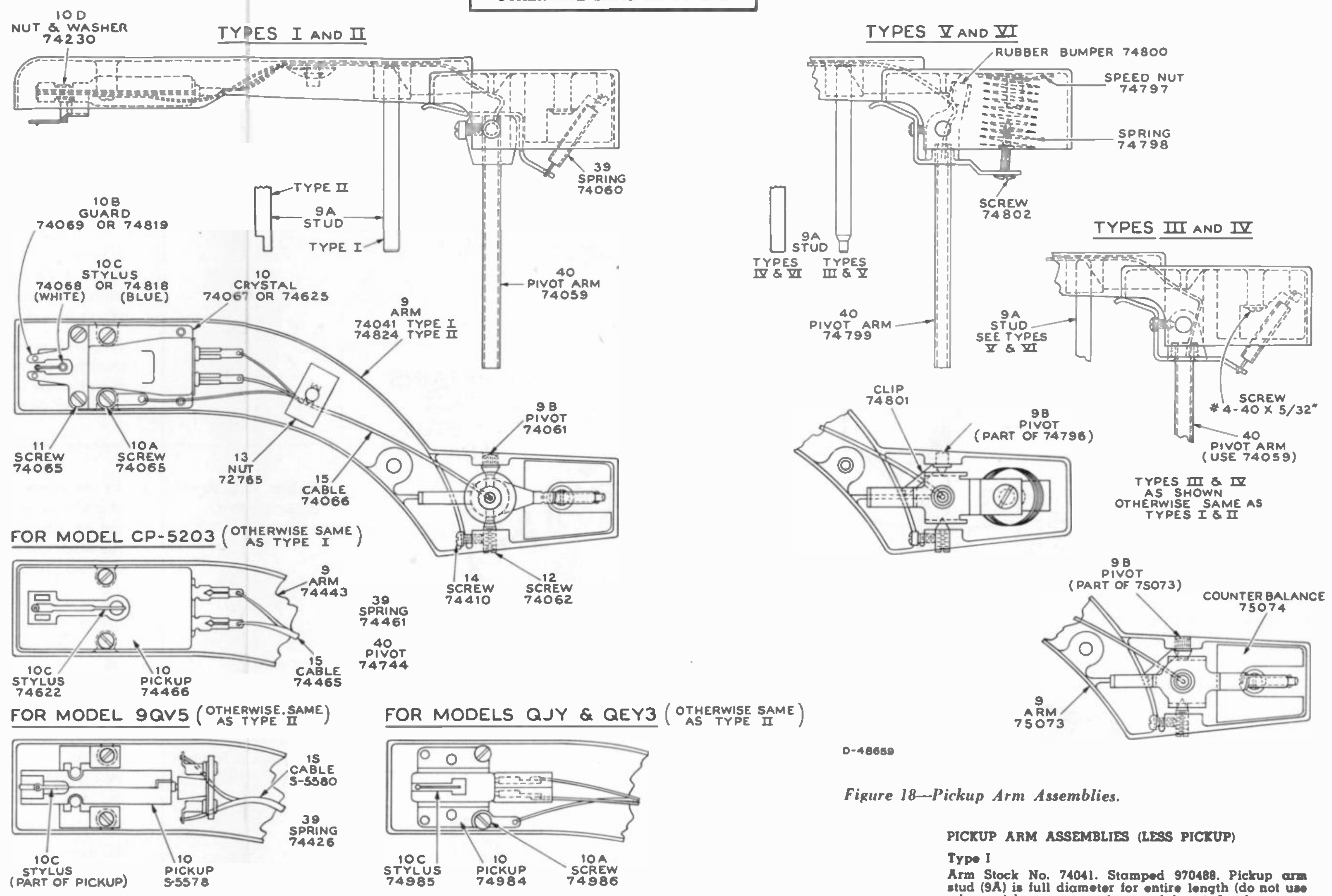


Figure 18—Pickup Arm Assemblies.

SUB-BASE ASSEMBLIES

Type I

Sub-base Stock No. 74070. Has staked studs for spring anchors and one-piece reject lever. Stamped or labelled RP168-1 or RP168-3.

Type II

Same as Type I, except it uses a two-piece reject lever. Use Stock No. 74743 Sub-base (Type III) for replacement.

Type III

Sub-base Stock No. 74743. Same as Type II, except that it has pickup arm rest on sub-base (when motorboard rest is used, the sub-base rest is to be deformed).

Type IV

Sub-base Stock No. 74468. It uses an a.c. input connector and audio output jack mounted on a separate bracket. Labelled RP168-2 and used only with Model CP-5203.

Type V

Sub-base Stock No. 74856. Has turned up lances for spring anchors. Idler wheel mounting plate (45B—Stock No. 74814) is removable. It is labelled RP168-1, RP168B-1, etc. It has pickup arm rest on sub-base (when motorboard rest is used, the sub-base rest is to be deformed).

Type VI

Stock No. 74803. Similar to Type V, but it does not bear any "RP168" identification. It has pickup arm rest on sub-base. Idler wheel mounting plate (45B) is secured to the sub-base with a shoulder rivet.

Type VII

Same as Type VI, except it does not have pickup arm rest on sub-base. Use Stock No. 74803 (Type VI) for replacement (the pickup arm rest is to be deformed).

Type VIII

Sub-base Stock No. 75652. Has cut-out for clearance of "On-Off" motorboard switch. Labeled RP168D-1 or RP168D-2. Otherwise same as Type V.

NOTE: Types VI and VII

Late production of these types have the idler wheel mounting stud (22) staked to its mounting plate. The idler wheel retainer (horseshoe washer) is Stock No. 75081.

NOTE:

Two different main levers (director lever) are used, depending upon which turntable assembly is used. Lever (41). Stock No. 74076 has a long end (41C) and is used with Turntables Types I and II. Lever (41), Stock No. 74857 has a short end and is used with Turntable Type III.

PICKUP ARM ASSEMBLIES (LESS PICKUP)

Type I

Arm Stock No. 74041. Stamped 970488. Pickup arm stud (9A) is full diameter for entire length (do not use where pickup arm rest is on sub-base). Lead counter-balance is riveted to arm.

Arm Stock No. 74443. For Model CP-5203 only. Black finish, otherwise similar to No. 74041.

Type II

Arm Stock No. 74824. Same as No. 74041 except that stud (9A) has a flat on one side at bottom end. Can be used with either type of pickup rest.

Arm Stock No. 75058. For Model 45EY only. Two-tone finish, otherwise same as No. 74824.

Arm Stock No. 75996. For Model 45-EY-1 only. Maroon finish, otherwise same as No. 74824.

Type III

Arm stock No. 75073. Stamped 3R1. Similar to No. 74824 except that a different pivot (9B) is used and the lead counter-balance is fastened to the arm with a screw. Stud (9A) is of smaller diameter at bottom end. Can be used with either type of pickup rest. Use only with No. 74059 pivot arm.

Type IV

Same as Type III except that stud (9A) is of full diameter for entire length. Use No. 75073 for replacement.

Type V

Arm Stock No. 74796. Stamped 3R1. Similar to Type III except that a different pivot (9B) is used and the lead counter-balance is not used. A ⅝" O.D. counter-balance spring is used. Can be used with either type of pickup rest. Use only with No. 74799 pivot arm.

Type VI

Same as Type V except that stud (9A) is of full diameter for entire length. Use No. 74796 for replacement.

STOCK No.	ILL. No.	DESCRIPTION
		SUB-BASE ASSEMBLIES
74256	16	Washer—Vellutex washer (pivot arm shaft bearing washer)
74080	17-19	Washer—Washer for turntable bearing
72349	18	Bearing—Turntable thrust bearing
72688	20	Washer—"C" washer—turntable assembly retainer
74079	22	Stud—Idler wheel mounting stud—for Sub-base Types I, II, III, IV, early VI, and early VII
74078	23	Washer—Dampening washer for idler wheel—top
74077	24	Wheel—Idler wheel for all except Model CP-5203
74470	24	Wheel—Idler wheel for Model CP-5203
74858		Hardware—Motor mounting hardware consisting of:
	25	Three hex nuts
	26	Three lockwashers
	27	Three flat washers
	28	Three spacers
	29	Three grommets
74089	30	Spring—Idler wheel tension spring (.195" O.D. x .593"—14 turns)
35969	34	Washer—"C" washer to retain pickup arm lift lever
74073	35	Lever—Pickup arm lift lever for mechanisms without dashpot
74757	35	Lever—Pickup arm lift lever for mechanisms with dashpot
——	35	Lever—Two piece pickup arm lift lever (use No. 74073 or No. 74757 for replacement)
74805	–	Spring—Tension spring for two piece pickup arm lift lever (.170" O.D. x ¾")
33726	36	Washer—"C" washer to retain trip pawl
74072	37	Pawl—Trip pawl
74453	–	Washer—Bearing washer between trip pawl (Ill. No. 37) and trip pawl lever (Ill. No. 66)
35969	38	Washer—"C" Washer to retain main lever
74076	41	Lever—Main lever (director lever) for use with turntables having rotating gear record separators
74857	41	Lever—Main lever (director lever) for use with turntables having push-out record separators
74084	42	Spring—Main lever spring (.195" O.D. x .800"—27¼ turns)
——	43	Screw—Screw to mount muting switch (No. 6-32 or No. 6 self tapping)
——	44	Washer—No. 6 lockwasher used with Item 43 (No. 6-32 screw)
74070	45	Base—Sub-base assembly complete with all staked and riveted parts, including idler lever and reject lever—Type I without pickup rest
74743	45	Base—Sub-base assembly complete with all staked and riveted parts, including idler lever and reject lever—Type III with pickup rest
74468	45	Base—Sub-base assembly complete with all staked and riveted parts, including idler lever and reject lever—less No. 74473 bracket—Type IV—for RP-168-2—used only on Model CP-5203
74473	–	Bracket—Metal bracket with power input connector and audio output jack—RP168-2 only
74856	45	Base—Sub-base assembly complete with all staked and riveted parts—less idler lever and reject lever—Type V—with pickup rest
74803	45	Base—Sub-base assembly complete with all staked and riveted parts, including idler lever—less reject lever—Type VI—with pickup rest
75652	45	Base—Sub-base assembly complete with all staked and riveted parts—for mechanisms labeled RP 168D-1 or RP 168D-2 (same as Type V except having cut-out for clearance of motorboard switch)
74860	45A-1	Lever—Reject lever — bottom section — for sub-base Types V, VI, and VII
74861	45A-2	Lever—Reject lever—top section—for sub-base Types V, VI, and VII
74814	45B	Plate—Idler wheel mounting plate and stud—for sub-base Type V
74870	45B-1	Retainer—Idler wheel retainer (spring sleeve) for use with No. 74814 plate (45B)
75081	45B-1	Retainer—Idler wheel retainer (horseshoe washer) for use with sub-base Types VI and VII (late production)
74804	45B-2	Washer—Idler wheel bearing washer (½" O.D. x .185" I.D. x .032" thick) for sub-base Types VI and VII (late production)
74430	45C	Stud—Eccentric stud for landing adjustment
74429	45D	Stud—Eccentric stud for height adjustment
74082	45E	Washer—Felt washer (½" O.D. x ¼" I.D. x 3/16" thick)
74086	46	Spring—Reject lever spring (.203" O.D. x 13/16"—34¾ turns) for sub-base having one piece reject lever—1 required
74427	46	Spring—Reject lever spring (.203" O.D. x .531"—13 turns) for sub-bases having two piece reject lever—2 required
74074	50	Lever—Return lever (includes spring Ill. No. 51)
74085	51	Spring—Return lever actuating spring (.195" O.D. x 29/32"—37½ turns)
74075	52	Spring—Return lever latch spring (.180" O.D. x .535"—21½ turns)
——	54	Washer — To clamp trip lever (Ill. No. 58) to pivot arm shaft (Ill. No. 40)
——	55	Nut — To clamp trip lever (Ill. No. 58) to pivot arm shaft (Ill. No. 40)
——	56	Washer — To clamp trip lever (Ill. No. 58) to pivot arm shaft (Ill. No. 40)
——	57	Screw — To clamp trip lever (Ill. No. 58) to pivot arm shaft (Ill. No. 40)
74099	58	Lever—Trip lever (includes Items 54, 55, 56, 57 and 59)
74426	59	Spring—Trip lever spring (.171" O.D. x .595"—30 turns)
33726	60	Washer—"C" washer for star wheel shaft
74083	61	Screw—No. 6-32 x .281" cone point set screw for star wheel (2 required)
74081	62	Wheel—Star wheel
74088	63	Switch—Muting switch
——	64	Screw—No. 8 x ¼" self tapping screw
33726	65	Washer—"C" washer to retain trip pawl lever
74245	66	Lever—Trip pawl lever
74100	67	Spring—Trip pawl take up spring (.195" O.D. x ⅝"—20½ turns)
——	68	Clamp—Cable clamp
74078	69	Washer—Dampening washer for idler wheel (bottom)
——	70	Washer—No. 4 lockwasher for idler mounting stud (Ill. No. 22)
——	71	Nut—No. 4-40 hex nut for idler wheel mounting stud (Ill. No. 22)
——	72	Washer—Part of No. 74132—see Ill. No. 27
74071	73	Motor—115 volt, 60 cycle motor complete with connector—shaded pole type. Not suitable for 50 cycle conversion
74624	73	Motor—115 volt, 60 cycle motor complete with connector and No. 73158 spring sleeve (for 50 cycle conversion), shaded pole type
74469	73	Motor—115 volt, 60 cycle motor complete with connector and 5 mf. capacitor—for RP 168-2 only
74621	–	Capacitor—Motor capacitor (5 mf.) for No. 74469 motor
30870	74	Connector—Two prong male plug (connector) for motor cable
73158	–	Spring—Spring sleeve to convert motors No. 74624 to 50 cycle operation
——	89	Screw—No. 8 x ¼" self tapping screw
74859	90	Clamp—To mount dash-pot
74428	91	Dash-pot—Pneumatic dash-pot complete with plunger
74431	92	Washer—"C" washer for mounting adjustment studs No. 74429 (Ill. No. 45D) and No. 74430 (Ill. No. 45C)
		PICKUP ARM ASSEMBLIES
74041	9	Arm—Pickup shell and stud—with pivot (9B) and lead counter-balance—Type I for use with rest on motorboard
74443	9	Arm—Pickup arm shell and stud—with pivot (9B) and lead counter-balance—for Model CP-5203 only—black finish
74824	9	Arm—Pickup arm shell and stud—with pivot (9B) and lead counter-balance—Type II for use with rest on sub-base
75058	9	Arm—Pickup arm shell and stud—with pivot (9B) and lead counter-balance—for Model 45EY only—two-tone finish
75073	9	Arm—Pickup arm shell and stud—with pivot (9B)—less lead counter-balance—Type III—for use with either type of pickup rest
74796	9	Arm—Pickup shell and stud—with pivot (9B)—less balance spring—Type V—for use with either type of pickup rest
75996	9	Arm—Pickup arm shell and stud—with pivot (9B) and lead counterbalance—Type II—for use with rest on sub-base—for Model 45-EY-1—Maroon finish
74061	9B	Pivot—Pickup arm pivot—for use with arms No. 74041, No. 74443, No. 74824, and No. 75058 only (arms stamped 970488)
74067	10	Pickup—Crystal pickup cartridge complete including sapphire and guard—RMP 128-1
74625	10	Pickup—Crystal pickup cartridge complete including sapphire and guard—RMP 128-2
74466	10	Pickup—Magnetic pickup cartridge complete with stylus—for Model CP-5203 only
74984	10	Pickup—Ceramic pickup cartridge complete with stylus—for Models QJY and QEY3
•S-5578	10	Pickup—Ceramic pickup cartridge complete with stylus—for Model 9QV5
74065	10A	Screw—No. 2-56 x 3/16" fillister head screw to mount No. 74067 or No. 74625 crystal pickups or No. S-5578 ceramic pickup
74464	10A	Screw—No. 2-56 x ¼" fillister head screw to mount No. 74466 pickup (Model CP-5203)
74986	10A	Screw—No. 2-56 x 3/16" screw for mounting No. 74984 pickup (Models QJY and QEY3)
74069	10B	Guard—Stylus guard for No. 74067 pickup (RMP 128-1)
74819	10B	Guard—Stylus guard for No. 74625 pickup (RMP 128-2)
74068	10C	Sapphire—Sapphire and holder (WHITE) for No. 74067 pickup (RMP 128-1)
74818	10C	Sapphire—Sapphire and holder (BLUE) for No. 74625 pickup (RMP 128-2)
74622	10C	Stylus—Diamond stylus and holder for No. 74466 pickup (Model CP-5203)
74985	10C	Stylus—Stylus and holder for No. 74984 pickup (Models QJY and QEY3)
74230	10D	Washer and Nut—to mount No. 74068 or No. 74818 stylus
74065	11	Screw—No. 2-56 x 3/16" fillister head screw to mount stylus guard on No. 74067 or No. 74625 pickups
74062	12	Screw—No. 8-32 x 13/32" cone point pivot adjusting screw
72765	13	Nut—Speed nut to hold pickup arm cable
74801	–	Clip—Spring clip to hold pickup arm cable (used only on pickup arm Type V and VI—No. 74796)
74410	14	Screw—No. 4-40 x 3/16" fillister head screw to lock pivot screw No. 74062
74066	15	Cable—3-wire twisted pickup arm cable complete with connectors
74465	15	Cable—Shielded pickup arm cable complete with connectors—Model CP-5203 only
•S-5580	15	Cable—Shielded pickup arm cable complete with connectors— Model 9QV5 only
74060	39	Spring—Counter-balance spring (.171" O.D. x .695"—43 turns) for Pickup Arm Types I, II, III and IV when using No. 74067, No. 74625 or No. 74984 pickups (most models)
74426	39	Spring—Counter-balance spring (.171" O.D. x .595"—30 turns) for Model 9QV5 only
74461	39	Spring—Counter-balance spring (.185" O.D. x .695"—29¾ turns) for Model CP-5203 only
74798	39	Spring—Counter-balance spring (⅝" O.D.—11 turns) for Pickup Arm Types V and VI (Stock No. 74796)
74797	–	Nut—Speed nut to hold No. 74798 spring in Pickup Arm Types V and VI
75074	–	Weight—Lead counter-balance weight for Pickup Arm Types III and IV
——	–	Screw—No. 4-40 round head screw to hold No. 75074 weight to No. 75073 Arm

STOCK No.	ILL. No.	DESCRIPTION
74059	40	Arm—Pivot arm and shaft for use with all pickup arms having lead counter-balance except Model CP-5203
74744	40	Arm—Pivot arm and shaft for Model CP-5203 only
74799	40	Arm—Pivot arm and shaft for use with Pickup Arm Types V and VI
74802	–	Screw—No. 4 x 9/16" oval head counter-balance adjusting screw for use with No. 74799 pivot arm
74800	–	Bumper—Rubber bumper for No. 74799 pivot arm
		TURNTABLE ASSEMBLIES
74090	1	Nose—Spindle nose—RED (early type—thin wall) for Turntable Type I
74620	1	Nose—Spindle nose—RED (late type—thick wall) for Turntable Type I or II
74863	1	Nose—Spindle nose—RED—for Turntable Type III
74472	1	Nose—Spindle nose—BLACK—for Turntable Type I
74795	1	Nose—Spindle nose—BLACK—for Turntable Type III
74091	2	Spring—Spindle nose spring — formed — for spindle nose No. 74090, No. 74620, or No. 74472
74862	2	Spring—Spindle nose spring—formed wire—for spindle nose No. 74863 or No. 74795
———	3	Screw—No. 6-32 round head machine screw for spindle nose spring No. 74091
74095	4	Spring—Separator shelf return spring (.180" O.D. x 1 1/16"—10 turns) for Turntable Types I and II
74866	4	Spring—Separator shelf return spring (.118" O.D. x ¾"—16 turns)—two required—for Turntable Type III
74096	5-6	Separator—Separator knife, shelf and gear assembly for Turntable Types I and II
74865	5-6	Shelf—Separator shelf for Turntable Type III
74864	5B 6B	Separator—Separator knife for Turntable Type III
74092	7	Shaft—Star wheel shaft and gear assembly for Turntable Types I and II
74867	7	Shaft—Star wheel shaft with cam for Turntable Type III
33726	–	Washer—"C" washer for top of No. 74867 shaft
74042	8	Turntable—Turntable with TAN MARBLEIZED mat—Type I—use No. 74090 RED nose (thin wall)
75065	8	Turntable—Turntable with TAN MARBLEIZED mat—Type I—use No. 74620 RED nose (thick wall)
74813	8	Turntable—Turntable with TAN MARBLEIZED mat—Type III—use No. 74863 RED nose
74445	8	Turntable—Turntable with BLACK mat—Type I—use No. 74472 BLACK nose
75145	8	Turntable—Turntable with RED mat—Type I—use No. 74472 BLACK nose
75059	8	Turntable—Turntable with RED mat—Type III—use No. 74795 BLACK nose
75997	8	Turntable—Turntable with MAROON mat—Type III—use No. 74863 RED nose
75998	8C	Mat—Turntable mat—MAROON
74094	8C	Mat—Turntable mat—TAN MARBLEIZED
74471	8C	Mat—Turntable mat—BLACK
74794	8C	Mat—Turntable mat—RED
———	21	Screw—No. 6-32 x 1¾" fillister head screw (holds nose to spindle) two required for Turntable Type I
74868	21	Screw—No. 6-32 x 1⅝" fillister head screw (holds nose to spindle) two required for Turntable Types II and III
74869	21A	Washer—No. 6 flat washer (for use under No. 74868 screw—two required for Turntable Types II and III

Two different main levers (director lever) are used, depending upon which turntable assembly is used. Lever (41) Stock No. 74076 has a long end (41C) and is used with Turntables Type I and II. Lever (41) Stock No. 74857 has a short end and is used with Turntable Assembly Type III.

STOCK No.	ILL. No.	DESCRIPTION
———	31	Screw—No. 4-40 x ⅜" fillister head screw (for use with cam, Ill. No. 33)—two required for Turntable Type I
———	32	Washer—No. 4 lockwasher—for use with cam (Ill. No. 33)—two required for Turntable Type I
74231	33	Cam—Follower cam for Turntable Type I
		MOTORBOARD ASSEMBLIES
74623		Hardware—To mount sub-base to plastic cabinet of Models 9EY3, 9EY35, 9EY36, 9Y51, 45EY and QEY3 or sub-base to motorboard of Models 9EY31 and 9EY32, consisting of:
	47	Three (3) grommets
	–	Three (3) spacers
	48	Three (3) flat washers
———	49	Screw—No. 8-32 x ¾" — for Models 9EY3, 9EY35, 9EY36, 9Y51, 45EY and QEY3
———	49	Screw—No. 8-32 x ½"—for 9JY, 45J and QJY
———	49	Screw—No. 8-32 x ⅜"—for instruments using spring mounting of motorboard
74209	75	Cover—Mounting screw cover (threaded type—3 required)—use with No. 74424 screw (Ill. No. 76)
74581	75	Cover—Mounting screw cover (plug-in type—3 required)—use with No. 74582 screw (Ill. No. 76)
74424	76	Screw—No. 8-32 x 1¾" special screw (with tapped hole) for mounting record changer (3 required)—use with No. 74209 cover (Ill. No. 75)
74582	76	Screw—No. 8-32 x 1¾" special screw (non-tapped hole) for mounting record changer (3 required)—use with No. 74581 cover (Ill. No. 75)
75057	76	Screw—No. 8 x ⅞" oval head wood screw for mounting record changer (3 required)—for Models 9EY31 and 9EY32
73549	77	Emblem—"RCA Victor" emblem—metal
74674	77	Emblem—"RCA Victor" emblem—plastic
74422	78	Spring—Conical spring for mounting record changer —upper L.H. side (2 required)
74423	79	Spring—Conical spring for mounting record changer —bottom (3 required)
74208	80	Nut—Tee nut for mounting record changer (3 required)
74184	81	Motorboard — Motorboard complete with welded brackets and stud—less rest and operating parts—for all models with motorboard rest except CP-5203, 9EY31 and 9EY32
74444	81	Motorboard — Motorboard complete with welded brackets and stud—less operating parts—for Model CP-5203
75076	81	Motorboard — Motorboard complete with welded brackets and stud—less rest and operating parts—for Models 9EY31 and 9EY32
74987	81 †	Motorboard — Motorboard complete with welded brackets and stud—less operating parts—for all models without motorboard rest
74185	82	Rest — Pickup arm rest — maroon — for all models (where required) except CP-5203, 9EY31 and 9EY32
74446	82	Rest—Pickup arm rest—black—used on Model CP-5203 only
75077	82	Rest—Pickup arm rest and latch—for Models 9EY31 and 9EY32
74210	83	Knob—Reject control knob—maroon
74467	83	Knob—Reject control knob—black
74421	84	Spring—Conical spring for mounting record changer —upper R.H. side (1 required)
74212	85	Nut—Speed nut for reject control knob
———	86	Screw—No. 6 self-tapping screw
33726	87	Washer—"C" washer for mounting reject lever actuating lever
74211	88	Lever—Reject lever actuating lever
74474	–	Switch—"ON-OFF" switch—used on Model CP-5203 only
32875	—	Switch—"ON-OFF" switch—used on Models A-82, A-91, A-108, 2-T-81, 6-T-84, 6-T-86, 6-T-87 and 9-T-89

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Items listed but without Stock Nos. are not stock items.

* Stock Nos. S-5578 and S-5580 are for use in instruments manufactured for RCA International Division and are not stocked by distributors in the U. S. A.

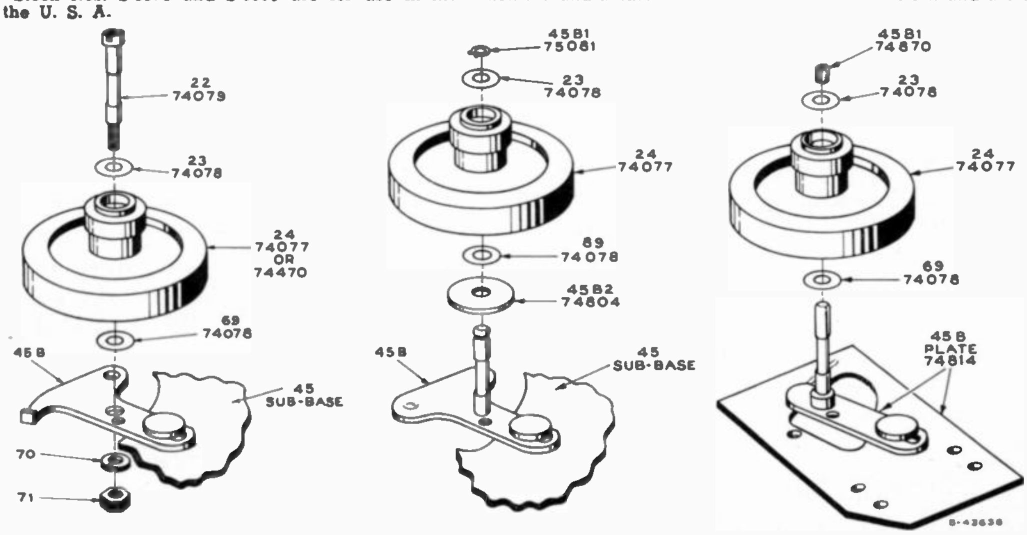
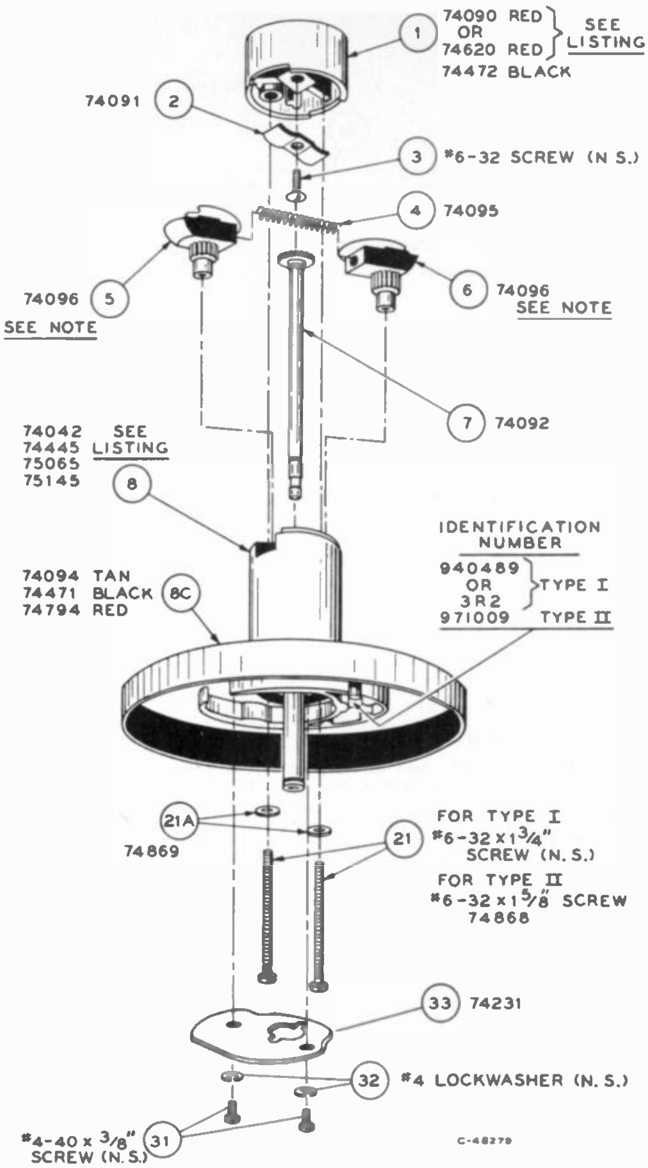


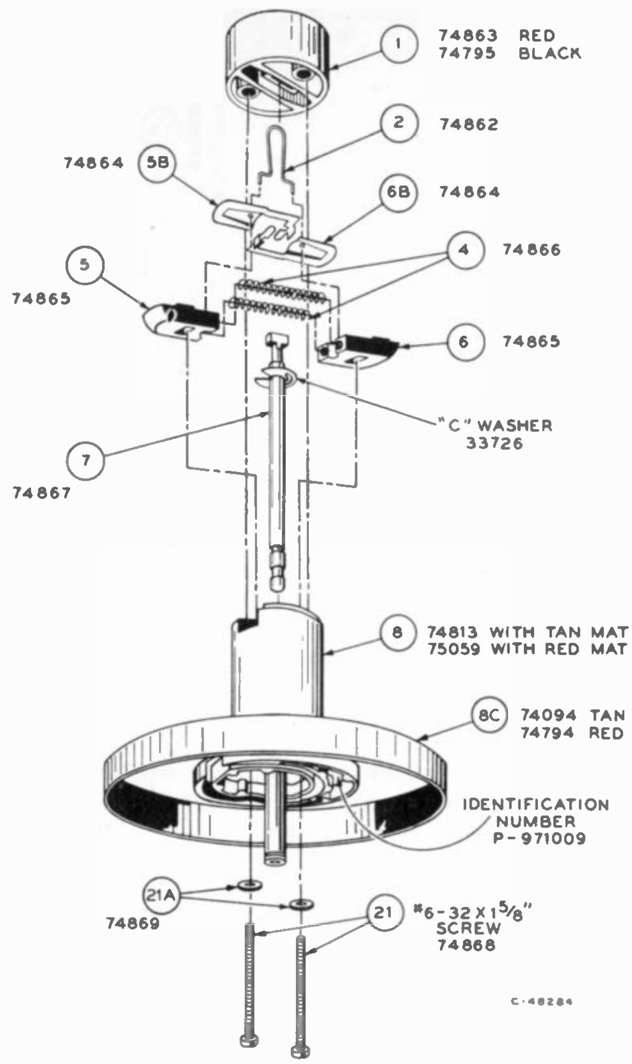
Figure 19—Idler Wheel Mounting.

† Maroon finish. Does not have provision for mounting "ON-OFF" switch. The gold finish motorboard having provision for mounting "ON-OFF" switch is not stocked.



ON TYPE II TURNTABLES THE CAM (33) IS CAST INTEGRAL WITH THE TURNTABLE (8)

Figure 20 – Turntable Assemblies, Types I and II.



NOTE: Use care in dis-assembly to prevent loss of springs. Remove screws—lift nose slightly—hold both separator knives down against shelves—then remove nose.

Figure 21—Turntable Assemblies, Type III.

Main Lever vs Record Separators:

Two different main levers (director lever) are used depending upon the type of record separators being used.

Stock No. 74076 lever is used only with the rotating gear type of record separators. The end (41C) that engages the star wheel is long.

Stock No. 74857 lever is used only with the push-out type of record separators. The end (41C) that engages the star wheel is short.

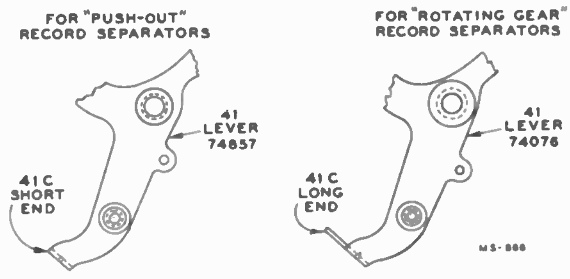


Figure 22—Main Lever.

TURNTABLE ASSEMBLIES

Type I

Turntable Stock No. 74042. Stamped 940489 or 3R2. Has TAN MARBLEIZED mat and uses rotating gear type of record separators. Use No. 74090 spindle nose—RED (thin wall)

Turntable Stock No. 75065. Same as No. 74042, except for diameter at top of spindle. Use No. 74620 spindle nose—RED (thick wall)

Turntable Stock No. 75145. Same as No. 75065, except that it has a RED mat. Use No. 74472 spindle nose—BLACK

Turntable Stock No. 74445. Same as No. 75065, except for finish and BLACK mat. Used only on Model CP-5203. Use No. 74472 spindle nose (BLACK)

Type II

Stamped 971009. Follower cam (33) is a part of the turntable casting. Otherwise, similar to No. 75065. Use No. 75065 turntable, and No. 74231 cam for replacement

Type III

Stock No. 74813. Stamped 971009. Has TAN MARBLEIZED mat and uses push-out type of record separators. Use No. 74863 spindle nose—RED. Although this turntable bears the same stamping as Type II, it does not have the shafts required for mounting the rotating gear type of separators

Stock No. 75059. Same as No. 74813, except that a RED mat is used. Use No. 74795 spindle nose—BLACK

NOTE: Main Lever (41)

Stock No. 74076 lever (with long end 41C) is used in conjunction with rotating gear type of record separators. Stock No. 74857 lever (with short end 41C) is used in conjunction with push-out type of record separators

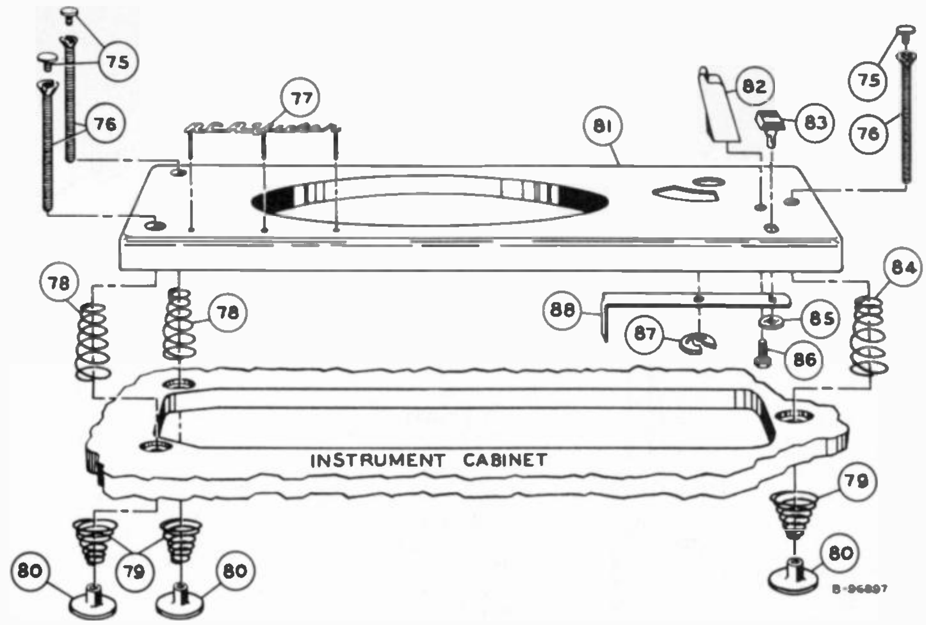


Figure 23
Motorboard Assemblies.

CHANGES—SERVICE HINTS (Continued from Page 4)

Pickup Arm Rest:

Two different types of pickup arm rest are in use. The original type was visible on the motorboard. The type presently in use is a metal projection on the sub-base.

The correct grouping of parts must be used, refer to descriptive text on page 6. The two types are illustrated below.

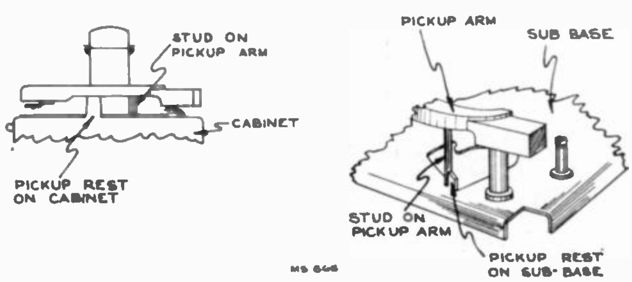


Figure 24—Pickup Arm Rest.

Sub-base Mounting:

The sub-base is attached directly to metal motorboards and to the cabinets of Models 9JY, QJY and 45J with three screws and three washers. No grommets or spacers are used except with Models 9EY31 and 9EY32.

On all other instruments, the sub-base is cushion mounted to the plastic cabinet with rubber grommets, metal spacers, screws and washers. The mounting is illustrated below.

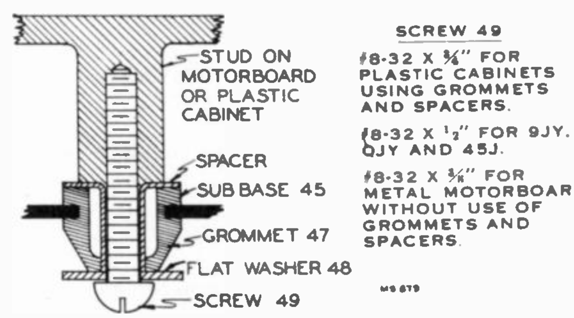


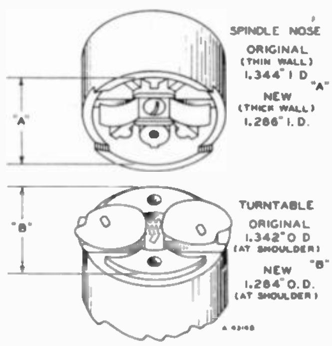
Figure 25—Sub-base Mounting.

Spindle Nose and Turntable (Type I):

The wall thickness of the spindle nose (Ill. No. 1) has been increased and the machined shoulder at the top of the turntable decreased accordingly. Thick wall spindle nose will not fit on early type turntable. The new type red spindle nose (thick wall) is available as Stock No. 74620.

NOTE: The screws (Ill. No. 21) which hold the spindle nose to the turntable should not be tightened too tight. The spindle nose can be distorted and cause records to bind.

← Figure 26—Spindle Nose.



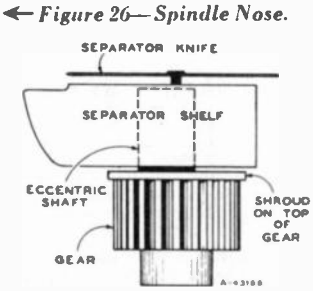


Figure 27—
Separator Assembly.

Separator Assemblies (Rotating Gear Type):

A flat has been added to the separator gears eccentric shafts. This flat permits the shelf (Ill. Nos. 5 and 6) to stay out until the nose of the blade (Ill. Nos. 5B and 6B) is approximately half-way out. Then the shelf retracts fast. This faster action minimizes unequal dropping of records.

The two types of separator assemblies (Stock No. 74096, Ill. Nos. 5 and 6) are NOT INTERCHANGEABLE. In addition the early type has been grouped according to mold number (at bottom of spring hole) and installed in pairs.

Group Mold Number	Group Mold Number	Group Mold Number
1, 3, 5	9, 10	0, 8

Assemblies of one group should not be mixed with assemblies of another group or unequal dropping of records may occur. If a matched pair is not available, first check timing of separator knives then the dropping of records; it may be necessary to file the edge of the shelf which released the record last.

The late type (having a flat on the eccentric shaft) do not need to be grouped, but an early assembly should not be used in conjunction with a late assembly (use two early or two late assemblies). The late type may be identified by its having a shroud at the top of the gear (see Figure 27).

Turntable Bearing Thrust Washers:

Three thrust washers (Ill. Nos. 17 and 19) are now being used in mounting the turntable. This is done because it was found that the top edge of some idler wheels would contact a non-machined surface on the underside of the turntable and cause noise similar to that caused by a rough idler wheel.

Jamming:

On early RP-168-1 mechanisms it was sometimes possible to jam the mechanism by maintaining pressure on the reject button during cycle. If such jamming should occur check the following:

1. The tip radius of the reject lever (Ill. No. 45A) should be $\frac{1}{16}$".
2. The edges of the trip pawl (Ill. No. 37) should have a slightly rounded edge (.010" radius).

Present production uses a two piece spring loaded reject lever (Ill. No. 45A) which eliminates the possibility of jamming caused by pressure on the reject button.

Jamming can also be caused by incorrect positioning of the director lever (main lever) (Ill. No. 41) in relation to the star wheel (Ill. No. 62). See Figure 35.

ERRATIC PICKUP LANDING

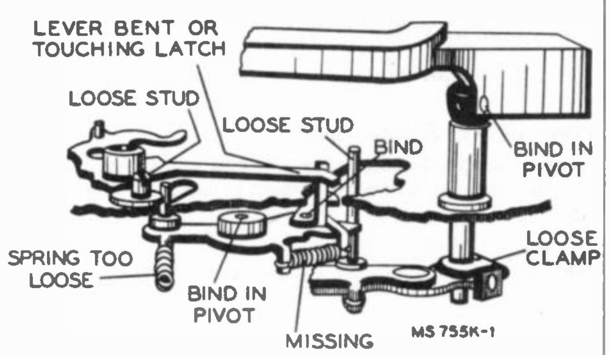


Figure 28.

WOW (Speed Variation)

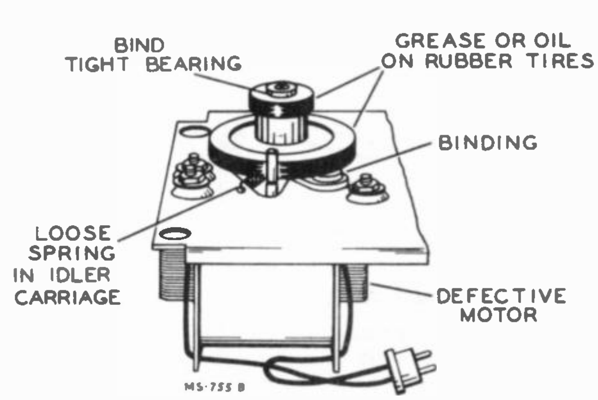


Figure 30.

Intermittent Non-Tripping:

The trip lever spring (Ill. No. 59) has been increased in tension to provide better tripping action. The new spring has 30 turns and is available as Stock No. 74426.

To reduce friction a washer has been added between the trip pawl (Ill. No. 37) and the trip pawl lever (Ill. No. 66). It is available as Stock No. 74453.

Eccentric Adjustment Studs:

In early production the eccentric landing (Ill. No. 45C) and height (Ill. No. 45D) adjustment studs were staked to the sub-base assembly. They are now secured to the sub-base assembly with "C" washers. The landing adjustment stud (Ill. No. 45C) is available as Stock No. 74430. The height adjustment stud (Ill. No. 45D) as Stock No. 74429 and the "C" washer (Ill. No. 92) as Stock No. 74431.

Pneumatic Dashpot

A pneumatic dashpot (Stock No. 74428) has been added to improve pickup arm landing. The dashpot case is clamped to the base sub-assembly and the plunger is attached to the long end of the tone arm lift lever (Ill. No. 35) (Stock No. 74757).

Polarized Motor:

On some instruments the connection of the power leads of the motor should not be reversed. The leads are color coded and reversed leads may introduce objectionable hum. The record changer mechanisms using this motor are labeled RP 168B-6 or RP 168D-2 and are used with Models 45-EY and 45-EY-1.

Replacement motors (Stock No. 74071) may not be color coded and in such cases it will be necessary to determine the correct connection by trial.

DISTORTED OUTPUT

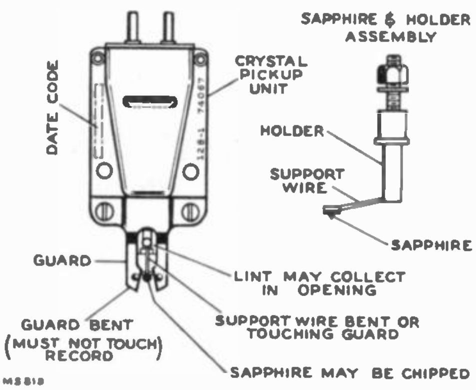


Figure 29.

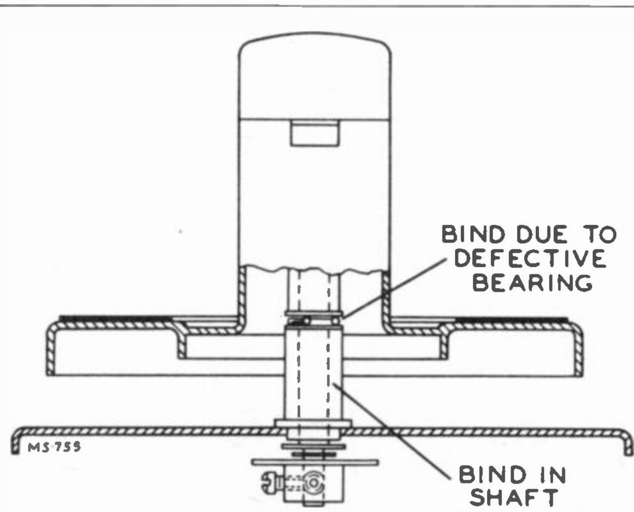


Figure 31.

SERVICE HINTS CONTINUED ON PAGE 14

Adjustment Sequence:

1. Synchronize separator shelf (Ill. No. 5) and separator knife (Ill. No. 5B) action (necessary only on rotating gear type of record separators).
2. Adjust position of star wheel (Ill. No. 62).
3. Adjust position of director lever (main lever) (Ill. No. 41) in relation to the star wheel by bending if necessary.
4. Adjust tone arm pivot screw (Ill. No. 12) for minimum side play without binding.
5. Adjust sapphire height above motorboard.
6. Adjust tripping position.
7. Adjust landing position.
8. Adjust pickup arm height during cycle.
9. Adjust position of muting switch so that contacts are open 1/32" during playing and are closed during cycle.

Separator Synchronization:

The following applies only to the rotating gear type of record separators:

1. Make certain the two embedded gears (5 and 6) are meshed with gear (7A) on the upper end of the star wheel shaft so the action of the separator knives is synchronized.

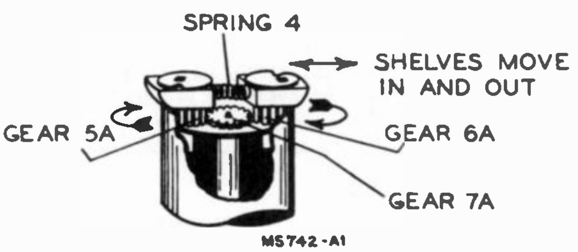


Figure 32.

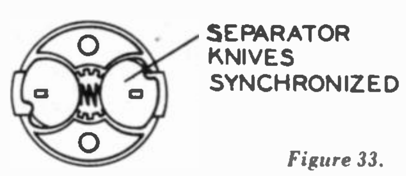


Figure 33.

Star Wheel Position:

1. Turn the star wheel so that the separator knives are in the position indicated in Figure 33 for rotating gear type of separators or fully retracted for push-out separators.
2. Loosen the two set screws (61) sufficiently to permit the star wheel to rotate without disturbing the shaft (7).
3. Rotate the star wheel points directly to a cam screw or nose screw (visible through slot) as shown in Figure 34.
4. Tighten the two set screws (61) and rotate the mechanism through a complete cycle to check operation. The separator knives must rotate 360° to the starting position as indicated in Figure 33.

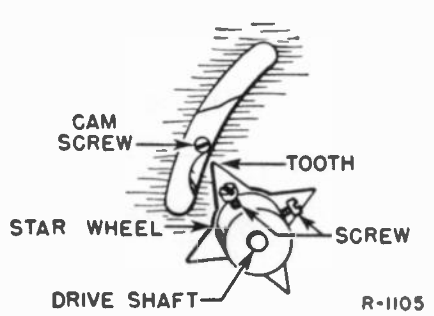


Figure 34—Star Wheel Timing.

Director Lever Position:

Push reject lever and rotate the turntable slowly by hand until the end (41C) of the director lever moves in to its limit of travel so when the star wheel is rotated it contacts by the amount indicated in Figure 35 for lever with long end. For lever with short end, the star wheel should first contact the end (41C) approximately 1 16-inch from the front or leading edge of the lever.

If the end of the director lever (main lever) is too close to the star wheel, it will jam. If too far away, it will cause erratic record dropping. If in doubt and unable to measure, move the end toward the star wheel until most of the play is removed when the star wheel is moved back and forth at this setting. With the push-out record separators and the lever with short end, there will be considerable play but the tension of the separator springs holds the star wheel against the lever.

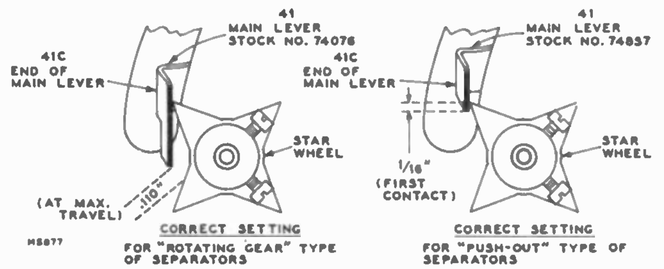


Figure 35 Setting of Director Lever.

Pivot Screw Adjustment:

Loosen the pivot locking screw (14) and adjust the pivot screw (12) for minimum side play without causing binding.

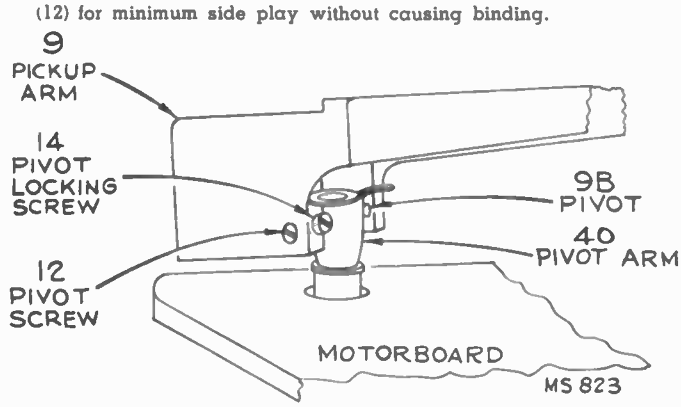


Figure 36.

Sapphire Height Adjustment (Out of Cycle):

Bend the lug on the pivot arm (40) so that the sapphire point is approximately 1/16" above the motorboard.

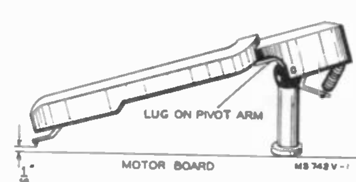


Figure 37.

Tripping Adjustment:

1. Assemble the pickup arm and trip lever assemblies as shown in Figure 38. Leave the clamping screw (57) loose enough to permit horizontal movement of the trip lever on the shaft. (Allow approximately .010 inch vertical end play.)
2. Turn the eccentric landing adjustment stud (45C) to determine the inward and outward limit of adjustment, then turn it to a setting half-way between the limits.

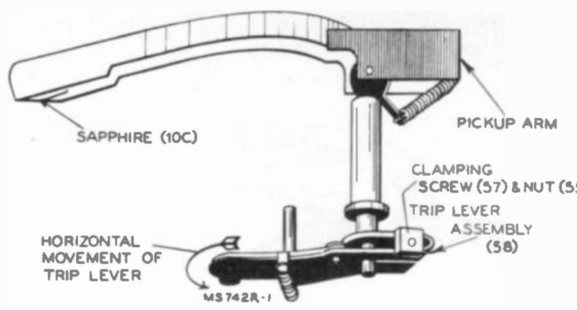


Figure 38.

3. Tripping should occur when the sapphire reaches a position $1\frac{9}{32}$" from the near side of the turntable spindle. This position is adjusted by holding the trip lever and moving the pickup arm inward or outward to obtain the specified position.
4. A convenient way of measuring this distance is to make a mark on the back side of a stroboscope disc $1\frac{9}{32}$" from the inner edge, place the disc on the turntable, with the turntable revolving, hold the disc stationary and move the pickup arm very slowly in towards the turntable spindle.
5. After this position has been obtained, tighten the clamping screw (57) and recheck the tripping position and vertical end play.

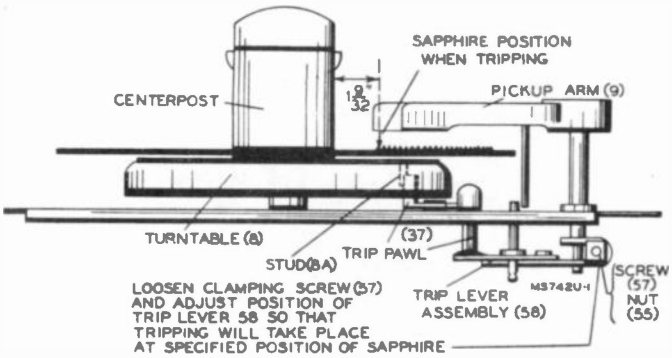


Figure 39—Tripping Position.

Landing Adjustment:

1. After the tripping adjustment has been made as described above, turn the eccentric landing adjustment stud (45C) so that the sapphire will set down on the record half-way between the outer edge and the first music groove. This position is $2\frac{5}{8}$" from the turntable spindle. The location of the adjustment stud is illustrated in Figure 42.

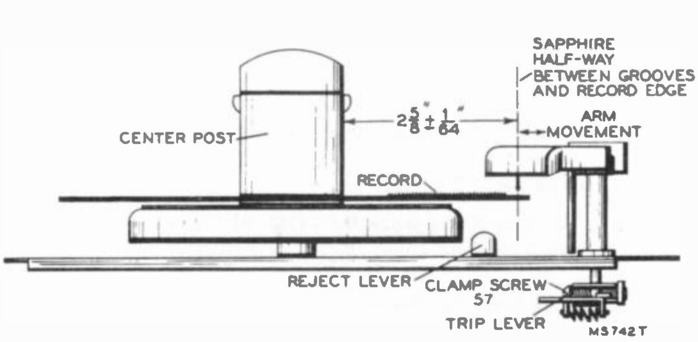


Figure 40—Landing Position.

Pickup Arm Height Adjustment (In Cycle):

Set the mechanism in cycle. Turn the turntable by hand, until the pickup arm has reached its maximum height. By means of a screwdriver turn the height adjustment stud (45D) until the distance between the top of the turntable and the sapphire point is ¾". Use that position of the eccentric stud which causes the pickup arm to rise during clockwise adjustment of the stud. The location of the adjusting stud is illustrated in Figure 42.

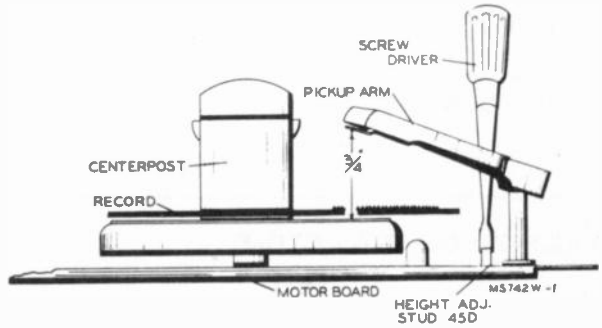


Figure 41—Height Adjustment.

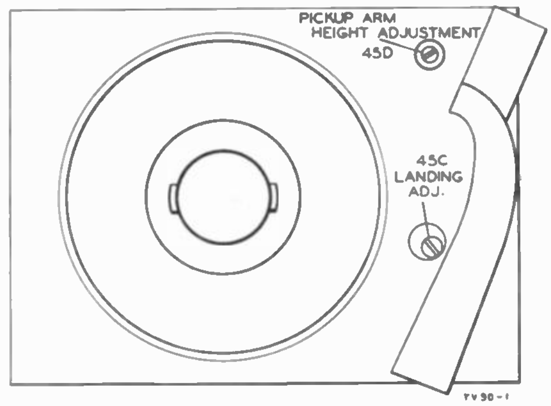


Figure 42—Height and Landing Adjustment Studs.

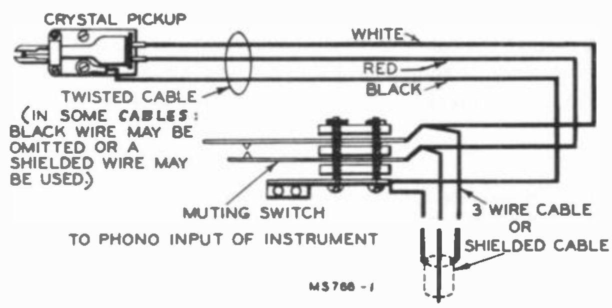


Figure 43—Pickup Muting Switch Wiring.

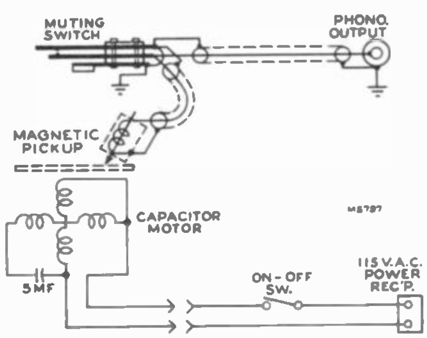


Figure 44—Schematic Diagram (Model CP-5203).

REPEATS GROOVES

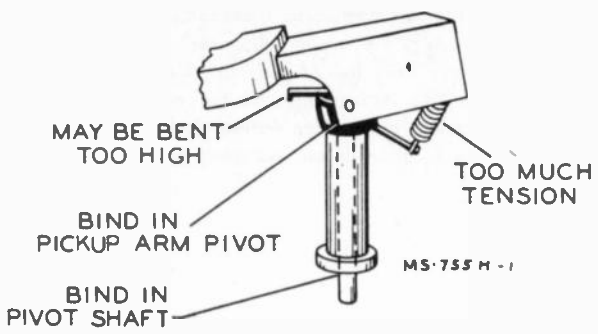


Figure 45.

CONTINUOUS TRIPPING

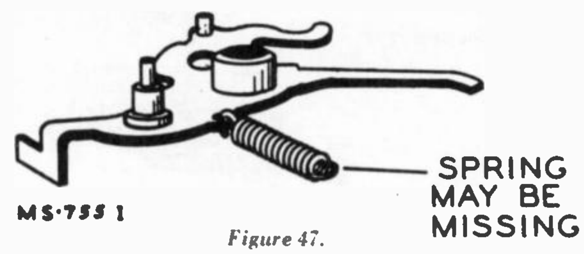


Figure 47.

FAILS TO GO INTO CYCLE

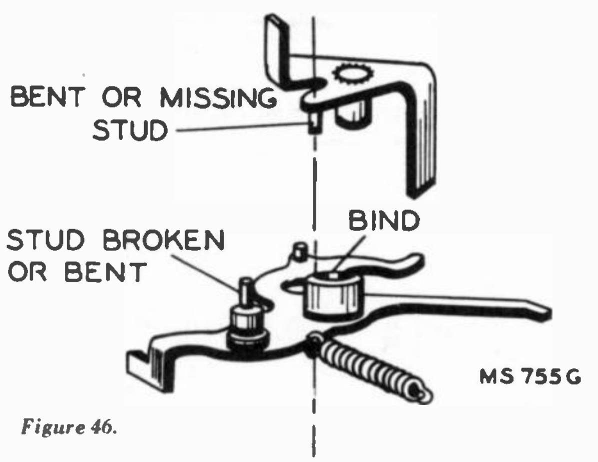


Figure 46.

RECORD DROP ON OR HIT PICKUP ARM

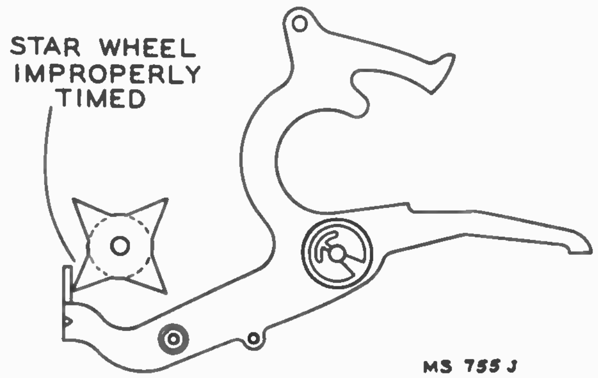


Figure 48.

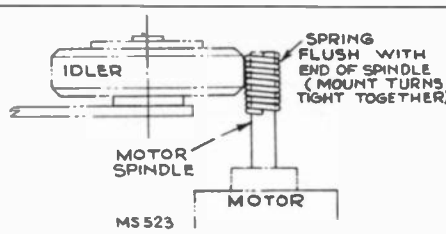


Figure 49—Spring Sleeve Installed on 60-Cycle Motor Spindle for Operation on 50-Cycle Supply.

Weak director lever (main lever) spring (Ill. No. 42) or excessive tension on muting switch may cause poor unlatching action and erratic pickup landing.

A drop of cement (Duco Household Cement or similar) applied to the ends of springs will prevent their becoming unhooked. Use care to prevent cementing turns of the springs.

PICKUP UNIT vs. INSTRUMENT MODEL

It is important to use the correct pickup unit. The receiver chassis has compensation designed for one pickup and may be incorrect for other pickups.

Pickup Stock No. 74067 (RMP 128-1) uses a stylus (Stock No. 74068) which has a WHITE paint coding. It is used with the following instruments: 9EY3†, 9EY35, 9EY36, 9JY*, 9TW333, 9TW390, 9W101, 9W102, 9W103, 9W105, 9Y7, 45EY†, 45EY1, 45EY15 and 45J*.

Pickup Stock No. 74625 (RMP 128-2) uses a stylus (Stock No. 74818) which has a BLUE paint coding. It is used with the following instruments: A55, A78, A106, TA128, TA129, TA169, 9EY3†, 9EY31, 9EY32, 9TW309, 9W51, 9W78, 9W106, 9Y51, 45EY†, S1000, A82, A91, A108, 9Y511, 4QV8C, 6QU3Y, 2T84, 6T86, 6T87 and 9T89.

* Models 9JY and 45J.

No. 74067 pickup is recommended as replacement although No. 74625 has been used as a substitute in some instruments.

The characteristics of the two pickups differ in that No. 74067 has a greater output in the middle audio frequencies. The response of No. 74625 is more "flat" and has a greater output at high audio frequencies.

† Models 9EY3 and 45EY.

Use No. 74067 pickup in conjunction with RS132, RS132E or RS132F amplifier.

Use No. 74625 pickup in conjunction with RS132A amplifier.

Pickup Stock No. 74466 (RMP 130-1) uses a stylus (Stock No. 74622) which has a BLACK paint coding It is used only with Model CP-5203.

Pickup Stock No. 74984 is a ceramic pickup used only with Models QJY, QEY3 and 6QU3Y.

Pickup Stock No. S-5578 is a ceramic pickup used with Models 9QV5 and 4QV8C.

CHANGE IN STYLUS COLOR CODE

The identification color on the bottom of the stylus holder of Stock Nos. 74068 and 74818 has been changed to provide identification of a factory process.

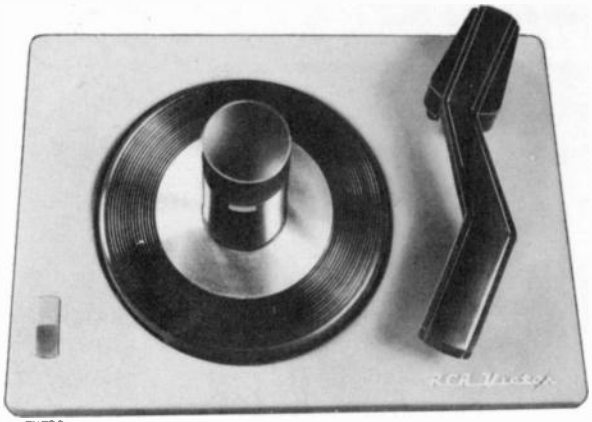
Stylus Stock No. 74068

Used in pickup Stock No. 74067 (RMP 128-1). Identification color may be either WHITE or BLACK.

Stylus Stock No. 74818

Used in pickup Stock No. 74625 (RMP 128-2). Identification color may be either BLUE or GREEN.

RCA VICTOR


PH993

RP-190 Series

45 R.P.M. Automatic Record Changer

SERVICE DATA

—1950 No. 14—

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

MODEL IDENTIFICATION

RP-190-1 RP-190-1a	Uses crystal pickup Stock No. 75476.* Models 45-EY-2, 45-EY-3, 45-J-2 and 9Y510.
RP-190-2 RP-190-2a	Uses crystal pickup Stock No. 75575. Models A-82, A-91, A-101, A-108, 45-W-9, 45-W-10, 2T81, 6T84, 6T86, 6T87 and 9T89.
RP-190-3 RP-190-3a	Uses crystal pickup Stock No. 75476* and special motor (85 volts). Model 45-EY-3.
RP-190-4 RP-190-4a	Uses crystal pickup Stock No. 75476* and different "On-Off" switch, otherwise same as RP-190-1 and RP-190-1a.
RP-190-5	Uses ceramic pickup Stock No. 72697, different counterbalance spring and motor suitable for 50 cycle conversion. Otherwise same as RP-190-4a. Models QEY4, QEY5 QJY2.
RP-190-6	Uses crystal pickup Stock No. 74067. Otherwise same as RP-190-4a.

*Use Stock No. 74067 for replacement.

NOTE: RP-190-1 vs. RP-190-1a.
RP-190-2 vs. RP-190-2a, etc.

Two types of cycling slides and counterbalance assemblies have been used. The "a" in the identification indicates the use of the late type assemblies. See Page 10 for details.

CAUTION

1. Avoid handling the pickup arm when the mechanism is in cycle.
2. Do not use force to release a jam.
3. Do not try to remove the records on the turntable if the turntable is stopped in cycle.
4. If the separator knives protrude from the center post when the mechanism is out of cycle, push the "start-reject" knob to reject and the condition should be corrected automatically.

AUTOMATIC OPERATION

1. Place a stack of records over the center post, with the desired selections upward, the last record to be played on top.
2. Push the "start-reject" knob to "start" (forward) and release. The mechanism will automatically play in sequence one side of each record stacked on the separator shelves.
3. To reject a record being played, push the "start-reject" knob.
4. At conclusion of playing and as the last record is being repeated, lift the pickup arm and place on its rest. Turn off the power to the drive motor by pushing back on control knob.
5. Remove the stack of records by lifting them straight up.

SPECIFICATIONS

Turntable speed .... 45 r.p.m.
Records used .... RCA type seven-inch fine groove
Record capacity .... 12 records
Pickup force .... Approx. 5 grams
Stylus tip radius .... .001 inch
Power supply .... 105-125 volts, 60 cycle, a.c.

(RP-190-3 uses 85 volt, 60 cycle motor.)

LUBRICATION

A light machine oil (SAE No. 10) should be used to oil the bearings of the drive motor.

On all bearing surfaces, excepting the motor bearings, Houghton STA-PUT No. 320, or equivalent, should be used. On all other sliding surfaces, STA-PUT No. 512, or equivalent, is recommended. STA-PUT can be purchased from E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia, Pa.

(Do not oil or grease record separator shelves.)

It is important that the drive motor spindle and the rubber tire on the idler wheel be kept clean and free from oil or grease, dirt, or any foreign material at all times. Carbon tetrachloride or naphtha is satisfactory for cleaning these parts.

INDEX

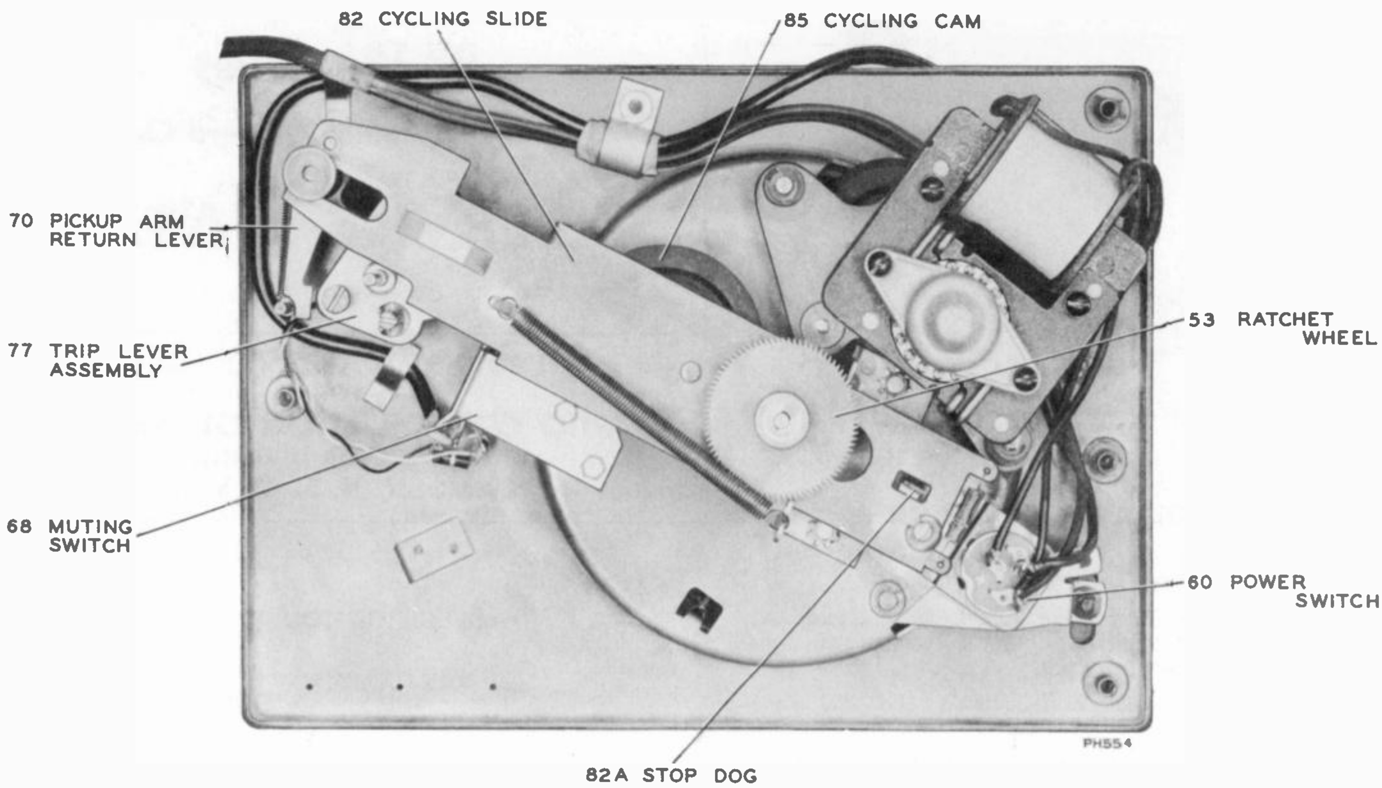

82 CYCLING SLIDE
85 CYCLING CAM
70 PICKUP ARM RETURN LEVER
77 TRIP LEVER ASSEMBLY
53 RATCHET WHEEL
68 MUTING SWITCH
60 POWER SWITCH
PH554
82A STOP DOG

Fig. 1

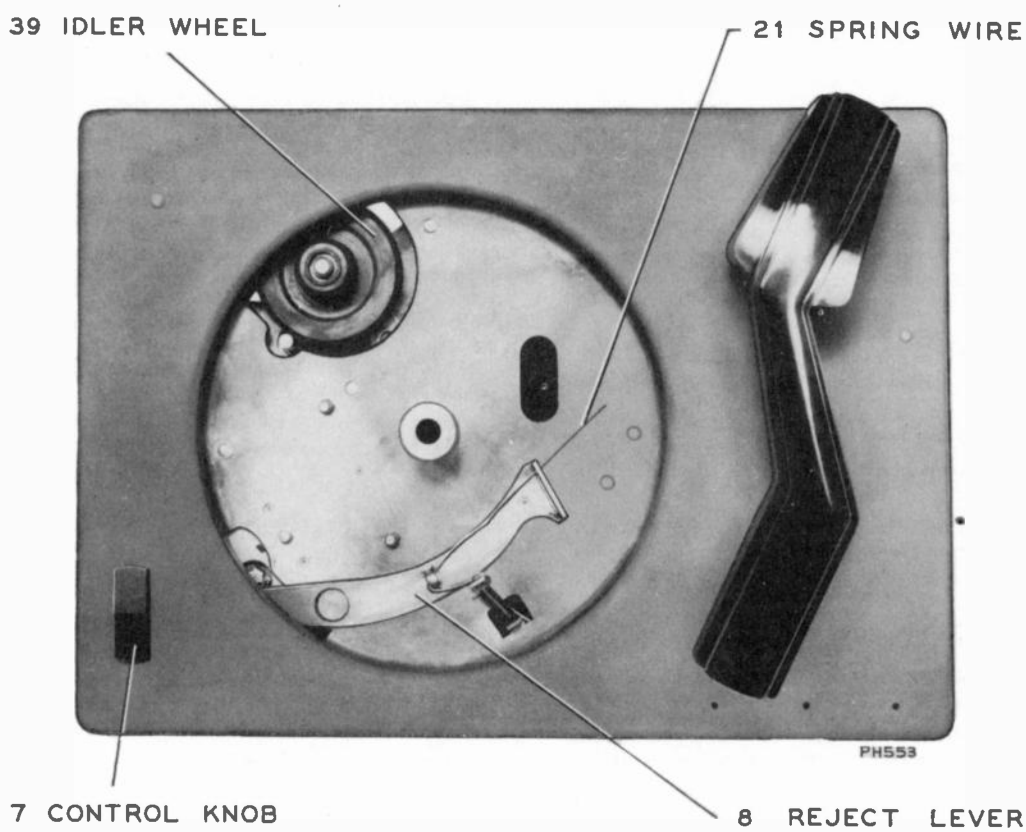

39 IDLER WHEEL
21 SPRING WIRE
PH553
7 CONTROL KNOB
8 REJECT LEVER

Fig. 2

Function of Principal Parts

Trip Lever (77)

The trip lever is mounted on the bottom end of the pickup arm vertical pivot shaft. The function is to transfer the movement of the pickup arm to parts of the operating mechanism below the motor board. The end of the trip lever contacts stud on cycling cam thereby starts tripping action.

Pickup Arm Return Lever (70)

The function of the pickup arm return lever is to provide a force necessary to push the pickup into landing position. The end of the pickup arm return lever is curved so as to provide a stop for trip lever. This stop determines landing position of the pickup.

Reject Lever (22)

The function of the reject lever is to transfer the action of the control knob to the cycling cam thereby starting a change cycle.

Muting Switch (68)

The function of the muting switch is to short the pickup leads to prevent amplifying of mechanical noise, of the merchanism during change cycle.

Cycling Cam (85)

The cycling cam is mounted on the cycling slide. The function of the cam is to transfer the rotary motion of the turntable shaft into sliding motion of the cycling slide.

Stop Dog (82A)

The stop dog is mounted on the end of cycling slide. The function of the stop dog is to engage the ratchet wheel on the separator shaft and prevent it from rotating, at the exact moment during change cycle.

Ratchet Wheel (53)

The function of the ratchet wheel located on the end of the separator shaft is to keep the separator shaft stationary at the proper time, so as to actuate the separator mechanism inside the centerpost.

Cycling Slide (82)

The cycling slide is the main connecting medium between the various moving parts.

Cycle of Operation

FUNCTION	EXPLANATION
Place a stack of records over centerpost.	1. Records rest on separator shelves protruding from either side of the centerpost.

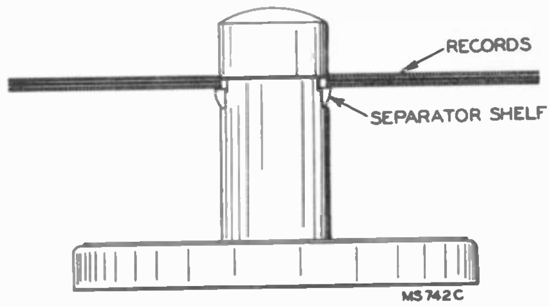


Fig. 3

FUNCTION	EXPLANATION
Push control knob to reject.	1. The control first actuates the power switch applying power to the drive motor. This starts the turntable rotating. 2. Further movement of the control knob actuates the reject lever assembly (8) which contacts the stud mounted on the eccentric cycling cam and moves it slightly.

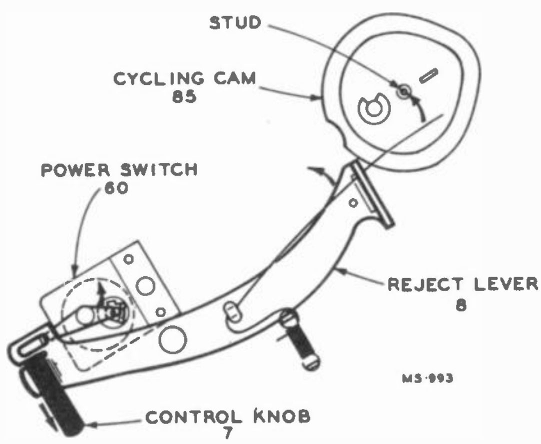


Fig. 4

FUNCTION	EXPLANATION
Cycling starts.	1. The slight movement of the eccentric cycling cam (85) is sufficient for engagement with the rotating knurled roller (62) mounted on turntable shaft. 2. The eccentric cycling cam which is mounted on the cycling slide (82) pushes the slide in the direction of the pickup arm pivot. In so doing tension is increased on the slide return spring (89). 3. The tab on the cycling slide moves back permitting muting switch to close.

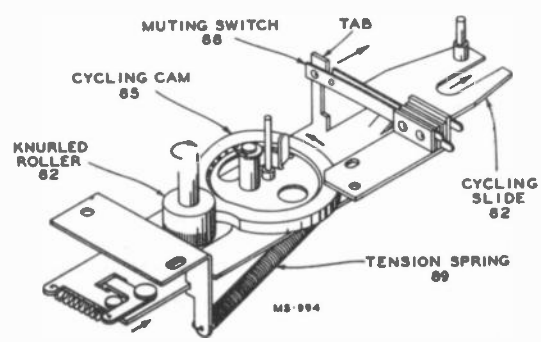


Fig. 5

Cycle of Operation—Continued

Pickup raises from the rest.

1. As the cycling slide continues to move in the direction of the pickup arm pivot the small incline pressed in the slide causes the elevating rod (74) to lift the pickup arm from the rest.

2. The raised pickup arm moves inward slightly from the inward force of the pickup arm return lever (70), until the stud on the trip lever (77) assembly comes against edge of the cycling slide.

3. The cycling slide continues to move further, which pushes the trip lever back. The eccentric landing adjustment stud (79) contacts and pushes the pickup arm return lever (70) against the tension of the return spring (69).

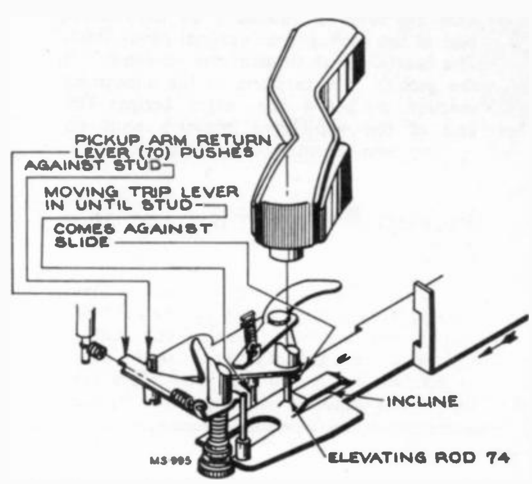


Fig. 7

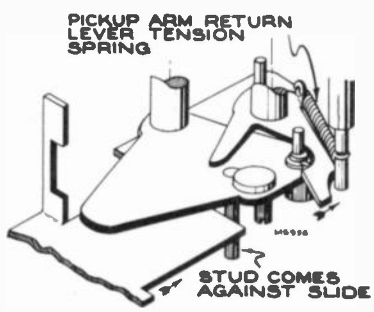


Fig. 6

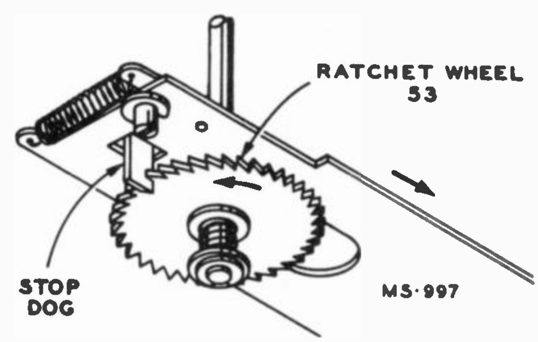


Fig. 8

Separator knives separate the lower record from the stack and the lower record drops to the turntable.

1. As the cycling slide reaches the limit in its movement in the direction of the pickup arm pivot, the stop dog mounted on the slide engages the rotating ratchet wheel (53).

2. The ratchet wheel and separator shaft (6) then remains stationary and the turntable continues to rotate.

3. The separator shelves and knives are coupled together in such a manner that the flattened end of the separator shaft pushes the knives out, which in turn pulls the opposite shelves in.

4. As the shelves recede, the separator knives mounted above the shelves move out and separate the lower record of the stack and support the remaining records while the lower record drops to the turntable.

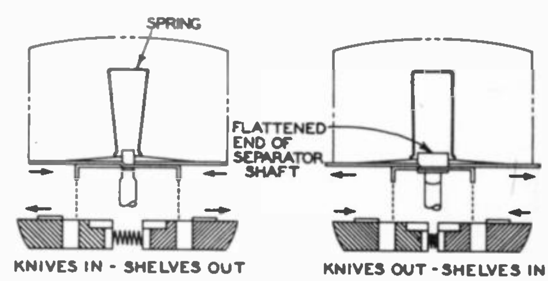


Fig. 9

Pickup moves in for landing.

1. The cycling slide moves away from the pickup arm pivot, due to the force produced by the tension spring (89) keeping the eccentric cycling cam against the rotating knurled roller (62). The knurled roller at this time is returning to the smaller diameter of the cam.

2. The stud on trip lever assembly follows the slide due to the force produced by the action of the pickup arm return lever.

3. After the slide has moved back a short distance the stud on the trip lever assembly no longer follows the slide since the landing adjustment stud comes against the curved stop on the end of the pickup arm return lever. At this moment the pickup is directly above the point of landing.

4. As the cycling slide completes the return movement the elevating rod slides down the incline which lowers the stylus on the record.

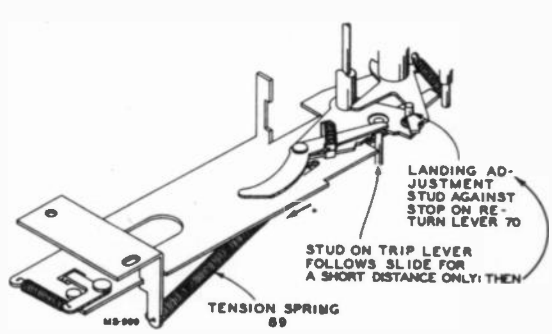


Fig. 10

Cycle of Operation—Continued

Cycle completed and the record plays.

1. The tab on the cycling slide contacts and opens the muting switch.
2. The stud on the cycling slide pushes pickup arm return lever back to permit free motion of the pickup arm.
3. The change cycle is completed as the cycling slide comes against the stop bracket, at which time the knurled roller rotates in the cut away section of the cam.
4. As the record plays and the pickup arm moves inward.
5. When the stylus reaches the end of the selection the end of the trip lever contacts the stud on the cycling cam, and pushes it slightly.
6. The slight movement of the cycling cam causes engagement with the rotating knurled roller, thereby starting a change cycle.
7. The mechanism repeats the preceding sequence of operations until the last record of the stack has dropped and has been played. This selection will be repeated until the pickup is lifted and placed on the rest.

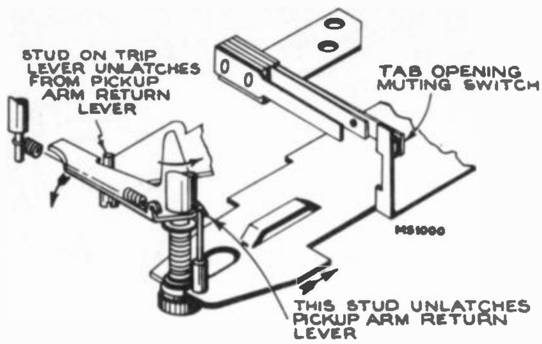


Fig. 11

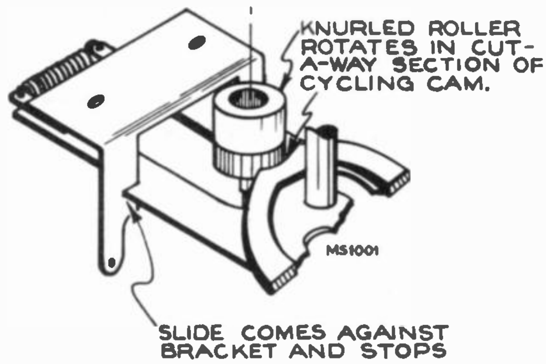


Fig. 12

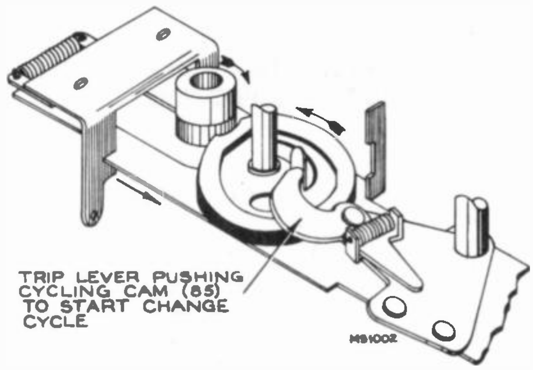


Fig. 13

DO YOU KNOW?

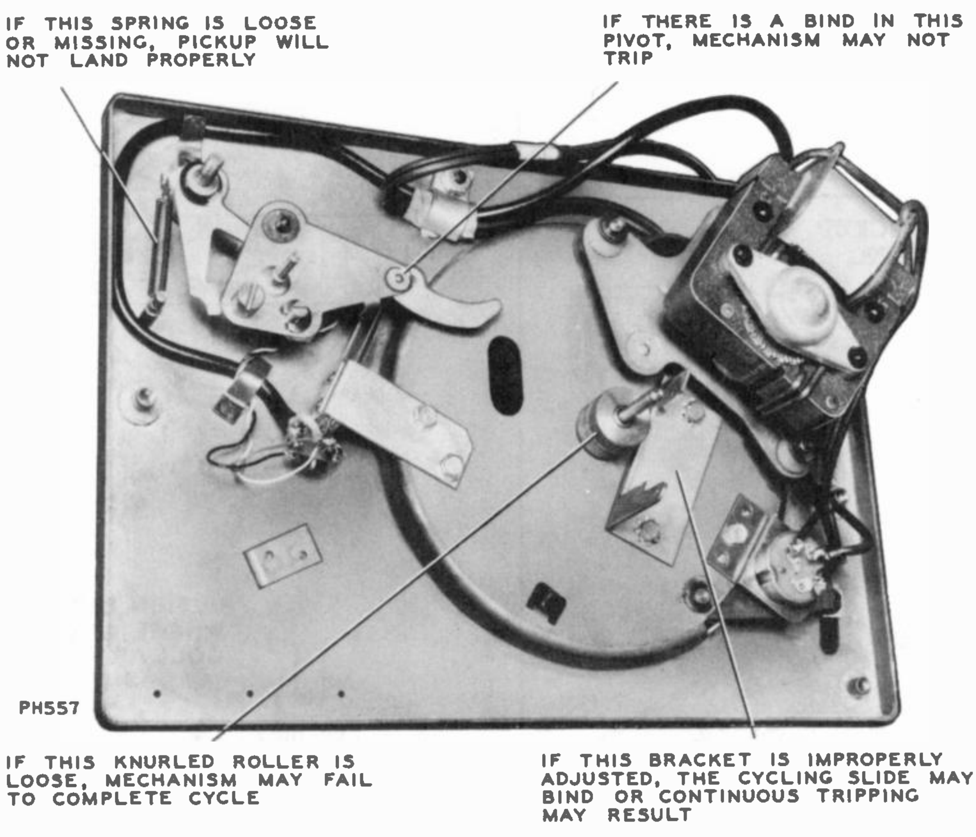


Fig. 14

DO YOU KNOW?—Continued

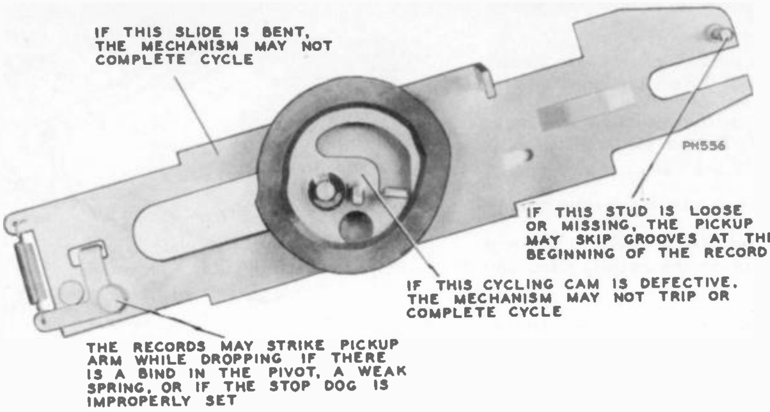
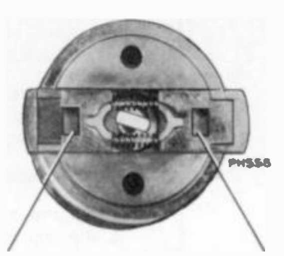


Fig. 15



IF THE SHELVES ARE GREASED, FOREIGN MATERIAL MAY COLLECT AND CAUSE BINDING. TENSION SPRINGS MAY NOT HAVE SUFFICIENT FORCE TO PUSH THE SHELVES OUT.

Fig. 16

SERVICE HINTS

REJECT CONTROL FAILS TO OPERATE

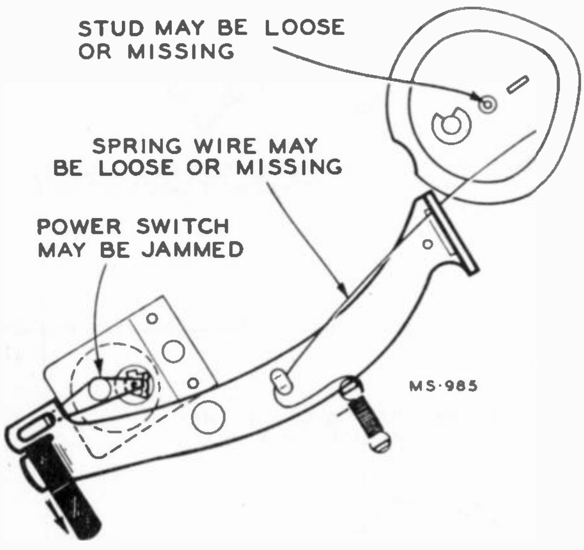
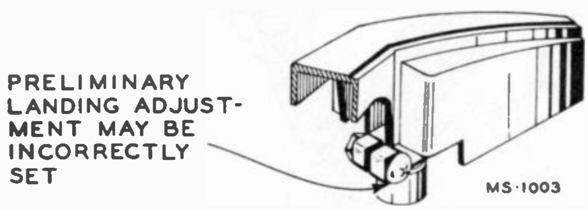


Fig. 17

RECORD STRIKES PICKUP ARM WHEN DROPPING



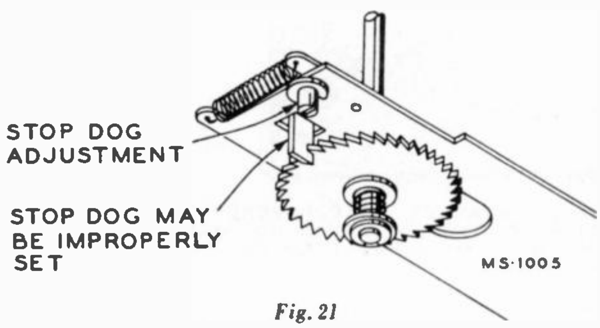


Fig. 21

MECHANISM FAILS TO SEPARATE RECORDS PROPERLY

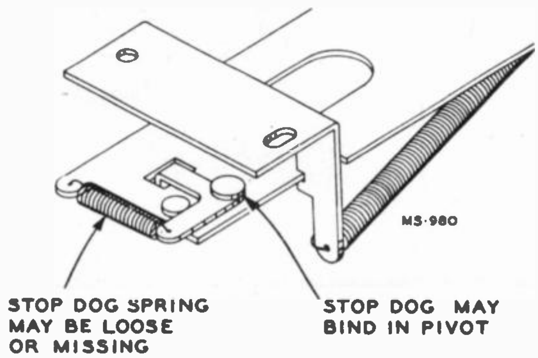


Fig. 18

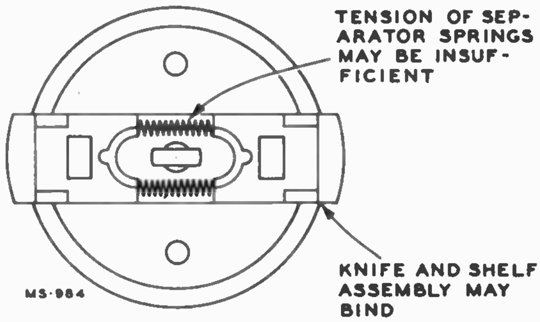


Fig. 19

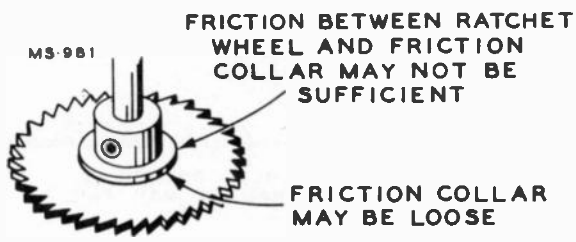


Fig. 20

PICKUP FAILS TO LAND PROPERLY

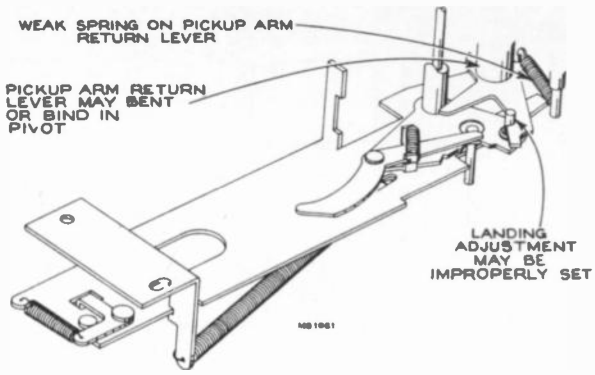


Fig. 22

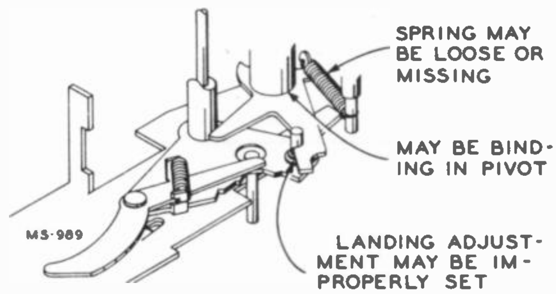


Fig. 23

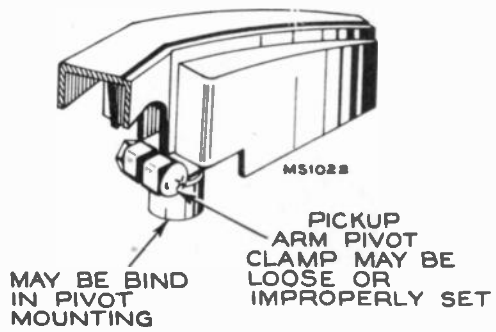


Fig. 24

DISTORTED OR NO OUTPUT

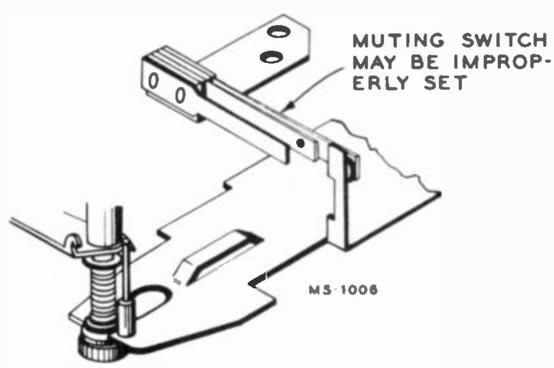


Fig. 28

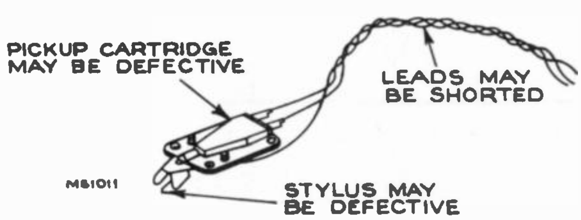


Fig. 29

PICKUP SKIPS GROOVES

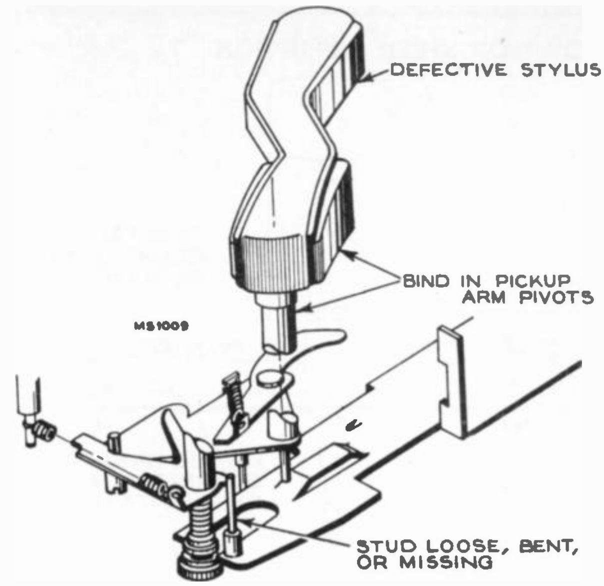


Fig. 25

MECHANISM FAILS TO TRIP

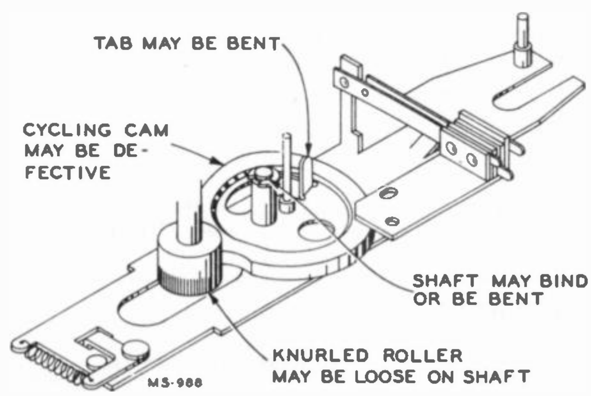


Fig. 26

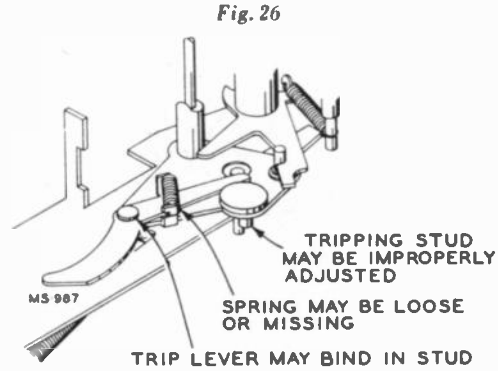


Fig. 27

PREMATURE TRIPPING

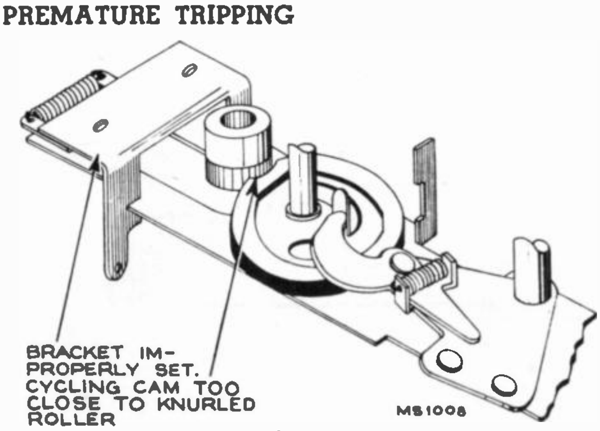


Fig. 30

"WOW" OR SPEED VARIATION

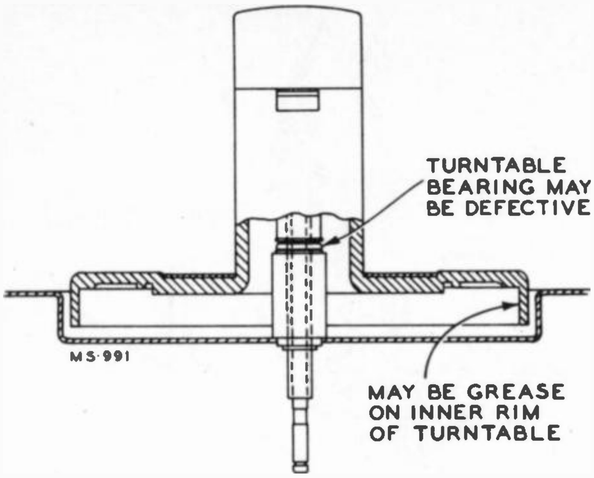


Fig. 31

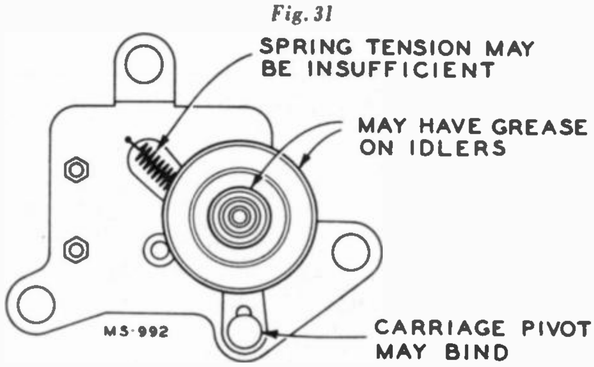


Fig. 32

CONTINUOUS TRIPPING

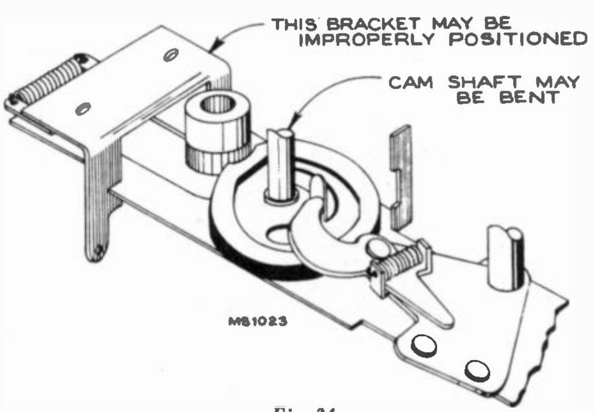


Fig. 34

RUMBLE

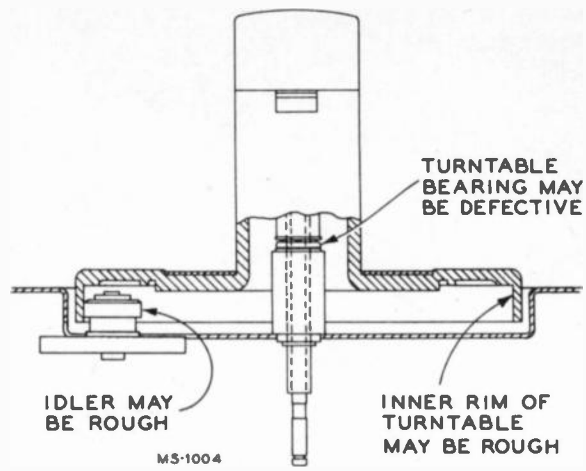


Fig. 33

MECHANISM FAILS TO COMPLETE CYCLE

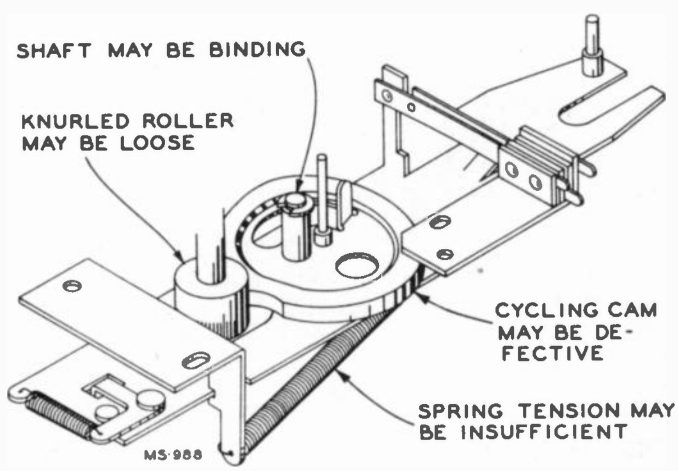


Fig. 35

ADJUSTMENTS

LANDING

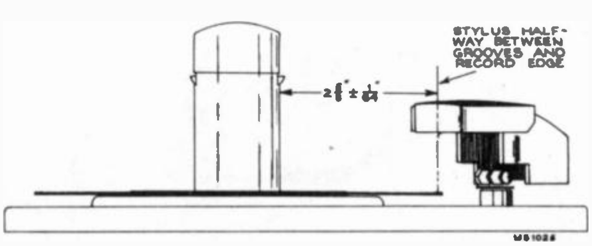


Fig. 36

TRIPPING

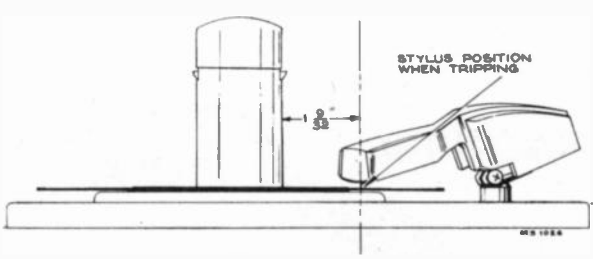


Fig. 37

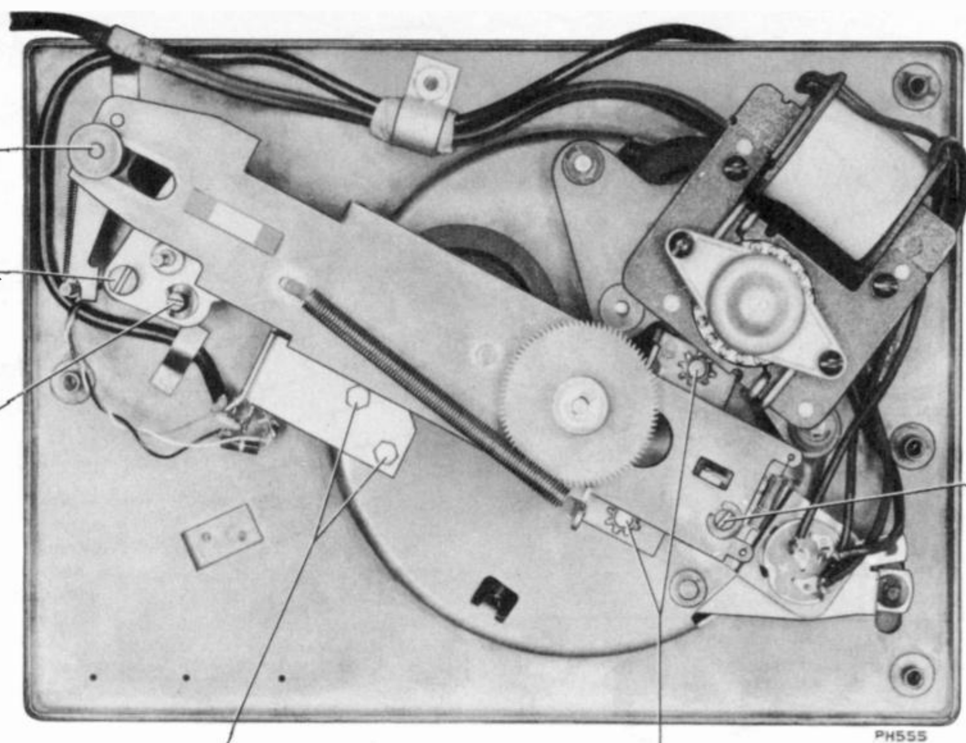


Fig. 38

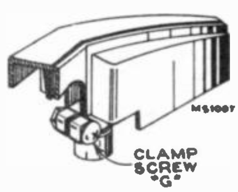


Fig. 39

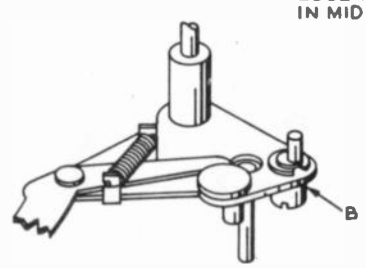


Fig. 40

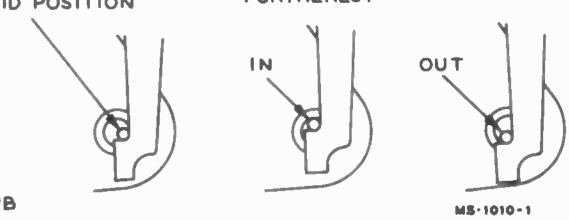


Fig. 41

Adjustments

Pickup Landing Adjustment:

Under ordinary conditions the landing adjustment is a screw-driver adjustment as shown. The adjustment of eccentric landing adjustment stud (B) gives approximately a ¼" movement. (See Figs. 38, 40.)

If, however, the pickup arm has been removed it is first necessary to make an approximate landing adjustment as follows:

1. With the mechanism out of cycle and the clamp screw (G) (Fig. 39) loose, place pickup arm on the rest and tighten clamp screw enough to prevent the clamp from slipping on the shaft.
2. Set the landing adjustment stud (B) as shown (mid-adjustment). (See Figs. 40, 41.)
3. With the power removed, push reject control to reject. Rotate turntable by hand in the correct direction until the pickup is about ready to land.
4. Loosen clamp screw (G) and move pickup arm so the stylus is approximately 2⅝" from side of centerpost. Tighten clamp screw. (See Figs. 36, 39.)
5. Exact landing adjustment can now be made by a screw-driver on stud (B). (See Fig. 38.)

Pickup Height Adjustment (See Fig. 38):

Adjust knurled nut (A) until the distance (during change cycle) between the top of the turntable and the stylus point is approximately 1⅛".

NOTE: If unable to adjust for sufficient height, it may be necessary to cut a few turns from the compression spring to allow more space on the shaft.

Tripping Adjustment (See Figs. 37, 38):

Adjust the eccentric tripping stud (C) until the mechanism trips when the stylus is 1 9/32" from the side of the centerpost.

Mounting Bracket Adjustment (See Fig. 38):

Loosen the two screws (F) and move the bracket so it is as near perpendicular to the slide as possible. Move back or forward until the cut away section of the cycling cam clears the knurled roller approximately 1/16". Tighten screws.

Muting Switch Adjustment (See Fig. 38):

Loosen the two screws (D) and adjust the position of the switch so the contacts are approximately 1/32 to 1/16 inches apart when the mechanism is out of cycle. If the mounting screws do not give sufficient adjustment, bend tab on slide slightly.

Stop Dog Adjustment (See Fig. 38):

Turn the eccentric screw (E) until the record drops to the turntable without striking the pickup arm.

RP-190 Series

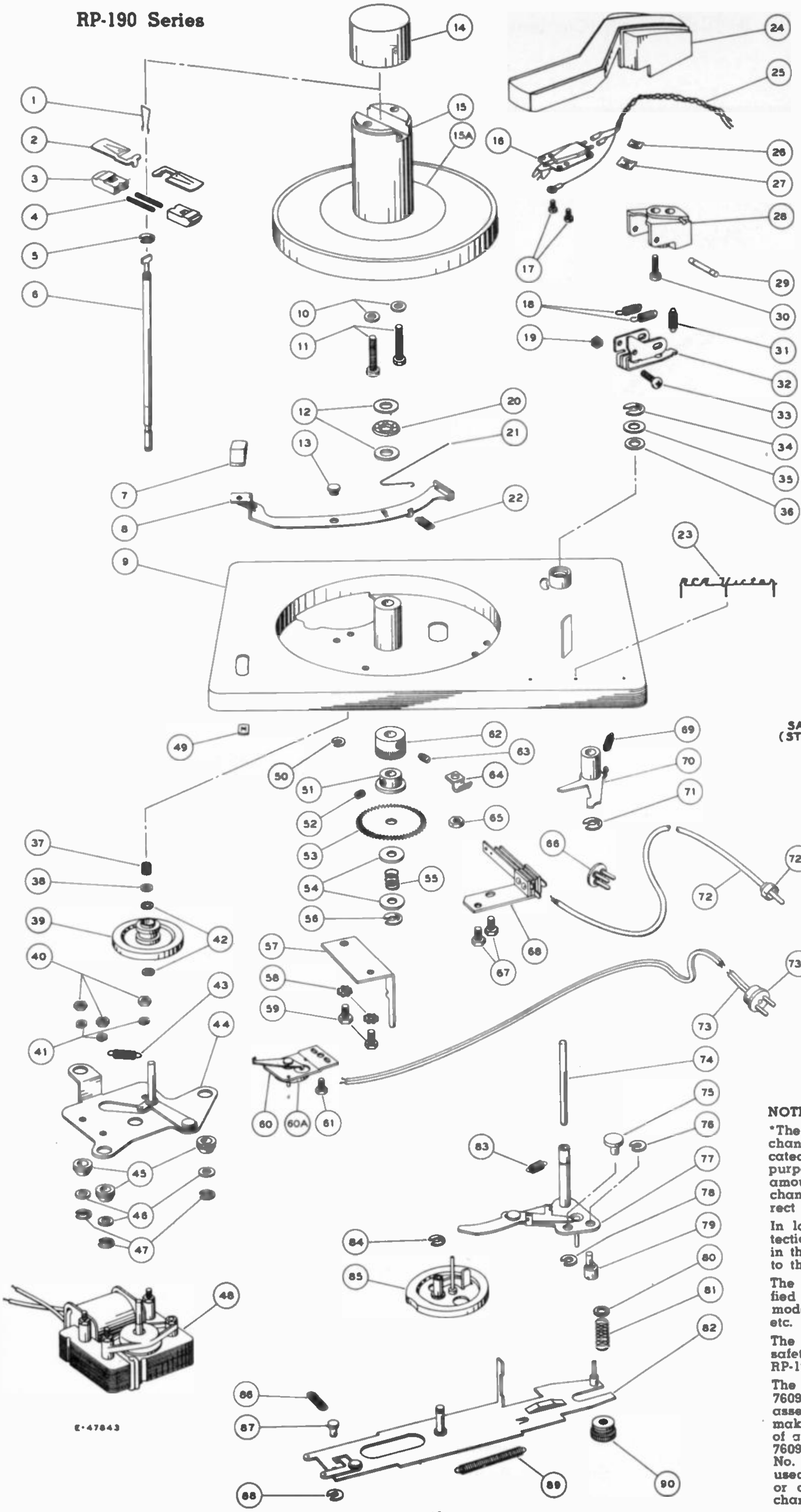
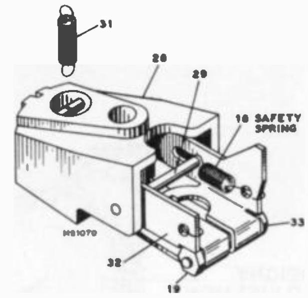
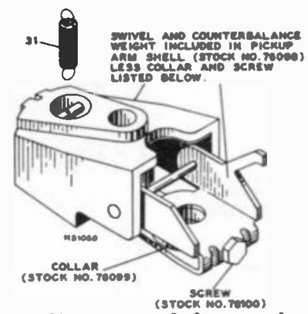


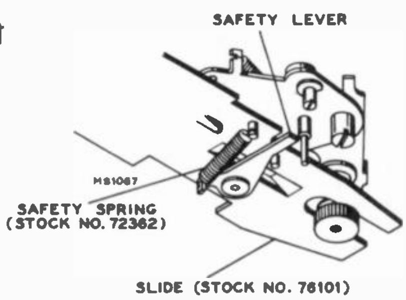
Fig. 42



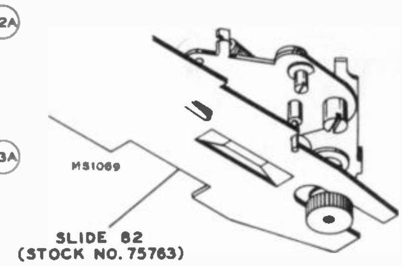
Original counterbalance and swivel assembly



New counterbalance and swivel assembly part of pickup arm



New cycling slide



Original cycling slide

NOTE:

*The original production of Model RP-190 record changer is provided with two safety springs located in the rear portion of the pickup arm. The purpose of these springs is to provide a limited amount of movement of the pickup arm during change cycle and continue to maintain the correct landing position.

In later production of the RP-190 the same protection is maintained by the removal of the springs in the pickup arm and adding a spring and lever to the cycling slide.

The models incorporating the change are identified by the addition of a small letter "a" to the model number. For example: RP-190-1a, RP-190-2a, etc.

The cycling slide Stock No. 76101 having the safety spring and lever can be used on any RP-190 mechanism.

The pickup arm and swivel assembly Stock No. 76098 has the swivel and counterbalance weight assembly cemented in the pickup arm shell. This makes it necessary to replace the entire assembly of arm, swivel, counterbalance weight (Stock No. 76098), collar (Stock No. 76099) and screw (Stock No. 76100) as a unit. This assembly should be used only in models marked with a small "a" or on models where the safety slide has been changed to the new type slide Stock No. 76101.

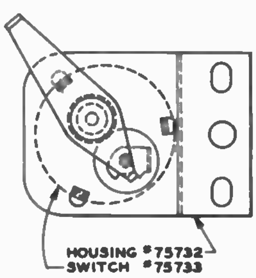
STOCK No.	ILL. No.	DESCRIPTION
74862	1	Spring—Spindle nose spring—formed
74864	2	Separator—Separator knife
74865	3	Shelf—Separator shelf
75756	4	Spring—Separator shelf return spring (.118" O.D. x ¾" — 16 turns)
33726	5	Washer—"C" washer to hold separator shaft and cam
75757	6	Shaft—Separator shaft with cam
75741	7	Knob—Control knob
75739	8	Lever—Reject lever complete with formed spring
75729	9	Board—Motorboard sub-assembly complete with welded and/or staked studs and rest
74869	10	Washer—No. 6 flat washer for under head of screws No. 75758
75758	11	Screw—No. 6-32 x 1" fillister head machine screw (holds nose to spindle)
74080	12	Washer—Thrust bearing washer
75748	13	Stud—Reject lever mounting stud
75755	14	Cap—Spindle nose cap—red
75753	15	Turntable—Turntable and shaft assembly complete with finished disc
75754	15A	Disc—Finished disc for turntable — part of No. 75753
74067	16	Pickup—Crystal pickup cartridge complete with stylus (RMP 128-1) for RP-190-1, -3, -4 and -6
75575	16	Pickup—Crystal pickup cartridge complete with stylus (RMP 128-4) for RP-190-2
76297	16	Pickup—Ceramic pickup cartridge complete with stylus for RP-190-5
74069	16A	Guard—Stylus guard for No. 74067 pickup
74819	16A	Guard—Stylus guard for No. 75575 pickup
74065	16B	Screw—No. 2-56 x 3/16" fillister head screw to mount No. 74069 or No. 74819 guard
74068	16C	Stylus—Replacement stylus and holder for No. 74067 pickup
75770	16C	Stylus—Replacement stylus and holder for No. 75575 pickup
74985	16C	Stylus—Replacement stylus for No. 76297 pickup
74230	16D	Nut—Nut and washer to mount No. 74068 or No. 75770 stylus
75722	17	Screw—No. 4 x ¼" fillister head screw to mount pickup
*75727	18	Spring—Shock absorbing spring (.187" O.D. x ¾") (see note)
*75725	19	Nut—No. 8-32 hex nut to mount pickup arm (see note)
72349	20	Bearing—Thrust bearing
75740	21	Spring—Reject lever spring (formed), part of reject lever
75742	22	Spring—Reject lever return spring (.180" O.D. x .535" — 21½ turns)
74782	23	Emblem—"RCA Victor" emblem
*75719	24	Arm—Pickup arm shell only (see note)
76098	24	Arm—Pickup arm (late type) complete with counterbalance, swivel and pin — less collar, pickup and cable (see note)
76099	24A	Collar—Pickup arm pivot shaft collar—less screw—for No. 76098 pickup arm (late type)
75728	25	Cable—3-wire twisted pickup arm cable complete with connectors for all models using crystal pickups
76298	25	Cable—3-wire twisted pickup arm cable complete with connectors for RP-190-5 using ceramic pickup
71095	26	Nut—Speed nut for cable—in rear of arm
72765	27	Nut—Speed nut for cable—in center of arm
*75721	28	Weight—Counterbalance weight—die cast (see note)
*75724	29	Pin—Pin for anchoring shock absorbing springs (see note)
*75723	30	Screw—No. 6 x 11/16" fillister head screw to fasten counterbalance (see note)
75886	31	Spring—Counterbalance spring (.180" O.D. x .600" — 30 turns for all models using crystal pickups
74060	31	Spring—Counterbalance spring (.171" O.D. x .695" — 43 turns for RP-190-5 using ceramic pickup
*75720	32	Swivel—Pickup arm swivel (see note)
*75726	33	Screw—No. 8-32 x ⅝" cross recessed pan head machine screw to mount pickup arm swivel No. 75720
76100	33	Screw—No. 6-32 x ¼" hex head machine screw for pivot shaft collar No. 76099
35969	34	Washer—"C" washer to mount trip lever
75752	35	Washer—Steel thrust washer
76005	36	Washer—Bearing washer for tone arm
74870	37	Retainer—Idler wheel retainer (spring sleeve type)
75887	38	Washer—Spring washer for idler wheel
74077	39	Wheel—Idler wheel
——	40	Nut—No. 6-32 hex nut for mounting motor to idler lever plate assembly
——	41	Lockwasher—No. 6 split lockwasher for No. 6-32 hex nut
74078	42	Washer—Dampening washer for idler wheel
75762	43	Spring—Idler wheel tension spring (.195" O.D. x 29/32" — 37½ turns)
75759	44	Plate—Motor mounting plate complete with idler lever
75761	45	Grommet—Rubber grommet for motor mounting plate
75749	46	Washer—Flat washer—metal (.0299" x .190" I.D. x ⅜" O.D.)—for mounting motor
33726	47	Washer—"C" washer to mount motor assembly

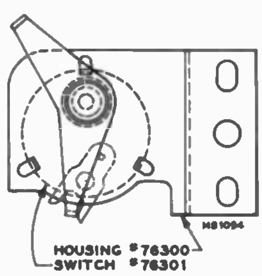
*SEE NOTE ON PAGE 10.

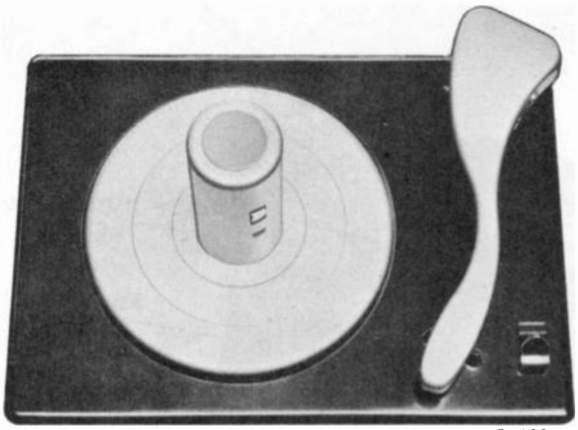
REPLACEMENT PARTS—Continued

STOCK No.	ILL. No.	DESCRIPTION
75760	48	Motor—117 volt, 60 cycle motor for all models except RP-190-3 and RP-190-5
75937	48	Motor—85 volt, 60 cycle motor for RP-190-3 (used in some Model 45-EY-3)
76299	48	Motor—117 volt, 60 cycle motor for RP-190-5 (less conversion spring)
76302	—	Spring—Conversion spring sleeve (60 to 50 cycle) for use on No. 76299 motor in RP-190-5
74212	49	Nut—Control knob speed nut
74431	50	Washer—Spring washer to mount reject lever mounting stud
75736	51	Collar—Friction collar
14974	52	Screw—No. 8-32 x 3/16" hex socket head—cup point—for friction collar
75738	53	Wheel—Ratchet wheel
75750	54	Washer—Flat washer—metal (.0299" x .180" I.D. x 9/16" O.D.)—for ratchet wheel, thrust spring
75743	55	Spring—Ratchet wheel thrust spring (5/16" O.D. x 7/16"—5½ turns)
33726	56	Washer—"C" washer to mount ratchet wheel
75735	57	Bracket—Mounting bracket for slide assembly
——	58	Lockwasher—No. 8 external teeth lockwasher for cycling slide mounting bracket
74670	59	Screw—No. 8 x ⅜" self-tapping hex head screw to mount slide assembly bracket
75732	60	Housing—"On-Off" switch housing and lever —less switch (for RP-190-1, -2 and -3)
76300	60	Housing—"On-Off" switch housing and lever —less switch (for RP-190-4, -5 and -6)
75733	60A	Switch—"On-Off" switch—less housing (for RP-190-1, -2 and -3)
76301	60A	Switch—"On-Off" switch—less housing (for RP-190-4, -5 and -6)
——	61	Screw—No. 8 x ¼" self-tapping hex head screw to mount "On-Off" switch
75737	62	Roller—Knurled roller
75751	63	Screw—No. 10-32 x 17/64" headless set screw—dog point—for knurled roller
——	64	Clamp—Cable clamp for audio cable
——	65	Nut—No. 8-32 hex nut to fasten cable clamp ILL. 64
74192	66	Connector—3 contact male connector for audio cable
——	67	Same as 61
75730	68	Switch—Muting switch
76004	69	Spring—Pickup arm return lever spring (.195" O.D. x 1¼"—69 turns)
75734	70	Lever—Return lever
35969	71	Washer—"C" washer to mount return lever
——	72	Cable—Shielded audio cable (see Service Data for various instruments)
31048	72A	Plug—Pin plug for audio cable
——	73	Power cord (see Service Data for various instruments)
30870	73A	Connector—2 contact male connector for power cable
75731	74	Rod—Elevating rod
75768	75	Stud—Tripping adjustment stud
74431	76	Washer—Spring washer for adjusting studs
75767	77	Lever—Trip lever assembly—less spring and tripping and landing adjustment studs
74431	78	Washer—Spring washer for adjusting studs
75769	79	Stud—Landing adjustment stud
75749	80	Washer—Flat washer—metal (.0299" x .190" I.D. x ⅜" O.D.)—to mount sub-motorboard
75746	81	Spring—Height adjustment spring (.262" O.D. x 13/16"—8 turns)
*75763	82	Slide—Cycling slide assembly complete with stop dog—less cam wheel and stop dog adjusting stud (see note)
76101	82	Slide—Cycling slide (late type) complete with stop dog and safety lever—less cam wheel, safety spring, stop dog spring and stop dog adjusting stud
——	82A	Dog—Stop dog—part of Item 82
72362	82B	Spring—Safety lever actuating spring (.242" O.D. x 1"—19½ turns) for slide No. 76101
75742	83	Spring—Trip lever spring (.180" O.D. x .535" —21½ turns)
33726	84	Washer—"C" washer for cam wheel
75764	85	Wheel—Cam wheel and tire
75765	86	Spring—Stop dog tension spring (.195" O.D. x 11/16"—24½ turns)
75786	87	Stud—Adjusting stud for stop dog
74431	88	Washer—Spring washer for stop dog adjusting stud
75744	89	Spring—Slide assembly return spring (¼" O.D. x 2 23/32"—90 turns)
75747	90	Nut—Knurled nut for height adjustment

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS







RCA VICTOR

RP-193-1

45 R.P.M. Automatic Record Changer

SERVICE DATA

—1950 No. 29—

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

The RP193-1 record changer is designed to play and change automatically twelve of the new RCA type seven inch fine groove 45 r.p.m. phonograph records.

SPECIFICATIONS

Turntable speed	**45 r.p.m.**
Records used	**RCA type seven-inch fine groove**
Record capacity	**12 records**
Pickup force	**Approx. 5 grams**
Stylus tip radius	**.001 inch**
Power supply	**105-125 volts, 60 cycle, a.c.**

LUBRICATION

A light machine oil (Singer Sewing Machine Oil) or equivalent, should be used to oil the bearings of the drive motor and the following:

- Idler Carriage.
- Pickup Arm Pivot Bearing.
- Top & Bottom Turntable Shaft Bearings.

Houghton STA-PUT No. 512 or equivalent grease should be used on the following:

- Ball beaing on bottom end of turntable shaft.
- Cycling cam shaft.
- Points of contact on reject slide assembly.
- Cam tracks where the following parts contact.
- Elevating rod, pickup arm lever and inclined edge where pinion gear rides.
- All gear teeth.
- Surfaces where pinion gear drive keys contact shelf and blade assemblies.

Houghton STA-PUT No. 320 can be used on the pinion gear shaft. (However, if available a graphite grease is highly recommended.)

(Do not oil or grease record separator shelves.)

It is important that the drive motor spindle and the rubber tire on the idler wheel be kept clean and free from oil and grease, dirt, or any foreign material at all times. Carbon tetrachloride or naphtha is satisfactory for cleaning those parts.

STA-PUT can be purchased from E. F. Houghton & Company, 303 W. Lehigh Avenue, Philadelphia, Pa.

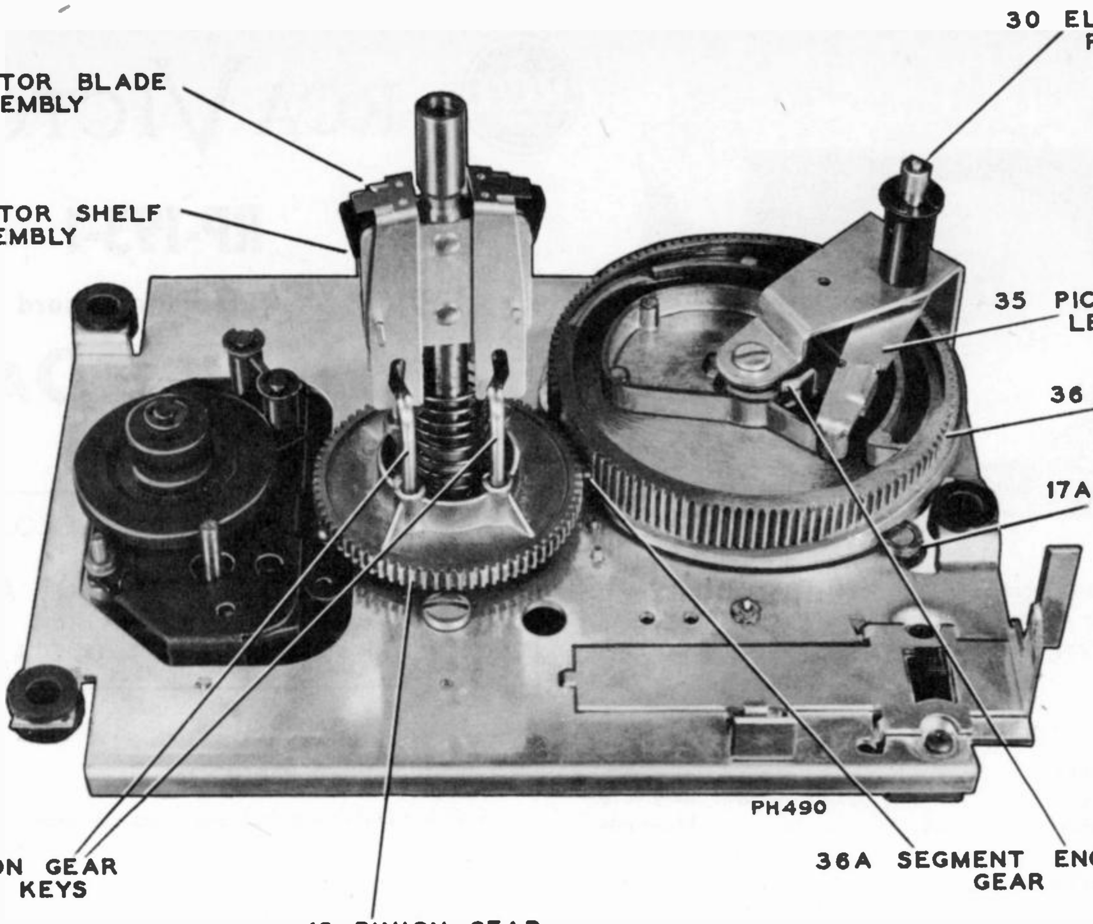
CAUTION

1. Avoid handling the pickup arm when the mechanism is in cycle.
2. Do not use force to release a jam.
3. Do not try to remove the records on the turntable if the turntable is stopped in cycle with separator blades exposed.

AUTOMATIC OPERATION

1. Place a stack of records over the center post, with the desired selections upward, the last record to be played on top.
2. Push the "start-reject" knob toward the back of the cabinet and let go. The mechanism will automatically play in sequence one side of each record stacked on the separator shelves.
3. To reject a record being played, push the "start-reject" knob toward the back of the cabinet.
4. At conclusion of playing and as the last record is being repeated, lift the pickup arm and place on its rest. Turn off the power to the drive motor by pulling forward on control knob.
5. Remove the stack of records by lifting them straight up.

TABLE OF CONTENTS



Function of Principal Parts

Pickup Arm Lever (35)

The function of the pickup arm lever is to direct the horizontal movement of the pickup arm during change cycle. This is accomplished as the end of the pickup arm lever rides in the channel molded in the cycling cam. Later, as the mechanism is playing, the pickup arm lever follows the movement of the pickup arm until the pickup arm lever contacts and moves the segment engagement gear, thus tripping the mechanism.

Pinion Gear (13)

The function of the pinion gear is to mount the pinion gear drive keys and transfer the rotating motion of the turntable to the cycling cam during change cycle.

Pinion Gear Drive Keys (13A)

The function of the drive keys mounted on the pinion gear is to actuate the separator mechanism inside the centerpost as they raise and lower with the pinion gear.

Segment Engagement Gear and Lever Assembly (36A)

The segment engagement gear is mounted on the underside of the cycling cam. During the playing time the segment engagement gear is receded. As the mechanism is tripped the segment gear is extended, thereby making a momentary contact with the rotating pinion gear. This contact provides the movement to start the cycling cam rotating and carry the mechanism through change cycle.

Cycling Cam (36)

The function of the cycling cam and its molded channels is to direct the movement of the pickup arm and the separator mechanism during change cycle.

Detent Lever (17A)

The function of the detent lever is to engage the depression in the side of the cycling cam, and stabilize the cycling cam in the out of cycle position.

ADJUSTMENTS

PICKUP ARM HEIGHT

Loosen the screw marked ("A") on back of the pickup arm and adjust so the pickup will clear a stack of twelve records. Raising the screw in the elongated hole raises the pickup arm, lowering the screw lowers the pickup arm.

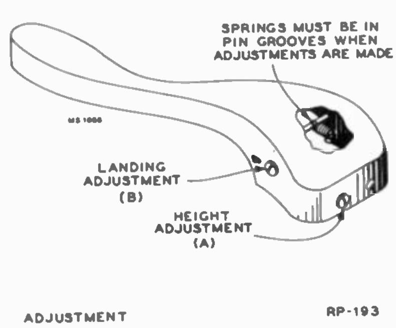
PICKUP-LANDING ADJUSTMENT

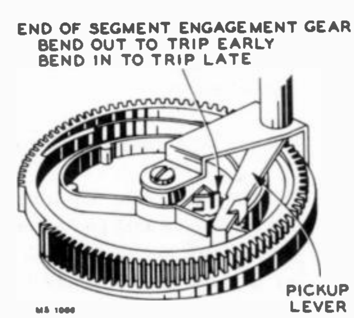
Loosen screw marked ("B") and slide the mounting bracket forward to move the landing point away from the centerpost, and back to move the landing point inward.

NOTE: Before making the adjustment, make certain the safety springs (26) are in the pin grooves.

TRIPPING ADJUSTMENT

If mechanism fails to trip when the stylus is approximately $1\frac{9}{32}$" from the side of the centerpost, bend the end of the segment engagement lever (indicated in drawing at right) out for early tripping and in for late tripping.

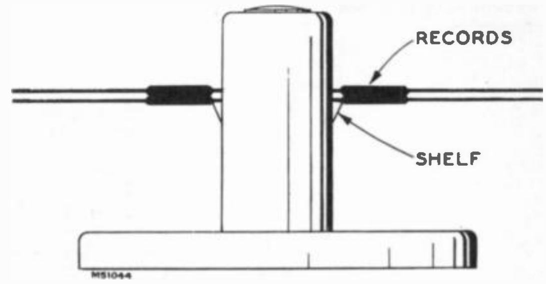




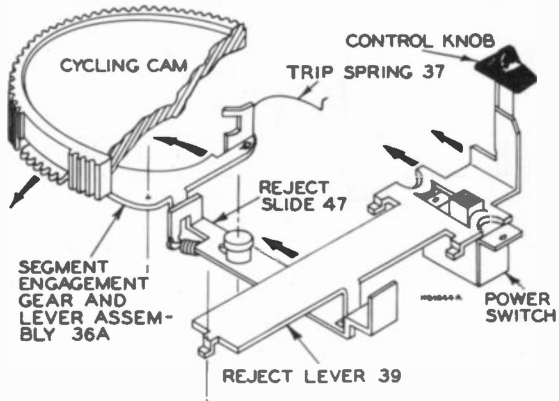
Note:
If spacing between separator blades and separator shelves do not fall between .040 to .048" bend blades accordingly.

Cycle of Operation

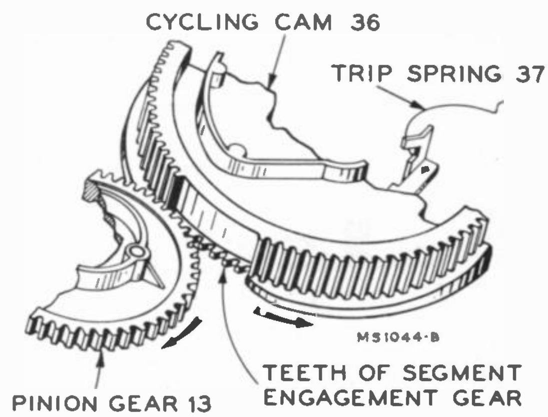
FUNCTION	EXPLANATION
Place a stack of records over the centerpost.	1. Records rest on separator shelves protruding from either side of the centerpost.



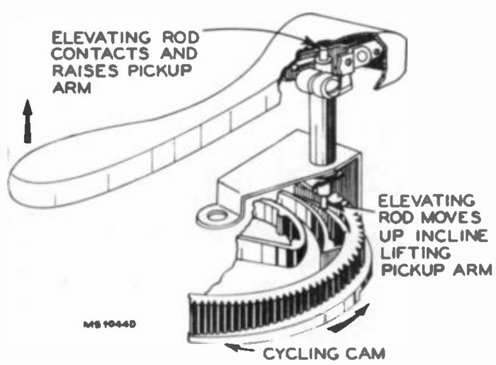
FUNCTION	EXPLANATION
Push control knob to reject and release.	1. The control first actuates the power switch applying power to the drive motor. This action starts the turntable rotating. 2. Further movement of the control knob causes the reject lever (39) to move the reject slide (47) sufficiently, for engagement with the end of the segment engagement gear and lever assembly (36A). This movement through the train of levers trips the mechanism.

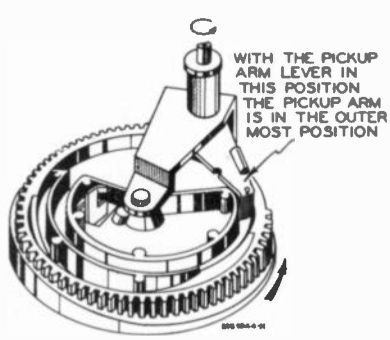


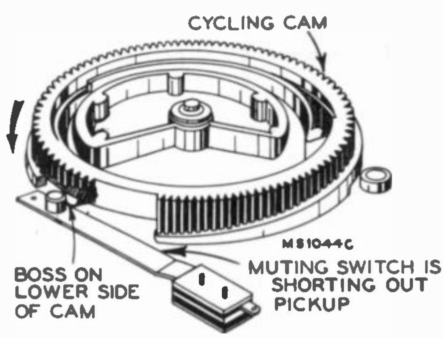
FUNCTION	EXPLANATION
Cycling starts.	1. As the reject slide moves the segment engagement gear slightly, the segment gear snaps outward due to the action of trip spring (37). 2. After the segment engagement gear has snapped out, the rotating pinion gear (13) engages the teeth of the segment gear and gives a slight rotary motion to the cycling cam (36). This slight rotary motion causes the teeth of the pinion gear and the teeth of the cycling gear to engage, thus starting change cycle.



FUNCTION	EXPLANATION
Pickup raises from the rest and moves out.	1. As the cycling gear starts rotating the pin on the muting switch moves off the boss on the gear permitting the switch to short out the pickup. 2. The elevating rod (30) rides up the incline surface of the track on the cycling cam, causing the pickup to raise from the rest. 3. As the cycling cam continues to rotate the turned down end of the pickup arm lever (35) follows the channel moulded in the cycling cam and swings the pickup arm out clear of the records.



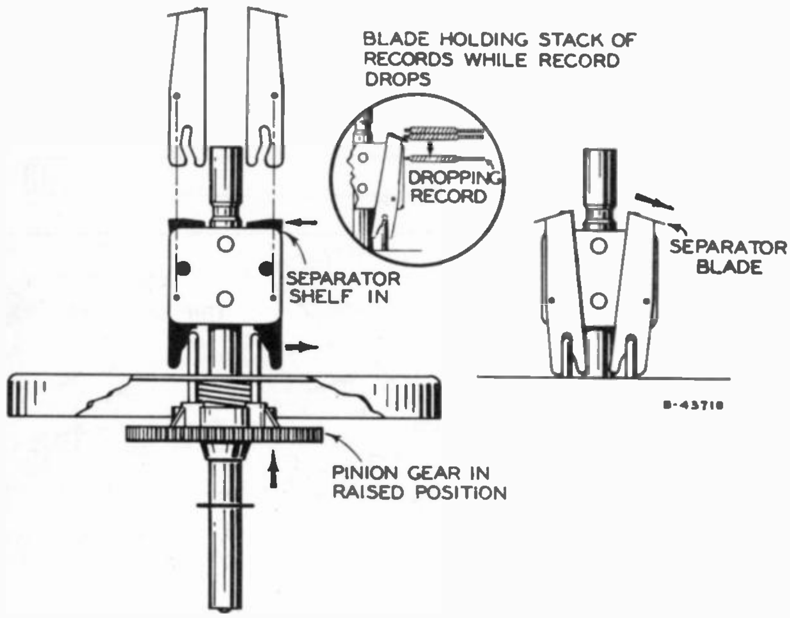


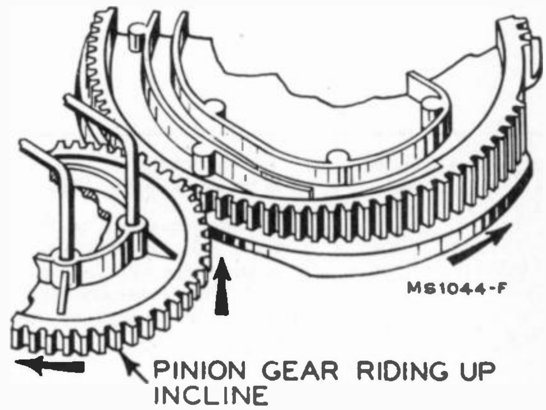


Separator blades separate the lower record from the stack and the lower record drops to the turntable.

1. An instant after the pickup arm has started to raise the rotating pinion gear (13) starts to raise also. This is due to the lower edge of the gear riding up the spiral incline formed on the edge of the cycling cam.

2. The raising of the pinion gear and key assembly actuates the separating mechanism inside the centerpost. This action causes the support shelves to recede and the separator blades to move out to select the lower record of the stack and to support the remaining records while the bottom record drops to the turntable.





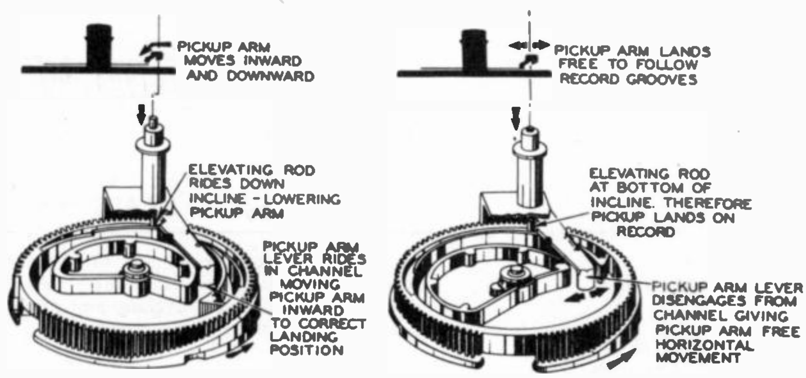
Pickup moves in for landing.

1. As the mechanism nears the end of the change cycle, the end of the segment engagement gear extending from the top of the rotating cycling gear comes against the mounting bracket. This contact resets the segment engagement gear preventing continuous cycling.

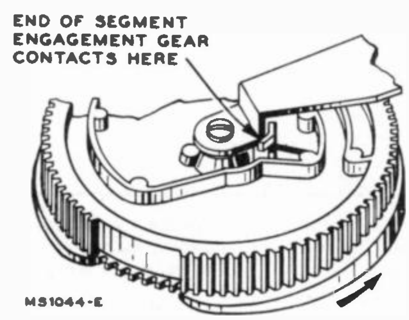
2. The end of the pickup arm lever riding in the channel in the cycling gear, moves the pickup arm in for landing.

3. The pickup lands on the start of the record as the elevating rod rides down the incline on the cycling gear.

4. At this very moment the end of the pickup arm lever moves into the open portion of the cycling cam track. This gives free movement to the pickup arm as it moves across the record.

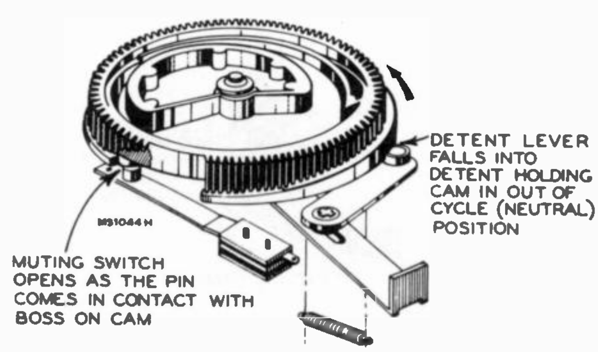


RP 193 - CYCLE OF OPERATION — PICKUP LANDS

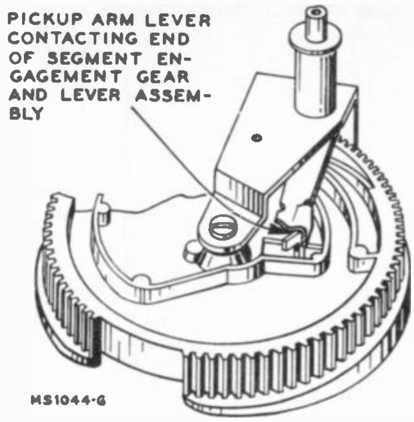


Cycling completed and the record plays.

1. The detent lever (17A) snaps the cycling cam into a neutral position as the muting switch pin comes in contact with the boss on the cam. This completes the change cycle.

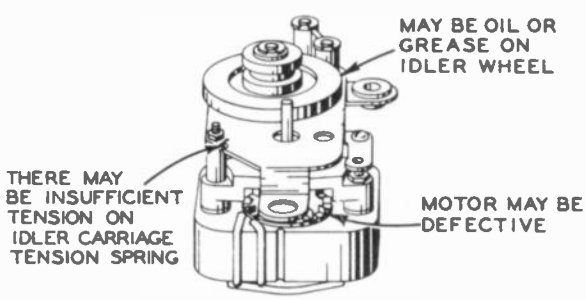


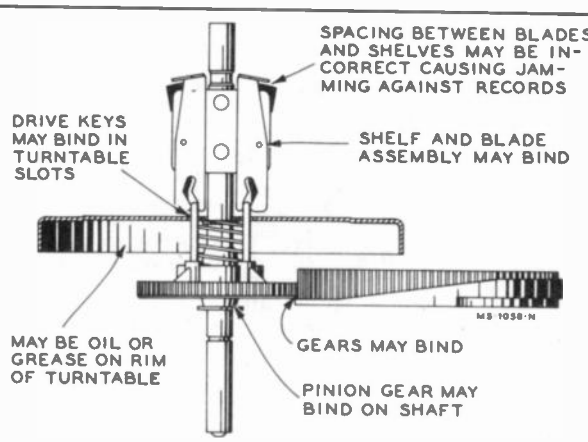
2. As the record plays, the pickup moves inward.
3. When the stylus reaches the end of the selection, the side of the pickup arm lever (35) contacts and trips the segment engagement gear and a new change cycle is started.
4. The mechanism repeats the preceding sequence of operations until the last record of the stack has dropped to the turntable and has been played.
5. The last record will be repeated until the pickup is lifted and placed on the rest.



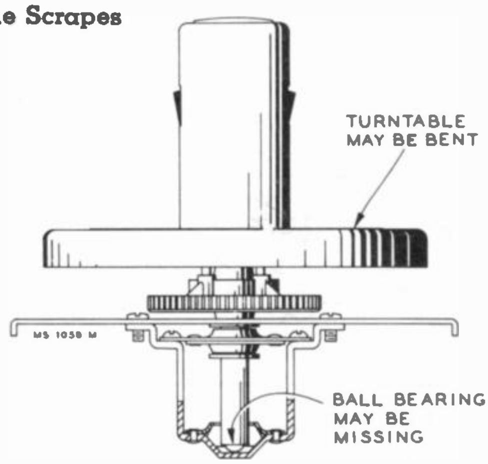
SERVICE HINTS

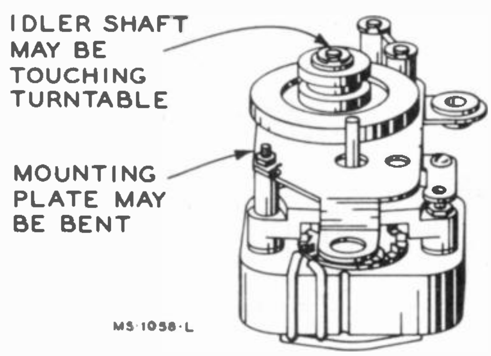
Stalling During Change Cycle



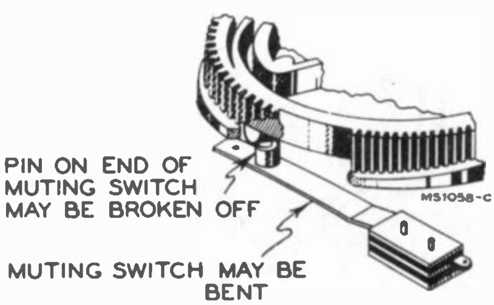


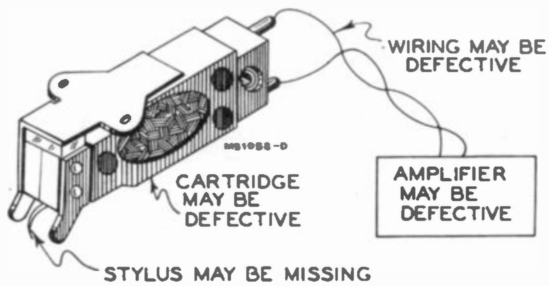
Turntable Scrapes



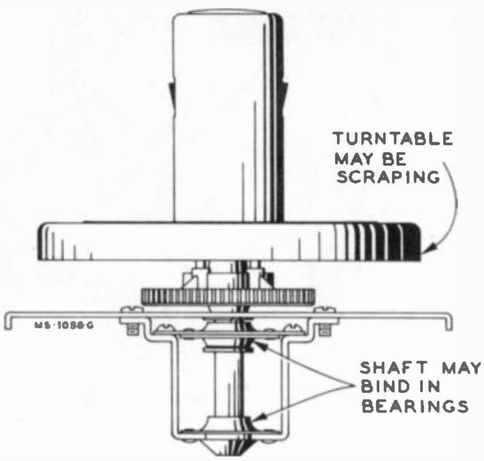


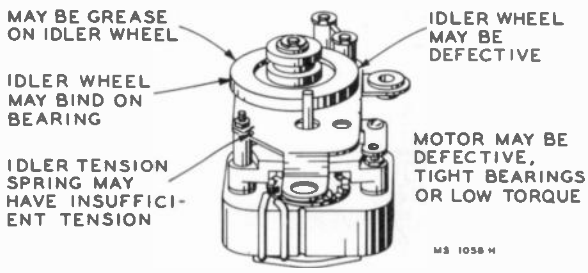
No Output From Instrument



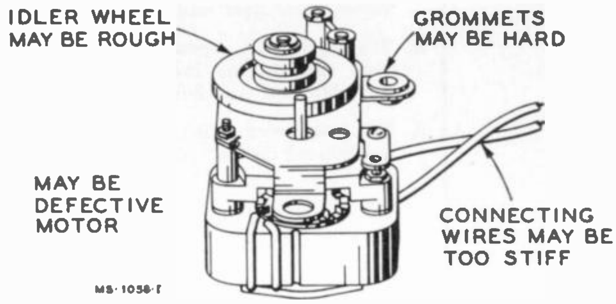


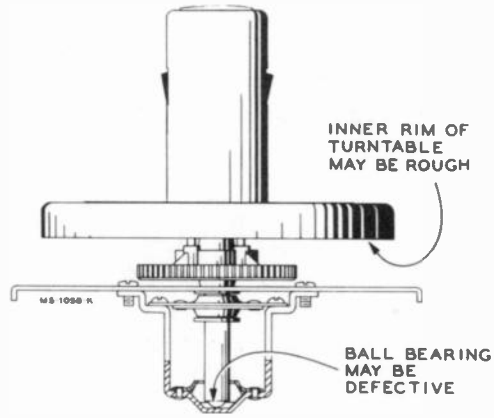
"WOW" OR SPEED VARIATION



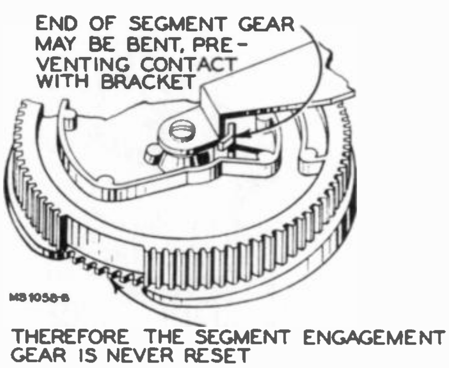


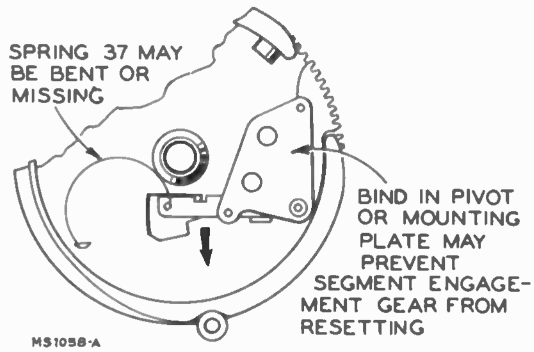
RUMBLE

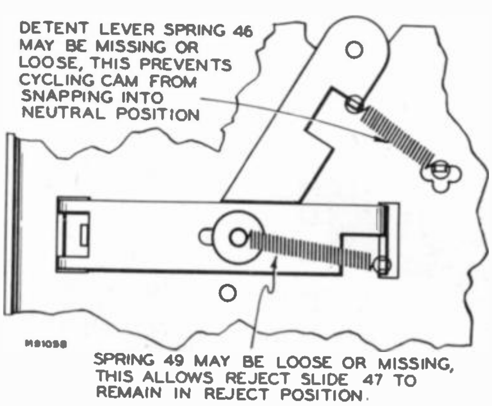




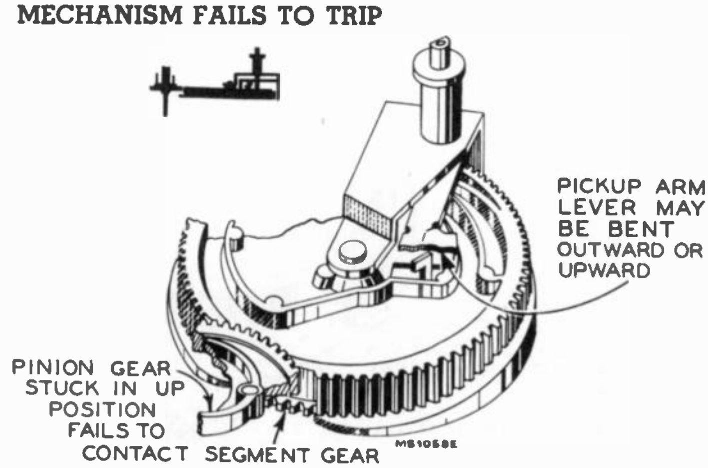
CONTINUOUS TRIPPING



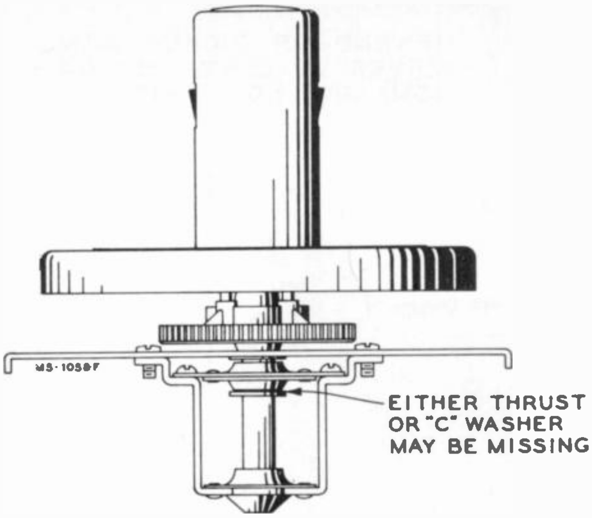




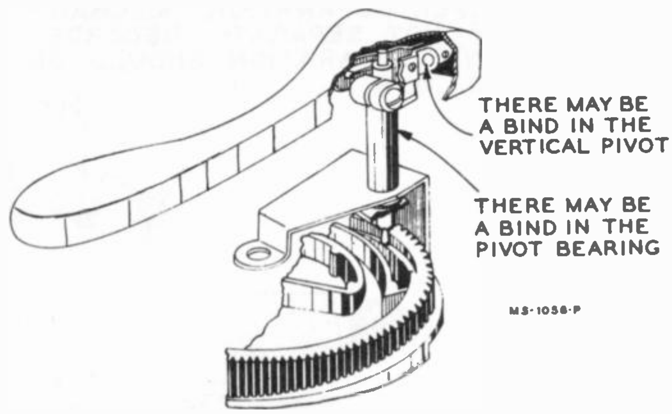
MECHANISM FAILS TO TRIP



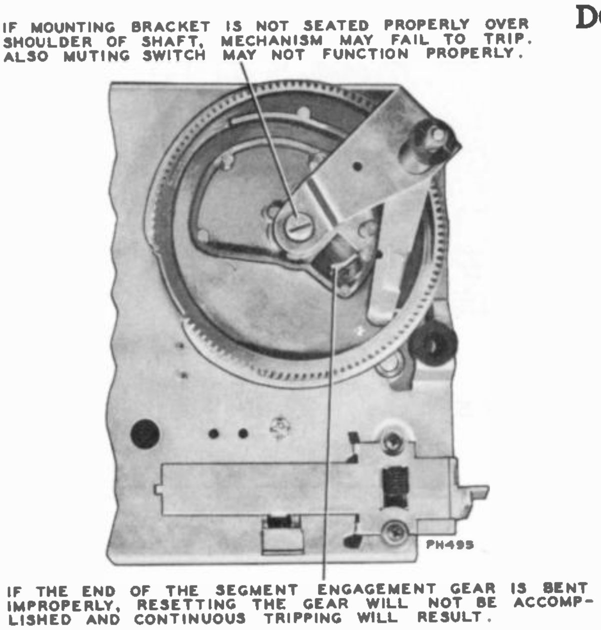
TURNTABLE RAISES DURING CHANGE CYCLE

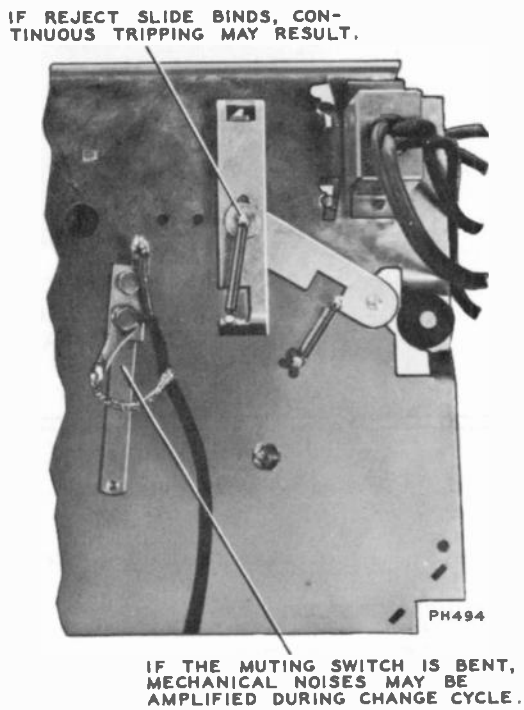


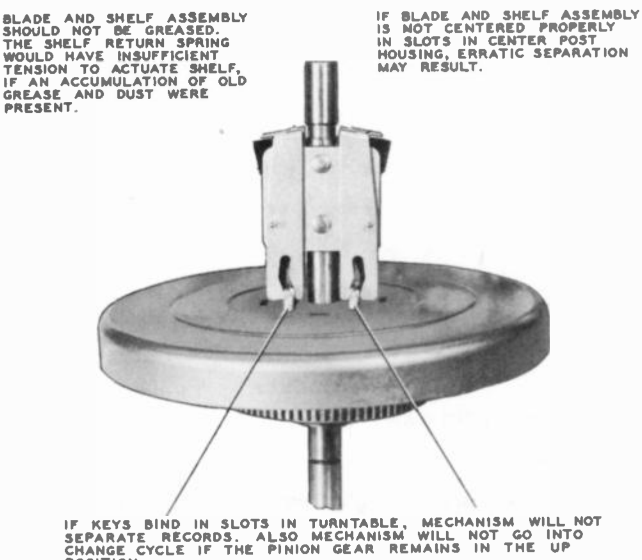
PICKUP SKIPS GROOVES

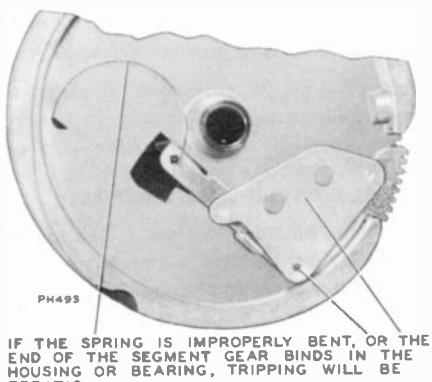


DO YOU KNOW?

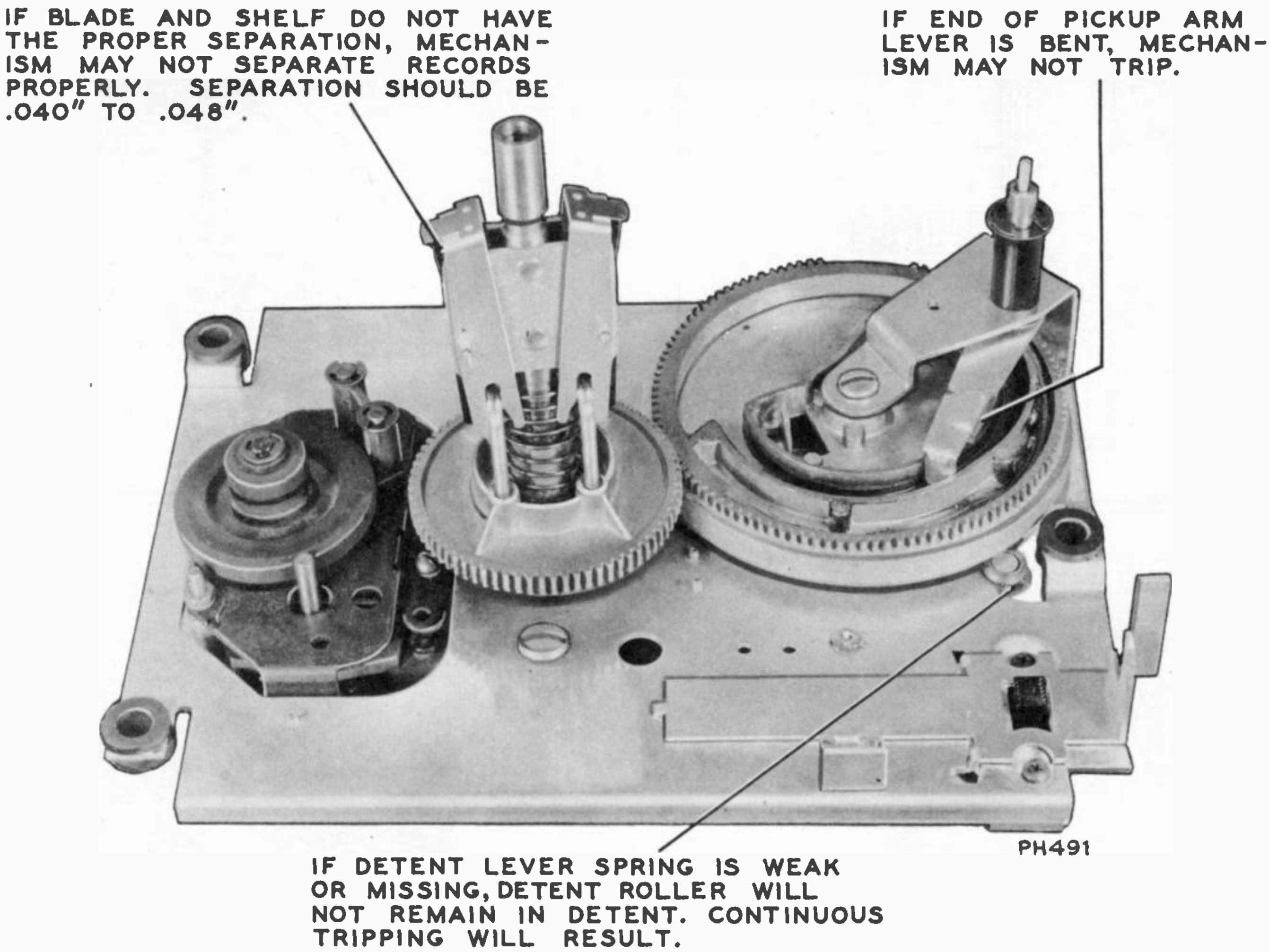








DO YOU KNOW? (Continued)



DISMANTLING MECHANISM

(Refer to exploded view on opposite page)

REMOVAL OF PICKUP ARM

1. Disconnect pickup wires.
2. Loosen clamp screw 28.
3. Lift pickup arm straight up.

REMOVAL OF PICKUP ARM SWIVEL (BRACKET)

1. Remove landing adjustment screw 22.
2. Push pivot pin 25 away from the slotted side of the pickup arm shell, bend shell slightly to remove pin and entire swivel assembly will slide out.

REMOVAL OF TURNTABLE ASSEMBLY

1. The entire turntable and pinion gear assembly (Nos. 1 to 40 inclusive) can be lifted out by removing the "C" washer 40 located below the upper turntable bearing.

DISMANTLING THE TURNTABLE ASSEMBLY

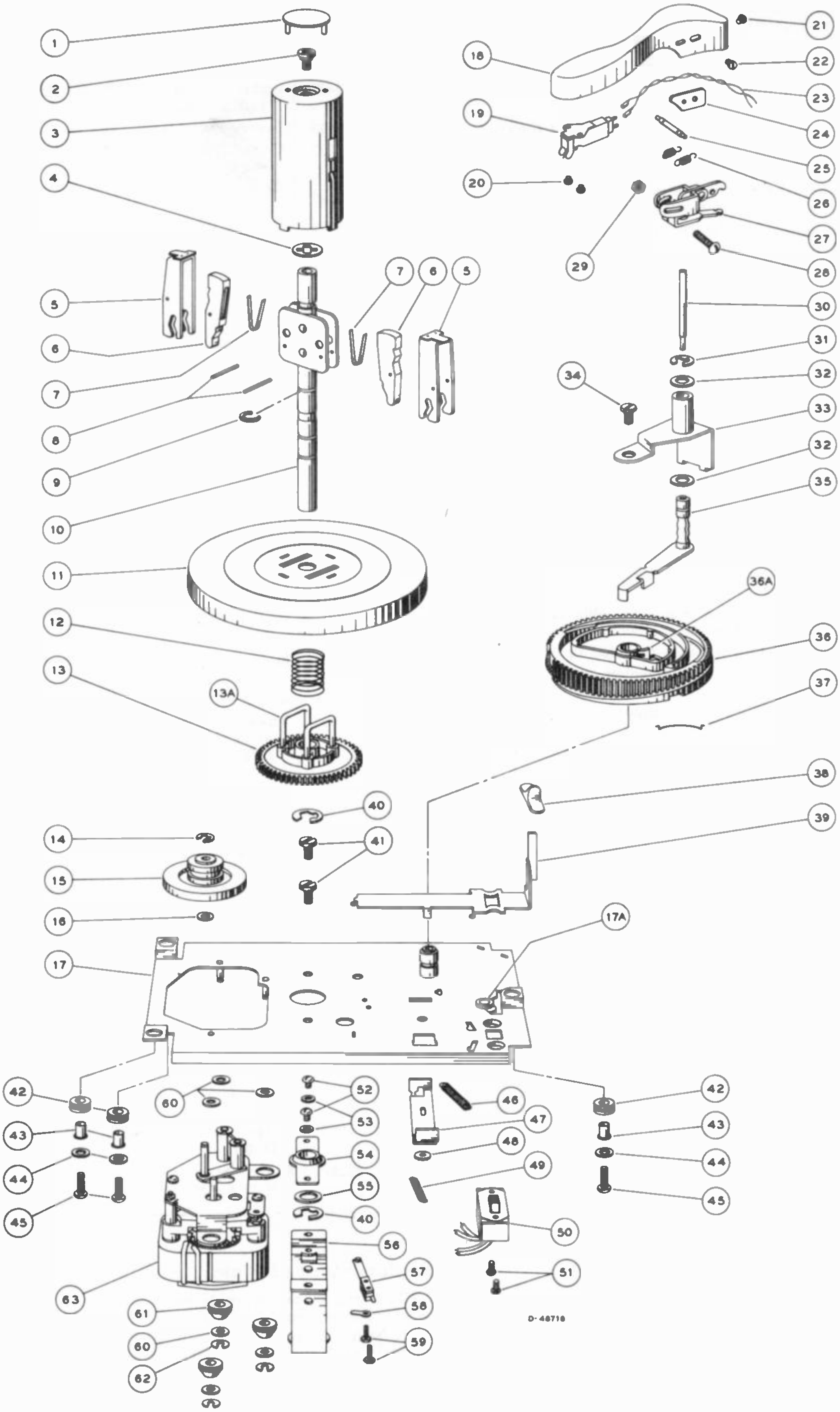
1. Remove "C" washer 40 located directly below the pinion gear.
2. Slide the pinion gear 13 and spring 12 off the spindle shaft 10.
3. Remove cap 1.
4. Remove screw 2.
5. Separate spindle cover 3 from the turntable.
6. Push pin 8 out to remove spring 7, shelf 6 and blade assembly 5.

REMOVAL OF TURNTABLE SPINDLE SHAFT

1. Remove "C" washer 9 and lift out spindle shaft 10.

REMOVAL OF CYCLING CAM

1. Remove screw 34.
2. Lift bracket assembly consisting parts Nos. 31 to 35 inclusive.
3. Remove cycling cam.



Exploded View

RP-193-1

REPLACEMENT PARTS

ILL. NO.	STOCK NO.	DESCRIPTION
1	76246	Cap—Turntable centerpost housing cap—red
2	76242	Screw—#8-32 x 3/8" cross-recessed shoulder screw
3	76241	Housing—Centerpost housing
4	76247	Washer—Spring washer for turntable centerpost and shoulder screw
5	76237	Separator—Record separator and knife
6	76238	Shelf—Record shelf
7	76239	Spring—Record shelf spring (formed)
8	76240	Pin—Record shelf and separator pin
9	76245	Washer—"C" washer for turntable centerpost
10	76236	Shaft—Turntable shaft
11	76248	Turntable—Turntable and mat
12	76244	Spring—Pinion gear return spring (23/32" O.D. 1 1/8"—8 turns)
13	76243	Gear—Turntable pinion gear complete with two (2) drive keys
13A	——	Key—Drive key for turntable pinion gear—included in Ill. #13
14	76229	Washer—"C" washer to fasten idler wheel on Motor #9220-1.
15	76286	Wheel—Idler wheel for Motor 9220-1
16	76287	Washer—Dampening washer for idler wheel for Motor 9220-1
17	76231	Base—Sub-base complete with all staked and riveted parts including detent lever
17A	——	Lever—Detent lever—included in Ill. #17
18	76215	Arm—Pickup arm complete with counterweight less crystal and cable
19	76257	Crystal—Crystal cartridge complete with stylus
20	76216	Screw—#2-56 x 1/8" cross recessed fillister head machine screw to mount crystal
21	76210	Screw—#4-40 x 1/8" binder head machine screw for height adjustment
22	76210	Screw—#4-40 x 1/8" binder head machine screw for landing adjustment
23	——	Cable—Twisted pair cable and connectors
24	76211	Bracket—Landing adjustment bracket
25	76212	Pin—Pivot pin
26	76213	Spring—Pickup arm safety spring (3/16" O.D. x 35/64"—9 turns)
27	76214	Bracket—Pickup arm mounting bracket
28	75726	Screw—#8-32 x 3/8" round head screw for moun'ing bracket
29	75725	Nut—#8-32 hex nut to fasten mounting bracket
30	76235	Rod—Elevating rod
31	76220	Washer—"C" washer to fasten pickup arm lever
32	57209	Washer—Spring washer for pickup arm lever and bearing bracket
33	76219	Bracket—Pickup arm bearing bracket
34	72409	Screw—#8-32 x 1/4" binder head screw to fasten pickup arm bearing bracket
35	76222	Lever—Pickup arm shaft and lever
36	76217	Cam—Cycling cam and gear complete with segment engaging gear and trip spring
36A	——	Gear—Segment engaging gear—part of Ill. #36
37	76218	Spring—Trip spring
38	76251	Knob—Reject knob
39	76223	Lever—Reject lever
40	76221	Washer—"C" washer to fasten spindle and centerpost
41	76227	Screw—#10-32 x 1/4" binder head machine screw to mount bearing assembly
42	76228	Grommet—Rubber grommet to mounting sub-base
43	76249	Spacer—Metal spacer to mount mechanism in plastic cabinet used in (45J3)
44	76250	Washer—Flat metal washer to mount mechanism in plastic cabinet used in (45J3)
45	——	Screw—#8-32 x 3/4" binder head machine screw to mount mechanism in plastic cabinet used in (45J3)
46	76233	Spring—Detent lever return spring (9/64" O.D. x 3/4"—34 turns)
47	76232	Link—Reject link
48	——	Washer—Flat washer for mounting reject slide
49	76230	Spring—Reject slide return spring (9/64" O.D. x 7/8"—42 turns)
50	32875	Switch—ON-OFF switch complete with cover
51	——	Screw—#4 x 3/16" cross recessed round head self tapping screw to mount ON-OFF switch
52, 53, 54, 56	76234	Bearing—Turntable bearing assembly
55	76226	Washer—Bakelite washer for bearing assembly
57	76224	Switch—Muting switch
58	——	Lug—Solder lug
59	76225	Screw—#5-40 x 5/16" hex head tapping screw for mounting muting switch (2 req'd)
60	70490	Washer—Fibre washer for mounting motor
61	76288	Grommet—Rubber grommet for motor mounting plate for Motor 9220-1
62	76229	Washer—"C" washer to mount motor
63	76291	Motor—115 volt, 60 cycle motor less mounting plate and idler wheel (stamped 9220-1)
—	76289	Plate—Motor mounting plate for Motor 9220-1
—	76290	Spring—Idler wheel spring (3/16" O.D. x 5/16") for Motor 9220-1

Additions to Parts List:

Stock No.	Description
75274	Nut—Knurled nut to fasten stylus #76374
76374	Stylus—Replacement stylus for pickup stamped 988370-1
76323	Stylus—Replacement stylus for pickup stamped 988370-2

Replacement of Pickup Stylus:

Either one of two types of pickups may be used in this record changer. Each has a replaceable osmium tipped stylus.

The stylus in pickups stamped 988370-1 is secured with a knurled nut. It is only necessary to loosen the knurled nut to remove the stylus. Replacement stylus is Stock No. 76374.

The stylus in pickups stamped 988370-2 is secured by push fit in the pickup. To remove—insert small blade of a penknife under the stylus (close to shank of holder) and twist the knife blade. To replace—push shank of stylus holder into pickup.

PH482

RCA VICTOR

AUTOMATIC RECORD CHANGER

MODEL 960282 SERIES

SERVICE DATA

— 1950 No. 2 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

IDENTIFICATION OF MODELS

Each record changer bears a label on the underside of the motorboard in accordance with the following:

960282-1

60 cycle version used in domestic instruments. Has Stock No. 75044 crystal pickup. Used in Models A55, A78, TA128 and TA129.

960282-2

50/60 cycle version used in instruments designed for export sale. Has Stock No. S-5652 ceramic pickup. Used in Models 9QV5 and 4QV8C.

960282-3

50/60 cycle version used in instruments designed for export sale. Has Stock No. 75044 crystal pickup. Used in early production of Model 9QV5.

960282-4

60 cycle version used in domestic instruments. Has Stock No. 75475 crystal pickup. Used in Models A82, 2T81 and 6T84 (mahogany and walnut).

960282-5

Identical to 960282-4 except for tan finish. Used in Models A82, 2T81 and 6T84 (blonde and limed oak).

Compensation:

Some of the above record changers have a resistor/capacitor combination on the pickup lead terminal board. This is to compensate for the differing frequency response of various instruments. Correct values of these resistors and capacitors are indicated in the Service Data for the instruments which use the record changer.

AUTOMATIC OPERATION

1. Lift the record stabilizing clamp.
2. Place a stack of records, ten inch if desired; over the center post leaving the edge of the stack resting on the ten-inch support.
   When playing a stack of twelve-inch records, raise both the stabilizing clamp and the ten-inch record support before placing the stack over the center post. The twelve inch records will rest on the main support.
3. Lower the stabilizing clamp on the stack of records.
4. Turn the speed selector control for the proper speed.
5. Select the proper stylus by turning the knob at the front end of the pickup arm.

NOTE: The speed selector and the stylus selector controls must indicate the same when selecting for a certain type of record.

6. Turn the control knob in the right hand end of the motorboard to "reject" and release.
   The mechanism will play one side of each record in the stack automatically. It will continue to repeat the last record of the stack until the pickup is raised from the record and placed on the rest.
7. To reject a record being played, turn the control knob to reject and release.
8. To remove records, place pickup arm on the rest, turn control knob to "off," raise stabilizing clamp and lift the entire stack.

NOTE: The pickup arm should only be handled when the control is in the manual position or before the pickup has played approximately ⅓ the distance in, if playing automatically. The pickup arm can also be handled when the mechanism is stopped if it feels free to move.

FEATURES

1. This record changer is a center support, drop type, two speed (78-33⅓ rpm) mechanism, designed to play automatically a series of twelve ten-inch, or ten twelve inch records of the standard 78 rpm type or of the long playing 33⅓ rpm type.
2. The mechanism is equipped with a light weight, dual stylus pickup cartridge.
3. The automatic tripping device is of the acceleration type.
4. The two speeds of 78 or 33⅓ rpm are controlled by a single knob.
5. The stylus selection is accomplished by a single knob.

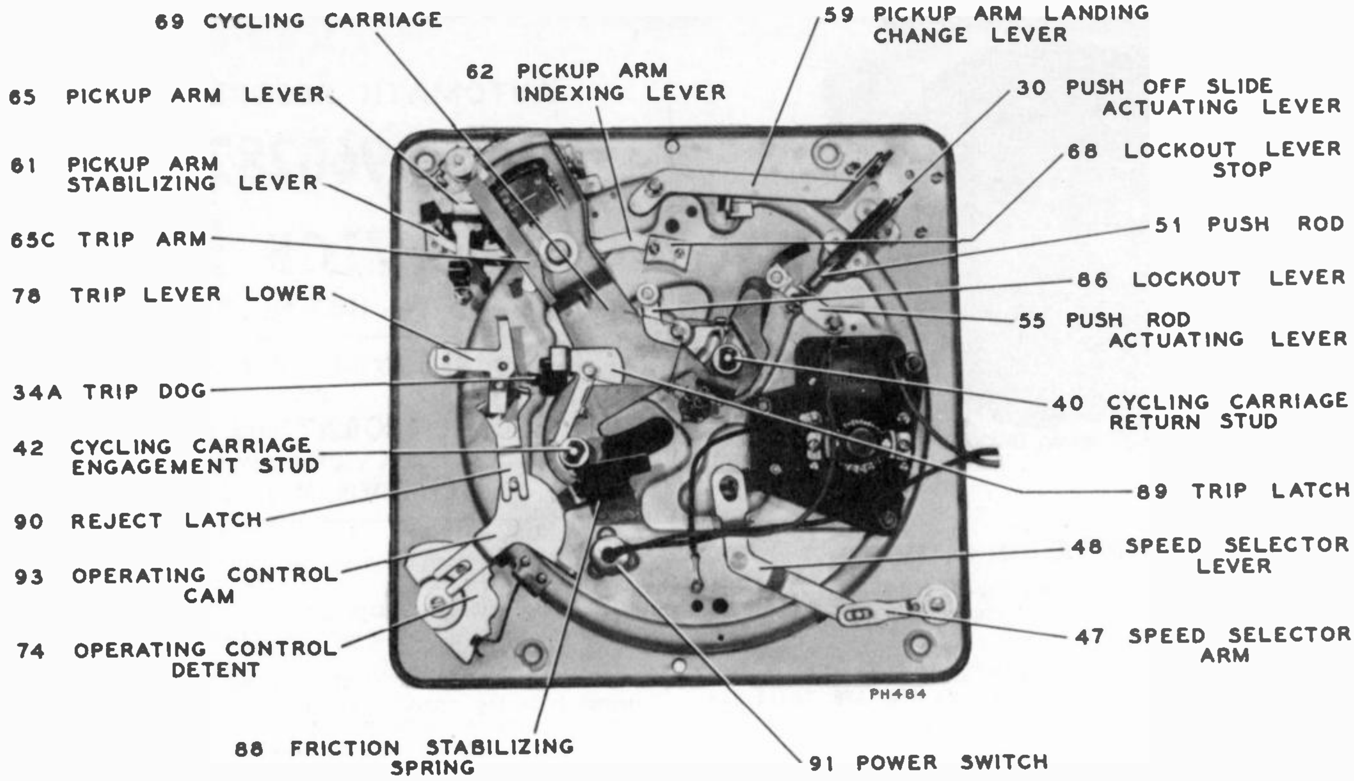
MANUAL OPERATION

1. Raise both the stabilizing clamps and the ten-inch support shelf.
2. Place either a ten or twelve inch record on turntable.
3. Select the proper speed and stylus.
4. Turn control knob to manual.
5. Place pickup on start of the record.
6. When selection is completed, lift pickup arm and place it on the rest.
7. Turn control knob to "off".
8. Lift record straight up to remove.

HELPFUL SUGGESTIONS

Before servicing the mechanism, inspect the assembly to determine whether all levers, springs and parts are in place and not jammed or bent.

1. Never use force to start or stop the turntable or any part of the mechanism.
2. (a) If for any reason the mechanism becomes jammed, it may be released by pulling both the spiral engagement stud and the cycling carriage return stud downward. Then move the cycling carriage in a clockwise direction (viewed from the bottom).
   (b) If the two studs cannot be pulled down, try to remove the turntable by lifting straight up.
3. Cracked or badly chipped records may damage the stylus.
4. Do not leave records on the mechanism for an extended period of time as a guard against warpage.



FUNCTIONS OF PRINCIPAL LEVERS

Push-off slide actuating lever 30

The actuating lever located inside the support post extends through the motorboard. The function is to transfer the movement of the push rod 51 to the 10 and 12 inch push-off slides.

Push-off slides 5, 10

The function of the slide is to push the records off the step in the center post.

Cycling Carriage 69

The cycling carriage forms the main tie link between the various levers. When the mechanism is tripped the cycling carriage engagement stud 42 raises and engages the cycling spiral channel located on the underside of the turntable. This engagement causes the cycling carriage to rotate about its pivot in a counterclockwise direction (Viewed from the bottom). The movement of the carriage continues in the same direction until the inclined portion of the spiral channel pushes the stud down to engage the latch (89). The next instant the cycling carriage return stud (40) becomes unlatched after which it raises and engages the spiral channel which returns the cycling carriage to the normal out of cycle position.

Cycling Carriage engagement Stud 42

The engagement stud forms a link between the cycling carriage and the cycling spiral on the under side of the turntable. This stud causes the cycling carriage to rotate in a counterclockwise direction (viewed from the bottom of the motorboard).

Cycling Carriage Return Stud 40

The return stud forms a link between the cycling carriage and the cycling spiral. This causes the cycling carriage to return to the normal out of cycle position.

Push Rod 51

The push rod forms a link between the push rod actuating lever (55) and the push off slide actuating lever (30).

Elevating Rod 19

The elevating rod functions as a lift for the pickup arm.

Push rod actuating lever 55

Push rod actuating lever is a tie link between the push rod (51) and the cycling carriage (69). It also is provided with an adjustment to govern the travel of the push-off slides 5 and 10.

Friction stabilizing spring 88

This spring forms a wedge which holds the cycling carriage (69) from drifting when the mechanism is in the playing position. In its braking action it provides a means of slowing the movement of the pickup to provide a gentle landing.

Trip lever (upper) 34

As the pickup arm travels towards the center of the record, the trip lever is carried along by the inter-connecting levers. A small offset located on the turntable shaft rotating with the turntable contacts the end of the trip lever once with each revolution. On each contact the trip lever is pushed back slightly. This slight backward movement continues as long as the pickup is moving at a constant rate of speed. When the pickup enters the eccentric groove of the record, the movement is accelerated and thus allows the trip dog (34A) to drop off the edge of the trip latch (89) before the turntable has made a revolution, therefore, the small offset on the turntable strikes the trip lever and in so doing, moves trip latch (89) and starts change cycle.

Trip Lever (lower) 78

The lower trip lever mechanically linked to the upper trip lever (34) transfers the action from the underside of the motorboard to the top of the motorboard.

Pickup Arm Landing Change Lever 59

The pickup arm landing change lever functions as a stop for the pickup indexing lever (62). The change lever position is altered depending upon the position of the 10 inch record support 4.

Pickup Arm Indexing Lever 62

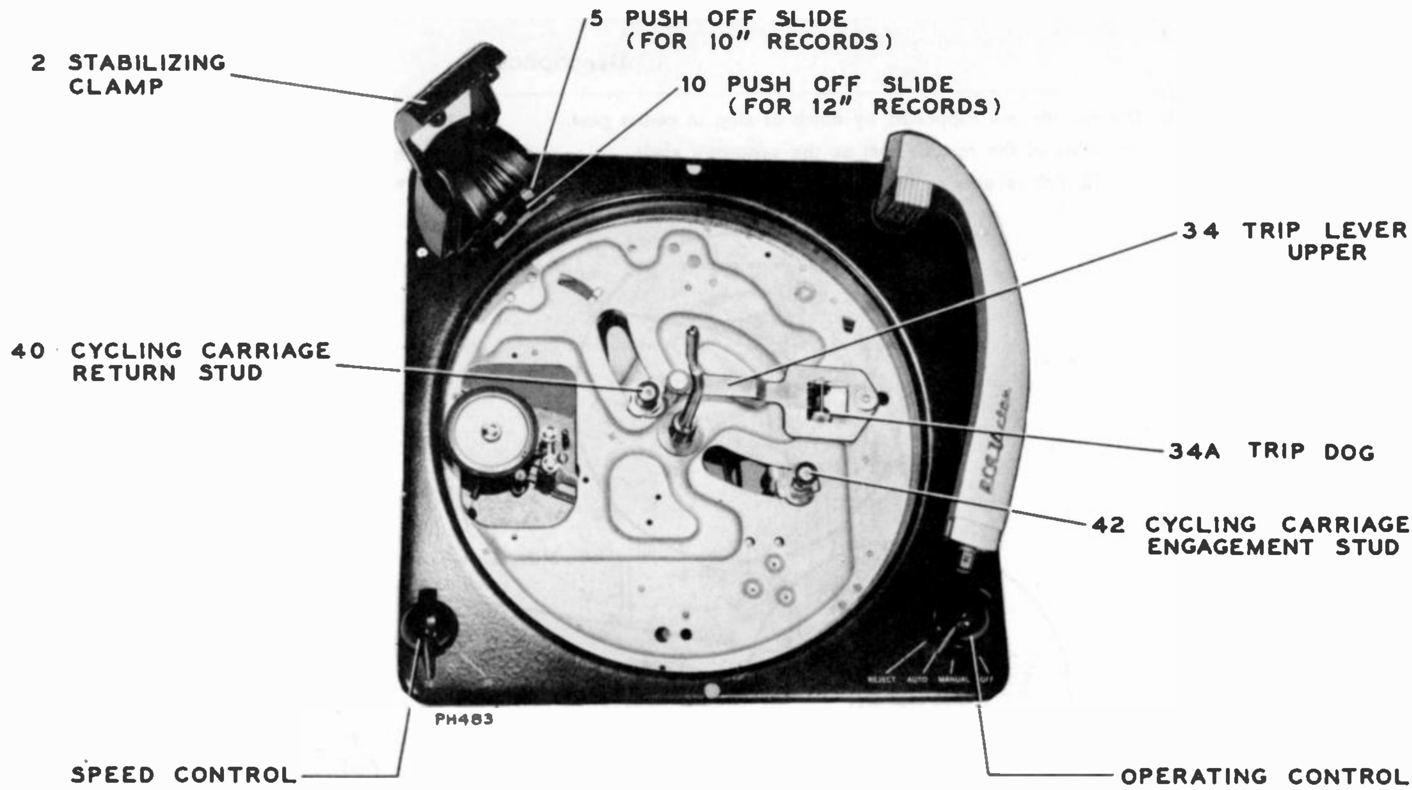
The pickup arm lever engages one of the notches in the indexing lever and in so doing determines the landing position of the pickup.

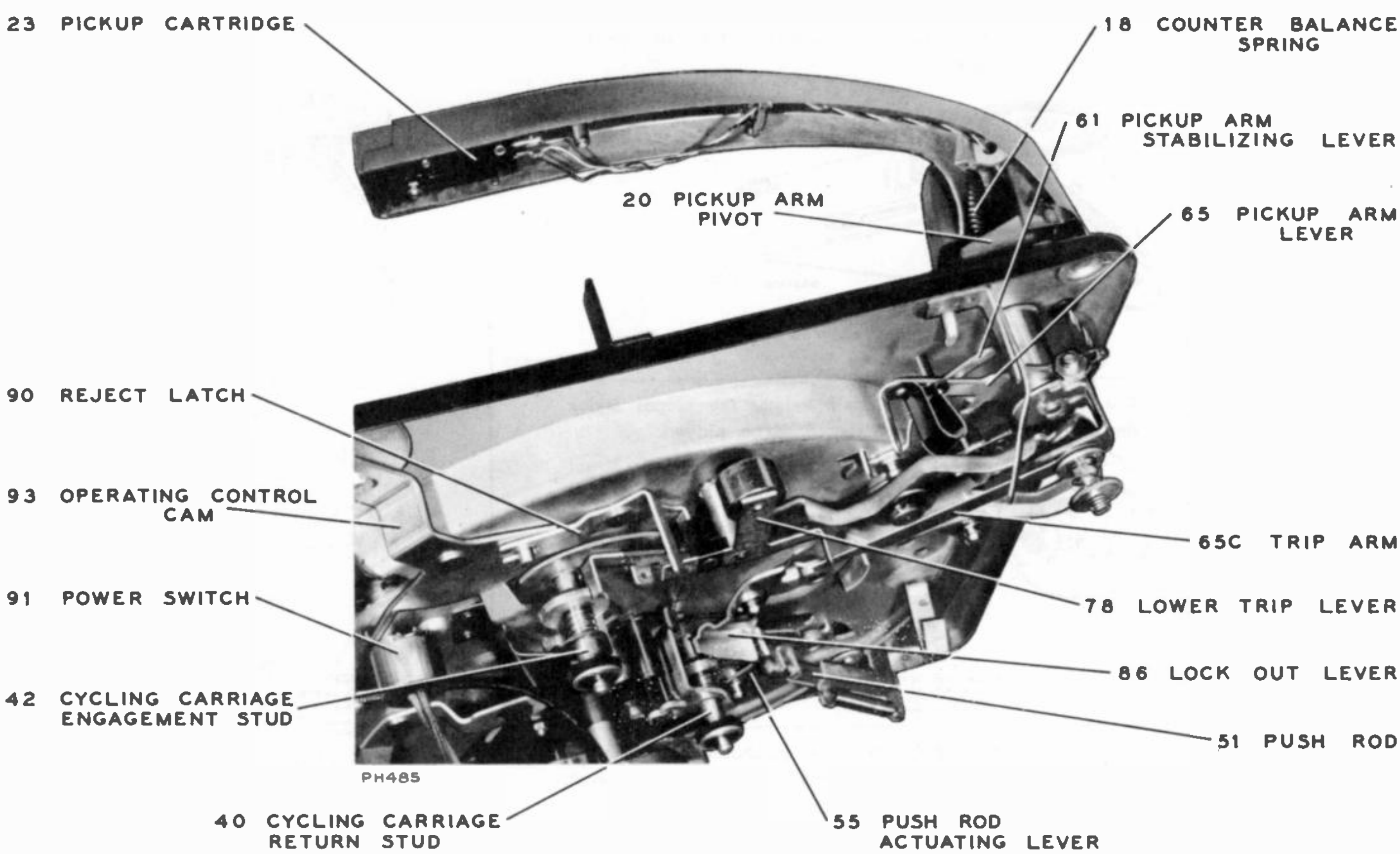
Pickup arm lever 65

The pickup arm lever is connected to the pickup arm through the pickup arm pivot (20). The inward motion of the pickup arm causes the tripping action as a result of the contact between the pickup arm lever and the lower trip lever.

Pickup Arm Stabilizing Lever 61

The pickup arm stabilizing lever is actuated by a small tab on the cycling carriage during the change cycle. The forward movement of this stabilizing lever permits contact with the stud (65A) on the pickup arm lever, thereby stabilizing the pickup arm during the change cycle of the mechanism.


2 STABILIZING CLAMP
5 PUSH OFF SLIDE (FOR 10" RECORDS)
10 PUSH OFF SLIDE (FOR 12" RECORDS)
34 TRIP LEVER UPPER
40 CYCLING CARRIAGE RETURN STUD
34A TRIP DOG
42 CYCLING CARRIAGE ENGAGEMENT STUD
PH483
SPEED CONTROL
OPERATING CONTROL


23 PICKUP CARTRIDGE
18 COUNTER BALANCE SPRING
61 PICKUP ARM STABILIZING LEVER
20 PICKUP ARM PIVOT
65 PICKUP ARM LEVER
90 REJECT LATCH
93 OPERATING CONTROL CAM
65C TRIP ARM
91 POWER SWITCH
78 LOWER TRIP LEVER
86 LOCK OUT LEVER
42 CYCLING CARRIAGE ENGAGEMENT STUD
51 PUSH ROD
PH485
40 CYCLING CARRIAGE RETURN STUD
55 PUSH ROD ACTUATING LEVER

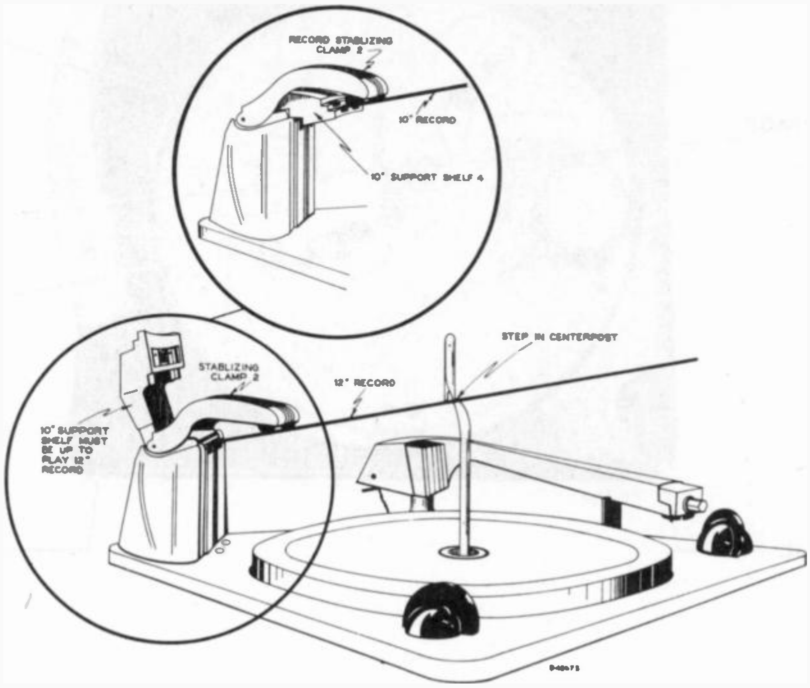
CYCLE OF OPERATION

Function	Description

Function: Place a stack of 10 or 12 inch records over the center post. Lower the record stabilizing clamp.

Description:

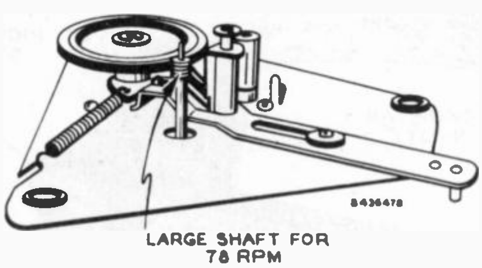
1. The records are supported by notch or step in center post.
2. The edge of the records rest on the separator shelf.
   10 inch records on the 10 inch shelf (4)
   12 inch records on the 12 inch shelf (9)
3. The position of the 10 inch support shelf (4) (up or down) determines the landing position of the pickup due to the action on the landing change (59) and index (62) levers.

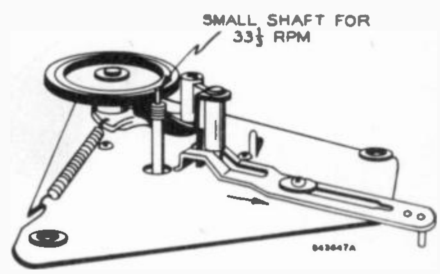


Function: Turn speed selector knob to 78 or $33\frac{1}{3}$ rpm position (depending on type of record).

Description:

1. The motor has a turned down shaft providing a means of changing speed by raising or lowering the idler on the dual diameter shaft.

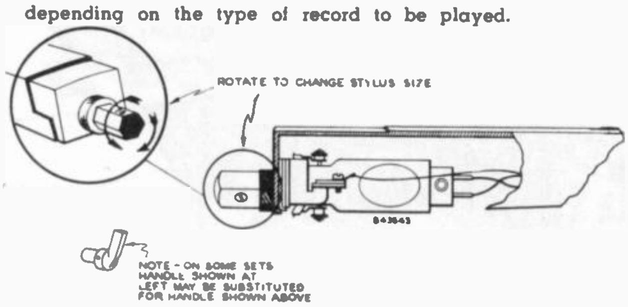




Function: Rotate stylus knob.

Description:

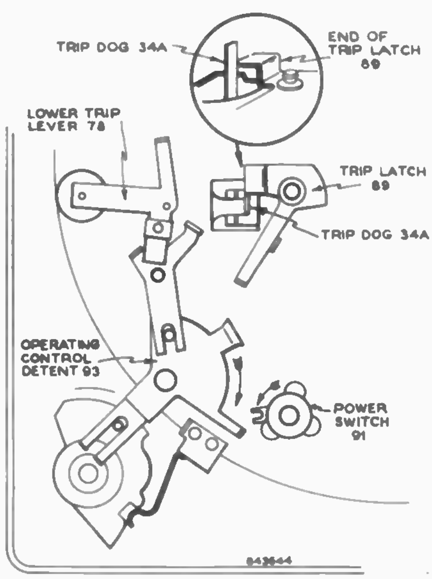
1. The rotation of the stylus knob selects the proper stylus depending on the type of record to be played.



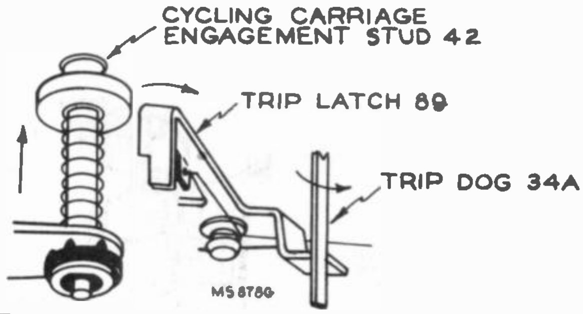
Function: Push Control knob to reject position and release.

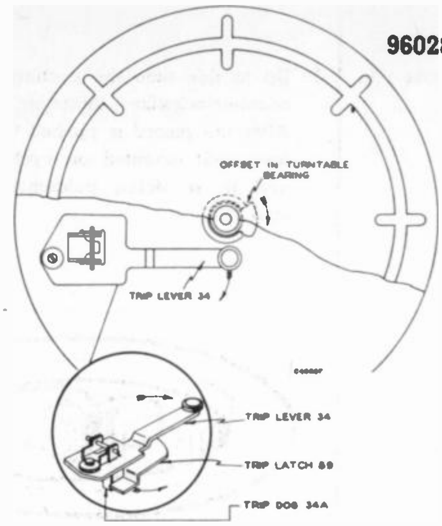
Description:

1. The Operating Control detent (74) mechanically connected to control knob engages and actuates the power switch (91) starting the turntable rotating.
2. Further rotation of the control knob moves the lower trip lever (78) sufficiently to allow the trip dog (34A) to slide off the end of the trip latch (89).



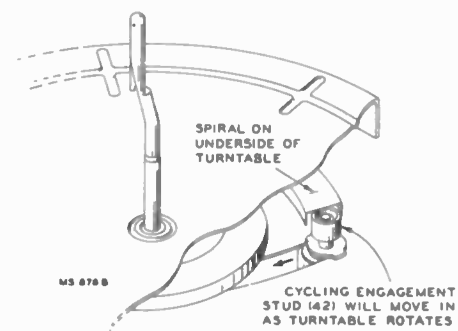
3. As the trip dog slides off the trip latch, the trip lever (34) has moved in sufficiently for the offset on the turntable shaft to contact the end of the trip lever and push it back.
4. The backward movement of the trip lever (34) unlatches cycling engagement stud (42) allowing it to raise and engage the cycling spiral.



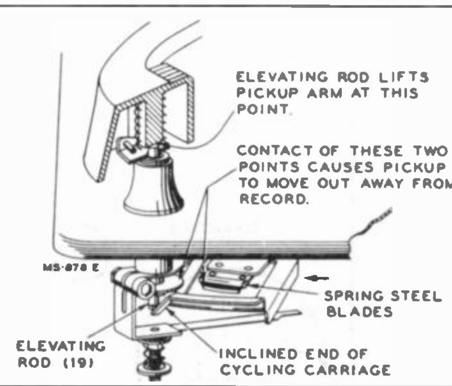


Cycling starts.

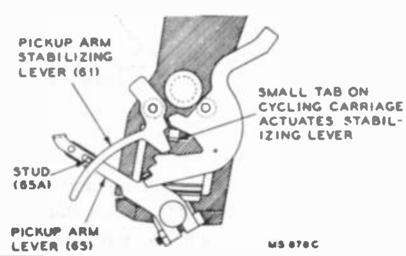
1. As the cycling carriage engagement stud (42) engages the spiral on the under side of the turntable, the carriage begins to move counterclockwise (viewed from the bottom of the motorboard) about its pivot.



2. The inclined end of the carriage located beneath the pickup arm pivot raises the elevating rod (19) lifting the pickup arm.
3. The same end of the cycling carriage has two spring steel blades forming a frictional connection between the cycling carriage and the pickup arm lever (65) by wedging the disc portion of the pickup arm lever between the two blades. This moves the pickup arm outward.



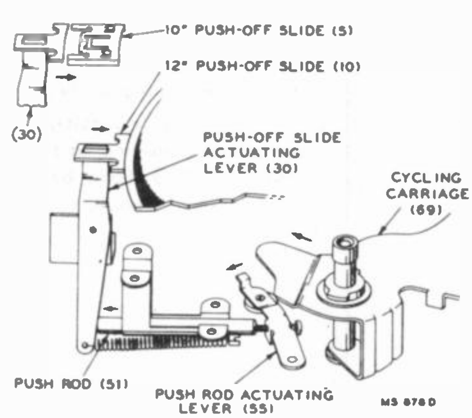
4. A small tab on the cycling carriage contacts and moves the pickup arm stabilizing lever (61) against the stud (65A) mounted on the tension spring incorporated in the pickup arm lever (65). This contact stabilizes the pickup arm in its movement during change cycle.



Record drops to the turntable.

1. As the cycling carriage continues to rotate, the end nearest the support post contacts push rod actuating lever (55), starting the action necessary to push the record off the center post.
2. The movement of the push rod actuating lever (55) through the linkage of push rod (51) push-off slide actuating lever (30) and push-off slide (5 or 10) pushes the record off the center post.
3. Record drops to turntable.

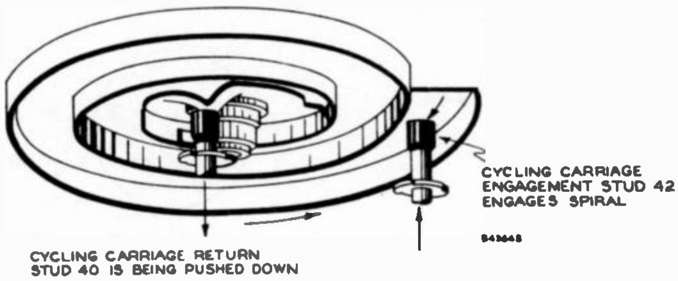
Note: The mechanism incorporates two push-off slides; one for ten inch (5) and one for twelve inch records (10).

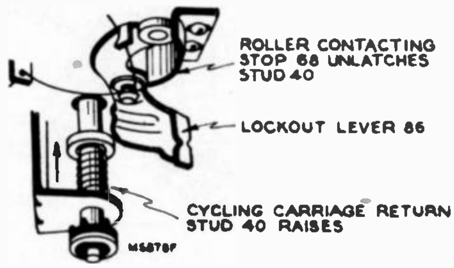


960282 Series

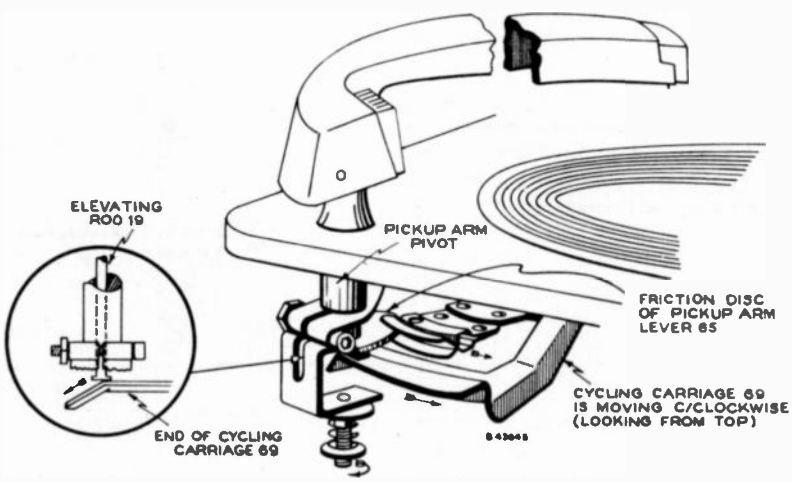
Pickup moves in for landing.

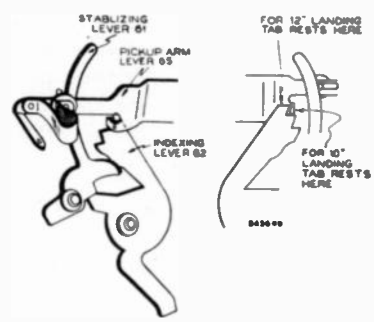
1. Up to this time the cycling carriage (69) is moving in a counterclockwise direction (viewed from the bottom). After the record is pushed off the center post the lock out lever (86) mounted on cycling carriage contacts the stop and in so doing unlatches the cycling carriage return stud (40).
2. As the cycling carriage return stud (40) raises to engage the spiral on the underside of the turntable, the cycling engagement stud (42) is pushed down and latched by the action of the incline in the spiral tract, thereby disengaging it from the spiral.
3. The cycling carriage is now moving clockwise (viewed from the bottom of the motorboard).





4. The end of the cycling carriage beneath the pickup arm pivot again makes the frictional contact with the disc on the pickup arm lever (65). This contact moves the pickup arm in for landing.
5. The pickup arm on its inward movement continues to be stabilized by the pickup arm stabilizing lever (61). This stabilizing continues until the tab on the pickup arm lever is against the ten or twelve inch landing notch in the indexing lever. At this point the pickup should be directly over the point of landing on the record.
6. An instant later the small tab on the cycling carriage contacts the side of the pickup arm stabilizing lever, unlatching the indexing lever (62) and permitting free motion of the pickup arm.
7. The elevating rod sliding down the small incline on the cycling carriage permits the pickup to land on the start of the record.

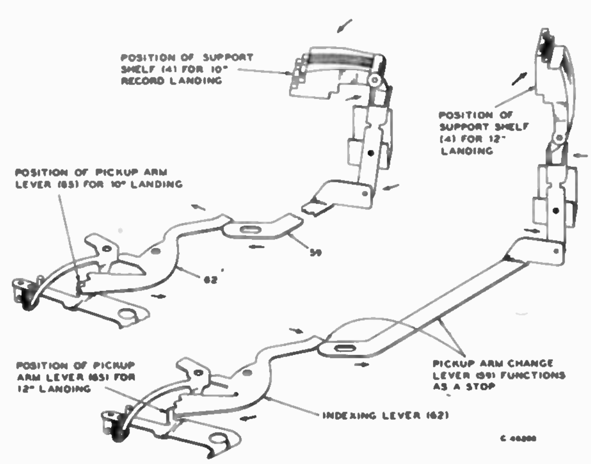




Note: It should be understood that the function of the indexing lever (62) is to determine the landing position of the pickup, both on ten and twelve inch records.

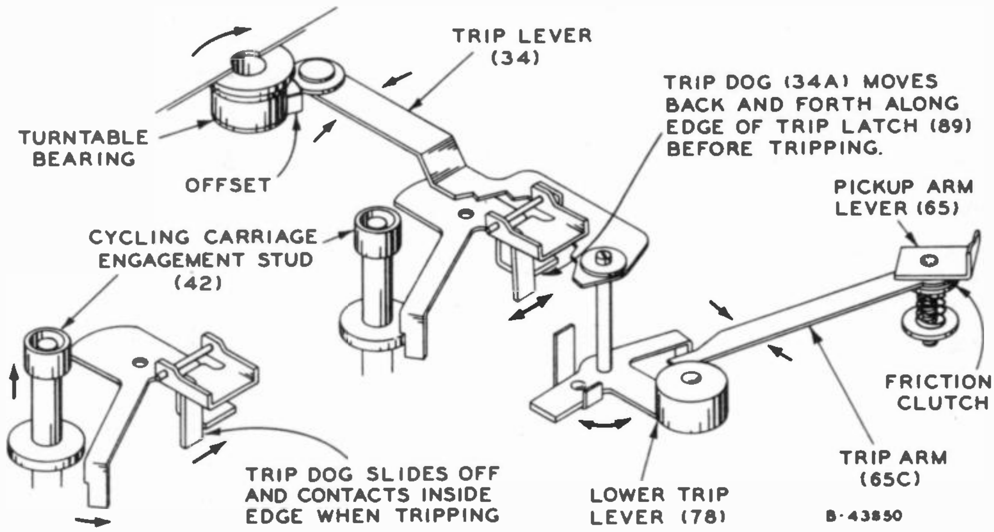
This is done by the pickup arm change lever (59) functioning as a stop for the indexing lever (62). The position of the pickup arm change lever in turn is governed by the position of the ten inch support shelf (4) (up or down).

8. As the pickup is landing the cycling carriage has reached its starting position and the cycling carriage return stud (40) is pushed down by the incline in the cycling spiral and locked in position.



Cycling is completed and record plays.

1. While the record plays, the end of the trip lever (34) is slowly moving toward the center post due to the force produced by the pickup arm down through the linkage of the pickup arm lever (65) trip arm (65C) and the lower trip lever (78).
2. As the trip lever slowly (34) approaches the offset on the inner shaft of the turntable it is pushed back slightly with each revolution of the turntable.
3. The trip lever continues to be pushed back against the friction clutch of the trip arm (65C) as long as the pickup arm moves in at a constant rate of speed.
4. When the pickup reaches the end of the selection the pickup moves into the eccentric groove quite rapidly. This rapid movement permits the trip dog (34A) to slide off the edge of the trip latch (89) before the offset on the turntable shaft has made one revolution. As the offset contacts the trip lever (34), it unlatches the trip latch (89) permitting the cycling carriage engagement stud (42) to raise and engage the cycling spiral starting a new cycle.



Pickup raises and moves out.

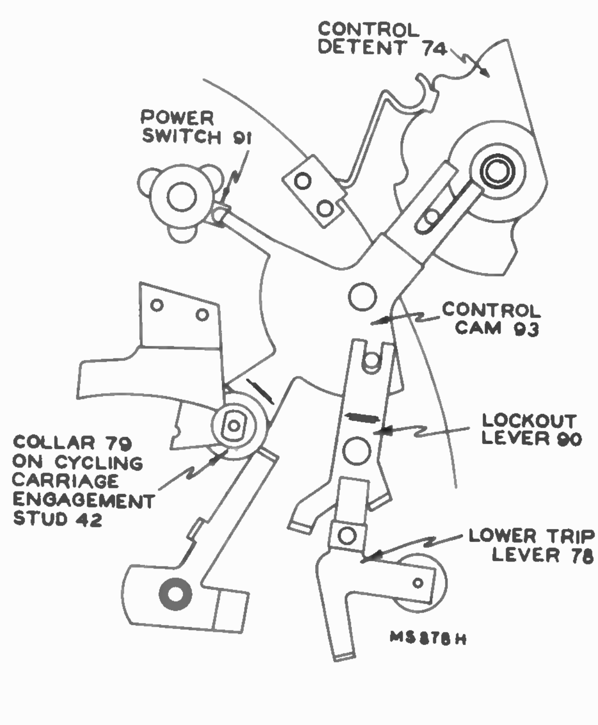
1. After the mechanism has been tripped the pickup arm moves out and rises by action of the cycling carriage (69) on the pickup arm lever (65) and the elevating rod (19).
2. The mechanism again follows the preceding sequence of dropping and playing records until the last record of this stack has been played. The mechanism is not provided with an automatic stop so the last selection is repeated until the pickup arm is placed on the rest and the power removed from the drive motor.

Note: The pickup arm can be raised and moved to the rest position any time after the mechanism has completed the change cycle, providing the pickup has not played more than approximately ⅓ of the selection. If the pickup arm is moved after this time, the mechanism will go into change cycle and the pickup arm should not be retarded in its movement.

The pickup arm can also be handled when the mechanism is not in operation, providing the pickup arm has freedom of motion.

Turn function control knob to manual.

1. The control detent (74) which is mechanically connected to the control knob, actuates the power switch through the control cam (93). This action starts the turntable rotating.
2. One end of the control cam also slides under the collar (79) on the cycling carriage engagement stud (42). This prevents the stud from raising if the trip lever is disturbed.
3. The control cam also holds the manual lock out lever (90) in such a position that it locks the lower trip lever (78) to prevent tripping. In this position, the trip lever (34) is held away preventing contact with off-set on turntable shaft.

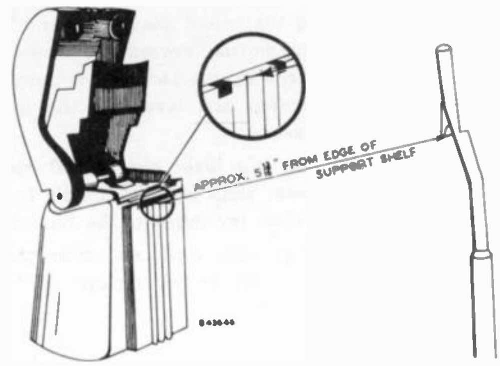


960282 Series

ADJUSTMENTS

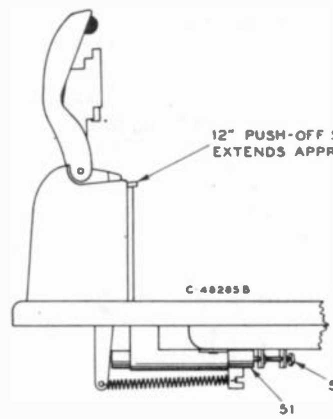
POSITION OF SUPPORT POST

1. Loosen three mounting screws at the base of the support post.
2. Slide support post to a position as indicated in accompanying drawing. The curvature of the shelf should conform with a 12" record.
3. After push-off slides have been adjusted, try a stack of both 10 and 12 inch records to determine the ease of separation. A compromise from the setting may be necessary due to differences in length of the 10 inch support shelf (4).



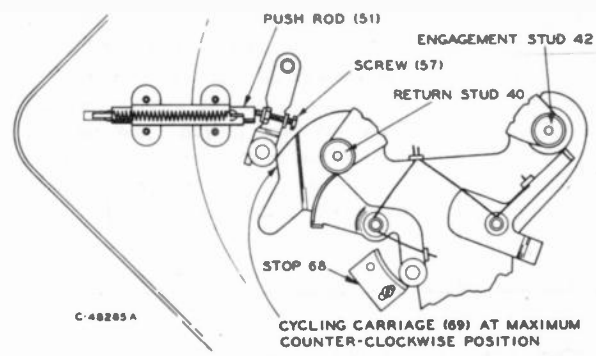
Adjustment of Push-Off Slides

1. Trip the mechanism and turn the turntable by hand until the cycling carriage has rotated counterclockwise. (Viewed from the bottom) to its limit.
2. Adjust screw 57 on push rod actuating lever until the 12 inch push-off slide is extending approximately 1/16" over the edge of the shelf.
3. Turn lock nut to hold screw and try a stack of 10 and 12 inch records for ease in separation.



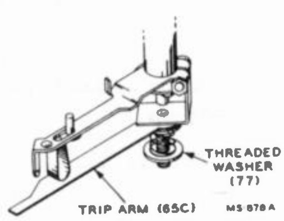
Adjust lock out lever stop (68)

The lock out lever stop (68) should be so adjusted that the cycling carriage return stud (40) raises an instant before the spiral engagement stud (42) is pushed down. If this timing is not properly made the mechanism will jam.



Adjustment of friction clutch on trip arm

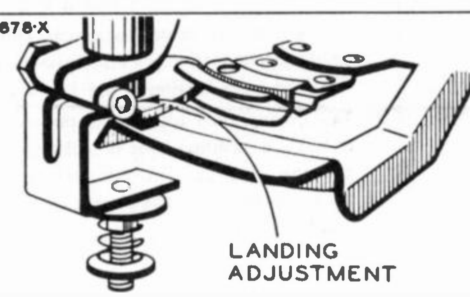
1. Turn the threaded washer on the pickup arm lever to produce sufficient friction for trip arm so the mechanism will have positive tripping. Care must be exercised against excessive friction as it would cause premature wear on the side walls of the record or in many cases, actually jump the grooves.

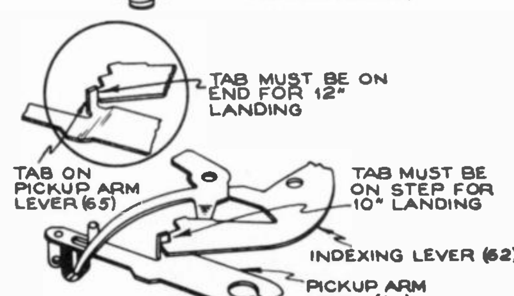


Pickup Landing Adjustment

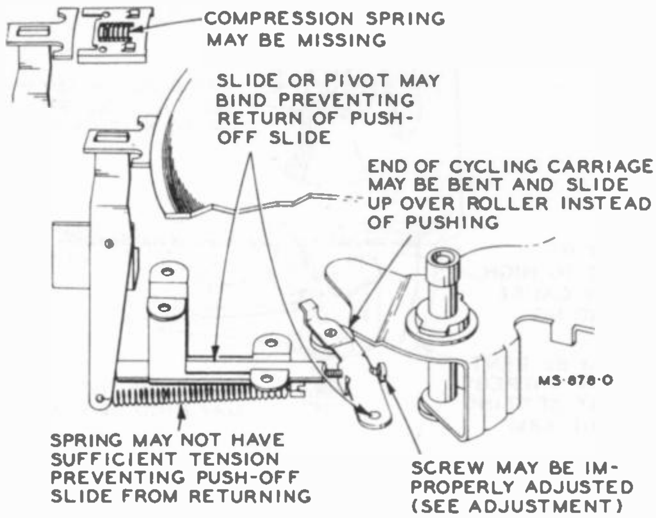
1. Disconnect power from mechanism.
2. Place a 10" record on turntable.
3. Turn the operating control to reject and release.
4. Rotate the turntable by hand until the tab on the pickup arm lever (65) is about ready to move away from the indexing lever. (The pickup will be a few inches above the record at this moment).
5. Loosen adjustment screw and hold the pickup arm lever in this position while moving the pickup arm directly above the point of landing. (Landing should be about half way between the edge of the record and the start of the recorded section. Approximately 4-11/16" from the side of the center post for a 10" record).
6. Tighten adjustment screw. apply power and check the pickup landing on both 10 and 12 inch records.
   If mechanism fails to land properly on 12" records the tab may be bent. In that case bend slightly.

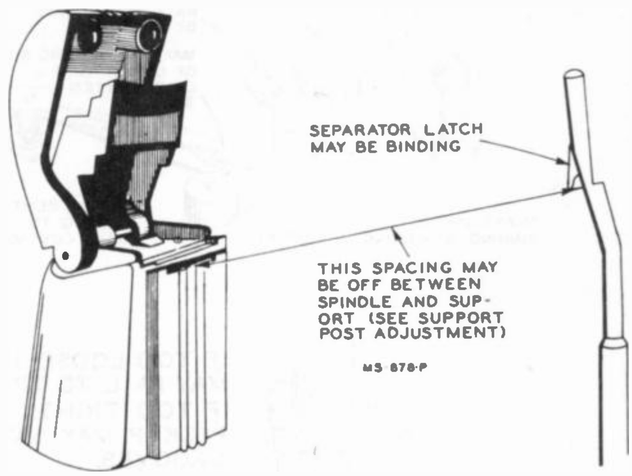
MS-878-X



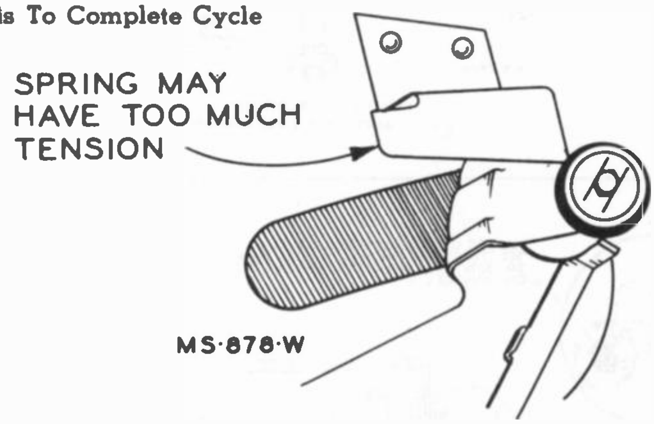


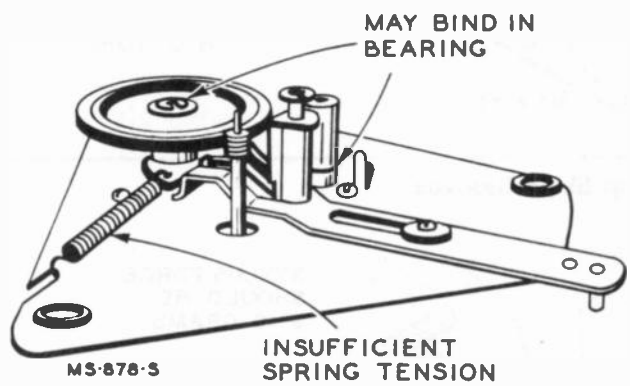
Fails To Separate Records Properly

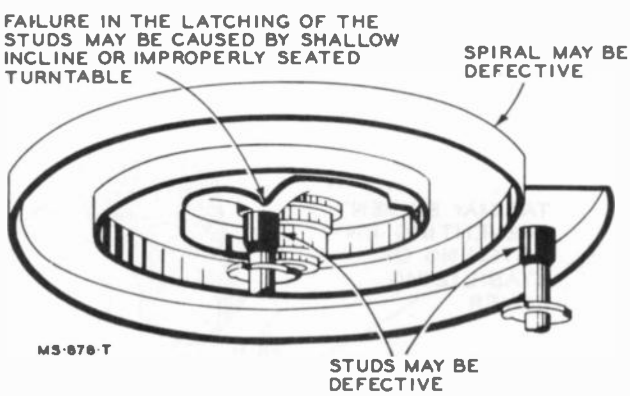


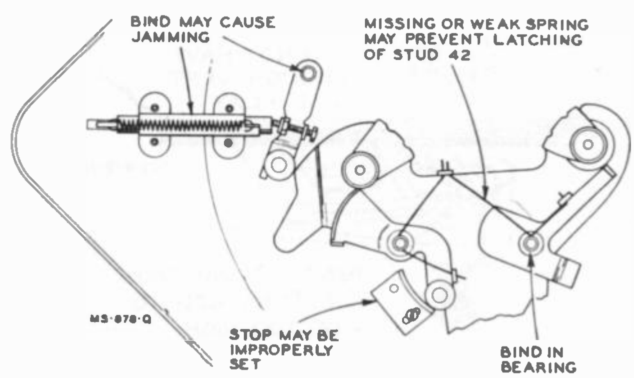


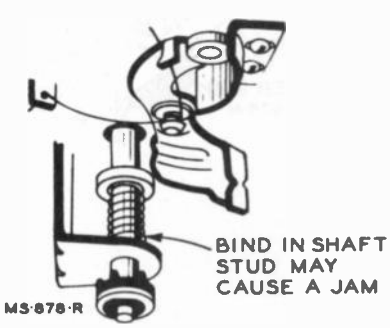
Fails To Complete Cycle



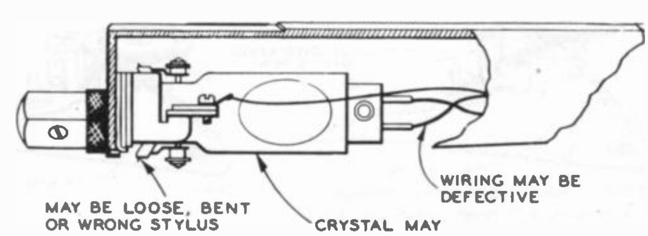








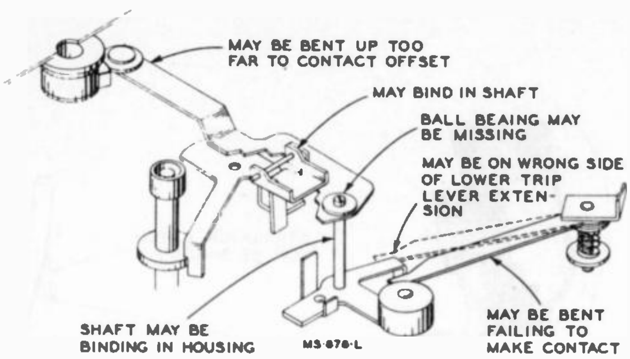
Weak—Distorted or No Output

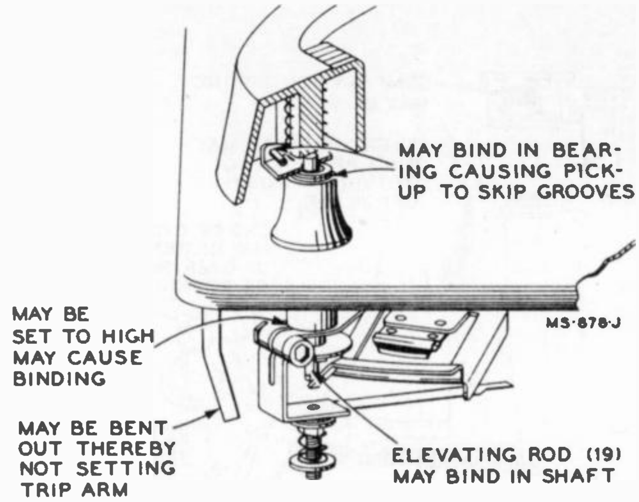


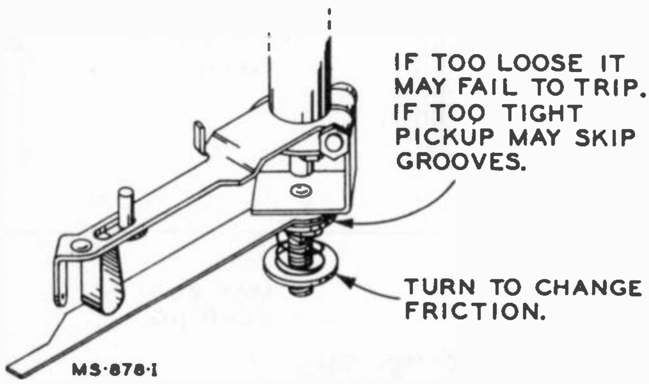
960282 Series

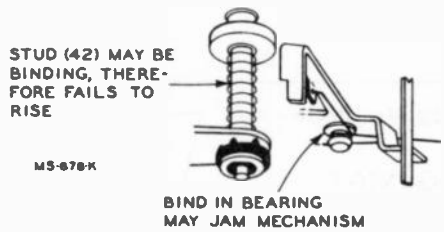
Fails to Trip

SERVICE HINTS (Continued)

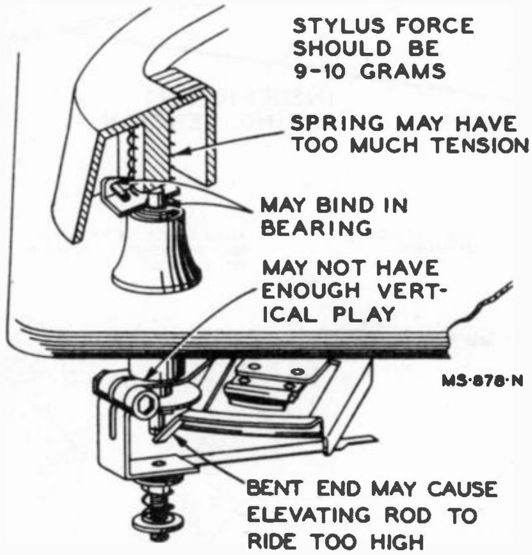


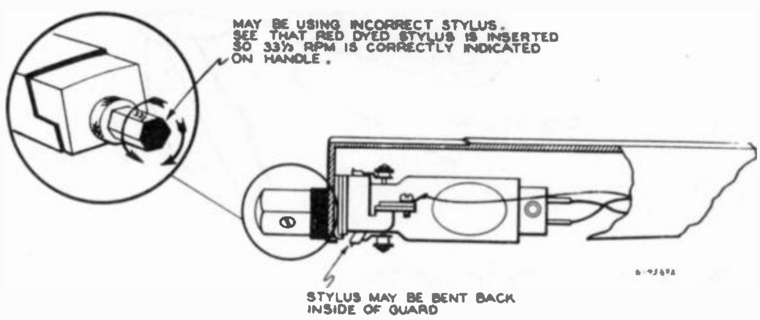


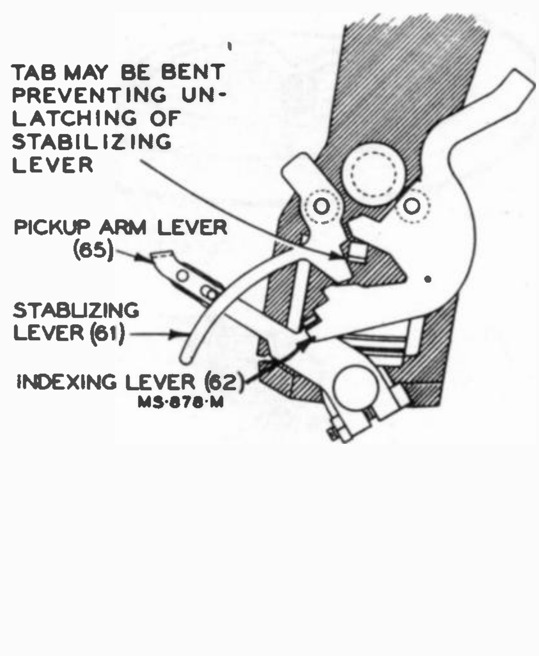




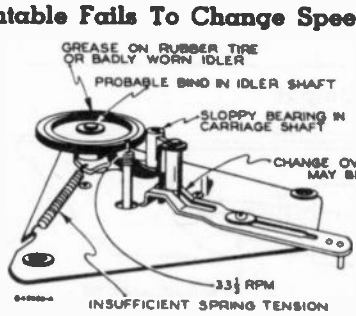
Pickup Skips Grooves



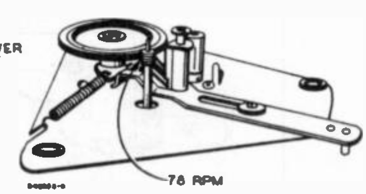




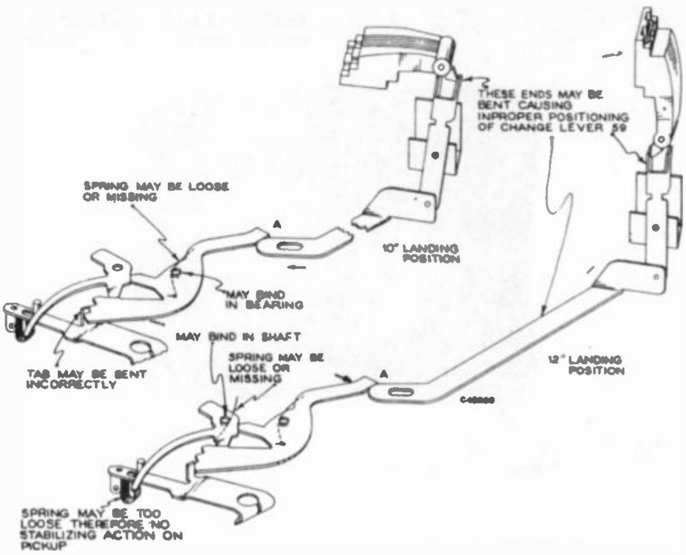
Turntable Fails To Change Speed or "Wow"

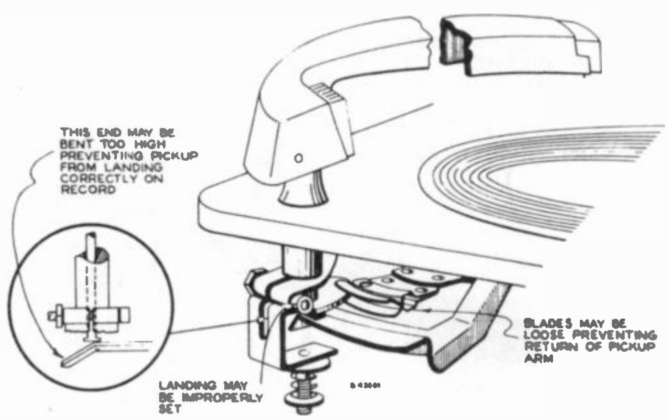


IF IDLER FAILS TO RAISE SUFFICIENTLY FOR 33⅓ RPM ADD THICKER SPACER WASHERS UNDER IDLER.
(SEE PARTS LIST ITEM 46Q)

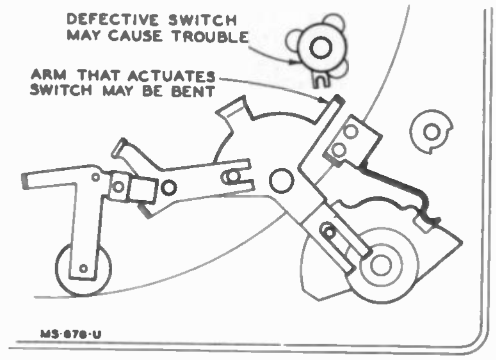


Fails To Land Properly

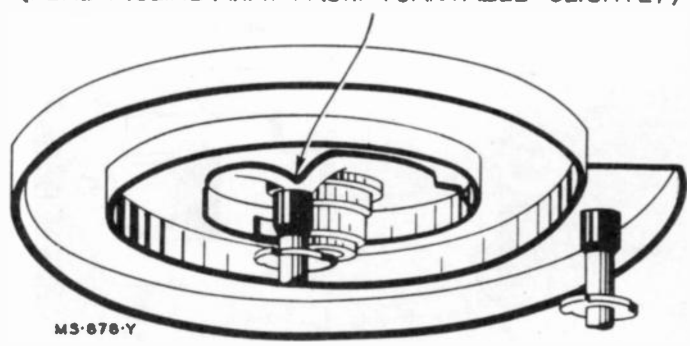




Turntable Fails To Rotate

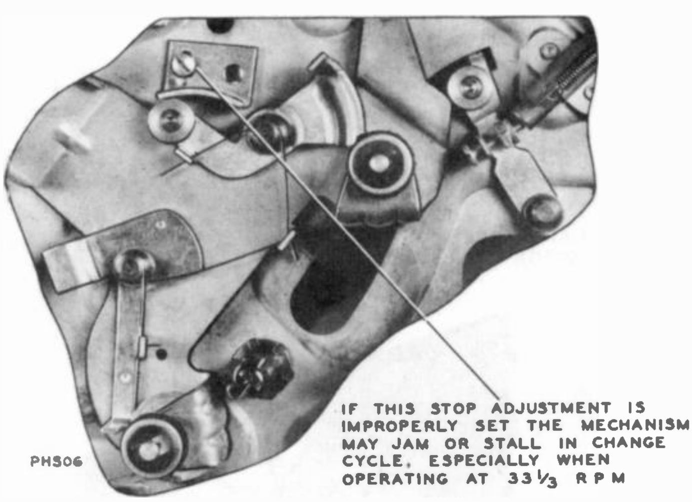


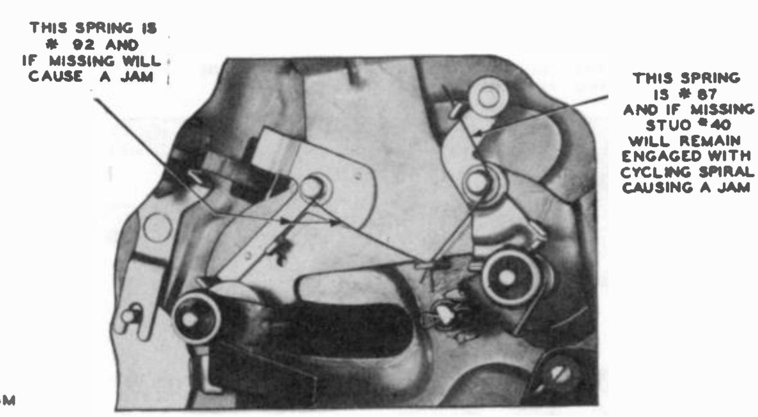
INCLINE IN SPIRAL MAY BE TOO SHALLOW THEREBY FAILING TO PUSH STUDS DOWN FAR ENOUGH CAUSING A JAM.
(BEND INCLINE AWAY FROM TURNTABLE SLIGHTLY)



DO YOU KNOW?

(Jamming or Stalling)

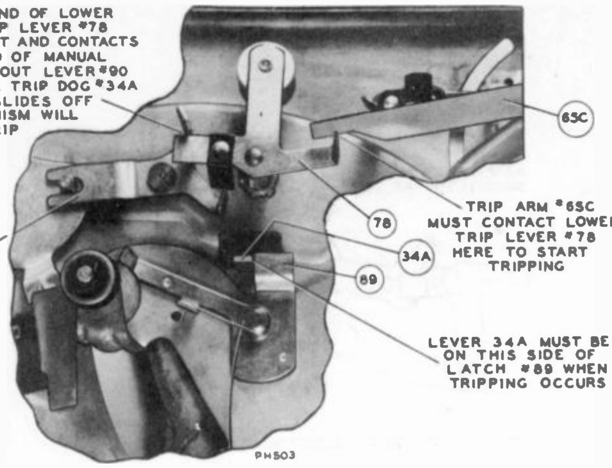


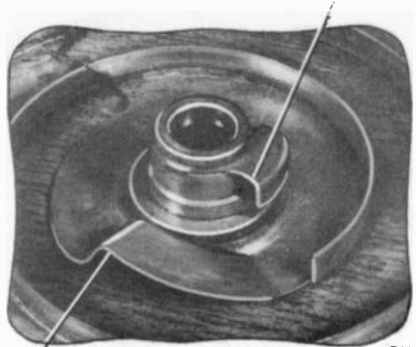


960282 Series

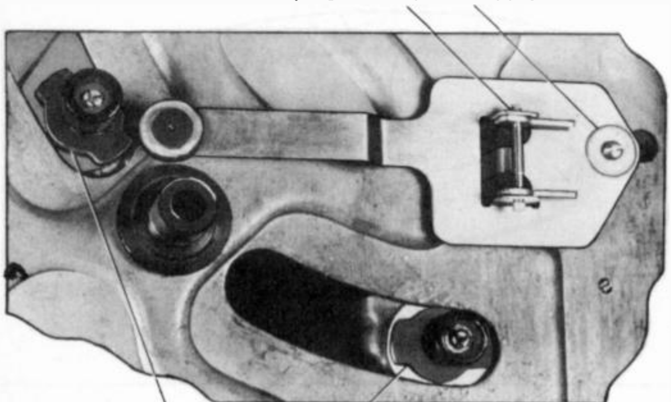
DO YOU KNOW?

(Tripping)

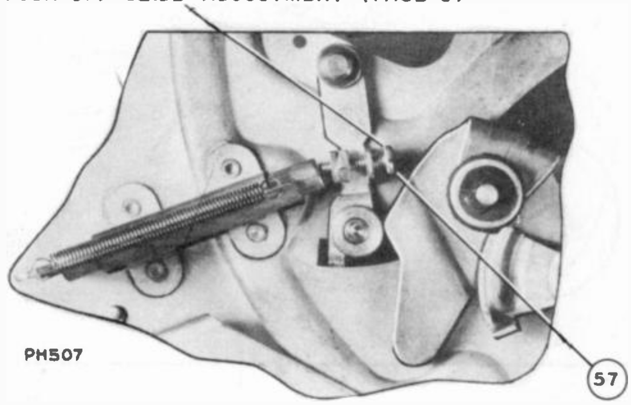




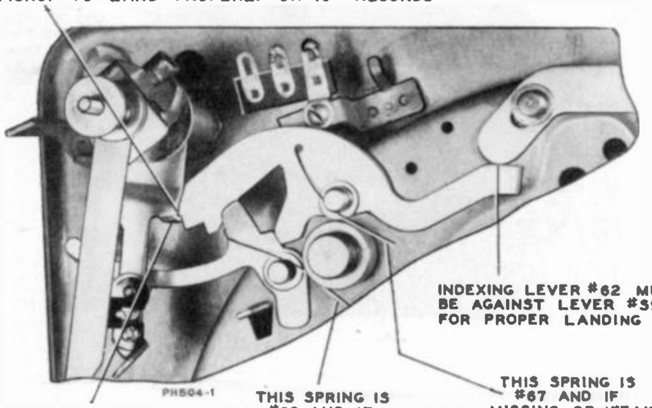
(Jumping grooves)

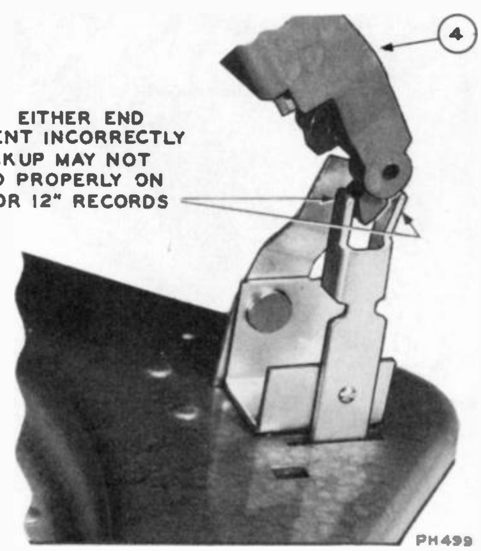


(Record separation)



(Pickup landing)



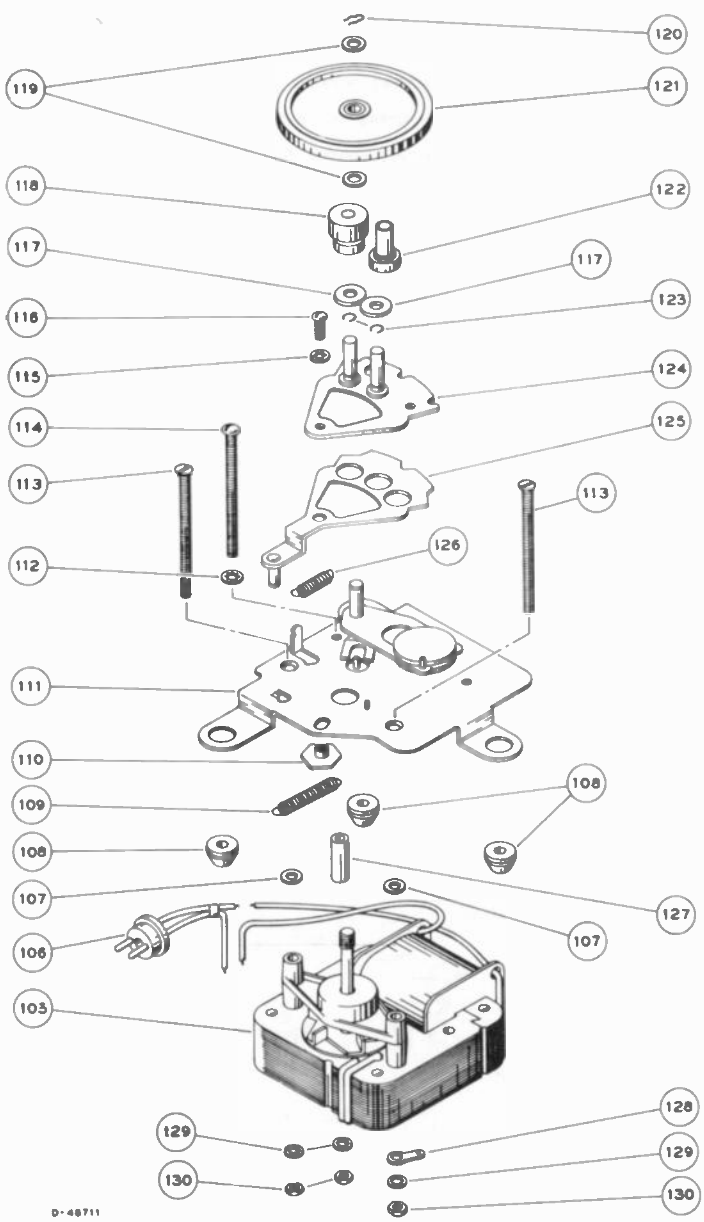


REPLACEMENT PARTS FOR MOTORS

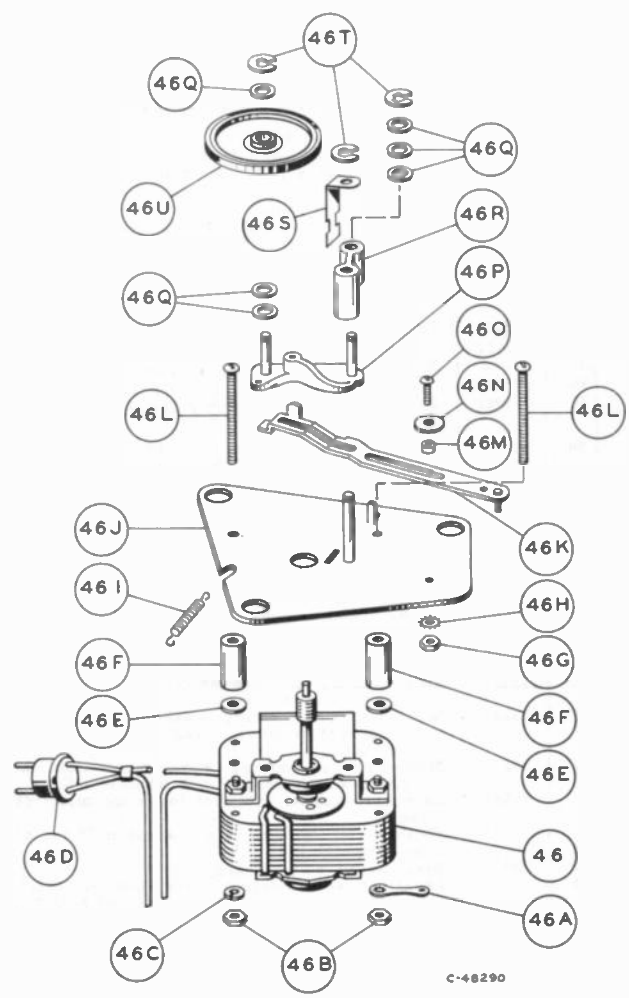
ILL. No.	STOCK No.	DESCRIPTION
46	75288	Motor—117 volt, 60 cycle motor complete with mounting plate, idler wheel and change-over mechanism—for 960282-1, -4 and -5. See illustration on page 13
46	S-5637	Motor—117 volt, 50/60 cycle motor complete with mounting plate, idler wheel and change-over mechanism — for 960282-2 and -3. See illustration on page 13
		The following motor parts (46A to 46U) are for #75288 motor only
46A	—	Lug—Terminal lug
46B	—	Nut—#6-32 hex nut to mount top plate (2 req'd)
46C	—	Lockwasher—#6 lockwasher (split) to mount top plate
46D	30870	Connector—2 contact male connector for motor leads
46E	—	Washer—Flat washer for under metal spacer (2 req'd)
46F	75290	Spacer—Metal spacer for motor mounting (2 req'd)
46G	—	Nut—#4 hex nut to mount idler riser slide
46H	—	Lockwasher—#4 (external) lockwasher to mount idler riser slide
46I	75291	Spring—Tension spring for idler carriage
46J	75292	Plate—Motor top plate including stud for idler pivot link
46K	75293	Slide—Idler riser slide
46L	—	Screw—#6-32 x 1¾" round head brass machine screw to mount top plate (2 req'd)
46M	75294	Spacer—Metal spacer to mount idler riser slide
46N	—	Washer—Flat washer to mount idler riser slide
46O	—	Screw—Screw to mount idler riser slide (#4-40 x ⅜" round head steel machine screw)
46P	75295	Carriage—Idler carriage
46Q	75296	Washer—Fibre dampening washer .010 thick
	75436	Washer—Fibre dampening washer .020 thick
46R	75297	Link—Idler pivot link
46S	75298	Guide—Idler riser slide guide
46T	75287	Washer—"C" washer to mount idler carriage and idler wheel
46U	75300	Wheel—Idler wheel

The following items are available as replacement parts for Stock No. S-5637 motor.

ILL. No.	STOCK No.	DESCRIPTION
108	S-6054	Grommet—Rubber grommet to mount motor
118	S-6050	Pulley—78 r.p.m. drive pulley
121	S-6051	Wheel—Idler wheel
122	S-6052	Pulley—33-1/3 r.p.m. drive pulley
130	S-6053	Spring—Spring sleeve for 60 to 50 cycle conversion.



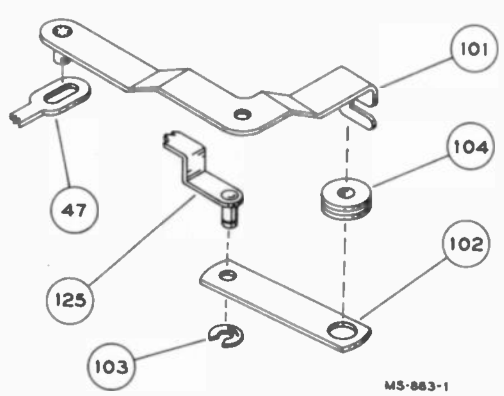
Exploded view of 50/60 cycle motor (960282-2 and -3)



Exploded view of 60 cycle motor (960282-1, -4, and -5)

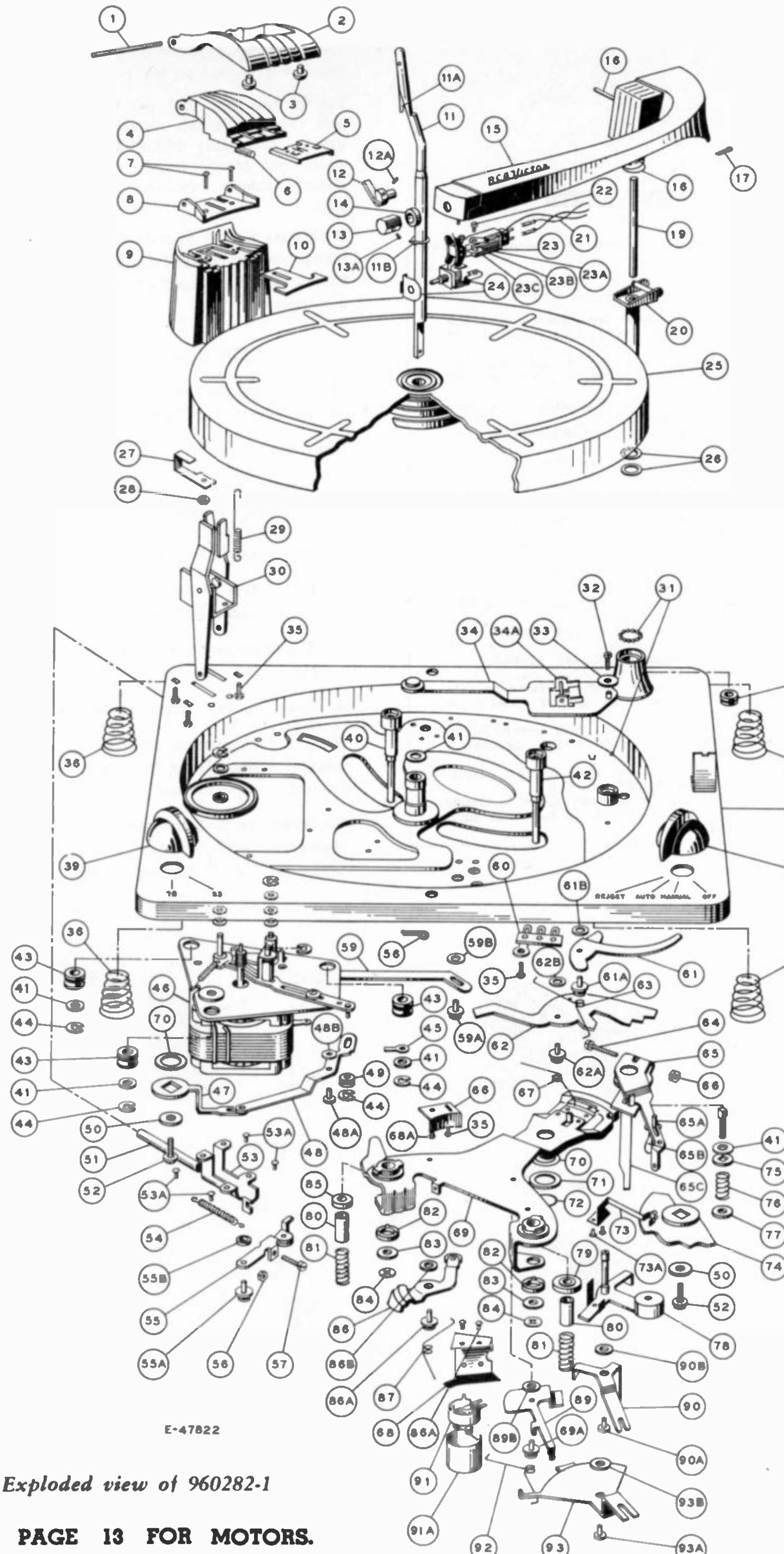
REPLACEMENT PARTS

ILL. No.	STOCK No.	DESCRIPTION
1	75254	Pin—Push-off box hinge pin
2	75255	Clamp—Stabilizing clamp assembly including rubber bumpers—maroon—for 960282-1, -2, -3 and -4
2	75921	Clamp—Stabilizing clamp assembly including rubber bumpers—light brown—for 960282-5
3	75256	Bumper—Rubber bumper for stabilizing clamp (2 req'd) (2 included)
4	75257	Support — 10" record support — maroon — for 960282-1, -2, -3 and -4
4	75922	Support—10" record support—light brown—for 960282-5
5	75258	Slide—10" record push-off slide
6	75259	Spring—Return spring for 10" push-off slide (.250" O.D. x 9/16"—5 turns)
7	——	Screw—#4-40 x 3/8" round head steel machine screw
8	75260	Cover—12" record push-off slide cover
9	75261	Support — Main support casting for push-off mechanism—maroon—for 960282-1, -2, -3 and -4
9	75923	Support—Main support casting for push-off mechanism—light brown—for 960282-5
10	75262	Slide—12" record push-off slide
11	75263	Spindle—Turntable spindle or centerpost (includes ILL.11A)
11B	75303	Ring—Turntable retainer ring
12	75264	Knob—Stylus selector knob complete with set screw—lever type—for 960282-1, -2 and -3
12	75924	Knob—Stylus selector knob complete with set screw—lever type—for 960282-4 and -5
12A	——	Screw—Screw for handle type control knob (included with Stock Nos. 75264 and 75924)
13	——	Knob—Stylus selector knob—hexagon—not used in actual production
13A	——	Screw—Screw for hexagon control knob
14	75265	Collar—Threaded collar for pickup mounting assembly—for 960282-1, -2 and -3
15	75266	Arm—Pickup arm shell complete with fibre guide—for 960282-1, -2, and -3
15	75925	Arm—Pickup arm shell for 960282-4 and -5
16	75267	Pin—Pivot arm pin
17	75268	Spring—Retaining spring (hair-pin) for pivot arm pin
18	75269	Spring—Counterbalance spring for 960282-1, -2 and -3
18	75929	Spring—Counterbalance spring for 960282-4 and -5
19	75270	Rod—Elevating rod
20	75271	Arm—Pivot arm and shaft
21	75272	Cable—Three wire pickup cable (12") complete with connectors
25	75275	Turntable—10" dia.
26	75276	Washer—Spacing washer (2 req'd) (.006 x 13/32" I.D. x 9/16" I.D.—Phosphor Bronze)
27	75277	Spring—Pressure spring for 10" record support
28	——	Nut—4-40 hex nut
29	75278	Spring—Tension spring for stabilizing clamp (.216" O.D. x 1 7/8"—20 turns)
30	75279	Lever—Push-off slide actuating lever assembly
31	3658	Ball—Steel ball (3/32" dia.)
32	——	Screw—#4-40 x 1/4" fillister head screw
33	75280	Washer—Steel washer (.031" x .125" x 1/2")
34	75281	Lever—Trip lever assembly including trip dog. ILL. 34A
35	28360	Screw—Screw to mount main support (3 req'd) (#6-32 x 3/8" thread cutting)
36	75040	Spring—Conical spring to mount record changer —4 required—for 960282-1, -2 and -3
36	75927	Spring—Conical spring to mount record changer —3 required—for 960282-4 and -5
37	75282	Grommet—Rubber grommet for pickup cable exit
38	——	Board—Motorboard complete with all riveted, staked and welded parts
39	75283	Knob—Speed selector or function control knob —maroon—for 960282-1, -2, -3 and -4
39	75928	Knob—Speed selector or function control knob—light brown—for 960282-5
40	75284	Stud—Cycling carriage return stud including shaft, washer and cambric roller
41	75285	Washer—Friction spring washer for turntable and motor mounting. (.250" x .281" I.D. x .450" O.D.)
42	75284	Stud—Cycling carriage engagement stud including shaft, washer and cambric roller
43	75286	Grommet—Rubber grommet to mount motor (3 req'd)
44	75287	Washer—"C" washer to mount motor (3 req'd)
45	——	Lug—Terminal lug
47	75301	Arm—Speed selector arm
48	75302	Lever — Speed selector lever complete with mounting pivot stud and washer—for 960282-1, -4 and -5. See page 18 for description of 960282-2 and -3
49	75282	Grommet—Rubber grommet used in speed change assembly
50	75304	Washer—Spacer washer (small) for speed selector arm (.059" x .190" I.D. x 3/8" O.D.)
51	75305	Rod—Push rod
52	75306	Screw—Mounting screw complete with lockwasher for control knobs (10-32 x 3/8" fillister head-special)
53	75307	Housing—Push rod housing complete with four (4) rivets
54	75308	Spring—Tension spring for push rod
55	75309	Lever—Push rod actuating lever complete with mounting pivot stud and washer (includes Ill. 56 and 57)
56	——	Nut—#6 hex nut for push rod travel adjusting screw (includes 75309, Ill. 55)
57	——	Screw—Adjusting screw for push rod travel (#6-32 x 3/8" fillister head screw) (included in 75309, Ill. 55)
58	75310	Pin—Cotter pin for turntable spindle or centerpost
59	75311	Lever—Pickup arm landing change lever complete with mounting pivot stud and washer
60	——	Board—Terminal board (3 contact)
61	75312	Lever—Pickup arm stabilizing lever complete with mounting pivot stud and washer
62	75313	Lever—Pickup arm indexing lever complete with mounting pivot stud and washer
63	75314	Spring—Tension spring for stabilizing lever
64	75315	Screw—Screw to mount pickup arm lever (10-32" x 1" socket head cap screw)
65	75316	Lever—Pickup arm lever including trip arm, engagement stud and tension spring
66	——	Nut—#10 hex nut for pickup arm lever mounting screw
67	75317	Spring—Tension spring for indexing lever (2 turns)
68	75318	Stop—Lockout lever stop complete with mounting rivet
69	75319	Carriage—Cycling carriage
70	75320	Washer—Mounting washer (thin) for cycling carriage
71	75321	Washer—Mounting washer (thick) for cycling carriage
72	75322	Washer—Mounting washer (split) for cycling carriage
73	75323	Spring—Lock spring for detent complete with (2) rivets
74	75324	Detent—Operating control detent
75	75325	Washer—Friction washer (square-hole) for trip arm (.060" x .189" square I.D. x 3/8" O.D.)
76	75326	Spring—Friction adjustment spring for trip arm (.360" O.D. x 33/64"—5 1/2 turns)
77	75327	Washer—Threaded washer for adjusting trip arm friction (.0673 x .159" I.D. x 3/8" O.D.—.159" I.D. hole tapped #10-32)
78	75328	Lever—Lower trip lever
79	75329	Washer—Shouldered washer for cycling carriage engagement stud for Ill. 42
80	75330	Spacer—Metal spacer for cycling carriage studs
81	75331	Spring—Tension spring for cam roller (.379" O.D. x 1-1/32"—7 turns)
82	75332	Grommet—Rubber grommet for cycling carriage studs
83	75304	Washer—Stop washer for cam studs (.059" x .190" I.D. x 3/8" I.D.)
84	75334	Nut—Speed nut for cycling carriage studs
85	75335	Washer—Engagement washer for cycling carriage return stud
86	75336	Lever—Lockout lever complete with mounting pivot stud and washer
87	75337	Spring—Tension spring for lockout lever (2 turns)
88	75338	Spring—Friction stabilizing spring for cycling carriage complete with two (2) rivets
89	75339	Latch—Trip latch complete with mounting pivot stud and washer
90	75340	Lever—Manual lockout lever complete with mounting pivot stud and washer
91	75341	Switch—Power switch complete with cover
92	75342	Spring—Trip latch tension spring—2 turns
93	75343	Cam—Operating control cam complete with mounting pivot stud and washer



Speed control levers used in 960282-2 and 960282-3 (order by item No. from RCA International Distributors only)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



Exploded view of 960282-1

SEE PAGE 13 FOR MOTORS.

SEE PAGE 16 FOR PICKUP ASSEMBLIES.

LUBRICATION

The motor bearings and all pivot bearings, excepting the pickup arm pivot, should be lubricated with S.A.E. 10 machine oil.

The pickup arm and the trip lever bearings are riding on ball bearings which should be packed sparingly with light grease, preferably STA-PUT #512. Use STA-PUT #512 or equivalent grease on the edges of all cams and pivots or sliding contacts including the spiral track and engagement stud.

NOTE: Do not oil friction clutch or trip arm 65C, spring steel wedge on end of cycling carriage 69 or friction brake 88.

NOTE: Keep oil and grease from all rubber parts of the mechanism.

PICKUP REPLACEMENT PARTS

ILL. No.	STOCK No.	DESCRIPTION
22	——	Screw—Mounting screw for pickup cartridge (4-40 x ⅛" fillister head) two required—for 960282-1, -2 and -3
22	75933	Screw—Mounting screw for pickup cartridge (2-56 x 1/8" fillister head) two required for 960282-4 and -5
23	75044	Pickup—Crystal pickup complete with two stylus—for 960282-1 and -3
23	S-5652	Pickup—Ceramic pickup complete with two stylus—for 960282-2
23	75475	Pickup—Crystal pickup complete with two stylus—for 960282-4 and -5
23A	75045	Stylus—33 1/3 r.p.m. stylus—RED—for #75044 pickup cartridge
23A	75496	Stylus—33 1/3 r.p.m. stylus—RED—for #75475 pickup cartridge
23B	75046	Stylus—78 r.p.m. stylus — PLAIN — for #75044 pickup cartridge
23B	75497	Stylus—78 r.p.m. stylus — PLAIN — for #75475 pickup cartridge
23C	75274	Nut—Stylus retaining nut—knurled—for #75044 pickup
23C	74230	Nut — Stylus retaining nut and washer — for #75475 pickup cartridge
24	75273	Mount—Pickup cartridge mount assembly (2-piece assembly)—for 960282-1, -2 and -3
24A	75931	Bracket—Bracket and bearing assembly (to mount #75932 rotor in #75925 arm) — for 960282-4 and -5
24B	75932	Rotor — Rotor bracket and shaft assembly (to mount #75475 pickup in #75931 bracket)—for 960282-4 and -5
24C	75930	Spring—Detent spring for rotor bracket assembly #75932—for 960282-4 and -5
24D	75975	Screw—3-48 x 1/8" truss head screw to mount #75931 bracket to #75925 pickup arm shell —for 960282-4 and -5

MODELS 960282-2 AND 960282-3

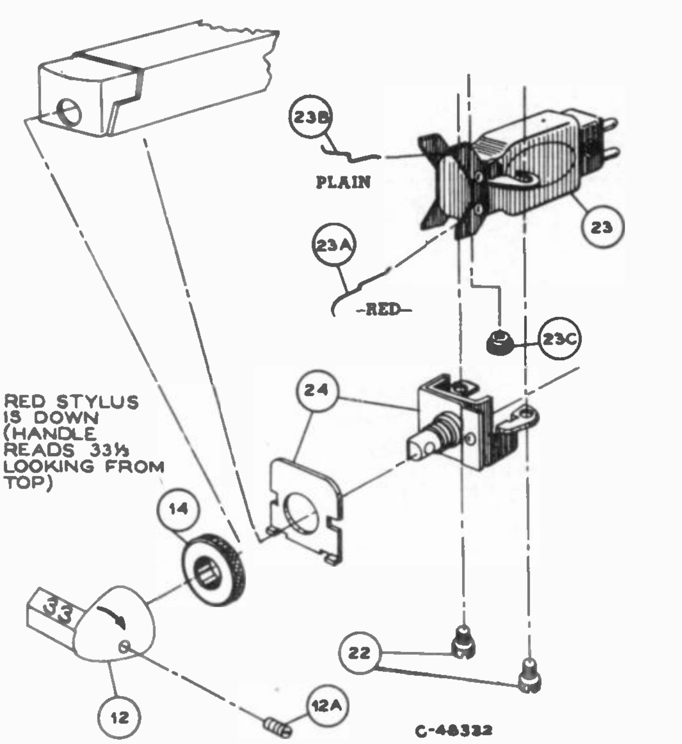
These record changers are used in instruments manufactured for RCA International Division.

They are identical to 960282-1 except for the following:

1. A motor is used which may be converted for operation on a 50 cycle power supply. Stock No. S-5637 motor includes mounting plate, grommets, idler wheel and change-over mechanism. A 50 cycle conversion spring is also included.
2. Two levers (Items #101 and #102) are different. (Order replacements by description and item number.)
3. A ceramic pickup cartridge is used only with 960282-2. Stock No. S-5652 ceramic cartridge complete, including styluses.
4. Stock No. 75044 crystal pickup is used with 960282-3.

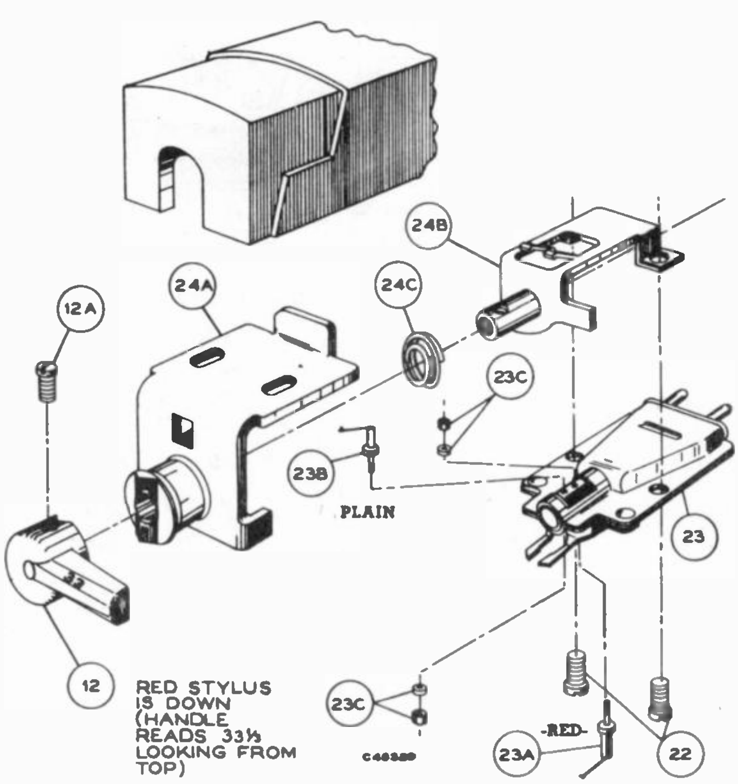
NOTE: For operation on a 50 cycle power supply. Remove original spring sleeve from motor shaft and replace with the 50 cycle conversion spring.

Replacements for items used only on 960282-2 and 960282-3 are stocked by RCA International Distributors but are not stocked in the U. S. A. Order parts giving full description.

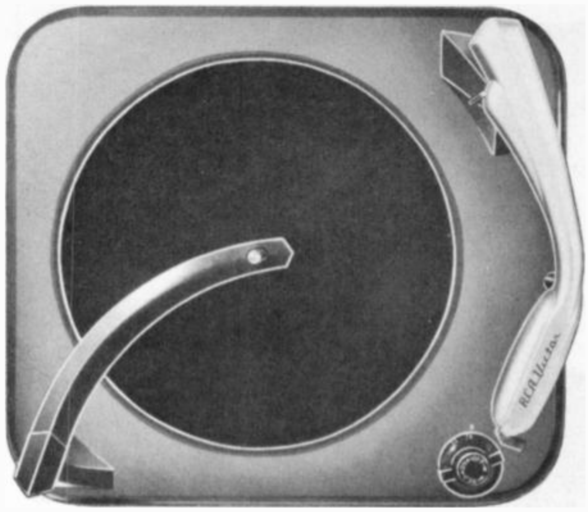


Note: The stylus are not replaceable in Stock No. S-5652 ceramic pickup used in 960282-2.

Pickup Assembly—Models 960282-1, -2 and -3



Pickup Assembly—Models 960282-4 and -5



PH536

RCA VICTOR

MODEL 960284-1,-2

Automatic Record Changer

SERVICE DATA

— 1950 No. 12 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Mechanism may be used in the following instruments:

Radio Combinations—A108	960284-1, -2
—A91	960284-1, -2
Television Combinations—9T89	960284-1, -2
—6T87	960284-1, -2

The difference between 960284-1 and 960284-2 is in color. (See parts list.)

SPECIFICATIONS

Turntable speed	78 or 33⅓ rpm
Record used	10" or 12" (intermixed)
Record capacity	Ten twelve-inch
	Twelve ten-inch
	Ten intermixed
Pickup force	10 to 12 grams
Stylus radius	.001 inch for 33⅓ rpm
	.003 inch for 78 rpm
Type pickup	Crystal
Power supply	105-125 volts, 60 cycles A-C

INDEX

FEATURES

1. This record changer is a center support intermix mechanism designed to play automatically a series of records up to ten 12-inch, twelve 10-inch, or ten intermixed records of the standard 78 RPM type. It will also play a series of the long playing 33-1/3 RPM type of similar diameter.
2. The mechanism is equipped with a light weight dual stylus pickup cartridge. The proper stylus can be selected by turning a knob in the end of the pickup arm.

After the last selection of the stack has been played, the pickup arm will go to the rest position and the mechanism will stop automatically.

4. The automatic tripping device is of the acceleration type.
5. The speed change is accomplished by a single control mounted on the motorboard.

AUTOMATIC OPERATION

1. Lift and rotate the record support to one side.
2. Place a stack of records over the center post.
3. Rotate the record support to a position so the center post will extend through the hole in the end of the support.
4. Turn the speed control to select the proper speed.
5. Rotate the knob in the end of the pickup arm to the proper numeral corresponding to the turntable speed.
6. Turn the function control knob to reject and release. The mechanism will play one side of each record of the stack until the last selection has been played at which time it will stop automatically.
7. To reject a record being played, turn the function control knob to reject and release.
8. To remove records, lift and turn the record support to one side.
9. Lift the stack of records straight up.

MANUAL OPERATION

1. Lift and rotate the record support to one side.
2. Place the record to be played on the turntable (tilt slightly to slide over the step in the centerpost).
3. Set the speed and pickup cartridge controls properly.
4. Turn function control to reject and release.
5. After the pickup sits on the record, place the record support over the centerpost, permitting it to rest on the step in the centerpost.
6. The mechanism will play the record after which it will stop automatically.

960284-1, -2

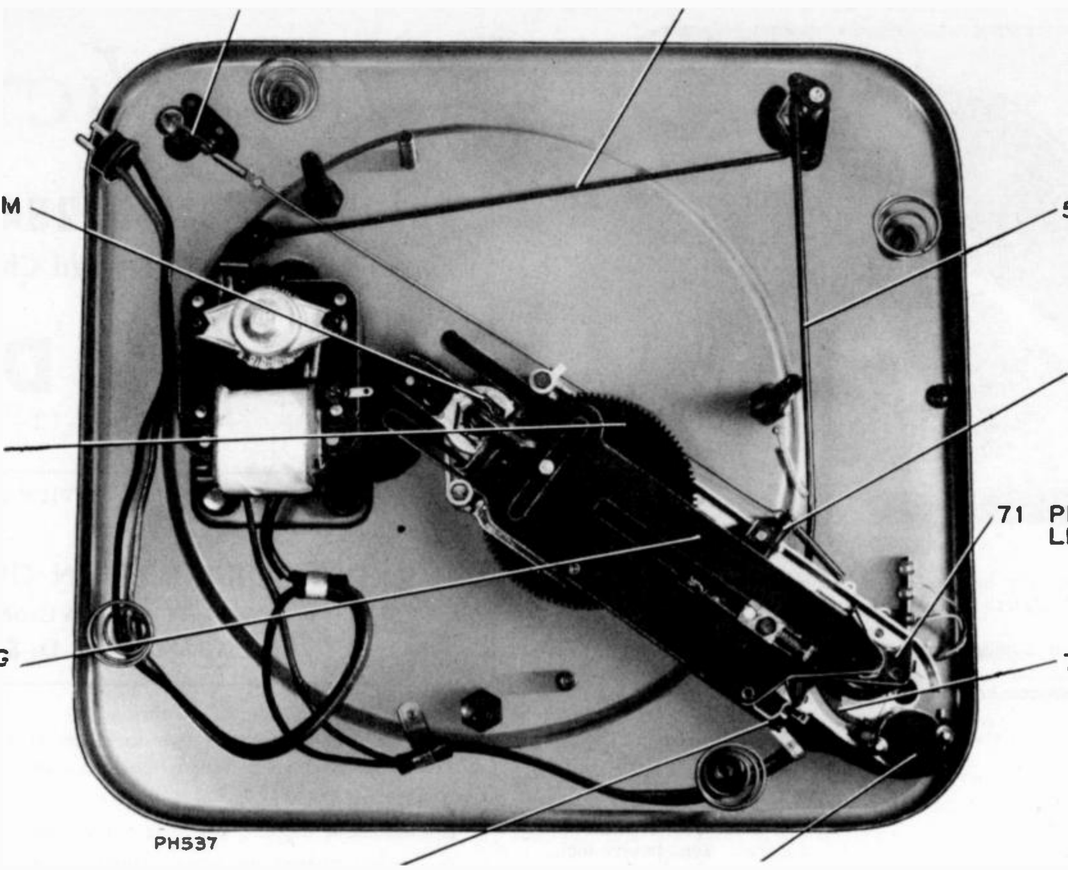


Fig. 1

FUNCTION OF PRINCIPAL LEVERS

See Fig. 1

Reject rod (56)

The function of the reject rod is to transfer the action from the control knob to the reject lever.

Trip slide (98)

The function of the trip slide is to transfer the movement of the pickup arm lever to the lower trip pawl. This action starts the change cycle.

Cycling gear (96)

The function of the cycling gears is to transfer the rotating motion of the turntable to the cycling mechanism.

Stop arm (43)

When the last record of the stack drops to the turntable, the record support arm drops. The lower end of the record support arm pivot actuates the stop lever thereby transferring the action for automatic stopping.

Lift arm (89)

The function of the lift arm is to transfer the movement of the cycling slide to the separator mechanism inside the centerpost.

Stop lever (80)

The function of the stop lever is to raise the trip slide and form a stop for pickup arm return lever. This results in the mechanism stopping automatically.

Cycling slide (102)

The function of the cycling slide is to transfer the action from the cycling gear to the other levers.

See Figs. 1 and 4

Pickup arm lever (71)

The function of the pickup arm lever is to transfer movement of the pickup arm to levers located beneath the motorboard. Other levers beneath the motorboard also counter react through the pickup arm lever thereby directing the movement of the pickup arm.

Reject lever (76)

The function of the reject lever is to actuate the power switch and trip slide.

See Fig. 2

Twelve-inch indexing lever (61)

After the completion of each change cycle of the mechanism, the pickup arm automatically is indexed for ten-inch records unless a twelve-inch record has dropped to the turntable. As a twelve-inch record drops to the turntable, it moves the twelve-inch indexing lever thereby directing the position of the selector lever.

See Fig. 3

Trip pawl (upper) (94)

The upper trip pawl functions as an actuating device for the cycling engagement pawl.

Cycling engagement pawl (96A)

The function of the cycling engagement pawl is to engage the off-set in the turntable shaft thereby starting change cycle.

See Fig. 4

Pickup arm return lever (68)

The function of the pickup arm return lever is to provide the force necessary to move the pickup into landing position.

Selector lever (83)

The function of the selector lever is to form a stop for the pickup arm return lever. The position of selector lever (up or down) determines whether the pickup lands on ten- or twelve-inch records.

Trip pawl (lower) (97)

The lower trip pawl transfers the action of the trip slide from the lower to the upper side of the cycling gear.

(See Exploded View—Fig. 6)

Record support (overarm) (1)

The function of the record support is to stabilize and hold the records in a horizontal plane which is parallel to the motorboard. After the last record of the stack drops to the turntable, the pivot of the record support drops down and actuates the automatic stopping device.

Center post (34)

The function of the center post is to support the stack of records. It also houses the separating mechanism.

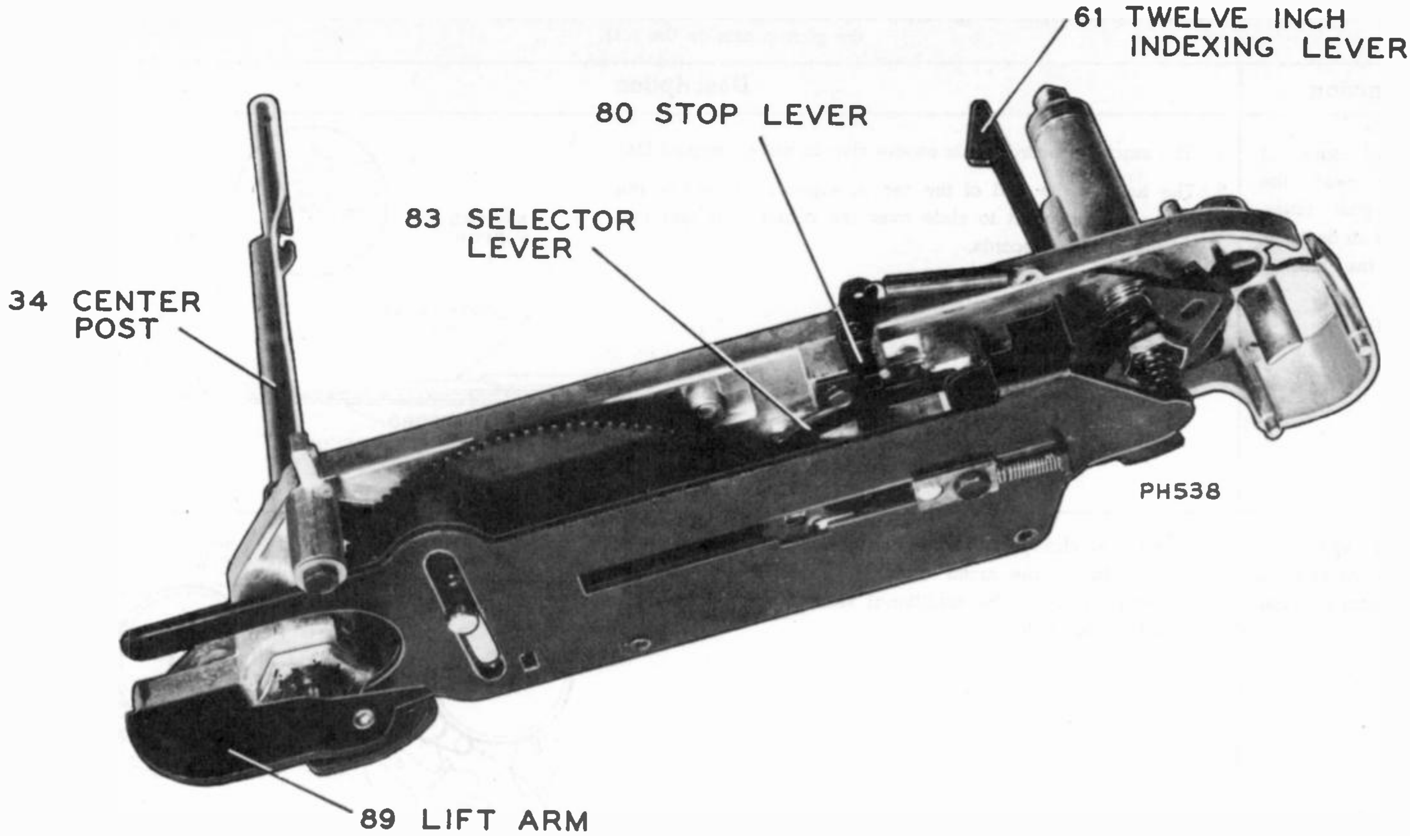


Fig. 2

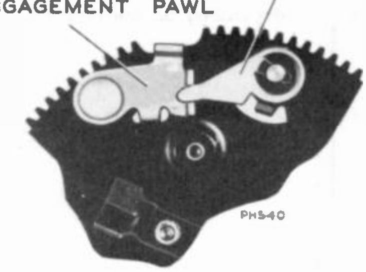


Fig. 3

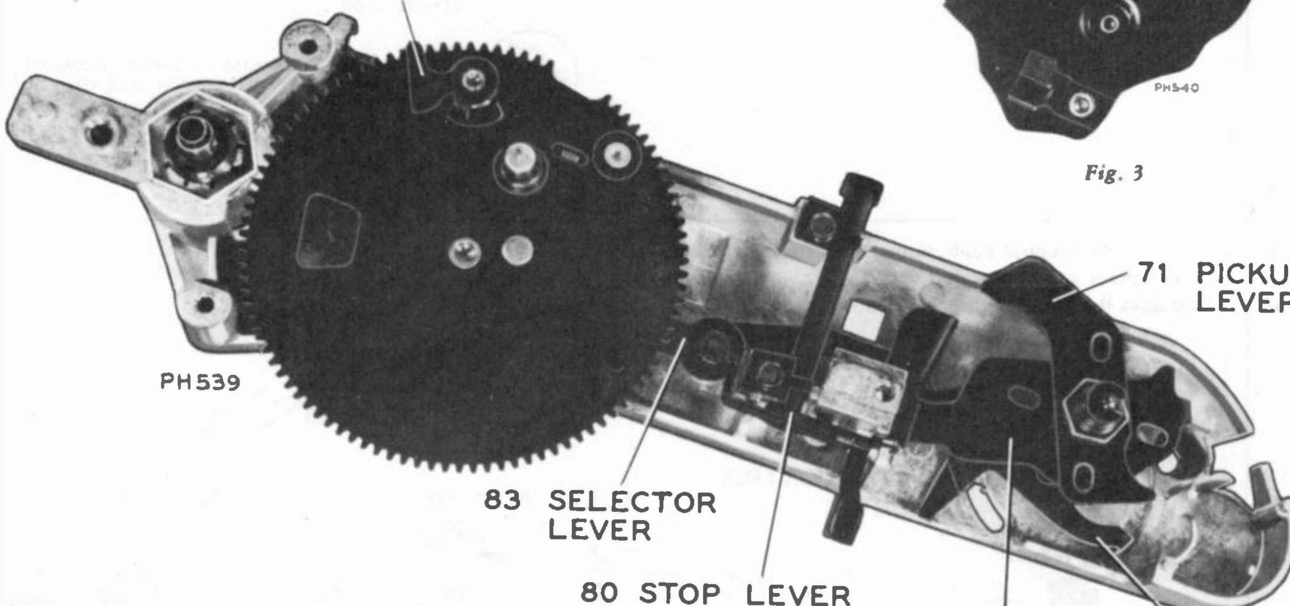


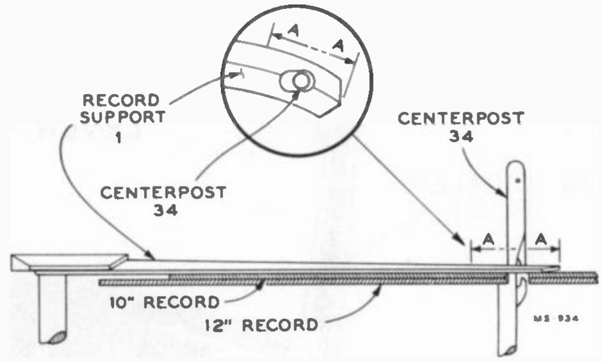
Fig. 4

CYCLE OF OPERATION

NOTE: In the cycle of operation it is assumed the mechanism has stopped automatically (out of cycle) with the pickup arm on the rest.

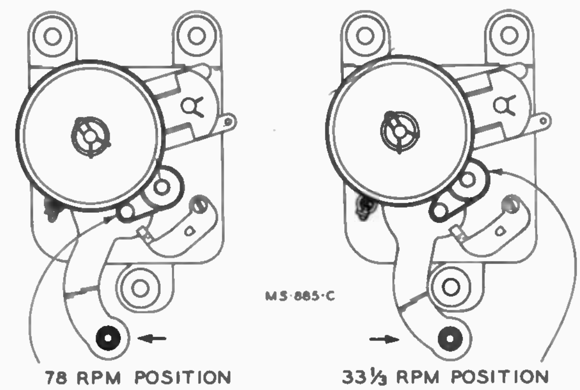
<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td>Place a stack of records over the center post (intermixed if so desired). Place the record support over the center post.</td><td>

1. The stack of records rests on the step in the centerpost (34).
2. The hole in the end of the record support (1) permits the end of the support to slide over the center post and rest on the stack of records.



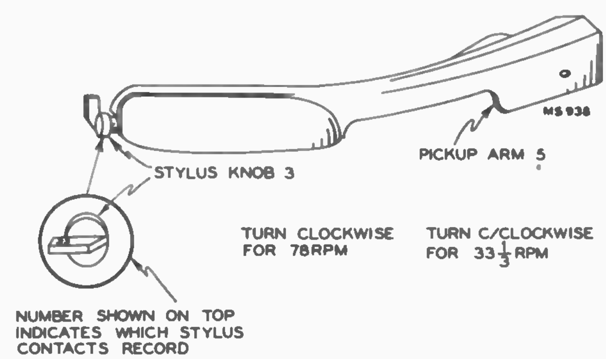
</td></tr>
<tr><td>Turn the speed selector knob to 78 or 33-1/3 rpm position.</td><td>

1. The speed change is accomplished by shifting to either of two shafts on the motor assembly which are rotating at different speeds. The additional shaft is connected by a small rubber belt.



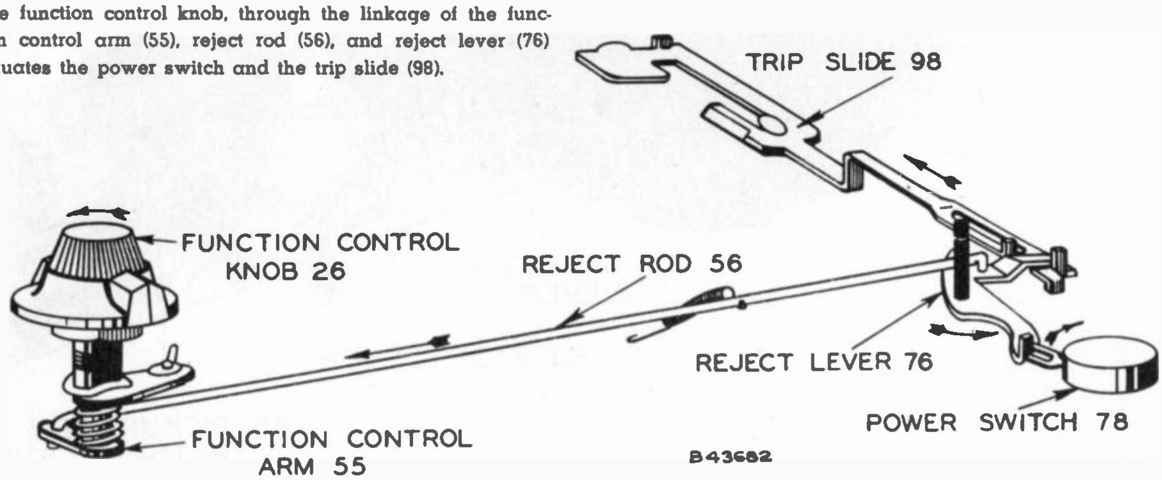
</td></tr>
<tr><td>Rotate the knobs to select the proper stylus.</td><td>

1. The rotation of the stylus knob (3) selects the proper stylus depending on the type of record to be played.



</td></tr>
<tr><td>Rotate function control knob to reject position and release.</td><td>

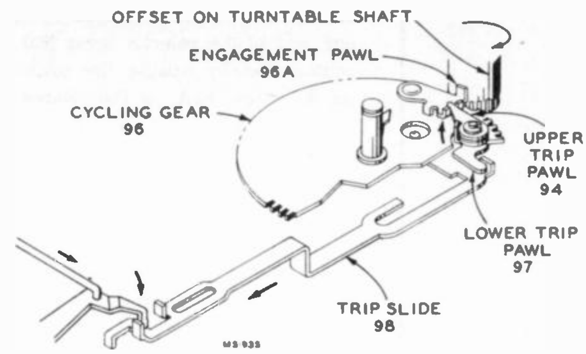
1. The function control knob, through the linkage of the function control arm (55), reject rod (56), and reject lever (76) actuates the power switch and the trip slide (98).



</td></tr>
</table>

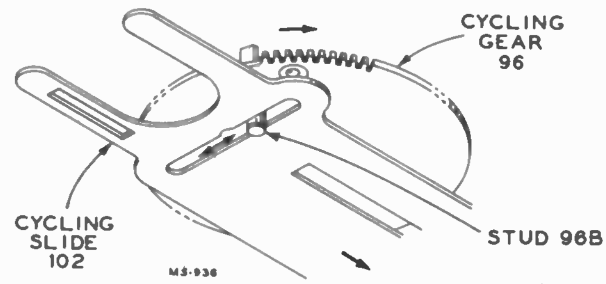
Cycling starts.

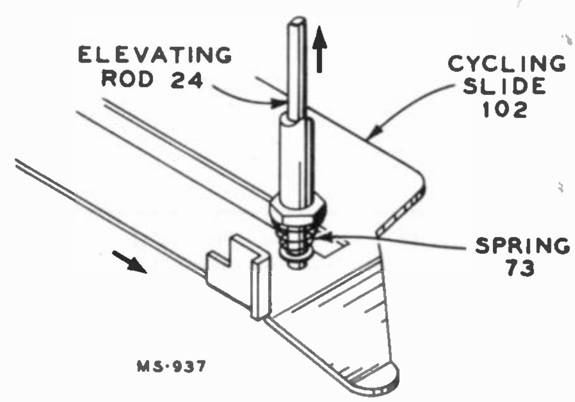
1. The closing of the power switch starts the turntable rotating.
2. The trip slide (98) in its movement contacts the lower trip pawl (97) and moves both the lower and the upper trip pawls which are tied together. The movement of the upper trip pawl (94) actuates the cycling engagement pawl (96A) sufficiently to cause engagement with the off-set on the rotating turntable shaft.
3. The contact between the cycling engagement pawl (96A) and the off-set on the turntable shaft gives the necessary push for the teeth in the cycling gear (96) to engage the teeth in the shaft of the turntable thereby starting change cycle.

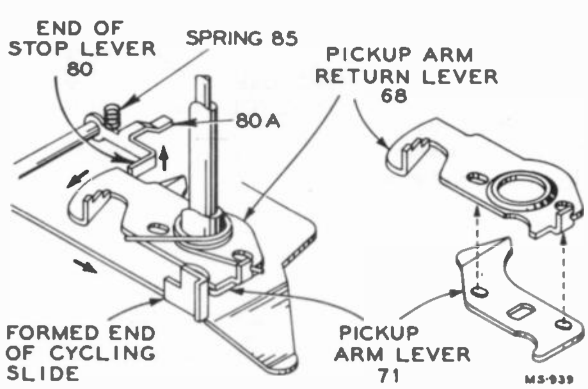


Pickup rises and remains outside turntable area.

1. As the cycling gear rotates, the stud (96B) mounted on the underside of the gear, rides inside a slot cut in the cycling slide (102).
2. The rotation of the cycling gear pushes the cycling slide back and forth.
3. As the slide moves away from the center post, an incline formed on the end of the slide causes the elevating rod (24) to raise and lift the pickup arm.
4. At the same time the elevating rod is pushed upward, the pickup arm lever (71) is also carried along from the force transferred through the spring (73). The raising of the pickup arm lever causes the two dimples formed in the pickup arm lever to engage the two holes in the pickup arm return lever (68) and couple them together. This stabilizes and directs the movement of the pickup arm during change cycle.
5. The cycling slide continues to move away from the center post until the formed end of the slide pushes against the pickup arm return lever. This relieves the force of pickup arm return lever against stop lever (80). This permits the stop lever return spring (85) to expand and return the stop lever to normal position.
6. The end (80A) of stop lever (80) pushes trip slide back ready for the next change cycle.

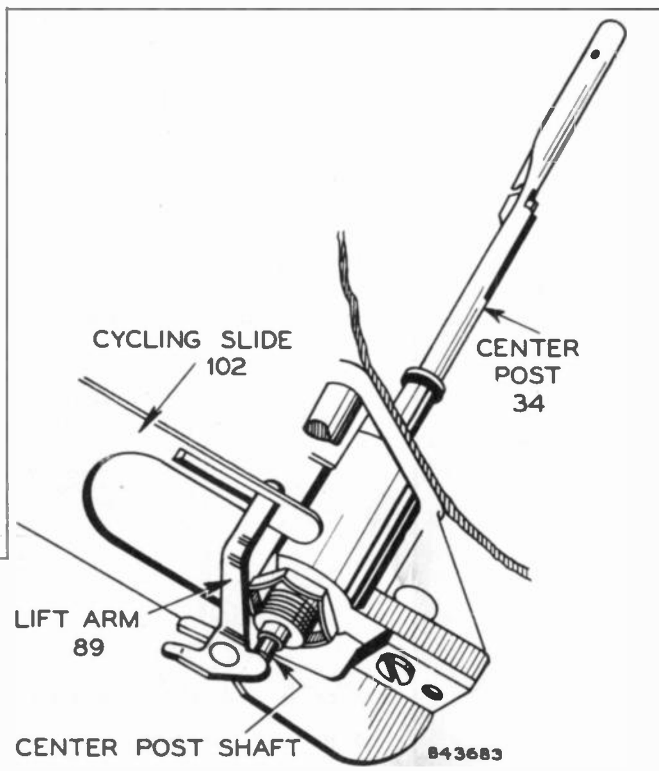




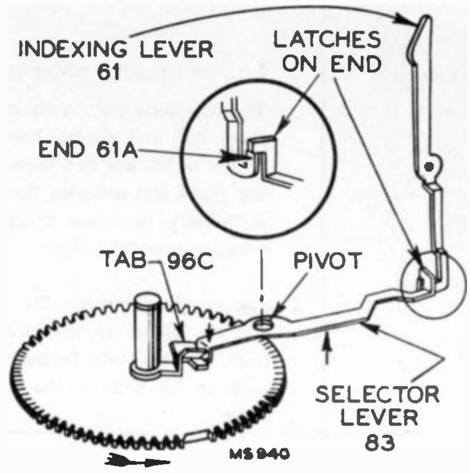


Record drops to turntable.

1. Further movement of the cycling slide causes the slot in the end of the cycling slide to actuate the lift arm (89).
2. The lift arm pushes up on the shaft extending from the bottom end of the center post. This shaft actuates the push off mechanism inside the center post, and the record drops to the turntable.

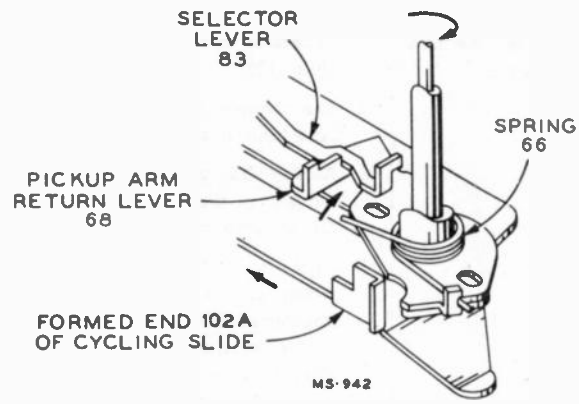


3. At this time the tab (96C) on cycling gear pushes down on one end of the selector lever (83) (which is pivoted in the center) thereby raising the other end causing it to latch on the edge (61A) of the twelve-inch indexing lever (61).



The pickup moves in for landing.

1. As the cycling slide returns, the formed edge (102A) on the slide moves back permitting the pickup arm return lever spring (66) to expand. This causes the pickup arm return lever (68) to move the pickup inward until the pickup arm return lever comes against the selector lever (83). The pickup is now directly above the point of landing.

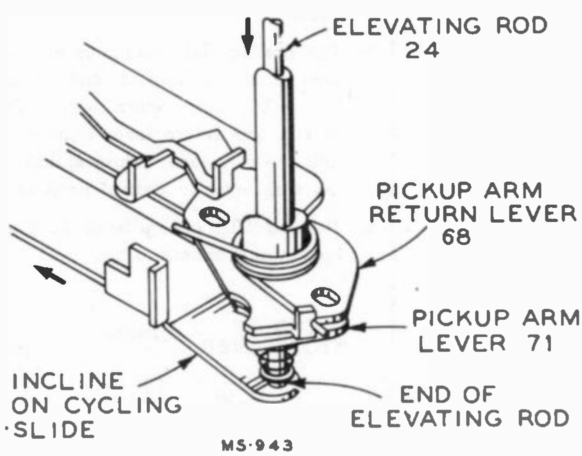


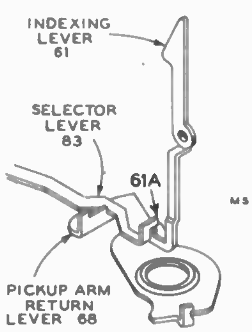
Pickup sits on record.

1. The elevating rod (24) slides down the incline on the slide permitting the pickup to sit on the start of the record.

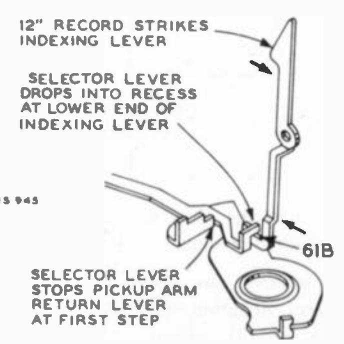
NOTE:—12" indexing.

The mechanism automatically is indexed for the pickup to land on a ten-inch record, each time the mechanism goes through change cycle, unless a twelve-inch record contacts indexing lever (61) as its drops to the turntable. On each revolution of the cycling gear (complete change cycle) the tab (96C) pushes down on the selector lever (83) and the other end of the selector lever latches on the top edge (61A) of the twelve-inch indexing lever. Under these conditions the pickup will land correctly on a ten-inch record. On the other hand if a twelve-inch record drops to the turntable, it strikes the indexing lever on the way down. This permits the end of the selector lever (83) to drop down futher into the recess (61B). The lower step of the pickup arm return lever makes contact with the selector lever and the pickup will land correctly on a twelve-inch record.

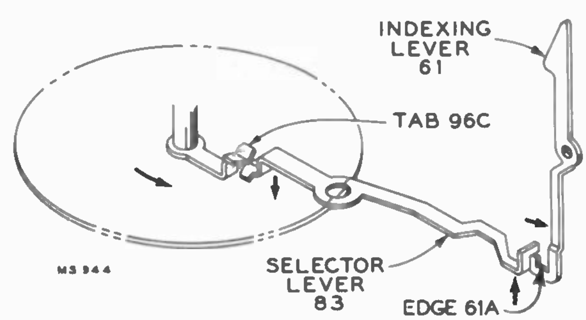




10" RECORD POSITION

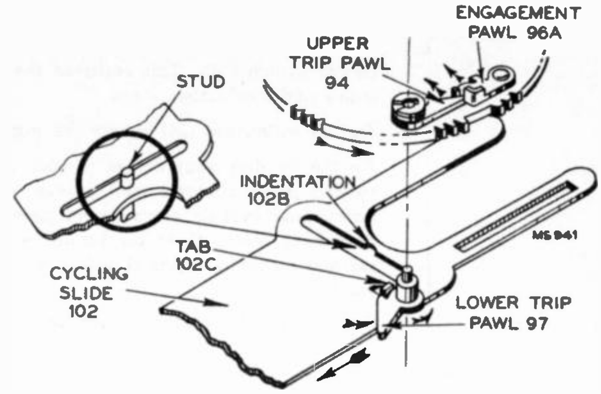


12" RECORD POSITION



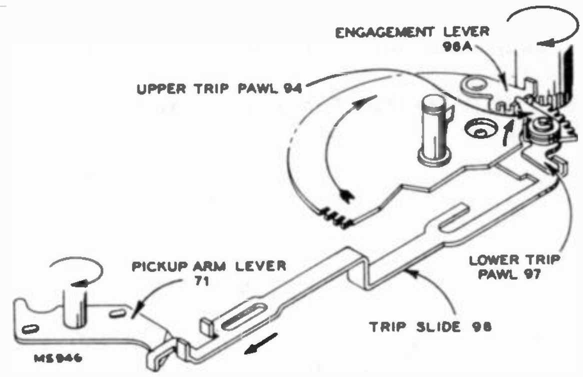
Mechanism completes cycle.

1. Just before the cycling gear completes cycle, a small tab (102C) on cycling slide makes contact with lower trip pawl (97) thereby moving upper trip pawl (94) and cycling engagement pawl (96A) back. This prevents the re-engagement with the off-set on the turntable shaft which would start a new change cycle.
2. The cycling gear comes to rest as the stud sliding in the cycling slide drops into a small indentation (102B) in the slide. The cut away section of the gear is in position so the gear on the turntable shaft is free to rotate.



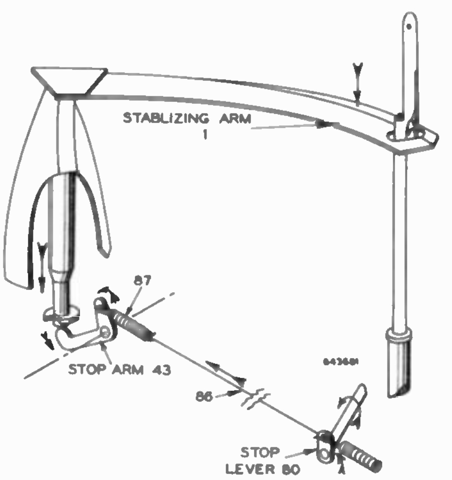
Record plays.

1. As the record plays, the pickup moves in toward the center of the record carrying the trip slide along. This is due to the contact made with the pickup arm lever which is rotating with the pickup arm pivot.
2. The trip slide contacts the lower trip pawl and both the lower and upper trip pawls and the cycling engagement pawls move slightly with each revolution of the record. This slight movement of the pawls is reversed each time the off-set on the turntable shaft comes in contact with the cycling engagement pawl. The back movement is taken up in the friction connection between the upper and lower trip pawls.
3. This action continues as long as the pickup moves in at a constant rate of speed. When the stylus leaves the recorded section of the record, the rapid acceleration results in the rapid movement of the cycling engagement pawl. The cycling engagement pawl assumes such a position that the off-set on the turntable shaft makes a positive contact and the cycling cam is pushed sufficiently for engagement between the teeth of the cycling gear and the teeth in the turntable shaft. This starts change cycle.



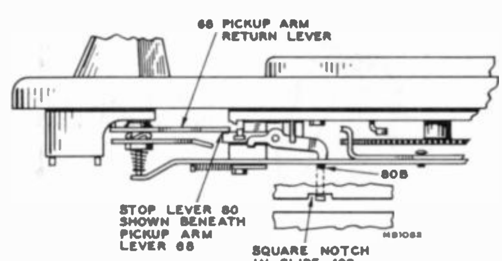
Pickup raises and moves out.

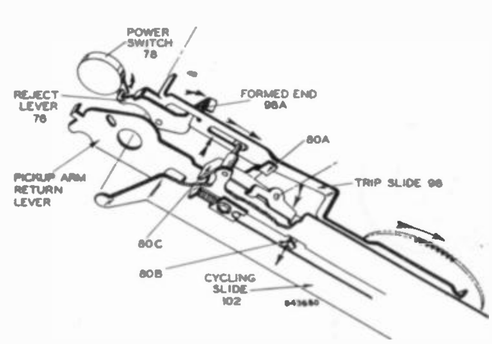
1. After the mechanism has been tripped the pickup arm moves out from action of the cycling slide (102) on the pickup arm lever (71).
2. The mechanism again follows the preceding sequence of dropping and playing the records until the last record of the stack has been played.



Mechanism stops automatically.

1. As the last record of the stack drops to the turntable the record support drops and actuates stop arm (43). This stop arm in turn applies force to stop lever through spring (87) and connecting wire (86). At this moment the cycling slide is in its outermost position (away from centerpost) and the hooked end (80B) of stop lever is forced down against, and slides along the top surface of the cycling slide.
2. As the cycling slide returns to the normal out of cycle position, the hooked end (80B) of the stop lever drops through the square hole cut in the slide. The end (80B) now extends slightly below the cycling slide. At this time the pickup arm return lever has rotated too far to be blocked by the other end (80C) of the stop lever so the pickup is permitted to land on the record.
3. After the last selection has been played the mechanism again goes into change cycle, and the cycling slide moves into its outermost position. At this moment the force which has been applied to the stop lever from the record support causes the end (80B) of the stop lever to lower, thus extending further through the cycling slide. The other end 80C of stop lever raises and blocks the pickup arm return lever which at this moment is held back by the cycling slide.

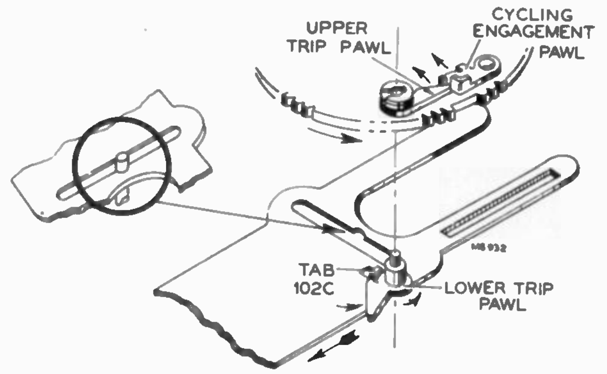




960284-1, -2

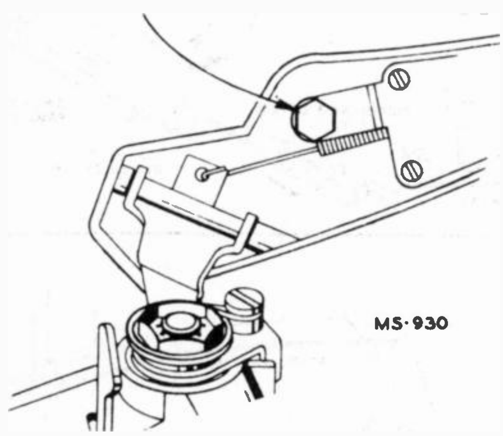
4. Next the cycling slide moves back, carrying the raised trip slide along until finally the formed end (98A) of the trip slide (98) pushes reject lever which in turn actuates the power switch (78). This removes the power from the drive motor and mechanism stops.
5. The elevating rod (24) lowers the pickup arm to the rest.
6. As the cycling gear comes to rest, a small tab (102C) on cycling slide contacts and moves lower and upper trip pawls and cycling engagement pawl back to prevent engagement with off-set on turntable shaft. This prevents starting a change cycle if power would be applied to drive motor.

(See page 17 for cycle of operation on modified mechanism.)

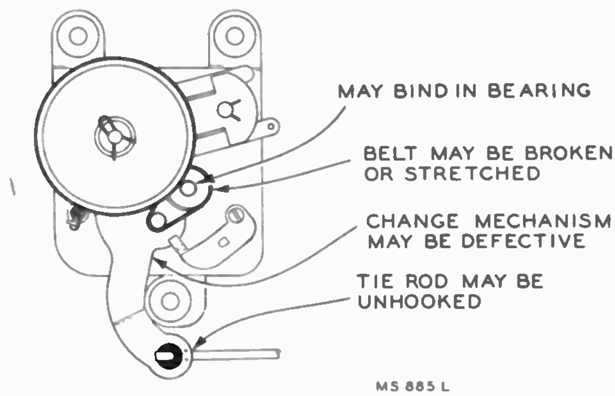


SERVICE HINTS

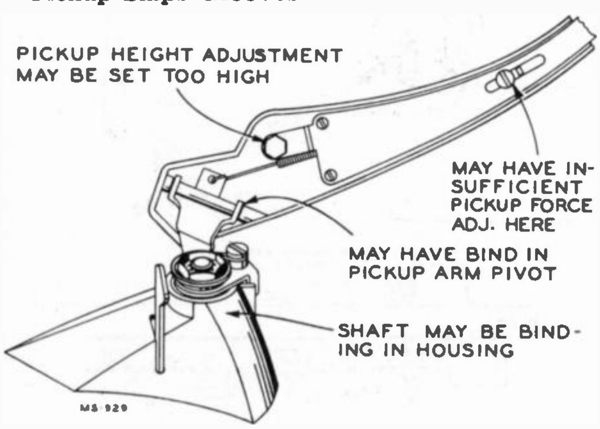
Pickup Arm Strikes Record on Center Post

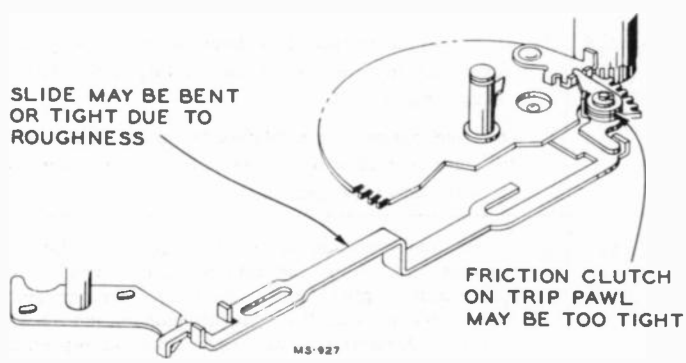


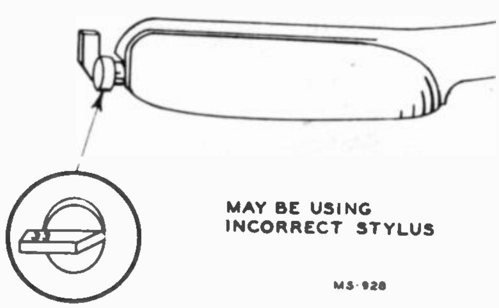
Speed Change Control Fails to Function



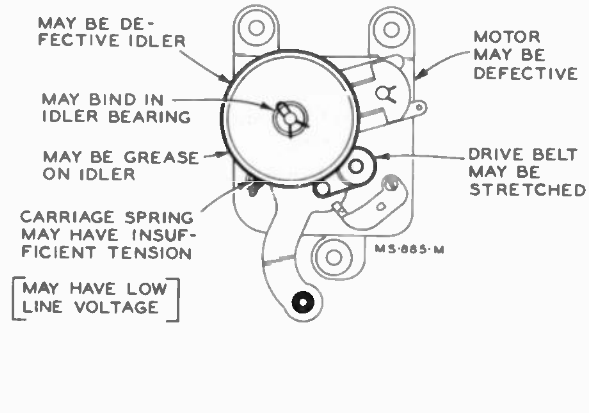
Pickup Skips Grooves





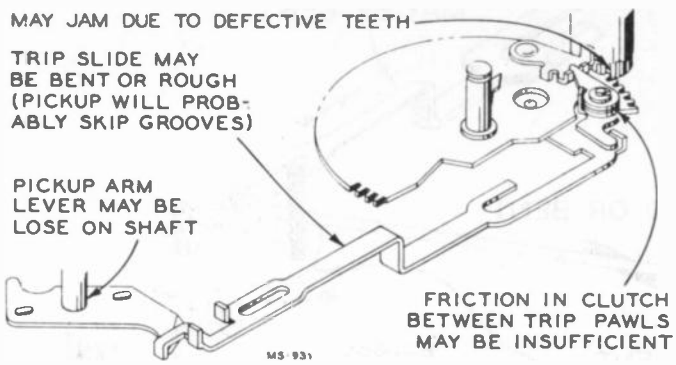


"Wow" or Speed Variation

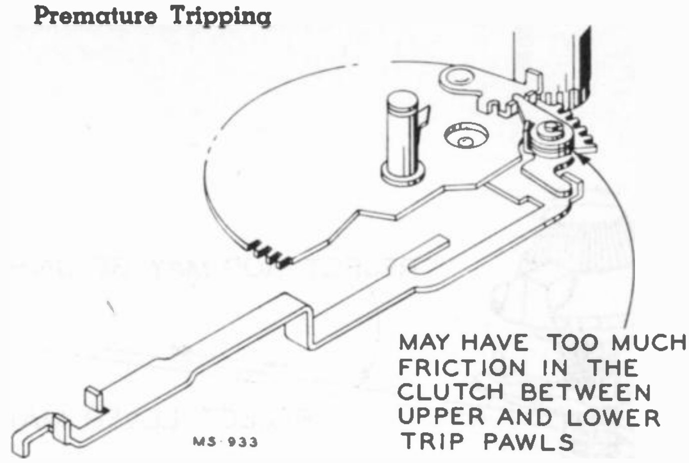


SERVICE HINTS (Continued)

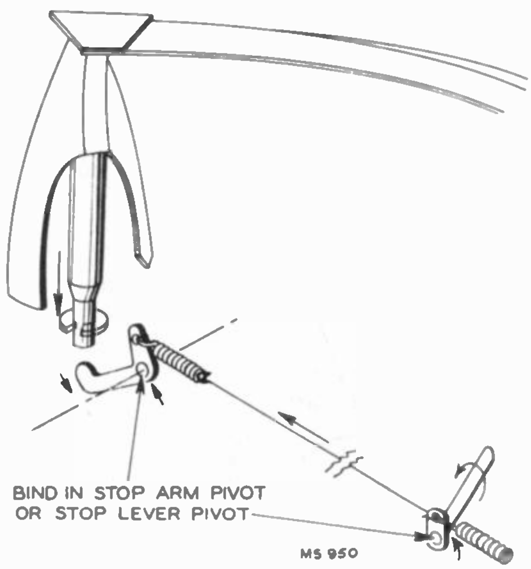
Mechanism Fails to Trip



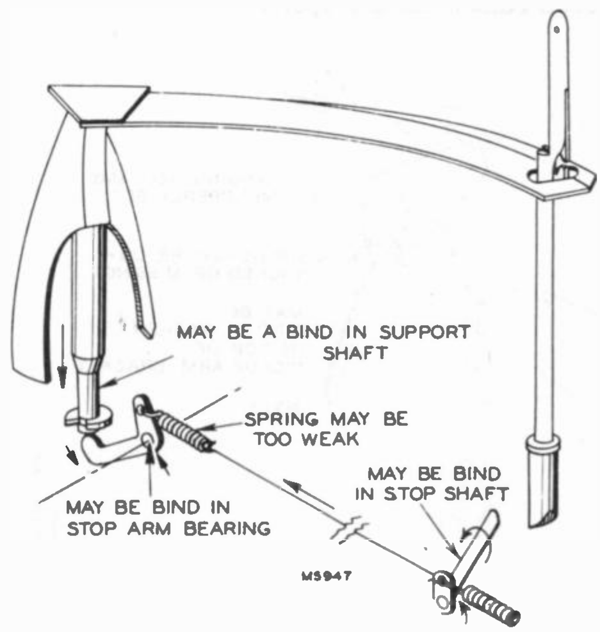
Premature Tripping



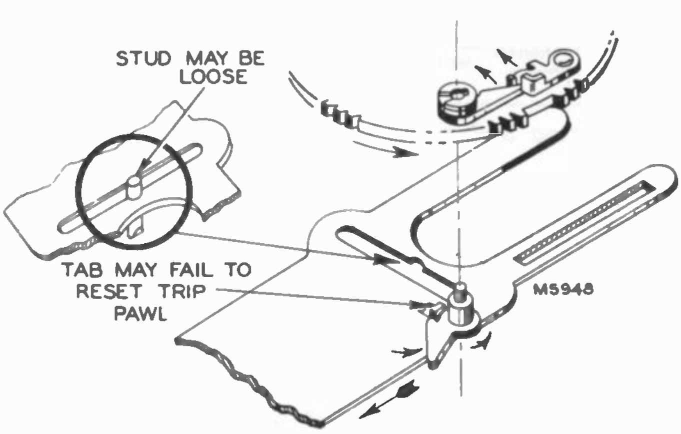
Pickup Sets Down on Rest Instead of Record



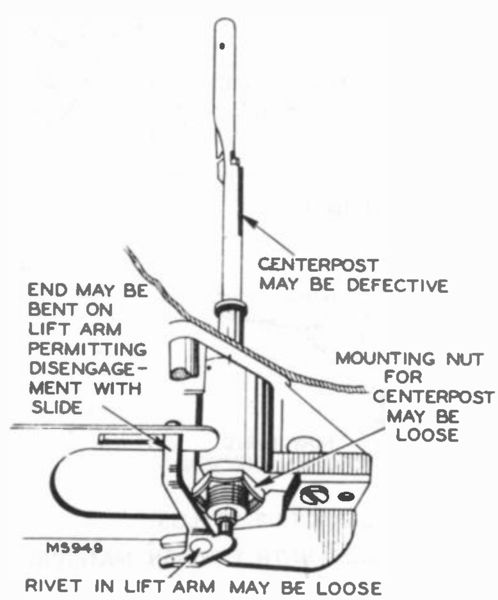
Mechanism Fails to Stop Automatically



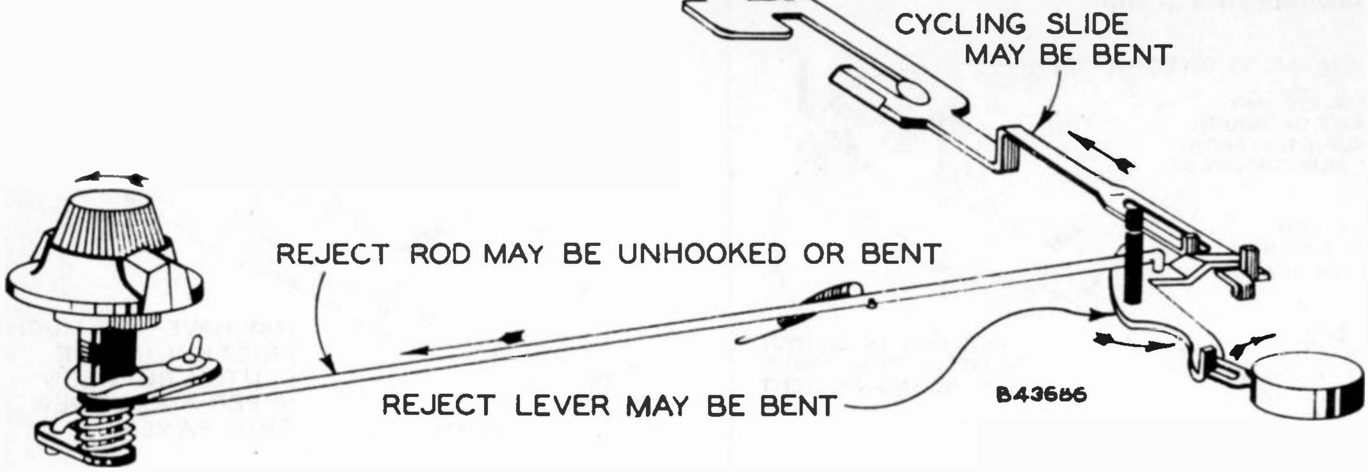
Mechanism Trips Continuously



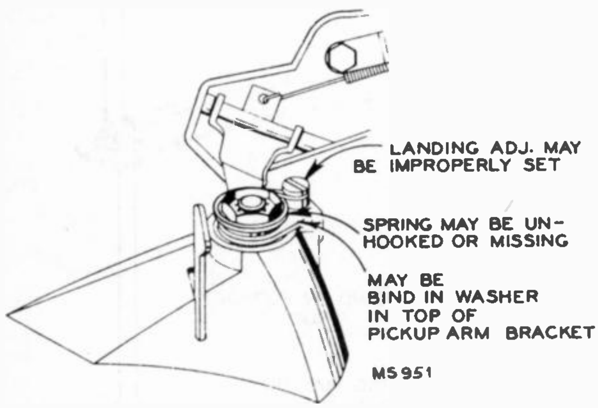
Failure to Separate Records Properly

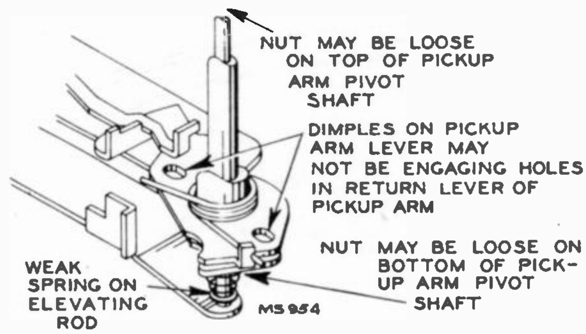


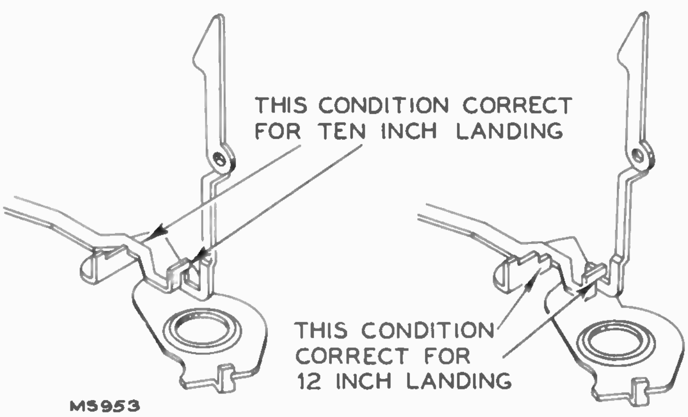
Reject Control Fails to Function

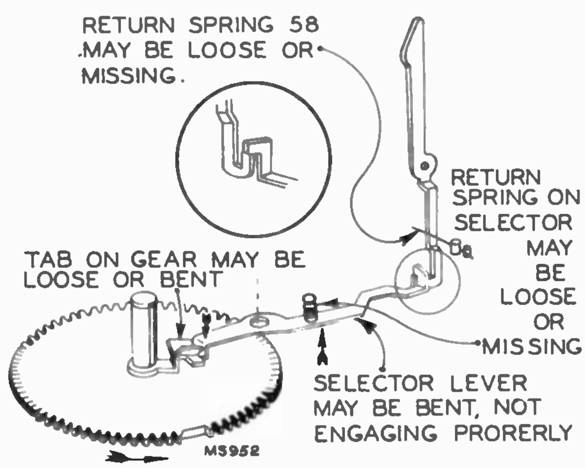


Pickup Fails to Land Properly

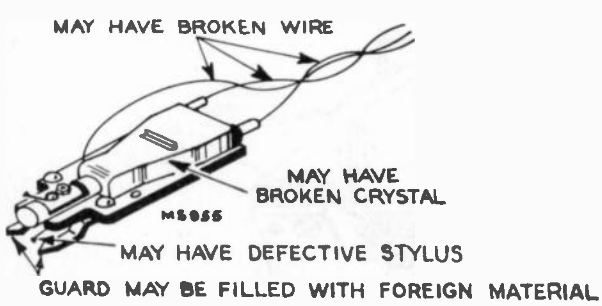




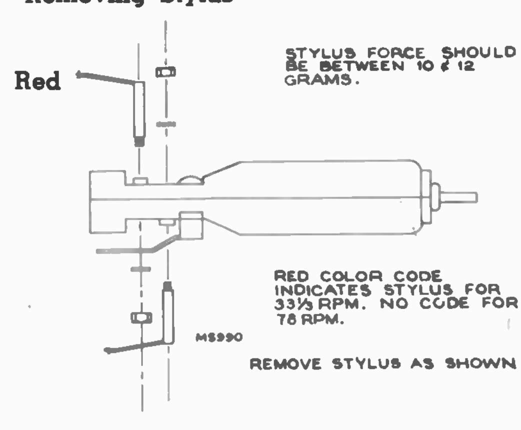




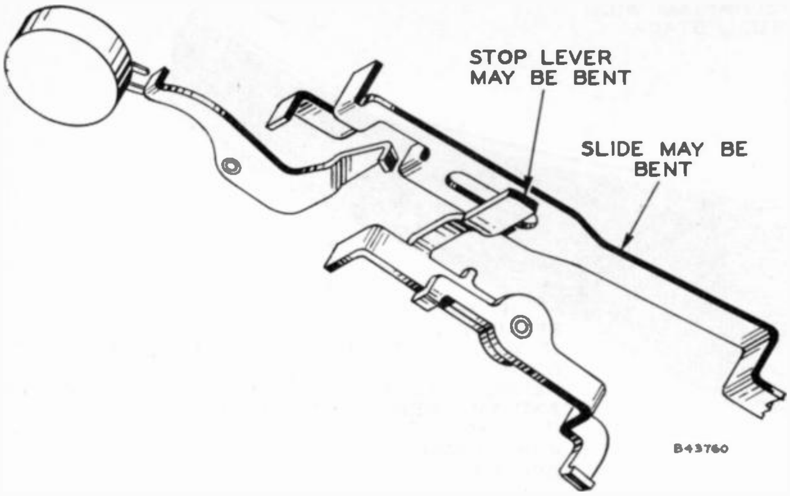
Distorted or No Output



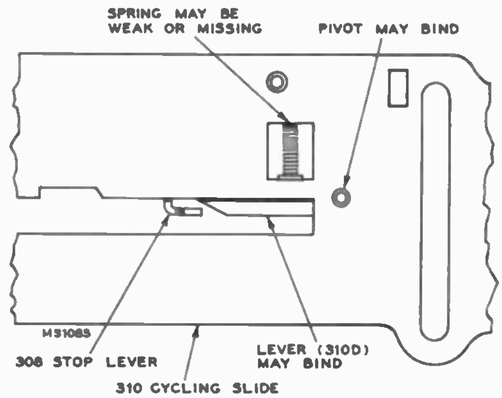
Removing Stylus



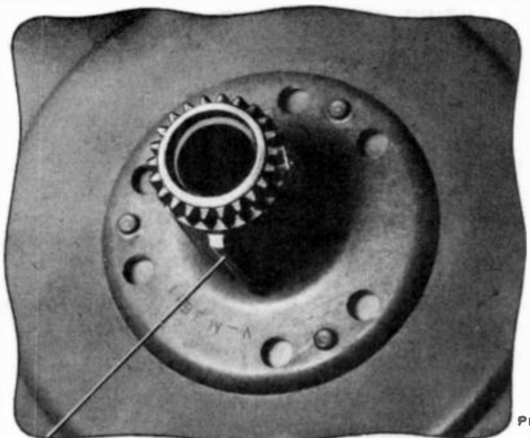
After Last Selection Has Been Played Pickup Sets on Rest, But Turntable Continues to Rotate

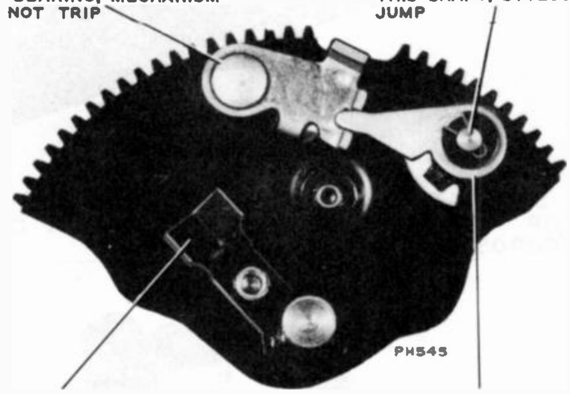


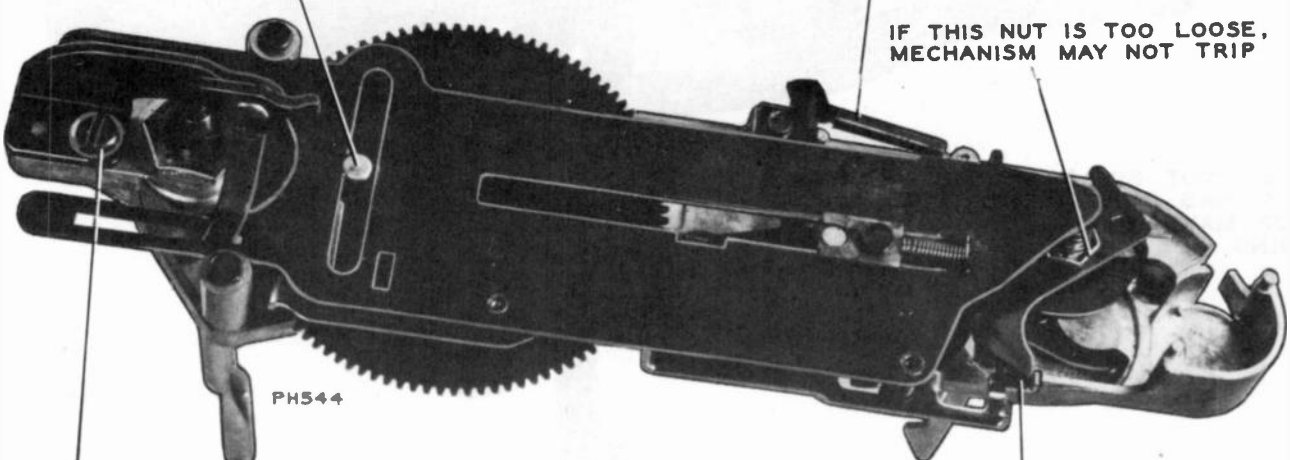
Mechanism Fails to Play Last Record (New Type Slide)



DO YOU KNOW?

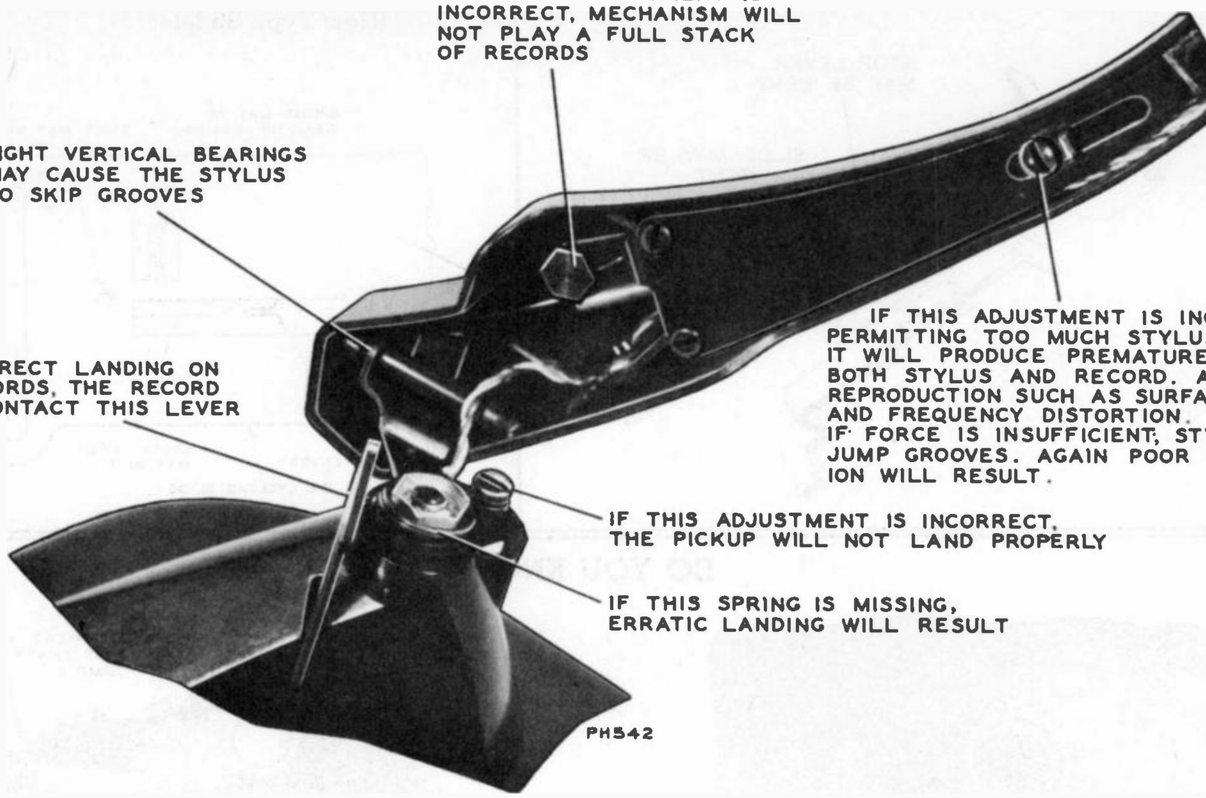




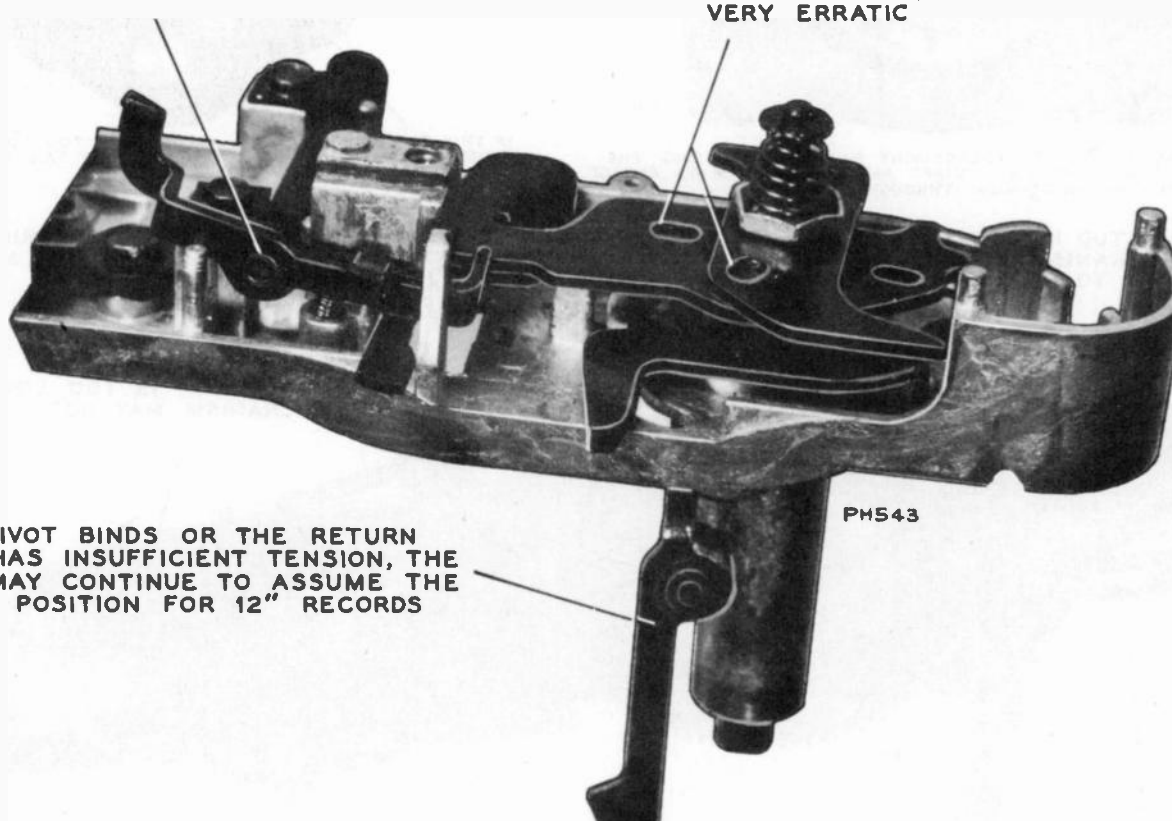


DO YOU KNOW?

960284-1, -2

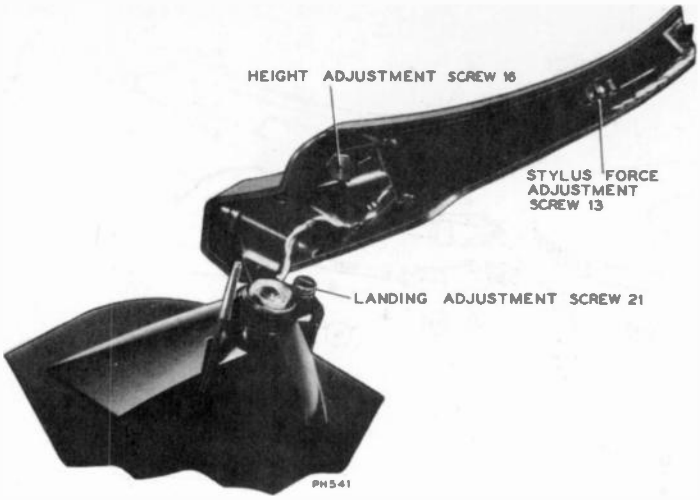


PH542



PH543

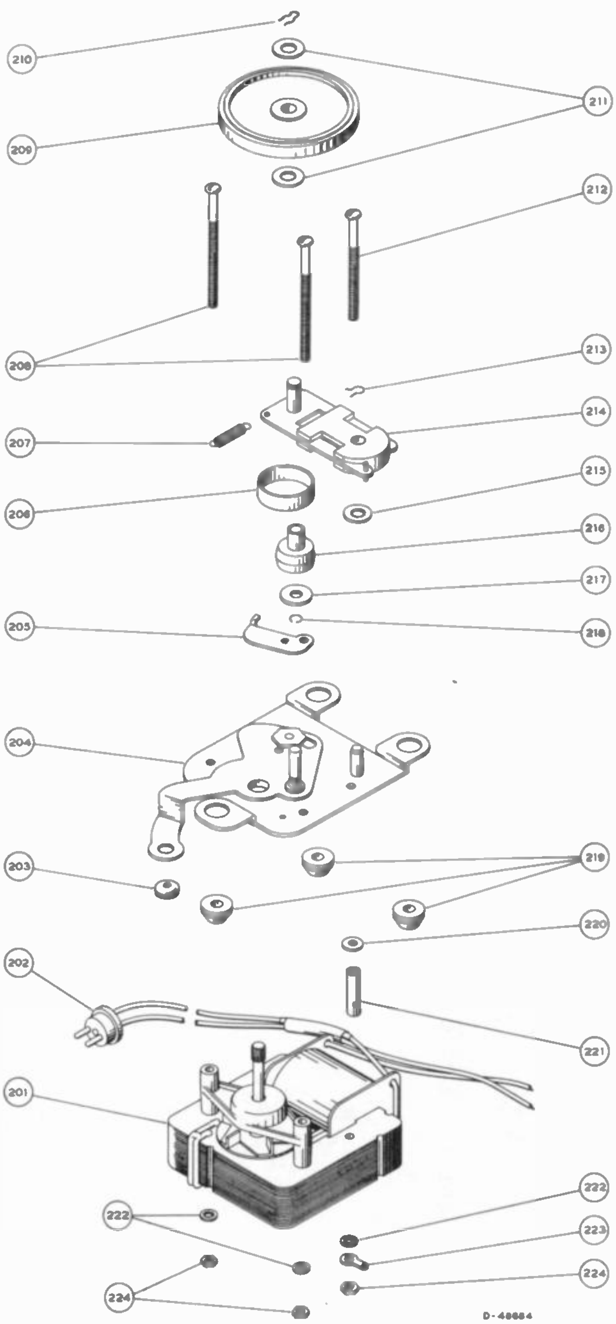
ADJUSTMENTS



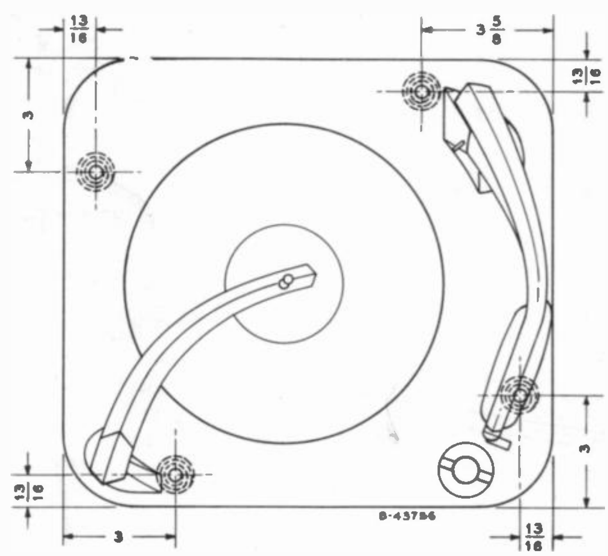
Landing Position—The landing position of the stylus is adjusted by means of the landing adjustment screw (21) mounted on the pickup arm support bracket assembly. Turn the screw for correct landing on 10" records and the 12" adjustment should automatically be correct.

Pickup Arm Height—The pickup arm height is adjusted by screw (16) located inside the pickup arm. To raise pickup arm turn screw counterclockwise to lower arm turn screw clockwise. The pickup arm height should be adjusted so that with a 1⅛" stack of records the pickup arm lifts ¼" straight up as the change cycle starts.

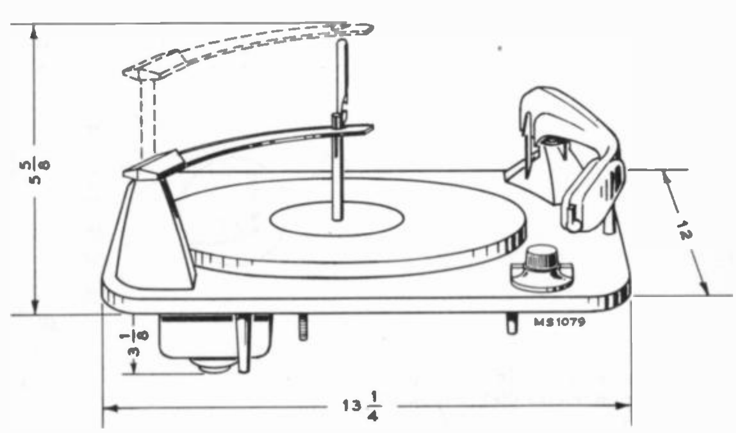
Stylus Force—Stylus force should be ten to twelve grams. Loosen screw (13) and move slide back and forth until the correct stylus force is obtained.



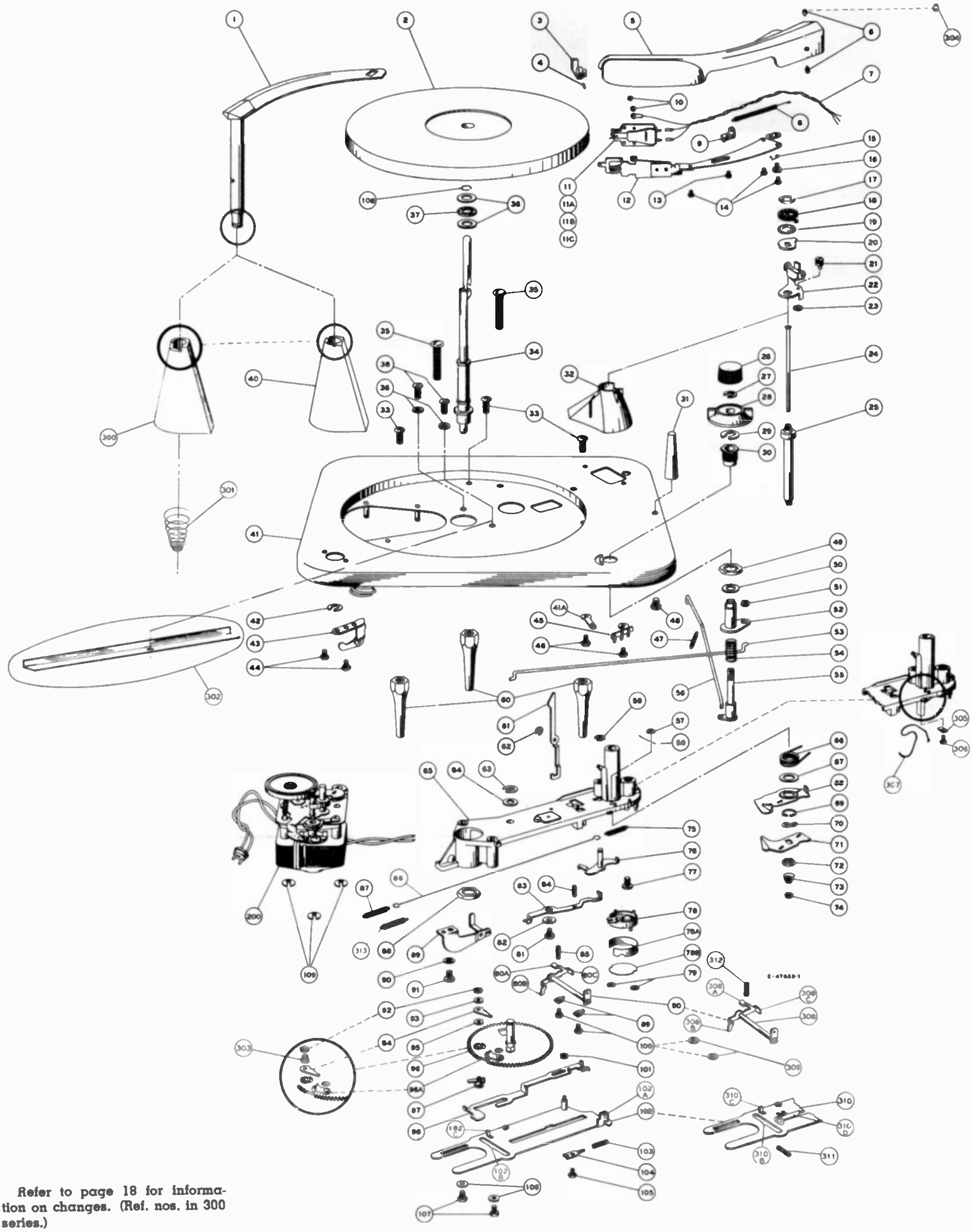
Exploded View of Motor



Mechanism Mounting Dimensions



Mechanism Overall Dimensions



Refer to page 18 for information on changes. (Ref. nos. in 300 series.)

Exploded View of Entire Mechanism—Fig. 6

REPLACEMENT PARTS

ILL. NO.	STOCK NO.	DESCRIPTION
1	75802	Support—Record support complete with plastic cap (maroon) and pin for 960284-1
1	75803	Support—Record support complete with plastic cap (tan) and pin for 960284-2
1A	75804	Cap—Plastic cap (maroon) for record support assembly for 960284-1
1A	75805	Cap—Plastic cap (tan) for record support assembly for 960284-2
2	75806	Turntable—Turntable and hub assembly
3	76409	Knob—Stylus selector knob complete with screw Ill. #4
4	——	Screw—Screw for stylus selector knob (included in 76409, Ill. #3)
5	75807	Arm—Pickup arm shell only complete with "RCA Victor" emblem
6	75357	Pivot—Pickup arm pivot (2 required)
7	75808	Cable—Three (3) wire pickup cable complete with connectors
8	75809	Spring—Pickup arm counterbalance spring (coil type)
9	75810	Bracket—Adjustment bracket for counterbalance spring
10	——	Screw—Mounting screw for crystal
11	75475	Crystal—Two-way (33⅓/78 RPM crystal complete with styluses
11A	75497	Stylus—Osmium tip stylus for 78 RPM section (not coded)
11B	75496	Stylus—Osmium tip stylus for 33⅓ RPM section (coded "red")
11C	74230	Nut—#00-112 nut and washer to mount stylus
12	75811	Mount—Crystal mount and swivel assembly
13	——	Screw—#6-32 x 1/8" round head machine screw to mount counterbalance spring adjustment bracket
14	71097	Screw—#4 x 1/4" self tapping screw for crystal mount and swivel assembly
15	75812	Spring—Lock spring (coil type) for height adjustment screw
16	75813	Screw—Height adjustment screw (hex head)
17	——	Nut—Pal nut for mounting pickup arm bracket
18	75814	Spring—Tension spring (coil type) for landing adjustment stud
19	——	Washer—Metal (steel) washer for pickup arm pivot shaft (1/16" x 1/4" I.D. x 1/2" O.D.)
20	75815	Cam—Landing adjustment cam
21	75816	Stud—Landing adjustment stud (eccentric)
22	75817	Bracket—Pickup arm mounting bracket complete with pin
23	75818	Nut—Speed nut for landing adjustment stud
24	75819	Rod—Elevating rod
25	75820	Shaft—Pickup arm pivot shaft and sleeve
26	75821	Knob—Function control knob (maroon) for 960284-1
26	75822	Knob—Function control knob (tan) for 960284-2
27	75399	Washer—"C" washer to mount function control arm and shaft assembly
28	75823	Knob—Motor speed control knob (maroon) for 960284-1
28	75824	Knob—Motor speed control knob (tan) for 960284-2
29	75825	Washer—"C" washer to mount motor control arm and shaft assembly
30	75826	Bushing—Threaded bushing for control shaft
31	75827	Rest—Pickup arm rest (maroon) for 960284-1
31	75828	Rest—Pickup arm rest (tan) for 960284-2
32	75829	Housing—Pickup arm pivot shaft housing (plum hammertone) (die-cast) for 960284-1
32	75873	Housing—Pickup arm pivot shaft housing (light brown) (die-cast) for 960284-2
33	75830	Screw—#10 x 1/2 self-tapping cross-recessed head screw to mount plastic legs
34	75831	Spindle—Turntable spindle assembly
35	75377	Screw—Motorboard mounting screw (1/4-20 x 1 3/8" round head—special)
36	75354	Washer—Thrust washer for turntable bearing (2 required)
37	75355	Bearing—Thrust bearing
38	——	Screw—#10-24 x 5/16" pan head machine screw to mount die-cast sub-assembly
39	——	Lockwasher—#10 internal tooth lockwasher to mount die-cast sub-assembly
40	75832	Housing—Record support housing (plum hammertone) (die-cast) for 960284-1
40	75874	Housing—Record support housing (light brown) (die-cast) for 960284-2
41	——	Board—Motorboard (plum hammertone) complete with mounting springs, cable clamps and motor mounting studs for 960284-1
41	——	Board—Motorboard (light brown) complete with mounting springs, cable clamps and motor mounting studs for 960284-2
41A	——	Lug—Terminal lug
42	75385	Washer—"C" washer for record support shaft
43	75834	Arm—Stop arm assembly
44	——	Screw—#6 x 5/16" hex head self-tapping screw to mount record support housing and stop arm
45	——	Board—Terminal board (3 contact)
46	——	Screw—#6-32 x 1/4" hex head self-tapping screw to mount terminal board and pickup arm pivot housing
47	75401	Spring—Reject rod return spring (coil type)
48	75830	Screw—#10 x 1/2" self-tapping cross-recessed head screw to mount arm rest
49	——	Nut—Pal nut to mount threaded bushing Ill. #30
50	75835	Washer—Bronze washer for control shaft
51	75403	Grommet—Rubber grommet for motor speed control rod
52	75836	Arm—Motor speed control arm and shaft assembly
53	75837	Rod—Motor speed control rod
54	75838	Spring—Compression spring for control lever shaft (coil type)
55	75839	Arm—Function control arm and shaft assembly
56	75840	Rod—Reject rod
57	75841	Nut—Speed nut for 12" indexing lever return spring
58	75842	Spring—12" indexing lever return spring (formed)
59	75392	Washer—"C" washer for mounting reject lever
60	75843	Leg—Plastic leg
61	75844	Lever—12" indexing lever
62	75397	Washer—"C" washer for mounting 12" indexing lever
63	75373	Washer—"C" washer for mounting cycling gear
64	75845	Washer—Fibre washer for mounting cycling gear
65	75846	Casting—Main casting
66	75847	Spring—Pickup arm return lever spring (coil type)
67	75848	Washer—Fiber washer for pickup arm pivot shaft
68	75849	Lever—Pickup arm return lever
69	75850	Retainer—Retainer ring for pickup arm return lever
70	75851	Washer—Spring washer for pickup arm pivot shaft
71	75852	Lever—Pickup arm lever
72	——	Nut—Pal nut to fasten pickup arm lever
73	75854	Spring—Thrust spring (coil type) for elevating rod
74	75397	Washer—"C" washer for elevating rod
75	75855	Spring—Return spring (coil type) for stop lever
76	75856	Lever—Reject lever
77	——	Screw—#10-24 x 5/16" round head machine screw and lockwasher
78	75857	Switch—"On-Off" switch complete with insulating strip and cover
79	75841	Nut—Speed nut for fastening switch cover

REPLACEMENT PARTS—Cont.

ILL. NO.	STOCK NO.	DESCRIPTION
80	75858	Lever—Stop lever assembly (including 80A, B, C)
81	——	Screw—#6-32 x ¼" hex head screw for selector lever
82	——	Washer—Flat washer (steel) for mounting selector lever
83	75859	Lever—Selector lever
84	75860	Spring—Return spring (coil type) for selector lever
85	75861	Spring—Return spring (coil type) for stop lever
86	75862	Link—Control link
87	75863	Spring—Return spring (coil type) for stop arm
88	——	Nut—Pal nut for spindle
89	75864	Arm—Lift arm
90	——	Lockwasher—Internal teeth lockwasher (#10) for lift arm mounting screw
91	——	Screw—#10-24 x 5/16" round head machine screw for lift arm
92	75397	Washer—"C" washer for mounting trip pawl
93	75396	Washer—Fibre washer for trip pawl shaft
94	75865	Pawl—Trip pawl—upper
95	75395	Washer—Spring washer for trip pawl shaft
96	75866	Gear—Cycling gear complete with shaft and engagement lever
96A	——	Lever—Engagement lever—part of Ill. 96
97	75867	Pawl—Trip pawl—lower
98	75868	Slide—Trip slide
99	75869	Strip—Bearing strip for stop lever shaft
100	——	Screw—#4-40 x ¼" hex head screw for mounting stop lever shaft bearing strips
101	75397	Washer—"C" washer for mounting trip slide
102	75870	Slide—Cycling slide and cam assembly
103	75871	Spring—Stabilizing spring (coil type) for cycling slide
104	75872	Plate—Bearing plate for cycling slide
105	——	Screw—#6-32 x ½" hex head machine screw for mounting cycling slide bearing plate
106	——	Washer—Brass washer for cycling slide
107	——	Screw—#6-32 x ½" hex head machine screw for mounting cycling slide
108	75353	Retainer—Turntable spindle thrust bearing assembly retainer
109	75876	Washer—"C" washer for mounting motor
200	75333	Motor—117 volt, 60 cycle, complete with top plate, idler wheel and drive belt
202	30870	Connector—2 contact male connector for motor leads
203	75403	Grommet—Rubber grommet for motor speed change tie rod (2 req'd)
204	75426	Plate—Motor top plate including speed change carriage, 3 mounting grommets and 1 speed change lever grommet
205	75431	Plate—Friction guide plate
206	75376	Belt—Rubber belt for motor drive shaft
207	75383	Spring—Tension spring for idler wheel
208	——	Screw—#6-32 x 2" round head machine screw to mount top plate to motor
209	75382	Wheel—Idler wheel
210	75380	Spring—Hairpin spring for idler wheel
211	75433	Washer—Dampening washer for idler wheel (2 req'd)
212	——	Screw—#6-32 x 2⅛" round head machine screw to mount top plate to motor
213	75432	Spring—Hairpin spring to mount idler carriage
214	75430	Carriage—Idler carriage
215	75433	Washer—Fibre washer
216	75429	Pulley—Drive pulley and shaft assembly for 33⅓ RPM
217	75428	Washer—Felt washer
218	75427	Retainer—Retainer ring for drive pulley and shaft
219	75386	Grommet—Rubber grommet to mount motor (3 req'd)
220	——	Washer—Flat metal washer
221	——	Spacer—Metal spacer to mount top plate to motor
222	——	Lockwasher—#6 internal teeth
223	——	Lug—Terminal lug
224	——	Nut—#6 hex nut

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

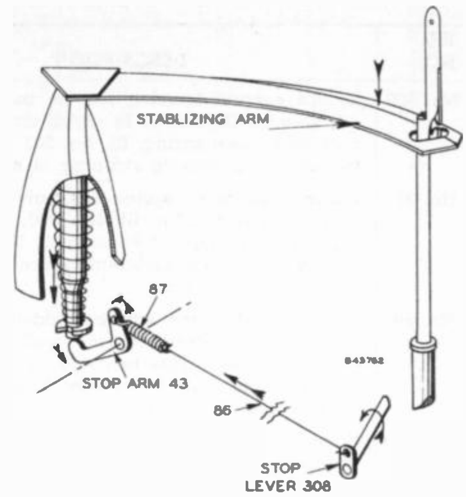
REPLACEMENT PARTS (Modified Type)

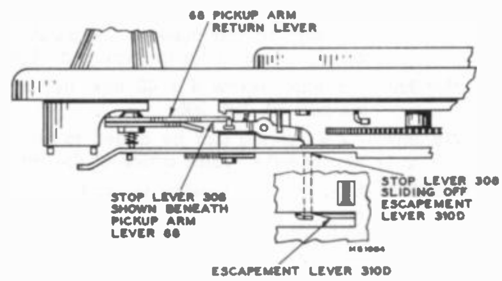
ILL. NO.	STOCK NO.	DESCRIPTION
300	76395	Housing—Record support housing (plum hammertone) (die cast) for 960284-1
300	76396	Housing—Record support housing (light brown) (die cast) for 960284-2
301	76308	Spring—Record support hold down spring
302	76307	Brace—Brace for motor board
303	76309	Spring—Friction spring for trip lever assembly
304	76306	Bearing—Hinge button bearing
305	76311	Support—Cycling slide support
306	——	Screw—Mounting screw for Ill. No. 305 (4-40 Hex. Hd.)
307	76312	Spring—Reject spring
308	76313	Lever—Stop lever
309	76310	Nut—Tinnerman nut, to mount stop lever on main support
310	76315	Slide—Cycling slide complete with escape lever Ill. 310D
311	75861	Spring—Escape lever spring
312	76314	Spring—Stop lever spring
313	76316	Spring—Stop arm take up spring

EXPLANATION OF AUTOMATIC STOPPING ACTION IN MECHANISMS HAVING NEW SLIDE (310) AND STOP LEVER (308) ASSEMBLIES

Mechanism stops automatically.

1. As the last record of the stack drops to the turntable the record support drops and actuates the stop arm (43). This stop arm in turn applies force to stop lever (308) through spring (87) and connecting wire (86). At this moment the cycling slide is in the outermost position (away from centerpost) and the end 308B of stop lever is forced against escape lever 310D which prevents it from lowering any further.
2. As the cycling slide returns to the out of cycle position the end (308B) of stop lever slides off the escape lever permitting the end (308B) to extend down through the slot in the cycling slide. At this time the pickup arm return lever has rotated too far to be blocked by the other end (308C) of the stop lever so the pickup is permitted to land on the record.
3. After the last selection has been played the mechanism again goes into change cycle, and the cycling slide moves into its outermost position. At this moment the force which has been applied to the stop lever from the record support causes the end (308B) to lower, thus extending further through the cycling slide. The other end (308C) of stop lever raises and blocks the pickup arm return lever which at this moment is held back by the cycling slide.
4. As the cycling slide moves back, it carries the raised trip slide along until finally the formed end (98A) of the trip slide (98) pushes reject lever which in turn actuates the power switch (78). This removes the power from the drive motor and mechanism stops.
5. The elevating rod (24) lowers the pickup arm to the rest.
6. As the cycling gear comes to rest, a small tab (310C) on cycling slide contacts and moves lower and upper trip pawls and cycling engagement pawl back to prevent engagement with off-set on turntable shaft. This prevents starting a change cycle if power would be applied to drive motor.



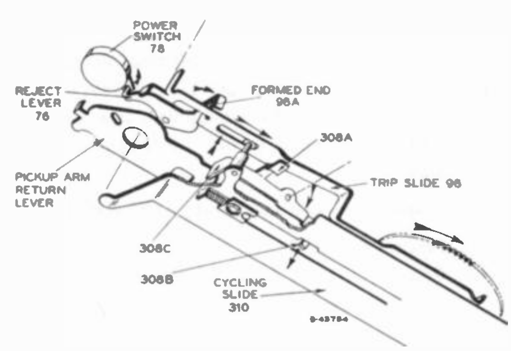


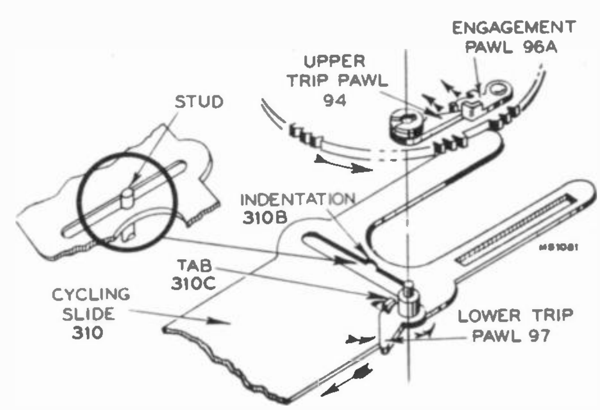
NOTE: Assuming the mechanism stopped automatically, the record support will be down as far as it will go and the one end of the stop lever will block the pickup arm return lever.

In the mechanism with the old split type stop lever, when the record support is raised to place a stack of records on the post, one half of the stop lever can raise therefore the end (80B) can raise up through the square hole in the cycling slide while the other end continues to block the pickup arm return lever.

The lowering of end (80C) at this time would cause the pickup to jump in over the record.

In the case of the new type one piece stop lever (308) the end (308B) remains down until the change cycle starts and the cycling slide has reached the outermost position. At this time the end (308B) slides over the edge of escape lever (310D) and raises when the other end is lowering away from the pickup arm return lever which at this moment is being held back by formed end of cycling slides.





GENERAL INFORMATION ON SUBSTITUTIONS AND CHANGES

ILL. NO.	DESCRIPTION
Ill. No. 300	Record support housing can be used to replace old housing Ill. No. 40 in which case record support hold down spring, Ill. No. 301 can be added to improve automatic stopping of mechanism.
Ill. No. 301	Record hold down spring can only be used with new support housing Ill. No. 300. It cannot be used with old support housing Ill. No. 40 because it does not provide sufficient vertical clearance for pin in record support.
Ill. No. 302	Motor board brace can be added to old type mechanism to straighten the well in which the turntable rides. This tends to prevent turntable scraping and also to prevent bending of motor board while in transit.
Ill. No. 303	Friction spring can be added to old mechanism by removing washers, Ill. Nos. 93 and 95. This change tends to improve tripping.
Ill. No. 304	Hinge button can be used in place of one pivot screw. The use of hinge button tends to control the friction in the vertical pickup arm pivot.
Ill. No. 305	Slide support Ill. No. 305 can be used on main castings having the standoff moulded on casting, as shown in circle in exploded view.
Ill. No. 306	Mounting screw 4 x 40 hex. hd. used with slide support Ill. No. 305.
Ill. No. 307	Reject spring can be added to old mechanism to improve the return action of the reject lever.
Ill. No. 308	Stop lever assembly is made in one piece and must be used in conjunction with the new type slide Ill. No. 310. Stop lever assembly 308 and slide 310 can be added to old mechanism as a unit, and not one of the old type and one of the new type.
	When substituting the new type stop lever Ill. No. 308 a new spring Ill. No. 312 must be added to increase tension on lever. Tension spring Ill. No. 313 will have to be substituted for Ill. No. 87.
Ill. No. 309	Tinnerman nuts are used on some castings in place of screws Ill. No. 100. Tinnerman nuts will be included when that type of casting is shipped.
Ill. No. 310	Cycling slide can be added to original mechanism if the stop lever new type Ill. No. 308 is also changed. If this change is made also change springs Ill. Nos. 312 and 313.
Ill. No. 311	Escape lever spring is the same spring as used on old mechanism item 85.
Ill. No. 312	Stop lever spring can be substituted in place of spring Ill. No. 85 on mechanism having old type "split" stop lever. This spring is absolutely essential on mechanism using new type stop lever Ill. No. 308.
Ill. No. 313	Stop arm take up spring must be used when mechanism incorporates the following parts: New type stop lever Ill. No. 308 New type cycling slide Ill. No. 310 Stop lever spring Ill. No. 312 Stop arm spring Ill. No. 313 can also be used without harm on old type mechanism.
Ill. No. 75	Spring is now deleted on new mechanism using new Stop lever Ill. No. 308 Cycling slide Ill. No. 310 Stop arm spring Ill. No. 313 Stop lever spring Ill. No. 312

LUBRICATION

The mechanism is properly lubricated when it leaves the factory, so no lubrication should be necessary for a long period of time. If, however, the mechanism has unusual use or high operating temperatures, it may be necessary to add additional lubrication.

It is suggested to use Lubriplate or STA-PUT No. 512 to:

1. Pickup arm pivot.
2. Points of sliding contact with cycling slide, including:
   a. elevating rod
   b. lift arm
   c. roller on cycling cam
   d. pickup arm return lever
   e. pickup arm lever
3. End of selector lever contacting tab on cycling gear.
4. Turntable thrust bearing.
5. Sparingly on a trip slide.
6. All points of sliding contact.

Apply a small quantity of light machine oil #10 or Singer Sewing machine oil to:

1. Trip pawl pivot.
2. Cycling engagement pawl pivot.
3. Bearing of record support.
4. Elevating rod.
5. Bearing of lift arm.
6. Bearing of reject lever.
7. Bearing of stop lever.
8. Bearing of cycling gear.
9. Motor bearings.

NOTE: Keep oil or grease away from all rubber parts.

RCA VICTOR

MODEL 960285-1

Automatic Record Changer

SERVICE DATA

—1950 No. 3—

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

PH512

Features

1. This record changer is a center support intermix mechanism designed to play automatically a series of records up to ten 12-inch, twelve 10-inch, or ten intermixed records of the standard 78 RPM type. It will also play a series of the long playing 33-1/3 RPM type of similar diameter.
2. The mechanism is equipped with a light weight dual stylus pickup cartridge which can be selected by turning a knob in the end of the pickup arm.
3. The mechanism will automatically stop and the pickup arm return to the rest position after the mechanism has played the last selection of the stack.
4. The automatic tripping device is of the acceleration type.
5. The speed change is accomplished by a single control mounted on the motorboard.

Automatic Operation

1. Lift and rotate the record support to one side.
2. Place a stack of records over the center post.
3. Rotate the record support so the center post will extend through the hole in the end of the support.
4. Turn the speed control to select the proper speed.
5. Rotate the knob in the end of the pickup arm to the proper numeral corresponding to the turntable speed.
6. Turn the function control knob to reject and release. The mechanism will play one side of each record of the stack until the last selection has been played at which time it will stop automatically.
7. To reject a record being played, turn the function control knob to reject and release.
8. To remove records, lift and turn the record support to one side.
9. Lift the stack of records straight up.

Manual Operation

1. Lift and rotate the record support to one side.
2. Place the record to be played on the turntable (tilt slightly) to slide over the stop in the center post.
3. Set the speed and pickup cartridge controls properly.
4. Turn function control to reject and release. (Allow mechanism to complete cycle.)
5. Place the record support (2) over the spindle, permitting it to rest on the step of the spindle.
6. The mechanism will play the record after which it will stop automatically.

Lubrication

The mechanism is properly lubricated when it leaves the factory, so lubrication should not be necessary for a long period of time. If, however, the mechanism has unusual use or high operating temperatures, it may be necessary to add additional lubrication.

It is suggested to use Lubriplate or STA-PUT No. 512 to:

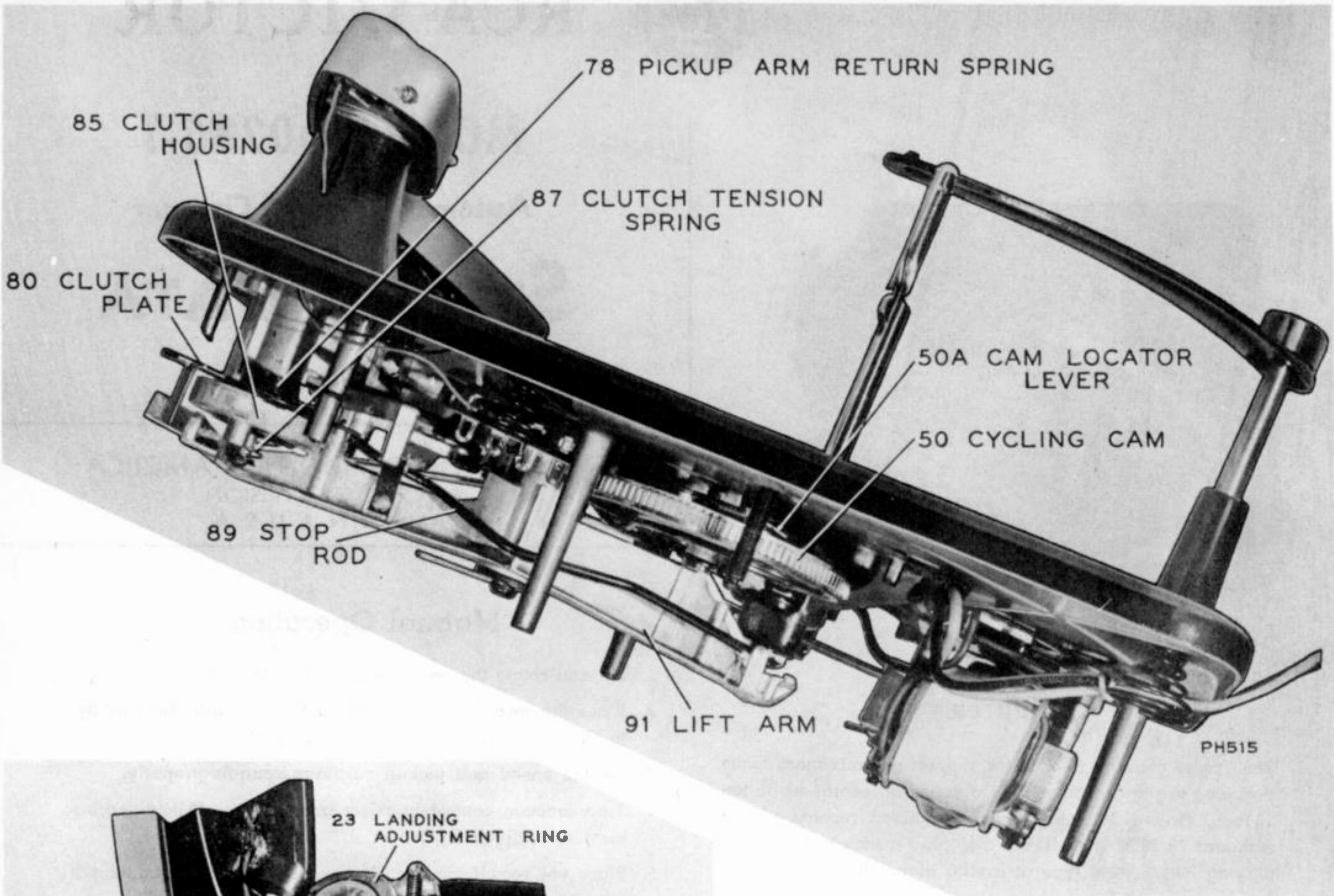
1. Pickup pivot bushing (27).
2. Frictional contact on the clutch assembly.
3. Lift arm bearing and cam faces.
4. Spring contact on stop rod (89).
5. Channel on cycling cam (50).
6. Roller on end of center post (39), ball bearing races 5-6-7.
7. Trip slide (71).
8. All frictional contacts and gears in general.

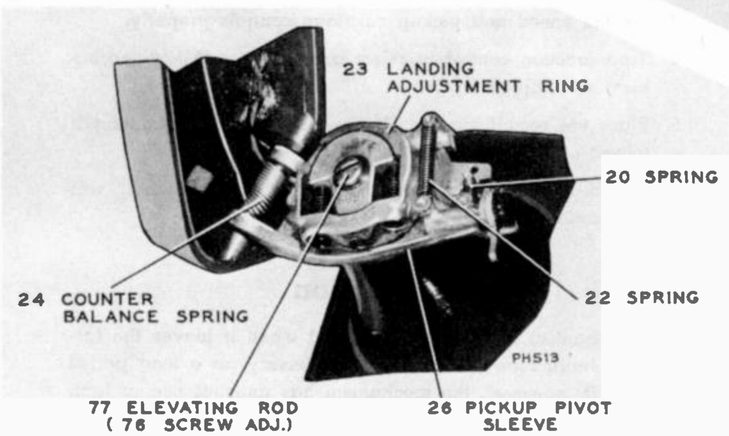
Apply a small quantity of light oil No. 10 or Singer Sewing machine oil to:

1. Trip dog (52).
2. Motor bearings.
3. Control levering bearing (59).
4. Record support bearing (2).

NOTE: Keep oil or grease away from all rubber parts.

960285-1





Functions of Principal Levers

Control lever (59A)

The function of the control lever is to actuate both the reject rod (40) and the power switch (66). It is also engaged by the stop rod (89) causing the mechanism to stop automatically after the last selection has been played.

Trip slide (71)

The trip slide consists of a long thin piece of brass which actuates the lower trip dog to start automatic tripping.

Stop rod (89)

The stop rod consists of a long rod running lengthwise along the side of the lift arm (91). The function of the stop rod is to engage the control lever and stop the mechanism after the last selection has been played.

Lift arm (91)

Lift arm functions as a main tie between the cycling cam (50) and the other parts of the mechanism. It also directs the separation of the records and the movement of the pickup arm.

Centerpost (39)

The center post functions as a support for the stack of records and also provides a means of record separation by the mechanism inside the center post.

Record support (2)

The record support performs the function of stabilizing the stack of records. It also clamps the push off mechanism built inside the center post which in turn controls the stopping of the mechanism after the last selection has been played.

Landing adjustment ring (23)

The landing adjustment ring forms a clamp which is used for landing adjustment and a latch controlling the indexing of 10- and 12-inch records.

Reject rod (40)

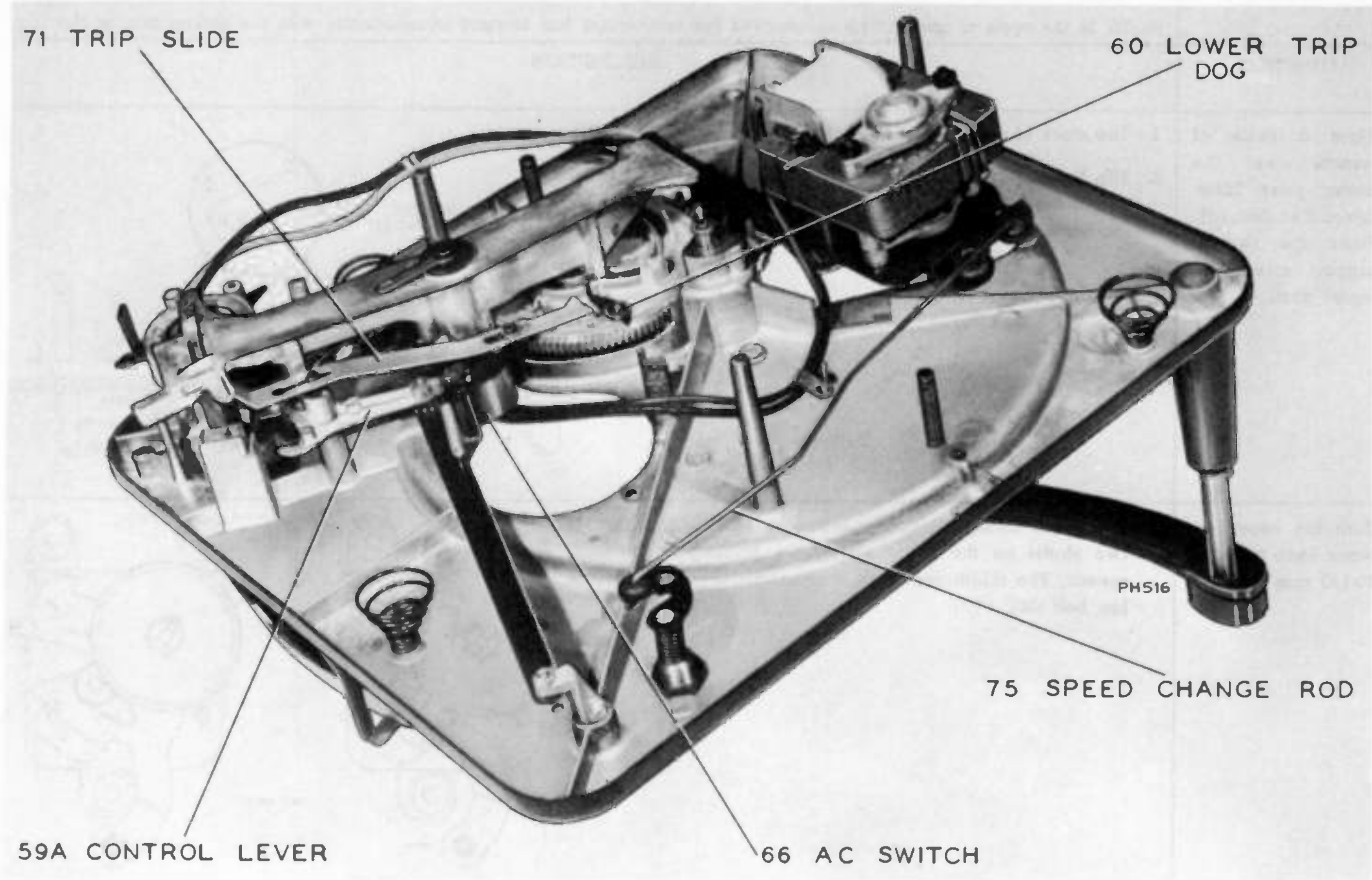
The reject rod forms a tie between trip dog and control lever (59A).

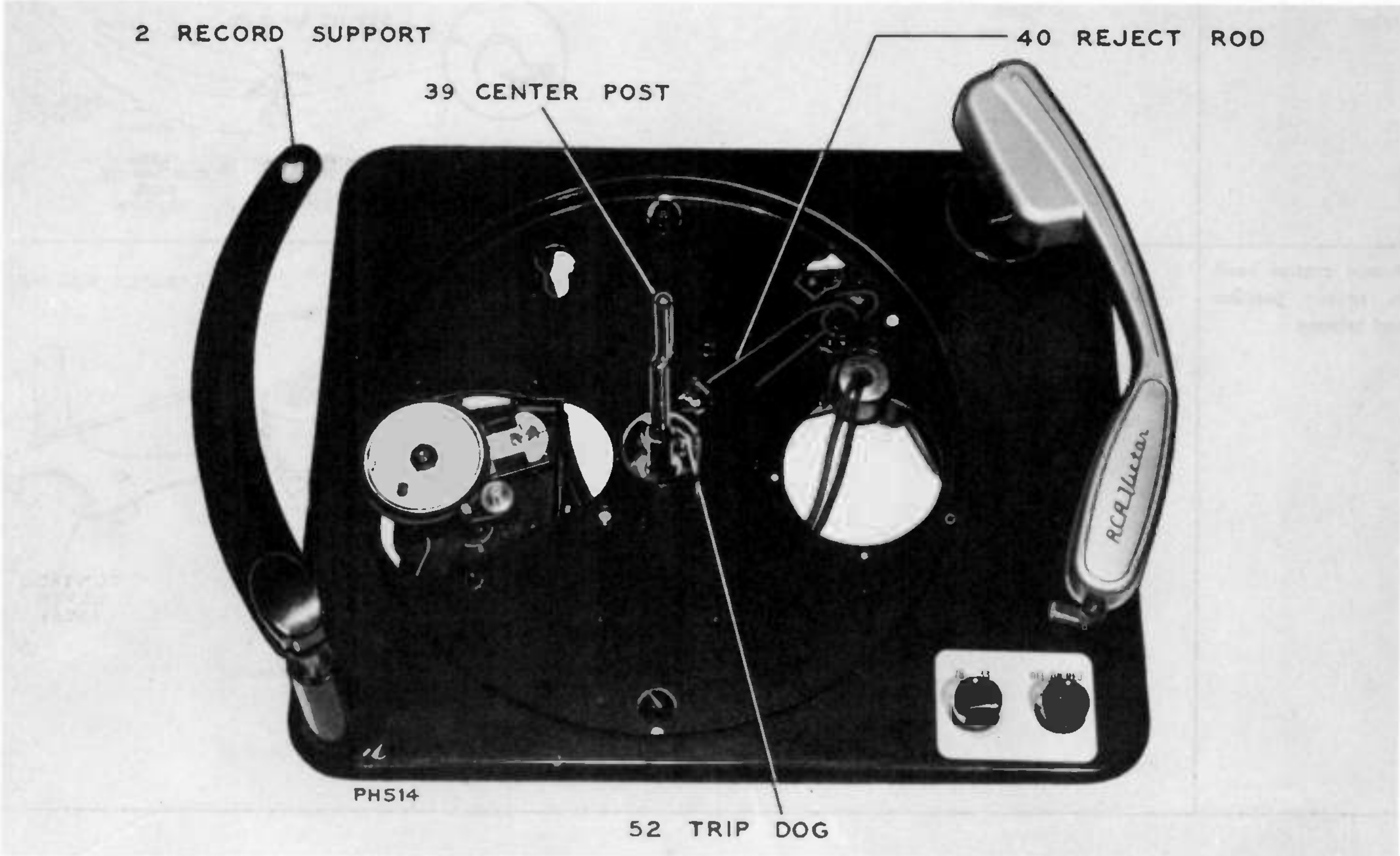
Upper trip dog (52)

The trip dog consists of a small piece of hardened steel mounted on the main cycling cam. The contact between the off-set on the turntable shaft and the trip dog cause the teeth of the cam and the teeth of the turntable shaft to engage thereby starting change cycle.

Lower trip dog (60)

The lower trip dog is in contact with trip slide (71) when tripping. It is connected by friction to the shaft of upper trip dog thereby providing the necessary take up to prevent the pickup from skipping grooves when tripping starts.

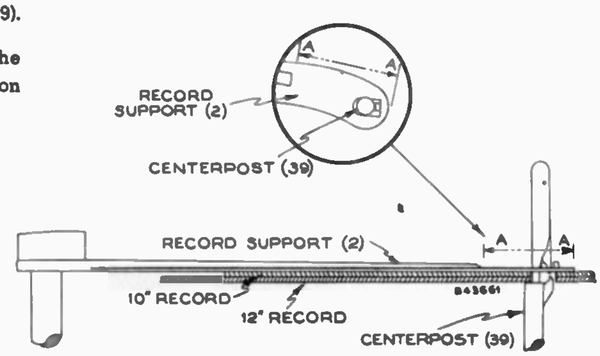
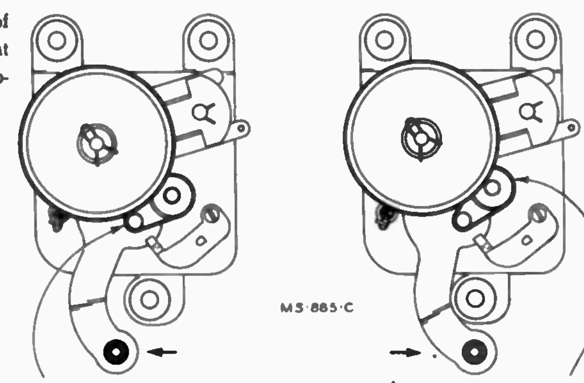
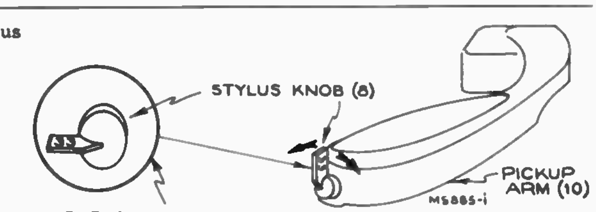
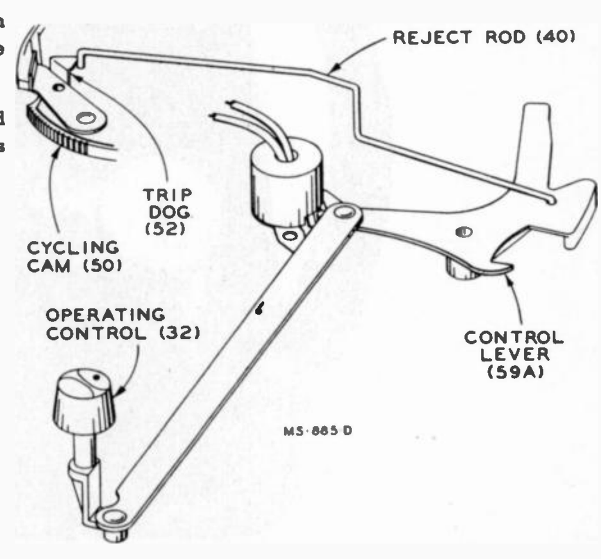

71 TRIP SLIDE
60 LOWER TRIP DOG
PH516
75 SPEED CHANGE ROD
59A CONTROL LEVER
66 AC SWITCH


2 RECORD SUPPORT
40 REJECT ROD
39 CENTER POST
RCA Victor
PH514
52 TRIP DOG

960285-1

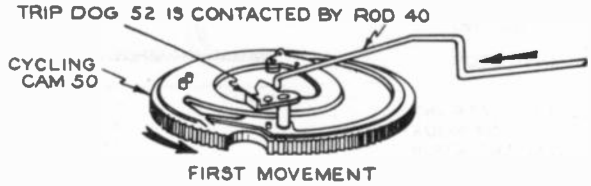
Cycle of Operation

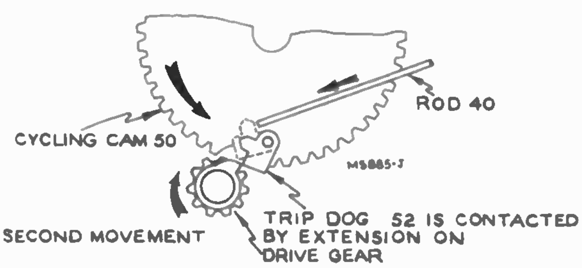
NOTE: In the cycle of operation it is assumed the mechanism has stopped automatically with the pickup arm on the rest.

FUNCTION	DESCRIPTION
Place a stack of records over the center post (intermixed if so desired). Place the record support over the center post.	1. The stack of records rest on the step in the center post (39). 2. The hole in the end of the record support (2) permits the end of the support to slide over the center post and rest on the stack of records. This stabilizes the records. 
Turn the speed selector knob to 78 or 33-1/3 rpm position.	1. The speed change is accomplished by shifting to either of two shafts on the motor which are rotating at different speeds. The additional shaft is connected by a small rubber belt (36). 
Rotate the knob to select the proper stylus.	1. The rotation of the stylus knob (8) selects the proper stylus depending on the type of record to be played. 
Rotate control knob to reject position and release.	1. The operating control actuates control lever (59A) which in turn actuates the power switch. This starts the turntable rotating. 2. Further rotation of the control knob moves the reject rod (40) sufficiently to actuate the trip dog (52) which starts change cycle. 

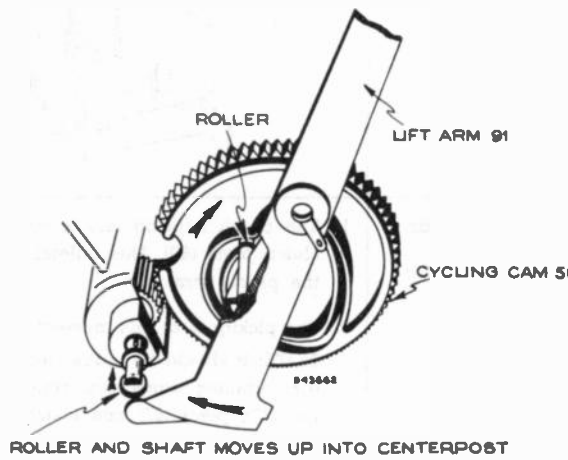
Cycling starts.

1. The reject rod (40) has moved the trip dog (52) sufficiently for the off-set in the rotating turntable shaft to engage and tend to push it away.
2. Since the trip dog (52) is mounted on the edge of the cycling cam (50) the movement rotates the cam and in so doing, causes engagement between the teeth in the turntable shaft and the cycling cam. This engagement starts change cycle.



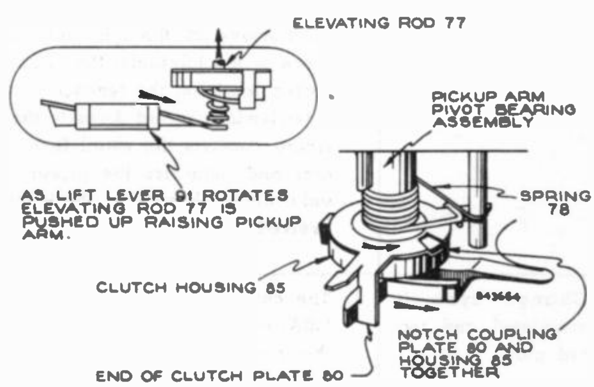


3. As the cycling cam rotates, a small roller mounted on the lift arm (91) follows the track formed in the cycling cam (50). This engagement causes the lift arm (91) to start rotating in a clockwise direction (viewed from the bottom).
4. The rotation of the lift arm (91) also causes contact with the small roller connecting the push-off mechanism inside the center post. This contact pushes the small roller and shaft upward.



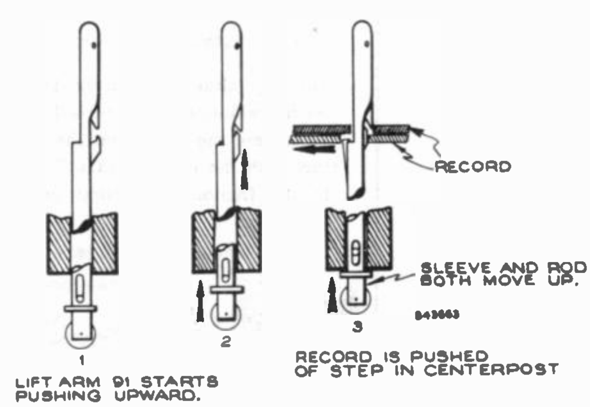
The pickup rises and remains outside turntable area.

1. While the lift arm (91) is rotating the end directly under the pickup arm pivot engages the elevating rod (77) and raises the pickup.
2. The pickup has been setting on the rest so it moves out very little when the lift arm (91) is rotating in a clockwise direction (viewed from bottom).
3. At this same time the extended end of the lift arm (91) contacts end of clutch plate (80) rotating it in a clockwise direction (viewed from bottom) against the tension of spring (78).
4. Since both the clutch plate (80) and housing (85) are rotated to the extreme clockwise direction, the clutch plate is engaged in a notch in the clutch housing which couples the two together.



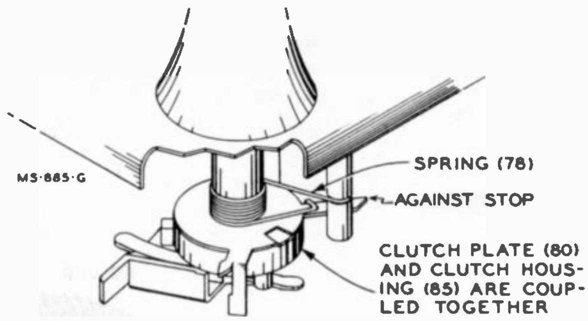
Record drops to turntable.

1. The upward movement of the push-off mechanism actuates the small lever embedded in the center post to engage the center hole of the record and push the record off the step permitting it to drop to the turntable.

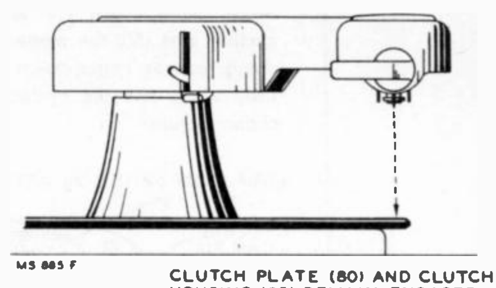


The pickup moves in for landing.

1. The next instant the lift arm (91) starts rotating in a counter-clockwise direction (viewed from bottom) returning to normal out of cycle position. The separator mechanism returns to normal, and the pickup arm is pushed in by the force produced by the expanding spring (78).



2. The pickup arm continues to be pushed in until the end of the clutch plate (80) comes against the stop. At this instant the pickup is directly over the landing point on the record.



CLUTCH PLATE (80) AND CLUTCH HOUSING (85) REMAIN ENGAGED UNTIL PICKUP HAS LANDED ON ON THE START OF THE RECORD

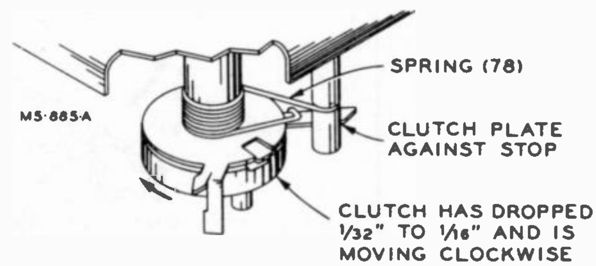
The pickup lands.

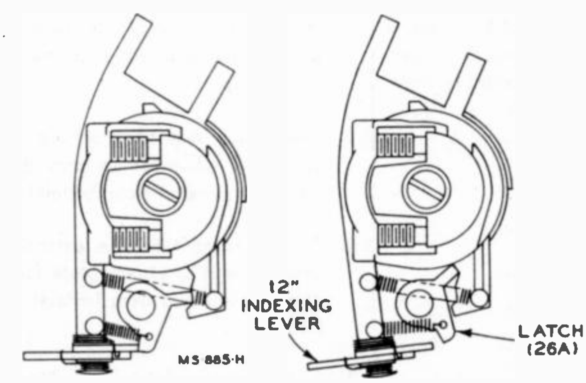
1. The clutch housing (85) is lowered slightly unlatching the clutch plate (80). This unlatching permits free movement of the pickup arm.

2. The pickup is at this moment landing on the record.

   NOTE: It should be made clear at this time that the pickup arm, landing adjustment ring (23), pivot sleeve (26), bushing (27), pivot (82) and clutch assemblies (78 to 88) move horizontally as one unit inside the pivot housing on the motorboard. In addition the pickup pivot sleeve (26) rotates in respect to the bushing (27) in approximately a 5 or 10 degree arc. This movement determines the difference in the landing position on ten- or twelve-inch records.

   As the pickup arm is moved out with each change cycle, the landing adjustment ring (23) it latched to the pickup pivot sleeve (26) through the latch (26A). If a ten-inch record drops to the turntable, the latch remains engaged and the pickup lands on the ten-inch record. On the other hand, if a twelve-inch record drops to the turntable, the edge of the record contacts the small lever at the side of the pickup arm and unlatches the pickup adjustment ring (23). This unlatching allows the pickup to position for landing on twelve-inch records.





LANDING ADJUSTMENT RING (23) REMAINS LATCHED FOR 10" RECORD LANDING

LANDING ADJUSTMENT RING (23) IS UNLATCHED FOR 12" RECORD LANDING

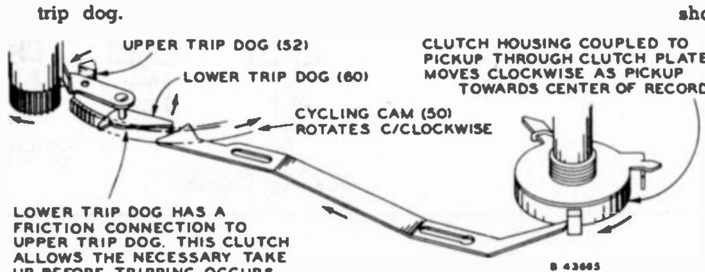
Change cycle is completed and record plays.

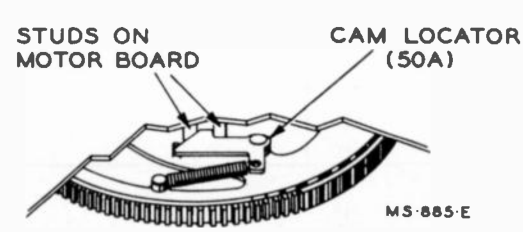
1. The change cycle is completed as the cam locator lever (50A) engages the two studs extending from the bottom of the motor board. This permits the drive gear on the turntable shaft to rotate in the cut away section of the cycling cam.

2. As the record plays, the pickup moves in toward the center of the record carrying the trip slide (71) along because of the contact made with the projection on the clutch housing which is rotating with the pickup arm pivot.

3. The trip slide (71) moves the trip dog (52) slightly with each revolution of the record, but this movement is reversed each time the off-set on the turntable shaft comes in contact with the trip dog (52). The back movement is taken up in the friction connection between the upper and lower trip dog.

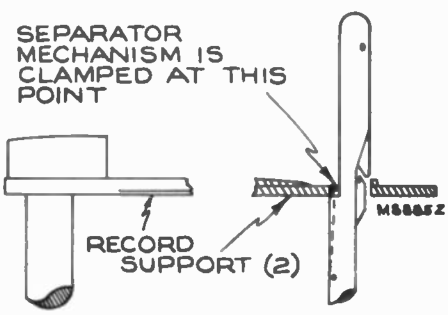
4. The trip dog (52) is mounted on the edge of the cycling cam (50) at such an angle that as long as the pickup moves in at a constant rate of speed the projection contacts the trip dog (52) along the side and pushes it back. When the pickup leaves the recorded section of the record, the rapid acceleration results in the rapid movement of the trip dog (52). The dog assumes such an angle that the off-set on the turntable shaft contacts the end and rotates the cycling cam sufficiently to cause engagement between the teeth of the cycling cam and teeth in the turntable shaft. This starts change cycle.

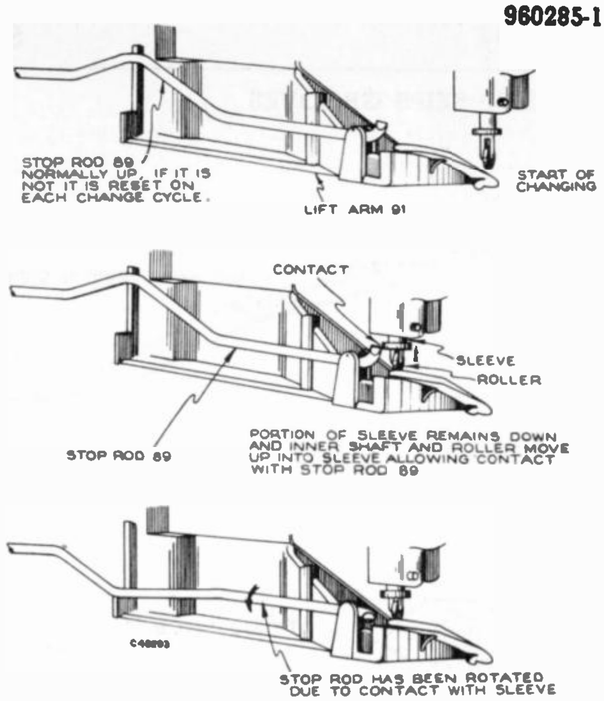


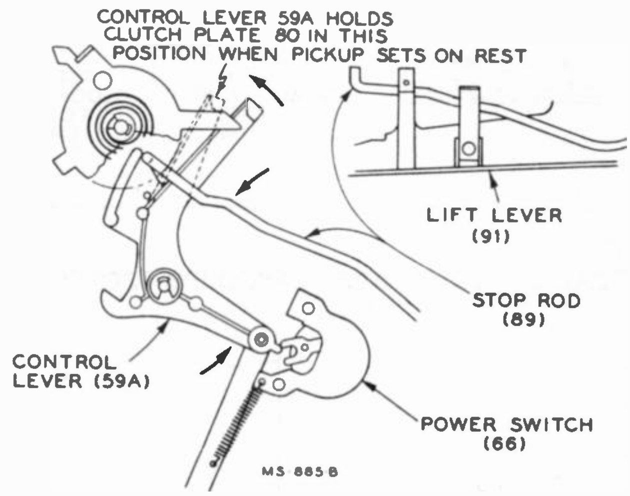


Pickup raises and moves out.

1. After the mechanism has been tripped, the pickup moves out from action of the lift arm on the clutch assembly which is linked to pickup arm.
2. The mechanism again follows the preceding sequence of dropping and playing records until the last record of the stack has been played.
3. After the last selection has been played and the mechanism again goes into change cycle, the support post (2) has dropped sufficiently for the hole in the end to clamp and stop the push-off action built in the center post.
4. Since the push-off action is blocked and the lift arm (91) tends to push up on the separator mechanism, the shaft mounting the small roller moves up into the brass sleeve instead of the entire assembly moving up.
5. The brass sleeve remaining down forming a stop for the end of the stop rod (89) which is mounted on the side of the lift arm (91). This contact causes it to rotate when the lift arm moves by.
6. The bent-up end of the stop rod (89) nearest the pickup arm pivot engages the control lever (59A).
7. The engagement between the stop rod (89) and the control lever (59A) turns the power switch off and also holds one end of the clutch plate causing the pickup to set down on the rest instead of the record.
8. The cycle is completed when the cycling cam becomes disengaged from the gear on the turntable shaft. This is accomplished by a cut-away section of the cam.







ADJUSTMENTS

Approximate Landing Adjustment (if pickup arm assembly has been removed).

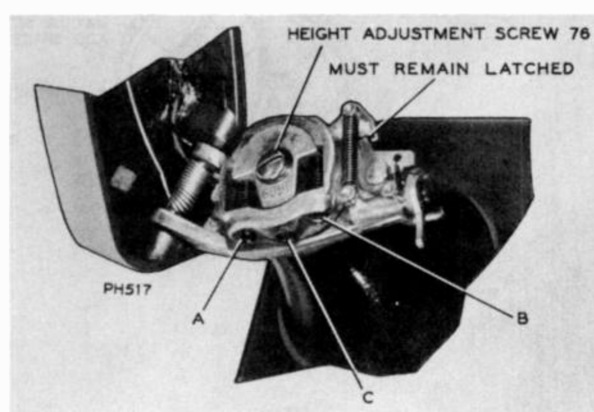
1. Remove power from mechanism.
2. Place a ten inch record on turntable.
3. Rotate turntable by hand until the pickup is just ready to land. Make sure the notch in the clutch plate remains engaged with clutch housing. The end of the clutch plate must be against stop also.
4. Hold the clutch and plate assembly. Loosen the set screw "C" and move the pickup into the approximate landing position.
5. Allow approximately 1/32" to 1/16" vertical play in pickup pivot shaft. (This vertical play is critical.)
6. Tighten set screw "C."

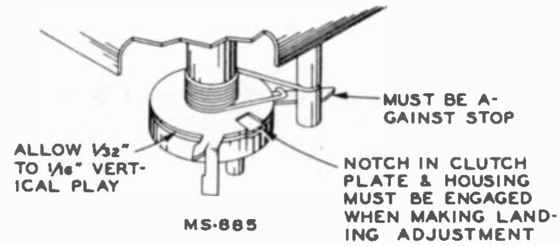
Exact Landing Adjustment.

1. Remove power from mechanism.
2. Place a ten inch record on turntable.
3. Rotate turntable by hand until pickup is about ready to land.
4. To move pickup in, loosen set screw "A" a few turns and tighten "B."
5. To move the pickup out, loosen set screw "B" a few turns and tighten "A."

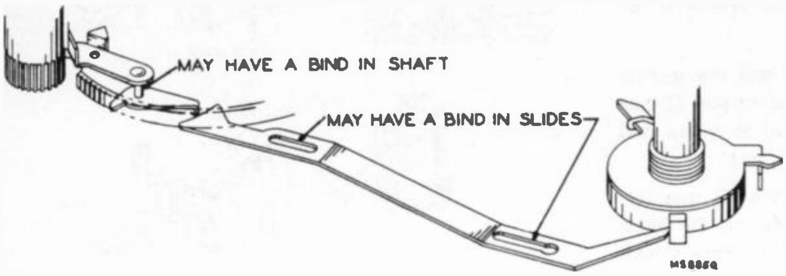
Pickup Arm Height.

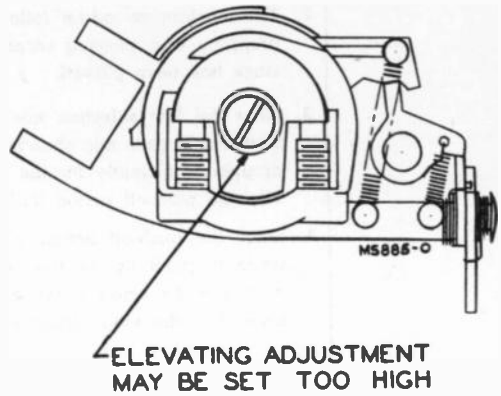
Adjust screw (76) in the end of the elevating rod so the under side of pickup arm clears the rest by 1/8" to 3/16" during change cycle.

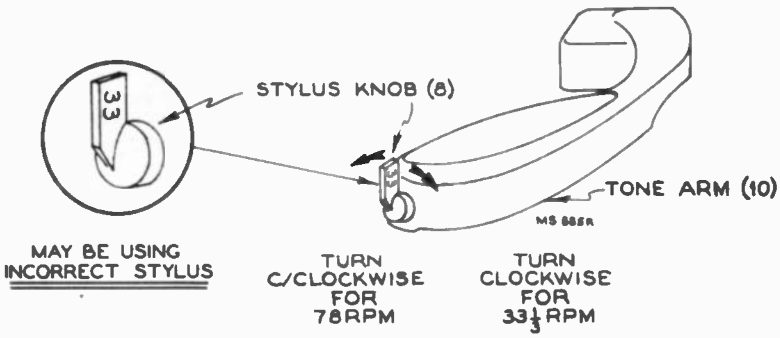


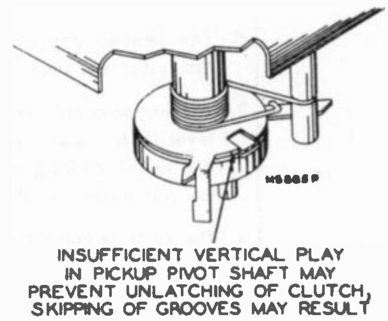


PICKUP SKIPS GROOVES

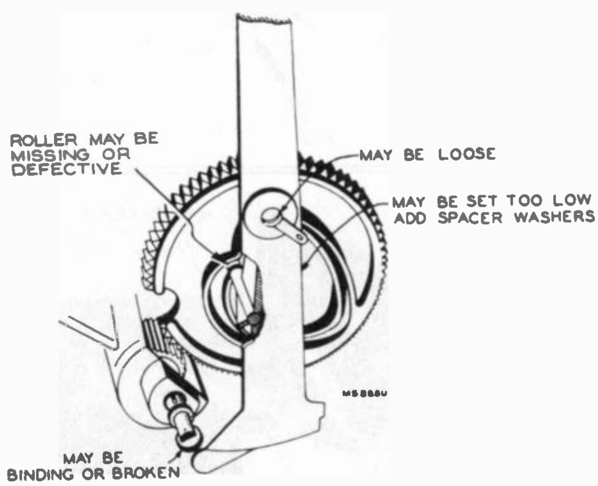


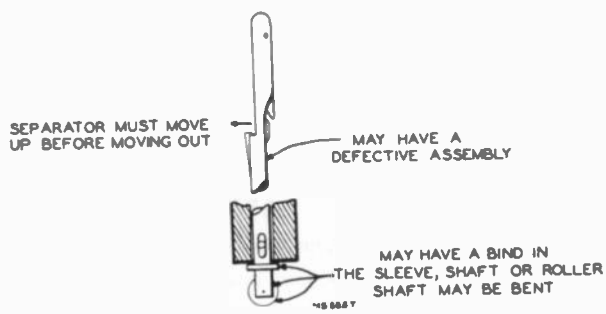


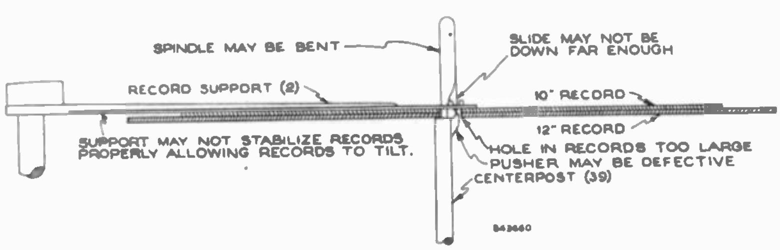




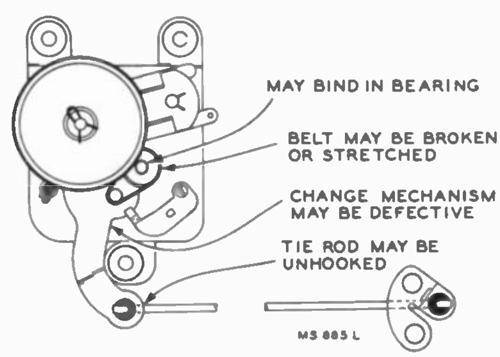
FAILURE TO SEPARATE RECORDS PROPERLY



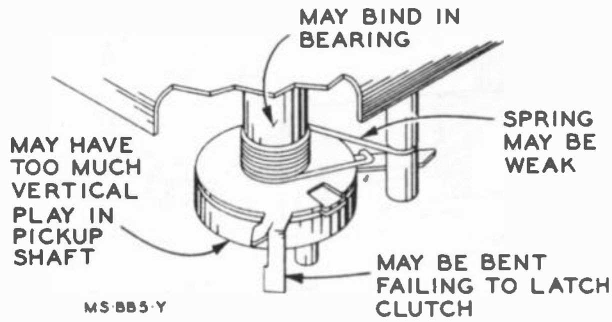




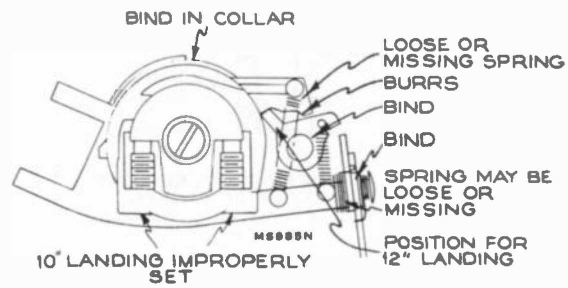
FAILS TO CHANGE SPEED



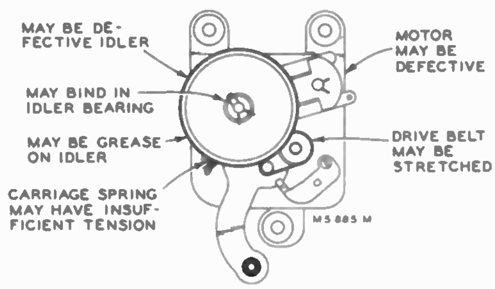
PICKUP FAILS TO LAND PROPERLY



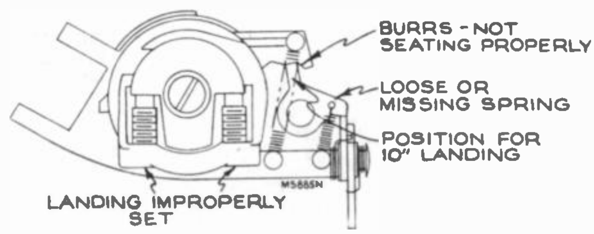
PICKUP FAILS TO LAND CORRECTLY ON 12" RECORDS



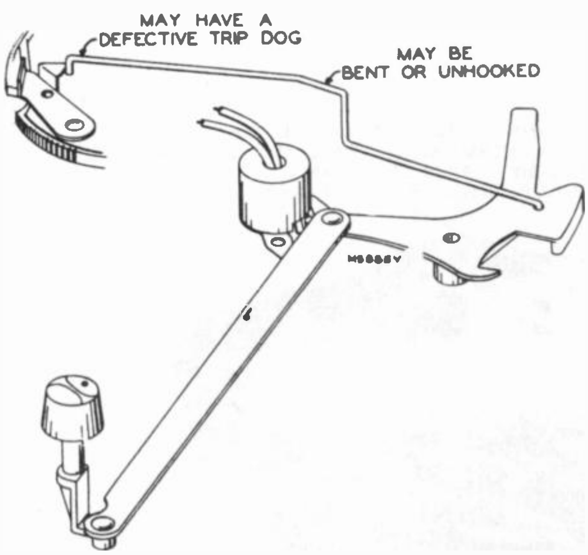
"WOW" OR SPEED VARIATION



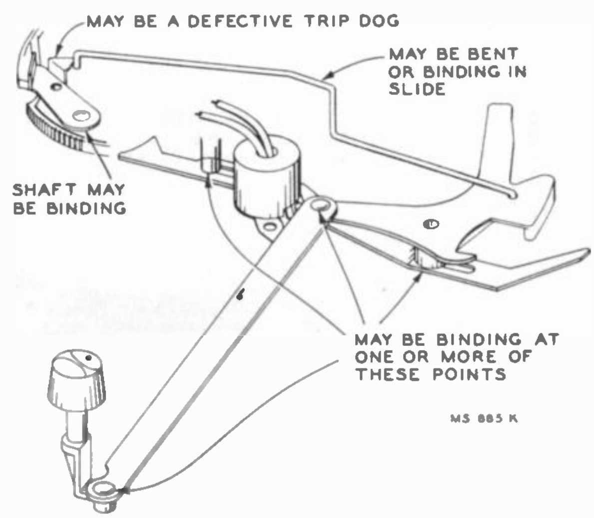
PICKUP FAILS TO LAND CORRECTLY ON 10" RECORDS



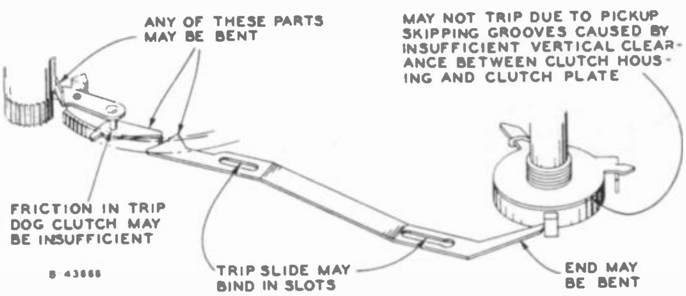
REJECT CONTROL DOES NOT FUNCTION



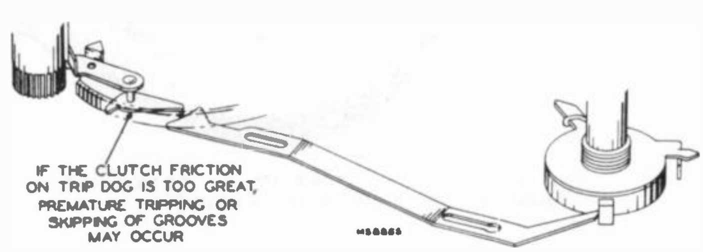
CONTINUOUS TRIPPING



FAILURE TO TRIP

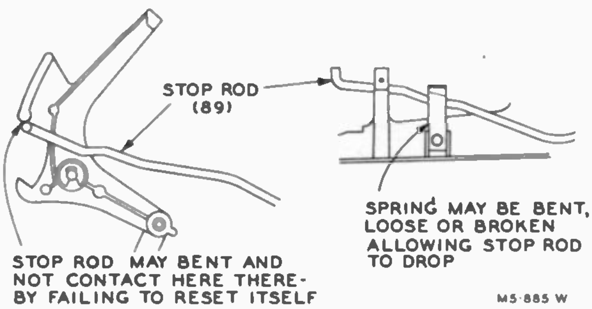


PREMATURE TRIPPING

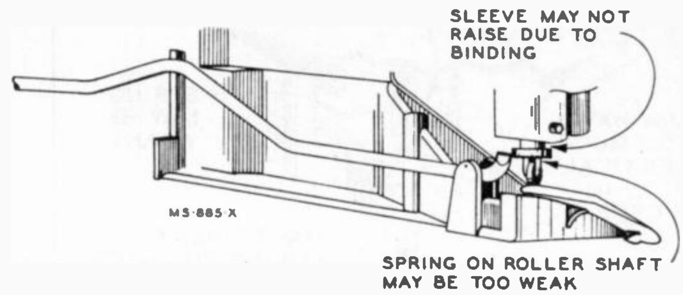


SERVICE HINTS (Continued)

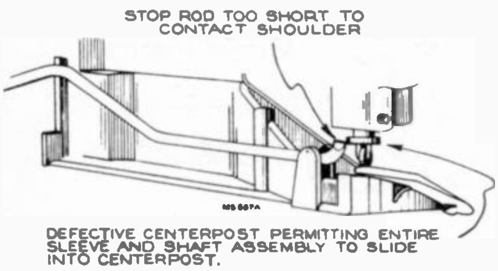
PICKUP SETS DOWN ON REST INSTEAD OF RECORD

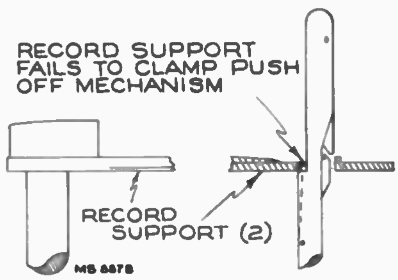


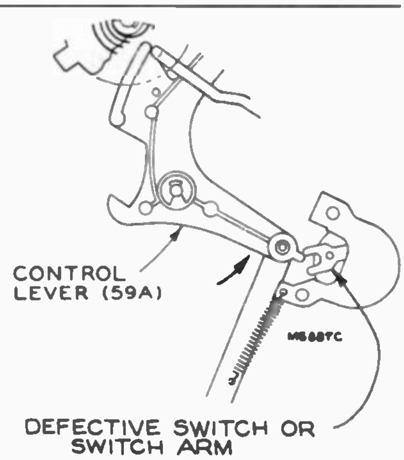
MECHANISM SHUTS OFF PREMATURELY



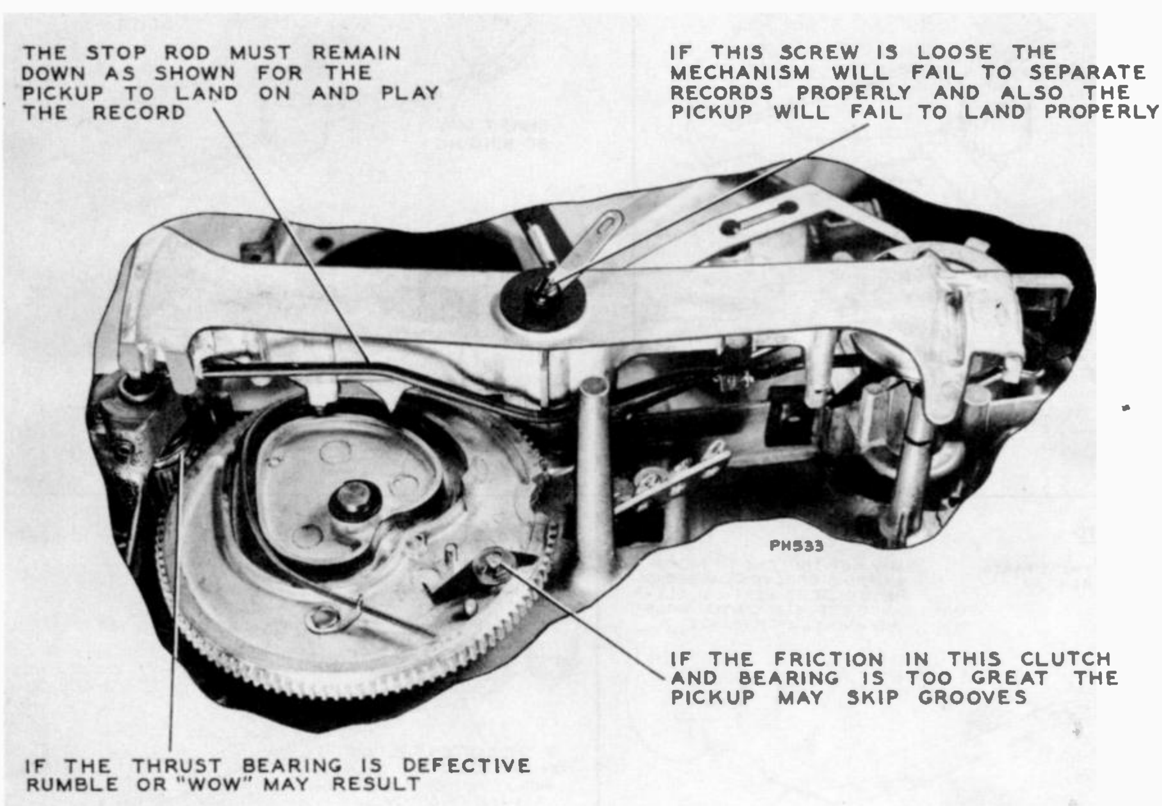
MECHANISM FAILS TO STOP AUTOMATICALLY



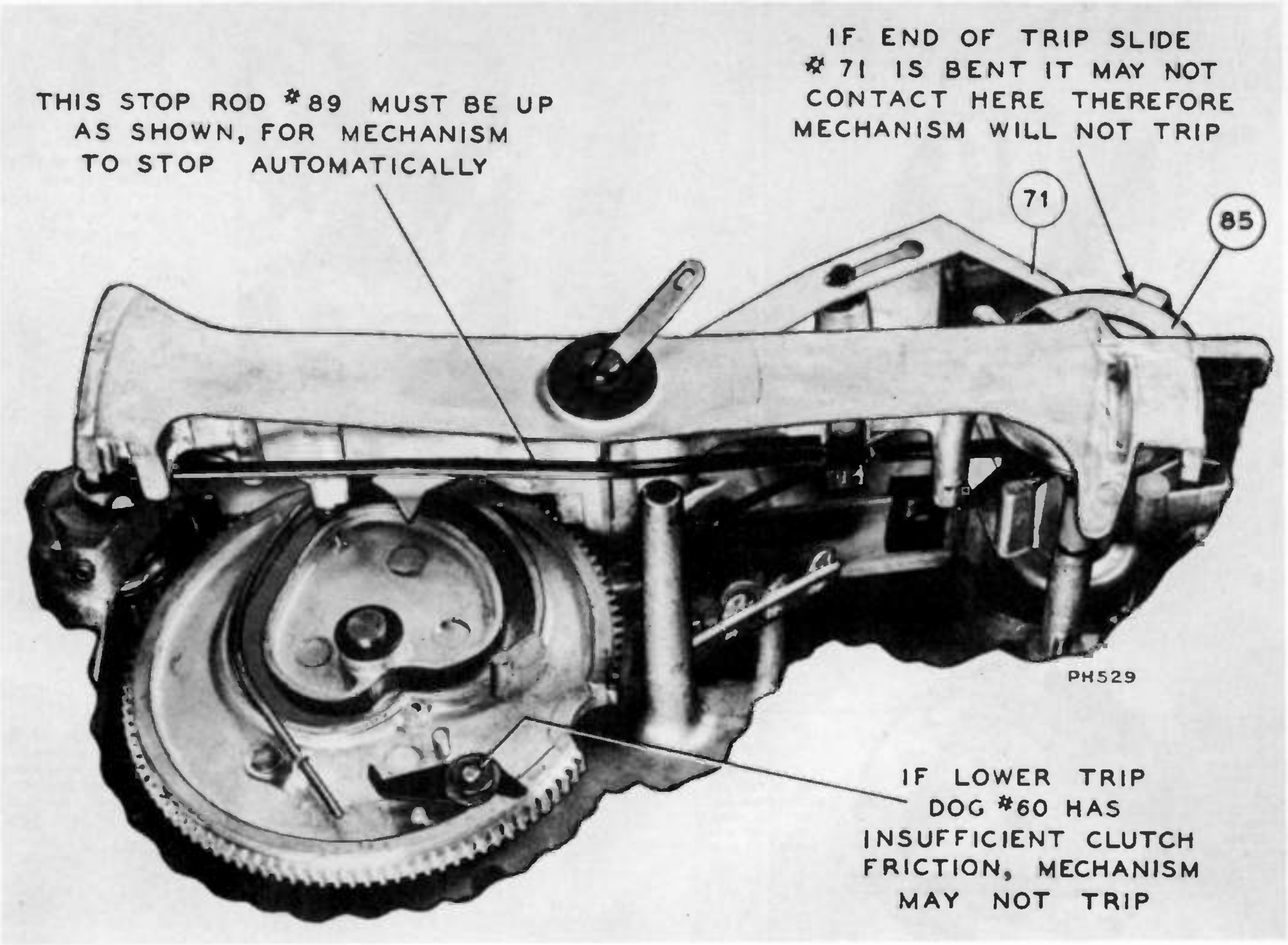


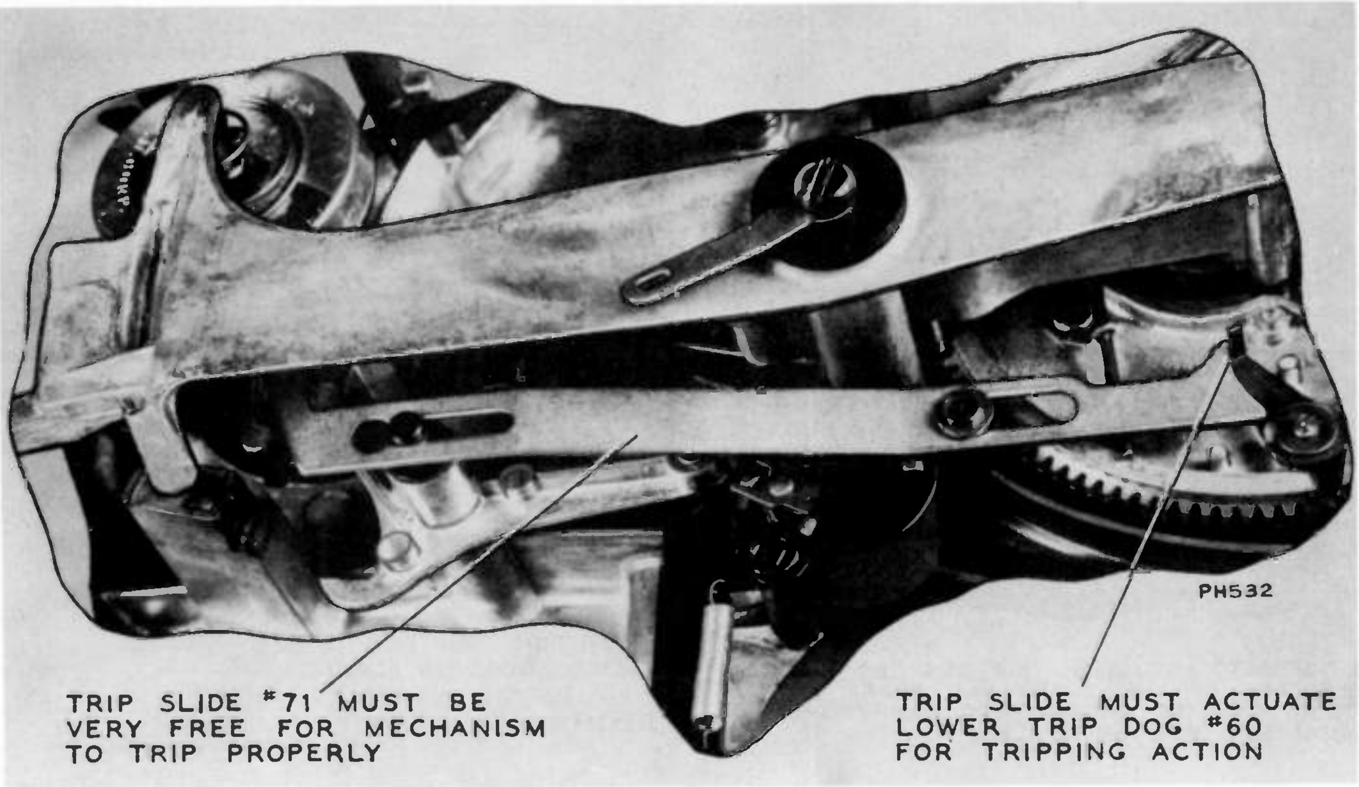


DO YOU KNOW?

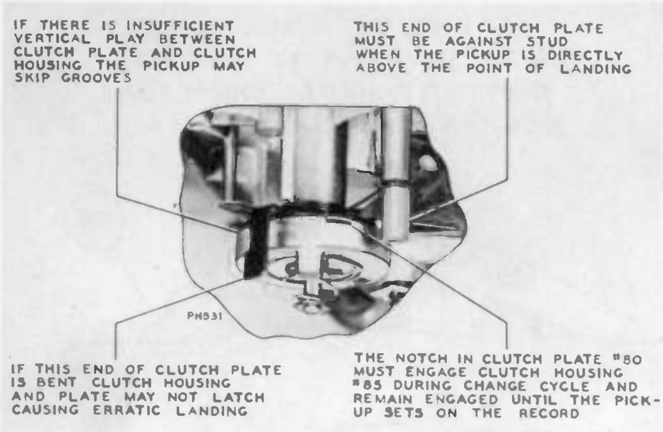


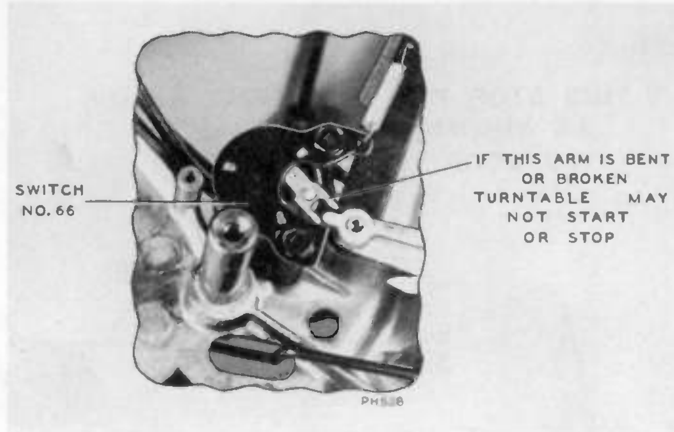
DO YOU KNOW?

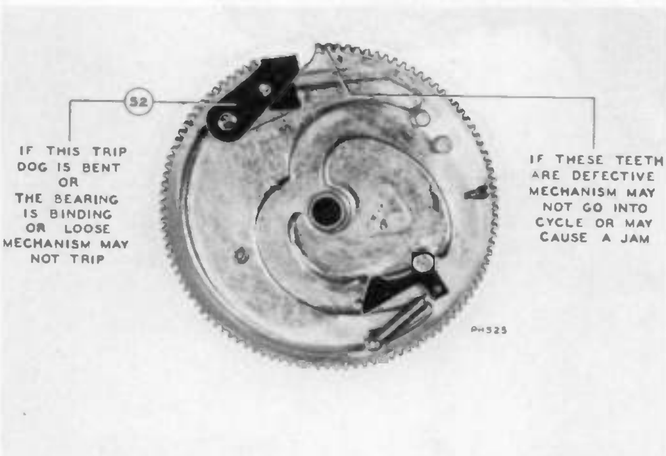

THIS STOP ROD #89 MUST BE UP AS SHOWN, FOR MECHANISM TO STOP AUTOMATICALLY
IF END OF TRIP SLIDE ✲ 71 IS BENT IT MAY NOT CONTACT HERE THEREFORE MECHANISM WILL NOT TRIP
71
85
PH529
IF LOWER TRIP DOG #60 HAS INSUFFICIENT CLUTCH FRICTION, MECHANISM MAY NOT TRIP

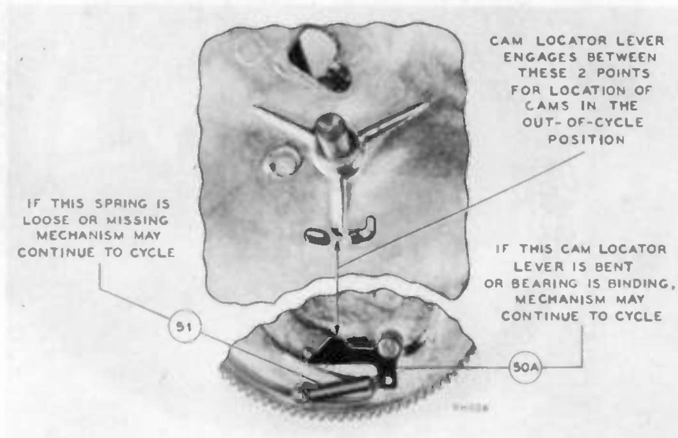

PH532
TRIP SLIDE #71 MUST BE VERY FREE FOR MECHANISM TO TRIP PROPERLY
TRIP SLIDE MUST ACTUATE LOWER TRIP DOG #60 FOR TRIPPING ACTION

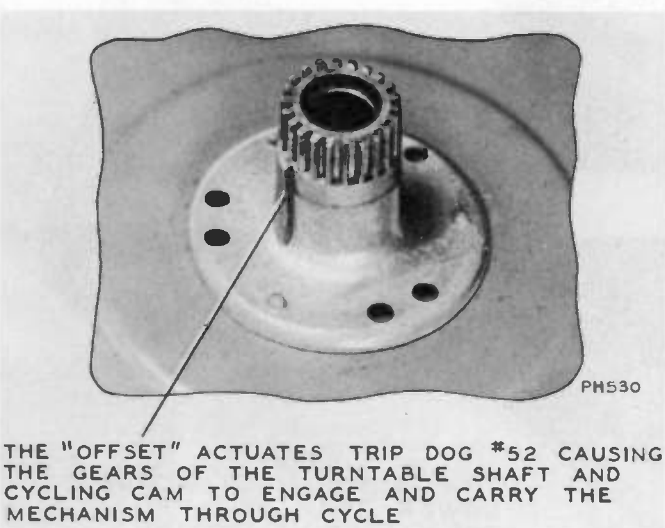
DO YOU KNOW?

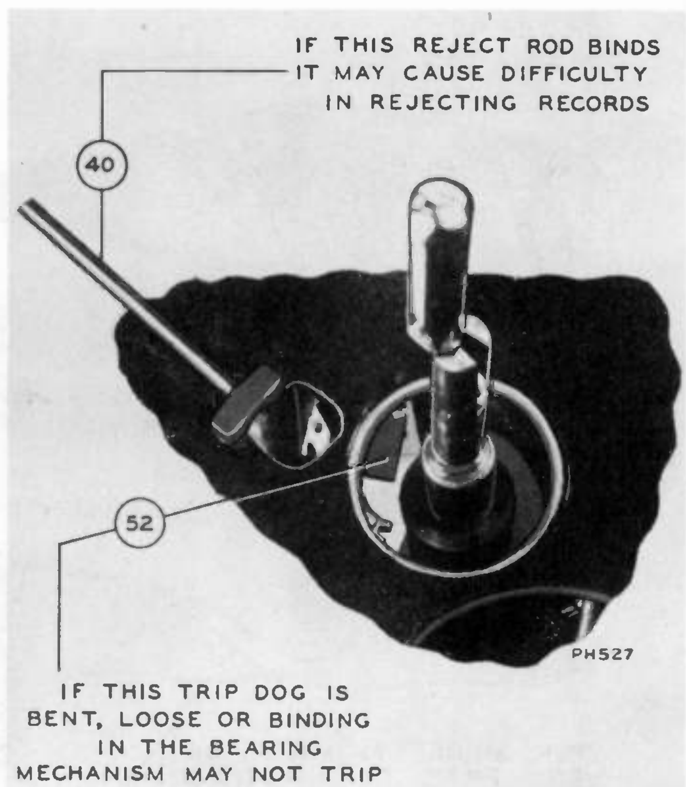

IF THERE IS INSUFFICIENT VERTICAL PLAY BETWEEN CLUTCH PLATE AND CLUTCH HOUSING THE PICKUP MAY SKIP GROOVES
THIS END OF CLUTCH PLATE MUST BE AGAINST STUD WHEN THE PICKUP IS DIRECTLY ABOVE THE POINT OF LANDING
PH531
IF THIS END OF CLUTCH PLATE IS BENT CLUTCH HOUSING AND PLATE MAY NOT LATCH CAUSING ERRATIC LANDING
THE NOTCH IN CLUTCH PLATE #80 MUST ENGAGE CLUTCH HOUSING #85 DURING CHANGE CYCLE AND REMAIN ENGAGED UNTIL THE PICK-UP SETS ON THE RECORD

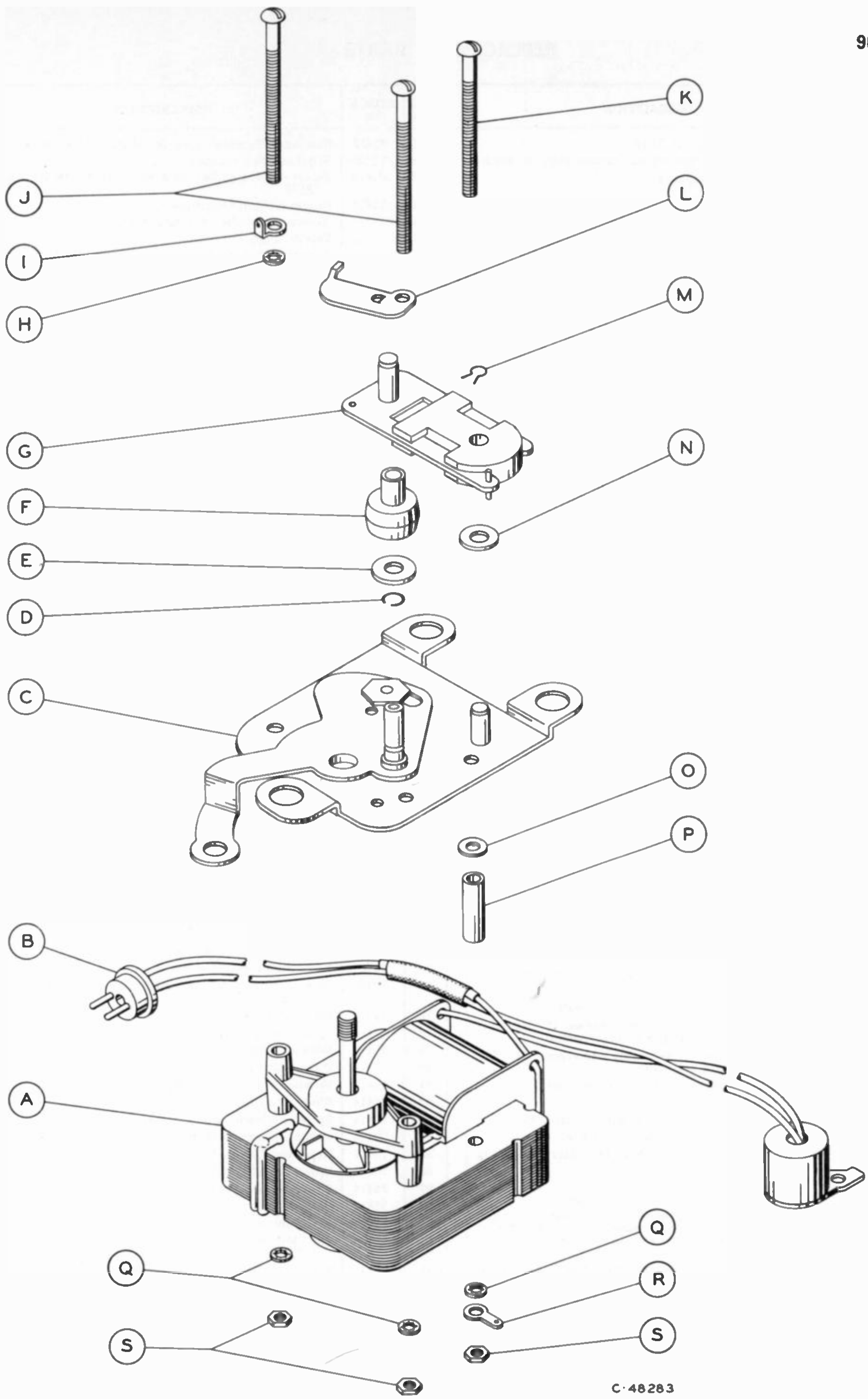

SWITCH NO. 66
IF THIS ARM IS BENT OR BROKEN TURNTABLE MAY NOT START OR STOP


52
IF THIS TRIP DOG IS BENT OR THE BEARING IS BINDING OR LOOSE MECHANISM MAY NOT TRIP
IF THESE TEETH ARE DEFECTIVE MECHANISM MAY NOT GO INTO CYCLE OR MAY CAUSE A JAM
PH525


CAM LOCATOR LEVER ENGAGES BETWEEN THESE 2 POINTS FOR LOCATION OF CAMS IN THE OUT-OF-CYCLE POSITION
IF THIS SPRING IS LOOSE OR MISSING MECHANISM MAY CONTINUE TO CYCLE
IF THIS CAM LOCATOR LEVER IS BENT OR BEARING IS BINDING, MECHANISM MAY CONTINUE TO CYCLE
51
50A


PH530
THE "OFFSET" ACTUATES TRIP DOG #52 CAUSING THE GEARS OF THE TURNTABLE SHAFT AND CYCLING CAM TO ENGAGE AND CARRY THE MECHANISM THROUGH CYCLE


IF THIS REJECT ROD BINDS IT MAY CAUSE DIFFICULTY IN REJECTING RECORDS
40
52
PH527
IF THIS TRIP DOG IS BENT, LOOSE OR BINDING IN THE BEARING MECHANISM MAY NOT TRIP

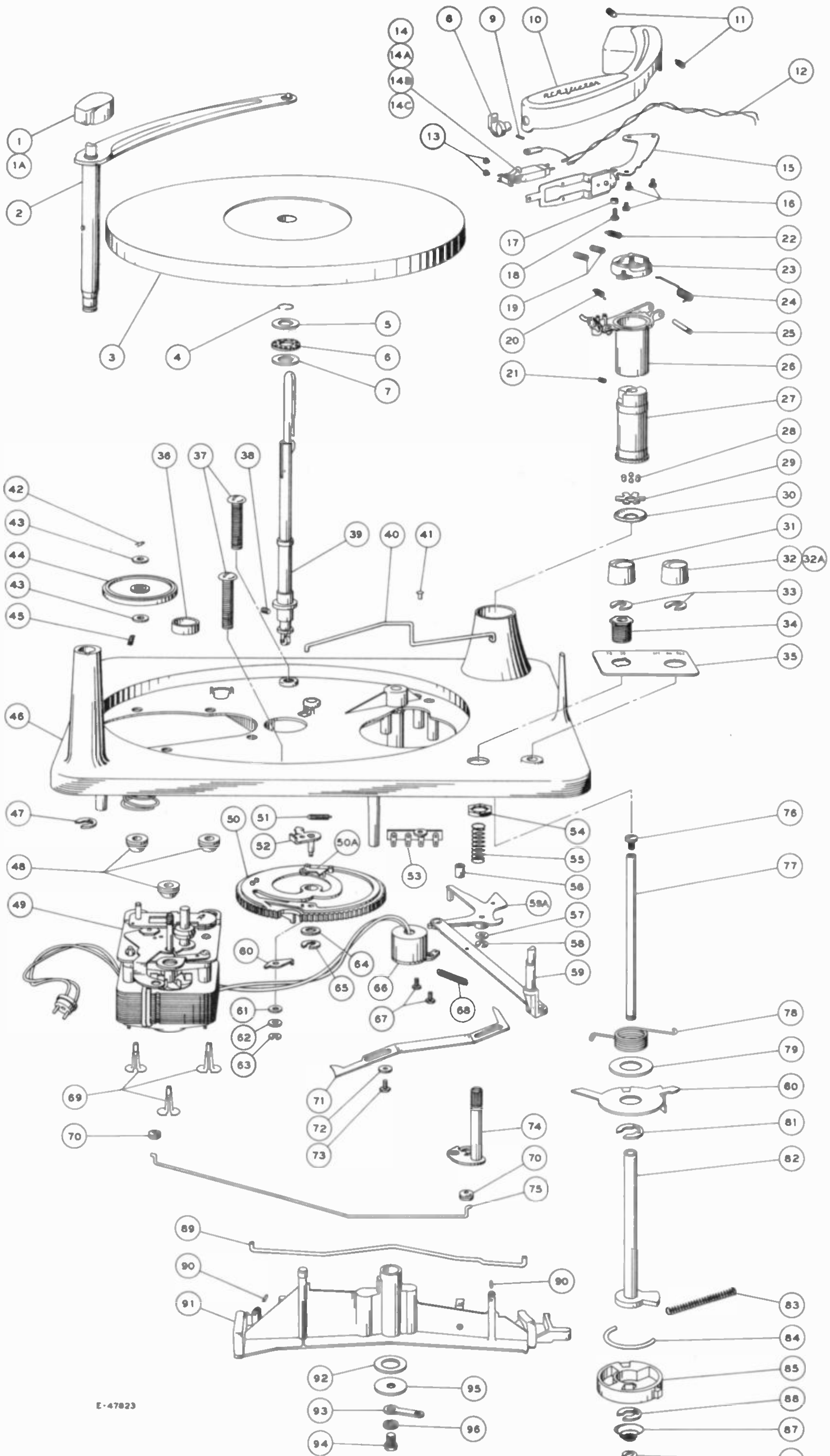


Exploded View of Motor (60 Cycle)

REPLACEMENT PARTS

ILL. No.	STOCK No.	DESCRIPTION
1	75350	Knob—Record support knob
1A	——	Spring—Retaining spring for record support knob
2	75351	Support—Record support
3	75352	Turntable
4	75353	Retainer—Turntable spindle thrust bearing assembly retainer
5	75354	Washer—Thrust washer for turntable bearing
6	75355	Bearing—Thrust bearing
7	75354	Washer—Thrust washer for turntable bearing
8	75264	Knob—Stylus selector knob (handle type) complete with screw
9	——	Screw—Screw for stylus selector knob (included in 75264, ILL. 8)
10	75356	Arm—Pickup arm shell only (plastic)
11	75357	Pivot—Pickup arm pivot (2 required)
12	75358	Cable—Three wire pickup cable complete with connectors
13	——	Screw—Mounting screw for crystal (2 required) (No. 4-40 x ⅛" round head screw)
14	75044	Crystal—Replacement crystal complete with styluses
14A	75045	Stylus—Stylus only (red) for 33 RPM section
14B	75046	Stylus—Stylus only (plain) for 78 RPM section
14C	75274	Nut—Mounting nut (knurled) for stylus
15	75359	Mount—Crystal cartridge mount and swivel assembly
16	71097	Screw—Mounting screw for crystal mount (3 required) (No. 4 x ¼" self-tapping)
17	75360	Spacer—Metal spacer for crystal mount screw, ILL. 18
18	75002	Screw—Mounting screw for crystal mount (No. 4 x ⅜" self-tapping)
19	75361	Screw—Landing adjustment screw (2 required) (No. 10 x ½" headless—special)
20	75362	Spring—Tension spring for indexing latch
21	31085	Screw—Pickup pivot bushing screw (No. 8 x ⅛" Allen head set screw)
22	75363	Spring—Tension spring for landing adjustment ring
23	75364	Ring—Landing adjustment ring
24	75365	Spring—Counterbalance spring for pickup arm
25	75366	Pin—Pivot pin for counterbalance spring
26	75367	Sleeve—Pickup arm pivot sleeve, including latch and two springs
27	75368	Bushing—Pickup arm pivot sleeve bushing
28	10941	Ball—Steel ball (⅛" diameter)
29	75369	Retainer—Ball bearing retainer
30	75370	Cup—Ball race cup
31	75371	Knob—Speed control knob
32	75372	Knob—Function control knob complete with spring
32A	——	Spring—Retaining spring for function control knob (included in 75372, ILL. 32)
33	75373	Washer—"C" washer for control knob (2 required)
34	75374	Bushing—Threaded bushing for speed control crank
35	75375	Escutcheon—Index escutcheon
36	75376	Belt—Rubber belt for motor drive shaft
37	75377	Screw—Motorboard mounting screws (2 required) (No. ¼-20 x 1⅜" round head—special)
38	30006	Screw—Set screw for turntable centerpost (No. 8 x ⅜" Allen head set screw)
39	75378	Spindle—Turntable spindle or centerpost
40	75379	Rod—Reject rod
41	——	Rivet—Mounting rivet for terminal board, ILL. 53
42	75380	Spring—Hairpin spring for idler wheel
43	75433	Washer—Dampening washer for idler wheel (2 required)
44	75382	Wheel—Idler wheel
45	75383	Spring—Tension spring for idler wheel
46	75384	Board—Motorboard complete with four mounting springs, pivot arm housing, record support housing, terminal board (ILL. 53) and mounting studs
47	75385	Washer—"C" washer for record support pivot shaft
48	75386	Grommet—Rubber grommet to mount motor (3 required)
49A	75333	Motor—117 volt, 60 cycle, complete with top plate, idler wheel and drive belt
49B	30870	Connector—2 contact male connector for motor leads
49C	75426	Plate—Motor top plate including speed change carriage, 3 mounting grommets and 1 speed change lever grommet
49D	75427	Retainer—Retainer ring for drive pulley and shaft
49E	75428	Washer—Felt washer
49F	75429	Pulley—Drive pulley and shaft assembly for 33-1/3 RPM
49G	75430	Carriage—Idler carriage
49H	——	Lockwasher—No. 6 internal teeth
49I	——	Terminal lug
49J	——	Screw—No. 6-32 x 2" round head machine screw to mount top plate to motor
49K	——	Screw—No. 6-32 x 2⅛" round head machine screw to mount top plate to motor
49L	75431	Plate—Friction guide plate
49M	75432	Spring—Hairpin spring to mount idler carriage
49N	75433	Washer—Fibre washer
49P	——	Spacer—Metal spacer to mount top plate to motor
49Q	——	Lockwasher—No. 6 internal teeth
49R	——	Terminal lug
49S	——	Nut—No. 6 hex nut
50	75387	Cam—Main cam (including wire spring)
51	75388	Spring—Cam locater lever spring
52	75389	Pawl—Trip pawl
53	——	Board—Terminal board
54	——	Nut—Locknut for speed control crank threaded bushing
55	75390	Spring—Spacer spring for speed control crank
56	——	Bumper—Rubber bumper not stocked
57	75391	Washer—Fibre washer for control lever shaft
58	75392	Washer—"C" washer for mounting control lever
59	75393	Lever—Function control crank, link and lever assembly
60	75394	Pawl—Lower trip pawl
61	75395	Washer—Bronze washer (⅜" O.D.) for trip pawl shaft
62	75396	Washer—Steel washer (¼" O.D.) for trip pawl shaft
63	75397	Washer—"C" washer for trip pawl
64	75398	Washer—Fibre washer (½" O.D.) for mounting main cam
65	75399	Washer—"C" washer for mounting main cam
66	75400	Switch—Power switch (includes cover)
67	——	Screw—Power switch mounting screw (No. 6-32 x ¼" hex head)
68	75401	Spring—Return spring for control lever link
69	75402	Fastener—Push fastener to mount motor (3 required)
70	75403	Grommet—Rubber grommet for motor speed change tie rod (2 required)
71	75404	Lever—Trip slide lever
72	75405	Washer—Metal washer to mount trip slide
73	——	Screw—Mounting screw to mount trip slide lever (No. 4 x ¼" hex head self-tapping)
74	75406	Crank—Speed control crank
75	75407	Rod—Motor speed change tie rod
76	75408	Screw—Pickup height adjusting screw (No. 6-32 x ¼" pan head brass)
77	75409	Rod—Elevating rod
78	75410	Spring—Return spring for pickup arm
79	75411	Washer—Spring washer for clutch plate
80	75412	Plate—Clutch plate
81	75413	Washer—"C" washer for pickup arm pivot
82	75414	Shaft—Pickup arm pivot shaft
83	75415	Spring—Clutch safety spring
84	75416	Guide—Clutch safety spring guide
85	75417	Housing—Clutch housing
86	75392	Washer—"C" washer for clutch housing
87	75418	Spring—Conical spring for elevating rod
88	75419	Washer—"C" washer for elevating rod
89	75423	Rod—Lift arm stop rod complete with pins, ILL. 90
90	——	Pin—Mounting pin for stop rod (included in 75423—ILL. 89)
91	75420	Arm—Lift arm assembly complete with stop rod and stop rod mounting pins (includes ILL. 89 and ILL. 90)
92	75421	Washer—Fibre washer for lift arm shaft
93	——	Lug—Terminal lug
94	——	Screw—Mounting screw for lift arm assembly (No. 8-32 x ⅜" pan head screw)
95	75422	Washer—Retainer washer for lift arm shaft
96	——	Lockwasher—No. 8 lockwasher (internal teeth)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



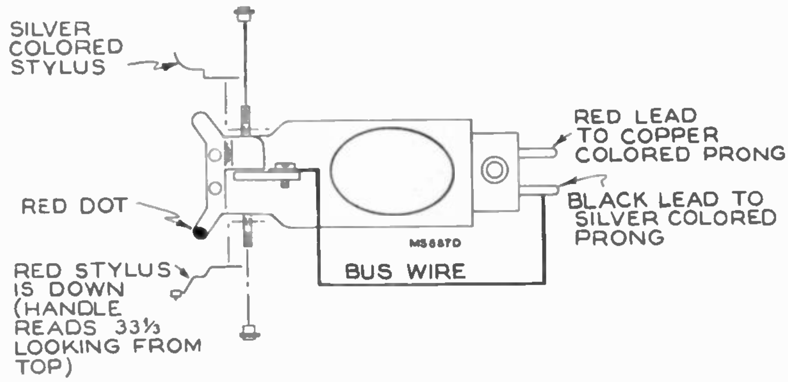
Exploded View of Entire Mechanism

960285-1

PICKUP INFORMATION

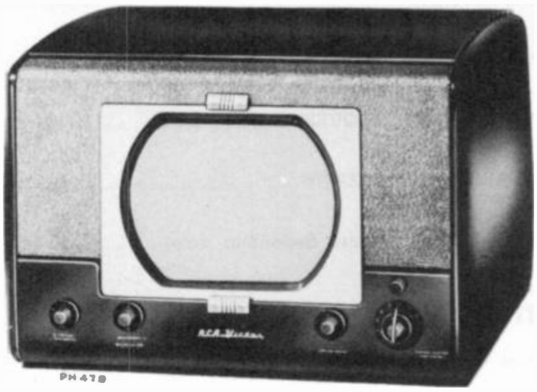
Pickup force should be approximately 8 to 10 grams. This force is determined by the design of the pickup and arm assembly.

However, a tight vertical bearing in the pickup arm will tend to have the same effect as insufficient pickup force.



RECORD CHANGERS

RCA VICTOR



Model T100, Mahogany Finish Metal Cabinet

TELEVISION RECEIVER

MODEL T100

Chassis No. KCS38

— Mfr. No. 274 —

SERVICE DATA

— 1950 No. T1 —

RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION

CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model T100 is a table type television receiver in a mahogany finish metal cabinet. The chassis employs twenty-one tubes plus two rectifiers and a 10BP4 kinescope.

Features of the television unit are: full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply. An auxiliary audio input jack is provided to permit the use of an external record playing attachment.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE .... 61 square inches on a 10BP4 Kinescope

R-F FREQUENCY RANGES

Channel Number	Channel Freq. Mc.	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.
2	54-60	55.25	59.75	81
3	60-66	61.25	65.75	87
4	66-72	67.25	71.75	93
5	76-82	77.25	81.75	103
6	82-88	83.25	87.75	109
7	174-180	175.25	179.75	201
8	180-186	181.25	185.75	207
9	186-192	187.25	191.75	213
10	192-198	193.25	197.75	219
11	198-204	199.25	203.75	225
12	204-210	205.25	209.75	231
13	210-216	211.25	215.75	237

FINE TUNING RANGE

Plus and minus approximately 250 kc on channel 2 and plus and minus approximately 650 kc on channel 13.

POWER SUPPLY RATING

KCS38 .... 115 volts, 60 cycles, 230 watts

AUDIO POWER OUTPUT RATING .... 2.0 watts max.

LOUDSPEAKERS

KCS38 .... 970773-1 5" x 7" EM Dynamic, 3.2 ohms

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside)	22	15⅝	21¼
Chassis (overall)	19½	13	20½

RECEIVER ANTENNA INPUT IMPEDANCE

Choice: 300 ohms balanced or 72 ohms unbalanced.

WEIGHT

Chassis with Tubes in Cabinet .... 84 lbs.

Shipping Weight .... 99 lbs.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6K6GT	Audio Output
(9)	RCA 6BA6	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6BA6	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector & Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier & Vertical Sweep Oscillator
(16)	RCA 6SN7GT	AGC Rectifier & 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier & 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 6W4GT	Damper
(22)	RCA 1B3-GT/8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier
(24)	RCA 10BP4	Kinescope

Specifications continued on page 2

ELECTRICAL AND MECHANICAL SPECIFICATIONS
(Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency ....25.75 Mc.
Adjacent Channel Sound Trap ....27.25 Mc.
Accompanying Sound Traps ....21.25 Mc.
Adjacent Channel Picture Carrier Trap ....19.75 Mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency ....21.25 Mc.
Sound Discriminator Band Width between peaks ....350 kc

VIDEO RESPONSE ....To 4 Mc.

FOCUS ....Magnetic

SWEEP DEFLECTION ....Magnetic

SCANNING ....Interlaced, 525 line

HORIZONTAL SWEEP FREQUENCY ....15,750 cps

VERTICAL SWEEP FREQUENCY ....60 cps

FRAME FREQUENCY (Picture Repetition Rate) ....30 cps

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. See that the TV-PH switch on the rear apron is in the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counter-clockwise until the retrace lines just disappear.

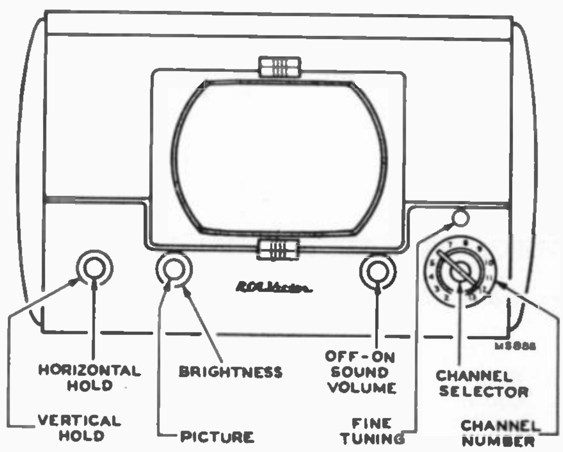


Figure 1—Receiver Operating Controls

9. Adjust the PICTURE control for suitable picture contrast.

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps 4, 8 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

13. If the positions of the controls have been changed, it may be necessary to repeat steps 2 through 9.

14. To use the instrument with a record player, plug the record-player output cable into the PHONO jack on the rear apron, and set the TV-PH switch on "PH." Set the TV-PH switch back to TV on completion of the record program.

NOTE: THE CHASSIS USED IN MODEL T100 IS VERY SIMILAR TO THE CHASSIS USED IN MODELS T120 AND T121. REFER TO MODELS T120 AND T121 FOR ALIGNMENT PROCEDURE, TEST PATTERN AND WAVEFORM PHOTOGRAPHS, R-F UNIT WIRING, LEAD DRESS AND VOLTAGES. IT SHOULD BE NOTED THAT MODEL T100 USES A 10BP4 KINESCOPE WHEREAS MODELS T120 AND T121 USE A 12LP4 KINESCOPE. THE SECOND ANODE VOLTAGE (RECTIFIER AND KINESCOPE) IS SLIGHTLY LOWER IN MODEL T100.

MODELS T120 AND T121 INCORPORATE A WIDTH SELECTOR SWITCH BUT T100 DOES NOT. MODELS T120 AND T121 USE A PM SPEAKER AND MODEL T100 USES AN EM SPEAKER.

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH-VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH-VOLTAGE COMPARTMENT SHIELD REMOVED.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2, and with the part number on magnet towards the rear of the chassis. Starting from this position immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

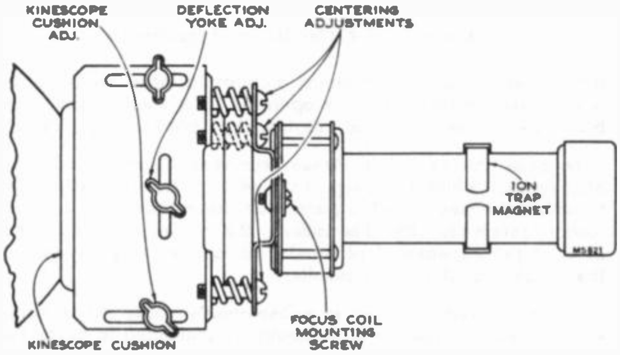


Figure 2—Yoke and Focus Coil Adjustments

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 on the rear apron (see Figure 3) clockwise until the set operates normally and the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Centering Adjustment."

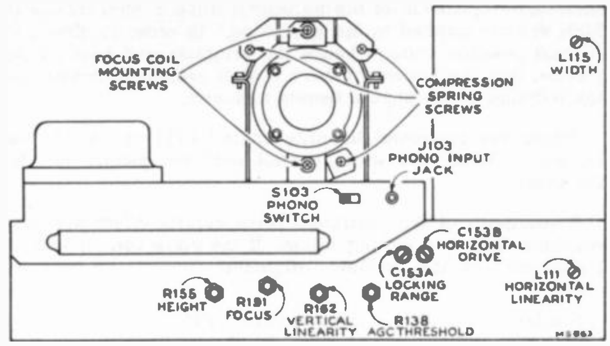


Figure 3—Rear Chassis Adjustments

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock in Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counter-clockwise. Turn the picture control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

CENTERING ADJUSTMENT.—No electrical centering controls are provided. Centering is obtained by mechanically orienting the focus coil with the three adjustment screws shown in Figure 2. Center the picture on the screen by adjustment of these screws. The focus coil should be concentric around the neck of the kinescope to prevent curvature of the raster.

FOCUS COIL ADJUSTMENTS.—If, after making the centering adjustments described in the above paragraph, a corner of the picture is shadowed, it will be necessary to loosen the focus coil mounting screws (shown in Figure 2) and change the position of the coil to eliminate the shadow. Recenter the picture by adjustment of the centering screws.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained. It is important that the kinescope not be operated with the ion trap magnet adjusted for less than maximum brightness. To do so may cause injury to the tube.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage hence the brightest and best focused picture, turn the horizontal drive control counter-clockwise until the left side of the picture begins to stretch.

Adjust the horizontal linearity control L111 to provide best linearity. Adjust the width control until the picture just fills the mask.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS.—Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

CHECK TO SEE THAT THE CUSHION AND YOKE THUMBSCREWS AND THE FOCUS COIL MOUNTING SCREWS ARE TIGHT.

AGC THRESHOLD CONTROL.—The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counter-clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counter-clockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counter-clockwise on a weak signal, then the receiver may overload when a strong signal is received.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

Replace the cabinet back and make sure that the screws are tight in order to prevent rattling at high volume.

WEAK SIGNAL AREA OPERATION—Since the vast majority of receivers are sold in strong signal areas, the chassis are

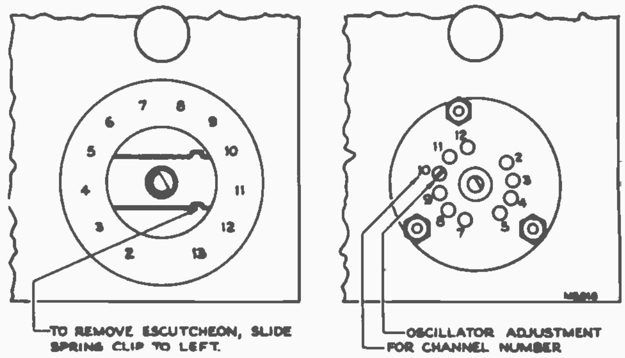


Figure 4—R-F Oscillator Adjustments

aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390 ohm resistor which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received. By this action, the r-f gain, is increased 50% at the expense of r-f bandwidth and an improvement in the weak signal picture results.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

KINESCOPE HANDLING PRECAUTION.—Do not install, remove, or handle the kinescope in any manner, unless shatterproof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope, remove the kinescope socket, the ion-trap magnet, and the second-anode connector. Loosen the cross-recessed head screw on the kinescope strap, as shown in Figure 5. Withdraw the kinescope toward the front of the chassis.

INSTALLATION OF KINESCOPE.—Slide the kinescope cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high-voltage compartment.

Insert the neck of the kinescope through the deflection and focus coils until the bell of the tube is against the rubber cushion. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slip the ion trap magnet assembly over the neck of the kinescope.

Connect the kinescope socket to the tube base.

Connect the high voltage lead to the kinescope second anode socket.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks.

To replace the chassis in the cabinet, first tighten the cross-recessed head screw on the kinescope strap. Slide the chassis into the cabinet, then insert and tighten the six chassis bolts. Loosen the kinescope strap from the rear of the cabinet, or from the bottom through a hole in the chassis shelf. The bottom end of the cross-recessed head screw is slotted to fit a screwdriver. Push the kinescope forward until the face of the tube is against the mask. Push the yoke cushion forward against the kinescope flare, then tighten the cushion adjusting screws. Push the yoke forward and tighten. Tighten the kinescope strap. Replace the knobs and the cabinet back.

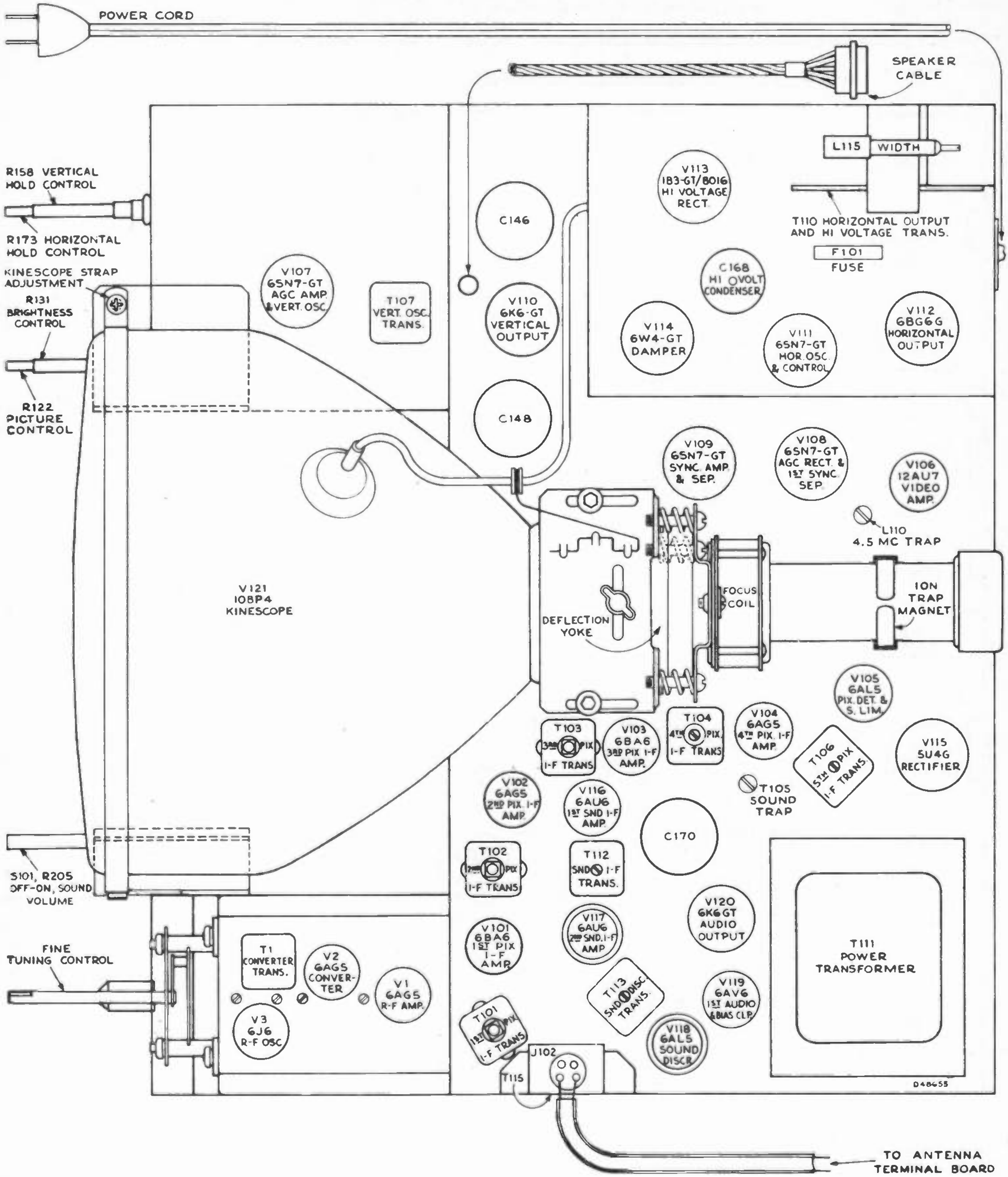


Figure 5—Chassis Top View

CHASSIS BOTTOM VIEW

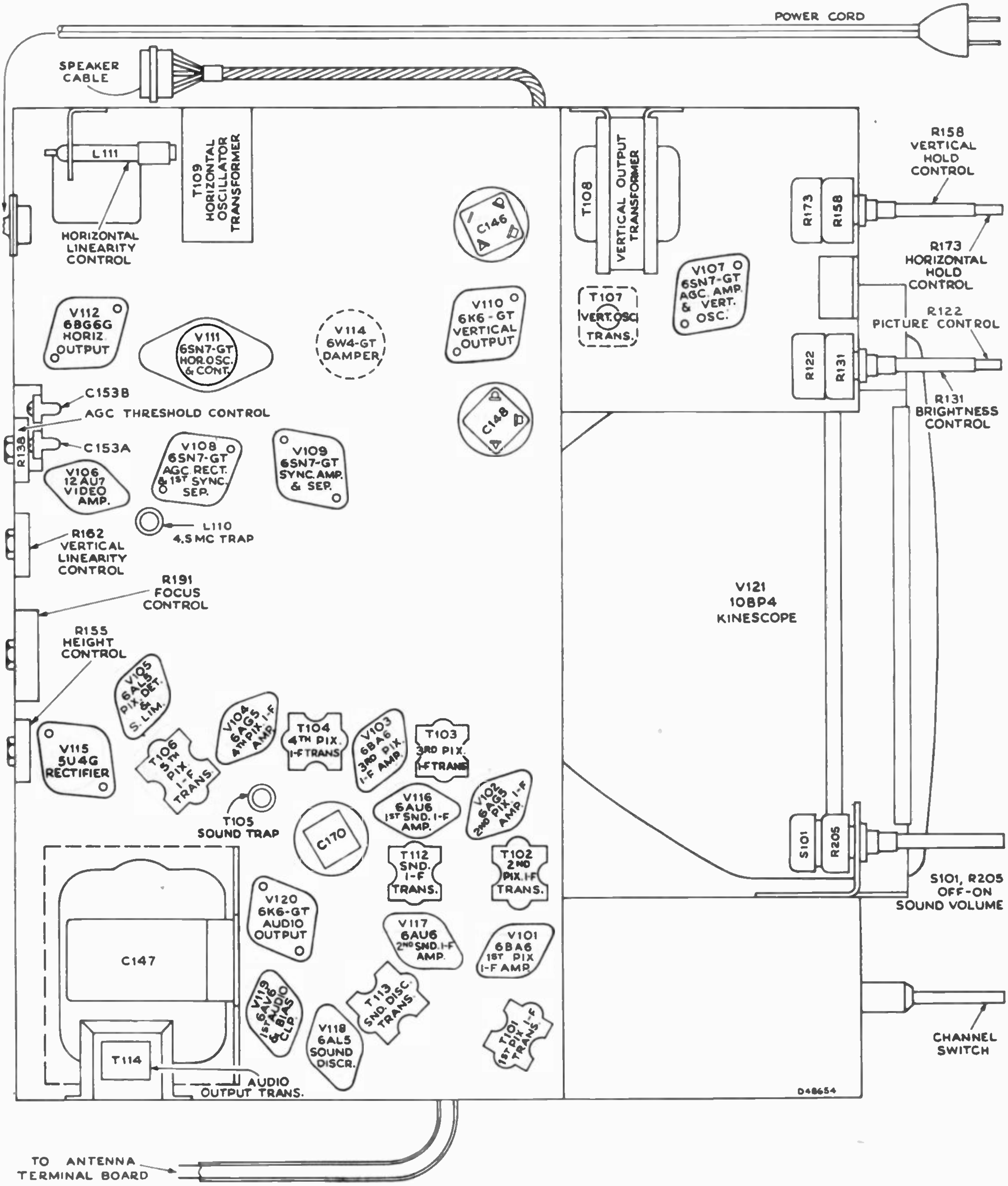
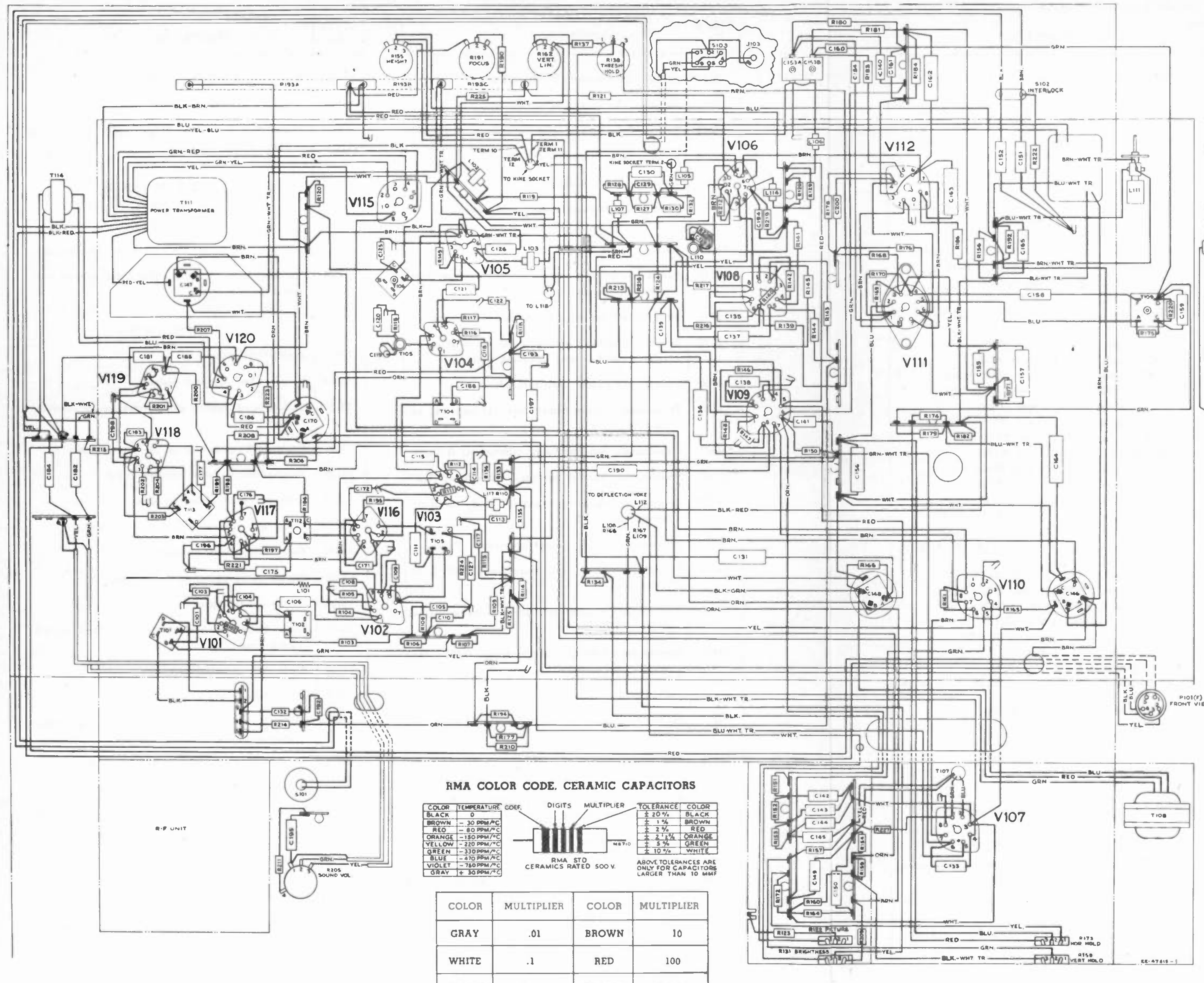
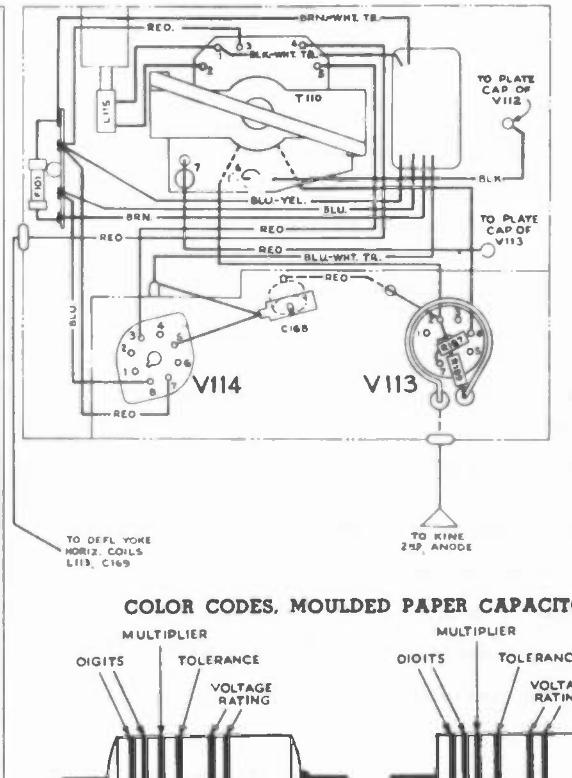


Figure 6—Chassis Bottom View

CHASSIS WIRING DIAGRAM





RMA COLOR CODE, CERAMIC CAPACITORS

COLOR	TEMPERATURE COEF.
BLACK	0
BROWN	- 30 PPM/°C
RED	- 80 PPM/°C
ORANGE	-150 PPM/°C
YELLOW	- 220 PPM/°C
GREEN	-330 PPM/°C
BLUE	- 470 PPM/°C
VIOLET	- 750 PPM/°C
GRAY	+ 30 PPM/°C

RMA STD
CERAMICS RATED 500 V.

TOLERANCE	COLOR
± 20%	BLACK
± 1%	BROWN
± 2%	RED
± 2½%	ORANGE
± 5%	GREEN
± 10%	WHITE

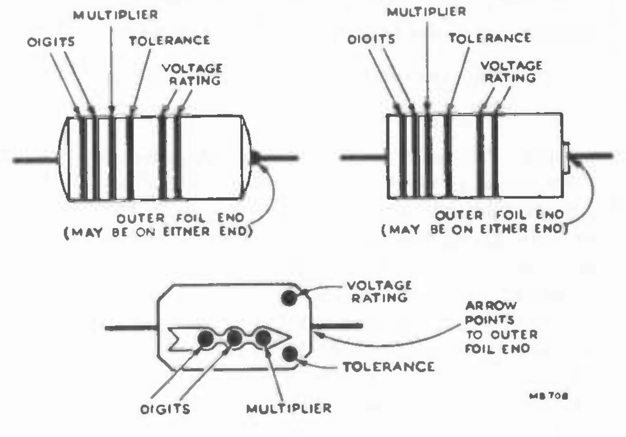
ABOVE TOLERANCES ARE ONLY FOR CAPACITORS LARGER THAN 10 MMF

COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

For digits, use digit column, page 8.

Figure 7—Chassis Wiring Diagram

COLOR CODES, MOULDED PAPER CAPACITORS

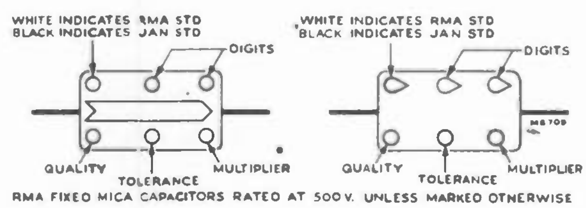


CAPACITY VALUE IN MMF		
COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

TOLERANCE	
COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	±5%

The Voltage Rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digit column to read voltage rating.

RMA COLOR CODE, FIXED MICA CAPACITORS



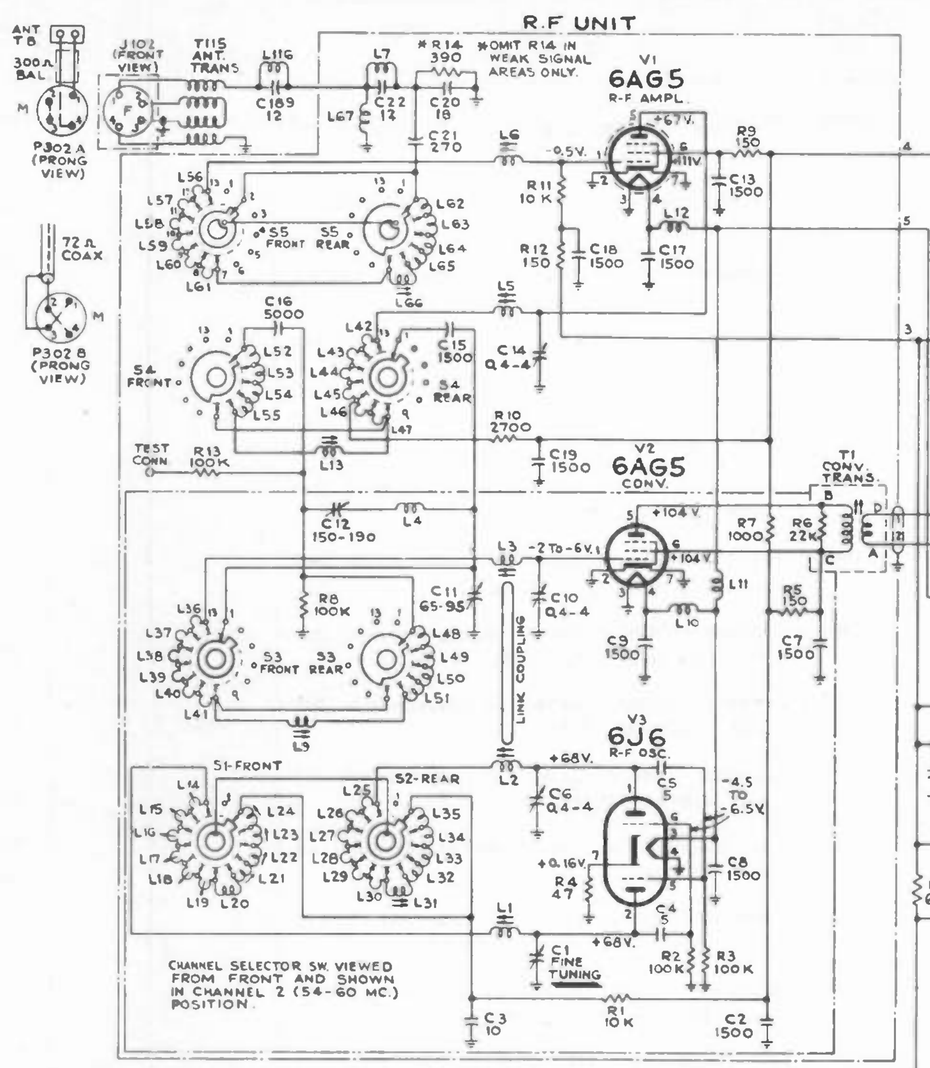
RMA FIXED MICA CAPACITORS RATED AT 500 V. UNLESS MARKED OTHERWISE

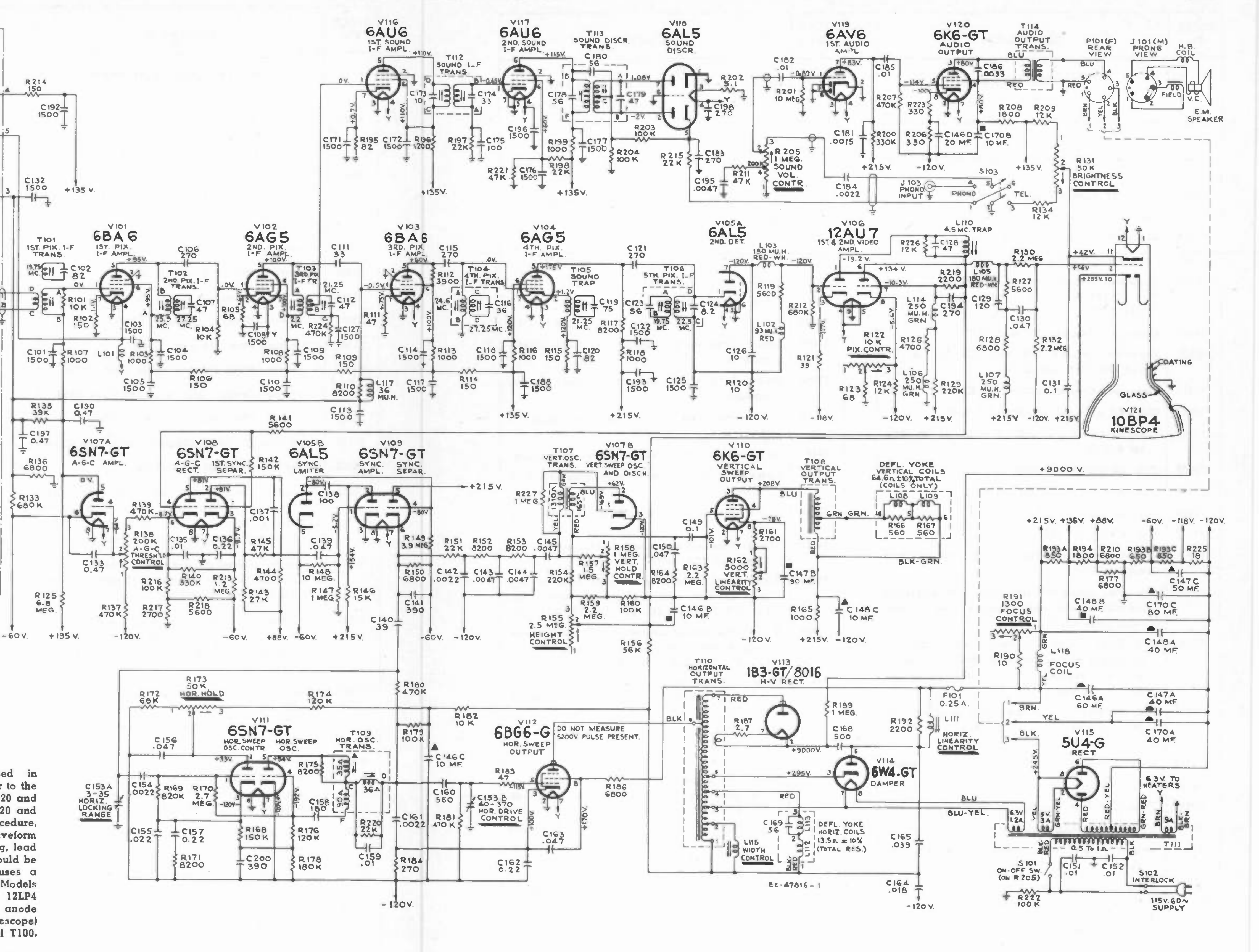
TOLERANCE		QUALITY			
COLOR	TOLERANCE	COLOR	CLASS	COLOR	CLASS
RED	±2%	BLACK	A	YELLOW	D
GREEN	±5%	BROWN	B	GRAY	I
SILVER	±10%	RED	C	WHITE	J
BLACK	±20%	ORANGE	D		

NOTE: The chassis used in Model T100 is very similar to the chassis used in Models T120 and T121. Refer to Models T120 and T121 for alignment procedure, test pattern and waveform photographs, r-f unit wiring, lead dress and voltages. It should be noted that Model T100 uses a 10BP4 kinescope whereas Models T120 and T121 use a 12LP4 kinescope. The second anode voltage (rectifier and kinescope) is slightly lower in Model T100.

Models T120 and T121 incorporate a width selector switch but T100 does not. Models T120 and T121 use a PM speaker and Model T100 uses an EM speaker.

CIRCUIT SCHEMATIC DIAGRAM





All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

In some chassis R181 is 1 meg.

In some chassis R227 is omitted.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Figure 8—Circuit Schematic Diagram

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES
	KRK 7
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield.
75069	Board—R-F unit power connection terminal board (5 contact)
73478	Cable—I-F transmission cable (W1)
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5,000 mmf. (C16)
73460	Coil—R-F plate coil for channel 6 (L13)
73461	Coil—Rear section—Oscillator plate coil for channel 6 (L20)
73462	Coil—Coupling inductance coil (L4)
73475	Coil—Antenna filter shunt coil (C67)
73476	Coil—I-F trap (L7, C22)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Front section—Oscillator plate coil for channel 6 (L31)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (plunger adjustment) (L1, C1)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment for oscillator section or converter section) (L2, L3, C6, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f amplifier section (L5, C14)
73455	Core—Sliding core for fine tuning control trimmer
74187	Core—Adjustable core for coil L9
73453	Form—Coil form assembly for L9, C13
73442	Link—Link assembly for fine tuning
71482	Loop—Oscillator to converter trimmer loop connector
74572	Plate—Front plate and bushing
	Resistor—Fixed, composition:—
	47 ohms, ±20%, ½ watt (R4)
	150 ohms, ±20%, ½ watt (R5, R8, R12)
	390 ohms, ±10%, ½ watt (R14)
	1000 ohms, ±20%, ½ watt (R7)
	2700 ohms, ±10%, ½ watt (R10)
	10,000 ohms, ±20%, ½ watt (R1, R11)
	100,000 ohms, ±20%, ½ watt (R2, R3, R8, R13)
30340	Retainer—Retainer ring for fine tuning stud
70881	Screw—#4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
73640	Screw—#4-40 x ⅜" adjusting screw for L68
71475	Screw—#4-40 x 15/32" adjusting screw for coils L21, L22, L23, L24
74575	Screw—#4-40 x 17/32" adjusting screw for L6
74573	Shaft—Channel selector shaft complete with pawl and stud
74574	Shaft—Fine tuning shaft and cam assembly
73632	Shield—Metal tube shield for V1
72951	Shield—Metal tube shield for V3
75443	Shield—"U" shape shield for bottom of R-F unit
71494	Socket—Tube socket, moulded, 7 prong, saddle mounted
73450	Socket—Tube socket, ceramic, 7 prong, bottom mounted
74576	Spacer—Insulating spacer for front plate (4 required)
73457	Spring—Return spring for fine tuning control core
74188	Spring—Retaining spring for adjustable core RCA 74187
75068	Spring—Retaining spring for r-f oscillator tube shield
74578	Spring—Retaining spring for adjusting screws RCA 73640 and RCA 74575
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment, and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Converter stator complete with rotor and coils (S3, L9, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L13, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55, C15, C16, R10)
75446	Stud—Capacitor stud, brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, uncoded or coded "ER"
75447	Stud—Capacitor stud, brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, coded numerically or "Hi Q"
73448	Transformer—Converter transformer (T1, R6)
73466	Washer—Insulating washer for front shield (1 set)
74577	Washer—Spring washer for fine tuning shaft and cam
2917	Washer—"C" washer for channel selector shaft or fine tuning shaft and cam

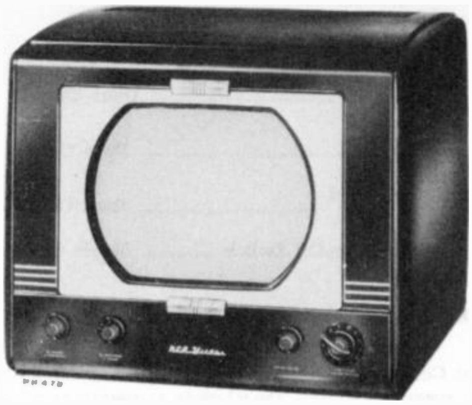
STOCK No.	DESCRIPTION
	R-F, I-F CHASSIS ASSEMBLIES
	KCS 38
74593	Capacitor—Mica trimmer, comprising 1 section of 3-35 mmf. and 1 section of 40-370 mmf. (C153A, C153B)
39604	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. C111)
74726	Capacitor—Mica, 39 mmf. (C140)
64062	Capacitor—Ceramic, 82 mmf. (C120)
75060	Capacitor—Mica, 100 mmf. (C138)
39396	Capacitor—Ceramic, 100 mmf. (C175)
73921	Capacitor—Ceramic, 120 mmf. (C129)
73102	Capacitor—Mica, 180 mmf. (C158)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
39642	Capacitor—Mica, 390 mmf. (C141, C200)
74153	Capacitor—Hi-voltage, 500 mmf., 15,000 volts (C168)
74250	Capacitor—Mica, 560 mmf. (C160)
71501	Capacitor—Ceramic, 1500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C127, C132, C171, C172, C178, C177, C188, C192, C193, C196)
71432	Capacitor—Electrolytic, comprising 2 sections of 40 mfd., 450 volts and 1 section of 10 mfd., 450 volts (C148A, C148B, C148C)
73582	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts and 1 section of 80 mfd., 200 volts (C170A, C170B, C170C)
73583	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 90 mfd., 150 volts and 1 section of 50 mfd., 150 volts (C147A, C147B, C147C)
73581	Capacitor—Electrolytic, comprising 1 section of 80 mfd., 450 volts, 2 sections of 10 mfd., 450 volts and 1 section of 20 mfd., 150 volts (C146A, C146B, C146C, C146D)
73801	Capacitor—Tubular, paper, oil impregnated, .001 mfd., 1000 volts (C137)
73802	Capacitor—Tubular, paper, oil impregnated, .0015 mfd., 1000 volts (C181)
73595	Capacitor—Tubular, moulded paper, oil filled, .0022 mfd., 800 volts (C142, C154, C161, C184)
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd., 600 volts (C186)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 600 volts (C143, C144, C145, C195)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C135, C182)
73594	Capacitor—Tubular, moulded paper, oil filled, .01 mfd., 600 volts (C159)
73565	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 1000 volts (C151, C152, C185)
74727	Capacitor—Tubular, moulded paper, oil filled, .018 mfd., 1000 volts (C164)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 400 volts (C155)
74728	Capacitor—Tubular, moulded paper, oil filled, .039 mfd., 1000 volts (C165)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C130, C139)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 600 volts (C150, C156)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 1000 volts (C163)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C149)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 600 volts (C131)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 400 volts (C136, C157, C162)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd., 200 volts (C133, C190, C197)
74585	Coil—Focus coil (L118)
71449	Coil—Horizontal linearity control coil (L111)
71429	Coil—Width control coil (L115)
74170	Coil—Peaking coil (36 muh) (L117, R110)
71527	Coil—Peaking coil (93 muh) (L102)
74214	Coil—Peaking coil (180 muh) (L103, L105)
71526	Coil—Peaking coil (250 muh) (L106, L107, L114)
73477	Coil—Choke coil (L101)
74594	Connector—2 contact male connector for power cable
35787	Connector—Phono input connector (J103)
12493	Connector—5 contact female connector for speaker cable
71789	Connector—Kinescope anode connector
71521	Contact—Hi-voltage capacitor contact
72734	Control—Horizontal and vertical hold control (R158, R173)
74047	Control—Brightness and picture control (R122, R131)
38408	Control—Sound volume control and power switch (R205, S101)

STOCK No.	DESCRIPTION
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
74475	Control—AGC threshold control (R138)
74597	Control—Focus control (R191)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics #71432, 73581 and 73582
74418	Cushion—Rubber cushion for kinescope bottom support
73590	Cushion—Rubber cushion for deflection yoke hood (2 required)
73600	Fuse—0.25 amp., 250 volts (F101)
71799	Grommet—Rubber grommet for yoke horizontal lead exit
37396	Grommet—Rubber grommet for mounting ceramic tube socket
73301	Magnet—Ion trap magnet (PM type)
73587	Nut—Speed nut to mount hi-voltage capacitor
18469	Plate—Bakelite mounting plate for electrolytics
74598	Resistor—Wire wound, 2.7 ohms, 1/3 watt (R187)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
18471	Resistor—Wire wound, 10 ohms, ½ watt (R190)
73588	Resistor—Voltage divider, comprising 1 section of 850 ohms, 12 watts and 2 sections of 650 ohms, 6 watts (R193A, R193B, R193C)
	Resistor—Fixed, composition:—
	10 ohms, ±20%, ½ watt (R120)
	18 ohms, ±10%, ½ watt (R225)
	39 ohms, ±10%, ½ watt (R121)
	47 ohms, ±5%, ½ watt (R111)
	47 ohms, ±20%, ½ watt (R183)
	68 ohms, ±10%, ½ watt (R105)
	68 ohms, ±20%, ½ watt (R123)
	82 ohms, ±10%, ½ watt (R195)
	150 ohms, ±5%, ½ watt (R102)
	150 ohms, ±10%, ½ watt (R115)
	150 ohms, ±20%, ½ watt (R106, R109, R114, R214)
	270 ohms, ±10%, 2 watts (R184)
	330 ohms, ±10%, ½ watt (R206, R223)
	1000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R199)
	1200 ohms, ±10%, ½ watt (R196)
	1800 ohms, ±10%, 2 watts (R194, R208)
	2200 ohms, ±10%, ½ watt (R219)
	2200 ohms, ±10%, 1 watt (R192)
	2700 ohms, ±10%, ½ watt (R161, R217)
	3900 ohms, ±5%, ½ watt (R112)
	4700 ohms, ±5%, ½ watt (R126)
	4700 ohms, ±10%, ½ watt (R144)
	5600 ohms, ±5%, ½ watt (R119)
	5600 ohms, ±10%, ½ watt (R141, R218)
	5600 ohms, ±10%, 1 watt (R127)
	6800 ohms, ±5%, ½ watt (R136)
	6800 ohms, ±10%, ½ watt (R150)
	6800 ohms, ±5%, 1 watt (R128)
	6800 ohms, ±10%, 2 watts (R177, R186, R210)
	8200 ohms, ±5%, ½ watt (R164, R175)
	8200 ohms, ±10%, ½ watt (R152, R153, R171)
	8200 ohms, ±5%, 1 watt (R117)
	10,000 ohms, ±5%, ½ watt (R104)
	10,000 ohms, ±10%, ½ watt (R182)
	12,000 ohms, ±10%, ½ watt (R134, R209, R226)
	12,000 ohms, ±10%, 2 watts (R124)
	15,000 ohms, ±10%, 1 watt (R146)
	22,000 ohms, ±10%, ½ watt (R151, R197, R220)
	22,000 ohms, ±20%, ½ watt (R198, R215)
	27,000 ohms, ±10%, ½ watt (R143)
	39,000 ohms, ±5%, ½ watt (R135)
	47,000 ohms, ±10%, ½ watt (R145, R211)
	47,000 ohms, ±20%, ½ watt (R221)
	56,000 ohms, ±10%, ½ watt (R156)
	68,000 ohms, ±10%, ½ watt (R172)
	100,000 ohms, ±5%, ½ watt (R203, R204)
	100,000 ohms, ±10%, ½ watt (R160, R216)
	100,000 ohms, ±10%, 1 watt (R179)
	100,000 ohms, ±20%, 1 watt (R222)
	120,000 ohms, ±5%, 1 watt (R176)
	120,000 ohms, ±10%, 1 watt (R174)
	150,000 ohms, ±10%, ½ watt (R168)
	150,000 ohms, ±20%, ½ watt (R142)
	180,000 ohms, ±5%, 1 watt (R178)
	220,000 ohms, ±10%, ½ watt (R129, R154)
	330,000 ohms, ±10%, ½ watt (R140, R200)
	470,000 ohms, ±10%, ½ watt (R137, R139, R180, R181, R224)
	470,000 ohms, ±20%, ½ watt (R207)
	680,000 ohms, ±10%, ½ watt (R133, R212)
	820,000 ohms, ±5%, ½ watt (R169)
	1 megohm, ±10%, ½ watt (R147)
	1 megohm, ±20%, 1 watt (R189, R227)
	1.2 megohm, ±5%, ½ watt (R213)
	1.5 megohm, ±5%, ½ watt (R157)
	2.2 megohm, ±10%, ½ watt (R130, R132, R159, R163)
	2.7 megohm, ±5%, 1 watt (R170)
	3.9 megohm, ±10%, ½ watt (R149)
	6.8 megohm, ±10%, ½ watt (R125)
	10 megohm, ±10%, ½ watt (R148)
	10 megohm, ±20%, ½ watt (R201)
74601	Screw—#8-32 x ⅜" cross-recessed binder head screw for focus coil mounting (2 required)
74602	Screw—#10-32 x 1¾" cross-recessed round head screw for focus coil adjustments (3 required)
74416	Screw—#10-32 x 1¾" round head cross-recessed screw for strap 74735
71456	Screw—#8-32 x 7/16" wing screw for deflection yoke mounting
75083	Screw—#8-32 x ¼" wing screw for deflection yoke mounting
73584	Shield—Tube shield
74937	Sleeve—Rubber sleeve for focus coil
73117	Socket—Tube socket, 7 pin, miniature

STOCK No.	DESCRIPTION
72927	Socket—Tube socket, 9 pin, miniature
31251	Socket—Tube socket, octal, wafer
73249	Socket—Tube socket, octal, ceramic, plate mounted
71508	Socket—Tube socket for 8016
72741	Socket—Kinescope socket
73586	Spring—Compression spring used under centering control screws (3 required)
74595	Spring—Anode lead spring
74936	Spring—Suspension spring (coil type) for kinescope tube socket leads
74735	Strap—Retaining strap for mounting kinescope
74596	Support—Bakelite supports (1 set) for mounting hi-voltage rectifier tube mounting plate
46760	Switch—"TV-Phono" switch (S103)
74586	Transformer—Power transformer, 117 volt x 60 cycle (T111)
74587	Transformer—Vertical output transformer (T108)
73569	Transformer—Vertical oscillator transformer (T107)
74588	Transformer—Horizontal output and hi-voltage transformer (T110)
71419	Transformer—Sound output transformer (T114)
74589	Transformer—First pix, i-f transformer (T101, C102, R101)
74590	Transformer—Second pix, i-f transformer (T102, C107)
74591	Transformer—Third pix, i-f transformer (T103, C112)
74592	Transformer—Fourth pix, i-f transformer (T104, C116)
73575	Transformer—Fifth pix, i-f transformer (T106, C123, C124)
71424	Transformer—Sound, i-f transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
73576	Transformer—Horizontal oscillator transformer (T109)
73578	Transformer—Antenna transformer complete with socket and bracket (T115, J102)
73577	Trap—4.5 mc trap (L110, C128)
71778	Trap—Sound trap (T105, C119)
73476	Trap—I-F trap (L116, C189)
71420	Yoke—Deflection yoke (L108, L109, L112, L113, C169, R166, R167)
	SPEAKER ASSEMBLIES
	970773-1
	RL 116-1
71560	Connector—5 contact male connector for speaker
74599	Speaker—5" x 7" EM speaker complete with cone and voice coil
	MISCELLANEOUS
74637	Back—Cabinet back
75039	Board—"Ant" terminal board
39153	Connector—4 contact male connector for antenna cable
74638	Cushion—Vinylite cushion for safety glass
74627	Decal—Control panel function decal
74809	Emblem—"RCA Victor" emblem
73642	Escutcheon—Channel marker escutcheon
74631	Foot—Rubber foot (4 required)
74632	Gasket—Cork gasket for safety glass
74629	Glass—Safety glass
74000	Knob—Horizontal hold control or picture control knob (inner)
74635	Knob—Channel selector knob
74636	Knob—Fine tuning knob
73998	Knob—Vertical hold control or brightness control knob (outer)
74002	Knob—Volume control and power switch knob
74633	Nut—Speed nut for safety glass retainers
74630	Panel—Removable grille panel and cloth assembly
74628	Retainers—Safety glass retainers (1 set)
30330	Spring—Retaining spring for knob #74000
14270	Spring—Retaining spring for knobs #73998, 74002, 74635, 74636
73643	Spring—Spring clip for channel marker escutcheon

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



Model T120, Mahogany Finish Metal Cabinet

Model T121 Mahogany Finish Metal Cabinet

RCA VICTOR

TELEVISION RECEIVER
MODELS T120, T121

Chassis No. KCS 34C

SERVICE DATA

— 1950 No. T3 & No. T4 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Models T120 and T121 are 12" table style television receivers in mahogany finish metal cabinets. The receivers employ twenty-one tubes plus two rectifiers and a 12LP4 kinescope.

Features of the receivers are full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator; four mc band width for picture channel and reduced hazard high voltage supply. A phono input jack is provided to permit the use of an external record player.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE .... 87 square inches on a 12LP4 Kinescope

R-F FREQUENCY RANGES

Channel Number	Channel Freq. Mc.	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.
2	54-60	55.25	59.75	81
3	60-66	61.25	65.75	87
4	66-72	67.25	71.75	93
5	76-82	77.25	81.75	103
6	82-88	83.25	87.75	109
7	174-180	175.25	179.75	201
8	180-186	181.25	185.75	207
9	186-192	187.25	191.75	213
10	192-198	193.25	197.75	219
11	198-204	199.25	203.75	225
12	204-210	205.25	209.75	231
13	210-216	211.25	215.75	237

FINE TUNING RANGE

Plus and minus approximately 250 kc on channel 2 and plus and minus approximately 650 kc on channel 13.

POWER SUPPLY RATING

KCS34C .... 115 volts, 60 cycles, 230 watts

AUDIO POWER OUTPUT RATING .... 2.6 watts max.

LOUDSPEAKER

KCS34C ....92573-4 PM Dynamic, 3.2 ohms

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside)	22	18	21¼
Chassis (overall)	19½	13	20½

RECEIVER ANTENNA INPUT IMPEDANCE

Choice: 300 ohms balanced or 72 ohms unbalanced.

WEIGHT

Chassis with Tubes in Cabinet ....92 lbs.
Shipping Weight ....108 lbs.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6K6GT	Audio Output
(9)	RCA 6BA6	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6BA6	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector & Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier & Vertical Sweep Oscillator
(16)	RCA 6SN7GT	AGC Rectifier & 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier & 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 6W4GT	Damper
(22)	RCA 1B3-GT/8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier
(24)	RCA 12LP4	Kinescope

Specifications continued on page 2

ELECTRICAL AND MECHANICAL SPECIFICATIONS
(Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency .... 25.75 Mc.
Adjacent Channel Sound Trap .... 27.25 Mc.
Accompanying Sound Traps .... 21.25 Mc.
Adjacent Channel Picture Carrier Trap .... 19.75 Mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency .... 21.25 Mc.
Sound Discriminator Band Width between peaks .... 350 kc

VIDEO RESPONSE .... To 4 Mc.

FOCUS .... Magnetic

SWEEP DEFLECTION .... Magnetic

SCANNING .... Interlaced, 525 line

HORIZONTAL SWEEP FREQUENCY .... 15,750 cps

VERTICAL SWEEP FREQUENCY .... 60 cps

FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

OPERATING CONTROLS (front panel)

Channel Selector, Fine Tuning .... Dual Control Knobs
Picture, Brightness .... Dual Control Knobs
Picture Horizontal Hold, Picture Vertical Hold .... Dual Control Knobs
Sound Volume and On-Off Switch .... Single Control Knob

NON-OPERATING CONTROLS (not including r-f & i-f adjustments)

Horizontal Centering .... top chassis screwdriver adjustment
Vertical Centering .... top chassis screwdriver adjustment
Width .... rear chassis screwdriver adjustment
Width Selector Switch .... rear chassis adjustment
Height .... rear chassis adjustment
Horizontal Linearity .... rear chassis screwdriver adjustment
Vertical Linearity .... rear chassis adjustment
Horizontal Drive .... rear chassis screwdriver adjustment
Horizontal Osc. Freq. .... bottom chassis adjustment
Horizontal Osc. Waveform .... side chassis adjustment
Horizontal Locking Range .... rear chassis adjustment
Focus .... rear chassis adjustment
Ion Trap Magnet .... top chassis adjustment
Deflection Coil .... top chassis wing nut adjustment
AGC Threshold Control .... rear chassis adjustment

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH-VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH-VOLTAGE COMPARTMENT SHIELD REMOVED.

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. See that the TV-PH switch on the rear apron is in the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counter-clockwise until the retrace lines just disappear.

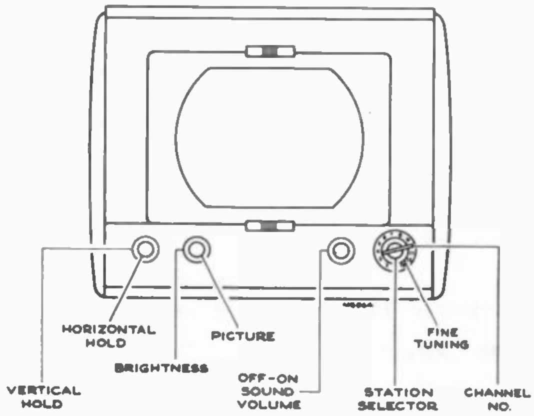


Figure 1—Receiver Operating Controls

9. Adjust the PICTURE control for suitable picture contrast.

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps 4, 8 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

13. If the positions of the controls have been changed, it may be necessary to repeat steps 2 through 9.

14. To use the instrument with a record player, plug the record-player output cable into the PHONO jack on the rear apron, and set the TV-PH switch on "PH." Set the TV-PH switch back to TV on completion of the record program.

ANTENNA AND POWER CONNECTIONS.—Connect the leads from the antenna to the receiver antenna terminals.

Make sure that the receiver power switch is in the off position. Plug the receiver power cord into a 115 volt 60 cycle a-c outlet.

WARNING.—The high voltage supply in this receiver delivers 10,000 volts! A.C. interlocks are provided at the back of the set so that when the back is removed—so is the power.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2.

Turn the power switch to the "on" position, the brightness control three-quarters clockwise, and picture control fully counter-clockwise.

Immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the rater is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 (on the rear of the chassis, see Figure 3) clockwise until the set operates normally and the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

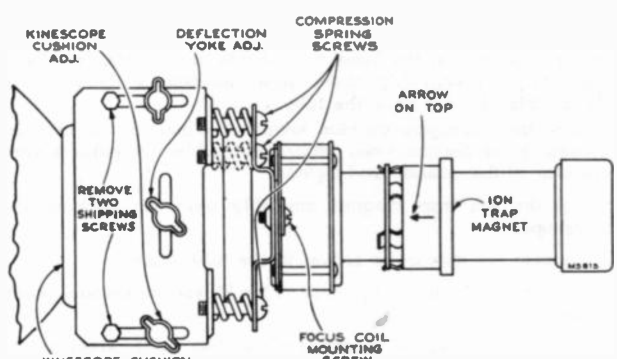


Figure 2—Yoke and Focus Coil Adjustments

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with Focus Coil Adjustments.

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock in Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counter-clockwise. Turn the picture control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure on page 13. For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

FOCUS COIL ADJUSTMENTS.—The focus coil should be adjusted so that there is approximately one-quarter inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus coil. This spacing gives best average focus over the face of the tube. However, it may be necessary to change this distance slightly in order to compensate for small differences in strength of the permanent magnets in the coil. If the receiver focuses with the focus control at or near the clockwise end of its range, the focus coil should be moved toward the yoke and if focus is obtained at or near the counter-clockwise end of the control, the coil should be moved away from the yoke.

The axis of the hole through the focus coil should be parallel with the axis of the kinescope neck.

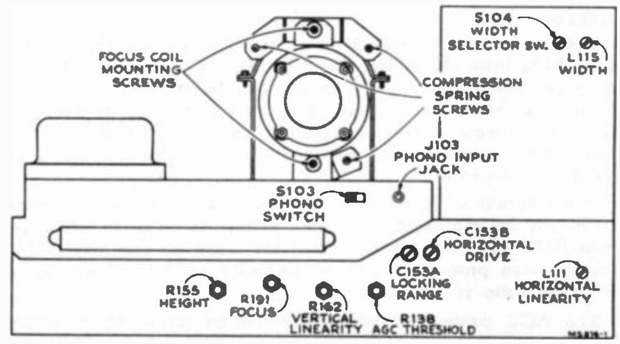


Figure 3—Rear Chassis Adjustments

CENTERING ADJUSTMENT. — No electrical centering controls are provided. Centering is obtained by loosening the two focus coil mounting screws and sliding the coil up or down or from side to side. If the focus coil was appreciably changed in position or if a corner of the raster is shadowed, check the position of the ion trap magnet. Reposition the magnet within the range of maximum raster brightness to eliminate the shadow and recenter the picture by sliding the coil. In no case should the magnet be adjusted to cause any loss of brightness since such operation may cause immediate or eventual damage to the tube. In extreme cases it may be necessary to adjust one or more of the three focus coil compression spring screws to eliminate a corner shadow.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjust the horizontal drive control C153B to give a picture of maximum width within the limits of good linearity. Adjust the horizontal linearity control L111 to provide best linearity. Adjust the width control until the picture just fills the mask.

A width control coil and a width selector switch are provided. With the switch in position 1 (fully counter-clockwise), adjust the width coil until the picture fills the mask. On low line voltages it may not be possible to get sufficient width by adjustment of the width coil. In this case turn the width selector switch clockwise to position 2. In this position the width coil is disconnected, and adjustment of the width coil will have no effect. For still greater width, turn the width selector switch fully clockwise to position 3. In this position, the high voltage is reduced slightly thus permitting greater deflection.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

FOCUS. — Adjust the focus control (R191 on chassis rear apron) for maximum deflection in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

In some cases it may be possible to improve focus by a slight reposition of the ion trap magnet while staying within the range of maximum brightness.

Check to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

AGC THRESHOLD CONTROL. — The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counter-clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counter-clockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counter-clockwise on a weak signal, then the receiver may overload when a strong signal is received.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure on page 10. The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well. See Figures 8 and 9 for their location.

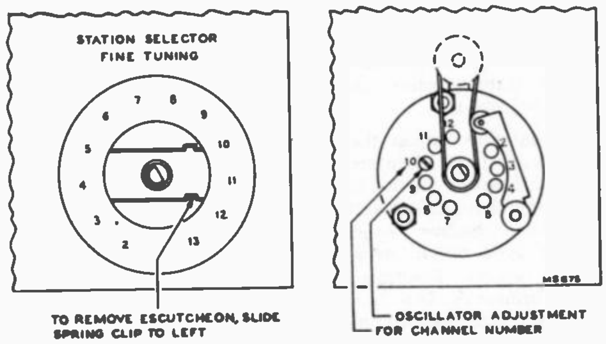


Figure 4—R-F Oscillator Adjustments

Replace the cabinet back and make sure that the screws are tight in order to prevent rattling at high volume.

WEAK SIGNAL AREA OPERATION.—Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390-ohm resistor which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received. By this action, the r-f gain is increased 50% at the expense of r-f bandwidth and an improvement in the weak signal picture results.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

INSTALLATION OF KINESCOPE.—The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high-voltage compartment.

Insert the neck of the kinescope through the deflection and focus coils until the base of the tube protrudes approximately two inches beyond the focus coil. If this tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slide the kinescope cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

Slip the ion trap magnet assembly over the neck of the kinescope.

Connect the kinescope socket to the tube base.

Connect the high voltage lead to the kinescope second anode socket.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks.

To replace the chassis in the cabinet, first tighten the cross-recessed head screw on the kinescope strap. Slide the chassis into the cabinet, then insert and tighten the six chassis bolts. Loosen the kinescope strap from the rear of the cabinet, or from the bottom through a hole in the chassis shelf. The bottom end of the cross-recessed head screw is slotted to fit a screwdriver. Push the kinescope forward until the face of the tube is against the mask. Push the yoke cushion forward against the kinescope flare, then tighten the cushion adjusting screws. Push the yoke forward and tighten. Tighten the kinescope strap. Replace the knobs, and the cabinet back.

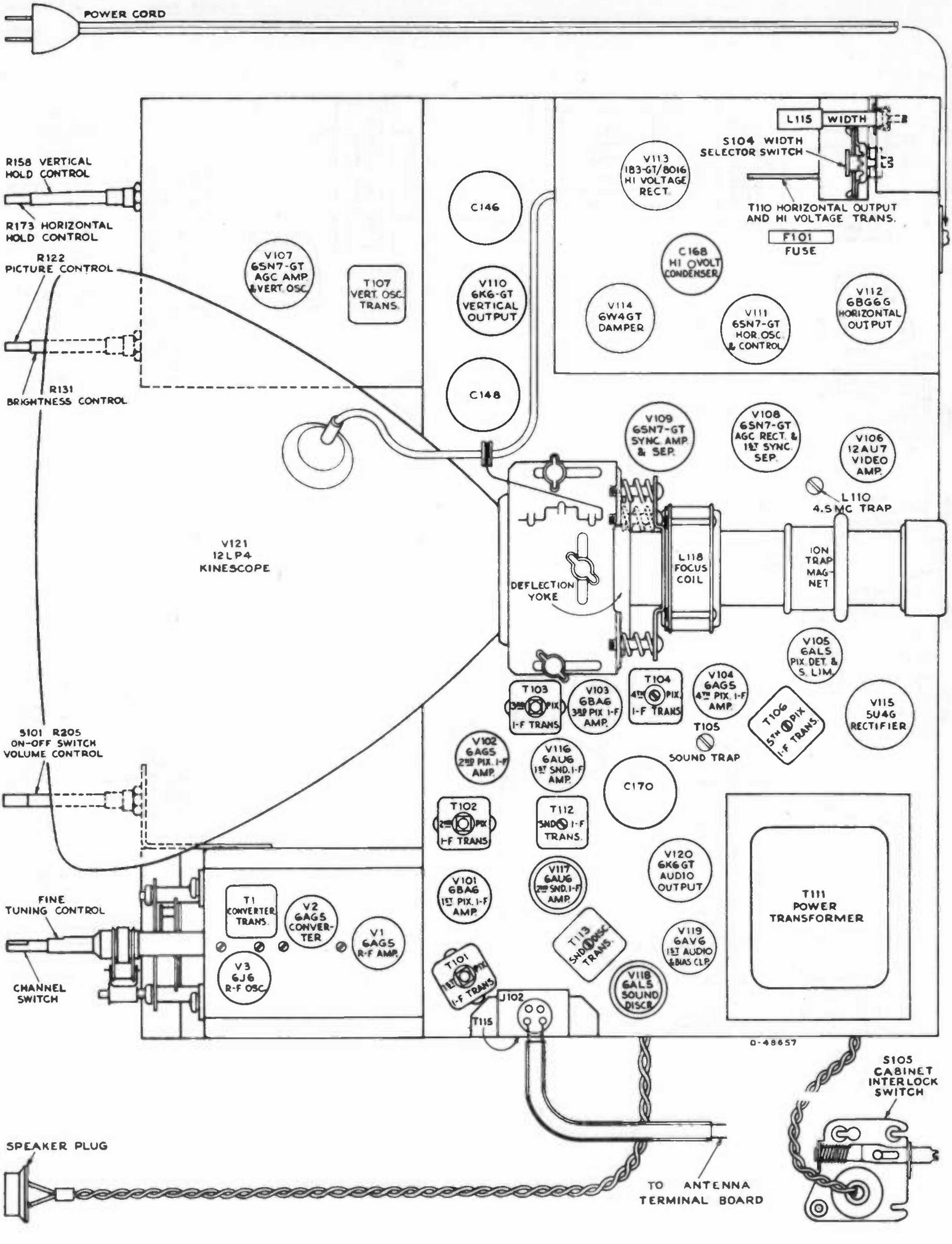


Figure 5—Chassis Top View

CHASSIS BOTTOM VIEW

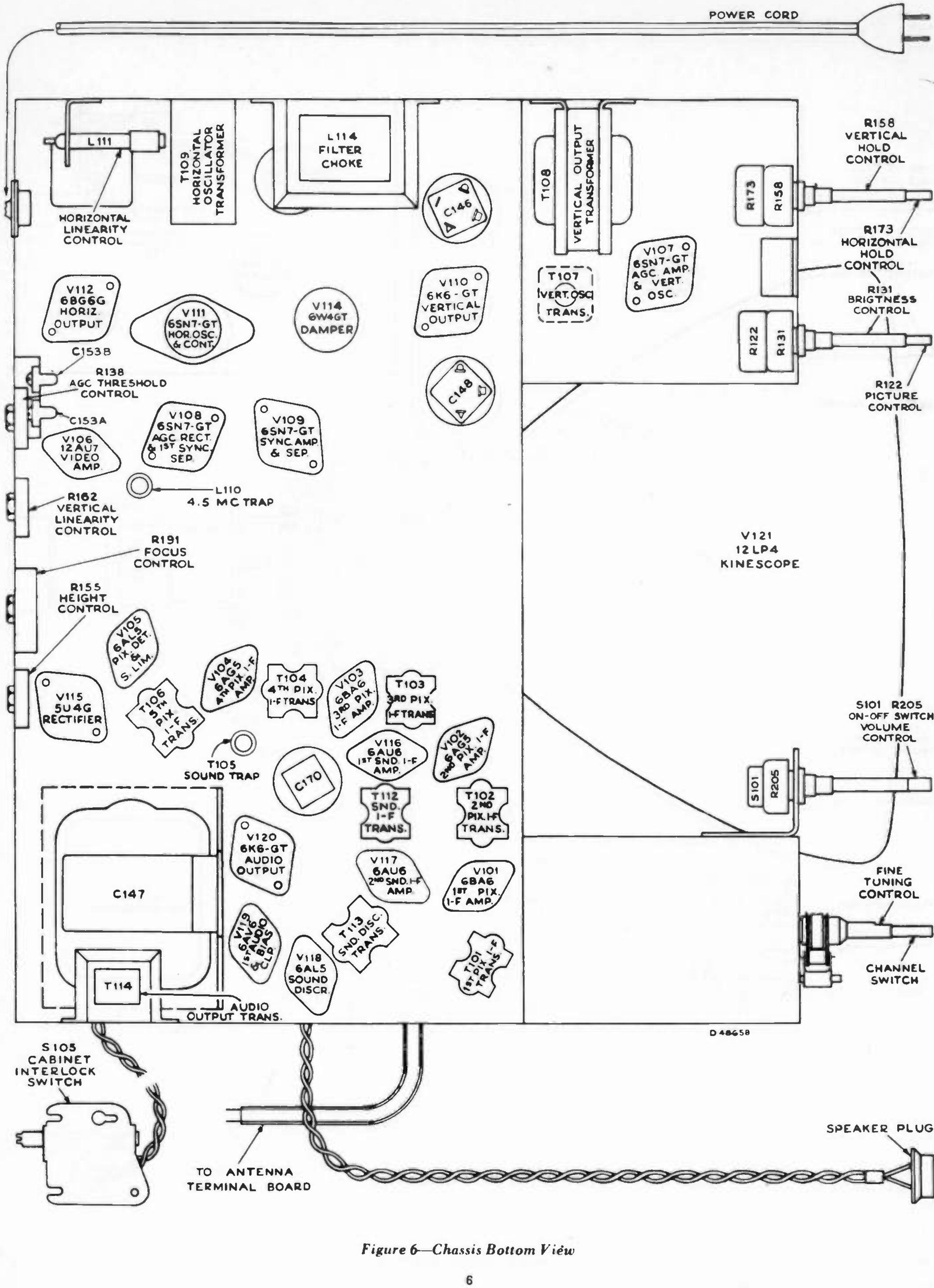


Figure 6—Chassis Bottom View

ALIGNMENT PROCEDURE

TEST EQUIPMENT. — To properly service the television chassis of this receiver, it is recommended that the following test equipment be available:

R-F Sweep Generator meeting the following requirements:

(a) Frequency Ranges

20 to 30 mc., 1 mc. and 10 mc. sweep width
50 to 90 mc., 10 mc. sweep width
170 to 225 mc., 10 mc. sweep width

(b) Output adjustable with at least .1 volt maximum.

(c) Output constant on all ranges.

(d) "Flat" output on all attenuator positions.

Cathode-Ray Oscilloscope. — For alignment purposes, the oscilloscope employed must have excellent low frequency and phase response, and should be capable of passing a 60-cycle square wave without appreciable distortion. While this requirement is not met by many commercial instruments, RCA Oscilloscopes, types WO-55A, WO-58A, WO-79A, and WO-60C fill the requirement and any of these may be employed.

For video and sync waveform observations, the oscilloscope must have excellent frequency and phase response from 10 cycles to at least two megacycles in all positions of the gain control. The RCA types WO-58A and WO-79A are ideally suited for this purpose.

Signal Generator to provide the following frequencies with crystal accuracy.

(a) Intermediate frequencies

19.75 mc. adjacent channel picture trap
21.25 mc. sound i-f and sound traps
22.05 and 24.75 mc. conv. and first pix i-f trans.
25.9 mc. second picture i-f transformer
24.6 mc. fourth picture i-f transformer
22.0 mc. third picture i-f transformer
22.5 mc. fifth picture i-f transformer
25.75 mc. picture carrier
27.25 mc. adjacent channel sound trap

(b) Radio frequencies

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.
2	55.25	59.75
3	61.25	65.75
4	67.25	71.75
5	77.25	81.75
6	83.25	87.75
7	175.25	179.75
8	181.25	185.75
9	187.25	191.75
10	193.25	197.75
11	199.25	203.75
12	205.25	209.75
13	211.25	215.75

(c) Output of these ranges should be adjustable and at least .1 volt maximum.

Heterodyne Frequency Meter with crystal calibrator if the signal generator is not crystal controlled.

Electronic Voltmeter of Junior "VoltOhmyst" type and a high voltage multiplier probe for use with this meter to permit measurements up to 10 kv.

Service Precautions. — If possible, the chassis should be serviced without the kinescope. However, if it is necessary to view the raster during servicing, make sure the kinescope retaining strap is secure, and the yoke cushion is up firmly against the flare of the tube.

CAUTION: Do not short the kinescope second anode lead. Its short circuit current is approximately 3 ma. This represents approximately 9 watts dissipation and a considerable overload on the high voltage filter resistor R189.

Adjustments Required. — Normally, only the r-f oscillator line will require the attention of the service technician. All other circuits are either broad or very stable and hence will seldom require readjustment.

The oscillator line is relatively non critical. When oscillator tubes are changed, in all probability it will be necessary to adjust only C6 in order to bring the entire line into adjustment.

ORDER OF ALIGNMENT. — When a complete receiver alignment is necessary, it can be most conveniently performed in the following order:

(1) Sound discriminator
(2) Sound i-f transformers
(3) Picture i-f traps
(4) Picture i-f transformers
(5) R-F and converter lines
(6) R-F oscillator line
(7) 4.5 mc. video trap
(8) Sensitivity check

SOUND DISCRIMINATOR ALIGNMENT. — Set the signal generator for approximately .1 volt output at 21.25 mc. and connect it to the second sound i-f grid.

Detune T113 secondary (bottom).

Set the "VoltOhmyst" on the 10 volt scale.

Connect the meter in series with a one megohm resistor to the junction of diode resistors R203 and R204.

Adjust the primary of T113 (top) for maximum output on the meter.

Connect the "VoltOhmyst" to the junction of C183 and R203. Adjust T113 secondary (bottom). It will be found that it is possible to produce a positive or negative voltage on the meter dependent upon this adjustment. Obviously to pass from a positive to a negative voltage, the voltage must go through zero. T113 (bottom) should be adjusted so that the meter indicates zero output as the voltage swings from positive to negative. This point will be called discriminator zero output.

Connect the sweep oscillator to the grid of the second sound i-f amplifier.

Adjust the sweep band width to approximately 1 mc. with the center frequency at approximately 21.25 mc and with an output of approximately .1 volt.

Connect the oscilloscope to the junction of C183 and R203. The pattern obtained should be similar to that shown in Figure 12. If it is not, adjust the T113 (top) until the waveform is symmetrical.

The peak-to-peak band width of the discriminator should be approximately 350 kc. and it should be linear from 21.175 mc. to 21.325 mc.

SOUND I-F ALIGNMENT. — Connect the sweep oscillator to the first sound i-f amplifier grid.

Connect the oscilloscope to the second sound i-f grid return (terminal A T112) in series with a 33,000 ohm isolating resistor.

Insert a 21.25 mc. marker signal from the signal generator into the second sound i-f grid.

Adjust T112 (top and bottom) for maximum gain and symmetry about the 21.25 mc. marker. The pattern obtained should be similar to that shown in Figure 13.

The output level from the sweep should be set to produce approximately .3 volt peak-to-peak at the second sound i-f grid return when the final touches on the above adjustment are made. It is necessary that the sweep output voltage should not exceed the specified values otherwise the response curve will be broadened, permitting slight misadjustment to pass unnoticed and possibly causing distortion on weak signals.

The band width at 70% response from the first sound i-f grid to the second i-f grid should be approximately 200 kc.

PICTURE I-F TRAP ADJUSTMENT. — Connect the "VoltOhmyst" to the junction of R135 and C190.

Remove the 6SN7GT AGC Amplifier tube V107. Connect a 250,000 ohm potentiometer between pins 5 and 6 of the V107 socket. Adjust the potentiometer until the "VoltOhmyst" reads approximately −12 volts. Note: Use approximately −6.5 volts bias on sets in which the third pix i-f obtains bias at junction of R135 and C190.

Set the channel switch to the blank position between channel numbers 2 and 13.

Connect the "VoltOhmyst" across the picture detector load resistor R119. Under this condition, both leads of the meter are at approximately −120 volts. In making this measurement, care should be taken not to touch the case of the meter or to permit the meter case to become grounded.

Connect the output of the signal generator to the grid of the converter tube V2. To do this, remove the tube from the socket and fashion a clip by twisting one end of a small piece of wire around pin number 1. Replace the tube in the socket leaving the end of the wire protruding from under the tube. Connect the signal generator to this wire through a 1,500 mmf capacitor keeping the leads as short as possible.

Set the generator to each of the following frequencies and with a thin fiber screwdriver tune the specified adjustment for minimum indication on the "VoltOhmyst." In each instance the generator should be checked against a crystal calibrator to insure that the generator is exactly on frequency.

(1) 21.25 mc.—T103 (top)	(4) 27.25 mc.—T104 (top)
(2) 21.25 mc.—T105 (top)	(5) 19.75 mc.—T106 (top)
(3) 27.25 mc.—T102 (top)	(6) 19.75 mc.—T101 (top)

In the above transformers using threaded cores, it is possible to run the cores completely through the coils and secure two peaks or nulls. The correct position is with the cores in the outside ends of the coils. If the cores are not in the correct position, the coupling will be incorrect and it will be impossible to secure the correct response.

PICTURE I-F TRANSFORMER ADJUSTMENTS. — Set the signal generator to each of the following frequencies and peak the specified adjustment for maximum indication on the "VoltOhmyst." During alignment, reduce the input signal if necessary to prevent overloading.

22.5 mc.—T106 (bottom)
24.6 mc.—T104 (bottom)
22.0 mc.—T103 (bottom)
25.9 mc.—T102 (bottom)

T1 and T101 are coupled by a link and in combination constitute an overcoupled transformer. The characteristics of such a transformer are such that it is impossible to adjust it to a single frequency.

To sweep align T1 and T101 connect a 330 ohm composition resistor across the primary coils of T102, T103, T104 and T106.

Connect the "VoltOhmyst" to the junction of R135 and C190. Adjust the 250,000 ohm potentiometer for −2.0 volts on the meter.

Connect the oscilloscope to the plate of the first video amplifier, pin 1 of V106.

Connect a sweep generator to the converter grid through a 1,500 mmf capacitor. Set the generator to sweep from 20.0 mc. to 30.0 mc. and adjust the output to provide a 4 volt peak-to-peak signal on the scope.

Connect the signal generator loosely to the converter grid and adjust to provide markers at 22.05 mc. and 24.75 mc.

Adjust T1 (top) and T101 (bottom) to obtain the response shown in Figure 14. The T1 core must penetrate to the terminal board end of the coil in order to obtain the correct response.

Remove the 330 ohm resistors from across T102, T103, T104 and T106.

Adjust the 250,000 ohm potentiometer for a 15 volt peak-to-peak signal at the plate of the first video amplifier. The bias as measured by the "VoltOhmyst" should be −12 volts or −6.5 volts for earlier sets.

Observe and analyze the response curve obtained. The response will not be ideal and the i-f adjustments must be retouched in order to obtain the desired curve. See Figure 15.

On final adjustment the picture carrier marker must be at approximately 45% response. The curve must be approximately flat topped, with the 22.1 mc. marker at approximately 95% response, the 25.0 mc. marker below 90% and the 26.5 mc. marker at 5% to 10% on the response curve.

The most important consideration in making the i-f adjustments is to get the picture carrier at the 45% response point. If the picture carrier operates too low on the response curve, loss of low frequency video response, of picture brilliance, of blanking, and of sync may occur. If the picture carrier operates too high on the response curve, the picture becomes smeared. In making these adjustments, care should be taken that no two transformers are tuned to the same frequency as i-f oscillation may result.

Remove the converter tube and take off the clip to pin number 1. Replace the tube in the socket.

Picture I-F Oscillation. — If the receiver will operate without oscillating with the test equipment disconnected but breaks into oscillation or becomes unstable with the equipment connected, it may become necessary to establish a ground plane. Cover the test bench with a sheet of copper and set the chassis on the sheet. Set all the test equipment except the "VoltOhmyst" on the sheet and bond or bypass them to it. A Junior "VoltOhmyst" should not be bonded to the sheet since the negative test probe is not always connected to ground during alignment.

If the receiver is badly misaligned and two or more of the i-f transformers are tuned to the same frequency, the receiver may fall into i-f oscillation. I-F oscillation shows up as a voltage across the picture detector load resistor that is unaffected by r-f signal input. If such a condition is encountered, it is sometimes possible to stop oscillation by increasing the grid bias. If so, it should then be possible to align the transformers by the usual method. Once aligned in this manner, the i-f should be stable with reduced bias.

If the oscillation cannot be stopped in the above manner, shunt the grids of the first three pix i-f amplifiers to ground with 1,000 mmf. capacitors. Connect the signal generator to the fourth pix i-f grid and align T106 to frequency. Progressively remove the shunt from each grid and align the plate coil of that stage to frequency.

If this does not stop the oscillation, the difficulty is not due to i-f misalignment as the i-f section is stable when properly aligned. Check all i-f by-pass condensers, transformer shunting resistors, tubes, socket voltages, etc.

ANTENNA, R-F AND CONVERTER LINE ADJUSTMENT.— In order to align the r-f tuner, it will first be necessary to set the channel 13 oscillator to frequency. The shield over the bottom of the r-f unit must be in place when making any adjustments.

The channel 13 oscillator may be aligned by adjusting it to beat with a crystal calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available. Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated.

If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, couple the meter probe loosely to the receiver oscillator.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier signal, connect the signal generator to the receiver antenna terminals. Connect the "VoltOhmyst" to the sound discriminator output (junction of C183 and R203).

Set the receiver channel switch to 13.

Adjust the frequency standard to the correct frequency (237 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range while making the adjustment.

Adjust C6 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator.

Now that the channel 13 oscillator is set to frequency, we may procede with the r-f alignment.

Remove the first pix i-f amplifier tube V101.

Connect the oscilloscope to the test connection at R13 in the r-f tuning unit.

Connect the "VoltOhmyst" to the junction of R135 and C197. Adjust the bias potentiometer for −3.5 volts on the meter.

Connect the r-f sweep oscillator to the receiver antenna terminals. The method of connection depends upon the output impedance of the sweep. The P102 connection for 300 ohm balanced or 72 ohm single-ended input are shown in the circuit diagram in Figure 79. If the sweep oscillator has a 50 ohm single-ended output, 300 ohm balanced output can be obtained by connecting as shown in Figure 7.

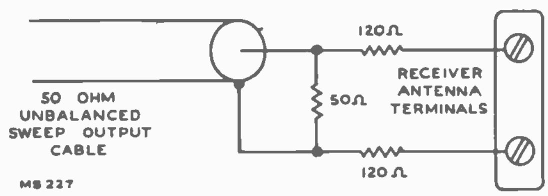


Figure 7—Unbalanced Sweep Cable Termination

Connect the signal generator loosely to the receiver antenna terminals.

Since channel 7 has the narrowest response of any of the high frequency channels, it should be adjusted first.

Set the receiver channel switch to channel 7.

Set the sweep oscillator to cover channel 7.

Insert markers of channel 7 picture carrier and sound carrier 175.25 mc. and 179.75 mc.

Adjust C10 and C14 until the curve falls symmetrically between the sound and picture carrier markers. Adjust C11 to give the proper bandwidth. Roughly peak L6 in conjunction with slight adjustments of C10 and C14 for a flat-topped, response curve with the sound and picture carriers at 90% to 95% response points on this curve. See Figure 16, channel 7.

Switch to channel 12 and adjust L6 for maximum response and minimum top slope of the curve.

Check the response of channels 7 through 13 by switching the receiver channel switch, sweep oscillator and marker oscillator to each of these channels and observe the response obtained. See Figure 16 for typical response curves. It should be found that all these channels have the proper shaped response with the markers above 80% response. If the markers do not fall within this requirement on one or more high frequency channels, since there are no individual channel adjustments, it will be necessary to readjust L6, C10, C11 and C14, and possibly compromise some channel slightly in order to get the markers up on other channels. Normally, however, no difficulty of this type should be experienced since the higher frequency channels become comparatively broad and the markers easily fall within the required range.

Channel 6 is next aligned in the same manner.

Set the receiver to channel 6.

Set the sweep oscillator to cover channel 6.

Set the marker oscillator to channel 6 picture and sound carrier frequencies.

Adjust L9, L13, L66 and C12, for an approximately flat-topped response curve located symmetrically between the markers. L9, L13 and L66 are the center frequency adjustments. C12 is the band width adjustment.

Check channels 5 down through channel 2 by switching the receiver, sweep oscillator and marker oscillator to each channel and observing the response obtained. In all cases, the markers should be above the 80% response point. If this is not the case, L9, L13, L66 and C12 should be retouched. On final adjustment, all channels must be within the 80% specification.

Disconnect the bias pot. and replace V107. Replace V101.

Following an r-f alignment, the oscillator alignment must be checked.

R-F OSCILLATOR LINE ADJUSTMENT. — The r-f oscillator line may be aligned by adjusting it to beat with a crystal calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available.

Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated. If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, the calibration frequency listed under R-F Osc. Freq. must be available.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier frequency, the frequencies listed under Sound Carrier Freq. must be available.

Channel Number	Receiver R-F Osc. Freq. Mc.	R-F Sound Carrier Freq. Mc.	Channel Oscillator Adjustment
2	81	59.75	L24
3	87	65.75	L23
4	93	71.75	L22
5	103	81.75	L21
6	109	87.75	L31
7	201	179.75	L19
8	207	185.75	L18
9	213	191.75	L17
10	219	197.75	L16
11	225	203.75	L15
12	231	209.75	L14
13	237	215.75	C6

If the heterodyne frequency meter method is used, couple the meter probe loosely to the receiver oscillator.

If the r-f sound carrier method is used, connect the "VoltOhmyst" to the sound discriminator output (junction of C183 and R203).

Connect the signal generator to the receiver antenna terminals. The order of alignment remains the same regardless of which method is used.

If the r-f unit is removed from the receiver for service and is aligned separately the shield over the bottom of the r-f unit must be in place when making adjustments.

Since lower frequencies are obtained by adding steps of inductance, it is necessary to align channel 13 first and continue in reverse numerical order.

Set the receiver channel switch to 13.

Adjust the frequency standard to the correct frequency (237 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range while making the adjustment.

Adjust C6 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator. Oscillator adjustments L1 and L2 shown on the schematic are factory control adjustments and should not be touched in the field.

Switch the receiver to channel 12.

Set the frequency standard to the proper frequency as listed in the alignment table.

Adjust L14 for indications as above.

Adjust the oscillator to frequency on all channels by switching the receiver and the frequency standard to each channel and adjusting the appropriate oscillator trimmer for the speci-

Continued on Page 13.

ALIGNMENT TABLE

THE DETAILED ALIGNMENT PROCEDURE BEGINNING ON PAGE 7 SHOULD BE READ BEFORE ALIGNMENT BY USE OF THE TABLE IS ATTEMPTED.

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
				DISCRIMINATOR AND SOUND I-F ALIGNMENT					
1	2nd sound i-f grid (pin 1, V117)	21.25 .1 volt output	Not used		Not used	In series with 1 meg. to junction of R203 & R204		Detune T113 (bot.) Adjust T113 (top) for max. on meter	Fig. 8 Fig. 9 Fig. 10
2	"	"	"		"	Junction of C183 & R203	Meter on 3 volt scale	T113 (bottom) for zero on meter	Fig. 9 Fig. 10
3	"	"	2nd sound i-f grid (pin 1, V117)	21.25 center 1 mc. wide .1 v. out	Junct. of C183 & R203	Not used	Check for symmetrical response waveform (positive & negative). If not equal adjust T113 (top) until they are equal		Fig. 10 Fig. 12
4	1st sound i-f grid (pin 1, V116)	21.25 reduced output	1st sound i-f grid	21.25 reduced output	Terminal A, T112 in series with a 33,000 ohm resistor.	"	Sweep output reduced to provide .3 volt p-to-p on scope	T112 (top & bot.) for max. gain and symmetry at 21.25 mc.	Fig. 8 Fig. 9 Fig. 10 Fig. 13
				PICTURE I-F AND TRAP ADJUSTMENT					
5	Not used		Not used		Not used	Junction of R135 & C190	Remove V107. Connect potentiometer between pins 5 & 6 of V107 socket	Adjust pot. for meter reading of −12 volts or −6.5 volts on early sets	Fig. 10
6	Converter grid (pin 1, V2)	21.25	"		"	Across R119	Meter on 3 volt scale. Receiver between 2 & 13	T103 (top) for min. on meter	Fig. 8
7	"	21.25	"		"	"	"	T105 (top) for min.	"
8	"	27.25	"		"	"	"	T102 (top) for min.	"
9	"	27.25	"		"	"	"	T104 (top) for min.	"
10	"	19.75	"		"	"	"	T106 (top) for min.	"
11	"	19.75	"		"	"	"	T101 (top) for min.	"
12	"	22.5	"		"	"	"	T106 (bottom) for max. on meter	Fig. 9
13	"	24.6	"		"	"	"	T104 (bottom) for max.	"
14	"	22.0	"		"	"	"	T103 (bottom) for max.	"
15	"	25.9	"		"	"	"	T102 (bottom) for max.	"
16	"	22.05 24.75	Converter grid (pin 1, V2)	Sweeping 20 to 30 mc.	Pin 1, V106	Junction of R135 & C190	Shunt 300 ohms across pri. T102, T103, T104, T106. Set bias −2 V. Set swp. gen. for 4 V. P-P on scope.	Adjust T1 (top) and T101 (bottom) for proper response	Fig. 8 Fig. 9 Fig. 14
17	"		"	"	"	"	Remove shunt resistors. Set bias to give 15 volts P to P on scope.	Adjust T1 (top), T101, T102, T103, T104, T106 (bot.) for proper resp.	Fig. 8 Fig. 9 Fig. 15
				ANTENNA, R-F AND CONVERTER LINE ALIGNMENT					
18	Antenna terminals	215.75	Not used		Not used	Junction of C183 & R203 for signal gen. method only	Fine tuning centered. Receiver on channel 13. Heterodyne meter coupled to oscillator if used.	C6 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10
19						Junction of R135 & C197	Remove V101	Potentiometer for −3.5 volts on meter	Fig. 8 Fig. 10
20	Antenna terminal (loosely)	175.25 & 179.75	Antenna terminals (see text for precaution)	Sweeping channel 7	Test Connection R13	Not used	Receiver on channel 7	L6, C10, C11 & C14 for flat top response between markers. Markers above 90%.	Fig. 8 Fig. 9 Fig. 16 (7)
21	"	205.25 209.75	"	channel 12	"	"	Receiver on channel 12	L6 for max. response and min. slope of top of curve	Fig. 8 Fig. 16 (12)
22	"	175.25 179.75	"	channel 7	"	"	Receiver on channel 7	Check to see that response is as above	Fig. 16 (7)
23	"	181.25 185.75	"	channel 8	"	"	Receiver on channel 8	"	Fig. 16 (8)
24	"	187.25 191.75	"	channel 9	"	"	Receiver on channel 9	"	Fig. 16 (9)
25	"	193.25 197.75	"	channel 10	"	"	Receiver on channel 10	"	Fig. 16 (10)

ALIGNMENT TABLE

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
				RF AND CONVERTER LINE ALIGNMENT (Cont'd)					
26	"	199.25 203.75	"	channel 11	"	"	Receiver on channel 11	"	Fig. 16 (11)
27	"	205.25 209.75	"	channel 12	"	"	Receiver on channel 12	"	Fig. 16 (12)
28	"	211.25 215.75	"	channel 13	"	"	Receiver on channel 13	"	Fig. 16 (13)
29	If the response on any channel (steps 22 through 28) is below 80% at either marker, switch to that channel and adjust L6, C10, C11 & C14 to pull response up on that channel. Then recheck steps 22 through 28.								
30	Antenna terminals (loosely)	83.25 87.75	Ant. terminals (see text for precaution)	Sweeping chan. 6	Test Connection R13	Not used	Receiver on channel 6	L9, L13, L66 & C12 for response as above	Fig. 16 (6)
31	"	77.25 81.75	"	channel 5	"	"	Receiver on channel 5	Check to see that response is as above	Fig. 16 (5)
32	"	67.25 71.75	"	channel 4	"	"	Receiver on channel 4	"	Fig. 16 (4)
33	"	61.25 65.75	"	channel 3	"	"	Receiver on channel 3	"	Fig. 16 (3)
34	"	55.25 59.75	"	channel 2	"	"	Receiver on channel 2	"	Fig. 16 (2)
35	If the response on any channel (steps 31 through 34) is below 80% at either marker, switch to that channel and adjust L9, L13, L66 & C12 to pull response up on that channel. Then recheck steps 30 through 34. Disconnect bias pot and replace V101 and V107.								

R-F OSCILLATOR ALIGNMENT

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
36	Antenna terminals	215.75	Loosely coupled to r-f osc.	237	Not used	Junction of C183 & R203 for sig. gen. method only	Fine tuning centered. Receiver on channel 13	C6 for zero on meter or beat on het. freq. meter	Fig. 10 Fig. 9 Fig. 8
37	"	209.75	"	231	"	"	Rec. on chan. 12	L14 as above	Fig. 11
38	"	203.75	"	225	"	"	Rec. on chan. 11	L15 as above	"
39	"	197.75	"	219	"	"	Rec. on chan. 10	L16 as above	"
40	"	191.75	"	213	"	"	Rec. on chan. 9	L17 as above	"
41	"	185.75	"	207	"	"	Rec. on chan. 8	L18 as above	"
42	"	179.75	"	201	"	"	Rec. on chan. 7	L19 as above	"
43	"	87.75	"	109	"	"	Rec. on chan. 6	L31 as above	Fig. 9
44	"	81.75	"	103	"	"	Rec. on chan. 5	L21 as above	Fig. 11
45	"	71.75	"	93	"	"	Rec. on chan. 4	L22 as above	"
46	"	65.75	"	87	"	"	Rec. on chan. 3	L23 as above	"
47	"	59.75	"	81	"	"	Rec. on chan. 2	L24 as above	"
48	Repeat steps 36 through 47 as a check.								
				AGC THRESHOLD ADJUSTMENT					
49	Not used		Not used		Pin 1, V106	Not used	Tune in station, turn pix control clockwise. Adjust R138 for max. gain without clipping sync on scope		Fig. 10 Fig. 17
				HORIZONTAL OSCILLATOR ADJUSTMENT					
50	Short circuit terminals C and D of T109. Tune in a station.								
51	Turn hold control fully clockwise. Adjust T109 Frequency Adjustment until horizontal blanking bar appears in the picture.								
52	Turn hold control ¼ turn from clockwise to sync picture. Adjust width (L115), linearity (L111) and drive (C153B) controls until picture is correct. Repeat step 51.								
53	Turn hold control fully counterclockwise. Momentarily remove signal. Turn hold control slowly clockwise. Note least number of bars before pull-in. Adjust Locking Range Control (C153A) for 7 to 9 bar pull-in.								
54	Remove clip from terminals C and D of T109. Turn hold control fully clockwise. Adjust T109 Oscillator Waveform Adjustment until horizontal blanking bar appears in picture.								
55	Connect low capacity probe of oscilloscope to terminal C of T109. Turn hold control ¼ turn from clockwise. Adjust T109 Oscillator Waveform Adjustment until broad and sharp peaks of wave on oscilloscope are same height. Keep picture in sync with hold control during adjustment. Remove oscilloscope.								
56	Turn hold control fully counterclockwise. Momentarily remove signal. Turn hold control slowly clockwise. Note least number of bars before pull-in. Adjust Locking Range Control (C153A) for 3 bar pull-in.								
57	Turn hold control fully clockwise. Adjust T109 Freq. Adjustment until horizontal blanking appears as single vertical or diagonal bar in pix.								
				4.5 MC VIDEO TRAP ADJUSTMENT					
58	Tune in a strong station. Short the trap winding of T103. If a 4.5 mc beat appears in picture adjust L110 until beat is eliminated.								
				SENSITIVITY CHECK					
59	Connect antenna to receiver through attenuator pad to provide weak signal. Compare the picture and sound obtained to that obtained on other receivers under the same conditions.								

ALIGNMENT DATA

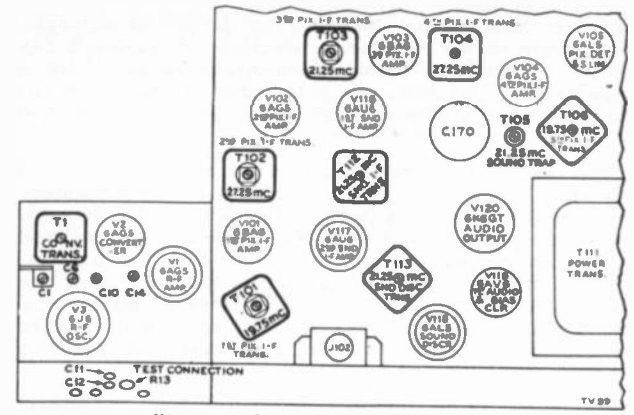


Figure 8—Top Chassis Adjustments

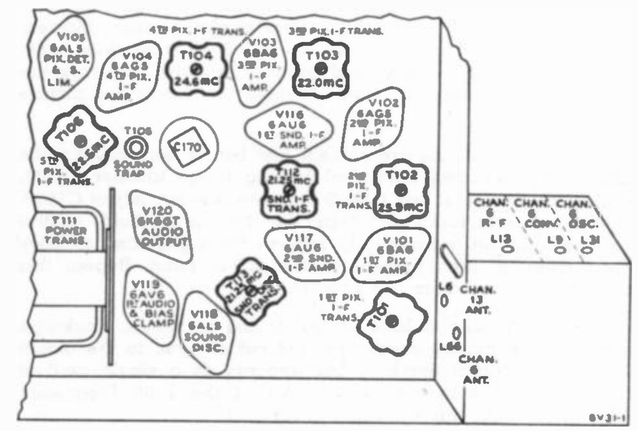


Figure 9—Bottom Chassis Adjustments

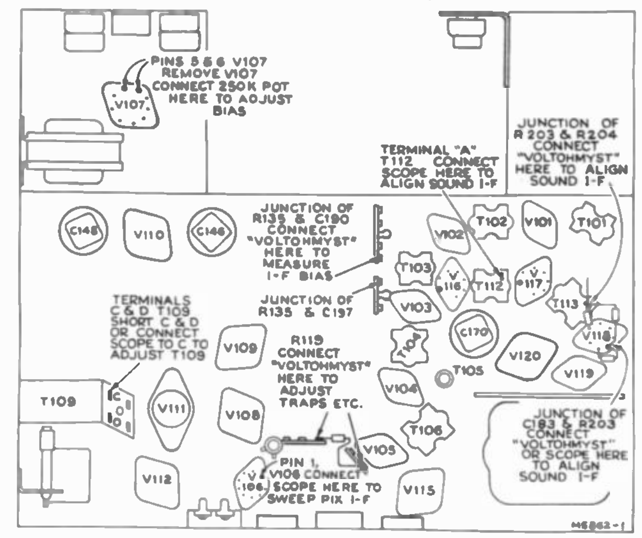
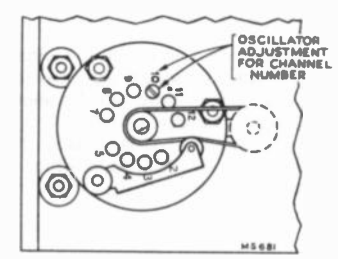


Figure 10—Test Connection Points



OSCILLATOR ADJUSTMENT FOR CHANNEL 13 IS ON TOP OF R-F UNIT AND CHANNEL 6 IS ON SIDE.

Figure 11—R-F Oscillator Adjustments

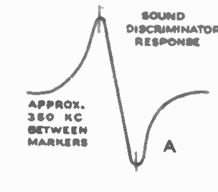


Figure 12 Discriminator Response

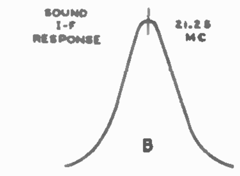


Figure 13 Sound I-F Response

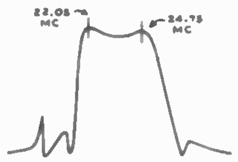


Figure 14 T1 and T101 Response

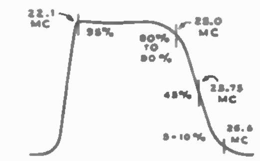


Figure 15 Overall I-F R-F Response

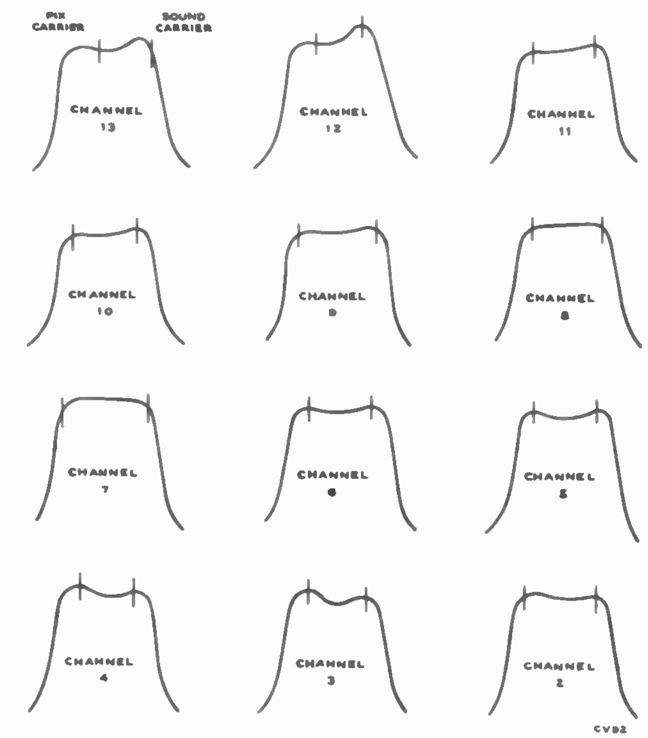


Figure 16—R-F Response

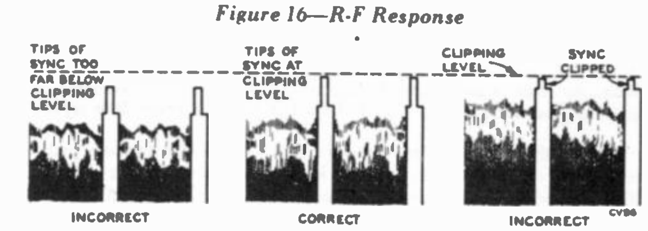


Figure 17—AGC Threshold Adjustment Waveforms

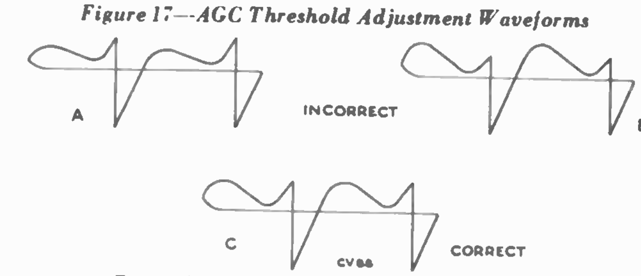


Figure 18—Horizontal Oscillator Waveforms

Continued from Page 9

fied indication. It should be possible to adjust the oscillator to the correct frequency on all channels with the fine tuning control in the middle third of its range.

After the oscillator has been set on all channels, start back at channel 13 and recheck to make sure that all adjustments are correct.

AGC THRESHOLD ADJUSTMENT. — The AGC threshold adjustment can be made by the method outlined in the Installation Instructions. However, a more accurate adjustment can be obtained by the use of an oscilloscope.

Tune in a station and advance the picture control to the maximum clockwise position. Connect the low capacity probe from the oscilloscope to the plate of the first video amplifier. Adjust the oscilloscope to observe the vertical sync pulse.

Turn the AGC threshold control R138 fully clockwise, then slowly counterclockwise. As the control is turned counterclockwise, the receiver gain will increase slowly, increasing the size of the pattern on the oscilloscope. R138 should be turned counterclockwise until the receiver begins to overload as indicated by clipping of the sync. The control should be left in the maximum gain position in which no clipping of sync is observed. See Figure 17 for proper waveforms.

HORIZONTAL OSCILLATOR ADJUSTMENT. — Normally the adjustment of the horizontal oscillator is not considered to be a part of the alignment procedure, but since the oscillator waveform adjustment requires the use of an oscilloscope, it can not be done conveniently in the field. The waveform adjustment is made at the factory and normally should not require readjustment in the field. However, the waveform adjustment should be checked whenever the receiver is aligned or whenever the horizontal oscillator operation is improper.

Horizontal Frequency Adjustment. — With a clip lead, short circuit the coil between terminals C and D of the horizontal oscillator transformer T109. Tune in a television station and sync the picture if possible.

A.—Turn the horizontal hold control R173 to the extreme clockwise position. Adjust the T109 Frequency Adjustment (under the chassis) so that the picture is just out of sync and the horizontal blanking appears in the picture as a vertical bar. The position of the bar is unimportant.

B.—Turn the hold control approximately one quarter of a turn from the extreme clockwise position and examine the width and linearity of the picture. If picture width or linearity is incorrect, adjust the horizontal drive conrtol C153B, the width control L115 and the linearity control L111 until the picture is correct. If C153B, L115 or L111 were adjusted, repeat step A above.

Horizontal Locking Range Adjustment. — Turn the horizontal hold control fully counterclockwise. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 9 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 7 bars are present, adjust C153A slightly counterclockwise. Turn the horizontal hold control counterclockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 7 to 9 bars are present.

Horizontal Oscillator Waveform Adjustment. — Remove the shorting clip from terminals C and D of T109. Turn the horizontal hold control to the extreme clockwise position. With a thin fibre screwdriver, adjust the Oscillator Waveform Adjustment Core of T109 (on the outside of the chassis) until the horizontal blanking bar appears in the raster.

A.—Connect the low capacity probe of an oscilloscope to terminal C of T109. Turn the horizontal hold control one quarter turn from the clockwise position so that the picture is in sync. The pattern on the oscilloscope should be as shown in Figure 18. Adjust the Oscillator Waveform Adjustment Core of T109 until the two peaks are at the same height. During this adjustment, the picture must be kept in sync by readjusting the hold control if necessary.

This adjustment is very important for correct operation of the circuit. If the broad peak of the wave on the oscilloscope is lower than the sharp peak, the noise immunity becomes poorer, the stabilizing effect of the tuned circuit is reduced and drift of the oscillator becomes more serious. On the other hand, if the broad peak is higher than the sharp peak, the oscillator is overstabilized, the pull-in range becomes inadequate and the broad peak can cause double triggering of the oscillator when the hold control approaches the clockwise position.

Remove the oscilloscope upon completion of this adjustment.

Check of Horizontal Oscillator Adjustments. — Set the horizontal hold control to the full counterclockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counterclockwise. Turn the horizontal hold control counterclockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 3 bars are present.

Turn the horizontal hold control to the maximum clockwise position. The picture should be just out of sync to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Adjust the T109 Frequency Adjustment until this condition is fulfilled.

4.5 MC. VIDEO TRAP ADJUSTMENT. — Tune in a strong input from a station, and with a very short clip lead, short the trap winding of T103. Observe the picture for the appearance of a 4.5 mc. beat. If the beat appears in the picture, adjust L110 until the beat is eliminated or minimized.

SENSITIVITY CHECK. — A comparative sensitivity check can be made by operating the receiver on a weak signal from a television station and comparing the picture and sound obtained to that obtained on other receivers under the same conditions.

This weak signal can be obtained by connecting the shop antenna to the receiver through a ladder type attenuator pad. The number of stages in the pad depends upon the signal strength available at the antenna. A sufficient number of stages should be inserted so that a somewhat less than normal contrast picture is obtained when the picture control is at the maximum clockwise position. Only carbon type resistors should be used to construct the pad.

RESPONSE CURVES. — The response curves shown on page 15 and referred to throughout the alignment procedure were taken from a production set. Although these curves are typical, some variations can be expected.

The response curves are shown in the classical manner of presentation, that is with "response up" and low frequency to the left. The manner in which they will be seen in a given test set-up will depend upon the characteristics of the oscilloscope and the sweep generator. The curves may be seen inverted and/or switched from left to right depending on the deflection polarity of the oscilloscope and the phasing of the sweep generator.

ALIGNMENT TABLE. — Both methods of oscillator alignment are presented in the alignment table. The service tecnnician may thereby choose the method to suit his test equipment.

TEST PATTERN PHOTOGRAPHS

Figure 19—Normal Picture

Figure 20—Focus Coil and Ion Trap Magnet Misadjusted

Figure 21—Horizontal Linearity Control Misadjusted (Picture Cramped in Middle)

Figure 22—Width Control Misadjusted

Figure 23—Horizontal Drive Control Misadjusted

Figure 24—Transients

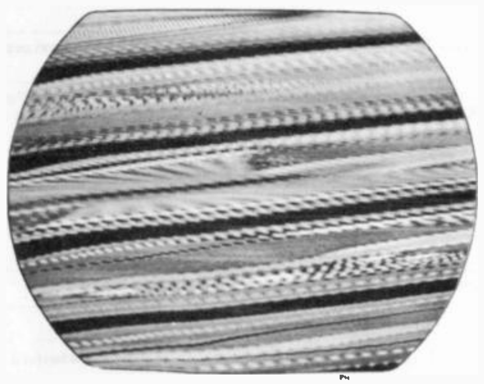


Figure 25—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is in a Counter-clockwise Position—Just Before Pulling Into Sync

Figure 26—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is at the Maximum Clockwise Position

PICTURE I-F RESPONSE.—At times it may be desirable to observe the individual i-f stage response. This can be achieved by the following method:

Shunt all i-f transformers and coils with a 330-ohm carbon resistor except the one whose response is to be observed.

Connect a wide band sweep generator to the converter grid and adjust it to sweep from 18 mc. to 30 mc.

Connect the oscilloscope across the picture detector load resistor and observe the overall response. The response obtained will be essentially that of the unshunted stage. The effects of the various traps are also visible on the stage response.

Figures 27 through 31 show the responses of the various stages obtained in the above manner. The curves shown are typical although some variation between receivers can be expected. Relative stage gain is not shown.

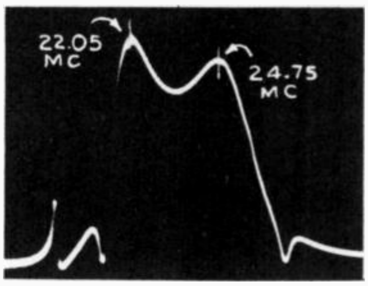


Figure 27—Response of Converter and First Pix I-F Transformer

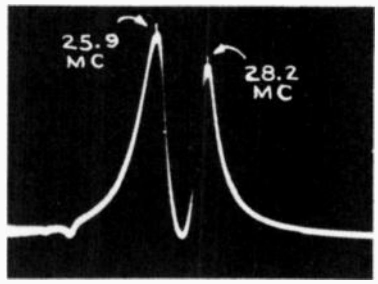


Figure 28—Response of Second Pix I-F Transformer

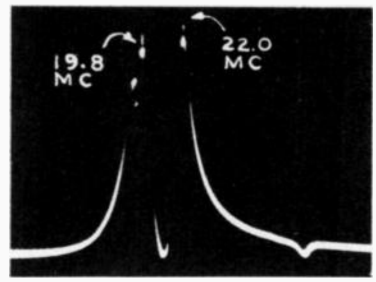


Figure 29—Response of Third Pix I-F Transformer

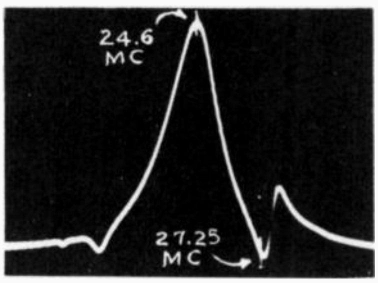


Figure 30—Response of Fourth Pix I-F Transformer

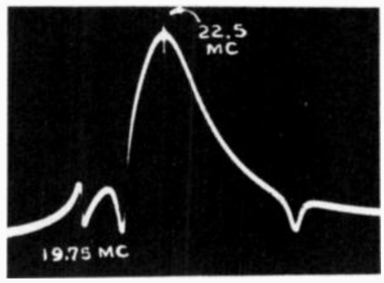


Figure 31—Response of Fifth Pix I-F Transformer

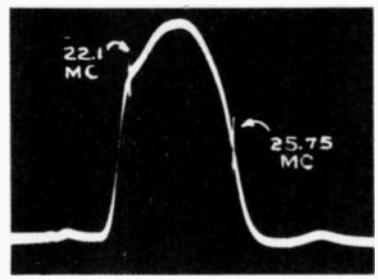


Figure 32—Response from First Pix I-F grid to Pix Det.

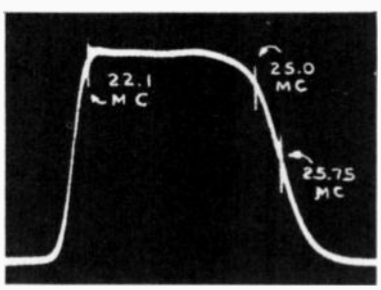


Figure 33—Overall Pix I-F Response

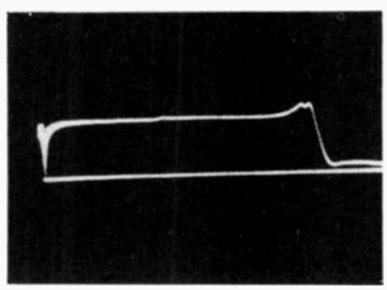


Figure 34—Video Response at Average Contrast

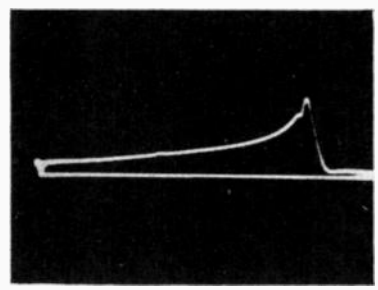
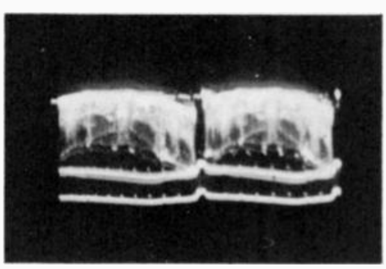


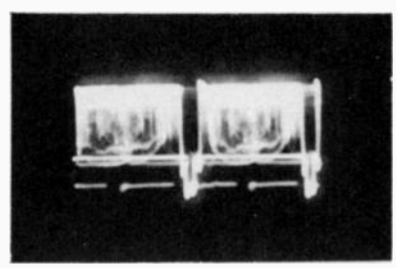
Figure 35—Video Response at Minimum Contrast

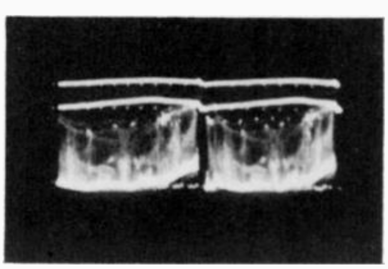


Video Signal Input to 1st Video Amplifier (Pin 2 of V106) (12AU7)

Figure 36—Vertical (Oscilloscope Synced to ½ of Vertical Sweep Rate) (5.4 Volts PP)

Figure 37—Horizontal (Oscilloscope Synced to ½ of Horizontal Sweep Rate) (5.4 Volts PP)

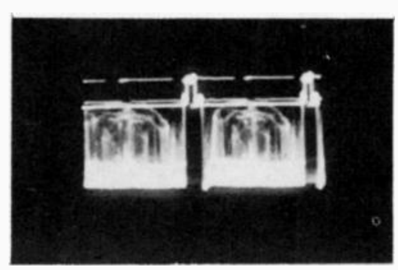




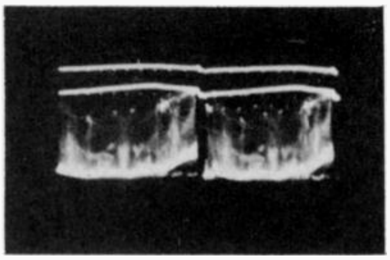
Sync Feed (Junction of L110, R219 and C194)

Figure 38—Vertical (28 Volts PP)

Figure 39—Horizontal (28 Volts PP)



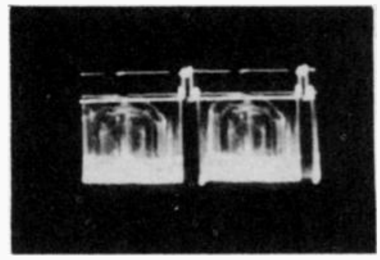
WAVEFORM PHOTOGRAPHS

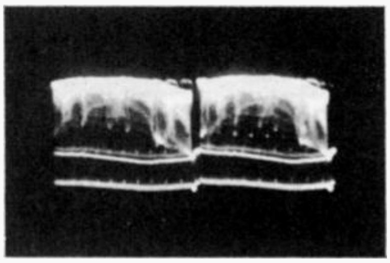


Input to 2nd Video Amplifier (Pin 7 of V106) (12AU7)

Figure 40—Vertical (17 Volts PP)

Figure 41—Horizontal (17 Volts PP)

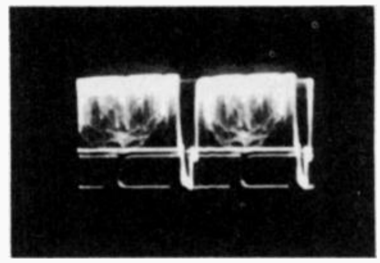


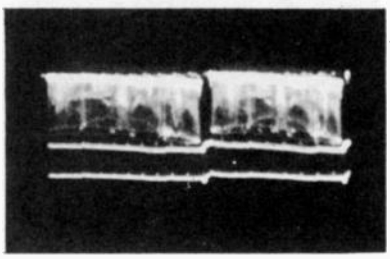


Output of 2nd Video Amplifier (Junction of L105 and R127) (Picture Max.)

Figure 42—Vertical (96 Volts PP)

Figure 43—Horizontal (96 Volts PP)

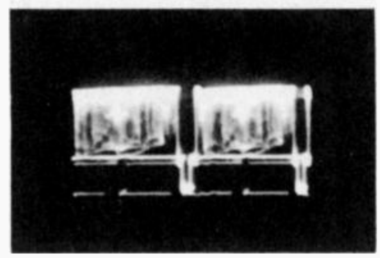


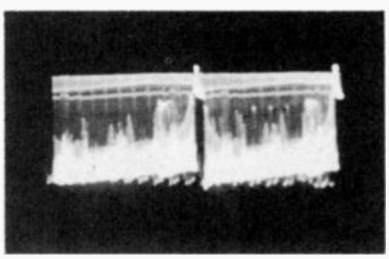


Input to Kinescope (Junction of R127 and R128) (Picture Max.)

Figure 44—Vertical (65 Volts PP)

Figure 45—Horizontal (65 Volts PP)

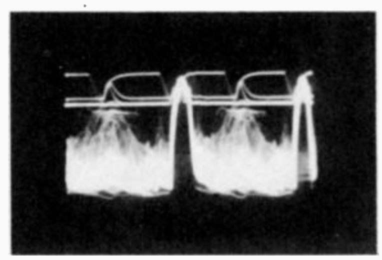


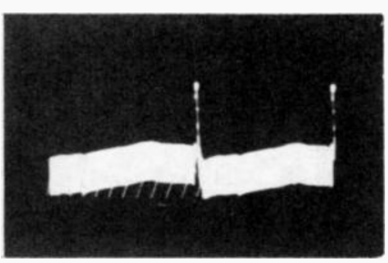


Input to 1st Sync Separator (Pin 1 of V108) (6SN7GT)

Figure 46—Vertical (23 Volts PP)

Figure 47—Horizontal (23 Volts PP)

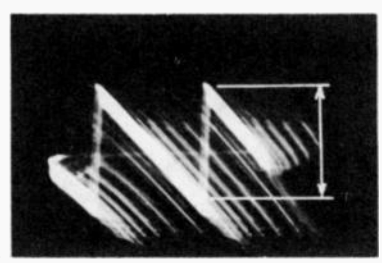


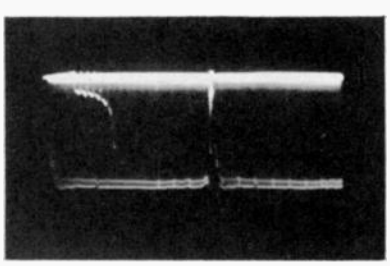


AGC Rectifier Cathode (Pin 6 of V108) (6SN7GT)

Figure 48—Vertical (4.7 Volts PP)

Figure 49—Horizontal (1.5 Volts PP)

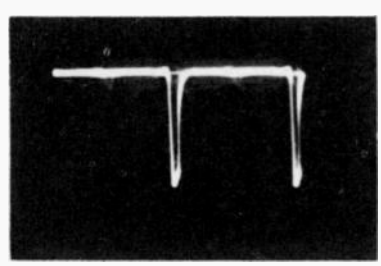




Output of 1st Sync Separator (Pin 5 of V108) (6SN7GT)

Figure 50—Vertical (24 Volts PP)

Figure 51—Horizontal (24 Volts PP)



WAVEFORM PHOTOGRAPHS

Output of 1st Sync Separator (Pin 2 of V108) (6SN7GT)

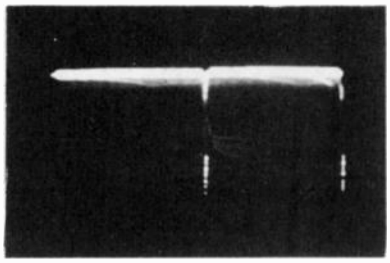


Figure 52—Vertical (26 Volts PP)

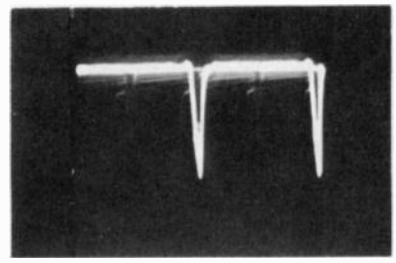


Figure 53—Horizontal (25.5 Volts PP)

Input to Sync Amplifier (Junction of C137, C139 and R145)

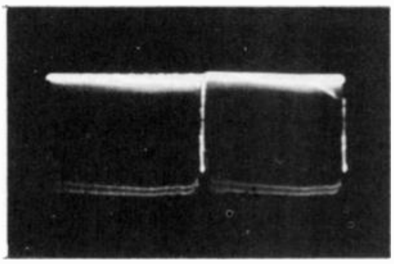


Figure 54—Vertical (21 Volts PP)

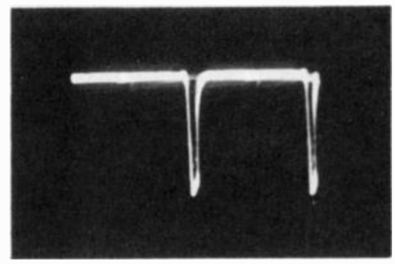


Figure 55—Horizontal (21 Volts PP)

Output of Sync Amplifier (Pin 2 of V109) (6SN7GT)

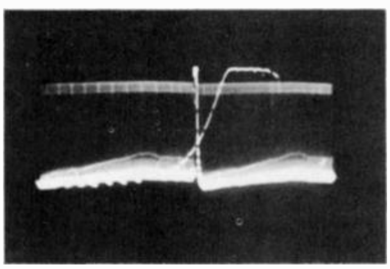


Figure 56—Vertical (115 Volts PP)

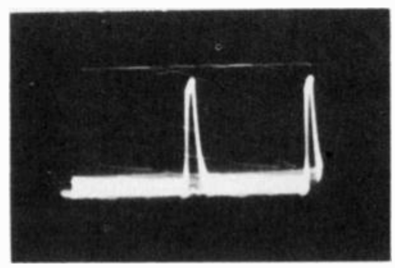


Figure 57—Horizontal (105 Volts PP)

Cathode of 2nd Sync Separator (Pin 6 of V109) (6SN7GT)

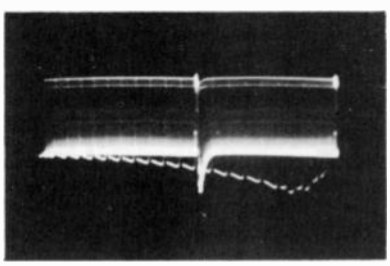


Figure 58—Vertical (17 Volts PP)

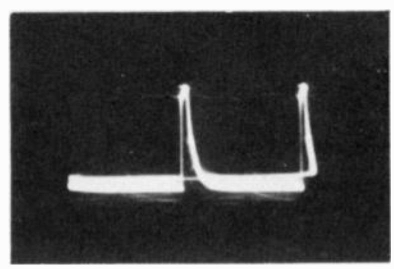


Figure 59—Horizontal (11 Volts PP)

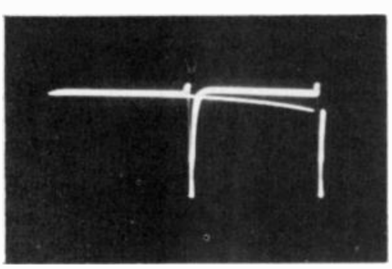


Figure 60—Output of Integrating Network (Junction of C144, C145 and R153) (45 Volts PP)

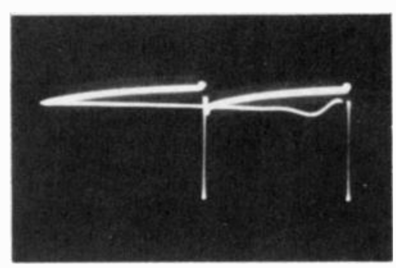


Figure 61—Grid of Vertical Oscillator (720 Volts PP) (Pin 1 of V107) (6SN7GT)

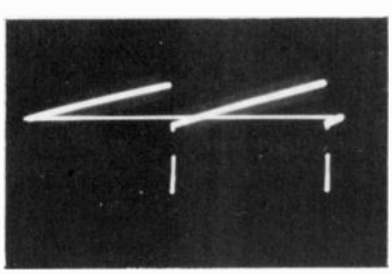


Figure 62—Grid of Vertical Output (160 Volts PP) (Pin 5 of V110) (6K6GT)

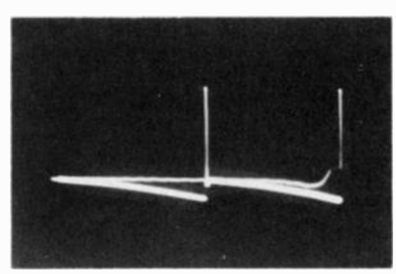


Figure 63—Plate of Vertical Output (750 Volts PP) (Pin 3 of V110) (6K6GT)

WAVEFORM PHOTOGRAPHS

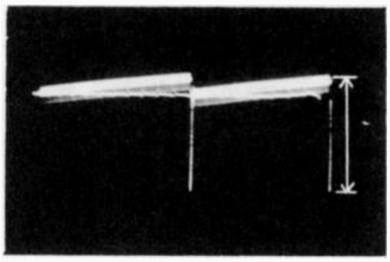


Figure 64—Input of Vertical Deflection Coils (75 Volts PP) (Junction of Green Lead of T108 and Green Lead of Yoke)

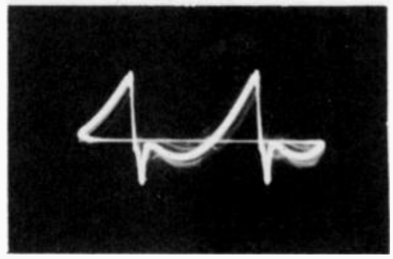


Figure 65—Input to Horizontal Oscillator (17.5 Volts PP) (Junction of C153A and C154)

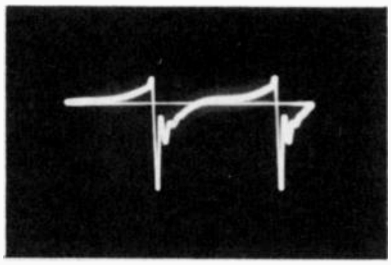


Figure 66—Junction of R168, R176 and R178 (150 Volts PP)

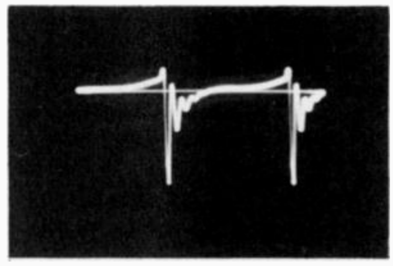


Figure 67—Grid of Horizontal Oscillator (480 Volts PP) (Pin 4 of V111) (6SN7GT)

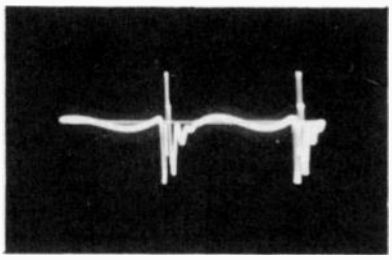


Figure 68—Plate of Horizontal Oscillator (270 Volts PP) (Pin 5 of V111) (6SN7GT)

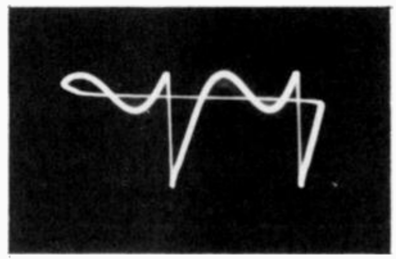


Figure 69—Terminal "C" of T109 (70 Volts PP)

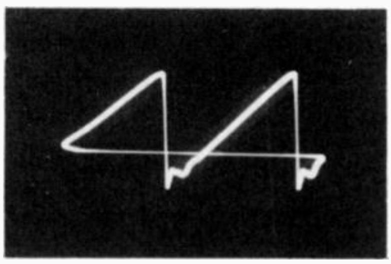


Figure 70—Input to Horizontal Output Tube (42 Volts PP) (Junction of C160, R183 and C153B)

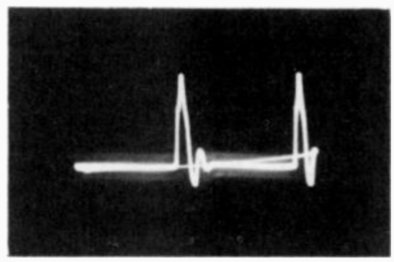


Figure 71—Plate of Horizontal Output (Approx. 6,000 Volts PP) (Measured Through a Capacity Voltage Divider Connected from Top Cap of V112 to Ground)

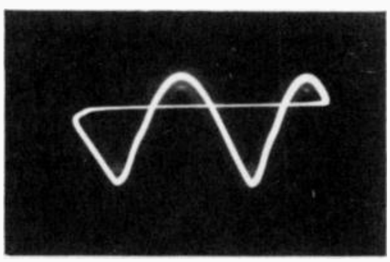


Figure 72—Junction of C167, L115 and Terminal 1 of T110 (165 Volts PP)

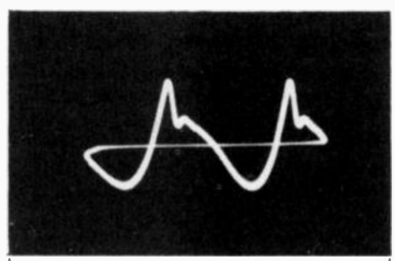


Figure 73—Plate of Damper (125 Volts PP) (Pin 5 of V114) (6W4GT)

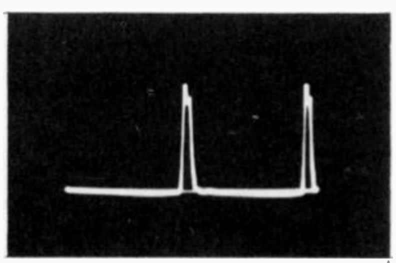


Figure 74—Input across Horizontal Deflection Coils (1,150 Volts PP)

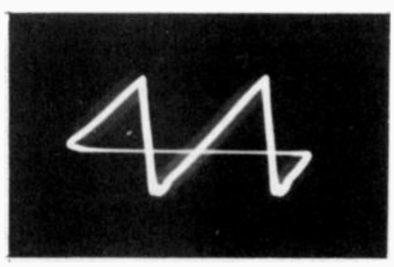


Figure 75—Horizontal Deflection Coil Current (0.6 amp. PP) Measured by Inserting a 5-ohm Resistor in Series with the Horizontal Deflection Coil and the Voltage across the Resistor Observed.

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition, a 2200 microvolt test pattern signal was fed into the receiver, the picture synced and the AGC threshold control properly adjusted. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles, a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6AG5	R-F Amplifier	2200 Mu.V. Signal	5	140	6	142	2 & 7	0	1	−4.2	.72	.33	
			No Signal	5	67	6	111	2 & 7	0	1	−.5	14.0	5.0	
V2	6AG5	Converter	2200 Mu.V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*−3.0 to −7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*104 to 109	6	*104 to 109	2 & 7	0	1	*−2.0 to −6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu.V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*−5.1 to −7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*−4.5 to −6.6	*1.8 to 2.1	—	
V101	6BA6	1st Pix. I-F Amplifier	2200 Mu.V. Signal	5	125	6	125	7	.4	1	−11.0	1.9	0.8	
			No Signal	5	95	6	95	7	1.1	1	0.0	7.5	3.5	
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu.V. Signal	5	115	6	115	2 & 7	.75	1	0	8.2	2.5	
			No Signal	5	100	6	100	2 & 7	.65	1	0	6.8	2.1	
V103	6BA6	3d Pix. I-F Amplifier	2200 Mu.V. Signal	5	110	6	135	7	.25	1	−4.2	4.0	3.8	
			No Signal	5	60	6	100	7	.75	1	−.5	11.0	4.8	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu.V. Signal	5	170	6	135	2 & 7	1.35	1	0	6.5	2.0	
			No Signal	5	175	6	120	2 & 7	1.2	1	0	5.9	1.8	
V105 A	6AL5	Picture 2d Det.	2200 Mu.V. Signal	7	−113	—	—	1	−112	—	—	.48	—	
			No Signal	7	−120	—	—	1	−120	—	—	—	—	
V105 B	6AL5	Sync Limiter	2200 Mu.V. Signal	2	−107	—	—	5	−56	—	—	—	—	
			No Signal	2	−80	—	—	5	−60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu.V. Signal	1	−23.2	—	—	3	−111	2	−113	4.38	—	
			No Signal	1	−19.2	—	—	3	−117	2	−120	3.82	—	
V106	12AU7	2d Video Amplifier	2200 Mu.V. Signal	6	*166	—	—	8	*−5.3	7	*−12.2	6.2	—	*At average contrast
			No Signal	6	*134	—	—	8	*−5.6	7	*−10.3	6.9	—	
V107 A	6SN7 GT	AGC Amplifier	2200 Mu.V. Signal	5	−11.0	—	—	6	−55.5	4	−56.5	.9	—	
			No Signal	5	0.0	—	—	6	−60	4	−64	.3	—	
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu.V. Signal	2	76	—	—	3	−111	1	−158	.2	—	
			No Signal	2	62	—	—	3	−120	1	−169	.2	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu.V. Signal	5	97	—	—	6	−3.4	4	−19.3	.3	—	
			No Signal	5	81	—	—	6	−8.7	4	−19.2	.28	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V108	6SN7 GT	1st Sync Separator	2200 Mu.V. Signal	2	96	—	—	3	−1.8	1	−19.5	.1	—	
			No Signal	2	.81	—	—	3	−9.7	1	−19.3	.1	—	
V109	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	158	—	—	3	0	1	−4.7	5.25	—	
			No Signal	2	154	—	—	3	0	1	−5.2	3.75	—	
V109	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	230	—	—	6	−51	4	−106	4	—	
			No Signal	5	215	—	—	6	−59	4	−80	35	—	
V110	6K6-GT	Vertical Output	2200 Mu. V. Signal	3	223	4	223	8	−67	5	−91		*7.85	*Screen connected to plate
			No Signal	3	208	4	208	8	−79	5	−101		*7.7	
V111	6SN7 GT	Horizontal Osc. Cont.	2200 Mu. V. Signal	2	*48	—	—	3	−110	1	−92	2	—	*Variation of hold gives −21.9 to +56 volts on plate
			No Signal	2	*33	—	—	3	−120	1	−108	2	—	
V111	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	70	—	—	6	−111	4	−185	2.4	—	
			No Signal	5	54	—	—	6	−120	4	−192	2.4	—	
V112	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	*	8	180	3	−90	5	−110	72	9.4	*6000 volt pulse present
			No Signal	Cap	Do Not Meas.	8	170	3	−100	5	−115	70	9.2	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	10200	—	—	0	—	*9700 volt pulse present
			Brightness Average	Cap	Do Not Meas.	—	—	2 & 7	9700	—	—	1	—	
V114	6W4GT	Damper	2200 Mu. V. Signal	5	*	—	—	3	300	—	—	66	—	*1200 volt pulse present
			No Signal	5	Do Not Meas.	—	—	3	295	—	—	65	—	
V115	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	*335	—	—	2 & 8	250	—	—	210	—	*A-C measured from plate to trans. center tap
			No Signal	4 & 6	*335	—	—	2 & 8	245	—	—	215	—	
V116	6AU6	1st Sound I-F Amp.	2200 Mu. V. Signal	5	134	6	134	7	9	1	0	8.2	3.3	
			No Signal	5	110	6	110	7	7	1	0	5.7	2.6	
V117	6AU6	2nd Sound I-F Amp.	2200 Mu. V. Signal	5	148	6	90	7	0	1	−9	1.6	8	
			No Signal	5	115	6	60	7	0	1	−65	3.35	1.15	
V118	6AL5	Sound Discrim.	2200 Mu. V. Signal	2 7	−8.4 −3.7	—	—	5 1	5.8 0	—	—	—	—	
			No Signal	2 7	−2.0 −1.08	—	—	5 1	41 0	—	—	—	—	
V119	6AV6	1st Audio Amplifier	2200 Mu. V. Signal	7	85	—	—	2	0	1	−89	.49	—	
			No Signal	7	83	—	—	2	0	1	−89	.4	—	
V120	6K6-GT	Audio Output	2200 Mu. V. Signal	3	102	4	113	8	−99	5	−108	19.3	3.3	
			No Signal	3	72	4	80	8	−111	5	−120	18	3	
V121	12LP4	Kinescope	2200 Mu. V. Signal	Cap	*9000	10	290	11	51	2	20	.1	—	*Average Brightness
			No Signal	Cap	—	10	285	11	42	2	14	—	—	

T120, T121 R-F UNIT WIRING DIAGRAM

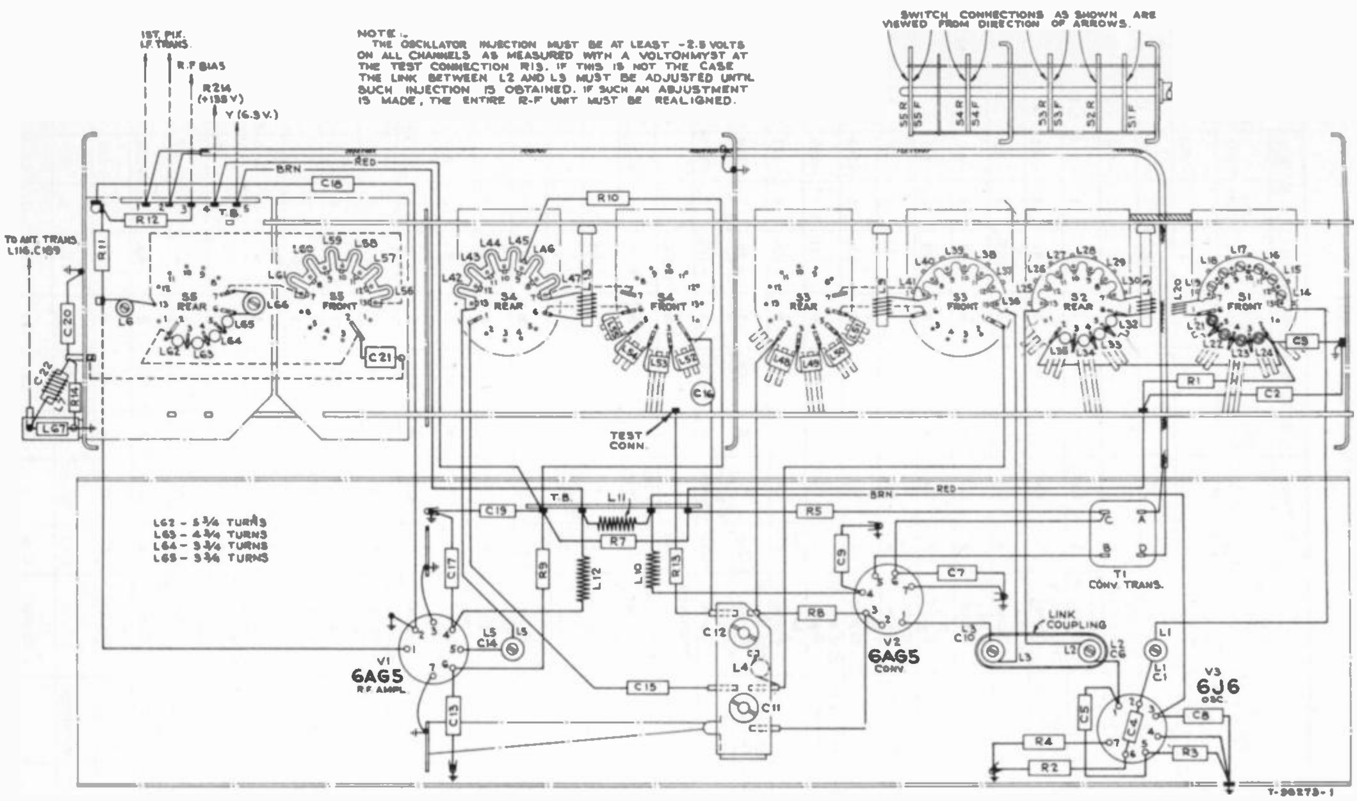


Figure 76—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V117, V118 and V119 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.
4. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
5. Leads to L102 and L103 must be as short as possible.
6. Dress peaking coils L105, L106 and L107 up and away from the chassis.
7. Dress C183 across tube pins 5 and 6 with leads not exceeding ⅜ inch.
8. Dress C129 and C130 up and away from the chassis.
9. Dress the yellow lead from the picture control away from the chassis and away from the volume-control leads. Dress the yellow lead from pin 8 of V106 away from the chassis.
10. Dress the green lead from pin 2 of V106 away from the chassis.
11. Dress R168, R169, R170, R176 and R178 up and away from the chassis.
12. The leads to the volume control should be dressed down against the chassis and away from V117 and V118.
13. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
14. Dress leads from L115 (width control coil) away from the transformer frame.
15. Dress T110 winding leads as shown in Figure 77.

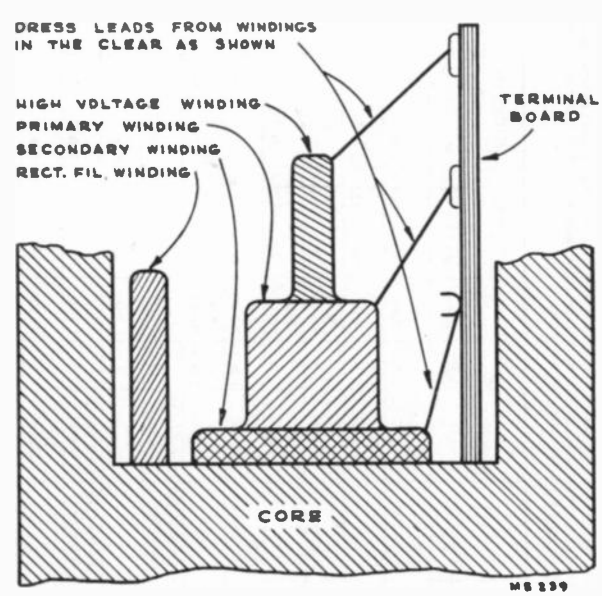
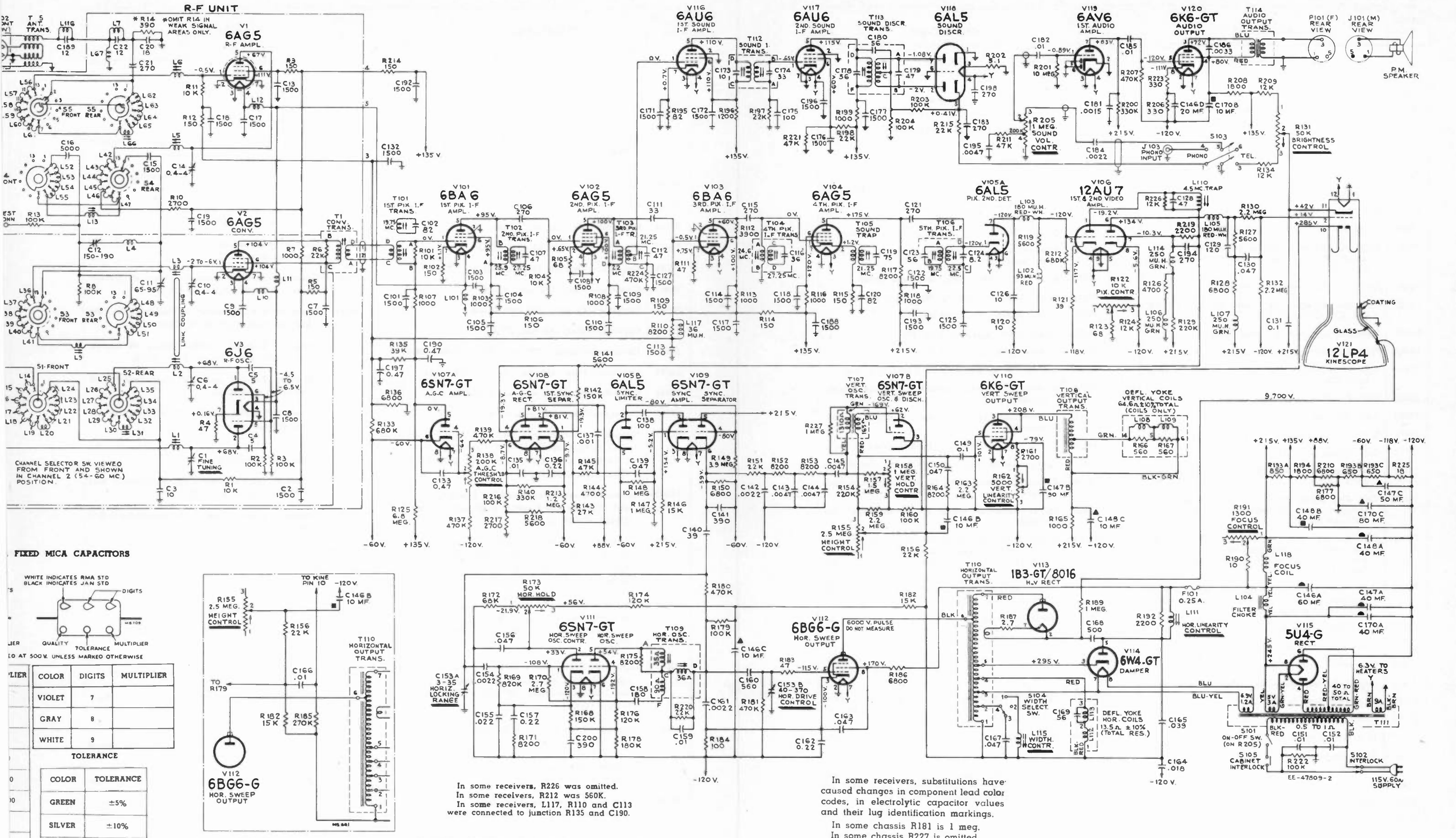


Figure 77—T110 Lead Dress



FIXED MICA CAPACITORS

WHITE INDICATES RMA STD
BLACK INDICATES JAN STD

DIGITS — QUALITY — TOLERANCE — MULTIPLIER

…ED AT 500V. UNLESS MARKED OTHERWISE

…LIER	COLOR	DIGITS	MULTIPLIER
	VIOLET	7	
	GRAY	8	
	WHITE	9	

TOLERANCE

	COLOR	TOLERANCE
0	GREEN	±5%
0	SILVER	±10%
	BLACK	±20%

In some receivers, R226 was omitted.
In some receivers, R212 was 560K.
In some receivers, L117, R110 and C113 were connected to junction R135 and C190.

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

In some chassis R181 is 1 meg.
In some chassis R227 is omitted.

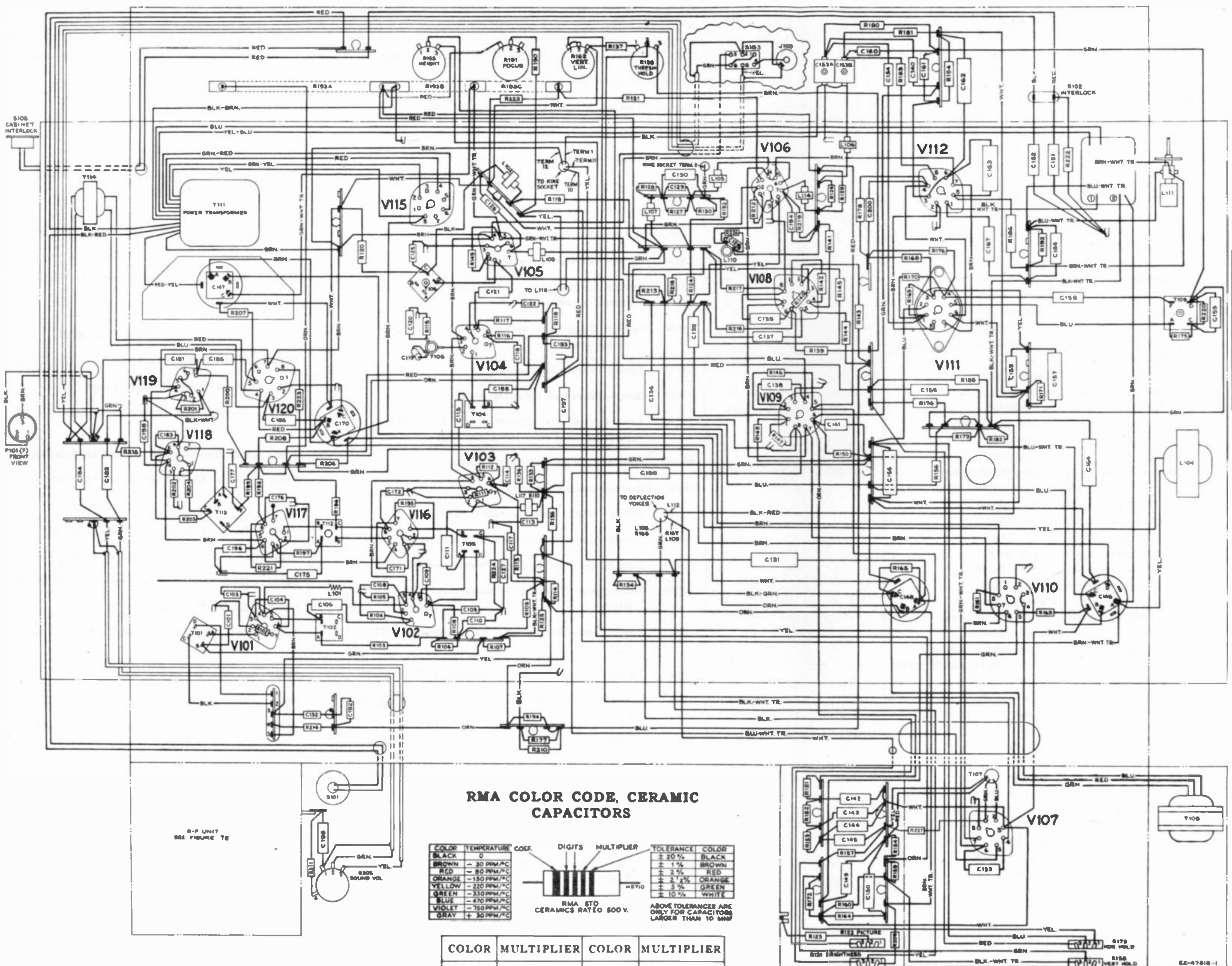
The deflection circuits must be connected as shown above for powdered iron core yokes. See partial schematic insert for iron wire wrap yokes.

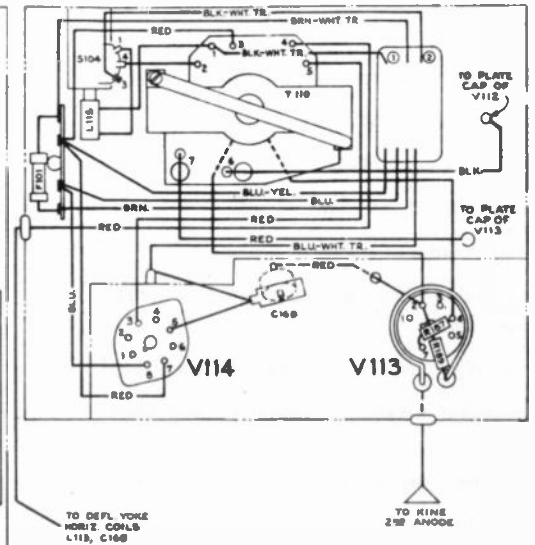
All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

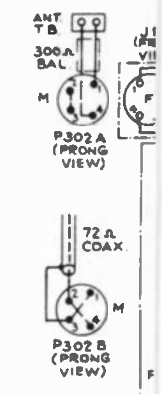
Figure 79—Circuit Schematic Diagram

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES
	KRK 5
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission cable (W1)
73441	Cam—Fine tuning adjustment
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 500 mmf. (C18)
73480	Coil—R-F plate coil for channel 8 (L13)
73461	Coil—Rear section—Oscillator plate coil for channel 8 (L20)
73462	Coil—Coupling inductance coil (L4)
73475	Coil—Antenna filter shunt coil (C67)
73476	Coil—I-F trap (L7, C22)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Front section—Oscillator plate coil for channel 6 (L31)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (plunger adjustment) (L1, C1)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment for oscillator section or converter section) (L2, L3, C6, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f amplifier section (L5, C14)
73455	Core—Sliding core for fine tuning control trimmer
74187	Core—Adjustable core for coil L9
71493	Connector—Oscillator segment connector
73440	Detent—R-F unit detent mechanism and fibre shaft
71487	Form—Coil form for coil L31
73453	Form—Coil form assembly for L9, L13
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to converter trimmer loop connector
73834	Nut—Speed nut for drive belt shield
73436	Plate—Front plate and bushing
73484	Pulley—Idler pulley
	Resistor—Fixed, composition:—
	47 ohms, ±20%, ½ watt (R4)
	150 ohms, ±20%, ½ watt (R5, R9, R12)
	390 ohms, ±10%, ½ watt (R14)
	1000 ohms, ±20%, ½ watt (R7)
	2700 ohms, ±10%, ½ watt (R10)
	10,000 ohms, ±20%, ½ watt (R1, R11)
	100,000 ohms, ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring
30340	Retainer—Retainer ring for fine tuning stud
70881	Screw—#4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
73640	Screw—#4-40 x ⅜" adjusting screw for L66
71475	Screw—#4-40 x 15/32" adjusting screw for coils L21, L22, L23, L24
74575	Screw—#4-40 x 17/32" adjusting screw for L6
73437	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
73439	Shaft—Actuating shaft for fine tuning control
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt
73632	Shield—Metal tube shield for V1
75443	Shield—"U" shape shield for bottom of r-f unit
71494	Socket—Tube socket, moulded, 7 prong, saddle mounted
73450	Socket—Tube socket, ceramic, 7 prong, bottom mounted
74576	Spacer—Insulating spacer for front plate (4 req'd)
73457	Spring—Return spring for fine tuning control core
74188	Spring—Retaining spring for adjustable core RCA 74187
75068	Spring—Retaining spring for r-f oscillator tube shield
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Converter stator complete with rotor and coils (S3, L9, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L13, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55, C15, C16, R10)
75446	Stud—Capacitor stud, brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, uncoded or coded "ER"
75447	Stud—Capacitor stud, brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, coded numerically or "Hi Q"
73448	Transformer—Converter transformer (T1, R6)
73466	Washer—Insulating washer for front shield (1 set)
2917	Washer—"C" washer for channel selector shaft or fine tuning shaft and cam

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	KCS 34C
74593	Capacitor—Mica trimmer comprising 1 section of 3-35 mmf. and 1 section of 40-370 mmf. (C153A, C153B)
74153	Capacitor—Hi-voltage, 500 mmf., 15,000 volts (C188)
39604	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)
74728	Capacitor—Mica, 39 mmf. (C140)
64062	Capacitor—Ceramic, 82 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C175)
75060	Capacitor—Mica, 100 mmf. (C138)
73921	Capacitor—Ceramic, 120 mmf. (C129)
73102	Capacitor—Mica, 180 mmf. (C158)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
68542	Capacitor—Mica, 390 mmf. (C141, C200)
74250	Capacitor—Mica, 560 mmf. (C160)
71501	Capacitor—Ceramic, 1500, mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C127, C132, C171, C172, C176, C177, C188, C192, C193, C196)
71432	Capacitor—Electrolytic, comprising 2 sections of 40 mfd. 450 volts and 1 section of 10 mfd. 450 volts (C148A, C148B, C148C)
73582	Capacitor—Electrolytic, comprising 1 section of 40 mfd. 450 volts, 1 section of 10 mfd. 450 volts and 1 section of 80 mfd. 200 volts (C170A, C170B, C170C)
73583	Capacitor—Electrolytic, comprising 1 section of 40 mfd. 450 volts, 1 section of 90 mfd. 150 volts and 1 section of 50 mfd. 150 volts (C147A, C147B, C147C)
73581	Capacitor—Electrolytic, comprising 1 section of 80 mfd. 450 volts, 2 sections of 10 mfd. 450 volts and 1 section of 20 mfd. 150 volts (C146A, C146B, C146C, C146D)
73801	Capacitor—Tubular, paper, oil impregnated, .001 mfd. 600 volts (C137)
73802	Capacitor—Tubular, paper, oil impregnated, .0015 mfd. 600 volts (C181)
73595	Capacitor—Tubular, moulded paper, oil impregnated, .0022 mfd. 600 volts (C142, C154, C161, C184)
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd. 600 volts (C166)
73920	Capacitor—Tubular, moulded paper, oil impregnated, .0047 mfd. 600 volts (C143, C144, C145, C195)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd. 400 volts (C135, C186, C182)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd. 600 volts (C159)
73565	Capacitor—Tubular, paper, oil impregnated, .01 mfd. 1000 volts (C151, C152, C185)
74727	Capacitor—Tubular, moulded paper, oil impregnated, .018 mfd. 1000 volts (C184)
73582	Capacitor—Tubular, paper, oil impregnated, .022 mfd. 400 volts (C155)
74728	Capacitor—Tubular, moulded paper, oil impregnated, .039 mfd. 1000 volts (C165)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd. 400 volts (C130, C139, C167)
73592	Capacitor—Tubular, moulded paper, oil impregnated, .047 mfd. 600 volts (C150, C156)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd. 1000 volts (C163)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd. 400 volts (C149)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd. 600 volts (C131)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd. 400 volts (C136, C157, C162)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd. 200 volts (C133, C190, C197)
73154	Choke—Filter choke (L104)
74585	Coil—Focus coil (L118)
71429	Coil—Width control coil (L115)
71449	Coil—Horizontal linearity control coil (L111)
74170	Coil—Peaking coil (38 muh) (L117, R110)
71527	Coil—Peaking coil (93 muh) (L102)
74214	Coil—Peaking coil (180 muh) (L103, L105)
71526	Coil—Peaking coil (250 muh) (L106, L107, L114)
73477	Coil—Filament choke coil (L101)
74594	Connector—2 contact male connector for power cable
5119	Connector—3 contact female connector for speaker cable
71789	Connector—Anode connector
71521	Connector—Hi-voltage capacitor connector
35787	Connector—Phono input connector (J103)







RMA COLOR CODE, CERAMIC CAPACITORS

COLOR	TEMPERATURE COEF.
BLACK	0
BROWN	− 30 PPM/°C
RED	− 80 PPM/°C
ORANGE	−150 PPM/°C
YELLOW	−220 PPM/°C
GREEN	−330 PPM/°C
BLUE	−470 PPM/°C
VIOLET	−750 PPM/°C
GRAY	+ 30 PPM/°C

RMA STD
CERAMICS RATED 500 V.

TOLERANCE	COLOR
± 20 %	BLACK
± 1 %	BROWN
± 2 %	RED
± 2½%	ORANGE
± 5 %	GREEN
± 10 %	WHITE

ABOVE TOLERANCES ARE ONLY FOR CAPACITORS LARGER THAN 10 MMF

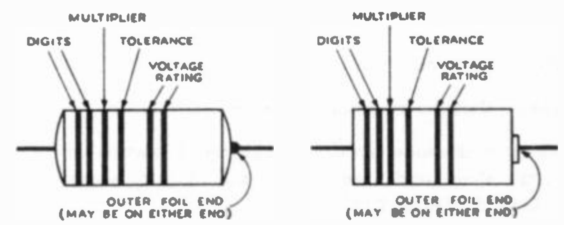
COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

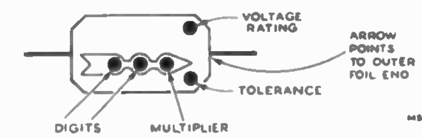
For digits, use digit column, page 22.

Wiring diagram above is for iron wire wrap yokes. C166 and R185 not used in chassis having powdered iron core yokes. See schematic diagram.

Figure 78—Chassis Wiring Diagram

COLOR CODES, MOULDED PAPER CAPACITORS





CAPACITY VALUE IN MMF

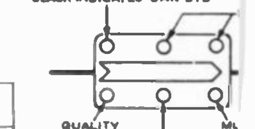
COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

TOLERANCE

COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	±5%

The Voltage Rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digit column to read voltage rating.

RMA COLOR CO



COLOR	DIGITS	MU
GOLD	—	
BLACK	0	
BROWN	1	
RED	2	
ORANGE	3	
YELLOW	4	
GREEN	5	
BLUE	6	

STOCK No.	DESCRIPTION
72784	Control—Horizontal and vertical hold control (R158, R173)
74047	Control—Brightness and picture control (R122, R131)
38408	Control—Sound volume control and power switch (R205, S101)
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
74597	Control—Focus control (R191)
74475	Control—AGC threshold control (R138)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics #71432, 73581 and 73582
74811	Cushion—Rubber cushion for kinescope mounting
73590	Cushion—Rubber cushion for deflection yoke hood (2 req'd)
73600	Fuse—0.25 amp., 250 volts (F101)
71799	Grommet—Rubber grommet for yoke horizontal lead exit
37396	Grommet—Rubber grommet for mounting ceramic tube socket (2 req'd)
74823	Magnet—Ion trap magnet (PM type)
73587	Nut—Speed nut to mount hi-voltage capacitor
18469	Plate—Bakelite mounting plate for electrolytics
73588	Resistor—Voltage divider comprising 1 section of 850 ohms, and 2 sections of 650 ohms, 6 watts (R193A, R193B, R193C)
74598	Resistor—Wire wound, 2.7 ohms, ⅓ watt (R187)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
18471	Resistor—Wire wound, 10 ohms, ½ watt (R190)
	Resistor—Fixed, composition:—
	10 ohms, ±20%, ½ watt (R120)
	18 ohms, ±10%, ½ watt (R225)
	39 ohms, ±10%, ½ watt (R121)
	47 ohms, ±5%, ½ watt (R111)
	47 ohms, ±20%, ½ watt (R183)
	68 ohms, ±10%, ½ watt (R105)
	68 ohms, ±20%, ½ watt (R123)
	82 ohms, ±10%, ½ watt (R195)
	100 ohms, ±10%, 2 watts (R184)
	150 ohms, ±5%, ½ watt (R102)
	150 ohms, ±10%, ½ watt (R115)
	150 ohms, ±20%, ½ watt (R106, R109, R114, R214)
	330 ohms, ±10%, ½ watt (R206, R223)
	1000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R199)
	1200 ohms, ±10%, ½ watt (R196)
	1800 ohms, ±10%, 2 watts (R194, R208)
	2200 ohms, ±10%, ½ watt (R219)
	2200 ohms, ±10%, 1 watt (R192)
	2700 ohms, ±10%, ½ watt (R161, R217)

STOCK No.	DESCRIPTION
	3900 ohms, ±5%, ½ watt (R112)
	4700 ohms, ±5%, ½ watt (R126)
	4700 ohms, ±10%, ½ watt (R144)
	5600 ohms, ±5%, ½ watt (R119)
	5600 ohms, ±10%, ½ watt (R141, R218)
	5600 ohms, ±10%, 1 watt (R127)
	6800 ohms, ±5%, ½ watt (R136)
	6800 ohms, ±10%, ½ watt (R150)
	6800 ohms, ±5%, 1 watt (R128)
	6800 ohms, ±10%, 2 watts (R177, R186, R210)
	8200 ohms, ±5%, ½ watt (R164, R175)
	8200 ohms, ±10%, ½ watt (R152, R153, R171)
	8200 ohms, ±5%, 1 watt (R117)
	10,000 ohms, ±5%, ½ watt (R104)
	12,000 ohms, ±10%, ½ watt (R134, R209, R226)
	12,000 ohms, ±10%, 2 watts (R124)
	15,000 ohms, ±10%, ½ watt (R182)
	15,000 ohms, ±10%, 1 watt (R146)
	22,000 ohms, ±10%, ½ watt (R151, R156, R197, R220)
	22,000 ohms, ±20%, ½ watt (R215)
	27,000 ohms, ±10%, ½ watt (R143)
	39,000 ohms, ±5%, ½ watt (R135)
	47,000 ohms, ±10%, ½ watt (R145, R211)
	47,000 ohms, ±20%, ½ watt (R221)
	68,000 ohms, ±10%, ½ watt (R172)
	100,000 ohms, ±5%, ½ watt (R203, R204)
	100,000 ohms, ±10%, ½ watt (R160, R216)
	100,000 ohms, ±10%, 1 watt (R179)
	100,000 ohms, ±20%, 1 watt (R222)
	120,000 ohms, ±5%, 1 watt (R176)
	120,000 ohms, ±10%, 1 watt (R174)
	150,000 ohms, ±10%, ½ watt (R168)
	150,000 ohms, ±20%, ½ watt (R142)
	180,000 ohms, ±5%, 1 watt (R178)
	220,000 ohms, ±10%, ½ watt (R129, R154)
	270,000 ohms, ±10%, ½ watt (R185)
	330,000 ohms, ±10%, ½ watt (R140, R200)
	470,000 ohms, ±10%, ½ watt (R137, R139, R180, R181, R224)
	470,000 ohms, ±20%, ½ watt (R207)
	680,000 ohms, ±10%, ½ watt (R133, R212)
	820,000 ohms, ±5%, ½ watt (R169)
	1 megohm, ±10%, ½ watt (R147)
	1 megohm, ±20%, 1 watt (R189, R227)
	1.2 megohm, ±5%, ½ watt (R213)
	1.5 megohm, ±5%, ½ watt (R157)
	2.2 megohm, ±10%, ½ watt (R130, R132, R159, R163)
	2.7 megohm, ±5%, 1 watt (R170)
	3.9 megohm, ±10%, ½ watt (R149)
	6.8 megohm, ±10%, ½ watt (R125)
	10 megohm, ±10%, ½ watt (R148)
	10 megohm, ±20%, ½ watt (R201)
74416	Screw—#10-32 x 1¾" cross recessed round head screw for kinescope retaining strap
74601	Screw—#8-32 x ⅜" cross recessed binder head screw for focus coil mounting (2 req'd)
74602	Screw—#10-32 x 1¾" cross recessed round head screw for focus coil adjustment (3 req'd)

STOCK No.	DESCRIPTION
71456	Screw—#8-32 wing screw for deflection yoke
73584	Shield—Tube shield
74937	Sleeve—Rubber sleeve for focus coil
73117	Socket—Tube socket, 7 pin, miniature
72927	Socket—Tube socket, 9 pin, miniature
31251	Socket—Tube socket, octal, wafer
73249	Socket—Tube socket, octal ceramic, plate mounted
71508	Socket—Tube socket for 8016
74834	Socket—Kinescope socket
73586	Spring—Compression spring used under centering control screws (3 req'd)
74936	Spring—Suspension spring (coil type) for kinescope socket leads
74595	Spring—Anode lead spring
74810	Strap—Kinescope retaining strap
74596	Support—Bakelite supports (1 set) for mounting hi-voltage rectifier tube mounting plate
46760	Switch—"TV-Phono" switch (S103)
74157	Switch—Interlock switch
74147	Switch—Width selector switch (S104)
73569	Transformer—Vertical oscillator transformer (T107)
71419	Transformer—Sound output transformer (T114)
74589	Transformer—First pix, i-f transformer (T101, C102, R101)
74590	Transformer—Second pix, i-f transformer (T102, C107)
74591	Transformer—Third pix, i-f transformer (T103, C112)
74592	Transformer—Fourth pix, i-f transformer (T104, C116)
73575	Transformer—Fifth pix, i-f transformer (T106, C123, C124)
71424	Transformer—Sound i-f transformer (T112, C173, C174)
71427	Transformer — Sound discriminator transformer (T113, C178, C179, C180)
73576	Transformer — Horizontal oscillator transformer (T109)
73578	Transformer—Antenna transformer complete with socket (T115, J102)
74586	Transformer—Power transformer 115 volts 60 cycle (T111)
74587	Transformer—Vertical output transformer (T108)

STOCK No.	DESCRIPTION
74588	Transformer—Horizontal output and hi-voltage transformer (T110)
73577	Trap—4.5 mc trap (L110, C128)
71778	Trap—Sound trap (T105, C119)
73476	Trap—I-F trap (L116, C189)
71420	Yoke—Deflection yoke (L108, L109, L112, L113, C169, R166, R167)
	SPEAKER ASSEMBLIES
	92573-4
73993	Speaker—5" x 7" PM speaker complete with cone and voice coil
	MISCELLANEOUS
74886	Back—Cabinet back
75039	Board—"Ant" terminal board
39153	Connector—4 contact male connector for antenna cable
74891	Cushion—Vinylite cushion for safety glass
74627	Decal—Control panel function decal
74809	Emblem—"RCA Victor" emblem
73642	Escutcheon—Channel marker escutcheon
74889	Foot—Cabinet foot (felt) (4 req'd)
74890	Gasket—Cork gasket for safety glass and cabinet
74888	Glass—Safety glass
74000	Knob—Horizontal hold control or picture control knob (inner)
73994	Knob—Fine tuning knob (outer)
74885	Knob—Channel selector knob (inner)
73998	Knob—Vertical hold control or brightness control knob (outer)
74002	Knob—Sound volume control and power switch knob
74633	Nut—Speed nut for safety glass retainers
74162	Plate—Mounting plate for interlock switch
74887	Retainers—Safety glass retainers (1 set)
30330	Spring—Retaining spring for knob #74000
72845	Spring—Retaining spring for knob #73994
14270	Spring—Retaining spring for knobs #73998, 74002 and 74885
73643	Spring—Spring clip for channel marker escutcheon

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

TELEVISION RECEIVERS

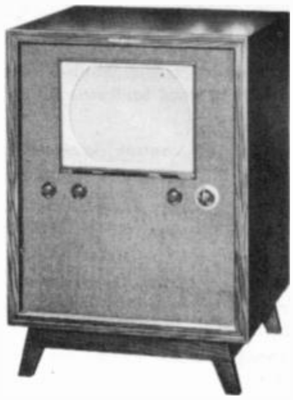
MODELS TC124, TC125, TC127

Chassis Nos. KCS 34B
Mfr. No. 274

SERVICE DATA

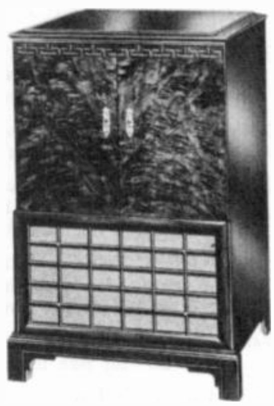
— 1950 No. T6 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.



Model TC124 Walnut, Mahogany or Oak

Model TC125 Walnut, Mahogany or Oak



Model TC127 Walnut, Mahogany or Oak

GENERAL DESCRIPTION

Models TC124, TC125, and TC127 are twelve and one-half inch television receivers and are electrically identical except for cabinets. The kinescopes are shipped in place in the cabinet. These receivers employ twenty-one tubes plus two rectifiers and a 12LP4 kinescope.

Features of the television unit are full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply. An auxiliary audio input jack is provided to permit the use of an external record playing attachment.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE ....87 square inches on a 12LP4 Kinescope

TELEVISION R-F FREQUENCY RANGE
All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range..±250 kc. on chan. 2, ±650 kc. on chan. 13
Picture Carrier Frequency ....25.75 mc.
Sound Carrier Frequency ....21.25 mc.

VIDEO RESPONSE ....To 4 mc.

SWEEP DEFLECTION ....Magnetic

FOCUS ....Magnetic

POWER SUPPLY RATING ....115 volts, 60 cycles, 230 watts

AUDIO POWER OUTPUT RATING ....2.6 watts max.

LOUDSPEAKERS—92569-7 ....12" PM Dynamic, 3.2 ohms

CHASSIS DESIGNATION KCS34B

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside) TC124	22⅞	33¼	20½
Cabinet (outside) TC125	25¼	36¼	21¼
Cabinet (outside) TC127	25⅜	36½	22⅝
Chassis Assembly (overall)	19½	14	20

WEIGHT

Chassis with Tubes in Cabinet	TC124	103 lbs.
	TC125	100 lbs.
	TC127	110 lbs.
Shipping Weight	TC124	125 lbs.
	TC125	122 lbs.
	TC127	133 lbs.

The chassis used in Models TC124, TC125 and TC127 are identical to the chassis used in Models T120 and T121 except for the addition of a jewel lamp. The service data for Models T120 and T121 will apply to Models TC124, TC125 and TC127 except as noted above, the speaker and miscellaneous parts as listed on the following page.

STOCK No.	DESCRIPTION
	SPEAKER ASSEMBLIES
	92569-7W RL111-9 RMA-274
	or 92569-7B
	or 92569-7K RMA-252
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly for 92569-7W
75875	Cone—Cone and voice coil assembly for 92569-7B
75642	Cone—Cone and voice coil assembly for 92569-7K
5118	Plug—3-prong male plug for speaker
73635	Speaker—12" PM speaker complete with cone and voice coil less plug
	NOTE: If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instruments, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74982	Back—Cabinet back for Model TC124
74968	Back—Cabinet back for Model TC125 and Model TC127
72857	Board—"Ant" terminal board
71599	Bracket—Pilot lamp bracket
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for doors (2 required) for Model TC127
X3092	Cloth—Grille cloth for mahogany or wálnut instruments for Model TC124
X3093	Cloth—Grille cloth for oak instruments for Model TC124
X3094	Cloth—Grille cloth for mahogany or walnut instruments for Model TC125
X3089	Cloth—Grille cloth for oak instruments for Model TC125
X3074	Cloth—Grille cloth for mahogany or walnut instruments for Model TC127
X3075	Cloth—Grille cloth for oak instruments for Model TC127
39153	Connector—4-contact male connector for antenna cable
74891	Cushion—Vinylite cushion for metal kinescope mask
74731	Decal—Control panel function decal for mahogany or walnut instruments
74732	Decal—Control panel function decal for oak instruments
71768	Decal—Trade mark decal for Model TC127
74809	Emblem—"RCA Victor" emblem
73642	Escutcheon—Channel marker escutcheon for mahogany or walnut instruments
73740	Escutcheon—Channel marker escutcheon for oak instruments
74755	Glass—Safety glass for Models TC124 and TC127
74989	Glass—Safety glass for Model TC125
37396	Grommet—Rubber grommet for speaker mounting (4 required)
74308	Hinge—Cabinet door hinge (1 set) (2 required) for Model TC127

STOCK No.	DESCRIPTION
74959	Knob—Fine tuning control knob—dark—(outer) for mahogany or walnut instruments—Models TC125 and TC127
73995	Knob—Fine tuning control knob—tan—(outer) for oak instruments
75027	Knob—Fine tuning control knob—chocolate brown—(outer) for mahogany or walnut instruments—Model TC124
74960	Knob—Channel selector knob—dark—(inner) for mahogany and walnut instruments—Models TC125 and TC127
74961	Knob—Channel selector knob—tan—(inner) for oak instruments
75028	Knob—Channel selector knob—chocolate brown—(inner) for mahogany or walnut instruments for Model TC124
74962	Knob—Brightness control or vertical hold control knob—dark—(outer) for mahogany or walnut instruments—Models TC125 and TC127
73999	Knob—Brightness control or vertical hold control knob—tan—(outer) for oak instruments
75029	Knob—Brightness control or vertical hold control knob—chocolate brown—(outer) for mahogany or walnut instruments for Model TC124
74969	Knob—Volume control and power switch knob—dark—for mahogany or walnut instruments for Models TC125 and TC127
74003	Knob—Volume control and power switch knob—tan—for oak instruments
75030	Knob—Volume control and power switch knob—chocolate brown—for mahogany or walnut instruments for Model TC124
74963	Knob—Picture control or horizontal hold control knob—dark—(inner) for mahogany or walnut instruments—Models TC125 and TC127
74001	Knob—Picture control or horizontal hold control knob—tan—(inner) for oak instruments
75031	Knob—Picture control or horizontal hold control knob—chocolate brown—(inner) for mahogany or walnut instruments for Model TC124
11765	Lamp—Pilot lamp—Mazda 51
74730	Nail—Decorative head nail for grille bars (4 required) for Model TC127
74162	Plate—Mounting plate for interlock switch
74971	Plate—Back plate for door pulls (2 required) for Model TC127
74970	Pull—Cabinet door pull (2 required) for Model TC127
74113	Screw—#8-32 x 1" trimit head screw for door pulls for Model TC127
72845	Spring—Retaining spring for knobs #73995, 74959 and 75027
14270	Spring—Retaining spring for knobs #73999, 74003, 74960, 74961, 74962, 74969, 75028, 75029 and 75030
30330	Spring—Retaining spring for knobs #74001, 74963 and 75031
73643	Spring—Spring clip for channel marker escutcheon
72936	Stop—Door stop for Model TC127
74161	Stud—Locating stud for back covers

REFER TO MODELS T120 AND T121 FOR CHASSIS PARTS LISTING.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

Model TA128 — Walnut, Mahogany or Oak

TELEVISION, AM-FM RADIO PHONOGRAPH COMBINATION MODEL TA128

Chassis Nos. KCS42A, RK135D
Mfr. No. 274

SERVICE DATA

— 1950 No. T7 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model TA128 television, AM-FM radio, phonograph combination employs twenty-six tubes plus two rectifiers and a 12LP4 kinescope. The radio tuner unit which feeds through the television audio system covers the AM and the FM broadcast bands. Two record changers are provided to play 33⅓, 45 and 78 RPM records.

Features of the television unit are full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE.........87 square inches on a 12LP4 kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range..±250 kc. on chan. 2, ±650 kc. on chan. 13
Picture Carrier Frequency ....25.75 mc.
Sound Carrier Frequency ....21.25 mc.

RADIO TUNING RANGE

Broadcast ....540-1,600 kc.
Frequency Modulation ....88-108 mc.
Intermediate Frequency—AM ....455 kc.
Intermediate Frequency—FM ....10.7 mc.

POWER SUPPLY RATING......115 volts, 60 cycles, 230 watts

AUDIO POWER OUTPUT RATING..............6 watts max.

CHASSIS DESIGNATIONS

Television Chassis KCS42A
Radio Chassis RK135D
33⅓/78 RPM Record Changer 960282
45 RPM Record Changer........................RP168

Refer to Service Data 960282 or RP168 for information on the record changers.

LOUDSPEAKER 92569-8.................12 inch PM Dynamic
Voice Coil Impedance ....3.2 ohms at 400 cycles

WEIGHT

Chassis with Tubes in Cabinet........................180 lbs.
Shipping Weight........................207 lbs.

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside)	36¼	34½	23½
Chassis (overall)	18⅝	17	18½

RECEIVER ANTENNA INPUT IMPEDANCE. 300 ohms balanced

If necessary, the television chassis may be fed separately from either a 300 ohm balanced line or a 72 ohm co-ax.

RCA TUBE COMPLEMENT

Tube Used	(Television Chassis)	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6V6GT	Audio Output
(9)	RCA 6BA6	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6BA6	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector & Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier & Vertical Sweep Osc.
(16)	RCA 6SN7GT	AGC Rectifier & 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier & 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 6W4GT	Damper
(22)	RCA 1B3-GT/8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier
(24)	RCA 12LP4	Kinescope

(Radio Tuner Chassis)

(1)	RCA 6J6	Mixer and Oscillator
(2)	RCA 6BA6	I-F Amplifier
(3)	RCA 6AU6	F-M Driver
(4)	RCA 6AL5	Ratio Detector
(5)	RCA 6BF6	AM Detector AVC and Phone Preamp.

Specifications continued on page 2

ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

PICTURE I-F FREQUENCIES

Picture Carrier Frequency .... 25.75 mc.
Adjacent Channel Sound Trap .... 27.25 mc.
Accompanying Sound Traps .... 21.25 mc.
Adjacent Channel Picture Carrier Trap .... 19.75 mc.

SOUND I-F FREQUENCIES

Sound Carrier Frequency .... 21.25 mc.
Sound Discriminator Band Width between peaks .... 350 kc.

VIDEO RESPONSE .... To 4 mc.

FOCUS .... Magnetic

SWEEP DEFLECTION .... Magnetic

SCANNING .... Interlaced, 525 line

HORIZONTAL SCANNING FREQUENCY .... 15,750 cps

VERTICAL SCANNING FREQUENCY .... 60 cps

FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

OPERATING CONTROLS (front panel)

Channel Selector / Fine Tuning .... Dual Control Knobs
Tone / Sound Volume and On-Off Switch .... Dual Control Knobs
Picture Horizontal Hold / Picture Vertical Hold .... Dual Control Knobs
Picture / Brightness .... Dual Control Knobs
Function Switch .... Single Control Knob
Radio Tuning .... Single Control Knob

NON-OPERATING CONTROLS

Horizontal Centering .... rear chassis adjustment
Vertical Centering .... rear chassis adjustment
Width .... rear chassis screwdriver adjustment
Width Selector Switch .... rear chassis screwdriver adjustment
Height .... rear chassis adjustment
Horizontal Linearity .... rear chassis screwdriver adjustment
Vertical Linearity .... rear chassis adjustment
Horizontal Drive .... rear chassis screwdriver adjustment
Horizontal Oscillator Frequency .... bottom chassis adjustment
Horizontal Oscillator Waveform .... side chassis adjustment
Focus .... rear chassis adjustment
Ion Trap Magnet .... top chassis adjustment
Deflection Coil .... top chassis wing nut adjustment
Focus Coil .... top chassis screwdriver adjustment

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For these reasons, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

The following adjustments are necessary when turning the receiver on for the first time.

1. Turn the radio FUNCTION switch to Tel.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and SOUND VOLUME for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counter-clockwise until the retrace lines just disappear.

9. Adjust the PICTURE control for suitable picture contrast.

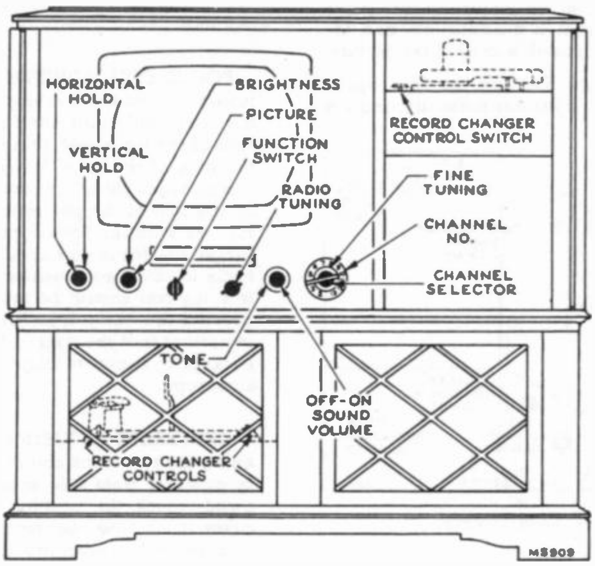


Figure 1—Receiver Operating Controls

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps numbers 4 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

13. If the positions of the controls have been changed, it may be necessary to repeat steps numbers 1 through 9.

14. For radio operation turn the FUNCTION switch to AM or FM and tune in station with the radio TUNING control.

15. For phono operation, turn the FUNCTION switch to PH for operation of the 33⅓/78 rpm record changer, or to XPH for operation of the 45 rpm record changer.

THE TELEVISION SECTION OF THE CHASSIS USED IN MODEL TA128 IS SIMILAR TO THE CHASSIS OF MODELS T120 AND T121.

REFER TO T120, T121 SERVICE DATA ON PAGES 199 TO 210 INCLUSIVE FOR TELEVISION ALIGNMENT PROCEDURE, TEST PATTERN PHOTOGRAPHS, RESPONSE CURVES AND WAVEFORM PHOTOGRAPHS.

INSTALLATION INSTRUCTIONS

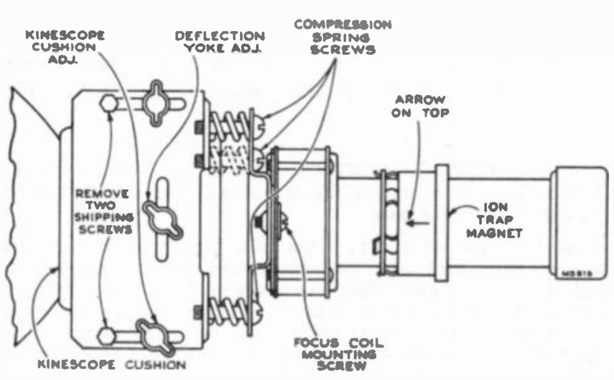


Figure 2—Yoke and Focus Coil Adjustments

Connect the antenna transmission line to the receiver antenna terminals.

Plug the receiver power cord into a 115 volt a-c power source. Turn the receiver power switch to the "on" position, the function switch to "tel," the brightness control three-quarters clockwise, and the picture control counter-clockwise.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2. Starting from this position adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 on the rear apron (see Figure 3) clockwise until the set operates normally and the picture can be synced.

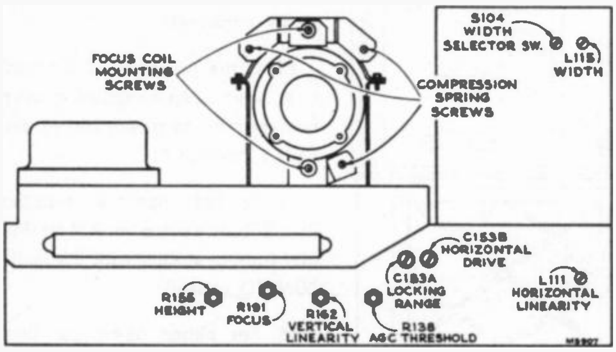


Figure 3—Rear Chassis Adjustments

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Coil Adjustments."

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock in Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counter-clockwise. Turn the picture control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

FOCUS COIL ADJUSTMENTS.—The focus coil should be adjusted so that there is approximately ¼ inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus coil. This spacing gives best average focus over the face of the tube. However, it may be necessary to change this distance slightly in order to compensate for small differences in strength of the permanent magnets in the coil. If the receiver focuses with the focus control towards the clockwise end of its range, the focus coil should be moved toward the yoke and if focus is obtained towards the counter-clockwise end of the control, the coil should be moved away from the yoke. In order to prevent the beam from striking the neck of the kinescope, it is important that the axis of the hole through the focus coil should be kept in accurate alignment with the axis of the neck of the kinescope.

CENTERING ADJUSTMENTS.—Centering is obtained by loosening the two focus coil mounting screws and sliding the coil up or down or from side to side. If a corner of the raster is shadowed, check the position of the ion trap magnet. In extreme cases it may be necessary to adjust one or more of the focus coil compression screws to eliminate a corner shadow.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage, hence the brightest and best focused picture, turn the horizontal drive control counter-clockwise until the left side of the picture begins to stretch.

Adjust the horizontal linearity control L111 to provide best linearity. Adjust the width control until the picture just fills the mask.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS.—Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

CHECK TO SEE THAT THE CUSHION AND YOKE THUMBSCREWS AND THE FOCUS COIL MOUNTING SCREWS ARE TIGHT.

AGC THRESHOLD CONTROL.—The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counter-clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counter-clockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counter-clockwise on a weak signal, then the receiver may overload when a strong signal is received.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure. The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

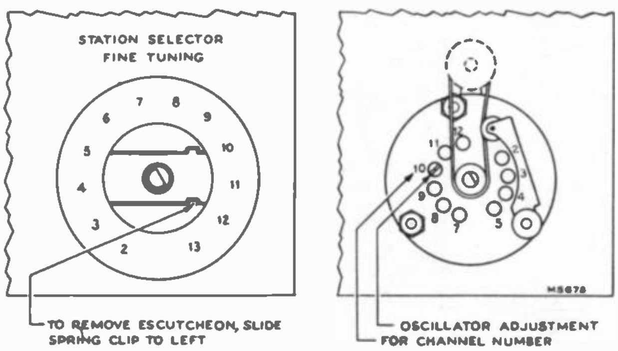


Figure 4—R-F Oscillator Adjustments

RECORD CHANGER OPERATION.—Turn the receiver function switch to each phono position and check each record player for proper operation.

RADIO OPERATION.—Turn the receiver function switch to AM and FM positions and check the radio for proper operation. Tune in a station of known frequency. If the dial pointer does not point to the correct spot on the dial, slip the dial pointer on the dial cord until the proper indication is obtained.

Replace the cabinet back and make sure that the screws are tight in order to prevent rattling at high volume.

WEAK SIGNAL AREA OPERATION.—Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390 ohm resistor which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received. By this action, the r-f gain is increased 50% at the expense of r-f bandwidth and an improvement in the weak signal picture results.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

CHASSIS REMOVAL.—To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the back and the knobs, unplug all cables and remove the chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet. The kinescope is held on the chassis by means of a special strap, so that the chassis and the kinescope can be handled together, as a unit.

KINESCOPE HANDLING PRECAUTION.—Do not install, remove, or handle the kinescope in any manner, unless shatterproof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope, remove the kinescope socket, the ion-trap magnet, and the second-anode connector. Loosen the cross-recessed head screw on the kinescope strap, as shown in Figure 6. Withdraw the kinescope toward the front of the chassis.

INSTALLATION OF KINESCOPE.—Slide the kinescope cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high-voltage compartment.

Insert the neck of the kinescope through the deflection and focus coils. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slip the ion trap magnet assembly over the neck of the kinescope.

Connect the kinescope socket to the tube base.

Connect the high voltage lead to the kinescope second anode socket.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks.

Tighten the cross-recessed head screw on the kinescope strap.

As may be seen by inspection, the radio dial lights and dial pointer are attached to the cabinet front panel. The dial cord is attached to the receiver chassis. The method of attachment may be seen in Figure 5.

Slide the dial pointer to the stop on the high frequency end of the dial. Turn the radio tuning shaft until the gang is completely unmeshed.

Slide the chassis into the cabinet until there is sufficient slack in the pilot light cable, then attach the pilot light sockets to the pilot light bracket.

Insert the chassis to its proper position, then install the six chassis bolts and tighten. Loosen the kinescope strap from the rear of the chassis. Push the kinescope forward until the face of the tube is against the mask. Push the yoke cushion forward against the kinescope flare, then tighten the cushion adjusting screws. Push the yoke forward and tighten. Tighten the kinescope strap. Replace the control knobs.

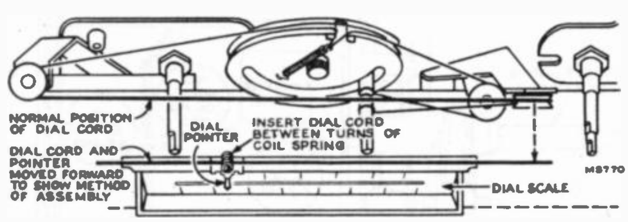


Figure 5—Dial Cord and Pointer Assembly

To hook up the dial pointer, reach over the television chassis to the radio and press the dial cord well into the coil spring.

Turn the set on and to radio position to see that the dial lighting is correct. If it is not, adjust the dial lights and shields. Tune in a station of known calibration and check the dial calibration.

Perform the entire television set-up procedure beginning with Ion Trap Magnet Adjustment.

CABINET ANTENNA.—A cabinet antenna is provided which may be employed in strong signal areas in which no reflections are experienced. The antenna leads are brought out near the receiver antenna terminals.

The link on the antenna terminal board on the back of the cabinet is for use in case it is desirable to connect a separate "A" band antenna.

CHASSIS TOP VIEW

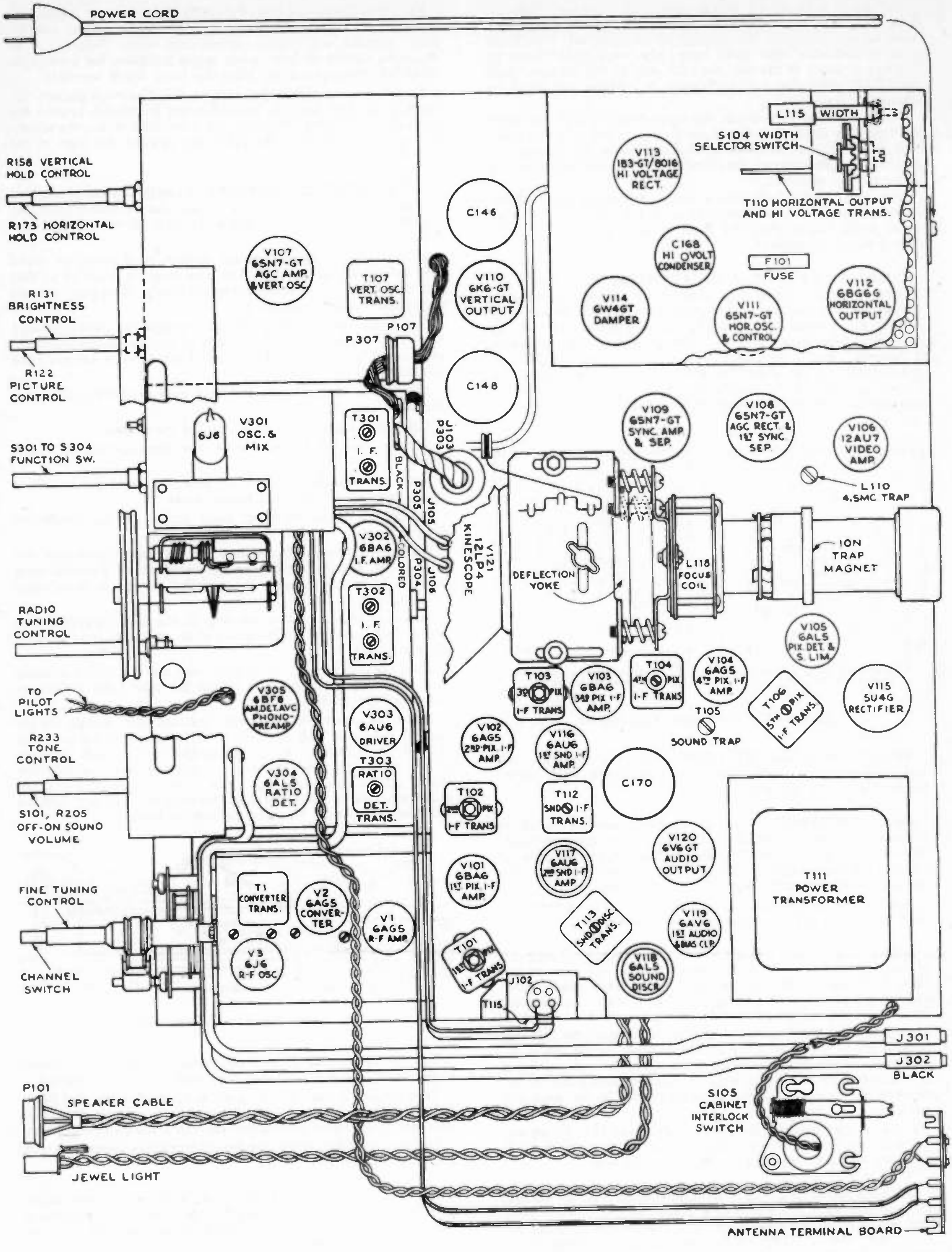


Figure 6—Chassis Top View

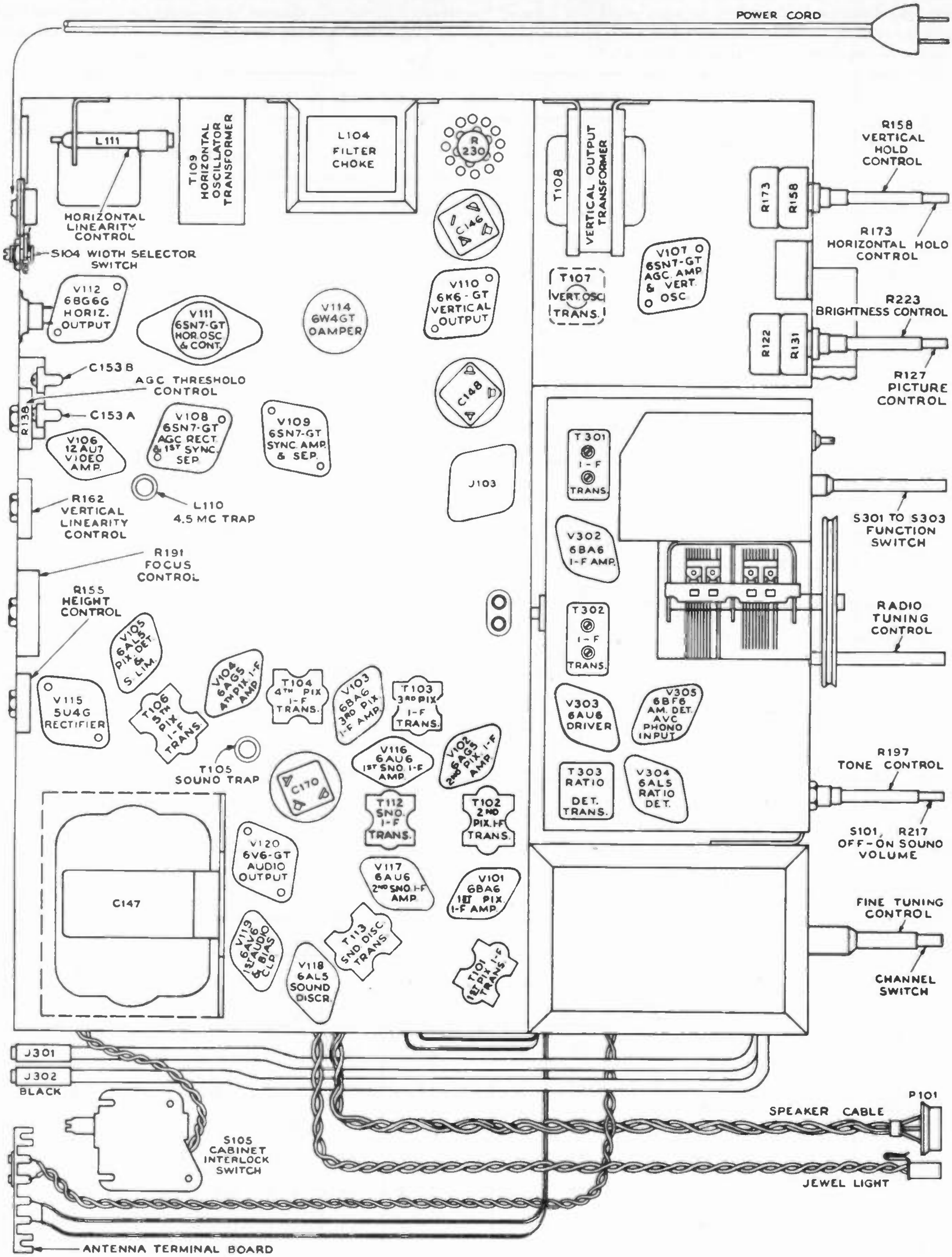


Figure 7—Chassis Bottom View

TA128 VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 microvolt test pattern signal was fed into the receiver, the picture was synced and the AGC threshold control was properly adjusted. The second condition was obtained by removing the antenna leads and short-circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	140	6	142	2 & 7	0	1	–2.4	5	2	
			No Signal	5	67	6	111	2 & 7	0	1	–.4	14.0	5.0	
V2	6AG5	Converter	2200 Mu. V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*–3.0 to –7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*104 to 109	6	*104 to 109	2 & 7	0	1	*–2.0 to –6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*–5.1 to –7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*–4.5 to –6.6	*1.8 to 2.1	—	
V101	6BA6	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5	125	6	125	7	.4	1	–12.5	2.8	1.3	
			No Signal	5	95	6	95	7	1.1	1	+.3	7.5	3.5	
V102	6AG5	2nd Pix. I-F Amplifier	2200 Mu. V. Signal	5	115	6	115	2 & 7	.75	1	0	8.2	2.5	
			No Signal	5	100	6	100	2 & 7	.65	1	0	6.8	2.1	
V103	6BA6	3d Pix. I-F Amplifier	2200 Mu. V. Signal	5	110	6	135	7	.25	1	–2.4	4.0	3.8	
			No Signal	5	60	6	100	2 & 7	.75	1	–.4	11.0	4.8	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu. V. Signal	5	170	6	135	2 & 7	1.35	1	0	6.5	2.0	
			No Signal	5	175	6	120	2 & 7	1.2	1	0	5.9	1.8	
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	–113	—	—	1	–112	—	—	.48	—	
			No Signal	7	–120	—	—	1	–120	—	—	—	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	–107	—	—	5	–56	—	—	—	—	
			No Signal	2	–80	—	—	5	–60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu. V. Signal	1	–23.2	—	—	3	–111	2	–113	4.38	—	
			No Signal	1	–19.2	—	—	3	–117	2	–120	3.82	—	
V106	12AU7	2d Video Amplifier	2200 Mu. V. Signal	6	*166	—	—	8	*–5.3	7	*–12.2	6.2	—	*At average contrast
			No Signal	6	*134	—	—	8	*–5.6	7	*–10.3	6.9	—	
V107 A	6SN7 GT	AGC Amplifier	2200 Mu. V. Signal	5	–12.6	—	—	6	–55.5	4	–56.5	.9	—	
			No Signal	5	+.3	—	—	6	–60	4	–64	.3	—	
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	76	—	—	3	–111	1	–158	.2	—	
			No Signal	2	62	—	—	3	–120	1	–169	.2	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	97	—	—	6	–3.4	4	–19.3	.3	—	
			No Signal	5	81	—	—	6	–8.7	4	–19.3	.28	—	
V108	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	96	—		3	–1.8	1	–19.5	.1	—	
			No Signal	2	81	—	—	3	–9.7	1	–19.3	.1	—	
V109	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	158	—	—	3	0	1	–4.7	5.25	—	
			No Signal	2	154	—	—	3	0	1	–5.2	3.75	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V109	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	230	—	—	6	–51	4	–106	.4	—	
			No Signal	5	215	—	—	6	–59	4	–80	.35	—	
V110	6K6-GT	Vertical Output	2200 Mu. V. Signal	3	223	4	223	8	–67	5	–91		*7.85	*Screen connected to plate
			No Signal	3	208	4	208	8	–79	5	–101		*7.7	
V111	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	*48	—	—	3	–110	1	–92	.2	—	*Variation of hold gives –21.9 to +56 volts on plate
			No Signal	2	*33	—	—	3	–120	1	–108	.2	—	
V111	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	70	—	—	6	–111	4	–185	2.4	—	
			No Signal	5	54	—	—	6	–120	4	–192	2.4	—	
V112	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	Do Not Meas.	8	180	3	–90	5	–110	72	9.4	
			No Signal	Cap	Do Not Meas.	8	170	3	–100	5	–115	70	9.2	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	Do Not Meas.	—	—	2 & 7	10,500	—	—	0	—	
			Brightness Average	Cap	Do Not Meas.	—	—	2 & 7	10,000	—	—	.1	—	
V114	6W4GT	Damper	2200 Mu. V. Signal	5	Do Not Meas.	—	—	3	306	—	—	66	—	
			No Signal	5	Do Not Meas.	—	—	3	295	—	—	65	—	
V115	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	335			2 & 8	250	—	—	210	—	*A-C measured from plate to trans. center tap
			No Signal	4 & 6	335			2 & 8	245	—	—	215	—	
V116	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	134	6	134	7	.9	1	–.5	8.2	3.3	
			No Signal	5	110	6	110	7	.7	1	–.5	5.7	2.6	
V117	6AU6	2nd Sound I-F Amplifier	2200 Mu. V. Signal	5	148	6	90	7	0	1	–9	1.6	.8	
			No Signal	5	115	6	60	7	0	1	–.65	3.35	1.15	
V118	6AL5	Sound Discrim.	2200 Mu. V. Signal	2	–8.4	—	—	5	5.8	—	—	—	—	
			No Signal	2	–2.0	—	—	5	.41	—	—	—	—	
			2200 Mu. V. Signal	7	–3.7	—	—	1	0	—	—	—	—	
			No Signal	7	–1.08	—	—	1	0	—	—	—	—	
V119	6AV6	1st Audio Amplifier	2200 Mu. V. Signal	7	85	—	—	2	0	1	–.89	.49	—	
			No Signal	7	83	—	—	2	0	1	–.89	.4	—	
V120	6V6-GT	Audio Output	2200 Mu. V. Signal	3	102	4	113	8	–99	5	–108	19.3	3.3	
			No Signal	3	72	4	80	8	–110	5	–120	18	3	
V121	12LP4	Kinescope	2200 Mu. V. Signal	Cap	*10,000	10	290	11	51	2	20	.1	—	*Average Brightness
			No Signal	Cap	*10,000	10	285	11	42	2	14	—	—	*Average Brightness
V301	6J6	Mixer and Oscillator	No Signal	1 2	110 95	— —	— —	7	0	6 5	–2.0 –5.0	— —	— —	Function switch in F-M position
V302	6BA6	Radio I-F Amplifier	No Signal	5	210	6	105	7	.8	1	–0.2	—	—	
V303	6AV6	Radio F-M Driver	No Signal	5	205	6	135	7	1.5	1	0	—	—	
V304	6AL5	Radio Ratio Det.	No Signal	2	–0.2 –0.2	—	—	1	–0.1	— —	— —	— —	— —	
V305	6BF6	A-M Det. and Phono Preamp.	No Signal	7	–0.2	—	—	2	0	—	—	—	—	

TA128

RADIO ALIGNMENT PROCEDURE

If any lead dressing is necessary, it should be done before aligning the receiver. When making a complete alignment follow the table below in sequence. If only a portion of the circuit is to be aligned select the portion required and follow with the remaining steps in the section. Any adjustments made on the 455 kc. I-F's make it necessary to adjust the 10.7 mc. I-F's.

"AM" R-F—I-F ALIGNMENT

Test-Oscillator.—For all alignment operations, connect low side of the test-osc. to the receiver chassis, and keep the osc. output as low as possible to avoid a-v-c action. Output Meter.—Connect the meter across the speaker voice coil, and turn the receiver volume control to max.

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Turn Radio Dial to—	Adjust the following
1	Antenna terminal in series with .01 mfd.	455 kc. Modulated	AM	Low Freq. end of Dial	†Top and bot. cores of T301 and T302. (For max. voltage across voice coil.)
2	Ant. terminal through dummy ant. of 200 mmfs.	1,620 kc.	AM	Min. capacity	Osc. C308 for maximum output.
3		1,400 kc.	AM	Tune to signal	Ant. C304 for maximum output.
4		600 kc.	AM	600 kc.	Osc. L306 and Ant. L303.
5	Repeat steps 2, 3 and 4 for maximum output.				

† Use alternate loading. Connect an 18,000-ohm resistor across the primary to load the plate winding while the grid winding of the same transformer is being peaked. Then load the grid winding with the 18,000-ohm resistor while the plate winding is being peaked.

RATIO DETECTOR ALIGNMENT

Connect probe of "VoltOhmyst" to negative side of C328 and low side to chassis. Connect output meter across speaker voice coil.

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Radio Dial Tuned to—	Adjust
6	Pin No. 1 of 6AU6 (V303) in series with .01 mfd.	10.7 mc. 30% AM Modulated	FM	———	Top of T303 for maximum DC on "VoltOhmyst."
7	Pin No. 1 of 6AU6 (V303) in series with .01 mfd.		FM	———	Bottom of T303 for minimum audio output on meter.
8	Repeat steps 6 and 7 as necessary making final adjustment with r-f input level set to give approximately –3.0 volts d-c on "VoltOhmyst."				

"FM" R-F—I-F ALIGNMENT

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Radio Dial Tuned to—	Adjust
9	Terminal 3 of S301-2 rear through 270 ohms.	10.7 mc.	FM	88 mc.	*T301 and T302 for max. with r-f input set to give –3 volts on "VoltOhmyst."
10	Terminal 3 of S301-2 rear through 270 ohms.	106 mc.	FM	106 mc.	Set C302 to max. capacity. Squeeze L307 and adjust C302 for maximum.
11	Terminal 3 of S301-2 rear through 270 ohms.	90 mc.	FM	Tune to signal	Squeeze L301 and rock gang for maximum output.
12	Repeat steps 10 and 11 as required.				

* Use a 680-ohm resistor to load the plate winding while the grid winding of the same transformer is being peaked. Then the grid winding is loaded with 680-ohm resistor while the plate winding is being peaked.

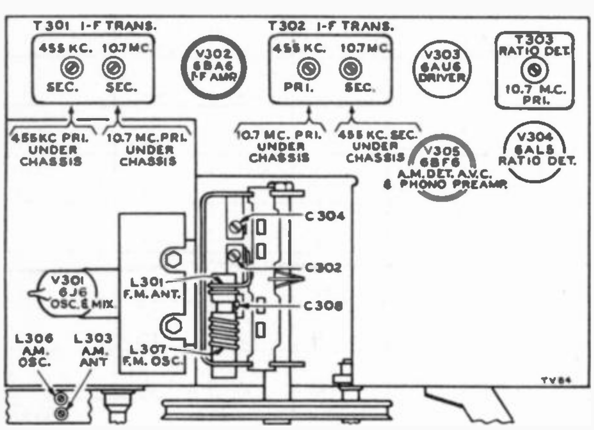


Figure 8—Chassis, Top View, Showing Adjustments

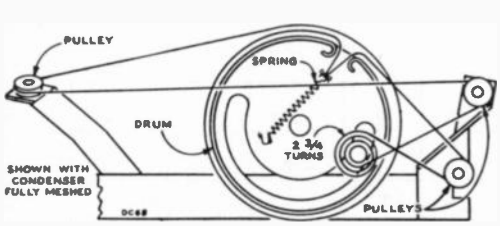


Figure 9—Dial and Drive Cord Assembly

CRITICAL LEAD DRESS:

1. Ground lead on pin 2 of V302 and V303 should be dressed down flat on chassis.
2. Dual .005 mfd. capacitors and diode filter should be dressed to clear the bottom of the cabinet.
3. Dress C329 across V302 sockets with short and direct leads.
4. Dress V302 plate lead from pin 5 down to the chassis.
5. Dress AVC lead from R321 to switch down to chassis and against back of gang mounting plate.
6. Dress lead from pin 6 of V305 down to chassis and against back of gang mounting plate.
7. Dress AVC lead from 1st I-F to switch against chassis and against gang mounting plate.
8. Dress lead from switch to pin 1 of V301 against plate supporting gang.
9. Dress all insulated F-M leads down to chassis.
10. Connect C309 with short lead to pin 6 of V301 keeping body of cap away from plate lead and switch terminals.
11. The coupling between L301 and L307 should be adjusted to give proper injection voltage to the mixer grid. This has been found to be correct when the distance between adjacent end turns is 3/8" to 7/16" measured at top of the form.
12. Dress cabled leads away from antenna transmission lines.
13. Dress all uninsulated bus wire so as to avoid short circuits.

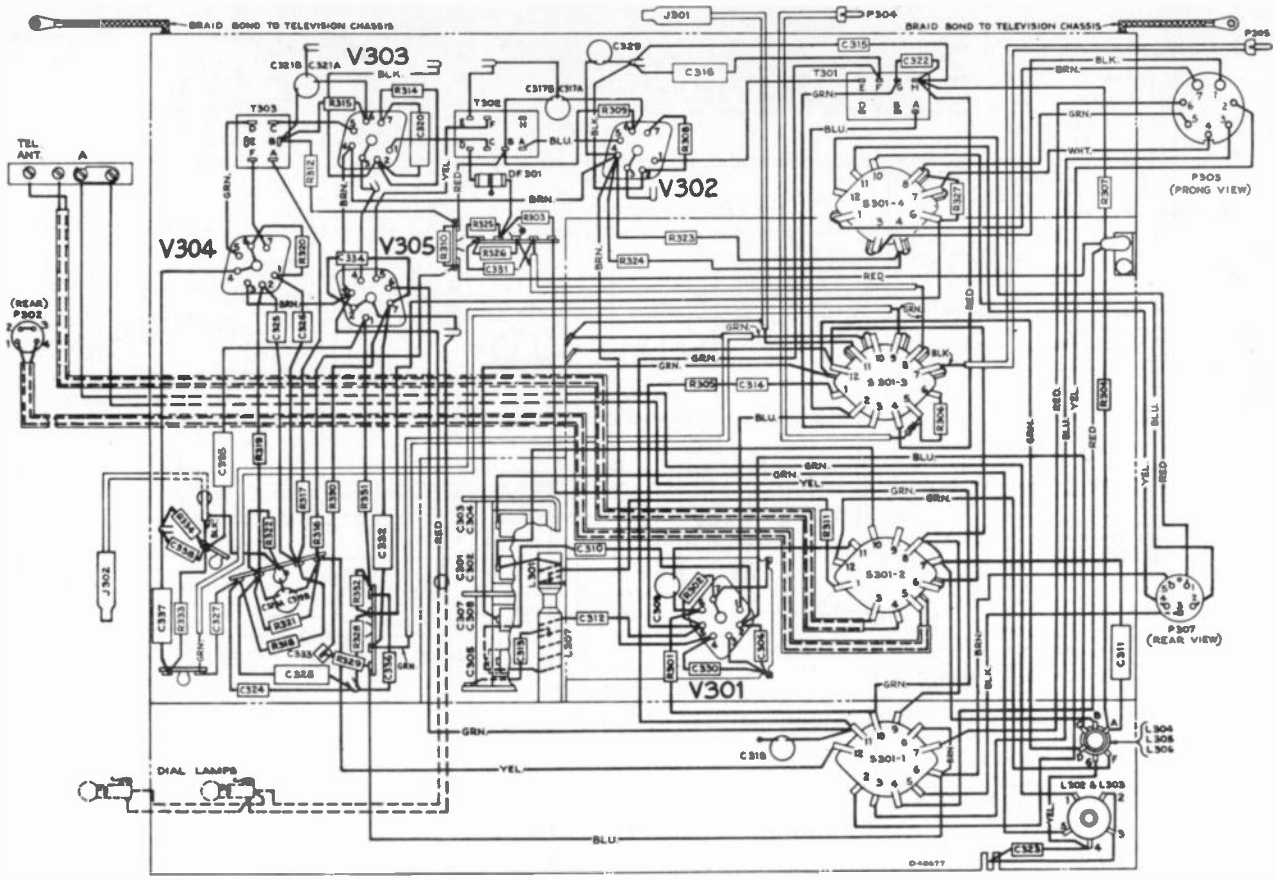


Figure 10—Radio Chassis Wiring Diagram (RK135D)

THE TELEVISION SECTION OF THE CHASSIS USED IN MODEL TA128 IS SIMILAR TO THE CHASSIS OF MODELS T120 AND T121.

REFER TO T120, T121 SERVICE DATA ON PAGES 199 TO 210 INCLUSIVE FOR TELEVISION ALIGNMENT PROCEDURE, TEST PATTERN PHOTOGRAPHS, RESPONSE CURVES AND WAVEFORM PHOTOGRAPHS.

R-F UNIT WIRING DIAGRAM

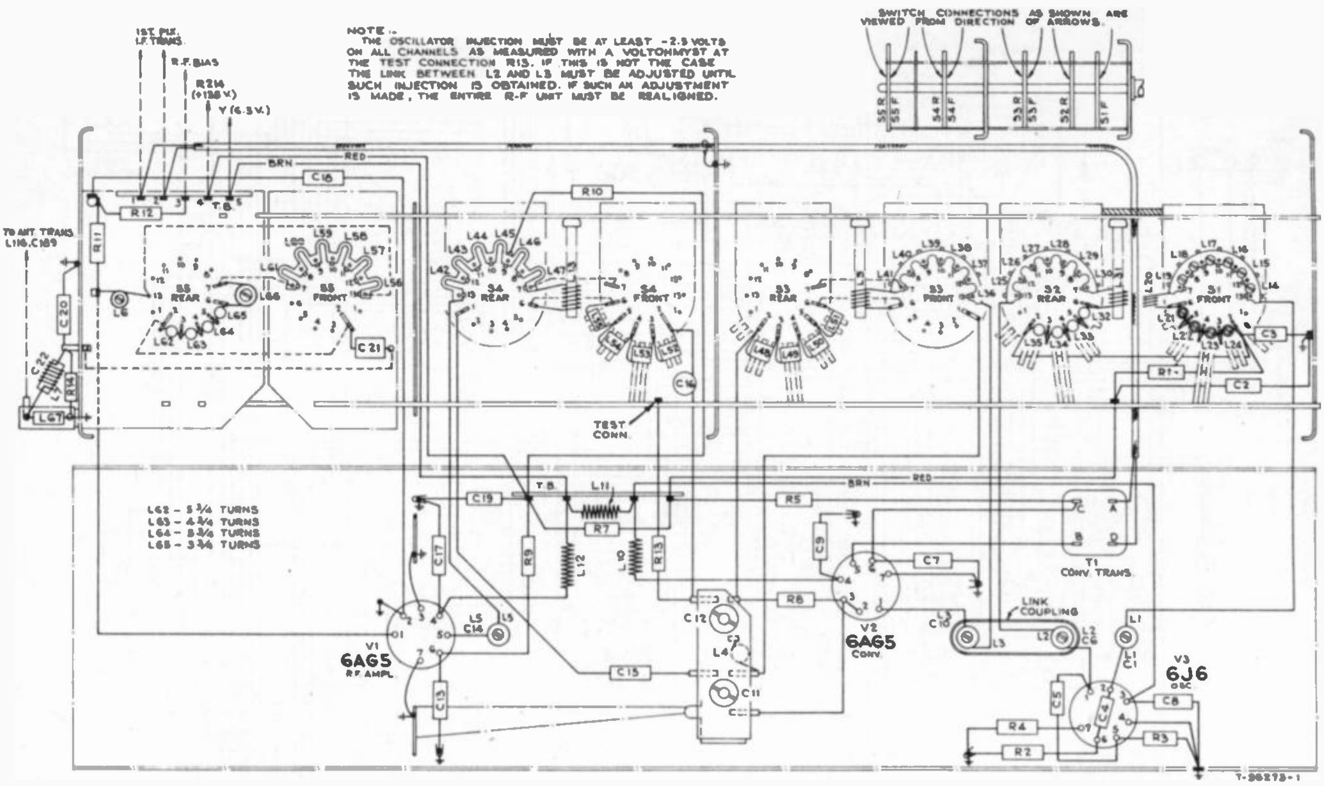


Figure 11—R-F Unit Wiring Diagram

TELEVISION CRITICAL LEAD DRESS

1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V117, V118 and V119 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.
4. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
5. Leads to L102 and L103 must be as short as possible.
6. Dress peaking coils L105, L106 and L107 up and away from the chassis.
7. Dress C183 across tube pins 5 and 6 with leads not exceeding ⅜ inch.
8. Dress C129 and C130 up and away from the chassis.
9. Dress the yellow lead from the picture control away from the chassis and away from the volume-control leads. Dress the yellow lead from pin 8 of V106 away from the chassis.
10. Dress the green lead from pin 2 of V106 away from the chassis.
11. Dress R168, R169, R170, R176 and R178 up and away from the chassis.
12. The leads to the volume control should be dressed down against the chassis and away from V117 and V118.
13. Contact between the i-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
14. Dress leads from L110 (width control coil) away from the transformer frame.
15. Dress T110 winding leads as shown in Figure 12.

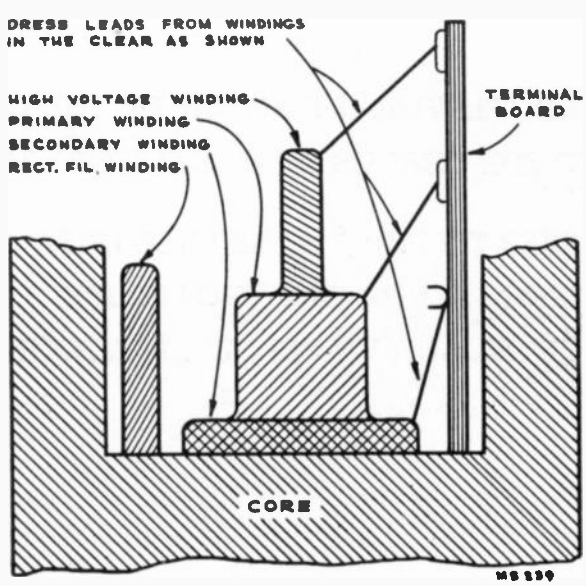


Figure 12—T110 Lead Dress

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	RF UNIT ASSEMBLIES
	KRK5
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission cable (W1)
73441	Cam—Fine tuning adjustment
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5000 mmf. (C16)
73460	Coil—R-F plate coil for channel 6 (L13)
73461	Coil—Rear section—Oscillator plate coil for channel 6 (L20)
73462	Coil—Coupling inductance coil (L4)
73475	Coil—Antenna filter shunt coil (C67)
73478	Coil—I-F trap (L7, C22)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Front section—Oscillator plate coil for channel 6 (L31)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (plunger adjustment) (L1, C1)
74108	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment for oscillator section or converter section) (L2, L3, C6, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f amplifier section (L5, C14)
73455	Core—Sliding core for fine tuning control trimmer
74187	Core—Adjustable core for coil L9
71493	Connector—Oscillator segment connector
73440	Detent—R-F unit detent mechanism and fibre shaft
71487	Form—Coil form for coil L31
73453	Form—Coil form assembly for L9, L13
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to converter trimmer loop connector
73634	Nut—Speed nut for drive belt shield
73438	Plate—Front plate and bushing
73464	Pulley—Idler pulley
	Resistor—Fixed, composition:
	47 ohms, ±20%, ½ watt (R4)
	150 ohms, ±20%, ½ watt (R5, R9, R12)
	390 ohms, ±10%, ½ watt (R14)
	1000 ohms, ±20%, ½ watt (R7)
	2700 ohms, ±10%, ½ watt (R10)
	10,000 ohms, ±20%, ½ watt (R1, R11)
	100,000 ohms, ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring
30340	Retainer—Retainer ring for fine tuning stud
70881	Screw—No. 4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
73640	Screw—No. 4-40 x ⅝" adjusting screw for L66
71475	Screw—No. 4-40 x 15/32" adjusting screw for coils L21, L22, L23, L24
74575	Screw—No. 4-40 x 17/32" adjusting screw for L6
73437	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
73439	Shaft—Actuating shaft for fine tuning control
75443	Shield—"U" shape shield for bottom of r-f unit
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt
73632	Shield—Metal tube shield for V1
71494	Socket—Tube socket, moulded, 7 prong, saddle mounted
73450	Socket—Tube socket, ceramic, 7 prong, bottom mounted
74576	Spacer—Insulating spacer for front plate (4 required)
73457	Spring—Return spring for fine tuning control core
74188	Spring—Retaining spring for adjustable core RCA 74187
75058	Spring—Retaining spring for r-f oscillator tube shield
74578	Spring—Retaining spring for adjusting screws RCA 73640 and RCA 74575
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment, coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Converter stator complete with rotor and coils (S3, L9, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L13, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55, C15, C16, R10)
75446	Stud—Capacitor stud—brass No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 uncoded or coded "ER"
75447	Stud—Capacitor stud—brass No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 coded numerically or "Hi Q"
73448	Transformer—Converter transformer (T1, R6)
73466	Washer—Insulating washer for front shield (1 set)
2917	Washer—"C" washer for channel selector shaft or fine tuning shaft and cam
	TELEVISION CHASSIS ASSEMBLIES
	KCS 42A
74593	Capacitor—Mica trimmer comprising 1 section of 3-35 mmf. and 1 section of 40-370 mmf. (C153A, C153B)
72615	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)
74726	Capacitor—Mica, 39 mmf. (C140)
64062	Capacitor—Ceramic, 82 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C175)
75060	Capacitor—Mica, 100 mmf. (C138)
73921	Capacitor—Ceramic, 120 mmf. (C129)
39630	Capacitor—Mica, 120 mmf. (C181)
73102	Capacitor—Mica, 180 mmf. (C158)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
68542	Capacitor—Mica, 390 mmf. (C141, C200)
74153	Capacitor—Ceramic, 500 mmf. 15,000 volts (C168)
74250	Capacitor—Mica, 560 mmf. (C160)
71501	Capacitor—Ceramic, 1500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C127, C132, C171, C172, C176, C177, C188, C192, C193, C196)
71432	Capacitor—Electrolytic, comprising 2 sections of 40 mfd., 450 volts and 1 section of 10 mfd., 450 volts (C148A, C148B, C148C)
73582	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts and 1 section of 80 mfd., 200 volts (C170A, C170B, C170C)
73583	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 90 mfd., 150 volts and 1 section of 50 mfd., 150 volts (C147A, C147B, C147C)
73581	Capacitor—Electrolytic, comprising 1 section of 60 mfd., 450 volts, 2 sections of 10 mfd., 450 volts and 1 section of 20 mfd., 150 volts (C146A, C146B, C146C, C146D)
73801	Capacitor—Tubular, paper, oil impregnated, .001 mfd., 600 volts (C137, C203)
73802	Capacitor—Tubular, paper, oil impregnated, .0015 mfd., 1000 volts (C186)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd., 600 volts (C142, C161)
73803	Capacitor—Tubular, moulded paper, .0022 mfd., 600 volts (C154)

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd., 600 volts (C184)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 600 volts (C143, C144, C145, C202)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C135, C182, C195)
73584	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd., 600 volts (C159)
73565	Capacitor—Tubular, moulded paper, .01 mfd., 1000 volts (C151, C152, C185)
73797	Capacitor—Tubular, paper, oil impregnated, .015 mfd., 600 volts (C204)
74727	Capacitor—Tubular, moulded paper, oil impregnated, .018 mfd., 1000 volts (C164)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 400 volts (C155)
74728	Capacitor—Tubular, moulded paper, oil impregnated, .039 mfd., 1000 volts (C165)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C130, C139, C201, C167)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 600 volts (C150, C156)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 1000 volts (C163)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C149)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 600 volts (C131)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 200 volts (C136, C157, C162)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd., 200 volts (C133, C190, C197)
73154	Choke—Filter choke (L104)
74585	Coil—Focus coil (L118)
71449	Coil—Horizontal linearity control coil (L111)
71429	Coil—Width control coil (L115)
74170	Coil—Peaking coil (36 muh) (L117, R110)
71527	Coil—Peaking coil (93 muh) (L102)
74214	Coil—Peaking coil (180 muh) (L103, L105)
71526	Coil—Peaking coil (250 muh) (L106, L107, L114)
73477	Coil—Filament choke coil (L101)
72108	Connector—7 contact female connector (J103)
74594	Connector—2 contact male connector for power cord
72172	Connector—3 contact female connector for changers cable (J108)
5040	Connector—4 contact female connector for speaker cable (P101)
71789	Connector—Anode connector
71521	Connector—Hi-voltage capacitor connector
14786	Connector—5 contact male connector (P107)
72734	Control—Horizontal hold and vertical hold control (R158, R173)
74047	Control—Picture and brightness control (R122, R131)
74359	Control—Tone control, volume control and power switch (R205, R233, S101)
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
74597	Control—Focus control (R191)
74475	Control—AGC threshold control (R138)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics Nos. 71432, 73581 and 73582
73590	Cushion—Rubber cushion for deflection yoke hood (2 required)
74811	Cushion—Rubber cushion for kinescope mounting
73600	Fuse—0.25 amp. 250 volts (F101)
71799	Grommet—Rubber grommet for yoke horizontal lead exit
37396	Grommet—Rubber grommet for mounting ceramic tube socket (2 required)
74030	Grommet—Rubber grommet for mounting radio chassis (3 required)
74823	Magnet—Ion trap magnet
73587	Nut—Speed nut for mounting hi-voltage capacitor
18469	Plate—Bakelite mounting plate for electrolytics
33514	Receptacle—2 contact female receptacle for audio cable and switching cable (J105, J106)
74598	Resistor—Wire wound, 2.7 ohms, 1/3 watt (R187)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
18471	Resistor—Wire wound, 10 ohms, ½ watt (R180)
74049	Resistor—Wire wound, 500 ohms, 20 watts (R230)
73588	Resistor—Voltage divider, comprising 1 section of 850 ohms, 12 watts and 2 sections of 650 ohms, 6 watts (R193A, R193B, R193C)
	Resistor—Fixed, composition:
	10 ohms, ±20%, ½ watt (R120)
	18 ohms, ±10%, ½ watt (R225)
	39 ohms, ±10%, ½ watt (R120)
	47 ohms, ±5%, ½ watt (R111)
	47 ohms, ±20%, ½ watt (R183)
	68 ohms, ±10%, ½ watt (R105)
	68 ohms, ±20%, ½ watt (R123)
	82 ohms, ±10%, ½ watt (R195)
	100 ohms, ±10%, 2 watts (R184)
	150 ohms, ±5%, ½ watt (R102)
	150 ohms, ±10%, ½ watt (R115)
	150 ohms, ±20%, ½ watt (R106, R109, R114, R214)
	220 ohms, ±10%, 1 watt (R223)
	270 ohms, ±10%, 1 watt (R206)
	1000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R199)
	1200 ohms, ±10%, ½ watt (R196)
	1800 ohms, ±10%, 2 watts (R194, R208)
	2200 ohms, ±10%, ½ watt (R219)
	2200 ohms, ±10%, 1 watt (R192)
	2700 ohms, ±10%, ½ watt (R161, R217)
	3900 ohms, ±5%, ½ watt (R112)
	4700 ohms, ±5%, ½ watt (R126)
	4700 ohms, ±10%, ½ watt (R144)
	5600 ohms, ±5%, ½ watt (R119)
	5600 ohms, ±10%, ½ watt (R141, R218)
	5600 ohms, ±10%, 1 watt (R127)
	6800 ohms, ±5%, ½ watt (R136)
	6800 ohms, ±10%, ½ watt (R150)
	6800 ohms, ±5%, 1 watt (R128)
	6800 ohms, ±10%, 2 watts (R177, R186, R210)
	8200 ohms, ±5%, ½ watt (R164, R175)
	8200 ohms, ±10%, ½ watt (R152, R153, R171)
	8200 ohms, ±5%, 1 watt (R117)
	10,000 ohms, ±5%, ½ watt (R104)
	12,000 ohms, ±10%, ½ watt (R134, R209, R226)
	12,000 ohms, ±10%, 2 watts (R124)
	15,000 ohms, ±10%, ½ watt (R182, R211)
	15,000 ohms, ±10%, 1 watt (R146)
	22,000 ohms, ±10%, ½ watt (R151, R156, R197, R220)
	22,000 ohms, ±20%, ½ watt (R198, R215)
	27,000 ohms, ±10%, ½ watt (R143, R234)
	39,000 ohms, ±5%, ½ watt (R135)
	47,000 ohms, ±10%, ½ watt (R145)
	47,000 ohms, ±20%, ½ watt (R221)
	68,000 ohms, ±10%, ½ watt (R172)
	100,000 ohms, ±5%, ½ watt (R203, R204)
	100,000 ohms, ±10%, ½ watt (R160, R216)
	100,000 ohms, ±10%, 1 watt (R179)
	100,000 ohms, ±20%, 1 watt (R222)

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
	120,000 ohms, ±5%, 1 watt (R176)
	120,000 ohms, ±10%, 1 watt (R174)
	150,000 ohms, ±10%, ½ watt (R168)
	150,000 ohms, ±20%, ½ watt (R142)
	180,000 ohms, ±10%, ½ watt (R232)
	180,000 ohms, ±5%, 1 watt (R178)
	220,000 ohms, ±10%, ½ watt (R129, R154)
	330,000 ohms, ±10%, ½ watt (R140, R200)
	470,000 ohms, ±10%, ½ watt (R137, R139, R180, R224, R231)
	470,000 ohms, ±20%, ½ watt (R207)
	680,000 ohms, ±10%, ½ watt (R133, R212)
	820,000 ohms, ±5%, ½ watt (R169)
	1 megohm, ±10%, ½ watt (R147)
	1 megohm, ±20%, 1 watt (R189, R227)
	1.2 megohm, ±5%, ½ watt (R213)
	1.5 megohm, ±5%, ½ watt (R157)
	2.2 megohm, ±10%, ½ watt (R130, R132, R159, R163)
	2.7 megohm, ±5%, 1 watt (R170)
	3.9 megohm, ±10%, ½ watt (R149)
	8.8 megohm, ±10%, ½ watt (R125)
	10 megohm, ±10%, ½ watt (R148)
	10 megohm, ±20%, ½ watt (R201)
74416	Screw—No. 10-32 x 1¾" cross recessed round head screw for kinescope retaining strap
71458	Screw—No. 8-32 wing screw for deflection yoke
74601	Screw—No. 8-32 x ⅜" cross recessed binder head screw for focus coil mounting (2 required)
74602	Screw—No. 10-32 x 1¼" cross recessed binder head screw for focus coil adjustment (3 required)
73584	Shield—Tube shield
74937	Sleeve—Rubber sleeve for focus coil
73117	Socket—Tube socket, 7 pin, miniature
72927	Socket—Tube socket, 9 pin, miniature
31251	Socket—Tube socket, octal, wafer
73249	Socket—Tube socket, octal, ceramic, plate mounted
71508	Socket—Tube socket for 1B3GT/8016
31364	Socket—Pilot lamp socket
74834	Socket—Kinescope tube socket
73586	Spring—Compression spring used under centering control screws (3 required)
74936	Spring—Suspension spring (coil type) for kinescope tube socket leads
74595	Spring—Anode lead spring
74893	Strap—Kinescope retaining strap
74596	Supports—Bakelite supports (1 set) for mounting hi-voltage rectifier tube mounting plate
74147	Switch—Width selector switch (S104)
74157	Switch—Cabinet interlock switch (S105)
74981	Transformer—Power transformer, 115 volt, 60 cycles (T111)
74587	Transformer—Vertical output transformer (T108)
73569	Transformer—Vertical oscillator transformer (T107)
74588	Transformer—Horizontal output and hi-voltage transformer (T110)
74589	Transformer—First pix, i-f transformer (T101, C102, R101)
74590	Transformer—Second pix, i-f transformer (T102, C107)
74591	Transformer—Third pix, i-f transformer (T103, C112)
74592	Transformer—Fourth pix, i-f transformer (T104, C116)
73575	Transformer—Fifth pix, i-f transformer (T106, C123, C124)
71424	Transformer—Sound i-f transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
73576	Transformer—Horizontal oscillator transformer (T109)
73578	Transformer—Antenna transformer complete with socket and bracket (T115, J102)
73577	Trap—4.5 mc trap (L110, C128)
71778	Trap—Sound trap (T105, C119)
73476	Trap—I-F trap (L116, C189)
74262	Yoke—Deflection yoke (L108, L109, L112, L113, C169, R166, R167)
	RADIO CHASSIS ASSEMBLIES
	RK 135D
74039	Board—"Telv-Ant" terminal board (TB301)
74026	Bracket—Drive cord bracket complete with two pulleys—R.H.
74027	Bracket—Drive cord bracket complete with pulley—L.H.
74911	Cable—Shielded cable complete with female connector (W307, W311)
71105	Cable—Shielded cable complete with pin plug (W301, W302)
74017	Capacitor—Variable tuning capacitor (C301, C302, C303, C304, C305, C307, C308)
73866	Capacitor—Ceramic, 2 mmf. (C306)
39044	Capacitor—Ceramic, 15 mmf. (C312)
39042	Capacitor—Ceramic, 47 mmf. (C330)
73867	Capacitor—Ceramic, 56 mmf. (C313)
33379	Capacitor—Ceramic, 68 mmf. (C310)
39396	Capacitor—Ceramic, 100 mmf. (C322, C323)
48125	Capacitor—Ceramic, 150 mmf. (C314)
71922	Capacitor—Ceramic, 180 mmf. (C334, C338)
39640	Capacitor—Mica, 330 mmf. (C325, C326)
73748	Capacitor—Ceramic, 1500 mmf. (C309)
74009	Capacitor—Ceramic, dual, 4000 mmf. (C317, C318, C321)
73473	Capacitor—Ceramic, 5000 mmf. (C318, C329)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C328)
32223	Capacitor—Electrolytic, 15 mfd., 300 volts (C333)
70602	Capacitor—Tubular, paper, .0025 mfd., 400 volts (C332)
73961	Capacitor—Tubular, paper, .003 mfd., 200 volts (C327, C331)
71553	Capacitor—Tubular, paper, .005 mfd., 400 volts (C315, C320, C324)
71923	Capacitor—Tubular, paper, .01 mfd., 200 volts (C335)
71925	Capacitor—Tubular, paper, .01 mfd., 400 volts (C311)
71928	Capacitor—Tubular, paper, .02 mfd., 200 volts (C337)
72596	Capacitor—Tubular, paper, .05 mfd., 200 volts (C336)
74455	Capacitor—Tubular, paper, .05 mfd., 400 volts (C316)
74020	Coil—Antenna coil—AM (L302, L303)
73744	Coil—Oscillator coil—AM (L304, L305, L306)
74024	Coil—Antenna coil—FM (L301)
74025	Coil—Oscillator coil—FM (L307)
38395	Connector—7 contact male connector (P103)
12493	Connector—5 contact female connector (P107B)
39153	Connector—4 prong male connector (P102)
72953	Cord—Drive cord (approx. 42" overall)
74011	Filter—Diode filter, dual 200 mmf. and 47,000 ohms (DF301)
74023	Resistor—Wire wound, 0.51 ohms, 1 watt (R323, R324)
	Resistor—Fixed, composition:
	10 ohms, ±20%, ½ watt (R311)
	68 ohms, ±20%, ½ watt (R308)
	100 ohms, ±20%, ½ watt (R305, R317)
	120 ohms, ±10%, ½ watt (R314)
	680 ohms, ±20%, ½ watt (R310, R312)
	1200 ohms, ±5%, ½ watt (R319)
	3300 ohms, ±5%, ½ watt (R320)
	4700 ohms, ±10%, ½ watt (R333)
	10,000 ohms, ±20%, ½ watt (R306)
	15,000 ohms, ±10%, ½ watt (R304)
	15,000 ohms, ±20%, ½ watt (R315, R318)
	18,000 ohms, ±10%, ½ watt (R302)
	27,000 ohms, ±10%, ½ watt (R307, R309)
	39,000 ohms, ±10%, ½ watt (R322)
	68,000 ohms, ±10%, ½ watt (R328)

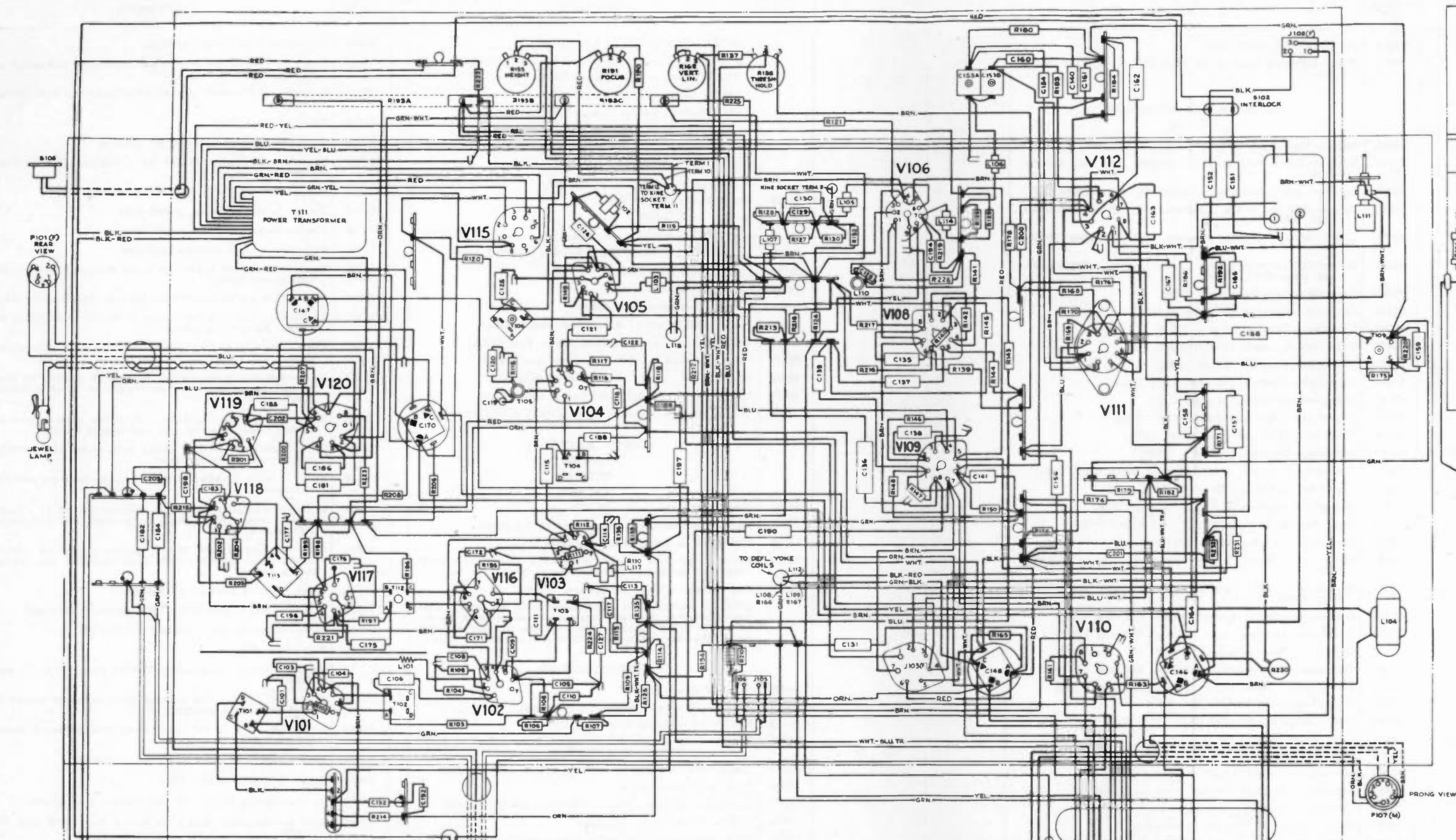
REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
	100,000 ohms, ±10%, ½ watt (R334)
	150,000 ohms, ±10%, ½ watt (R325, R326, R329)
	270,000 ohms, ±10%, ½ watt (R330)
	470,000 ohms, ±10%, ½ watt (R331)
	470,000 ohms, ±20%, ½ watt (R321)
	1 megohm, ±10%, ½ watt (R327, R332)
	2.2 megohm, ±20%, ½ watt (R303)
	3.9 megohm, ±10%, ½ watt (R301)
	22 megohm, ±20%, ½ watt (R316)
74028	Shaft—Tuning knob shaft
73632	Shield—Tube shield
73117	Socket—Tube socket, 7 pin, miniature for V301, V304, V305
74179	Socket—Tube socket, 7 pin, miniature for V302, V303
31364	Socket—Dial lamp socket
74038	Spring—Drive cord spring
74894	Switch—Selector switch (S301)
73745	Transformer—First i-f transformer, dual (T301)
74018	Transformer—Second i-f transformer, dual (T302)
73743	Transformer—Ratio detector transformer (T303)
33726	Washer—"C" washer for tuning shaft (rear)
34457	Washer—Spring washer for tuning shaft (front)
74172	Washer—Fibre washer to prevent drive cord slippage
	SPEAKER ASSEMBLIES
	92569-8W
	RL-111-10
	RMA-#274
13867	Cap—Dust cap
74801	Cone—Cone complete with voice coil (3.2 ohms)
5039	Connector—4 prong male connector (J101)
74800	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms) less transformer and plug
74802	Transformer—Output transformer (T114)
	NOTE: If stamping in instruments does not agree with above speaker number, order replacement parts by referring to model number of instruments, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74977	Back—Cabinet back
74054	Bracket—Dial lamp bracket (2 required)
71599	Bracket—Pilot lamp bracket
75041	Button—Plug button for shipping bolts holes in 33/78 changer motorboard (2 required)
72437	Cable—Shielded pickup cable complete with pin plug
13103	Cap—Pilot lamp cap
73803	Capacitor—Tubular, paper, .002 mfd., 400 volts (C402)
71892	Catch—Bullet catch and strike
X3074	Cloth—Grille cloth for mahogany or walnut instruments
X3090	Cloth—Grille cloth for oak instruments
14782	Connector—3 contact male connector for record changer power cable
30868	Connector—2 contact female connector for record changer power cable
74581	Cover—Mounting screw cover for 45 RPM changer (3 required)
71984	Decal—Trade mark decal (RCA Victor)
74273	Decal—Trade mark decal (Victrola)
74898	Decal—Control panel function decal for mahogany or walnut instruments
74899	Decal—Control panel function decal for oak instruments
74052	Dial—Dial scale and bezel
74891	Edging—Vinylite edging for metal mask
74674	Emblem—"RCA Victor" emblem
73642	Escutcheon—Channel marker escutcheon for mahogany or walnut instruments
73740	Escutcheon—Channel marker escutcheon for oak instruments
74755	Glass—Safety glass
37396	Grommet—Rubber grommet for speaker
74206	Grommet—Rubber grommet for mounting 33/78 record changer (4 required)
74308	Hinge—Door hinge (1 set) for L.H. or R.H. doors
73200	Hinge—Lower hinge for center door
70166	Hinge—Upper hinge for center door
74051	Indicator—Station selector indicator
74959	Knob—Fine tuning knob—dark—for mahogany or walnut instruments (outer)
73995	Knob—Fine tuning knob—tan—for oak instruments (outer)
74960	Knob—Channel selector knob—dark—for mahogany or walnut instruments (inner)
74961	Knob—Channel selector knob—tan—for oak instruments (inner)
74962	Knob—Vertical hold control, brightness control or tone control knob—dark—for mahogany or walnut instruments (outer)
73999	Knob—Vertical hold control, brightness control or tone control knob—tan—for oak instruments (outer)
74978	Knob—Tuning or selector switch knob—dark—for mahogany or walnut instruments
74979	Knob—Tuning or selector switch knob—tan—for oak instruments
74963	Knob—Horizontal hold control, picture control or volume control and power switch knob—dark—for mahogany instruments (inner)
74001	Knob—Horizontal hold control, picture control or volume control and power switch knob—tan—for oak instruments (inner)
11765	Lamp—Dial or pilot lamp—Mazda 51
74208	Nut—Tee nut to mount 45 RPM changer (3 required)
74162	Plate—Mounting plate for interlock switch
75037	Pull—Door pull
	Resistor—Fixed, composition, 47,000 ohms, ±10%, ½ watt (R402)
74582	Screw—No. 8-32 x 1¾" special head screw to mount 45 RPM changer (3 required)
75038	Screw—No. 8-32 x ½" trimit head cross-recessed screw for door pull
74736	Slide—Record changer tray slide mechanism
74050	Slide—Station indicator slide
73643	Spring—Spring clip for channel marker escutcheon
72845	Spring—Retaining spring for knobs No. 73995 and No. 74959
14270	Spring—Retaining spring for knobs Nos. 73999, 74960, 74961, 74962
30330	Spring—Retaining spring for knobs Nos. 74001 and 74963
74055	Spring—Spring clip for dial and bezel assembly (2 required)
74421	Spring—Conical spring to mount 45 RPM changer—upper—R.H. (1 required)
74422	Spring—Conical spring to mount 45 RPM changer—upper—L.H. (2 required)
74423	Spring—Conical spring to mount 45 RPM changer—lower—(3 required)
75040	Spring—Mounting spring for 33/78 RPM record changer (4 required)
72936	Stop—Door stop
74161	Stud—Locating stud for back cover (2 required)

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

TELEVISION CHASSIS WIRING DIAGRAM



RMA COLOR CODE, CERAMIC CAPACITORS

COLOR	TEMPERATURE COEF.
BLACK	0
BROWN	− 30 PPM/°C
RED	− 80 PPM/°C
ORANGE	− 150 PPM/°C
YELLOW	− 220 PPM/°C
GREEN	− 330 PPM/°C
BLUE	− 470 PPM/°C
VIOLET	− 750 PPM/°C
GRAY	+ 30 PPM/°C

COEF. DIGITS MULTIPLIER

RMA STD
CERAMICS RATED 500 V.

TOLERANCE	COLOR
± 20 %	BLACK
± 1 %	BROWN
± 2 %	RED
± 2½ %	ORANGE
± 5 %	GREEN
± 10 %	WHITE

ABOVE TOLERANCES ARE ONLY FOR CAPACITORS LARGER THAN 10 MMF

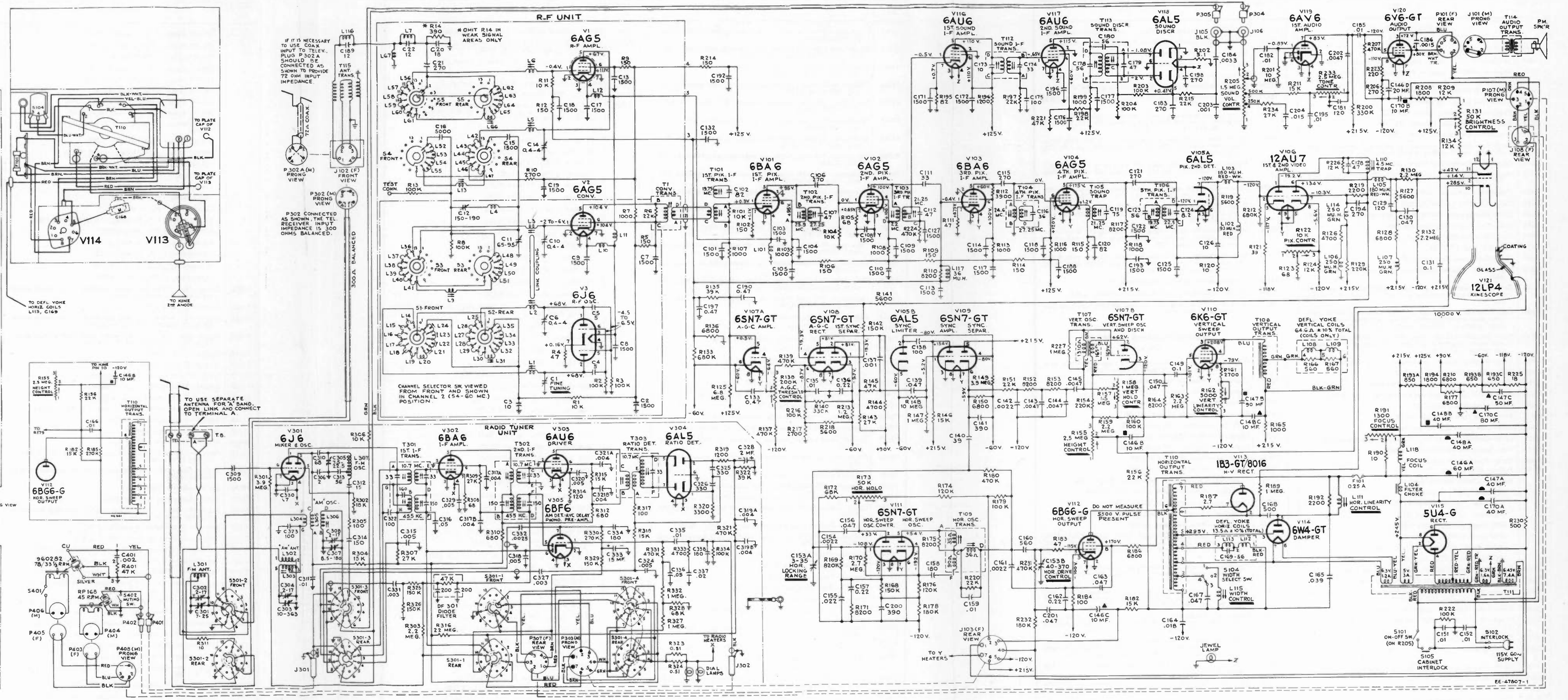
COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

In some receivers, a four color ceramic capacitor color code is employed. It reads the same as the RMA color code except that the tolerance stripe is omitted.

If the coefficient stripe is silver, it indicates that the capacitor has a very large temperature coefficient and is to be employed for by-pass or other usages where a wide variation of capacity is unimportant. Silver striped capacitors are rated at 350 volts unless otherwise marked.

Figure 13—Chassis Wiring Diagram

CIRCUIT SCHEMATIC DIAGRAM



Function switch S301 viewed from front and shown in Number 1 (maximum counterclockwise position).
Switch position 1—Television.
Switch position 2—AM.
Switch position 3—FM.
Switch position 4—Phono 45 RPM.
Switch position 5—Phono 78 RPM.

All resistance values in ohms. K = 1,000.

All capacitance values less than 1 in MF and above 1 in MMF unless noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "VoltOhmyst," no signal input with 117 v. a-c supply with the pix control fully clockwise and the brightness control set for average brightness.

The deflection circuits must be connected as shown above for powdered iron core yokes. The partial schematic insert shows the method of connection employed in early production receivers which employed an iron wire wrap yoke.

Figure 14—Circuit Schematic Diagram

Model TA129
Walnut, Mahogany or Oak

RCA VICTOR

TELEVISION, AM-FM RADIO PHONOGRAPH COMBINATION
MODEL TA129

Chassis Nos. KCS41A-1, RK135D

— Mfr. No. 274 —

SERVICE DATA

— 1950 No. T8 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model TA129 receiver employs twenty-six tubes plus three rectifiers and a 12LP4 kinescope.

The television receiver is provided with Electronic Magnifier deflection circuits by which the center portion of the picture may be enlarged to fill the screen. Choice of picture coverage is made by operation of a remote switch.

The radio tuner unit which feeds through the television audio system covers the AM and the FM broadcast bands.

Two record changers are provided to play 45 and 78/33⅓ RPM records.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE............... 87 square inches on a 12LP4 kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range....±250 kc. on chan. 2, ±650 kc. on chan. 13
Picture Carrier Frequency ....25.75 mc.
Sound Carrier Frequency ....21.25 mc.

RADIO TUNING RANGE

Broadcast ....540-1,600 kc.
Frequency Modulation ....88-108 mc.
Intermediate Frequency—AM ....455 kc.
Intermediate Frequency—FM ....10.7 mc.

POWER SUPPLY RATING ....115 volts, 60 cycles, 300 watts

AUDIO POWER OUTPUT RATING ....6 watts max.

CHASSIS DESIGNATIONS

Television Chassis KCS41A-1
Radio Chassis RK135D
78/33⅓ RPM Record Changer 960282
45 RPM Record Changer RP168C
Refer to Service Data 960282 or RP168 for information on the record changers.

LOUDSPEAKER—92569-8 (RL111-10) ....12 inch PM Dynamic

Voice Coil Impedance ....3.2 ohms at 400 cycles

WEIGHT

Chassis with Tubes in Cabinet ....183 lbs.
Shipping Weight ....221 lbs.

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside)	37	38¾	22¾
Chassis (Overall)	19⅜	12¼	20¼

RECEIVER ANTENNA INPUT IMPEDANCE....300 ohms balanced

If necessary, the television chassis may be fed separately from either a 300 ohm balanced line or a 72 ohm co-ax.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6V6GT	Audio Output
(9)	RCA 6BA6	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6BA6	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector & Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier & Vertical Sweep Osc.
(16)	RCA 6SN7GT	AGC Rectifier & 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier & 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 6W4GT	Damper
(22)	RCA 1B3-GT/8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier (2 tubes)
(24)	RCA 12LP4	Kinescope

(Radio Tuner Chassis)

	Tube Used	Function
(1)	RCA 6J6	Mixer and Oscillator
(2)	RCA 6BA6	I-F Amplifier
(3)	RCA 6AU6	F-M Driver
(4)	RCA 6AL5	Ratio Detector
(5)	RCA 6BF6	AM Detector AVC

Specifications continued on page 2

TA129 ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

PICTURE I-F FREQUENCIES

Picture Carrier Frequency .... 25.75 mc.
Adjacent Channel Sound Trap .... 27.25 mc.
Accompanying Sound Traps .... 21.25 mc.
Adjacent Channel Picture Carrier Trap .... 19.75 mc.

SOUND I-F FREQUENCIES

Sound Carrier Frequency .... 21.25 mc.
Sound Discriminator Band Width between peaks .... 350 kc.

VIDEO RESPONSE .... To 4 mc.

FOCUS .... Magnetic

SWEEP DEFLECTION .... Magnetic

SCANNING .... Interlaced, 525 line

HORIZONTAL SCANNING FREQUENCY .... 15,750 cps

VERTICAL SCANNING FREQUENCY .... 60 cps

FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

OPERATING CONTROLS (front panel)

Channel Selector, Fine Tuning .... Dual Control Knobs
Tone, Sound Volume and On-Off Switch .... Dual Control Knobs
Picture Horizontal Hold, Picture Vertical Hold .... Dual Control Knobs
Picture, Brightness .... Dual Control Knobs
Function Switch .... Single Control Knob
Radio Tuning .... Single Control Knob

NON-OPERATING CONTROLS

Horizontal Centering .... rear chassis adjustment
Vertical Centering .... rear chassis adjustment
Shunt Width Coil .... rear chassis screwdriver adjustments
Series Width Coil .... rear chassis screwdriver adjustment
Expanded Width Coil .... rear chassis screwdriver adjustment
Width Selector Switch .... rear chassis screwdriver adjustment
Height .... rear chassis adjustment
Horizontal Linearity .... rear chassis screwdriver adjustment
Vertical Linearity .... rear chassis adjustment
Horizontal Drive .... rear chassis screwdriver adjustment
Horizontal Oscillator Frequency .... bottom chassis adjustment
Horizontal Oscillator Waveform .... side chassis adjustment
Focus .... rear chassis adjustment
Ion Trap Magnet .... top chassis adjustment
Deflection Coil .... top chassis wing nut adjustment
Focus Coil .... top chassis screwdriver adjustment

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For these reasons, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time.

1. Turn the radio FUNCTION switch to Tel.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and SOUND VOLUME for suitable volume

5. Turn the BRIGHTNESS control fully counterclockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counterclockwise until the retrace lines just disappear.

9. Adjust the PICTURE control for suitable picture contrast.

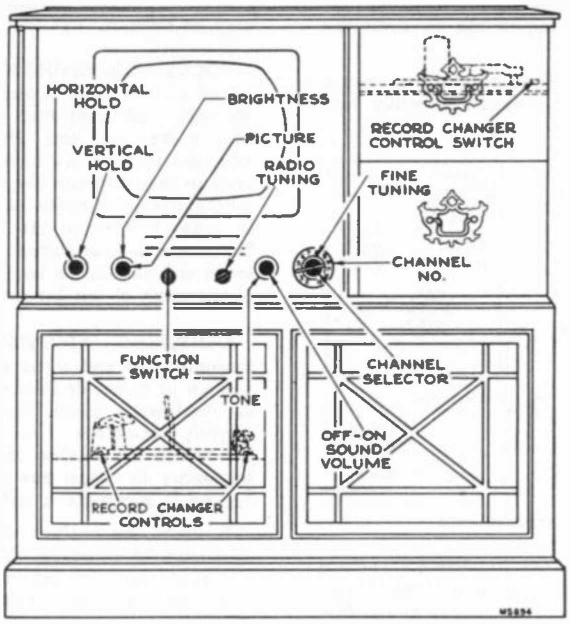


Figure 1—Receiver Operating Controls

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps numbers 4 and 9.

12. To operate the Electric Magnifier, push the button on the remote cable.

13. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

14. If the positions of the controls have been changed, it may be necessary to repeat steps numbers 1 through 9.

15. For radio operation turn the FUNCTION switch to AM or FM and tune in station with the radio TUNING control.

16. For phono operation, turn the function switch to PH for operation of the 78 rpm changer or to XPH for operation of the 45 rpm changer.

THE TELEVISION SECTION OF THE CHASSIS USED IN MODEL TA129 IS SIMILAR TO THE CHASSIS OF MODELS T120 AND T121.

REFER TO T120, T121 SERVICE DATA ON PAGES 199 TO 210 INCLUSIVE FOR TELEVISION ALIGNMENT PROCEDURE, TEST PATTERN PHOTOGRAPHS, RESPONSE CURVES AND WAVEFORM PHOTOGRAPHS.

THE RADIO SECTION OF MODEL TA129 IS IDENTICAL TO THE RADIO SECTION OF MODEL TA128. REFER TO PAGE 232 FOR RADIO ALIGNMENT PROCEDURE.

INSTALLATION INSTRUCTIONS

Remove the television compartment back.

Make sure that all tubes are in place and are firmly seated in their sockets.

Check to see that the high voltage lead is attached to the kinescope second anode connector socket on the bell of the tube.

Connect the antenna transmission line to the receiver antenna terminals.

Plug the receiver power cord into a 115 volt a-c power source. Turn the power switch to the "on" position, the function switch to Tel, the brightness control three-quarters clockwise, and picture control counterclockwise.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2. Starting from this position immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

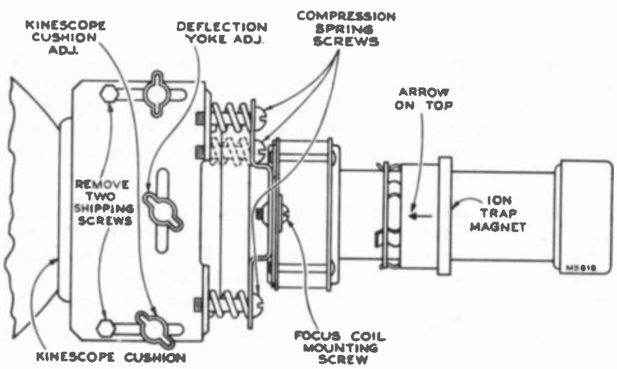


Figure 2—Yoke and Focus Coil Adjustments

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 on the rear apron (see Figure 3) clockwise until the set operates normally and the picture can be synced.

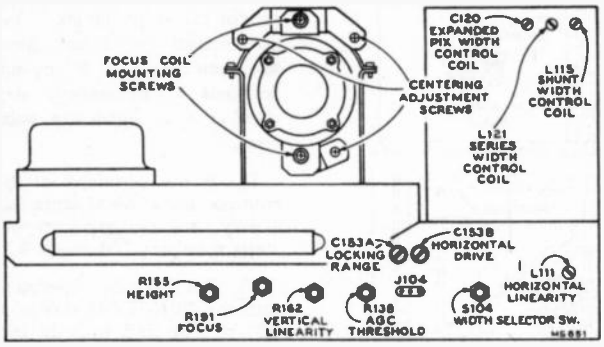


Figure 3—Rear Chassis Adjustments

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Coil Adjustments."

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or disagonal black bar in the raster.

Horizontal Lock in Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counter-clockwise. Turn the picture control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

FOCUS COIL ADJUSTMENTS.—The focus coil should be adjusted so that there is approximately ¼ inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus coil. This spacing gives best average focus over the face of the tube. However, it may be necessary to change this distance slightly in order to compensate for small differences in strength of the permanent magnets in the coil. In order to prevent the beam from striking the neck of the kinescope, it is important that the axis of the hole through the focus coil should be kept in accurate alignment with the axis of the neck of the kinescope.

CENTERING ADJUSTMENTS.—Centering is obtained by loosening the two focus coil mounting screws and sliding the coil up or down or from side to side. If a corner of the raster is shadowed, check the position of the ion trap magnet. Slightly reposition it to eliminate the shadow and recenter the picture by sliding the coil. In extreme cases it may be necessary to adjust one or more of the focus coil compression screws to eliminate a corner shadow.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained. It is important that the kinescope not be operated with the ion trap magnet adjusted for less than maximum brightness. To do so may cause injury to the tube.

PICTURE SIZE AND LINEARITY.—Connect the "Electronic Magnifier" switch to its socket on the rear apron of the chassis. Set the switch to the large (expanded) picture position. Set the Expanded Width Selector Switch S104 to the counter-clockwise position and adjust the Expanded Width Control L120 so that the test pattern outer circle normally tangent to the top of the picture is now tangent to the side of the picture. (If the width is not sufficient, set the Expanded Width Selector Switch to the center or the clockwise end position.) Adjust the Horizontal Drive and the Horizontal Linearity Control until the pattern is symmetrical from left to right. In general, the core of the Linearity Control Coil should be between ½ to all the way out of the coil.

Set the "Electronic Magnifier" switch to the normal size position. Observe to see if the picture width is correct. If it is not, adjust either the Series Width Control Coil L121, or the Shunt Width Control Coil L115 until the picture is the correct width. If the Series Width Coil core is out too far, the picture will "ring" on the left half. This ring will be shown as one or more faint light or dark vertical bars somewhere on the left half of the picture with resulting poor horizontal linearity.

When the proper width is obtained, switch to the expanded picture position, wait for a few seconds then switch back to the normal position. Observe if the top of the picture immediately assumes its final position or if it takes several seconds to come to a stop. If the picture requires more than a second to become still, adjust the core of L115 or L121 in and the other out while maintaining the proper width. Repeat the above test and observe if the picture immediately comes to rest when switched to the normal size position. Continue to adjust L115 and L121 until this condition is satisfied and the picture is the proper width. Observe the picture horizontal linearity and if necessary retouch Horizontal Drive, Linearity and Width Controls L115 and L121.

With the "Electronic Magnifier" switch in normal position, adjust the Height (R155) and the Vertical Linearity control (R162) as usual in order to obtain good vertical linearity. In addition, if difficulty is experienced in obtaining good vertical linearity at the top one-half inch of the picture, slightly adjust the Vertical Peaking Control L119.

Switch to the expanded picture position and note if the proper aspect ratio is obtained. If not, adjust L112 and/or S104.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS.—Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

AGC THRESHOLD CONTROL.—The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counter-clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counter-clockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counter-clockwise on a weak signal, then the receiver may overload when a strong signal is received.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

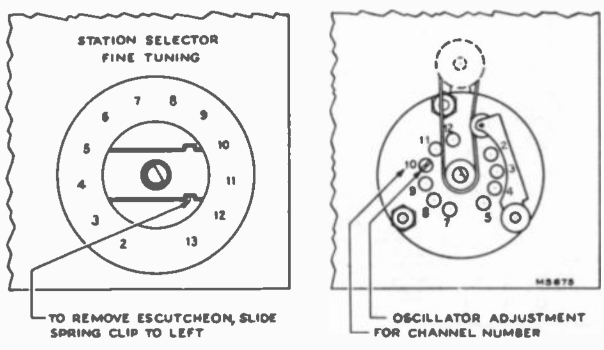


Figure 4—R-F Oscillator Adjustments

Replace the cabinet back and make sure that the screws are tight in order to prevent rattling at high volume.

WEAK SIGNAL AREA OPERATION.—Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390 ohm resistor which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

CHASSIS REMOVAL.—To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the back and the knobs, unplug all cables and remove the chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet. The kinescope is held on the chassis by means of a special strap, so that the chassis and the kinescope can be handled together, as a unit.

KINESCOPE HANDLING PRECAUTION.—Do not install, remove, or handle the kinescope in any manner, unless shatter-proof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope, remove the kinescope socket, the ion-trap magnet, and the second-anode connector. Loosen the cross-recessed head screw on the kinescope strap. Withdraw the kinescope toward the front of the chassis.

INSTALLATION OF KINESCOPE.—Slide the kinescope cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high-voltage compartment.

Insert the neck of the kinescope through the deflection and focus coils. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slip the ion trap magnet assembly over the neck of the kinescope.

Connect the kinescope socket to the tube base.

Connect the high voltage lead to the kinescope second anode socket.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks.

As may be seen by inspection, the radio dial lights and dial pointer are attached to the cabinet front panel. The dial cord is attached to the receiver chassis. The method of attachment may be seen in Figure 5.

Slide the dial pointer to the stop on the high frequency end of the dial. Turn the radio tuning shaft until the gang is completely unmeshed.

To replace the chassis in the cabinet, first tighten the cross recessed head screw on the kinescope strap. Slide the chassis into the cabinet until there is sufficient slack in the pilot light cable then attach the pilot light sockets to the pilot light bracket.

Insert the chassis to its proper position, then install the six chassis bolts and tighten. Loosen the kinescope strap from the rear of the chassis. Push the kinescope forward until the face of the tube is against the mask. Push the yoke cushion forward against the kinescope flare then tighten the cushion adjusting screws. Push the yoke forward and tighten. Tighten the kinescope strap. Replace the control knobs.

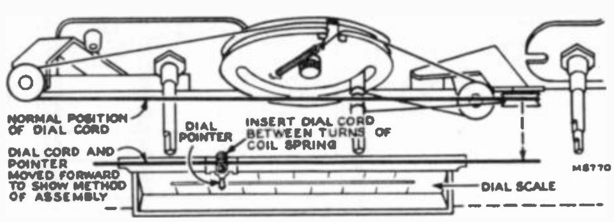


Figure 5—Dial Cord and Pointer Assembly

To hook up the dial pointer, reach over the television chassis to the radio and press the dial cord well into the coil spring.

Turn the set on and to radio position to see that the dial lighting is correct. If it is not, adjust the dial lights and shields. Tune in a station of known frequency and check the dial calibration.

CABINET ANTENNA.—A cabinet antenna is provided which may be employed in strong signal areas in which no reflections are experienced. The antenna leads are brought out near the receiver antenna terminal board.

The link on the antenna terminal board is for use in case it is desirable to connect a separate "A" band antenna.

TA129

CHASSIS TOP VIEW

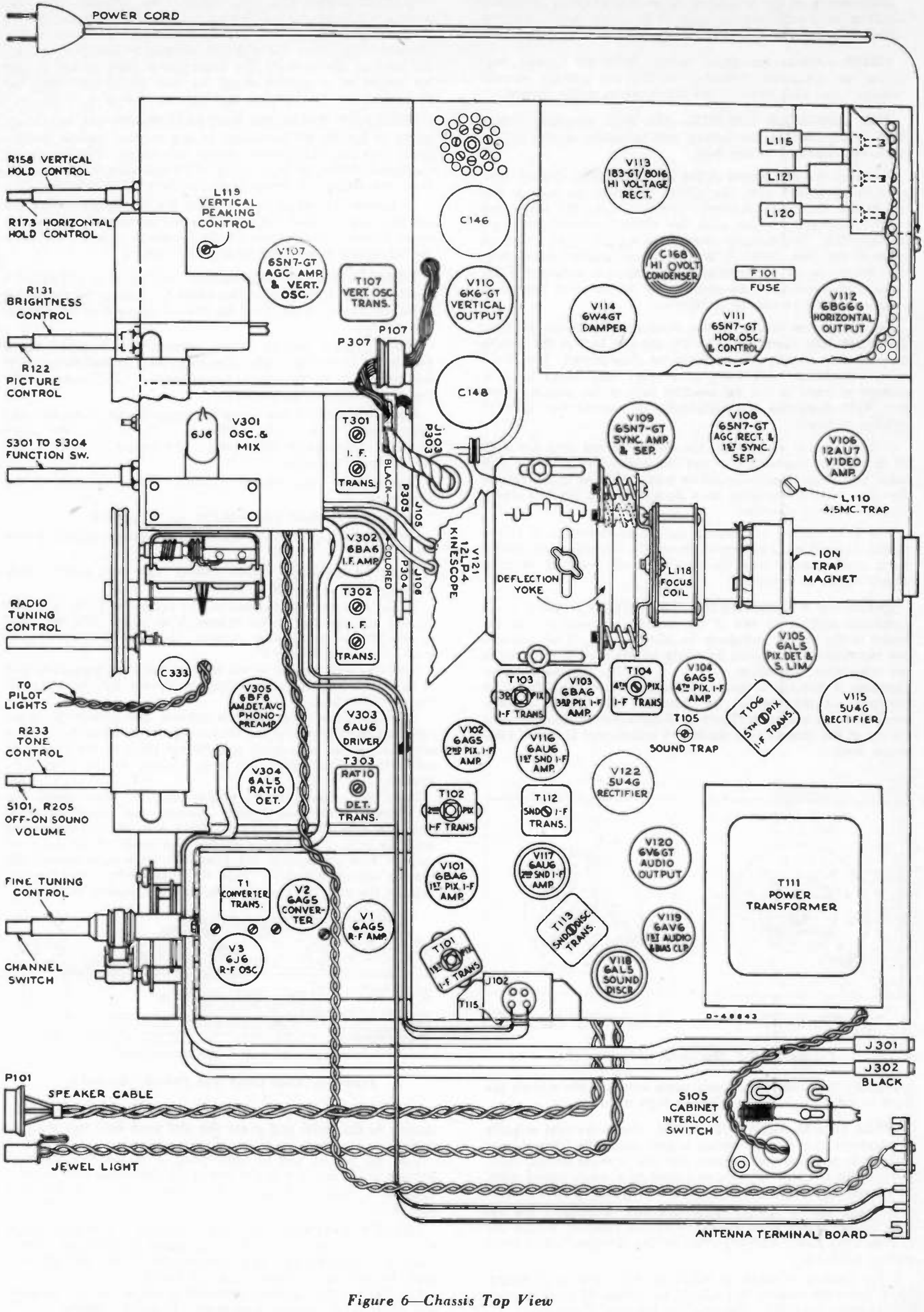


Figure 6—Chassis Top View

CHASSIS BOTTOM VIEW

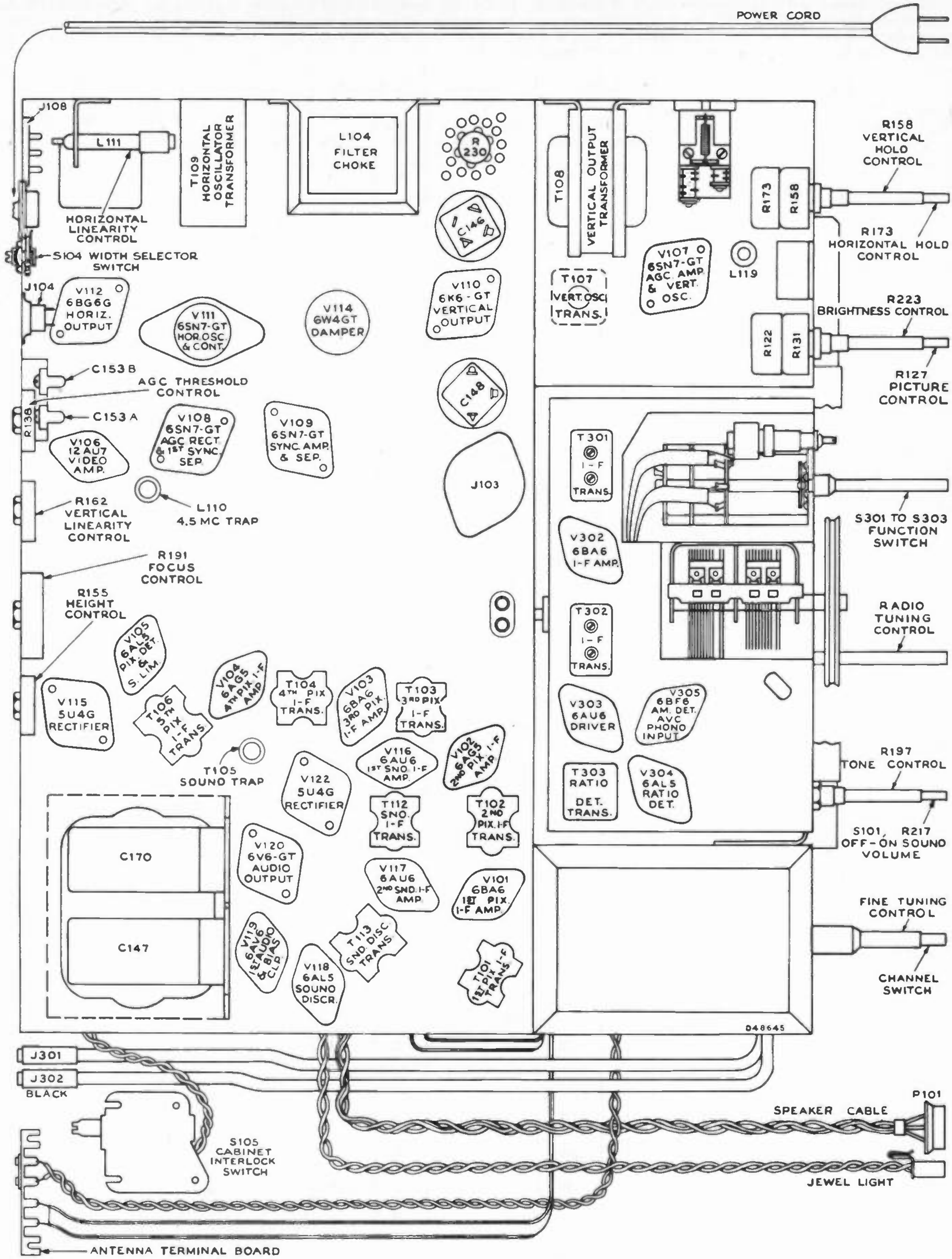


Figure 7—Chassis Bottom View

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 microvolt test pattern signal was fed into the receiver, the picture was synced and the AGC threshold control was properly adjusted. The second condition was obtained by removing the antenna leads and short-circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	140	6	142	2 & 7	0	1	−2.4	.72	.33	
			No Signal	5	67	6	111	2 & 7	0	1	−.4	14.0	5.0	
V2	6AG5	Converter	2200 Mu. V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*−3.0 to −7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*104 to 109	6	*104 to 109	2 & 7	0	1	*−2.0 to −6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*−5.1 to −7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*−4.5 to −6.6	*1.8 to 2.1	—	
V101	6BA6	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5	125	6	125	7	.4	1	−12.5	2.8	1.3	
			No Signal	5	95	6	95	7	1.1	1	+.3	7.5	3.5	
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu. V. Signal	5	115	6	115	2 & 7	.75	1	0	8.2	2.5	
			No Signal	5	100	6	100	2 & 7	.65	1	0	6.8	2.1	
V103	6BA6	3d Pix I-F Amplifier	2200 Mu. V. Signal	5	110	6	135	7	.25	1	−2.4	4.0	3.8	
			No Signal	5	60	6	100	2 & 7	.75	1	−.4	11.0	4.8	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu. V. Signal	5	170	6	135	2 & 7	1.35	1	0	6.5	2.0	
			No Signal	5	175	6	120	2 & 7	1.2	1	0	5.9	1.8	
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	−113	—	—	1	−112	—	—	.48	—	
			No Signal	7	−120	—	—	1	−120	—	—	—	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	−107	—	—	5	−56	—	—	—	—	
			No Signal	2	−80	—	—	5	−60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu. V. Signal	1	−23.2	—	—	3	−111	2	−113	4.38	—	
			No Signal	1	−19.2	—	—	3	−117	2	−120	3.82	—	
V106	12AU7	2d Video Amplifier	2200 Mu. V. Signal	6	*166	—	—	8	*−5.3	7	*−12.2	6.2	—	*At average contrast
			No Signal	6	*134	—	—	8	*−5.6	7	*−10.3	6.9	—	
V107 A	6SN7 GT	ACG Amplifier	2200 Mu. V. Signal	5	−12.6	—	—	6	−55.5	4	−56.5	.9	—	
			No Signal	5	+.3	—	—	6	−60	4	−64	.3	—	
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	76	—	—	3	−111	1	−158	.2	—	
			No Signal	2	62	—	—	3	−120	1	−169	.2	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	97	—	—	6	−3.4	4	−19.3	.3	—	
			No Signal	5	81	—	—	6	−8.7	4	−19.3	.28	—	
V108	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	96	—	—	3	−1.8	1	−19.5	.1	—	
			No Signal	2	81	—	—	3	−9.7	1	−19.3	.1	—	
V109	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	158	—	—	3	0	1	−4.7	5.25	—	
			No Signal	2	154	—	—	3	0	1	−5.2	3.75	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V109	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	230	—	—	6	–51	4	–106	.4	—	
			No Signal	5	215	—	—	6	–59	4	–80	.35	—	
V110	6K6–GT	Vertical Output	2200 Mu. V. Signal	3	223	4	223	8	–67	5	–91		*7.85	*Screen connected to plate
			No Signal	3	208	4	208	8	–79	5	–101		*7.7	
V111	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	*48	—	—	3	–110	1	–92	.2	—	*Variation of hold gives –21.9 to +56 volts on plate
			No Signal	2	*33	—	—	3	–120	1	–108	.2	—	
V111	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	70	—	—	6	–111	4	–185	2.4	—	
			No Signal	5	54	—	—	6	–120	4	–192	2.4	—	
V112	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	Do Not Meas.	8	180	3	–90	5	–110	68	-	
			No Signal	Cap	Do Not Meas.	8	170	3	–100	5	–115	67	—	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	Do Not Meas.	—	—	2 & 7	9500	—	—	0	—	
			Brightness . Average	Cap	Do Not Meas.	—	—	2 & 7	9000	—	—	.1	—	
V114	6W4GT	Damper	2200 Mu. V. Signal	5	Do Not Meas.	—	—	3	300	—	—	66	—	
			No Signal	5	Do Not Meas.	—	—	3	295	—	—	65	—	
V115 V122	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	335			2 & 6	250	—	—	210	—	*A-C measured from plate to trans. center tap
			No Signal	4 & 6	335			2 & 8	245	—	—	215	—	
V116	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	134	6	134	7	.9	1	0	8.2	3.3	
			No Signal	5	110	6	110	7	.7	1	0	5.7	2.6	
V117	6AU6	2nd Sound I-F Amplifier	2200 Mu. V. Signal	5	148	6	90	7	0	1	–9	1.6	.8	
			No Signal	5	115	6	60	7	0	1	–.65	3.35	1.15	
V118	6AL5	Sound Discrim.	2200 Mu. V Signal	2	–8.4	—	—	5	5.8	—	—	—	—	
			No Signal	2	–2.0	—	—	5	.41	—	—	—	—	
			2200 Mu. V. Signal	7	–3.7	—	—	1	0	—	—	—	—	
			No Signal	7	–1.08	—	—	1	0	—	—	—	—	
V119	6AV6	1st Audio Amplifier	2200 Mu. V. Signal	7	85	—	—	2	0	1	–.89	.49	—	
			No Signal	7	83	—	—	2	0	1	–.89	.4	—	
V120	6K6–GT	Audio Output	2200 Mu. V. Signal	3	102	4	113	8	–99	5	–108	19.3	3.3	
			No Signal	3	72	4	80	8	–111	5	–114	18	3	
V121	12LP4	Kinescope	2200 Mu. V. Signal	Cap	9000	10	290	11	51	2	20	.1	—	*Average Brightness
			No Signal	Cap	—	10	285	11	42	2	14	—	—	Average Brightness
V301	6J6	Mixer and Oscillator	No Signal	1 2	110 95	— —	— —	7	0	6 5	–2.0 –5.0	— —	—	
V302	6BA6	Radio I-F Amplifier	No Signal	5	210	6	105	7	.8	1	–0.2	—	—	
V303	6AV6	Radio F-M Driver	No Signal	5	205	6	135	7	1.5	1	0	—	—	Function switch in F-M position
V304	6AL5	Radio Radio Det.	No Signal	2 7	–0.2 –0.2	—	—	5 1	–0.2 –0.1	— —	— —	— —	— —	
V305	6BF6	Radio A-M Det.	No Signal	6 Diode	–0.2	—	—	2	0	—	—	—	—	

RADIO CHASSIS WIRING DIAGRAM

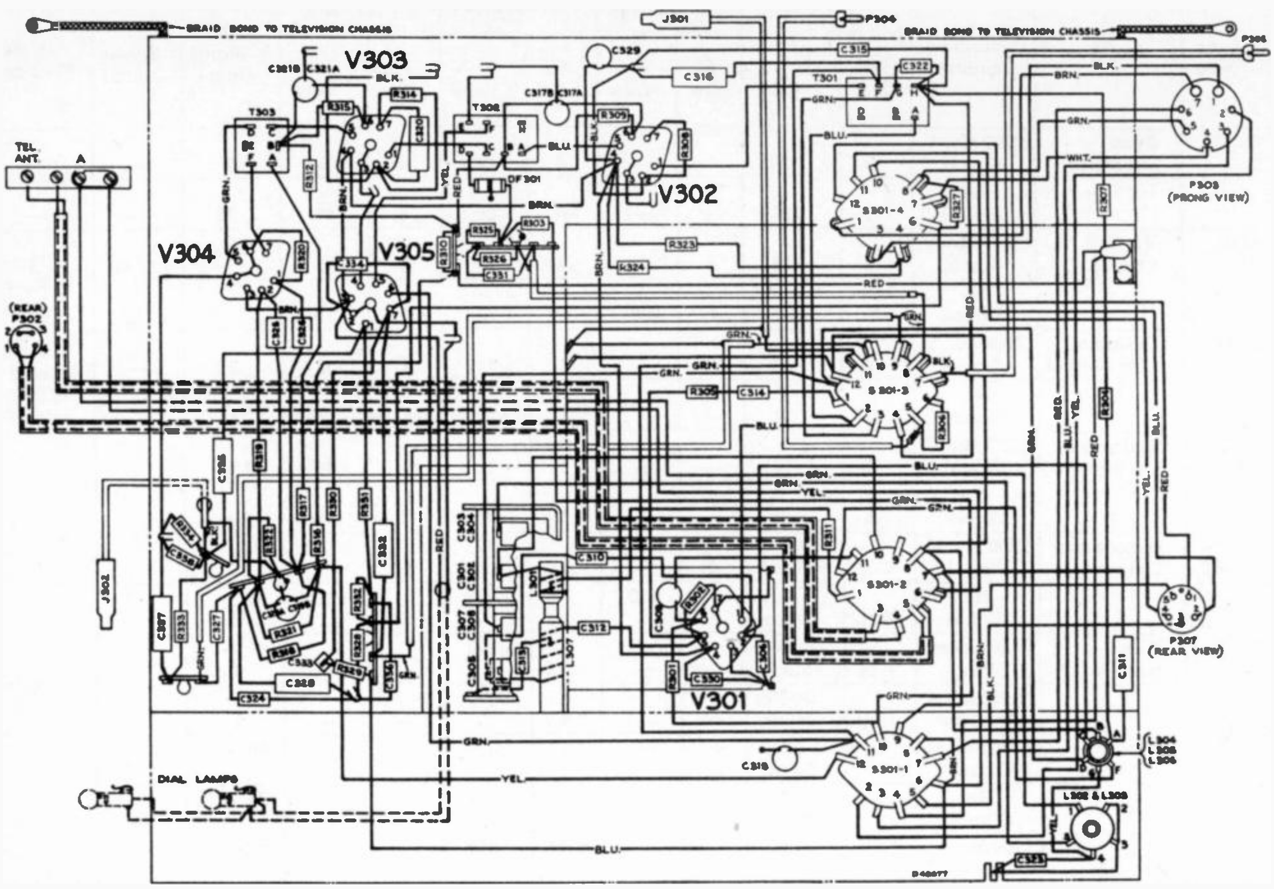


Figure 8—Radio Chassis Wiring Diagram (RK135D)

TELEVISION CRITICAL LEAD DRESS

1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V117, V118 and V119 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.
4. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
5. Leads to L102 and L103 must be as short as possible.
6. Dress peaking coils L105, L106 and L107 up and away from the chassis.
7. Dress C183 across tube pins 5 and 6 with leads not exceeding ⅜ inch.
8. Dress C129 and C130 up and away from the chassis.
9. Dress the yellow lead from the picture control away from the chassis and away from the volume-control leads. Dress the yellow lead from pin 8 of V106 away from the chassis.
10. Dress the green lead from pin 2 of V106 away from the chassis.
11. Dress R169, R169, R170, R176 and R178 up and away from the chassis.
12. The leads to the volume control should be dressed down against the chassis and away from V117 and V118.
13. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
14. Dress leads from the width control coils away from the transformer frame.
15. Dress T110 winding leads as shown in Figure 9.

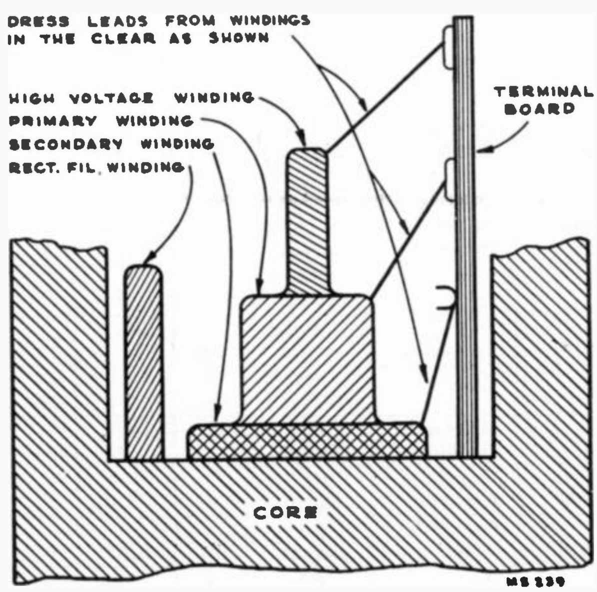
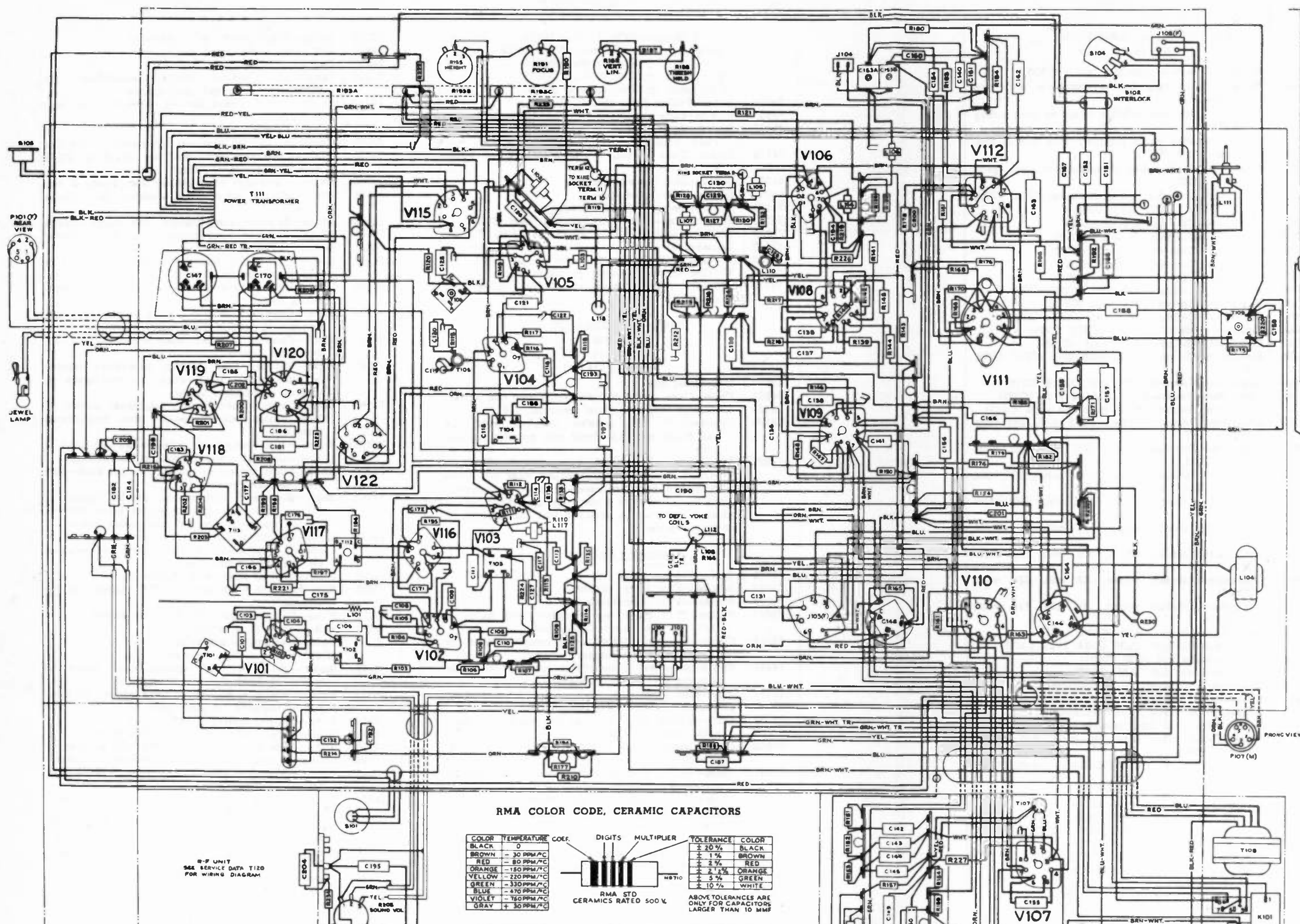


Figure 9—T110 Lead Dress

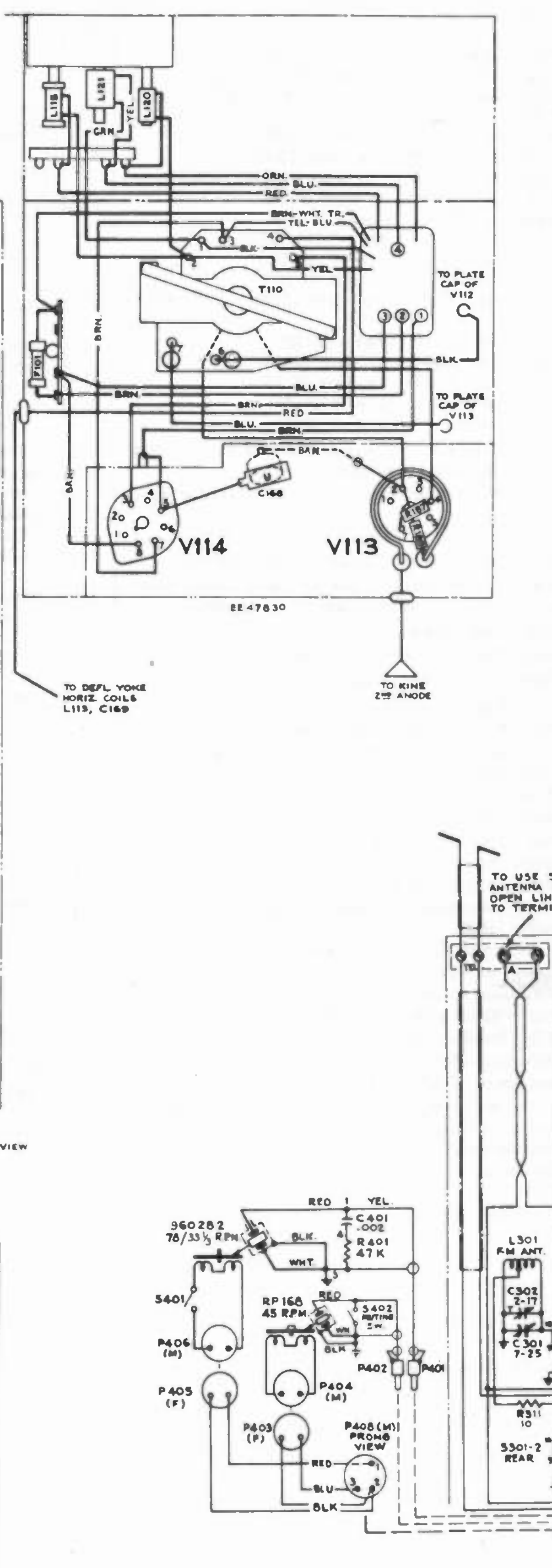
TELEVISION CHASSIS WIRING DIAGRAM



RMA COLOR CODE, CERAMIC CAPACITORS

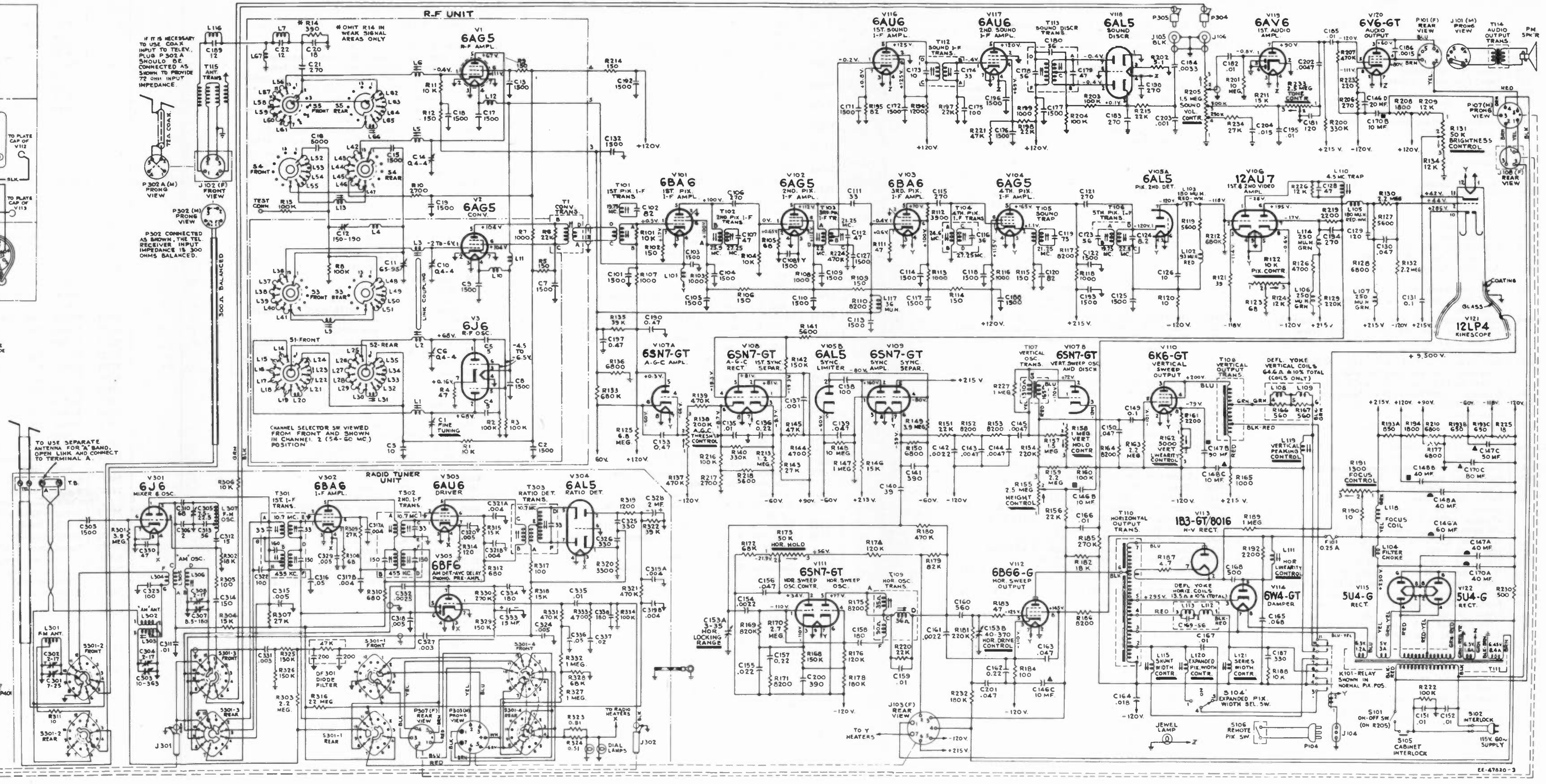
COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

Figure 10—Chassis Wiring Diagram



Function switch S301 viewed from front and shown in Number 1 (maximum counterclockwise position).

CIRCUIT SCHEMATIC DIAGRAM



Switch position 1—Television.
Switch position 2—AM.
Switch position 3—FM.
Switch position 4—Phono 45 RPM.
Switch position 5—Phono 78 RPM.

All resistance values in ohms. K = 1,000.

All capacitance values less than 1 in MF and above 1 in MMF unless noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "VoltOhmyst," no signal input with 117 v. a-c supply with the pix control fully clockwise and the brightness control set for average brightness.

Some chassis marked KCS41B were employed in this model. C184 was .01, a 1 meg resistor was added across the RP168 mute switch and R401 was 18K.

In some sets, R227 was omitted.

Figure 11—Circuit Schematic Diagram

STOCK No.	DESCRIPTION
	RF UNIT ASSEMBLIES KRK 5
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board
75067	Bracket—Vertical bracket for r-f oscillator shield
73478	Cable—I-F transmission cable (W1)
73441	Cam—Fine tuning adjustment
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5000 mmf. (C16)
73460	Coil—R-F plate coil for channel 6 (L13)
73461	Coil—Rear section—Oscillator plate coil for channel 6 (L20)
73462	Coil—Coupling inductance coil (L4)
73475	Coil—Antenna filter shunt coil (C67)
73476	Coil—I-F trap (L7, C22)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Front section—Oscillator plate coil for channel 6 (L31)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (plunger adjustment) (L1, C1)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment for oscillator section or converter section) (L2, L3, C6, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f amplifier section (L5, C14)
71493	Connector—Oscillator segment connector
73455	Core—Sliding core for fine tuning control trimmer
74187	Core—Adjustable core for coil L9
73440	Detent—R-F unit detent mechanism and fibre shaft
71487	Form—Coil form for coil L31
73453	Form—Coil form assembly for L9, L13
73442	Link—Link assembly for fine tuning
71462	Loop—Osc. to converter trimmer loop connector
73634	Nut—Speed nut for drive belt shield
73436	Plate—Front plate and bushing
73464	Pulley—Idler pulley
	Resistor—Fixed, composition:
	47 ohms, ±20%, ½ watt (R4)
	150 ohms, ±20%, ½ watt (R5, R9, R12)
	390 ohms, ±10%, ½ watt (R14)
	1000 ohms, ±20%, ½ watt (R7)
	2700 ohms, ±10%, ½ watt (R10)
	10,000 ohms, ±20%, ½ watt (R1, R11)
	100,000 ohms, ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring
30340	Retainer—Retainer ring for fine tuning stud
70881	Screw—#4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
73640	Screw—#4-40 x ⅝" adjusting screw for L66
71475	Screw—#4-40 x 15/32" adjusting screw for coils L21, L22, L23, L24
74575	Screw—#4-40 x 17/32" adjusting screw for L6
73437	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
73439	Shaft—Actuating shaft for fine tuning control
75443	Shield—"U" shape shield for bottom of r-f unit
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt
73632	Shield—Metal tube shield for V1
71494	Socket—Tube socket, moulded, 7 prong, saddle mounted
73450	Socket—Tube socket, ceramic, 7 prong, bottom mounted
74576	Spacer—Insulating spacer for front plate (4 reqd.)
73457	Spring—Return spring for fine tuning control core
74188	Spring—Retaining spring for adjustable core RCA 74187
74578	Spring—Retaining spring for adjusting screws 73640 and RCA 74575
*75068	Spring—Retaining spring for r-f oscillator tube shield
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Converter stator complete with rotor and coils (S3, L9, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L13, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55, C15, C16, R10)
75446	Stud—Capacitor stud—brass #4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 uncoded or coded "ER"
75447	Stud—Capacitor stud—brass #4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 coded numerically or "Hi Q"
73448	Transformer—Converter transformer (T1, R6)
73466	Washer—Insulating washer for front shield (1 set)
2917	Washer—"C" washer for channel selector shaft or fine tuning shaft and cam
	TELEVISION CHASSIS ASSEMBLIES KCS 41A
74593	Capacitor—Mica trimmer comprising 1 section of 3-35 mmf. and 1 section of 40-370 mmf. (C153A, C153B)
39604	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)
74726	Capacitor—Mica, 39 mmf. (C140)
64062	Capacitor—Ceramic, 82 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C175)
75060	Capacitor—Mica, 100 mmf., 1000 v. (C138)
73921	Capacitor—Ceramic, 120 mmf. (C129)
39630	Capacitor—Mica, 120 mmf. (C181)
73102	Capacitor—Mica, 180 mmf. (C158)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
39640	Capacitor—Mica, 330 mmf. (C187)
39642	Capacitor—Mica, 390 mmf. (C141, C200)
74153	Capacitor—Hi-voltage, 500 mmf., 15 kv (C168)
74250	Capacitor—Mica, 560 mmf. (C160)
71501	Capacitor—Ceramic, 1500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C127, C132, C171, C172, C176, C177, C188, C192, C193, C196)
71432	Capacitor—Electrolytic comprising 2 sections of 40 mfd. 450 volts and 1 section of 10 mfd. 450 volts (C148A, C148B, C148C)
73582	Capacitor—Electrolytic comprising 1 section of 40 mfd. 450 volts, 1 section of 10 mfd. 450 volts and 1 section of 80 mfd. 200 volts (C170A, C170B, C170C)
73583	Capacitor—Electrolytic comprising 1 section of 40 mfd. 450 volts, 1 section of 90 mfd. 150 volts, and 1 section of 50 mfd. 150 volts (C147A, C147B, C147C)
73581	Capacitor—Electrolytic comprising 1 section of 60 mfd. 450 volts, 2 sections of 10 mfd. 450 volts, and 1 section of 20 mfd. 150 volts (C146A, C146B, C146C, C146D)
73801	Capacitor—Tubular, paper, oil impregnated, .001 mfd. 600 volts (C137,C203)
73802	Capacitor—Tubular, paper, oil impregnated, .0015 mfd. 1000 volts (C186)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd. 600 volts (C142, C154, C161)

STOCK No.	DESCRIPTION
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd. 600 volts (C184)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd. 600 volts (C143, C144, C145, C202)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd. 400 volts (C135, C166, C167, C182, C195)
73565	Capacitor—Tubular, moulded paper, .01 mfd. 1000 volts (C151, C152, C185)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd. 600 volts (C159)
73797	Capacitor—Tubular, paper, oil impregnated, .015 mfd. 600 volts (C204)
74727	Capacitor—Tubular, moulded paper, oil impregnated, .018 mfd. 1000 volts (C164)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd. 400 volts (C155)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd. 400 volts (C130, C139, C201)
73592	Capacitor—Tubular, moulded paper, oil impregnated, .047 mfd. 600 volts (C150, C156)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd. 1000 volts (C163)
73815	Capacitor—Tubular, moulded paper, oil impregnated, .068 mfd. 1000 volts (C165)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd. 400 volts (C149)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd. 600 volts (C131)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd. 400 volts (C136, C157, C162)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd. 200 volts (C133, C190, C197)
73154	Choke—Filter choke (L104)
74585	Coil—Focus coil (L118)
71449	Coil—Horizontal linearity control coil (L111)
71429	Coil—Width control coil (L115, L120)
74877	Coil—Vertical peaking coil (L119)
74878	Coil—Series width coil (L121)
74170	Coil—Peaking coil (36 muh) (L117, R110)
71527	Coil—Peaking coil (93 muh) (L102)
74214	Coil—Peaking coil (180 muh) (L103, L105)
71526	Coil—Peaking coil (250 muh) (L106, L107, L114)
73477	Coil—Filament choke coil (L101)
74879	Connector—2 contact (polarized) female connector for electronic magnifier cable (J104)
72108	Connector—7 contact female connector (J103)
74594	Connector—2 contact male connector for power cord
72172	Connector—3 contact female connector (J108)
5040	Connector—4 contact female connector for speaker cable (P101)
71789	Connector—Anode connector
71521	Connector—Hi-voltage capacitor connector
14786	Connector—5 contact male connector (P107)
72734	Control—Horizontal and vertical hold control (R158, R173)
74047	Control—Brightness and picture control (R122, R131)
74359	Control—Tone control, volume control and power switch (R205, R233, S101)
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
74597	Control—Focus control (R191)
74475	Control—AGC threshold control (R138)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics #71432 and 73581
74811	Cushion—Rubber cushion for kinescope mounting
73590	Cushion—Rubber cushion for deflection yoke hood (2 required)
73600	Fuse—0.25 amp., 250 volts (F101)
71799	Grommet—Rubber grommet for yoke horizontal lead exit
37396	Grommet—Rubber grommet for mounting ceramic tube socket (2 required)
74030	Grommet—Rubber grommet for mounting radio chassis (3 required)
72283	Grommet—Rubber grommet for mounting relay (2 required)
74148	Magnet—Ion trap magnet (P.M. type)
73587	Nut—Speed nut to mount hi-voltage capacitor
18469	Plate—Bakelite mounting plate for electrolytics
33514	Receptacle—2 contact female receptacle for audio cable and switching cable (J105, J106)
74873	Relay—Electronic magnifier relay (K101)
72633	Resistor—Wire wound, 4.7 ohms, ⅓ watt (R187)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
18471	Resistor—Wire wound, 10 ohms, ½ watt (R190)
74049	Resistor—Wire wound, 500 ohms, 20 watts (R230)
73588	Resistor—Voltage divider, comprising 1 section of 850 ohms, 12 watts and 2 sections of 650 ohms, 6 watts (R193A, R193B, R193C)
	Resistor—Fixed, composition:
	10 ohms, ±20%, ½ watt (R120)
	18 ohms, ±10%, ½ watt (R225)
	39 ohms, ±10%, ½ watt (R121)
	47 ohms, ±5%, ½ watt (R111)
	47 ohms, ±20%, ½ watt (R183)
	68 ohms, ±10%, ½ watt (R105)
	68 ohms, ±20%, ½ watt (R123)
	82 ohms, ±10%, ½ watt (R195)
	100 ohms, ±10%, 2 watts (R184)
	150 ohms, ±5%, ½ watt (R102)
	150 ohms, ±10%, ½ watt (R115)
	150 ohms, ±20%, ½ watt (R106, R109, R114, R214)
	220 ohms, ±10%, 1 watt (R223)
	270 ohms, ±10%, 1 watt (R206)
	1000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R199)
	1200 ohms, ±10%, ½ watt (R196)
	1800 ohms, ±10%, 2 watts (R194, R208)
	2200 ohms, ±10%, ½ watt (R219)
	2200 ohms, ±10%, 1 watt (R161, R192)
	2700 ohms, ±10%, ½ watt (R217)
	3900 ohms, ±5%, ½ watt (R112)
	4700 ohms, ±5%, ½ watt (R126)
	4700 ohms, ±10%, ½ watt (R144)
	5600 ohms, ±5%, ½ watt (R119)
	5600 ohms, ±10%, ½ watt (R141, R218)
	5600 ohms, ±10%, 1 watt (R127)
	6800 ohms, ±5%, ½ watt (R136)
	6800 ohms, ±10%, ½ watt (R150)
	6800 ohms, ±5%, 1 watt (R128)
	6800 ohms, ±10%, 2 watts (R177, R210)
	8200 ohms, ±5%, ½ watt (R164, R175)
	8200 ohms, ±10%, ½ watt (R152, R153, R171)
	8200 ohms, ±5%, 1 watt (R117)
	8200 ohms, ±10%, 2 watts (R186)
	10,000 ohms, ±5%, ½ watt (R104)
	10,000 ohms, ±10%, ½ watt (R188)
	12,000 ohms, ±10%, ½ watt (R134, R209, R226)
	12,000 ohms, ±10%, 2 watts (R124)
	15,000 ohms, ±10%, ½ watt (R211)
	15,000 ohms, ±10%, 1 watt (R146)
	18,000 ohms, ±10%, 1 watt (R182)
	22,000 ohms, ±10%, ½ watt (R151, R156, R197, R220)
	22,000 ohms, ±20%, ½ watt (R198, R215)
	27,000 ohms, ±10%, ½ watt (R143, R234)
	39,000 ohms, ±5%, ½ watt (R135)
	47,000 ohms, ±10%, ½ watt (R145)
	47,000 ohms, ±20%, ½ watt (R221)
	68,000 ohms, ±10%, ½ watt (R172)
	82,000 ohms, ±10%, 1 watt (R179)
	100,000 ohms, ±5%, ½ watt (R203, R204)
	100,000 ohms, ±10%, ½ watt (R160, R216)
	100,000 ohms, ±20%, 1 watt (R222)
	120,000 ohms, ±5%, 1 watt (R176)
	120,000 ohms, ±10%, 1 watt (R174)
	150,000 ohms, ±10%, ½ watt (R168)
	150,000 ohms, ±20%, ½ watt (R142)
	180,000 ohms, ±10%, ½ watt (R232)
	180,000 ohms, ±5%, 1 watt (R178)
	220,000 ohms, ±10%, ½ watt (R129, R154, R181)

STOCK No.	DESCRIPTION
	270,000 ohms, ±10%, ½ watt (R185)
	330,000 ohms, ±10%, ½ watt (R140, R200)
	470,000 ohms, ±10%, ½ watt (R137, R139, R224, R180)
	470,000 ohms, ±20%, ½ watt (R207)
	560,000 ohms, ±10%, ½ watt (R212)
	680,000 ohms, ±10%, ½ watt (R133)
	820,000 ohms, ±5%, ½ watt (R169)
	1 megohm, ±10%, ½ watt (R147)
	1 megohm, ±20%, 1 watt (R189, R227)
	1.2 megohm, ±5%, ½ watt (R123)
	1.5 megohm, ±5%, ½ watt (R157)
	2.2 megohm, ±10%, ½ watt (R130, R132, R159, R163)
	2.7 megohm, ±5%, 1 watt (R170)
	3.9 megohm, ±10%, ½ watt (R149)
	6.8 megohm, ±10%, ½ watt (R125)
	10 megohm, ±10%, ½ watt (R148)
	10 megohm, ±20%, ½ watt (R201)
74416	Screw—#10-32 x 1¾" cross recessed round head screw for kinescope retaining strap
75083	Screw—#8-32 x ¼" wing screw for deflection yoke mounting
74601	Screw—#8-32 x ⅜" cross recessed binder head screw for focus coil mounting (2 required)
74602	Screw—#10-32 x 1¼" cross recessed binder head screw for focus coil adjustment (3 required)
73584	Shield—Tube shield
74937	Sleeve—Rubber sleeve for focus coil
73117	Socket—Tube socket, 7 pin, miniature
72927	Socket—Tube socket, 9 pin, miniature
31251	Socket—Tube socket, octal, wafer
73249	Socket—Tube socket, octal, ceramic, plate mounted
71508	Socket—Tube socket for 8016
74834	Socket—Kinescope socket
31364	Socket—Pilot lamp socket
73586	Spring—Compression spring used under centering control screws (3 required)
74595	Spring—Anode lead spring
74936	Spring—Suspension spring for kinescope tube socket leads
74893	Strap—Kinescope retaining strap
74596	Support—Bakelite supports (1 set) for mounting hi-voltage rectifier tube mounting plate
74872	Switch—Width selector switch (S104)
74157	Switch—Interlock switch (S105)
74892	Transformer—Power transformer 115 volt (T111)
74875	Transformer—Vertical cutout transformer (T108)
73569	Transformer—Vertical oscillator transformer (T107)
74588	Transformer—Horizontal output and hi-voltage transformer (T110)
74589	Transformer—First pix. i-f transformer (T101, C102, R101)
74590	Transformer—Second pix. i-f transformer (T102, C107)
74591	Transformer—Third pix. i-f transformer (T103, C112)
74592	Transformer—Fourth pix. i-f transformer (T104, C116)
73575	Transformer—Fifth pix. i-f transformer (T106, C123, C124)
71424	Transformer—Sound i-f transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
73576	Transformer—Horizontal oscillator transformer (T109)
73578	Transformer—Antenna transformer complete with socket and bracket (T115, J102)
73577	Trap—4.5 mc trap (L110, C128)
71778	Trap—Sound trap (T105, C119)
73476	Trap—I-F trap (L116, C189)
74282	Yoke—Deflection yoke (L108, L109, L112, L113, C189, R166, R167)
	RADIO CHASSIS ASSEMBLIES RK 135D
74039	Board—"Telv-Ant" terminal board (TB301)
74026	Bracket—Drive cord bracket complete with two pulleys—R.H.
74027	Bracket—Drive cord bracket complete with pulley—L.H.
74911	Cable—Shielded cable complete with female connector (W307, W311)
71105	Cable—Shielded cable complete with pin plug (W301, W302)
74017	Capacitor—Variable tuning capacitor (C301, C302, C303, C304, C305, C307, C308)
73866	Capacitor—Ceramic, 2 mmf. (C306)
39044	Capacitor—Ceramic, 15 mmf. (C312)
39042	Capacitor—Ceramic, 47 mmf. (C330)
73867	Capacitor—Ceramic, 56 mmf. (C313)
33379	Capacitor—Ceramic, 68 mmf. (C310)
39396	Capacitor—Ceramic, 100 mmf. (C322, C323)
48125	Capacitor—Ceramic, 150 mmf. (C314)
71922	Capacitor—Ceramic, 180 mmf. (C334, C338)
39640	Capacitor—Mica, 330 mmf. (C325, C326)
73748	Capacitor—Ceramic, 1500 mmf. (C309)
74009	Capacitor—Ceramic, dual, 4000 mmf. (C317, C319, C321)
73473	Capacitor—Ceramic, 5000 mmf. (C318, C329)
73747	Capacitor—Electrolytic, 2 mfd. 50 volts (C328)
32223	Capacitor—Electrolytic, 15 mfd. 300 volts (C333)
70602	Capacitor—Tubular, paper, .0025 mfd. 400 volts (C332)
73961	Capacitor—Tubular, paper, .003 mfd. 200 volts (C327, C331)
71553	Capacitor—Tubular, paper, .005 mfd. 400 volts (C315, C320, C324)
71923	Capacitor—Tubular, paper, .01 mfd. 200 volts (C335)
71925	Capacitor—Tubular, paper, .01 mfd. 400 volts (C311)
71928	Capacitor—Tubular, paper, .02 mfd. 200 volts (C337)
72596	Capacitor—Tubular, paper, .05 mfd. 200 volts (C336)
74455	Capacitor—Tubular, paper, .05 mfd. 400 volts (C316)
74020	Coil—Antenna coil—A.M. (L302, L303)
73744	Coil—Oscillator coil—A.M. (L304, L305, L306)
74024	Coil—Antenna coil—F.M. (L301)
74025	Coil—Oscillator coil—F.M. (L307)
36395	Connector—7 contact male connector (P103)
12493	Connector—5 contact female connector (P107B)
39153	Connector—4 prong male connector (P102)
72953	Cord—Drive cord (approximately 42" overall)
74011	Filter—Diode filter, dual 200 mmf. and 47,000 ohms (DF301)
74023	Resistor—Wire wound, 0.51 ohms, 1 watt (R323, R324)
	Resistor—Fixed, composition:
	10 ohms, ±20%, ½ watt (R311)
	68 ohms, ±20%, ½ watt (R308)
	100 ohms, ±20%, ½ watt (R305, R317)
	120 ohms, ±10%, ½ watt (R314)
	680 ohms, ±20%, ½ watt (R310, R312)
	1200 ohms, ±5%, ½ watt (R319)
	3300 ohms, ±5%, ½ watt (R320)
	4700 ohms, ±10%, ½ watt (R333)
	10,000 ohms, ±20%, ½ watt (R306)
	15,000 ohms, ±10%, ½ watt (R304)
	15,000 ohms, ±20%, ½ watt (R315, R318)
	18,000 ohms, ±10%, ½ watt (R302)
	27,000 ohms, ±10%, ½ watt (R307, R309)
	39,000 ohms, ±10%, ½ watt (R322)
	68,000 ohms, ±10%, ½ watt (R328)
	100,000 ohms, ±10%, ½ watt (R334)
	150,000 ohms, ±10%, ½ watt (R325, R326, R329)
	270,000 ohms, ±10%, ½ watt (R330)
	470,000 ohms, ±10%, ½ watt (R331)

STOCK No.	DESCRIPTION
	470,000 ohms, ±20%, ½ watt (R321)
	1 megohm, ±10%, ½ watt (R327, R332)
	2.2 megohm, ±20%, ½ watt (R303)
	3.9 megohm, ±10%, ½ watt (R301)
	22 megohm, ±20%, ½ watt (R316)
74028	Shaft—Tuning knob shaft
73632	Shield—Tube shield
73117	Socket—Tube socket, 7 pin, miniature for V301, V304, V305
74179	Socket—Tube socket, 7 pin, miniature for V302, V303
31364	Socket—Dial lamp socket
74038	Spring—Drive cord spring
74894	Switch—Selector switch (S301)
73745	Transformer—First i-f transformer dual (T301)
74019	Transformer—Second i-f transformer dual (T302)
73743	Transformer—Ratio detector transformer (T303)
33726	Washer—"C" washer for tuning shaft (rear)
34457	Washer—Spring washer for tuning shaft (front)
74172	Washer—Fibre washer to prevent drive cord slippage
	SPEAKER ASSEMBLIES 92569-8W RL-111-10 RMA-#274
13867	Cap—Dust cap
74901	Cone—Cone complete with voice coil (3.2 ohms)
5039	Connector—4 prong male connector (J101)
74900	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms) less transformer and plug
74902	Transformer—Audio output transformer (T114)
	NOTE: If stamping in instruments does not agree with above speaker number, order replacement parts by referring to model number of instruments, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74895	Back—Cabinet back
74054	Bracket—Dial lamp bracket
71599	Bracket—Pilot lamp bracket
75041	Button—Plug button for shipping bolts holes in 33/78 RPM changer (2 required)
72437	Cable—Shielded pickup cable complete with pin plug for 45 RPM changer
74298	Cable—Shielded pickup cable complete with pin plug for 33/78 RPM changer
13103	Cap—Pilot lamp cap
73803	Capacitor—Tubular, paper, .002 mfd. 400 volts
74883	Case—Plastic case and bottom cover for electronic magnifier switch
71892	Catch—Bullet catch and strike for doors (3 required)
X3067	Cloth—Grille cloth for mahogany or walnut instruments
X3090	Cloth—Grille cloth for oak instruments
74882	Connector—3 contact male connector for electronic magnifier cable
14782	Connector—3 contact male connector for record changer power cable
30868	Connector—2 contact female connector for record changer power cable
74581	Cover—Mounting screw cover for 45 RPM changer (3 required)
74891	Cushion—Vinylite cushion (edging) for masking panel
74898	Decal—Control panel function decal for mahogany or walnut instruments
74899	Decal—Control panel function decal for oak instruments
71984	Decal—Trade mark decal (RCA Victor)
74273	Decal—Trade mark decal (Victrola)
74052	Dial—Dial scale and bezel
74809	Emblem—"RCA Victor" emblem
73642	Escutcheon—Channel marker escutcheon for mahogany or walnut instruments
73740	Escutcheon—Channel marker escutcheon for oak instruments
74755	Glass—Safety glass
37396	Grommet—Rubber grommet for mounting speaker
74206	Grommet—Rubber grommet for mounting 33/78 RPM changer (4 required)
74308	Hinge—Television compartment door hinge (1 set)
74896	Hinge—Record storage compartment door hinge (1 set)
70166	Hinge—Speaker compartment door hinge—upper
73200	Hinge—Speaker compartment door hinge—lower
74051	Indicator—Station selector indicator
74959	Knob—Fine tuning knob—dark—for mahogany or walnut instruments (outer)
73995	Knob—Fine tuning knob—tan—for oak instruments (outer)
74960	Knob—Channel selector knob—dark—for mahogany or walnut instruments (inner)
74961	Knob—Channel selector knob—tan—for oak instruments (inner)
74962	Knob—Vertical hold control, brightness control or tone control knob—dark—for mahogany or walnut instruments (outer)
73999	Knob—Vertical hold control, brightness control or tone control knob—tan—for oak instruments (outer)
74978	Knob—Radio tuning or selector switch knob—dark—for mahogany or walnut instruments
74979	Knob—Radio tuning or selector switch knob—tan—for oak instruments
74963	Knob—Horizontal hold control, picture control or volume control and power switch knob—dark—for mahogany or walnut instruments (inner)
74001	Knob—Horizontal hold control, picture control or volume control and power switch knob—tan—for oak instruments (inner)
11765	Lamp—Dial or pilot lamp, Mazda 51
74208	Nut—Tee nut to mount 45 RPM changer (3 required)
74162	Plate—Mounting plate for interlock switch
74897	Pull—Door pull (4 required)
	Resistor—Fixed, composition:
	47,000 ohms, ±10%, ½ watt
74582	Screw—#8-32 x 1¾", special head screw to mount 45 RPM changer (3 required)
74269	Screw—#8-32 x ¾" trimit head screw for door pull (2 required for each pull)
74050	Slide—Station indicator slide
74835	Slide—Slide mechanism for 45 RMP drawer
74736	Slide—Slide mechanism for 33/78 RPM drawer
73643	Spring—Spring clip for channel marker escutcheon
72845	Spring—Retaining spring for knobs #73995 and 74959
14270	Spring—Retaining spring for knobs #73999, 74960, 74961, 74962, 74978 and 74979
30330	Spring—Retaining spring for knobs #74001 and 74963
74055	Spring—Spring clip for dial and bezel assembly (2 required)
74421	Spring—Conical spring to mount 45 RPM changer—upper—R.H. (1 required)
74422	Spring—Conical spring to mount 45 RPM changer—upper—L.H. (2 required)
74423	Spring—Conical spring to mount 45 RPM changer—lower (3 required)
75040	Spring—Mounting spring for 33/78 RPM changer (4 required)
74161	Stud—Locating stud for back cover
74881	Switch—Electronic magnifier switch

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

TELEVISION RECEIVERS
MODELS T164, TC165, TC166, TC167, TC168
Chassis Nos. KCS40 or KCS40A
— Mfr. No. 274 —

SERVICE DATA
— 1950 No. T5 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Model T164
Walnut, Mahogany or Oak

Model TC165
Walnut, Mahogany or Oak

Model TC166
Walnut, Mahogany or Oak

Model TC167
Walnut, Mahogany or Oak

Model TC168
Walnut, Mahogany or Oak

GENERAL DESCRIPTION

Models T164, TC165, TC166, TC167 and TC168 receivers employ twenty-one tubes plus two rectifiers and a 16GP4 kinescope. The receivers are identical except for cabinets, jewel lights and speakers. A phono input jack is provided to permit the use of an external record player.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE...... 146 square inches on a 16GP4 kinescope

R-F FREQUENCY RANGES

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range . . ±250 kc. on chan. 2, ±650 kc. on chan. 13
Picture Carrier Frequency........................ 25.75 mc.
Sound Carrier Frequency........................ 21.25 mc.

CHASSIS DESIGNATIONS

KCS40.................................... In Model T164
KCS40A............. In Models TC165, TC166, TC167, TC168

LOUDSPEAKERS

KCS40................ (92580-3W) 8" PM Dynamic, 3.2 ohms
KCS40A........... (92569-10W) 12" PM Dynamic, 3.2 ohms

POWER SUPPLY RATING...... 115 volts, 60 cycles, 250 watts

AUDIO POWER OUTPUT RATING............ 3.5 watts max.

RECEIVER ANTENNA INPUT IMPEDANCE

Choice: 300 ohms balanced or 72 ohms unbalanced.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6K6GT	Audio Output
(9)	RCA 6BA6	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6BA6	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector and Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier and Vertical Sweep Osc.
(16)	RCA 6SN7GT	AGC Rectifier and 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier and 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 6W4GT	Damper
(22)	RCA 1B3-GT/8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier
(24)	RCA 16GP4	Kinescope

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside), T164	23	21¼	21⅜
Cabinet (outside), TC165	27⅞	38¼	20⅝
Cabinet (outside), TC166	27⅝	38¾	22¾
Cabinet (outside), TC167	25¾	38¾	22¾
Cabinet (outside), TC168	26⅝	37⅞	22⅞
Chassis (overall)	19¼	11	18½

WEIGHT Model	Chassis with Tubes in Cabinet	Shipping Weight
T164	96	115
TC165	101	123
TC166	106	130
TC167	123	148
TC168	117	141

Specifications continued on page 2

ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

PICTURE INTERMEDIATE FREQUENCIES
Picture Carrier Frequency........................25.75 Mc.
Adjacent Channel Sound Trap....................27.25 Mc.
Accompanying Sound Traps......................21.25 Mc.
Adjacent Channel Picture Carrier Trap............19.75 Mc.

SOUND INTERMEDIATE FREQUENCIES
Sound Carrier Frequency.........................21.25 Mc.
Sound Discriminator Band Width between peaks.......350 kc

VIDEO RESPONSE...............................To 4 Mc.

FOCUS..Magnetic

SCANNING............................Interlaced, 525 line

HORIZONTAL SWEEP FREQUENCY..............15,750 cps

SWEEP DEFLECTION...........................Magnetic

VERTICAL SWEEP FREQUENCY.....................60 cps

FRAME FREQUENCY (Picture Repetition Rate).........30 cps

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. See that the TV-PH switch on the rear apron is in the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counter-clockwise until the retrace lines just disappear.

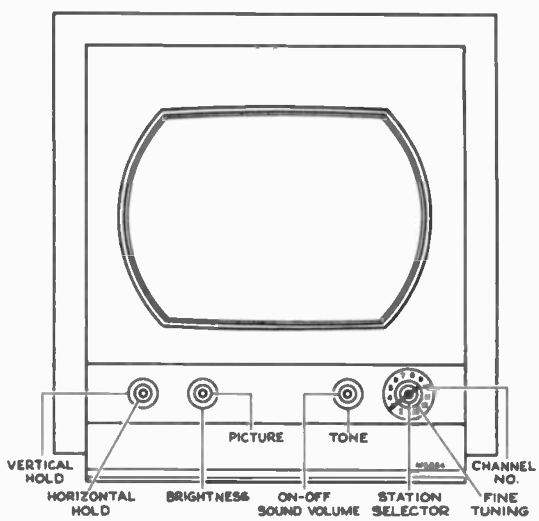


Figure 1—Receiver Operating Controls

9. Adjust the PICTURE control for suitable picture contrast.

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps 4, 8 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

13. If the positions of the controls have been changed, it may be necessary to repeat steps 2 through 9.

14. To use the instrument with a record player, plug the record-player output cable into the PHONO jack on the rear apron, and set the TV-PH switch on "PH." Set the TV-PH switch back to TV on completion of the record program.

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH-VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH-VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

INSTALLATION INSTRUCTIONS

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2, and with the part number on magnet towards the rear of the chassis. Starting from this position immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches of this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

INSTALLATION INSTRUCTIONS

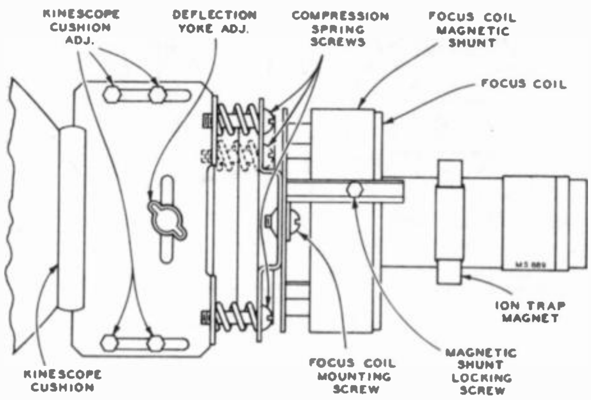


Figure 2—Yoke and Focus Coil Adjustments

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 on the rear apron (see Figure 3) clockwise until the set operates normally and the picture can be synced.

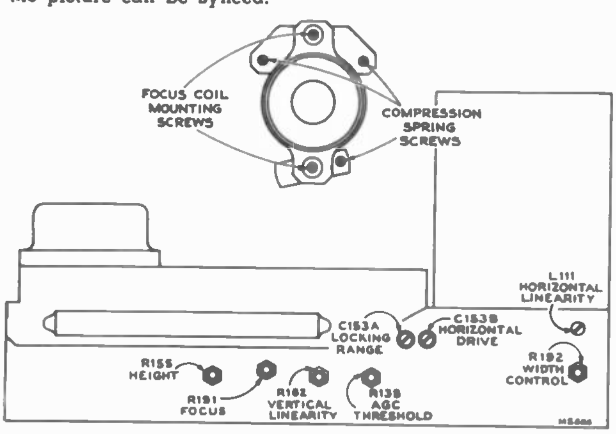


Figure 3—Rear Chassis Adjustments

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Usually the picture will remain in sync. Turn the control clockwise slowly. If the picture did fall out of sync upon removal of the signal, the number of diagonal black bars will be gradually reduced and when only 2 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. The picture should remain in sync for approximately 180 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Coil Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 180 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment.—Turn the T109 sine wave core (on the outside of the apron) all the way out of the coil.

Set the locking range trimmer C153A one-half turn out from maximum capacity.

Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and turn the frequency wave core of T109 under the chassis until the picture syncs and the sync bar just begins to move into the picture.

Note.—Occasionally, a tube may be found which does not respond to this alignment procedure since it may not be possible to sync the picture by means of the frequency core when the sine wave core is all the way out of the coil. Yet, the tube may work perfectly well when the circuit is properly aligned. In such a case, it may be necessary to turn the sine wave core in slightly, and readjust the frequency core to obtain sync.

Turn the sine wave core of T109 in until the blanking bar begins to move off to the left of the picture. Alternately turn the sine wave core in and the frequency out, keeping the picture in sync and the blanking bar showing in the picture.

Continue alternate adjustments until the picture falls from sync into a parasitic oscillation as indicated by a non-synchronized pattern which flickers in width and centering with possibly a light ragged vertical bar through the center of the screen.

Turn the sine wave core out ½ turn. Adjust the frequency core in until the picture is in sync and horizontal blanking appears as a vertical bar in the picture.

Check of Pull-in Range.—Turn the horizontal hold control fully counter-clockwise. Connect a 270K ohm resistor across C156. Momentarily switch off channel and back; the picture will then be out of sync. Turn the hold control clockwise slowly and observe the minimum number of bars obtained just before the picture pulls into sync.

The picture should snap in from two complete blanking bars. If two bars are not obtained, turn the locking range trimmer C153A in to obtain less bars or out to obtain more bars.

If C153A was adjusted, remove the 270K resistor, turn the horizontal hold control fully clockwise and adjust the T109 frequency core until horizontal blanking appears as a vertical bar in the synced picture. Then repeat the entire check of pull-in range to this point.

Repeat the adjustments under "Check of Pull-in Range" until the conditions specified are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If the oscillator does not hold sync properly at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure on page 13.

FOCUS COIL ADJUSTMENTS.—The focus coil should be adjusted so that there is approximately one-quarter inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus coil. This spacing gives best average focus over the face of the tube. The axis of the hole through the focus coil should be parallel with the axis of the kinescope neck.

The focus coil is provided with a magnetic shunt in the form of a metal sleeve as shown in Figure 2. If the receiver focuses with the focus control near the end of its range, loosen the shunt locking screw and slide the shunt backward or forward until focus occurs in the center range of the focus control.

CENTERING ADJUSTMENT.—No electrical centering controls are provided. Centering is obtained by loosening the two focus coil mounting screws and sliding the coil up or down or from side to side. If the focus coil was appreciably changed in position or if a corner of the raster is shadowed, check the position of the ion trap magnet. Reposition the magnet within the range of maximum raster brightness to eliminate the shadow and recenter the picture by sliding the coil. In no case should the magnet be adjusted to cause any loss of brightness since such operation may cause immediate or eventual damage to the tube. In extreme cases it may be necessary to adjust one or more of the three focus coil compression spring screws to eliminate a corner shadow.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage hence the brightest and best focused picture, adjust horizontal drive counter-clockwise as far as possible without losing tension on trimmer.

Set the width control to minimum picture width.

Turn the horizontal linearity coil out until appreciable loss in width occurs, then in until nearly maximum width and the best linearity is obtained. Do not run the core in beyond the point of maximum linearity change, as the current drawn by the 6BG6G then becomes excessive.

Adjust the width control for the proper picture width.

Readjust linearity, but again not beyond the point of maximum linearity change. If necessary adjust the drive control for best linearity.

If at very high line voltage, the picture width is excessive even with the width control set at minimum, turn the linearity coil out to obtain the proper width. On high line voltage, excessive width generally will be accompanied by good linearity, without retouching the drive.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS.—Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron) until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust the focus coil to align the picture with the mask.

Check to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

AGC THRESHOLD CONTROL.—The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC threshold control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counter clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counter-clockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counter-clockwise on a weak signal, then the receiver may overload when a strong signal is received.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure on page 9. The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well. See Figures 8 and 9 for their location.

Replace the cabinet back and make sure that the screws are tight in order to prevent rattling at high volume.

WEAK SIGNAL AREA OPERATION.—Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

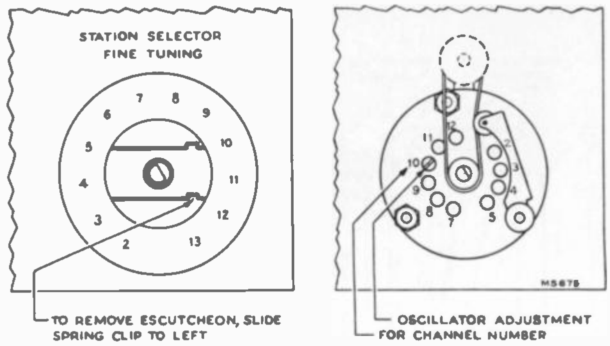


Figure 4—R-F Oscillator Adjustments

To peak the r-f unit in these receivers, disconnect the 390-ohm resistor R14 which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

CHASSIS REMOVAL.—To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the control knobs, the cabinet back, unplug the speaker cable, the kinescope socket, the antenna cable, the pilot light cable, the yoke and focus coil cable. Remove the yoke frame grounding strap and the interlock switch. Take out the six chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet.

KINESCOPE HANDLING PRECAUTION.—Do not install, remove, or handle the kinescope in any manner, unless shatter-proof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope from the cabinet, take out the four screws and one wing screw which hold the yoke frame to the cabinet. Remove the kinescope, the yoke frame with yoke and focus coil as an assembly.

INSTALLATION OF KINESCOPE.—Handle this tube by the metal rim at the edge of the screen. Do not cover the glass bell of the tube with fingermarks as it will produce leakage paths which may interfere with reception. If this portion of the tube has inadvertently been handled, wipe it clean with a soft cloth moistened with "dry" carbon tetrachloride.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and fingermarks with a soft cloth moistened with "Windex" or similar cleaning agent.

Turn the tube so that the key on the base of the tube will be down and insert the neck of the kinescope through the deflection and focus coils. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Replace the kinescope and yoke frame assembly in the cabinet. Insert the four screws and wing screw and tighten.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible. If this is not done, difficulty will be encountered in adjusting the ion trap magnet and focus coil because of shadows on the corner of the raster.

Slide the chassis into the cabinet, then insert and tighten the six chassis bolts.

Slip the ion trap magnet over the neck of the kinescope.

Connect the kinescope socket to the tube base and slip the high voltage lead clip between the rim of the kinescope and the mask.

Reconnect all other cables. Do not forget to replace the yoke frame grounding strap. Perform the entire set-up procedure beginning with Ion Trap Magnet Adjustment.

CABINET ANTENNA.—A cabinet antenna is provided which may be employed in strong signal areas in which no reflections are experienced. The antenna leads are brought out near the receiver antenna terminal board.

CHASSIS TOP VIEW

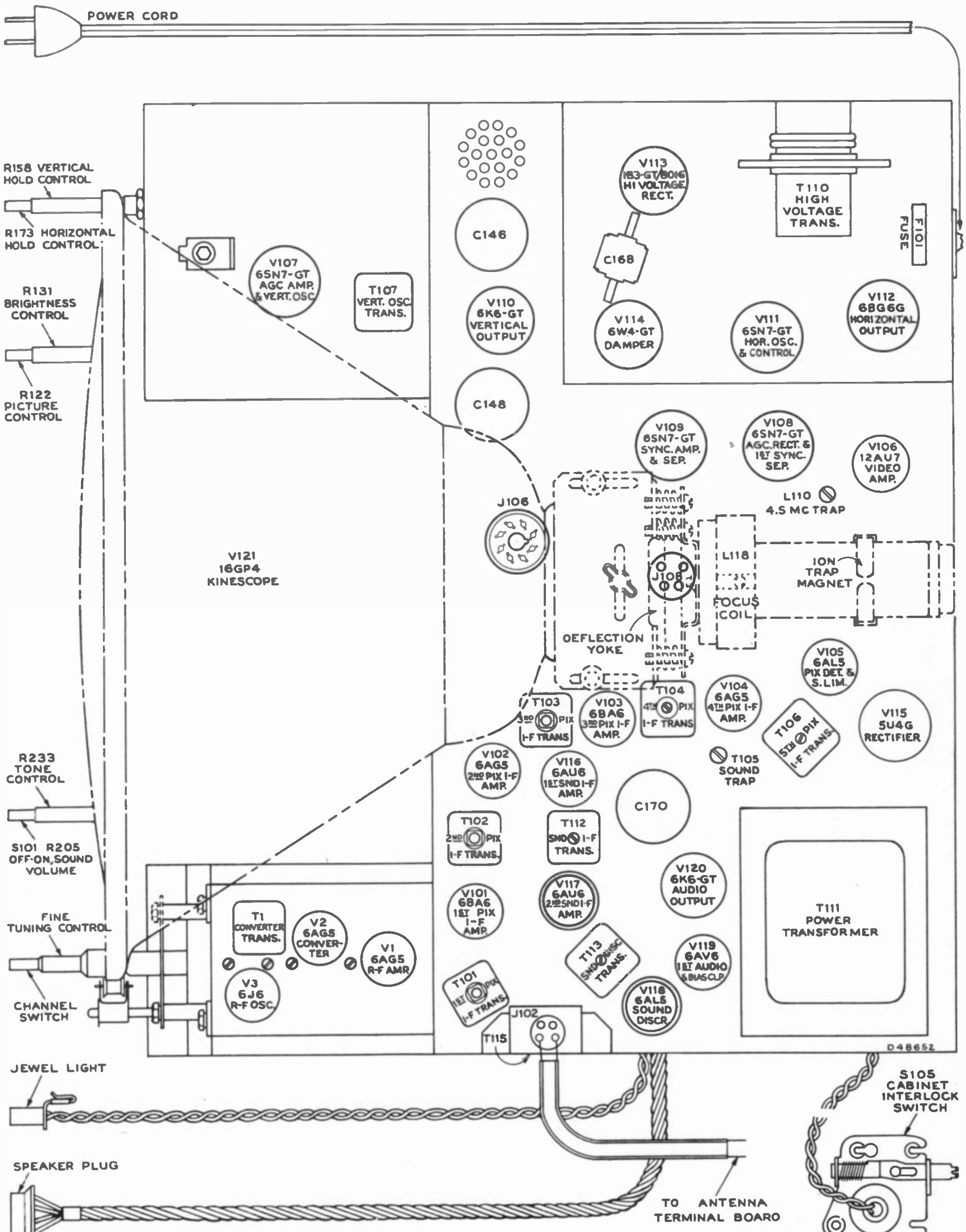


Figure 5—Chassis Top View

CHASSIS BOTTOM VIEW

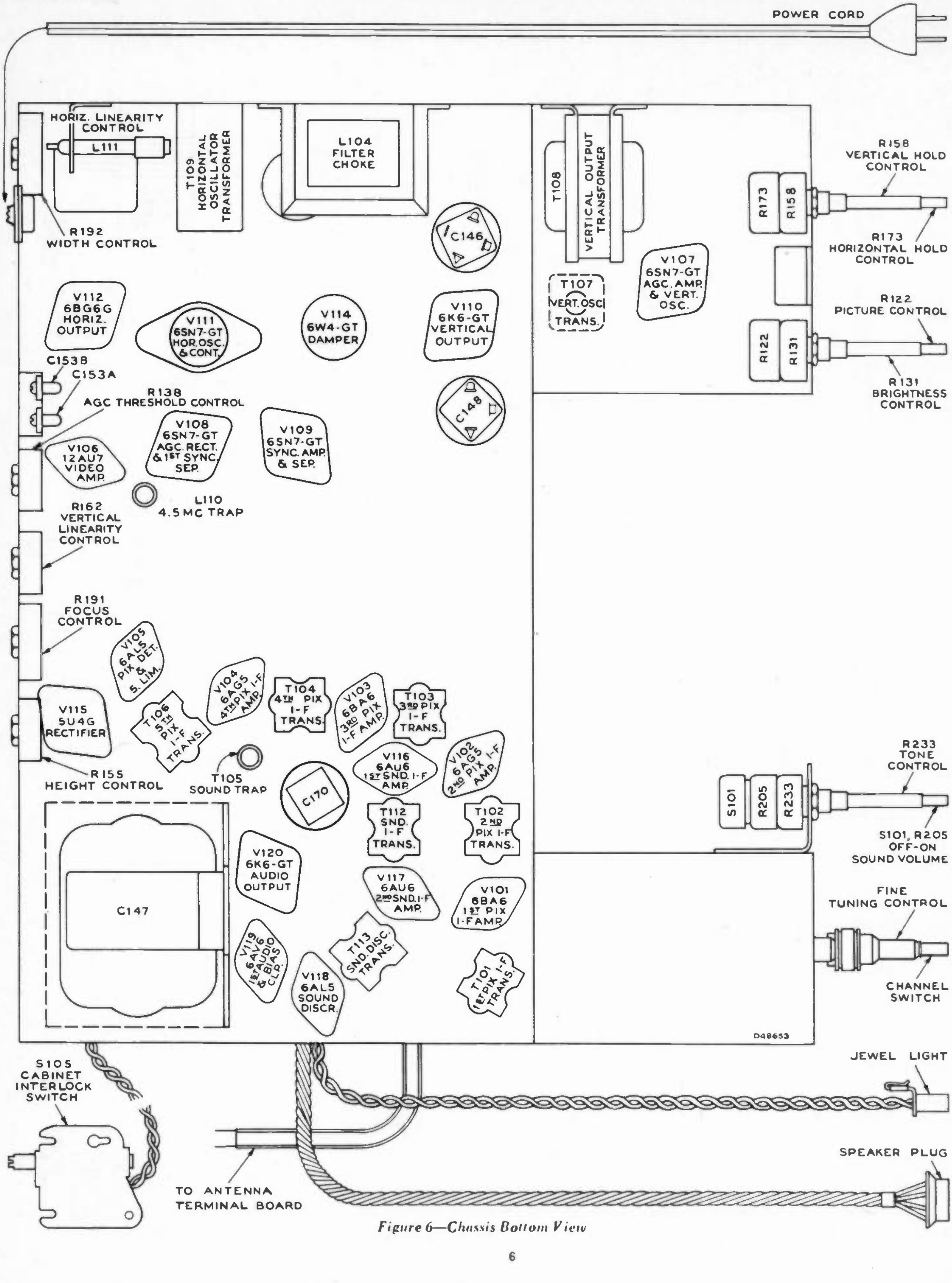


Figure 6—Chassis Bottom View

TEST EQUIPMENT. — To service properly the television chassis of this receiver, it is recommended that the following test equipment be available:

R-F Sweep Generator meeting the following requirements:

(a) Frequency Ranges
20 to 30 mc., 1 mc. and 10 mc. sweep width
50 to 90 mc., 10 mc. sweep width
170 to 225 mc., 10 mc. sweep width

(b) Output adjustable with at least .1 volt maximum.

(c) Output constant on all ranges.

(d) "Flat" output on all attenuator positions.

Cathode-Ray Oscilloscope. — For alignment purposes, the oscilloscope employed must have excellent low frequency and phase response, and should be capable of passing a 60-cycle square wave without appreciable distortion. While this requirement is not met by many commercial instruments, RCA Oscilloscopes, types WO-55A, WO-58A, WO-79A, and WO-60C fill the requirement and any of these may be employed.

For video and sync waveform observations, the oscilloscope must have excellent frequency and phase response from 10 cycles to at least two megacycles in all positions of the gain control. The RCA types WO-58A and WO-79A are ideally suited for this purpose.

Signal Generator to provide the following frequencies with crystal accuracy.

(a) Intermediate frequencies
19.75 mc. adjacent channel picture trap
21.25 mc. sound i-f and sound traps
22.05 and 24.75 mc. conv. and first pix i-f trans.
25.9 mc. second picture i-f transformer
24.6 mc. fourth picture i-f transformer
22.0 mc. third picture i-f transformer
22.5 mc. fifth picture i-f transformer
25.75 mc. picture carrier
27.25 mc. adjacent channel sound trap

(b) Radio frequencies

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.
2	55.25	59.75
3	61.25	65.75
4	67.25	71.75
5	77.25	81.75
6	83.25	87.75
7	175.25	179.75
8	181.25	185.75
9	187.25	191.75
10	193.25	197.75
11	199.25	203.75
12	205.25	209.75
13	211.25	215.75

(c) Output on these ranges should be adjustable and at least .1 volt maximum.

Heterodyne Frequency Meter with crystal calibrator if the signal generator is not crystal controlled.

Electronic Voltmeter of Junior "VoltOhmyst" type and a high voltage multiplier probe for use with this meter to permit measurements up to 15 kv.

Service Precautions. — If possible, the chassis should be serviced without the kinescope. However, if it is necessary to view the raster during servicing, it would be a great convenience to have a set of yoke, focus coil, kinescope socket, high voltage and speaker extension cables.

CAUTION: Do not short the kinescope second-anode lead. Its short circuit current represents a considerable overload on the high voltage rectifier V113.

Adjustments Required. — Normally, only the r-f oscillator line will require the attention of the service technician. All other circuits are either broad or very stable and hence will seldom require readjustment.

The oscillator line is relatively non-critical. When oscillator tubes are changed, in all probability it will be necessary to adjust only C6 in order to bring the entire line into adjustment.

ORDER OF ALIGNMENT. — When a complete receiver alignment is necessary, it can be most conveniently performed in the following order:

(1) Sound discriminator
(2) Sound i-f transformers
(3) Picture i-f traps
(4) Picture i-f transformers
(5) R-F and converter lines
(6) R-F oscillator line
(7) 4.5 mc. video trap
(8) Sensitivity check

SOUND DISCRIMINATOR ALIGNMENT. — Set the signal generator for approximately .1 volt output at 21.25 mc. and connect it to the second sound i-f grid.

Detune T113 secondary (bottom).

Set the "VoltOhmyst" on the 3-volt scale.

Connect the meter, in series with a 1-megohm resistor, to the junction of diode resistors R203 and R204.

Adjust the primary of T113 (top) for maximum output on the meter.

Connect the "VoltOhmyst" to the junction of C183 and R203. Adjust T113 secondary (bottom). It will be found that it is possible to produce a positive or negative voltage on the meter dependent upon this adjustment. Obviously to pass from a positive to a negative voltage, the voltage must go through zero. T113 (bottom) should be adjusted so that the meter indicates zero output as the voltage swings from positive to negative. This point will be called discriminator zero output.

Connect the sweep oscillator to the grid of the second sound i-f amplifier.

Adjust the sweep band width to approximately 1 mc. with the center frequency at approximately 21.25 mc. and with an output of approximately .1 volt.

Connect the oscilloscope to the junction of C183 and R203. The pattern obtained should be similar to that shown in Figure 12. If it is not, adjust T113 (top) until the waveform is symmetrical.

The peak-to-peak band width of the discriminator should be approximately 350 kc. and the trace should be linear from 21.175 mc. to 21.325 mc.

SOUND I-F ALIGNMENT. — Connect the sweep oscillator to the first sound i-f amplifier grid.

Connect the oscilloscope to the second sound i-f grid return (terminal A of T112) in series with a 33,000-ohm isolating resistor.

Insert a 21.25 mc. marker signal from the signal generator into the first sound i-f grid.

Adjust T112 (top and bottom) for maximum gain and symmetry about the 21.25 mc. marker. The pattern obtained should be similar to that shown in Figure 13.

The output level from the sweep should be set to produce approximately .3 volt peak-to-peak at the second sound i-f grid return when the final touches on the above adjustment are made. It is necessary that the sweep output voltage should not exceed the specified values otherwise the response curve will be broadened, permitting slight misadjustment to pass unnoticed and possibly causing distortion on weak signals.

The band width at 70% response from the first sound i-f grid to the second i-f grid should be approximately 200 kc.

ALIGNMENT PROCEDURE

PICTURE I-F TRAP ADJUSTMENT. — Connect the "VoltOhmyst" to the junction of R135 and C190.

Remove the 6SN7GT AGC Amplifier tube V107. Connect a 250,000-ohm potentiometer between pins 5 and 6 of the V107 socket. Adjust the potentiometer until the "VoltOhmyst" reads approximately −12 volts.

Set the channel switch to the blank position between channels number 2 and 13.

Connect the "VoltOhmyst" across the picture detector load resistor R119. Under this condition, both leads of the meter are at approximately −120 volts. In making this connection, care should be taken not to touch the case of the meter or to permit the meter case to become grounded.

Connect the output of the signal generator to the grid of the converter tube V2. To do this, remove the tube from the socket and fashion a clip by twisting one end of a small piece of wire around pin number 1. Replace the tube in the socket leaving the end of the wire protruding from under the tube. Connect the signal generator to this wire through a 1,500 mmf capacitor keeping the leads as short as possible.

Set the generator to each of the following frequencies and with a thin fiber screwdriver tune the specified adjustment for minimum indication on the "VoltOhmyst." In each instance the generator should be checked against a crystal calibrator to insure that the generator is exactly on frequency.

(1) 21.25 mc.—T103 (top)	(4) 27.25 mc.—T104 (top)
(2) 21.25 mc.—T105 (top)	(5) 19.75 mc.—T106 (top)
(3) 27.25 mc.—T102 (top)	(6) 19.75 mc.—T101 (top)

In the above transformers using threaded cores, it is possible to run the cores completely through the coils and secure two peaks or nulls. The correct position is with the cores in the outside ends of the coils. If the cores are not in the correct position, the coupling will be incorrect and it will be impossible to secure the correct response.

PICTURE I-F TRANSFORMER ADJUSTMENTS. — Set the signal generator to each of the following frequencies and peak the specified adjustment for maximum indication on the "VoltOhmyst." During alignment, reduce the input signal if necessary to prevent overloading.

22.5 mc.—T106 (bottom)
24.6 mc.—T104 (bottom)
22.0 mc.—T103 (bottom)
25.9 mc.—T102 (bottom)

T1 and T101 are coupled by a link and in combination constitute an overcoupled transformer. The characteristics of such a transformer are such that it is impossible to adjust it to a single frequency.

To sweep align T1 and T101, connect a 330-ohm composition resistor across the primary coils of T102, T103, T104 and T106.

Connect the "VoltOhmyst" to the junction of R135 and C190. Adjust the 250,000-ohm variable resistor for −2.0 volts on the meter.

Connect the oscilloscope to the plate of the first video amplifier, pin 1 of V106.

Connect a sweep generator to the converter grid through a 1,500 mmf capacitor. Set the generator to sweep from 20.0 mc. to 30.0 mc. and adjust the output to provide a 4-volt peak-to-peak signal on the scope.

Connect the signal generator loosely to the converter grid and tune it to provide markers at 22.05 mc. and 24.75 mc.

Adjust T1 (top) and T101 (bottom) to obtain the response shown in Figure 14. The T1 core must penetrate to the terminal-board end of the coil in order to obtain the correct response.

Remove the 330-ohm resistors from across T102, T103, T104 and T106.

Adjust the 250,000-ohm potentiometer for a 15-volt peak-to-peak signal at the plate of the first video amplifier. The bias as measured by the "VoltOhmyst" should be −12 volts or less.

Observe and analyze the response curve obtained. The response will not be ideal and the i-f adjustments must be retouched in order to obtain the desired curve. See Figure 15.

On final adjustment the picture carrier marker must be at approximately 45% response. The curve must be approximately flat topped, with the 22.1 mc. marker at approximately 95% response and the 25.0 mc. marker below 90% response. A 26.5 mc. marker must fall between 5 and 10% response.

The most important consideration in making the i-f adjustments is to get the picture carrier at the 45% response point. If the picture carrier operates too low on the response curve, loss of low frequency video response, of picture brilliance, of blanking, and of sync may occur. If the picture carrier operates too high on the response curve, the picture becomes smeared. In making these adjustments, care should be taken to see that no two transformers are tuned to the same frequency as i-f oscillation may result.

Remove the converter tube and take off the clip to pin number 1. Replace the tube in the socket.

Picture I-F Oscillation. — If the receiver will operate without oscillating with the test equipment disconnected but breaks into oscillation or becomes unstable with the equipment connected, it may become necessary to establish a ground plane. Cover the test bench with a sheet of copper and set the chassis on the sheet. Set all the test equipment except the "VoltOhmyst" on the sheet and bond or bypass them to it. A Junior "VoltOhmyst" should not be bonded to the sheet since the negative test probe is not always connected to ground during alignment. If the receiver is badly misaligned and two or more of the i-f transformers are tuned to the same frequency, the receiver may fall into i-f oscillation. I-F oscillation shows up as a voltage across the picture detector load resistor that is unaffected by r-f signal input. If such a condition is encountered, it is sometimes possible to stop oscillation by adjusting the transformers approximately to frequency by setting the adjustment cores of T101, T102, T103, T104, T105 and T106 to be approximately equal to those of another receiver known to be in proper alignment. If this does not have the desired effect, it may now be possible to stop oscillation by increasing the grid bias. If so, it should then be possible to align the transformers by the usual method. Once aligned in this manner, the i-f amplifier should be stable with reduced bias.

If the oscillation cannot be stopped in the above manner, shunt the grids of the first three pix i-f amplifiers to ground with 1,000 mmf. capacitors. Connect the signal generator to the fourth pix i-f grid and align T106 to frequency. Progressively remove the shunt from each grid and align the plate coil of that stage to frequency.

If this does not stop the oscillation, the difficulty is not due to i-f misalignment as the i-f section is stable when properly aligned. Check all i-f by-pass condensers, transformer shunting resistors, tubes, socket voltages, etc.

ANTENNA, R-F AND CONVERTER LINE ADJUSTMENT. — In order to align the r-f tuner, it will first be necessary to set the channel-13 oscillator to frequency. The shield over the bottom of the r-f unit must be in place when making any adjustments.

The channel-13 oscillator may be aligned by adjusting it to beat with a crystal-calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available. Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated.

If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, couple the meter probe loosely to the receiver oscillator.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier signal, connect the signal generator to the receiver antenna terminals. Connect the "VoltOhmyst" to the sound discriminator output (junction of C183 and R203).

Set the receiver switch to 13.

Adjust the frequency standard to the correct frequency (237 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range.

Adjust C6 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator.

Now that the channel-13 oscillator is set to frequency, we may proceed with the r-f alignment.

Connect the "VoltOhmyst" to the junction of R135 and L117. Adjust the 250K pot. for –3.5 volts on the meter

Remove the first pix i-f amplifier tube V101.

Connect the oscilloscope to the test connection at R13 in the r-f tuning unit.

Connect the r-f sweep oscillator to the receiver antenna terminals. The method of connection depends upon the output impedance of the sweep. The P102 connections for 300-ohm balanced or 72-ohm single-ended input are shown in the circuit diagrams in Figure 78. If the sweep oscillator has a 50-ohm single-ended output, 300-ohm balanced output can be obtained by connecting as shown in Figure 7.

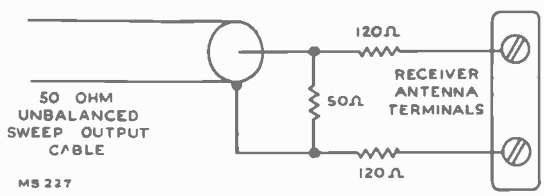


Figure 7—Unbalanced Sweep Cable Termination

Connect the signal generator loosely to the receiver antenna terminals.

Since channel 7 has the narrowest response of any of the high frequency channels, it should be adjusted first.

Set the receiver channel switch to channel 7.

Set the sweep oscillator to cover channel 7.

Insert markers of channel 7 picture carrier and sound carrier, 175.25 mc. and 179.75 mc.

Adjust C10 and C14 until the curve falls symmetrically between the sound and picture carrier markers. Adjust C11 to give the proper band width. Roughly peak L6 in conjunction with slight adjustments of C10 and C14 for a flat-topped response curve with the sound and picture carriers at 90% to 95% response points on this curve. See Figure 16, channel 7.

Switch to channel 12 and adjust L6 for maximum response and minimum top slope of the curve.

Check the response of channels 7 through 13 by switching the receiver channel switch, sweep oscillator and marker oscillator to each of these channels and observing the response obtained. See Figure 16 for typical response curves. It should be found that all these channels have the proper shaped response with the markers above 80% response. If the markers do not fall within this requirement on one or more high frequency channels, since there are no individual channel adjustments, it will be necessary to readjust L6, C10, C11 and C14, and possibly compromise some channel slightly in order to get the markers up on other channels. Normally, however, no difficulty of this type should be experienced since the higher frequency channels are comparatively broad and the markers easily fall within the required range.

Channel 6 is next aligned in the same manner.

Set the receiver to channel 6.

Set the sweep oscillator to cover channel 6.

Set the marker oscillator to channel 6 picture and sound carrier frequencies.

Adjust L9, L13, L66, and C12 for an approximately flat-topped response curve located symmetrically between the markers. L9, L13 and L66 are the center frequency adjustments. C12 is the band-width adjustment

Check channels 5 down through channel 2 by switching the receiver, sweep oscillator and marker oscillator to each channel and observing the response obtained. In all cases, the markers should be above the 80% response point. If this is not the case, L9, L13, L66 and C12 should be retouched. On final adjustment, all channels must be within the 80% specification.

Disconnect the 250K pot., and replace V107 and V101.

Following an r-f alignment, the oscillator alignment must be checked.

R-F OSCILLATOR LINE ADJUSTMENT. — The r-f oscillator line may be aligned by adjusting it to beat with a crystal calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available.

Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated. If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, the calibration frequency listed under R-F Osc. Freq. must be available.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier frequency, the frequencies listed under Sound Carrier Freq. must be available.

Channel Number	Receiver R-F Osc. Freq. Mc.	R-F Sound Carrier Freq. Mc.	Channel Oscillator Adjustment
2	81	59.75	L24
3	87	65.75	L23
4	93	71.75	L22
5	103	81.75	L21
6	109	87.75	L31
7	201	179.75	L19
8	207	185.75	L18
9	213	191.75	L17
10	219	197.75	L16
11	225	203.75	L15
12	231	209.75	L14
13	237	215.75	C6

If the heterodyne frequency meter method is used, couple the meter probe loosely to the receiver oscillator.

If the r-f sound carrier method is used, connect the "VoltOhmyst" to the sound discriminator output (junction of C183 and R203) and connect the signal generator to the receiver antenna terminals. The order of alignment remains the same regardless of which method is used.

If the r-f unit is removed from the receiver for service and is aligned separately, the shield over the bottom of the r-f unit must be in place when making adjustments.

Since the lower frequencies are obtained by adding steps of inductance, it is necessary to align channel 13 first and continue in reverse numerical order.

Set the receiver channel switch to 13.

Adjust the frequency standard to the correct frequency (237 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range while making the adjustment.

Adjust C6 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator. Oscillator adjustments L1 and L2 shown on the schematic are factory control adjustments and should not be touched in the field.

Switch the receiver to channel 12.

Set the frequency standard to the proper frequency as listed in the alignment table.

Adjust L14 for indications as above.

Adjust the oscillator to frequency on all channels by switching the receiver and the frequency standard to each channel and adjusting the appropriate oscillator trimmer for the speci-

Continued on page 13

T164, TC165, TC166, TC167, TC168

ALIGNMENT TABLE

THE DETAILED ALIGNMENT PROCEDURE BEGINNING ON PAGE 7 SHOULD BE READ BEFORE ALIGNMENT BY USE OF THE TABLE IS ATTEMPTED.

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
DISCRIMINATOR AND SOUND I-F ALIGNMENT									
1	2nd sound i-f grid (pin 1, V117)	21.25 .1 volt output	Not used		Not used	In series with 1 meg. to junction of R203 & R204		Detune T113 (bot.) Adjust T113 (top) for max. on meter	Fig. 8 Fig. 9 Fig. 10
2	"	"	"		"	Junct. of C183 & R203	Meter on 3 volt scale	T113 (bottom) for zero on meter	Fig. 9 Fig. 10
3	"	"	2nd sound i-f grid (pin 1, V117)	21.25 center 1 mc. wide .1 v. out	Junction of C183 & R203	Not used	Check for symmetrical response waveform (positive & negative). If not equal adjust T113 (top) until they are equal		Fig. 10 Fig. 12
4	1st sound i-f grid (pin 1, V116)	21.25 reduced output	1st sound i-f grid	21.25 reduced output	Terminal A, T112 in series with a 33,000 ohm resistor	"	Sweep output reduced to provide .3 volt p-to-p on scope	T112 (top & bot.) for max. gain and symmetry at 21.25 mc.	Fig. 8 Fig. 9 Fig. 10 Fig. 13
PICTURE I-F AND TRAP ADJUSTMENT									
5	Not used		Not used		Not used	Junction of R135 & C190	Remove V107. Connect potentiometer between pins 5 & 6 of V107 socket	Adjust pot. for meter reading of −12 volts	Fig. 10
6	Converter grid (pin 1, V2)	21.25	"		"	Across R119	Meter on 3 volt scale. Receiver between 2 and 13	T103 (top) for min. on meter	Fig. 8
7	"	21.25	"		"	"	"	T105 (top) for min.	"
8	"	27.25	"		"	"	"	T102 (top) for min.	"
9	"	27.25	"		"	"	"	T104 (top) for min.	"
10	"	19.75	"		"	"	"	T106 (top) for min.	"
11	"	19.75	"		"	"	"	T101 (top) for min.	"
12	"	22.5	"		"	"	"	T106 (bottom) for max. on meter	Fig. 9
13	"	24.6	"		"	"	"	T104 (bottom) for max.	"
14	"	22.0	"		"	"	"	T103 (bottom) for max.	"
15	"	25.9	"		"	"	"	T102 (bottom) for max.	"
16	"	22.05 24.75	Converter grid (pin 1, V2)	Sweeping 20 to 30 mc.	Pin 1, V106	Junction of R135 & C190	Shunt 330 ohms across pri. T102, T103, T104, T106. Set bias −2 V. Set swp. gen. for 4 V. P-P on scope.	Adjust T1 (top) and T101 (bottom) for proper response	Fig. 8 Fig. 9 Fig. 14
17	"		"	"	"	"	Remove shunt resistors. Set bias to give 15 volts P to P on scope.	Adjust T1 (top), T101, T102, T103, T104, T106 (bot.) for proper resp.	Fig. 8 Fig. 9 Fig. 15
ANTENNA, R-F AND CONVERTER LINE ALIGNMENT									
18	Antenna terminals	215.75	Not used		Not used	Junction of C183 & R203 for signal gen. method only	Fine tuning centered. Receiver on channel 13. Heterodyne meter coupled to oscillator if used.	C6 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10
19						Junction of R135 & L117	Remove V101	Potentiometer for −3.5 volts on meter	Fig. 8 Fig. 10
20	Antenna terminal (loosely)	175.25 & 179.75	Antenna terminals (see text for precaution)	Sweeping channel 7	Test Connection R13	Not used	Receiver on channel 7	L6, C10, C11 & C14 for flat top response between markers. Markers above 90%.	Fig. 8 Fig. 9 Fig. 16 (7)
21	"	205.25 209.75	"	channel 12	"	"	Receiver on channel 12	L6 for max. response and min. slope of top of curve	Fig. 8 Fig. 16 (12)
22	"	175.25 179.75	"	channel 7	"	"	Receiver on channel 7	Check to see that response is as above	Fig. 16 (7)
23	"	181.25 185.75	"	channel 8	"	"	Receiver on channel 8	"	Fig. 16 (8)
24	"	187.25 191.75	"	channel 9	"	"	Receiver on channel 9	"	Fig. 16 (9)
25	"	193.25 197.75	"	channel 10	"	"	Receiver on channel 10	"	Fig. 16 (10)

ALIGNMENT PROCEDURE

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
	ANTENNA, R-F AND CONVERTER LINE ALIGNMENT (Continued)								
26	"	199.25 203.75	"	channel 11	"	"	Receiver on channel 11	"	Fig. 16 (11)
27	"	205.25 209.75	"	channel 12	"	"	Receiver on channel 12	"	Fig. 16 (12)
28	"	211.25 215.75	"	channel 13	"	"	Receiver on channel 13	"	Fig. 16 (13)
29	If the response on any channel (steps 22 through 28) is below 80% at either marker, switch to that channel and adjust L6, C10, C11 & C14 to pull response up on that channel. Then recheck steps 22 through 28.								
30	Antenna terminals (loosely)	83.25 87.75	Ant. terminals (see text for precaution)	Sweeping chan. 6	Test Connection R13	Not used	Receiver on channel 6	L9, L13, L66 & C12 for response as above	Fig. 16 (6)
31	"	77.25 81.75	"	channel 5	"	"	Receiver on channel 5	Check to see that response is as above	Fig. 16 (5)
32	"	67.25 71.75	"	channel 4	"	"	Receiver on channel 4	"	Fig. 16 (4)
33	"	61.25 65.75	"	channel 3	"	"	Receiver on channel 3	"	Fig. 16 (3)
34	"	55.25 59.75	"	channel 2	"	"	Receiver on channel 2	"	Fig. 16 (2)
35	If the response on any channel (steps 31 through 34) is below 80% at either marker, switch to that channel and adjust L9, L13, L66 & C12 to pull response up on that channel. Then recheck steps 30 through 34. Disconnect the bias pot. and replace V101 and V107.								

R-F OSCILLATOR ALIGNMENT

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
36	Antenna terminals	215.75	Loosely coupled to r-f osc.	237	Not used	Junction of C183 & R203 for sig. gen. method only	Fine tuning centered. Receiver on channel 13	C6 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10
37	"	209.75	"	231	"	"	Rec. on chan. 12	L14 as above	Fig. 11
38	"	203.75	"	225	"	"	Rec. on chan. 11	L15 as above	"
39	"	197.75	"	219	"	"	Rec. on chan. 10	L16 as above	"
40	"	191.75	"	213	"	"	Rec. on chan. 9	L17 as above	"
41	"	185.75	"	207	"	"	Rec. on chan. 8	L18 as above	"
42	"	179.75	"	201	"	"	Rec. on chan. 7	L19 as above	"
43	"	87.75	"	109	"	"	Rec. on chan. 6	L31 as above	Fig. 9
44	"	81.75	"	103	"	"	Rec. on chan. 5	L21 as above	Fig. 11
45	"	71.75	"	93	"	"	Rec. on chan. 4	L22 as above	"
46	"	65.75	"	87	"	"	Rec. on chan. 3	L23 as above	"
47	"	59.75	"	81	"	"	Rec. on chan. 2	L24 as above	"
48	Repeat steps 36 through 47 as a check.								
	AGC THRESHOLD ADJUSTMENT								
49	Not used		Not used		Pin 1, V106	Not used	Tune in station, turn pix control clockwise. Adjust R138 for max. gain without clipping sync on scope		Fig. 10 Fig. 17
	HORIZONTAL OSCILLATOR ADJUSTMENT								
50	Short circuit terminals C and D of T109. Tune in a station. Set locking range trimmer C153A ½ turn out from maximum.								
51	Turn hold control fully clockwise. Adjust T109 Frequency Adjustment until horizontal blanking bar appears in the picture.								
52	Turn hold control ¼ turn from clockwise to sync picture. Adjust width (R192), linearity (L111) and drive (C153B) controls until picture is correct. Repeat step 51, then proceed with step 53.								
53	Remove clip from terminals C and D of T109. Turn hold control fully clockwise. Adjust T109 Oscillator Waveform Adjustment until horizontal blanking bar appears in picture with core in outer of two possible positions.								
54	Connect low capacity probe of oscilloscope to terminal C of T109. Alternately adjust T109 Oscillator Waveform Adjustment and frequency adjustment until broad and sharp peaks of wave on oscilloscope are same height while keeping picture in sync. Remove oscilloscope.								
55	Connect a 270K resistor across C156. Turn hold control fully counter-clockwise. Momentarily remove signal. Turn hold control slowly clockwise. Note least number of bars before pull-in. Adjust Locking Range Control (C153A) for 2 bar pull-in.								
56	Turn hold control fully clockwise. Adjust T109 Freq. Adjustment until horizontal blanking appears as single vertical or diagonal bar in pix.								
	4.5 MC VIDEO TRAP ADJUSTMENT								
57	Tune in a strong station. Short T103 trap. If a 4.5 mc. beat appears in picture adjust 4.5 mc. trap (L110) until beat is eliminated.								
	SENSITIVITY CHECK								
58	Connect antenna to receiver through attenuator pad to provide weak signal. Compare the picture and sound obtained to that obtained on other receivers under the same conditions.								

ALIGNMENT DATA

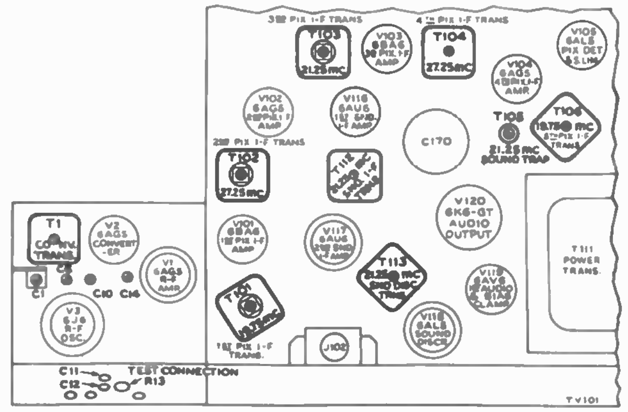


Figure 8—Top Chassis Adjustments

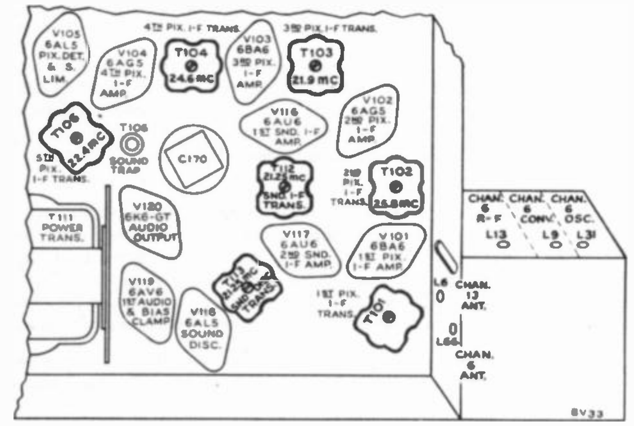


Figure 9—Bottom Chassis Adjustments

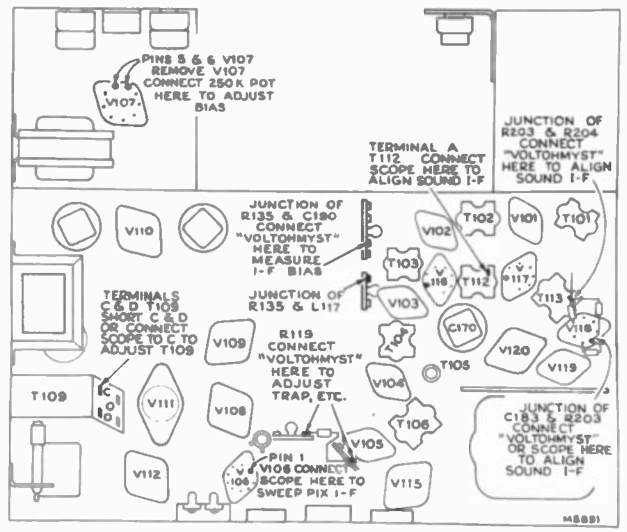
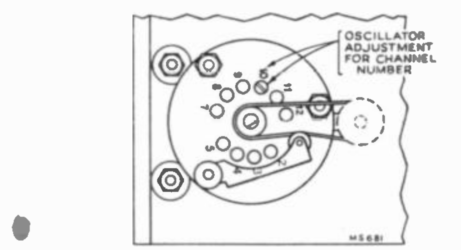


Figure 10—Test Connection Points



OSCILLATOR ADJUSTMENT FOR CHANNEL 13 IS ON TOP OF R-F UNIT AND CHANNEL 6 IS ON SIDE.

Figure 11—R-F Oscillator Adjustments

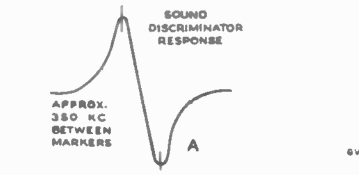


Figure 12
Discriminator
Response

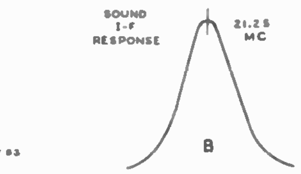


Figure 13
Sound I-F
Response

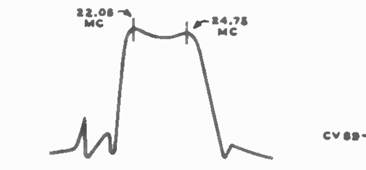


Figure 14
T1 and T101
Response

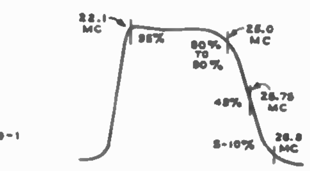


Figure 15
Overall I-F
R-F Response

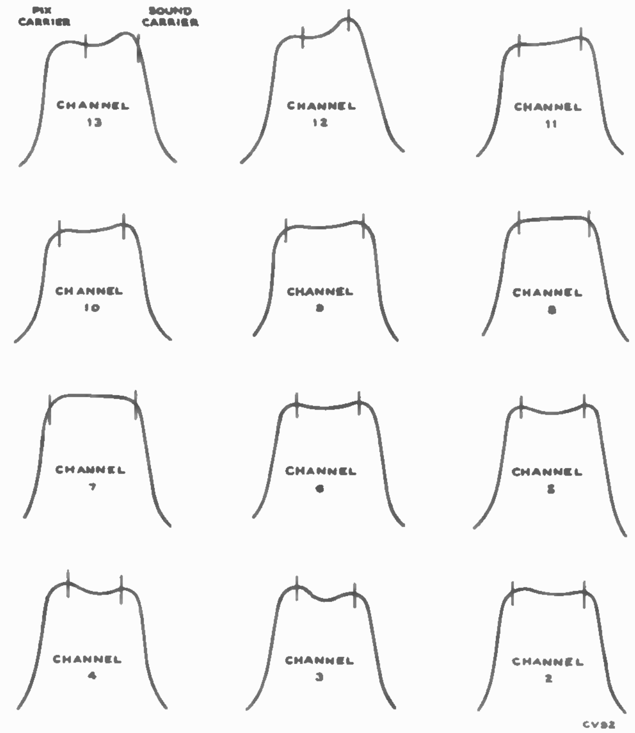


Figure 16—R-F Response

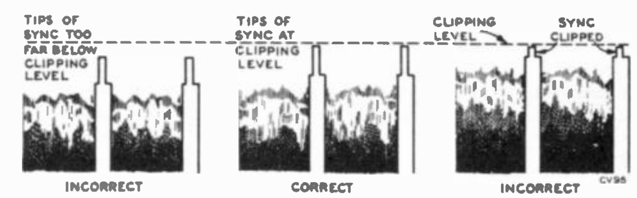


Figure 17—AGC Threshold Adjustment Waveforms

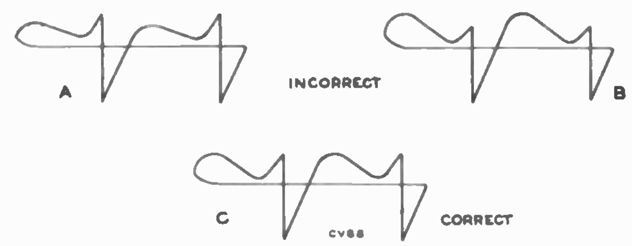


Figure 18—Horizontal Oscillator Waveforms

ALIGNMENT PROCEDURE (Continued)

fied indication. It should be possible to adjust the oscillator to the correct frequency on all channels with the fine tuning control in the middle third of its range.

After the oscillator has been set on all channels, start back at channel 13 and recheck to make sure that all adjustments are correct.

AGC THRESHOLD ADJUSTMENT. — The AGC threshold adjustment can be made by the method outlined in the Installation Instructions. However, a more accurate adjustment can be obtained by the use of an oscilloscope.

Tune in a station and advance the picture control to the maximum clockwise position. Connect the low capacity probe from the oscilloscope to the plate of the first video amplifier, pin 1 of V106. Adjust the oscilloscope to observe the horizontal sync pulse.

Turn the AGC threshold control R138 fully clockwise, then slowly counter-clockwise. As the control is turned counter-clockwise, the receiver gain will increase slowly, increasing the size of the pattern on the oscilloscope. R138 should be turned counter-clockwise until the receiver begins to overload as indicated by clipping of the sync. The control should be left in the maximum gain position in which no clipping of sync is observed. See Figure 17 for proper waveforms.

HORIZONTAL OSCILLATOR ADJUSTMENT. — Normally the adjustment of the horizontal oscillator is not considered to be a part of the alignment procedure, but since the oscillator waveform adjustment requires the use of an oscilloscope, it can not be done conveniently in the field. The waveform adjustment is made at the factory and normally should not require readjustment in the field. However, the waveform adjustment should be checked whenever the receiver is aligned or whenever the horizontal oscillator operation is improper.

Horizontal Frequency Adjustment.—Set the locking range trimmer one half turn out from maximum capacity. With a clip lead, short circuit the coil between terminals C and D of the horizontal oscillator transformer T109. Tune in a television station and sync the picture if possible.

A. — Turn the horizontal hold control R173 to the extreme clockwise position. Adjust the T109 Frequency Adjustment (under the chassis) so that the picture is just out of sync and the horizontal blanking appears in the picture as a vertical bar. The position of the bar is unimportant.

Note.—Occasionally a tube may be found which does not respond to step "A" above, since it may not be possible to sync the picture by means of the frequency core when the sine wave coil is shorted out. Yet, the tube may work perfectly well when the circuit is properly aligned. In such a case it may be necessary to remove the short then turn the sine wave core out then in until it is possible to obtain sync by adjustment of the frequency core.

B. — Turn the hold control approximately one-quarter of a turn from the extreme clockwise position and examine the width and linearity of the picture. If picture width or linearity is incorrect, adjust the horizontal drive control C153B, the width control R192 and the linearity control L111 until the picture is correct. If C153B was adjusted, repeat step "A" and note above.

Horizontal Oscillator Waveform Adjustment. — Remove the shorting clip from terminals C and D of T109. Turn the horizontal hold control to the extreme clockwise position. With a thin fibre screwdriver, if necessary, adjust the Oscillator Waveform Adjustment Core of T109 (on the outside of the chassis) until the horizontal blanking bar appears in the raster. The waveform adjustment core will sync the picture in two positions. The core should be in the position nearest the outside of the chassis.

A. — Connect the low capacity probe of an oscilloscope to terminal C of T109. Alternately adjust the waveform and frequency cores of T109 until the peak of the sine wave is equal in amplitude to the peak of the saw tooth, on the oscilloscope as shown in Figure 18, while maintaining the picture in synchronization. Then adjust the frequency core until horizontal blanking shows as a vertical bar in the picture.

This adjustment is very important for correct operation of the circuit. If the broad peak of the wave on the oscilloscope is lower than the sharp peak, the noise immunity becomes poorer, the stabilizing effect of the tuned circuit is reduced and drift of the oscillator becomes more serious. On the other hand, if the broad peak is higher than the sharp peak, the oscillator is overstabilized, the pull-in range becomes inadequate and the broad peak can cause double triggering of the oscillator when the hold control approaches the clockwise position.

Remove the oscilloscope upon completion of this adjustment.

Check of Oscillator Pull-in Range.—Set the horizontal hold control to the full counter-clockwise position.

Connect a 270K ohm resistor across C156.

Momentarily switch off channel and back. The picture will then be out of sync.

Turn the hold control clockwise slowly and observe the minimum number of bars obtained just before the picture pulls into sync. The picture should snap in from two complete blanking bars. If two bars are not obtained turn the locking range trimmer C153A in to obtain less bars or out to obtain more bars.

After adjustment of C153A, remove the 270K resistor, turn the horizontal hold control fully clockwise and readjust the frequency core of T109 until the picture is in sync and the horizontal blanking bar begins to move in the picture. Then repeat the entire "Check of Pull-in Range" procedure to this point. Repeat this procedure until two bar pull-in is obtained.

Turn the horizontal hold control to the maximum clockwise position. The picture should be just out of sync to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Adjust the T109 Frequency Adjustment until this condition is fulfilled.

4.5 MC. VIDEO TRAP. — With a strong input from a station, detune the receiver from the correct fine tuning point. With a very short clip lead, short the trap winding of T103. Observe the picture for the appearance of a 4.5 mc. beat. If the beat appears in the picture, adjust L110 until the beat is eliminated.

SENSITIVITY CHECK. — A comparative sensitivity check can be made by operating the receiver on a weak signal from a television station and comparing the picture and sound obtained to that obtained on other receivers under the same conditions.

This weak signal can be obtained by connecting the shop antenna to the receiver through a ladder type attenuator pad. The number of stages in the pad depends upon the signal strength available at the antenna. A sufficient number of stages should be inserted so that a somewhat less than normal contrast picture is obtained when the picture control is at the maximum clockwise position. Only carbon type resistors should be used to construct the pad.

RESPONSE CURVES. — The response curves shown on page 12 and referred to throughout the alignment procedure were taken from a production set. Although these curves are typical, variations can be expected.

The response curves are shown in the classical manner of presentation, that is with "response up" and low frequency to the left. The manner in which they will be seen in a given test set-up will depend upon the characteristics of the oscilloscope and the sweep generator. The curves may be seen inverted and/or switched from left to right depending on the deflection polarity of the oscilloscope and the phasing of the sweep generator.

ALIGNMENT TABLE. — Both methods of oscillator alignment are presented in the alignment table. The service technician may thereby choose the method to suit his test equipment.

RESPONSE AND WAVEFORM PHOTOGRAPHS

PICTURE I-F RESPONSE. — At times it may be desirable to observe the individual i-f stage response. This can be achieved by the following method:

Shunt all i-f transformers and coils with a 330 ohm carbon resistor except the one whose response is to be observed.

Connect a wide band sweep generator to the converter grid and adjust it to sweep from 18 mc. to 30 mc.

Connect the oscilloscope across the picture detector load resistor and observe the overall response. The response obtained will be essentially that of the unshunted stage. The effects of the various traps are also visible on the stage response.

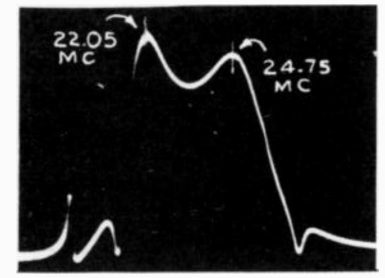


Figure 19—Response of Converter and First Pix I-F Transformer

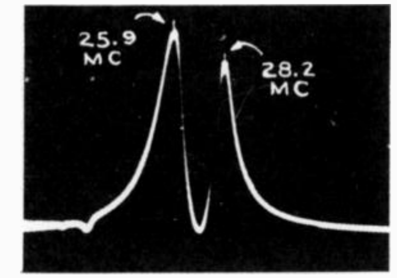


Figure 20—Response of Second Pix I-F Transformer

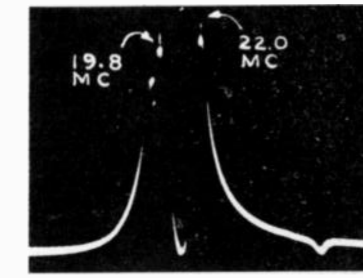


Figure 21—Response of Third Pix I-F Transformer

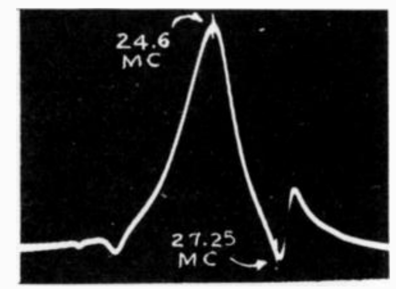


Figure 22—Response of Fourth Pix I-F Transformer

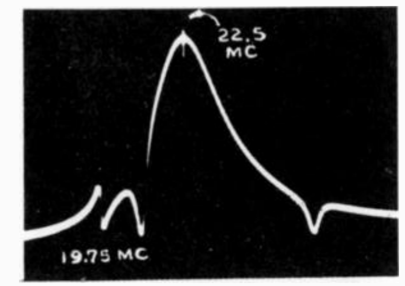


Figure 23—Response of Fifth Pix I-F Transformer

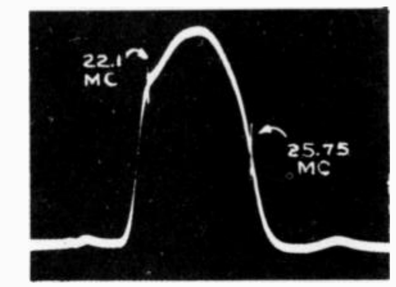


Figure 24—Response from First Pix I-F grid to Pix Det.

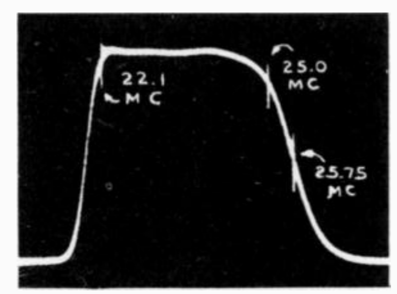


Figure 25—Overall Pix I-F Response

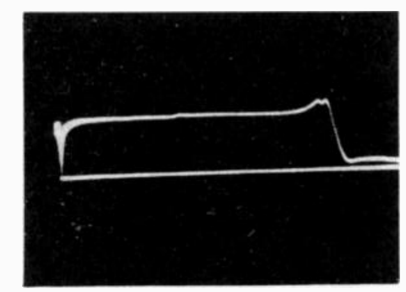


Figure 26—Video Response at Average Contrast

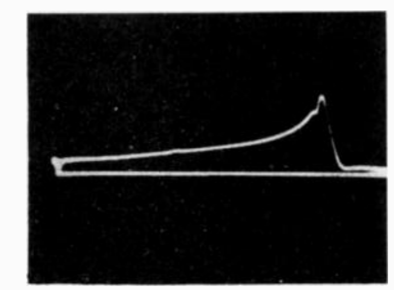
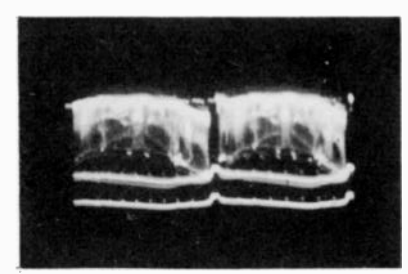


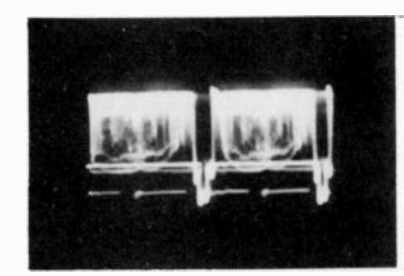
Figure 27—Video Response at Minimum Contrast

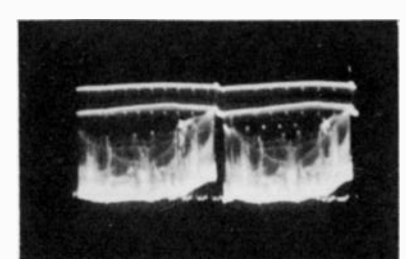


Video Signal Input to 1st Video Amplifier (Pin 2 of V106) (12AU7)

Figure 28—Vertical (Oscilloscope Synced to ½ of Vertical Sweep Rate) (5.4 Volts PP)

Figure 29—Horizontal (Oscilloscope Synced to ½ of Horizontal Sweep Rate) (5.4 Volts PP)

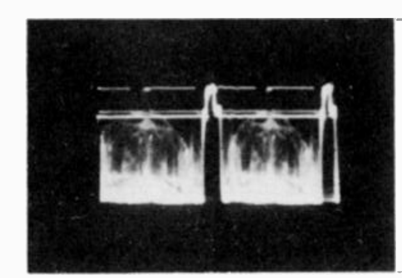


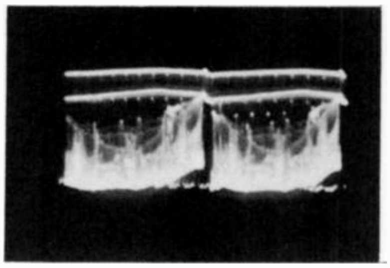


Sync Feed (Junction of L104, R219 and C194)

Figure 30—Vertical (28 Volts PP)

Figure 31—Horizontal (28 Volts PP)

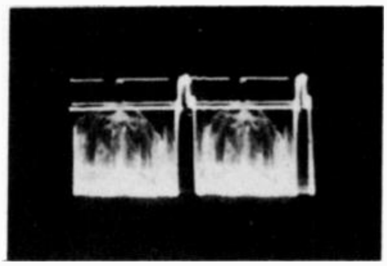


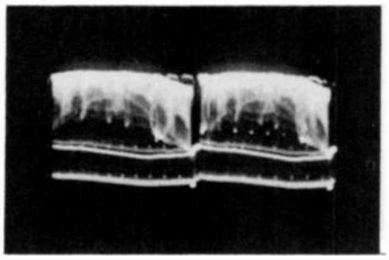


Input to 2nd Video Amplifier (Pin 7 of V106) (12AU7)

Figure 32—Vertical (17 Volts PP)

Figure 33—Horizontal (17 Volts PP)

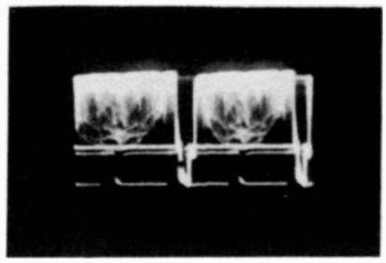


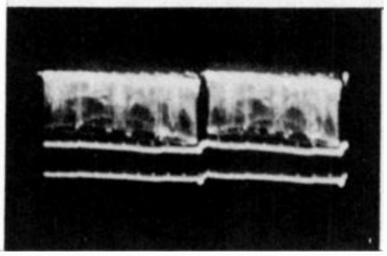


Output of 2nd Video Amplifier (Junction of L105 and R127) (Picture Max.)

Figure 34—Vertical (96 Volts PP)

Figure 35—Horizontal (96 Volts PP)

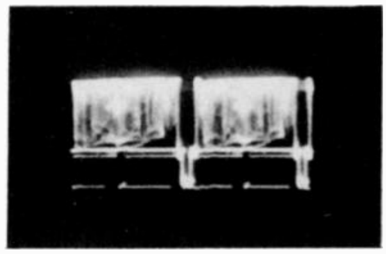


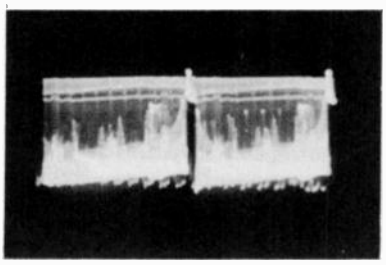


Input to Kinescope (Junction of R127 and R128) (Picture Max.)

Figure 36—Vertical (65 Volts PP)

Figure 37—Horizontal (65 Volts PP)

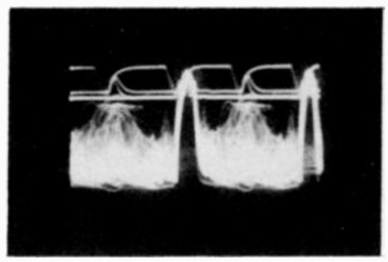


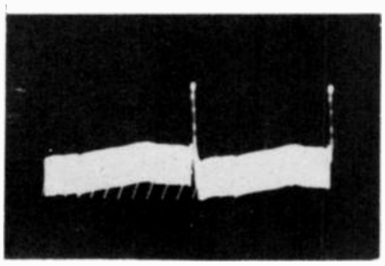


Input to 1st Sync Separator (Pin 1 of V108) (6SN7GT)

Figure 38—Vertical (25 Volts PP)

Figure 39—Horizontal (23 Volts PP)

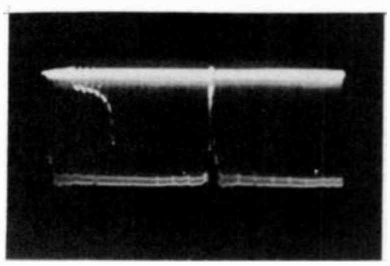




AGC Rectifier Cathode (Pin 6 of V108) (6SN7GT)

Figure 40—Vertical (4.7 Volts PP)

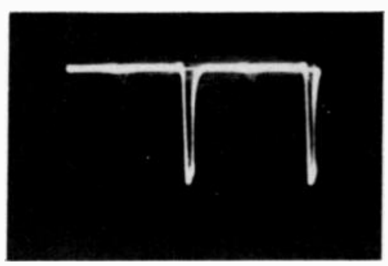
Figure 41—Horizontal (1.5 Volts PP)



Output of AGC Rectifier (Pin 5 of V108) (6SN7GT)

Figure 42—Vertical (24 Volts PP)

Figure 43—Horizontal (24 Volts PP)



WAVEFORM PHOTOGRAPHS

Output of 1st Sync Separator (Pin 2 of V108) (6SN7GT)

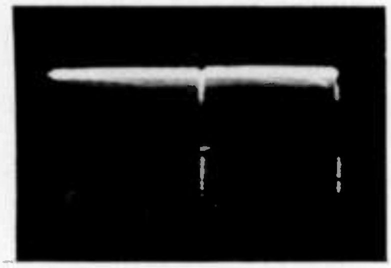


Figure 44—Vertical (26 Volts PP)

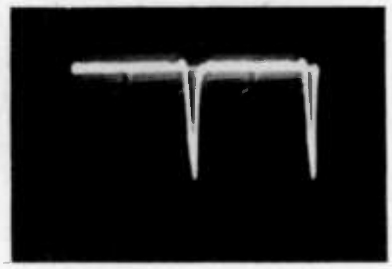


Figure 45—Horizontal (25.5 Volts PP)

Input to Sync Amplifier (Junction of C137, C139 and R145)

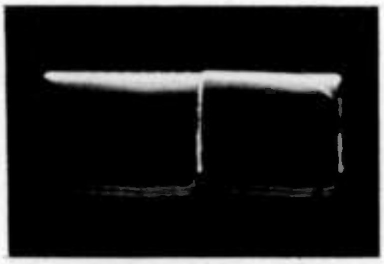


Figure 46—Vertical (21 Volts PP)

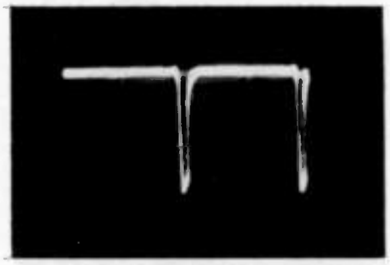


Figure 47—Horizontal (21 Volts PP)

Output of Sync Amplifier (Pin 2 of V109) (6SN7GT)

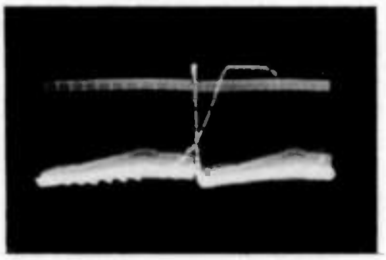


Figure 48—Vertical (115 Volts PP)

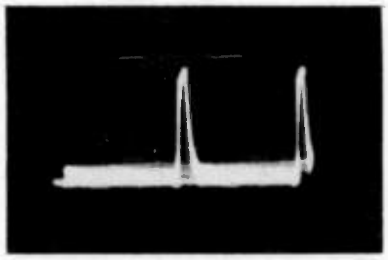


Figure 49—Horizontal (105 Volts PP)

Cathode of 2nd Sync Separator (Pin 6 of V109) (6SN7GT)

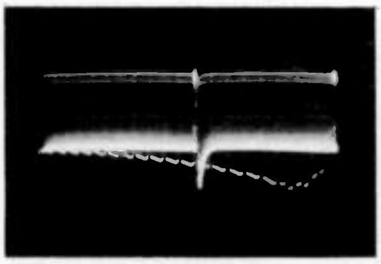


Figure 50—Vertical (17 Volts PP)

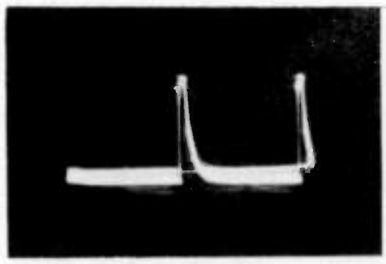


Figure 51—Horizontal (11 Volts PP)

Figure 52—Output of Integrating Network (Junction of C144, C145 and R153) (45 Volts PP)

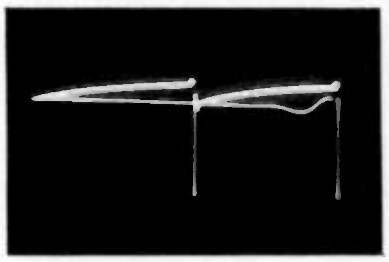


Figure 53—Grid of Vertical Oscillator (720 Volts PP) (Pin 1 of V107) (6SN7GT)

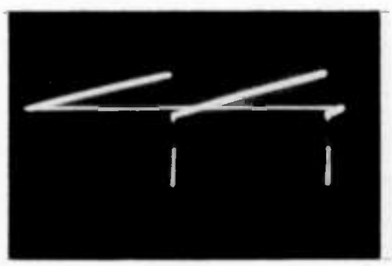


Figure 54—Grid of Vertical Output (160 Volts PP) (Pin 5 of V110) (6K6GT)

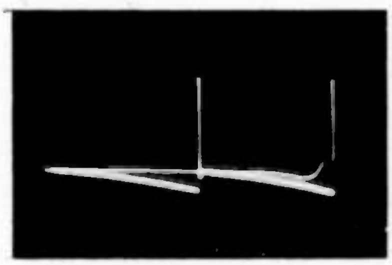


Figure 55—Plate of Vertical Output (750 Volts PP) (Pin 3 of V110) (6K6GT)

WAVEFORM PHOTOGRAPHS

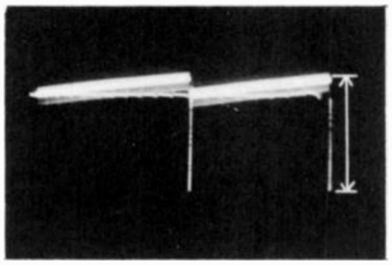
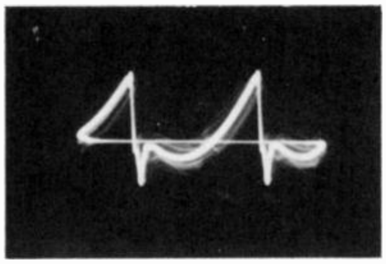


Figure 56—Input of Vertical Deflection Coils (75 Volts PP) (Junction of Green Lead of T108 and Green Lead of Yoke)

Figure 57—Input to Horizontal Oscillator (17.5 Volts PP) (Junction of C153A and C154)



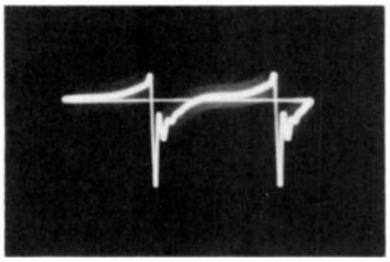
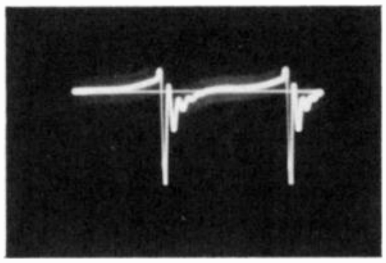


Figure 58—Junction of R168, R176 and R178 (150 Volts PP)

Figure 59—Grid of Horizontal Oscillator (480 Volts PP) (Pin 4 of V111) (6SN7GT)



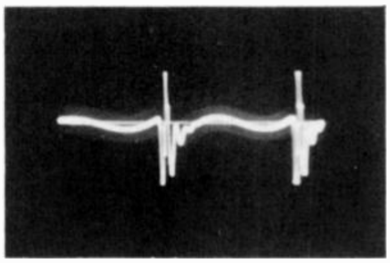
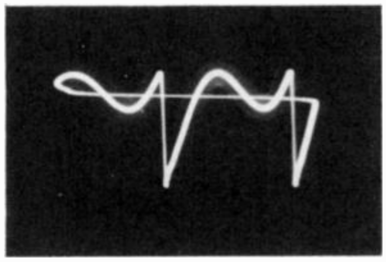


Figure 60—Plate of Horizontal Oscillator (270 Volts PP) (Pin 5 of V111) (6SN7GT)

Figure 61—Terminal "C" of T109 (70 Volts PP)



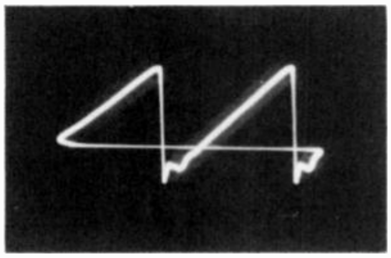
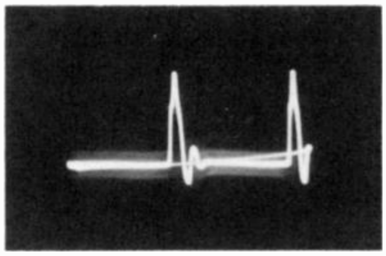


Figure 62—Input to Horizontal Output Tube (42 Volts PP) (Junction of C160, R183 and C153B)

Figure 63—Plate of Horizontal Output (Approx. 6,500 Volts PP) (Measured Through a Capacity Voltage Divider Connected from Top Cap of V112 to Ground)



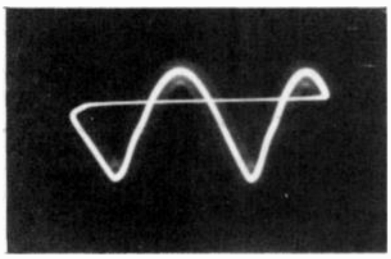
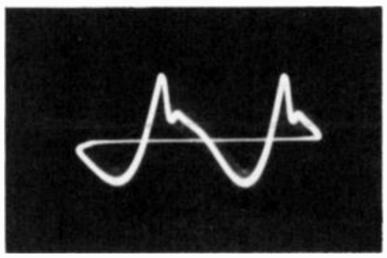


Figure 64—Terminal 1 of T110 (200 Volts PP)

Figure 65—Plate of Damper (250 Volts PP) (Pin 5 of V114) (6W4GT)



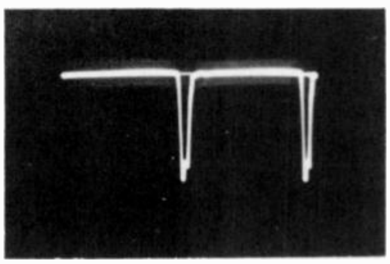
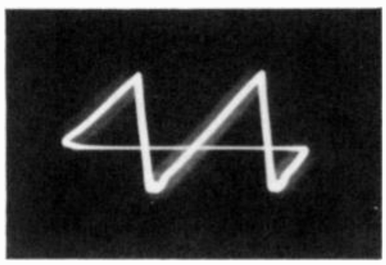


Figure 66—Input to Horizontal Deflection Coils (3,000 Volts PP)

Figure 67—Horizontal Deflection Coil Current (0.5 Amp. PP) Measured by Inserting a 5-ohm Resistor in series with the yoke and observing the waveform across the resistor.



T164, TC165, TC166, TC167, TC168

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 microvolt test pattern signal was fed into the receiver, the picture was synced and the AGC threshold control was properly adjusted. The second condition was obtained by removing the antenna leads and short-circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles a-c. Symbol < means less than.

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	130	6	132	2 & 7	0	1	-2.2	5	2	
			No Signal	5	67	6	111	2 & 7	0	1	0.0	14.0	5.0	
V2	6AG5	Converter	2200 Mu. V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*-3.0 to -7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*107 to 109	6	*107 to 109	2 & 7	0	1	*-2.0 to -6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*-5.1 to -7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*-4.5 to -6.6	*1.8 to 2.1	—	
V101	6BA6	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5	128	6	128	7	.4	1	-11.0	1.9	.8	
			No Signal	5	95	6	95	7	1.73	1	+.2	8.1	3.4	
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu. V. Signal	5	119	6	119	2 & 7	.78	1	0	8.8	2.4	
			No Signal	5	100	6	100	2 & 7	.62	1	0	7.4	1.6	
V103	6BA6	3d Pix. I-F Amplifier	2200 Mu. V. Signal	5	81	6	119	7	.52	1	-2.2	11.1	.3	
			No Signal	5	55	6	96	7	.62	1	+0.2	13.2	.3	
V104	6AG5	4th pix. I-F Amplifier	2200 Mu. V. Signal	5	159	6	135	2 & 7	1.5	1	0	7.2	2.2	
			No Signal	5	165	6	118	2 & 7	1.35	1	0	6.8	2.4	
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	-116	—	—	1	-127	—	—	.3	—	
			No Signal	7	-131	—	—	1	-135	—	—	<0.1	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	-117	—	—	5	-58	—	—	—	—	
			No Signal	2	-63	—	—	5	-60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu. V. Signal	1	-18.7	—	—	3	-125	2	-129	2.6	—	
			No Signal	1	-28.0	—	—	3	-133	2	-135	6.6	—	
V106	12AU7	2d Video Amplifier	2200 Mu. V. Signal	6	*120	—	—	8	*-11.0	7	*-13.2	9.2	—	*At minimum contrast
			No Signal	6	*127	—	—	8	*-17.0	7	*-21.0	8.5	—	
			2200 Mu. V. Signal	6	*193	—	—	8	*-0.6	7	*-13.1	3.2	—	*At maximum contrast
			No Signal	6	*228	—	—	8	*-0.8	7	*-20.0	0.2	—	
V107 A	6SN7 GT	ACG Amplifier	2200 Mu. V. Signal	5	-11	—	—	6	-58	4	-61	.12	—	
			No Signal	5	+ 0.2	—	—	6	-60	4	-66	0	—	
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	125	—	—	3	-127	1	-170	.31	—	
			No Signal	2	120	—	—	3	-135	1	-175	.30	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	87	—	—	6	-2	4	-19.5	.3	—	
			No Signal	5	75	—	—	6	-22	4	-28.0	<.1	—	
V108	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	87	—	—	3	-3	1	-18.5	<.1	—	
			No Signal	2	73	—	—	3	-22	1	-28.0	<.1	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V109	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	153	—	—	3	0	1	–5.0	5.8	—	
			No Signal	2	160	—	—	3	0	1	–5.6	5.4	—	
V109	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	241	—	—	6	–58	4	–117	.22	—	
			No Signal	5	240	—	—	6	–57	4	–65	.71	—	
V110	6K6-GT	Vertical Output	2200 Mu. V. Signal	3	240	4	240	8	–78	5	–107	10	2.0	Screen connected to plate
			No Signal	3	235	4	235	8	–83	5	–111	10	1.9	
V111	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	50	—	—	3	–136	1	–127	.11	—	
			No Signal	2	14	—	—	3	*–155	1	*–147	.10	—	Hold control counterclockwise
			No Signal	2	78	—	—	3	*–140	1	*–142	.11	—	Hold control clockwise
V111	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	86	—	—	6	–127	4	–193	2.0	—	
			No Signal	5	80	—	—	6	–135	4	–205	1.7	—	
V112	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	Do Not Meas.	8	152	3	–117	5	–145	67.9	8.1	
			No Signal	Cap	Do Not Meas.	8	150	3	–126	5	–157	66.0	8.0	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	Do Not Meas.	—	—	2 & 7	12,300	—	—	0	—	
			Brightness Average	Cap	Do Not Meas.	—	—	2 & 7	11,700	—	—	.1	—	
V114	6W4GT	Damper	2200 Mu. V. Signal	5	Do Not Meas.	—	—	3	498	—	—	86	—	
			No Signal	5	Do Not Meas.	—	—	3	496	—	—	70	—	
V115	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	*385	—	—	2 & 8	267	—	—	225	—	*AC measured from plate to trans. center tap
			No Signal	4 & 6	*385	—	—	2 & 8	260	—	—	226	—	
V116	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	124	6	124	7	.87	1	–0.1	7.0	3.0	
			No Signal	5	107	6	107	7	.75	1	–0.15	6.4	2.3	
V117	6AU6	2nd Sound I-F Amplifier	2200 Mu. V. Signal	5	130	6	67	7	0	1	–9	4.3	1.5	
			No Signal	5	120	6	60	7	0	1	–0.37	3.7	1.6	
V118	6AL5	Sound Discrim.	2200 Mu. V. Signal	2	–8.4	—	—	5	5.8	—	—	—	—	
			No Signal	2	–0.4	—	—	5	0	—	—	—	—	
			2200 Mu. V. Signal	7	–3.7	—	—	1	0	—	—	—	—	
			No Signal	7	–0.4	—	—	1	0	—	—	—	—	
V119	6AV6	1st Audio Amplifier	2200 Mu. V. Signal	7	80	—	—	2	0	1	–.89	.48	—	
			No Signal	7	77	—	—	2	0	1	–.89	.47	—	
V120	6K6-GT	Audio Output	2200 Mu. V. Signal	3	193	4	135	8	–101	5	–127	12.4	2.1	
			No Signal	3	193	4	121	8	–109	5	–135	11.9	2.1	
V121	16GP4	Kinescope	2200 Mu. V. Signal	Cap	12,300	10	250	11	77	2	35	.06	—	Avg. Bright. Avg. Contrast
			2200 Mu. V. Signal	Cap	12,700	10	250	11	110	2	36	0	—	Min. Bright. Avg. Contrast
			2200 Mu. V. Signal	Cap	12,700	10	368	11	105	2	–2	0	—	Low Bright. Min. Contrast
			No Signal	Cap	11,700	10	366	11	73	2	48	.18	—	Avg. Bright. Avg. Contrast

T164, TC165, TC166, TC167, TC168

R-F UNIT WIRING DIAGRAM

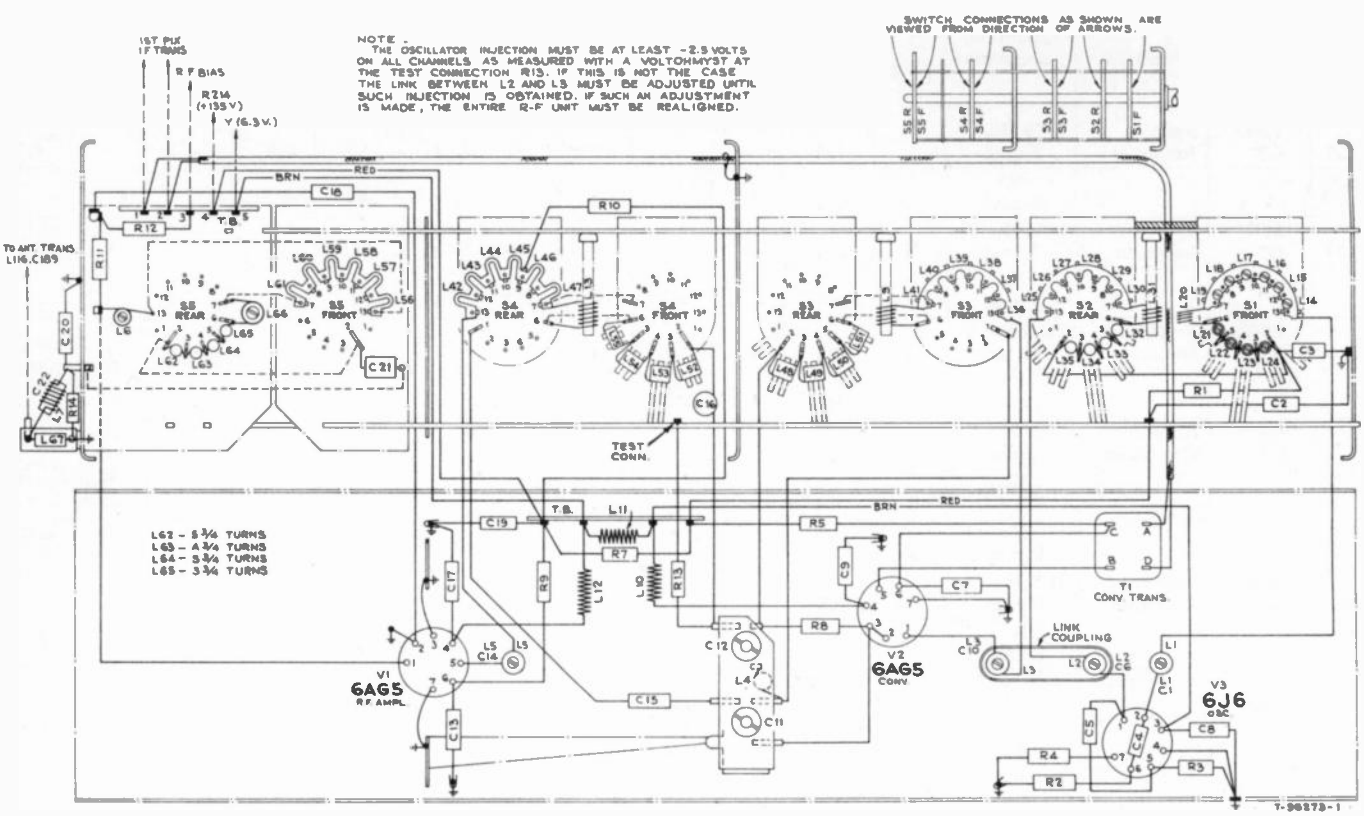


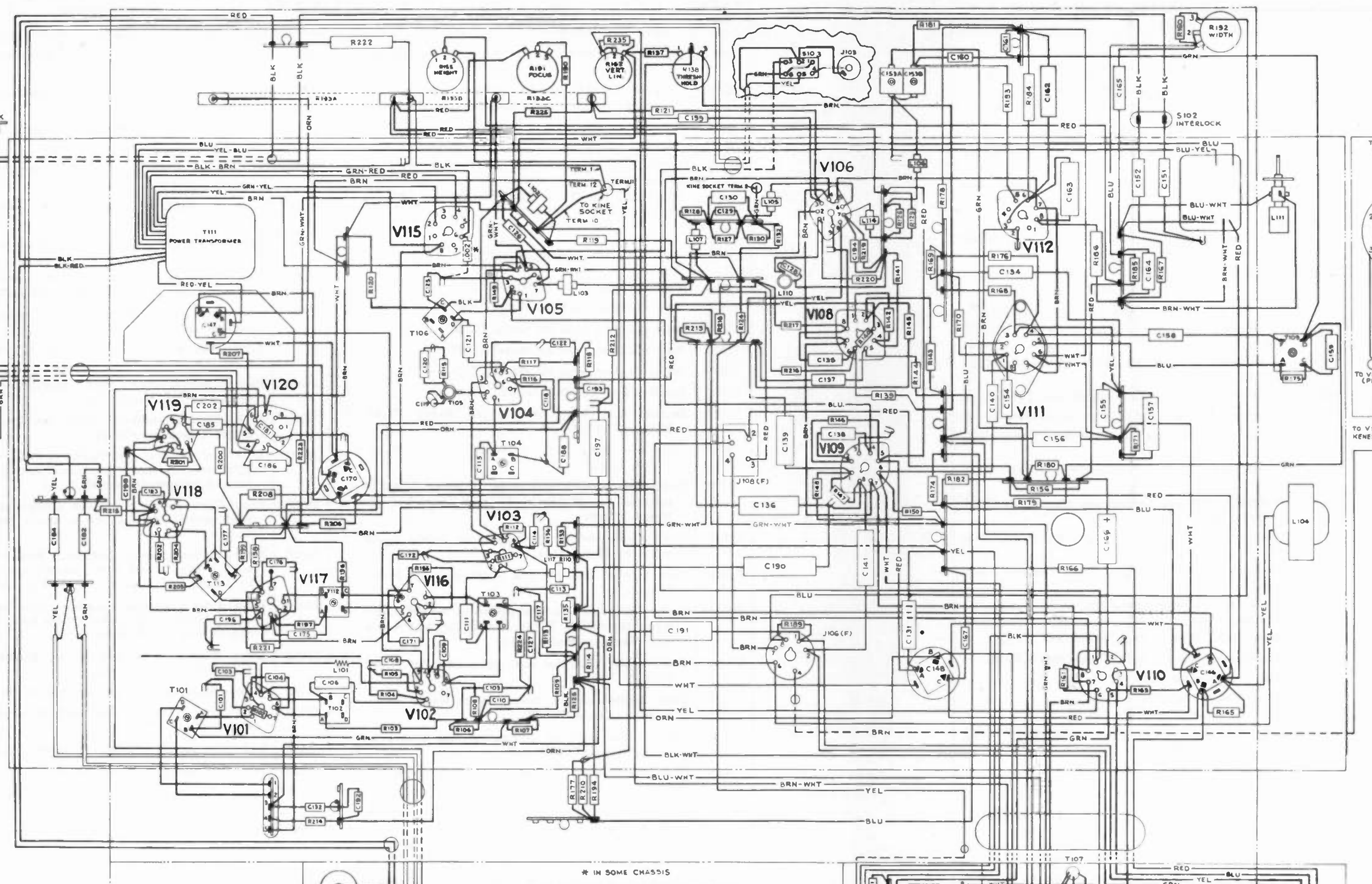
Figure 68—R-F Unit Wiring Diagram

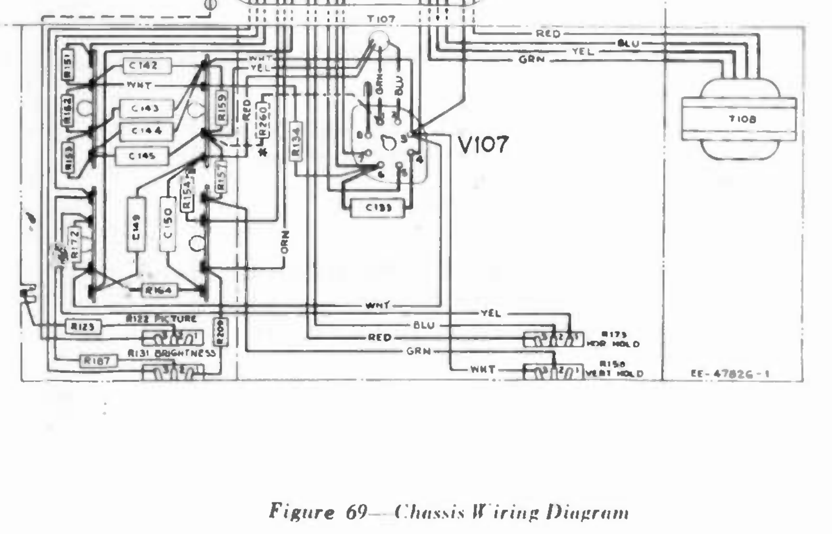
CRITICAL LEAD DRESS:

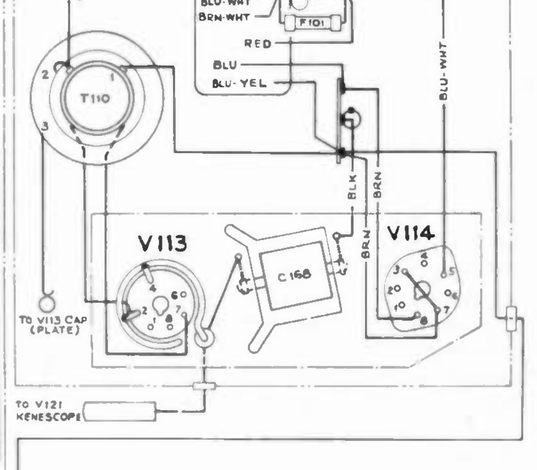
1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V117, V118 and V119 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.
4. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
5. Dress black lead from terminal C of T106 down next to chassis.
6. Leads to L102 and L103 must be as short as possible.
7. Dress peaking coils L105, L106, L107 and L114 up and away from the chassis.
8. Dress C183 across tube pins 5 and 6 with leads not exceeding ⅜ inch.
9. Dress body of R215 as close to tube pin as possible.
10. Dress C129 and C130 up and away from the chassis.
11. Dress the yellow lead from the picture control away from the chassis and away from the volume-control leads. Dress the yellow lead from pin 8 of V106 away from the chassis.
12. Dress the green lead from pin 2 of V106 away from the chassis.
13. Dress R168, R176 and R178 up and away from the chassis.
14. The leads to the volume control should be dressed down against the chassis and away from V117 and V118.
15. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
16. Dress three a-c leads to S101 under clamp and away from R211.
17. Dress black lead from power transformer and red lead from S102 to terminal board, on top side of four potentiometers.
18. Dress all leads from V115 to V122 on power transformer side of terminal board.
19. All solder joints in the high voltage section should be free of sharp edges.
20. The lead side of the V113 plate cap should be turned away from the fixed high voltage shield and the lead should be dressed away from all objects.
21. All leads under the horizontal plate in the high voltage section should be kept reasonably short and dressed away from the V113 corona ring.
22. The red-black lead from terminal 2 of the deflection yoke should be dressed around the green and yellow leads and away from the red lead. The loose end of the red-black wire should be heavily taped.

CHASSIS WIRING DIAGRAM

T164, TC165, TC166, TC167, TC168



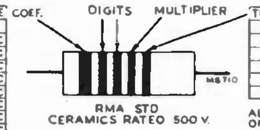




* IN SOME CHASSIS

RMA COLOR CODE, CERAMIC CAPACITORS

COLOR	TEMPERATURE COEF.
BLACK	0
BROWN	− 30 PPM/°C
RED	− 80 PPM/°C
ORANGE	− 150 PPM/°C
YELLOW	− 220 PPM/°C
GREEN	− 330 PPM/°C
BLUE	− 470 PPM/°C
VIOLET	− 750 PPM/°C
GRAY	+ 30 PPM/°C



TOLERANCE	COLOR
± 20 %	BLACK
± 1 %	BROWN
± 2 %	RED
± 2½ %	ORANGE
± 5 %	GREEN
± 10 %	WHITE

ABOVE TOLERANCES ARE ONLY FOR CAPACITORS LARGER THAN 10 MMF

COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

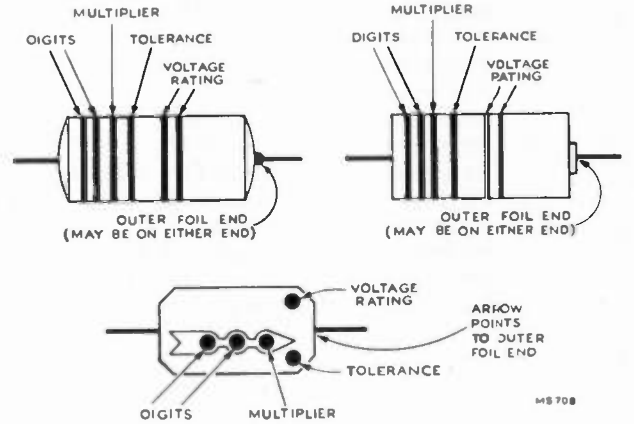
For digits, use digit column, page 22

In some receivers, a four color ceramic capacitor color code is employed. It reads the same as the RMA color code except that the tolerance stripe is omitted.

If the coefficient stripe is silver, it indicates that the capacitor has a very large temperature coefficient and is to be employed for by-pass or other usages where a wide variation of capacity is unimportant. Silver striped capacitors are rated at 350 volts unless otherwise marked.

Figure 69—Chassis Wiring Diagram

COLOR CODES, MOULDED PAPER CAPACITORS



CAPACITY VALUE IN MMF

COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

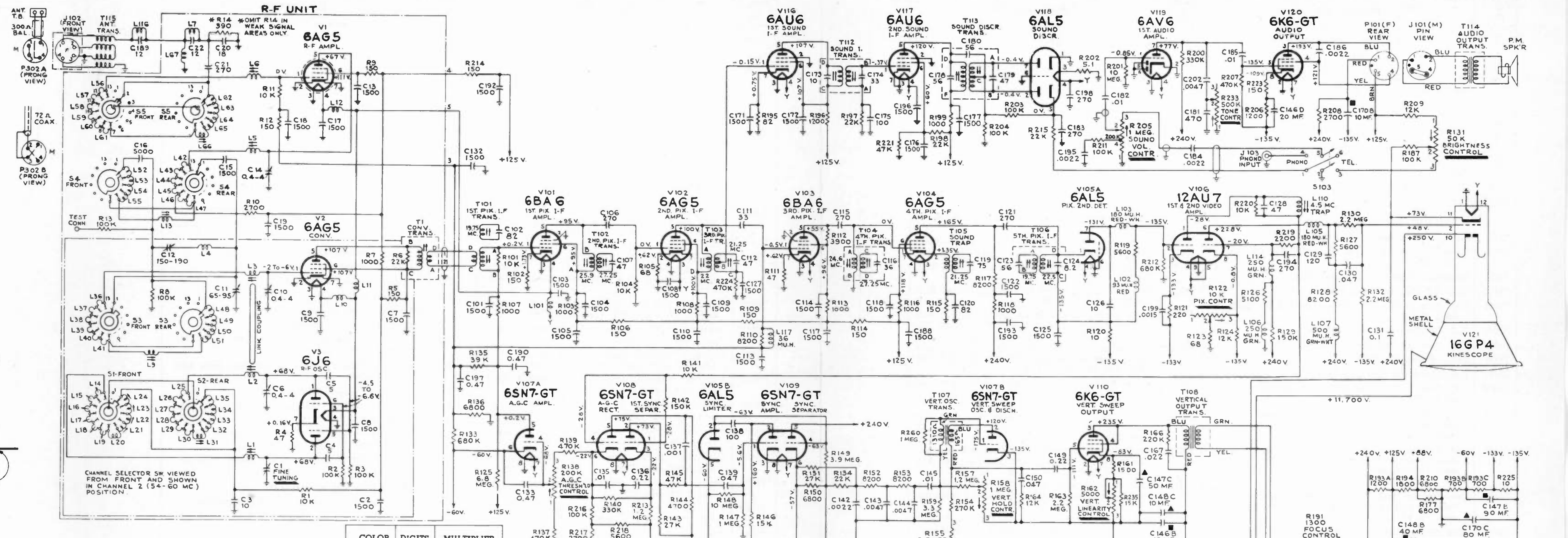
TOLERANCE

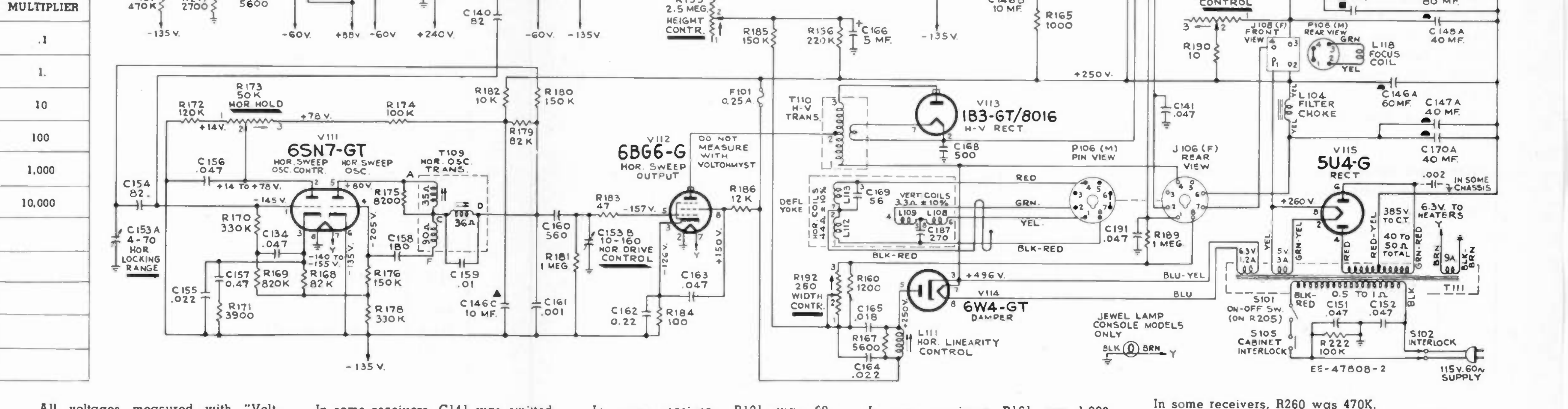
COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	±5%

The Voltage Rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digit column to read voltage rating.

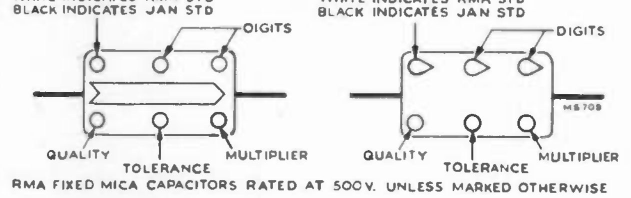
CIRCUIT SCHEMATIC DIAGRAM

T164, TC165, TC166, TC167, TC168





RMA COLOR CODE, FIXED MICA CAPACITORS



RMA FIXED MICA CAPACITORS RATED AT 500V. UNLESS MARKED OTHERWISE

TOLERANCE		QUALITY			
COLOR	TOLERANCE	COLOR	CLASS	COLOR	CLASS
RED	±2%	BLACK	A	YELLOW	D
GREEN	±5%	BROWN	B	GRAY	I
SILVER	±10%	RED	C	WHITE	J
BLACK	±20%	ORANGE	D		

COLOR	DIGITS	MULTIPLIER
GOLD	—	.1
BLACK	0	1.
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

In some receivers, C141 was omitted.

In some receivers, R206 and R223 were 820 ohms.

In some receivers, R220 was 12K.

In some receivers, R121 was 39, R225 was 18, R128 was 6,800, R129 was 220K, L107 was 250 Muh and C199 was omitted.

In some receivers, R161 was 1,000 and R235 was omitted.

In some receivers, R160 and R167 were omitted.

In some receivers, R260 was 470K.

In some receivers, R187 was 150K and V121-10 was connected to arm (2) of height control R155. R188 (470K) was used between V121-11 and +125 v.

In some receivers, C151 and C152 were .01 mfd.

Figure 70—Circuit Schematic Diagram

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES KRK 5B
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission cable (W1)
73441	Cam—Fine tuning adjustment
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1,500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5,000 mmf. (C16)
73460	Coil—R-F plate coil for channel 6 (L13)
73461	Coil—Rear section—Oscillator plate coil for channel 6 (L20)
73462	Coil—Coupling inductance coil (L4)
73475	Coil—Antenna filter shunt coil (C67)
73476	Coil—I-F trap (L7, C22)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Front section—Oscillator plate coil for channel 6 (L31)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (plunger adjustment) (L1, C1)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment for oscillator section or converter section) (L2, L3, C6, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f amplifier section (L5, C14)
73455	Core—Sliding core for fine tuning control trimmer
74187	Core—Adjustable core for coil L9
71493	Connector—Oscillator segment connector
73440	Detent—R-F unit detent mechanism and fibre shaft
71487	Form—Coil form for coil L31
73453	Form—Coil form assembly for L9, L13
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to converter trimmer loop connector
73634	Nut—Speed nut for drive belt shield
73436	Plate—Front plate and bushing
73464	Pulley—Idler pulley
	Resistor—Fixed, composition: 47 ohms, ±20%, ½ watt (R4) 150 ohms, ±20%, ½ watt (R5, R9, R12) 390 ohms, ±10%, ½ watt (R14) 1,000 ohms, ±20%, ½ watt (R7) 2,700 ohms, ±10%, ½ watt (R10) 10,000 ohms, ±20%, ½ watt (R1, R11) 100,000 ohms, ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring
30340	Retainer—Retainer ring for fine tuning stud
70881	Screw—No. 4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
73640	Screw—No. 4-40 x ⅜" adjusting screw for L66
74575	Screw—No. 4-40 x 17/32" adjusting screw for L6
71475	Screw—No. 4-40 x 15/32" adjusting screw for coils L21, L22, L23, L24
73437	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
73439	Shaft—Actuating shaft for fine tuning control
75443	Shield—"U" shaped shield for bottom of r-f unit
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt
73632	Shield—Metal tube shield for V1
71494	Socket—Tube socket, moulded, 7 prong, saddle mounted
73450	Socket—Tube socket, ceramic, 7 prong, bottom mounted
74576	Spacer—Insulating spacer for front plate (4 required)
75068	Spring—Retaining spring for r-f oscillator tube shield
73457	Spring—Return spring for fine tuning control core
74188	Spring—Retaining spring for adjustable core RCA 74187
74578	Spring—Retaining spring for adjusting screws RCA 73640 and RCA 74575
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Converter stator complete with rotor and coils (S3, L9, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L13, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55, C15, C16, R10)
75446	Stud—Capacitor stud—brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, uncoded or coded "ER"
75447	Stud—Capacitor stud—brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, coded numerically or "Hi Q"
73448	Transformer—Converter transformer (T1, R6)
73466	Washer—Insulating washer for front shield (1 set)
2917	Washer—"C" washer for channel selector shaft or fine tuning shaft and cam
	CHASSIS ASSEMBLIES KCS40 - T164 KCS40A - TC165, TC166, TC167, TC168
75086	Bracket—Focus coil mounting bracket—upper
75087	Bracket—Focus coil mounting bracket—lower
74946	Capacitor—Mica trimmer comprising 1 section of 4-70 mmf. and 1 section of 10-160 mmf. (C153A, C153B)
39604	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)
64062	Capacitor—Ceramic, 82 mmf. (C120)
73090	Capacitor—Mica, 82 mmf. (C140, C154)
39396	Capacitor—Ceramic, 100 mmf. (C175)
75060	Capacitor—Mica, 100 mmf. (C138)
73921	Capacitor—Ceramic, 120 mmf. (C129)
73102	Capacitor—Mica, 180 mmf. (C158)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
39644	Capacitor—Mica, 470 mmf. (C181)

STOCK No.	DESCRIPTION
74947	Capacitor—Ceramic, 500 mmf., 20,000 volts (C168)
74250	Capacitor—Mica, 560 mmf. (C160)
71501	Capacitor—Ceramic, 1,500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C127, C132, C171, C172, C176, C177, C188, C192, C193, C196)
28417	Capacitor—Electrolytic, 5 mfd, 450 volts (C166)
71432	Capacitor—Electrolytic, comprising 2 sections of 40 mfd, 450 volts and 1 section of 10 mfd, 450 volts (C148A, C148B, C148C)
73582	Capacitor—Electrolytic, comprising 1 section of 40 mfd, 450 volts, 1 section of 10 mfd, 450 volts, and 1 section of 80 mfd, 200 volts (C170A, C170B, C170C)
73583	Capacitor—Electrolytic, comprising 1 section of 40 mfd, 450 volts, 1 section of 90 mfd, 150 volts and 1 section of 50 mfd, 150 volts (C147A, C147B, C147C)
73581	Capacitor—Electrolytic, comprising 1 section of 60 mfd, 450 volts, 2 sections of 10 mfd, 450 volts and 1 section of 20 mfd, 150 volts (C146A, C146B, C146C, C146D)
73801	Capacitor—Tubular, moulded paper, oil impregnated, .001 mfd, 1,000 volts (C137, C161)
73802	Capacitor—Tubular, paper, oil impregnated, .0015 mfd, 600 volts (C199)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd, 600 volts (C142, C184, C186, C195)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd, 600 volts (C143, C144, C202)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd, 400 volts (C135, C182)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd, 600 volts (C145, C159)
73565	Capacitor—Tubular, paper, oil impregnated, .01 mfd, 1,000 volts (C185)
74727	Capacitor—Tubular, paper, oil impregnated, .018 mfd, 1,000 volts (C165)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd, 400 volts (C155, C167)
73810	Capacitor—Tubular, paper, oil impregnated, .022 mfd, 1,000 volts (C164)
75071	Capacitor—Tubular, moulded paper, .047 mfd, 400 volts (C151, C152)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 400 volts (C130, C134)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 600 volts (C139, C156)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 1,000 volts (C141, C150, C163, C191)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd, 600 volts (C131)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd, 400 volts (C136, C162)
74957	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd, 600 volts (C149)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd, 200 volts (C133, C157, C190, C197)
73154	Choke—Filter choke (L104)
71449	Coil—Horizontal linearity control coil (L111)
74983	Coil—Focus coil (L118, P108)
73477	Coil—Filament choke coil (L101)
74170	Coil—Peaking coil (36 muh) (L117, R110)
71527	Coil—Peaking coil (93 muh) (L102)
74214	Coil—Peaking coil (180 muh) (L103, L105)
71526	Coil—Peaking coil (250 muh) (L106, L114)
75252	Coil—Peaking coil (500 muh) (L107)
31027	Connector—4 contact female connector for focus coil (J108)
30568	Connector—4 contact male connector—part of focus coil (P108)
60942	Connector—8 contact female connector for deflection yoke (J106)
74594	Connector—Male connector for power cable
5040	Connector—4 contact female connector for speaker cable (P101)
74967	Connector—Anode connector
72734	Control—Horizontal and vertical hold control (R158, R173)
74047	Control—Brightness and picture control (R122, R131)
74048	Control—Volume control, tone control and power switch (R205, R233, S101)
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
74597	Control—Focus control (R191)
74475	Control—AGC threshold control (R138)
74945	Control—Width control (R192)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics Nos. 71432, 73581 and 73582
74956	Cushion—Rubber cushion for deflection yoke hood (2 required)
73600	Fuse—0.25 amps., 250 volts (F101)
71799	Grommet—Rubber grommet for horizontal yoke lead exit or 2nd anode lead exit
37396	Grommet—Rubber grommet for mounting ceramic tube socket
75445	Hood—Deflection yoke hood less rubber cushions
35787	Jack—Phono input jack (J103)
74953	Magnet—Ion trap magnet (P.M.)
18469	Plate—Bakelite mounting plate for electrolytics
75444	Plate—Bakelite plate complete with tube socket for high voltage rectifier
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
18471	Resistor—Wire wound, 10 ohms, ½ watt (R190)
74955	Resistor—Voltage divider comprising 1 section of 1,200 ohms, 16 watts, and 2 sections of 700 ohms, 5½ watts (R193A, R193B, R193C)
	Resistor—Fixed, composition— 10 ohms, ±20%, ½ watt (R120) 10 ohms, ±10%, ½ watt (R225) 47 ohms, ±5%, ½ watt (R111) 47 ohms, ±20%, ½ watt (R183) 68 ohms, ±10%, ½ watt (R105) 68 ohms, ±20%, ½ watt (R123) 82 ohms, ±10%, ½ watt (R195) 100 ohms, ±10%, 2 watts (R184) 150 ohms, ±5%, ½ watt (R102) 150 ohms, ±10%, ½ watt (R115, R223) 150 ohms, ±20%, ½ watt (R106, R109, R114, R214) 220 ohms, ±10%, ½ watt (R121) 1,000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R199) 1,200 ohms, ±10%, ½ watt (R196) 1,200 ohms, ±10%, 1 watt (R160, R206) 1,500 ohms, ±10%, ½ watt (R161) 1,800 ohms, ±10%, 2 watts (R194) 2,200 ohms, ±10%, ½ watt (R219) 2,700 ohms, ±10%, ½ watt (R217) 2,700 ohms, ±10%, 2 watts (R208)

STOCK No.	DESCRIPTION
	3,900 ohms, ±5%, ½ watt (R112) 3,900 ohms, ±10%, ½ watt (R171) 4,700 ohms, ±10%, ½ watt (R144) 5,100 ohms, ±5%, ½ watt (R126) 5,600 ohms, ±5%, ½ watt (R119) 5,600 ohms, ±10%, ½ watt (R218) 5,600 ohms, ±10%, 1 watt (R127, R167) 6,800 ohms, ±5%, ½ watt (R136) 6,800 ohms, ±10%, ½ watt (R150) 6,800 ohms, ±10%, 2 watts (R177, R210) 8,200 ohms, ±5%, ½ watt (R175) 8,200 ohms, ±10%, ½ watt (R152, R153) 8,200 ohms, ±5%, 1 watt (R117, R128) 10,000 ohms, ±5%, ½ watt (R104) 10,000 ohms, ±10%, ½ watt (R141, R182, R220) 12,000 ohms, ±5%, ½ watt (R164) 12,000 ohms, ±10%, ½ watt (R209) 12,000 ohms, ±10%, 1 watt (R186) 12,000 ohms, ±10%, 2 watts (R124) 15,000 ohms, ±10%, ½ watt (R235) 15,000 ohms, ±10%, 1 watt (R146) 22,000 ohms, ±10%, ½ watt (R134, R197) 22,000 ohms, ±20%, ½ watt (R198, R215) 27,000 ohms, ±10%, ½ watt (R143, R151) 39,000 ohms, ±5%, ½ watt (R135) 47,000 ohms, ±10%, ½ watt (R145) 47,000 ohms, ±20%, ½ watt (R221) 82,000 ohms, ±5%, 1 watt (R179) 82,000 ohms, ±10%, 1 watt (R168) 100,000 ohms, ±5%, ½ watt (R203, R204) 100,000 ohms, ±10%, ½ watt (R187, R211, R216) 100,000 ohms, ±10%, 1 watt (R174) 100,000 ohms, ±20%, 2 watts (R222) 120,000 ohms, ±10%, 1 watt (R172) 150,000 ohms, ±10%, ½ watt (R129, R180, R185) 150,000 ohms, ±20%, ½ watt (R142) 150,000 ohms, ±5%, 1 watt (R176) 220,000 ohms, ±10%, ½ watt (R156, R166) 270,000 ohms, ±10%, ½ watt (R154) 330,000 ohms, ±10%, ½ watt (R140, R170, R200) 330,000 ohms, ±5%, 1 watt (R178) 470,000 ohms, ±10%, ½ watt (R137, R139, R224) 470,000 ohms, ±20%, ½ watt (R207) 680,000 ohms, ±10%, ½ watt (R133, R212) 820,000 ohms, ±10%, ½ watt (R169) 1 megohm, ±10%, ½ watt (R147, R181) 1 megohm, ±20%, ½ watt (R189, R260) 1.2 megohm, ±5%, ½ watt (R157, R213) 2.2 megohm, ±10%, ½ watt (R130, R132, R163) 3.3 megohm, ±5%, ½ watt (R159) 3.9 megohm, ±10%, ½ watt (R149) 6.8 megohm, ±10%, ½ watt (R125) 10 megohm, ±10%, ½ watt (R148) 10 megohm, ±20%, ½ watt (R201)
74602	Screw—No. 10-32 x 1¾" cross recessed round head screw for focus coil adjustments (3 required)
74601	Screw—No. 8-32 x ⅜" cross recessed pan head screw for focus coil mounting (2 required)
71456	Screw—No. 8-32 x 5/16" wing screw for fastening support and bracket
75083	Screw—No. 8-32 wing screw for mounting deflection yoke
73584	Shield—Tube shield
74937	Sleeve—Rubber sleeve for focus coil
73117	Socket—Tube socket, 7 pin, miniature
75223	Socket—Tube socket, 9 pin, miniature.
31251	Socket—Tube socket, octal, wafer
73249	Socket—Tube socket, octal, ceramic
71508	Socket—Tube socket for 1B3GT/8016
74834	Socket—Kinescope socket
31364	Socket—Pilot lamp socket for KCS40A
74936	Spring—Suspension spring (coil type) for kinescope socket leads
74954	Spring—Compression spring for hood and yoke assembly (3 required)
74944	Support—Rubber support for 2nd anode lead
74948	Support—Bakelite supports (1 set) for mounting hi-voltage plate
46760	Switch—"TV - Phono" switch (S103)
74157	Switch—Cabinet interlock switch (S105)
73569	Transformer—Vertical oscillator transformer (T107)
74589	Transformer—First pix I-F transformer (T101, C102, R101)
74590	Transformer—Second pix I-F transformer (T102, C107)
74591	Transformer—Third pix I-F transformer (T103, C112)
74592	Transformer—Fourth pix I-F transformer (T104, C116)
73575	Transformer—Fifth pix I-F transformer (T106, C123, C124)
71424	Transformer—Sound I-F transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
73576	Transformer—Horizontal ocscillator transformer (T109)
73578	Transformer—Antenna transformer complete with socket (T115, J102)
74949	Transformer—Power transformer, 115 volts, 60 cycles (T111)
74951	Transformer—High voltage transformer (T110)
74950	Transformer—Vertical output transformer (T108)
73577	Trap—4.5 mc trap (L110, C128)
71778	Trap—Sound trap (T105, C119)
73476	Trap—I-F trap (L116, C189)
74952	Yoke—Deflection yoke (L108, L109, L112, L113, C169, C187, P106)
	SPEAKER ASSEMBLIES FOR MODEL T164 Stamped 92580-3 W RMA-274 RL105C5
75023	Cap—Dust cap
75024	Cone—Cone and voice coil assembly
5039	Connector—4 contact male connector for speaker (J101)
75025	Gasket—Speaker cone gasket
75022	Speaker—8" P.M. speaker complete with cone and voice coil (3.2 ohms) less output transformer and connector
75034	Transformer—Output transformer (T114)
	SPEAKER ASSEMBLIES FOR MODELS TC165, TC166, TC167, TC168 Stamped 92569-10W RL 111-16 RMA 274 or 92569-10B
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly for 92569-10W
75875	Cone—Cone and voice coil assembly for 92569-10B

STOCK No.	DESCRIPTION
5039	Connector—4 contact male connector for speaker (J101)
75035	Speaker—12" P.M. speaker complete with cone and voice coil less output transformer and plug
75036	Transformer—Output transformer
	NOTE: If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74958	Back—Cabinet back for Model T164
75019	Back—Cabinet back for Model TC165
75026	Back—Cabinet back for Model TC166
74972	Back—Cabinet back for Model TC167
75020	Back—Cabinet back for Model TC168
72857	Board—"Ant" terminal board
71599	Bracket—Pilot lamp bracket for Models TC165, TC166, TC167, TC168
13103	Cap—Pilot lamp cap for Models TC165, TC166, TC167, TC168
71892	Catch—Bullet catch and strike for doors (1 set) (4 required for Model TC167 and 2 required for Model TC168)
X1917	Cloth—Grille cloth for mahogany or walnut instruments for Model T164
X1918	Cloth—Grille cloth for oak instruments for Model T164
X3074	Cloth—Grille cloth for mahogany or walnut instruments for Models TC165, and TC168, and maple instruments for Model TC168
X3089	Cloth—Grille cloth for oak instruments for Model TC165
X3088	Cloth—Grille cloth for mahogany or walnut instruments for Model TC167
X3101	Cloth—Grille cloth for mahogany and walnut instruments for Model TC166
X3090	Cloth—Grille cloth for oak instruments for Models TC166 and TC167
39153	Connector—4 contact male connector for antenna cable (P102)
30566	Connector—4 contact male connector, part of focus coil (P108)
35383	Connector—8 contact male connector, part of deflection yoke (P106)
74607	Decal—Control panel function decal for mahogany or walnut instruments
74608	Decal—Control panel function decal for oak or maple instruments
71984	Decal—Trade mark decal (RCA Victor) for Model T164
71768	Decal—Trade mark decal (RCA Victor) for Models TC167 and TC168
74809	Emblem—"RCA Victor" emblem
73642	Escutcheon—Channel marker escutcheon for mahogany or walnut instruments
73740	Escutcheon—Channel marker escutcheon for oak or maple instruments
72113	Foot—Rubber foot (4 required) for Model T164
74975	Glass—Safety glass for Model T164
74606	Glass—Safety glass for Models TC165, TC166, TC167 and TC168
37396	Grommet—Rubber grommet to mount speaker (4 required) for Models TC165, TC167 and TC168
73200	Hinge—Drop panel hinge (2 required) for Model T164
74308	Hinge—Cabinet door hinge (1 set) (4 required for Model TC167 and 2 required for Model TC168)
74959	Knob—Fine tuning knob—dark—for mahogany or walnut instruments (outer)
73995	Knob—Fine tuning knob—tan—for oak or maple instruments (outer)
74960	Knob—Channel selector knob—dark—for mahogany or walnut instruments (inner)
74961	Knob—Channel selector knob—tan—for oak or maple instruments (inner)
74962	Knob—Tone control, brightness control or vertical hold control knob—dark—for walnut or mahogany instruments (outer)
73999	Knob—Tone control, brightness control, or vertical hold control—tan—for oak or maple instruments (outer)
74963	Knob—Picture control, horizontal hold control or volume control and power switch knob—dark—for mahogany or walnut instruments (inner)
74001	Knob—Picture control, horizontal hold control or volume control and power switch knob—tan—for oak or maple instruments (inner)
11765	Lamp—Pilot lamp—Mazda 51—for Models TC165, TC166, TC167 and TC168
74162	Plate—Mounting plate for interlock switch
74450	Plate—Back plate for door pull (4 required) for Model TC167
74451	Pull—Door pull (4 required) for Model TC167
75021	Pull—Door pull (2 required) for Model TC168
74113	Screw—No. 8-32 x 1" trimit head screw for door pulls for Model TC167
74269	Screw—No. 8-32 x ¾" trimit head screw for door pull for Model TC168
73643	Spring—Spring clip for channel marker escutcheons
72845	Spring—Retaining spring for knobs Nos. 73995 and 74959
14270	Spring—Retaining spring for knobs Nos. 73999, 74960, 74961 and 74962
30330	Spring—Retaining spring for knobs Nos. 74001 and 74963
74966	Spring—Formed spring for kinescope masking panel (8 required)
72936	Stop—Door stop (2 required for Model TC167 and 1 required for Model TC168)
74161	Stud—Locating stud for back (2 required)

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Model TA169
Walnut, Mahogany or Oak

RCA VICTOR

TELEVISION, AM-FM RADIO PHONOGRAPH COMBINATION MODEL TA169

Chassis Nos. KCS43, RK135D

SERVICE DATA

— 1950 No. T9 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model TA169 is a "16 inch" television, AM-FM radio phonograph combination. The receiver employs thirty tubes plus three rectifiers and a 16GP4 kinescope. Two record changers are provided to play 33⅓, 45 and 78 RPM records.

Features of the television unit are full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE.......146 square inches on a 16GP4 kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range..±250 kc. on chan. 2, ±650 kc. on chan. 13
Picture Carrier Frequency..........................25.75 mc.
Sound Carrier Frequency..........................21.25 mc.

RADIO TUNING RANGE

Broadcast ....540-1,600 kc.
Frequency Modulation ....88-108 mc.
Intermediate Frequency—AM........................455 kc.
Intermediate Frequency—FM ....10.7 mc.

RECEIVER ANTENNA INPUT IMPEDANCE. 300 ohms balanced

If necessary, the television chassis may be fed separately from either a 300 ohm balanced line or a 72 ohm co-ax.

POWER SUPPLY RATING......115 volts, 60 cycles, 270 watts

AUDIO POWER OUTPUT RATING.............10 watts max.

CHASSIS DESIGNATIONS

Television Chassis KCS43
Radio Chassis....................................RK135D
33⅓/78 RPM Record Changer......................960285
45 RPM Record Changer..........................RP168C
Refer to Service Data 960285 or RP168 for information on the record changers.

LOUDSPEAKER 92569-5.................12 inch PM Dynamic
Voice Coil Impedance................3.2 ohms at 400 cycles

WEIGHT

Chassis with Tubes in Cabinet......................190 lbs.
Shipping Weight..................................230 lbs.

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside)	37¾	39	23½
Chassis (overall)	19¼	11	18½

RCA TUBE COMPLEMENT

Tube Used	(Television Chassis)	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 12AX7	Audio Amplifier and Phase Inverter
(8)	RCA 6V6GT	Audio Output (2 tubes)
(9)	RCA 6BA6	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6BA6	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector & Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier & Vertical Sweep Osc.
(16)	RCA 6SN7GT	AGC Rectifier & 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier & 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 6W4GT	Damper
(22)	RCA 1B3-GT/8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier (2 tubes)
(24)	RCA 16GP4	Kinescope

(Radio Tuner Chassis)

(1)	RCA 6J6	Mixer and Oscillator
(2)	RCA 6BA6	I-F Amplifier
(3)	RCA 6AU6	F-M Driver
(4)	RCA 6AL5	Ratio Detector
(5)	RCA 6BF6	AM Detector AVC and Phono Preamp.

VIDEO RESPONSE ....To 4 mc.

FOCUS ....Magnetic

SWEEP DEFLECTION ....Magnetic

SCANNING..........................Interlaced, 525 line

Specifications continued on page 2

TA169 **ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)**

HORIZONTAL SCANNING FREQUENCY............15,750 cps

VERTICAL SCANNING FREQUENCY..................60 cps

FRAME FREQUENCY (Picture Repetition Rate)..........30 cps

SOUND I-F FREQUENCIES

Sound Carrier Frequency....... ....21.25 mc.
Sound Discriminator Band Width between peaks.......350 kc.

PICTURE I-F FREQUENCIES

Picture Carrier Frequency.........................25.75 mc.
Adjacent Channel Sound Trap.....................27.25 mc.
Accompanying Sound Traps.......................21.25 mc.
Adjacent Channel Picture Carrier Trap..............19.75 mc.

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time.

1. Turn the radio FUNCTION switch to Tel.
2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.
3. Set the STATION SELECTOR to the desired channel.
4. Adjust the FINE TUNING control for best sound fidelity and SOUND VOLUME for suitable volume.
5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.
6. Adjust the VERTICAL hold control until the pattern stops vertical movement.
7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.
8. Turn the BRIGHTNESS control counter-clockwise until the retrace lines just disappear.
9. Adjust the PICTURE control for suitable picture contrast.

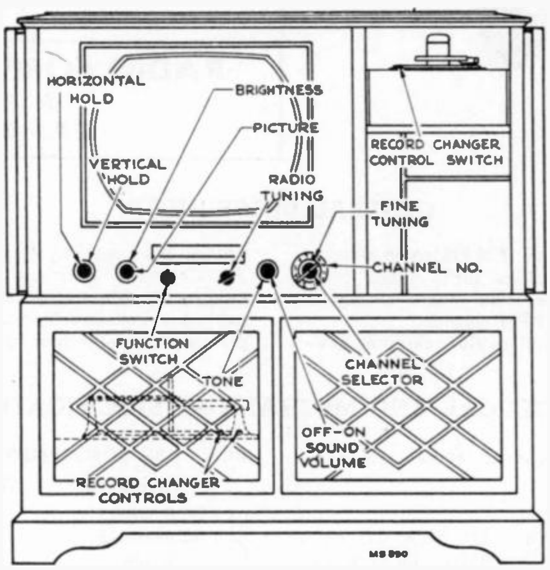


Figure 1—Receiver Operating Controls

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.
11. In switching from one station to another, it may be necessary to repeat steps numbers 4 and 9.
12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.
13. If the positions of the controls have been changed, it may be necessary to repeat steps numbers 1 through 9.
14. For radio operation turn the FUNCTION switch to AM or FM and tune in station with the radio TUNING control.
15. For phono operation, turn the FUNCTION switch to PH for operation of the 33⅓/78 rpm record changer, or to XPH for operation of the 45 rpm record changer.

INSTALLATION INSTRUCTIONS

WARNING.—The high voltage supply in this receiver delivers 12,000 volts! A.C. interlocks are provided at the back of the set so that when the back is removed so is the power.

ANTENNA AND POWER CONNECTIONS.—Connect the leads from the antenna to the receiver antenna terminals.

Make sure that the receiver power switch is in the off position. Plug the receiver power cord into a 115 volt, 60 cycle a-c outlet.

Turn the power switch to the "on" position, the brightness control three-quarters clockwise, and picture control fully counter-clockwise.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2. Starting from this position adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

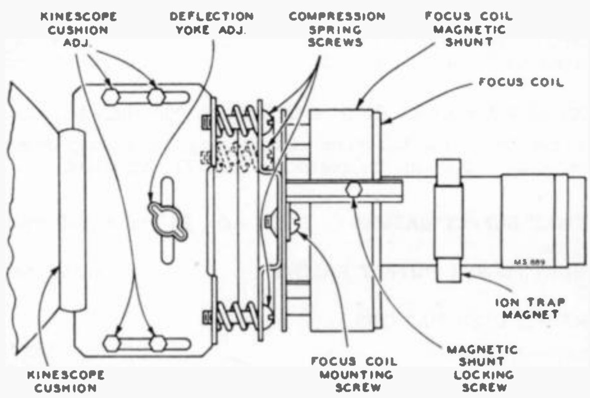


Figure 2—Yoke and Focus Coil Adjustments

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 on the rear apron (see Figure 3) clockwise until the set operates normally and the picture can be synced.

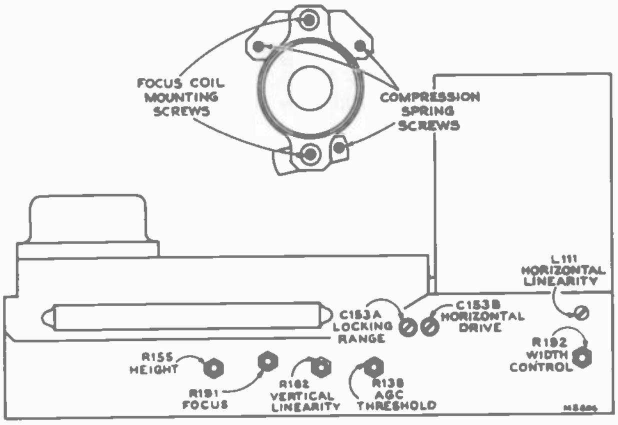


Figure 3– Rear Chassis Adjustments

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Usually the picture will remain in sync. Turn the control clockwise slowly. If the picture did fall out of sync upon removal of the signal, the number of diagonal black bars will be gradually reduced and when only 2 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. The picture should remain in sync for approximately 180 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Coil Adjustments."

ALIGNMENT OF HORIZONTAL OSCILLATOR. — If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 180 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment.—Turn the T109 sine wave core (on the outside of the apron) all the way out of the coil.

Set the locking range trimmer C153A one-half turn out from maximum capacity.

Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and turn the frequency wave core of T109 under the chassis until the picture syncs and the sync bar just begins to move into the picture.

NOTE.—Occasionally, a tube may be found which does not respond to this alignment procedure since it may not be possible to sync the picture by means of the frequency core when the sine wave core is all the way out of the coil. Yet, the tube may work perfectly well when the circuit is properly aligned. In such a case, it may be necessary to turn the sine wave core in slightly, and readjust the frequency core to obtain sync.

Turn the sine wave core of T109 in until the blanking bar begins to move off to the left of the picture. Alternately turn the sine wave core in and the frequency out, keeping the picture in sync and the blanking bar showing in the picture.

Continue alternate adjustments until the picture falls from sync into a parasitic oscillation as indicated by a non-synchronized pattern which flickers in width and centering with possibly a light ragged vertical bar through the center of the screen.

Turn the sine wave core out ½ turn. Adjust the frequency core in until the picture is in sync and horizontal blanking appears as a vertical bar in the picture.

Check of Pull-in Range.—Turn the horizontal hold control fully counter-clockwise. Connect a 270K ohm resistor across C156. Momentarily switch off channel and back; the picture will then be out of sync. Turn the hold control clockwise slowly and observe the minimum number of bars obtained just before the picture pulls into sync.

The picture should snap in from two complete blanking bars. If two bars are not obtained, turn the locking range trimmer C153A in to obtain less bars or out to obtain more bars.

If C153A was adjusted, remove the 270K resistor, turn the horizontal hold control fully clockwise and adjust the T109 frequency core until horizontal blanking appears as a vertical bar in the synced picture. Then repeat the entire check of pull-in range to this point.

Repeat the adjustments under "Check of Pull-in Range" until the conditions specified are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If the oscillator does not hold sync properly at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure.

FOCUS COIL ADJUSTMENTS.—The focus coil should be adjusted so that there is approximately one-quarter inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus coil. This spacing gives best average focus over the face of the tube. The axis of the hole through the focus coil should be parallel with the axis of the kinescope neck. The focus coil is provided with a magnetic shunt in the form of a metal sleeve. If the receiver focuses with the focus control at or near the end of its range, loosen the shunt locking screw and slide the shunt forward or backward until focus is obtained with the focus control in the middle of its range.

CENTERING ADJUSTMENT.—No electrical centering controls are provided. Centering is obtained by loosening the two focus coil mounting screws and sliding the coil up or down or from side to side. If the focus coil was appreciably changed in position or if a corner of the raster is shadowed, check the position of the ion trap magnet. Reposition the magnet within the range of maximum raster brightness to eliminate the shadow and recenter the picture by sliding the coil. In no case should the magnet be adjusted to cause any loss of brightness since such operation may cause immediate or eventual damage to the tube. In extreme cases it may be necessary to adjust one or more of the three focus coil compression spring screws to eliminate a corner shadow.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage hence the brightest and best focused picture, adjust horizontal drive counter-clockwise as far as possible without losing tension on trimmer.

Set the width control to minimum picture width.

Turn the horizontal linearity coil out until appreciable loss in width occurs, then in until nearly maximum width and the best linearity is obtained. Do not run the core in beyond the point of maximum linearity change, as the current drawn by the 6BG6G then becomes excessive.

Adjust the width control for the proper picture width.

Readjust linearity, but again not beyond the point of maximum linearity change. If necessary adjust the drive control for best linearity.

If at very high line voltage, the picture width is excessive even with the width control set at minimum, turn the linearity coil out to obtain the proper width. On high line voltage, excessive width generally will be accompanied by good linearity, without retouching the drive.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS. — Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron) until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust the focus coil to align the picture with the mask.

Check to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

AGC THRESHOLD CONTROL.—The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC threshold control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counter-clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counter-clockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counter-clockwise on a weak signal, then the receiver may overload when a strong signal is received.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure. The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

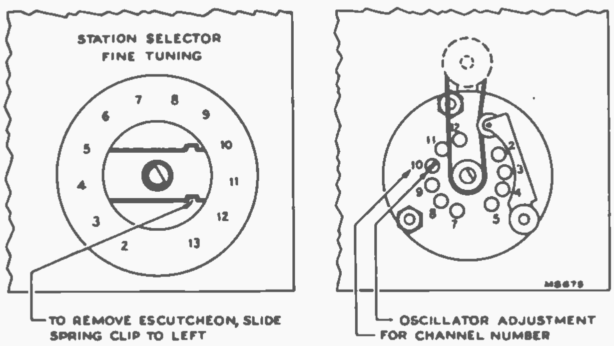


Figure 4—R-F Oscillator Adjustments

RADIO OPERATION.—Turn the receiver function switch to AM and FM positions and check the radio for proper operation. Tune in a station of known frequency. If the dial pointer does not point to the correct spot on the dial, slip the dial pointer on the dial cord until the proper indication is obtained.

RECORD CHANGER OPERATION.—Turn the receiver function switch to each phono position and check each record player for proper operation.

Replace the cabinet back and make sure that the screws are tight in order to prevent rattling at high volume.

WEAK SIGNAL AREA OPERATION.—Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390 ohm resistor R14 which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

CHASSIS REMOVAL.—To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the control knobs, the cabinet back, unplug the speaker cable, the kinescope socket, the antenna cable, the pilot light cable, the yoke and focus coil cable. Remove the yoke frame grounding strap and the interlock switch. Take out the six chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet.

KINESCOPE HANDLING PRECAUTION.—Do not install, remove, or handle the kinescope in any manner, unless shatter-proof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope from the cabinet, take out the four screws and one wing screw which hold the yoke frame to the cabinet. Remove the kinescope, the yoke frame with yoke and focus coil as an assembly.

INSTALLATION OF KINESCOPE.—Handle this tube by the metal rim at the edge of the screen. Do not cover the glass bell of the tube with fingermarks as it will produce leakage paths which may interfere with reception. If this portion of the tube has inadvertently been handled, wipe it clean with a soft cloth moistened with "dry" carbon tetrachloride.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and fingermarks with a soft cloth moistened with "Windex" or similar cleaning agent.

Turn the tube so that the key on the base of the tube will be down and insert the neck of the kinescope through the deflection and focus coils. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Replace the kinescope and yoke frame assembly in the cabinet. Insert the four screws and wing screw and tighten.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment locking screws. Slide the deflection yoke as far forward as possible and tighten. If this is not done, difficulty will be encountered in adjusting the ion trap magnet and focus coil because of shadows on the corner of the raster.

Slide the chassis into the cabinet, then insert and tighten the six chassis bolts.

Slip the ion trap magnet over the neck of the kinescope.

Connect the kinescope socket to the tube base and slip the high voltage lead clip between the rim of the kinescope and the mask.

Reconnect all other cables. Do not forget to replace the yoke frame grounding strap.

As may be seen by inspection, the radio dial lights and dial pointer are attached to the cabinet front panel. The dial cord is attached to the receiver chassis. The method of attachment may be seen in Figure 5.

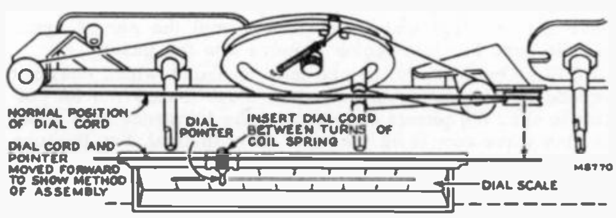


Figure 5—Dial Cord and Pointer Assembly

Reach over the television chassis to the radio and slip the radio pilot lights on the cabinet pilot light brackets.

To hook up the dial pointer, turn the tuning shaft until the gang is fully meshed. Slip the dial pointer to the low frequency end of the dial and press the dial cord well into the coil spring.

Turn the set on and to radio position to see that the dial lighting is correct. If it is not, adjust the dial lights and shields. Tune in a station of known calibration and check the dial calibration.

Perform the entire television set-up procedure beginning with Ion Trap Magnet Adjustment.

CABINET ANTENNA.—A cabinet antenna is provided for use in strong signal areas in which no reflections are experienced. The leads from the antenna are brought out near the receiver antenna terminal board. To connect the cabinet antenna, attach the leads to the terminal board. If reception is satisfactory, no other antenna is necessary. However, if reception is unsatisfactory, it will be necessary to employ an outdoor antenna or an indoor antenna which can be oriented.

RADIO ALIGNMENT PROCEDURE

If any lead dressing is necessary, it should be done before aligning the receiver. When making a complete alignment follow the table below in sequence. If only a portion of the circuit is to be aligned select the portion required and follow with the remaining steps in the section. Any adjustments made on the 455 kc. I-F's make it necessary to adjust the 10.7 mc. I-F's.

"AM" R-F—I-F ALIGNMENT

Test-Oscillator.—For all alignment operations, connect low side of the test-osc. to the receiver chassis, and keep the osc. output as low as possible to avoid a-v-c action. Output Meter.—Connect the meter across the speaker voice coil, and turn the receiver volume control to max.

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Turn Radio Dial to—	Adjust the following
1	Antenna terminal in series with .01 mfd.	455 kc. Modulated	AM	Low Freq. end of Dial	†Top and bot. cores of T301 and T302. (For max. voltage across voice coil.)
2	Ant. terminal through dummy ant. of 200 mmfs.	1,620 kc.	AM	Min. capacity	Osc. C308 for maximum output.
3		1,400 kc.	AM	Tune to signal	Ant. C304 for maximum output.
4		600 kc.	AM	600 kc.	Osc. L306 and Ant. L303.
5	Repeat steps 2, 3 and 4 for maximum output.				

† Use alternate loading. Connect an 18,000-ohm resistor across the primary to load the plate winding while the grid winding of the same transformer is being peaked. Then load the grid winding with the 18,000-ohm resistor while the plate winding is being peaked.

RATIO DETECTOR ALIGNMENT

Connect probe of "VoltOhmyst" to negative side of C328 and low side to chassis. Connect output meter across speaker voice coil.

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Radio Dial Tuned to—	Adjust
6	Pin No. 1 of 6AU6 (V303) in series with .01 mfd.	10.7 mc. 30% AM Modulated	FM	———	Top of T303 for maximum DC on "VoltOhmyst."
7	Pin No. 1 of 6AU6 (V303) in series with .01 mfd.		FM	———	Bottom of T303 for minimum audio output on meter.
8	Repeat steps 6 and 7 as necessary making final adjustment with r-f input level set to give approximately –3.0 volts d-c on "VoltOhmyst."				

"FM" R-F—I-F ALIGNMENT

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Radio Dial Tuned to—	Adjust
9	Terminal 3 of S301-2 rear through 270 ohms.	10.7 mc.	FM	88 mc.	*T301 and T302 for max. with r-f input set to give –3 volts on "VoltOhmyst."
10	Terminal 3 of S301-2 rear through 270 ohms.	106 mc.	FM	106 mc.	Set C302 to max. capacity. Squeeze L307 and adjust C302 for maximum.
11	Terminal 3 of S301-2 rear through 270 ohms.	90 mc.	FM	Tune to signal	Squeeze L301 and rock gang for maximum output.
12	Repeat steps 10 and 11 as required.				

* Use a 680-ohm resistor to load the plate winding while the grid winding of the same transformer is being peaked. Then the grid winding is loaded with 680-ohm resistor while the plate winding is being peaked.

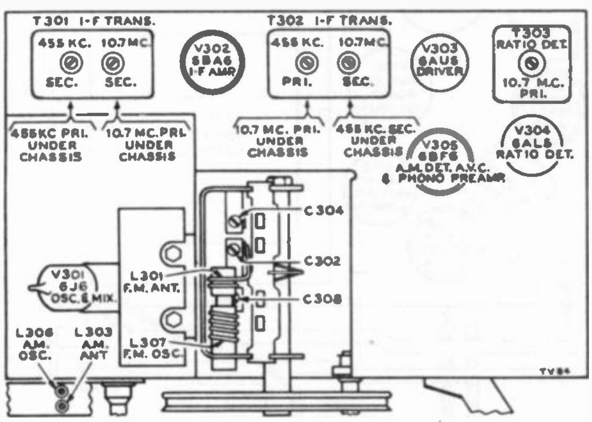


Figure 6—Chassis, Top View, Showing Adjustments

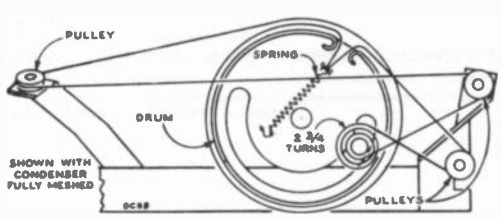


Figure 7—Dial and Drive Cord Assembly

CRITICAL LEAD DRESS:

1. Ground lead on pin 2 of V302 and V303 should be dressed down flat on chassis.
2. Dual .005 mfd. capacitors and diode filter should be dressed to clear the bottom of the cabinet.
3. Dress C329 across V302 sockets with short and direct leads.
4. Dress V302 plate lead from pin 5 down to the chassis.
5. Dress AVC lead from R321 to switch down to chassis and against back of gang mounting plate.
6. Dress lead from pin 6 of V305 down to chassis and against back of gang mounting plate.
7. Dress AVC lead from 1st I-F to switch against chassis and against gang mounting plate.
8. Dress lead from switch to pin 1 of V301 against plate supporting gang.
9. Dress all insulated F-M leads down to chassis.
10. Connect C309 with short lead to pin 6 of V301 keeping body of cap away from plate lead and switch terminals.
11. The coupling between L301 and L307 should be adjusted to give proper injection voltage to the mixer grid. This has been found to be correct when the distance between adjacent end turns is 3/8" to 7/16" measured at top of the form.
12. Dress cabled leads away from antenna transmission lines.
13. Dress all uninsulated bus wire so as to avoid short circuits.

CHASSIS TOP VIEW

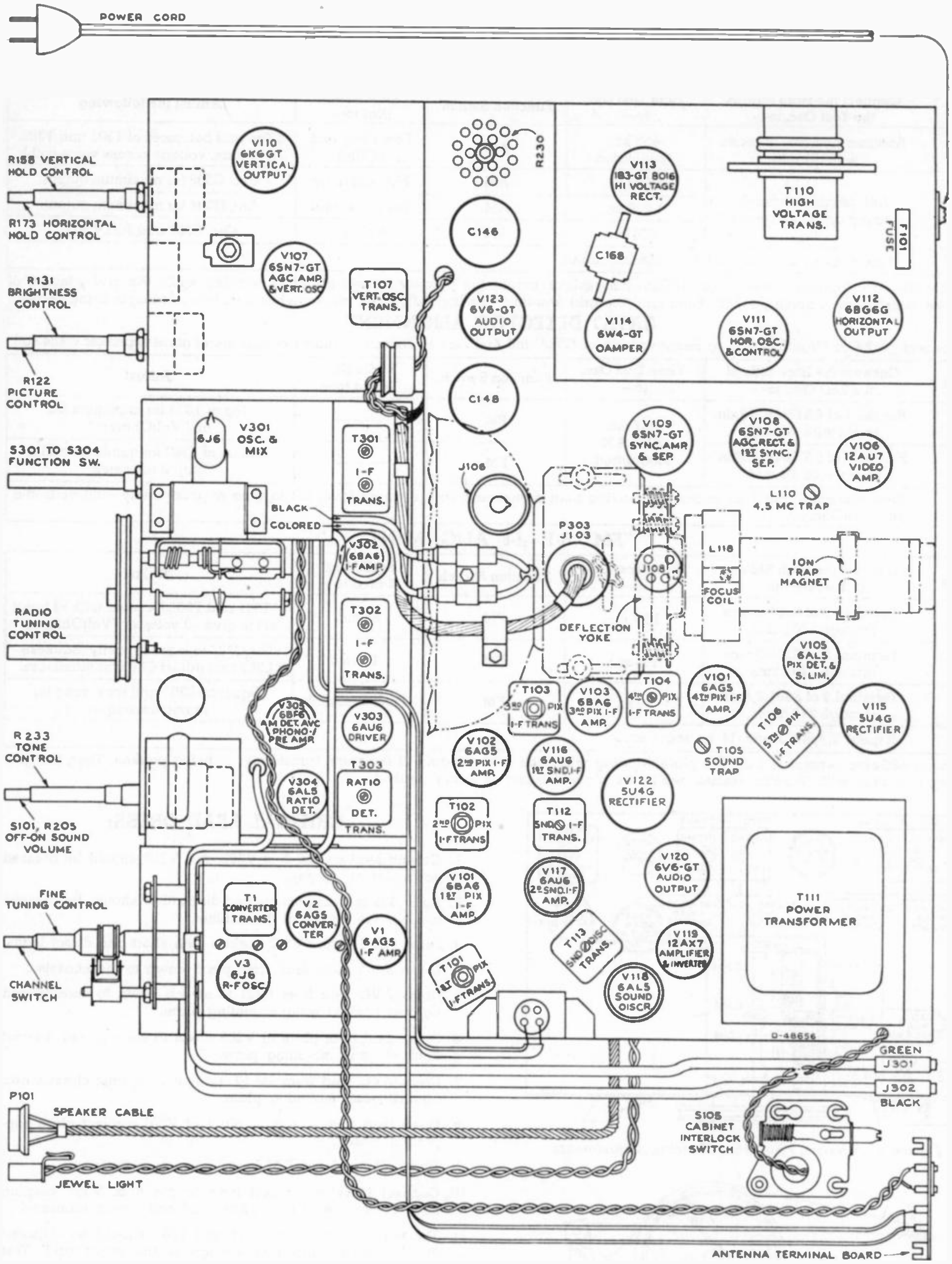


Figure 8—Chassis Top View

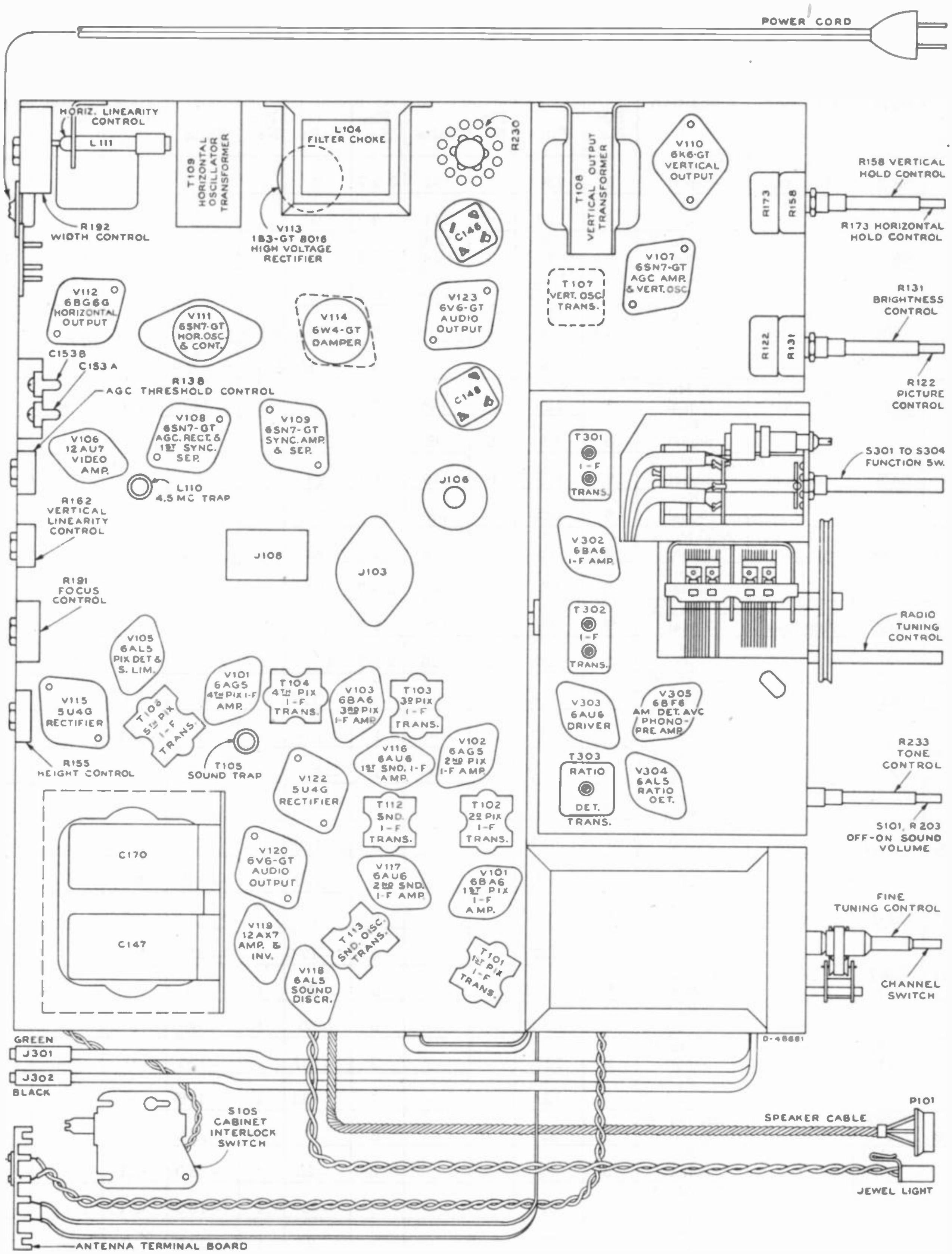


Figure 9 — Chassis Bottom View

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 microvolt test pattern signal was fed into the receiver, the picture was synced and the AGC threshold control was properly adjusted. The second condition was obtained by removing the antenna leads and short-circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles a-c. Symbol < means less than.

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	130	6	132	2 & 7	0	1	−2.2	5	2	
			No Signal	5	67	6	111	2 & 7	0	1	0.0	14.0	5.0	
V2	6AG5	Converter	2200 Mu. V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*−3.0 to −7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*107 to 109	6	*107 to 109	2 & 7	0	1	*−2.0 to −6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*−5.1 to −7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*−4.5 to −6.6	*1.8 to 2.1	—	
V101	6BA6	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5	128	6	128	7	.4	1	−11.0	1.9	.8	
			No Signal	5	95	6	95	7	1.73	1	+.2	8.1	3.4	
V102	6AG5	2nd Pix. I-F Amplifier	2200 Mu. V. Signal	5	119	6	119	2 & 7	.78	1	0	8.8	2.4	
			No Signal	5	100	6	100	2 & 7	.62	1	0	7.4	1.6	
V103	6BA6	3d Pix. I-F Amplifier	2200 Mu. V. Signal	5	81	6	119	7	.52	1	−2.2	11.1	.3	
			No Signal	5	55	6	96	2 & 7	.62	1	+.2	13.2	.3	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu. V. Signal	5	159	6	135	2 & 7	1.5	1	0	7.2	2.2	
			No Signal	5	165	6	118	2 & 7	1.35	1	0	6.8	2.4	
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	−116	—	—	1	−127	—	—	.3	—	
			No Signal	7	−131	—	—	1	−135	—	—	<0.1	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	−117	—	—	5	−58	—	—	—	—	
			No Signal	2	−83	—	—	5	−60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu. V. Signal	1	−18.7	—	—	3	−125	2	−129	2.6	—	
			No Signal	1	−28.0	—	—	3	−133	2	−135	6.6	—	
V106	12AU7	2d Video Amplifier	2200 Mu. V. Signal	6	*120	—	—	8	*−11.0	7	*−13.2	9.2	—	*At minimum contrast
			No Signal	6	*127	—	—	8	*−17.0	7	*−21.0	8.5	—	
V107 A	6SN7 GT	AGC Amplifier	2200 Mu. V. Signal	5	−11.0	—	—	6	−58	4	−61	.12	—	
			No Signal	5	+0.2	—	—	6	−60	4	−66	0	—	
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	.125	—	—	3	−127	1	−170	.31	—	
			No Signal	2	120	—	—	3	−135	1	−175	.30	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	87	—	—	6	−2	4	−19.5	.3	—	
			No Signal	5	75	—	—	6	−22	4	−28.0	<.1	—	
V108	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	87	—	—	3	−3	1	−18.5	<.1	—	
			No Signal	2	73	—	—	3	−22	1	−28.0	<.1	—	
V109	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	153	—	—	3	0	1	−5.7	5.8	—	
			No Signal	2	160	—	—	3	0	1	−5.6	5.4	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V109	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	241	—	—	6	—58	4	—117	.22	—	
			No Signal	5	240	—	—	6	—57	4	—65	.71	—	
V110	6K6-GT	Vertical Output	2200 Mu. V. Signal	3	240	4	*240	8	—78	5	—107	10	2.0	*Screen connected to plate
			No Signal	3	235	4	*235	8	—83	5	—111	10	1.9	
V111	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	*48	—	—	3	—136	1	—127	.11	—	*Variation of hold gives — 21.9 to +56 volts on plate
			No Signal	2	*33	—	—	3	—140	1	—140	.10	—	
V111	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	86	—	—	6	—127	4	—193	2.0	—	
			No Signal	5	80	—	—	6	—135	4	—205	1.7	—	
V112	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	Do Not Meas.	8	152	3	—117	5	—145	67.9	8.1	
			No Signal	Cap	Do Not Meas.	8	150	3	—126	5	—157	66.0	8.0	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	Do Not Meas.	—	—	2 & 7	12,300	—	—	0	—	
			Brightness Average	Cap	Do Not Meas.	—	—	2 & 7	11,700	—	—	.1	—	
V114	6W4GT	Damper	2200 Mu. V. Signal	5	Do Not Meas.	—	—	3	498	—	—	86	—	
			No Signal	5	Do Not Meas.	—	—	3	496	—	—	70	—	
V115	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	385			2 & 8	267	—	—	225	—	*A-C measured from plate to trans. center tap
			No Signal	4 & 6	385			2 & 8	260	—	—	226	—	
V116	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	124	6	124	7	.87	1	—0.1	7.0	3.0	
			No Signal	5	107	6	107	7	.75	1	—0.15	6.4	2.3	
V117	6AU6	2nd Sound I-F Amplifier	2200 Mu. V. Signal	5	130	6	67	7	0	1	—9	4.3	1.5	
			No Signal	5	120	6	60	7	0	1	—0.37	3.7	1.6	
V118	6AL5	Sound Discrim.	2200 Mu. V. Signal	2 7	—8.4 —3.7	—	—	5 1	5.8 0	— —	— —	— —	— —	
			No Signal	2 7	—0.4 —0.4	—	—	5 1	0 0	—	—	—	—	
V119	12AX7	1st Audio Amplifier	2200 Mu. V. Signal	1	100	—	—	3	0	2	—.9	—	—	
			No Signal	1	100	—	—	3	0	2	—.9	—	—	
		Phase Inverter	2200 Mu. V. Signal	6	130	—	—	8	0	7	—.9	—	—	
			No Signal	6	130	—	—	8	0	7	—.9	—	—	
V120 V123	6V6-GT	Audio Output	2200 Mu. V. Signal	3	230	4	85	8	—113	5	—127	22	5	*Per tube
			No Signal	3	230	4	85	8	—120	5	—135	22	5	*Per tube
V121	16GP4	Kinescope	2200 Mu. V. Signal	Cap	12,300	10	250	11	77	2	35	.06	—	*Average Brightness
			No Signal	Cap	11,700	10	250	11	73	2	48	.18	—	Average Brightness
V301	6J6	Mixer and Oscillator	No Signal	1 2	110 95	— —	— —	7	0	6 5	—2.0 —5.0	— —	— —	Function switch in F-M position
V302	6BA6	Radio I-F Amplifier	No Signal	5	210	6	105	7	.8	1	—0.2	—	—	
V303	6AV6	Radio F-M Driver	No Signal	5	205	6	135	7	1.5	1	0	—	—	
V304	6AL5	Radio Ratio Det.	No Signal	2 7	—0.2 —0.2	—	—	5 1	—0.2 —0.1	— —	— —	— —	— —	
V305	6BF6	A-M Det. and Phono Preamp	No Signal	7	—0.2	—	—	2	0	—	—	—	—	

RADIO CHASSIS WIRING DIAGRAM

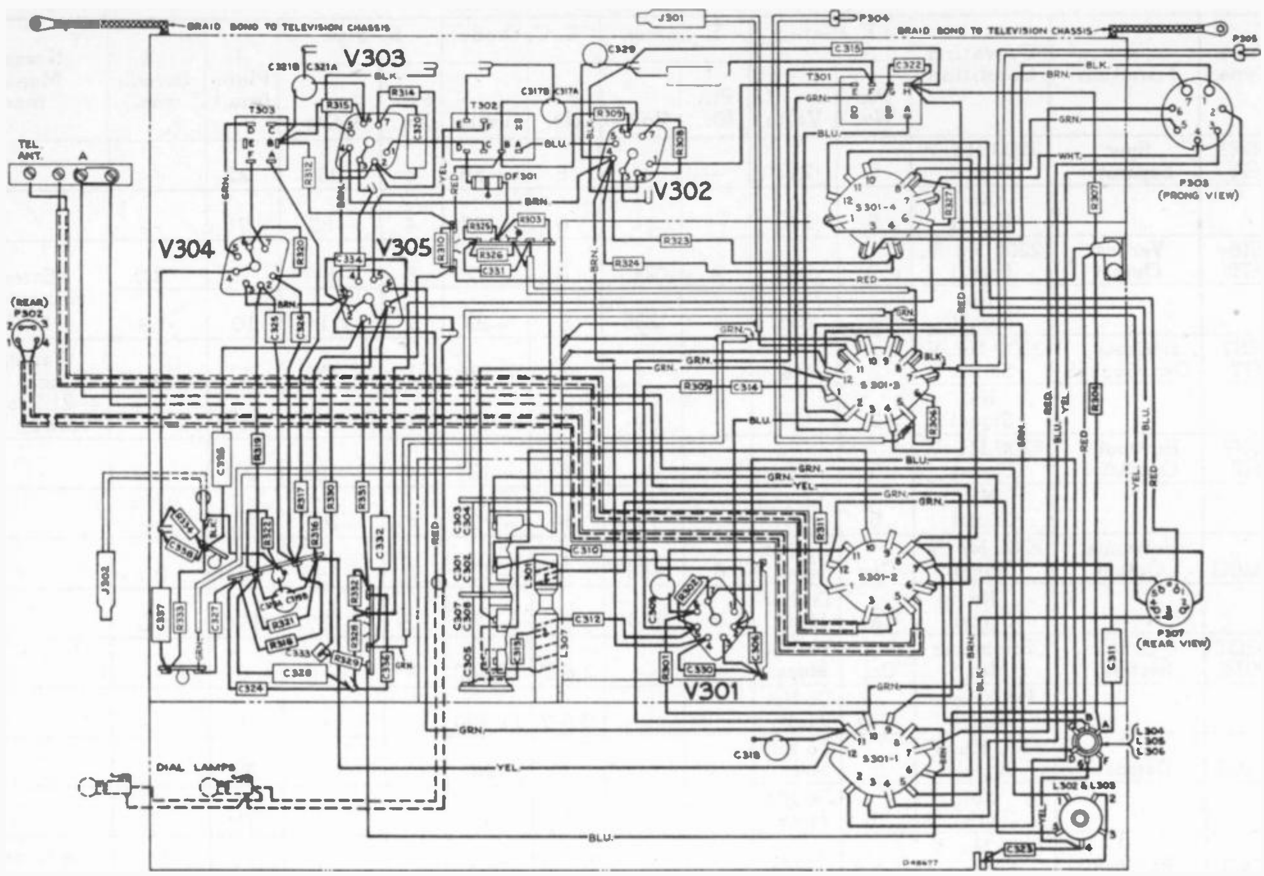


Figure 10—Radio Chassis Wiring Diagram (RK135D)

TELEVISION CRITICAL LEAD DRESS

1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.

2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V117, V118 and V119 should be down against the chassis and away from grid or plate leads.

3. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.

4. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.

5. Dress black lead from terminal C of T106 down next to chassis.

6. Leads to L102 and L103 must be as short as possible.

7. Dress peaking coils L105, L106 and L107 up and away from the chassis.

8. Dress C183 across tube pins 5 and 6 with leads not exceeding 3/8 inch.

9. Dress body of R215 as close to tube pin as possible.

10. Dress C129 and C130 up and away from the chassis.

11. Dress the yellow lead from the picture control away from the chassis and away from the volume-control leads. Dress the yellow lead from pin 8 of V106 away from the chassis.

12. Dress the green lead from pin 2 of V106 away from the chassis.

13. Dress R168, R169, R170, R176 and R178 up and away from the chassis.

14. The leads to the volume control should be dressed down against the chassis and away from V117 and V118.

15. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.

16. Dress three a-c leads to S101 under clamp and away from R211.

17. Dress black lead from power transformer and red lead from S102 to terminal board, on top of four potentiometers.

18. Dress all leads from V115 to V122 on power transformer side of terminal board.

19. Dress all leads away from R230.

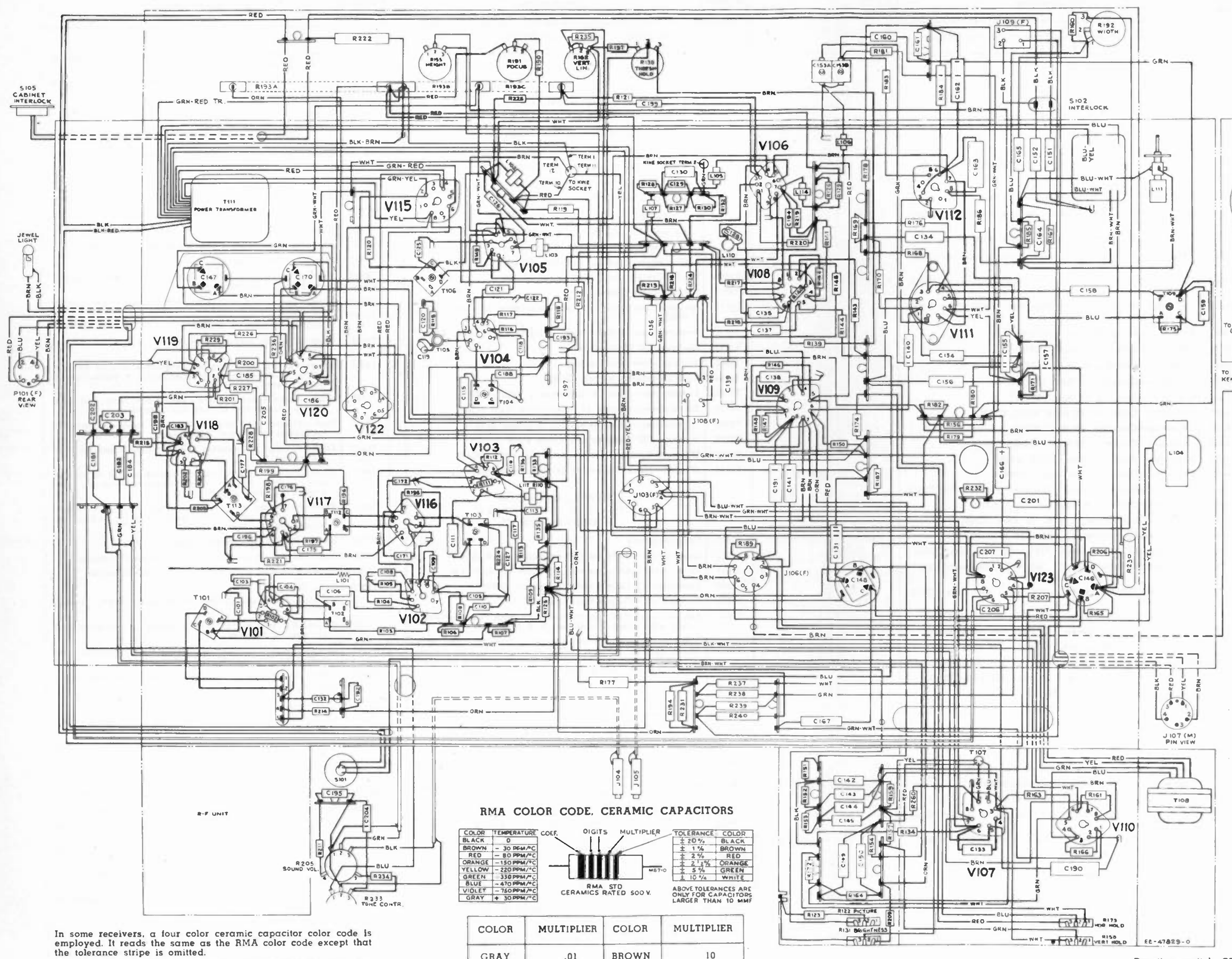
20. Dress brown and yellow leads of phono motor cable under R165 and under C201.

21. All solder joints in the high voltage section should be free of sharp edges.

22. The lead side of the V113 plate cap should be turned away from the fixed high voltage shield.

23. All leads under the horizontal plate in the high voltage section should be kept reasonably short and dressed away from the V113 corona ring.

TELEVISION CHASSIS WIRING DIAGRAM



RMA COLOR CODE, CERAMIC CAPACITORS

COLOR	TEMPERATURE COEF.
BLACK	0
BROWN	− 30 PPM/°C
RED	− 80 PPM/°C
ORANGE	−150 PPM/°C
YELLOW	− 220 PPM/°C
GREEN	330 PPM/°C
BLUE	− 470 PPM/°C
VIOLET	− 750 PPM/°C
GRAY	+ 30 PPM/°C

RMA STD CERAMICS RATED 500 V.

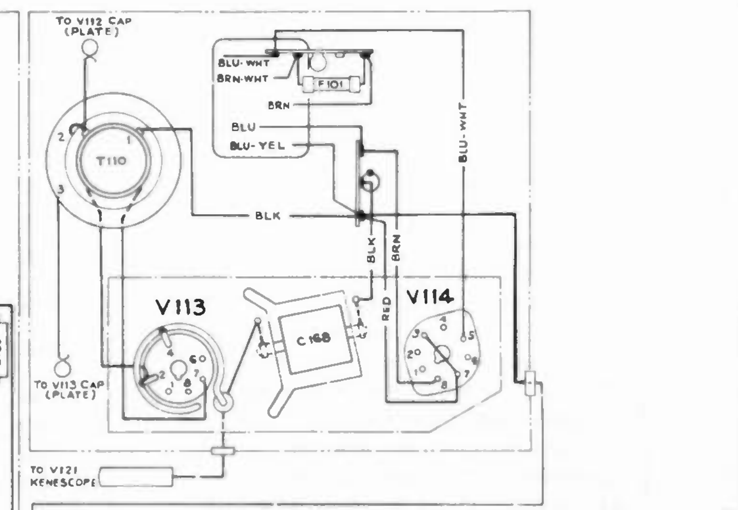
TOLERANCE	COLOR
± 20%	BLACK
± 1%	BROWN
± 2%	RED
± 2½%	ORANGE
± 5%	GREEN
± 10%	WHITE

ABOVE TOLERANCES ARE ONLY FOR CAPACITORS LARGER THAN 10 MMF

COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

In some receivers, a four color ceramic capacitor color code is employed. It reads the same as the RMA color code except that the tolerance stripe is omitted.

If the coefficient stripe is silver, it indicates that the capacitor has a very large temperature coefficient and is to be employed for bypass or other usages where a wide variation of capacity is unimportant. Silver striped capacitors are rated at 350 volts unless otherwise marked.

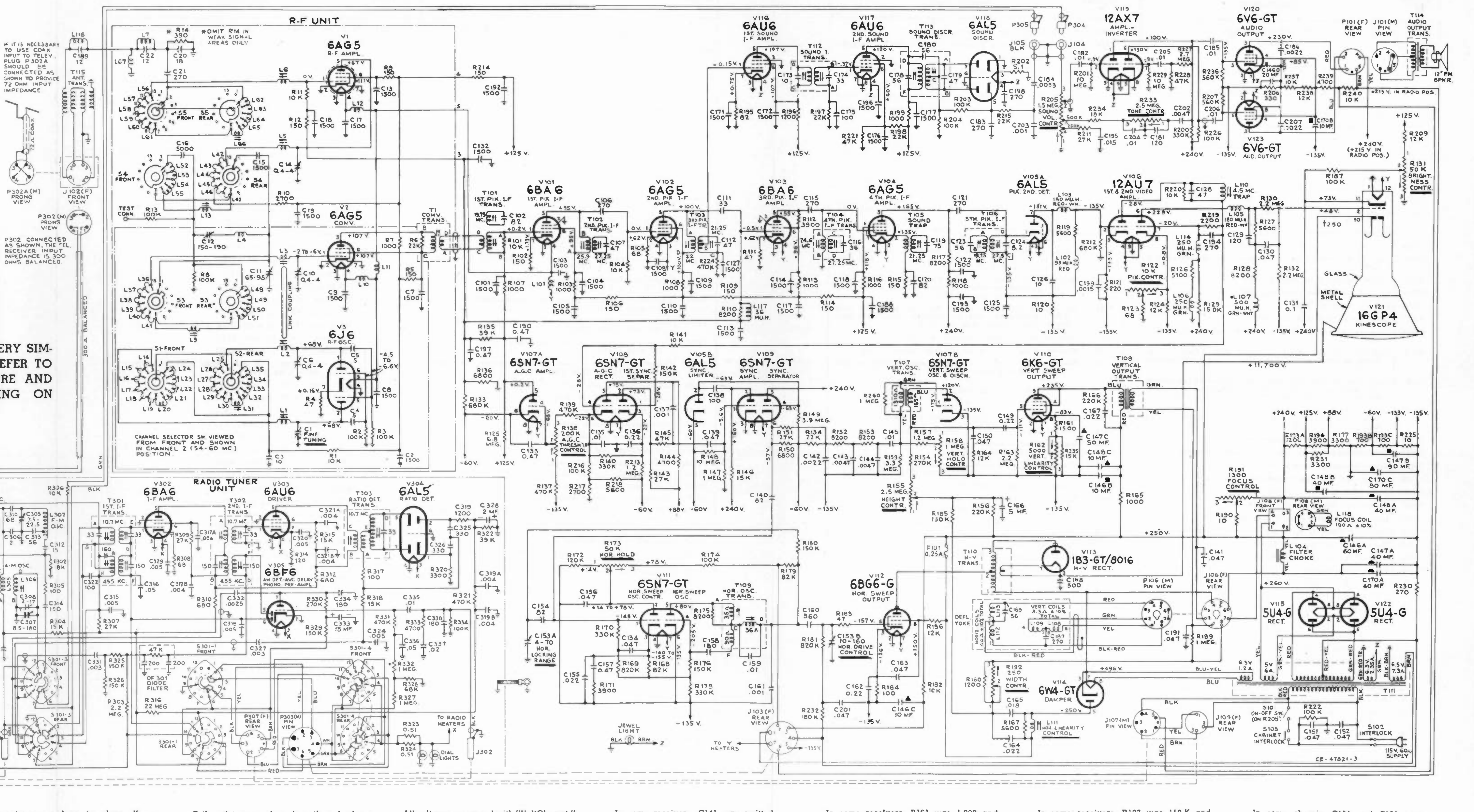


THE TELEVISION SECTION OF MODEL TA169 IS VERY SIMILAR TO THE CHASSIS USED IN MODEL T164. REFER TO PAGES 267 TO 277 FOR ALIGNMENT PROCEDURE AND WAVEFORM PHOTOGRAPHS. R-F UNIT WIRING ON PAGE 280.

Figure 11—Chassis Wiring Diagram

Function switch S301 viewed from front and shown in Number 1 (maximum counterclockwise position).
Switch position 1—Television.

CIRCUIT SCHEMATIC DIAGRAM



Switch position 2—AM.
Switch position 3—FM.
Switch position 4—Phono 45 RPM.
Switch position 5—Phono 78 RPM.

All resistance values in ohms. K = 1,000.
All capacitance values less than 1 in MF and above 1 in MMF unless noted.

Coil resistance values less than 1 ohm are not shown.
Direction of arrows at controls indicates clockwise rotation.

All voltages measured with "VoltOhmyst," no signal input with 117 v. a-c supply with the pix control fully clockwise and the brightness control set for average brightness.

In some receivers, C141 was omitted.
In some receivers, R220 was 12 K.
In some receivers, R121 was 39, R225 was 18, R128 was 6,800, R129 was 220 K, L107 was 250 Muh. and C199 was omitted.

In some receivers, R161 was 1,000 and R235 was omitted.
In some receivers, R160 and R167 were omitted.

In some receivers, R187 was 150 K and R188 470 K was connected from V121-11 to +125 V and V121-10 was connected to the junction of R156 and C166.
In some receivers, R260 was omitted.

In some chassis, C151 and C152 were .01 mfd.

Figure 12—Circuit Schematic Diagram

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES **KRK 5B**
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board (5 contact)
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission cable (W1)
73441	Cam—Fine, tuning adjustment
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer, comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1,500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5,000 mmf. (C16)
73460	Coil—R-F plate coil for channel 6 (L13)
73461	Coil—Rear section—Oscillator plate coil for channel 6 (L20)
73462	Coil—Coupling inductance coil (L4)
73475	Coil—Antenna filter shunt coil (C67)
73476	Coil—I-F trap (L7, C22)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Front section—Oscillator plate coil for channel 6 (L31)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (plunger adjustment) (L1, C1)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment for oscillator section or converter section) (L2, L3, C6, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f amplifier section (L5, C14)
71493	Connector—Oscillator segment connector
73455	Core—Sliding core for fine tuning control trimmer
74187	Core—Adjustable core for coil L9
73440	Detent—R-F unit detent mechanism and fibre shaft
71487	Form—Coil form for coil L31
73453	Form—Coil form assembly for L9, L13
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to converter trimmer loop connector
73634	Nut—Speed nut for drive belt shield
73436	Plate—Front plate and bushing
73464	Pulley—Idler pulley
	Resistor—Fixed, composition:
	47 ohms, ±20%, ½ watt (R4)
	150 ohms, ±20%, ½ watt (R5, R9, R12)
	390 ohms, ±10%, ½ watt (R14)
	1,000 ohms, ±20%, ½ watt (R7)
	2,700 ohms, ±10%, ½ watt (R10)
	10,000 ohms, ±20%, ½ watt (R1, R11)
	100,000 ohms, ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring
30340	Retainer—Retainer ring for fine tuning stud
70881	Screw—No. 4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
73640	Screw—No. 4-40 x ⅝" adjusting screw for L66
71475	Screw—No. 4-40 x 15/32" adjusting screw for coils L21, L22, L23, L24
74575	Screw—No. 4-40 x 17/32" adjusting screw for L6
73437	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
73439	Shaft—Actuating shaft for fine tuning control
75443	Shield—"U" shape shield for bottom of r-f unit
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt

STOCK No.	DESCRIPTION
73632	Shield—Metal tube shield for V1
71494	Socket—Tube socket, moulded, 7 prong, saddle mounted
73450	Socket—Tube socket, ceramic, 7 prong, bottom mounted
74576	Spacer—Insulating spacer for front plate (4 required)
73457	Spring—Return spring for fine tuning control core
74188	Spring—Retaining spring for adjustable core RCA 74187
74578	Spring—Retaining spring for adjusting screws RCA 73640 and RCA 74575
75068	Spring—Retaining spring for R-F oscillator tube shield
73466	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Converter stator complete with rotor and coils (S3, L9, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L13, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55, C15, C16, R10)
75446	Stud—Capacitor stud — brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, uncoded or coded "ER"
75447	Stud—Capacitor stud — brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, coded numerically or "Hi Q"
73448	Transformer—Converter transformer (T1, R6)
73466	Washer—Insulating washer for front shield (1 set)
2917	Washer—"C" washer for channel selector shaft or fine tuning shaft and cam
	TELEVISION CHASSIS ASSEMBLIES **KCS 43**
•75086	Bracket—Mounting bracket (upper) for focus coil
•75087	Bracket—Mounting bracket (lower) for focus coil
74911	Cable—Shielded cable complete with female connector (W101, W103, J104, J105)
74946	Capacitor—Mica trimmer, comprising 1 section of 4-70 mmf. and 1 section of 10-160 mmf. (C153A, C153B)
39604	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)
64062	Capacitor—Ceramic, 82 mmf. (C120)
73090	Capacitor—Mica, 82 mmf. (C140, C154)
39396	Capacitor—Ceramic, 100 mmf. (C175)
75060	Capacitor—Mica, 100 mmf. (C138)
73921	Capacitor—Ceramic, 120 mmf. (C129)
39630	Capacitor—Mica, 120 mmf. (C181)
73102	Capacitor—Mica, 180 mmf. (C158)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
74947	Capacitor—Ceramic, 500 mmf., 20,000 volts (C168)
74250	Capacitor—Mica, 560 mmf. (C160)
71501	Capacitor—Ceramic, 1,500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C127, C132, C171, C172, C176, C177, C188, C192, C193, C196)
28417	Capacitor—Electrolytic, 5 mfd., 450 volts (C166)
73582	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, and 1 section of 10 mfd., 450 volts, and 1 section of 80 mfd., 200 volts (C170A, C170B, C170C)
73583	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 90 mfd., 150 volts, and 1 section of 50 mfd., 150 volts (C147A, C147B, C147C)
71432	Capacitor—Electrolytic, comprising 2 sections of 40 mfd., 450 volts, and 1 section of 10 mfd., 450 volts (C148A, C148B, C148C)
73581	Capacitor—Electrolytic, comprising 1 section of 60 mfd., 450 volts, 2 sections of 10 mfd., 450 volts, and 1 section of 20 mfd., 150 volts (C146A, C146B, C146C, C146D)
73801	Capacitor—Tubular, moulded paper, oil impregnated, .001 mfd., 1,000 volts (C137, C161, C203)
73802	Capacitor—Tubular, paper, oil impregnated, .0015 mfd., 600 volts (C199)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd., 600 volts (C142)

STOCK No.	DESCRIPTION
73803	Capacitor—Tubular, paper, oil impregnated, .0022 mfd., 1,000 volts (C186, C207)
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd., 600 volts (C184)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 600 volts (C143, C144, C202)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C135, C182, C204)
73594	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 600 volts (C145, C159, C205)
73565	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 1,000 volts (C185, C206)
73797	Capacitor—Tubular, paper, oil impregnated, .015 mfd., 600 volts (C195)
74727	Capacitor—Tubular, paper, oil impregnated, .018 mfd., 1,000 volts (C165)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 1,000 volts (C155, C164, C167)
75071	Capacitor—Tubular, molded paper, .047 mfd., 400 volts (C151, C152)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C130, C134, C201)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 600 volts (C139, C156)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 1,000 volts (C141, C150, C163, C191)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 600 volts (C131)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 200 volts (C136, C162)
74957	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 600 volts (C149)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd., 200 volts (C133, C157, C190, C197)
73154	Choke—Filter choke (L104)
74983	Coil—Focus coil (L118, P108)
71449	Coil—Horizontal linearity control coil (L111)
73477	Coil—Filament choke coil (L101)
74170	Coil—Peaking coil (36 muh) (L117, R110)
71527	Coil—Peaking coil (93 muh) (L102)
74214	Coil—Peaking coil (180 muh) (L103, L105)
71526	Coil—Peaking coil (250 muh) (L106, L114)
75252	Coil—Peaking coil (500 muh) (L107)
72172	Connector—3 contact female connector (J107A)
31027	Connector—4 contact female connector for focus coil leads (J108)
72108	Connector—7 contact female connector (J103)
74594	Connector—Male connector for power cable
60942	Connector—8 contact female connector for deflection yoke leads (J106)
30568	Connector—4 contact male connector—part of focus coil (P108)
35383	Connector—8 contact male connector—part of deflection yoke (P106)
•74967	Connector—Anode connector
5040	Connector—4 contact female connector for speaker cable (P101)
14786	Connector—5 contact male connector for motor switching cable (J107B)
72734	Control—Horizontal and vertical hold control (R158, R173)
74047	Control—Picture and brightness control (R122, R131)
74359	Control—Tone control, volume control and power switch (R205, R233, S101)
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
74597	Control—Focus control (R191)
74475	Control—AGC threshold control (R138)
74945	Control—Width control (R192)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics No. 71432 and No. 73581
74956	Cushion—Rubber cushion for yoke hood (2 required)
73600	Fuse—0.25 amp., 250 volts (F101)
71799	Grommet—Rubber grommet for yoke horizontal lead exit
37396	Grommet—Rubber grommet for mounting ceramic tube socket (2 required)

STOCK No.	DESCRIPTION
74030	Grommet—Rubber grommet for mounting radio chassis
75445	Hood—Deflection yoke hood less rubber cushions
74953	Magnet—Ion trap magnet (PM type)
18469	Plate—Bakelite mounting plate for electrolytics
75444	Plate—Bakelite plate complete with tube sockets for high voltage rectifier
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
18471	Resistor—Wire wound, 10 ohms, ½ watt (R190)
•75085	Resistor—Wire wound, 270 ohms, 20 watts (R230)
74955	Resistor—Voltage divider, comprising 1 section of 1,200 ohms, 16 watts and 2 sections of 700 ohms, 5½ watts (C193A, C193B, C193C)
48207	Resistor—Wire wound, 3,300 ohms, 10 watts (R177)
	Resistor—Fixed, composition:
	10 ohms, ±20%, ½ watt (R120)
	10 ohms, ±10%, ½ watt (R225)
	47 ohms, ±5%, ½ watt (R111)
	47 ohms, ±20%, ½ watt (R183)
	68 ohms, ±10%, ½ watt (R105)
	68 ohms, ±20%, ½ watt (R123)
	82 ohms, ±10%, ½ watt (R195)
	100 ohms, ±10%, 2 watts (R184)
	150 ohms, ±5%, ½ watt (R102)
	150 ohms, ±10%, ½ watt (R115)
	150 ohms, ±20%, ½ watt (R108, R109, R114, R214)
	220 ohms, ±10%, ½ watt (R121)
	330 ohms, ±10%, 2 watts (R206)
	1,000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R199)
	1,200 ohms, ±10%, 1 watt (R160)
	1,200 ohms, ±10%, ½ watt (R196)
	1,500 ohms, ±10%, ½ watt (R161)
	2,200 ohms, ±10%, ½ watt (R219)
	2,700 ohms, ±10%, ½ watt (R217)
	3,300 ohms, ±10%, 2 watts (R231)
	3,900 ohms, ±5%, ½ watt (R112)
	3,900 ohms, ±10%, ½ watt (R171)
	3,900 ohms, ±10%, 2 watts (R194)
	4,700 ohms, ±10%, ½ watt (R144)
	4,700 ohms, ±10%, 2 watts (R239)
	5,100 ohms, ±5%, ½ watt (R126)
	5,600 ohms, ±5%, ½ watt (R119)
	5,600 ohms, ±10%, ½ watt (R218)
	5,600 ohms, ±10%, 1 watt (R127, R167)
	6,800 ohms, ±5%, ½ watt (R136)
	6,800 ohms, ±10%, ½ watt (R150)
	8,200 ohms, ±5%, ½ watt (R175)
	8,200 ohms, ±10%, ½ watt (R152, R153)
	8,200 ohms, ±5%, 1 watt (R117, R128)
	10,000 ohms, ±5%, ½ watt (R104)
	10,000 ohms, ±10%, ½ watt (R141, R182, R220)
	10,000 ohms, ±10%, 2 watts (R237, R240)
	12,000 ohms, ±5%, ½ watt (R164)
	12,000 ohms, ±10%, ½ watt (R209)
	12,000 ohms, ±10%, 1 watt (R186)
	12,000 ohms, ±10%, 2 watts (R124, R238)
	15,000 ohms, ±10%, 1 watt (R146)
	15,000 ohms, ±10%, ½ watt (R235)
	18,000 ohms, ±10%, ½ watt (R234)
	22,000 ohms, ±10%, ½ watt (R134, R197)
	22,000 ohms, ±20%, ½ watt (R198, R215)
	27,000 ohms, ±10%, ½ watt (R143, R151, R211)
	39,000 ohms, ±5%, ½ watt (R135)
	47,000 ohms, ±5%, ½ watt (R228)
	47,000 ohms, ±10%, ½ watt (R145)
	47,000 ohms, ±20%, ½ watt (R221)

STOCK No.	DESCRIPTION
	82,000 ohms, ±5%, 1 watt (R179)
	82,000 ohms, ±10%, 1 watt (R168)
	100,000 ohms, ±5%, ½ watt (R203, R204)
	100,000 ohms, ±10%, ½ watt (R187, R216, R226)
	100,000 ohms, ±10%, 1 watt (R174)
	100,000 ohms, ±20%, 2 watts (R222)
	120,000 ohms, ±10%, 1 watt (R172)
	150,000 ohms, ±10%, ½ watt (R129, R180, R185)
	150,000 ohms, ±20%, ½ watt (R142)
	150,000 ohms, ±5%, 1 watt (R176)
	180,000 ohms, ±10%, ½ watt (R232)
	220,000 ohms, ±10%, ½ watt (R156, R166)
	270,000 ohms, ±10%, ½ watt (R154)
	330,000 ohms, ±10%, ½ watt (R140, R170, R200)
	330,000 ohms, ±5%, 1 watt (R178)
	470,000 ohms, ±10%, ½ watt (R137, R139, R224)
	560,000 ohms, ±10%, ½ watt (R207, R236)
	680,000 ohms, ±10%, ½ watt (R133, R212)
	820,000 ohms, ±10%, ½ watt (R169, R181)
	1 megohm, ±10%, ½ watt (R147)
	1 megohm, ±20%, ½ watt (R189, R260)
	1.2 megohm, ±5%, ½ watt (R157, R213)
	2.2 megohm, ±10%, ½ watt (R130, R132, R163)
	2.7 megohm, ±5%, 1 watt (R227)
	3.3 megohm, ±5%, ½ watt (R159)
	3.9 megohm, ±10%, ½ watt (R149)
	6.8 megohm, ±10%, ½ watt (R125)
	10 megohm, ±10%, ½ watt (R148)
	10 megohm, ±20%, ½ watt (R201, R229)
74602	Screw—No. 10-32 x 1¾" cross recessed round head screw for focus coil adjustments (3 required)
•75083	Screw—No. 8-32 x ¼" wing screw for deflection yoke mounting
74601	Screw—No. 8-32 x ⅜" cross recessed pan head screw for focus coil mounting (2 required)
73584	Shield—Tube shield
74937	Sleeve—Rubber sleeve for focus coil
73117	Socket—Tube socket, 7 pin, miniature
72927	Socket—Tube socket, 9 pin, miniature
31251	Socket—Tube socket, octal
73249	Socket—Tube socket, octal, ceramic, plate mounted
71508	Socket—Tube socket, 8 contact for 1B3 GT/8016
74834	Socket—Kinescope socket
31364	Socket—Pilot lamp socket
74954	Spring—Compression spring used under centering control screws (3 required)
74936	Spring—Suspension spring (coil type) for kinescope socket leads
74944	Support—Rubber support for 2nd anode lead
74948	Support—Bakelite support (1 set) for mounting hi-voltage plate
74157	Switch—Cabinet interlock switch (S105)
•75084	Transformer—Power transformer, 115 volts, 60 cycles (T111)
74950	Transformer—Vertical output transformer (T108)
73569	Transformer—Vertical oscillator transformer (T107)
74951	Transformer—Hi-voltage transformer (T110)
74589	Transformer—First pix, i-f transformer (T101, C102, R101)
74590	Transformer—Second pix, i-f transformer (T102, C107)
74591	Transformer—Third pix, i-f transformer (T103, C112)
74592	Transformer—Fourth pix, i-f transformer (T104, C116)
73575	Transformer—Fifth pix, i-f transformer (T106, C123, C124)
71424	Transformer—Sound i-f transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)

STOCK No.	DESCRIPTION
73576	Transformer—Horizontal oscillator transformer (T109)
73578	Transformer—Antenna transformer complete with socket (T115, J102)
73577	Trap—4.5 mc trap (L110, C128)
71778	Trap—Sound trap (T105, C119)
73476	Trap—I-F trap (L116, C189)
74952	Yoke—Deflection yoke (L108, L109, L112, L113, C169, C187, P106)
	RADIO CHASSIS ASSEMBLIES **RK 135 D**
74039	Board—"Telv-Ant" terminal board (TB301)
74026	Bracket—Drive cord bracket complete with two pulleys—R.H.
74027	Bracket—Drive cord bracket complete with pulley—L.H.
74911	Cable—Shielded cable complete with female connector (W307, W311)
71105	Cable—Shielded cable complete with pin plug (W301, W302)
74017	Capacitor—Variable tuning capacitor (C301, C302, C303, C304, C305, C307, C308)
73866	Capacitor—Ceramic, 2 mmf. (C306)
39044	Capacitor—Ceramic, 15 mmf. (C312)
39042	Capacitor—Ceramic, 47 mmf. (C330)
73867	Capacitor—Ceramic, 56 mmf. (C313)
33379	Capacitor—Ceramic, 68 mmf. (C310)
39396	Capacitor—Ceramic, 100 mmf. (C322, C323)
48125	Capacitor—Ceramic, 150 mmf. (C314)
71922	Capacitor—Ceramic, 180 mmf. (C334, C338)
39640	Capacitor—Mica, 330 mmf. (C325, C326)
73748	Capacitor—Ceramic, 1,500 mmf. (C309)
74009	Capacitor—Ceramic, dual, 4,000 mmf. (C317, C319, C321)
73473	Capacitor—Ceramic, 5,000 mmf. (C318, C329)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C328)
32223	Capacitor—Electrolytic, 15 mfd., 300 volts (C333)
70502	Capacitor—Tubular, paper, .0025 mfd., 400 volts (C332)
73961	Capacitor—Tubular, paper, .003 mfd., 200 volts (C327, C331)
71553	Capacitor—Tubular, paper, .005 mfd., 400 volts (C315, C320, C324)
71923	Capacitor—Tubular, paper, .01 mfd., 200 volts (C335)
71925	Capacitor—Tubular, paper, .01 mfd., 400 volts (C311)
71928	Capacitor—Tubular, paper, .02 mfd., 200 volts (C337)
72596	Capacitor—Tubular, paper, .05 mfd., 200 volts (C336)
74455	Capacitor—Tubular, paper, .05 mfd., 400 volts (C316)
74020	Coil—A-M antenna coil (L302, L303)
73744	Coil—A-M oscillator coil (L304, L305, L306)
74024	Coil—F-M antenna coil (L301)
74025	Coil—F-M oscillator coil (L307)
36395	Connector—7 contact male connector (P103)
12493	Connector—5 contact female connector (P107B)
39153	Connector—4 prong male connector (P102)
72953	Cord—Drive cord (approx. 42" overall)
74011	Filter—Diode filter, dual, 200 mmf. and 47,000 ohms (DF 301)
74023	Resistor—Wire wound, 0.51 ohms, 1 watt (R323, R324)
	Resistor—Fixed, composition:
	10 ohms, ±20%, ½ watt (R311)
	68 ohms, ±20%, ½ watt (R308)
	100 ohms, ±20%, ½ watt (R305, R317)
	120 ohms, ±10%, ½ watt (R314)
	680 ohms, ±20%, ½ watt (R310, R312)
	1,200 ohms, ±5%, ½ watt (R319)
	3,300 ohms, ±5%, ½ watt (R320)
	4,700 ohms, ±10%, ½ watt (R333)
	10,000 ohms, ±20%, ½ watt (R306)

STOCK No.	DESCRIPTION
	15,000 ohms, ±10%, ½ watt (R304)
	15,000 ohms, ±20%, ½ watt (R315, R318)
	18,000 ohms, ±10%, ½ watt (R302)
	27,000 ohms, ±10%, ½ watt (R307, R309)
	39,000 ohms, ±10%, ½ watt (R322)
	68,000 ohms, ±10%, ½ watt (R328)
	100,000 ohms, ±10%, ½ watt (R334)
	150,000 ohms, ±10%, ½ watt (R325, R326, R329)
	270,000 ohms, ±10%, ½ watt (R330)
	470,000 ohms, ±10%, ½ watt (R331)
	470,000 ohms, ±20%, ½ watt (R321)
	1 megohm, ±10%, ½ watt (R327, R332)
	2.2 megohm, ±20%, ½ watt (R303)
	3.9 megohm, ±10%, ½ watt (R301)
	22 megohm, ±20%, ½ watt (R316)
74028	Shaft—Tuning knob shaft
73632	Shield—Tube shield
73117	Socket—Tube socket, 7 pin, miniature for V301, V304, V305
74179	Socket—Tube socket, 7 pin, miniature for V302, V303
31364	Socket—Dial lamp socket
74038	Spring—Drive cord spring
74894	Switch—Selector switch (S301)
73745	Transformer—First i-f transformer, dual (T301)
74019	Transformer—Second i-f transformer, dual (T302)
73743	Transformer—Ratio detector transformer (T303)
33726	Washer—"C" washer for tuning shaft
34457	Washer—Spring washer for tuning shaft (front)
74172	Washer—Fibre washer to prevent drive cord slippage
	SPEAKER ASSEMBLIES 92569-5 W RL 111-8 RMA 274 or 92569-5 K RMA 252
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly for 92569-5 W
75642	Cone—Cone and voice coil assembly for 92569-5 K
5039	Connector—4 contact male connector (J101)
73636	Transformer—Output transformer (T114)
73635	Speaker—12" P.M. speaker complete with cone and voice coil less output transformer and plug
	NOTE:—If stamping in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
75102	Back—Cabinet back
74054	Bracket—Dial lamp bracket (2 required)
71599	Bracket—Pilot lamp bracket
74296	Cable—Shielded pickup cable complete with pin plug for 45 RPM changer
72437	Cable—Shielded pickup cable complete with pin plug for 33/78 RPM changer
13103	Cap—Pilot lamp cap
73803	Capacitor—Tubular, paper, .002 mfd., 400 volts (C401)
71892	Catch—Bullet catch and strike for doors (3 required)
X3092	Cloth—Grille cloth for mahogany or walnut cabinets
X3090	Cloth—Grille cloth for oak cabinets
30868	Connector—2 contact female connector for 45 RPM motor extension cable
30870	Connector—2 contact male connector for 45 RPM motor extension cable
14782	Connector—3 contact male connector for record changer power cable
74581	Cover—Mounting screw cover for 45 RPM changer

STOCK No.	DESCRIPTION
74273	Decal—Trade mark decal (Victrola)
74898	Decal—Control panel function decal for mahogany or walnut instruments
74899	Decal—Control panel function decal for oak instruments
74052	Dial—Dial scale and bezel assembly
74809	Emblem—"RCA Victor" emblem
73642	Escutcheon—Channel marker escutcheon for mahogany or walnut instruments
73740	Escutcheon—Channel marker escutcheon for oak instruments
74606	Glass—Safety glass
37396	Grommet—Rubber grommet to mount speaker (4 required)
74308	Hinge—Cabinet door hinges (1 set) for RH or LH door
70166	Hinge—Cabinet door hinge for center door—upper
73200	Hinge—Cabinet door hinge for center door—lower
74051	Indicator—Station selector indicator
74959	Knob—Fine tuning knob — maroon — for mahogany or walnut instruments (outer)
73995	Knob—Fine tuning knob—tan—for oak instruments (outer)
74960	Knob—Channel selector knob—maroon—for mahogany or walnut instruments (inner)
74961	Knob—Channel selector knob—tan—for oak instruments (inner)
74962	Knob—Vertical hold control, brightness control or tone control knob—maroon—for mahogany or walnut instruments (outer)
73999	Knob—Vertical hold control, brightness control or tone control knob—tan—for oak instruments (outer)
74978	Knob—Tuning or selector switch knob—maroon—for mahogany or walnut instruments
74979	Knob—Tuning or selector switch knob—tan—for oak instruments
74963	Knob—Horizontal hold control, picture control or volume control and power switch knob—maroon—for mahogany or walnut instruments
74001	Knob—Horizontal hold control, picture control or volume control and power switch knob—tan—for oak instruments (inner)
11765	Lamp—Dial or pilot lamp—Mazda 51
74208	Nut—Tee nut to mount 45 RPM changer (3 required)
74162	Plate—Mounting plate for cabinet interlock switch
75037	Pull—Door pull
	Resistor—Fixed, composition, 47,000 ohms, ±10%, ½ watt (R401)
74582	Screw—No. 8-32 x 1¾" special screw to mount 45 RPM changer (3 required)
74156	Screw—No. 8-32 x 7/16" wing screw for deflection yoke and focus coil support and bracket
75038	Screw—No. 8-32 x ½" trimit head screw for door pull
74050	Slide—Station indicator slide
74736	Slide—Slide mechanism for changer carriages
74055	Spring—Spring clip for dial and bezel assembly (2 required)
72845	Spring—Retaining spring for knobs No. 73995 and No. 74959
14270	Spring—Retaining spring for knobs 73999, 74960, 74961 and 74962
30330	Spring—Retaining spring for knobs 74001 and 74963
73643	Spring—Spring clip for channel marker escutcheon
74421	Spring—Conical spring to mount 45 RPM changer—upper—R.H. (1 required)
74422	Spring—Conical spring to mount 45 RPM changer—upper L.H. (2 required)
74423	Spring—Conical spring to mount 45 RPM changer—lower—(3 required)
74966	Spring—Formed spring for kinescope masking panel (8 required)
72936	Stop—Door stop
74161	Stud—Locating stud for back cover (2 required)
75146	Washer—"C" washer for mounting 33/78 RPM changer (2 required)

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Model S1000—Walnut or Mahogany

RCA VICTOR

TELEVISION, AM-FM RADIO PHONOGRAPH COMBINATION MODEL S1000

Chassis Nos. KCS31-1 and RC617B
Mfr. No. 274

SERVICE DATA

— 1950 No. T2 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model S1000 is a deluxe 16 inch television and AM-FM radio receiver. Two record changers are provided to play 78, 33⅓ and 45 RPM records. The "MAGIC MONITOR," an automatic scratch suppressor, is provided to permit improved reproduction from old or worn records. The instrument employs 34 tubes plus 4 rectifiers and a 16AP4 kinescope.

Features of the television unit are full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc band width for picture channel and reduced hazard high voltage supply.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE........146 square inches on a 16 inch kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.

Fine Tuning Range....±250 kc on chan. 2, ±650 kc on chan. 13

Picture Carrier Frequency.................. 25.75 mc.

Sound Carrier Frequency.................. 21.25 mc.

VIDEO RESPONSE.................. To 4 Mc.

SWEEP DEFLECTION.................. Magnetic

FOCUS.................. Magnetic

RADIO TUNING RANGE

Broadcast.................. 540-1,600 kc

Short Wave.................. 9.2-16 mc.

Frequency Modulation ....88-108 mc.

Intermediate Frequency—AM .... 455 kc

Intermediate Frequency—FM .... 10.7 mc.

POWER SUPPLY RATING............ 115 volts, 60 cycles, 310 watts

AUDIO POWER OUTPUT RATING.................. 11 watts max.

CHASSIS DESIGNATIONS

Television Chassis KCS31-1

Radio Chassis RC617B

78/33⅓ RPM Record Changer 960285

45 RPM Record Changer RP168C

Refer to Service Data 960285 or RP168 for information on the record changers.

LOUDSPEAKER 92569-6..................12 inch PM Dynamic

Voice Coil Impedance.................. 3.2 ohms at 400 cycles

DIMENSIONS (inches)

	Width	Height	Depth
Cabinet (outside)	39½	43½	24¾

WEIGHT

Chassis with Tubes in Cabinet.................. 228 lbs.

Shipping Weight.................. 305 lbs.

RECEIVER ANTENNA INPUT IMPEDANCE....300 ohms balanced
If desired, television chassis may be fed from 72 ohm co-ax.

RCA TUBE COMPLEMENT

	Tube Used (Television Chassis)	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6J6	R-F Oscillator
(3)	RCA 6AG5	Converter
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	Bias Clamp
(8)	RCA 6AG5	1st Picture I-F Amplifier
(9)	RCA 6AG5	2nd Picture I-F Amplifier
(10)	RCA 6AG5	3rd Picture I-F Amplifier
(11)	RCA 6AG5	4th Picture I-F Amplifier
(12)	RCA 6AL5	Picture 2nd Detector and Sync Limiter
(13)	RCA 6AU6	1st Video Amplifier
(14)	RCA 6K6GT	2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier and Vert. Sweep Osc.
(16)	RCA 6SN7GT	AGC Rectifier and 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier and 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 5V4G	Damper
(22)	RCA 1B3-GT/8016	H. V. Rectifier (2 tubes)
(23)	RCA 5U4G	Power Supply Rectifier (2 tubes)
(24)	RCA 16AP4	Kinescope

(Radio Tuner Chassis)

	Tube Used	Function
(1)	RCA 6BA6	R-F Amplifier
(2)	RCA 6BA6	Mixer
(3)	RCA 6BE6	Oscillator
(4)	RCA 6BA6	I-F Amplifier
(5)	RCA 6AU6	F-M Driver
(6)	RCA 6AL5	Ratio Detector
(7)	RCA 6AV6	AM Detector, AVC, AF Amplifier
(8)	RCA 6C4	Phase Invertor
(9)	RCA 6V6GT	Audio Output (2 tubes)
(10)	RCA 6BA6	MM Band Pass Amplifier
(11)	RCA 6BF6	MM Amplifier and Rectifier
(12)	RCA 6BA6	MM Reactance Tube

TELEVISION OPERATION

The following adjustments are necessary when tuning the receiver on for the first time.

1. Turn the radio FUNCTION switch to Tel.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and SOUND VOLUME for suitable volume.

5. Turn the PICTURE control to mid-position.

6. Turn the BRIGHTNESS control fully counterclockwise then clockwise until a light pattern appears on the screen.

7. Adjust the VERTICAL hold control until the pattern stops vertical movement.

8. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

9. Turn the BRIGHTNESS control counterclockwise until the retrace lines just disappear.

10. Adjust the PICTURE control for suitable picture contrast.

11. After the receiver has been on for some time it may be necessary to readjust FINE TUNING control for improved sound fidelity.

12. In switching from one station to another, it may be necessary to repeat steps numbers 4 and 10.

13. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

14. If the position of the controls has been changed, it may be necessary to repeat steps numbers 2 through 10.

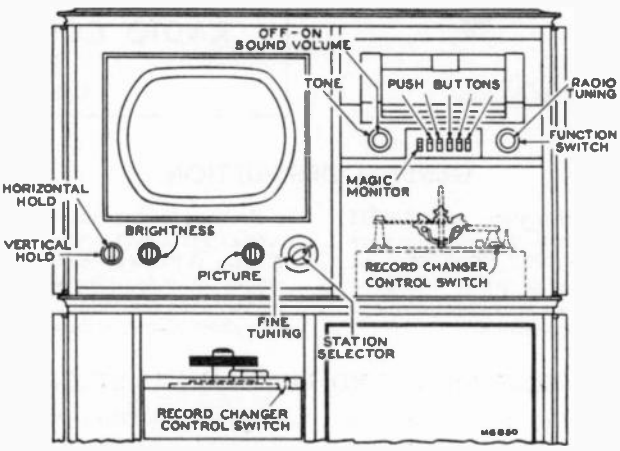


Figure 1—Receiver Operating Controls

RADIO OPERATION

1. Turn the radio FUNCTION switch to the desired band.

2. Tune in the desired station with the TUNING control.

PUSH BUTTON OPERATION

1. Turn the radio FUNCTION switch to PB.

2. Push the appropriate button to receive the desired station.

PHONOGRAPH OPERATION

1. Turn the radio FUNCTION switch to Ph for operation of the 78/33⅓ RPM changer or to XPh. for operation of the 45 RPM changer.

2. Place a record on the appropriate changer and slip the changer power switch to "ON".

"MAGIC MONITOR"

The MAGIC MONITOR operates only when the function switch is in the phono position.

1. Push the gold push button to turn MM on.

2. Push the gold push button a second time to turn MM off.

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For these reasons, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

MODEL S1000 IS VERY SIMILAR TO MODEL 9TW390. THE TELEVISION CHASSIS IS IDENTICAL. MODEL S1000 USES 960285 RECORD CHANGER (78/33⅓ r.p.m.) INSTEAD OF RP177B (78 r.p.m.). THE RADIO CHASSIS DIFFERS ONLY IN THE VALUE OF A FEW COMPONENTS.

REFER TO MODEL 9TW390 IN VOL. V FOR ADDITIONAL INFORMATION.

INSTALLATION INSTRUCTIONS

Remove the television front panel by loosening the two wingnuts inside the cabinet and by turning the two locking plates as shown in Figure 2. Hinge the panel at the bottom and tilt it out at the top.

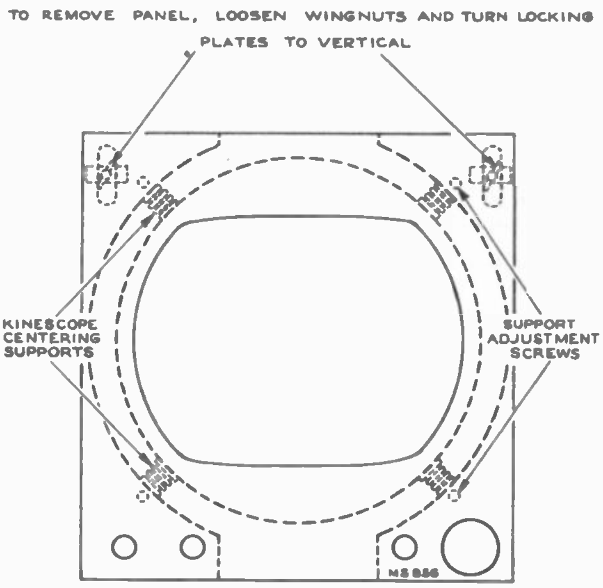


Figure 2—Television Panel, Front View

Remove the two self-tapping screws from the kinescope-cushion slide as shown in Figure 3.

Loosen the two kinescope cushion adjustment wing screws and slide the cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

From the front of the cabinet, look through the deflection yoke and check the alignment of the focus coil with the yoke. If the focus coil is not in line, loosen the two focus coil mounting screws and move the coil until alignment is obtained. Tighten the mounting screws with the coil in this position.

Loosen the two lower kinescope face centering supports, and set them at approximately mid-position. See Figure 2 for location of the supports and their adjustment screws. Loosen the two upper supports (from inside the cabinet), slip them up as far as possible and tighten.

Check the centering supports. There should be a small wire clip on the inner surface of each. The clip in the lower left corner should be connected to the high voltage lead.

KINESCOPE HANDLING PRECAUTION.—Do not open the kinescope shipping carton, install, remove, or handle the kinescope in any manner, unless shatter-proof goggles and heavy gloves are worn. Persons not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling. The shipping carton should be kept for use in case of future moves.

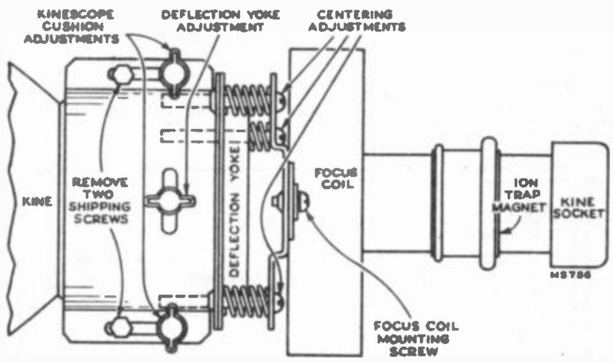


Figure 3—Yoke and Focus Coil Adjustments

Handle this tube by the metal rim at the edge of the screen. Do not cover the glass bell of the tube with fingermarks as it will produce leakage paths which may interfere with reception. If this portion of the tube has inadvertently been handled, wipe it clean with a soft cloth moistened with "dry" carbon tetrachloride.

KINESCOPE INSTALLATION.—Turn the kinescope so that the key on the base of the tube will be down and insert the neck of the kinescope through the deflection and focus coils as shown in Figure 4. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slip the ion trap magnet assembly over the neck of the kinescope with the large magnet towards the base of the tube.

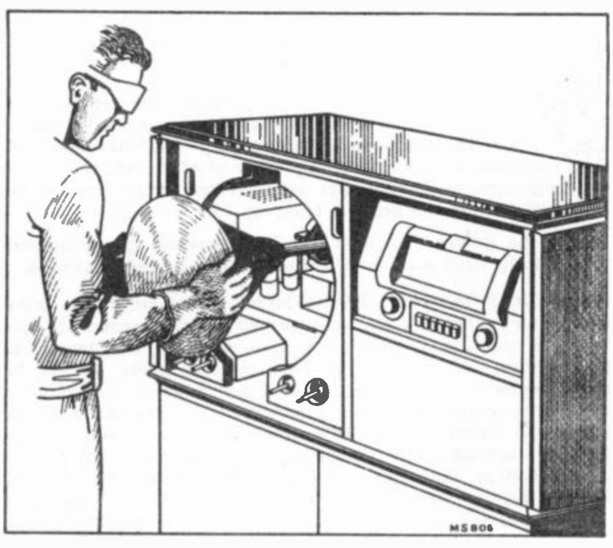


Figure 4—Kinescope Insertion

Connect the kinescope socket to the tube base.

Adjust the four centering supports until the face of the kinescope is in the center of the cabinet opening. Tighten the four supports securely.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks with a soft cloth moistened with the Drackett Co.'s "Windex" or similar cleaning agent.

Install the cabinet front panel by reversal of the procedure indicated in Figure 2. Fasten the two bars in back of the panel and tighten the wingnuts.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible. If this is not done, difficulty will be encountered in adjusting the ion trap magnet and focus coil because of shadows on the corner of the raster.

The antenna and power connections should now be made. Install the front panel control knobs.

Make sure that all tubes are firmly seated in their sockets and all cable plugs are in the proper sockets as shown in Figure 5.

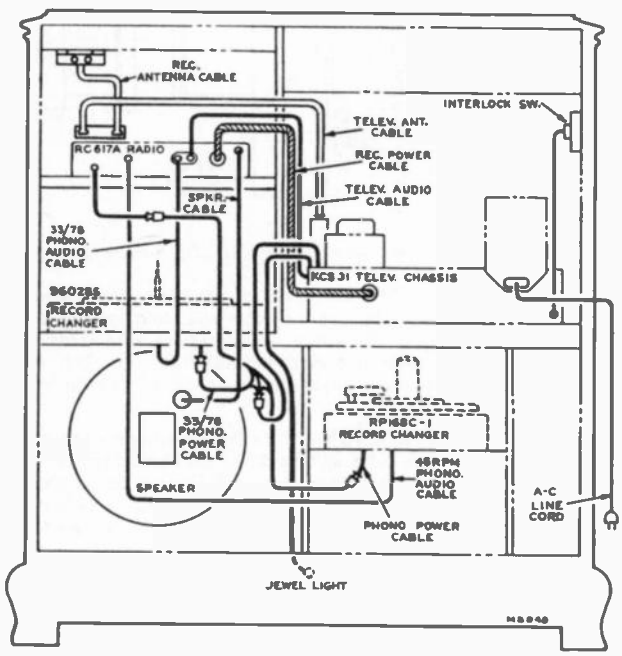


Figure 5—Interconnecting Cable Diagram

WARNING.—The high voltage supply in this receiver delivers 12,000 volts! If it is necessary to remove the kinescope after the receiver has been operating, short the kinescope cone to the chassis before attempting removal of or adjustments to the kinescope. A.C. interlocks are provided at the back of the set so that when the back is removed—so is the power.

Turn the power switch to the "on" position, the brightness control fully clockwise, and picture control counterclockwise.

ION TRAP MAGNET ADJUSTMENT.—Looking at the kinescope gun structure, it will be observed that the second cylinder from the base inside the glass neck is provided with two small metal flags. The ion trap rear magnet poles should be approximately over these flags. Starting from this position adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R201 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

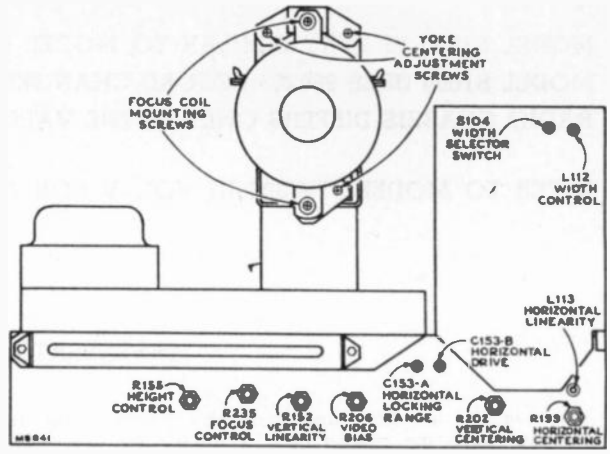


Figure 6—Rear Chassis Adjustments

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 2 through 10 of the television receiver operating instructions on page 2.

If the Horizontal Oscillator is operating properly, it should be possible to sync the picture at this point.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counterclockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull in should occur when the control is approximately 90 degrees from the extreme counterclockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Centering Adjustment."

ALIGNMENT OF HOLIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counterclockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull in point, it will be necessary to make the following adjustments.

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock In Range Adjustment.—Set the horizontal hold control to the full counterclockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counterclockwise. Turn the picture control counterclockwise, momentarily remove the signal and recheck the number of bars present at the pull in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is operating properly it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure For field purposes paragraph "A" under Oscillator Waveform Adjustment may be omitted.

CENTERING ADJUSTMENTS.—Centering is obtained by adjustment of the centering controls and by mechanically orienting the focus coil with three adjustment screws shown in Figure 3. The focus coil should be concentric around the neck of the kinescope to prevent curvature of the raster.

Adjust the focus coil until it is at right angles to the neck of the kinescope. Center the picture with the electrical centering controls. If a shadow appears on a corner of the picture, adjust the focus coil centering screws to eliminate the shadow and re-center the picture with the electrical centering controls.

FOCUS COIL ADJUSTMENTS.—If, after making the centering adjustments in the above paragraph, a corner of the picture is shadowed, it will be necessary to loosen the focus coil mounting screws (shown in Figure 3) and change the position of the coil to eliminate the shadow. Re-center the picture by adjustment of the electrical centering controls and the focus coil centering adjustments.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron) until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust vertical centering to align the picture with the mask.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjust the horizontal drive control C153B to give a picture of maximum width within the limits of good linearity. Adjust the horizontal linearity control L113 to provide best linearity.

A width control coil and a width selector switch are provided. With the switch in position 1 (fully counterclockwise), adjust the width coil until the picture fills the mask. On low line voltages it may not be possible to get sufficient width by adjustment of the width coil. In this case turn the width selector switch clockwise to position 2. In this position the width coil is disconnected, and adjustment of the width coil will have no effect. For still greater width, turn the width selector switch fully clockwise to position 3. In this position, the 6BG6G screen voltage is increased as well as disconnecting the width control coil.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS.—Adjust the focus control (R235) on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

CHECK to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

VIDEO BIAS CONTROL.—Normally the video bias control (R206) should be in the fully clockwise position. To check to see if this is the correct position, turn the picture control clockwise and adjust the brightness control until the retrace lines just disappear. If the whites are compressed as indicated by a "washed out" appearance in light areas, turn the video bias control counterclockwise until the picture appears normal.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 7. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

In the event that it becomes necessary to adjust the channel 6 oscillator, the core may be reached through a hole through the cabinet partition in back of the 960285 record changer.

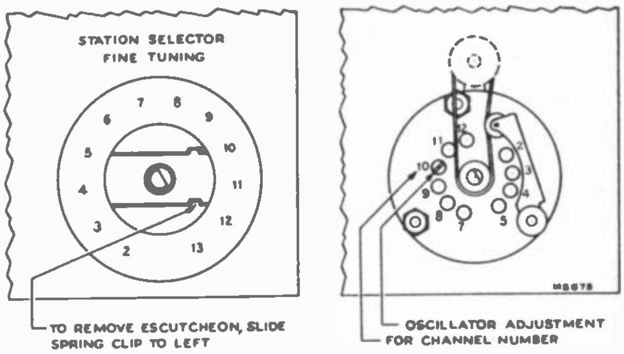


Figure 7—R-F Oscillator Adjustments

RADIO OPERATION—Turn the receiver function switch to AM and FM positions and check the radio for proper operation. In switching from radio to television or from television to radio, approximately 30 seconds warm-up time is required.

PUSH-BUTTON ADJUSTMENT—To adjust the radio push buttons, set the function switch to the broadcast band position, tune the receiver to the desired station and identify the program. Turn the function switch to the push button position and push the appropriate push button. Adjust the corresponding oscillator core until the desired station is heard. Adjust the corresponding antenna trimmer for maximum output. Proceed in the same manner to adjust the remaining push buttons. Figure 21 shows the location of the push-button adjustments and the range which the adjustments will cover.

Select the proper station call letter marker, moisten the back of the marker and insert in the appropriate recess in the push button bezel. Place marker celluloid cover in the recess over the marker.

RECORD CHANGER OPERATION—Turn the receiver function switch to each phono position and check each record player for proper operation.

Replace the cabinet back and make sure that the screws holding it are up tight, otherwise it may rattle or buzz when the receiver is operated at high volume.

WEAK SIGNAL AREA OPERATION—Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390 ohm resistor which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received. By this action, the r-f gain, is increased 50% at the expense of r-f bandwidth and an improvement in the weak signal picture results.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

CABINET ANTENNA—A cabinet antenna is provided for use in strong signal areas in which no reflections are experienced. The leads from the antenna are brought out near the receiver antenna terminal board. To connect the cabinet antenna, attach the leads to the terminal board. If reception is satisfactory, no other antenna is necessary. However, if reception is unsatisfactory, it will be necessary to employ an outdoor antenna or an indoor antenna which can be oriented.

TELEVISION CHASSIS TOP VIEW

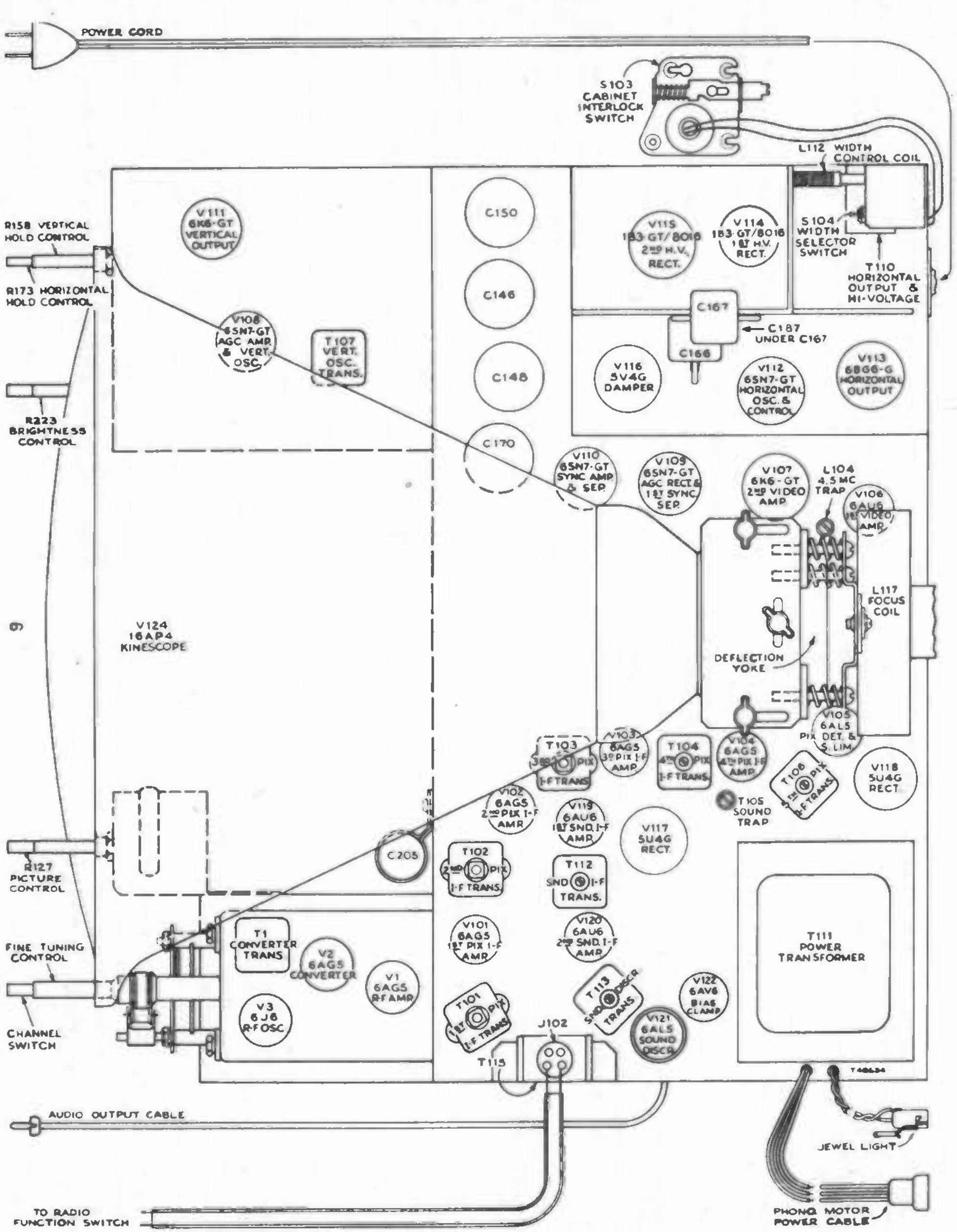


Figure 8—Chassis Top View

TELEVISION CHASSIS BOTTOM VIEW

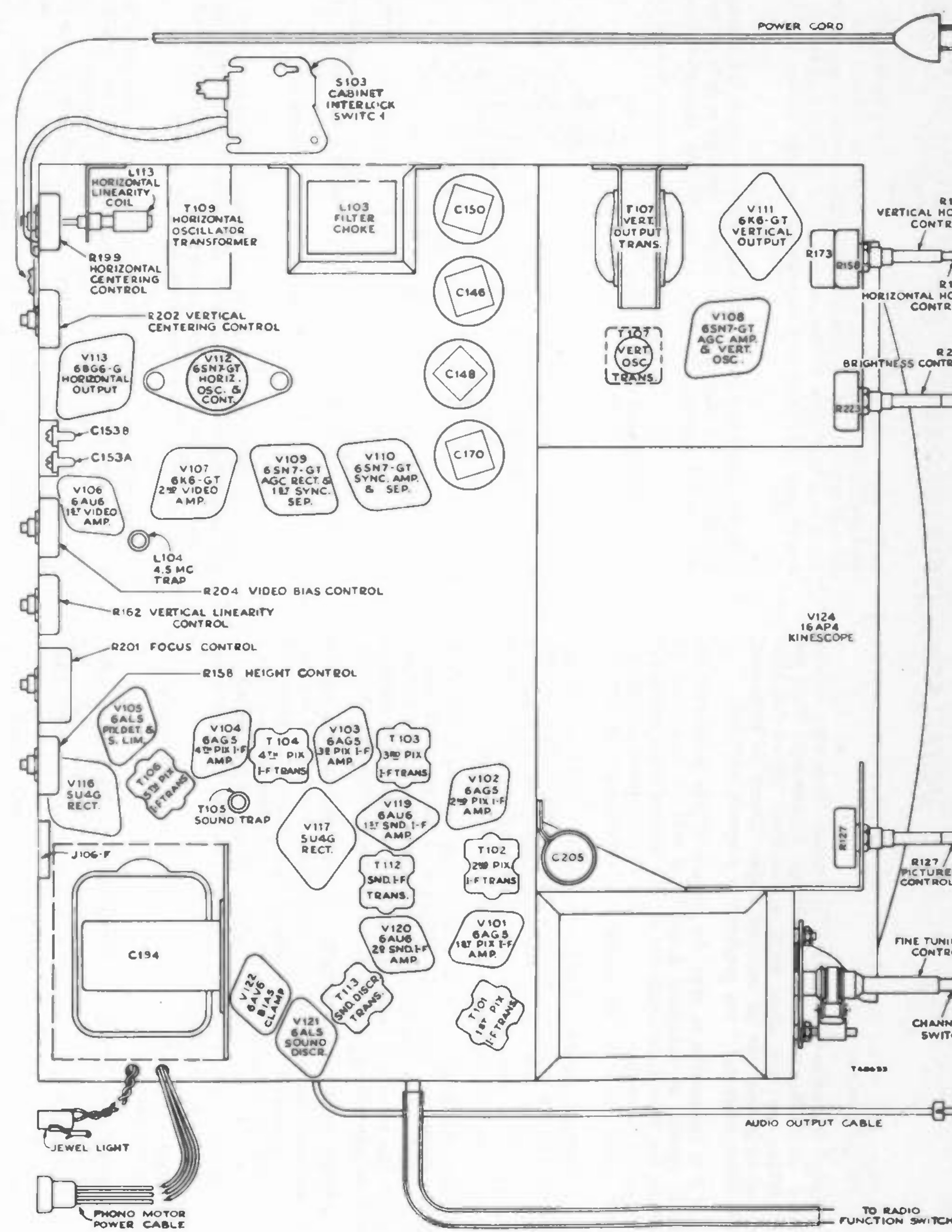


Figure 9—Chassis Bottom View

TELEVISION VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 mircovolt test pattern signal was fed into the receiver, the picture synced. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts 60 cycles a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	140	6	142	2 & 7	0	1	-4.8	7	3	
			No Signal	5	67	6	111	2 & 7	0	1	-0.3	14.0	5.0	
V2	6AG5	Converter	2200 Mu. V. Signal	5	137	6	137	2 & 7	0	1	*-5.4	—	—	*Depending upon channel
			No Signal	5	108	6	108	2 & 7	0	1	*-2.0 to -7.0	*6.0 to 10	*1.5 to 3.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	90.5	—	—	7	.19	5 & 6	*-7.0	—	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*-4.5 to -8.8	*1.8 to 2.1	—	
V101	6AG5	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5	136	6	136	2 & 7	<0.1	1	-4.2	0.5	0.1	
			No Signal	5	110	6	103	2 & 7	0.17	1	-1.5	3.8	0.6	
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu. V. Signal	5	122	6	122	2 & 7	0.9	1	0	10.3	2.9	
			No Signal	5	96	6	100	2 & 7	0.6	1	0	6.8	2.0	
V103	6AG5	3d Pix. I-F Amplifier	2200 Mu. V. Signal	5	130	6	137	2 & 7	<0.1	1	-4.2	1.0	3	
			No Signal	5	95	6	106	2 & 7	0.17	1	-1.5	3.6	8	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu. V. Signal	5	194	6	137	2 & 7	1.6	1	0	8.3	2.7	
			No Signal	5	200	6	113	2 & 7	1.2	1	0	7.1	1.4	
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	-117	—	—	1	-115	—	—	0.2	—	
			No Signal	7	-130	—	—	1	-125	—	—	0.3	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	-131	—	—	5	-46	—	—	<0.1	—	
			No Signal	2	-100	—	—	5	-52	—	—	<0.1	—	
V106	6AU6	1st Video Amplifier	2200 Mu. V. Signal	5	-68	6	27	7	-114.5	1	-117	3.9	1.8	
			No Signal	5	-72	6	25	7	-124	1	-130	3.7	1.6	
V107	6K6 GT	2d Video Amplifier	2200 Mu. V. Signal	3	*68	4	140	8	-47	5	-68	10.0	2.5	Maximum contrast
			No Signal	3	*34	4	120	8	-52	5	-72	11.0	2.3	
V108 A	6SN7 GT	AGC Amplifier	2200 Mu. V. Signal	5	-24	—	—	6	-50	4	-51	0.4	—	
			No Signal	5	-7	—	—	6	-58	4	-60	<0.1	—	
V108 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	54	—	—	3	-110	1	-157	0.32	—	
			No Signal	2	39	—	—	3	-125	1	-171	0.32	—	
V109	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	27	—	—	6	-51	4	-68	0.25	—	
			No Signal	5	19	—	—	6	-59	4	-70	0.25	—	
V109	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	23	—	—	3	-52	1	-68	0.13	—	
			No Signal	2	18	—	—	3	-63	1	-70	0.18	—	

TELEVISION VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V110	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	81	—	—	3	-46	1	-48	10.8	—	
			No Signal	2	71	—	—	3	-50	1	-54	10.8	—	
V110	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	210	—	—	6	-44	4	-131	0.34	—	
			No Signal	5	200	—	—	6	-51	4	-100	0.15	—	
V111	6K6-GT	Vertical Output	2200 Mu. V. Signal	3	197	4	*197	8	-76	5	-96	7.7	1.3	*Screen connected to plate
			No Signal	3	185	4	*185	8	-93	5	-110	7.6	1.3	
V112	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	25	—	—	3	-120	1	-110	0.24	—	Horizontal hold control completely clockwise
			No Signal	2	-8	—	—	3	-146	1	-128	0.1	—	
			No Signal	2	+80	—	—	3	-130	1	-114	0.13	—	Hold control counterclockwise
V112	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	75	—	—	6	-115	4	-190	2.3	—	
			No Signal	5	60	—	—	6	-125	4	-204	1.5	—	
V113	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	*	8	180	3	-100	5	-120	90.0	10.0	*5200 volt pulse present
			No Signal	Cap	Do Not Meas.	8	180	3	-112	5	-128	92.6	10.4	
V114	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	6400	—	—	—	—	*6000 volt pulse present
			Brightness Max.	Cap	Do Not Meas.	—	—	2 & 7	6100	—	—	—	—	
V115	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	11700	—	—	—	—	*6000 volt pulse present
			Brightness Max.	Cap	Do Not Meas.	—	—	2 & 7	11600	—	—	—	—	
V116	5V4G	Damper	2200 Mu. V. Signal	4 & 6	*	—	—	2 & 8	350	—	—	93.0	—	*1200 volt pulse present
			No Signal	4 & 6	Do Not Meas.	—	—	2 & 8	340	—	—	92.0	—	
V117 V118	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	*385	—	—	2 & 8	277	—	—	†125	—	†Per tube *A-C measured from plate to trans. center tap
			No Signal	4 & 6	*385	—	—	2 & 8	264	—	—	†130	—	
V119	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	131	6	131	7	0.65	1	0	6.0		
			No Signal	5	106	6	106	7	0.55	1	0	4.8		
V120	6AU6	2d Sound I-F Amplifier	2200 Mu. V. Signal	5	136	6	80	7	0	1	-0.6	3.5		
			No Signal	5	111	6	62	7	0	1	-0.7	3.0		
V121	6AL5	Sound Discrim.	2200 Mu. V. Signal	2	-1.4	—	—	5	0	—	—	—	—	
			No Signal	2	-0.7	—	—	5	0	—	—	—	—	
V122	6AV6	Bias Clamp	2200 Mu. V. Signal	7	—	—	—	2	0	1	—	—	—	
			No Signal	7	—	—	—	2	0	1	—	—	—	
V124	16AP4	Kinescope	2200 Mu. V. Signal	Cap	11700	10	320	11	26	2	-29	0.08	—	Average Brightness
			No Signal	Cap	11600	10	305	11	11	2	-47	0.08	—	Average Brightness

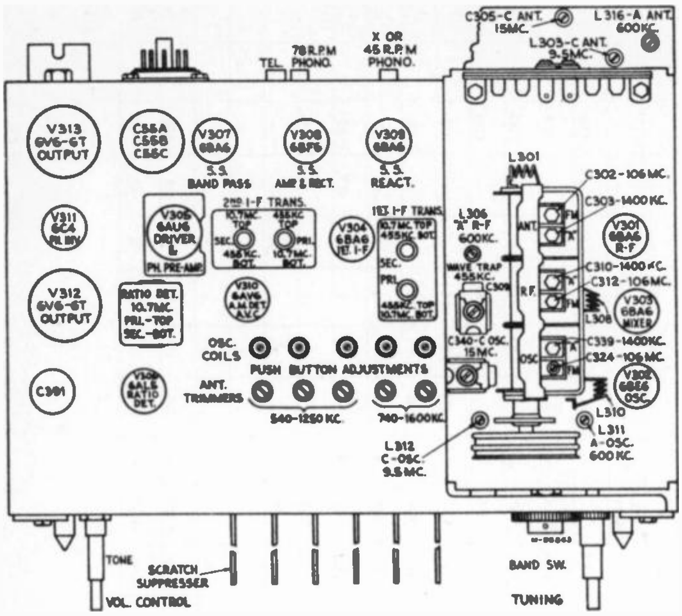


Figure 10—Chassis, Top View, Showing Adjustments

CRITICAL LEAD DRESS

The lead from terminal 5, switch S304, front, to terminal on switch S307, must be dressed between the main base and r-f shelf.

Dress all other leads away from the lead between T301 and S303 front.

Dress lead from pin 1 V305 to T302 down along chassis base.

Keep R327 dressed down along chassis base.

Keep the leads of C329 as short as possible.

The lead from pin 2 V304 must be dressed close to be dressed close to base. This lead provides degeneration for the i-f stage and neither its length or the point at which it is grounded to the chassis should be changed.

All the r-f and i-f wiring in the receiver is critical as to length and placement and should not be changed unless necessary.

PUSH BUTTON ADJUSTMENT

Make a list of the desired stations, arranged in order from low to high frequencies.

Turn the range switch to the broadcast position and manually tune in the first station on the list.

Turn range switch to push-button position and press in the second from the left-hand button.

Adjust the oscillator core rod to receive the first station.

Adjust the antenna trimmer screw for peak output on the first station.

Proceed in the same manner to adjust for the remaining stations.

Repeat adjustments for best results.

RADIO VOLTAGE CHART

Voltages measured in respect to ground, using a "VoltOhmyst."

Tube	Type	Element	Pin	Tel.	Phono.	FM
V301	6BA6	Plate	5	—	175	168
		Scg.	6	—	86	87
V302	6BE6	Plate	5	—	—	130
		G 2, 3, 4	6 & 7	—	—	120
		G.	1	—	—	-7.8
V303	6BA6	Plate	5	—	—	250
		Scg.	6	—	30	52
		Grid	1	—	-.52	-.45
		Cath.	7	—	.42	1.1
V304	6BA6	Plate	5	—	228	215
		Scg.	6	—	1.0	110
		Cath.	7	—	1.15	1.0
V305	6AU6	Plate	5	—	0	250
		Scg.	6	—	145	184
V306	6AL5	—	—	—	—	—
V307	6BA6	Plate	5	—	211	197
		Scg.	6	—	72	68
		Grid	1	—	0	0
		Cath.	7	—	8.3	7.5
V308	6BF6	Plate	7	—	127	118
		Cath.	2	—	6.6	6.2
V309	6BA6	Plate	5	—	62	60
		Scg.	6	—	22	123
V310	6AV6	Plate	7	88	95	84
		Grid	1	-.8	-.8	-.8
V311	6C4	Plate	1 & 5	170	145	182
		Grid	6	+39	+47	+25.5
		Cath.	7	48	57.5	5.2
V312 V313	6V6GT	Plate	3	240	290	270
		Scg.	4	90	195	175
		Grid	5	-122	-79	-91.5
		Cath.	8	-109	-61	-75

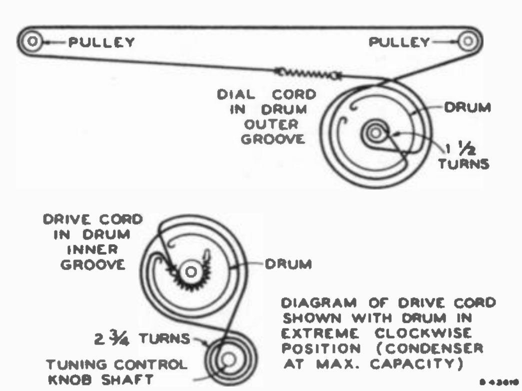


Figure 11—Dial and Drive Cord Assembly

MODEL S1000 IS VERY SIMILAR TO MODEL 9TW390.

THE TELEVISION CHASSIS IS IDENTICAL.

MODEL S1000 USES 960285 RECORD CHANGER (78/33⅓ r.p.m.) INSTEAD OF RP177B (78 r.p.m.). THE RADIO CHASSIS DIFFERS ONLY IN THE VALUE OF A FEW COMPONENTS.

REFER TO MODEL 9TW390 IN VOL. V FOR ADDITIONAL INFORMATION.

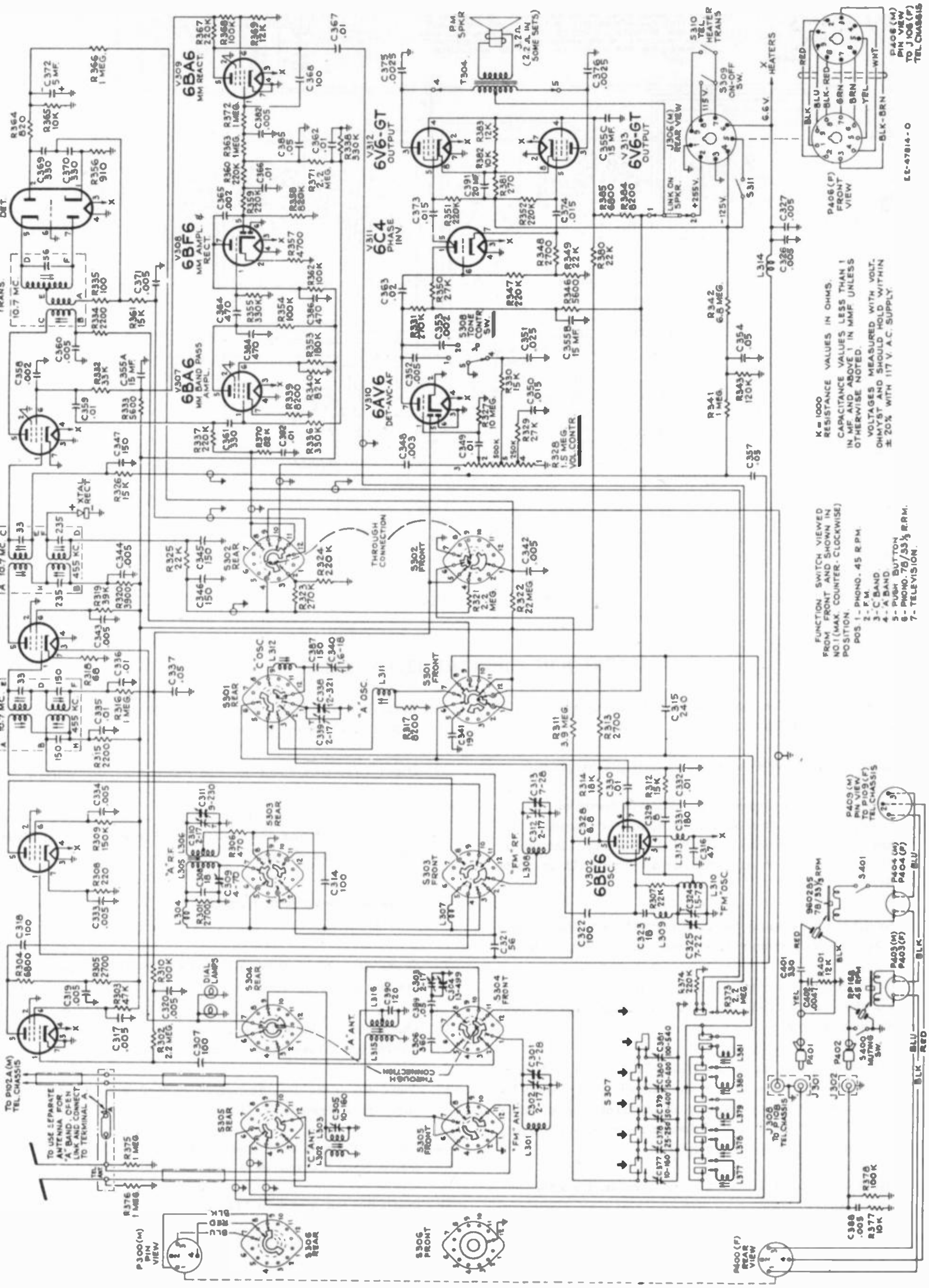


Figure 12—Radio Schematic Diagram

S1000

TELEVISION R-F UNIT WIRING DIAGRAM

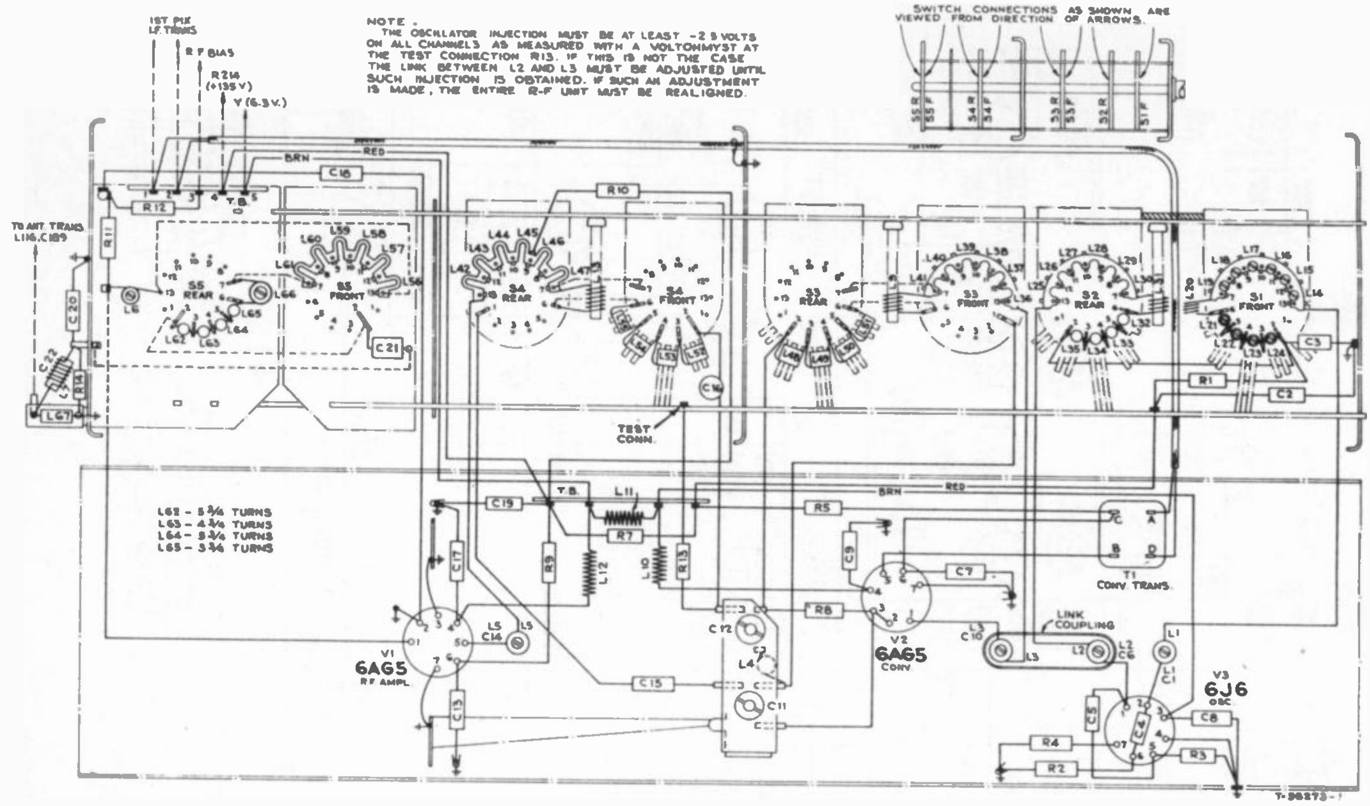


Figure 13—R-F Unit Wiring Diagram

TELEVISION CRITICAL LEAD DRESS:

1. The ground bus from pin 2 and the center shield of V120 socket should not be shortened or rerouted.
2. Dress the body of R195 as close to tube pin as possible.
3. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V120, V121 and V122 should be down against the chassis and away from grid or plate leads.
4. Dress all leads crossing the i-f circuits close to the chassis and held so they cannot move and change alignment.
5. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.
6. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
7. Leads to L102 and L103 must be as short as possible.
8. Dress peaking coils L105, L106, L107, L108 and L109 up and away from the chassis.
9. Dress R129 away from L109.
10. Dress C183 across V121 tube pins 5 and 6 with leads not exceeding ⅜ inch.
11. Dress the blue lead from pin 5 of V122 down against the chassis and under two shielded leads.
12. Dress C129 and C199 up and away from the chassis.
13. Dress the yellow lead from the picture control away from the chassis. Dress the yellow lead from pin 8 of V106 away from the chassis.
14. Dress the green lead from pin 8 of V107 away from the chassis.
15. Dress R168, R169, R170, R176 and R178 up and away from the chassis.
16. The leads to the volume control should be dressed down against the chassis and away from V119 and V120.
17. Dress the yoke red horizontal deflection lead under the clips of the fixed H. V. shield.
18. Dress the green lead from C166 close to the chassis and away from the red lead connected to T110-4.
19. Insert the red lead into T110-4 from the top of the terminal.
20. All soldered connections in the high voltage compartment should be free of sharp points.
21. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.

R. F. UNIT ASSEMBLIES KRK5 A

STOCK No.	DESCRIPTION
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board
75087	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission (4⅞") (W1)
73441	Cam—Fine tuning adjustment cam
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer, comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5,000 mmf. (C16)
73475	Coil—Antenna filter shunt coil (L7)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Convertor grid coil for channel #6 (L9, L31)
73462	Coil—Coupling inductance coil (L4)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (threaded bushing type with plunger adjustment) (L1, C1)
73476	Coil—I-F trap (L7, C22)
73461	Coil—Osc. plate coil (4 turns) for channel #6 (L20)
73460	Coil—R-F plate coil for channel #6 (L13)
74109	Coil—Trimmer coil (1½ turns) with adj. inductance core and capacitor stud (threaded bushing type with screw adjustment) for oscillator section or convertor section (L2, C6, L3, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (threaded bushing type with screw adjustment) for r-f amplifier section (L5, C14)
71493	Connector—Oscillator segment connector
74187	Core—Adjustable core for L31
73455	Core—Sliding core for fine tuning control trimmer
73440	Detent—R-F unit detent mechanism and fibre shaft
73453	Form—Coil form assembly for L9, L13
71487	Form—Coil form for oscillator plate coil L31
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to convertor trimmer loop connector
73456	Nut—Speed nut for drive belt shield
73467	Nut—Speed nut to mount trimmer coils 73443, 73444 and 73446
74166	Plate—Front plate and bushing
73464	Pulley—Idler pulley
	Resistor—Fixed, composition, 47 ohms ±20%, ½ watt (R4)
	Resistor—Fixed, composition, 150 ohms ±20%, ½ watt (R5, R9, R12)
	Resistor—Fixed, composition, 1,000 ohms ±20%, ½ watt (R7)
	Resistor—Fixed, composition, 1,000 ohms ±10%, ½ watt (R11)
	Resistor—Fixed, composition, 2700 ohms ±10%, ½ watt (R10)
	Resistor—Fixed, composition, 10,000 ohms ±20%, ½ watt (R1)
	Resistor—Fixed, composition, 100,000 ohms ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring
30340	Retainer—Retainer for fine tuning link stud
71476	Screw—#4-40 x ⅛" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
71475	Screw—#4-40 x .296 adjusting screw for coils L6, L21, L22, L23, L24
73640	Screw—#4-40 x ⅜" adjusting screw for L65
74187	Shaft—Actuating shaft for fine tuning control
74168	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt
73832	Shield—Metal tube shield for V1
73443	Shield—"U" shape shield for bottom of r-f unit
71494	Socket—Tube socket
73450	Socket—Tube socket, ceramic, 7 prong
74188	Spring—Retaining spring for adjustable core #74187
73457	Spring—Return spring for fine tuning control core
73456	Spring—Tension spring for drive belt shield
75068	Spring—Retaining spring for r-f oscillator tube shield
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Convertor stator complete with rotor and coils (S3, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)

STOCK No.	DESCRIPTION
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55)
75446	Stud—Capacitor stud-brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, uncoded or coded "ER"
75447	Stud—Capacitor stud-brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, coded numerically or "Hi Q"
2917	Washer—"C" washer for channel selector shaft
73466	Washer—Insulating washers for front shield (1 set)
73448	Transformer—Convertor transformer (T1 (R6))

TELEVISION CHASSIS ASSEMBLIES KCS31

STOCK No.	DESCRIPTION
72437	Cable—Shielded audio cable complete with pin plug
73414	Cap—Hi-voltage rectifier and horiz. output plate cap
72809	Capacitor—Mica, 5 mmf. (C166)
74182	Capacitor—Ceramic, 6 mmf. (C126)
73580	Capacitor—Mica trimmer, comprising 1 section 10-160 mmf., 1 section of 40-370 mmf. (C153A, C153B)
74105	Capacitor—Mica, 33 mmf. (C111)
64062	Capacitor—Ceramic, 82 mmf. (C120)
75060	Capacitor—Mica, 100 mmf. (C138)
39396	Capacitor—Ceramic, 100 mmf. (C175)
73921	Capacitor—Ceramic, 120 mmf. (C199)
51416	Capacitor—Mica, 180 mmf. (C140)
73102	Capacitor—Mica, 180 mmf. (C158)
74154	Capacitor—Ceramic, 250 mmf., 20,000 volts (C187)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121, C136)
73922	Capacitor—Ceramic, 270 mmf. (C183, C204)
39642	Capacitor—Mica, 390 mmf. (C141)
74153	Capacitor—Ceramic, 500 mmf., 15 kv (C167, C168)
74250	Capacitor—Mica, 560 mmf. (C160)
71501	Capacitor—Ceramic, 1500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C132, C171, C172, C176, C177, C188, C191, C192, C193, C196)
73801	Capacitor—Tublar, moulded paper, .001 mfd. 600 volts (C137)
73803	Capacitor—Tubular, moulded paper, .0022 mfd. 600 volts (C142, C154)
73595	Capacitor—Tubular, moulded paper, oil filled, .0022 mfd. 600 volts (C161)
73795	Capacitor—Tubular, moulded paper, .0033 mfd. 600 volts (C202)
73796	Capacitor—Tubular, moulded paper, .0039 mfd. 600 volts (C198)
73550	Capacitor—Tubular, moulded paper, .0047 mfd. 600 volts (C127, C143, C144)
73920	Capacitor—Tubular, moulded paper, oil filled, .0047 mfd. 600 volts (C145)
73561	Capacitor—Tubular, moulded paper, .01 mfd. 400 volts (C134, C151, C152)
73594	Capacitor—Tubular, moulded paper, oil filled, .01 mfd. 600 volts (C159)
73562	Capacitor—Tubular, moulded paper, .022 mfd. 400 volts (C155, C217)
73596	Capacitor—Tubular, moulded paper, oil filled, .033 mfd. 1000 volts (C164)
73553	Capacitor—Tubular, moulded paper, .047 mfd. 400 volts (C129, C139, C197)
73592	Capacitor—Tubular, moulded paper, oil filled, .047 mfd. 600 volts (C147, C156)
73564	Capacitor—Tubular, moulded paper, .047 mfd. 1000 volts (C163)
73597	Capacitor—Tubular, moulded paper, oil filled, .047 mfd. 1000 volts (C165)
73784	Capacitor—Tubular, moulded paper, 0.1 mfd. 200 volts (C201)
73551	Capacitor—Tubular, moulded paper, 0.1 mfd. 400 volts (C130, C149)
73560	Capacitor—Tubular, moulded paper, 0.22 mfd. 200 volts (C135)
73794	Capacitor—Tubular, moulded paper, 0.22 mfd. 400 volts (C157)
73787	Capacitor—Tubular, moulded paper, 0.47 mfd. 200 volts (C133, C162, C200)
74106	Capacitor—Electrolytic 5 mfd. 50 volts (C131)
71432	Capacitor—Electrolytic comprising 2 sections of 40 mfd. 450 volts and 1 section of 10 mfd. 450 volts (C150 A, C150 B, C150 C)

STOCK No.	DESCRIPTION
73582	Capacitor—Electrolytic comprising 1 section of 40 mfd. 450 volts, 1 section of 10 mfd. 450 volts and 1 section of 80 mfd. 200 volts (B section not used) (C194 A, C194 B, C194 C)
73583	Capacitor—Electrolytic comprising 1 section of 40 mfd. 450 volts, 1 section of 90 mfd. 450 volts and 1 section of 50 mfd. 150 volts (C148 A, C148 B, C148 C)
74266	Capacitor—Electrolytic 40 mfd. 400 volts (C205)
73581	Capacitor—Electrolytic comprising 1 section of 60 mfd. 450 volts, 2 sections of 10 mfd. 450 volts and 1 section of 20 mfd. 150 volts (D section not used) (C146 A, C146 B, C146 C, C146 D)
74433	Capacitor—Electrolytic comprising 1 section of 90 mfd. 350 volts and 1 section of 10 mfd. 350 volts (C212 A, C212 B)
71436	Capacitor—Electrolytic comprising 1 section of 250 mfd. 10 volts and 1 section of 1000 mfd. 6 volts (C170 A, C170 B)
73578	Coil—Antenna matching coils complete with socket and bracket (T115, J102)
73577	Coil—Video trap (L104, C128)
71449	Coil—Horizontal linearity control coil (L113)
71429	Coil—Width control coil (L112)
71778	Coil—Sound trap (T105, C119)
74570	Coil—Focus coil (L120)
73476	Coil—I-F trap (L118, C189)
71529	Coil—Peaking coil (120 mh) (L102, L108, R119, R226)
71528	Coil—Peaking coil (180 mh) (L105, L109, R123, R130)
73477	Coil—Choke coil (L101)
71526	Coil—Peaking coil (250 mh) (L103)
74214	Coil—Peaking coil (180 mh) (L106)
71527	Coil—Peaking coil (93 mh) (L107)
74170	Coil—Peaking coil (36 mh) (L119, R110)
74160	Connector—Anode connector
71521	Contact—Hi-voltage capacitor contact
72734	Control—Hor. and vert. hold control (R158, R173)
73156	Control—Brightness control (R223)
73663	Control—Picture control (R127)
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
71443	Control—Vertical centering control (R202)
74146	Control—Hor. cent. or video bias control (R199, R206)
74442	Control—Focus control (R235)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics #71432, 73581 and 73583
72772	Cover—Insulating cover for electrolytic 71436
73590	Cushion—Deflection yoke hook cushion (2 req'd)
73600	Fuse—0.25 amperes, 250 volts (F101, F102)
71799	Grommet—Rubber grommet for 2nd anode lead
37396	Grommet—Rubber grommet to mount ceramic tube socket (2 req'd)
74148	Magnet—Ion trap magnet (P.M. type)
18469	Plate—Bakelite mounting plate for electrolytics
71448	Plug—Male plug for power cable
31572	Plug—3 contact female plug for motor cable
31048	Plug—Pin plug for shielded audio cable
73154	Reactor—Filter choke
74156	Resistor—Wire wound, 3.9 ohms, ⅓ watt (R189, R190)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R214)
	Resistor—Fixed, composition, 10 ohms, ±20%, ½ watt (R121)
	Resistor—Fixed, composition, 39 ohms, ±10%, ½ watt (R111)
	Resistor—Fixed, composition, 47 ohms, ±20%, ½ watt (R183)
	Resistor—Fixed, composition, 68 ohms, ±10%, ½ watt (R105, R102)
	Resistor—Fixed, composition, 82 ohms, ±5%, ½ watt (R122)
	Resistor—Fixed, composition, 82 ohms, ±10%, ½ watt (R207)
	Resistor—Fixed, composition, 120 ohms, ±10%, ½ watt (R126)
	Resistor—Fixed, composition, 150 ohms, ±10%, ½ watt (R115)
	Resistor—Fixed, composition, 150 ohms, ±20%, ½ watt (R106, R109, R114, R198)
	Resistor—Fixed, composition, 150 ohms, ±10%, 2 watt (R184)
74375	Resistor—Wire wound, 150 ohms, 20 watt (R196)
74155	Resistor—Voltage divider comprising 1 section of 775 ohms, 9.5 watts, 1 section of 550 ohms, 5 watts, 1 section of 350 ohms, 3 watts and 1 section of 450 ohms, 5 watts (R203 A, R203 B, R203 C, R203 D)
73582	Capacitor—Electrolytic comprising 1 section of 40

STOCK No.	DESCRIPTION
74213	Resistor—Wire wound, 820 ohms, 4 watt (R205, R234)
	Resistor—Fixed, composition, 1000 ohms, ±10%, ½ watt (R138)
	Resistor—Fixed, composition, 1000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R211)
	Resistor—Fixed, composition, 1200 ohms, ±10%, ½ watt (R161, R208)
	Resistor—Fixed, composition, 3300 ohms, ±10%, ½ watt (R188)
48207	Resistor—Wire wound, 3300 ohms, 10 watt (R204)
	Resistor—Fixed, composition, 3900 ohms, ±5%, 2 watt (R125, R129, R128)
	Resistor—Fixed, composition, 4700 ohms, ±5%, ½ watt (R120)
	Resistor—Fixed, composition, 4700 ohms, ±10%, ½ watt (R146)
	Resistor—Fixed, composition, 5100 ohms, ±5%, ½ watt (R124)
	Resistor—Fixed, composition, 5600 ohms, ±5%, ½ watt (R112)
	Resistor—Fixed, composition, 5600 ohms, ±10%, 1 watt (R187)
	Resistor—Fixed, composition, 6800 ohms, ±10%, ½ watt (R150)
	Resistor—Fixed, composition, 6800 ohms, ±5%, 1 watt (R117)
	Resistor—Fixed, composition, 8200 ohms, ±5%, ½ watt (R164, R175)
	Resistor—Fixed, composition, 8200 ohms, ±10%, ½ watt (R152, R153, R171)
	Resistor—Fixed, composition, 10,000 ohms, ±5%, ½ watt (R104)
	Resistor—Fixed, composition, 10,000 ohms, ±10%, ½ watt (R141, R182, R224)
	Resistor—Fixed, composition, 12,000 ohms, ±5%, ½ watt (R136)
	Resistor—Fixed, composition, 12,000 ohms, ±10%, 2 watt (R147)
	Resistor—Fixed, composition, 18,000 ohms, ±10%, ½ watt (R137)
	Resistor—Fixed, composition, 22,000 ohms, ±10%, ½ watt (R145, R151, R177)
	Resistor—Fixed, composition, 22,000 ohms, ±20%, ½ watt (R195, R209, R210)
	Resistor—Fixed, composition, 39,000 ohms, ±10%, ½ watt (R249)
	Resistor—Fixed, composition, 47,000 ohms, ±10%, ½ watt (R142, R144)
	Resistor—Fixed, composition, 47,000 ohms, ±20%, ½ watt (R225)
	Resistor—Fixed, composition, 56,000 ohms, ±5%, ½ watt (R135)
	Resistor—Fixed, composition, 56,000 ohms, ±10%, ½ watt (R156)
	Resistor—Fixed, composition, 82,000 ohms, ±10%, ½ watt (R172)
	Resistor—Fixed, composition, 100,000 ohms, ±5%, ½ watt (R215, R216)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, ½ watt (R140, R160)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, 1 watt (R176, R179)
	Resistor—Fixed, composition, 100,000 ohms, ±20%, 2 watt (R236)
	Resistor—Fixed, composition, 150,000 ohms, ±10%, ½ watt (R168, R180)
	Resistor—Fixed, composition, 150,000 ohms, ±5%, 1 watt (R178)
	Resistor—Fixed, composition, 150,000 ohms, ±10%, 1 watt (R174)
	Resistor—Fixed, composition, 180,000 ohms, ±10%, ½ watt (R143, R186)
	Resistor—Fixed, composition, 180,000 ohms, ±10%, 2 watt (R191, R192, R193)
	Resistor—Fixed, composition, 220,000 ohms, ±10%, ½ watt (R154)
	Resistor—Fixed, composition, 360,000 ohms, ±5%, ½ watt (R134)
	Resistor—Fixed, composition, 560,000 ohms, ±10%, ½ watt (R194)
	Resistor—Fixed, composition, 820,000 ohms, ±5%, ½ watt (R169)
	Resistor—Fixed, composition, 820,000 ohms, ±10%, ½ watt (185)
	Resistor—Fixed, composition, 1 megohm, ±20%, ½ watt (R139, R148, R250)
	Resistor—Fixed, composition, 1.5 megohm, ±5%, ½ watt (R157)

STOCK No.	DESCRIPTION
	Resistor—Fixed, composition, 2.2 megohm, ±10%, ½ watt (R131, R132, R159, R163)
	Resistor—Fixed, composition, 2.7 megohm, ±5%, 1 watt (R170)
	Resistor—Fixed, composition, 3.9 megohm, ±10%, ½ watt (R149)
	Resistor—Fixed, composition, 4.7 megohm, +5%, 1 watt (R133)
71456	Screw—#8-32 x 7/16" wing screw for deflection yoke mounting
75083	Screw—#8-32 x 1/4" wing screw for deflection yoke mounting
73584	Shield—Tube shield for V120 and V121
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
73249	Socket—Tube socket, ceramic, octal, plate mounted
31319	Socket—Tube socket, moulded, octal, saddle mounted
71508	Socket—Tube socket for 8016
75061	Socket—9 pin socket—moulded (J106)
31364	Socket—Pilot lamp socket
74251	Socket—Kinescope socket
74151	Spacer—Bakelite spacer to mount moulded tube socket
74936	Spring—Suspension spring for kinescope leads
72190	Spring—Hood and yoke pressure spring (3 req'd)
74152	Spring—Anode spring
74150	Support—Vertical plate support (bakelite)
74425	Support—Bakelite support for 2nd anode lead
74147	Switch—Width control coil switch (S104)
74157	Switch—Interlock switch (S103)
74194	Transformer—Power trans. 115 volt, 60 cycle (T117)
73568	Transformer—Vertical output transformer (T108)
74144	Transformer—Vertical oscillator transformer (T107)
74145	Transformer—Horizontal output and hi-voltage (T110)
73571	Transformer—First pix i-f trans. (T101, C102, R101)
73572	Transformer—Second pix i-f transformer (T102, C107)
73573	Transformer—Third pix i-f transformer (T103, C112)
73574	Transformer—Fourth pix i-f transformer (T104, C116)
73575	Transformer—Fifth pix i-f trans. (T106, C123, C124)
71424	Transformer—Sound i-f transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
73576	Transformer—Horizontal oscillator transformer (T109)
74195	Transformer—Filament trans. 115 volt, 60 cycle (T116)
74141	Yoke—Deflection yoke (L110, L111, L114, L115, C169, R166, R167)

RADIO CHASSIS ASSEMBLY RC 617B

STOCK No.	DESCRIPTION
74534	Board—"Tel-"A"-Ant." terminal board with link
73673	Capacitor—Variable tuning capacitor (C301, C302, C303, C304, C310, C311, C312, C313, C325, C338, C339)
73685	Capacitor—Trimmer 1.5-7 mmf. (C324)
71809	Capacitor—Adjustable trimmer—1.6-18 mmf. (C340)
72334	Capacitor—Adjustable trimmer—4-70 mmf. (C309)
39043	Capacitor—Ceramic, 6.8 mmf. (C328)
73686	Capacitor—Ceramic, 8 mmf. (C329)
71807	Capacitor—Adjustable trimmer—10-160 mmf. (C305)
36463	Capacitor—Ceramic, 18 mmf. (C308)
39042	Capacitor—Ceramic, 47 mmf. (C316)
39622	Capacitor—Mica, 56 mmf. (C321)
39396	Capacitor—Ceramic, 100 mmf. (C307, C314, C322, C368)
39628	Capacitor—Mica, 100 mmf. (C318)
73682	Capacitor—Mica trimmer consisting of 1 section of 100-540 mmf., 2 sections of 50-400 mmf., 1 section of 25-250 mmf., and 1 section of 10-180 mmf. (C377, C378, C379, C380, C381)
71614	Capacitor—Ceramic, 120 mmf. (C390)
48125	Capacitor—Ceramic, 150 mmf. (C345, C346, C347, C387)
71933	Capacitor—Mica, 180 mmf. (C331)
73687	Capacitor—Ceramic, 190 mmf. (C341)
72789	Capacitor—Mica, 240 mmf. (C315)
39640	Capacitor—Mica, 330 mmf. (C361, C369, C370)
64641	Capacitor—Mica, 360 mmf. (306)
39644	Capacitor—Mica, 470 mmf. (C364, C384, C386)
72121	Capacitor—Electrolytic 5 mfd. 50 volts (C372)
74532	Capacitor—Electrolytic, triple, 15 mfd. 450 volts (C355 A, C355 B, C355 C)
74533	Capacitor—Electrolytic, 20 mfd. 25 volts (C391)
71927	Capacitor—Tubular .002 mfd. 400 volts (C353, C358, C365)
70644	Capacitor—Tubular, .0025 mfd. 1000 volts (C375, C376)
71921	Capacitor—Tubular .003 mfd. 200 volts (C348)
71926	Capacitor—Tubular .005 mfd. 200 volts (C320, C326, C327, C333, C342, C371, C382, C388)

STOCK No.	DESCRIPTION
72791	Capacitor—Tubular .005 mfd. 400 volts (C317, C319, C334, C343, C344, C352, C360)
71923	Capacitor—Tubular, .01 mfd. 200 volts (C336, C349, C366, C392)
72827	Capacitor—Tubular, .01 mfd. 400 volts (C330, C332, C335, C359, C367)
72120	Capacitor—Tubular, .015 mfd. 200 volts (C350)
73797	Capacitor—Tubular, .015 mfd. 400 volts (C373, C374)
73638	Capacitor—Tubular, .02 mfd. 400 volts (C363)
73554	Capacitor—Tubular, .025 mfd. 400 volts (C351)
71551	Capacitor—Tubular, .05 mfd. 200 volts (C337, C354, C357, C362, C385)
73676	Coil—Oscillator coil complete with core and stud—"C" band (L312)
73677	Coil—R-F coil complete with core and stud—"A" band (L305, L306)
73383	Coil—Oscillator coil complete with core and stud—"A" band (L311)
73661	Coil—Antenna coil complete with core and stud—"A" band (L315, L316)
73678	Coil—Antenna coil complete with core and stud—"C" band (L302, L303)
73679	Coil—Low pass filter coil (L307)
72050	Coil—P.B. oscillator coil complete with core and stud—H.F. (L377, L378)
72051	Coil—P.B. oscillator coil complete with core and stud—L.F. (L379, L380, L381)
74536	Coil—Antenna coil—F.M. #16 buss tinned, 8 turns per inch 3¼ (L301)
74537	Coil—R.F. coil—F.M. #16 buss tinned, 8 turns per inch 4 turns R.H. (L308)
74538	Coil—Oscillator coil F.M. #16 buss tinned, 8 turns per inch 3½ turns R.H. (L310)
72574	Coil—Choke coil (L313)
71942	Coil—Choke coil (L314)
73688	Coil—Peaking coil (L304)
75062	Connector—9 prong male connector for interconnecting power supply cable (between television and radio chassis) (J306)
5040	Connector—4 contact female plug for speaker cable
35384	Connector—5 contact male plug for phono cable
72145	Control—Volume control, tone control and power switch (R328, S308, S309)
72953	Cord—Tuning drive cord (approx. 22" overall)
72953	Cord—Indicator drive cord (approx. 40" overall)
71941	Coupling—F.M. coupling unit (L309, R307, C323)
72043	Drum—Drive drum
73758	Gear—Selector switch drive gear
72042	Gear—Sleeve gear
73767	Gear—Scissor gear for tuning capacitor
72069	Grommet—Rubber grommet for rear mounting feet (2 req'd)
70930	Grommet—Rubber grommet for mounting r-f shelf (4 req'd)
70429	Grommet—Rubber grommet for mounting tube socket (4 req'd)
33514	Jack—Phono-television input jack
35787	Jack—Phono input jack for RP168A changer
73766	Pinion—Pinion and shaft for tuning capacitor
72035	Plate—Dial back plate
19820	Plate—Mounting plate for electrolytic #74533
72602	Pulley—Drive cord pulley
54374	Rectifier—Crystal rectifier
	Resistor—Fixed, composition, 68 ohms, ±10%, ½ watt (R318)
	Resistor—Fixed, composition, 100 ohms, ±10%, ½ watt (R335)
	Resistor—Fixed, composition, 220 ohms, ±10%, ½ watt (R308)
	Resistor—Fixed, composition, 270 ohms, ±10%, 2 watt (R381)
	Resistor—Fixed, composition, 470 ohms, ±10%, ½ watt (R306)
	Resistor—Fixed, composition, 820 ohms, ±10%, ½ watt (R364)
	Resistor—Fixed, composition, 910 ohms, ±5%, ½ watt (R356)
	Resistor—Fixed, composition, 2200 ohms, ±10%, ½ watt (R315, R334)
	Resistor—Fixed, composition, 2700 ohms, ±10%, ½ watt (R301, R305, R348)
	Resistor—Fixed, composition, 2700 ohms, ±10%, 1 watt (R313)
	Resistor—Fixed, composition, 3900 ohms, ±10%, 1 watt (R320)
	Resistor—Fixed, composition, 4700 ohms, ±10%, ½ watt (R357)

STOCK No.	DESCRIPTION
	Resistor—Fixed, composition, 5600 ohms, ±10%, ½ watt (R333, R346)
	Resistor—Fixed, composition, 6800 ohms, ±10%, 1 watt (R304)
	Resistor—Fixed, composition, 6800 ohms, ±10%, 2 watt (R385)
	Resistor—Fixed, composition, 8200 ohms, ±10%, ½ watt (R317, R339)
	Resistor—Fixed, composition, 8200 ohms, ±10%, 2 watt (R384)
	Resistor—Fixed, composition, 10,000 ohms, ±10%, ½ watt (R365, R377)
	Resistor—Fixed, composition, 10,000 ohms, ±10%, 2 watt (R382)
	Resistor—Fixed, composition, 12,000 ohms, ±10%, ½ watt (R369)
	Resistor—Fixed, composition, 12,000 ohms, ±10%, 2 watt (R383)
	Resistor—Fixed, composition, 15,000 ohms, ±10%, ½ watt (R326, R330, R361)
	Resistor—Fixed, composition, 18,000 ohms, ±10%, 1 watt (R314)
	Resistor—Fixed, composition, 22,000 ohms, ±10%, ½ watt (R325, R349)
	Resistor—Fixed, composition, 22,000 ohms, ±10%, 1 watt (R380)
	Resistor—Fixed, composition, 27,000 ohms, ±10%, ½ watt (R329, R350)
	Resistor—Fixed, composition, 33,000 ohms, ±10%, ½ watt (R332)
	Resistor—Fixed, composition, 39,000 ohms, ±10%, 1 watt (R319)
	Resistor—Fixed, composition, 47,000 ohms, ±10%, 1 watt (R303)
	Resistor—Fixed, composition, 82,000 ohms, ±10%, ½ watt (R340, R370)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, ½ watt (R354, R362, R378)
	Resistor—Fixed, composition, 100,000 ohms, ±20%, ½ watt (R310)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, 1 watt (R368)
	Resistor—Fixed, composition, 120,000 ohms, ±10%, ½ watt (R343)
	Resistor—Fixed, composition, 150,000 ohms, ±10%, 1 watt (R309)
	Resistor—Fixed, composition, 180,000 ohms, ±10%, ½ watt (R353)
	Resistor—Fixed, composition, 220,000 ohms, ±10%, ½ watt (R324, R337, R347, R351, R352, R359, R360, R367, R374)
	Resistor—Fixed, composition, 270,000 ohms, ±10%, ½ watt (R323, R331)
	Resistor—Fixed, composition, 330,000 ohms, ±10%, ½ watt (R336, R338, R355)
	Resistor—Fixed, composition, 820,000 ohms, ±10%, ½ watt (R358)
	Resistor—Fixed composition, 1 megohm, ±10%, ½ watt (R341)
	Resistor—Fixed, composition, 1 megohm, ±20%, ½ watt (R316, R363, R366, R372, R375, R376)
	Resistor—Fixed, composition, 2.2 megohm, ±20%, ½ watt (R302, R321, R371, R373)
	Resistor—Fixed, composition, 3.9 megohm, ±10%, ½ watt (R311)
	Resistor—Fixed, composition, 6.8 megohm, ±10%, ½ watt (R342)
	Resistor—Fixed, composition, 10 megohm, ±20%, ½ watt (R327)
	Resistor—Fixed, composition, 22 megohm, ±20%, ½ watt (R322)
14343	Retainer—Retainer ring for tuning knob shaft
31611	Screw—#8-32 x ¼" set screw for drive drum
73675	Shaft—Tuning knob shaft
72951	Shield—Tube shield
71850	Socket—Tube socket complete with base and shield
73117	Socket—Tube socket, 7 pin, miniature, wafer
31251	Socket—Tube socket wafer
31364	Socket—Dial lamp socket
74483	Socket—Tube socket
31418	Spring—Tuning drive cord spring or indicator drive cord spring
73671	Support—Dial back plate support bracket complete with drive cord pulley and lamp bracket—L.H.
73672	Support—Dial back plate support bracket complete with drive cord pulley and lamp bracket—R.H.
74535	Switch—Selector switch including filaments switch (S301, S302, S303, S304, S305, S306, S310, S311)

STOCK No.	DESCRIPTION
73683	Switch—P.B. switch complete less coils and trimmer (S307, S307A)
72889	Transformer—Ratio detector transformer (T303)
73376	Transformer—First i-f transformer—dual (T301)
74019	Transformer—Second i-f transformer—dual (T302)

SPEAKER ASSEMBLIES

92569-6W RL111-13

RMA 274

STOCK No.	DESCRIPTION
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly
5039	Connector—4 contact male connector for speaker
74753	Speaker—12" P. M. speaker complete with cone and voice coil (3.2 ohms) less output transformer and plug
73636	Transformer—Output transformer

NOTE:—If stamping in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.

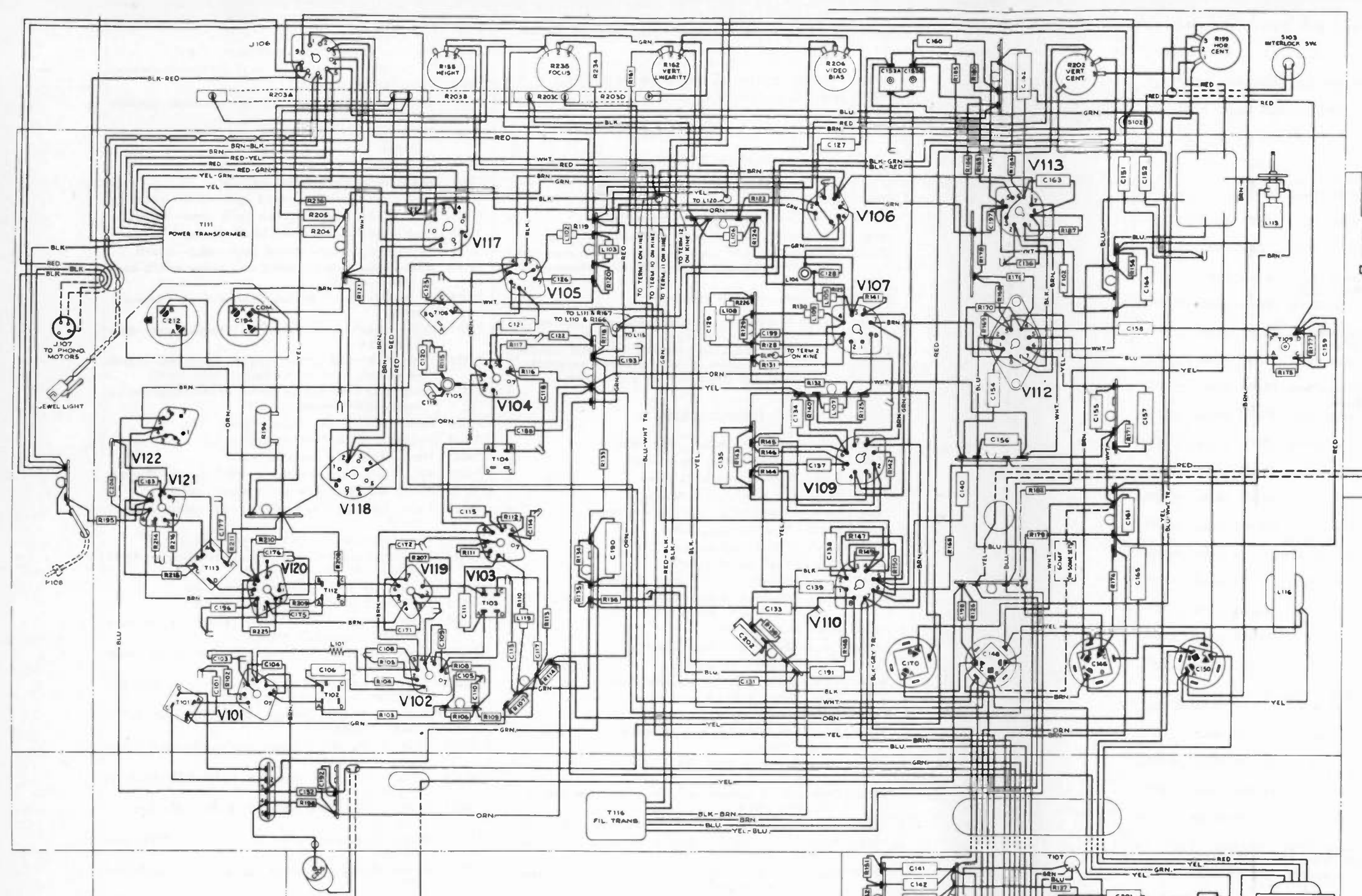
MISCELLANEOUS

STOCK No.	DESCRIPTION
74158	Back—Television chassis back cover
74541	Back—Cabinet bottom back cover
74540	Back—Radio chassis back cover
72146	Bezel—P.B. bezel less buttons
74544	Bezel—Radio dial scale bezel less dial
72857	Board—"Ant" terminal board
71599	Bracket—Pilot lamp bracket
72151	Button—Push button—black
73696	Button—"Magic Monitor" push button—gold
74545	Cable—Shielded pickup cable complete with pin plug for 45 RPM changer
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike
72157	Clip—P.B. bezel spring clip
X3033	Cloth—Grille cloth for mahogany instruments
X3105	Cloth—Grille cloth for walnut instruments
74160	Connector—Anode connector (3 req'd)
72850	Connector—2 contact male connector for television to radio cable
72850	Connector—2 contact male connector for antenna cable
39153	Connector—4 contact male connector for television to radio cable
75063	Connector—9 contact male connector for power cable
75064	Connector—9 contact female connector for power cable
31567	Connector—3 contact male connector for interconnecting motor cable
30868	Connector—2 contact female connector for interconnecting motor cable
30868	Connector—2 contact female connector for motor cable for 45 RPM changer
35352	Connector—4 contact female connector for interconnecting cable
30870	Connector—2 contact male connector for motor cable for 45 RPM changer
36765	Cover—Celluloid cover for call letter markers and "MM" marker
74581	Cover—Cover for mounting screw for 45 RPM changer (3 req'd)
74539	Cover—Bottom cover for 33/78 RPM changer carriage
74619	Cover—Bottom cover for 45 RPM changer
73612	Decal—Television control panel decal
72695	Decal—Radio control panel—L.H. decal (tone control, volume control and power switch)
74613	Decal—Radio control panel—R.H. (Selector switch and tuning control)
74273	Decal—Trade mark decal (Victrola)

STOCK No.	DESCRIPTION
73705	Dial—Glass dial scale
73180	Emblem—"RCA Victor" emblem
73642	Escutcheon—Television channel marker escutcheon
74609	Glass—Safety glass
37396	Grommet—Rubber grommet for mounting speaker (4 req'd)
11889	Grommet—Rubber grommet for mounting radio chassis
74308	Hinge—Door hinge (1 set) (4 req'd)
72036	Indicator—Station selector indicator
73222	Knob—Television fine tuning knob—dark—(outer)
72147	Knob—Radio selector switch knob—dark—(outer)
72148	Knob—Radio tone control knob—maroon—(outer)
72149	Knob—Radio tuning control knob—dark—(inner)
72150	Knob—Radio volume control and power switch knob—dark—(inner)
73224	Knob—Television channel selector knob—maroon—(inner)
73228	Knob—Television horizontal hold control knob—dark—(inner)
73226	Knob—Television picture control, brightness control or vertical hold control knob—dark—(outer)
73230	Knob—Television picture control or brightness control knob—dark—(inner)
11765	Lamp—Dial or pilot lamp—Mazda #51
74543	Marker—"Magic Monitor" marker tab
74605	Mask—Kinescope masking panel
74208	Nut—Tee nut for mounting 45 RPM changer (3 req'd)
74162	Plate—Mounting plate for interlock switch
74124	Plate—Stud plate and wing nut for control panel (2 req'd)
73771	Pull—Door pull for upper doors (2 req'd)
73760	Pull—Door pull for lower doors (4 req'd) or for 33/78 RPM record changer drawer
74271	Runner—45 RPM changer runner—R.H.
74272	Runner—45 RPM changer runner—L.H.
74582	Screw—#8-32 x 1¾" special screw for mounting 45 RPM changer (3 req'd)
74279	Screw—#8-32 x ⅞" trimit head screw for upper doors door pull
74269	Screw—#8-32 x ¾" trimit head screw for door pull #73760 (2 req'd for each pull)
74617	Slide—33/78 RPM changer slide and bracket—R.H.—(part of cabinet)
74618	Slide—33/78 RPM changer slide and bracket—L.H.—(part of cabinet)
74615	Slide—33/78 RPM changer slide—R.H.—(part of carriage)
74616	Slide—33/78 RPM changer slide—L.H.—(part of carriage)
34053	Spring—Retaining spring for buttons #72151 and 73696
72845	Spring—Retaining spring for knobs #72147 and 73222
14270	Spring—Retaining spring for knobs #72148, 73224, 73226, and 73230
30330	Spring—Retaining spring for knobs #72150 and 73228
30900	Spring—Retaining spring for knob #72149
73643	Spring—Spring clip for channel marker escutcheon
72156	Spring—P.B. bezel spring
74423	Spring—Conical spring to mount 45 RPM changer—bottom (3 req'd)
74421	Spring—Conical spring to mount 45 RPM changer—upper R.H. (1 req'd)
74422	Spring—Conical spring to mount 45 RPM changer—upper L.H. (2 req'd)
72936	Stop—Door stop (3 req'd)
73185	Stop—Metal stop for 45 RPM changer runners (2 req'd)
74161	Stud—Locating stud for cabinet back
74159	Support—Moulded support for kinescope (4 req'd)
73182	Track—45 RPM changer compartment track (2 req'd)

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



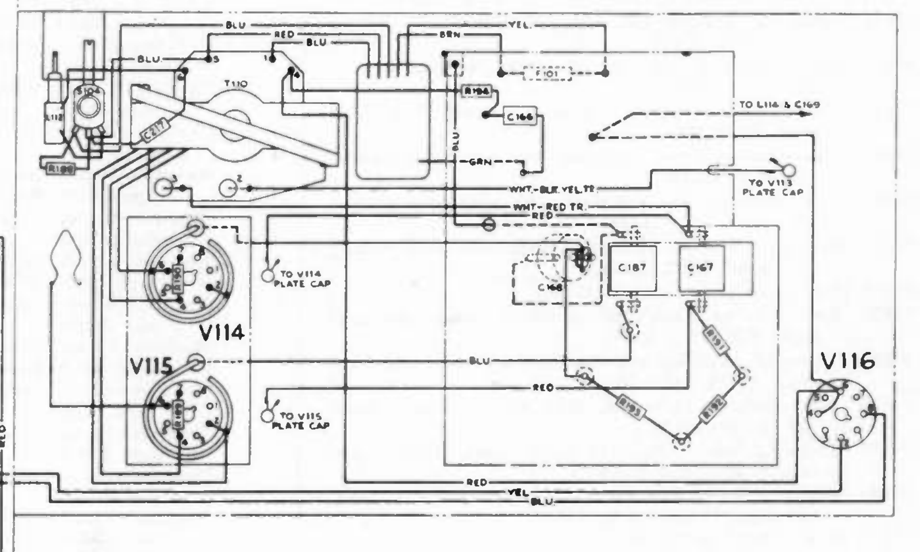
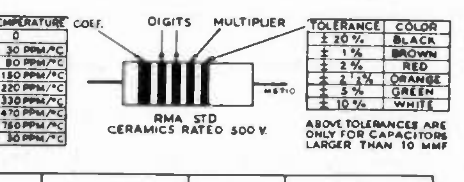


Figure 14—Television Chassis Wiring Diagram

RMA COLOR CODE, CERAMIC CAPACITORS



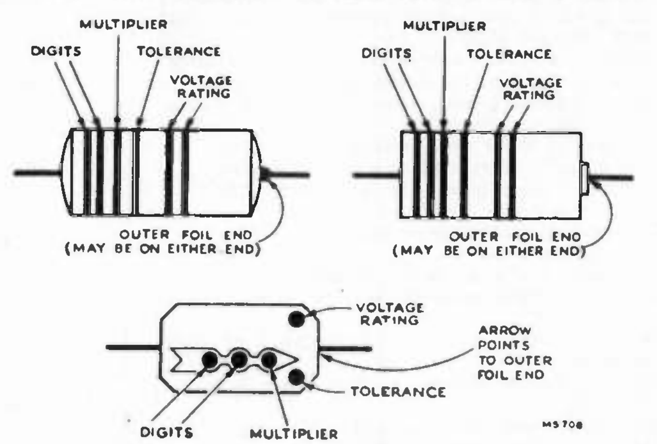
COLOR	TEMPERATURE
BLACK	0
BROWN	− 30 PPM/°C
RED	− 80 PPM/°C
ORANGE	−150 PPM/°C
YELLOW	− 220 PPM/°C
GREEN	− 330 PPM/°C
BLUE	− 470 PPM/°C
VIOLET	− 750 PPM/°C
GRAY	+ 30 PPM/°C

TOLERANCE	COLOR
± 20 %	BLACK
± 1 %	BROWN
± 2 %	RED
± 2½%	ORANGE
± 5 %	GREEN
± 10 %	WHITE

COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

For digits, use digit column, page 12.

COLOR CODES, MOULDED PAPER CAPACITORS



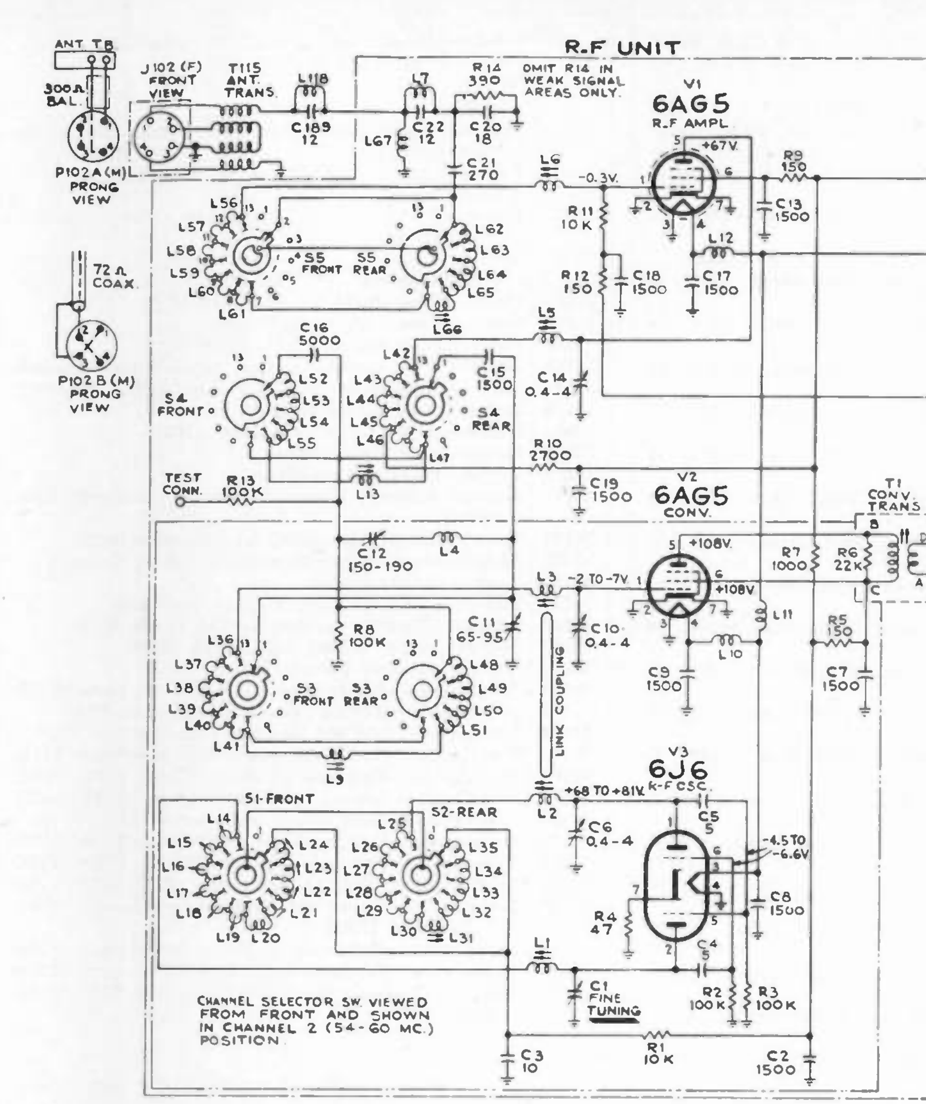
CAPACITY VALUE IN MMF

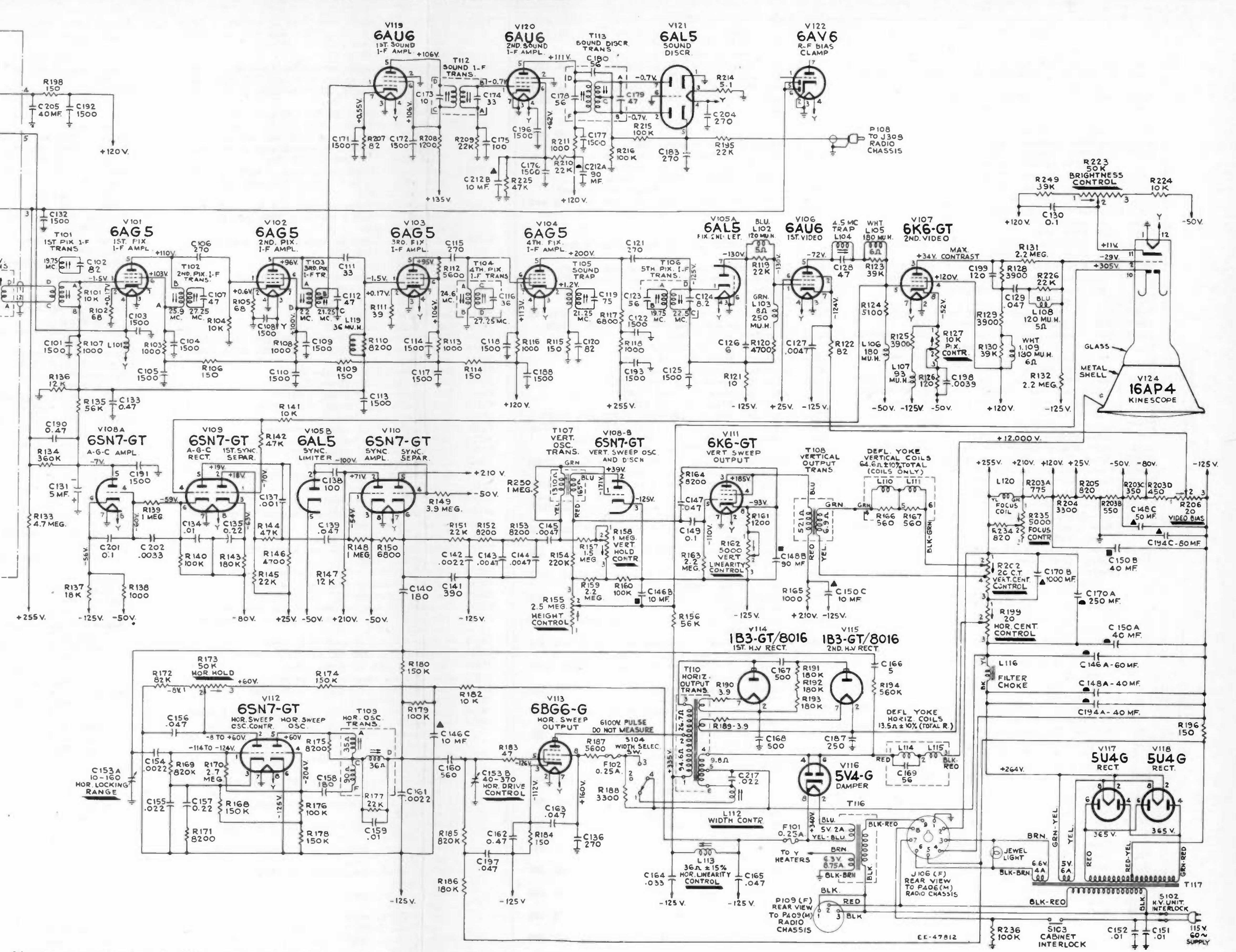
COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

TOLERANCE

COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	±5%

The Voltage Rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digit column to read voltage rating.

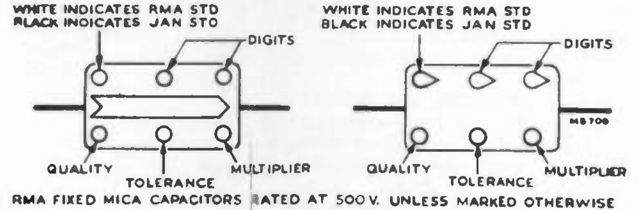




MODEL S1000 IS VERY SIMILAR TO MODEL 9TW390.
THE TELEVISION CHASSIS IS IDENTICAL.

REFER TO MODEL 9TW390 IN VOL. V FOR ADDITIONAL INFORMATION.

RMA COLOR CODE, FIXED MICA CAPACITORS



TOLERANCE

COLOR	TOLERANCE
RED	±2%
GREEN	±5%
SILVER	±10%
BLACK	±20%

QUALITY

COLOR	CLASS	COLOR	CLASS
BLACK	A	YELLOW	D
BROWN	B	GRAY	I
RED	C	WHITE	J
ORANGE	D		

COLOR	DIGITS	MULTIPLIER
GOLD	—	.1
BLACK	0	1.
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "VoltOhmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

In some receivers C148B was 10 MF and a 60 MF tubular condenser was connected in parallel with it.

In some receivers, R11 is 1000 ohms and R14 is omitted.

In weak signal areas, R14 may be disconnected and L66 peaked for best picture on the weakest low channel station.

In some chassis C162 was .22 mfd.

In some chassis R222 (47K) was used instead of R249 (39K).

In some chassis R250 is omitted.

Figure 15—Television Circuit Schematic Diagram

Model 2T51 "Shelby" Mahogany Finish

Model 2T60 "Cumberland" Walnut, Mahogany or Oak

RCA VICTOR

TELEVISION RECEIVERS MODELS 2T51, 2T60

Chassis Nos. KCS45, or KCS45A

— Mfr. No. 274 —

SERVICE DATA

— 1950 No. T12 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model 2T51 and 2T60 receivers employ nineteen tubes plus rectifier and a 12LP4 kinescope. The receivers are identical except for cabinets, jewel lights, speakers and filter chokes.

Features of the television unit are: full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply. An auxiliary audio input jack is provided to permit the use of an external record playing attachment.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE ....87 square inches on a 12LP4 Kinescope

TELEVISION R-F FREQUENCY RANGE
All 12 television channels, 54 mc. to 88 mc. 174 mc. to 216 mc.
Fine Tuning Range..±250 kc. on chan. 2, ±650 kc. on chan. 13
Picture Carrier Frequency ....25.50 mc.
Sound Carrier Frequency ....21.00 mc.

VIDEO RESPONSE ....To 4 mc.

SWEEP DEFLECTION ....Magnetic

FOCUS ....Magnetic

POWER SUPPLY RATING ....115 volts, 60 cycles, 160 watts

AUDIO POWER OUTPUT RATING ....5 watts max.

CHASSIS DESIGNATIONS
KCS45 .... In Model 2T51
KCS45A .... In Model 2T60

LOUDSPEAKERS
KCS45 .... (970773-2) 5" x 7" EM Dynamic, 3.2 ohms
KCS45A .... (92580-4W) 8" PM Dynamic, 3.2 ohms

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside), 2T51	18⅛	16⅛	22
Cabinet (outside), 2T60	21	34¼	21
Chassis (overall)	16	15	19

WEIGHT Model	Chassis with Tubes in Cabinet	Shipping Weight
2T51	73 lbs.	85 lbs.
2T60	81 lbs.	98 lbs.

RECEIVER ANTENNA INPUT IMPEDANCE
Choice: 300 ohms balanced or 72 ohms unbalanced.

RCA TUBE COMPLEMENT

Tube Used	Function
(1) RCA 6CB6	R-F Amplifier
(2) RCA 6J6	R-F Oscillator and Mixer
(3) RCA 6AU6	1st Sound I-F-Amplifier
(4) RCA 6AU6	2nd Sound I-F Amplifier
(5) RCA 6AL5	Sound Discriminator
(6) RCA 6AV6	1st Audio Amplifier
(7) RCA 6AQ5	Audio Output
(8) RCA 6AU6	1st Picture I-F Amplifier
(9) RCA 6CB6	2nd Picture I-F Amplifier
(10) RCA 6AU6	3rd Picture I-F Amplifier
(11) RCA 6CB6	4th Picture I-F Amplifier
(12) RCA 6AL5	Picture 2nd Detector and AGC Detector
(13) RCA 12AU7	1st and 2nd Video Amplifier
(14) RCA 12AU7	DC Restorer and Sync Separator
(15) RCA 6AV6	Vertical Sweep Oscillator
(16) RCA 6AQ5	Vertical Sweep Output
(17) RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(18) RCA 6AU5GT	Horizontal Sweep Output
(19) RCA 6W4GT	Damper
(20) RCA 1B3-GT/8016	High Voltage Rectifier
(21) RCA 12LP4	Kinescope

Specifications continued on page 2

ELECTRICAL AND MECHANICAL SPECIFICATIONS
(Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency .... 25.50 Mc.
Adjacent Channel Sound Trap .... 27.00 Mc.
Accompanying Sound Traps .... 21.00 Mc.
Adjacent Channel Picture Carrier Trap .... 19.50 Mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency .... 21.00 Mc.
Sound Discriminator Band Width between peaks .... 400 kc

VIDEO RESPONSE .... To 4 Mc.
FOCUS .... Magnetic
SWEEP DEFLECTION .... Magnetic
HORIZONTAL SWEEP FREQUENCY .... 15,750 cps
SCANNING .... Interlaced, 525 line
VERTICAL SWEEP FREQUENCY .... 60 cps
FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. See that the TV-PH switch on the rear apron is in the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Adjust the PICTURE and brightness controls for suitable picture contrast and brightness.

9. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

10. In switching from one position to another, it may be necessary to repeat steps 4 and 8.

11. When the set is turned on again after an idle period it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

12. If the positions of the controls have been changed, it may be necessary to repeat steps 2 through 9.

13. To use a record player, plug the record-player output cable into the PHONO jack on the rear apron, and set the TV-PH switch to "PH." Upon completion of the record program, set the TV-PH switch to TV position.

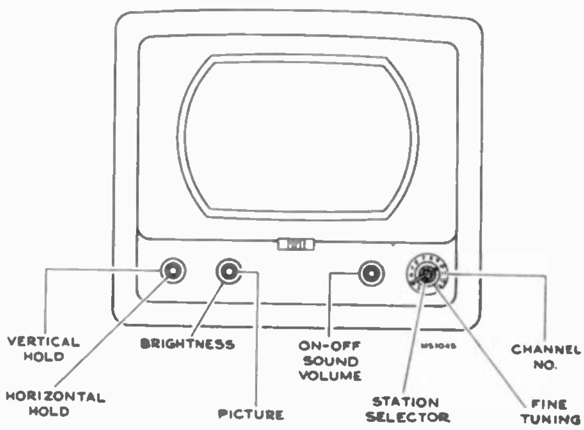


Figure 1—Receiver Operating Controls

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT REMOVE THE RECEIVER CHASSIS, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

INSTALLATION INSTRUCTIONS

Make sure that all tubes are in place and are firmly seated in their sockets.

Check to see that the kinescope high voltage lead clip is in place.

Connect the antenna transmission line to the receiver antenna terminals. Plug a power cord into the 115 volt a-c power source and into the receiver interlock receptacle. Turn the receiver power switch to the "on" position, the brightness control fully clockwise, and the picture control counter-clockwise.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2. Starting from this position immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Turn the focus control (shown in Figure 2) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches of this adjustment should be made with the brightness control at the maximum clockwise position with which good line focus can be maintained.

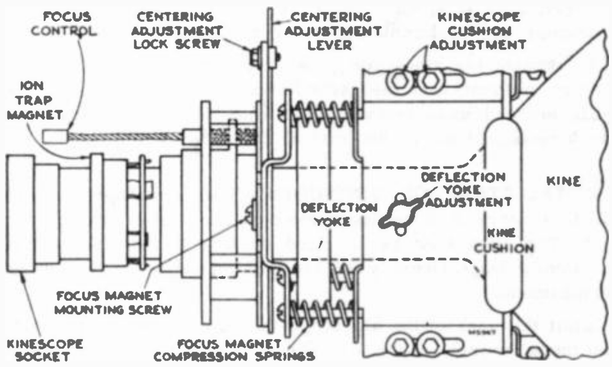


Figure 2—Yoke and Focus Magnet Adjustments

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn S105 on the rear apron (see Figure 3) counter-clockwise until the set operates normally and the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 2 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull-in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Magnet Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control

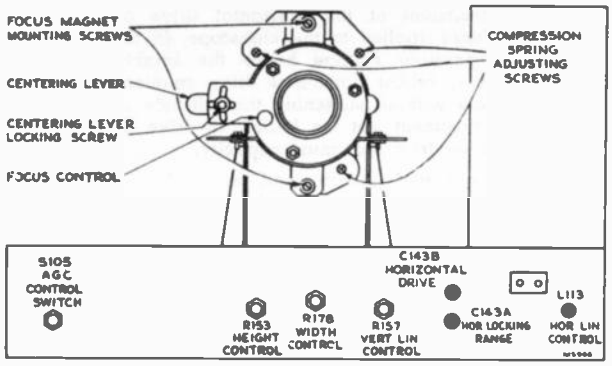


Figure 3—Rear Chassis Adjustments

from the pull-in point, it will be necessary to make the following adjustments.

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T107 horizontal frequency adjustment on top of the chassis until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Locking Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. The picture may remain in sync. If so turn the T108 top core slightly and momentarily switch off channel. Repeat until the picture falls out of sync with the diagonal lines sloping down to the left. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 2 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C147A slightly clockwise. If less than 2 bars are present, adjust C147A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 2 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure on page 13. For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

FOCUS MAGNET ADJUSTMENT.—The focus coil should be adjusted so that there is approximately three-eighths inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus magnet. This spacing gives best average focus over the face of the tube.

The axis of the hole through the magnet should be parallel with the axis of the kinescope neck with the kinescope neck through the middle.

CENTERING ADJUSTMENT.—No electrical centering controls are provided. Centering is accomplished by means of a separate plate on the focus magnet. Some centering plates include a locking screw which must be loosened before centering, and others are held in adjustment by friction. Up and down adjustment of the plate moves the picture side to side and sidewise adjustment moves the picture up and down.

If a corner of the raster is shadowed, check the position of the ion trap magnet. Reposition the magnet within the range of maximum raster brightness to eliminate the shadow and recenter the picture by adjustment of the focus magnet plate. In no case should the magnet be adjusted to cause any loss of brightness since such operation may cause immediate or eventual damage to the tube. In some cases it may be necessary to shift the position of the focus magnet in order to eliminate a corner shadow.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage hence the brightest and best focused picture, adjust horizontal drive counter-clockwise as far as possible without stretching the left side of the picture. As a first adjustment, set the horizontal drive trimmer C143B one-half turn out from maximum capacity.

Turn the horizontal linearity coil out until appreciable loss in width occurs, then in until nearly maximum width and the best linearity is obtained.

Adjust the width control R178 to obtain correct picture width.

A slight readjustment of these three controls may be necessary to obtain the best linearity.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R153 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R157 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

FOCUS.—Adjust the focus magnet for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

On focus magnets using two shunts, the one with the cable is the "fine adjustment" and the other is the "focus range" adjustment. In general, the two shunts should be adjusted to approximately equal positions.

Recheck the position of the ion trap magnet to make sure that maximum brightness is obtained.

Check to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

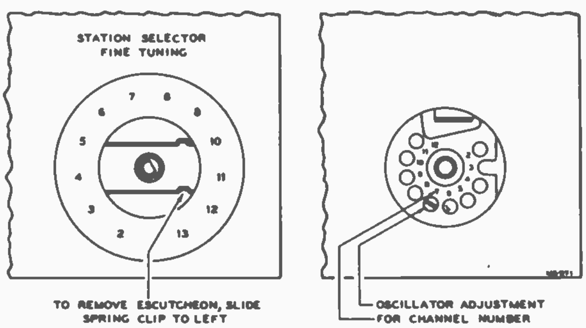


Figure 4—R-F Oscillator Adjustments

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure on page 9. The adjustments for channels 2 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment of channel 13 is on top of the chassis.

AGC CONTROL.—The AGC control switch is provided as an installation adjustment. The normal position for strong signal areas is with the switch in the number 1 or counter-clockwise position. If impulse type of interference is experienced, turn the switch to the number 2 or center position. In very weak signal areas in which impulse type interference is experienced, turn the switch to position number 3 or fully clockwise. In this position, all AGC is removed and the receiver will overload if the input signal exceeds 200 microvolts. However, for signals under 200 microvolts, this position of the AGC control switch gives best noise immunity of sync.

FM TRAP ADJUSTMENT.—In some instances interference may be encountered from a strong FM station signal. A trap is provided to eliminate this type of interference. To adjust the trap tune in the station on which the interference is observed and adjust the L203 core on top of the r-f unit for minimum interference in the picture.

CAUTION: In some receivers, the FM trap L203 will tune down into channel 6 or even into channel 5. Needless to say, such an adjustment will cause greatly reduced sensitivity on these channels. If channels 5 or 6 are to be received, check L203 to make sure that it does not affect sensitivity on these two channels.

Replace the cabinet back and reconnect the antenna leads to the cabinet back.

VENTILATION CAUTION.—The receiver is provided with adequate ventilation holes in the bottom and back of the cabinet. Care should be taken not to allow these holes to be covered or ventilation to be impeded in any way.

If the receiver is to be operated with the back of the cabinet near a wall, at least a two-inch clearance should be maintained between cabinet and wall.

CHASSIS REMOVAL.—To remove the chassis for repair or installation of a new kinescope, remove the cabinet back and the control knobs, unplug the speaker cable, and remove the four chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet. The kinescope is held on the chassis by means of a special strap, so that the chassis and the kinescope can be handled together, as a unit.

To remove the kinescope, remove the kinescope socket, the ion-trap magnet, and the second-anode connector. Loosen the cross-recessed head screw on the kinescope strap. Withdraw the kinescope toward the front of the chassis.

INSTALLATION OF KINESCOPE.—The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high-voltage compartment.

Insert the neck of the kinescope through the deflection yoke and focus magnet. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slide the kinescope cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

Slip the ion trap magnet assembly over the neck of the kinescope.

Connect the kinescope socket to the tube base.

Connect the high voltage lead to the kinescope second anode socket.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks.

To replace the chassis in the cabinet, first tighten the cross-recessed head screw on the kinescope strap. Slide the chassis into the cabinet, then insert and tighten the four chassis bolts. Loosen the kinescope strap from the rear of the cabinet. Push the kinescope forward until the face of the tube is against the mask. Push the yoke cushion forward against the kinescope flare, then tighten the cushion adjusting screws. Tighten the kinescope strap. Then replace the knobs, and the cabinet back.

ANTENNAS.—The finest television receiver built may be said to be only as good as the antenna design and installation. It is therefore important to select the proper antenna to suit the particular local conditions, to install it properly and orient it correctly.

If two or more stations are available between channels two and six and the two stations are in different directions, it may be possible to make a compromise orientation which will provide a satisfactory signal on all such channels.

CABINET ANTENNA.—A cabinet antenna is provided in both model receivers and the leads are brought out near the antenna terminal board. The cabinet antenna may be employed in place of the outdoor antenna in areas where the signals are strong and no reflections are experienced.

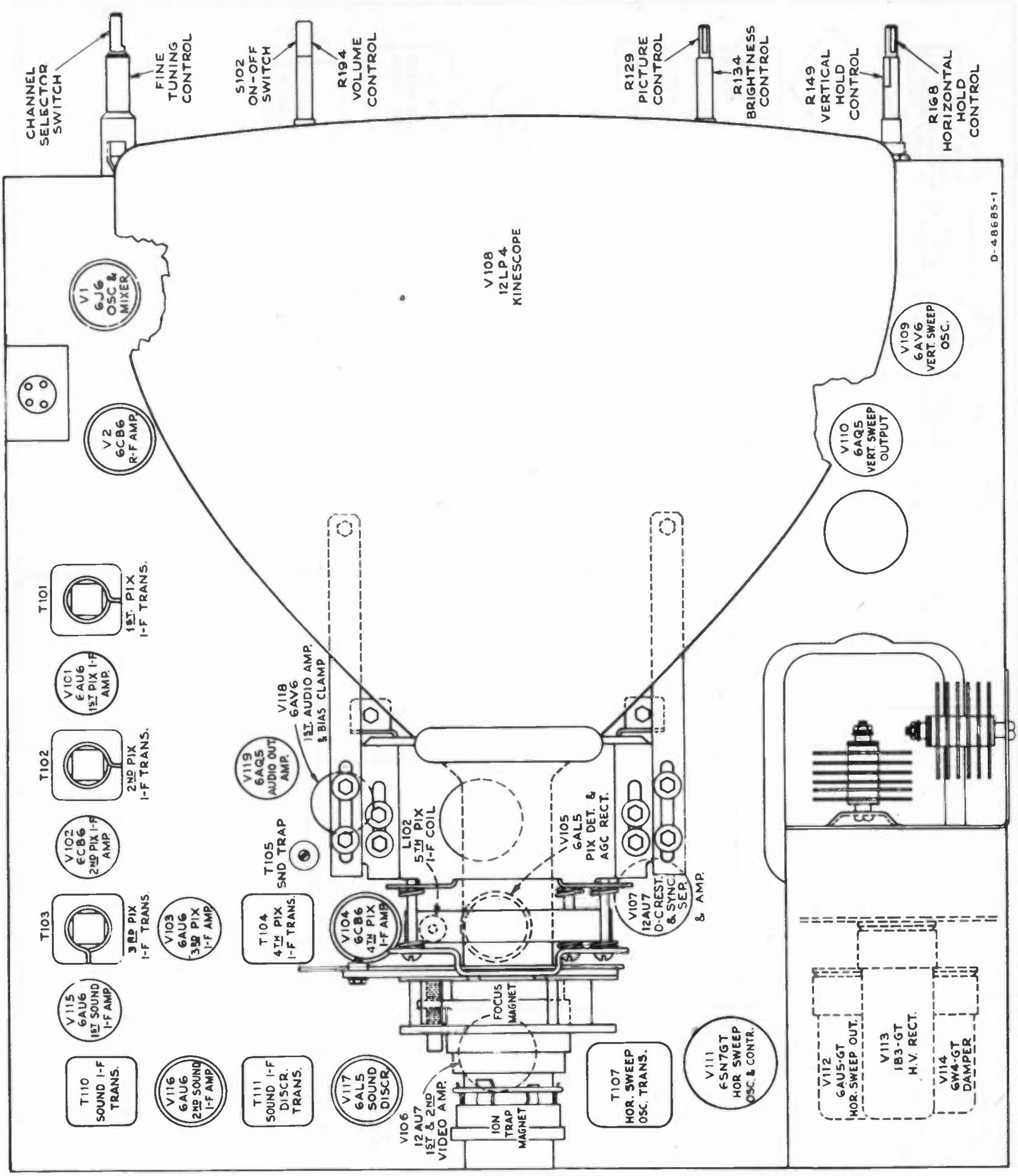


Figure 5—Chassis Top View

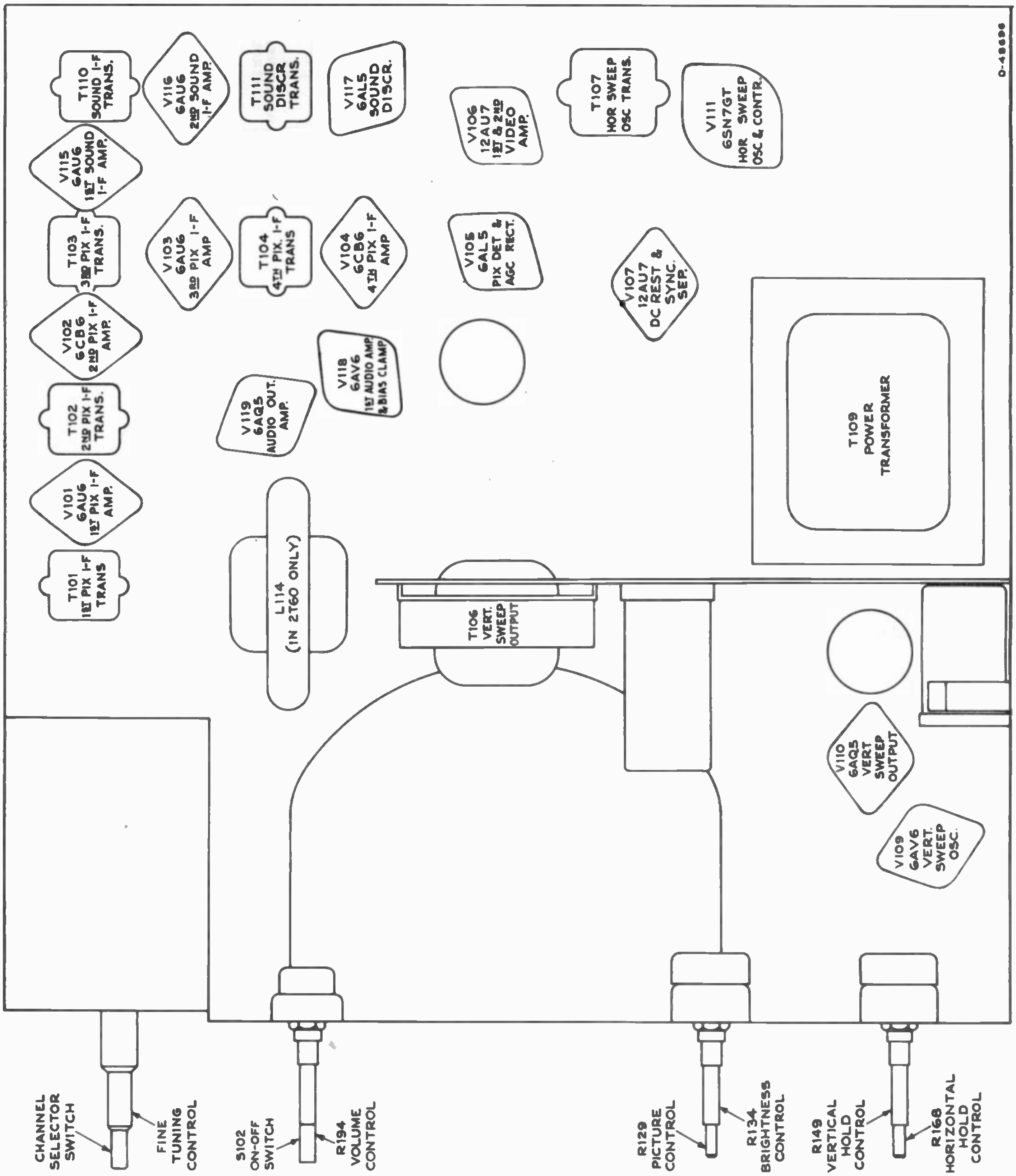


Figure 6—Chassis Bottom View

TEST EQUIPMENT.—To properly service the television chassis of this receiver, it is recommended that the following test equipment be available:

R-F Sweep Generator meeting the following requirements:

(a) Frequency Ranges
20 to 30 mc., 1 mc. and 10 mc. sweep width
50 to 90 mc., sweep width
170 to 225 mc., 10 mc. sweep width

(b) Output adjustable with at least .1 volt maximum.

(c) Output constant on all ranges.

(d) "Flat" output on all attenuator positions.

Cathode-Ray Oscilloscope.—For alignment purposes, the oscilloscope employed must have excellent low frequency and phase response, and should be capable of passing a 60-cycle square wave without appreciable distortion. While this requirement is not met by many commercial instruments, RCA Oscilloscopes, types WO-55A, WO-58A, WO-79A, and WO-60C fill the requirement and any of these may be employed.

For video and sync waveform observations, the oscilloscope must have excellent frequency and phase response from 10 cycles to at least two megacycles in all positions of the gain control. The RCA types WO-58A and WO-79A are ideally suited for this purpose.

Signal Generator to provide the following frequencies with crystal accuracy.

(a) Intermediate frequencies
19.50 mc. adjacent channel picture trap
21.00 mc. sound i-f and sound traps
22.3 and 25.4 mc. conv. and first pix i-f trans.
25.3 mc. second picture i-f transformer
22.5 mc. fourth picture i-f transformer
21.75 mc. third picture i-f transformer
24.35 mc. fifth picture i-f coil
25.50 mc. picture carrier
27.00 mc. adjacent channel sound trap

(b) Radio frequencies

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.
2	55.25	59.75
3	61.25	65.75
4	67.25	71.75
5	77.25	81.75
6	83.25	87.75
7	175.25	179.75
8	181.25	185.75
9	187.25	191.75
10	193.25	197.75
11	199.25	203.75
12	205.25	209.75
13	211.25	215.75

(c) Output of these ranges should be adjustable and at least .1 volt maximum.

Heterodyne Frequency Meter with crystal calibrator if the signal generator is not crystal controlled.

Electronic Voltmeter of Junior "VoltOhmyst" type and a high voltage multiplier probe for use with this meter to permit measurements up to 10 kv.

Service Precautions.—If possible, the chassis should be serviced without the kinescope. However, if it is necessary to view the raster during servicing, make sure the kinescope retaining strap is secure, and the yoke cushion is up firmly against the flare of the tube.

CAUTION: Do not short the kinescope second anode lead. Its short circuit current is approximately 3 ma. This represents approximately 9 watts dissipation and a considerable overload on the high voltage filter resistor R179.

Adjustments Required.—Normally, only the r-f oscillator and mixer lines will require the attention of the service technician. All other circuits are either broad or very stable and hence will seldom require readjustment.

ORDER OF ALIGNMENT.—When a complete receiver alignment is necessary, it can be most conveniently performed in the following order:

(1) Sound discriminator
(2) Sound i-f transformers
(3) Picture i-f traps
(4) Picture i-f transformers
(5) R.F. unit
(6) Overall picture i-f
(7) Horizontal oscillator
(8) Sensitivity check

SOUND DISCRIMINATOR ALIGNMENT.—Set the signal generator for approximately .1 volt output at 21.00 mc. and connect it to the second sound i-f grid, pin 1 of V116.

Detune T111 secondary (bottom) to the extreme counterclockwise position.

Set the "VoltOhmyst" on the 3-volt scale.

Connect the meter, in series with a one-megohm resistor, to pin 7 of V117.

Adjust the primary of T111 (top) for maximum output on the meter.

Connect the "VoltOhmyst" to the junction of R192 and S103. Adjust T111 secondary (bottom). It will be found that it is possible to produce a positive or negative voltage on the meter dependent upon this adjustment. Obviously to pass from a positive to a negative voltage, the voltage must go through zero. T111 (bottom) should be adjusted so that the meter indicates zero output as the voltage swings from positive to negative. This point will be called discriminator zero output.

Connect the sweep oscillator to the grid of the second sound i-f amplifier, pin 1 to V116.

Adjust the sweep band width to approximately 1 mc. with the center frequency at approximately 21.00 mc. and with an output of approximately .1 volt.

Connect the oscilloscope to the junction of R192 and S103. The pattern obtained should be similar to that shown in Figure 12. If it is not, adjust T111 (top) until the wave form is symmetrical.

The peak-to-peak band width of the discriminator should be approximately 400 kc. and the trace should be linear from 20.925 mc. to 21.075 mc.

Note.—The bottom core and stud in the discriminator transformer are at plus B potential.

SOUND I-F ALIGNMENT.—Connect the sweep oscillator to the first sound i-f amplifier grid, pin 1 of V115.

Insert a 21.00 mc. marker signal from the signal generator into the first sound i-f grid.

With the oscilloscope connected as above, adjust T110 for maximum gain and symmetry about the 21.00 mc. marker on the discriminator pattern. The pattern obtained should be similar to that shown in Figure 12.

The output level from the sweep should be set to produce approximately 1.0 volt peak-to-peak at the junction of R192 and S103, when the final touches on the above adjustment are made. It is necessary that the sweep output voltage should not exceed the specified values otherwise the response curve will be broadened, permitting slight misadjustment to pass unnoticed and possibly causing distortion on weak signals.

The band width at 70% response from the first sound i-f grid to the second i-f grid should be approximately 530 kc.

PICTURE I-F TRAP ADJUSTMENT.—Connect the "VoltOhmyst" to the junction of R102 and R103.

Obtain a 7.5 volt battery capable of withstanding appreciable current drain and connect the ends of a 1,000 ohm potentiometer across it. Connect the battery positive terminal to chassis and the potentiometer arm to the junction of R102 and R103. Adjust the potentiometer for –3.0 volts indication on the "VoltOhmyst."

Set the channel switch to the blank position between channels number 2 and 13.

Connect the "VoltOhmyst" to pin 2 of V106 and to ground.

Connect the output of the signal generator to terminal D of T101.

Set the generator to each of the following frequencies and with a thin fiber screwdriver tune the specified adjustment for minimum indication on the "VoltOhmyst." In each instance the generator should be checked against a crystal calibrator to insure that the generator is exactly on frequency.

(1) 21.00 mc.—T103 (top)
(2) 21.00 mc.—T105 (top)
(3) 27.00 mc.—T102 (top)
(4) 27.00 mc.—T104 (top)
(5) 19.50 mc.—T101 (top)

In the above transformers using threaded cores, it is possible to run the cores completely through the coils and secure two peaks or nulls. The correct position is with the cores in the outside ends of the coils. If the cores are not in the correct position, the coupling will be incorrect and it will be impossible to secure the correct response.

PICTURE I-F TRANSFORMER ADJUSTMENTS.—Set the signal generator to each of the following frequencies and peak the specified adjustment for maximum indication on the "VoltOhmyst." During alignment, reduce the input signal if necessary to prevent overloading.

*24.35 mc.—L102	21.75 mc.—T103 (bottom)
*22.5 mc.—T104 (bottom)	25.3 mc.—T102 (bottom)

* In some receivers R115 was 3900, R119 was 8,200, and L114 was omitted, T104 bottom was tuned to 24.35MC and L102 was tuned to 22.5MC.

R-F UNIT ALIGNMENT.—Disconnect the co-ax link from terminal 2 of the r-f unit terminal board and connect a 39 ohm composition resistor between lugs 1 and 2.

Detune T1 by backing the core all the way out of the coil.

In early production units in which L44 is adjustable, back the L44 core all the way out. Back L203 core all the way out.

In order to align the r-f tuner, it will first be necessary to set the channel 13-oscillator to frequency. The shield over the bottom of the r-f unit must be in place when making any adjustments.

The oscillator may be aligned by adjusting it to beat with a crystal-calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available. Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated.

If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, couple the meter probe loosely to the receiver oscillator.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier signal, connect the signal generator to the receiver antenna terminals. Connect the "VoltOhmyst" to the sound discriminator output (junction of R192 and S103). Also couple the link loosely to lug 2 of the r-f unit terminal board so as to permit measurement at sound discriminator.

Set the channel selector switch to 13.

Adjust the frequency standard to the correct frequency (236.75 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range.

Adjust C1 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator.

Now that the channel-13 oscillator is set to frequency, we may proceed with the r-f alignment.

Turn the AGC control to the counter-clockwise position.

Connect the bias box to terminal 3 of the r-f unit terminal board and adjust the bias box potentiometer for –3.5 volts.

Connect the oscilloscope to the test connection at R5 on top of the r-f unit.

Connect the r-f sweep oscillator to the receiver antenna terminals. The method of connection depends upon the output impedance of the sweep. The P300 connections for 300-ohm balanced or 72-ohm single-ended input are shown in the circuit schematic diagram on page 27. If the sweep oscillator has a 50-ohm single-ended output, 300-ohm balanced output can be obtained by connecting as shown in Figure 7.

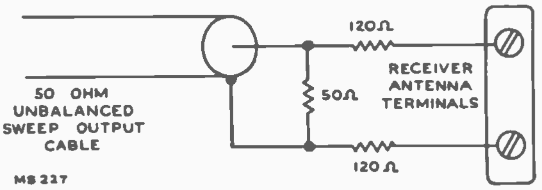


Figure 7—Unbalanced Sweep Cable Termination

Connect the signal generator loosely to the receiver antenna terminals.

Set the receiver channel switch to channel 8.

Set the sweep oscillator to cover channel 8.

Insert markers of channel 8 picture carrier and sound carrier, 181.25 mc. and 185.75 mc.

Adjust C9, C11, C16 and C22 for approximately correct curve shape, frequency, and band width as shown in Figure 15.

The correct adjustment of C22 is indicated by maximum amplitude of the curve midway between the markers. C16 tunes the r-f amplifier plate circuit and affects the frequency of the curve most noticeably. C9 tunes the converter grid circuit and affects the tilt of the curve most noticeably (assuming that C22 has been properly adjusted). C11 is the coupling adjustment and hence primarily affects the response band width.

Set the receiver channel switch to channel 6.

Adjust the frequency standard to the correct frequency (108.75 mc. for heterodyne frequency meter or 87.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range.

Adjust L5 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator.

Set the sweep generator to channel 6.

From the signal generator, insert channel 6 sound and picture carrier markers, 83.25 mc. and 87.75 mc.

Adjust L42, L45 and L49 for proper response as shown in Figure 15.

L42 is adjusted to give maximum amplitude of the curve between the markers. L45 primarily affects the tilt of the curve. L49 primarily affects the frequency of response.

Connect the "VoltOhmyst" to the r-f unit test point at R5.

Adjust C7 for –3.0 volts at the test point.

Retouch L42, L45 and L49 for proper response if necessary. If necessary, retouch C11 for proper band width on channel 6. Continue these retouching adjustments until proper response is obtained and –3.0 volts of oscillator injection are present at the test point.

Set the receiver channel selector switch to channel 8 and readjust C1 for proper oscillator frequency.

Set the sweep oscillator and signal generator to channel 8.

Readjust C9, C16 and C22 for correct curve shape, frequency and band width. Readjust C11 only if necessary.

Switch the receiver, the sweep oscillator and signal generator to channel 13.

Adjust L52 for maximum amplitude of the curve midway between markers and then overshoot the adjustment by turning the slug in the same direction from thte initial setting a little more than the amount of turning required to reach maximum amplitude of response.

Adjust C22 for maximum amplitude of response.

Turn off the sweep generator. Adjust the L43 core for correct channel 13 oscillator frequency, then overshoot the adjustment by turning the slug a little more in the same direction from the initial setting. Reset the oscillator to proper frequency by adjustment of C1.

Turn the sweep oscillator back on.

Check the response of channels 7 through 13 by switching the receiver channel switch, sweep oscillator and marker oscillator to each of these channels and observing the response and oscillator injection obtained. See Figure 15 for typical response curves. It should be found that all these channels have the proper shaped response with the markers above 80% response.

If the markers do not fall within this requirement, switch to channel 8 and readjust C9, C11, C16 and C22 as necessary. If C22 required adjustment, the adjustment should be overshot a small amount and corrected by adjustment of L52 to give maximum amplitude of response between the sound and picture carrier markers. The antenna circuit (L52, C22) is broad so that tracking is not particularly critical.

If the valley in the top of the selectivity curves for the high channels is deeper than normal, the curve can be flattened somewhat by decreasing the inductance of L44 by turning the core stud in. Be sure to check for undesirable resonant suckouts on channels 7 and 8 if this is done. In later production units, L44 may be fixed and not require adjustment.

Turn the sweep oscillator off and check the receiver channel 8 r-f oscillator frequency. If the oscillator is off frequency overshoot the adjustment of C1 and correct by adjusting L43.

Turn the receiver channel selector switch to channel 6. Adjust L5 for correct oscillator frequency.

Turn the sweep oscillator on and to channel 6 and observe the response curve. If necessary readjust L42, L45 and L49. It should not be necessary to touch C11.

Check the oscillator injection voltage at the test point. If necessary adjust C7 to give –3 volts injection. If C7 is adjusted, switch to channel 8, and readjust C9 for proper curve shape, then recheck channel 6.

Switch the receiver through channel 6 down through channel 2 and check for normal reponse curve chapes and oscillator injection voltage.

Likewise check channels 7 through 13, stopping on 13 for the next step.

With the receiver on channel 13, check the receiver oscillator frequency. Correct by adjustment of C1 if necessary.

Adjust the oscillator to frequency on all channels by switching the receiver and the frequency standard to each channel and adjusting the appropriate oscillator trimmer for the specified indication. It should be possible to adjust the oscillator to the correct frequency on all channels with the fine tuning control in the middle third of its range.

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.	Channel Oscillator Adjustment
2	55.25	59.75	80.750	L1
3	61.25	65.75	86.750	L2
4	67.25	71.75	92.750	L3
5	77.25	81.75	102.750	L4
6	83.25	87.75	108.750	L5
7	175.25	179.75	200.750	L6
8	181.25	185.75	206.750	L7
9	187.25	191.75	212.750	L8
10	193.25	197.75	218.750	L9
11	199.25	203.75	224.750	L10
12	205.25	209.75	230.750	L11
13	211.25	215.75	236.750	C1

Switch to channel 8 and observe the response.

Adjust T1 clockwise while watching the change in response. When T1 is properly adjusted, the selectivity curve will be slightly wider with a slightly deeper valley in its top.

Switch through all channels and observe response, oscillator injection and r-f oscillator frequency. Minor touch-ups of adjustments may be made at this time. However, if C7 or C9 are changed appreciably, then a recheck of the oscillator frequency on all channels should be made.

Reconnect the link from T101 to terminal 2 of the r-f unit terminal board.

Since T1 was adjusted during the r-f unit alignment it will be necessary to sweep the overall i-f response.

R-F UNIT TUBE CHANGES.—Since most of the circuits are low capacitance circuits the r-f unit may require readjustments when the tubes are changed.

If the 6CB6 r-f amplifier tube is changed, it may be necessary to readjust C16 and C22.

If the 6J6 oscillator and mixer tube is changed, then more extensive adjustments are required.

For good conversion efficiency, the oscillator injection to a triode mixer must be held reasonably close to the optimum value. Although there is some latitude in this level, it is nearly expended in the normal variation in injection from channel to channel. Consequently, the adjustment of C7 is limited primarily to establishing the conditions for good conversion. Since changes in oscillator injection affect conversion gain, it also affects the input capacity of the mixer, thus also affecting tracking of the mixer grid circuit. These tube variations with their consequent effect on circuit alignment thereby require readjustment of the r-f unit if maximum conversion efficiency is to be retained after the 6J6 tube is changed. It may be possible, however, to try several 6J6 tubes and select one which gives satisfactory performance without realignment.

SWEEP ALIGNMENT OF PIX I-F.—Set the r-f unit bias to –3.5 volts.

Connect a 47 ohm resistor across the link circuit at T101 terminals C and D.

Remove the second picture i-f tube.

With the oscilloscope connected to the r-f unit test connection and the sweep oscillator connected to the antenna terminals, set the sweep output to give 0.1 volt peak-to-peak on the oscilloscope.

Switch through the channels and select one that is essentially flat and with the two carriers at 90% response or higher. Channel 6 is usually the most desirable for this test.

Remove the 47 ohm resistor and replace V102

Connect the oscilloscope to terminal 2 of V106 socket.

Clip 330 ohm resistors across R107, R110, R115 and R119.

Connect the bias box to the junction of R102 and R103. Adjust the box for –1 volt.

Adjust the sweep oscillator output to give 0.5 volt peak-to-peak on the oscilloscope.

Connect the signal generator loosely to the i-f amplifier.

Adjust T1 and T101 bottom core to obtain the response curve shown in Figure 13.

Remove the 330 ohm resistors across R107, R110, R115 and R119.

Set the i-f bias to –4.5 volts.

Adjust the sweep output to give 3 volts peak-to-peak on the oscilloscope.

Retouch T1, T101 bottom, T102 bottom, T103 bottom, T104 bottom and L102 to obtain the response curve shown in Figure 14.

Continued on Page 13.

2T51, 2T60

ALIGNMENT TABLE

THE DETAILED ALIGNMENT PROCEDURE BEGINNING ON PAGE 7 SHOULD BE READ BEFORE ALIGNMENT BY USE OF THE TABLE IS ATTEMPTED

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
	DISCRIMINATOR AND SOUND I-F ALIGNMENT								
1	2nd sound i-f grid (pin 1, V116)	21.00 .1 volt output	Not used	—	Not used.	In series with 1 meg. to pin 7 of V117	Meter on 3 volt scale	Detune T111 (bot.) Adjust T111 (top) for max. on meter	Fig. 12 Fig. 9 Fig. 8
2	"	"	"	—	"	Junction of R192 & S103	Meter on 3 volt scale	T111 (bottom) for zero on meter	Fig. 12 Fig. 9
3	"	"	2nd sound i-f grid (pin 1, V116)	21.00 center 1 mc. wide .1 v. out	Junction of R192 & S103	Not used	Check for symmetrical response wave-form (positive & negative). If not equal adjust T111 (top) until they are equal		Fig. 12 Fig. 9
4	1st sound i-f grid (pin, 1, V115)	21.00 re-duced output	1st sound i-f grid (pin 1, V115)	21.00 reduced output	"	"	Sweep output re-duced to provide 1.0 volt p-to-p on scope	T110 for max. gain and symmetry at 21.00 mc.	Fig. 12 Fig. 10 Fig. 8
	PICTURE I-F AND TRAP ADJUSTMENT								
5	Not used		Not used	—	Not used	Junction of R102 & R103	Connect bias box to junction of R102 & R103 and to ground	Adjust potentiom-eter for −3.0 volts on meter	Fig. 10
6	Terminal D of T101	21.00	"	—	"	Pin 2 of V106 and to ground	Meter on 3 volt scale. Receiver be-tween 2 & 13	T103 (top) for min. on meter	Fig. 10 Fig. 8
7	"	21.00	"	—	"	"	"	T105 (top) for min.	Fig. 8
8	"	27.00	"	—	"	"	"	T102 (top) for min.	"
9	"	27.00	"	—	"	"	"	T104 (top) for min.	"
10	"	19.50	"	—	"	"	"	T101 (top) for min.	"
11	"	24.35	"	—	"	"	"	L102 (top) for max.	"
12	"	22.5	"	—	"	"	"	T104 (bot.) for max.	Fig. 9
13	"	21.75	"	—	"	"	"	T103 (bot.) for max.	"

R-F UNIT ALIGNMENT

STEP. No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
14	Disconnect the co-ax link from terminal 2 of the r-f unit terminal board and connect a 39 ohm composition resistor between lugs 1 and 2. If the receiver oscillator is adjusted by feeding in the r-f sound carrier signal, couple the link loosely to lug 2 of the r-f unit terminal board so as to permit measurement at sound discriminator. In early production units in which L44 is adjustable, back the L44 core all the way out. Detune T1 by backing the core all the way out of the coil. In order to align the r-f tuner, it will first be necessary to set the channel 13 oscillator to frequency. The shield over the bottom of the r-f unit must be in place when making any adjustments.									
15	Antenna terminals	215.75 MC.	Not used		Loosely coupled to r-f oscillator	236.75 MC.	Junction of R192 & S103 for signal gen. method only	Fine tuning cen-tered. Receiver on channel 13. Het. freq. meter coupled to osc. if used.	C1 for zero on meter or beat on het. freq. meter	Fig. 10 Fig. 8
16			"				Connect "Volt-Ohmyst" to ter-minal 3 of the r-f unit terminal board	Turn AGC control counter-clockwise. Connect bias box to terminal 3 of r-f unit term. board	Adjust the bias box potentiometer for −3.5 volts.	Fig. 10
17	Antenna terminal (loosely)	181.25 185.75	Antenna terminals (see text for precaution)	Sweep-ing channel 8	Not used	—	Not used	Rec. on chan. 8. Connect oscilloscope to test connection at R5 on top the r-f unit. Adjust C9, C11, C16 and C22. Correct curve shape, frequency, and band width. C22 is adjusted to give max. amplitude between markers. C9 primarily affects tilt and C16 primarily affects the frequency of response. C11 affects the response band width.		Fig. 15 (8)
18	"	87.75	"	Not used	Loosely coupled to r-f oscillator	108.75	Junction of R192 & S103 for signal gen. method only	Rec. on channel 6	L5 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10 Fig. 11
19	"	83.25 87.75	"	Channel 6	Not used	—		Rec. on chan. 6. Adjust L42, L45 and L49 for proper response. L42 is adjusted to give max. amplitude between markers. L45 primarily affects tilt and L49 pri-marily affects freq. of response. If necessary, retouch C11 for proper width.		Fig. 15 (6)
20	Not used	—	Not used	—	Not used	—	Connect "Volt-Ohmyst" to r-f unit test point R5	Rec. on channel 6	Adjust C7 for −3.0 volts at the test point	Fig. 8 Fig. 9
21	Repeat steps 18, 19 and 20 until the specified conditions are obtained.									
22	Antenna terminal (loosely)	185.75	Not used	—	Loosely coupled to r-f oscillator	206.75	Junction of R192 & S103 for sig. gen. method only	Rec. on chan. 8	C1 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER	HET. FREQ. METER MC.	CONNECT "VOLTOHMYST" TO	MISCELLLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
23	Antenna terminal (loosely)	181.25 185.75	Antenna terminals (see text for precaution)	Sweeping channel 8	Nnt used	—	Not used	Rec. on chan. 8. Readjust C9, C16 and C22 for correct curve shape, frequency and band width. Readjust C11 only if necessary.		Fig. 8 Fig. 9 Fig. 15 (8)
24	"	211.25 215.75	"	Sweeping channel 13	Not used	—	Not used	Rec. on chan. 13. Adjust L52 for max. amplitude between markers and then overshoot a little more than the amount of turning required to reach max. response. Adjust C22 to regain max. amplitude of response.		Fig. 9 Fig. 15 (13)
25	"	215.75	Not used	—	Loosely coupled to r-f oscillator	236.75	Junction of R192 & S103 for signal gen. method only	Fine tuning centered. Receiver on chan. 13. Adjust L43 for correct channel 13 osc. freq. then overshoot. Reset the osc. to proper freq. by adjustment of C1.		Fig. 10 Fig. 11
26	"	205.25 209.75	Antenna terminals (see text for precaution)	channel 12	Not used	—	Connect "Volt-Ohmyst" to r-f unit test point at R5	Rec. on chan. 12	Check to see that response is correct and -3.0 volts of osc. injection is present	Fig. 8 Fig. 15
27	"	199.25 203.75		channel 11	"	—	"	Rec. on chan. 11	"	Fig. 15 (11)
28	"	193.25 197.75	"	channel 10	"	—	"	Rec. on chan. 10	"	Fig. 15 (10)
29	"	187.25 191.75	"	channel 9	"	—	"	Rec. on chan. 9	"	Fig. 15 (9)
30	"	181.25 185.75	"	channel 8	"	—	"	Rec. on chan. 8	"	Fig. 15 (8)
31	"	175.25 179.75	"	channel 7	"	—	"	Rec. on chan. 7	"	Fig. 15 (7)
32	If the response of any channel (steps 26 through 31) is below 80% at either marker, repeat step 23 and adjust C9, C11, C16 and C22 as necessary to pull response up on the low channel yet maintain correct response on channel 8. If C22 required adjustment, the adjustment should be overshot a small amount and corrected by adjustment of L52 to give maximum amplitude of response between the sound and picture carrier markers.									
33	Repeat step 22. If the oscillator is off frequency overshoot the adjustment of C1 and correct by adjusting L43.									
34	Repeat steps 26 through 33 until all requirements are obtained.									
35	Antenna terminals (loosely)	87.75	Not used	—	Loosely coupled to r-f oscillator	108.75	Junction of R192 & S103 for sig. gen. method only	Rec. on chan. 6	L5 for zero on meter or beat on het. freq. meter	Fig. 10 Fig. 10
36	"	83.25 87.75	Ant. terminals (see text for precaution)	Sweeping channel 6	Not used	—	Not used	Observe response. If necessary readjust L42, L45 and L49. It should not be necessary to touch C11.		Fig. 8 Fig. 9 Fig. 15
37	Not used	—	Not used	—	Not used	—	Connect "Volt-Ohmyst" to the r-f unit test point at R5	Check osc. injection. If necessary adjust C7 to give -3 volts. If C7 is adjusted, switch to channel 8, and readjust C9 for proper response then repeat step 36.		Fig. 9 Fig. 10
38	Antenna terminals (loosely)	77.25 81.75	Ant. terminals (see text for precaution)	channel 5	"	—	"	Rec. on chan. 5	Check to see that response is correct and -3.0 volts of osc. injection is present	Fig. 15 (5)
39	"	67.25 71.75	"	channel 4	"	—	"	Rec. on chan. 4		Fig. 15 (9)
40	"	61.25 65.75	"	channel 3	"	—	"	Rec. on chan. 3	"	Fig. 15 (3)
41	"	55.25 59.75	"	channel 2	"	—	"	Rec. on chan. 2	"	Fig. 15 (2)
42	Likewise check channels 7 through 13, as outlined in steps 31 back through 26, stopping on channel 13 for next step.									
43	Antenna terminals	215.75	Not used	—	Loosely coupled to r-f oscillator	236.75	Junction of R192 & S103 for sig. gen. method only	Fine tuning centered. Receiver on channel 13	C1 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10
44	"	209.75	"	—	"	230.75	"	Rec. on chan. 12	L11 as above	Fig. 11
45	"	203.75	"	—	"	224.75	"	Rec. on chan. 11	L10 as above	Fig. 11
46	"	197.75	"	—	"	218.75	"	Rec. on chan. 10	L9 as above	Fig. 11
47	"	191.75	"	—	"	212.75	"	Rec. on chan. 9	L8 as above	Fig. 11
48	"	185 75	"	—	"	206.75	"	Rec. on chan. 8	L7 as above	Fig. 11
49	"	179.75	"	—	"	200.75	"	Rec. on chan. 7	L6 as above	Fig. 11
50	"	87.75	"	—	"	108.75	"	Rec. on chan. 6	L5 as above	Fig. 11
51	"	81.75	"	—	"	102.75	"	Rec. on chan. 5	L4 as above	Fig. 11
52	"	71.75	"	—	"	92.75	"	Rec. on chan. 4	L3 as above	Fig. 11
53	"	65.75	"	—	"	86.75	"	Rec. on chan. 3	L2 as above	Fig. 11
54	"	59.75	"	—	"	80.75	"	Rec. on chan. 2	L1 as above	Fig. 11
55	Repeat steps 43 through 54 as a check.									
56	Antenna terminals	181.25 185.75	Antenna terminals	Sweeping channel 8	Not used	—		Rec. on chan. 8. Oscilloscope at R5 test point. Adjust T1 clockwise. When properly adjusted, curve will be slightly wider with a slightly deeper valley in top.		Fig. 15 (8)
57	Switch through all channels and observe response, oscillator injection and r-f oscillator frequency. Minor touch-ups of adjustments may be made at this time. However, if C7 or C9 are changed appreciably, then a recheck of the oscillator frequency on all channels should be made.									
58	Remove 39 ohm resistor and reconnect link from T101 to terminal 2 of r-f unit terminal board. Proceed with sweep alignment of Pix I-F.									

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
	SWEEP ALIGNMENT OF PICTURE I-F AMPLIFIER								
59	Loosely coupled to i-f amplifier	22.3 23.4	Antenna terminals	Sweeping selected channel	Terminal 2 of V106 socket	Junction of R102 and R103	Select channel known to have good r-f response. Clip 330 ohm resistors across R107, R110, R115, R119. Connect bias box to junction R102, R103.	Adjust bias box for -1.0 v. Set sweep to give 0.5 v. p-p on oscilloscope. Adjust T1 and T101 for correct response.	Fig. 8 Fig. 9 Fig. 10 Fig. 13
60	"	21.85 24.75 25.50 26.25	"	"	"	"	Remove 330 ohm resistors. Set bias box for -4.5 v.	Set sweep to give 3.0 v. p-p on oscilloscope. Adjust T1, T101 bot., T102 bot., T103 bot., T104 bot. and L102 for desired response	Fig. 14

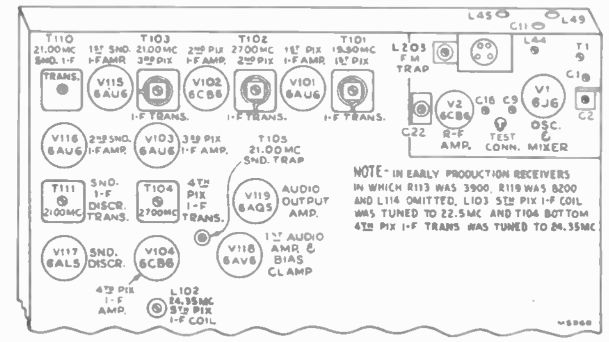


Figure 8—Top Chassis Adjustments

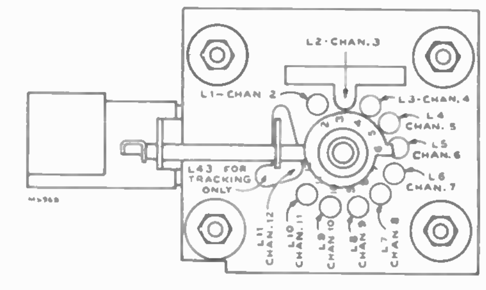


Figure 11—R-F Oscillator Adjustments

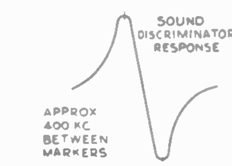


Figure 12 Discriminator Response

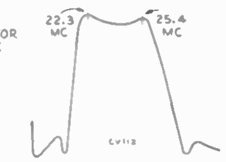


Figure 13 T1 and T101 Response

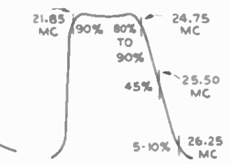


Figure 14 Overall I-F R-F Response

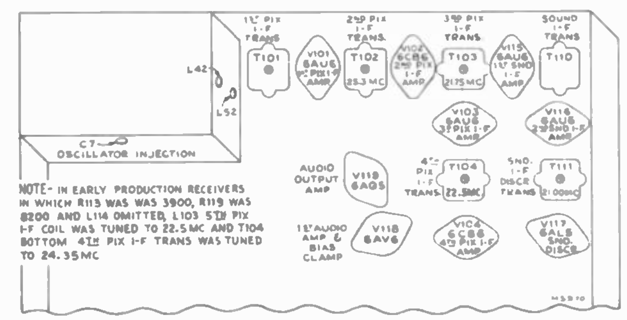


Figure 9— Bottom Chassis Adjustments

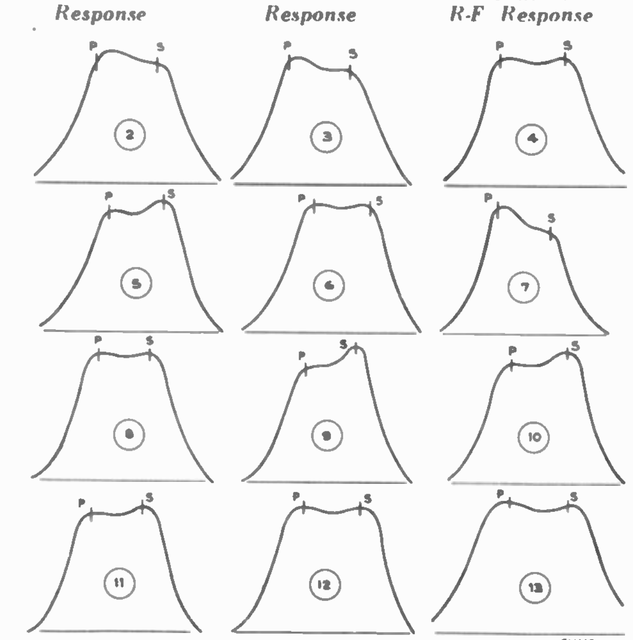


Figure 15—R-F Response

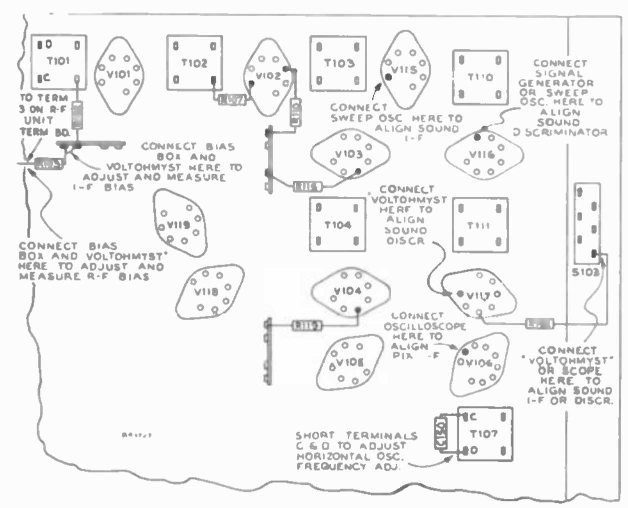


Figure 10—Test Connection Points

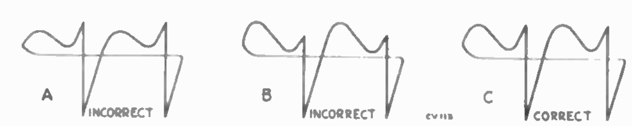


Figure 16—Horizontal Oscillator Waveforms

Continued from Page 9

HORIZONTAL OSCILLATOR ADJUSTMENT.—Normally the adjustment of the horizontal oscillator is not considered to be a part of the alignment procedure, but since the oscillator waveform adjustment requires the use of an oscilloscope, it can not be done conveniently in the field. The waveform adjustment is made at the factory and normally should not require readjustment in the field. However, the waveform adjustment should be checked whenever the receiver is aligned or whenever the horizontal oscillator operation is improper.

Horizontal Frequency Adjustment.—With a clip lead, short circuit the coil between terminals C and D of the horizontal oscillator transformer T107. Tune in a television station and sync the picture if possible.

A.—Turn the horizontal hold control R168 to the extreme clockwise position. Adjust the T107 Frequency Adjustment (atop the chassis) so that the picture is just out of sync and the horizontal blanking appears in the picture as a vertical bar. The position of the bar is unimportant.

B.—Turn the hold control approximately one-quarter of a turn from the extreme clockwise position and examine the width and linearity of the picture. If picture width or linearity is incorrect, adjust the horizontal drive control C143B, the width control R178 and the linearity control L113 until the picture is correct. If C143B, R178 or L113 were adjusted, repeat step A above.

Horizontal Locking Range Adjustment.—Turn the horizontal hold control fully counter-clockwise. The picture may remain in sync. If so, turn the T107 top core slightly and momentarily switch off channel. Repeat until the picture falls out of sync with the diagonal lines sloping down to the left. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 9 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C143A slightly clockwise. If less than 7 bars are present, adjust C143A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 7 to 9 bars are present.

Horizontal Oscillator Waveform Adjustment.—Remove the shorting clip from terminals C and D of T107. Turn the horizontal hold control to the extreme clockwise position. With a thin fibre screwdriver, adjust the Oscillator Waveform Adjustment Core of T107 (under the chassis) until the horizontal blanking bar appears in the center.

A.—Connect the low capacity probe of an oscilloscope to terminal C of T107. Turn the horizontal hold control one-quarter turn from the clockwise position so that the picture is in sync. The pattern on the oscilloscope should be as shown in Figure 16. Adjust the Oscillator Waveform Adjustment Core of T107 until the two peaks are at the same height. During this adjustment, the picture must be kept in sync by readjusting the hold control if necessary.

This adjustment is very important for correct operation of the circuit. If the broad peak of the wave on the oscilloscope is lower than the sharp peak, the noise immunity becomes poorer, the stabilizing effect of the tuned circuit is reduced and drift of the oscillator becomes more seroius. On the other hand, if the broad peak is higher than the sharp peak, the oscillator is overstabilized, the pull-in range becomes inadequate and the broad peak can cause double triggering of the oscillator when the hold control approaches the clockwise position.

Remove the oscilloscope upon completion of this adjustment.

Check of Horizontal Oscillator Adjustments.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 2 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C143A slightly clockwise. If less than 2 bars are present, adjust C143A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 2 bars are present.

Turn the horizontal hold control to the maximum clockwise position. The picture should be just out of sync to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Adjust the T107 Frequency Adjustment until this condition is fulfilled.

SENSITIVITY CHECK.—A comparative sensitivity check can be made by operating the receiver on a weak signal from a television station and comparing the picture and sound obtained to that obtained on other receivers under the same conditions.

This weak signal can be obtained by connecting the shop antenna to the receiver through a ladder type attenuator pad. The number of stages in the pad depends upon the signal strength available at the antenna. A sufficient number of stages should be inserted so that a somewhat less than normal contrast picture is obtained when the picture control is at the maximum clockwise position. Only carbon type resistors should be used to construct the pad.

RESPONSE CURVES.—The response curves shown on page 12 and referred to throughout the alignment procedure were taken from a production set. Although these curves are typical, some variations can be expected.

The response curves are shown in the classical manner of presentation, that is with "response up" and low frequency to the left. The manner in which they will be seen in a given test set-up will depend upon the characteristics of the oscilloscope and the sweep generator. The curves may be seen inverted and/or switched from left to right depending on the deflection polarity of the oscilloscope and the phasing of the sweep generator.

CHANGE OF I-F FREQUENCY.—Early production chassis were aligned with 21.25 mc. sound i-f and 25.75 mc. picture carrier i-f frequencies. See Television Supplement No. 2 for a discussion of i-f harmonic interference and its cure by change of i-f frequency.

NOTES ON R-F UNIT ALIGNMENT.—Because of the frequency spectrum involved and the nature of the device, many of the r-f unit leads and components are critical in some respects. Even the power supply leads form loops which couple to the tuned circuits, and if resonant at any of the frequencies involved in the performance of the tuner, may cause serious departures from the desired characteristics. In the design of the receiver these undesirable resonant loops have been shifted far enough away in frequency to allow reasonable latitude in their components and physical arrangement without being troublesome. When the r-f unit is aligned in the receiver, no trouble from resonant loops should be experienced. However, if the unit is aligned in a jig separate from the receiver, attention should be paid to insure that unwanted resonances do not exist which might present a faulty representation of r-f unit alignment.

A resonant circuit exists between the r-f tuner chassis and the outer shield box, which couples into the antenna and r-f plate circuits. The frequency of this resonance depends on the physical structure of the shield box, and the capacitance between the tuner chassis and the front plate. In the KRK8 units, this resonance should fall between 120 and 135 mc. and is controlled in the design by using insulating washers of different thicknesses (in the front plate to tuner chassis mounting) to compensate for differences in the shield boxes of different models of receivers. The performance of the tuner, particularly on channels 7 and 8 will be impaired if the proper washers for the particular shield box involved are not used. Obviously then, if the r-f unit is removed for service, the washers should be replaced in the correct order when the unit is replaced.

PICTURE I-F RESPONSE.—At times it may be desirable to observe the individual i-f stage response. This can be achieved by the following method:

Shunt all i-f transformers and coils with a 330 ohm carbon resistor except the one whose response is to be observed.

Connect a wide band sweep generator to the converter grid and adjust it to sweep from 18 mc. to 30 mc.

Connect the oscilloscope across the picture detector load resistor and observe the overall response. The response obtained will be essentially that of the unshunted stage. The effects of the various traps are also visible on the stage response.

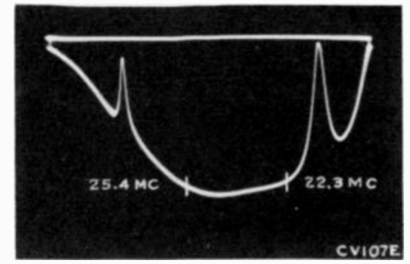


Figure 17—Response of Converter and First Pix I-F Transformer

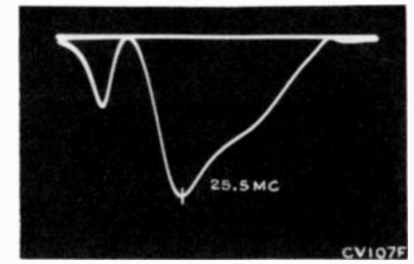


Figure 18—Response of Second Pix I-F Transformer

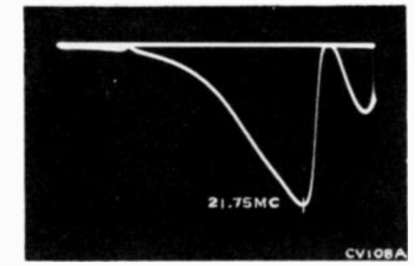


Figure 19—Response of Third Pix I-F Transformer

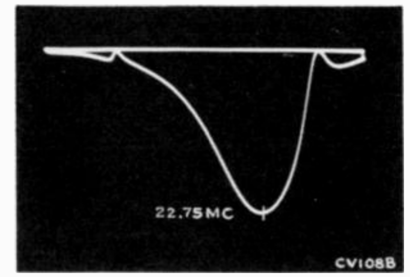


Figure 20—Response of Fourth Pix I-F Transformer

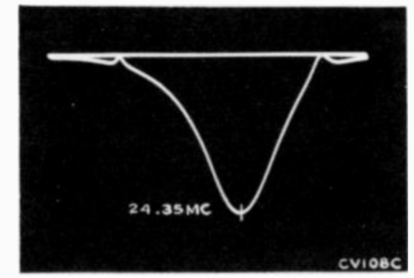


Figure 21—Response of Fifth Pix I-F Coil

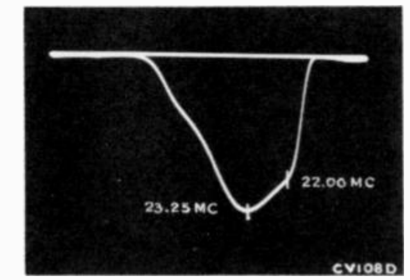


Figure 22—Response from First Pix I-F Grid to Pix Det.

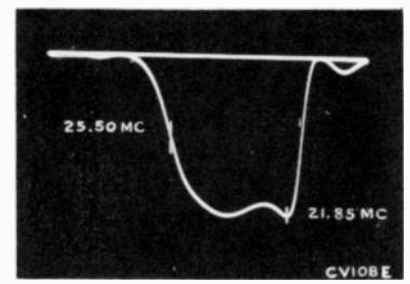


Figure 23—Overall Pix I-F Response

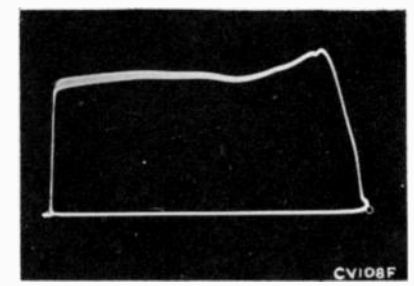


Figure 24—Video Response at Average Contrast

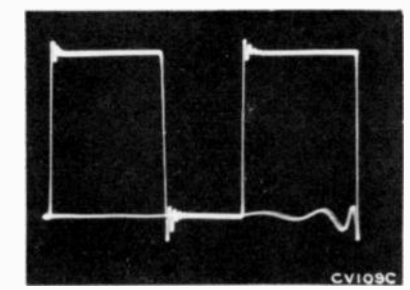


Figure 25—Video Response (100KC Square Wave)

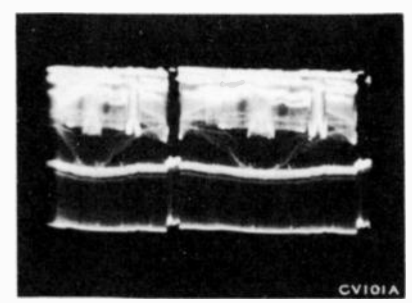
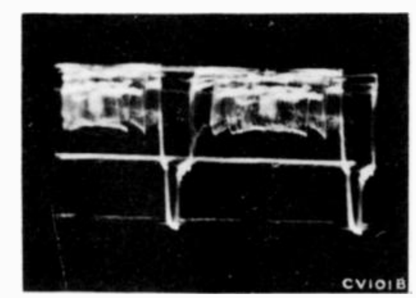
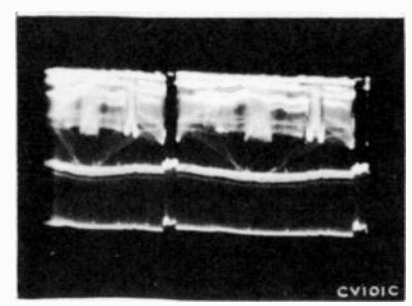


Plate of Picture Detector (Pin 2 of V105) (6AL5)

Figure 26—Vertical (Oscilloscope Synced to ½ of Vertical Sweep Rate) (5.5 Volts PP)

Figure 27—Horizontal (Oscilloscope Synced to ½ of Horizontal Sweep Rate) (5.5 Volts PP)

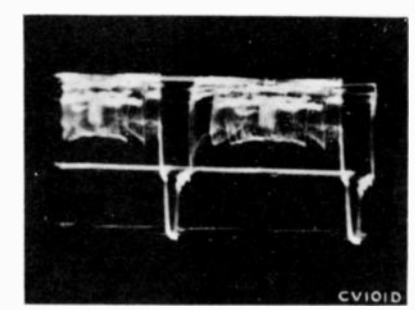




Grid of 1st Video Amplifier (Pin 2 of V106) (12AU7)

Figure 28—Vertical (5.3 Volts PP)

Figure 29—Horizontal (5.3 Volts PP)



WAVEFORM PHOTOGRAPHS

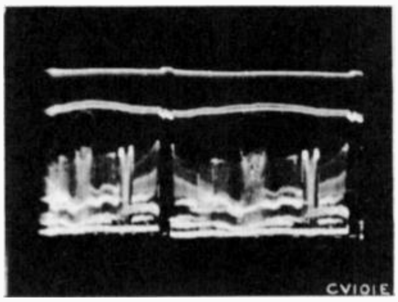
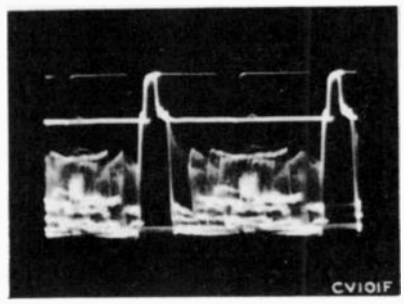


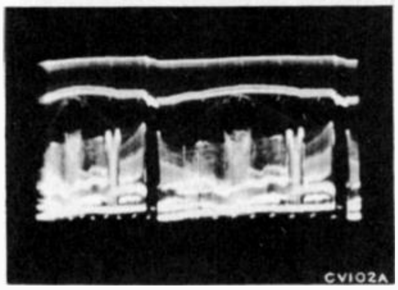
Plate of 1st Video Amplifier (Pin 1 of V106) (12AU7)

Voltages depend on setting of Pix control

Figure 30—Vertical (2-18 Volts PP)

Figure 31—Horizontal (2-18 Volts PP)



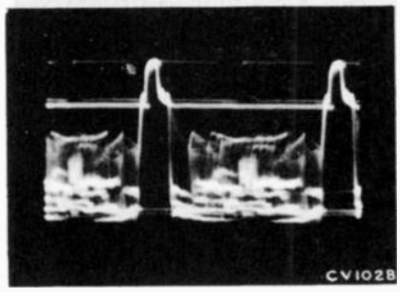


Grid of 2nd Video Amplifier (Pin 7 of V106) (12AU7)

Voltages depend on setting of Pix control

Figure 32—Vertical (2-18 Volts PP)

Figure 33—Horizontal (2-18 Volts PP)



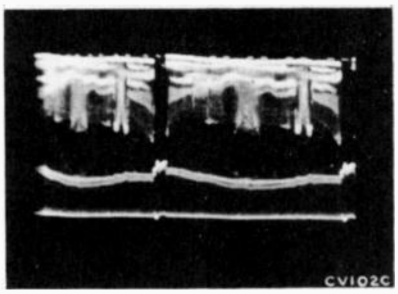
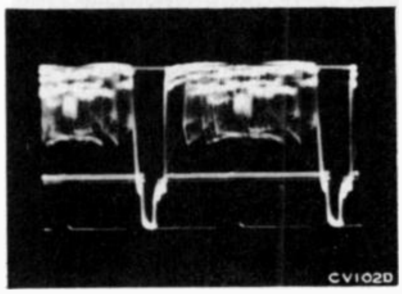


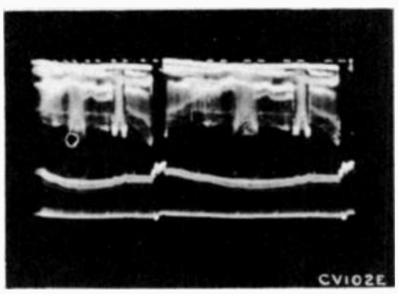
Plate of 2nd Video Amplifier (Picture Max.) (Pin 6 of V106) (12AU7)

Voltages depend on setting of Pix control

Figure 34—Vertical (15-90 Volts PP)

Figure 35—Horizontal (15-90 Volts PP)



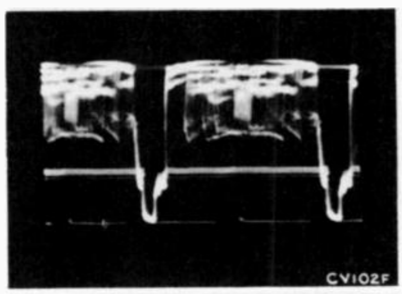


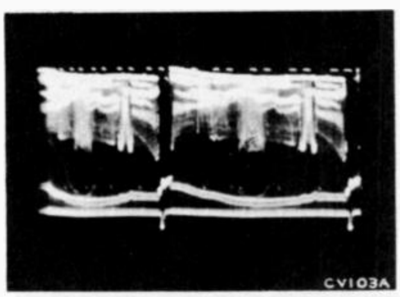
Input to Kinescope (Junction of R121 and C192) (Picture Max.)

Voltages depend on setting of Pix control

Figure 36—Vertical (15-90 Volts PP)

Figure 37—Horizontal (15-90 Volts PP)



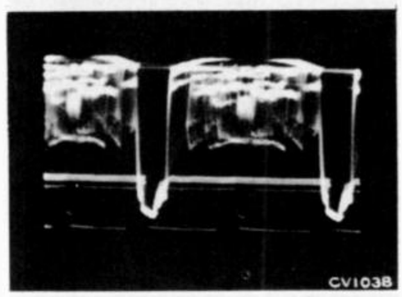


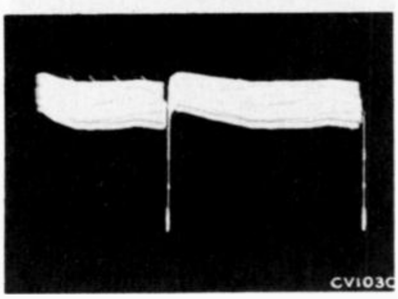
Cathode of D-C Restorer (Pin 3 of V107A) (12AU7)

Voltages depend on setting of Pix control

Figure 38—Vertical (11-80 Volts PP)

Figure 39—Horizontal (11-80 Volts PP)



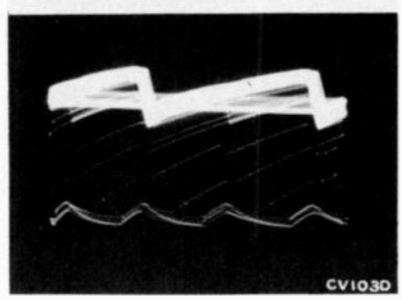


Grid of D-C Restorer (Pin 2 of V107A) (12AU7)

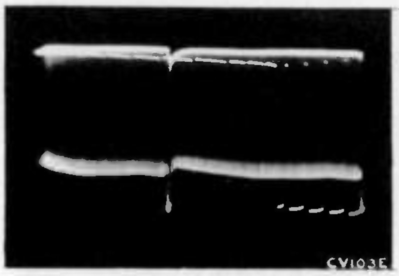
Voltages depend on setting of Pix control

Figure 40—Vertical (0.4-7.5 Volts PP)

Figure 41—Horizontal (0.4-7.5 Volts PP)



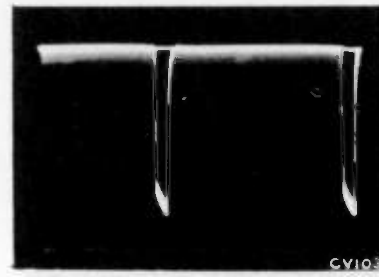
WAVEFORM PHOTOGRAPHS



Grid of Sync Separator (Pin 7 of V107B) (12AU7)
Voltages depend on setting of Pix control

Figure 42—Vertical (2.5-16 Volts PP)

Figure 43—Horizontal (2.5-16 Volts PP)



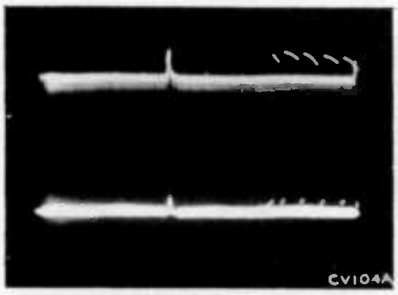
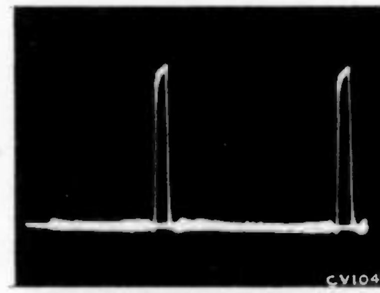
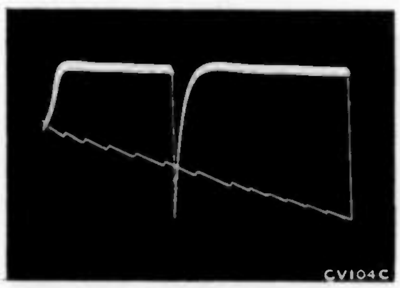


Plate of Sync Separator (Pin 6 of V107B) (12AU7)
Voltages depend on setting of Pix control

Figure 44—Vertical (18-22 Volts PP)

Figure 45—Horizontal (18-22 Volts PP)

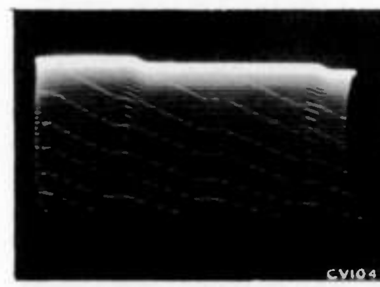




Cathode of Sync Separator (Pin 8 of V107B) (12AU7)
Voltages depend on setting of Pix control

Figure 46—Vertical (0.2-1.2 Volts PP)

Figure 47—Horizontal (0.2-1.2 Volts PP)



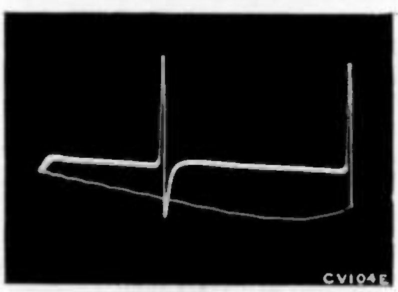
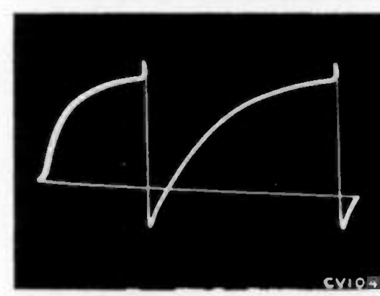


Figure 48—Output of Integrating Network (Junction of C139, C140 and R147) (8.5 Volts PP)

Figure 49—Grid of Vertical Oscillator (75 Volts PP) (Pin 1 of V109) (6AV6)



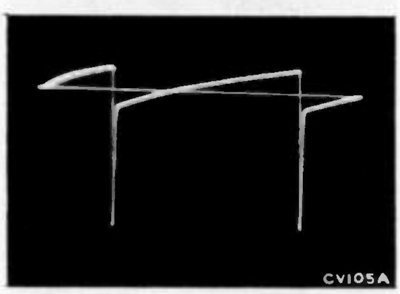
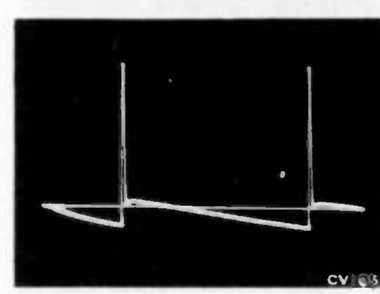


Figure 50—Grid of Vertical Output (90 Volts PP) (Pin 1 of V110) (6AQ5)

Figure 51—Plate of Vertical Output (600 Volts PP) (Pin 5 of V110) (6AQ5)



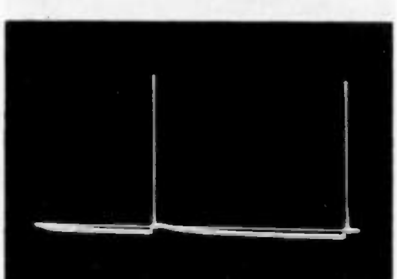
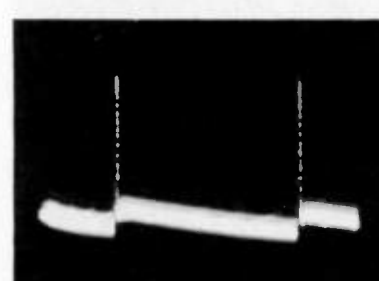


Figure 52—Junction of C159, C179 and R202 (275 Volts PP)

Figure 53—Input of Vertical Deflection Coils (20 Volts PP) (Junction of Green Lead of T106 and Green Lead of Yoke)



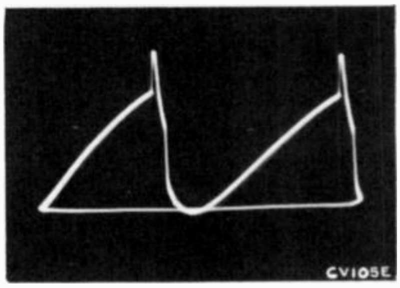


Figure 54—Grid of Horizontal Oscillator Control (27 Volts PP) (Pin 1 of V111) (6SN7GT)

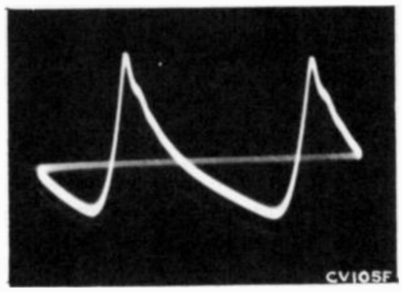


Figure 55—Cathode of Horizontal Oscillator Control (1.0 Volts PP) (Pin 3 of V111) (6SN7GT)

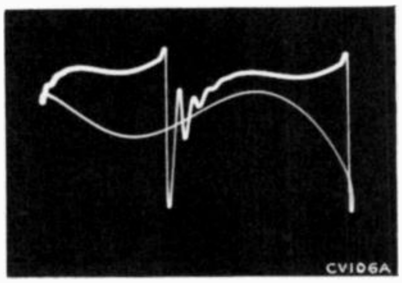


Figure 56—Junction of R163, R164 and R170 (70 Volts PP)

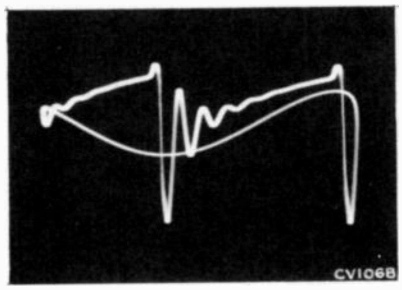


Figure 57 Grid of Horizontal Oscillator (290 Volts PP) (Pin 4 of V111) (6SN7GT)

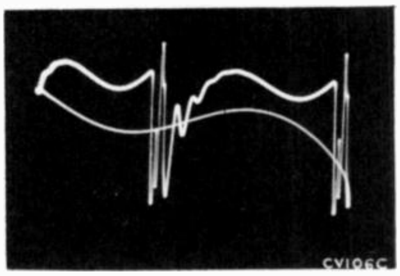


Figure 58—Plate of Horizontal Oscillator (150 Volts PP) (Pin 5 of V111) (6SN7GT)

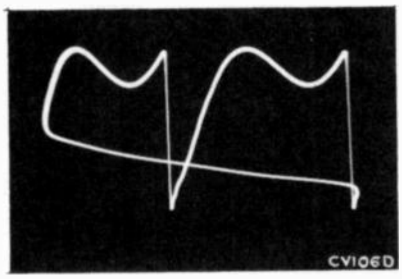


Figure 59—Terminal "C" of T107 (100 Volts PP)

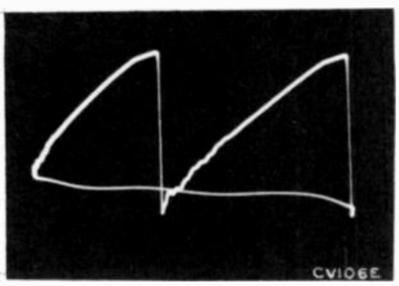


Figure 60—Input to Horizontal Output Tube (60-80 Volts PP) Depends on setting of drive control (Junction of C152 and C143B)

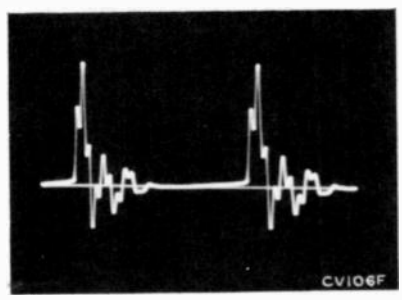


Figure 61—Plate of Horizontal Output (Approx. 5000 Volts PP) (Measured Through a Capacity Voltage Divider Connected from Top Cap of V112 to Ground)

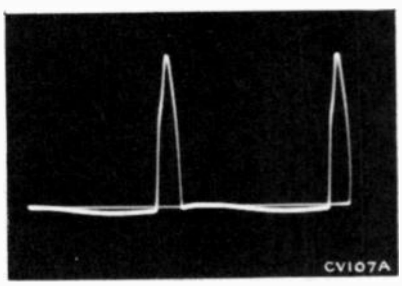


Figure 62 Cathode of Damper (2100-2700 Volts PP) Depends on setting of width control (Pin 3 of V114) (6W4GT)

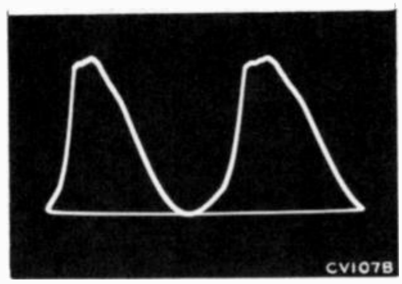


Figure 63—Plate of Damper (90-130 Volts PP) Depends on setting of width control (Pin 5 of V114) (6W4GT)

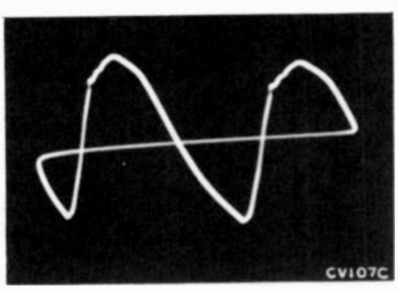


Figure 64—Junction of Yoke and Width Control (80-145 Volts PP) Depends on setting of width control

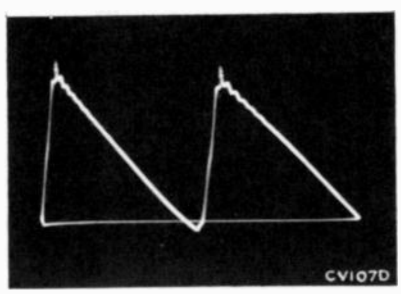


Figure 65—Voltage Across Width Control (0-85 Volts PP) Depends on setting of width control

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition, a 2500 microvolt test pattern signal was fed into the receiver, the picture synchronized and the AGC control properly adjusted. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are read with a "Senior VoltOhmyst" type WV97A between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles, a-c. The symbol < means less than.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6J6	Mixer	2500 Mu. V. Signal	2	135	—	—	7	0	5	−3.25	7.4	—	
			No Signal	2	130	—	—	7	0	5	−3.1	7.1	—	
V1	6J6	R-F Oscillator	2500 Mu. V. Signal	1	119	—	—	7	0	6	*−4.16	4.83	—	*Depending upon channel
			No Signal	1	104	—	—	7	0	6	*−2.37	4.6	—	
V2	6AG5	R-F Amplifier	2500 Mu. V. Signal	5	243	6	173	2	<0.1	1	−4.45	0.44	0.13	
			No Signal	5	197	6	114	2	0.28	1	−0.31	8.6	2.35	
V101	6AU6	1st Pix. I-F Amplifier	2500 Mu. V. Signal	5	205	6	232	7	0.15	1	−5.8	1.32	0.52	
			No Signal	5	112	6	152	7	1.0	1	−0.6	6.8	2.8	
V102	6CB6	2nd Pix. I-F Amplifier	2500 Mu. V. Signal	5	192	6	205	2	0.5	1	−5.8	4.4	0.8	
			No Signal	5	118	6	122	2	1.38	1	−0.6	9.8	2.5	
V103	6AU6	3d Pix. I-F Amplifier	2500 Mu. V. Signal	5	190	6	228	7	0.2	1	−0.6	1.28	0.55	
			No Signal	5	85	6	145	7	1.8	1	0	6.5	2.98	
V104	6CB6	4th Pix. I-F Amplifier	2500 Mu. V. Signal	5	159	6	148	2	1.8	1	0	9.3	2.7	
			No Signal	5	166	6	143	2	1.62	1	0	0.42	2.4	
V105	6AL5	Picture 2d Det.	2500 Mu. V. Signal	2	−2.3	—	—	5	0	—	—	8.2	—	
			No Signal	2	−0.52	—	—	5	0	—	—	<0.1	—	
V105	6AL5	AGC Rectifier	2500 Mu. V. Signal	7	−9.0	—	—	1	0	—	—	0.12	—	
			No Signal	7	−2.45	—	—	1	0	—	—	<0.1	—	
V106	12AU7	1st Video Amplifier	2500 Mu. V. Signal	1	100	—	—	3	1.0	2	−2.4	3.8	—	At maximum contrast
			No Signal	1	48	—	—	3	0.7	2	−0.38	2.7	—	
			2500 Mu. V. Signal	1	180	—	—	3	9.1	2	−2.9	0.69	—	At minimum contrast
			No Signal	1	100	—	—	3	5.9	2	−0.38	0.6	—	
V106	12AU7	2d Video Amplifier	2500 Mu. V. Signal	6	221	—	—	8	1.68	7	−6.2	7.5	—	At maximum contrast
			No Signal	6	191	—	—	8	2.6	7	−1.0	11.1	—	
			2500 Mu. V. Signal	6	189	—	—	8	2.75	7	−2.6	12.5	—	At minimum contrast
			No Signal	6	188	—	—	8	2.69	7	−0.4	12.3	—	
V107 A	12AU7	D-C Rest. & Sync Sep.	2500 Mu. V. Signal	1	4.6	—	—	3	48.0	2	−6.2	<0.1	—	At maximum contrast
			No Signal	1	2.8	—	—	3	4.6	2	−0.3	<0.1	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V107 B	12AU7	Snyc Sep. & Amplifier	2500 Mu. V. Signal	6	44.1	—	—	8	5.9	7	5.69	2.47	—	
			No Signal	6	42.8	—	—	8	6.1	7	6.1	2.58	—	
V108	12LP4	Kinescope	2500 Mu. V. Signal	Cap	*10,000	10	405	11	69	2	34	0.075	—	*Average Brightness
			No Signal	Cap	*10,000	10	405	11	40	2	9.5	0.04	—	*Average Brightness
V109	6AV6	Vertical Oscillator	2500 Mu. V. Signal	7	93	—	—	2	0	1	−11.2	0.15	—	
			No Signal	7	93	—	—	2	0	1	−11.1	0.15	—	
V110	6AQ5	Vertical Output	2500 Mu. V. Signal	5	250	6	250	2	19.0	1	0	13.9	1.20	
			No Signal	5	248	6	248	2	18.8	1	0	13.8	1.20	
V111	6SN7 GT	Horizontal Osc. Control	2500 Mu. V. Signal	2	185	—	—	3	25.0	1	−2.0	.33	—	
			No Signal	2	181	—	—	3	16.3	1	−2.9	.31	—	
V111	6SN7 GT	Horizontal Oscillator	2500 Mu. V. Signal	5	161	—	—	6	0	4	−53	1.35	—	
			No Signal	5	158	—	—	6	0	4	−54	1.35	—	
V112	6AU5 GT	Horizontal Output	2500 Mu. V. Signal	5	*440	8	189	3	19.0	1	−8.0	77.0	11.2	*5000 volt pulse present
			No Signal	5	*435	8	185	3	18.6	1	−7.4	75.0	11.0	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	*10,100	—	—	0.075	—	*10,100 volt pulse present
			Brightness Average	Cap	*	—	—	2 & 7	*10,100	—	—	0.040	—	
V114	6W4 GT	Damper	2500 Mu. V. Signal	5	269	—	—	3	*430	—	—	88	—	*3000 volt pulse present
			No Signal	5	264	—	—	3	*429	—	—	87	—	
V115	6AU6	1st Sound I-F. Amp.	2500 Mu. V. Signal	5	234	6	168	7	0.98	1	0	8.1	3.24	
			No Signal	5	231	6	165	7	0.95	1	0	7.9	3.30	
V116	6AU6	2d Sound I-F Amp.	2500 Mu. V. Signal	5	200	6	73	7	0	1	−0.45	3.73	1.37	
			No Signal	5	198	6	75	7	0	1	−0.53	3.64	1.28	
V117	6AL5	Sound Discrim.	2500 Mu. V. Signal	2	−0.6	—	—	5	0.1	—	—	—	—	
			No Signal	2	−1.52	—	—	5	1.5	—	—	—	—	
V118	6AV6	1st Audio Amplifier	2500 Mu. V. Signal	7	96	—	—	2	0	1	−0.87	0.54	—	
			No Signal	7	95	—	—	2	0	1	−0.86	0.52	—	
V119	6AQ5	Audio Output	2500 Mu. V. Signal	5	257	6	271	2	19.8	7	0	28.5	1.97	
			No Signal	5	251	6	268	2	19.2	7	0	28.2	1.92	
SR101		Rectifier	2500 Mu. V. Signal	—	0	—	—	—	141	—	—	226	—	
			No Signal	—	0	—	—	—	140	—	—	245	—	
SR102		Rectifier	2500 Mu. V. Signal	—	141	—	—	—	282	—	—	226	—	
			No Signal	—	140	—	—	—	280	—	—	245	—	

R-F UNIT WIRING DIAGRAM

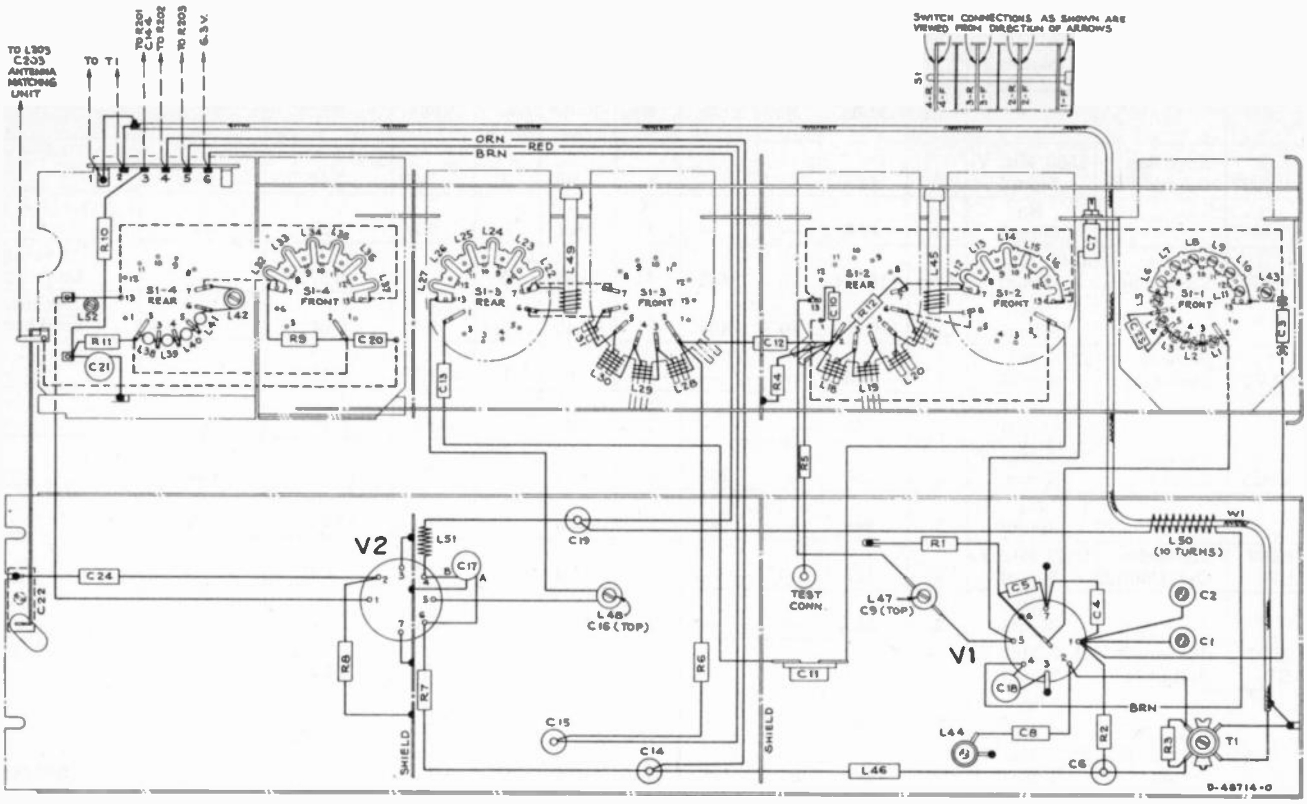


Figure 66—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. All leads in the picture and sound i-f circuits must be dressed as short and direct as possible with the exception of C107, C11 and C117 which are to be dressed with enough slack so as not to have to move the body of the capacitor to align that particular stage.
2. Dress the yellow lead from pin 3 of V106 socket up in the air and away from V105 socket.
3. Dress all components connected to V106 socket up and away from the chassis except L103.
4. Keep the body and coded end of L103 as close to pin 2 of V105 socket as possible.
5. Keep the bus from pin 5 of V105 socket to L102 as short as possible and employ sleeving to prevent shorting.
6. Dress the red lead from kinescope socket away from V105 and V106 sockets and on power transformer side of terminal boards.
7. Dress the yellow lead from the kinescope socket along the rear apron between T107 and V111 socket, up between V107 socket and the power transformer to the terminal board.
8. The green lead from the kinescope socket should be dressed away from all other leads and components and away from V106.
9. Pin 7 of V116 socket should be soldered to the chassis as short as possible.
10. Dress fuse in high voltage compartment so as not to short circuit to ground.
11. Dress the two filament leads away from the T108 high voltage winding by pulling them up through hole so as to have all slack on the transformer side of the insulating board.
12. Keep V113 filament leads away from the metal side of the high voltage compartment shield.
13. Dress C158 on high voltage rectifier socket so as to keep the hot end of the capacitor away from the metal side of the high voltage compartment.
14. Keep all leads away from R177 for heat reasons.
15. Dress R210 and R211 away from all components on account of their heat.
16. Dress AC leads at S102 away from audio components on R194.
17. Clamp W105 in cable lance provided on rear apron.
18. Keep leads on C182 and C183 as short as possible.
19. Keep C133 dressed above leads.
20. Dress the body of C131 away from the chassis.
21. Keep C150 dressed away from the chassis.
22. Dress the orange lead from C160-C on the power transformer side of the terminal boards and around the rear apron side of V106 socket.
23. Dress the body of R119 as close to pin 5 on V104 socket as possible.
24. Dress the body of R124 as close to pin 2 on V105 socket as possible.
25. Keep the leads of C122 and C125 as short and direct as possible.
26. Keep the leads of C126 as short as possible.
27. Dress the leads of the AGC switch S105 next to the base in the chassis and away from sound components.
28. Solder terminal on can of C160 to bracket along with C134.

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES
	KRK8
10705	Ball—Steel ball for detent (5/32 dia.)
75188	Board—Terminal board, 5 contact and ground
75067	Bracket—Vertical bracket for holding oscillator tube shield
75201	Cable—75 ohms, coax cable (7¼") complete with coil (W1, L50)
75186	Capacitor—Ceramic, variable, for fine tuning—plunger type (C2)
75289	Capacitor—Ceramic, 4 mmf., ±0.5 mmf. (C4)
75189	Capacitor—Adjustable, 7-30 mmf. (C22)
75200	Capacitor—Ceramic, 12 mmf. (C24)
45465	Capacitor—Ceramic, 15 mmf. (C3)
75196	Capacitor—Ceramic, 39 mmf. (C5)
75174	Capacitor—Ceramic, trimmer, 50-75 mmf. (C11)
75199	Capacitor—Ceramic, 270 mmf. (C12, C13, C20)
75641	Capacitor—Ceramic, 390 mmf. (C10)
75166	Capacitor—Ceramic, 1500 mmf. (C6, C14, 15, C19)
75089	Capacitor—Ceramic, dual, 1500 mmf. (C17A, C17B)
73748	Capacitor—Ceramic, 1500 mmf. (C18)
73473	Capacitor—Ceramic, 5000 mmf. (C21)
75172	Capacitor—Tubular, steatite, adjustable, 0.8-1.4 mmf. (C7)
71504	Capacitor—Ceramic, 0.68 mmf. (C23)
75184	Capacitor—Ceramic, adjustable, 0.75-4 mmf., complete with adjusting stud (C1)
75197	Capacitor—Ceramic, 6.8 mmf. (C8)
75167	Clip—Tubular clip for mounting stand-off capacitors
75182	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment) for convertor section (C9, L47)
75183	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f section (L48, C16)
75185	Coil—Convertor plate loading coil (L44)
75202	Coil—Choke coil .56 muh (L46)
73477	Coil—Choke coil (L51)
75187	Core—Adjustable core for fine tuning capacitor C2
75162	Detent—Detent mechanism and fibre shaft
73453	Form—Coil form for L45 and L49
75165	Link—Link assembly for fine tuning
14343	Retainer—Fine tuning shaft retaining ring
	Resistor—Fixed, composition:—
	27 ohms, ±10%, ½ watt (R8)
	150 ohms, ±20%, ½ watt (R10)
	3300 ohms, ±10%, ½ watt (R6)
	3900 ohms, ±10%, ½ watt (R9, R11)
	8200 ohms, ±10%, ½ watt (R12)
	10,000 ohms, ±5%, ½ watt (R3)
	10,000 ohms, ±20%, ½ watt (R2)
	22,000 ohms, ±10%, ½ watt (R7)
	100,000 ohms, ±20%, ½ watt (R1, R4, R5)
75164	Rod—Actuating plunger rod (fibre) for fine tuning link
71476	Screw—#4-40 x ¼" binder head machine screw for adjusting L6, L7, L8, L9, L10, L11

STOCK No.	DESCRIPTION
75176	Screw—#4-40 x ⅜" fillister head screw for adjusting L5
75177	Screw—#4-40 x 5/16" fillister head screw for adjusting L1, L2, L3, L4, L43
74575	Screw—#4-40 x .359" adjusting screw for L42
73640	Screw—#4-40 x 7/16" adjusting screw for L52
75159	Shaft—Channel selector shaft and plate
75160	Shaft—Fine tuning shaft and cam
75168	Shield—Oscillator and convertor sections shield for r-f unit—snap-on type
75193	Shield—Tube shield for V1
75192	Shield—Tube shield for V2
75088	Socket—Tube socket, 7 contact, miniature, ceramic, saddle mounted
75191	Spacer—Insulating spacer for front plate (4 req'd)
75163	Spring—Friction spring (formed) for fine tuning cam
75068	Spring—Retaining spring for oscillator tube shield
74578	Spring—Retaining spring for adjusting screws
73457	Spring—Return spring for tuning control
30340	Spring—Hair pin spring for fine tuning link
75175	Stator—Oscillator section stator complete with rotor, segment, coils, adjusting screws and capacitors C3, and C23 (S1-1, C3, C23, L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L43)
75178	Stator—Convertor stator complete with rotor, coils, capacitors (C10 and C12) and resistors, (R4 and R5) (S1-2, C10, C12, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L45, R4, R5, R12)
75179	Stator—R-F amplifier stator complete with rotor, coils, capacitor (C13) and resistor (R6) (S1-3, C13, L22, L23, L24, L25, L26, L27, L28, L29, L30, L31, L49, R6)
75180	Stator—Antenna stator complete with rotor, coils, capacitors (C20 and C21) and resistors (R9, R10, R11) (S-4, C20, C21, L32, L33, L34, L35, L36, L37, L38, L39, L40, L41, L42, L52, R9, R10, R11)
75169	Strip—Coil segment mounting strip—RH center
75170	Strip—Coil segment mounting strip—LH lower
75171	Strip—Coil segment mounting strip—LH upper—less trimmer C7
75173	Stud—#6-32 x 13/16" adjusting stud for C7 trimmer
75446	Stud—Capacitor stud—brass—#4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1 uncoded and coded "ER"
75447	Stud—Capacitor stud—brass—#4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1 coded numerically and "Hi Q"
75181	Transformer—Convertor transformer
75190	Washer—Insulating washer (neoprene) for capacitor C7
73466	Washer—Insulating washer (round)
	CHASSIS ASSEMBLIES
	KCS 45—Model 2T51
	KCS45A—Model 2T60
75235	Board—Hi-voltage shield terminal board (3 contact)
75228	Bracket—Focus magnet mounting bracket—upper
75229	Bracket—Focus magnet mounting bracket—lower
75230	Bracket—Kinescope mounting bracket—on front apron of chassis
75217	Capacitor—Mica trimmer, dual, 10-160 mmf. (C143A, C143B)
53511	Capacitor—Ceramic, 10 mmf. (C126)

STOCK No.	DESCRIPTION
75450	Capacitor—Ceramic, 39 mmf. (C203)
74726	Capacitor—Mica, 39 mmf. (C135)
71924	Capacitor—Ceramic, 56 mmf. (C196)
75247	Capacitor—Mica, 75 mmf. (C144)
75437	Capacitor—Ceramic, 100 mmf. (C202)
45469	Capacitor—Ceramic, 100 mmf. (C119)
39396	Capacitor—Ceramic, 100 mmf. (C125)
75248	Capacitor—Mica, 220 mmf. (C149)
75244	Capacitor—Ceramic, 270 mmf. (C172)
73091	Capacitor—Mica, 270 mmf. (C107, C111, C117, C122)
73094	Capacitor—Mica, 390 mmf. (C188)
74250	Capacitor—Mica, 560 mmf. (C152)
75166	Capacitor—Ceramic, 1500 mmf. (C166, C168, C190, C191)
75089	Capacitor—Ceramic, dual, 1500 mmf. (C102A, C102B, C108A, C108B, C112A, C112B, C121A, C121B)
73748	Capacitor—Ceramic, 1500 mmf. (C103, C104, C115, C116, C124, C128, C165, C184, C185, C186)
73473	Capacitor—Ceramic, 5000 mmf. (C182, C183, C189)
75877	Capacitor—Ceramic, dual, 10,000 mmf. (C105A, C105B, C110A, C110B)
73960	Capacitor—Ceramic, 10,000 mmf. (C194, C195, C197)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C127)
75218	Capacitor—Electrolytic, comprising 1 section of 10 mfd., 350 volts, 1 section of 5 mfd., 350 volts, and 1 section of 150 mfd., 50 volts (C132A, C132B, C132C)
75219	Capacitor—Electrolytic, comprising 1 section of 10 mfd., 450 volts, 1 section of 100 mfd., 350 volts, 1 section of 10 mfd., 350 volts, and 1 section of 20 mfd., 25 volts (C160A, C160B, C160C, C160D)
75220	Capacitor—Electrolytic, 150 mfd., 200 volts (C161, C162)
75250	Capacitor—Tubular, moulded paper, mineral oil impregnated, .00025 mfd., 12,500 volts (C158)
73801	Capacitor—Tubular, paper, oil impregnated, .001 mfd., 600 volts (C140)
75249	Capacitor—Tubular, moulded paper, oil impregnated, .001 mfd., 600 volts (C151)
75344	Capacitor—Tubular, moulded paper, oil impregnated, .001 mfd., 1000 volts (C109)
73598	Capacitor—Tubular, paper, oil impregnated, .0015 mfd., 600 volts (C130, C176, C199)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd., 600 volts (C137, C173, C193)
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd., 600 volts (C178)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 600 volts (C138, C139, C174, C179)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C175, C177)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd., 600 volts (C150)
74727	Capacitor—Tubular, moulded paper, oil impregnated, .018 mfd., 1000 volts (C156)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 400 volts (C147)
73798	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 600 volts (C159)
75345	Capacitor—Tubular, moulded paper, oil impregnated, .027 mfd., 600 volts (C157)

STOCK No.	DESCRIPTION
73596	Capacitor—Tubular, moulded paper, oil impregnated, .033 mfd., 1000 volts (C156)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C145, C192)
75071	Capacitor—Tubular, moulded paper, .047 mfd., 600 volts (C163, C164)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 600 volts (C141)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 1000 volts (C123, C154)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C131, C133, C134, C146, C181)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 600 volts (C142)
73560	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 200 volts (C153)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd., 200 volts (C136, C148, C187)
73154	Choke—Filter for KCS45 (L114)
75224	Clip—Mounting clip for electrolytic #75220
75167	Clip—Tubular clip for mounting stand-off capacitor #75166
75210	Coil—Fifth pix, i-f coil complete with adjustable core (L102)
71449	Coil—Horizontal linearity coil (L113)
73591	Coil—Antenna matching coil (2 req'd) (Part of T200)
75241	Coil—Antenna shunt coil (L202)
73477	Coil—Filament choke coil (L101, L115)
71793	Coil—Peaking coil (36 muh) (L107)
75299	Coil—Peaking coil (36 muh) (L103)
76011	Coil—Peaking coil—(36 muh) (L116)
75253	Coil—Peaking coil (120 muh) (L104, L108)
75252	Coil—Peaking coil (500 muh) (L106)
35787	Connector—Single contact phono input connector (J102)
74594	Connector—2 contact male connector for power cable
38853	Connector—4 contact female connector for antenna transformer (J200)
5040	Connector—4 contact female connector for speaker cable for KCS45A (P101)
71789	Connector—Anode connector
5119	Connector—3 contact female connector for speaker cable for KCS45 (P101)
75215	Control—Horizontal and vertical hold control (R149, R168)
75216	Control—Picture and brightness control (R129, R134)
71441	Control—Vertical linearity control (R157)
71440	Control—Height control (R153)
74945	Control—Width control (R178)
75237	Control—Volume control and power switch (R194, S102)
71498	Core—Adjustable core and stud for F.M. trap #75449 (part of Transformer #75214)
72772	Cover—Insulating cover for electrolytic #75220
73590	Cushion—Rubber cushion for deflection yoke hood (2 req'd)
74839	Fastener—Push fastener to mount ceramic tube socket (2 req'd)
73600	Fuse—0.25 amp; 250 volts (F101)
37396	Grommet—Rubber grommet for mounting ceramic tube socket (2 req'd)

STOCK No.	DESCRIPTION
16058	Grommet—Rubber grommet for 2nd. anode lead exit
75206	Hood—Deflection yoke hood complete with cushions
75205	Magnet—Focus magnet complete with adjustable plate and stud
74148	Magnet—Ion trap magnet (PM type)
75225	Pad—Rubber pad to mount kinescope (4 req'd)
75234	Pad—Rubber pad (3" long) for junction of kinescope straps
75147	Plate—Hi-voltage transformer mounting plate (bakelite) complete with tube socket less transformer
18469	Plate—Bakelite mounting plate for electrolytic #75220
75221	Rectifier—Selenium rectifier (SR101, SR102)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R172)
	Resistor—Fixed, composition:—
	47 ohms, ±20%, ½ watt (R175)
	82 ohms, ±10%, ½ watt (R113, R183)
	100 ohms, ±20%, ½ watt (R205, R206)
	120 ohms, ±10%, ½ watt (R104, R108)
	180 ohms, ±10%, ½ watt (R117)
	220 ohms, ±10%, ½ watt (R127, R128)
	220 ohms, ±10%, 2 watts (R176)
	330 ohms, ±10%, 1 watt (R198, R199)
	470 ohms, ±20%, ½ watt (R158)
	680 ohms, ±10%, ½ watt (R219)
	1000 ohms, ±20%, ½ watt (R102, R106, R116, R118, R159, R185, R216)
	1800 ohms, ±10%, ½ watt (R115)
	2200 ohms, ±20%, ½ watt (R141)
	2200 ohms, ±20%, 1 watt (R180)
	3900 ohms, ±10%, ½ watt (R166)
	4700 ohms, ±5%, ½ watt (R131)
	4700 ohms, ±10%, ½ watt (R137)
	4700 ohms, ±10%, 1 watt (R111)
	5600 ohms, ±5%, ½ watt (R126)
	5600 ohms, ±10%, 2 watts (R181)
	6800 ohms, ±10%, 1 watt (R120)
	6800 ohms, ±10%, 2 watts (R135, R177)
	6800 ohms, ±20%, 2 watts (R207)
	8200 ohms, ±5%, ½ watt (R107)
	8200 ohms, ±10%, ½ watt (R146, R147, R189)
	10,000 ohms, ±10%, ½ watt (R140)
	10,000 ohms, ±5%, ½ watt (R155)
	12,000 ohms, ±5%, ½ watt (R171)
	12,000 ohms, ±10%, ½ watt (R143)
	12,000 ohms, ±5%, 1 watt (R110)
	15,000 ohms, ±10%, ½ watt (R133)
	18,000 ohms, ±10%, ½ watt (R119, R123, R209)
	18,000 ohms, ±10%, 1 watt (R212)
	18,000 ohms, ±10%, 2 watts (R210, R211)
	22,000 ohms, ±10%, ½ watt (R142, R145)
	22,000 ohms, ±20%, ½ watt (R192)
	22,000 ohms, ±10%, 1 watt (R169)
	27,000 ohms, ±10%, ½ watt (R184)
	27,000 ohms, ±10%, 1 watt (R150)
	33,000 ohms, ±10%, ½ watt (R103, R105)
	33,000 ohms, ±20%, ½ watt (R114, R124)
	33,000 ohms, ±10%, 2 watts (R139)
	39,000 ohms, ±10%, 1 watt (R202)
	47,000 ohms, ±10%, ½ watt (R138, R193, R217)
	47,000 ohms, ±20%, ½ watt (R109)
	56,000 ohms, ±10%, ½ watt (R154, R187, R188, R214)
	68,000 ohms, ±20%, ½ watt (R200, R201)

STOCK No.	DESCRIPTION
	82,000 ohms, ±10%, ½ watt (R132)
	82,000 ohms, ±10%, 1 watt (R165, R173)
	100,000 ohms, ±5%, ½ watt (R190, R191)
	100,000 ohms, ±10%, 1 watt (R122, R167)
	100,000 ohms, ±20%, 1 watt (R182)
	150,000 ohms, ±10%, ½ watt (R161)
	150,000 ohms, ±20%, ½ watt (R125)
	220,000 ohms, ±5%, 1 watt (R170)
	270,000 ohms, ±10%, ½ watt (R203)
	330,000 ohms, ±5%, ½ watt (R162)
	330,000 ohms, ±10%, ½ watt (R196)
	330,000 ohms, ±5%, 1 watt (R164)
	390,000 ohms, ±10%, ½ watt (R136, R218)
	470,000 ohms, ±10%, ½ watt (R112, R113, R148, R174, R183, R197)
	560,000 ohms, ±10%, ½ watt
	680,000 ohms, ±10%, ½ watt (R215)
	820,000 ohms, ±10%, ½ watt (R121, R163)
	1 megohm, ±10%, ½ watt (R204)
	1 megohm, ±20%, ½ watt (R160)
	1 megohm, ±20%, 1 watt (R179)
	1.2 megohm, ±10%, 1 watt (R144)
	1.5 megohm, ±10%, ½ watt (R152)
	2.2 megohm, ±10%, ½ watt (R156)
	2.2 megohm, ±20%, ½ watt (R151, R208)
	4.7 megohm, ±10%, ½ watt (R213)
	10 megohm, ±20%, ½ watt (R195)
74416	Screw—#10-32 x 1¾" hex head screw to fasten kinescope retaining straps
75083	Screw—#8-32 x ¼" wing screw to mount deflection yoke
74602	Screw—#10-32 x 1¾" cross recessed round head screw for focus magnet adjustment
75236	Screw—#8-32 x ⅜" cross recess binder head screw for focus magnet mounting (2 req'd)
73584	Shield—Tube shield for V104 and V116
75232	Shield—R-F unit shield
73521	Shield—Tube shield for V105, V117
75222	Socket—Tube socket, octal, ceramic, plate mounted
73117	Socket—Tube socket, 7 pin, miniature
75223	Socket—Tube socket, 9 pin, miniature
71508	Socket—Tube socket, 6 contact, moulded for 1B3/8016
60942	Socket—Tube socket, 6 contact, steatite for 6AU5GT & 6W4GT
74834	Socket—Kinescope socket
31364	Socket—Pilot lamp socket for KCS45A
75233	Spring—Compression spring for focus magnet adjustment
75239	Spring—Suspension spring for 2nd. anode lead
75226	Strap—Kinescope retaining strap (metal)—upper
75227	Strap—Kinescope retaining strap (metal)—lower
75231	Strap—Mounting strap for deflection yoke hood (2 req'd)
33491	Switch—"TV-phono" switch (S103)
75629	Switch—AGC switch (S105)
75207	Transformer—Power transformer 117 volts, 60 cycle (T109)
75208	Transformer—Vertical output transformer (T106)
74589	Transformer—First pix, i-f transformer (T101, C101, R101)
74590	Transformer—Second pix, i-f transformer (T102, C106)
75209	Transformer—Third pix, i-f transformer (T103, C113)
73574	Transformer—Fourth pix, i-f transformer (T104, C118)

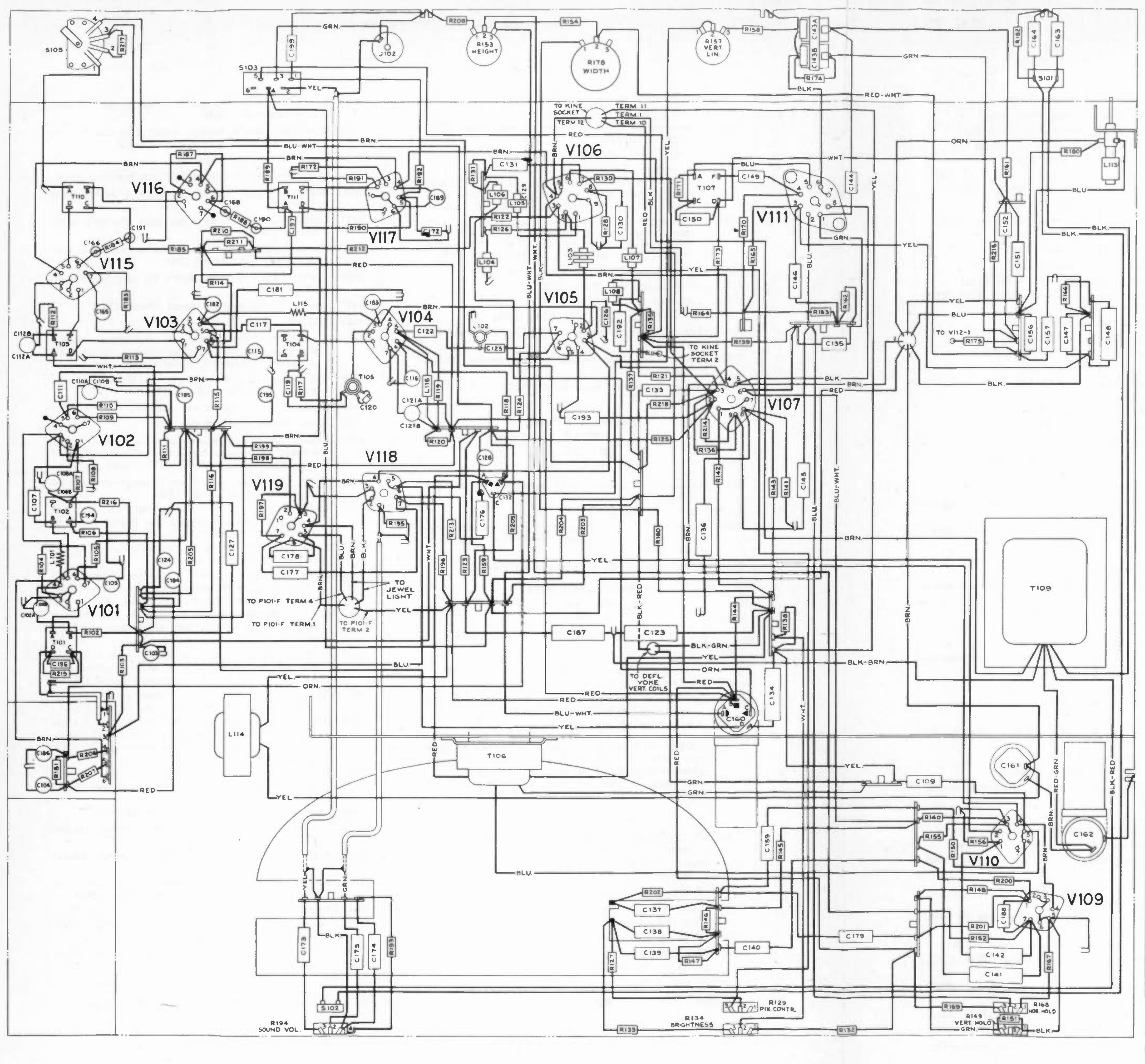
STOCK No.	DESCRIPTION
75211	Transformer—Sound i-f transformer (T110, C114, C167, R186)
75212	Transformer—Sound discriminator transformer (T111, C169, C170, C171)
75213	Transformer—Horizontal oscillator transformer (T107)
75214	Transformer—Antenna matching transformer complete with antenna connector, i-f and FM traps and antenna shunt coil for KCS45A (T200, C200, C201, C202, C203, J200, L200, L201, L202, L203)
75509	Transformer—Antenna matching transformer complete with antenna connector, i-f and F-M traps and antenna shunt coil for KCS45 (T200, C200, C201, C202, C203, J200, L200, L201, L202, L203)
75240	Transformer—Hi-voltage transformer (T108)
71778	Trap—Sound trap (T105, C120)
75251	Trap—4.5 mc trap (L105, C129)
75242	Trap—I-F trap (L200, L201, C200, C201)
75449	Trap—FM trap complete with adjustable core and stud (L203, C203)
75451	Tubing—Insulated tubing for kinescope straps (30¾")
75204	Yoke—Deflection yoke (L109, L110, L111, L112, C155, C180)
	SPEAKER ASSEMBLIES
	970773-2
	RL 116-2
	(For Model 2T51)
74316	Connector—3 contact male connector for speaker (J101)
X3128	Cloth—Speaker grille cloth
75628	Speaker—5" x 7" EM speaker complete with cone and voice coil (3.2 ohms) less output transformer and plug
71419	Transformer—Output transformer (T112)
	SPEAKER ASSEMBLIES
	92580-4W
	RL 105C8
	(For Model 2T60)
75023	Cap—Dust cap
75024	Cone—Cone complete with voice coil (3.2 ohms)
5039	Connector—4 contact male connector (J101)
75022	Speaker—8" PM speaker complete with cone and voice coil less plug and transformer
75520	Transformer—Output transformer (T112)
	NOTE:—If stamping on speaker in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
75502	Back—Cabinet back complete with power cord and terminal board for Model 2T60
75472	Back—Cabinet back complete with power cord and terminal board for Model 2T51
75473	Board—"Ant" terminal board
71599	Bracket—Pilot lamp bracket (Model 2T60)
13103	Cap—Pilot lamp cap for Model 2T60
73643	Clip—Spring clip for channel marker escutcheon
X3123	Cloth—Grille cloth for mahogany or walnut instruments (Model 2T60)

STOCK No.	DESCRIPTION
39153	Connector—4 contact male connector for antenna interconnecting cable
75474	Connector—Single contact male connector for antenna interconnecting cable (2 req'd)
71457	Cord—Power cord and plug
74891	Cushion—Vinylite cushion (35") for masking panel
75470	Cushion—Rubber cushion for back of safety glass (2 req'd)
75471	Cushion—Rubber cushion for front of safety glass (Model 2T51)
75479	Decal—Control function decal for mahogany or walnut instruments (Model 2T60)
75480	Decal—Control function decal for oak instruments (Model 2T60)
75467	Decal—Control function decal (Model 2T51)
74809	Emblem—"RCA Victor" emblem
75499	Escutcheon—Channel marker escutcheon—dark—for mahogany or walnut instruments (Model 2T60) or plastic instruments (Model 2T51)
75501	Escutcheon—Channel marker escutcheon—light—for oak instruments (Model 2T60)
75478	Glass—Safety glass (Model 2T60)
75468	Glass—Safety glass (Model 2T51)
74959	Knob—Fine tuning control knob—maroon—for mahogany or walnut instruments (Model 2T60) or plastic instruments (Model 2T51) (outer)
75461	Knob—Fine tuning control knob—beige—for oak instruments (outer) (Model 2T60)
74960	Knob—Channel selector knob—maroon—for mahogany or walnut instruments (Model 2T60) or plastic instruments (Model 2T51) (inner)
75462	Knob—Channel selector knob—beige—for oak instruments (inner) (Model 2T60)
74962	Knob—Brightness control or vertical hold control knob—maroon—for mahogany instruments (Model 2T60) or plastic instruments (Model 2T51) (outer)
75463	Knob—Brightness control or vertical hold control knob—beige—for oak instruments (outer) (Model 2T60)
74969	Knob—Volume control and power switch knob—maroon—for mahogany or walnut instruments (Model 2T60) or plastic instruments (Model 2T51)
75503	Knob—Volume control and power switch knob—beige—for oak instruments (dual) (Model 2T60)
74963	Knob—Picture control or horizontal hold control knob—maroon—for mahogany or walnut instruments (Model 2T60) and plastic instruments (Model 2T51) (inner)
75464	Knob—Picture control or horizontal hold control knob—beige—for oak instruments (inner) (Model 2T60)
11765	Lamp—Pilot lamp—Mazda—for Model 2T60
75477	Mask—Kinescope masking panel (metal) (Model 2T60)
75469	Mask—Kinescope masking panel (metal) (Model 2T51)
33225	Nut—Speed nut to fasten antenna in cabinet or to fasten masking panel to cabinet (Model 2T51)
72845	Spring—Retaining spring for knobs 74959 and 75461
14270	Spring—Retaining spring for knobs 74960, 74962, 74969, 75462, 75463, and 75503
30330	Spring—Retaining spring for knobs 74963 and 75464
75500	Washer—Felt washer

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

CHASSIS WIRING DIAGRAM



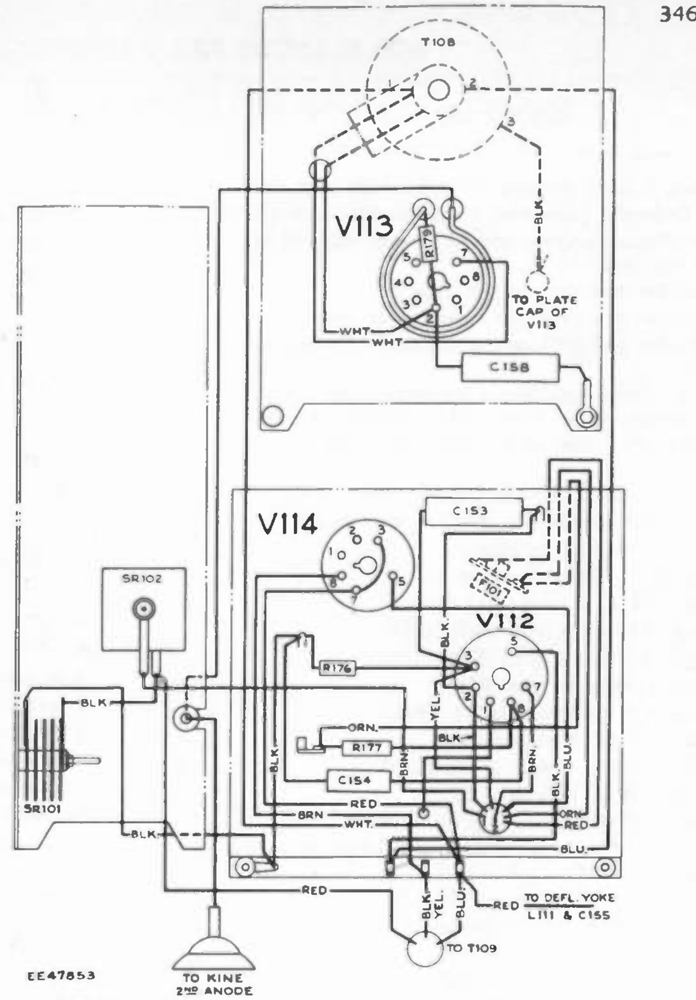
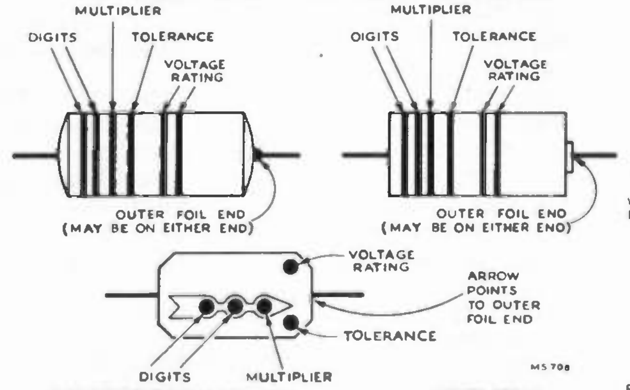


Figure 67—Chassis Wiring Diagram

COLOR CODES, MOULDED PAPER CAPACITORS



CAPACITY VALUE IN MMF

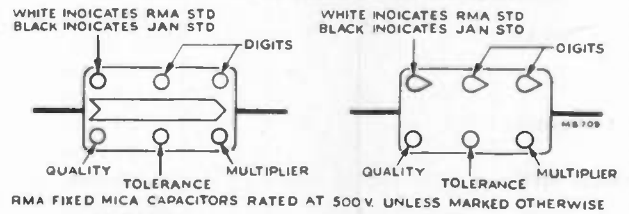
COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

TOLERANCE

COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	±5%

The Voltage Rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digit column to read voltage rating.

RMA COLOR CODE, FIXED MICA CAPACITORS

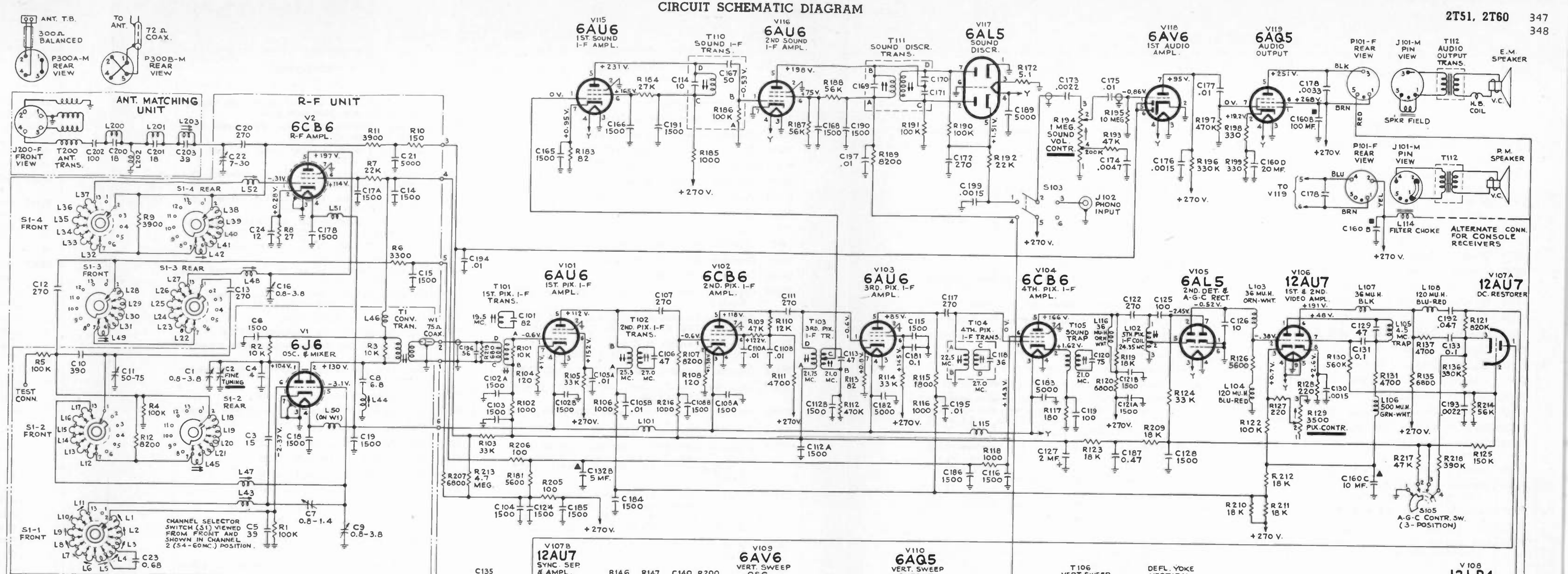


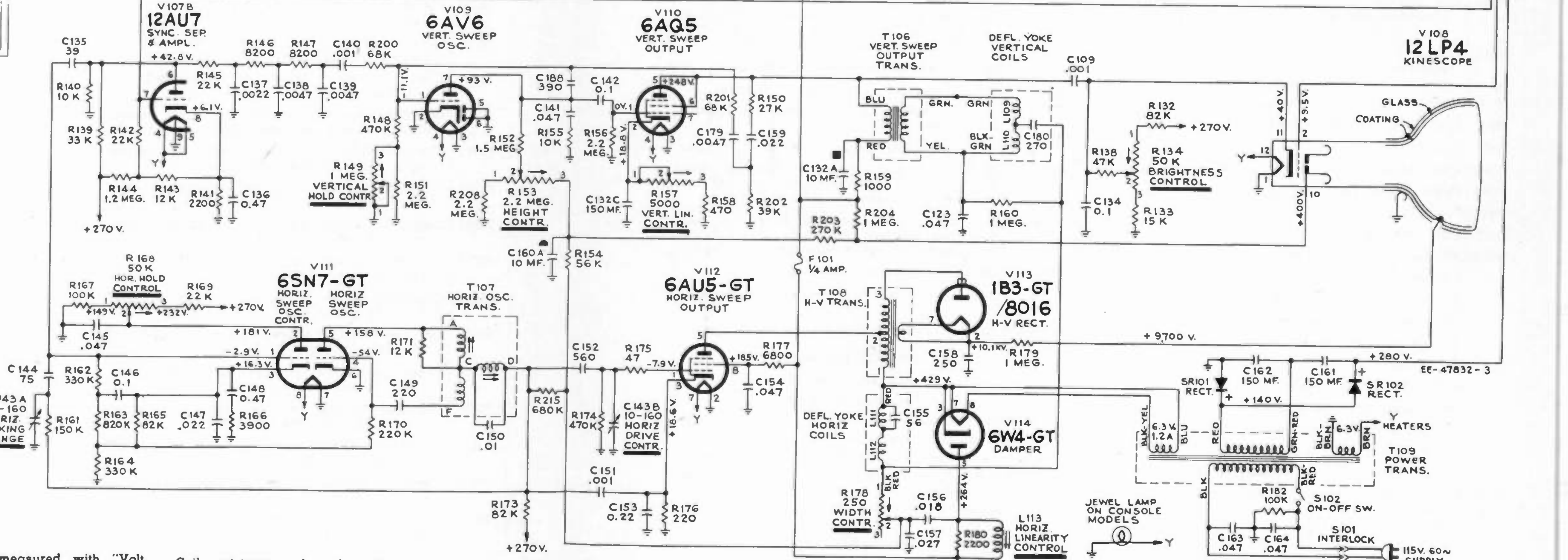
RMA FIXED MICA CAPACITORS RATED AT 500 V. UNLESS MARKED OTHERWISE

TOLERANCE		QUALITY			
COLOR	TOLERANCE	COLOR	CLASS	COLOR	CLASS
RED	±2%	BLACK	A	YELLOW	D
GREEN	±5%	BROWN	B	GRAY	I
SILVER	±10%	RED	C	WHITE	J
BLACK	±20%	ORANGE	D		

COLOR	DIGITS	MULTIPLIER
GOLD		.1
BLACK	0	1.
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

CIRCUIT SCHEMATIC DIAGRAM





All resistance values in ohms. K = 1,000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

In some receivers, substitutions have caused changes in component lead color codes, in resistor and capacitor values.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers R130 was 390K.

In some receivers C105A was 1500, C110A & B were 1500 and C156 was .033.

In some receivers R219 was omitted.

In some receivers R155 was 12K. R130 was connected between pin 7 of V106 and gnd.

In some receivers C197 and C199 were omitted.

In some receivers R115 was 3900, R119 was 8200, R120 was 1000 and L116 was omitted. T104 bottom was tuned to 24.35 mc. and L102 was tuned to 22.5 mc.

Figure 68—Circuit Schematic Diagram

RCA VICTOR

"Somervell"
Model 2T81, Walnut, Mahogany or Limed Oak

TELEVISION, RADIO PHONOGRAPH COMBINATION MODEL 2T81

Chassis Nos. KCS46 and RC1090
Record Changers RP168 or RP190 and 960282
— Mfr. No. 274 —

SERVICE DATA

— 1950 No. T13 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model 2T81 is a 12½-inch television radio phonograph combination. Two record changers are provided to play 78, 33⅓ and 45 RPM records. The instrument employs 23 tubes plus 4 rectifiers and a 12LP4 kinescope.

Features of the television unit are full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc band width for picture channel and reduced hazard high voltage supply.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE........ 87 square inches on a 12LP4 kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range..±250 kc. on chan. 2, ±650 kc. on chan. 13
Picture Carrier Frequency.......................... 25.50 mc.
Sound Carrier Frequency .... 21.00 mc.

RADIO TUNING RANGE....................... 540-1,600 kc.

Radio Intermediate Frequency....................... 455 kc.

POWER SUPPLY RATING...... 115 volts, 60 cycles, 235 watts

AUDIO POWER OUTPUT RATING............ 6.0 watts max.

CHASSIS DESIGNATIONS

Television Chassis.................................. KCS46
Radio Chassis..................................... RC1090
33⅓/78 RPM Record Changer........................960282
45 RPM Record Changer.....................RP168 or RP190
Refer to Service Data 960282 and RP168 or RP190 for information on the record changers.

LOUDSPEAKER—92569-9 (RL111-14)...... 12-inch PM Dynamic
Voice Coil Impedance................ 3.2 ohms at 400 cycles

WEIGHT

Chassis with Tubes in Cabinet...................... 148 lbs.
Shipping Weight.................................. 182 lbs.

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside)	33¾	34¼	23⅜
TV Chassis (overall)	16	15	20¼

RECEIVER ANTENNA INPUT IMPEDANCE..300 ohms balanced

If necessary, the television chassis may be fed separately from either a 300-ohm balanced line or a 72-ohm co-ax.

RCA TUBE COMPLEMENT

Tube Used	Function
(Television Chassis)	
(1) RCA 6CB6	R-F Amplifier
(2) RCA 6J6	R-F Oscillator and Mixer
(3) RCA 6AU6	1st Sound I-F Amplifier
(4) RCA 6AU6	2nd Sound I-F Amplifier
(5) RCA 6AL5	Sound Discriminator
(6) RCA 6AU6	1st Picture I-F Amplifier
(7) RCA 6CB6	2nd Picture I-F Amplifier
(8) RCA 6AU6	3rd Picture I-F Amplifier
(9) RCA 6CB6	4th Picture I-F Amplifier
(10) RCA 6AL5	Picture 2nd Detector and AGC Detector
(11) RCA 12AU7	1st and 2nd Video Amplifier
(12) RCA 12AU7	DC Restorer and Sync Separator
(13) RCA 6AV6	Vertical Sweep Oscillator
(14) RCA 6AQ5	Vertical Sweep Output
(15) RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(16) RCA 6AU5GT	Horizontal Sweep Output
(17) RCA 6W4GT	Damper
(18) RCA 1B3-GT/8016	High Voltage Rectifier
(19) RCA 12LP4	Kinescope
(Radio Chassis)	
(1) RCA 6BE6	Converter
(2) RCA 6BA6	I-F Amplifier
(3) RCA 6AV6	Detector and 1st Audio
(4) RCA 6C4	Phase Inverter
(5) RCA 6V6GT (2 tubes)	Audio Output
(6) RCA 6X5GT	Rectifier

Specifications continued on page 2

ELECTRICAL AND MECHANICAL SPECIFICATIONS
(Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency	25.50 mc.
Adjacent Channel Sound Trap	27.00 mc.
Accompanying Sound Traps	21.00 mc.
Adjacent Channel Picture Carrier Trap	19.50 mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency	21.00 mc.
Sound Discriminator Band Width between peaks	400 kc.

VIDEO RESPONSE	To 4 mc.
FOCUS	Magnetic
SWEEP DEFLECTION	Magnetic
SCANNING	Interlaced, 525 line
HORIZONTAL SWEEP FREQUENCY	15,750 cps
VERTICAL SWEEP FREQUENCY	60 cps
FRAME FREQUENCY (Picture Repetition Rate)	30 cps

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. Turn the radio FUNCTION switch to TV.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Adjust the PICTURE and brightness controls for suitable picture contrast and brightness.

9. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

10. In switching from one channel to another, it may be necessary to repeat steps 4 and 8.

11. When the set is turned on again after an idle period it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step No. 4 is generally sufficient.

12. If the positions of the controls have been changed, it may be necessary to repeat steps 1 through 8.

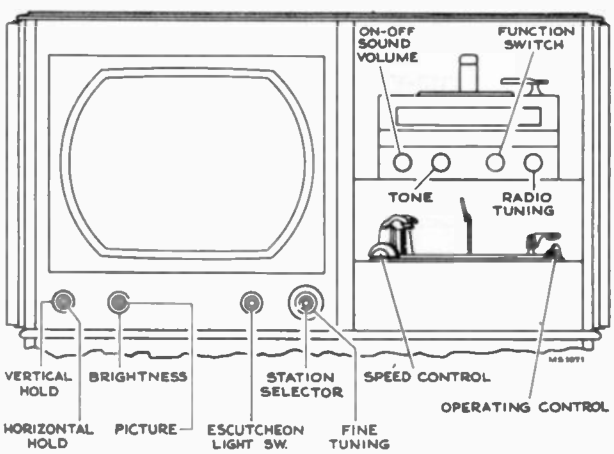


Figure 1—Receiver Operating Controls

RADIO OPERATION

1. Turn the radio FUNCTION switch to AM.

2. Tune in the desired station with the TUNING control.

PHONOGRAPH OPERATION

1. Turn the radio FUNCTION switch to 78-33 for operation of the 78/33⅓ RPM changer or to 45 for operation of the 45 RPM changer.

2. Place a record on the appropriate changer and slip the changer power switch to "ON."

REFER TO MODELS 2T51 AND 2T60 (PAGES 327 TO 341) FOR INSTALLATION INSTRUCTIONS, TELEVISION ALIGNMENT AND WAVEFORM PHOTOGRAPHS.

THE TELEVISION OF MODEL 2T81 IS VERY SIMILAR TO THE CHASSIS USED IN MODELS 2T51 AND 2T60. WHEN REFERRING TO MODELS 2T51 AND 2T60 IT SHOULD BE NOTED THAT V118 (6AV6 1st Audio) AND V119 (6AQ5 Audio Output) ARE NOT USED IN MODEL 2T81.

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

R-F UNIT WIRING DIAGRAM

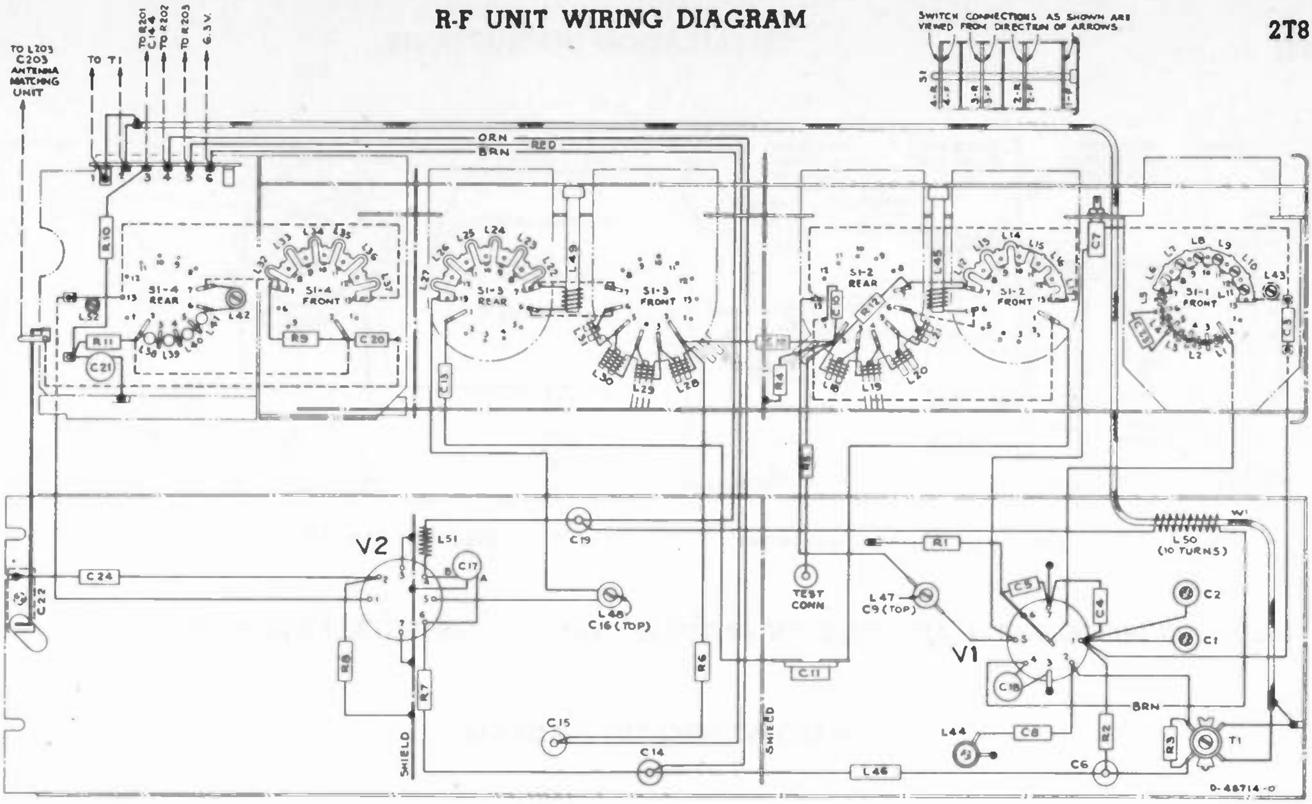


Figure 2—R-F Unit Wiring Diagram

TELEVISION CHASSIS TOP VIEW

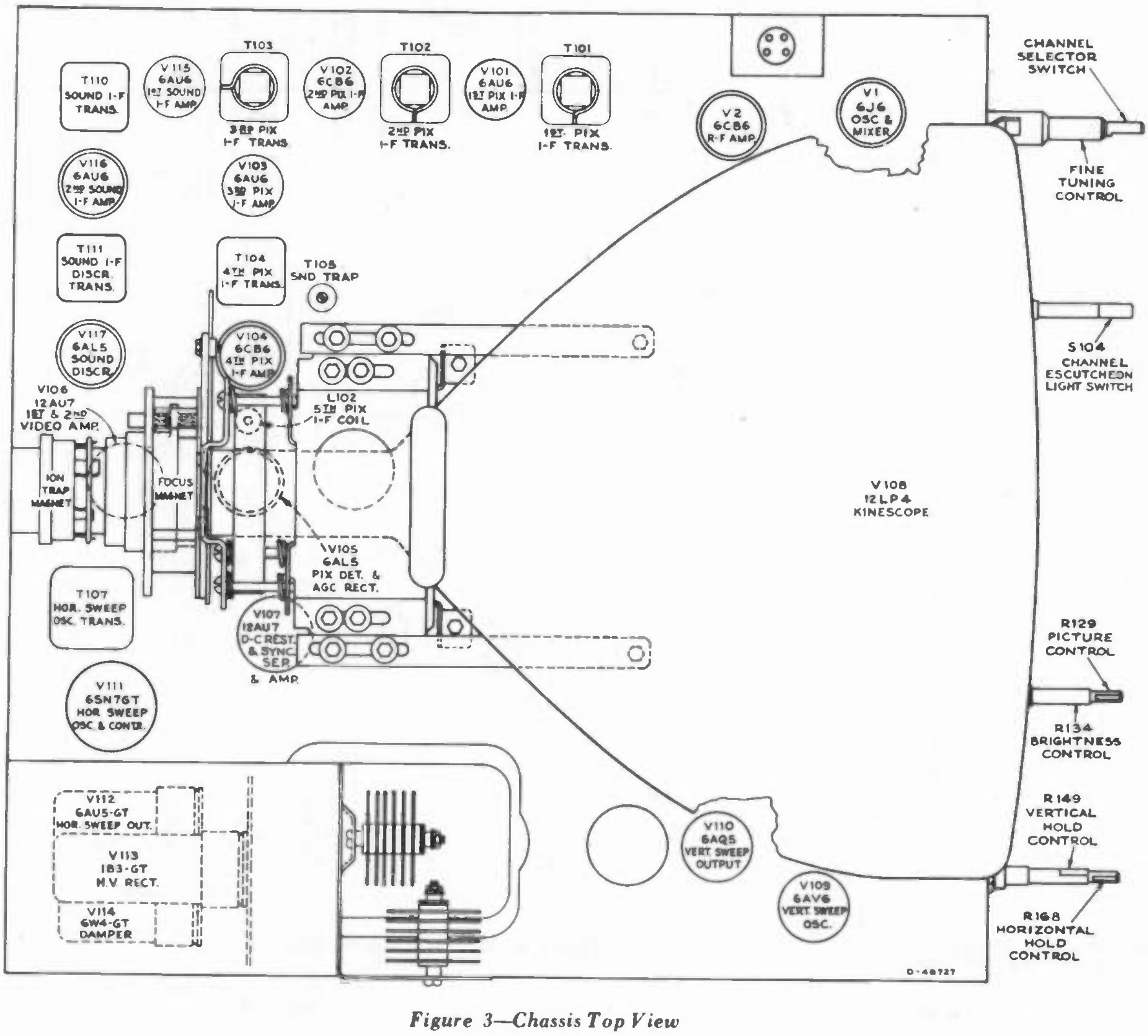


Figure 3—Chassis Top View

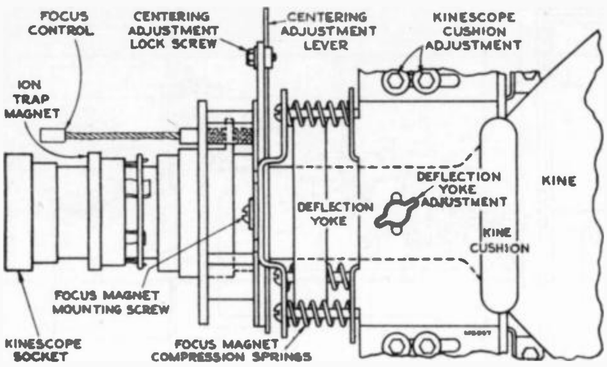


Figure 4—Yoke and Focus Magnet Adjustments

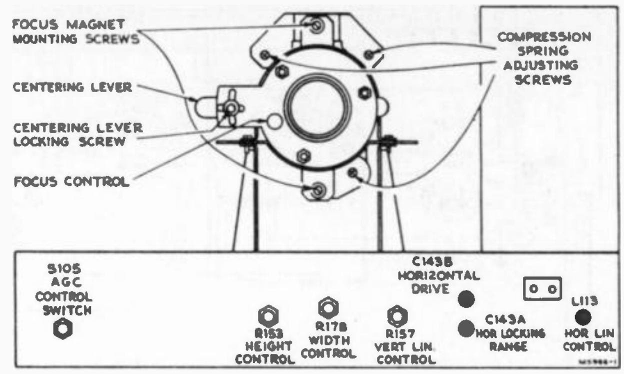


Figure 5—Rear Chassis Adjustments

REFER TO MODELS 2T51 AND 2T60 ON PAGES 327 AND 328 FOR INSTALLATION PROCEDURE.

RADIO SCHEMATIC DIAGRAM

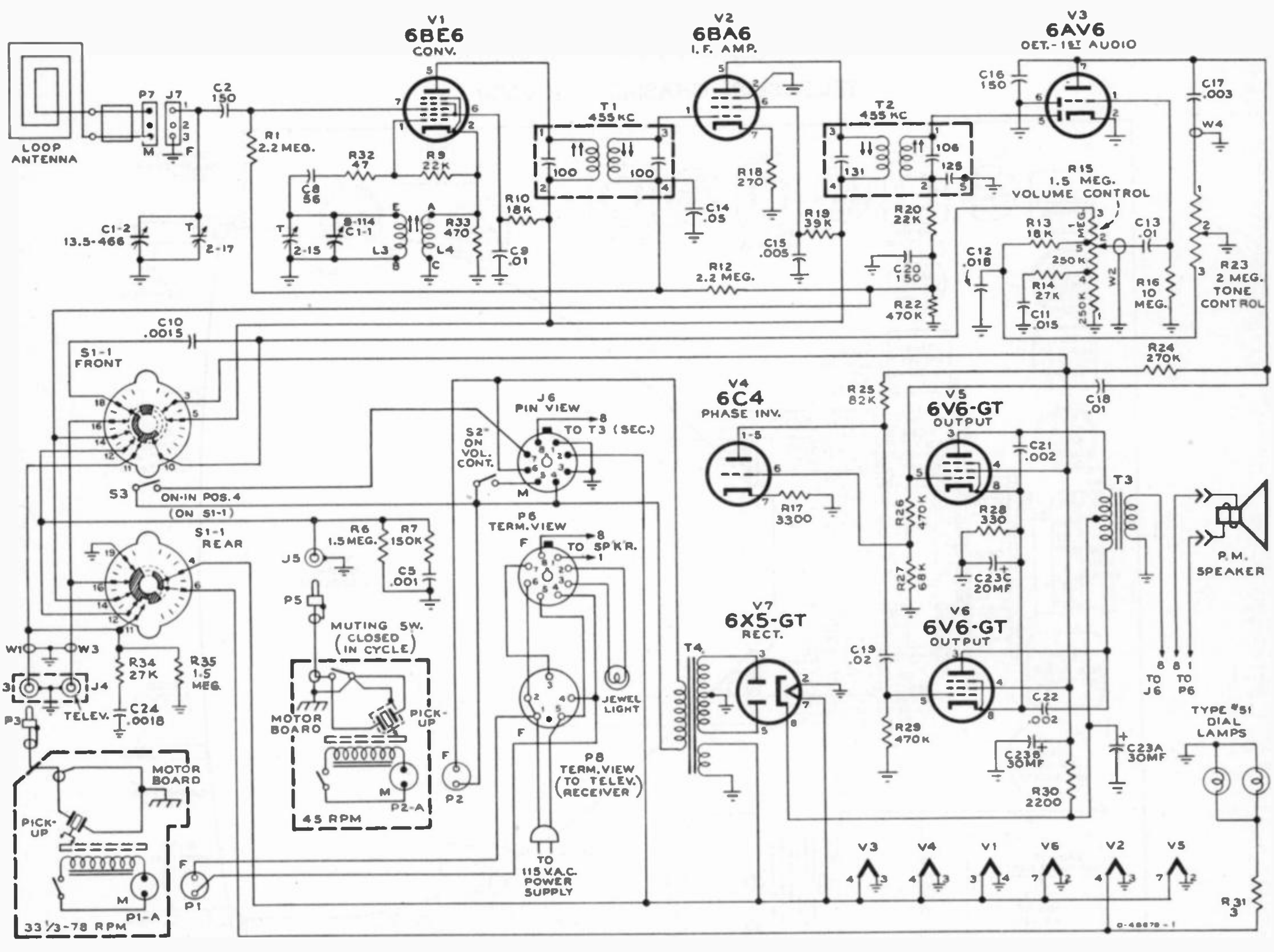


Figure 6—Radio Schematic Diagram

In some receivers R34 was 100K and was connected between S1-1 rear terminal 7 and J3. C24 was .0015 and was connected between S1-1 rear terminal 7 and gnd. In some receivers R35 was omitted.

In some receivers R17 was 2700 and R25 was 120K.

RADIO ALIGNMENT PROCEDURE

Test-Oscillator. — For all alignment operations, connect low side of the test-osc. to the receiver chassis, and keep the osc. output as low as possible to avoid a-v-c action. **Output Meter.** — Connect the meter across the speaker voice coil, and turn the receiver volume control to max. If any lead dressing is necessary, it should be done before aligning the receiver.

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Turn Radio Dial to—	Adjust the following
1	Stator of C1-2 in series with .01 mfd.	455 kc. Modulated	AM	Low Freq. end of Dial	†Top and bot. cores of T1 and T2 (For max. voltage across voice coil.)
2	Short wire placed near loop for radiated signal	1,620 kc.	AM	Min. capacity	Osc. C1-1 for maximum output
3		1,400 kc.	AM	Tune to signal	Ant. C1-2 for maximum output
4		600 kc.	AM	600 kc.	††Osc. L3 for maximum output
5	Repeat steps 2, 3 and 4 for maximum output.				

†First peak T1 and T2 for maximum output. Then, starting with T2 use alternate loading. Connect a 47,000-ohm resistor across the primary to load the plate winding while the grid winding of the same transformer is being peaked. Then load the grid winding with the 47,000-ohm resistor while the plate winding is being peaked.
††"Rock" the gang condenser and adjust L3 for maximum output.

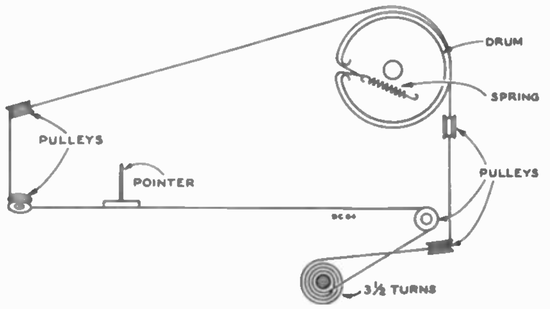


Figure 7—Dial Cord and Drive Assembly

CRITICAL LEAD DRESS

1. Dress all filament wiring down to the chassis and away from the audio coupling capacitors.
2. Dress the a-c power-switch leads away from all audio circuit components.
3. Dress all uninsulated bus wire so as to avoid short circuits.

VOLTAGE CHART

Tube	Type	Pin No.	Radio	Phono
V1	6BE6 Converter	Plate, Pin 5	208	—
		Screen, Pin 6	88	—
		Cathode, Pin 2	0	—
		Grid, Pin 7	–.77	—
V2	6BA6 I-F Amp.	Plate, Pin 5	208	—
		Screen, Pin 6	118	—
		Cathode, Pin 7	2.42	—
		Grid, Pin 1	–.68	—
V3	6AV6 Audio Amp.	Plate, Pin 7	84	94
		Grid, Pin 1	–.86	–.84
V4	6C4 Inverter	Plate, Pins 1 & 5	70	83
		Cathode, Pin 7	2.95	3.6
		Grid, Pin 6	.01	.04
V5 V6	6V6GT Audio Output	Plate, Pin 3	250	255
		Screen, Pin 4	208	250
		Cathode, Pin 8	13.1	17.3
		Grid, Pin 5	0	0
V7	6X5GT Rectifier	Cathode, Pin 8	255	260

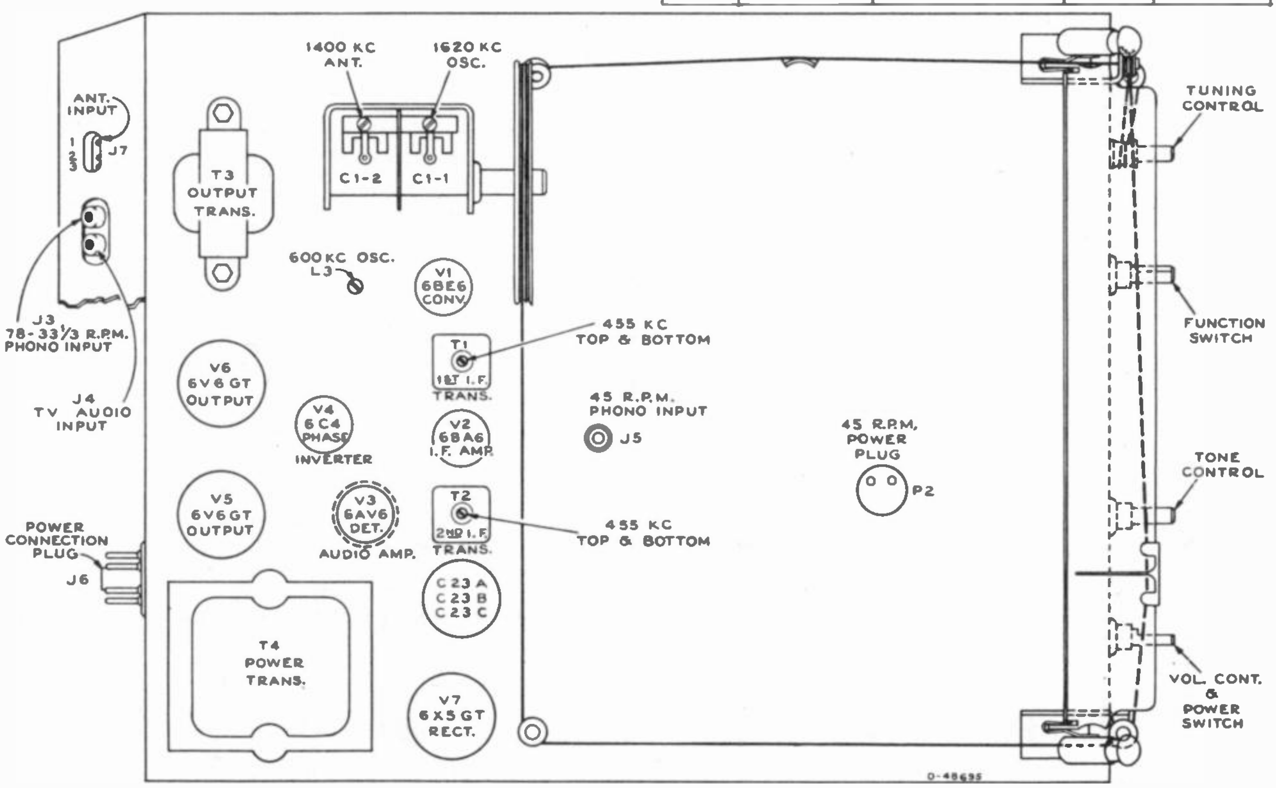


Figure 8—Chassis, Top View, Showing Adjustments

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition, a 2,500-microvolt test pattern signal was fed into the receiver, the picture synced and the AGC control properly adjusted. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are read with "Senior VoltOhmyst" type WV97A between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles, a-c. The symbol < means less than.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6J6	Mixer	2500 Mu. V. Signal	2	135	—	—	7	0	5	-3.25	7.4	—	
			No Signal	2	130	—	—	7	0	5	-3.1	7.1	—	
V1	6J6	R-F Oscillator	2500 Mu. V. Signal	1	119	—	—	7	0	6	*-4.16	4.83	—	*Depending upon channel
			No Signal	1	104	—	—	7	0	6	*-2.37	4.6	—	
V2	6AG5	R-F Amplifier	2500 Mu. V. Signal	5	243	6	173	2	<0.1	1	-4.45	0.44	0.13	
			No Signal	5	197	6	114	2	0.28	1	-0.31	8.6	2.35	
V101	6AU6	1st Pix. I-F Amplifier	2500 Mu. V. Signal	5	205	6	232	7	0.15	1	-5.8	1.32	0.52	
			No Signal	5	112	6	152	7	1.0	1	-0.6	6.8	2.8	
V102	6CB6	2nd Pix. I-F Amplifier	2500 Mu. V. Signal	5	192	6	205	2	0.5	1	-5.8	4.4	0.8	
			No Signal	5	118	6	122	2	1.38	1	-0.6	9.8	2.5	
V103	6AU6	3d Pix. I-F Amplifier	2500 Mu. V. Signal	5	190	6	228	7	0.2	1	-0.6	1.28	0.55	
			No Signal	5	85	6	145	7	1.8	1	0	6.5	2.98	
V104	6CB6	4th Pix. I-F Amplifier	2500 Mu. V. Signal	5	159	6	148	2	1.8	1	0	9.3	2.7	
			No Signal	5	166	6	143	2	1.62	1	0	0.42	2.4	
V105	6AL5	Picture 2d Det.	2500 Mu. V. Signal	2	-2.3	—	—	5	0	—	—	8.2	—	
			No Signal	2	-0.52	—	—	5	0	—	—	<0.1	—	
V105	6AL5	AGC Rectifier	2500 Mu. V. Signal	7	-9.0	—	—	1	0	—	—	0.12	—	
			No Signal	7	-2.45	—	—	1	0	—	—	<0.1	—	
V106	12AU7	1st Video Amplifier	2500 Mu. V. Signal	1	100	—	—	3	1.0	2	-2.4	3.8	—	At maximum contrast
			No Signal	1	48	—	—	3	0.7	2	-0.38	2.7	—	
			2500 Mu. V. Signal	1	180	—	—	3	9.1	2	-2.9	0.69	—	At minimum contrast
			No Signal	1	100	—	—	3	5.9	2	-0.38	0.6	—	
V106	12AU7	2d Video Amplifier	2500 Mu. V. Signal	6	221	—	—	8	1.68	7	-6.2	7.5	—	At maximum contrast
			No Signal	6	191	—	—	8	2.6	7	-1.0	11.1	—	
			2500 Mu. V. Signal	6	189	—	—	8	2.75	7	-2.6	12.5	—	At minimum contrast
			No Signal	6	188	—	—	8	2.69	7	-0.4	12.3	—	
V108	12AU7	D-C Rest. & Sync Sep.	2500 Mu. V. Signal	1	4.6	—	—	3	48.0	2	-6.2	<0.1	—	At maximum contrast
			No Signal	1	2.8	—	—	3	4.6	2	-1.0	<0.1	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V107 B	12AU7	Sync Sep. & Amplifier	2500 Mu. V. Signal	6	44.1	—	—	8	5.9	7	5.69	2.47	—	
			No Signal	6	42.8	—	—	8	6.1	7	6.1	2.58	—	
V108	12LP4	Kinescope	2500 Mu. V. Signal	Cap	*10,000	10	405	11	69	2	34	0.075	—	*Average Brightness
			No Signal	Cap	*10,000	10	405	11	40	2	9.5	0.04	—	*Average Brightness
			2500 Mu. V. Signal	Cap	*9,700	10	405	11	65	2	32.5	0.10	—	*Maximum Brightness
V109	6AV6	Vertical Oscillator	2500 Mu. V. Signal	7	93	—	—	2	0	1	-11.2	0.15	—	
			No Signal	7	93	—	—	2	0	1	-11.1	0.15	—	
V110	6AQ5	Vertical Output	2500 Mu. V. Signal	5	250	6	250	2	19.0	1	0	13.9	1.20	
			No Signal	5	248	6	248	2	18.8	1	0	13.8	1.20	
V111	6SN7 GT	Horizontal Osc. Control	2500 Mu. V. Signal	2	185	—	—	3	25.0	1	-2.0	.33	—	
			No Signal	2	181	—	—	3	16.3	1	-2.9	.31	—	
V111	6SN7 GT	Horizontal Oscillator	2500 Mu. V. Signal	5	161	—	—	6	0	4	-53	1.35	—	
			No Signal	5	158	—	—	6	0	4	-54	1.35	—	
V112	6AU5 GT	Horizontal Output	2500 Mu. V. Signal	5	*440	8	189	3	19.0	1	-8.0	77.0	11.2	*5000 volt pulse present
			No Signal	5	*435	8	185	3	18.6	1	-7.4	75.0	11.0	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	*10,100	—	—	0.075	—	*10,100 volt pulse present
			Brightness Average	Cap	*	—	—	2 & 7	*10,100	—	—	0.040	—	
V114	6W4 GT	Damper	2500 Mu. V. Signal	5	269	—	—	3	*430	—	—	88	—	*3000 volt pulse present
			No Signal	5	264	—	—	3	*429	—	—	87	—	
V115	6AU6	1st Sound I-F Amp.	2500 Mu. V. Signal	5	234	6	168	7	0.98	1	0	8.1	3.24	
			No Signal	5	231	6	165	7	0.95	1	0	7.9	3.30	
V116	6AU6	2d Sound I-F Amp.	2500 Mu. V. Signal	5	200	6	73	7	0	1	-0.45	3.73	1.37	
			No Signal	5	198	6	75	7	0	1	-0.53	3.64	1.28	
V117	6AL5	Sound Discrim.	2500 Mu. V. Signal	2	-0.6	—	—	5	0.1	—	—	—	—	
			No Signal	2	-1.52	—	—	5	1.5	—	—	—	—	
SR101		Rectifier	2500 Mu. V. Signal	—	0	—	—	—	141	—	—	226	—	
			No Signal	—	0	—	—	—	140	—	—	245	—	
SR102		Rectifier	2500 Mu. V. Signal	—	141	—	—	—	282	—	—	226	—	
			No Signal	—	140	—	—	—	280	—	—	245	—	

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	RF UNIT ASSEMBLIES KRK8
10705	Ball—Steel ball for detent (5/32 dia.)
75188	Board—Terminal board, 5 contact and ground
75067	Bracket—Vertical bracket for holding oscillator tube shield
75201	Cable—75 ohms, coax cable (7¼") complete with coil (W1, L50)
75186	Capacitor—Ceramic, variable, for fine tuning — plunger type (C2)
75289	Capacitor—Ceramic, 4 mmf., ±0.5 mmf. (C4)
75189	Capacitor—Adjustable, 7-30 mmf. (C22)
75200	Capacitor—Ceramic, 12 mmf. (C24)
45465	Capacitor—Ceramic, 15 mmf. (C3)
75196	Capacitor—Ceramic, 39 mmf. (C5)
75174	Capacitor—Ceramic, trimmer, 50-75 mmf. (C11)
75199	Capacitor—Ceramic, 270 mmf. (C12, C13, C20)
75641	Capacitor—Ceramic, 390 mmf. (C10)
75166	Capacitor—Ceramic, 1,500 mmf. (C6,C14, C15, C19)
75089	Capacitor—Ceramic, dual, 1,500 mmf. (C17A, C17B)
73748	Capacitor—Ceramic, 1,500 mmf. (C18)
73473	Capacitor—Ceramic, 5,000 mmf. (C21)
75172	Capacitor—Tubular, steatite, adjustable, 0.8-1.4 mmf. (C7)
71504	Capacitor—Ceramic, 0.68 mmf. (C23)
75184	Capacitor—Ceramic, adjustable, 0.75-4 mmf., complete with adjusting stud (C1)
75197	Capacitor—Ceramic, 6.8 mmf. (C8)
75167	Clip—Tubular clip for mounting stand-off capacitors
75182	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment) for convertor section (C9, L47)
75183	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f section (L48, C16)
75185	Coil—Convertor plate loading coil (L44)
75202	Coil—Choke coil, .56 muh (L46)
73477	Coil—Choke coil (L51)
75187	Core—Adjustable core for fine tuning capacitor C2
75162	Detent—Detent mechanism and fibre shaft
73453	Form—Coil form for L45 and L49
75165	Link—Link assembly for fine tuning
14343	Retainer—Fine tuning shaft retaining ring
	Resistor—Fixed, composition:
	27 ohms, ±10%, ½ watt (R8)
	150 ohms, ±20%, ½ watt (R10)
	3,300 ohms, ±10%, ½ watt (R6)
	3,900 ohms, ±10%, ½ watt (R9, R11)
	8,200 ohms, ±10%, ½ watt (R12)
	10,000 ohms, ±5%, ½ watt (R3)
	10,000 ohms, ±20%, ½ watt (R2)
	22,000 ohms, ±10%, ½ watt (R7)
	100,000 ohms, ±20%, ½ watt (R1, R4, R5)
75164	Rod—Actuating plunger rod (fibre) for fine tuning link
71476	Screw—No. 4-40 x ¼" binder head machine screw for adjusting L6, L7, L8, L9, L10, L11
75176	Screw—No. 4-40 x ⅜" fillister head screw for adjusting L5
75177	Screw—No. 4-40 x 5/16" fillister head screw for adjusting L1, L2, L3, L4, L43
74575	Screw—No. 4-40 x .359" adjusting screw for L42
73640	Screw—No. 4-40 x 7/16" adjusting screw for L52
75159	Shaft—Channel selector shaft and plate
75160	Shaft—Fine tuning shaft and cam
75168	Shield—Oscillator and convertor sections shield for r-f unit—snap-on type
75193	Shield—Tube shield for V1
75192	Shield—Tube shield for V2
75088	Socket—Tube socket, 7 contact, miniature, ceramic, saddle mounted
75191	Spacer—Insulating spacer for front plate (4 required)
75163	Spring—Friction spring (formed) for fine tuning cam
75068	Spring—Retaining spring for oscillator tube shield
74578	Spring—Retaining spring for adjusting screws
73457	Spring—Return spring for fine tuning control
30340	Spring—Hair pin spring for fine tuning link

STOCK No.	DESCRIPTION
75175	Stator—Oscillator section stator complete with rotor, segment, coils, adjusting screws and capacitors C3 and C23 (S1-1, C3, C23, L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L43)
75178	Stator—Convertor stator complete with rotor, coils, capacitors (C10 and C12) and resistors (R4 and R5) (S1-2, C10, C12, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L45, R4 R5, R12)
75179	Stator—R-F amplifier stator complete with rotor, coils, capacitor (C13) and resistor (R6) (S1-3, C13, L22, L23, L24, L25, L26, L27, L28, L29, L30, L31, L49, R6)
75180	Stator—Antenna stator complete with rotor, coils, capacitors (C20 and C21) and resistors (R9, R10, R11) (S1-4, C20, C21, L32, L33, L34, L35, L36, L37, L38, L39, L40, L41, L42, L52, R9, R10, R11)
75169	Strip—Coil segment mounting strip—RH center
75170	Strip—Coil segment mounting strip—LH lower
75171	Strip—Coil segment mounting strip—LH upper—less trimmer C7
75173	Stud—No. 6-32 x 13/16" adjusting stud for C7 trimmer
75446	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils L47, L48 and capacitor C1 uncoded and coded "ER"
75447	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils L47, L48 and capacitor C1 coded numerically and "Hi Q"
75181	Transformer—I-F convertor transformer
73466	Washer—Insulating washer (round)
75190	Washer—Insulating washer (neoprene) for capacitor C7
	TELEVISION CHASSIS ASSEMBLY KCS 46
75235	Board—Hi-voltage shield terminal board (3 contact)
75228	Bracket—Focus magnet mounting bracket—upper
75229	Bracket—Focus magnet mounting bracket—lower
75230	Bracket—Kinescope mounting bracket—on front apron of chassis
75591	Bracket—Indicator lamp bracket
53511	Capacitor—Ceramic, 10 mmf. (C126)
75217	Capacitor—Mica trimmer, dual, 10-160 mmf. (C143A, C143B)
75450	Capacitor—Ceramic, 39 mmf. (C203)
74726	Capacitor—Mica, 39 mmf. (C135)
71924	Capacitor—Ceramic, 56 mmf. (C196)
75247	Capacitor—Mica, 75 mmf. (C144)
75437	Capacitor—Ceramic, 100 mmf. (C202)
45469	Capacitor—Ceramic, 100 mmf. (C119)
39396	Capacitor—Ceramic, 100 mmf. (C125)
75248	Capacitor—Mica, 220 mmf. (C149)
75244	Capacitor—Ceramic, 270 mmf. (C172)
73091	Capacitor—Mica, 270 mmf. (C107, C111, C117, C122)
73094	Capacitor—Mica, 390 mmf. (C188)
74250	Capacitor—Mica, 560 mmf. (C152)
75166	Capacitor—Ceramic, 1,500 mmf. (C166, C168, C190, C191)
75089	Capacitor—Ceramic, dual, 1,500 mmf. (C102A, C102B, C108A, C108B, C112A, C112B, C121A, C121B)
73748	Capacitor—Ceramic, 1,500 mmf. (C103, C104, C115, C116, C124, C128, C165, C184, C185, C186)
73473	Capacitor—Ceramic, 5,000 mmf. (C182, C183, C189)
73360	Capacitor—Ceramic, 10,000 mmf. (C194, C195, C197)
75877	Capacitor—Ceramic, dual, 10,000 mmf. (C105A, C105B, C110A, C110B)
73747	Capacitor—Electrolytic, 2 mfd, 50 volts (C127)
75218	Capacitor—Electrolytic, comprising 1 section of 10 mfd, 350 volts, 1 section of 5 mfd, 350 volts, and 1 section of 150 mfd, 50 volts (C132A, C132B, C132C)
75219	Capacitor—Electrolytic, comprising 1 section of 10 mfd, 450 volts, 1 section of 100 mfd, 350 volts, 1 section of 10 mfd, 350 volts, and 1 section of 20 mfd, 25 volts (C160A, C160B, C160C) NOTE: 20 mfd, 25 volts section not used.
75220	Capacitor—Electrolytic, 150 mfd, 200 volts (C161, C162)
75250	Capacitor—Tubular, moulded paper, mineral oil impregnated, .00025 mfd, 12,500 volts (C158)
73801	Capacitor—Tubular, paper, oil impregnated, .001 mfd, 600 volts (C140, C199)
75249	Capacitor—Tubular, moulded paper, oil impregnated, .001 mfd, 600 volts (C151)
75344	Capacitor—Tubular, moulded paper, oil impregnated, .001 mfd, 1,000 volts (C109)
73598	Capacitor—Tubular, paper, oil impregnated, .0015 mfd, 600 volts (C130)

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd, 600 volts (C137, C193)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd, 600 volts (C138, C139, C179)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd, 600 volts (C150)
74727	Capacitor—Tubular moulded paper, oil impregnated, .018 mfd, 1,000 volts (C156)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd, 400 volts (C147)
73798	Capacitor—Tubular, paper, oil impregnated, .022 mfd, 600 volts (C159)
75345	Capacitor—Tubular, moulded paper, oil impregnated, .027 mfd, 600 volts (C157)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 400 volts (C145, C192)
75071	Capacitor—Tubular, moulded paper, .047 mfd, 400 volts (C163, C164)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 600 volts (C141)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 1,000 volts (C123, C154)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd, 400 volts (C131, C133, C134, C146, C181)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd, 600 volts (C142)
73560	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd, 200 volts (C153)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd, 200 volts (C136, C148, C187)
73154	Choke—Filter choke (L114)
75167	Clip—Tubular clip for mounting stand-off capacitor 75166
75224	Clip—Mounting clip for electrolytic 75220
75210	Coil—Fifth pix i-f coil complete with adjustable core (L102)
71449	Coil—Horizontal linearity coil (L113)
73591	Coil—Antenna matching coil (2 required) (Part of T200)
75241	Coil—Antenna shunt coil (L202)
73477	Coil—Filament choke coil (L101, L115)
75299	Coil—Peaking coil (36 muh) (L103)
76011	Coil—Peaking coil (36 muh) (L116)
71793	Coil—Peaking coil (36 muh) (L107)
75253	Coil—Peaking coil (120 muh) (L104, L108)
75252	Coil—Peaking coil (500 muh) (L106)
35787	Connector—Single contact audio output connector
74594	Connector—2 contact male connector for power cable
38853	Connector—4 contact female connector for antenna transformer (J200)
71789	Connector—Anode connector
75215	Control—Horizontal and vertical hold control (R149, R168)
75216	Control—Picture and brightness control (R129, R134)
71441	Control—Vertical linearity control (R157)
71440	Control—Height control (R153)
74945	Control—Width control (R178)
71498	Core—Adjustable core and stud for F-M trap 75449 (part of transformer 75214)
72772	Cover—Insulating cover for electrolytic 75220
73590	Cushion—Rubber cushion for deflection yoke hood (2 required)
74839	Fastener—Push fastener to mount ceramic tube socket
73600	Fuse—0.25 amp., 250 volts (F101)
37396	Grommet—Rubber grommet to mount ceramic tube socket
16058	Grommet—Rubber grommet for 2nd anode lead exit
75206	Hood—Deflection yoke hood complete with cushions
75205	Magnet—Focus magnet complete with adjustable plate and stud
74148	Magnet—Ion trap magnet (P.M. type)
75225	Pad—Rubber pad to mount kinescope (4 required)
75234	Pad—Rubber pad (3" long) for junction of kinescope straps
75147	Plate—Hi-voltage transformer mounting plate (bakelite) complete with tube socket less transformer
18469	Plate—Bakelite mounting plate for electrolytic 75220
75221	Rectifier—Selenium rectifier (SR101, SR102)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R172)
	Resistor—Fixed, composition:
	47 ohms, ±20%, ½ watt (R175)
	82 ohms, ±10%, ½ watt (R113, R183)

STOCK No.	DESCRIPTION
	100 ohms, ±20%, ½ watt (R205, R206)
	120 ohms, ±10%, ½ watt (R104, R108)
	180 ohms, ±10%, ½ watt (R117)
	220 ohms, ±10%, ½ watt (R127, R128)
	220 ohms, ±10%, 2 watts (R176)
	470 ohms, ±20%, ½ watt (R158)
	680 ohms, ±10%, ½ watt (R219)
	1,000 ohms, ±20%, ½ watt (R102, R106, R116, R118, R159, R185, R216)
	1,800 ohms, ±10%, ½ watt (R115)
	2,200 ohms, ±20%, ½ watt (R141)
	2,200 ohms, ±20%, 1 watt (R180)
	3,900 ohms, ±10%, ½ watt (R166)
	4,700 ohms, ±5%, ½ watt (R131)
	4,700 ohms, ±10%, ½ watt (R137)
	4,700 ohms, ±10%, 1 watt (R111)
	5,500 ohms, ±5%, ½ watt (R126)
	5,600 ohms, ±10%, 2 watts (R181)
	6,800 ohms, ±10%, 1 watt (R120)
	6,800 ohms, ±10%, 2 watts (R135, R177)
	6,800 ohms, ±20%, 2 watts (R207)
	8,200 ohms, ±5%, ½ watt (R107)
	8,200 ohms, ±10%, ½ watt (R146, R147, R189)
	10,000 ohms, ±5%, ½ watt (R155)
	10,000 ohms, ±10%, ½ watt (R140)
	12,000 ohms, ±5%, ½ watt (R171)
	12,000 ohms, ±10%, ½ watt (R143)
	12,000 ohms, ±5%, 1 watt (R110)
	15,000 ohms, ±10%, ½ watt (R133)
	18,000 ohms, ±10%, ½ watt (R119, R123, R209)
	18,000 ohms, ±10%, 1 watt (R212)
	18,000 ohms, ±10%, 2 watts (R210, R211)
	22,000 ohms, ±10%, ½ watt (R142, R145)
	22,000 ohms, ±20%, ½ watt (R192)
	22,000 ohms, ±10%, 1 watt (R169)
	27,000 ohms, ±10%, ½ watt (R184)
	27,000 ohms, ±10%, 1 watt (R150)
	33,000 ohms, ±10%, ½ watt (R103, R105)
	33,000 ohms, ±20%, ½ watt (R114, R124)
	33,000 ohms, ± 10%, 2 watts (R139)
	39,000 ohms, ±10%, 1 watt (R202)
	47,000 ohms, ±10%, ½ watt (R138, R217)
	47,000 ohms, ±20%, ½ watt (R109)
	56,000 ohms, ±10%, ½ watt (R154, R187, R188, R214)
	68,000 ohms, ±20%, ½ watt (R200, R201)
	82,000 ohms, ±10%, ½ watt (R132)
	82,000 ohms, ±10%, 1 watt (R165, R173)
	100,000 ohms, ±5%, ½ watt (R190, R191)
	100,000 ohms, ±10%, 1 watt (R122, R167)
	100,000 ohms, ±20%, 1 watt (R182)
	150,000 ohms, ±10%, ½ watt (R161)
	150,000 ohms, ±20%, ½ watt (R125)
	220,000 ohms, ±5%, 1 watt (R170)
	270,000 ohms, ±10%, ½ watt (R203)
	330,000 ohms, ±5%, ½ watt (R162)
	330,000 ohms, ±5%, 1 watt (R164)
	390,000 ohms, ±10%, ½ watt (R136, R218)
	470,000 ohms, ±5%, ½ watt (R148)
	470,000 ohms, ±10%, ½ watt (R112, R174)
	560,000 ohms, ±10%, ½ watt (R130)
	680,000 ohms, ±10%, ½ watt (R215)
	820,000 ohms, ±10%, ½ watt (R121, R163)
	1 megohm, ±10%, ½ watt (R204)
	1 megohm, ±20%, ½ watt (R160)
	1 megohm, ±20%, 1 watt (R179)
	1.2 megohm, ±10%, 1 watt (R144)
	1.5 megohm, ±10%, ½ watt (R152)
	2.2 megohm, ±10%, ½ watt (R156)
	2.2 megohm, ±20%, ½ watt (R151, R208)
	4.7 megohm, ±10%, ½ watt (R213)
74416	Screw—No. 10-32 x 1¾" hex head screw to hold kinescope straps together

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
75083	Screw—No. 8-32 x ¼" wing screw to mount deflection yoke
74602	Screw—No. 10-32 x 1¾" cross-recessed round head screw for focus magnet adjustment
75236	Screw—No. 8-32 x ⅜" cross-recessed binder head screw to mount focus magnet
73521	Shield—Tube shield for V104 and V105
73584	Shield—Tube shield for V117 and V118
75232	Shield—R-F unit shield
75222	Socket—Tube socket, octal, ceramic, plate mounted
73117	Socket—Tube socket, 7 pin, miniature
75223	Socket—Tube socket, 9 pin, miniature
71508	Socket—Tube socket, 6 contact, moulded for 1B3/8016
60942	Socket—Tube socket, 6 contact, steatite for V112 and V114
75718	Socket—Socket and clamp complete with 7" lead for channel indicator lamp
74834	Socket—Kinescope socket
75233	Spring—Compression spring for focus magnet adjustment
75239	Spring—Suspension spring for 2nd anode lead
75226	Strap—Kinescope retaining strap (metal)—upper
75227	Strap—Kinescope retaining strap (metal)—lower
75231	Strap—Mounting strap for deflection yoke hood (2 required)
75590	Switch—Indicator light switch (S104)
75629	Switch—AGC switch (S105)
75207	Transformer—Power transformer, 115 volt, 60 cycle (T109)
75208	Transformer—Vertical output transformer (T106)
74589	Transformer—First pix, i-f transformer (T101, C101, R101)
74590	Transformer—Second pix, i-f transformer (T102, C106)
75209	Transformer—Third pix, i-f transformer (T103, C113)
73574	Transformer—Fourth pix, i-f transformer (T104, C118)
75211	Transformer—Sound i-f transformer (T110, C114, C167, R186)
75212	Transformer—Sound discriminator transformer (T111, C169, C170, C171)
75213	Transformer—Horizontal oscillator transformer (T107)
75214	Transformer—Antenna matching transformer complete, including antenna connector, i-f traps and antenna shunt coil (T200, ..200, C201, C202, C203, J200, L200, L201, L202, L203)
75240	Transformer—Hi-voltage transformer (T108)
71778	Trap—Sound trap (T105, C120)
75242	Trap—I-F trap (L200, L201, C200, C201)
75449	Trap—F-M trap complete with adjustable core and stud (L203, C203)
75251	Trap—4.5 mc trap (L105, C129)
75451	Tubing—Insulated tubing for kinescope straps (30¾")
75204	Yoke—Deflection yoke (L109, L110, L111, L112, C155, C180)
	RADIO CHASSIS ASSEMBLIES RC 1090
75541	Bracket—Pulley bracket complete with drive cord and pulley
75534	Capacitor—Variable tuning capacitor complete with drive drum (C1-1, C1-2)
71924	Capacitor—Ceramic, 56 mmf. (C8)
39632	Capacitor—Mica, 150 mmf. (C2, C16, C20)
73372	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 350 volts, 1 section of 30 mfd, 300 volts and 1 section of 20 mfd, 25 volts (C23A, C23B, C23C)
73801	Capacitor—Tubular, paper, .001 mfd, 400 volts (C5)
71394	Capacitor—Tubular, paper, .0015 mfd, 600 volts (C10)
73851	Capacitor—Tubular, paper, oil impregnated, .0018 mfd, 1,600 volts (C24)
73803	Capacitor—Tubular, paper, .002 mfd, 1,000 volts (C21, C22)
70603	Capacitor—Tubular, paper, .003 mfd, 400 volts (C17)
73920	Capacitor—Tubular, paper, .005 mfd, 400 volts (C15)
73561	Capacitor—Tubular, paper, .01 mfd, 400 volts (C9, C13, C18)
70572	Capacitor—Tubular, paper, .015 mfd, 400 volts (C11)
58476	Capacitor—Tubular, paper, oil impregnated, .018 mfd, 400 volts (C12)
73562	Capacitor—Tubular, paper, .02 mfd, 400 volts (C19)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C14)

STOCK No.	DESCRIPTION
73935	Clip—Mounting clip for i-f transformer
75627	Clip—Clip for main cable—on rear apron of chassis
75485	Coil—Oscillator coil complete with adjustable core and stud (L3, L4)
35787	Connector—Single contact female connector for 45 RPM pickup cable (J5)
75542	Connector—8 contact male connector for power input cable (J6)
75543	Connector—2 contact female connector for 45 RPM motor cable (P2)
74879	Connector—Two contact (polarized) female connector for antenna leads (J7)
33514	Connector—Dual two contact female connector for 33/78 RPM pickup cable and television cable (J3, J4)
75537	Control—Volume control and power switch (R15, S2)
75538	Control—Tone control (R23)
72953	Cord—Drive cord (approx. 60" overall)
75547	Grommet—Rubber grommet to mount slides to bottom—rear (2 required)
75548	Grommet—Rubber grommet to mount slides to bottom—front (2 required)
11765	Lamp—Dial lamp—Mazda No. 51
75544	Nut—Rivnut to fasten screw for mounting chassis (4 required)
75535	Plate—Dial back plate complete with three (3) pulleys
75536	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R31)
73637	Resistor—Wire wound, 2,200 ohms, 5 watts (R30)
	Resistor—Fixed, composition:
	47 ohms, ±20%, ½ watt (R32)
	270 ohms, ±10%, ½ watt (R18)
	330 ohms, ±10%, 1 watt (R28)
	470 ohms, ±20%, ½ watt (R33)
	3,300 ohms, ±5%, ½ watt (R17)
	18,000 ohms, ±10%, ½ watt (R13)
	18,000 ohms, ±10%, 1 watt (R10)
	22,000 ohms, ±10%, ½ watt (R9, R20)
	27,000 ohms, ±10%, ½ watt (R14, R34)
	39,000 ohms, ±10%, ½ watt (R19)
	68,000 ohms, ±10%, ½ watt (R27)
	82,000 ohms, ±10%, ½ watt (R25)
	150,000 ohms, ±10%, ½ watt (R7)
	270,000 ohms, ±10%, ½ watt (R24)
	470,000 ohms, ±10%, ½ watt (R22, R26, R29)
	1.5 megohm, ±10%, ½ watt (R6, R35)
	2.2 megohm, ±20%, ½ watt (R1, R12)
	10 megohm, ±20%, ½ watt (R16)
75540	Shaft—Tuning knob shaft
73584	Shield—Tube shield
75546	Slide—Slide mechanism complete for radio chassis bottom
31364	Socket—Dial lamp socket
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
74038	Spring—Drive cord spring
75539	Switch—Function switch (S1-1, S3)
73636	Transformer—Output transformer (T3)
75486	Transformer—First i-f transformer complete with adjustable core and studs (T1)
75487	Transformer—Second i-f transformer complete with adjustable core and studs (T2)
70127	Transformer—Power transformer, 115 volts, 60 cycle (T4)
33726	Washer—"C" washer for tuning knob shaft
	RADIO ROLLOUT CARRIAGE
75552	Decal—Function decal for radio controls
75550	Dial—Polystyrene dial scale
75549	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM changer for mahogany or walnut instruments
75683	Frame—Moulded frame (light brown) for mounting radio chassis and 45 RPM changer for oak instruments
75551	Handle—Metal pull-out handle for mounting frame
75555	Screw—No. 8-32 x ⅝" cross recessed pan head machine screw to mount radio chassis (4 required)

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
	SPEAKER ASSEMBLY 92569-9W RMA 274 RL 111-14
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly
74974	Speaker—12" P.M. speaker (3.16 oz.) complete with cone and voice coil (3.2 ohms)
	NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	SPEAKER ASSEMBLY 92569-9B
75875	Cone—Cone and voice coil assembly (3.2 ohms)
	MISCELLANEOUS
75706	Antenna—Radio antenna loop complete, less cable
75692	Back—Back cover—maroon—for radio—45 RPM phono compartment for mahogany or walnut instruments—assembled to rollout
75693	Back—Back cover—light brown—for radio—45 RPM phono compartment for oak instruments
75798	Back—Back cover—maroon—for 33⅓/78 RPM phono compartment for mahogany or walnut instruments—assembled to rollout
75799	Back—Back cover—light brown—for 33⅓/78 RPM phono compartment for oak instruments—assembled to rollout
75800	Back—Back cover complete with terminal board and power cord for television chassis
75473	Board—Television antenna terminal board (2 contact)
75694	Bracket—Rollout mechanism stop bracket less rubber bumper
71599	Bracket—Pilot lamp bracket
75696	Bumper—Rubber bumper for rollout mechanism stop bracket
72447	Cable—Shielded audio cable complete with two (2) pin plugs
74296	Cable—Shielded pickup cable complete with pin plug for 33⅓/78 RPM changer
72437	Cable—Shielded pickup cable complete with pin plug for 45 RPM changer
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for cabinet doors
X3144	Cloth—Grille cloth for mahogany or walnut instruments
X3089	Cloth—Grille cloth for oak instruments
75703	Connector—5 contact male connector for television power cord assembly, less shell
39153	Connector—4 contact male connector for T-V antenna cable
75474	Connector—Single contact male connector for T-V antenna cable or for speaker
74882	Connector—2 contact (polarized) male connector for radio antenna loop cable
75709	Connector—8 contact female connector for main cable, less shell
75710	Connector—5 contact female connector for main cable, less shell
30868	Connector—2 contact female connector for main cable
30870	Connector—2 contact male connector for AC power cable for 45 RPM changer
75702	Cord—Television power cord complete with two (2) contact female connector, less five (5) contact male connector
70392	Cord—Power cord and plug—part of main cable
74891	Cushion—Vinylite cushion for masking panel
75640	Decal—Control function decal for mahogany or walnut instruments
75680	Decal—Control function decal for oak instruments
71984	Decal—Trade mark decal (RCA Victor)
74273	Decal—Trade mark decal (Victrola)
74809	Emblem—"RCA Victor" emblem

STOCK No.	DESCRIPTION
75455	Escutcheon—Channel marker escutcheon—dark—for mahogany or walnut instruments
75456	Escutcheon—Channel marker escutcheon—light—for oak instruments
75889	Glass—Safety glass
37396	Grommet—Rubber grommet for mounting speaker (4 required)
74838	Grommet—Power cord strain relief (1 set)
75697	Grommet—Rubber grommet to mount 45 RPM changer (3 required)
75551	Handle—Metal pullout handle for 33⅓/78 RPM changer mounting frame
74308	Hinge—Cabinet door hinge (1 set)
74959	Knob—Television fine tuning control knob—maroon—for mahogany or walnut instruments (outer)
73995	Knob—Television fine tuning control knob—tan—for oak instruments (outer)
73996	Knob—Television channel selector knob—maroon—for mahogany or walnut instruments (inner)
73997	Knob—Television channel selector knob—tan—for oak instruments (inner)
74962	Knob—Television brightness control or television vertical hold control knob—maroon—for mahogany or walnut instruments (outer)
73999	Knob—Television brightness control or television vertical hold control knob—tan—for oak instruments (outer)
74969	Knob—Television channel marker light switch knob—maroon—for mahogany or walnut instruments
74003	Knob—Television channel marker light switch knob—tan—for oak instruments
74963	Knob—Television picture control or television horizontal hold control knob—maroon—for mahogany or walnut instruments (inner)
74001	Knob—Television picture control or television horizontal hold control knob—tan—for oak instruments (inner)
75712	Knob—Radio tone control, tuning control or volume control and power switch knob—maroon—for mahogany or walnut instruments
75713	Knob—Radio tone control, tuning control or volume control and power switch knob—tan—for oak instruments
75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75715	Knob—Function switch knob—tan—for oak instruments
11765	Lamp—Pilot or channel indicator lamp—Mazda 51
75459	Mask—Channel indicator light mask—burgundy—for mahogany or walnut instruments
75460	Mask—Channel indicator light mask—gold—for oak instruments
75890	Mask—Kinescope masking panel
73634	Nut—Speed nut for speaker mounting screws
75888	Pull—Door pull
74269	Screw—No. 8-32 x ⅜" trimit head screw for door pull
75704	Shell—Shell for connector, RCA 75703
75708	Shell—Shell for connector for RCA 75709
75711	Shell—Shell for connector, RCA 75710
31364	Socket—Pilot lamp socket
72845	Spring—Retaining spring for knobs 73995 and 74959
14270	Spring—Retaining spring for knobs 73996, 73997, 73999, 74003, 74962 and 74969
30330	Spring—Retaining spring for knobs 74001 and 74963
74734	Spring—Retaining spring for knobs 75712, 75713, 75714, and 75715
73643	Spring—Spring clip for channel marker escutcheon
75691	Spring—Suspension spring (coil type) for main cable
72936	Stop—Door stop
75457	Washer—Felt washer—dark brown—between knob and channel marker escutcheon for mahogany or walnut instruments
75523	Washer—Felt washer—tan—between knob and channel marker escutcheon for oak instruments
75500	Washer—Felt washer for television compartment back cover

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

TELEVISION CHASSIS WIRING DIAGRAM

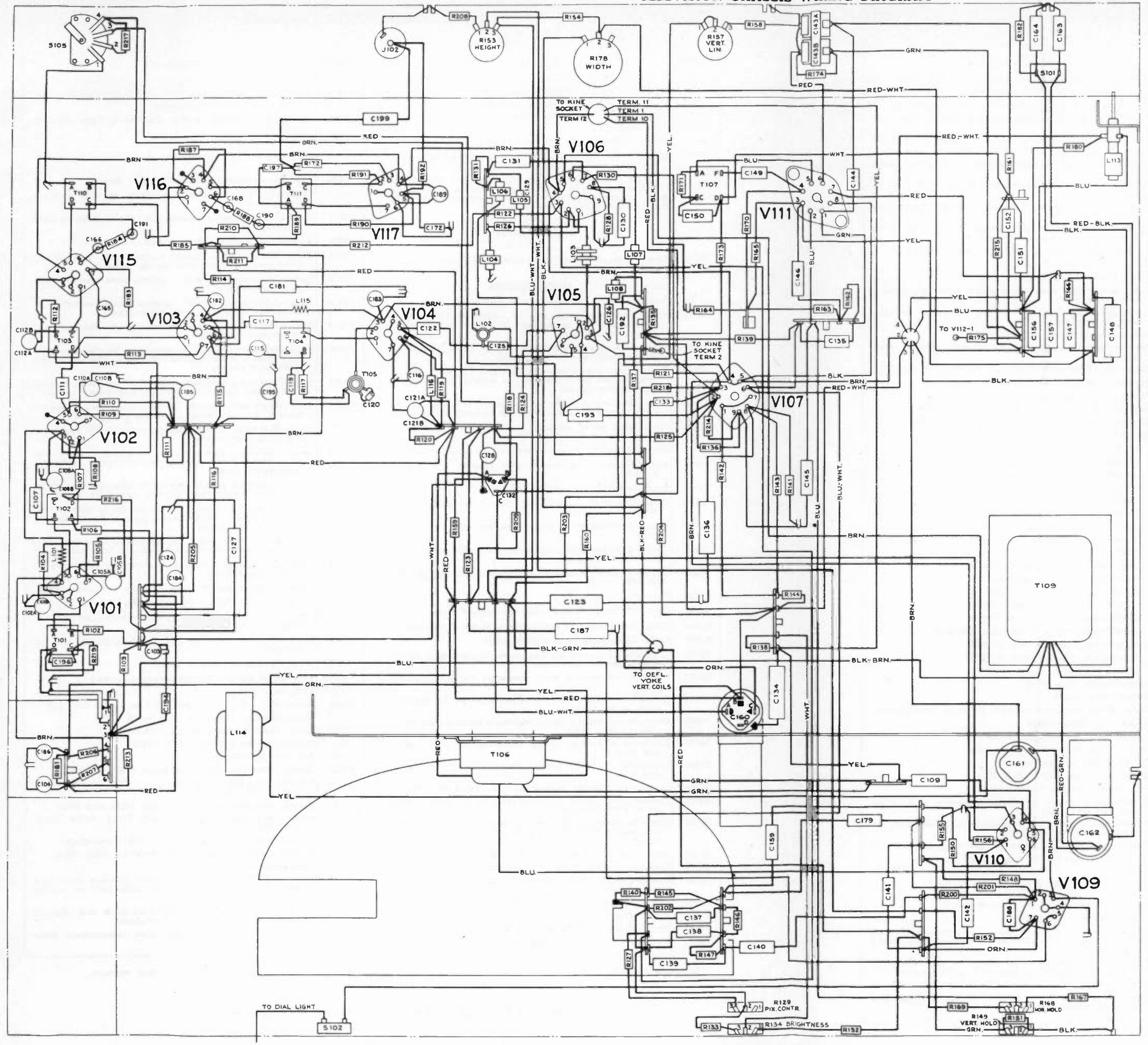
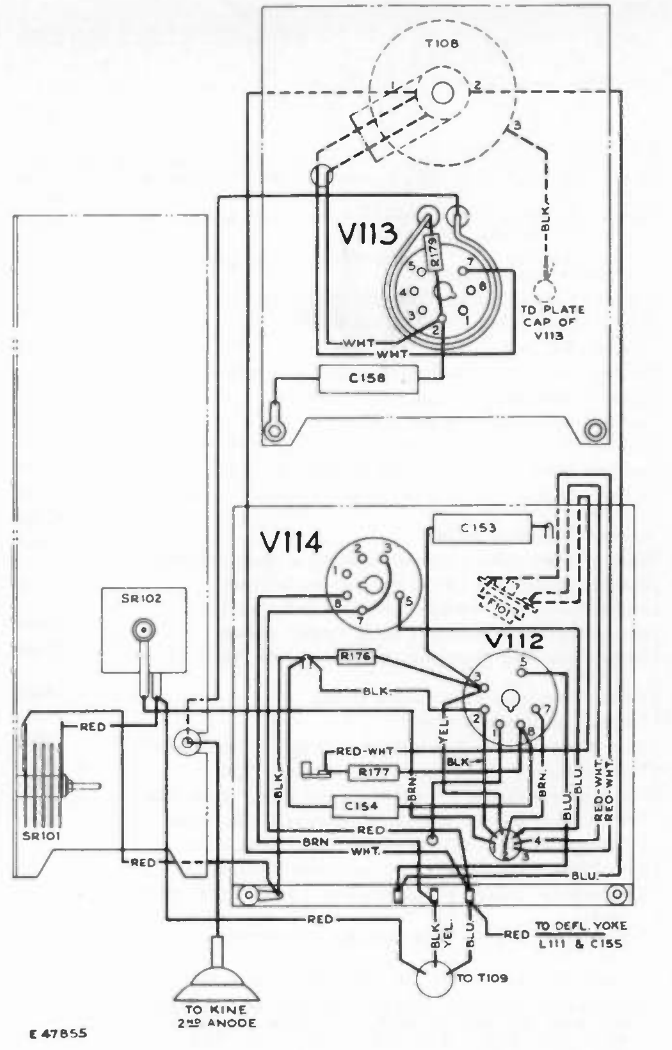


Figure 6—Chassis Wiring Diagram



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TELEVISION CRITICAL LEAD DRESS

1. All leads in the picture and sound i-f circuits must be dressed as short and direct as possible with the exception of C107, C111 and C117 which are to be dressed with enough slack so as not to have to move the body of the capacitor to align that particular stage.
2. Dress the yellow lead from pin 3 of V106 socket up in the air and away from V105 socket.
3. Dress all components connected to V106 socket up and away from the chassis except L103.
4. Keep the body and coded end of L103 as close to pin 2 of V105 socket as possible.
5. Keep the bus from pin 5 of V105 socket to L102 as short as possible and employ sleeving to prevent shorting.
6. Dress the red lead from the kinescope socket away from V105 and V106 sockets and on the power transformer side of the terminal boards.
7. Dress the yellow lead from the kinescope socket along the rear apron between T107 and V111 socket, up between V107 socket and the power transformer to the terminal board.
8. The green lead from the kinescope socket should be dressed away from all other leads and components and away from V106.
9. Pin 7 of V116 socket should be soldered to the chassis as short as possible.
10. Dress the fuse in the high voltage compartment so as not to short circuit to ground.
11. Dress the two filament leads away from the T108 high voltage winding by pulling them up through the hole so as to have all slack on the transformer side of the insulating board.

12. Keep the V113 filament leads away from the metal side of the high voltage compartment shield.
13. Dress C158 on the high voltage rectifier socket so as to keep the hot end of the capacitor away from the metal side of the high voltage compartment.
14. Keep all leads away from R177 for heat reasons.
15. Dress R210 and R211 away from all components on account of their heat.
16. Keep the leads at C182 and C183 as short as possible.
17. Keep C133 dressed above leads.
18. Dress the body of C131 away from the chassis.
19. Keep C150 dressed away from the chassis.
20. Dress the orange lead from C160C on the power transformer side of the terminal boards and around the rear apron side of V106 socket.
21. Dress the body of R119 as close to pin 5 of V104 socket as possible.
22. Dress the body of R124 as close to pin 2 of V105 socket as possible.
23. Keep the leads of C122 and C125 as short and direct as possible.
24. Keep the leads at C126 as short as possible.
25. Dress the leads of the AGC switch S105 next to the base in the chassis and away from sound components.
26. Solder terminal on can of C160 to bracket along with C134.

TELEVISION CIRCUIT SCHEMATIC DIAGRAM

All resistance values in ohms. K = 1000.

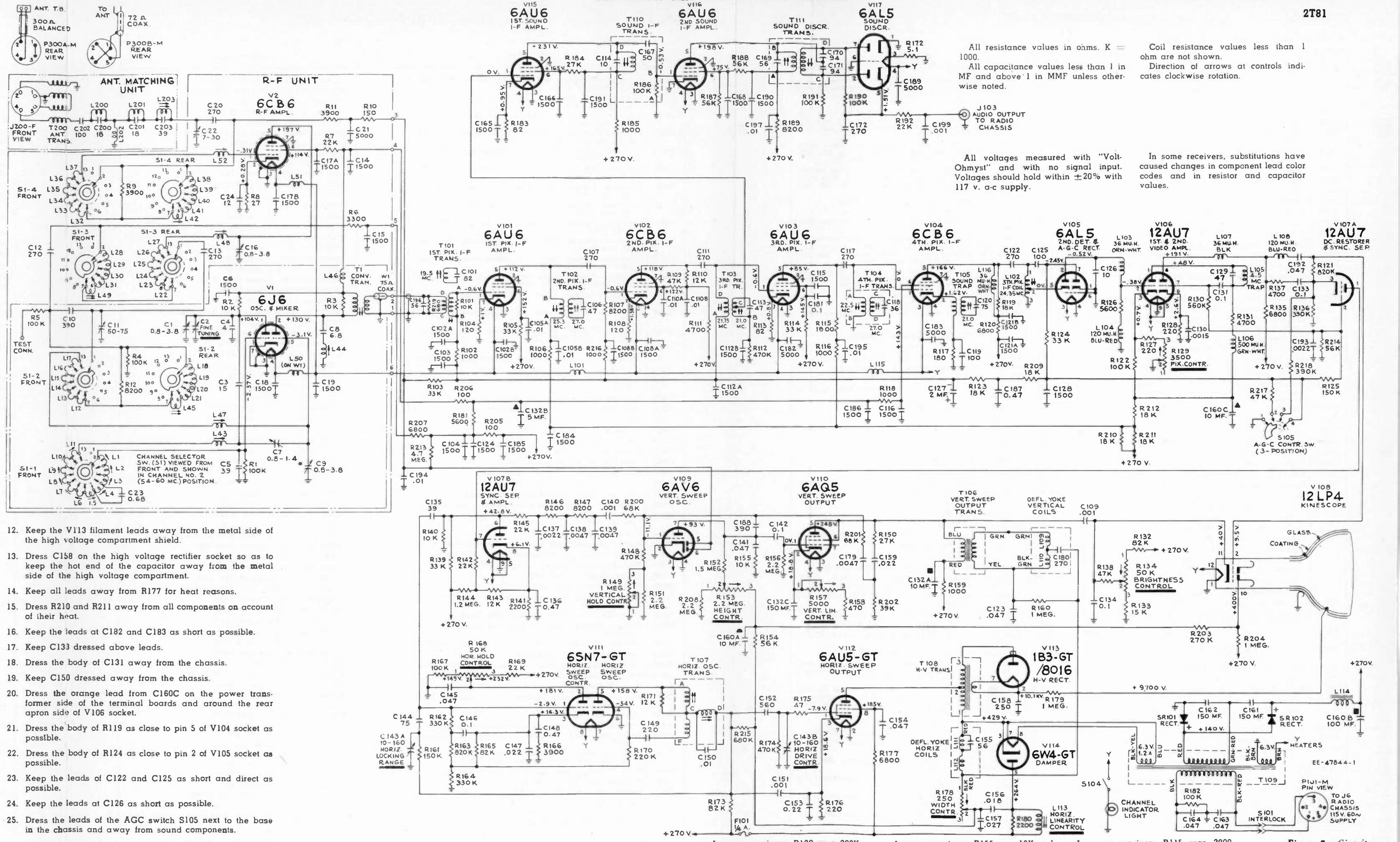
All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

In some receivers, substitutions have caused changes in component lead color codes and in resistor and capacitor values.



In some receivers, R219 was omitted.

In some receivers, R130 was 390K.

In some receivers, C105A was 1500, C110 A and B were 1500 and C156 was .033.

In some receivers, R155 was 12K and R130 was connected between pin 7 of V106 and gnd.

In some receivers, R120 was 1000

In some receivers R115 was 3900, R119 was 8200 and L116 was omitted. L102 was tuned to 22.5 and T104 was tuned to 24.35 mc.

Figure 7—Circuit Schematic Diagram

RCA VICTOR

TELEVISION RECEIVERS
MODELS 6T53, 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76

Chassis Nos. KCS47, KCS47T, KCS47A or KCS47AT

— Mfr. No. 274 —

SERVICE DATA

— 1950 No. T14 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Model 6T53 "Newport"
Mahogany Finish Metal

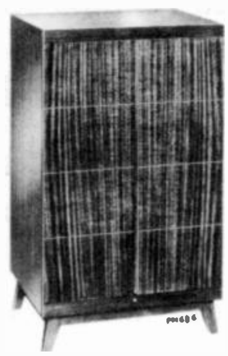
Model 6T54 "Kent"
Mahogany Finish Metal

Model 6T64 "Kingsbury"
Walnut, Mahogany, Limed Oak

Model 6T65 "Highland"
Walnut, Mahogany, Limed Oak

Model 6T71 "Fairfield"
Walnut, Mahogany, Limed Oak

Model 6T74 "Regency"
Walnut, Mahogany



Model 6T75 "Modern"
Walnut, Mahogany, Limed Oak

Model 6T76 "Provincial"
Mahogany, Natural Walnut, Maple

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE.......146 square inches on a 16GP4 Kinescope

TELEVISION R-F FREQUENCY RANGE
All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.

POWER SUPPLY RATING......115 volts, 60 cycles, 205 watts

AUDIO POWER OUTPUT RATING.............3.5 watts max.

CHASSIS DESIGNATIONS
KCS47 or KCS47T...................In Models 6T53 and 6T54
KCS47A or KCS47AT..In 6T64, 6T65, 6T71, 6T74, 6T75 and 6T76

LOUDSPEAKERS
KCS47 or KCS47T......(92580-4) 8" PM Dynamic, 3.2 ohms
KCS47A or KCS47AT..(92569-11) 12" PM Dynamic, 3.2 ohms

WEIGHT AND DIMENSIONS (inches)

Model	Net Weight	Shipping Weight	Width	Height	Depth
6T53	92	117	21½	21	20
6T54	106	139	21½	37⅞	20
6T64	88	107	23¾	36¾	19¼
6T65	94	112	27¼	37¾	19½
6T71	108	131	28	36¾	22¼
6T74	113	131	27¼	36¾	21½
6T75	122	144	23½	41	21
6T76	109	132	28	37	21½

RECEIVER ANTENNA INPUT IMPEDANCE
Choice: 300 ohms balanced or 72 ohms unbalanced.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6CB6	R-F Amplifier
(2)	RCA 6J6	R-F Oscillator and Mixer
(3)	RCA 6AU6	1st Sound I-F Amplifier
(4)	RCA 6AU6	2nd Sound I-F Amplifier
(5)	RCA 6AL5	Sound Discriminator
(6)	RCA 6AV6	1st Audio Amplifier
(7)	RCA 6K6GT	Audio Output
(8)	RCA 6AU6	1st Picture I-F Amplifier
(9)	RCA 6CB6	2nd Picture I-F Amplifier
(10)	RCA 6AU6	3rd Picture I-F Amplifier
(11)	RCA 6CB6	4th Picture I-F Amplifier
(12)	RCA 6AL5	Picture 2nd Detector and AGC Detector
(13)	RCA 12AU7	1st and 2nd Video Amplifier
(14)	RCA 12AU7	DC Restorer and Sync Separator
(15)	RCA 6J5	Vertical Sweep Oscillator
or	RCA 6SN7GT	Sync Separator and Vertical Sweep Osc.
(16)	RCA 6K6GT	Vertical Sweep Output
(17)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(18)	RCA 6BG6G	Horizontal Sweep Output
(19)	RCA 6W4GT	Damper
(20)	RCA 1B3-GT/8016	High Voltage Rectifier
(21)	RCA 16GP4, 16GP4A, 16GP4B or 16GP4C	Kinescope
(22)	RCA 5U4G	Rectifier

(Specifications continued on page 2.)

6T53, 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76 ELECTRICAL AND MECHANICAL SPECIFICATIONS

(Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency	25.50 mc.
Adjacent Channel Sound Trap	27.00 mc.
Accompanying Sound Traps	21.00 mc.
Adjacent Channel Picture Carrier Trap	19.50 mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency	21.00 mc.
Sound Discriminator Band Width between peaks	400 kc

VIDEO RESPONSE	To 4 mc.
FOCUS	Magnetic
SWEEP DEFLECTION	Magnetic
SCANNING	Interlaced, 525 line
HORIZONTAL SWEEP FREQUENCY	15,750 cps
VERTICAL SWEEP FREQUENCY	60 cps
FRAME FREQUENCY (Picture Repetition Rate)	30 cps

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT REMOVE THE RECEIVER CHASSIS, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. See that the TV-PH switch on the rear apron is in the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Adjust the PICTURE and BRIGHTNESS controls for suitable picture contrast and brightness.

9. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

10. In switching from one channel to another, it may be necessary to repeat steps 4 and 8.

11. When the set is turned on again after an idle period it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

12. If the positions of the controls have been changed, it may be necessary to repeat steps 2 through 8.

13. To use a record player, plug the record-player output cable into the PHONO jack on the rear apron, and set the TV-PH switch to "PH."

14. On console type receivers, to turn on station escutcheon light, pull out on picture control knob, and push in to turn off.

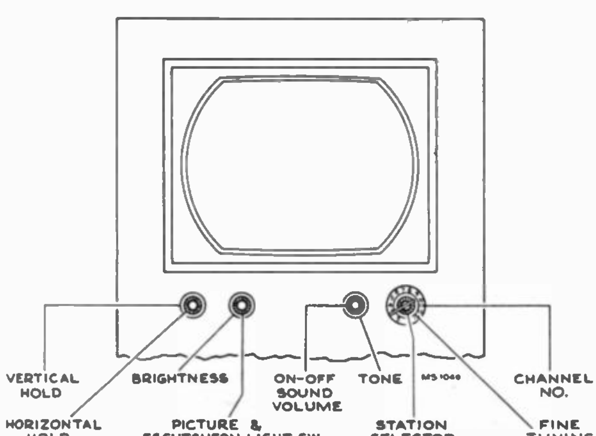


Figure 1—Receiver Operating Controls

Check to see that the kinescope high voltage lead clip is in place.

Connect the antenna transmission line to the receiver antenna terminals. Plug a power cord into the 115 volt a-c power source and into the receiver interlock receptacle. Turn the receiver power switch to the "on" position, the brightness control fully clockwise, and the picture control counter-clockwise.

ION TRAP MAGNET ADJUSTMENT. — Set the ion trap magnet approximately in the position shown in Figure 2. Starting from this position immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Turn the focus control (shown in Figure 2) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches of this adjustment should be made with the brightness control at the maximum clockwise position with which good line focus can be maintained.

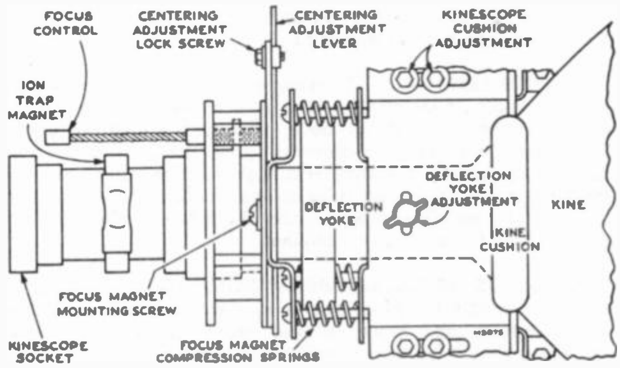


Figure 2—Yoke and Focus Magnet Adjustments

DEFLECTION YOKE ADJUSTMENT. — If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS. — It will now be necessary to obtain a test pattern picture in order to make further adjustments.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn S106 on the rear apron (see Figure 3) counter-clockwise until the set operates normally and the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT. — Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 2 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull-in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Magnet Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR. — If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments.

Horizontal Frequency Adjustment — Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T108 horizontal frequency adjustment on top of the chassis until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Locking Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. The picture may remain in sync. If so turn the T108 top core slightly and momentarily switch off channel. Repeat until the picture falls out of sync with the diagonal lines sloping down to the left. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 2 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C147A slightly clockwise. If less than 2 bars are present, adjust C147A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 2 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure on page 9. For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

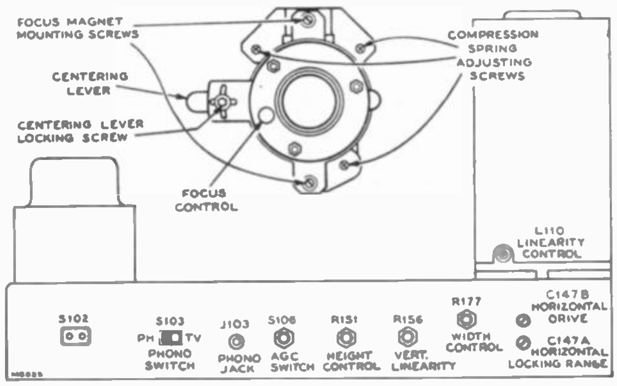


Figure 3—Rear Chassis Adjustments

FOCUS MAGNET ADJUSTMENT. — The focus coil should be adjusted so that there is approximately three-eighths inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus magnet. This spacing gives best average focus over the face of the tube.

The axis of the hole through the magnet should be parallel with the axis of the kinescope neck with the kinescope neck through the middle.

CENTERING ADJUSTMENT. — No electrical centering controls are provided. Centering is accomplished by means of a separate plate on the focus magnet. Some centering plates include a locking screw which must be loosened before centering, and others are held in adjustment by friction. Up and down adjustment of the plate moves the picture side to side and sidewise adjustment moves the picture up and down.

If a corner of the raster is shadowed, check the position of the ion trap magnet. Reposition the magnet within the range of maximum raster brightness to eliminate the shadow and recenter the picture by adjustment of the focus magnet plate. In no case should the magnet be adjusted to cause any loss of brightness since such operation may cause immediate or eventual damage to the tube. In some cases it may be necessary to shift the position of the focus magnet in order to eliminate a corner shadow.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS. — Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage, hence the brightest and best focused picture, adjust horizontal drive counter-clockwise as far as possible without stretching the left side of the picture. As a first adjustment, set the horizontal drive trimmer C147B one-half turn out from maximum capacity.

Turn the horizontal linearity coil out until appreciable loss in width occurs, then in until nearly maximum width and the best linearity is obtained.

Adjust the width control R177 to obtain correct picture width.

A slight readjustment of these three controls may be necessary to obtain the best linearity.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS. —Adjust the height control (R151 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R156 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

FOCUS. — Adjust the focus magnet for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

On focus magnets using two shunts, the one with the cable is the "fine adjustment" and the other is the "focus range" adjustment. In general, the two shunts should be adjusted to approximately equal positions.

Recheck the position of the ion trap magnet to make sure that maximum brightness is obtained.

Check to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

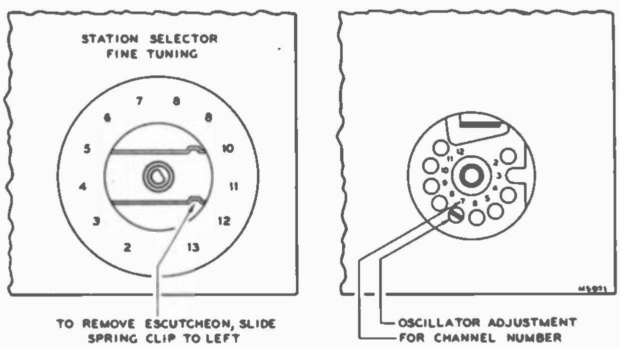


Figure 4—R-F Oscillator Adjustments

CHECK OF R-F OSCILLATOR ADJUSTMENTS. — Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure on page 10. The adjustments for channels 2 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment of channel 13 is on top of the chassis.

AGC CONTROL. — The AGC control switch is provided as an installation adjustment. The normal position for strong signal areas is with the switch in the number 1 or counterclockwise position. If impulse type of interference is experienced, turn the switch to the number 2 or center position. In very weak signal areas in which impulse type interference is experienced, turn the switch to position number 3 or fully clockwise. In this position, all AGC is removed and the receiver will overload if the input signal exceeds 200 microvolts. However, for signals under 200 microvolts, this position of the AGC control switch gives best noise immunity of sync.

FM TRAP ADJUSTMENT. — In some instances interference may be encountered from a strong FM station signal. A trap is provided to eliminate this type of interference. To adjust the trap tune in the station on which the interference is observed and adjust the L203 core on top of the r-f unit for minimum interference in the picture.

CAUTION. — In some receivers, the FM trap L203 will tune down into channel 6 or even into channel 5. Needless to say, such an adjustment will cause greatly reduced sensitivity on these channels. If channels 5 or 6 are to be received, check L203 to make sure that it does not affect sensitivity at these two channels.

Replace the cabinet back and reconnect the antenna leads to the cabinet back.

CABINET ANTENNA. — A cabinet antenna is provided in all except model 6T53 and 6T54 receivers and the leads are brought out near the antenna terminal board. The cabinet antenna may be employed in place of the outdoor antenna in areas where the signals are strong and no reflections are experienced.

VENTILATION CAUTION. — The receiver is provided with adequate ventilation holes in the bottom and back of the cabinet. Care should be taken not to allow these holes to be covered or ventilation to be impeded in any way.

If the receiver is to be operated with the back of the cabinet near a wall, at least a two-inch clearance should be maintained between cabinet and wall.

CHASSIS REMOVAL. — To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the control knobs the cabinet back, unplug the speaker cable, the kinescope socket, the antenna cable, the pilot light cable on console models, the yoke and high voltage cable. Remove the yoke frame grounding strap on the wooden cabinet models. Take out the six chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet.

KINESCOPE HANDLING PRECAUTION. — Do not install, remove, or handle the kinescope in any manner, unless shatterproof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope from the cabinet, take out the four screws and one wing screw which hold the yoke frame to the cabinet. Remove the kinescope, the yoke frame with yoke and focus magnet as an assembly.

INSTALLATION OF KINESCOPE. — Handle this tube by the metal rim at the edge of the screen. Do not cover the glass bell of the tube with fingermarks as it will produce leakage paths which may interfere with reception. If this portion of the tube has inadvertently been handled, wipe it clean with a soft cloth moistened with "dry" carbon tetrachloride.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and fingermarks with a soft cloth moistened with "Windex" or similar cleaning agent.

Turn the tube so that the key on the base of the tube will be down and insert the neck of the kinescope through the deflection coil and focus magnet. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Replace the kinescope and yoke frame assembly in the cabinet. Insert the four screws and wing screw and tighten.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible. If this is not done, difficulty will be encountered in adjusting the ion trap and focus magnet because of shadows on the corner of the raster.

Slide the chassis into the cabinet, then insert and tighten the six chassis bolts.

Slip the ion trap magnet over the neck of the kinescope.

Connect the kinescope socket to the tube base and connect the high voltage lead from the rim of the kinescope into the high voltage bushing on the high voltage compartment.

Reconnect all other cables. Do not forget to replace the yoke frame grounding strap. Perform the entire set-up procedure beginning with Ion Trap Magnet Adjustment.

CHASSIS TOP VIEW

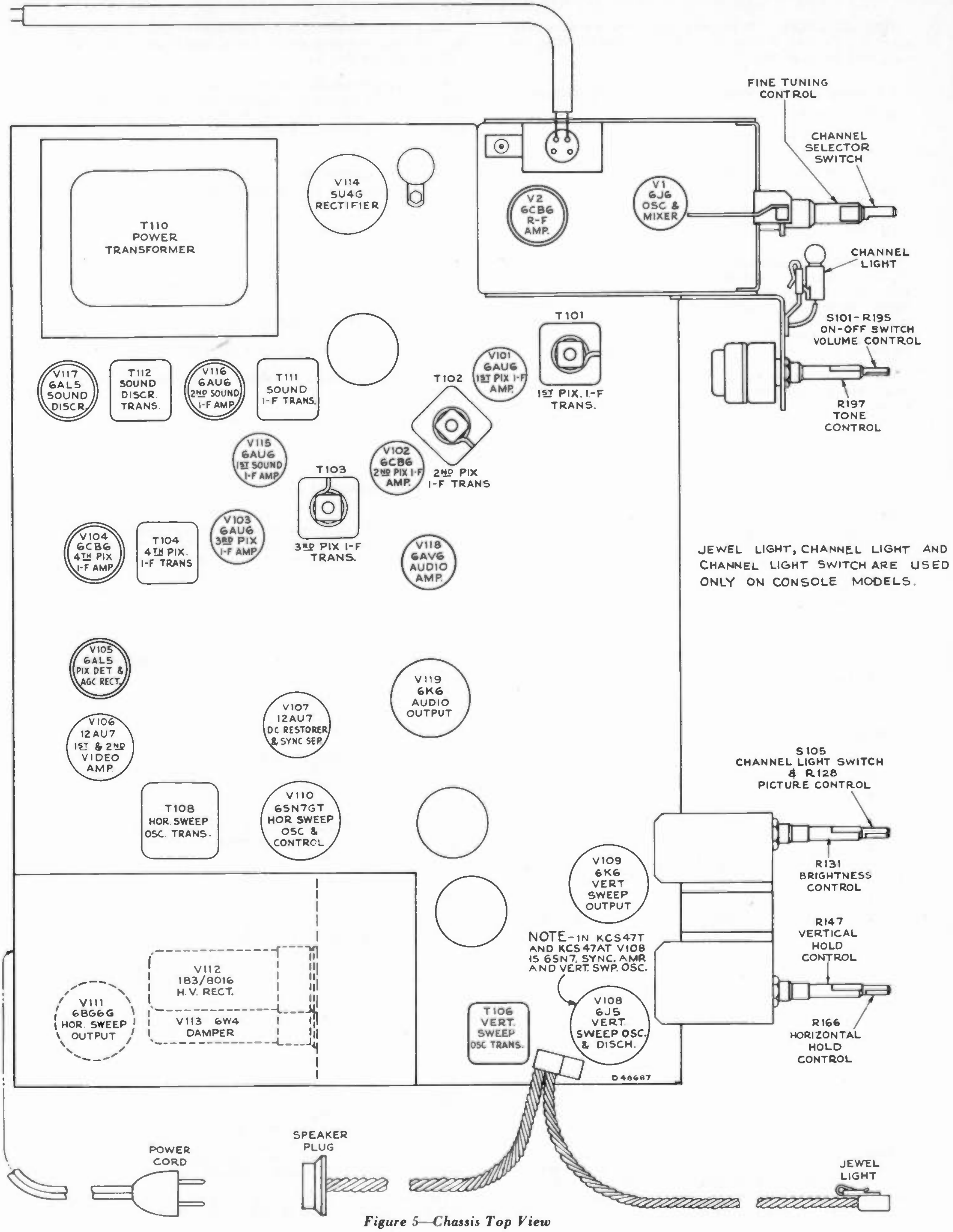


Figure 5—Chassis Top View

ALIGNMENT PROCEDURE

TEST EQUIPMENT. — To properly service the television chassis of this receiver, it is recommended that the following test equipment be available:

R-F Sweep Generator meeting the following requirements:

(a) Frequency Ranges

20 to 30 mc., 1 mc. and 10 mc. sweep width
50 to 90 mc., sweep width
170 to 225 mc., 10 mc. sweep width

(b) Output adjustable with at least .1 volt maximum.

(c) Output constant on all ranges.

(d) "Flat" output on all attenuator positions.

Cathode-Ray Oscilloscope. — For alignment purposes, the oscilloscope employed must have excellent low frequency and phase response, and should be capable of passing a 60-cycle square wave without appreciable distortion. While this requirement is not met by many commercial instruments, RCA Oscilloscopes, types WO-55A, WO-58A, WO-79A, and WO-60C fill the requirement and any of these may be employed.

For video and sync waveform observations, the oscilloscope must have excellent frequency and phase response from 10 cycles to at least two megacycles in all positions of the gain control. The RCA types WO-58A and WO-79A are ideally suited for this purpose.

Signal Generator to provide the following frequencies with crystal accuracy.

(a) Intermediate frequencies

19.50 mc. adjacent channel picture trap
21.00 mc. sound i-f and sound traps
22.3 and 25.4 mc. conv. and first pix i-f trans.
25.3 mc. second picture i-f transformer
22.5 mc. fourth picture i-f transformer
21.75 mc. third picture i-f transformer
24.35 mc. fifth picture i-f coil
25.50 mc. picture carrier
27.00 mc. adjacent channel sound trap

(b) Radio frequencies

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.
2	55.25	59.75
3	61.25	65.75
4	67.25	71.75
5	77.25	81.75
6	83.25	87.75
7	175.25	179.75
8	181.25	185.75
9	187.25	191.75
10	193.25	197.75
11	199.25	203.75
12	205.25	209.75
13	211.25	215.75

(c) Output of these ranges should be adjustable and at least .1 volt maximum.

Heterodyne Frequency Meter with crystal calibrator if the signal generator is not crystal controlled.

Electronic Voltmeter of Junior or Senior "VoltOhmyst" type and a high voltage multiplier probe for use with this meter to permit measurements up to 15 kv.

Service Precautions. — If possible, the chassis should be serviced without the kinescope. However, if it is necessary to view the raster during servicing, it would be a great convenience to have a set of yoke, focus coil, kinescope socket, high voltage and speaker extension cables.

CAUTION. — Do not short the kinescope second anode lead. Its short circuit current presents a considerable overload on the high voltage rectifier V112.

Adjustments Required. — Normally, only the r-f oscillator and mixer lines will require the attention of the service technician. All other circuits are either broad or very stable and hence will seldom require readjustment.

ORDER OF ALIGNMENT. — When a complete receiver alignment is necessary, it can be most conveniently performed in the following order:

(1) Sound discriminator
(2) Sound i-f transformers
(3) Picture i-f traps
(4) Picture i-f transformers
(5) R.F. unit
(6) Overall picture i-f
(7) Horizontal oscillator
(8) Sensitivity check

SOUND DISCRIMINATOR ALIGNMENT. — Set the signal generator for approximately .1 volt output at 21.00 mc. and connect it to the second sound i-f grid, pin 1 of V116.

Detune T112 secondary (bottom) to the extreme counterclockwise position.

Set the "VoltOhmyst" on the 3-volt scale.

Connect the meter, in series with a 1-megohm resistor, to pin 7 of V117.

Adjust the primary of T112 (top) for maximum output on the meter.

Connect the "VoltOhmyst" to the junction of R192 and S103. Adjust T112 secondary (bottom). It will be found that it is possible to produce a positive or negative voltage on the meter dependent upon this adjustment. Obviously to pass from a positive to a negative voltage, the voltage must go through zero. T112 (bottom) should be adjusted so that the meter indicates zero output as the voltage swings from positive to negative. This point will be called discriminator zero output.

Connect the sweep oscillator to the grid of the second sound i-f amplifier, pin 1 to V116.

Adjust the sweep band width to approximately 1 mc. with the center frequency at approximately 21.00 mc. and with an output of approximately .1 volt.

Connect the oscilloscope to the junction of R192 and S103. The pattern obtained should be similar to that shown in Figure 12. If it is not, adjust T112 (top) until the wave form is symmetrical.

The peak-to-peak band width of the discriminator should be approximately 400 kc. and the trace should be linear from 20.925 mc. to 21.075 mc.

Note. — The bottom core and stud in the discriminator transformer are at plus B potential.

SOUND I-F ALIGNMENT. — Connect the sweep oscillator to the first sound i-f amplifier grid, pin 1 of V115.

Insert a 21.00 mc. marker signal from the signal generator into the first sound i-f grid.

With the oscilloscope connected as above, adjust T111 for maximum gain and symmetry about the 21.00 mc. marker on the discriminator pattern. The pattern obtained should be similar to that shown in Figure 12.

The output level from the sweep should be set to produce approximately 1.0 volt peak-to-peak at the junction of R192 and S103, when the final touches on the above adjustment are made. It is necessary that the sweep output voltage should not exceed the specified values otherwise the response curve will be broadened, permitting slight misadjustment to pass unnoticed and possibly causing distortion on weak signals.

The band width at 70% response from the first sound i-f grid to the second i-f grid should be approximately 530 kc.

PICTURE I-F TRAP ADJUSTMENT. — Connect the "VoltOhmyst" to the junction of R102 and R201.

Obtain a 7.5 volt battery capable of withstanding appreciable current drain and connect the ends of a 1,000 ohm potentiometer across it. Connect the battery positive terminal to chassis and the potentiometer arm to the junction of R102 and R201. Adjust the potentiometer for −3.0 volts indication on the "VoltOhmyst."

Set the channel switch to the blank position between channels number 2 and 13.

Connect the "VoltOhmyst" to pin 2 of V106 and to ground.

Connect the output of the signal generator to terminal D of T101.

Set the generator to each of the following frequencies and with a thin fiber screwdriver tune the specified adjustment for minimum indication on the "VoltOhmyst." In each instance the generator should be checked against a crystal calibrator to insure that the generator is exactly on frequency.

(1) 21.00 mc.—T103 (top)
(2) 21.00 mc.—T105 (top)
(3) 27.00 mc.—T102 (top)
(4) 27.00 mc.—T104 (top)
(5) 19.50 mc.—T101 (top)

In the above transformers using threaded cores, it is possible to run the cores completely through the coils and secure two peaks or nulls. The correct position is with the cores in the outside ends of the coils. If the cores are not in the correct position, the coupling will be incorrect and it will be impossible to secure the correct response.

PICTURE I-F TRANSFORMER ADJUSTMENTS. — Set the signal generator to each of the following frequencies and peak the specified adjustment for maximum indication on the "VoltOhmyst." During alignment, reduce the input signal if necessary to prevent overloading.

*24.35 mc.—L103	21.75 mc.—T103 (bottom)
*22.5 mc.—T104 (bottom)	25.3 mc.—T102 (bottom)

*In some receivers R113 was 3,900, R119 was 8,200, and L114 was omitted, T104 (bottom) was tuned to 24.35 mc. and L103 was tuned to 22.5 mc.

R-F UNIT ALIGNMENT. — Disconnect the co-ax link from terminal 2 of the r-f unit terminal board and connect a 39 ohm composition resistor between lugs 1 and 2.

Detune T1 by backing the core all the way out of the coil.

In early production units in which L44 is adjustable, back the L44 core all the way out. Back L203 core all the way out.

In order to align the r-f tuner, it will first be necessary to set the channel-13 oscillator to frequency. The shield over the bottom of the r-f unit must be in place when making any adjustments.

The oscillator may be aligned by adjusting it to beat with a crystal-calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available. Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated.

If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, couple the meter probe loosely to the receiver oscillator.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier signal, connect the signal generator to the receiver antenna terminals. Connect the "VoltOhmyst" to the sound discriminator output (junction of R192 and S103). Also couple the link loosely to lug 2 of the r-f unit terminal board so as to permit measurement of sound discriminator.

Set the channel selector switch to 13.

Adjust the frequency standard to the correct frequency (236.75 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator.

Set the fine tuning control to the middle of its range.

Adjust C1 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator.

Now that the channel-13 oscillator is set to frequency, we may proceed with the r-f alignment.

Turn the AGC control to the counter-clockwise position.

Connect the bias box to terminal 3 of the r-f unit terminal board and adjust the bias box potentiometer for −3.5 volts.

Connect the oscilloscope to the test connection at R5 on top of the r-f unit.

Connect the r-f sweep oscillator to the receiver antenna terminals. The method of connection depends upon the output impedance of the sweep. The P300 connections for 300-ohm balanced or 72-ohm single-ended input are shown in the circuit schematic diagram. If the sweep oscillator has a 50-ohm single-ended output, 300-ohm balanced output can be obtained by connecting as shown in Figure 7.

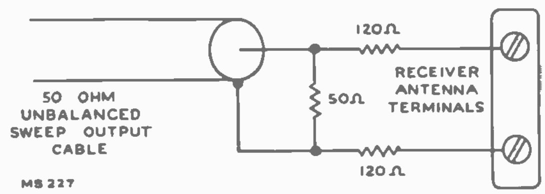


Figure 7—Unbalanced Sweep Cable Termination

Connect the signal generator loosely to the receiver antenna terminals.

Set the receiver channel switch to channel 8.

Set the sweep oscillator to cover channel 8.

Insert markers of channel 8 picture carrier and sound carrier, 181.25 mc. and 185.75 mc.

Adjust C9, C11, C16 and C22 for approximately correct curve shape, frequency, and band width as shown in Figure 15.

The correct adjustment of C22 is indicated by maximum amplitude of the curve midway between the markers. C16 tunes the r-f amplifier plate circuit and affects the frequency of the curve most noticeably. C9 tunes the converter grid circuit and affects the tilt of the curve most noticeably (assuming that C22 has been properly adjusted). C11 is the coupling adjustment and hence primarily affects the response band width.

Set the receiver channel switch to channel 6.

Adjust the frequency standard to the correct frequency (108.75 mc. for heterodyne frequency meter or 87.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range.

Adjust L5 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator.

Set the sweep generator to channel 6.

From the signal generator, insert channel 6 sound and picture carrier markers, 83.25 mc. and 87.75 mc.

Adjust L42, L45 and L49 for proper response as shown in Figure 15.

L42 is adjusted to give maximum amplitude of the curve between the markers. L45 primarily affects the tilt of the curve. L49 primarily affects the frequency of response.

Connect the "VoltOhmyst" to the r-f unit test point at R5.

Adjust C7 for −3.0 volts at the test point.

Retouch L42, L45 and L49 for proper response if necessary. If necessary, retouch C11 for proper band width on channel 6. Continue these retouching adjustments until proper response is obtained and −3.0 volts of oscillator injection are present at the test point.

Set the receiver channel selector switch to channel 8 and readjust C1 for proper oscillator frequency.

Set the sweep oscillator and signal generator to channel 8.

Readjust C9, C16 and C22 for correct curve shape, frequency and band width. Readjust C11 only if necessary.

Switch the receiver, the sweep oscillator and signal generator to channel 13.

Adjust L52 for maximum amplitude of the curve midway between markers and then overshoot the adjustment by turning the slug in the same direction from the initial setting a little more than the amount of turning required to reach maximum amplitude of response.

Adjust C22 for maximum amplitude of response.

Turn off the sweep generator. Adjust the L43 core for correct channel 13 oscillator frequency, then overshoot the adjustment by turning the slug a little more in the same direction from the initial setting. Reset the oscillator to proper frequency by adjustment of C1.

Turn the sweep oscillator back on.

Check the response of channels 7 through 13 by switching the receiver channel switch, sweep oscillator and marker oscillator to each of these channels and observing the response and oscillator injection obtained. See Figure 15 for typical response curves. It should be found that all these channels have the proper shaped response with the markers above 80% response.

If the markers do not fall within this requirement, switch to channel 8 and readjust C9, C11, C16 and C22 as necessary. If C22 required adjustment, the adjustment should be overshot a small amount and corrected by adjustment of L52 to give maximum amplitude of response between the sound and picture carrier markers. The antenna circuit (L52, C22) is broad so that tracking is not particularly critical.

If the valley in the top of the selectivity curves for the high channels is deeper than normal, the curve can be flattened somewhat by decreasing the inductance of L44 by turning the core stud in. Be sure to check for undesirable resonant suckouts on channels 7 and 8 if this is done. In later production units, L44 may be fixed and not require adjustment.

Turn the sweep oscillator off and check the receiver channel 8 r-f oscillator frequency. If the oscillator is off frequency overshoot the adjustment of C1 and correct by adjusting L43.

Turn the receiver channel selector switch to channel 6. Adjust L5 for correct oscillator frequency.

Turn the sweep oscillator on and to channel 6 and observe the response curve. If necessary readjust L42, L45 and L49. It should not be necessary to touch C11.

Check the oscillator injection voltage at the test point. If necessary adjust C7 to give −3 volts injection. If C7 is adjusted, switch to channel 8, and readjust C9 for proper curve shape, then recheck channel 6.

Switch the receiver through channel 6 down through channel 2 and check for normal response curve shapes and oscillator injection voltage.

Likewise check channels 7 through 13, stopping on 13 for the next step.

With the receiver on channel 13, check the receiver oscillator frequency. Correct by adjustment of C1 if necessary.

Adjust the oscillator to frequency on all channels by switching the receiver and the frequency standard to each channel and adjusting the appropriate oscillator trimmer for the specified indication. It should be possible to adjust the oscillator to the correct frequency on all channels with the fine tuning control in the middle third of its range.

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.	Channel Oscillator Adjustment
2	55.25	59.75	80.750	L1
3	61.25	65.75	86.750	L2
4	67.25	71.75	92.750	L3
5	77.25	81.75	102.750	L4
6	83.25	87.75	108.750	L5
7	175.25	179.75	200.750	L6
8	181.25	185.75	206.750	L7
9	187.25	191.75	212.750	L8
10	193.25	197.75	218.750	L9
11	199.25	203.75	224.750	L10
12	205.25	209.75	230.750	L11
13	211.25	215.75	236.750	C1

Switch to channel 8 and observe the response.

Adjust T1 clockwise while watching the change in response. When T1 is properly adjusted, the selectivity curve will be slightly wider with a slightly deeper valley in its top.

Switch through all channels and observe response, oscillator injection and r-f oscillator frequency. Minor touch-ups of adjustments may be made at this time. However, if C7 or C9 are changed appreciably, then a recheck of the oscillator frequency on all channels should be made.

Reconnect the link from T101 to terminal 2 of the r-f unit terminal board.

Since T1 was adjusted during the r-f unit alignment it will be necessary to sweep the overall i-f response.

R-F UNIT TUBE CHANGES. — Since most of the circuits are low capacitance circuits the r-f unit may require readjustments when the tubes are changed.

If the 6CB6 r-f amplifier tube is changed, it may be necessary to readjust C16 and C22.

If the 6J6 oscillator and mixer tube is changed, then more extensive adjustments are required.

For good conversion efficiency, the oscillator injection to a triode mixer must be held reasonably close to the optimum value. Although there is some latitude in this level, it is nearly expended in the normal variation in injection from channel to channel. Consequently, the adjustment of C7 is limited primarily to establishing the conditions for good conversion. Since changes in oscillator injection affect conversion gain, it also affects the input capacity of the mixer, thus also affecting tracking of the mixer grid circuit. These tube variations with their consequent effect on circuit alignment thereby require readjustment of the r-f unit if maximum conversion efficiency is to be retained after the 6J6 tube is changed. It may be possible, however, to try several 6J6 tubes and select one which gives satisfactory performance without realignment.

SWEEP ALIGNMENT OF PIX I-F. — Set the r-f unit bias to −3.5 volts.

Connect a 47 ohm resistor across the link circuit at T101 terminals C and D.

Remove the second picture i-f tube.

With the oscilloscope connected to the r-f unit test connection and the sweep oscillator connected to the antenna terminals, set the sweep output to give 0.1 volt peak-to-peak on the oscilloscope.

Switch through the channels and select one that is essentially flat and with the two carriers at 90% response or higher. Channel 6 is usually the most desirable for this test.

Remove the 47 ohm resistor and replace V102.

Connect the oscilloscope to terminal 2 of V106 socket.

Clip 330 ohm resistors across R106, R108, R113 and R119.

Connect the bias box to the junction of R102 and R201. Adjust the box for −1 volt.

Adjust the sweep oscillator output to give 0.5 volt peak-to-peak on the oscilloscope.

Connect the signal generator loosely to the i-f amplifier.

Adjust T1 and T101 bottom core to obtain the response curve shown in Figure 13.

Remove the 330 ohm resistors across R106, R108, R113 and R119.

Set the i-f bias to −4.5 volts.

Adjust the sweep output to give 3 volts peak-to-peak on the oscilloscope.

Retouch T1, T101 bottom, T102 bottom, T103 bottom, T104 bottom and L103 to obtain the response curve shown in Figure 14.

HORIZONTAL OSCILLATOR ADJUSTMENT. — Normally the adjustment of the horizontal oscillator is not considered to be a part of the alignment procedure, but since the oscillator waveform adjustment requires the use of an oscilloscope, it can not be done conveniently in the field. The waveform adjustment is made at the factory and normally should not require readjustment in the field. However, the waveform adjustment should be checked whenever the receiver is aligned or whenever the horizontal oscillator operation is improper.

Horizontal Frequency Adjustment. — With a clip lead, short circuit the coil between terminals C and D of the horizontal oscillator transformer T108. Tune in a television station and sync the picture if possible.

A. — Turn the horizontal hold control R166 to the extreme clockwise position. Adjust the T108 Frequency Adjustment (atop the chassis) so that the picture is just out of sync and the horizontal blanking appears in the picture as a vertical bar. The position of the bar is unimportant.

B. — Turn the hold control approximately one-quarter of a turn from the extreme clockwise position and examine the width and linearity of the picture. If picture width or linearity is incorrect, adjust the horizontal drive control C147B, the width control R177 and the linearity control L110 until the picture is correct. If C147B, R177 or L110 were adjusted, repeat step A above.

Horizontal Locking Range Adjustment. — Turn the horizontal hold control fully counter-clockwise. The picture may remain in sync. If so, turn the T108 top core slightly and momentarily switch off channel. Repeat until the picture falls out of sync with the diagonal lines sloping down to the left. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 9 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C147A slightly clockwise. If less than 7 bars are present, adjust C147A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 7 to 9 bars are present.

Horizontal Oscillator Waveform Adjustment. — Remove the shorting clip from terminals C and D of T108. Turn the horizontal hold control to the extreme clockwise position. With a thin fibre screwdriver, adjust the Oscillator Waveform Ad ustment Core of T108 (under the chassis) until the horizontal blanking bar appears in the center.

A. — Connect the low capacity probe of an oscilloscope to terminal C of T108. Turn the horizontal hold control one-quarter turn from the clockwise position so that the picture is in sync. The pattern on the oscilloscope should be as shown in Figure 16. Adjust the Oscillator Waveform Adjustment Core of T108 until the two peaks are at the same height. During this adjustment, the picture must be kept in sync by readjusting the hold control if necessary.

This adjustment is very important for correct operation of the circuit. If the broad peak of the wave on the oscilloscope is lower than the sharp peak, the noise immunity becomes poorer, the stabilizing effect of the tuned circuit is reduced and drift of the oscillator becomes more serious. On the other hand, if the broad peak is higher than the sharp peak, the oscillator is overstabilized, the pull-in range becomes inadequate and the broad peak can cause double triggering of the oscillator when the hold control approaches the clockwise position.

Remove the oscilloscope upon completion of this adjustment.

Check of Horizontal Oscillator Adjustments. — Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 2 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C147A slightly clockwise. If less than 2 bars are present, adjust C147A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 2 bars are present.

Turn the horizontal hold control to the maximum clockwise position. The picture should be just out of sync to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Adjust the T108 Frequency Adjustment until this condition is fulfilled.

SENSITIVITY CHECK. — A comparative sensitivity check can be made by operating the receiver on a weak signal from a television station and comparing the picture and sound obtained to that obtained on other receivers under the same conditions.

This weak signal can be obtained by connecting the shop antenna to the receiver through a ladder type attenuator pad. The number of stages in the pad depends upon the signal strength available at the antenna. A sufficient number of stages should be inserted so that a somewhat less than normal contrast picture is obtained when the picture control is at the maximum clockwise position. Only carbon type resistors should be used to construct the pad.

RESPONSE CURVES. — The response curves shown on page 12 and referred to throughout the alignment procedure were taken from a production set. Although these curves are typical, some variations can be expected.

The response curves are shown in the classical manner of presentation, that is with "response up" and low frequency to the left. The manner in which they will be seen in a given test set-up will depend upon the characteristics of the oscilloscope and the sweep generator. The curves may be seen inverted and/or switched from left to right depending on the deflection polarity of the oscilloscope and the phasing of the sweep generator.

NOTES ON R-F UNIT ALIGNMENT. — Because of the frequency spectrum involved and the nature of the device, many of the r-f unit leads and components are critical in some respects. Even the power supply leads form loops which couple to the tuned circuits, and if resonant at any of the frequencies involved in the performance of the tuner, may cause serious departures from the desired characteristics. In the design of the receiver these undesirable resonant loops have been shifted far enough away in frequency to allow reasonable latitude in their components and physical arrangement without being troublesome. When the r-f unit is aligned in the receiver, no trouble from resonant loops should be experienced. However, if the unit is aligned in a jig separate from the receiver, attention should be paid to insure that unwanted resonances do not exist which might present a faulty representation of r-f unit alignment.

A resonant circuit exists between the r-f tuner chassis and the outer shield box, which couples into the antenna and r-f plate circuits. The frequency of this resonance depends on the physical structure of the shield box, and the capacitance between the tuner chassis and the front plate. In the KRK8 units, this resonance should fall between 120 and 135 mc. and is controlled in the design by using insulating washers of different thicknesses (in the front plate to tuner chassis mounting) to compensate for differences in the shield boxes of different models of receivers. The performance of the tuner, particularly on channels 7 and 8 will be impaired if the proper washers for the particular shield box involved are not used. Obviously then, if the r-f unit is removed for service, the washers should be replaced in the correct order when the unit is replaced.

6T53, 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76

ALIGNMENT TABLE

THE DETAILED ALIGNMENT PROCEDURE BEGINNING ON PAGE 6 SHOULD BE READ BEFORE ALIGNMENT BY USE OF THE TABLE IS ATTEMPTED

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
	DISCRIMINATOR AND SOUND I-F ALIGNMENT								
1	2nd sound i-f grid (pin 1, V116)	21.00 .1 volt output	Not used		Not used	In series with 1 meg. to pin 7 of V117	Meter on 3 volt scale	Detune T112 (bot.) Adjust T112 (top) for max. on meter	Fig. 12 Fig. 9 Fig. 8
2	"	"	"		"	Junction of R192 & S103	Meter on 3 volt scale	T112 (bottom) for zero on meter	Fig. 12 Fig. 9
3	"	"	2nd sound i-f grid (pin 1, V116)	21.00 center 1 mc. wide .1 v. out	Junction of R192 & S103	Not used	Check for symmetrical response wave-form (positive & negative). If not equal adjust T112 (top) until they are equal.		Fig. 12 Fig. 9
4	1st sound i-f grid (pin 1, V115)	21.00 reduced output	1st sound i-f grid (pin 1, V115)	21.00 reduced output	"	"	Sweep output reduced to provide 1.0 volt p-to-p on scope	T111 for max. gain and symmetry at 21.00 mc.	Fig. 12 Fig. 10 Fig. 9 Fig. 8
	PICTURE I-F AND TRAP ADJUSTMENT								
5	Not used		Not used	—	Not used	Junction of R102 & R201	Connect bias box to junction of R102 & R201 and to ground	Adjust potentiometer for −3.0 volts on meter	Fig. 10
6	Terminal D of T101	21.00	"	—	"	Pin 2 of V106 and to ground	Meter on 3 volt scale. Receiver between 2 & 13	T103 (top) for min. on meter	Fig. 10 Fig. 8
7	"	21.00	"	—	"	"	"	T105 (top) for min.	Fig. 8
8	"	27.00	"	—	"	"	"	T102 (top) for min.	"
9	"	27.00	"	—	"	"	"	T104 (top) for min.	"
10	"	19.50	"	—	"	"	"	T101 (top) for min.	"
11	"	24.35	"	—	"	"	"	L103 (top) for max.	"
12	"	22.5	"	—	"	"	"	T104 (bot.) for max.	Fig. 9
13	"	21.75	"	—	"	"	"	T103 (bot.) for max.	"

R-F UNIT ALIGNMENT

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
14	Disconnect the co-ax link from terminal 2 of the r-f unit terminal board and connect a 39 ohm composition resistor between lugs 1 and 2. If the receiver oscillator is adjusted by feeding in the r-f sound carrier signal, couple the link loosely to lug 2 of the r-f unit terminal board so as to permit measurement at sound discriminator. In early production units in which L44 is adjustable, back the L44 core all the way out. Detune T1 by backing the core all the way out of the coil. In order to align the r-f tuner, it will first be necessary to set the channel 13 oscillator to frequency. The shield over the bottom of the r-f unit must be in place when making any adjustments.									
15	Antenna terminals	215.75 mc.	Not used		Loosely coupled to r-f oscillator	236.75 mc.	Junction of R192 & S103 for signal gen. method only	Fine tuning centered. Receiver on channel 13. Het. freq. meter coupled to osc. if used.	C1 for zero on meter or beat on het. freq. meter	Fig. 10 Fig. 8
16			"				Connect "Volt-Ohmyst" to terminal 3 of the r-f unit terminal board	Turn A G C control counter - clockwise. Connect bias box to terminal 3 of r-f unit term. board.	Adjust the bias box potentiometer for −3.5 volts.	Fig. 10
17	Antenna terminal (loosely)	181.25 185.75	Antenna terminals (see text for precaution)	Sweeping channel 8	Not used	—	Not used	Rec. on chan. 8. Connect oscilloscope to test connection at R5 on top the r-f unit. Adjust C9, C11, C16 and C22. Correct curve shape, frequency, and band width. C22 is adjusted to give max. amplitude between markers. C9 primarily affects tilt and C16 primarily affects the frequency of response. C11 affects the response band width.		Fig. 15 (8)
18	"	87.75	"	Not used	Loosely coupled to r-f oscillator	108.75	Junction of R192 & S103 for signal gen. method only	Rec. on channel 6	L5 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10 Fig. 11
19	"	83.25 87.75	"	Channel 6	Not used	—		Rec. on chan. 6. Adjust L42, L45 and L49 for proper response. L42 is adjusted to give max. amplitude between markers. L45 primarily affects tilt and L49 primarily affects freq. of response. If necessary, retouch C11 for proper width.		Fig. 15 (6)
20	Not used	—	Not used	—	Not used	—	Connect "Volt-Ohmyst" to r-f unit test point R5	Rec. on channel 6	Adjust C7 for 3.0 volts at the test point	Fig. 8 Fig. 9
21	Repeat steps 18, 19 and 20 until the specified conditions are obtained.									
22	Antenna terminal (loosely)	185.75		—	Loosely coupled to r-f oscillator	206.75	Junction of R192 & S103 for sig. gen. method only	Rec. on channel 8	C1 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10

Figure 2, shows the schematic of the same circuits of the 16" and 19" combination instruments (chassis KCS60).

Figure 3, shows the modified sync, D.C. restorer and vertical oscillator circuits, which are the same for both straight television instruments and combinations.

Comparing figure 1 with figure 3, it will be noted that V107, which was originally used as a D.C. restorer, sync separator and amplifier, is reconnected with the first half of the tube as D.C. restorer and horizontal sync separator, and with the second half connected as a vertical sync separator. V108, which was a 6J5 type used as a vertical sweep oscillator and discharge tube, is replaced by a 6SN7 type, half of which is used as the vertical sweep oscillator and discharge tube, while the remaining half is used as a sync amplifier.

If the changes covered by these schematics are warranted, the following parts are required:

Quantity	Stock No.	Symbol	Description
1*	6SN7	V108	Tube
1**	6AV6	V118	Tube
1	30733	R235	3300 ohm resistor, ½ watt
1	30494	R230	4700 ohm resistor, ½ watt
2	3078	R229, R236	10 K resistor, ½ watt
1	30650	R234	56 K resistor, ½ watt
1	3252	R233	100 K resistor, ½ watt
1	30180	R142	120 K resistor, ½ watt
4	14583	R134, R223, R231, R232	220 K resistor, ½ watt
1	73094	C215	390 mmf. mica capacitor
1	73595	C216	.0022 mfd. capacitor
1	75252	L115	550 muh. peaking coil
1	76010	S106	A. G. C. switch
1**	73117	....	7-pin miniature tube socket
1	....	....	4 lug terminal strip
1	....	....	1 lug terminal strip

* This part not required for combination instruments.
** Only required in combination models.

The additional tube and socket are required in the 16" and 19" combination models since the portion of the 6SN7 tube V108 which was formerly used as a bias-clamp is reconnected as a sync amplifier, and it is necessary to install a separate bias-clamp tube. The connections for the additional bias-clamp are shown in figure 4. Although type 6AV6 is recommended for this bias-clamp application, any of the following tubes may be used with the same socket connections, 6BA6, 6BF6, 6AT6, 6AQ6, 6AK6, 6AR5, 6AG5, 6AU6, 6BJ6 or 6CB6. The additional tube can be installed in the existing hole near the center of the chassis.

AGC CONTROL SWITCH IN "T" CHASSIS

The AGC switch used in these chassis is a four-contact, three-position rotary type. It is very similar to that used in the earlier production 16" and 19" models, the difference being that the new rotor is longer, and contacts terminal 4 when the switch is in the center (number 2) position. In addition, the leads to terminals 3 and 4 are reversed.

The correct setting for the AGC switch can be determined as follows:

1. POSITION #1 (ccw when viewed from rear) Maximum AGC voltage is used in this position. It is the correct position for strong signals.
2. POSITION #2 (center) In this position, the rotor contacts terminals 1, 2, and 4 of the AGC switch. This reduces the AGC voltage and changes the time constant of the AGC system to allow quicker recovery of the AGC from any tendency to "set up" on noise. In addition, improved noise immunity results from the change in cathode resistance of the D.C. restorer. This position of the AGC switch should be used when receiving medium to weak signals.
3. POSITION #3 (cw) In this position, the AGC voltage is completely shorted out. The receiver operates at maximum gain and maximum noise immunity. This position should only be used on very weak signals.

In some fringe areas it may be desirable to leave this switch in the No. 3 (clockwise) position for best signal-to-noise ratio. In this event, the customer should be instructed that daily or seasonal variations in signal intensity or difference in signal strength between channels may cause overload of the receiver, and he should turn this switch to No. 2 (center) position for the channel which is too strong.

POOR SOUND

When investigating the causes of weak or poor sound, do not overlook the possibility of defective 94 mmfd. capacitors contained within the sound discriminator transformer.

Also, check for loose slug adjustments in this transformer. Vibration over a period of time can cause detuning through physical movement of the slugs. If any loose slugs are encountered, the adjusting screw may be lightly cemented after proper alignment.

Poor or weak sound can result from leakage, opening or shorting of Capacitors C171 and C172.

PICTURE BEND

Under certain critical signal conditions a bending may occur in the picture which may be corrected by the following suggestions:

1. R142 may be changed to 390K, and connected to +120 volts instead of ±250 volts.
2. Certain conditions of intermittent picture bending can result from improper ground connections to R8, Pins 3 and 7 of V2, and the base of V2 tube shield.

KCS47T, KCS47AT, KCS48T, KCS49T, KCS49AT, KCS60T

PICTURE "SMEAR"

Smear is generally intepreted as an extension or washing out of white or black trailing edges so that the trailing edge is not sharply defined, but is smeared out toward the right side of the screen.

This type of smear may result from incorrect:

1. R-F unit response in the receiver.
2. I-F amplifier response in the receiver.
3. Overall R-F—I-F amplifier response in the receiver.
4. High frequency response in the video amplifier in the receiver.
5. High frequency response in station transmission.
6. High frequency response due to relayed or cabled transmission.

If smear is encountered, the initial step in correction is to make certain that the R-F and I-F alignment is correct as indicated in service data. Particular care should be taken to have the 26.25 mc., 25.50 mc., and 24.75 mc. markers at the proper location on the overall R-F—I-F response curve.

Additional peaking of the high video frequencies can be obtained in the video amplifier in 16" and 19" models by the following:

1. Add 1500 mmfd. across R126 (cathode of first video amplifier).
2. Add 100 mmfd. from the junction of R126 and R224 to ground.
3. Change L105 (grid circuit of first video amplifier) from 120 muh. to 500 muh. (Use Stock #75252.)
4. Capacitors C190, C132, and C133 should be dressed away from each other to reduce coupling.

INCREASED SOUND AND PICTURE GAIN

The following changes, which have been incorporated in production, are suggested where necessary to provide additional sound and picture gain on very weak signals.

1. Change the first and second picture I-F cathode resistors (R103 and R107) from 120 ohms to 82 ohms. This provides additional gain through these stages.
2. Move the point of sound take-off (connection C) on the trap of T103 up two turns on the coil. This provides additional 21 mc. sound voltage to the sound I-F amplifier.
3. After the above changes, it will be necessary to accurately realign the sound and picture I-F amplifiers.

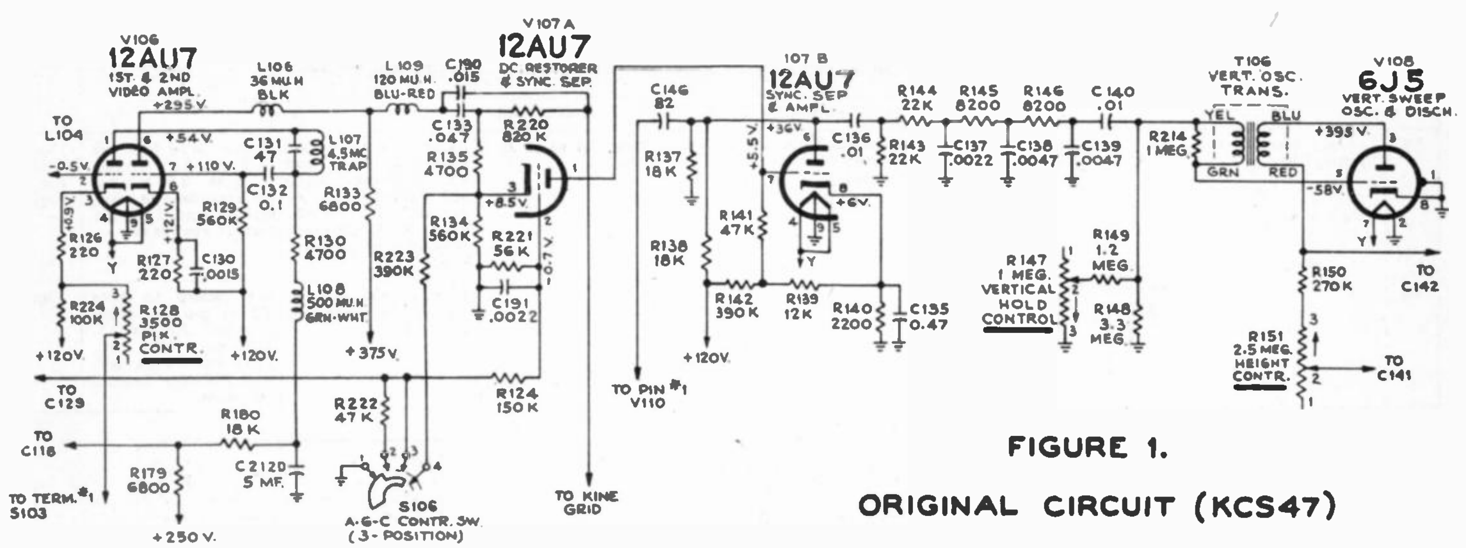


FIGURE 1.
ORIGINAL CIRCUIT (KCS47)

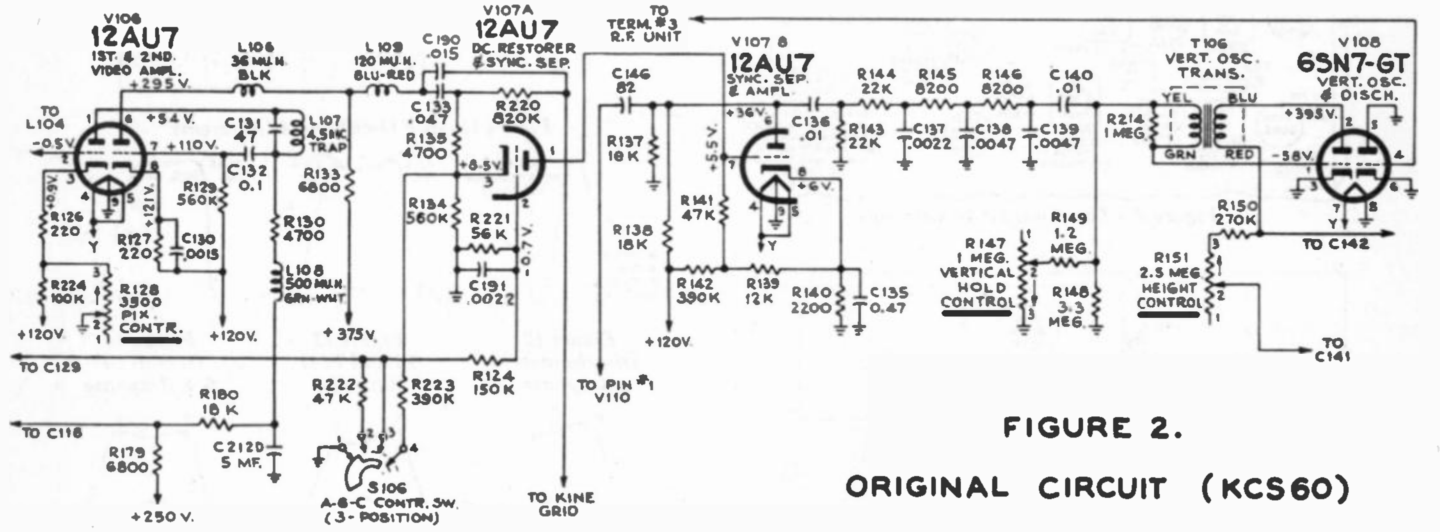


FIGURE 2.
ORIGINAL CIRCUIT (KCS60)

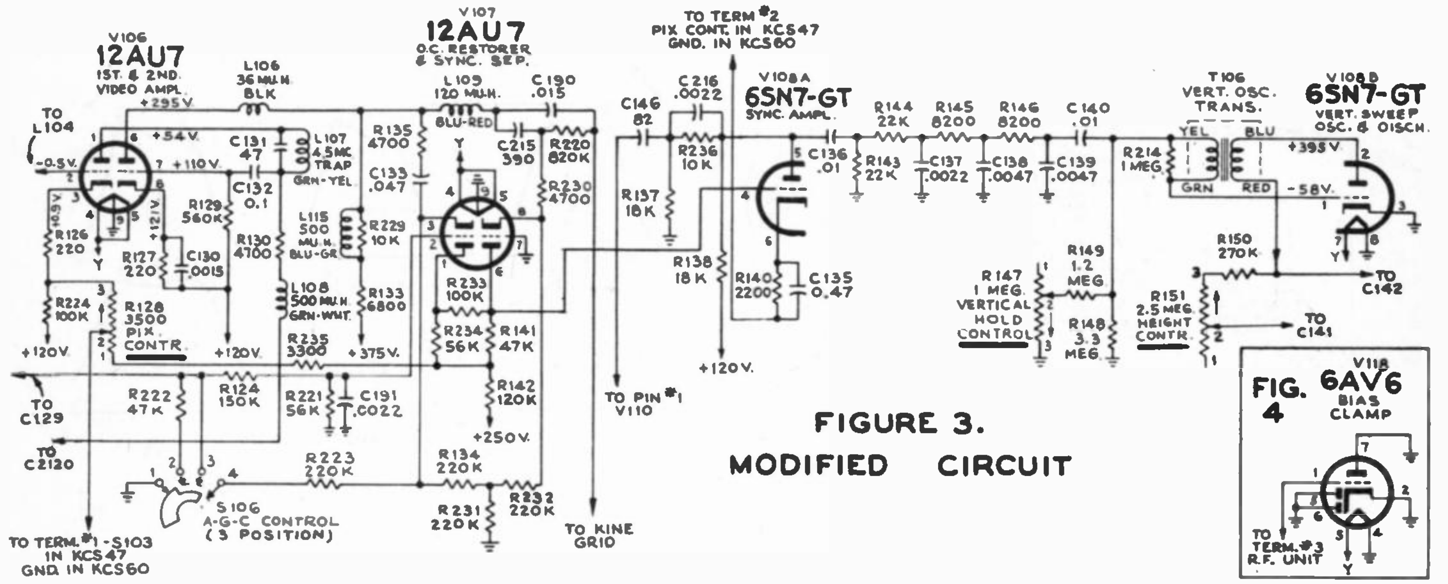


FIGURE 3.
MODIFIED CIRCUIT

FIG. 4

6T53, 6T54, 6T64, 6T65,
6T71, 6T74, 6T75, 6T76

RESPONSE AND WAVEFORM PHOTOGRAPHS

Taken from RCA WO58A Oscilloscope

PICTURE I-F RESPONSE. — At times it may be desirable to observe the individual i-f stage response. This can be achieved by the following method:

Shunt all i-f transformers and coils with a 330 ohm carbon resistor except the one whose response is to be observed.

Connect a wide band sweep generator to the converter grid and adjust it to sweep from 18 mc. to 30 mc.

Connect the oscilloscope across the picture detector load resistor and observe the overall response. The response obtained will be essentially that of the unshunted stage. The effects of the various traps are also visible on the stage response.

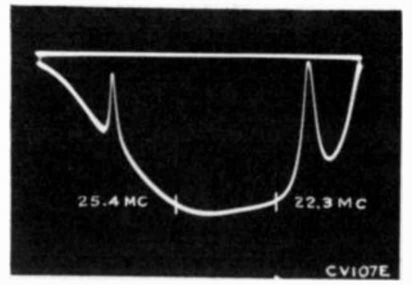


Figure 17—Response of Converter and First Pix I-F Transformer

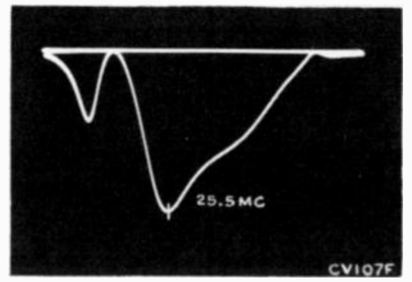


Figure 18—Response of Second Pix I-F Transformer

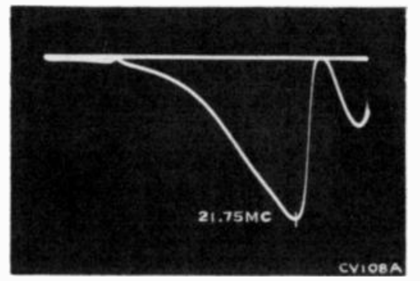


Figure 19—Response of Third Pix I-F Transformer

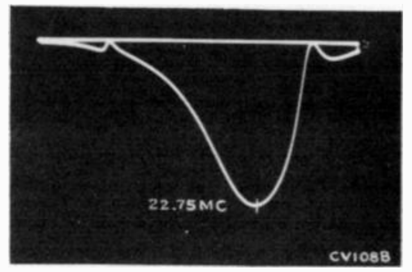


Figure 20—Response of Fourth Pix I-F Transformer

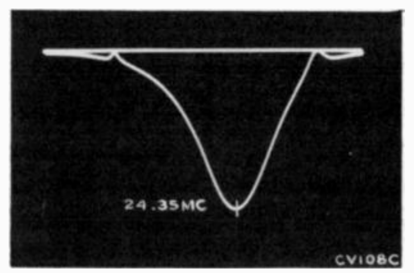


Figure 21—Response of Fifth Pix I-F Coil

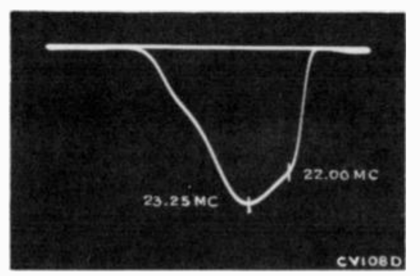


Figure 22—Response from First Pix I-F Grid to Pix Det.

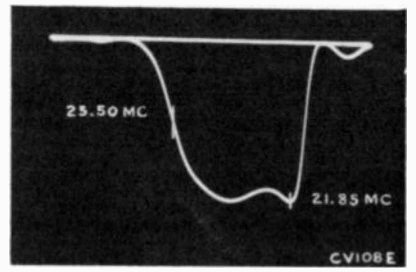


Figure 23—Overall Pix I-F Response

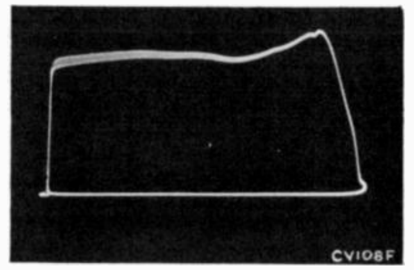


Figure 24—Video Response at Average Contrast

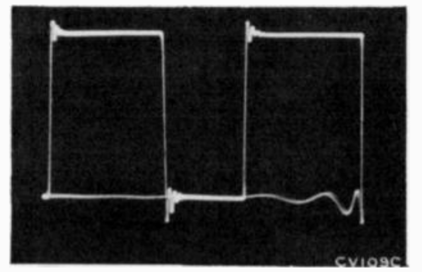


Figure 25—Video Response at Minimum Contrast

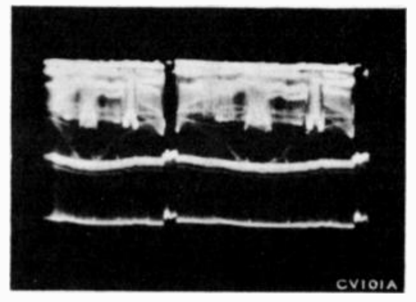
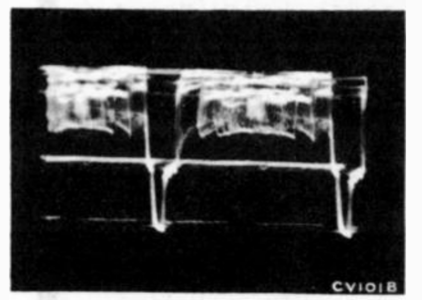
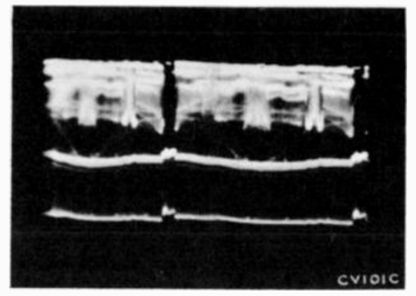


Plate of Picture Detector (Pin 7 of V105) (6AL5)

Figure 26—Vertical (Oscilloscope Synced to ½ of Vertical Sweep Rate) (5.5 Volts PP)

Figure 27—Horizontal (Oscilloscope Synced to ½ of Horizontal Sweep Rate) (5.5 Volts PP)

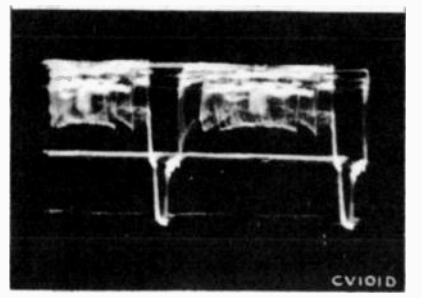




Grid of 1st Video Amplifier (Pin 2 of V106) (12AU7)

Figure 28—Vertical (5.3 Volts PP)

Figure 29—Horizontal (5.3 Volts PP)



ALIGNMENT TABLE

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
23	Antenna terminal (loosely)	181.25 185.75	Antenna terminals (see text for precaution)	Sweeping channel 8	Not used	—	Not used	Rec. on chan. 8. Readjust C9, C16 and C22 for correct curve shape, frequency and band width. Readjust C11 only if necessary.		Fig. 8 Fig. 9 Fig. 15 (8)
24	"	211.25 215.75	"	Sweeping channel 12	Not used	—	Not used	Rec. on chan. 13. Adjust L52 for max. amplitude between markers and then overshoot a little more than the amount of turning required to reach max. response. Adjust C22 to regain max. amplitude of response.		Fig. 9 Fig. 15 (13)
25	"	215.75	Not used	—	Loosely coupled to r-f oscillator	236.75	Junction of R192 & S103 for signal gen. method only	Fine tuning centered. Receiver on chan. 13. Adjust L43 for correct channel 13 osc. freq. then overshoot. Reset the osc. to proper freq. by adjustment of C1.		Fig. 8 Fig. 11
26	"	205.25 209.75	Antenna terminals (see text for precaution)	channel 12	Not used	—	Connect "VoltOhmyst" to r-f unit test point at R5	Rec. on channel 12	Check to see that response is correct and −3.0 volts of osc. injection is present	Fig. 10 Fig. 15
27	"	199.25 203.75		channel 11	"	—	"	Rec. on channel 11	"	Fig. 15 (11)
28	"	193.25 197.75	"	channel 10	"	—	"	Rec. on channel 10	"	Fig. 15 (10)
29	"	187.25 191.75	"	channel 9	"	—	"	Rec. on channel 9	"	Fig. 15 (9)
30	"	181.25 185.75	"	channel 8	"	—	"	Rec. on channel 8	"	Fig. 15 (8)
31	"	175.25 179.75	"	channel 7	"	—	"	Rec. on channel 7	"	Fig. 15 (7)
32	If the response of any channel (steps 26 through 31) is below 80% at either marker, repeat step 23 and adjust C9, C11, C16 and C22 as necessary to pull response up on the low channel yet maintain correct response on channel 8. If C22 required adjustment, the adjustment should be overshot a small amount and corrected by adjustment of L52 to give maximum amplitude of response between the sound and picture carrier markers.									
33	Repeat step 22. If the oscillator is off frequency overshoot the adjustment of C1 and correct by adjusting L43.									
34	Repeat steps 26 through 33 until all adjustments are obtained.									
35	Antenna terminals (loosely)	87.75	Not used	—	Loosely coupled to r-f oscillator	108.75	Junction of R192 & S103 for sig. gen. method only	Rec. on channel 6	L5 for zero on meter or beat on het. freq. meter	Fig. 10 Fig. 10
36	"	83.25 87.75	Ant. terminals (see text for precaution)	Sweeping channel 6	Not used	—	Not used	Observe response. If necessary readjust L42, L45 and L49. It should not be necessary to touch C11.		Fig. 8 Fig. 9 Fig. 15
37	Not used	—	Not used	—	Not used	—	Connect "VoltOhmyst" to the r-f unit test point at R5	Check osc. injection. If necessary adjust C7 to give −3 volts. If C7 is adjusted, switch to channel 8, and readjust C9 for proper response then repeat step 36.		Fig. 9 Fig. 10
38	Antenna terminals (loosely)	77.25 81.75	Ant. terminals (see text for precaution)	channel 5	"	—	"	Rec. on channel 5	Check to see that response is correct and −3.0 volts of osc. injection is present	Fig. 15 (5)
39	"	67.25 71.75	"	channel 4	"	—	"	Rec. on channel 4		Fig. 15 (9)
40	"	61.25 65.75	"	channel 3	"	—	"	Rec. on channel 3	"	Fig. 15 (3)
41	"	55.25 59.75	"	channel 2	"	—	"	Rec. on channel 2	"	Fig. 15 (2)
42	Likewise check channels 7 through 13, as outlined in steps 31 back through 26, stopping on channel 13 for next step.									
43	Antenna terminals	215.75	Not used	—	Loosely coupled to r-f oscillator	236.75	Junction of R192 & S103 for sig. gen. method only	Fine tuning centered. Receiver on channel 13	C1 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10
44	"	209.75	"	—	"	230.75	"	Rec. on channel 12	L11 as above	Fig. 11
45	"	203.75	"	—	"	224.75	"	Rec. on channel 11	L10 as above	Fig. 11
46	"	197.75	"	—	"	218.75	"	Rec. on channel 10	L9 as above	Fig. 11
47	"	191.75	"	—	"	212.75	"	Rec. on channel 9	L8 as above	Fig. 11
48	"	185.75	"	—	"	206.75	"	Rec. on channel 8	L7 as above	Fig. 11
49	"	179.75	"	—	"	200.75	"	Rec. on channel 7	L6 as above	Fig. 11
50	"	87.75	"	—	"	108.75	"	Rec. on channel 6	L5 as above	Fig. 11
51	"	81.75	"	—	"	102.75	"	Rec. on channel 5	L4 as above	Fig. 11
52	"	71.75	"	—	"	92.75	"	Rec. on channel 4	L3 as above	Fig. 11
53	"	65.75	"	—	"	86.75	"	Rec. on channel 3	L2 as above	Fig. 11
54	"	59.75	"	—	"	80.75	"	Rec. on channel 2	L1 as above	Fig. 11
55	Repeat steps 43 through 54 as a check.									
56	Antenna terminals	181.25 185.75	Antenna terminals	Sweeping channel 8	Not used	—		Rec. on chan. 8. Oscilloscope at R5 test point. Adjust T1 clockwise. When properly adjusted, curve will be slightly wider with a slightly deeper valley in top.		Fig. 15 (8)
57	Switch through all channels and observe response, oscillator injection and r-f oscillator frequency. Minor touch-ups of adjustments may be made at this time. However, if C7 or C9 are changed appreciably, then a recheck of the oscillator frequency on all channels should be made.									
58	Remove 39 ohm resistor and reconnect link from T101 to terminal 2 of r-f unit terminal board. Proceed with sweep alignment of Pix I-F.									

ALIGNMENT TABLE

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
SWEEP ALIGNMENT OF PICTURE I-F AMPLIFIER									
59	Loosely coupled to i-f amplifier	22.3 25.4	Antenna terminals	Sweeping selected channel	Terminal 2 of V108 socket	Junction of R102 & R201	Select channel known to have good r-f response. Clip 330 ohm resistors across R105, R108, R113, R119. Connect bias box to junction R102, R201.	Adjust bias box for −1.0 v. Set sweep to give 0.5 v. p-p on oscilloscope. Adjust T1 and T101 for correct response.	Fig. 8 Fig. 9 Fig. 10 Fig. 13
60	"	21.85 24.75 25.50 26.25	"	"	"	"	Remove 330 ohm resistors. Set bias box for −4.5 v.	Set sweep to give 3.0 v. p-p on oscilloscope. Adjust T1, T101 bot., T102 bot., T103 bot., T104 bot. and L103 for desired response.	Fig. 14

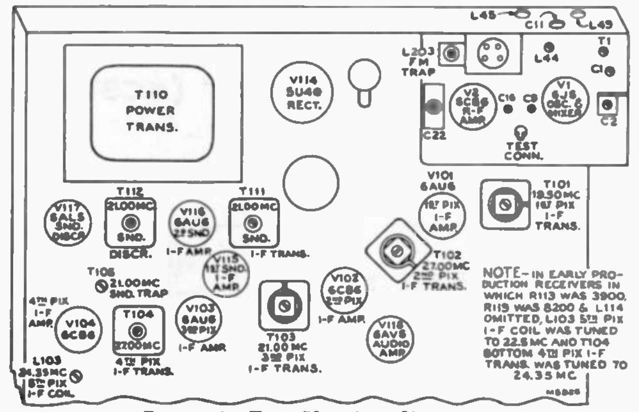


Figure 8—Top Chassis Adjustments

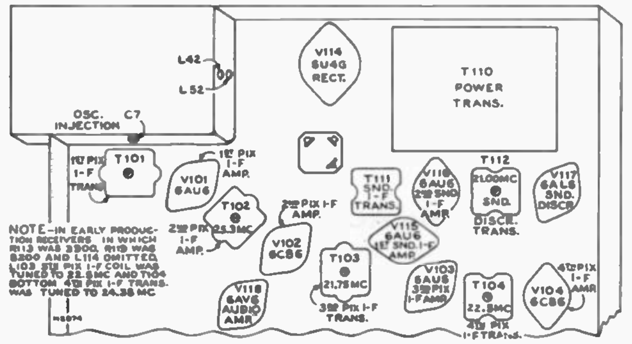


Figure 9—Bottom Chassis Adjustments

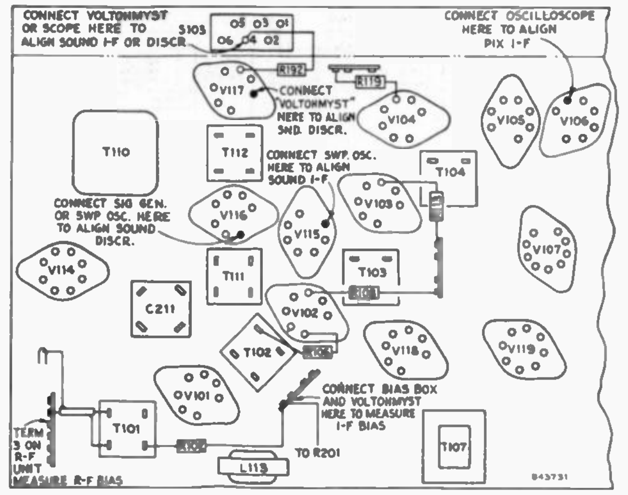


Figure 10—Test Connection Points

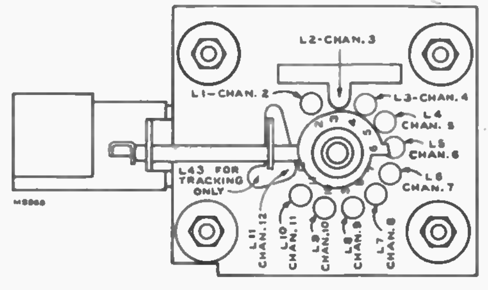


Figure 11—R-F Oscillator Adjustments

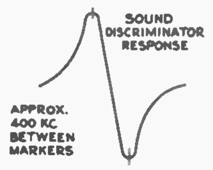


Figure 12 Discriminator Response

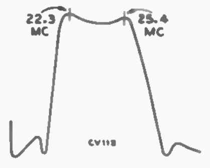


Figure 13 T1 and T101 Response

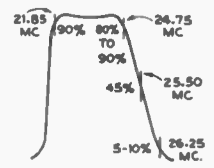


Figure 14 Overall I-F R-F Response

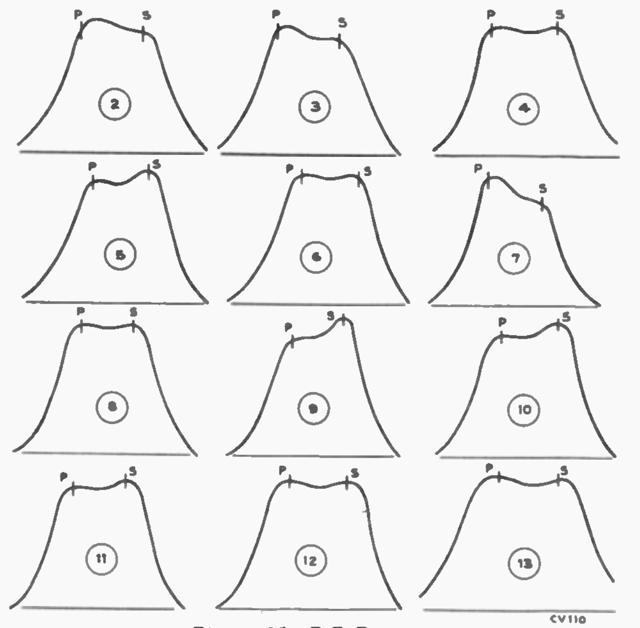


Figure 15—R-F Response

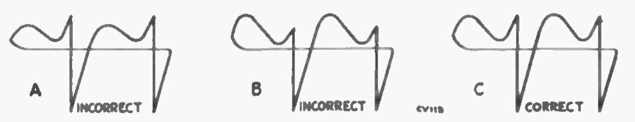


Figure 16—Horizontal Oscillator Waveforms

PRODUCTION CHANGES

6T53, -54, -64, -65, -71, -74, -75, -76 (Chassis No. KCS47, KCS47A, KCS47T, KCS47AT)

6T84, 6T86, 6T87 (Chassis No. KCS48, KCS48T)

9T57, 9T77, 9T79 (Chassis No. KCS49, KCS49A, KCS49T, KCS49AT)

9T89 (Chassis No. KCS60, KCS60T)

Numerous changes have been made in the chassis used in the above models. Some changes apply only to chassis without "T" in the chassis identification number, some are the difference between chassis without "T" and with "T" and some apply only to chassis with "T" in the chassis number. They are so segregated in the information contained on this and the following two pages (13, 14 and 15).

KCS47, KCS47A, KCS48, KCS49, KCS49A, KCS60

WIDTH CONTROL (STOCK #75516)

Some failure of this control has been reported as a result of excessive dissipation when the control is in certain positions of adjustment.

To overcome this difficulty, the factory has reversed the leads on terminals 1 and 3 of this control (R177) so that a greater portion of the control is used, giving greater heat dissipation capacity. With this change, the control will give maximum width in the counterclockwise position. All chassis modified as above are marked with a small "w" adjacent to the width control on the rear apron, and a small "w" has been added under the serial number on the carton.

WIDTH & HORIZONTAL LINEARITY

In order to improve these items, the following parts and wiring changes are suggested:

1. C160 (.022 mfd.) is changed to .018 mfd. 1000 V—Stock #74727.
2. R176 (8200 ohms) is changed to 6800 ohms, 1 watt—Stock #38887.
3. The blue and blue/yellow leads of V113 (6W4) should be twisted approximately one turn per inch to reduce capacity to chassis.
4. The lead from Pin 4 of J101 (F) should be dressed away from all metal.

THE FOLLOWING CHANGES ARE SUGGESTED IN THE EVENT ANY OF THE LISTED SERVICE PROBLEMS ARE ENCOUNTERED IN THE ABOVE MODELS:

1. **Noise in Sound—(Fringe Areas)**
   a. Add .0015 mfd. capacitor (Stock #73598) from connection point of R192 on TV-Phono switch to ground. (All models except Combinations.)
   b. Properly align sound I.F. and discriminator circuits.
   c. Thoroughly check 1500 mmf. "plug-in type" capacitors for open and leakage. (A number of these capacitors have been found in this condition and contribute to weak and noisy sound.)
   d. Check 6AU6 second sound I-F tube. Some of these tubes have been found to have remote cut-off characteristics and cause insufficient limiting in this circuit.
2. **Picture Bending (Top of Picture)**
   a. Change cathode resistor R134 of DC restorer tube to 560K.

      NOTE: This should only be done in strong signal areas where bending of the top of picture usually occurs. Changing this resistor in weak signal areas may decrease the noise immunity of the restorer circuit.
3. **Picture Bending (Bottom of Picture)**
   a. Change third picture I-F plate load resistor R113 from 3900 to 1800 ohms.
   b. Change fourth picture I-F plate load resistor R119 from 8200 to 18K ohms. Shunt this resistor with a 36 muh. peaking coil Stock #75299. It is important that this stock number coil be used because of its distributed capacity. Do not use any other 36 muh. coil.
   c. Retune the fourth picture I.F. (T104) to 22.5 mcs. Retune the fifth picture I.F. (L103) to 24.25 mcs.

      NOTE: It is important that I.F.'s be "peak" aligned so these two circuits will be tuned to the exact new frequencies before the overall I.F/R.F. response is "touched up" to obtain a good response curve.
4. **Insufficient Width**
   a. Add a 4.7 mmf. capacitor (Stock #75646) in shunt with the present 4.7 mmf. capacitor (C198). This should give a considerable increase in width.
5. **Picture Flashing**

   This is due to "set up" of capacitor C133 on strong burst of noise.
   a. Change connection of C190 (.015) from junction of R230 (820K) and C133 (.047) to the junction of L109 and C133. The end of C190 connection to the kinescope grid is not changed.
6. **To Improve Focus**

   Some increase in range of focus magnet shunt can be obtained by the following modification. This is most effective if the present adjustment just misses good focus.
   a. Remove "C" washer from rear end of focus control screw. This allows control screw to be unscrewed from shunt.
   b. Unscrew focus control screw from shunt.
   c. Remove spacers from focus control screw.
   d. Re-assemble focus control screw in shunt and replace "C" washer in place.
   e. Move focus magnet as close to the rear end of yoke as possible by tightening the three screws in the compression springs.

   With the spacers removed and the focus magnet moved forward, better focus can be obtained with the increased range of the magnet shunt.

   This modification cannot be applied to ALL magnets used with these models. Some magnets do not allow the spacers to be removed from the shunt control screw. The only remedy, if this type magnet is encountered, is to replace the magnet with one which has more magnetism.
7. **Overload of Receiver on Strong Signals**

   Several cases have been reported where L103 has been installed in reverse position. Wiring this I-F coil correctly has eliminated the trouble.

CHASSIS NO'S. WITHOUT "T" VS. CHASSIS NO'S. WITH "T"

FRINGE AREA RECEPTION

Out beyond their normal ranges, the reception from television transmitters becomes spotty, is more subject to interference, and may vary with the weather, season, and time of day. Television is becoming so popular that people farther away from transmitting stations are buying receivers. Not too long ago, locations 35 to 40 miles from the transmitting station were often regarded as fringe areas. Today, people are attempting to obtain television reception at distances up to 100 to 125 miles from transmitting stations. This has resulted in an increase in fringe area problems. Chief among these is perhaps the ability of a receiver to hold sync. RCA Victor engineers have developed a means for increasing sync stability in low signal strength, high noise level areas. This can be applied to any of the above 16" or 19" receivers.

Figure 1 (page 15), shows the conventional 16" and 19" table model and console (chassis KCS47) sync separator, D.C. restorer, sync amplifier and vertical oscillator circuits.

WAVEFORM PHOTOGRAPHS
Taken from RCA WO58A Oscilloscope

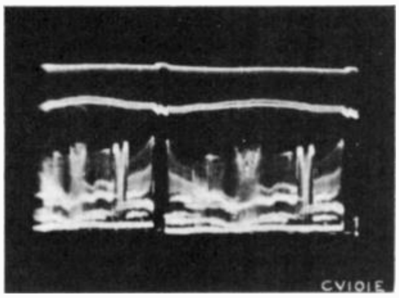
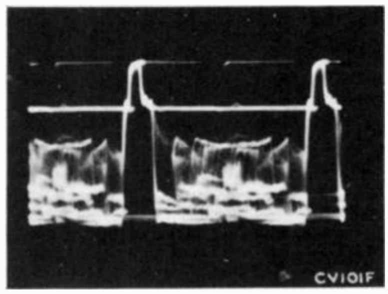
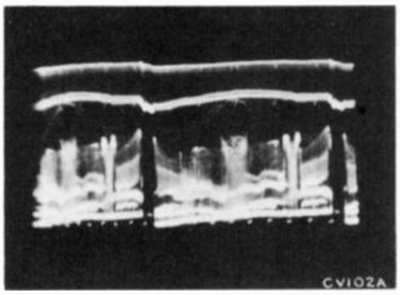


Plate of 1st Video Amplifier
(Pin 1 of V106) (12AU7)
Voltage depends on setting of picture control

Figure 30—Vertical (3-18 Volts PP)
←

Figure 31—Horizontal (3-18 Volts PP)
→

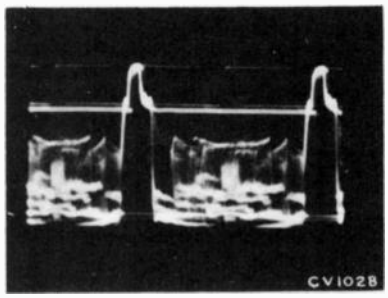




Grid of 2nd Video Amplifier
(Pin 7 of V106) (12AU7)
Voltage depends on setting of picture control

Figure 32—Vertical (3-18 Volts PP)
←

Figure 33—Horizontal (3-18 Volts PP)
→



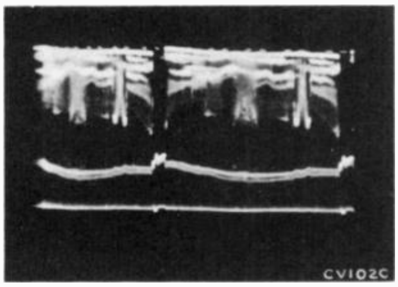
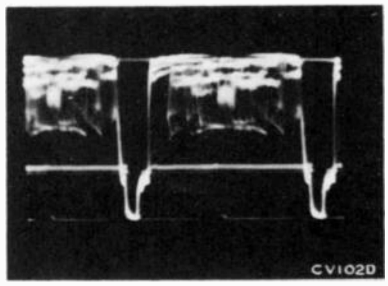
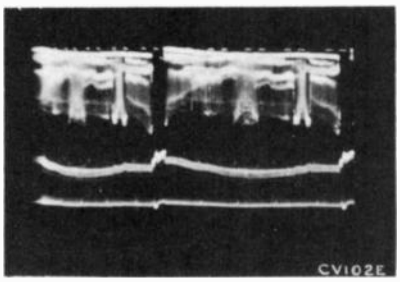


Plate of 2nd Video Amplifier
(Picture Max.)
(Pin 6 of V106) (12AU7)
Voltage depends on setting of picture control

Figure 34—Vertical (25-90 Volts PP)
←

Figure 35—Horizontal (25-90 Volts PP)
→

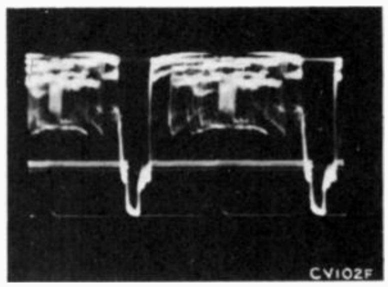


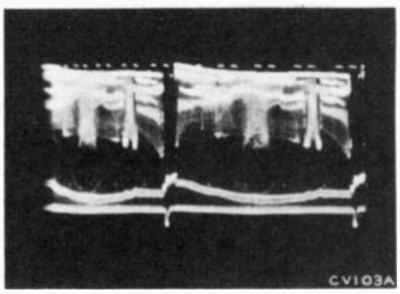


Cathode of Sync Separator
(Pin 8 of V107B) (KCS47 or KCS47A)
(Pin 6 of V108A) (KCS47T or KCS47AT)

Figure 36—Vertical (25-90 Volts PP)
←

Figure 37—Horizontal (25-90 Volts PP)
→

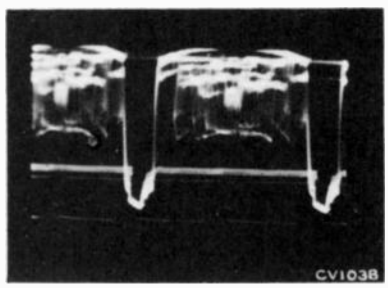


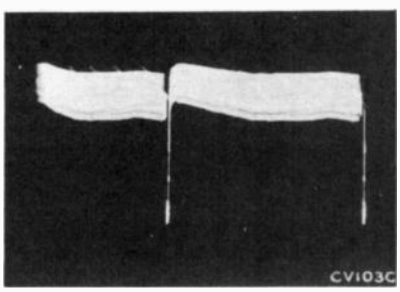


Cathode of D-C Restorer
(Pin 3 of V107) (12AU7)
Voltage depends on setting of picture control

Figure 38—Vertical (20-80 Volts PP)
←

Figure 39—Horizontal (20-80 Volts PP)
→

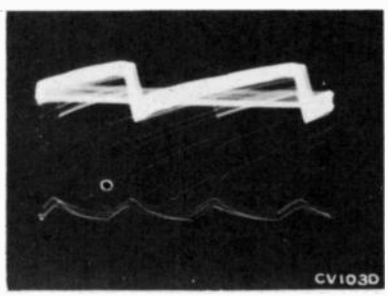




Grid of D-C Restorer
(Pin 2 of V107) (12AU7)
Voltage depends on setting of picture control

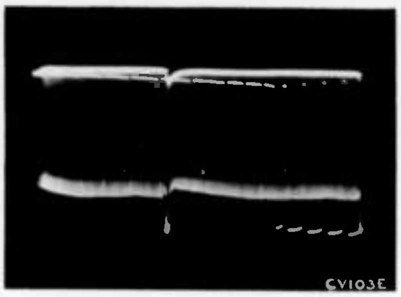
Figure 40—Vertical (3-10 Volts PP)
←

Figure 41—Horizontal (3-10 Volts PP)
→



WAVEFORM PHOTOGRAPHS

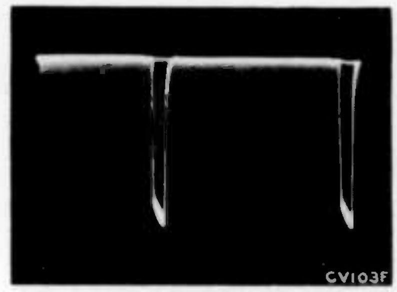
Taken from RCA WO58A Oscilloscope



Grid of Sync Separator (Pin 7 of V107B) (KCS47 or KCS47A) (Pin 4 of V108A) (KCS47T or KCS47AT) Voltage depends on setting of picture control

Figure 42—Vertical (6-8 Volts PP)

Figure 43—Horizontal (6-8 Volts PP)



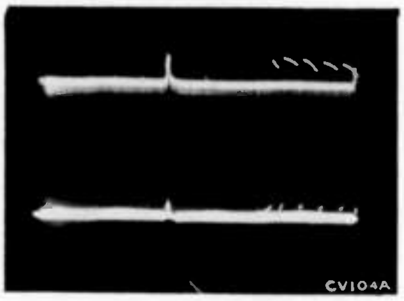
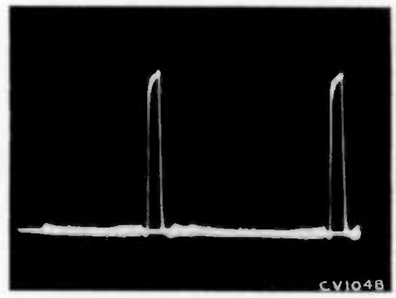
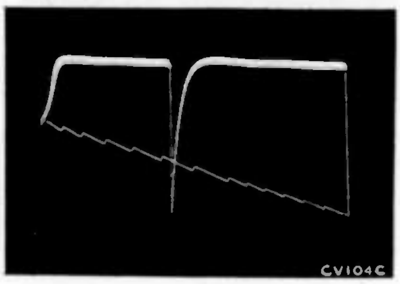


Plate of Sync Separator (Pin 6 of V107B) (KCS47 or KCS47A) (Pin 5 of V108A) (KCS47T or KCS47AT) Voltage depends on setting of picture control

Figure 44—Vertical (14-16 Volts PP)

Figure 45—Horizontal (14-16 Volts PP)

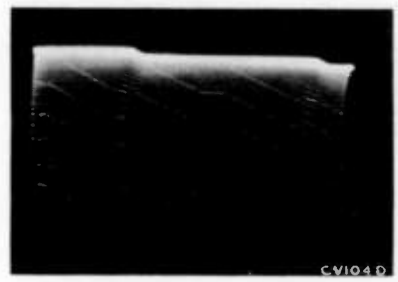




Cathode of Sync Separator (Pin 8 of V107B) (KCS47 or KCS47A) (Pin 6 of V108A) (KCS47T or KCS47AT) Voltage depends on setting of picture control

Figure 46—Vertical (.8-1.0 Volt PP)

Figure 47—Horizontal (.8-1.0 Volt PP)



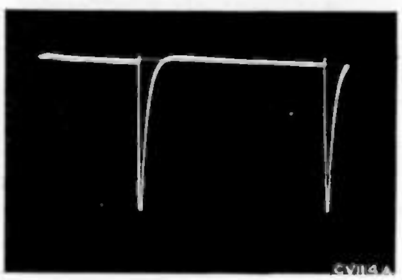
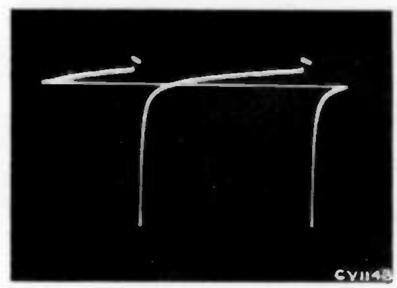


Figure 48—Output of Integrating Network (Junction of C139, C140 and R146) (45 Volts PP)

Figure 49—Grid of Vertical Oscillator (Pin 5 of V108) (KCS47 or KCS47A) (Pin 1 of V108B) (KCS47T or KCS47AT) (180 Volts PP)



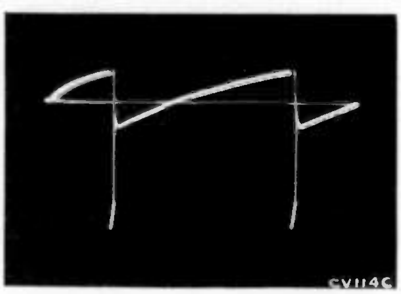
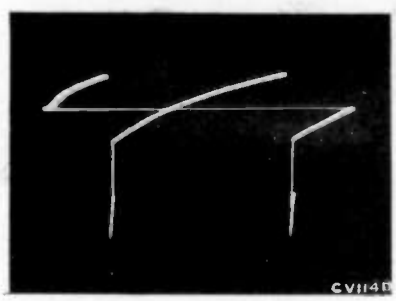


Figure 50—Plate of Vertical Oscillator (Pin 3 of V108) (KCS47 or KCS47A) (Pin 2 of V108B) (KCS47T or KCS47AT) (120 Volts PP)

Figure 51—Grid of Vertical Output (190 Volts PP) (Pin 5 of V109) (6K6GT)



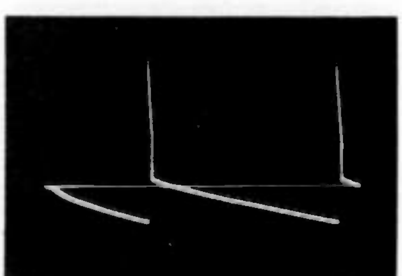
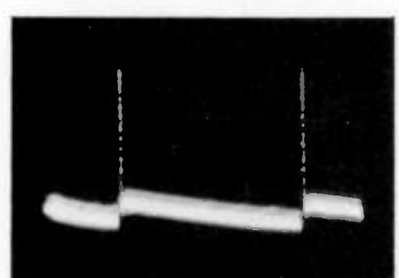


Figure 52—Plate of Vertical Output (1300 Volts PP) (Pin 3 of V109) (6K6GT)

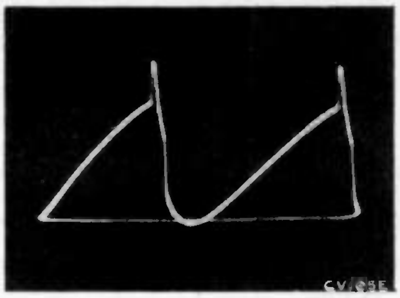
Figure 53—Input of Vertical Deflection Coils (15 Volts PP) (Voltage Across Pins 1 and 2 of J101F)



WAVEFORM PHOTOGRAPHS

Taken from RCA WO58A Oscilloscope

6T53, 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76



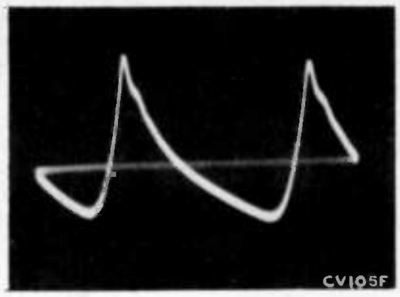
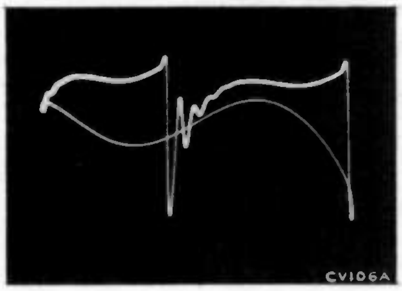


Figure 54—Grid of Horizontal Oscillator Control (22 Volts PP) (Pin 1 of V110) (6SN7GT)

Figure 55—Cathode of Horizontal Oscillator Control (1.0 Volt PP) (Pin 3 of V110) (6SN7GT)



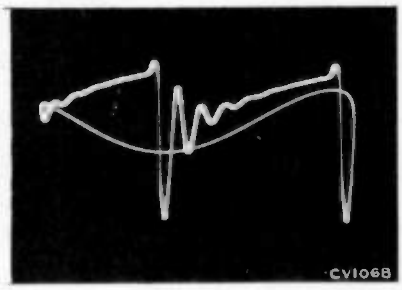
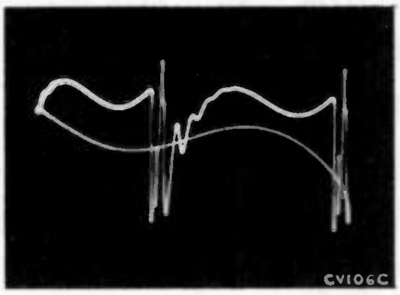


Figure 56—Junction of R162, R163 and R170 (52 Volts PP)

Figure 57—Grid of Horizontal Oscillator (340 Volts PP) (Pin 4 of V110) (6SN7GT)



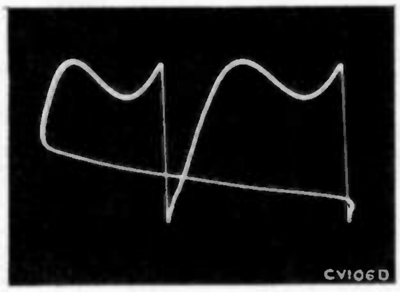
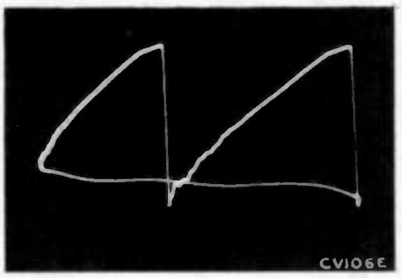


Figure 58—Plate of Horizontal Oscillator (190 Volts PP) (Pin 5 of V110) (6SN7GT)

Figure 59—Terminal "C" of T108 (120 Volts PP)



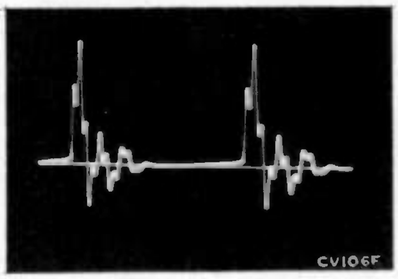
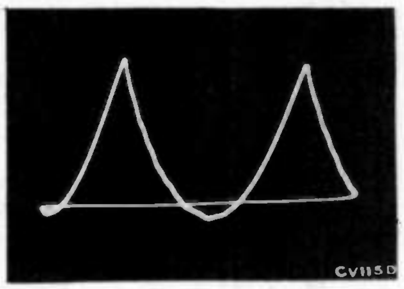


Figure 60—Input to Horizontal Output Tube (80-110 Volts PP) (Junction of C155 and C147B)

Figure 61—Plate of Horizontal Output (Approx. 6,000 Volts PP) (Measured Through a Capacity Voltage Divider Connected from Top Cap of V111 to Ground)



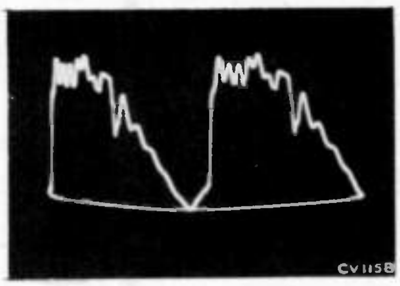
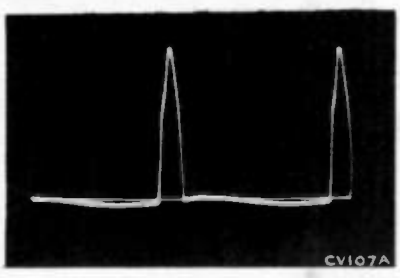


Figure 62—Cathode of Horizontal Output Tube (9-12 Volts PP) (Pin 3 of V111) (6BG6G)

Figure 63—Screen of Horizontal Output Tube (5-120 Volts PP) (Pin 8 of V111) (6BG6G)



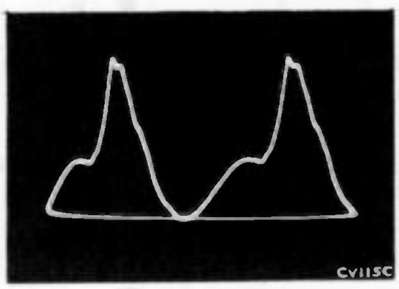


Figure 64—Cathode of Damper (3000 Volts PP) (Pin 3 of V113) (6W4GT)

Figure 65—Plate of Damper (140 Volts PP) (Pin 5 of V113) (6W4GT)

6T53, 6T54, 6T64, 6T65,
6T71, 6T74, 6T75, 6T76

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition, a 2500 microvolt test pattern signal was fed into the receiver, the picture synced and the AGC control properly adjusted. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are read with a WV97A Senior "VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles, a-c. The symbol < means less than.

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6J6	Mixer	2500 Mu. V. Signal	2	144	—	—	7	0	5	−2.3	6.6	—	
			No Signal	2	135	—	—	7	0	5	−2.1	5.6	—	
V1	6J6	R-F Oscillator	2500 Mu. V. Signal	1	100	—	—	7	0	6	−3.0	4.0	—	Depending upon channel
			No Signal	1	96	—	—	7	0	6	−2.7	3.9	—	
V2	6AG5	R-F Amplifier	2500 Mu. V. Signal	5	250	6	130	2	0.1	1	−3.4	3.0	0.6	
			No Signal	5	166	6	84	2	0.4	1	−0.2	10.3	2.3	
V101	6AU6	1st Pix. I-F Amplifier	2500 Mu. V. Signal	5	195	6	222	7	0.3	1	−5.0	1.7	0.8	
			No Signal	5	121	6	135	7	0.8	1	−0.8	5.2	2.2	
V102	6CB6	2nd Pix. I-F Amplifier	2500 Mu. V. Signal	5	222	6	203	2	0.3	1	−5.0	2.0	0.7	
			No Signal	5	124	6	112	2	0.8	1	−0.8	5.5	1.6	
V103	6AU6	3rd Pix. I-F Amplifier	2500 Mu. V. Signal	5	185	6	225	7	0.2	1	−5.0	1.7	0.7	
			No Signal	5	94	6	132	7	0.5	1	−0.75	4.9	2.0	
V104	6CB6	4th Pix. I-F Amplifier	2500 Mu. V. Signal	5	165	6	142	2	2.25	1	0	9.6	3.1	
			No Signal	5	118	6	132	2	2.1	1	0	9.0	3.1	
V105	6AL5	Picture 2nd Det.	2500 Mu. V. Signal	7	−2.0	—	—	1	0	—	—	0.3	—	
			No Signal	7	−0.5	—	—	1	0	—	—	<0.1	—	
V105	6AL5	AGC Rectifier	2500 Mu. V. Signal	2	−9.5	—	—	5	0	—	—	<0.1	—	
			No Signal	2	−2.0	—	—	5	0	—	—	<0.1	—	
V106	12AU7	1st Video Amplifier	2500 Mu. V. Signal	1	100	—	—	3	1.2	2	−2.3	3.6	—	At maximum contrast
			No Signal	1	54	—	—	3	0.9	2	−0.5	2.6	—	
			2500 Mu. V. Signal	1	190	—	—	3	9.0	7	−2.6	0.9	—	At minimum contrast
			No Signal	1	122	—	—	3	6.9	7	−0.5	0.6	—	
V106	12AU7	2nd Video Amplifier	2500 Mu. V. Signal	6	330	—	—	8	125	2	118	9.3	—	At maximum contrast
			No Signal	6	295	—	—	8	121	2	110	13.6	—	
			2500 Mu. V. Signal	6	300	—	—	8	131	7	120	12.9	—	At minimum contrast
			No Signal	6	295	—	—	8	121	7	110	13.6	—	
V107 A	12AU7 KCS47	D-C Rest. & Sync Sep.	2500 Mu. V. Signal	1	5.0	—	—	3	45.5	2	−4.7	<0.1	—	At maximum contrast
	KCS47		No Signal	1	5.5	—	—	3	8.5	2	−0.7	<0.1	—	
V107 B	12AU7 KCS47	Sync Sep. & Amplifier	2500 Mu. V. Signal	6	36	—	—	8	6.0	7	4.7	4.0	—	
	KCS47		No Signal	6	36	—	—	8	6.0	7	5.5	2.8	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V107	12AU7 KCS47T	DC Rest. & Sync. Sep.	2500 Mu. V. Signal	1	10	—	—	3	45	2	–4.5	—	—	At maximum contrast
	KCS47T		No Signal	1	8	—	—	3	1.7	2	–0.4	—	—	
	KCS47T		2500 Mu. V. Signal	6	7.2	—	—	8	54	7	0	—	—	
	KCS47T		No Signal	6	7.0	—	—	8	—	7	0	—	—	
V108A	6SN7 KCS47T	Sync. Amplifier	2500 Mu. V. Signal	5	50	—	—	6	7.8	4	7.4	—	—	
	KCS47T		No Signal	5	46	—	—	6	7.0	4	7.0	—	—	
V108	6SN7 or 6J5	Vertical Oscillator	2500 Mu. V. Signal	2 or 3	*345	—	—	3 or 8	0	1 or 5	*–58	0.4	—	*Depends on setting of height control
			No Signal	2 or 3	*395	—	—	3 or 8	0	1 or 5	*–58	0.4	—	
V109	6K6GT	Vertical Output	2500 Mu. V. Signal	3	370	4	370	8	51	5	0	11.5	1.9	
			No Signal	3	365	4	365	8	51	5	0	11.4	1.9	
V110	6SN7 GT	Horizontal Osc. Control	2500 Mu. V. Signal	2	*160	—	—	3	*–4.6	1	*–14.6	0.32	—	*Depends on setting of hold control
			No Signal	2	*152	—	—	3	*–4.4	1	*–3.5	0.28	—	
V110	6SN7 GT	Horizontal Oscillator	2500 Mu. V. Signal	5	230	—	—	6	0	4	–82	1.8	—	
			No Signal	5	225	—	—	6	0	4	–85	1.8	—	
V111	6BG6G	Horizontal Output	2500 Mu. V. Signal	5	*630	8	335	3	7.2	5	–33	67	5.0	*6000 volt pulse present
			No Signal	5	*630	8	329	3	7.2	5	–33	67.1	4.9	
V112	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	*11,000	—	—	0	—	*12,000 volt pulse present
			Brightness Maximum	Cap	*	—	—	2 & 7	*12,200	—	—	0.1	—	
V113	6W4 CT	Damper	2500 Mu. V. Signal	5	387	—	—	3	*391	—	—	69	—	*3000 volt pulse present
			No Signal	5	380	—	—	3	*387	—	—	70	—	
V114	5U4G	Rectifier	2500 Mu. V. Signal	4 & 6	*368	—	—	2 & 8	391	—	—	185	—	*AC measured with AC voltmeter
			No Signal	4 & 6	*367	—	—	2 & 8	387	—	—	199	—	
V115	6AU6	1st Sound I-F Amp.	2500 Mu. V. Signal	5	120	6	120	7	0.8	1	–0.2	6.8	2.9	
			No Signal	5	108	6	108	7	0.8	1	–0.1	6.2	2.8	
V116	6AU6	2nd Sound I-F Amp.	2500 Mu. V. Signal	5	118	6	87	7	0	1	–1.3	4.9	2.8	
			No Signal	5	110	6	76	7	0	1	–0.5	6.9	3.1	
V117	6AL5	Sound Discrim.	2500 Mu. V. Signal	2	–7.2	—	—	5	0	—	—	<0.1	—	
			No Signal	2	–10.0	—	—	5	0	—	—	<0.1	—	
V118	6AV6	1st Audio Amplifier	2500 Mu. V. Signal	7	95	—	—	2	0	1	–0.5	0.5	—	
			No Signal	7	84	—	—	2	0	1	–0.4	0.4	—	
V119	6K6GT	Audio Output	2500 Mu. V. Signal	3	352	4	368	8	131	5	112	28.7	4.3	
			No Signal	3	348	4	360	8	134	5	108	28.8	4.2	
V120	16GP4	Kinescope	2500 Mu. V. Signal	Cone	11,000	10	384	11	100	2	46	<0.1	<0.1	
			No Signal	Cone	12,200	10	375	11	74	2	8.3	<0.1	<0.1	

6T53, 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76

R-F UNIT WIRING DIAGRAM

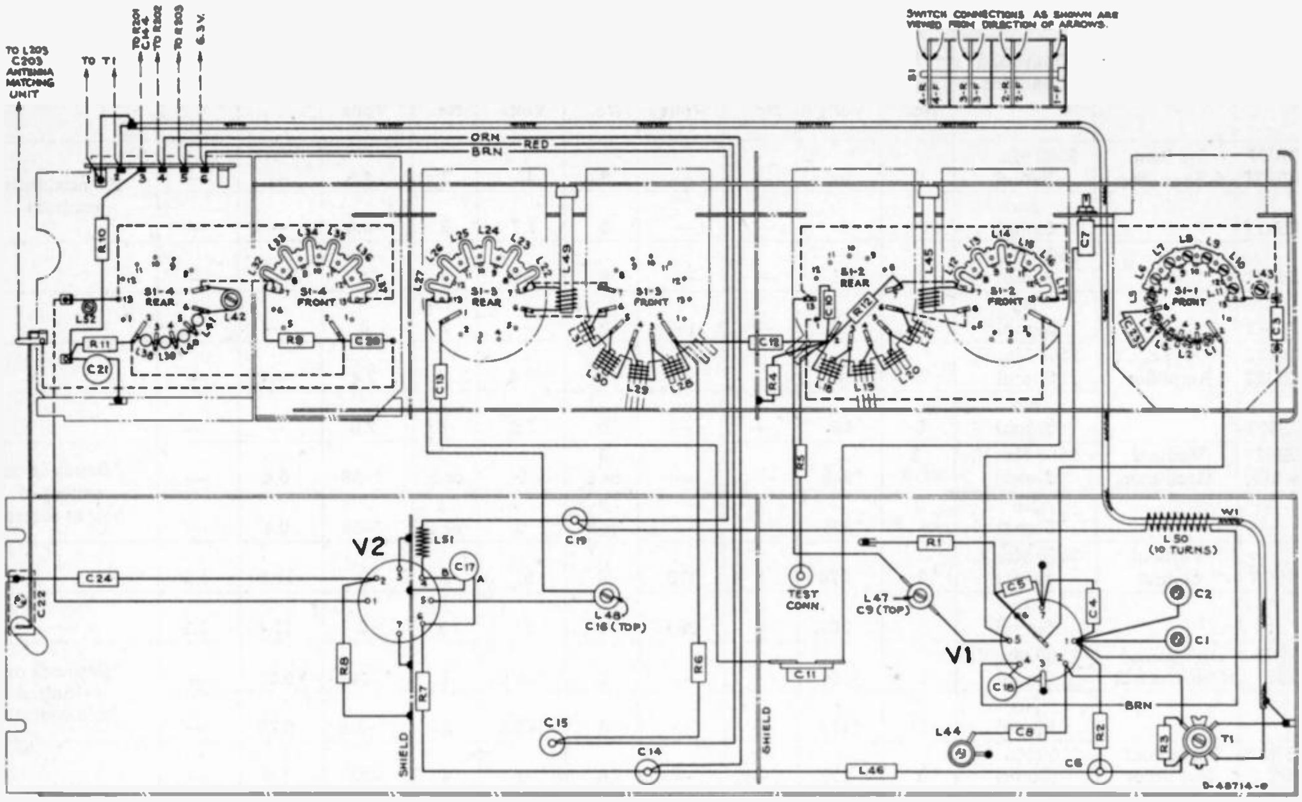
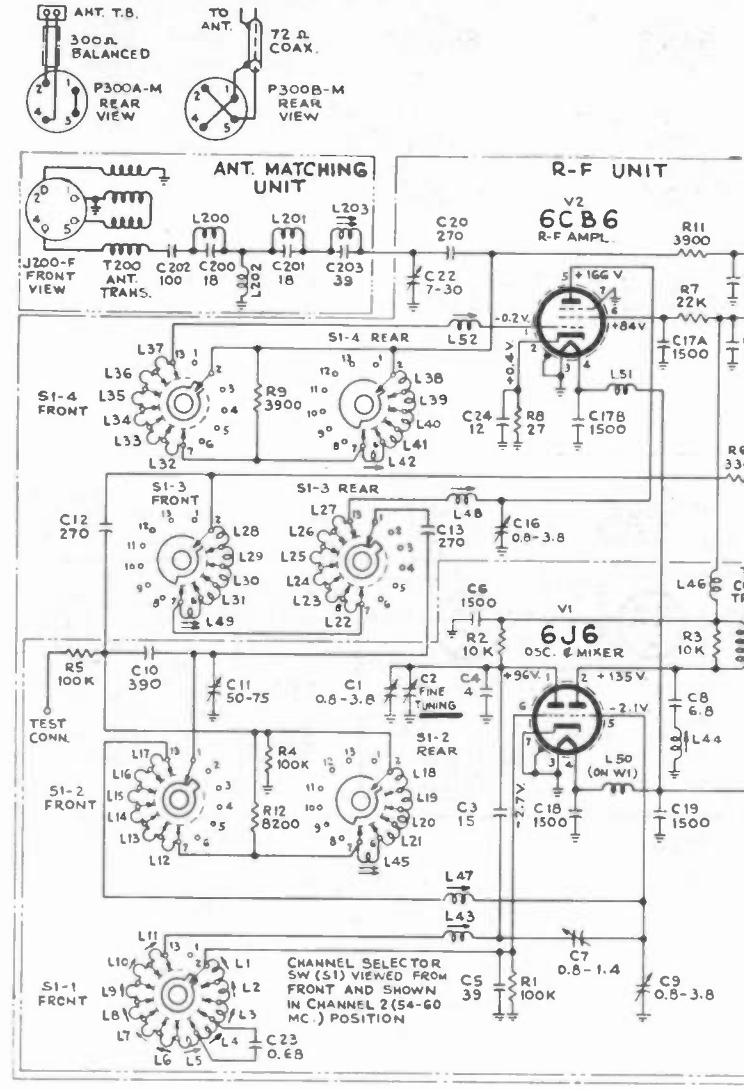


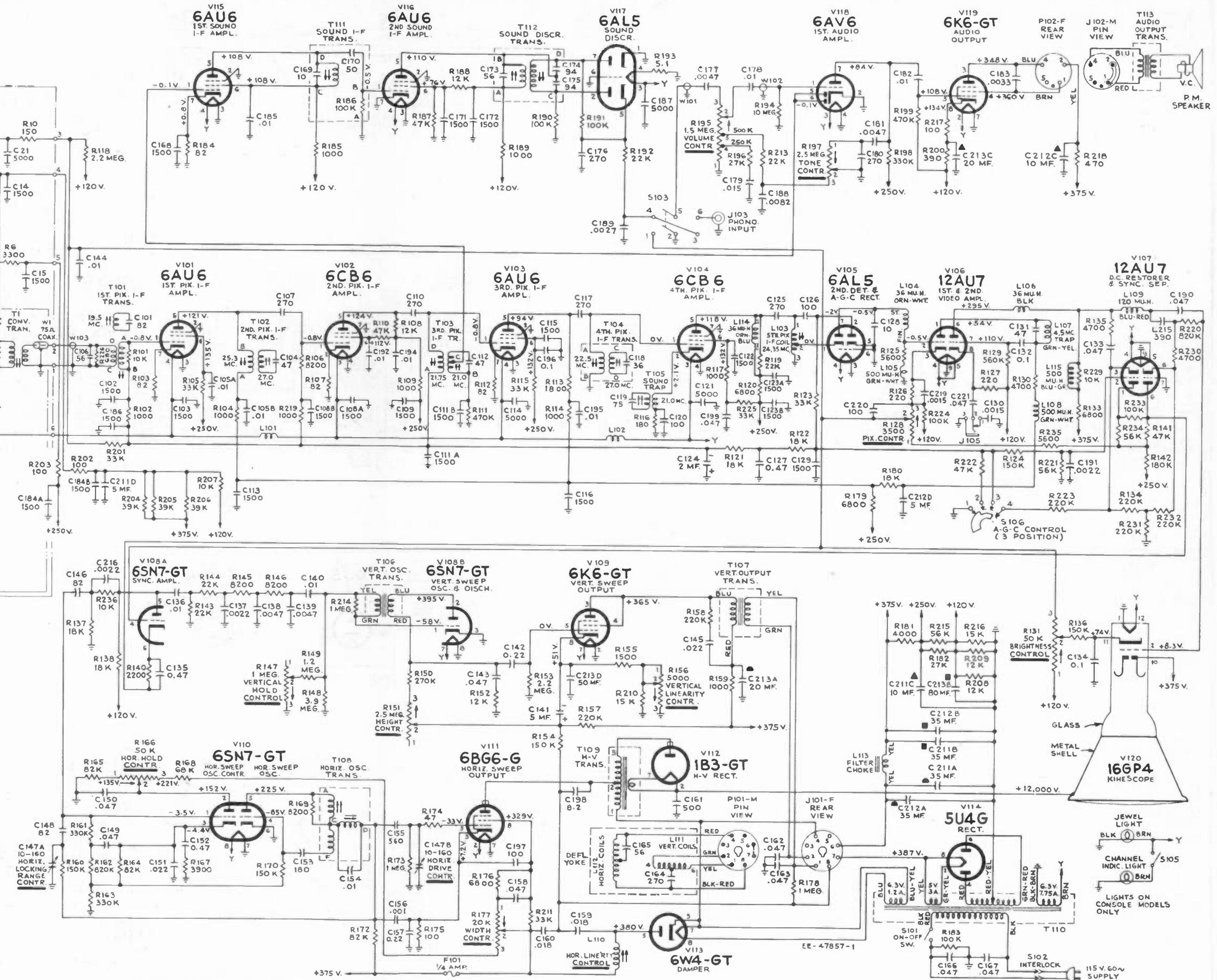
Figure 66—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. All leads in the picture and sound i-f circuits must be dressed as short and direct as possible with the exception of C106, C107, C110 and C117, which are to be dressed with enough slack so as not to have to move the body of the capacitor to align that particular stage.
2. Dress all 1,500 mmf, .005 mfd and .01 mfd capacitors in the i-f section with leads as short as possible.
3. Dress all wires between T101 and the r-f unit in clamp.
4. Dress C185 to act as shield for lead between pin 5 of V115 socket to T111D and picture i-f circuits.
5. Dress the bodies of resistors R106, R108, R113, R119, R191, R192 and capacitor C176 as close to tube pin as possible.
6. Dress L114 with coded end as close to pin 2 of U105 socket as possible.
7. The length of the bus wire from pin 2 of V116 to ground should not be shortened or rerouted.
8. Dress R194 as close to chassis with leads as short as possible.
9. Dress C199 with leads as short as possible and away from S106.
10. Keep the leads on C126 as short and direct as possible.
11. Dress all components connected to V106 socket up and away from the chassis except L104.
12. Keep the body and coded end of L104 as close to pin 2 of V105 socket as possible.
13. Dress the 4.5 mc. trap L107 up and away from the chassis base.
14. Dress C132 up in the air and towards V105 socket.
15. Dress R125 with body as close as possible to pin 2 of U106 socket.
16. Keep body of R123 as close as possible to pin 2 of V105 socket.
17. Dress C133 and C190 away from C132, C151 and C153.
18. Dress the white wire from picture control R128-3 away from the chassis.
19. Dress all slack on kinescope socket leads under chassis. Dress brown wire away from any components associated with V105 or V106.
20. The green lead from the kinescope socket should be dressed away from all other leads and components and away from V106.
21. Dress R133 towards chassis rear apron.
22. Dress all leads in clamps on rear apron away from V117, V104, V105, V108 sockets and S103.
23. Dress green wire from C147A up and away from chassis.
24. Dress blue wire of T107 toward front apron of chassis.
25. Dress C153 down next to the chassis base.
26. Dress blue/white wire from height control R151-3 under R180.
27. Dress R161, R162, R163, R164 and R170 up and away from the chassis and with a half-inch clearance from the soldering point.
28. Dress the yellow wire from pin 3 of V110 socket over C153.
29. Dress both leads of C198 away from the body of the capacitor.
30. Dress fuse in high voltage compartment so as not to short circuit to ground.
31. Dress blue and blue/yellow wire from power transformer in 3 clamps on chassis base and away from S103 and video section.
32. Dress both wires on S106 away from blue/yellow damper leads of T110.
33. Dress the brown wire from pin 8 of V114 socket away from V118 socket.
34. Dress all 2 watt resistors away from each other and away from all wires and other components.

KCS47T AND KCS47AT CIRCUIT SCHEMATIC DIAGRAM





PRODUCTION CHANGES IN KCS47T AND KCS47AT

In some receivers, R120 was 1000 ohms.

In some receivers, C196 was .01 mfd.

In some receivers, R103 and R107 were 120 ohms and point C of T103 was 5 turns down from top of coil on the actual transformer.

In some receivers, J105, C219, C220 and C221 were omitted. L105 was 120 Muh (Red/Blue) and C130 was connected between Pin 8 of V106 and plus 125 volt bus.

In some receivers, R148 was 3.3 meg and C189 was .0015.

The following changes will be made on a few late production receivers but these changes are not shown in the schematic or wiring diagrams.

In a few late production chassis T111 will be replaced by a dual winding transformer with two adjustable cores for primary and secondary which are adjustable from the top and bottom of the chassis. R186 will be 22K and will be connected between terminal A of T111 and ground. A 100 mmf capacitor C222 will be connected in parallel with R186. Terminal B of T111 will be connected to Pin 1 of V116. Connections to Terminals C and D of T111 will remain unchanged. For circuit diagram see Service Data, Model 7T103.

In a few late production receivers the following changes will be made. R118 will be changed to 10 meg and R201 will become 150K. The bleeder resistors R208, R209 and R216 will be lifted from ground and a 220 ohm resistor R239 will be inserted between the old bleeder and ground. This will create a new 5.5 volt bus. The cathode of the AGC diode Pin 5 of V105 will be lifted from ground and connected to this 5.5 volt bus. A .01 mfd capacitor C224 will be connected from Pin 5 of V105 to ground. Video load resistors R133, R229 and L115 will be removed. A 2700 ohm resistor R139 will be connected to junction of L106 and L109. R133 a 4700 ohm resistor will be connected between R139 and the 375 volt bus. A 270 mmf capacitor C223 will be connected from the junction of R133, R139 and to Pin 8 of V107. C130 will be changed to .0033 mfd. For circuit diagram, see the Service Data for Model 7T103.

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

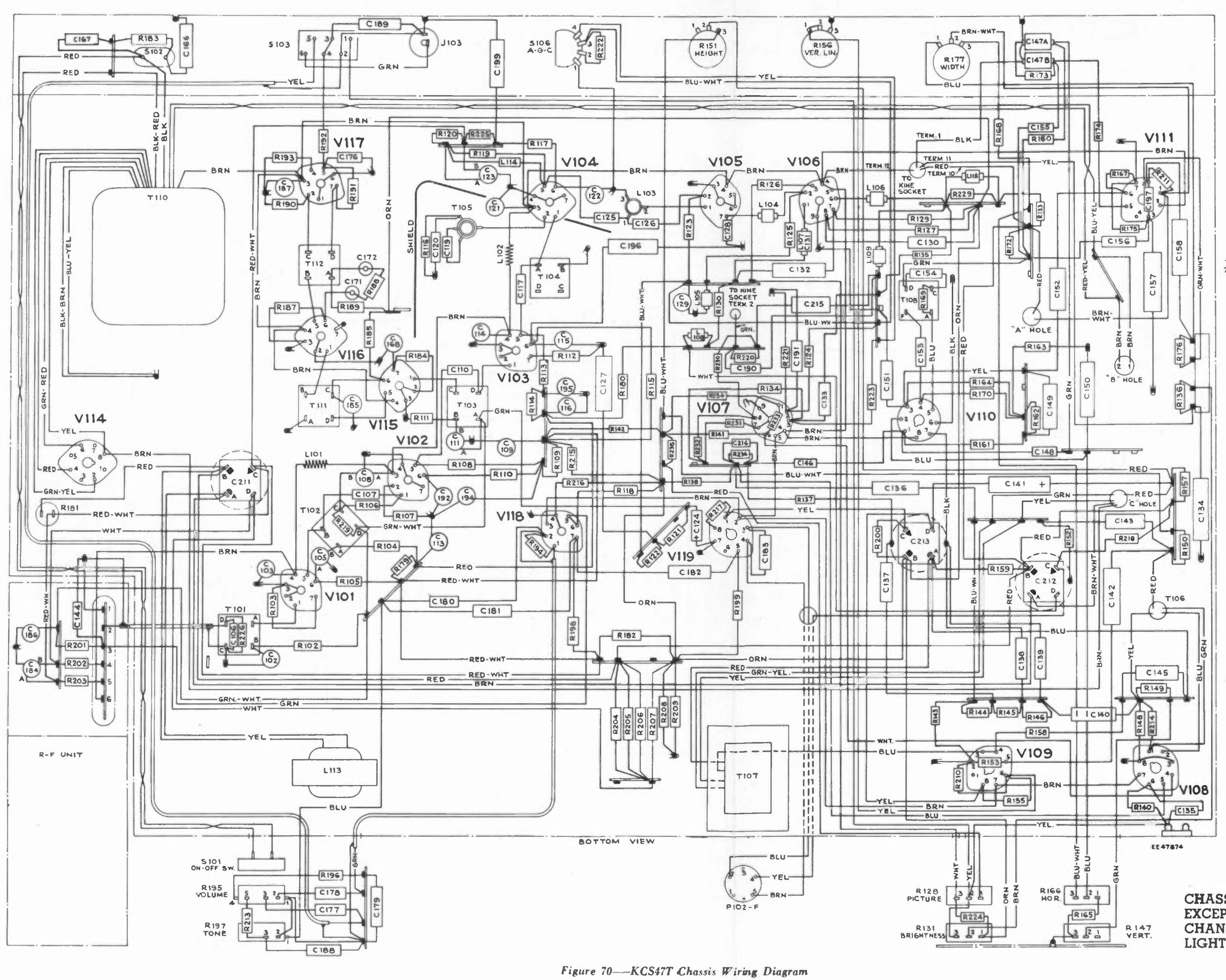
Direction of arrows at controls indicates clockwise rotation.

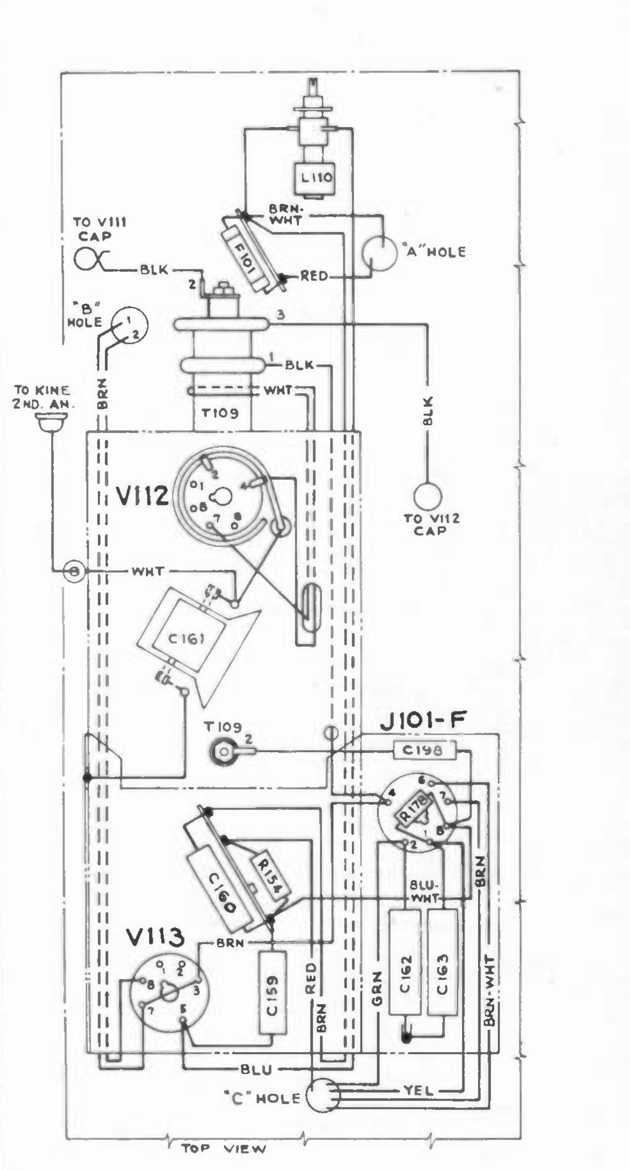
In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Figure 69—KCS47T and KCS47AT Schematic Diagram

KCS47T AND KCS47AT CHASSIS WIRING DIAGRAM

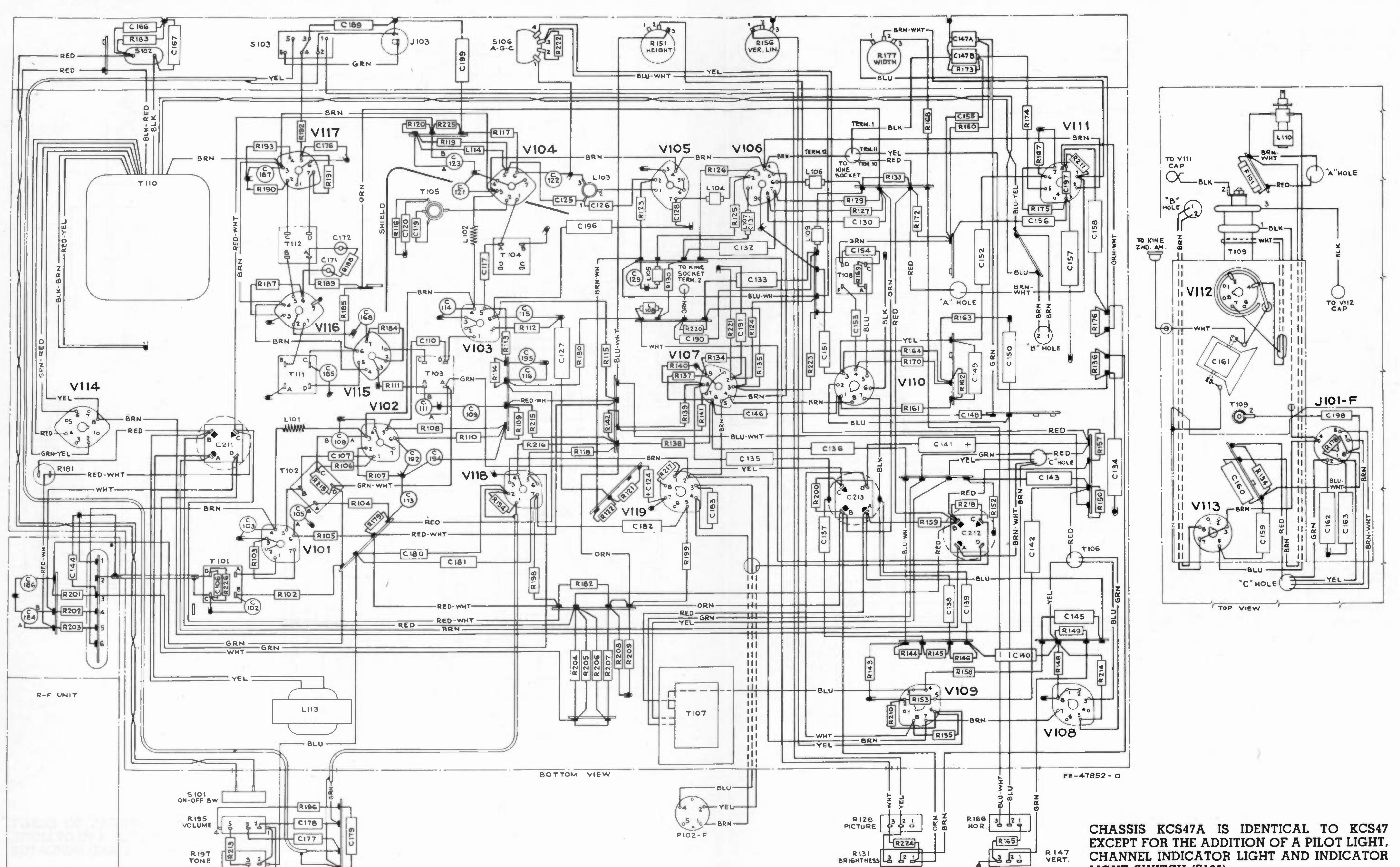




CHASSIS KCS47AT IS IDENTICAL TO KCS47T EXCEPT FOR THE ADDITION OF A PILOT LIGHT, CHANNEL INDICATOR LIGHT AND INDICATOR LIGHT SWITCH (S105).

Figure 70—KCS47T Chassis Wiring Diagram

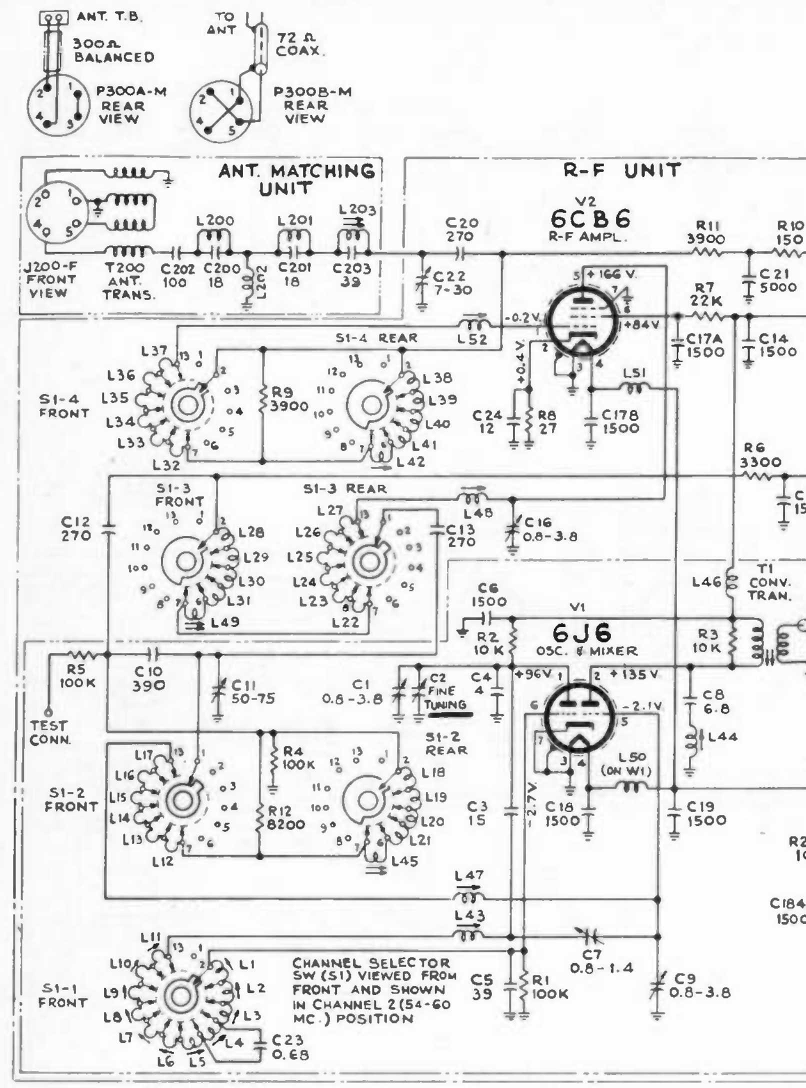
KCS47, KCS47A CHASSIS WIRING DIAGRAM

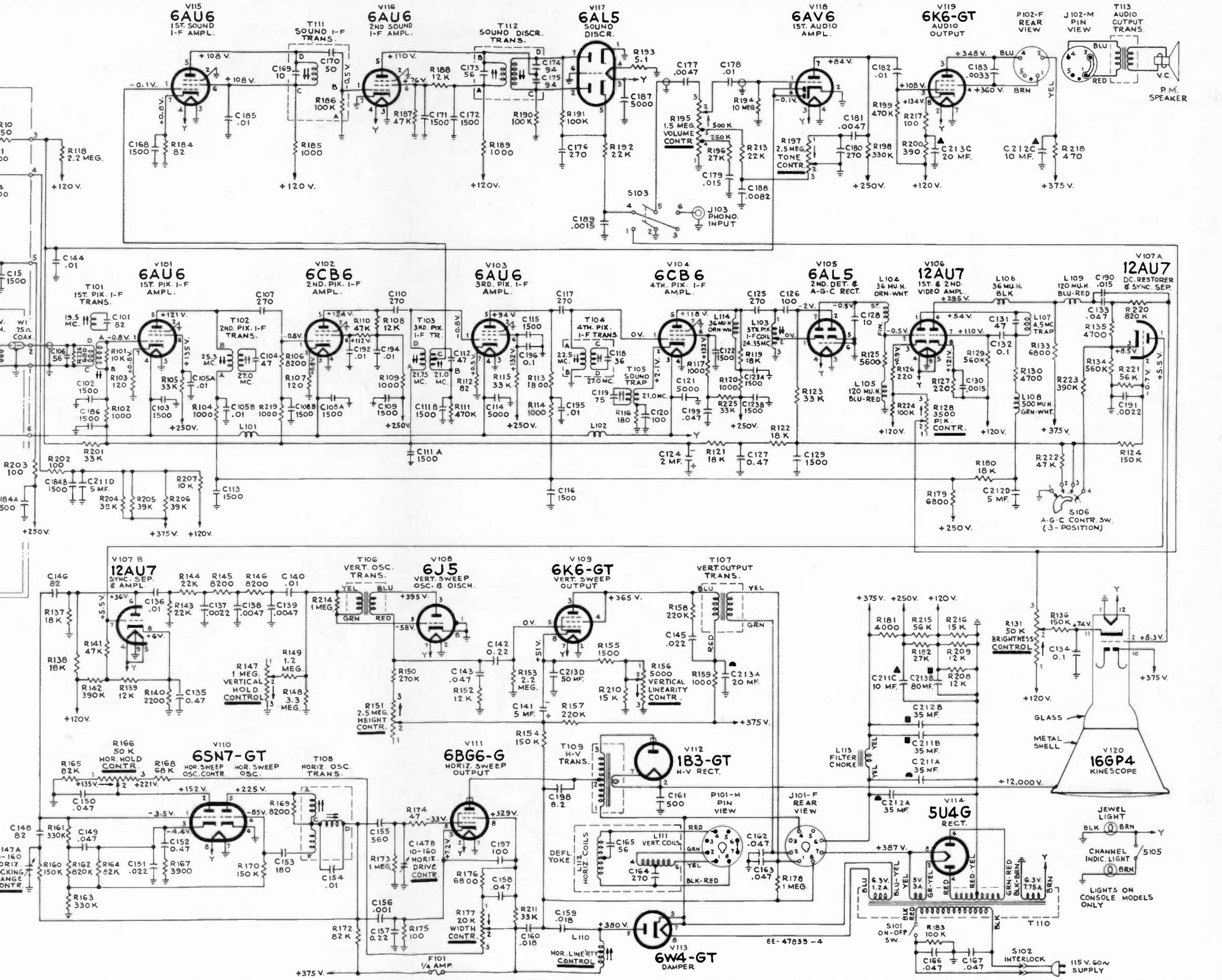


CHASSIS KCS47A IS IDENTICAL TO KCS47 EXCEPT FOR THE ADDITION OF A PILOT LIGHT, CHANNEL INDICATOR LIGHT AND INDICATOR LIGHT SWITCH (S105).

Figure 67—KCS47 Chassis Wiring Diagram

KCS47 AND KCS47A CIRCUIT SCHEMATIC DIAGRAM





PRODUCTION CHANGES IN KCS47 AND KCS47A

In some receivers, C160 was .022, C161 was 250, C105A and C105B were 1500, R129 was 330K, R180 was 22K, R176 was 8200, C141 was connected between R151, R154 and plus 120 volts. C144 and R226 were omitted.

In some receivers, the connections to terminals 1 and 3 of R177 were reversed.

In some receivers, R142 was 1.2 meg and was connected to plus 250 volts.

In some receivers, C198 was 4.7, R134 was 470K, C190 was connected at R135.

In some receivers, R113 was 3900, R119 was 8200, and L114 was omitted, T104 bottom was tuned to 24.35 MC and L103 was tuned to 22.5 MC.

In some receivers, C189 was omitted.

In some receivers, R134 was 820K, and R142 was connected to R104, C113, etc.

Due to a severe resistor shortage during the production of this series of receivers it was found necessary to substitute resistors of different values from the nominal value shown on the schematic. These substitutions were approved by the engineering department for each particular application in the circuit only if the change in value did not impair receiver operation. In some such instances, these substitutions involved a change in the value of 5%, 10%, 20% or in a few instances even greater change.

In critical circuits where a change of value could not be tolerated, the proper resistance was obtained by the use of series, parallel or even series-parallel combinations of resistors in order to obtain the correct value of resistance or wattage.

If it should become necessary to replace a resistor or group of resistors, the values shown in the schematic and parts list should be employed.

If the value of the resistor to be replaced is different from the value shown in the schematic, and the schematic value is not available, then it is permissible to replace it with the value found in the receiver or some value between that and the value shown in the schematic. Some of the commercially available, low resistance value, molded body types are of wire wound construction. Such resistors should not be employed in the r-f unit, i-f or video sections as the inductive affect of these resistors may impair circuit operation.

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Figure 68—KCS47 and KCS47A Schematic Diagram

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES
	KRK8B
10705	Ball—Steel ball for detent (5/32 dia.)
75188	Board—Terminal board, 5 contact and ground
75067	Bracket—Vertical bracket for holding oscillator tube shield
75201	Cable—75 ohms, coax cable (7¼") complete with coil (W1, L50)
75186	Capacitor—Ceramic, variable, for fine tuning—plunger type (C2)
75289	Capacitor—Ceramic, 4 mmf., ±0.5 mmf. (C4)
75189	Capacitor—Adjustable, 7-30 mmf. (C22)
75200	Capacitor—Ceramic, 12 mmf. (C24)
45465	Capacitor—Ceramic, 15 mmf. (C3)
75196	Capacitor—Ceramic, 39 mmf. (C5)
75174	Capacitor—Ceramic, trimmer, 50-75 mmf. (C11)
75199	Capacitor—Ceramic, 270 mmf. (C12, C13, C20)
75641	Capacitor—Ceramic, 390 mmf. (C10)
75166	Capacitor—Ceramic, 1,500 mmf. (C6, C14, C15, C19)
75089	Capacitor—Ceramic, dual, 1,500 mmf. (C17A, C17B)
73748	Capacitor—Ceramic, 1,500 mmf. (C18)
73473	Capacitor—Ceramic, 5,000 mmf. (C21)
75172	Capacitor—Tubular, steatite, adjustable, 0.8-1.4 mmf. (C7)
71504	Capacitor—Ceramic, 0.68 mmf. (C23)
75184	Capacitor—Ceramic, adjustable, 0.75-4 mmf., complete with adjusting stud (C1)
75197	Capacitor—Ceramic, 6.8 mmf. (C8)
75167	Clip—Tubular clip for mounting stand-off capacitors
75182	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment) for convertor section (C9, L47)
75183	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f section (L48, C16)
75185	Coil—Convertor plate loading coil (L44)
75202	Coil—Choke coil, .56 muh (L46)
73477	Coil—Choke coil (L51)
75187	Core—Adjustable core for fine tuning capacitor C2
75162	Detent—Detent mechanism and fibre shaft
73453	Form—Coil form for L45 and L49
75165	Link—Link assembly for fine tuning
14343	Retainer—Fine tuning shaft retaining ring
	Resistor—Fixed, composition:
	27 ohms, ±10%, ½ watt (R8)
	150 ohms, ±20%, ½ watt (R10)
	3,300 ohms, ±10%, ½ watt (R6)
	3,900 ohms, ±10%, ½ watt (R9, R11)
	8,200 ohms, ±10%, ½ watt (R12)
	10,000 ohms, ±5%, ½ watt (R3)
	10,000 ohms, ±20%, ½ watt (R2)
	22,000 ohms, ±10%, ½ watt (R7)
	100,000 ohms, ±20%, ½ watt (R1, R4, R5)
75164	Rod—Actuating plunger rod (fibre) for fine tuning link
71476	Screw—No. 4-40 x ¼" binder head machine screw for adjusting L6, L7, L8, L9, L10, L11
75176	Screw—No. 4-40 x ⅜" fillister head screw for adjusting L5
75177	Screw—No. 4-40 x 5/16" fillister head screw for adjusting L1, L2, L3, L4, L43
74575	Screw—No. 4-40 x .359" adjusting screw for L42
73640	Screw—No. 4-40 x 7/16" adjusting screw for L52
75159	Shaft—Channel selector shaft and plate
75160	Shaft—Fine tuning shaft and cam
75168	Shield—Oscillator and convertor sections shield for r-f unit—snap-on type
75193	Shield—Tube shield for V1
75192	Shield—Tube shield for V2
75088	Socket—Tube socket, 7 contact, miniature, ceramic, saddle mounted
75191	Spacer—Insulating spacer for front plate (4 required)
75163	Spring—Friction spring (formed) for fine tuning cam
75068	Spring—Retaining spring for oscillator tube shield
74578	Spring—Retaining spring for adjusting screws
73457	Spring—Return spring for fine tuning control
30340	Spring—Hair pin spring for fine tuning link
75175	Stator—Oscillator section stator complete with rotor, segment, coils, adjusting screws and capacitors C3 and C23 (S1-1, C3, C23, L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L43)
75178	Stator—Convertor stator complete with rotor, coils, capacitors (C10 and C12) and resistors (R4 and R5) (S1-2, C10, C12, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L45, R4, R5, R12)
75179	Stator—R-F amplifier stator complete with rotor, coils, capacitor (C13) and resistor (R6) (S1-3, C13, L22, L23, L24, L25, L26, L27, L28, L29, L30, L31, L49, R6)
75180	Stator—Antenna stator complete with rotor, coils, capacitors (C20 and C21) and resistors (R9, R10, R11) (S1-4, C20, C21, L32, L33, L34, L35, L36, L37, L38, L39, L40, L41, L42, L52, R9, R10, R11)
75169	Strip—Coil segment mounting strip—RH center
75170	Strip—Coil segment mounting strip—LH lower
75171	Strip—Coil segment mounting strip—LH upper—less trimmer C7
75173	Stud—No. 6-32 x 13/16" adjusting stud for C7 trimmer
75446	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1, uncoded and coded "ER"
75447	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1, coded numerically and "Hi Q"
75181	Transformer—Convertor transformer
75190	Washer—Insulating washer (neoprene) for capacitor C7
75607	Washer—Insulating washer (hex)
	CHASSIS ASSEMBLIES
	KCS47 or KCS47T—Table Model
	KCS47A or KCS47AT—Console Model
75228	Bracket—Focus magnet mounting bracket—upper
75229	Bracket—Focus magnet mounting bracket—lower
75515	Bracket—Channel indicator lamp bracket for KCS47A and KCS47AT)
76009	Capacitor—Ceramic, 8.2 mmf., 5,000 volts (C198)
75217	Capacitor—Mica trimmer, dual, 10-160 mmf. (C147A, C147B)
53511	Capacitor—Ceramic, 10 mmf. (C128)
75450	Capacitor—Ceramic, 39 mmf. (C203)
71924	Capacitor—Ceramic, 56 mmf. (C106)
73090	Capacitor—Mica, 82 mmf. (C146, C148)
75437	Capacitor—Ceramic, 100 mmf. (C202)
45469	Capacitor—Ceramic, 100 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C126, C197, C220, C222)
73102	Capacitor—Mica, 180 mmf. (C153)
75244	Capacitor—Ceramic, 270 mmf. (C176)
39638	Capacitor—Mica, 270 mmf. (C180)
73091	Capacitor—Mica, 270 mmf. (C107, C110, C117, C125)
73094	Capacitor—Mica, 390 mmf. (C215) (in KCS47T and KCS47AT)
74947	Capacitor—Ceramic, 500 mmf., 20,000 volts (C161)
74250	Capacitor—Mica, 560 mmf. (C155)
75166	Capacitor—Ceramic, 1,500 mmf. (C171, C172)
73748	Capacitor—Ceramic, 1,500 mmf. (C102, C103, C109, C113, C115, C116, C122, C129, C168, C186)
75089	Capacitor—Ceramic, dual, 1,500 mmf. (C108A, C108B, C111A, C111B, C123A, C123B, C184A, C184B)
73473	Capacitor—Ceramic, 5,000 mmf. (C114, C121, C187)
73960	Capacitor—Ceramic, 10,000 mmf. (C144, C185, C192, C194, C195)

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
75877	Capacitor—Ceramic, dual, 10,000 mmf. (C105A, C105B)
73747	Capacitor—Electrolytic, 2 mfd, 50 volts (C124)
28417	Capacitor—Electrolytic, 5 mfd, 450 volts (C141)
75511	Capacitor—Electrolytic, comprising 1 section of 20 mfd, 450 volts, 1 section of 80 mfd, 200 volts, 1 section of 20 mfd, 200 volts, and 1 section of 50 mfd, 50 volts (C213A, C213B, C213C, C213D)
75510	Capacitor—Electrolytic, comprising 2 sections of 35 mfd., 450 volts, 1 section of 10 mfd, 450 volts, and 1 section of 5 mfd, 450 volts (C211A, C211B, C211C, C211D, C212A, C212B, C212C, C212D)
75643	Capacitor—Tubular, moulded paper, oil impregnated, .001 mfd, 1,000 volts (C156)
73598	Capacitor—Tubular, paper, oil impregnated, .0015 mfd, 600 volts (C130, C219)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd, 600 volts (C137, C191) (C216 in KCS47T)
73599	Capacitor—Tubular, paper, oil impregnated, .0027 mfd, 600 volts (C189)
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd, 600 volts (C183)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd, 600 volts (C138, C139, C177, C181)
73808	Capacitor—Tubular, paper, oil impregnated, .0082 mfd, 1,000 volts (C188)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd, 400 volts (C136, C178, C182)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd, 600 volts (C140, C154)
73797	Capacitor—Tubular, paper, oil impregnated, .015 mfd, 600 volts (C179)
74727	Capacitor—Tubular, paper, oil impregnated, .018 mfd, 1,000 volts (C159, C160)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd, 400 volts (C145, C151)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 400 volts (C149, C199, C221)
75071	Capacitor—Tubular, moulded paper, .047 mfd, 400 volts (C166, C167)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 600 volts (C133, C150, C190)
73597	Capacitor—Tubular, moulded paper, oil impregnated, .047 mfd, 1,000 volts (C143, C158, C162, C163)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd, 400 volts (C132, C196)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd, 600 volts (C134)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd, 400 volts (C157)
74957	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd, 600 volts (C142)
73787	Capacitor—Tubular, moulded paper, 0.47 mfd, 200 volts (C127, C135, C152)
73154	Choke—Filter choke (L113)
75167	Clip—Tubular clip for mounting stand-off capacitor No. 75166
75210	Coil—Fifth pix, i-f coil complete with adjustable core (L103)
71449	Coil—Horizontal linearity control coil (L110)
73591	Coil—Antenna matching coil (2 required) (Part of T200)
75241	Coil—Antenna shunt coil (L202)
73477	Coil—Choke coil (L101, L102)
71793	Coil—Peaking coil (36 muh) (L106)
75299	Coil—Peaking coil (36 muh) (L104)
76285	Coil—Peaking coil (36 muh) (L114, R119)
75253	Coil—Peaking coil (120 muh) (L109)
75252	Coil—Peaking coil (500 muh) (L105, L108)
76132	Coil—Peaking coil (500 muh) (L115) (in KCS47T, KCS47AT)
74594	Connector—2 contact male connector for power cord
38853	Connector—4 contact female connector for antenna transformer (J200)
5040	Connector—4 contact female connector for speaker cable (P102)
35383	Connector—8 contact male connector—part of deflection yoke (P101)
68592	Connector—8 contact female connector for deflection yoke leads (J101)
75517	Contact—Anode connector assembly contact only
75215	Control—Horizontal and vertical hold control (R147, R166)
75513	Control—Tone control, volume control and power switch (R195, R197, S101)
71441	Control—Vertical linearity control (R156)
71440	Control—Height control (R151)
75514	Control—Picture control, brightness control and channel light switch for KCS47A and KCS47AT) (R128, R131, S105)
75216	Control—Picture and brightness control for KCS47 and KCS47T (R128, R131)
75516	Control—Width control (R177)
71498	Core—Adjustable core and stud for F-M trap No. 75449
74956	Cushion—Rubber cushion for deflection yoke hood (2 required)
74839	Fastener—Push fastener to mount ceramic tube socket (2 required)
73600	Fuse—0.25 ampere, 250 volts (F101)
16058	Grommet—Rubber grommet for 2nd anode lead exit
37396	Grommet—Rubber grommet to mount ceramic tube socket (2 required)
75445	Hood—Deflection yoke hood less rubber cushions
75644	Insulator—2nd anode insulator assembly
35787	Jack—Phono input jack (J103)
75482	Jack—Video jack (J106)
74953	Magnet—Ion trap magnet (P.M.)
75504	Magnet—Focus magnet complete with adjustable plate and stud
75518	Plate—Hi-voltage plate—bakelite—less transformer, capacitor and tube socket
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R193)
75512	Resistor—Wire wound, 4,000 ohms, 10 watts (R181)
	Resistors—Fixed, composition:
	47 ohms, ±20%, ½ watt (R174)
	82 ohms, ± 10%, ½ watt (R103, R107, R112, R184)
	100 ohms, ±10%, ½ watt (R217)
	100 ohms, ±20%, ½ watt (R202, R203)
	100 ohms, ±10%, 2 watts (R175)
	180 ohms, ±10%, ½ watt (R116)
	220 ohms, ±10%, ½ watt (R126, R127)
	390 ohms, ±10%, 1 watt (R200)
	470 ohms, ±10%, 1 watt (R218)
	680 ohms, ±10%, ½ watt (R226)
	1,000 ohms, ±20%, ½ watt (R102, R104, R109, R114, R117, R159, R185, R189, R219)
	1,500 ohms, ±10%, 1 watt (R155)
	1,800 ohms, ±10%, ½ watt (R113)
	2,200 ohms, ±20%, ½ watt (R140)
	3,900 ohms, ±10%, ½ watt (R167)
	4,700 ohms, ±5%, ½ watt (R130)
	4,700 ohms, ±10%, ½ watt (R135) (R230 in KCS47T, KCS47AT)
	5,600 ohms, ±5%, ½ watt (R125)
	5,600 ohms, ± 10%, ½ watt (R235) (in KCS47T, KCS47AT)
	6,800 ohms, ±10%, 1 watt (R120, R176)
	6,800 ohms, ±10%, 2 watts (R133, R179)
	8,200 ohms, ±5%, ½ watt (R106, R169)
	8,200 ohms, ±10%, ½ watt (R145, R146)
	10,000 ohms, ±10%, ½ watt (R236) (in KCS47T, KCS47AT)
	10,000 ohms, ±10%, 2 watts (R207)
	12,000 ohms, ±5%, ½ watt (R152)
	12,000 ohms, ±10%, ½ watt (R188) (R139 in KCS47 and KCS47A)
	12,000 ohms, ±5%, 1 watt (R108)

STOCK No.	DESCRIPTION
	12,000 ohms, ±10%, 2 watts (R208, R209)
	15,000 ohms, ±10%, ½ watt (R210)
	15,000 ohms, ±10%, 2 watts (R216)
	18,000 ohms, ±10%, ½ watt (R121, R122, R137)
	18,000 ohms, ±10%, 1 watt (R138, R180)
	22,000 ohms, ±10%, ½ watt (R143, R144, R186, R213)
	22,000 ohms, ±20%, ½ watt (R192)
	27,000 ohms, ±10%, ½ watt (R196)
	27,000 ohms, ±10%, 2 watts (R182)
	33,000 ohms, ±10%, ½ watt (R105, R115, R201, R211, R225)
	33,000 ohms, ±20%, ½ watt (R123)
	39,000 ohms, ±10%, 2 watts (R204, R205, R206)
	47,000 ohms, ±10%, ½ watt (R141, R187, R222)
	47,000 ohms, ±20%, ½ watt (R110)
	56,000 ohms, ±10%, ½ watt (R221) (R234 in KCS47T and KCS47AT)
	56,000 ohms, ±10%, 1 watt (R215)
	68,000 ohms, ±10%, 1 watt (R168)
	82,000 ohms, ±5%, 1 watt (R172)
	82,000 ohms, ±10%, 1 watt (R164, R165)
	100,000 ohms, ±10%, ½ watt (R224) (R233 in KCS47T and KCS47AT)
	100,000 ohms, ±5%, ½ watt (R190, R191)
	100,000 ohms, ±20%, 2 watts (R183)
	150,000 ohms, ±10%, ½ watt (R136, R154, R160)
	150,000 ohms, ±20%, ½ watt (R124)
	150,000 ohms, ±5%, 1 watt (R170)
	180,000 ohms, ±10%, ½ watt (R142) (in KCS47T and KCS47AT)
	220,000 ohms, ±10%, ½ watt (R157, R158) (R134, R223, R231, R232 in KCS47T and KCS47AT)
	270,000 ohms, ±10%, ½ watt (R150)
	330,000 ohms, ±10%, ½ watt (R161, R198)
	330,000 ohms, ±5%, 1 watt (R163)
	390,000 ohms, ±10%, ½ watt (R142, R223 in KCS47 and KCS47A)
	470,000 ohms, ±10%, ½ watt (R111)
	470,000 ohms, ±20%, ½ watt (R199)
	560,000 ohms, ±10%, ½ watt (R129) (R134 in KCS47 and KCS47A)
	820,000 ohms, ±10%, ½ watt (R162, R220)
	1 megohm, ±10%, ½ watt (R173)
	1 megohm, ±20%, ½ watt (R178, R214)
	1.2 megohm, ±5%, ½ watt (R149)
	2.2 megohm, ±10%, ½ watt (R118, R153)
	3.9 megohm, ±5%, ½ watt (R148)
	10 megohm, ±20%, ½ watt (R194)
75083	Screw—No. 8-32 x ¼" wing screw for mounting deflection yoke
75236	Screw—No. 8-32 x ⅜" binder head brass machine screw to mount focus magnet (2 required)
74602	Screw—No. 10-32 x 1¾" round head machine screw for focus magnet adjustment (3 required)
73584	Shield—Tube shield
74834	Socket—Kinescope socket
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
75223	Socket—Tube socket, 9 pin, miniature
73249	Socket—Tube socket, octal, ceramic, plate mounted
31319	Socket—Tube socket, octal, moulded
71508	Socket—Tube socket, for 1B3/8016
68592	Socket—Tube socket, 6 contact, moulded, for V113
31364	Socket—Pilot light socket
75718	Socket—Channel indicator light socket
75233	Spring—Compression spring for focus magnet adjustment (3 required)
75506	Support—Bakelite support only—part of hi-voltage shield
33491	Switch—"TV-Phono" switch (S103)
76010	Switch—AGC switch (S106)
75508	Transformer—Power transformer, 115 volt, 60 cycle (T110)
74950	Transformer—Vertical output transformer (T107)
74144	Transformer—Vertical oscillator transformer (T106)

STOCK No.	DESCRIPTION
75211	Transformer—Sound i-f transformer, single winding (T111, C169, C170, R186)
71424	Transformer—Sound i-f transformer, dual winding (T111, C169, C170)
74589	Transformer—First pix, i-f transformer (T101, C101, R101)
74590	Transformer—Second pix, i-f transformer (T102, C104)
76264	Transformer—Third pix, i-f transformer (T103, C112)
73574	Transformer—Fourth pix, i-f transformer (T104, C118)
75212	Transformer—Sound discriminator transformer (T112, C173, C174, C175)
75213	Transformer—Horizontal oscillator transformer (T108)
75509	Transformer—Antenna matching transformer complete with antenna connector, i-f and FM traps and shunt coil (T200, C200, C201, C202, C203, J200, L200, L201, L202, L203)
75519	Transformer—Hi-voltage transformer (T109)
71778	Trap—Sound trap (T105, C119)
75242	Trap—I-F trap (L200, C200, L201, C201)
75449	Trap—FM trap complete with adjustable core and stud (L203, C203)
75251	Trap—4.5 mc trap (L107, C131)
74952	Yoke—Deflection yoke complete with cable and connector (L111, L112, C164, C165, P101)
	SPEAKER ASSEMBLIES 92580-4 (For Models 6T53, 6T54 and 6T64)
75023	Cap—Dust cap
75024	Cone—Cone complete with voice coil (3.2 ohms)
5039	Connector—4 contact male connector (J101)
75022	Speaker—8" P.M. speaker complete with cone and voice coil less plug and transformer
75520	Transformer—Output transformer (T112)
	NOTE: If stamping on speaker in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	SPEAKER ASSEMBLIES 92569-11W RL 111 A2 (For Models 6T65, 6T71, 6T74, 6T75, 6T76)
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly (3.2 ohms)
5039	Connector—4 contact male connector for speaker (J102)
74974	Speaker—12" P.M. speaker complete with cone and voice coil less output transformer and connector
75520	Transformer—Output transformer (T113)
	NOTE: If stamping on speaker in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	SPEAKER ASSEMBLIES 92569-11B (For Models 6T65, 6T71, 6T74, 6T75, 6T76)
75875	Cone—Cone and voice coil assembly (3.2 ohms)
	SPEAKER ASSEMBLIES 92569-11K RMA-252 (For Models 6T65, 6T71, 6T74, 6T75, 6T76)
75642	Cone—Cone and voice coil assembly (3.2 ohms)
	MODEL 6CB1 STAND (Used with 6T54 Instrument)
76008	Caster—Caster and socket assembly
76094	Pull—Door pull
74307	Screw—No. 8-32 x 1⅛" trimit head screw for door pull

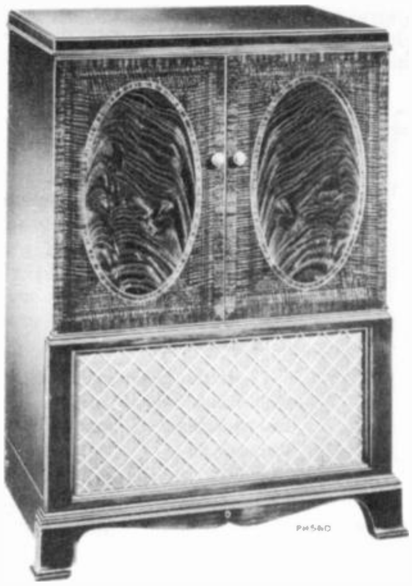
6T53, 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76 REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
	MISCELLANEOUS
75521	Back—Cabinet back complete with power cord and terminal board for Models 6T64 and 6T75
75522	Back—Cabinet back complete with power cord and terminal board for Models 6T65, 6T71, 6T74 and 6T76
75525	Back—Cabinet back complete with power cord and terminal board for Models 6T53, 6T54
75473	Board—"Ant" terminal board
71599	Bracket—Pilot lamp bracket (Models 6T64, 6T65, 6T71, 6T74, 6T75, 6T76)
13103	Cap—Pilot lamp cap (Models 6T64, 6T65, 6T71, 6T74, 6T75, 6T76)
71892	Catch—Cabinet doors bullet catch and strike (Models 6T71, 6T74, 6T75, 6T76)
X3120	Cloth—Grille cloth for mahogany or walnut instruments (Model 6T71)
X3123	Cloth—Grille cloth for mahogany or walnut instruments (Models 6T64, 6T74, 6T65)
X3090	Cloth—Grille cloth for oak instruments (Models 6T64, 6T65, 6T71, 6T74)
X3129	Cloth—Grille cloth (Model 6T75)
X3130	Cloth—Grille cloth (Model 6T76)
39153	Connector—4 contact male connector for antenna cable
75474	Connector—Single contact male connector for antenna cable (2 required)
71457	Cord—Power cord and plug
75531	Cover—Control cover assembly, including drop panel hinges and emblem
75608	Cushion—Dust seal cushion (rubber)
75440	Decal—Control panel function decal for mahogany or walnut instruments (Models 6T64, 6T65, 6T71, 6T74, 6T76)
75441	Decal—Control panel function decal for oak instruments or maple instruments (Models 6T64, 6T65, 6T71, 6T74, 6T75, 6T76) and walnut instruments (Model 6T75)
71984	Decal—Trade mark decal (Models 6T74 and 6T75)
71768	Decal—Trade mark decal (Model 6T76)
71910	Decal—Trade mark decal (Model 6T71)
75532	Decal—Control panel function decal (Models 6T53, 6T54)
76003	Decal—Decorative decal (3 gold stripes) for front of 6T54 cabinet
74809	Emblem—"RCA Victor" emblem (Models 6T64, 6T65, 6T71, 6T74, 6T75, 6T76)
73180	Emblem—"RCA Victor" emblem (Models 6T53, 6T54)
75455	Escutcheon—Channel marker escutcheon — dark — for mahogany or walnut cabinets (Models 6T64, 6T65, 6T71, 6T74, 6T75, 6T76)
75456	Escutcheon—Channel marker escutcheon — light — for oak or maple cabinets (Models 6T64, 6T65, 6T71, 6T74, 6T75, 6T76)
75499	Escutcheon—Channel marker escutcheon — dark — for metal cabinet (Models 6T53, 6T54)
74889	Feet—Felt feet for metal cabinet (Models 6T53, 6T54)
74606	Glass—Safety glass (Models 6T64, 6T65, 6T71, 6T74, 6T75, 6T76)
75530	Glass—Safety glass (Models 6T53, 6T54)
75439	Grille—Metal grille (Model 6T71)
37396	Grommet—Rubber grommet for speaker mounting (4 required) for Models 6T65, 6T71, 6T74, 6T75 and 6T76
74308	Hinge—Cabinet door hinge (1 set) (Models 6T71, 6T74, 6T75, 6T76)
74959	Knob—Fine tuning knob—maroon—for mahogany, walnut or metal instruments (outer)
73995	Knob—Fine tuning knob — tan — for maple instruments (outer)
75461	Knob—Fine tuning knob — beige — for oak instruments (outer)
74960	Knob—Channel selector knob — maroon — for mahogany, walnut or metal instruments (inner)
74961	Knob—Channel selector knob — tan — for maple instruments (inner)
75462	Knob—Channel selector knob — beige — for oak instruments (inner)
74962	Knob—Tone control, brightness control or vertical hold control knob—maroon—for mahogany, walnut or metal instruments (outer)
73999	Knob—Tone control, brightness control or vertical hold control knob — tan — for maple instruments (outer)
75463	Knob—Tone control, brightness control or vertical hold control knob—beige—for oak instruments (outer)
74963	Knob—Picture control, horizontal hold control or volume control and power switch knob—maroon—for mahogany, walnut or metal instruments (inner)
74001	Knob—Picture control, horizontal hold control or volume control and power switch knob—tan—for maple instruments (inner)
75464	Knob—Picture control, horizontal hold control or volume control and power switch knob—beige—for oak instruments (inner)
11765	Lamp—Pilot or channel indicator lamp—Mazda 51 (Models 6T64, 6T65, 6T71, 6T74, 6T75, 6T76)
75460	Mask—Light mask—gold—for oak or maple instruments
75459	Mask—Light mask — burgundy — for mahogany or walnut instruments
73634	Nut—Speed nut for speaker mounting screws (4 required) (Models 6T65, 6T71, 6T74, 6T75, 6T76)
75526	Pull—Cabinet door pull (center of door) (Model 6T74)
75438	Pull—Door pull (Model 6T71)
75527	Pull—Cabinet door pull (top of door) (Model 6T74)
75528	Pull—Cabinet door pull—R.H. (Model 6T76)
75529	Pull—Cabinet door pull—L.H. (Model 6T76)
75533	Retainer—Snap-on moulding and retainer for safety glass (Models 6T53, 6T54)
71456	Screw—No. 8-32 x 7/16" wing screw for deflection yoke and focus magnet mounting support
74307	Screw—No. 8-32 x 1¼" trimit head screw for door pull (Model 6T71)
73643	Spring—Spring clip for channel marker escutcheon
72845	Spring—Retaining spring for knobs Nos. 73995, 74959 and 75461
14270	Spring—Retaining spring for knobs Nos. 73999, 74960, 74961, 74962, 75462 and 75463
30330	Spring—Retaining spring for knobs Nos. 74001, 74963 and 75465
74966	Spring—Formed spring for kinescope masking panel
72936	Stop—Cabinet door stop (Models 6T71, 6T74, 6T75, 6T76)
75457	Washer—Felt washer—dark brown between knob and channel marker escutcheon for mahogany or walnut instruments
75523	Washer—Felt washer — tan — between knob and channel marker escutcheon for maple instruments (Model 6T76)
75458	Washer—Felt washer—beige—between knob and channel marker escutcheon for oak instruments
75500	Washer—Felt washer for cabinet back screws

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR



Model 6T72 Walnut, Mahogany or Oak

TELEVISION RECEIVER MODEL 6T72

Chassis No. KCS40B

— Mfr. No. 274 —

SERVICE DATA

— 1950 No. T10 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model 6T72 is a console type television receiver in a choice of three cabinet finishes. The chassis employs twenty-one tubes plus two rectifiers and a 16GP4 kinescope.

Features of the television unit are: full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply. An auxiliary audio input jack is provided to permit the use of an external record playing attachment.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE .... 146 square inches on a 16GP4 Kinescope

TELEVISION R-F FREQUENCY RANGE
All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range.. ±250 kc. on chan. 2, ± 650 kc. on chan. 13

RECEIVER ANTENNA INPUT IMPEDANCE
Choice: 300 ohms balanced or 72 ohms unbalanced.

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency	25.50 Mc.
Adjacent Channel Sound Trap	27.00 Mc.
Accompanying Sound Traps	21.00 Mc.
Adjacent Channel Picture Carrier Trap	19.50 Mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency	21.00 Mc.
Sound Discriminator Band Width between peaks	350 kc

VIDEO RESPONSE .... To 4 Mc.

FOCUS .... Magnetic

SWEEP DEFLECTION .... Magnetic

SCANNING .... Interlaced, 525 line

HORIZONTAL SWEEP FREQUENCY .... 15,750 cps

VERTICAL SWEEP FREQUENCY .... 60 cps

FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

POWER SUPPLY RATING
KCS40B .... 115 volts, 60 cycles, 250 watts

AUDIO POWER OUTPUT RATING .... 3.5 watts max.

LOUDSPEAKERS
KCS40B .... 92569-10W 12" PM Dynamic, 3.2 ohms

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6K6GT	Audio Output
(9)	RCA 6BA6	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6BA6	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector & Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier & Vertical Sweep Oscillator
(16)	RCA 6SN7GT	AGC Rectifier & 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier & 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator & Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 6W4GT	Damper
(22)	RCA 1B3-GT/8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier
(24)	RCA 16GP4	Kinescope

WEIGHT

Chassis with Tubes in Cabinet .... 116 lbs.

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside)	28	37⅛	23⅜
Chassis (overall)	19¼	11	18½

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. See that the TV-PH switch on the rear apron is in the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counter-clockwise until the retrace lines just disappear.

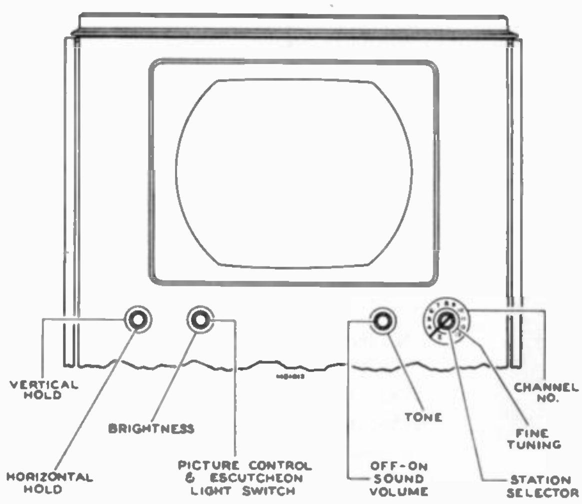


Figure 1—Receiver Operating Controls

9. Adjust the PICTURE control for suitable picture contrast.

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps 4, 8 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

13. If the positions of the controls have changed, it may be necessary to repeat steps 2 through 9.

14. To use the instrument with a record player, plug the record-player output cable into the PHONO jack on the rear apron, and set the TV-PH switch on "PH." Set the TV-PH switch back to TV on completion of the record program.

INSTALLATION INSTRUCTIONS

Connect the antenna transmission line to the receiver antenna terminals. Plug the receiver power cord into a 115 volt a-c power source. Turn the receiver power switch to the "on" position, the brightness control fully clockwise, and the picture control counter-clockwise.

WARNING. — The high voltage supply in this receiver delivers 12,000 volts! A.C. interlocks are provided at the back of the set so that when the back is removed — so is the power.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2, and with the part number on magnet towards the rear of the chassis. Starting from this position immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet

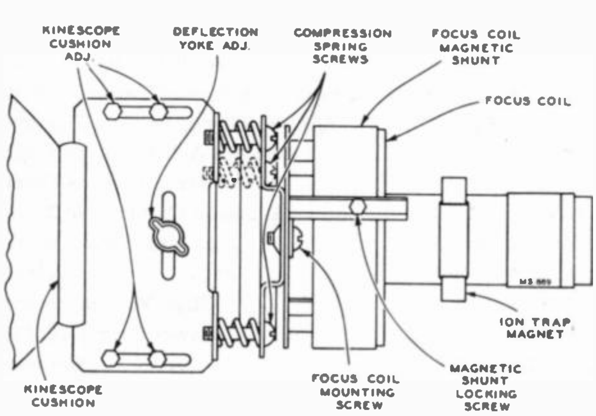


Figure 2—Yoke and Focus Coil Adjustments

for maximum raster brilliance. The final touches of this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 on the rear apron (see Figure 3) clockwise until the set operates normally and the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Usually the picture will remain in sync. Turn the control clockwise slowly. If the picture did fall out of sync upon removal of the signal, the number of diagonal black bars will be gradually reduced and when only 2 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. The picture should remain in sync for approximately 180 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Coil Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR. — If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 180 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment.—Turn the T109 sine wave core (on the outside of the apron) all the way out of the coil.

Set the locking range trimmer C153A one-half turn out from maximum capacity.

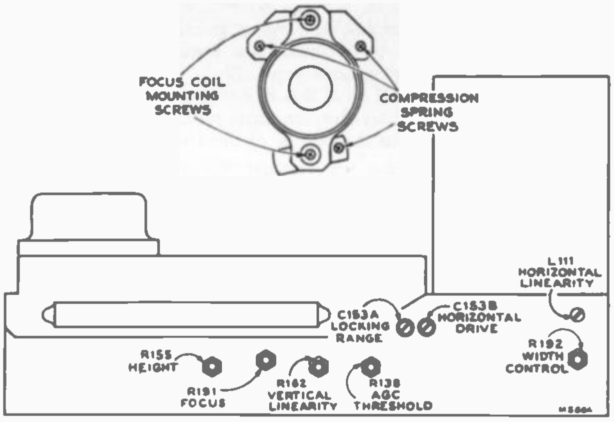


Figure 3—Rear Chassis Adjustments

Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and turn the frequency wave core of T109 under the chassis until the picture syncs and the sync bar just begins to move into the picture.

Note.—Occasionally, a tube may be found which does not respond to this alignment procedure since it may not be possible to sync the picture by means of the frequency core when the sine wave core is all the way out of the coil. Yet, the tube may work perfectly well when the circuit is properly aligned. In such a case, it may be necessary to turn the sine wave core in slightly, and readjust the frequency core to obtain sync.

Turn the sine wave core of T109 in until the blanking bar begins to move off to the left of the picture. Alternately turn the sine wave core in and the frequency out, keeping the picture in sync and the blanking bar showing in the picture.

Continue alternate adjustments until the picture falls from sync into a parasitic oscillation as indicated by a non-synchronized pattern which flickers in width and centering with possibly a light ragged vertical bar through the center of the screen.

Turn the sine wave core out ½ turn. Adjust the frequency core in until the picture is in sync and horizontal blanking appears as a vertical bar in the picture.

Check of Pull-in Range.—Turn the horizontal hold control fully counter-clockwise. Connect a 270K ohm resistor across C156. Momentarily switch off channel and back; the picture will then be out of sync. Turn the hold control clockwise slowly and observe the minimum number of bars obtained just before the picture pulls into sync.

The picture should snap in from two complete blanking bars. If two bars are not obtained, turn the locking range trimmer C153A in to obtain less bars or out to obtain more bars.

If C153A was adjusted, remove the 270K resistor, turn the horizontal hold control fully clockwise and adjust the T109 frequency core until horizontal blanking appears as a vertical bar in the synced picture. Then repeat the entire check of pull-in range to this point.

Repeat the adjustments under "Check of Pull-in Range" until the conditions specified are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If the oscillator does not hold sync properly at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure on page 11.

FOCUS COIL ADJUSTMENTS.—The focus coil should be adjusted so that there is approximately one-quarter inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus coil. This spacing gives best average focus over the face of the tube. The axis of the hole through the focus coil should be parallel with the axis of the kinescope neck.

The focus coil is provided with a magnetic shunt in the form of a metal sleeve as shown in Figure 2. If the receiver focuses with the focus control near the end of its range, loosen the shunt locking screw and slide the shunt backward or forward until focus occurs in the center range of the focus control.

CENTERING ADJUSTMENT.—No electrical centering controls are provided. Centering is obtained by loosening the two focus coil mounting screws and sliding the coil up or down or from side to side. If the focus coil was appreciably changed in position or if a corner of the raster is shadowed, check the position of the ion trap magnet. Reposition the magnet within the range of maximum raster brightness to eliminate the shadow and recenter the picture by sliding the coil. In no case should the magnet be adjusted to cause any loss of brightness since such operation may cause immediate or eventual damage to the tube. In extreme cases it may be necessary to adjust one or more of the three focus coil compression spring screws to eliminate a corner shadow.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage hence the brightest and best focused picture, adjust horizontal drive counter-clockwise as far as possible without losing tension on trimmer.

Set the width control to minimum picture width.

Turn the horizontal linearity coil out until appreciable loss in width occurs, then in until nearly maximum width and the best linearity is obtained. Do not run the core in beyond the point of maximum linearity change, as the current drawn by the 6BG6G then becomes excessive.

Adjust the width control for the proper picture width.

Readjust linearity, but again not beyond the point of maximum linearity change. If necessary adjust the drive control for best linearity.

If at very high line voltage, the picture width is excessive even with the width control set at minimum, turn the linearity coil out to obtain the proper width. On high line voltage, excessive width generally will be accompanied by good linearity, without retouching the drive.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS.—Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron) until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust the focus coil to align the picture with the mask.

Check to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

AGC THRESHOLD CONTROL.—The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC threshold control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counter-clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counter-clockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counter-clockwise on a weak signal, then the receiver may overload when a strong signal is received.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure on page 10. The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well. See Figures 8 and 9 for their location.

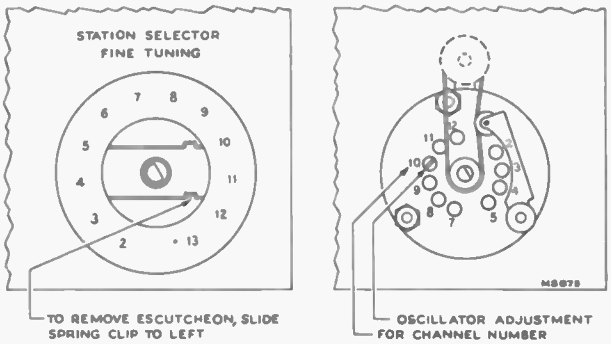


Figure 4—R-F Oscillator Adjustments

Replace the cabinet back and make sure that the screws are tight in order to prevent rattling at high volume.

WEAK SIGNAL AREA OPERATION.—Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390-ohm resistor R14 which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

CHASSIS REMOVAL.—To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the control knobs, the cabinet back, unplug the speaker cable, the kinescope socket, the antenna cable, the pilot light cable, the yoke and focus coil cable. Remove the yoke frame grounding strap and the interlock switch. Take out the six chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet.

KINESCOPE HANDLING PRECAUTION.—Do not install, remove, or handle the kinescope in any manner, unless shatterproof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope from the cabinet, take out the four screws and one wing screw which hold the yoke frame to the cabinet. Remove the kinescope, the yoke frame with yoke and focus coil as an assembly.

INSTALLATION OF KINESCOPE.—Handle this tube by the metal rim at the edge of the screen. Do not cover the glass bell of the tube with fingermarks as it will produce leakage paths which may interfere with reception. If this portion of the tube has inadvertently been handled, wipe it clean with a soft cloth moistened with "dry" carbon tetrachloride.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and fingermarks with a soft cloth moistened with "Windex" or similar cleaning agent.

Turn the tube so that the key on the base of the tube will be down and insert the neck of the kinescope through the deflection and focus coils. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Replace the kinescope and yoke frame assembly in the cabinet. Insert the four screws and wing screw and tighten.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible. If this is not done, difficulty will be encountered in adjusting the ion trap magnet and focus coil because of shadows on the corner of the raster.

Slide the chassis into the cabinet, then insert and tighten the six chassis bolts.

Slip the ion trap magnet over the neck of the kinescope.

Connect the kinescope socket to the tube base and slip the high voltage lead clip between the rim of the kinescope and the mask.

Reconnect all other cables. Do not forget to replace the yoke frame grounding strap. Perform the entire set-up procedure beginning with Ion Trap Magnet Adjustment.

ANTENNAS.—The finest television receiver built may be said to be only as good as the antenna design and installation. It is therefore important to select the proper antenna to suit local conditions, to install it properly and orient it correctly.

CABINET ANTENNA.—A cabinet antenna is provided which may be employed in strong signal areas in which no reflections are experienced. The antenna leads are brought out near the receiver antenna terminal board.

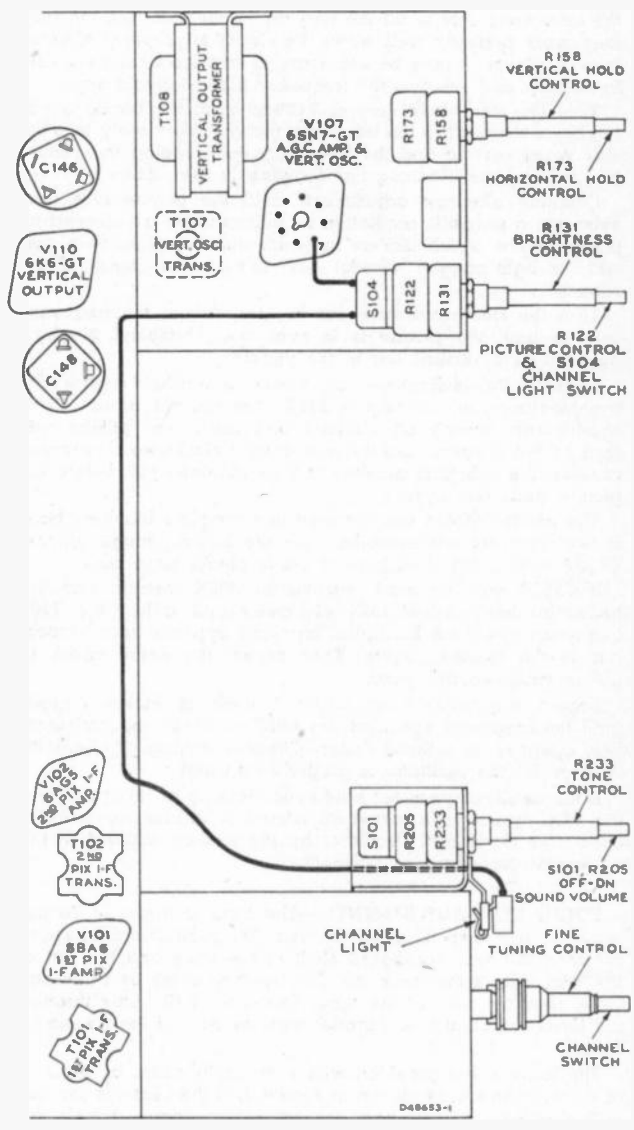


Figure 5—Partial Bottom View of Chassis Showing Channel Light and Channel Light Switch (Chassis is otherwise identical to KCS40A used in Models TC165, TC166, TC167 and TC168)

THE CHASSIS USED IN MODEL 6T72 IS VERY SIMILAR TO THE CHASSIS USED IN MODELS T164, TC165, ETC. THE DIFFERENCE BEING IN THE ADDITION OF A CHANNEL INDICATOR LIGHT SWITCH (S104) IN MODEL 6T72.

THE ALIGNMENT PROCEDURE IS IDENTICAL TO THAT GIVEN FOR MODELS T164, TC165, ETC., ON PAGES 267 TO 273 EXCEPT FOR A SLIGHT DIFFERENCE IN THE ALIGNMENT FREQUENCIES.

(EARLY PRODUCTION OF MODEL 6T72 WAS ALIGNED AT THE SAME FREQUENCIES AS MODEL T164. THE CHANGE WAS MADE TO REDUCE I-F HARMONIC INTERFERENCE.)

REFER TO MODELS T164, TC165, ETC., ON PAGES 261 TO 288 FOR ADDITIONAL SERVICE INFORMATION.

ALIGNMENT PROCEDURE

Service Precautions. — If possible, the chassis should be serviced without the kinescope. However, if it is necessary to view the raster during servicing, it would be a great convenience to have a set of yoke, focus coil, kinescope socket, high voltage and speaker extension cables.

CAUTION: Do not short the kinescope second-anode lead. Its short circuit current represents a considerable overload on the high voltage rectifier V113.

TEST EQUIPMENT. — To service properly the television chassis of this receiver, it is recommended that the following test equipment be available:

R-F Sweep Generator meeting the following requirements:

(a) Frequency Ranges
- 20 to 30 mc., 1 mc. and 10 mc. sweep width
- 50 to 90 mc., 10 mc. sweep width
- 170 to 225 mc., 10 mc. sweep width

(b) Output adjustable with at least .1 volt maximum.

(c) Output constant on all ranges.

(d) "Flat" output on all attenuator positions.

Cathode-Ray Oscilloscope. — For alignment purposes, the oscilloscope employed must have excellent low frequency and phase response, and should be capable of passing a 60-cycle square wave without appreciable distortion. While this requirement is not met by many commercial instruments, RCA Oscilloscopes, types WO-55A, WO-58A, WO-79A, and WO-60C fill the requirement and any of these may be employed.

Electronic Voltmeter of Junior "VoltOhmyst" type and a high voltage multiplier probe for use with this meter to permit measurements up to 15 kv.

Signal Generator to provide the following frequencies with crystal accuracy.

(a) Intermediate frequencies
- 19.50 mc. adjacent channel picture trap
- 21.00 mc. sound i-f and sound traps
- 22.05 and 24.75 mc. conv. and first pix i-f trans.
- 25.3 mc. second picture i-f transformer
- 24.35 mc. fourth picture i-f transformer
- 21.75 mc. third picture i-f transformer
- 22.5 mc. fifth picture i-f transformer
- 25.50 mc. picture carrier
- 27.00 mc. adjacent channel sound trap

(b) Radio frequencies

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.
2	55.25	59.75
3	61.25	65.75
4	67.25	71.75
5	77.25	81.75
6	83.25	87.75
7	175.25	179.75
8	181.25	185.75
9	187.25	191.75
10	193.25	197.75
11	199.25	203.75
12	205.25	209.75
13	211.25	215.75

(c) Output on these ranges should be adjustable and at least .1 volt maximum.

Heterodyne Frequency Meter with crystal calibrator if the signal generator is not crystal controlled.

Adjustments Required. — Normally, only the r-f oscillator line will require the attention of the service technician. All other circuits are either broad or very stable and hence will seldom require readjustment.

The oscillator line is relatively non-critical. When oscillator tubes are changed, in all probability it will be necessary to adjust only C6 in order to bring the entire line into adjustment.

ORDER OF ALIGNMENT. — When a complete receiver alignment is necessary, it can be most conveniently performed in the following order:

(1) Sound discriminator
(2) Sound i-f transformers
(3) Picture i-f traps
(4) Picture i-f transformers
(5) R-F and converter lines
(6) R-F oscillator line
(7) 4.5 mc. video trap
(8) Sensitivity check

SOUND DISCRIMINATOR ALIGNMENT. — Set the signal generator for approximately .1 volt output at 21.00 mc. and connect it to the second sound i-f grid.

Detune T113 secondary (bottom).

Set the "VoltOhmyst" on the 3-volt scale.

Connect the meter, in series with a 1-megohm resistor, to the junction of diode resistors R203 and R204.

continued on page 9

6T72

ALIGNMENT TABLE

THE DETAILED ALIGNMENT PROCEDURE BEGINNING ON PAGE 5 SHOULD BE READ BEFORE ALIGNMENT BY USE OF THE TABLE IS ATTEMPTED.

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
DISCRIMINATOR AND SOUND I-F ALIGNMENT									
1	2nd sound i-f grid (pin 1, V117)	21.00 .1 volt output	Not used		Not used	In series with 1 meg. to junction of R203 & R204		Detune T113 (bot.) Adjust T113 (top) for max. on meter	Fig. 8 Fig. 9 Fig. 10
2	"	"	"		"	Junct. of C183 & R203	Meter on 3 volt scale	T113 (bottom) for zero on meter	Fig. 9 Fig. 10
3	"	"	2nd sound i-f grid (pin 1, V117)	21.25 center 1 mc. wide .1 v. out	Junction of C183 & R203	Not used	Check for symmetrical response waveform (positive & negative). If not equal adjust T113 (top) until they are equal		Fig. 10 Fig. 12
4	1st sound i-f grid (pin 1, V116)	21.00 reduced output	1st sound i-f grid	21.25 reduced output	Terminal A, T112 in series with a 33,000 ohm resistor	"	Sweep output reduced to provide .3 volt p-to-p on scope	T112 (top & bot.) for max. gain and symmetry at 21.00 mc.	Fig. 8 Fig. 9 Fig. 10 Fig. 13
PICTURE I-F AND TRAP ADJUSTMENT									
5	Not used		Not used		Not used	Junction of R135 & C190	Remove V107. Connect potentiometer between pins 5 & 6 of V107 socket	Adjust pot. for meter reading of −12 volts	Fig. 10
6	Converter grid (pin 1, V2)	21.00	"		"	Across R119	Meter on 3 volt scale. Receiver between 2 and 13	T103 (top) for min. on meter	Fig. 8
7	"	21.00	"		"	"	"	T105 (top) for min.	"
8	"	27.00	"		"	"	"	T102 (top) for min.	"
9	"	27.00	"		"	"	"	T104 (top) for min.	"
10	"	19.50	"		"	"	"	T106 (top) for min.	"
11	"	19.50	"		"	"	"	T101 (top) for min.	"
12	"	22.5	"		"	"	"	T106 (bottom) for max. on meter	Fig. 9
13	"	24.35	"		"	"	"	T104 (bottom) for max.	"
14	"	21.75	"		"	"	"	T103 (bottom) for max.	"
15	"	25.3	"		"	"	"	T102 (bottom) for max.	"
16	"	22.05 24.75	Converter grid (pin 1, V2)	Sweeping 20 to 30 mc.	Pin 1, V106	Junction of R135 & C190	Shunt 330 ohms across pri. T102, T103, T104, T106. Set bias −2 V. Set swp. gen. for 4 V. P-P on scope.	Adjust T1 (top) and T101 (bottom) for proper response	Fig. 8 Fig. 9 Fig. 14
17	"		"	"	"	"	Remove shunt resistors. Set bias to give 15 volts P to P on scope.	Adjust T1 (top), T101, T102, T103, T104, T106 (bot.) for proper resp.	Fig. 8 Fig. 9 Fig. 15
ANTENNA, R-F AND CONVERTER LINE ALIGNMENT									
18	Antenna terminals	215.75	Not used		Not used	Junction of C183 & R203 for signal gen. method only	Fine tuning centered. Receiver on channel 13. Heterodyne meter coupled to oscillator if used.	C6 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10
19						Junction of R135 & L117	Remove V101	Potentiometer for —3.5 volts on meter	Fig. 8 Fig. 10
20	Antenna terminal (loosely)	175.25 & 179.75	Antenna terminals (see text for precaution)	Sweeping channel 7	Test Connection R13	Not used	Receiver on channel 7	L6, C10, C11 & C14 for flat top response between markers. Markers above 90%.	Fig. 8 Fig. 9 Fig. 16 (7)
21	"	205.25 209.75	"	channel 12	"	"	Receiver on channel 12	L6 for max. response and min. slope of top of curve	Fig. 8 Fig. 16 (12)
22	"	175.25 179.75	"	channel 7	"	"	Receiver on channel 7	Check to see that response is as above	Fig. 16 (7)
23	"	181.25 185.75	"	channel 8	"	"	Receiver on channel 8	"	Fig. 16 (8)
24	"	187.25 191.75	"	channel 9	"	"	Receiver on channel 9	"	Fig. 16 (9)
25	"	193.25 197.75	"	channel 10	"	"	Receiver on channel 10	"	Fig. 16 (10)

ALIGNMENT PROCEDURE

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
	ANTENNA, R-F AND CONVERTER LINE ALIGNMENT (Continued)								
26	"	199.25 203.75	"	channel 11	"	"	Receiver on channel 11	"	Fig. 16 (11)
27	"	205.25 209.75	"	channel 12	"	"	Receiver on channel 12	"	Fig. 16 (12)
28	"	211.25 215.75	"	channel 13	"	"	Receiver on channel 13	"	Fig. 16 (13)
29	If the response on any channel (steps 22 through 28) is below 80% at either marker, switch to that channel and adjust L6, C10, C11 & C14 to pull response up on that channel. Then recheck steps 22 through 28.								
30	Antenna terminals (loosely)	83.25 87.75	Ant. terminals (see text for precaution)	Sweeping chan. 6	Test Connection R13	Not used	Receiver on channel 6	L9, L13, L66 & C12 for response as above	Fig. 16 (6)
31	"	77.25 81.75	"	channel 5	"	"	Receiver on channel 5	Check to see that response is as above	Fig. 16 (5)
32	"	67.25 71.75	"	channel 4	"	"	Receiver on channel 4	"	Fig. 16 (4)
33	"	61.25 65.75	"	channel 3	"	"	Receiver on channel 3	"	Fig. 16 (3)
34	"	55.25 59.75	"	channel 2	"	"	Receiver on channel 2	"	Fig. 16 (2)
35	If the response on any channel (steps 31 through 34) is below 80% at either marker, switch to that channel and adjust L9, L13, L66 & C12 to pull response up on that channel. Then recheck steps 30 through 34. Disconnect the bias pot. and replace V101 and V107.								
	R-F OSCILLATOR ALIGNMENT								
STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
36	Antenna terminals	215.75	Loosely coupled to r-f osc.	236.75	Not used	Junction of C183 & R203 for sig. gen. method only	Fine tuning centered. Receiver on channel 13	C6 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10
37	"	209.75	"	230.75	"	"	Rec. on chan. 12	L14 as above	Fig. 11
38	"	203.75	"	224.75	"	"	Rec. on chan. 11	L15 as above	"
39	"	197.75	"	218.75	"	"	Rec. on chan. 10	L16 as above	"
40	"	191.75	"	212.75	"	"	Rec. on chan. 9	L17 as above	"
41	"	185.75	"	206.75	"	"	Rec. on chan. 8	L18 as above	"
42	"	179.75	"	200.75	"	"	Rec. on chan. 7	L19 as above	"
43	"	87.75	"	108.75	"	"	Rec. on chan. 6	L31 as above	Fig. 9
44	"	81.75	"	102.75	"	"	Rec. on chan. 5	L21 as above	Fig. 11
45	"	71.75	"	92.75	"	"	Rec. on chan. 4	L22 as above	"
46	"	65.75	"	86.75	"	"	Rec. on chan. 3	L23 as above	"
47	"	59.75	"	80.75	"	"	Rec. on chan. 2	L24 as above	"
48	Repeat steps 36 through 47 as a check.								
	AGC THRESHOLD ADJUSTMENT								
49	Not used		Not used		Pin 1, V106	Not used	Tune in station, turn pix control clockwise. Adjust R138 for max. gain without clipping sync on scope		Fig. 10 Fig. 17
	HORIZONTAL OSCILLATOR ADJUSTMENT								
50	Short circuit terminals C and D of T109. Tune in a station. Set locking range trimmer C153A ½ turn out from maximum.								
51	Turn hold control fully clockwise. Adjust T109 Frequency Adjustment until horizontal blanking bar appears in the picture.								
52	Turn hold control ¼ turn from clockwise to sync picture. Adjust width (R192), linearity (L111) and drive (C153B) controls until picture is correct. Repeat step 51, then proceed with step 53.								
53	Remove clip from terminals C and D of T109. Turn hold control fully clockwise. Adjust T109 Oscillator Waveform Adjustment until horizontal blanking bar appears in picture with core in outer of two possible positions.								
54	Connect low capacity probe of oscilloscope to terminal C of T109. Alternately adjust T109 Oscillator Waveform Adjustment and frequency adjustment until broad and sharp peaks of wave on oscilloscope are same height while keeping picture in sync. Remove oscilloscope.								
55	Connect a 270K resistor across C156. Turn hold control fully counter-clockwise. Momentarily remove signal. Turn hold control slowly clockwise. Note least number of bars before pull-in. Adjust Locking Range Control (C153A) for 2 bar pull-in.								
56	Turn hold control fully clockwise. Adjust T109 Freq. Adjustment until horizontal blanking appears as single vertical or diagonal bar in pix.								
	4.5 MC VIDEO TRAP ADJUSTMENT								
57	Tune in a strong station. Short T103 trap. If a 4.5 mc. beat appears in picture adjust 4.5 mc. trap (L110) until beat is eliminated.								
	SENSITIVITY CHECK								
58	Connect antenna to receiver through attenuator pad to provide weak signal. Compare the picture and sound obtained to that obtained on other receivers under the same conditions.								

ALIGNMENT DATA

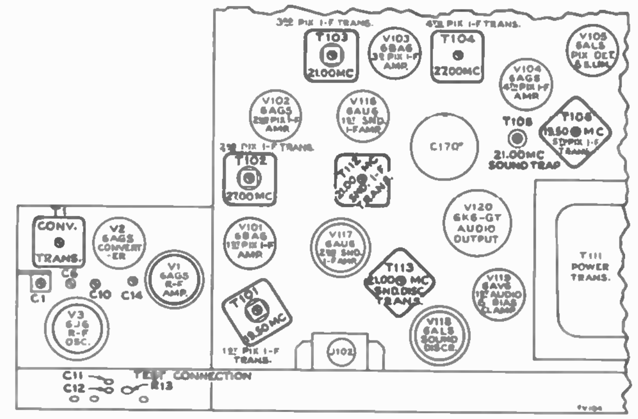


Figure 8—Top Chassis Adjustments

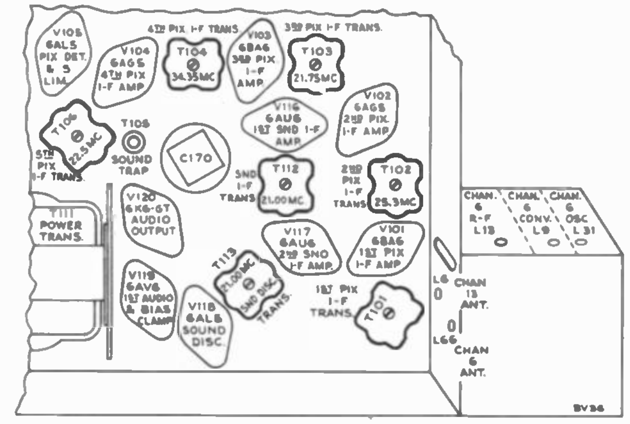


Figure 9—Bottom Chassis Adjustments

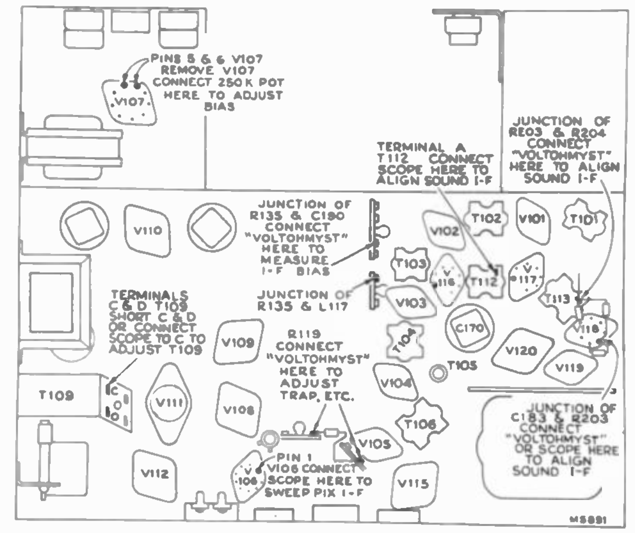
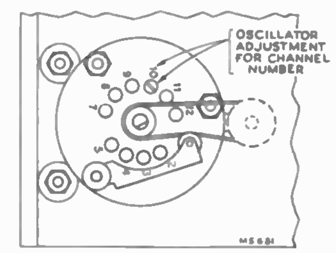


Figure 10—Test Connection Points



OSCILLATOR ADJUSTMENT FOR CHANNEL 13 IS ON TOP OF R-F UNIT AND CHANNEL 6 IS ON SIDE.

Figure 11—R-F Oscillator Adjustments

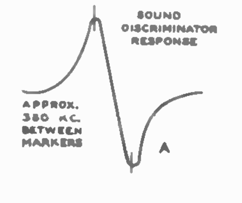


Figure 12 Discriminator Response

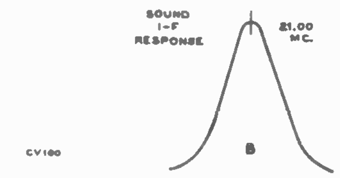


Figure 13 Sound I-F Response

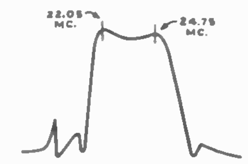


Figure 14 T1 and T101 Response

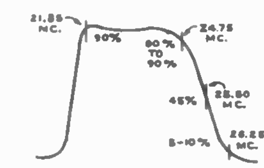


Figure 15 Overall I-F R-F Response

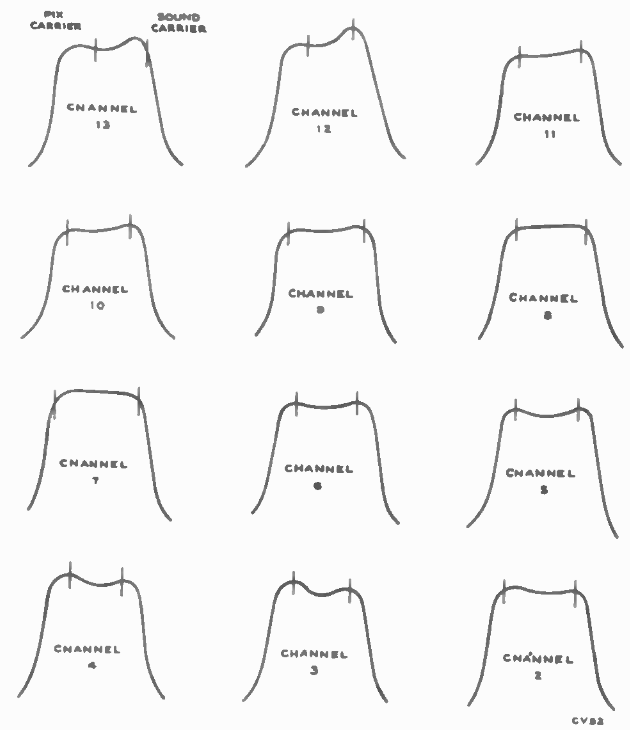


Figure 16—R-F Response

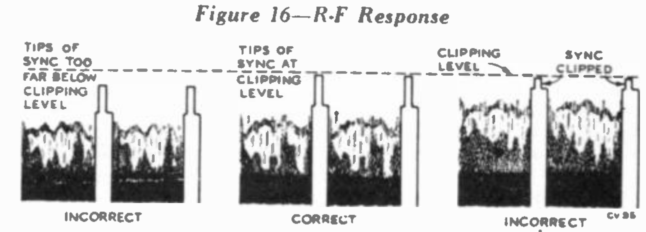


Figure 17—AGC Threshold Adjustment Waveforms

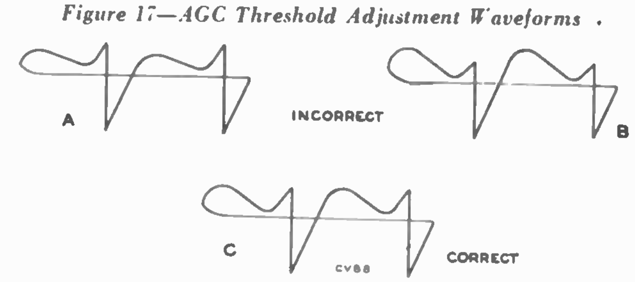


Figure 18—Horizontal Oscillator Waveforms

Continued from Page 5

ALIGNMENT PROCEDURE (Continued)

Adjust the primary of T113 (top) for maximum output on the meter.

Connect the "VoltOhmyst" to the junction of C183 and R203. Adjust T113 secondary (bottom). It will be found that it is possible to produce a positive or negative voltage on the meter dependent upon this adjustment. Obviously to pass from a positive to a negative voltage, the voltage must go through zero. T113 (bottom) should be adjusted so that the meter indicates zero output as the voltage swings from positive to negative. This point will be called discriminator zero output.

Connect the sweep oscillator to the grid of the second sound i-f amplifier.

Adjust the sweep band width to approximately 1 mc. with the center frequency at approximately 21.00 mc. and with an output of approximately .1 volt.

Connect the oscilloscope to the junction of C183 and R203. The pattern obtained should be similar to that shown in Figure 12. If it is not, adjust T113 (top) until the waveform is symmetrical.

The peak-to-peak band width of the discriminator should be approximately 350 kc. and the trace should be linear from 21.150 mc. to 21.300 mc.

SOUND I-F ALIGNMENT. — Connect the sweep oscillator to the first sound i-f amplifier grid.

Connect the oscilloscope to the second sound i-f grid return (terminal A of T112) in series with a 33,000-ohm isolating resistor.

Insert a 21.25 mc. marker signal from the signal generator into the first sound i-f grid.

Adjust T112 (top and bottom) for maximum gain and symmetry about the 21.00 mc. marker. The pattern obtained should be similar to that shown in Figure 13.

The output level from the sweep should be set to produce approximately .3 volt peak-to-peak at the second sound i-f grid return when the final touches on the above adjustment are made. It is necessary that the sweep output voltage should not exceed the specified values otherwise the response curve will be broadened, permitting slight misadjustment to pass unnoticed and possibly causing distortion on weak signals.

The band width at 70% response from the first sound i-f grid to the second i-f grid should be approximately 200 kc.

PICTURE I-F TRAP ADJUSTMENT. — Connect the "VoltOhmyst" to the junction of R135 and C190.

Remove the 6SN7GT AGC Amplifier tube V107. Connect a 250,000-ohm potentiometer between pins 5 and 6 of the V107 socket. Adjust the potentiometer until the "VoltOhmyst" reads approximately −12 volts.

Set the channel switch to the blank position between channels number 2 and 13.

Connect the "VoltOhmyst" across the picture detector load resistor R119. Under this condition, both leads of the meter are at approximately −120 volts. In making this connection, care should be taken not to touch the case of the meter or to permit the meter case to become grounded.

Connect the output of the signal generator to the grid of the converter tube V2. To do this, remove the tube from the socket and fashion a clip by twisting one end of a small piece of wire around pin number 1. Replace the tube in the socket leaving the end of the wire protruding from under the tube. Connect the signal generator to this wire through a 1,500 mmf capacitor keeping the leads as short as possible.

Set the generator to each of the following frequencies and with a thin fiber screwdriver tune the specified adjustment for minimum indication on the "VoltOhmyst." In each instance the generator should be checked against a crystal calibrator to insure that the generator is exactly on frequency.

(1) 21.00 mc.—T103 (top)
(2) 21.00 mc.—T105 (top)
(3) 27.00 mc.—T102 (top)
(4) 27.00 mc.—T104 (top)
(5) 19.50 mc.—T106 (top)
(6) 19.50 mc.—T101 (top)

In the above transformers using threaded cores, it is possible to run the cores completely through the coils and secure two peaks or nulls. The correct position is with the cores in the outside ends of the coils. If the cores are not in the correct position, the coupling will be incorrect and it will be impossible to secure the correct response.

PICTURE I-F TRANSFORMER ADJUSTMENTS. — Set the signal generator to each of the following frequencies and peak the specified adjustment for maximum indication on the "VoltOhmyst." During alignment, reduce the input signal if necessary to prevent overloading.

22.5 mc.—T106 (bottom)
24.35 mc.—T104 (bottom)
21.75 mc.—T103 (bottom)
25.3 mc.—T102 (bottom)

T1 and T101 are coupled by a link and in combination constitute an overcoupled transformer. The characteristics of such a transformer are such that it is impossible to adjust it to a single frequency.

To sweep align T1 and T101, connect a 330-ohm composition resistor across the primary coils of T102, T103, T104 and T106.

Connect the "VoltOhmyst" to the junction of R135 and C190. Adjust the 250,000-ohm variable resistor for −2.0 volts on the meter.

Connect the oscilloscope to the plate of the first video amplifier, pin 1 of V106.

Connect a sweep generator to the converter grid through a 1,500 mmf capacitor. Set the generator to sweep from 20.0 mc. to 30.0 mc. and adjust the output to provide a 4-volt peak-to-peak signal on the scope.

Connect the signal generator loosely to the converter grid and tune it to provide markers at 22.05 mc. and 24.75 mc.

Adjust T1 (top) and T101 (bottom) to obtain the response shown in Figure 14. The T1 core must penetrate to the terminal-board end of the coil in order to obtain the correct response.

Remove the 330-ohm resistors from across T102, T103, T104 and T106.

Adjust the 250,000-ohm potentiometer for a 15-volt peak-to-peak signal at the plate of the first video amplifier. The bias as measured by the "VoltOhmyst" should be −12 volts or less.

Observe and analyze the response curve obtained. The response will not be ideal and the i-f adjustments must be retouched in order to obtain the desired curve. See Figure 15.

On final adjustment the picture carrier marker must be at approximately 45% response. The curve must be approximately flat topped, with the 21.85 mc. marker at approximately 90% response and the 24.75 mc. marker below 90% response. A 26.25 mc. marker must fall between 5 and 10% response.

The most important consideration in making the i-f adjustments is to get the picture carrier at the 45% response point. If the picture carrier operates too low on the response curve, loss of low frequency video response, of picture brilliance, of blanking, and of sync may occur. If the picture carrier operates too high on the response curve, the picture becomes smeared. In making these adjustments, care should be taken to see that no two transformers are tuned to the same frequency as i-f oscillation may result.

Remove the converter tube and take off the clip to pin number 1. Replace the tube in the socket.

Picture I-F Oscillation. — If the receiver will operate without oscillating with the test equipment disconnected but breaks into oscillation or becomes unstable with the equipment connected, it may become necessary to establish a ground plane. Cover the test bench with a sheet of copper and set the chassis on the sheet. Set all the test equipment except the "VoltOhmyst" on the sheet and bond or bypass them to it. A Junior "VoltOhmyst" should not be bonded to the sheet since the negative test probe is not always connected to ground during alignment. If the receiver is badly misaligned and two or more of the i-f transformers are tuned to the same frequency, the receiver may fall into i-f oscillation. I-F oscillation shows up as a voltage across the picture detector load resistor that is unaffected by r-f signal input. If such a condi-

ALIGNMENT PROCEDURE

tion is encountered, it is sometimes possible to stop oscillation by adjusting the transformers approximately to frequency by setting the adjustment cores of T101, T102, T103, T104, T105 and T106 to be approximately equal to those of another receiver known to be in proper alignment. If this does not have the desired effect, it may now be possible to stop oscillation by increasing the grid bias. If so, it should then be possible to align the transformers by the usual method. Once aligned in this manner, the i-f amplifier should be stable with reduced bias.

If the oscillation cannot be stopped in the above manner, shunt the grids of the first three pix i-f amplifiers to ground with 1,000 mmf. capacitors. Connect the signal generator to the fourth pix i-f grid and align T106 to frequency. Progressively remove the shunt from each grid and align the plate coil of that stage to frequency.

If this does not stop the oscillation, the difficulty is not due to i-f misalignment as the i-f section is stable when properly aligned. Check all i-f by-pass condensers, transformer shunting resistors, tubes, socket voltages, etc.

ANTENNA, R-F AND CONVERTER LINE ADJUSTMENT. — In order to align the r-f tuner, it will first be necessary to set the channel-13 oscillator to frequency. The shield over the bottom of the r-f unit must be in place when making any adjustments.

The channel-13 oscillator may be aligned by adjusting it to beat with a crystal-calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available. Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated.

If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, couple the meter probe loosely to the receiver oscillator.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier signal, connect the signal generator to the receiver antenna terminals. Connect the "VoltOhmyst" to the sound discriminator output (junction of C183 and R203).

Set the receiver switch to 13.

Adjust the frequency standard to the correct frequency 236.75 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range.

Adjust C6 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator.

Now that the channel-13 oscillator is set to frequency, we may proceed with the r-f alignment.

Connect the "VoltOhmyst" to the junction of R135 and L117. Adjust the 250K pot. for −3.5 volts on the meter.

Remove the first pix i-f amplifier tube V101.

Connect the oscilloscope to the test connection at R13 in the r-f tuning unit.

Connect the r-f sweep oscillator to the receiver antenna terminals. The method of connection depends upon the output impedance of the sweep. The P102 connections for 300-ohm balanced or 72-ohm single-ended input are shown in the circuit diagrams. If the sweep oscillator has a 50-ohm single-ended output, 300-ohm balanced output can be obtained by connecting as shown in Figure 7.

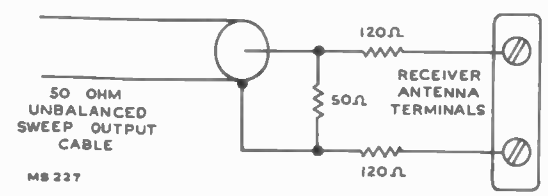


Figure 7—Unbalanced Sweep Cable Termination

Connect the signal generator loosely to the receiver antenna terminals.

Since channel 7 has the narrowest response of any of the high frequency channels, it should be adjusted first.

Set the receiver channel switch to channel 7.

Set the sweep oscillator to cover channel 7.

Insert markers of channel 7 picture carrier and sound carrier, 175.25 mc. and 179.75 mc.

Adjust C10 and C14 until the curve falls symmetrically between the sound and picture carrier markers. Adjust C11 to give the proper band width. Roughly peak L6 in conjunction with slight adjustments of C10 and C14 for a flat-topped response curve with the sound and picture carriers at 90% to 95% response points on this curve. See Figure 16, channel 7.

Switch to channel 12 and adjust L6 for maximum response and minimum top slope of the curve.

Check the response of channels 7 through 13 by switching the receiver channel switch, sweep oscillator and marker oscillator to each of these channels and observing the response obtained. See Figure 16 for typical response curves. It should be found that all these channels have the proper shaped response with the markers above 80% response. If the markers do not fall within this requirement on one or more high frequency channels, since there are no individual channel adjustments, it will be necessary to readjust L6, C10, C11 and C14, and possibly compromise some channel slightly in order to get the markers up on other channels. Normally, however, no difficulty of this type should be experienced since the higher frequency channels are comparatively broad and the markers easily fall within the required range.

Channel 6 is next aligned in the same manner.

Set the receiver to channel 6.

Set the sweep oscillator to cover channel 6.

Set the marker oscillator to channel 6 picture and sound carrier frequencies.

Adjust L9, L13, L66, and C12 for an approximately flat-topped response curve located symmetrically between the markers. L9, L13 and L66 are the center frequency adjustments. C12 is the band-width adjustment

Check channels 5 down through channel 2 by switching the receiver, sweep oscillator and marker oscillator to each channel and observing the response obtained. In all cases, the markers should be above the 80% response point. If this is not the case, L9, L13, L66 and C12 should be retouched. On final adjustment, all channels must be within the 80% specification.

Disconnect the 250K pot., and replace V107 and V101.

Following an r-f alignment, the oscillator alignment must be checked.

R-F OSCILLATOR LINE ADJUSTMENT. — The r-f oscillator line may be aligned by adjusting it to beat with a crystal calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available.

Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated. If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, the calibration frequency listed under R-F Osc. Freq. must be available.

Channel Number	Receiver R-F Osc. Freq. Mc.	R-F Sound Carrier Freq. Mc.	Channel Oscillator Adjustment
2	80.750	59.75	L24
3	86.750	65.75	L23
4	92.750	71.75	L22
5	102.750	81.75	L21
6	108.750	87.75	L31
7	200.750	179.75	L19
8	206.750	185.75	L18
9	212.750	191.75	L17
10	218.750	197.75	L16
11	224.750	203.75	L15
12	230.750	209.75	L14
13	236.750	215.75	C6

If the receiver oscillator is adjusted by feeding in the r-f sound carrier frequency, the frequencies listed under Sound Carrier Freq. must be available.

If the heterodyne frequency meter method is used, couple the meter probe loosely to the receiver oscillator.

If the r-f sound carrier method is used, connect the "Volt-Ohmyst" to the sound discriminator output (junction of C183 and R203) and connect the signal generator to the receiver antenna terminals. The order of alignment remains the same regardless of which method is used.

If the r-f unit is removed from the receiver for service and is aligned separately, the shield over the bottom of the r-f unit must be in place when making adjustments.

Since the lower frequencies are obtained by adding steps of inductance, it is necessary to align channel 13 first and continue in reverse numerical order.

Set the receiver channel switch to 13.

Adjust the frequency standard to the correct frequency 236.75 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range while making the adjustment.

Adjust C6 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator. Oscillator adjustments L1 and L2 shown on the schematic are factory control adjustments and should not be touched in the field.

Switch the receiver to channel 12.

Set the frequency standard to the proper frequency as listed in the alignment table.

Adjust L14 for indications as above.

Adjust the oscillator to frequency on all channels by switching the receiver and the frequency standard to each channel and adjusting the appropriate oscillator trimmer for the specified indication. It should be possible to adjust the oscillator to the correct frequency on all channels with the fine tuning control in the middle third of its range.

After the oscillator has been set on all channels, start back at channel 13 and recheck to make sure that all adjustments are correct.

AGC THRESHOLD ADJUSTMENT. — The AGC threshold adjustment can be made by the method outlined in the Installation Instructions. However, a more accurate adjustment can be obtained by the use of an oscilloscope.

Tune in a station and advance the picture control to the maximum clockwise position. Connect the low capacity probe from the oscilloscope to the plate of the first video amplifier, pin 1 of V106. Adjust the oscilloscope to observe the horizontal sync pulse.

Turn the AGC threshold control R138 fully clockwise, then slowly counter-clockwise. As the control is turned counter-clockwise, the receiver gain will increase slowly, increasing the size of the pattern on the oscilloscope. R138 should be turned counter-clockwise until the receiver begins to overload as indicated by clipping of the sync. The control should be left in the maximum gain position in which no clipping of sync is observed. See Figure 17 for proper waveforms.

HORIZONTAL OSCILLATOR ADJUSTMENT. — Normally the adjustment of the horizontal oscillator is not considered to be a part of the alignment procedure, but since the oscillator waveform adjustment requires the use of an oscilloscope, it can not be done conveniently in the field. The waveform adjustment is made at the factory and normally should not require readjustment in the field. However, the waveform adjustment should be checked whenever the receiver is aligned or whenever the horizontal oscillator operation is improper.

Horizontal Frequency Adjustment.—Set the locking range trimmer one half turn out from maximum capacity. With a clip lead, short circuit the coil between terminals C and D of the horizontal oscillator transformer T109. Tune in a television station and sync the picture if possible.

A. — Turn the horizontal hold control R173 to the extreme clockwise position. Adjust the T109 Frequency Adjustment (under the chassis) so that the picture is just out of sync and the horizontal blanking appears in the picture as a vertical bar. The position of the bar is unimportant.

Note.—Occasionally a tube may be found which does not respond to step "A" above, since it may not be possible to sync the picture by means of the frequency core when the sine wave coil is shorted out. Yet, the tube may work perfectly well when the circuit is properly aligned. In such a case it may be necessary to remove the short then turn the sine wave core out then in until it is possible to obtain sync by adjustment of the frequency core.

B. — Turn the hold control approximately one-quarter of a turn from the extreme clockwise position and examine the width and linearity of the picture. If picture width or linearity is incorrect, adjust the horizontal drive control C153B, the width control R192 and the linearity control L111 until the picture is correct. If C153B was adjusted, repeat step "A" and note above.

Horizontal Oscillator Waveform Adjustment. — Remove the shorting clip from terminals C and D of T109. Turn the horizontal hold control to the extreme clockwise position. With a thin fibre screwdriver, if necessary, adjust the Oscillator Waveform Adjustment Core of T109 (on the outside of the chassis) until the horizontal blanking bar appears in the raster. The waveform adjustment core will sync the picture in two positions. The core should be in the position nearest the outside of the chassis.

A. — Connect the low capacity probe of an oscilloscope to terminal C of T109. Alternately adjust the waveform and frequency cores of T109 until the peak of the sine wave is equal in amplitude to the peak of the saw tooth, on the oscilloscope as shown in Figure 18, while maintaining the picture in synchronization. Then adjust the frequency core until horizontal blanking shows as a vertical bar in the picture.

This adjustment is very important for correct operation of the circuit. If the broad peak of the wave on the oscilloscope is lower than the sharp peak, the noise immunity becomes poorer, the stabilizing effect of the tuned circuit is reduced and drift of the oscillator becomes more serious. On the other hand, if the broad peak is higher than the sharp peak, the oscillator is overstabilized, the pull-in range becomes inadequate and the broad peak can cause double triggering of the oscillator when the hold control approaches the clockwise position.

Remove the oscilloscope upon completion of this adjustment.

Check of Oscillator Pull-in Range.—Set the horizontal hold control to the full counter-clockwise position.

Connect a 270K ohm resistor across C156.

Momentarily switch off channel and back. The picture will then be out of sync.

Turn the hold control clockwise slowly and observe the minimum number of bars obtained just before the picture pulls into sync. The picture should snap in from two complete blanking bars. If two bars are not obtained turn the locking range trimmer C153A in to obtain less bars or out to obtain more bars.

After adjustment of C153A, remove the 270K resistor, turn the horizontal hold control fully clockwise and readjust the frequency core of T109 until the picture is in sync and the horizontal blanking bar begins to move in the picture. Then repeat the entire "Check of Pull-in Range" procedure to this point. Repeat this procedure until two bar pull-in is obtained.

Turn the horizontal hold control to the maximum clockwise position. The picture should be just out of sync to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Adjust the T109 Frequency Adjustment until this condition is fulfilled.

4.5 MC. VIDEO TRAP. — With a strong input from a station, detune the receiver from the correct fine tuning point. With a very short clip lead, short the trap winding of T103. Observe the picture for the appearance of a 4.5 mc. beat. If the beat appears in the picture, adjust L110 until the beat is eliminated.

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES KRK 5B
	Same as listed on page 285
	TELEVISION CHASSIS ASSEMBLIES KCS 40B
	Same as listed for KCS 40A on page 285 except for the following:
75453	Bracket—Channel indicator lamp bracket
75452	Control—Picture control, brightness control and channel light switch (R122, R131, S104)
75454	Socket—Indicator lamp socket complete with lead (12¼")
	SPEAKER ASSEMBLIES 92569-10W RL 111-16 RMA 274
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly (3.2 ohms)
5039	Connector—4 contact male connector for speaker (J101)
75035	Speaker—12" P.M. speaker complete with cone and voice coil less output transformer and plug
75036	Transformer—Output transformer (T114)
	SPEAKER ASSEMBLIES 92569-10B
75875	Cone—Cone and voice coil assembly (3.2 ohms)
	NOTE: If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
75020	Back—Cabinet back
71599	Bracket—Pilot lamp bracket
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike
X3120	Cloth—Grille cloth for mahogany or walnut instruments
X3090	Cloth—Grille cloth for oak instruments
75608	Cushion—Dust seal cushion
71910	Decal—Trade mark decal
75440	Decal—Control panel function decal for mahogany or walnut instruments
75441	Decal—Control panel function decal for oak instruments
74809	Emblem—"RCA Victor" emblem
75455	Escutcheon—Channel marker escutcheon—dark—for walnut or mahogany instruments

STOCK No.	DESCRIPTION
75456	Escutcheon—Channel marker escutcheon — light — for oak instruments
74606	Glass—Safety glass
75439	Grille—Metal grille
37396	Grommet—Rubber grommet to mount speaker (4 required)
74308	Hinge—Cabinet door hinge (1 set)
74959	Knob—Fine tuning knob—maroon—for mahogany or walnut instruments (outer)
75461	Knob—Fine tuning knob—beige—for oak instruments (outer)
74960	Knob—Channel selector knob — maroon — for mahogany or walnut instruments (inner)
75462	Knob—Channel selector knob—beige—for oak instruments (inner)
74962	Knob—Tone control, brightness control or vertical hold control knob — maroon — for mahogany or walnut instruments (outer)
75463	Knob—Tone control, brightness control or vertical hold control knob — beige — for oak instruments (outer)
74963	Knob—Picture control, horizontal hold control or volume control and power switch knob—maroon—for mahogany or walnut instruments (inner)
75464	Knob—Picture control, horizontal hold control or volume control and power switch knob—beige—for oak instruments (inner)
11765	Lamp—Pilot or channel indicator lamp—Mazda 51
75460	Mask—Light mask—gold for channel marker escutcheon for oak instruments
75459	Mask—Light mask—burgundy for channel marker escutcheon for mahogany or walnut instruments
74162	Plate—Mounting plate for interlock switch
75438	Pull—Door pull
71456	Screw—No. 8-32 x 7/16" wing screw for deflection yoke and focus magnet mounting support
74307	Screw—No. 8-32 x 1¼" trimit head screw for door pull
73643	Spring—Spring clip for channel marker escutcheon
74966	Spring—Formed spring for kinescope masking panel (8 required)
30330	Spring—Retaining spring for knobs 74963 and 75464
72845	Spring—Retaining spring for knobs 74959 and 75461
14270	Spring—Retaining spring for knobs 74960, 74962, 75462 and 75463
72936	Stop—Cabinet door stop
74161	Stud—Locating stud for back (2 required)
75457	Washer—Felt washer—dark brown—between knob and channel marker escutcheon for mahogany or walnut instruments
75458	Washer—Felt washer—beige—between knob and channel marker escutcheon for oak instruments

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

TELEVISION, RADIO PHONOGRAPH COMBINATIONS
MODELS 6T84, 6T86, 6T87

Chassis Nos. KCS48 or KCS48T and RC1090 or RC1092
45 Record Changer RP168 or RP190
33⅓/78 Record Changer 960282 or 960284

— Mfr. No. 274 —

SERVICE DATA

— 1950 No. T15 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Model 6T84 "Fairfax" Walnut, Mahogany or Oak

Model 6T86 "Rutland" Walnut, Mahogany or Oak

Model 6T87 "Hartford" Walnut, Mahogany or Oak

GENERAL DESCRIPTION

Models 6T84, 6T86 and 6T87 are 16-inch television radio phonograph combinations. Two record changers are provided to play 78, 33⅓ and 45 RPM records.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE................146 square inches on a 16GP4 kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range, ±250 kc. on chan. 2, ±650 kc. on chan. 13

RADIO TUNING RANGE

RC1090 .... AM—540-1600 kc.
RC1092 ....AM—540-1600 kc.—FM—88-108 mc.

AUDIO POWER OUTPUT

RC1090—6 watts max..............................RC1092—11 watts max.

POWER SUPPLY RATING .... 115 volts, 60 cycles
6T84—290 watts max....................6T86 or 6T87—315 watts max.

CHASSIS DESIGNATIONS

Television Chassis...KCS48 or KCS48T
Radio Chassis (6T84) RC1090
Radio Chassis (6T86 or 6T87) RC1092
33⅓/78 RPM Record Changer...........................960282 or 960284
45 RPM Record Changer.......................................RP168 or RP190
Refer to Service Data 960282, 960284, RP168 or RP190 for information on the record changers.

LOUDSPEAKER—92569 .... 12-inch PM Dynamic
Voice Coil Impedance .... 3.2 ohms at 400 cycles

WEIGHT	Net Weight	Shipping Weight
6T84	162	199
6T86	177	216
6T87	200	232

DIMENSIONS (Cabinet Outside)	Width	Height	Depth
6T84	39	37⅝	21¾
6T86	38½	39	22¼
6T87	41¾	41½	22

RECEIVER ANTENNA INPUT IMPEDANCE 300 ohms balanced.

If necessary, the television chassis may be fed separately from either a 300-ohm balanced line or a 72-ohm co-ax.

RCA TUBE COMPLEMENT

(1)	RCA 6CB6	R-F Amplifier
(2)	RCA 6J6	R-F Oscillator and Mixer
(3)	RCA 6AU6	1st Sound I-F Amplifier
(4)	RCA 6AU6	2nd Sound I-F Amplifier
(5)	RCA 6AL5	Sound Discriminator
(6)	RCA 6AV6 (KCS48T only)	Bias Clamp
(7)	RCA 6AU6	1st Picture I-F Amplifier
(8)	RCA 6CB6	2nd Picture I-F Amplifier
(9)	RCA 6AU6	3rd Picture I-F Amplifier
(10)	RCA 6CB6	4th Picture I-F Amplifier
(11)	RCA 6AL5	Picture 2nd Detector and AGC Detector
(12)	RCA 12AU7	1st and 2nd Video Amplifier
(13)	RCA 12AU7	DC Restorer and Sync Separator
(14)	RCA 6SN7GT (KCS48)	Vert. Sweep Osc. & Bias Clamp
	or RCA 6SN7GT (KCS48T)	Sync. Amp. & Vert. Sweep Osc.
(15)	RCA 6K6GT	Vertical Sweep Output
(16)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(17)	RCA 6BG6G	Horizontal Sweep Output
(18)	RCA 6W4GT	Damper
(19)	RCA 1B3-GT/8016	High Voltage Rectifier
(20)	RCA 16GP4, 16GP4A, 16GP4B, 16GP4C	Kinescope
(21)	RCA 5U4G	Rectifier

(RC1090 Radio Chassis)

(1)	RCA 6BE6	Converter
(2)	RCA 6BA6	I-F Amplifier
(3)	RCA 6AV6	Detector and 1st Audio
(4)	RCA 6C4	Phase Inverter
(5)	RCA 6V6GT (2 tubes)	Audio Output
(6)	RCA 6X5GT	Rectifier

(RC1092 Radio Chassis)

(1)	RCA 6CB6	R-F Amplifier
(2)	RCA 6J6	Oscillator and Mixer
(3)	RCA 6BA6	I-F Amplifier
(4)	RCA 6AV6	Driver
(5)	RCA 6AL5	Ratio Detector
(6)	RCA 6AV6	AM Det., AVC and Audio Amplifier
(7)	RCA 6C4	Phase Inverter
(8)	RCA 6V6GT (2 tubes)	Audio Output
(9)	RCA 5Y3GT	Rectifier

Specifications continued on page 2

ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency	25.50 Mc.
Adjacent Channel Sound Trap	27.00 Mc.
Accompanying Sound Traps	21.00 Mc.
Adjacent Channel Picture Carrier Trap	19.50 Mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency	21.00 Mc.
Sound Discriminator Band Width between peaks	400 kc.

VIDEO RESPONSE	To 4 Mc.
FOCUS	Magnetic
SWEEP DEFLECTION	Magnetic
SCANNING	Interlaced, 525 line
HORIZONTAL SWEEP FREQUENCY	15,750 cps
VERTICAL SWEEP FREQUENCY	60 cps
FRAME FREQUENCY (Picture Repetition Rate)	30 cps

THE TELEVISION CHASSIS USED IN MODELS 6T84, 6T86 AND 6T87 IS VERY SIMILAR TO THE CHASSIS USED IN MODELS 6T53, 6T64, 6T71, ETC. REFER TO PAGES 372 TO 385 FOR TELEVISION ALIGNMENT DATA AND WAVEFORM PHOTOGRAPHS.

THE RADIO CHASSIS (RC-1090) USED IN MODEL 6T84 IS IDENTICAL TO THE RADIO CHASSIS USED IN MODEL 2T81. REFER TO PAGES 356 AND 357 FOR SERVICE INFORMATION ON RADIO CHASSIS RC-1090.

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. Turn the radio FUNCTION switch to TV.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Adjust the PICTURE and BRIGHTNESS controls for suitable picture contrast and brightness.

9. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

10. In switching from one channel to another, it may be necessary to repeat steps 4 and 8.

11. When the set is turned on again after an idle period it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step No. 4 is generally sufficient.

12. If the positions of the controls have been changed, it may be necessary to repeat steps 1 through 8.

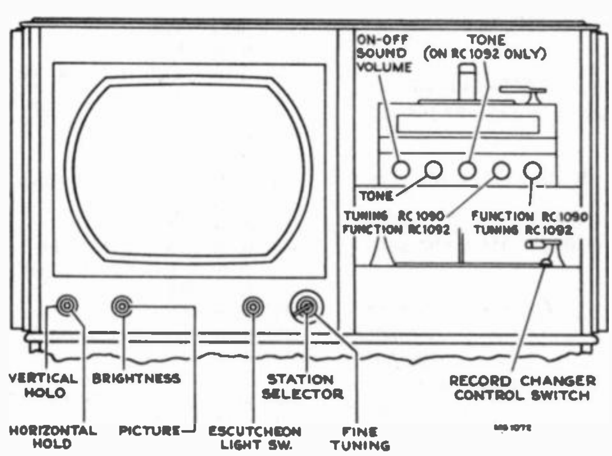


Figure 1—Receiver Operating Controls

RADIO OPERATION

1. Turn the radio FUNCTION switch to AM.

2. Tune in the desired station with the TUNING control.

PHONOGRAPH OPERATION

1. Turn the radio FUNCTION switch to 78-33 for operation of the 78/33⅓ RPM changer or to 45 for operation of the 45 RPM changer.

2. Place a record on the appropriate changer and slip the changer power switch to "ON."

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

Connect the antenna transmission line to the receiver antenna terminals. Plug a power cord into the 115-volt a-c power source and into the receiver interlock receptacle. Turn the receiver power switch to the "on" position, the brightness control fully clockwise, and the picture control counter-clockwise.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2. Starting from this position immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Turn the focus control (shown in Figure 2) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches of this adjustment should be made with the brightness control at the maximum clockwise position with which good line focus can be maintained.

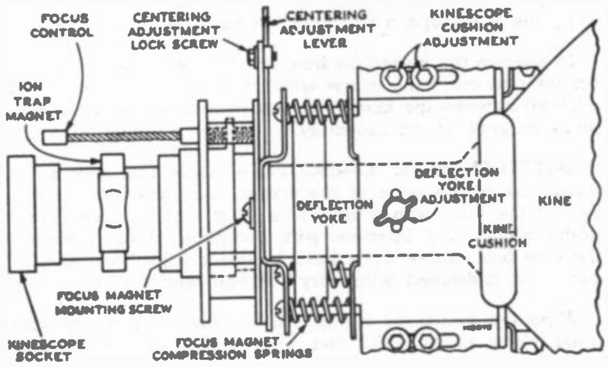


Figure 2—Yoke and Focus Magnet Adjustments

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn S105 on the rear apron (see Figure 3) counter-clockwise until the set operates normally and the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced, and when only 2 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull-in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Magnet Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments.

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T108 horizontal frequency adjustment on top of the chassis until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Locking Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. The picture may remain in sync. If so turn the T108 top core slightly and momentarily switch off channel. Repeat until the picture falls out of sync with the diagonal lines sloping down to the left. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 2 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C147A slightly clockwise. If less than 2 bars are present, adjust C147A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 2 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure. For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

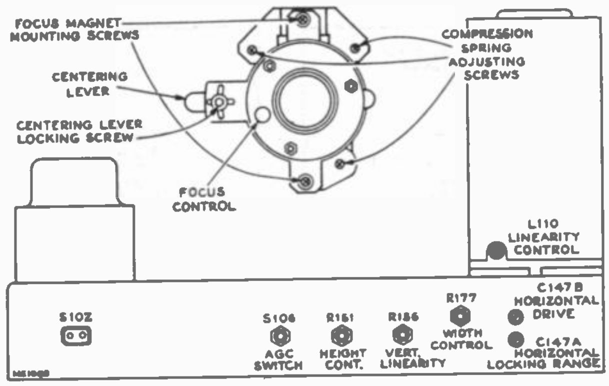


Figure 3—Rear Chassis Adjustments

FOCUS MAGNET ADJUSTMENT.—The focus coil should be adjusted so that there is approximately three-eighths inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus magnet. This spacing gives best average focus over the face of the tube.

The axis of the hole through the magnet should be parallel with the axis of the kinescope neck with the kinescope neck through the middle.

CENTERING ADJUSTMENT.—No electrical centering controls are provided. Centering is accomplished by means of a separate plate on the focus magnet. Some centering plates include a locking screw which must be loosened before centering, and others are held in adjustment by friction. Up and down adjustment of the plate moves the picture side to side and sidewise adjustment moves the picture up and down.

If a corner of the raster is shadowed, check the position of the ion trap magnet. Reposition the magnet within the range of maximum raster brightness to eliminate the shadow and recenter the picture by adjustment of the focus magnet plate. In no case should the magnet be adjusted to cause any loss of brightness since such operation may cause immediate or eventual damage to the tube. In some cases it may be necessary to shift the position of the focus magnet in order to eliminate a corner shadow.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage hence the brightest and best focused picture, adjust horizontal drive counter-clockwise as far as possible without stretching the left side of the picture. As a first adjustment, set the horizontal drive trimmer C143B one-half turn out from maximum capacity.

Turn the horizontal linearity coil out until appreciable loss in width occurs, then in until nearly maximum width and the best linearity is obtained.

Adjust the width control R177 to obtain correct picture width.

A slight readjustment of these three controls may be necessary to obtain the best linearity.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R151 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R156 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

FOCUS.—Adjust the focus magnet for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

On focus magnets using two shunts, the one with the cable is the "fine adjustment" and the other is the "focus range" adjustment. In general, the two shunts should be adjusted to approximately equal positions.

Recheck the position of the ion trap magnet to make sure that maximum brightness is obtained.

Check to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

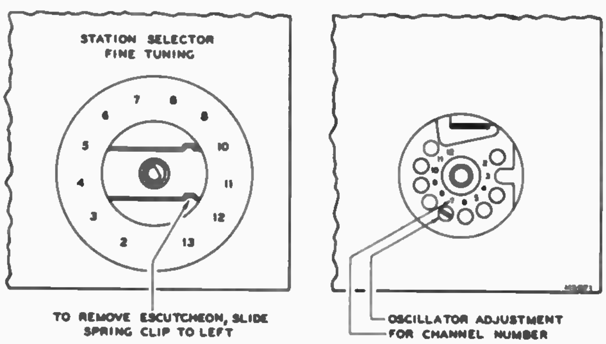


Figure 4—R-F Oscillator Adjustments

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure. The adjustments for channels 2 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment of channel 13 is on top of the chassis.

AGC CONTROL.—The AGC control switch is provided as an installation adjustment. The normal position for strong signal areas is with the switch in the number 1 or counter-clockwise position. If impulse type of interference is experienced, turn the switch to the number 2 or center position. In very weak signal areas in which impulse type interference is experienced, turn the switch to position number 3 or fully clockwise. In this position, all AGC is removed and the receiver will overload if the input signal exceeds 200 microvolts. However, for signals under 200 microvolts, this position of the AGC control switch gives best noise immunity of sync.

FM TRAP ADJUSTMENT.—In some instances interference may be encountered from a strong FM station signal. A trap is provided to eliminate this type of interference. To adjust the trap tune in the station on which the interference is observed and adjust the L203 core on top of the r-f unit for minimum interference in the picture.

CAUTION.—In some receivers, the FM trap L203 will tune down into channel 6 or even into channel 5. Needless to say, such an adjustment will cause greatly reduced sensitivity on these channels. If channels 5 or 6 are to be received, check L203 to make sure that it does not affect sensitivity on these two channels.

VENTILATION CAUTION.—The receiver is provided with adequate ventilation holes in the bottom and back of the cabinet. Care should be taken not to allow these holes to be covered or ventilation to be impeded in any way.

If the receiver is to be operated with the back of the cabinet near a wall, at least a two-inch clearance should be maintained between cabinet and wall.

CHASSIS REMOVAL.—To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the control knobs, the cabinet back, unplug the speaker cable, the kinescope socket, the antenna cable, the yoke and high voltage cable. Remove the yoke frame grounding strap and the interlock switch. Take out the six chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet.

KINESCOPE HANDLING PRECAUTION.—Do not install, remove, or handle the kinescope in any manner, unless shatter-proof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope from the cabinet, take out the four screws and one wing screw which hold the yoke frame to the cabinet. Remove the kinescope, the yoke frame with yoke and focus magnet as an assembly.

INSTALLATION OF KINESCOPE.—Handle this tube by the metal rim at the edge of the screen. Do not cover the glass bell of the tube with fingermarks as it will produce leakage paths which may interfere with reception. If this portion of the tube has inadvertently been handled, wipe it clean with a soft cloth moistened with "dry" carbon tetrachloride.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and fingermarks with a soft cloth moistened with "Windex" or similar cleaning agent.

Turn the tube so that the key on the base of the tube will be down and insert the neck of the kinescope through the deflection coil and focus magnet. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Replace the kinescope and yoke frame assembly in the cabinet. Insert the four screws and wing screw and tighten.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible. If this is not done, difficulty will be encountered in adjusting the ion trap and focus magnets because of shadows on the corner of the raster.

Slide the chassis into the cabinet, then insert and tighten the six chassis bolts.

Slip the ion trap magnet over the neck of the kinescope.

Connect the kinescope socket to the tube base and connect the high voltage lead clip from the rim of the kinescope into the high voltage bushing on the high voltage compartment.

Reconnect all other cables. Perform the entire set-up procedure beginning with ion Trap Magnet Adjustment.

RADIO OPERATION.—Turn the receiver function switch to the positions and check the radio for proper operation. In switching from radio to television or from television to radio, approximately 30 seconds warm-up time is required.

RECORD CHANGER OPERATION.—Turn the receiver function switch to each phono position and check each record player for proper operation.

Replace the cabinet back and connect the receiver antenna leads to the cabinet back. Make sure that the screws holding it are up tight, otherwise it may rattle or buzz when the receiver is operated at high volume.

CABINET ANTENNA.—A cabinet antenna is provided for use in strong signal areas in which no reflections are experienced. The leads from the antenna are brought out near the receiver antenna terminal board. To connect the cabinet antenna, attach the leads to the terminal board. If reception is satisfactory, no other antenna is necessary. However, if reception is unsatisfactory, it will be necessary to employ an outdoor antenna or an indoor antenna which can be oriented.

TELEVISION CHASSIS TOP VIEW

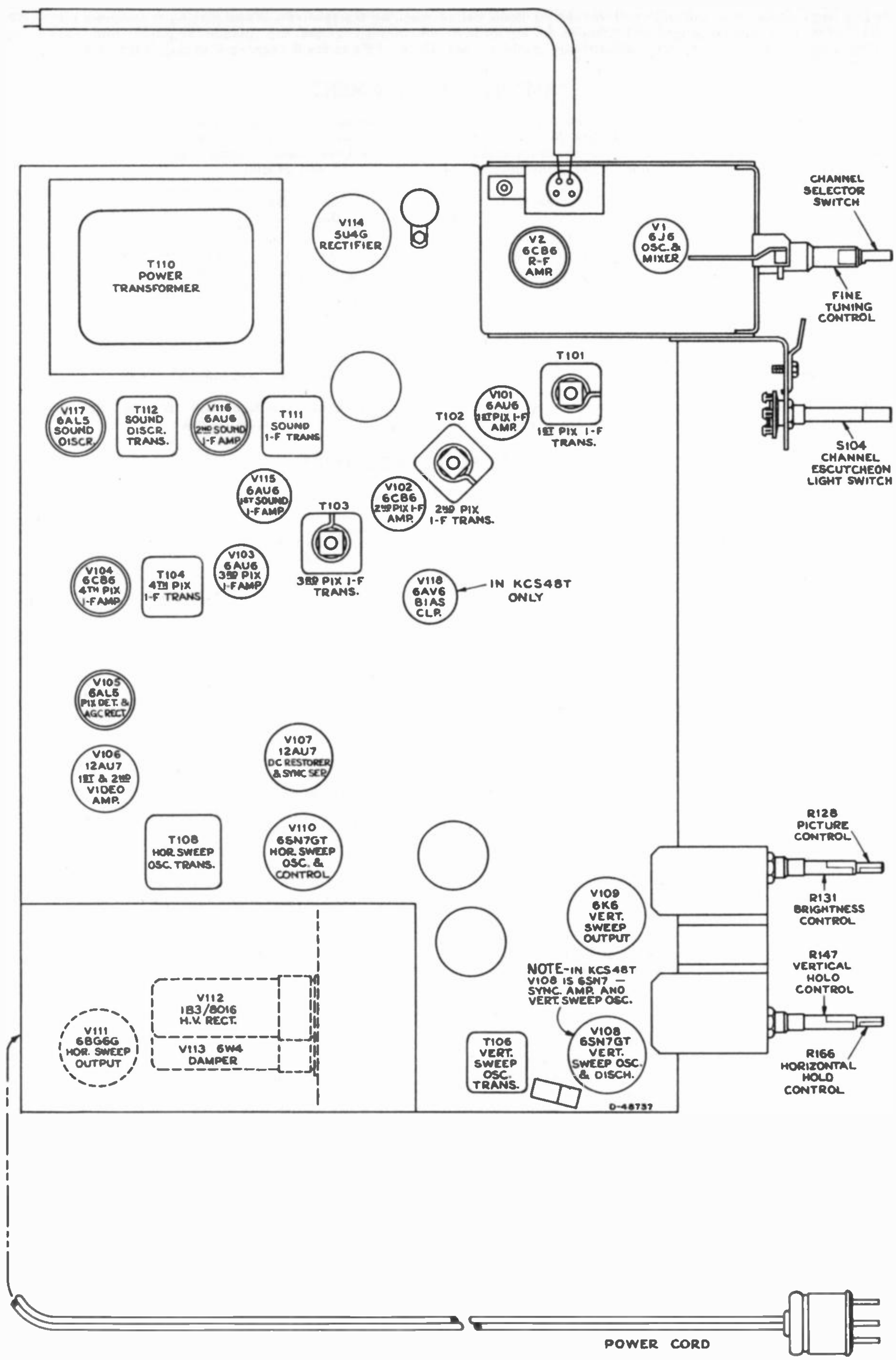


Figure 5 —Chassis Top View

6T84, 6T86, 6T87

RADIO ALIGNMENT PROCEDURE

If any lead dressing is necessary, it should be done before aligning the receiver. When making a complete alignment follow the table below in sequence. If only a portion of the circuit is to be aligned select the portion required and follow with the remaining steps in the section. Any adjustments made on the 455 kc. I-F's make it necessary to adjust the 10.7 mc. I-F's.

"AM" R-F—I-F ALIGNMENT

Test-Oscillator.—For all alignment operations, connect low side of the test-osc. to the receiver chassis, and keep the osc. output as low as possible to avoid a-v-c action. **Output Meter.**—Connect the meter across the speaker voice coil, and turn the receiver volume control to max. Turn tone controls for maximum highs and maximum lows. Before aligning set, completely mesh the gang and set the dial pointer to the mechanical max. calibration point at extreme left end of dial.

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Turn Radio Dial to—	Adjust the following
1	Stator of C1-4	455 kc. Modulated	AM	Low Freq. end of Dial	†Top and bot. cores of T4 and T2. (For max. voltage across voice coil.)
2	Ant. terminal through dummy ant. of 200 mmfs.	1,620 kc.	AM	Min. capacity	Osc. C1-2T for maximum output.
3		1,400 kc.	AM	Tune to signal	C1-4T and C1-5T for max. output.
4		600 kc.	AM	600 kc.	‡Osc. L5 and R-FL7.
5	Repeat steps 2, 3 and 4 for maximum output at 600 kc. and 1,400 kc.				

† First peak T2 and T4 then starting with T4, use alternate loading. Connect a 47,000-ohm resistor across the primary to load the plate winding while the grid winding of the same transformer is being peaked. Then load the grid winding with the 47,000-ohm resistor while the plate winding is being peaked.

‡ With a 10,000-ohm resistor clipped across C1-4, peak the oscillator core L5, simultaneously "rocking" the gang condenser for maximum output. Then, remove the 10,000-ohm shunt resistor and peak L7 for maximum output.

FM ALIGNMENT PROCEDURE

Connect probe of "VoltOhmyst" to negative side of C40 and low side to chassis. Connect output meter across speaker voice coil. Turn the tone controls for maximum highs and lows.

Steps	Connect the High side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Radio Dial Tuned to—	Adjust
6	Pin No. 1 of 6AU6 (V4) in series with .01 mfd.	10.7 mc.	FM	———	Top of Driver Trans. T5 for maximum DC on "VoltOhmyst."
7	Pin No. 1 of 6AU6 (V4) in series with .01 mfd.	30% AM Modulated	FM	———	Bottom of Driver Trans. T5 for minimum audio output on meter.
6	Repeat steps 6 and 7 as necessary making final adjustment with r-f input level set to give approximately –4.0 volts d-c on "VoltOhmyst."				
9	Through 470 ohms to stator. of C1-3, gang at max. Connect gnd. of cable close to V2 cathode ground on r-f shelf.	10.7 mc.	FM	88 mc.	*T3 then T1 for max. with r-f input set to give –3 volts on "VoltOhmyst" connected across C40.
10	Connect cable to antenna terminals through 120 ohms in each side of line.	90 mc.	FM	90 mc.	OSC. L8 for max. voltage across C40.
11		106 mc.	FM	Tune to signal	ANT. C1-3 and R-F C1-6 for max. voltage across C40.
12		90 mc.	FM	Tune to signal	ANT. L1 and R-F L2 for max. voltage across C40.
13	Repeat steps 10, 11 and 12 as required.				
14	Connect a sweep generator to the antenna terminals through 120 ohms in each side of line. Connect an oscilloscope to junction of R44 and C41 and check response and linearity of FM band. Peak to peak separation should not be less than 180 kc.				

* Use a 680-ohm resistor to load the plate winding while the grid winding of the same transformer is being peaked. Then the grid winding is loaded with 680-ohm resistor while the plate winding is being peaked. When windings are loaded, it is necessary to increase the 10.7 mc. input, since gain will decrease and voltage across C40 will be less.

CRITICAL LEAD DRESS:

1. The 2.2 meg. mixer grid resistor should have a minimum practicable amount of lead extending on the grid end.
2. The first AM and first FM i-f plate leads should be dressed away from the range switch wafer.
3. The ground strap between the r-f shelf and the main chassis should be well soldered and kept as short as practicable.
4. Arrange wiring to prevent the filament wire between mixer and 1st i-f tubes from passing near the mixer grid, or the AVC wiring.
5. Dress filament wires away from 1st audio and inverter coupling condensers.
6. Dress ac power switch wires away from the audio coupling condenser which is wired to the volume control.
7. Dress the mixer grid coupling condenser away from the lugs on the front range switch wafer.
8. The 1st i-f tube AVC and screen by-pass condensers should ground at same point as cathode neutralizing loop.
9. The discriminator tube plate and screen by-pass condensers should ground at the same point as the neutralizing loop.
10. The mixer plate by-pass should ground as close to the r-f shelf ground strap as practicable.
11. The shielded audio leads connecting to the front function switch wafer should have a min. of exposed lead on the function switch end.

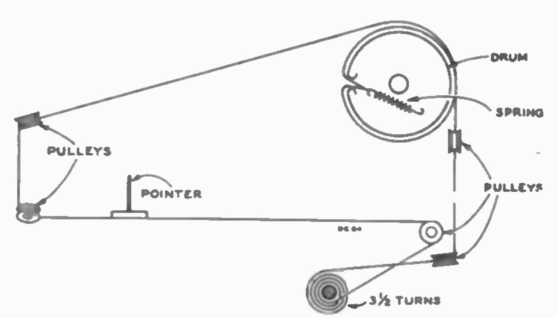


Figure 6—Dial and Drive Cord Assembly

Voltages measured with Chanalyst or VoltOhmyst and should hold within ±20% with rated line voltage. Tuning condenser closed—no signal input.

Tube	Terminal	Voltage		
		Phono	A.M.	F.M.
V1 6CB6 R.F. Amp.	Plate 5	—	203	132
	Screen 6	—	48	39
	Cathode 2	—	0.2	0.2
	Grid 1	—	−1.1	−0.9
V2 6J6 Mixer and Osc.	Plate 2	—	55	51
	Grid 5	—	−1.4	−1.2
	Plate 1	—	33	27
	Grid 6	—	−2.1	−1.9
V3 6BA6 I.F. Amp.	Plate 5	—	192	188
	Screen 6	—	106	101
	Cathode 7	—	0.9	
	Grid 1	—	−1.1	−0.35
V4 6AU6 Driver	Plate 5	—	186	180
	Screen 6	—	122	120
	Cathode 7	—	1.05	1.07
V5 6AL5 Ratio Det.	—— ——	—	—	—
V6 6AV6 A.F. Amp.	Plate 7	112	94	94
	Grid 1	−0.7	−0.7	−0.7
V7 6C4 Ph. Inverter	Plate 1–5	125	87	85
	Grid 6	−19.2	−16	−16
	Cathode 7	−11.1	−11.4	−11.4
V8 6V6GT or Output V9	Plate 3	305	295	298
	Screen 4	299	208	204
	Grid 5	−19.2	−16	−16
V10 5Y3GT Rectifier	Filament 2	314	313	313

Cathode Currents (Ma.)

Tube	Terminal	Phono	A.M.	F.M.
V1 6CB6	2	—	3	3
V2 6J6	7	—	2.6	2.6
V3 6BA6	7	—	13.2	14.7
V4 6AU6	7	—	9.3	9
V5 6AL5	1 & 5	—	—	—
V6 6AV6	2	0.8	0.5	0.5
V7 6C4	7	2.2	1.5	1.5
V8 6V6GT	8	35.6	17.8	17.7
V9 6V6GT	8	35.6	17.8	17.7
10 5Y3GT	2	74.2	73.6	74.2

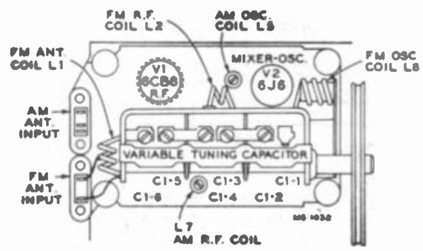


Figure 7—F. M. Coil Locations

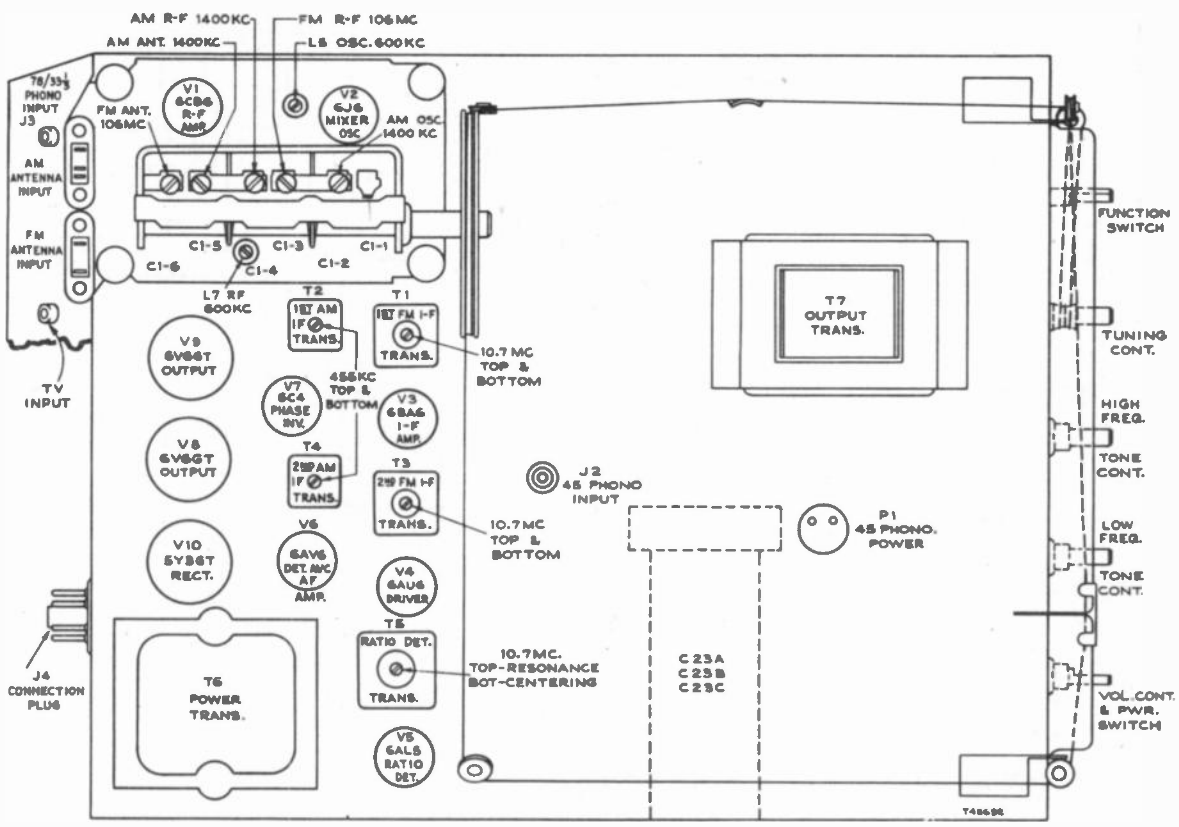
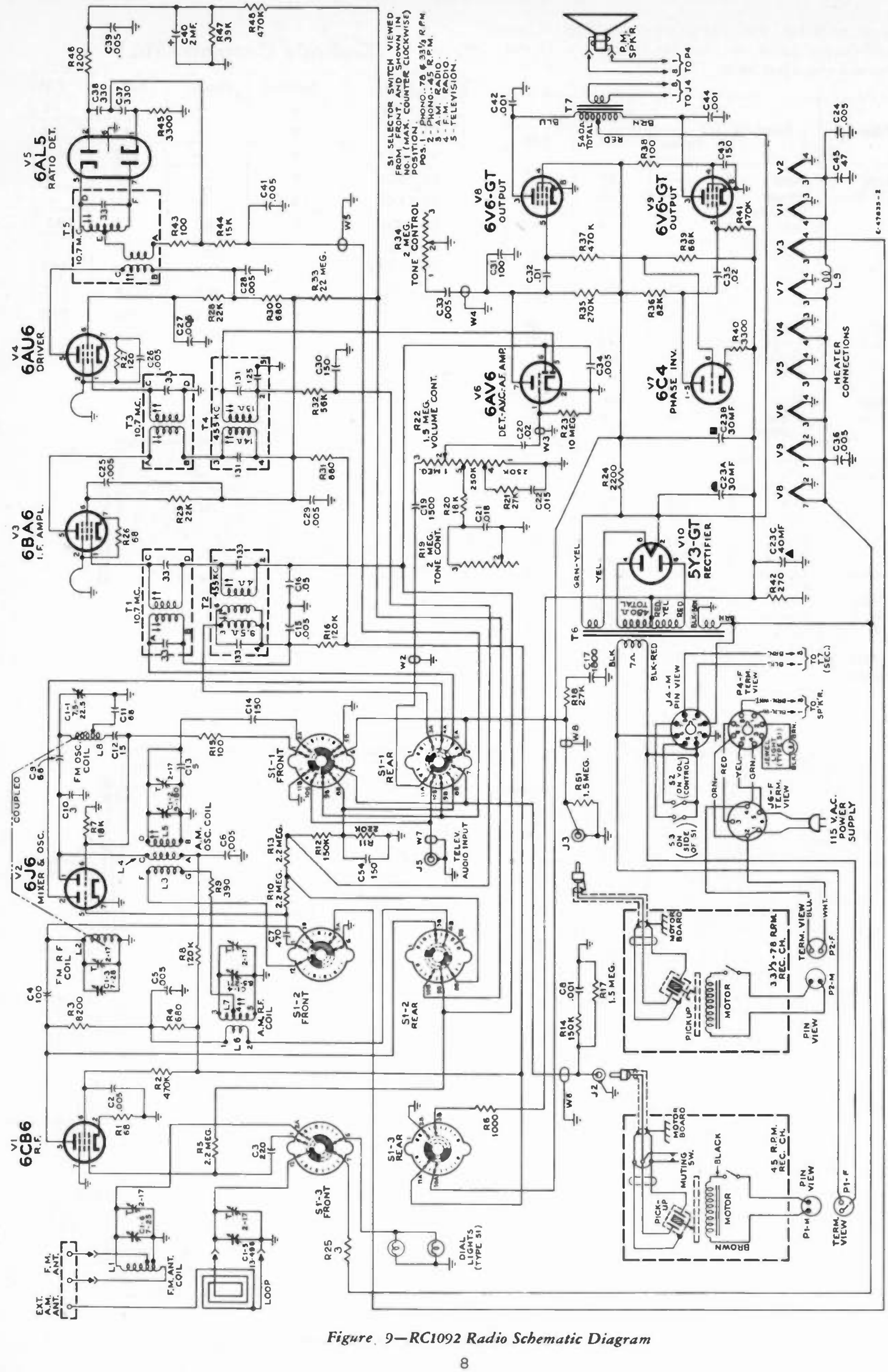


Figure 8—Chassis, Top View, Showing Adjustments

RC1092
RADIO SCHEMATIC DIAGRAM



In some receivers C25 was connected from V3-6 to gnd. R8 was 33K and R16 was 39K.

The cathode loops of V3 and V4 are approx. 2 in. long. Do not alter length.

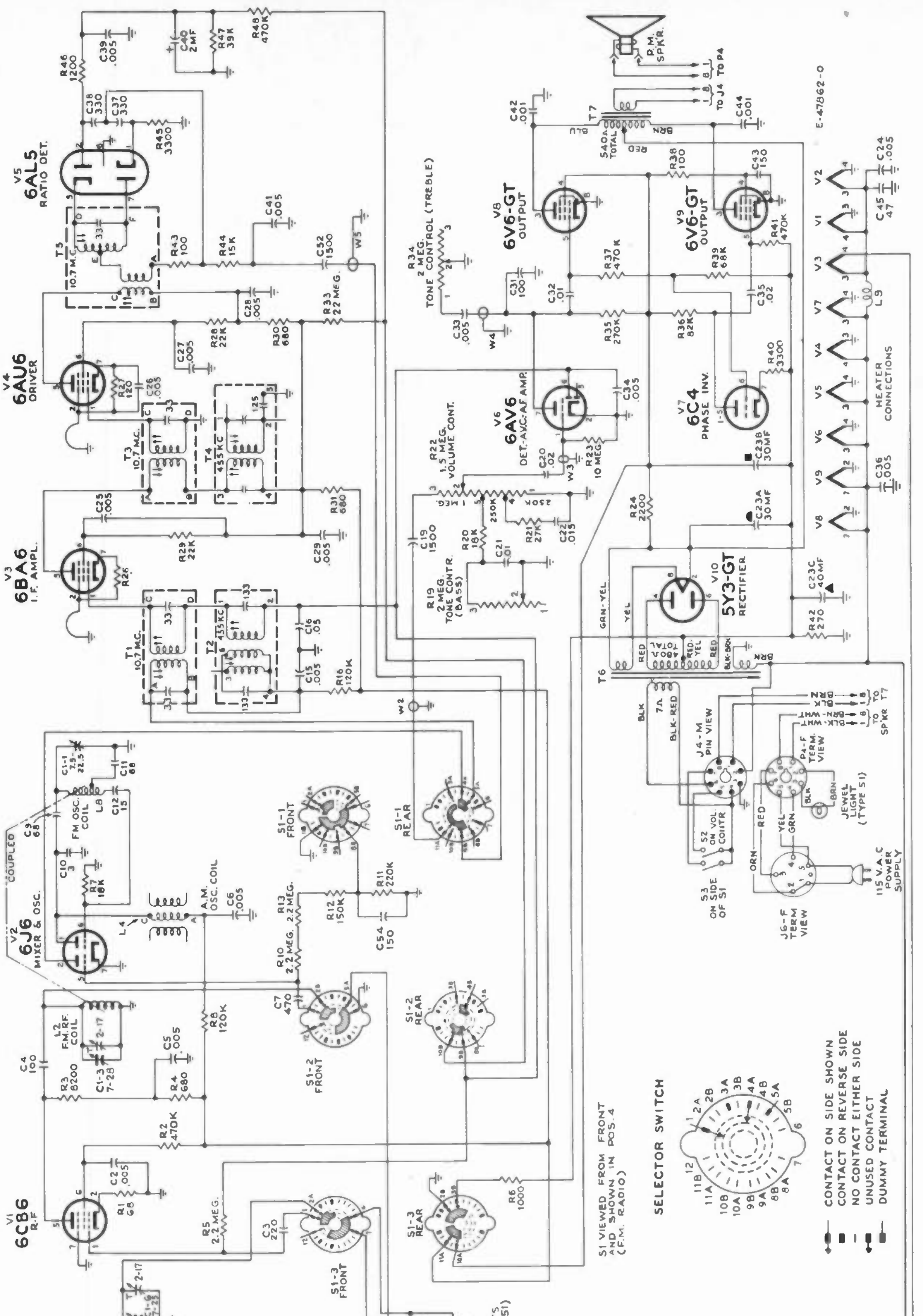
In some receivers R2 was 33K. In some receivers C17 and R18 were connected at R51 and J3 and W8 was omitted.

In some receivers C17 was 1500 and was connected between R18 & S1-1 to gnd. R18 was 100K and was connected between J3 and S1-1 rear. R51 was omitted.

Figure 9—RC1092 Radio Schematic Diagram

RC1092
SIMPLIFIED RADIO SCHEMATIC DIAGRAM

6T84, 6T86, 6T87



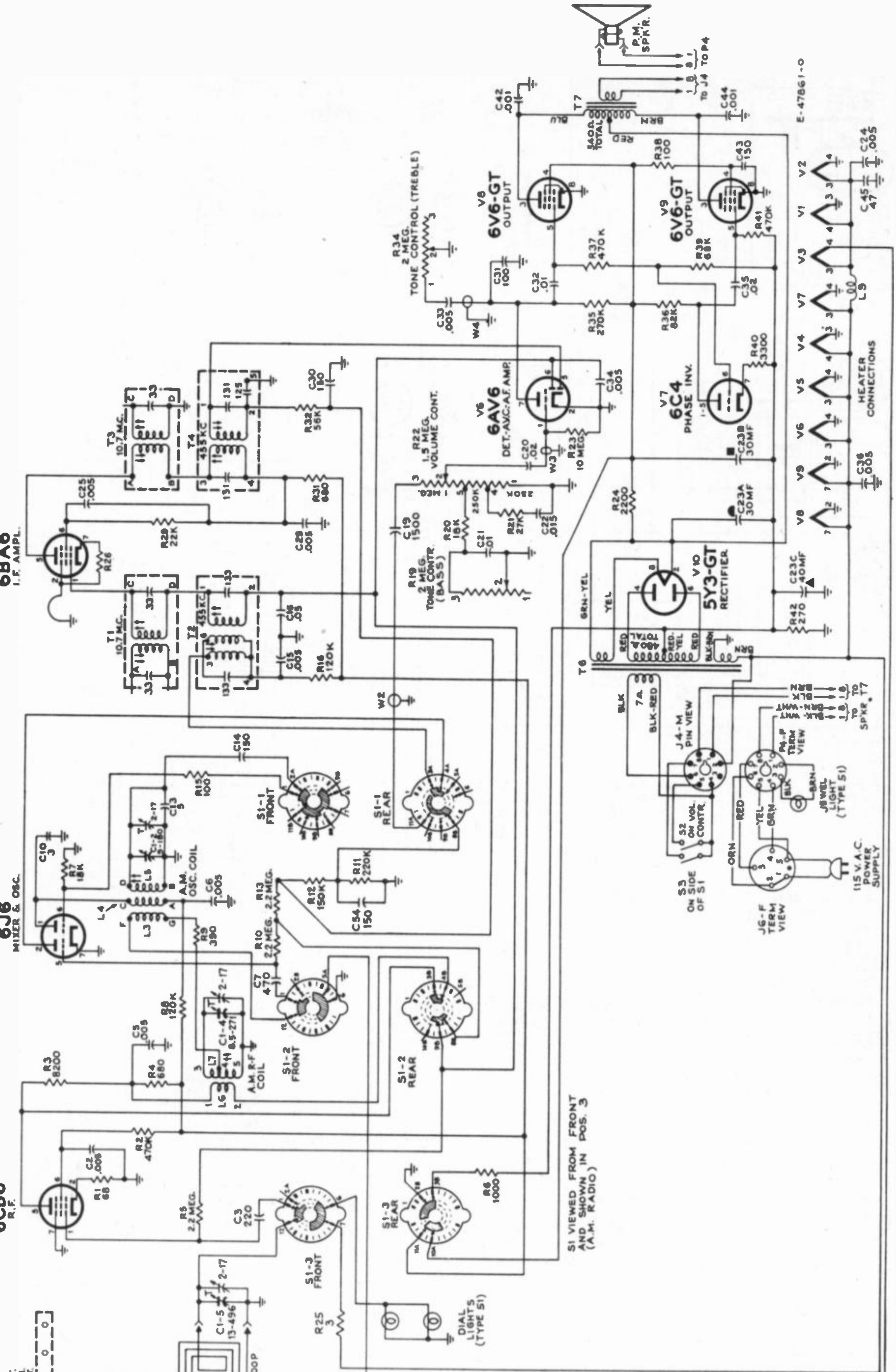
In some receivers C25 was connected from V3-6 to gnd. R8 was 33K and R16 was 39K. The cathode loops of V3 and V4 are approx. 2 in. long. Do not alter length.

In some receivers R2 was 33K. In some receivers C17 and R18 were connected at R51 and J3 and W8 was omitted.

In some receivers C17 was 1500 and was connected between R18 & SI-1 to gnd. R18 was 100K and was connected between J3 and SI-1 rear. R51 was omitted.

Figure 10—RC1092 Simplified Schematic Diagram Showing Function Switch in AM Position

RC1092
SIMPLIFIED RADIO SCHEMATIC DIAGRAM



In some receivers C17 was 1500 and was connected between R18 & S1-1 to gnd. R18 was 100K and was connected between J3 and S1-1 rear. R51 was omitted.

In some receivers R2 was 33K. In some receivers C17 and R18 were connected at R51 and J3 and W8 was omitted.

In some receivers C25 was connected from V3-6 to gnd. R8 was 33K and R16 was 39K.
The cathode loops of V3 and V4 are approx. 2 in. long. Do not alter length.

Figure 11—Simplified Radio Schematic Diagram Showing Function Switch in FM Position

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition, a 2500 microvolt test pattern signal was fed into the receiver, the picture synced and the AGC control properly adjusted. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are read with a type WV97A senior "VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles, a-c. The symbol < means less than.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6J6	Mixer	2500 Mu. V. Signal	2	144	—	—	7	0	5	-2.3	6.8	—	
			No Signal	2	135	—	—	7	0	5	-2.1	5.6	—	
V1	6J6	R-F Oscillator	2500 Mu. V. Signal	1	100	—	—	7	0	6	*-3.0	4.0	—	*Depending upon channel
			No Signal	1	96	—	—	7	0	6	*-2.7	3.9	—	
V2	6AG5	R-F Amplifier	2500 Mu. V. Signal	5	250	6	130	2	0.1	1	-3.4	3.0	0.8	
			No Signal	5	166	6	84	2	0.4	1	-0.2	10.3	2.3	
V101	6AU6	1st Pix. I-F Amplifier	2500 Mu. V. Signal	5	195	6	222	7	0.3	1	-5.0	1.7	0.8	
			No Signal	5	121	6	135	7	0.8	1	-0.8	5.2	2.2	
V102	6CB6	2nd Pix. I-F Amplifier	2500 Mu. V. Signal	5	222	6	203	2	0.3	1	-5.0	2.0	0.7	
			No Signal	5	124	6	112	2	0.8	1	-0.8	5.5	1.6	
V103	6AU6	3d Pix. I-F Amplifier	2500 Mu. V. Signal	5	185	6	225	7	0.2	1	-5.0	1.7	0.7	
			No Signal	5	94	6	132	7	0.5	1	-0.75	4.9	2.0	
V104	6CB6	4th Pix. I-F Amplifier	2500 Mu. V. Signal	5	165	6	142	2	2.25	1	0	9.6	3.1	
			No Signal	5	118	6	132	2	2.1	1	0	9.0	3.1	
V105	6AL5	Picture 2d Det.	2500 Mu. V. Signal	7	-2.0	—	—	1	0	—	—	0.3	—	
			No Signal	7	-0.5	—	—	1	0	—	—	<0.1	—	
V105	6AL5	AGC Rectifier	2500 Mu. V. Signal	2	-9.5	—	—	5	0	—	—	<0.1	—	
			No Signal	2	-2.0	—	—	5	0	—	—	<0.1	—	
V106	12AU7	1st Video Amplifier	2500 Mu. V. Signal	1	100	—	—	3	1.2	2	-2.3	3.6	—	At maximum contrast
			No Signal	1	54	—	—	3	0.9	2	-0.5	2.6	—	
			2500 Mu. V. Signal	1	190	—	—	3	9.0	2	-2.8	0.9	—	At minimum contrast
			No Signal	1	122	—	—	3	6.9	2	-0.5	0.6	—	
V106	12AU7	2d Video Amplifier	2500 Mu. V. Signal	6	330	—	—	8	125	7	118	9.3	—	At maximum contrast
			No Signal	6	295	—	—	8	121	7	110	13.6	—	
			2500 Mu. V. Signal	6	300	—	—	8	131	7	120	12.9	—	At minimum contrast
			No Signal	6	295	—	—	8	121	7	110	13.8	—	
V107 A	12AU7 KCS48	D-C Rest. & Sync Sep.	2500 Mu. V. Signal	1	5.0	—	—	3	45.5	2	-4.7	<0.1	—	At maximum contrast
	KCS48		No Signal	1	5.5	—	—	3	6.5	2	-0.7	<0.1	—	
V107 B	12AU7 KCS48	Sync Sep. & Amplifier	2500 Mu. V. Signal	6	36	—	—	8	6.0	7	4.7	4.0	--	
	KCS48		No Signal	6	36	—	—	8	6.0	7	5.5	2.8	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V107	12AU7 KCS48T	DC Rest & Sync Sep	2500 Mu. V. Signal	1	10	—	—	3	45	2	-4.5	—	—	At Maximum Contrast
	KCS48T		No Signal	1	8	—	—	3	1.7	2	-0.4	—	—	
	KCS48T		2500 Mu. V. Signal	6	7.2	—	—	8	54	7	0	—	—	
	KCS48T		No Signal	6	7.0	—	—	8		7	0	—	—	
V108A	6SN7 KCS48T	Sync Amp	2500 Mu. V. Signal	5	50	—	—	6	7.8	4	7.4	—	—	
	KCS48T		No Signal	5	46	—	—	6	7.0	4	7.0	—	—	
V108	6SN7 GT	Vertical Oscillator	2500 Mu. V. Signal	2	*395	—	—	3	0	1	*-58	0.4	—	*Depends on Setting of height control
			No Signal	2	395	—	—	3	0	1	*-58	0.4	—	
V109	6K6GT 6SN7	Vertical Output	2500 Mu. V. Signal	3	370	4	370	8	51	5	0	11.5	1.9	
			No Signal	3	365	4	365	8	51	5	0	11.4	1.9	
V110	6SN7 GT	Horizontal Osc. Control	2500 Mu. V. Signal	2	*160	—	—	3	*-4.8	1	*-14.6	0.32	—	*Depends on Setting of hold control
			No Signal	2	*152	—	—	3	*-4.4	1	*-3.5	0.28	—	
V110	6SN7 GT	Horizontal Oscillator	2500 Mu. V. Signal	5	230	—	—	6	0	4	-82	1.8	—	
			No Signal	5	225	—	—	6	0	4	-85	1.8	—	
V111	6BG6G	Horizontal Output	2500 Mu. V. Signal	5	*630	8	335	3	7.2	5	-33	67	5.0	*6000 volt pulse present
			No Signal	5	*630	8	329	3	7.2	5	-33	67.1	4.9	
V112	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	11,000	—	—	0	—	*12000 volt pulse present
			Brightness Max.	Cap	*	—	—	2 & 7	12,200	—	—	0.1	—	
V113	6W4 GT	Damper	2500 Mu. V. Signal	5	387	—	—	3	*	—	—	69	—	*3000 volt pulse present
			No Signal	5	380	—	—	3	*	—	—	70	—	
V114	5U4G	Rectifier	2500 Mu. V. Signal	4 & 6	*368	—	—	2 & 8	391	—	—	185	—	*AC measured with AC Voltmeter
			No Signal	4 & 6	*367	—	—	2 & 8	387	—	—	199	—	
V115	6AU6	1st Sound I-F. Amp.	2500 Mu. V. Signal	5	120	6	120	7	0.8	1	-0.2	6.8	2.9	
			No Signal	5	108	6	108	7	0.8	1	-0.1	6.2	2.8	
V116	6AU6	2d Sound I-F Amp.	2500 Mu. V. Signal	5	118	6	67	7	0	1	-1.3	4.9	2.8	
			No Signal	5	110	6	76	7	0	1	-0.5	6.9	3.1	
V117	6AL5	Sound Discrim.	2500 Mu. V. Signal	2	-7.2	—	—	5	0	—	—	<0.1	—	
			No Signal	2	-10.0	—	—	5	0	—	—	<0.1	—	
V118	6AV6 KCS48T	Bias Clamp	2500 Mu. V. Signal	7	0	—	—	2	0	1	-3.4	—	—	
	KCS48T		No Signal	7	0	—	—	2	0	1	-0.2	—	—	
V120	16GP4	Kinescope	2500 Mu. V. Signal	Cone	11,000	10	384	11	100	2	46	<0.1	<0.1	
			No Signal	Cone	12,200	10	375	11	74	2	8.3	<0.1	<0.1	

TELEVISION R-F UNIT WIRING DIAGRAM

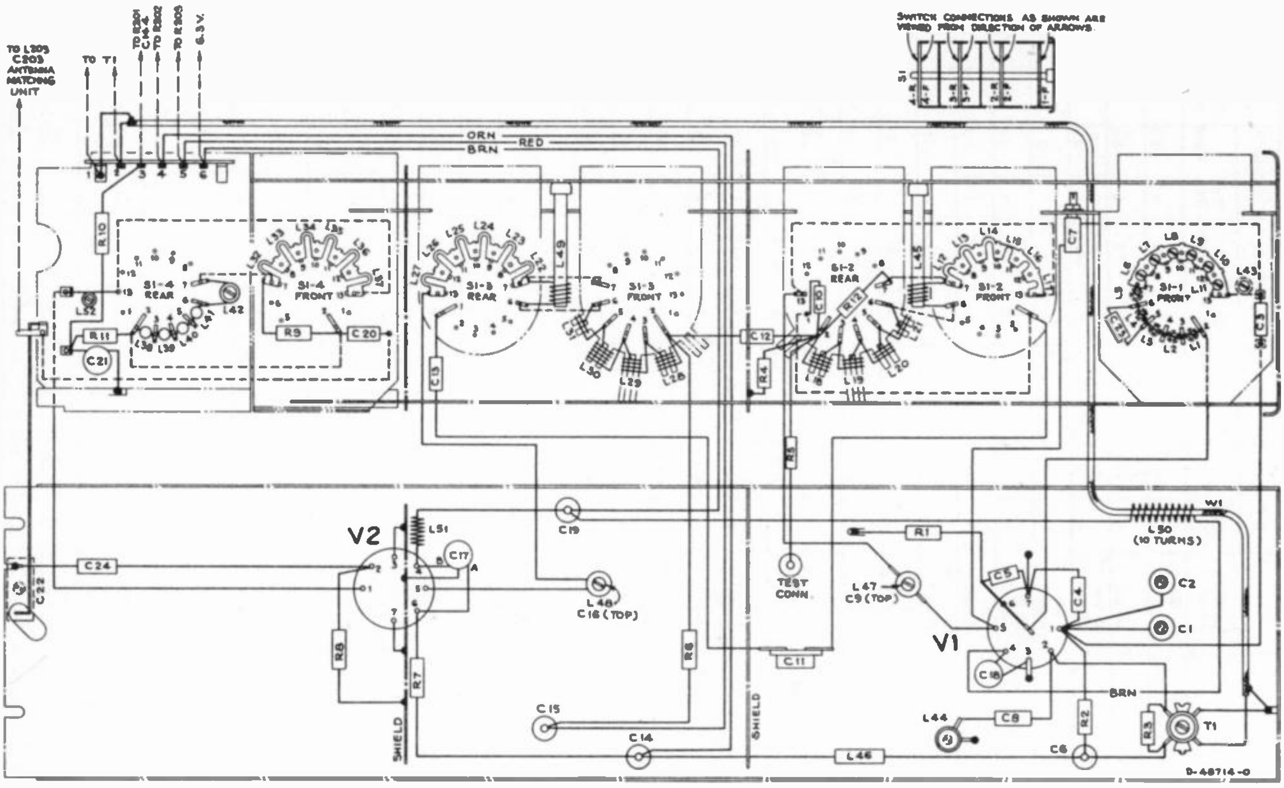


Figure 12—Television R-F Unit Wiring Diagram

TELEVISION CRITICAL LEAD DRESS

1. All leads in the picture and sound i-f circuits must be dressed as short and direct as possible with the exception of C106, C107, C110 and C117 which are to be dressed with enough slack so as not to have to move the body of the capacitor to align that particular stage.
2. Dress all 1500 mmf .005 mfd and .01 mfd capacitors in the i-f section with leads as short as possible.
3. Dress all wires between T101 and the r-f unit in clamp.
4. Dress C185 to act as shield for lead between pin 5 of V115 socket to T111D and picture i-f circuits.
5. Dress the bodies of resistors R106, R108, R113, R119, R191, R192 and capacitor C176 as close to tube pin as possible.
6. Dress L114 with coded end as close to pin 2 of U105 socket as possible.
7. The length of the bus wire from pin 2 of V116 to ground should not be shortened or rerouted.
8. Dress R194 as close to chassis with leads as short as possible.
9. Keep the leads on C126 as short and direct as possible.
10. Dress all components connected to V106 socket up and away from the chassis except L104.
11. Keep the body and coded end of L104 as close to pin 2 of V105 socket as possible.
12. Dress the 4.5 mc. trap L107 up and away from the chassis base.
13. Dress C132 up in the air and towards V105 socket.
14. Dress R125 with body as close as possible to pin 2 of V106 socket.
15. Keep body of R123 as close as possible to pin 2 of V105 socket.
16. Dress C133 and C190 away from C132, C151 and C153.
17. Dress the white wire from picture control R128-3 away from the chassis.
18. Dress all slack on kine socket leads under chassis. Dress brown wire away from any components associated with V105 or V106.
19. The green lead from the kinescope socket should be dressed away from all other leads and components and away from V106.
20. Dress R133 towards chassis rear apron.
21. Dress all leads in clamps on rear apron away from V117, V104, V105, V106 sockets and S103.
22. Dress green wire from C147A up and away from chassis.
23. Dress blue wire of T107 toward front apron of chassis.
24. Dress C153 down next to the chassis base.
25. Dress blue/white wire from height control R151-3 under R180.
26. Dress R161, R162, R163, R164 and R170 up and away from the chassis and with a half inch clearance from the soldering point.
27. Dress the yellow wire from pin 3 of V110 socket over C153.
28. Dress both leads of C198 away from the body of the capacitor.
29. Dress fuse in high voltage compartment so as not to short circuit to ground.
30. Dress blue and blue/yellow wire from power transformer in 3 clamps on chassis base and away from S103 and video section.
31. Dress both wires on S106 away from blue/yellow damper leads of T110.
32. Dress all 2 watt resistors away from each other and away from all wires and other components.

KCS48 CHASSIS WIRING DIAGRAM

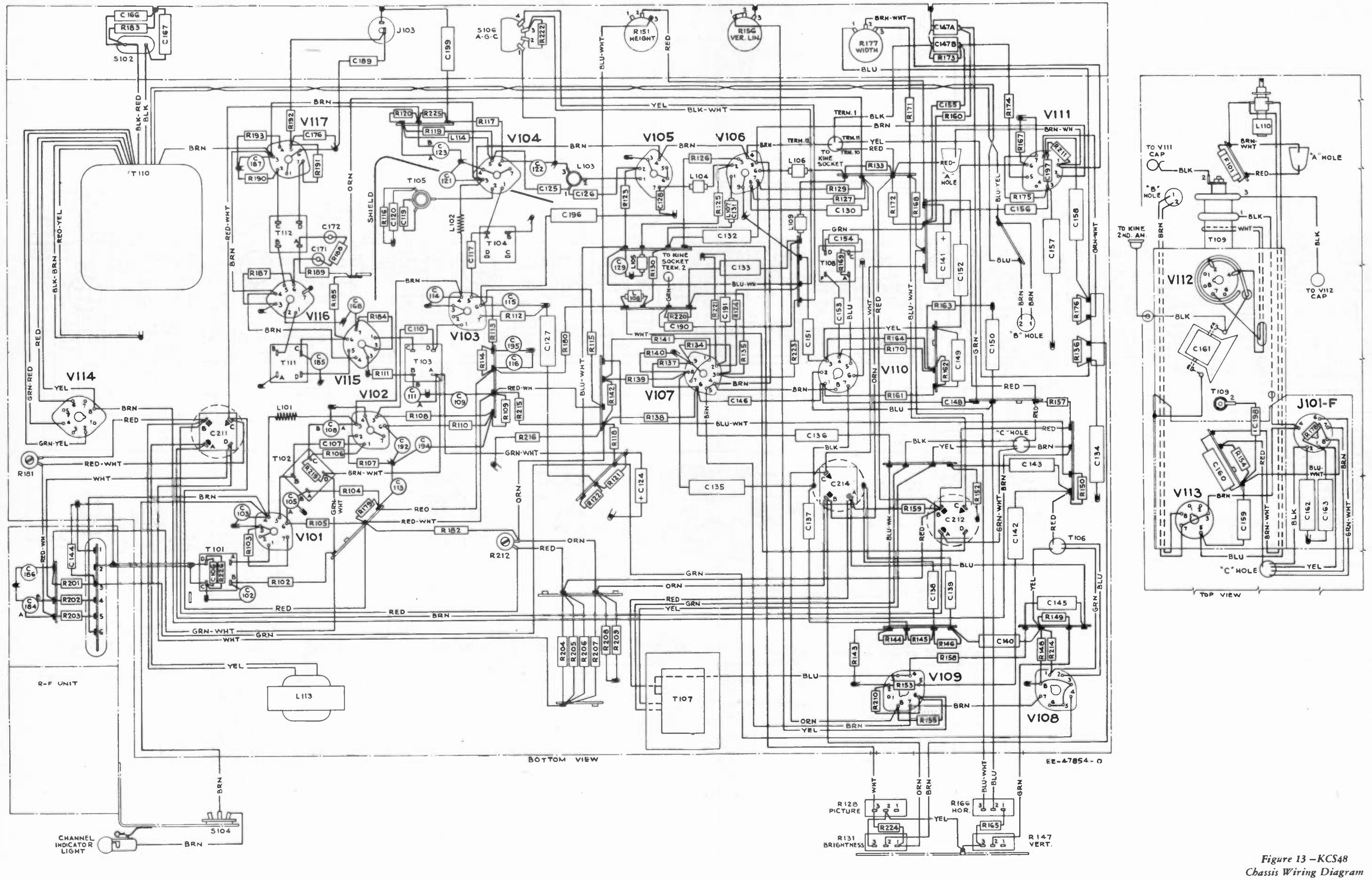
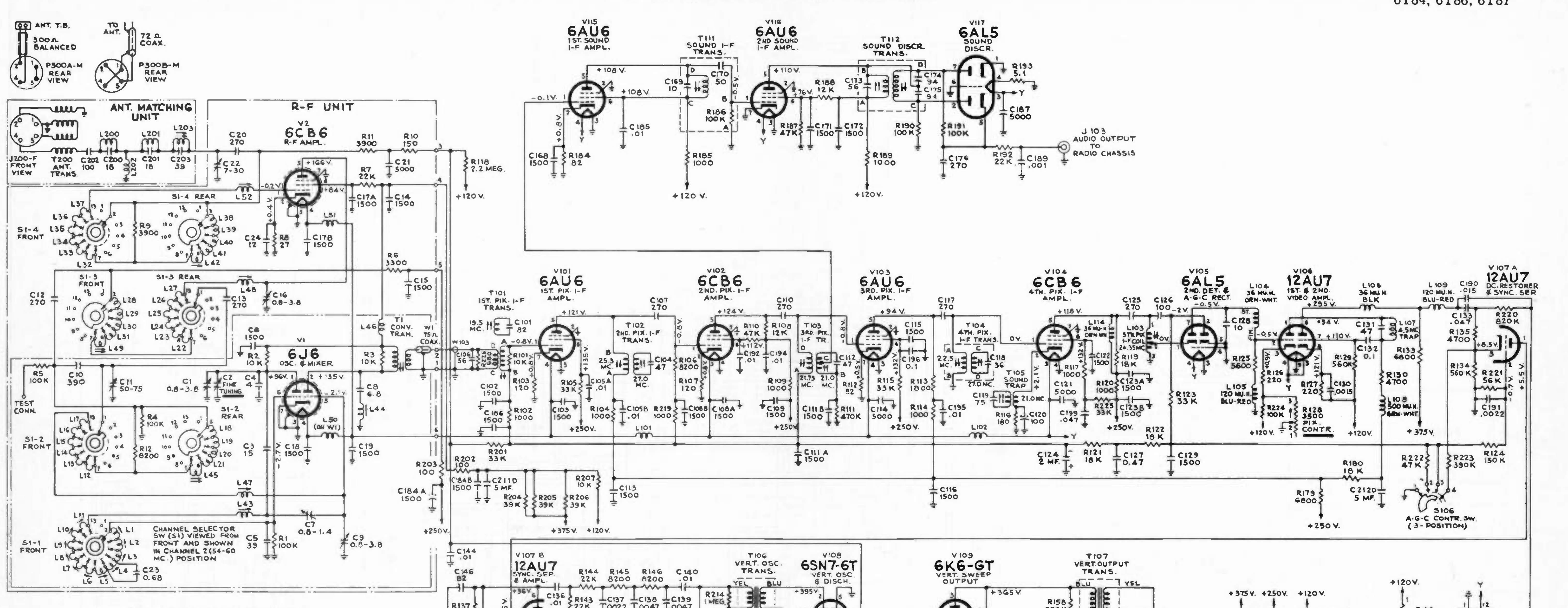


Figure 13—KCS48 Chassis Wiring Diagram

KCS48 CIRCUIT SCHEMATIC DIAGRAM



PRODUCTION CHANGES IN KCS48

In some receivers C160 was .022, C161 was 250, C105A and C105B were 1500, R129 was 390 k, R180 was 22 k, R176 was 8200, C141 was connected between R151, R154 and plus 120 volts. C144 and R226 were omitted.

In some receivers the connections to terminals 1 and 3 of R177 were reversed.

In some receivers R142 was 1.2 meg and was connected to plus 250 volts.

In some receivers C198 was 4.7, R134 was 470 k, C190 was connected at R135.

In some receivers R113 was 3900, R119 was 8200, and L114 was omitted, T104 bottom was tuned to 24.35 MC and L103 was tuned to 22.5 MC.

In some receivers C189 was omitted.

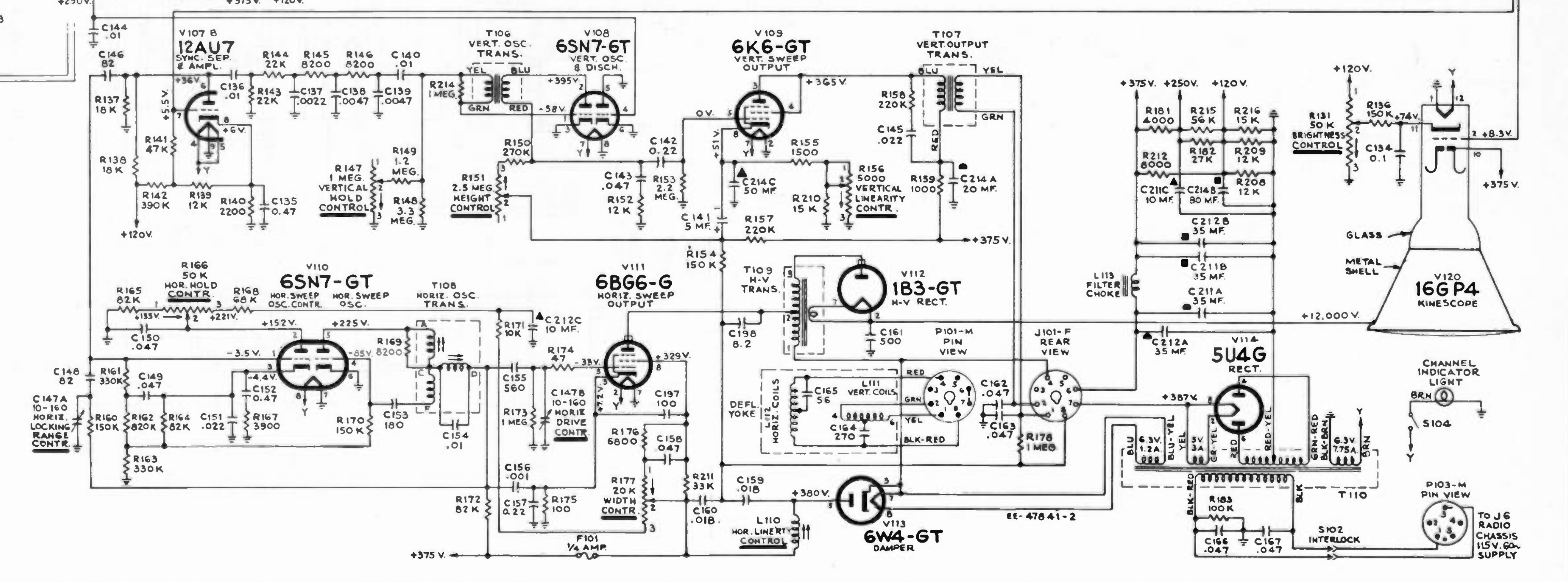
In some receivers R134 was 820 k, and R142 was connected to R104, C113, etc.

Due to a severe resistor shortage during the production of this series of receivers it was found necessary to substitute resistors of different values from the nominal value shown on the schematic. These substitutions were approved by the engineering department for each particular application in the circuit only if the change in value did not impair receiver operation. In some such instances, these substitutions involved a change in value of 5%, 10%, 20% or in a few instances even greater change.

In critical circuits where a change of value could not be tolerated, the proper resistance was obtained by the use of series, parallel or even series-parallel combinations of resistors in order to obtain the correct value of resistance or wattage.

If it should become necessary to replace a resistor or group of resistors, the values shown in the schematic and parts list should be employed.

If the value of the resistor to be replaced is different from the value shown in the schematic, and the schematic value is not available, then it is permissable to replace it with the value found in the receiver or some value between that and the value shown in the schematic. Some of the commercially available, low resistance value, molded body types are of wire wound construction. Such resistors should not be employed in the r-f unit, i-f or video sections as the inductive affect of tese resistors may impair circuit operation.



All resistance values in ohms. K=1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Figure 14—Circuit Schematic Diagram KCS48 chassis

KCS48T CHASSIS WIRING DIAGRAM

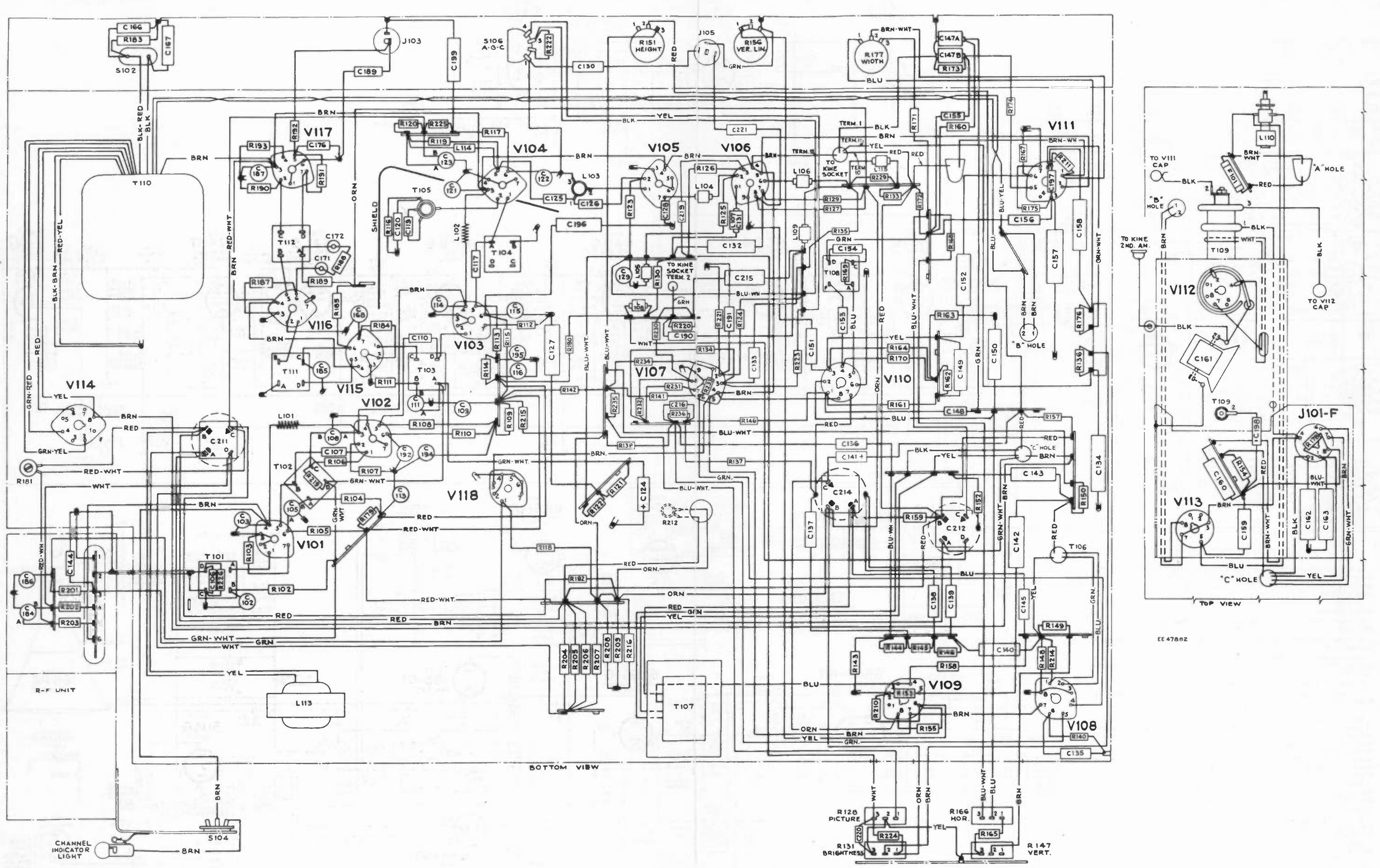
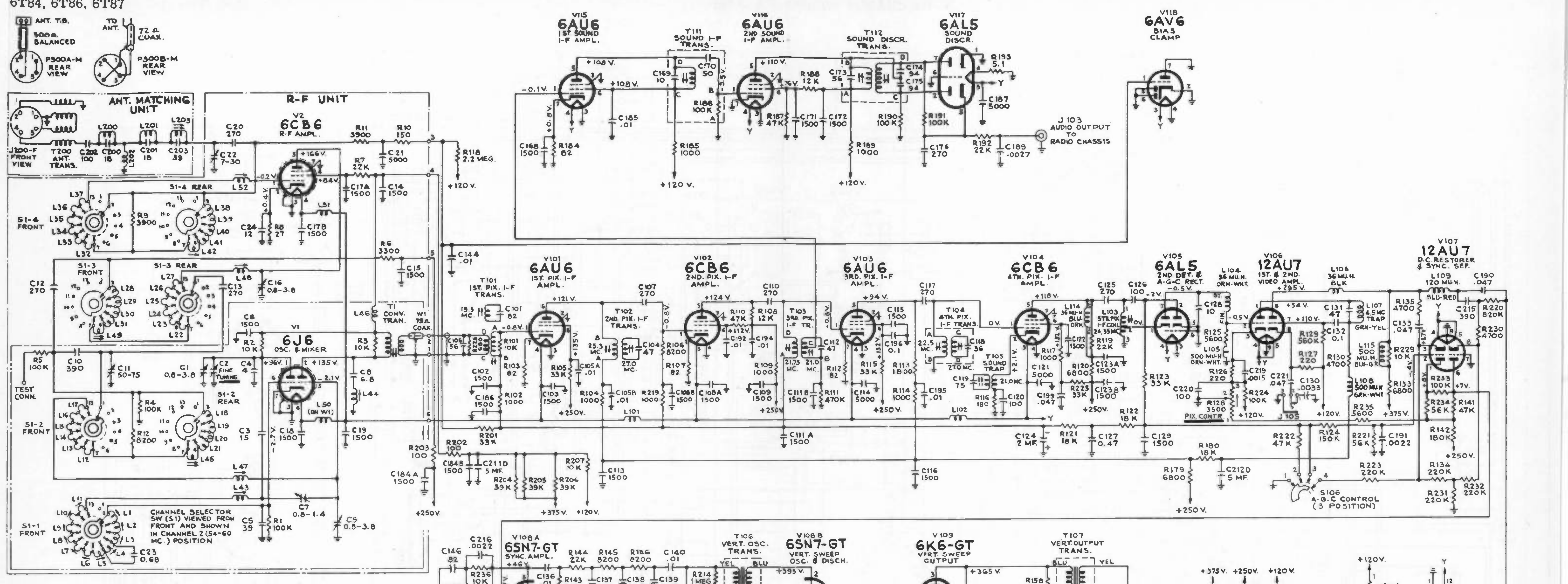


Figure 15—KCS48T Chassis Wiring Diagram

KCS48T CIRCUIT SCHEMATIC DIAGRAM



PRODUCTION CHANGES IN KCS48T

In some receivers, R120 was 1000 ohms.

In some receivers, C196 was .01 mfd.

In some receivers, R103 and R107 were 120 ohms and point C of T103 was 5 turns down from top of coil on the actual transformer.

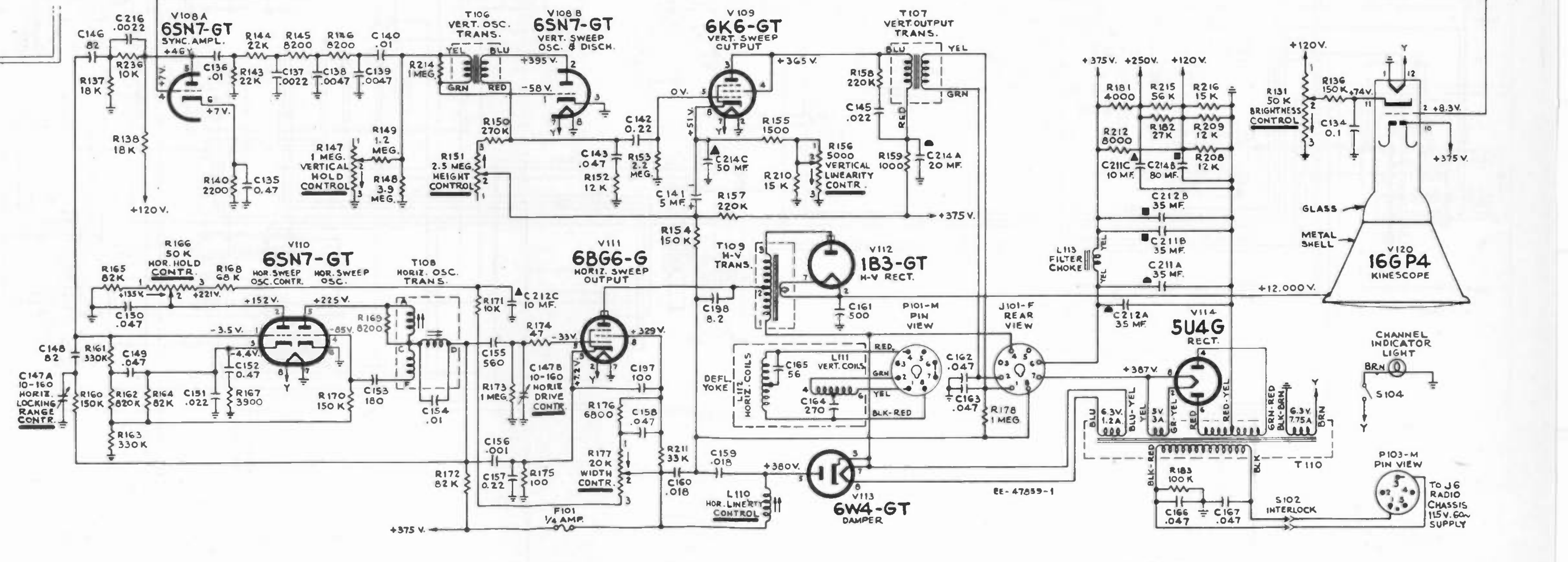
In some receivers, J105, C219, C220 and C221 were omitted. L105 was 120 Muh (Red/Blue) and C130 was connected between pin 8 of V106 and plus 125 volt bus.

In some receivers, R148 was 3.3 meg and C189 was .0015.

The following changes will be made on a few late production receivers but these changes are not shown in the schematic or wiring diagrams.

In a few late production chassis T111 will be replaced by a dual winding transformer with two adjustable cores for primary and secondary which are adjustable from the top and bottom of the chassis. R186 will be 22K and will be connected between terminal A of T111 and ground. A 100 mmf capacitor will be connected in parallel with R186. Terminal B of T111 will be connected to Pin 1 of V116. Connections to Terminals C and D of T111 will remain unchanged. For circuit diagram see Service Data, Model 7T143.

In a few late production receivers the following changes will be made. R118 will be changed to 10 meg and R201 will become 150K. The bleeder resistors, R208, R209 and R216 will be lifted from ground and a 220 ohm resistor, R239 will be inserted between the old bleeder and ground. This will create a new 5.5 volt bus. The cathode of the AGC diode pin 5 of V105 will be lifted from ground and connected to this 5.5 volt bus. A .01 mfd capacitor C224, will be connected from Pin 5 of V105 to ground. Video load resistors R133, R229, and L115 will be removed. A 2700 ohm resistor R139 will be connected to junction of L106 and L109. R133 a 4700 ohm resistor will be connected between R139 and the 375 volt bus. A 270 mmf. capacitor C223 will be connected from the junction of R133, R139 and to Pin 8 of V107 C130 will be changed to .0033 mfd. For circuit diagram, see the Service Data for Model 7T143.



All resistance values in ohms. K=1000.
All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Fig. 16—Circuit Schematic Diagram for KCS48T chassis

REPLACEMENT PARTS 6T84, 6T86, 6T87

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES KRK8B
10708	Ball—Steel ball for detent (5/32 dia.)
75188	Board—Terminal board, 5 contact and ground.
75067	Bracket—Vertical bracket for holding oscillator tube shield
75201	Cable—75 ohms, coax cable (7¼") complete with coil (W1, L50)
75186	Capacitor—Ceramic, variable, for fine tuning—plunger type (C2)
75289	Capacitor—Ceramic, 4 mmf., ±0.5 mmf. (C4)
75189	Capacitor—Adjustable, 7-30 mmf. (C22)
75200	Capacitor—Ceramic, 12 mmf. (C24)
45465	Capacitor—Ceramic, 15 mmf. (C3)
75196	Capacitor—Ceramic, 39 mmf. (C5)
75174	Capacitor—Ceramic, trimmer, 50-75 mmf. (C11)
75199	Capacitor—Ceramic, 270 mmf. (C12, C13, C20)
75641	Capacitor—Ceramic, 390 mmf. (C10)
75166	Capacitor—Ceramic, 1500 mmf. (C6, C14, C15, C19)
75089	Capacitor—Ceramic, dual, 1500 mmf. (C17A, C17B)
73748	Capacitor—Ceramic, 1500 mmf. (C18)
73473	Capacitor—Ceramic, 5000 mmf. (C21)
75172	Capacitor—Tubular, steatite, adjustable, 0.8-1.4 mmf. (C7)
71504	Capacitor—Ceramic, 0.88 mmf. (C23)
75184	Capacitor—Ceramic, adjustable, 0.75-4 mmf., complete with adjusting stud (C1)
75197	Capacitor—Ceramic, 6.8 mmf. (C8)
75167	Clip—Tubular clip for mounting stand-off capacitors
75182	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment) for convertor section (C9, L47)
75183	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f section (L48, C16)
75185	Coil—Convertor plate loading coil (L44)
75202	Coil—Choke coil .56 muh (L46)
73477	Coil—Choke coil (L51)
75187	Core—Adjustable core for fine tuning capacitor C2
75162	Detent—Detent mechanism and fibre shaft
73453	Form—Coil form for L45 and L49
75165	Link—Link assembly for fine tuning
14343	Retainer—Fine tuning shaft retaining ring
	Resistor—Fixed, composition:—
	27 ohms, ±10%, ½ watt (R8)
	150 ohms, ±20%, ½ watt (R10)
	3300 ohms, ±10%, ½ watt (R6)
	3900 ohms, ±10%, ½ watt (R9, R11)
	8200 ohms, ±10%, ½ watt (R12)
	10,000 ohms, ±5%, ½ watt (R3)
	10,000 ohms, ±20%, ½ watt (R2)
	22,000 ohms, ±10%, ½ watt (R7)
	100,000 ohms, ±20%, ½ watt (R1, R4, R5)
75164	Rod—Actuating plunger rod (fibre) for fine tuning link
71467	Screw—No. 4-40 x ¼" binder head machine screw for adjusting L6, L7, L8, L9, L10, L11
75167	Screw—No. 4-40 x ⅜" fillister head screw for adjusting L5
75177	Screw—No. 4-40 x 5/16" fillister head screw for adjusting L1, L2, L3, L4, L43
74575	Screw—No. 4-40 x .359" adjusting screw for L42
73640	Screw—No. 4-40 x 7/16" adjusting screw for L52
75159	Shaft—Channel selector shaft and plate
75160	Shaft—Fine tuning shaft and cam
75168	Shield—Oscillator and convertor sections shield for r-f unit—snap-on type
75193	Shield—Tube shield for V1
75192	Shield—Tube shield for V2
75088	Socket—Tube socket, 7 contact, miniature, ceramic, saddle mounted
75191	Spacer—Insulating spacer for front plate (4 required)
75163	Spring—Friction spring (formed) for fine tuning cam
75068	Spring—Retaining spring for oscillator tube shield
74578	Spring—Retaining spring for adjusting screws
73457	Spring—Return spring for fine tuning control
30340	Spring—Hair pin spring for fine tuning link
75175	Stator—Oscillator section stator complete with rotor, segment, coils, adjusting screws and capacitors C3 and C23 (S1-1, C3, C23, L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L43)
75178	Stator—Convertor stator complete with rotor, coils, capacitors (C10 and C12) and resistors (R4 and R5) (S1-2, C10, C12, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L45, R4, R5, R12)
75179	Stator—R-F amplifier stator complete with rotor, coils, capacitor (C13) and resistor (R6) (S1-3, C13, L22, L23, L24, L25, L26, L27, L28, L29, L30, L31, L49, R6)
75180	Stator—Antenna stator complete with rotor, coils, capacitors (C20 and C21) and resistors (R9, R10, R11) (S1-4, C20, C21, L32, L33, L34, L35, L36, L37, L38, L39, L40, L41, L42, L52, R9, R10, R11)
75169	Strip—Coil segment mounting strip—RH center
75170	Strip—Coil segment mounting strip—LH lower
75171	Strip—Coil segment mounting strip—LH upper—less trimmer C7
75173	Stud—No. 6-32 x 13/16" adjusting stud for C7 trimmer
75446	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1 uncoded and coded "ER"

STOCK No.	DESCRIPTION
75447	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1 coded numerically and "Hi Q"
75181	Transformer—I-F convertor transformer
75190	Washer—Insulating washer (neoprene) for capacitor C7
75607	Washer—Insulating washer (hex)
	TELEVISION CHASSIS ASSEMBLIES KCS48
78515	Bracket—Channel indicator lamp bracket
75228	Bracket—Focus magnet mounting bracket—upper
75229	Bracket—Focus magnet mounting bracket—lower
76009	Capacitor—Ceramic, 8.2 mmf. (C198)
75217	Capacitor—Mica trimmer, dual, 10-160 mmf. (C147A, C147B)
53511	Capacitor—Ceramic, 10 mmf. (C128)
75450	Capacitor—Ceramic, 39 mmf. (C203)
71924	Capacitor—Ceramic, 56 mmf. (C106)
73090	Capacitor—Mica, 82 mmf. (C146, C148)
75437	Capacitor—Ceramic, 100 mmf. (C202)
45469	Capacitor—Ceramic, 100 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C126, C197, C220, C222)
73102	Capacitor—Mica, 180 mmf. (C153)
74947	Capacitor—Ceramic, 500 mmf., 20,000 volts (C161)
75244	Capacitor—Ceramic, 270 mmf. (C176)
73091	Capacitor—Mica, 270 mmf. (C107, C110, C117, C125)
73094	Capacitor—Mica, 390 mmf. (C215)
74250	Capacitor—Mica, 560 mmf. (C155)
75166	Capacitor—Ceramic, 1500 mmf. (C171, C172)
73748	Capacitor—Ceramic, 1500 mmf. (C102, C103, C109, C113, C115, C116, C122, C129, C168, C186)
75089	Capacitor—Ceramic, dual, 1500 mmf. (C108A, C108B, C111A, C111B, C123A, C123B, C184A, C184B)
73473	Capacitor—Ceramic, 5000 mmf. (C114, C121, C187)
73960	Capacitor—Ceramic, 10,000 mmf. (C144, C185, C192, C194, C195)
73877	Capacitor—Ceramic, dual, 10,000 mmf. (C105A, C105B)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C124)
28417	Capacitor—Electrolytic, 5 mfd., 450 volts (C141)
75592	Capacitor—Electrolytic, comprising 1 section of 20 mfd., 450 volts, 1 section of 80 mfd., 200 volts and 1 section of 50 mfd., 50 volts (C214A, C214B, C214C)
75510	Capacitor—Electrolytic, comprising 2 sections of 35 mfd., 450 volts, 1 section of 10 mfd., 450 volts and 1 section of 5 mfd., 450 volts (C211A, C211B, C211C, C211D, C212A, C212B, C212C, C212D)
75643	Capacitor—Tubular, moulded paper, oil impregnated, .001 mfd., 1000 volts (C156)
73598	Capacitor—Tubular, paper, oil impregnated, .0015 mfd., 600 volts (C130, C219)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd., 600 volts (C137, C191, C216)
73599	Capacitor—Tubular, paper, oil impregnated, .0027 mfd., 600 volts (C189)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 600 volts (C138, C139)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C136)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd., 600 volts (C140, C154)
73797	Capacitor—Tubular, paper, oil impregnated, .015 mfd., 600 volts (C190)
74727	Capacitor—Tubular, paper, oil impregnated, .018 mfd., 1000 volts (C159, C160)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 400 volts (C145, C151)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C149, C199, C221)
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts (C166, C167)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 600 volts (C133, C150, C190)
73597	Capacitor—Tubular, moulded paper, oil impregnated, .047 mfd., 1000 volts (C143, C158, C162, C163)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C132, C196)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 600 volts (C134)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 400 volts (C157)
74957	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 600 volts (C142)
73787	Capacitor—Tubular, moulded paper, 0.47 mfd., 200 volts (C127, C135, C152)
73154	Choke—Filter choke (L113)
75167	Clip—Tubular clip for mounting stand-off capacitor 75166
75210	Coil—Fifth pix i-f coil complete with adjustable core (L103)
71449	Coil—Horizontal linearity control coil (L110)
73591	Coil—Antenna matching coil (2 req'd) (Part of T200)
75241	Coil—Antenna shunt coil (L202)
73477	Coil—Choke coil (L101, L102)
75299	Coil—Peaking coil (36 muh) (L104)
71793	Coil—Peaking coil (36 muh) (L106)
76285	Coil—Peaking coil (36 muh) (L114, R119)
75253	Coil—Peaking coil (120 muh) (L109)
75252	Coil—Peaking coil (500 muh) (L105, L108)
76132	Coil—Peaking coil (500 muh) (L115) (In KCS48T)
35787	Connector—Single contact female connector for audio cable (J103)

6T84, 6T86, 6T87 REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
74594	Connector—2 contact male connector for power cord
38853	Connector—4 contact female connector for antenna transformer (J200)
35383	Connector—8 contact male connector—part of deflection yoke (P101)
68592	Connector—8 contact female connector for deflection yoke leads (J101)
75517	Contact—Anode connector assembly contact only
75215	Control—Horizontal and vertical hold control (R147, R166)
75216	Control—Picture and brightness control (R128, R131)
71441	Control—Vertical linearity control (R156)
71440	Control—Height control (R151)
75516	Control—Width control (R177)
71498	Core—Adjustable core and stud for F-M trap 75449
74956	Cushion—Rubber cushion for deflection yoke hood (2 req'd)
74839	Fastener—Push fastener to mount ceramic tube socket (2 req'd)
73600	Fuse—.25 amp., 250 volts (F101)
16058	Grommet—Rubber grommet for 2nd. anode lead exit
37396	Grommet—Rubber grommet to mount ceramic tube socket (2 req'd)
75445	Hood—Deflection yoke hood less rubber cushions
75644	Insulator—2nd. anode insulator
75842	Jack—Video jack (J105)
75504	Magnet—Focus magnet complete with adjustable plate and stud
74953	Magnet—Ion trap magnet (P.M.)
75518	Plate—Hi-voltage plate bakelite—less transformer, capacitor and tube socket
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R193)
75512	Resistor—Wire wound, 4000 ohms, 10 watts (R181)
75593	Resistor—Wire wound, 8000 ohms, 15 watts (R212)
	Resistor—Fixed, composition:—
	47 ohms, ±20%, ½ watt (R174)
	82 ohms, ±10%, ½ watt (R103, R107, R112, R184)
	100 ohms, ±20%, ½ watt (R202, R203)
	100 ohms, ±10%, 2 watts (R175)
	180 ohms, ±10%, ½ watt (R116)
	220 ohms, ±10%, ½ watt (R126, R127)
	680 ohms, ±10%, ½ watt (R226)
	1000 ohms, ±20%, ½ watt (R102, R104, R109, R114, R117, R159, R185, R189, R219)
	1500 ohms, ±10%, 1 watt (R155)
	1800 ohms, ±10%, ½ watt (R113)
	2200 ohms, ±20%, ½ watt (R140)
	3900 ohms, ±10%, ½ watt (R167)
	4700 ohms, ±5%, ½ watt (R130)
	4700 ohms, ±10%, ½ watt (R135) (R230 in KCS48T)
	5600 ohms, ±5%, ½ watt (R125)
	5600 ohms, ±10%, ½ watt (R235 in KCS48T)
	6800 ohms, ±10%, 1 watt (R120, R176)
	6800 ohms, ±10%, 2 watts (R133, R179)
	8200 ohms, ±5%, ½ watt (R106, R169)
	8200 ohms, ±10%, ½ watt (R145, R146)
	10,000 ohms, ±10%, ½ watt (R171) (R236 in KCS48T)
	10,000 ohms, ±10%, 2 watts (R207)
	12,000 ohms, ±5%, ½ watt (R152)
	12,000 ohms, ±10%, ½ watt (R188) (R139 in KCS48)
	12,000 ohms, ±5%, 1 watt (R108)
	12,000 ohms, ±10%, 2 watts (R208, R209)
	15,000 ohms, ±10%, ½ watt (R210)
	15,000 ohms, ±10%, 2 watts (R216)
	18,000 ohms, ±10%, ½ watt (R119, R121, R122, R137)
	18,000 ohms, ±10%, 1 watt (R138, R180)
	22,000 ohms, ±10%, ½ watt (R143, R144, R186)
	22,000 ohms, ±20%, ½ watt (R192)
	27,000 ohms, ±10%, 2 watts (R182)
	33,000 ohms, ±10%, ½ watt (R105, R115, R201, R211, R225)
	33,000 ohms, ±20%, ½ watt (R123)
	39,000 ohms, ±10%, 2 watts (R204, R205, R206)
	47,000 ohms, ±10%, ½ watt (R141, R187, R222)
	47,000 ohms, ±20%, ½ watt (R110)
	56,000 ohms, ±10%, ⅜ watt (R221) (R234 in KCS48T)
	56,000 ohms, ±10%, 1 watt (R215)
	68,000 ohms, ±10%, 1 watt (R168)
	82,000 ohms, ±5%, 1 watt (R172)
	82,000 ohms, ±10%, 1 watt (R164, R165)
	100,000 ohms, ±5%, ½ watt (R190, R191)
	100,000 ohms, ±10%, ½ watt (R224) (R233 in KCS48T)
	100,000 ohms, ±20%, 2 watts (R183)
	150,000 ohms, ±10%, ½ watt (R136, R154, R160)
	150,000 ohms, ±20%, ½ watt (R124)
	150,000 ohms, ±5%, 1 watt (R170)
	180,000 ohms, ±10%, ½ watt (R142 in KCS48T)
	220,000 ohms, ±10%, ½ watt (R157, R158) (R134, R223, R231, R232 in KCS48T)
	270,000 ohms, ±10%, ½ watt (R150)
	330,000 ohms, ±10%, ½ watt (R161)
	330,000 ohms, ±5%, 1 watt (R163)
	390,000 ohms, ±10%, ½ watt (R142, R223 in KCS48)
	470,000 ohms, ±10%, ½ watt (R111)
	560,000 ohms, ±10%, ½ watt (R129) (R134 in KCS48)
	820,000 ohms, ±10%, ½ watt (R162, R220)
	1 megohm, ±10%, ½ watt (R173)
	1 megohm, ±20%, ½ watt (R178)
	1.2 megohm, ±5%, ½ watt (R149)
	2.2 megohm, ±10%, ½ watt (R118, R153)
	3.9 megohm, ±5%, ½ watt (R148)
75083	Screw—No. 8-32 x ¼" wing screw for mounting deflection yoke
75236	Screw—No. 8-32 x ⅜" pan head machine screw (brass) for focus magnet mounting (2 req'd)

STOCK No.	DESCRIPTION
74602	Screw—No. 10-32 x 1¾" round head machine screw for focus magnet adjustment (3 req'd)
73584	Shield—Tube shield
31251	Socket—Tube socket, octal, wafer
73249	Socket—Tube, octal, ceramic, plate mounted
31319	Socket-Tube socket, octal, moulded
73117	Socket—Tube, socket, 7 pin, miniature
75223	Socket—Tube socket, 9 pin, miniature
68592	Socket—Tube socket, 6 contact, moulded for V113
71508	Socket—Tube socket for 1B3/8016
74834	Socket—Kinescope socket
75718	Socket—Channel indicator light socket
75233	Spring—Compression spring for focus magnet adjustment (3 req'd)
75506	Support—Bakelite support only—part of hi-voltage shield
75594	Switch—Indicator light switch (S104)
76010	Switch—AGC switch (S106)
75508	Transformer—Power transformer 115 volts, 60 cycle (T110)
74950	Transformer—Vertical output transformer (T107)
74144	Transformer—Vertical oscillator transformer (T106)
74589	Transformer—First pix, i-f transformer (T101, C101, R101)
74590	Transformer—Second pix, i-f transformer (T102, C104)
76264	Transformer—Third pix, i-f transformer (T103, C112)
73574	Transformer—Fourth pix. i-f transformer (T104, C118)
75211	Transformer—Sound i-f transformer (simple winding type) (T111, C169, C170, R186)
71424	Transformer—Sound i-f transformer (dual winding type) (T111, C169, C170)
75212	Transformer—Sound discriminator transformer (T112, C173, C174, C175)
75213	Transformer—Horizontal oscillator transformer (T108)
75509	Transformer—Antenna matching transformer complete with antenna connector, I-F and F-M traps and shunt coil (T200, C200, C201, C202, C203, J200, L200, L201, L202, L203)
75519	Transformer—Hi-voltage transformer (T109)
71778	Trap—Sound trap (T105, C119)
75242	Trap—I-F trap (L200 (C200), L201 (C201)
75449	Trap—F-M trap complete with adjustable core and stud (L203, C203)
75281	Trap—4.5 mc trap (L107, L131)
74952	Yoke—Deflection yoke (L111, L112, C164, C165, P101)
	RADIO CHASSIS ASSEMBLIES RC 1090—Model 6T84
75541	Bracket—Pulley bracket complete with drive cord and pulley
75534	Capacitor—Variable tuning capacitor complete with drive drum (C1-1, C1-2)
71924	Capacitor—Ceramic, 56 mmf. (C8)
39632	Capacitor—Mica, 150 mmf. (C2, C16, C20)
73372	Capacitor—Electrolytic comprising 1 section of 30 mfd., 350 volts, 1 section of 30 mfd., 300 volts and 1 section of 20 mfd., 25 volts (C23A, C23B, C23C)
73801	Capacitor—Tubular, paper, .001 mfd., 400 volts (C5)
71394	Capacitor—Tubular, paper, .0015 mfd., 600 volts (C10)
73851	Capacitor—Tubular, paper, oil impregnated, .018 mfd., 1600 volts (C24)
73803	Capacitor—Tubular, paper, .002 mfd., 1000 volts (C21, C22)
70603	Capacitor—Tubular, paper, .003 mfd., 400 volts (C17)
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts (C15)
73561	Capacitor—Tubular, paper, .01 mfd., 400 volts (C9, C13, C18)
70572	Capacitor—Tubular, paper, .015 mfd., 400 volts (C11)
58476	Capacitor—Tubular, paper, oil impregnated, .018 mfd., 400 volts (C12)
73562	Capacitor—Tubular, paper, .02 mfd., 400 volts (C19)
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts (C14)
73935	Clip—Mounting clip for I-F transformer
75627	Clip—Clip for main cable—on rear apron of chassis
75485	Coil—Oscillator coil complete with adjustable core and stud (L3, L4)
35787	Connector—Single contact female connector for 45 RPM pickup cable (J5)
75542	Connector—8 contact male connector for power input cable (J6)
75543	Connector—2 contact female connector for 45 RPM motor cable (P2)
74879	Connector—Two contact (polarized) female connector for antenna leads (J7)
33514	Connector—Dual two contact female connector for 33/78 RPM pickup cable and television cable (J3, J4)
75537	Control—Volume control and power switch (R15, S2)
75538	Control—Tone control (R23)
72953	Cord—Drive cord (approx. 60" overall)
75547	Grommet—Rubber grommet to mount slides to bottom—rear (2 req'd)
75548	Grommet—Rubber grommet to mount slides to bottom—front (2 req'd)
11765	Lamp—Dial lamp—Mazda No. 51
75544	Nut—Rivnut to fasten screw for mounting chassis (4 req'd)
75535	Plate—Dial back plate complete with three (3) pulleys
75536	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R31)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R30)
	Resistor—Fixed, composition:—
	47 ohms, ±20%, ½ watt (R32)
	270 ohms, ±10%, ½ watt (R18)
	330 ohms, ±10%, 1 watt (R28)
	470 ohms, ±20%, ½ watt (R33)

REPLACEMENT PARTS (Continued) 6T84, 6T86, 6T87

STOCK No.	DESCRIPTION
	3300 ohms, ±5%, ½ watt (R17)
	18,000 ohms, ±10%, ½ watt (R13)
	18,000 ohms, ±10%, 1 watt (R10)
	22,000 ohms, ±10%, ½ watt (R9, R20)
	27,000 ohms, ±10%, ½ watt (R14, R34)
	39,000 ohms, ±10%, ½ watt (R19)
	68,000 ohms, ±10%, ½ watt (R27)
	82,000 ohms, ±10%, ½ watt (R25)
	150,000 ohms, ±10%, ½ watt (R7)
	270,000 ohms, ±10%, ½ watt (R24)
	470,000 ohms, ±10%, ½ watt (R22, R26, R29)
	1.5 megohm, ±10%, ½ watt (R6, R35)
	2.2 megohm, ±20%, ½ watt (R1, R12)
	10 megohm, ±20%, ½ watt (R16)
75540	Shaft—Tuning knob shaft
73584	Shield—Tube shield
75546	Slide—Slide mechanism complete for radio chassis bottom
31364	Socket—Dial lamp socket
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
4038	Spring—Drive cord spring
75539	Switch—Function switch (S1-1, S3)
73636	Transformer—Output transformer (T3)
75486	Transformer—First i-f transformer complete with adjustable core and studs (T1)
75487	Transformer—Second i-f transformer complete with adjustable core and studs (T2)
70127	Transformer—Power transformer 115 volts, 60 cycle (T4)
33726	Washer—"C" washer for tuning knob shaft

CHASSIS ASSEMBLIES

RC 1092—Models 6T86, 6T87

STOCK No.	DESCRIPTION
75567	Capacitor—Variable tuning capacitor complete with drive drum (C1-1, C1-2, C1-3, C1-4, C1-5, C1-6)
76423	Capacitor—Ceramic, 3 mmf. (C10)
75613	Capacitor—Ceramic, 5 mmf. (C13)
39044	Capacitor—Ceramic, 15 mmf. (C12)
75609	Capacitor—Ceramic, 47 mmf. (C45)
75612	Capacitor—Ceramic, 68 mmf. (C9, C11)
39396	Capacitor—Ceramic, 100 mmf. (C4)
75437	Capacitor—Ceramic, 100 mmf. (C31)
75614	Capacitor—Ceramic, 150 mmf. (C14, C30, C43, C54)
75611	Capacitor—Ceramic, 220 mmf. (C3)
39640	Capacitor—Mica, 330 mmf. (C37, C38)
72571	Capacitor—Mica, 470 mmf. (C7)
75610	Capacitor—Ceramic, 1500 mmf. (C19)
74850	Capacitor—Ceramic, 1800 mmf. (C17)
73473	Capacitor—Ceramic, 5000 mmf. (C2, C5, C6, C15, C24, C25, C27, C28, C29, C34, C36)
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts (C33)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C04)
72052	Capacitor—Electrolytic, comprising 1 section of 30 mfd., 450 volts, 1 section of 30 mfd., 350 volts, and 1 section of 40 mfd., 25 volts (C23A, C23B, C23C)
73801	Capacitor—Tubular, paper, .001 mfd., 400 volts (C8)
70642	Capacitor—Tubular, paper, .001 mfd., 1000 volts (C42, C44)
71926	Capacitor—Tubular, paper, .005 mfd., 200 volts (C26, C39, C41)
71925	Capacitor—Tubular, paper, .01 mfd., 400 volts (C32)
72120	Capacitor—Tubular, paper, .015 mfd., 200 volts (C22)
58476	Capacitor—Tubular, paper, oil impregnated, .018 mfd., 400 volts (C21)
74010	Capacitor—Tubular, paper, .02 mfd., 400 volts (C20, C35)
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts (C16)
73935	Clip—Mounting clip for AM I-F transformer
75627	Clip—Clip for main cable—on rear of chassis
75569	Coil—Oscillator coil—AM—complete with adjustable screws (L3, L4, L5)
75570	Coil—R-F coil—AM—complete with adjusting screws (L6, L7)
75615	Coil—Antenna coil—FM (L1)
71942	Coil—Filament choke coil (L9)
74817	Coil—Oscillator coil—FM (L8)
74815	Coil—R-F coil—FM (L2)
35787	Connector—Single contact female connector for record changer's pickup cables and television (J2, J3, J5)
75542	Connector—8 contact male connector for power input cable (J4)
75543	Connector—2 contact female connector for 45 RPM motor cable (P1)
74879	Connector—2 contact female connector for antenna leads
75537	Control—Volume control and power switch (R22, S2)
75561	Control—Tone control—L.F. (R19)
75562	Control—Tone control—H.F. (R34)
72953	Cord—Drive cord (approx. 66" overall)
75564	Coupling—Spring coupling for function switch extension shaft
75556	Cover—insulating cover for electrolytic
74839	Fastener—Push fastener for mounting r-f shelf (4 req'd)
16058	Grommet—Rubber grommet for mounting r-f shelf (4 req'd)
75547	Grommet—Rubber grommet to mount slides to bottom—rear (2 req'd)
75548	Grommet—Rubber grommet to mount slides to bottom—front (2 req'd)
11765	Lamp—Dial lamp—Mazda 51
75544	Nut—Rivnut to fasten screw for mounting chassis (4 req'd)
18469	Plate—Bakelite mounting plate for electrolytic
75535	Plate—Dial back plate complete with three (3) pulleys
75536	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R25)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R24)
	Resistor—Fixed, composition:—
	68 ohms, ±10%, ½ watt (R1, R26)
	100 ohms, ±10%, ½ watt (R15, R38, R43)
	120 ohms, ±10%, ½ watt (R27)
	270 ohms, ±5%, 2 watts (R42)
	390 ohms, ±10%, ½ watt (R9)
	680 ohms, ±10%, ½ watt (R4)
	680 ohms, ±20%, ½ watt (R30, R31)
	1000 ohms, ±10%, ½ watt (R6)
	1200 ohms, ±5%, ½ watt (R46)
	3300 ohms, ±5%, ½ watt (R40, R45)
	8200 ohms, ±10%, 1 watt (R3)
	15,000 ohms, ±10%, ½ watt (R44)
	18,000 ohms, ±10%, ½ watt (R7, R20)
	22,000 ohms, ±10%, ½ watt (R28, R29)
	27,000 ohms, ±10%, ½ watt (R18, R21)
	39,000 ohms, ±10%, 1 watt (R16)
	56,000 ohms, ±10%, ½ watt (R32)
	68,000 ohms, ±10%, ½ watt (R39)
	82,000 ohms, ±10%, ½ watt (R36)
	120,000 ohms, ±10%, ½ watt (R8, R16)
	150,000 ohms, ±10%, ½ watt (R12, R14)
	220,000 ohms, ±20%, ½ watt (R11)
	270,000 ohms, ±10%, ½ watt (R35)
	470,000 ohms, ±10%, ½ watt (R2, R37, R41, R48)
	1.5 megohm, ±10%, ½ watt (R17, R51)
	2.2 megohm, ±20%, ½ watt (R5, R10, R13)
	10 megohm, ±20%, ½ watt (R23)
	22 megohm, ±20%, ½ watt (R33)
75540	Shaft—Tuning knob shaft
75565	Shaft—Extension shaft for function switch
73584	Shield—Tube shield
75546	Slide—Slide mechanism complete for radio chassis bottom
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
74179	Socket—Tube socket, 7 pin, miniature for V1 and V2
31364	Socket—Dial lamp socket
75563	Spring—Retaining spring for function switch extension shaft
76332	Spring—Drive cord tension spring
74847	Support—Polystyrene support for FM, oscillator coil complete with mounting bracket
75568	Switch—Function switch (S1-1, S1-2, S1-3, S3)
75557	Transformer—Output transformer (T7)
73743	Transformer—Radio detector transformer (T5)
75558	Transformer—First i-f transformer (AM) complete with adjustable screws (T2)
75559	Transformer—First i-f transformer (FM) complete with adjustable cores (T1)
73037	Transformer—Second i-f transformer (AM) complete with adjustable screws (T4)
75560	Transformer—Second i-f transformer (FM) complete with adjustable cores (T3)
75566	Transformer—Power transformer 115 volts, 60 cycle (T6)
33726	Washer—"C" for tuning knob shaft

RADIO ROLLOUT CARRIAGE

STOCK No.	DESCRIPTION
75552	Decal—Function decal for radio controls—Model 6T84
75573	Decal—Function decal for radio controls—Models 6T86 and 6T87
75550	Dial—Polystyrene dial scale—Model 6T84
75572	Dial—Polystyrene dial scale—Models 6T86 and 6T87
75571	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM changer for mahogany or walnut instrument—Models 6T86 and 6T87
75549	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM changer for mahogany or walnut instrument—Model 6T84
75683	Frame—Moulded frame (light brown) for mounting radio chassis and 45 RPM changer for oak instruments—Model 6T84
75684	Frame—Moulded frame (light brown) for mounting radio chassis and 45 RPM changer for oak instruments—Models 6T86 and 6T87
75551	Handle—Metal pull-out handle for mounting frame
75555	Screw—No. 8-32 x ⅜" cross recessed pan head machine screw to mount radio chassis (4 req'd)

SPEAKER ASSEMBLY

Model 6T84

92569-9 WRMA 274

RL 111—14

STOCK No.	DESCRIPTION
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly
74974	Speaker—12" P.M. speaker (3.16 oz.) complete with cone and voice coil (3.2 ohms)

SPEAKER ASSEMBLY

92569-9B

Model 6T84

STOCK No.	DESCRIPTION
75675	Cone—Cone and voice coil assembly (3.2 ohms)
	Note: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.

6T84, 6T86, 6T87 REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
	SPEAKER ASSEMBLY Models 6T86 and 6T87 92569-12W RMA 274 RL 111-A1
13867	Cap—Dust cap
75682	Cone—Cone and voice coil assembly (3.2 ohms)
75681	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms)
	Note: If stamping on speaker does not agree with above numbers, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
75705	Antenna—Radio antenna loop complete less cable for Models 6T86 and 6T87
75706	Antenna—Radio antenna loop complete less cable for Model 6T84
75685	Back—Cabinet back cover for radio-phono (45 RPM) compartment—assembled to cabinet (Model 6T84)
75688	Back—Cabinet back cover for radio-phono (45 RPM) compartment—assembled to cabinet (Model 6T87)
75698	Back—Cabinet back cover for radio-phono (45 RPM) compartment—assembled to cabinet (Model 6T86)
75700	Back—Back cover complete with terminal board and power cord for television chassis (Models 6T84 and 6T86)
75701	Back—Back cover complete with terminal board and power cord for television chassis (Model 6T87)
75686	Back—Back cover—maroon—for 33 1/3/78 phono compartment for mahogany or walnut instruments—assembled to rollout (Model 6T84)
75689	Back—Back cover—maroon—for radio—45 RPM phono compartment for mahogany or walnut instruments—assembled to rollout (Model 6T84)
75692	Back—Back cover—maroon—for radio—45 RPM phono compartment for mahogany or walnut instruments—assembled to rollout (Models 6T86 and 6T87)
75699	Back—Back cover—maroon for 33 1/3/78 RPM phono compartment for mahogany or walnut instruments—assembled to rollout (Model 6T86)
75687	Back—Back cover—light brown—for 33 1/3/78 phono compartment for oak instruments—assembled to rollout (Model 6T84)
75690	Back—Back cover—light brown—for radio—45 RPM phono compartment for oak instruments—assembled to rollout (Model 6T84)
75693	Back—Back cover—light brown—for radio—45 RPM phono compartment for oak instruments—assembled to rollout (Models 6T86 and 6T87)
75473	Board—Television antenna terminal board (2 contact)
75707	Board—F-M antenna terminal board (3 contact) for (Models 6T86 and 6T87)
75694	Bracket—Radio—45 RPM phono rollout mechanism stop bracket less rubber bumper
75695	Bracket—33 1/3/78 RPM phono rollout mechanism stop bracket less rubber bumper (Models 6T84 and 6T86)
71599	Bracket—Pilot lamp bracket
75696	Bumper—Rubber bumper for rollout mechanism stop bracket
74545	Cable—Shielded pickup cable complete with pin plug for 33 1/3/78 RPM changer (Models 6T86 and 6T87)
74296	Cable—Shielded pickup cable complete with pin plug for 33 1/3/78 RPM phono (Model 6T84)
72447	Cable—Shielded audio cable complete with two (2) pin plugs
72437	Cable—Shielded pickup cable complete with pin plug for 45 RPM phono
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for cabinet door
X3144	Cloth—Grille cloth for mahogany or walnut instruments (Model 6T84)
X3093	Cloth—Grille cloth for oak instruments (Model 6T84 and 6T87)
X3130	Cloth—Grille cloth for mahogany or walnut instruments (Models 6T86 and 6T87)
30870	Connector—2 contact male connector for motor leads for 45 RPM phono
75703	Connector—5 contact male connector for television power cord assembly less shell
74882	Connector—2 contact (polarized) male connector for radio antenna loop cable
74752	Connector—2 contact male connector for F-M antenna cable
30868	Connector—2 contact female connector for main cable
75474	Connector—Single contact male connector for speaker (on main cable) (2 req'd)
75709	Connector—8 contact female connector for main cable less shell (P6 (RC1090) P4 (RC1092)
75710	Connector—5 contact female connector for main cable less shell (P8 (RC1090) J6 (RC1092)
39153	Connector—4 contact male connector for television antenna cable
75702	Cord—Television power cord complete with two (2) contact female connector less 5 contact male connector
70392	Cord—Power cord and plug—part of main cable
75608	Cushion—Dust seal cushion (rubber) for kinescope mask
74273	Decal—Trade mark decal (Victrola)
71984	Decal—Trade mark decal (RCA Victor)
75640	Decal—Television controls function decal for mahogany or walnut instruments
75680	Decal—Television controls function decal for oak instruments
74809	Emblem—"RCA Victor" emblem
75455	Escutcheon—Channel marker escutcheon — dark — for mahogany or walnut instruments
75456	Escutcheon—Channel marker escutcheon—light—for oak instruments
74606	Glass—Safety Glass
37396	Grommet—Rubber grommet to mount speaker (4 req'd)
74838	Grommet—Power cord strain relief (1 set)
75697	Grommet—Rubber grommet to mount 45 RPM changer (3 req'd)
75551	Handle—Metal pullout handle for 33 1/3/78 RPM phono mounting frame (Models 6T84 and 6T86)
74308	Hinge—Cabinet door hinge (1 set)
36817	Hinge—Cabinet door hinge (1 set) for center door (Model 6T84)
74959	Knob—Television fine tuning control knob—maroon—for mahogany or walnut instruments (outer)
73995	Knob—Television fine tuning control knob—tan—for oak instruments (outer)
73996	Knob—Television channel selector knob—maroon—for mahogany or walnut instruments (inner)
73997	Knob—Television channel selector knob—tan—for oak instruments (inner)
74962	Knob—Television brightness control or vertical hold control knob—maroon—for mahogany or walnut instruments (outer)
73999	Knob—Television brightness control or vertical hold control knob—tan—for oak instruments (outer)
74969	Knob—Television channel marker escutcheon light switch knob—maroon—for mahogany or walnut instruments
74003	Knob—Television channel marker escutcheon light switch knob—tan—for oak instruments
74963	Knob—Television picture control or horizontal hold control knob—maroon—for mahogany or walnut instruments (inner)
74001	Knob—Television picture control or horizontal hold control—tan—for oak instruments (inner)
75712	Knob—Radio tone control, tuning control or volume control and power switch knob—maroon—for mahogany or walnut instruments
75713	Knob—Radio tone control, tuning control or volume control and power switch knob—tan—for oak instruments
75714	Knob—Function switch knob—maroon—for mahogany or walnut instruments
75715	Knob—Function switch knob—tan—for oak instruments
11765	Lamp—Pilot or channel indicator lamp—Mazda No. 51
75459	Mask—Channel indicator light mask—burgundy—for mahogany or walnut instruments
75460	Mask—Channel indicator light mask—gold—for oak instruments
73634	Nut—Speed nut for speaker mounting screws (4 req'd)
75884	Nut—Speed nut for 33 1/3/78 RPM phono mounting screw (Model 6T86)
75675	Pull—Cabinet door pull (Model 6T84)
75677	Pull—Cabinet door pull for lower doors (Model 6T86)
75678	Pull—Cabinet door pull for upper doors (Model 6T86)
75679	Pull—Cabinet door pull for upper doors (Model 6T87)
74451	Pull—Cabinet door pull for lower doors (Model 6T87)
71456	Screw—No. 8-32 x 7/16" wing screw for deflection yoke and focus magnet mounting support
75883	Screw—No. 10-24 x 2¼" round head machine screw to mount 33 1/3/78 RPM phono (Model 6T86)
75377	Screw—¼—28 x 1⅜" round head machine screw to mount 33 1/3/78 RPM changer (Model 6T87)
75676	Screw—No. 8-32 x ¼" trimit head screw for door pull (Model 6T84)
74269	Screw—No. 8-32 x ¾" trimit head screw for door pulls (Model 6T86)
75623	Screw—No. 8-32 x ⅝" trimit head screw for door pulls for upper doors (Model 6T87)
74113	Screw—No. 8-32 x 1" trimit head screw for door pulls for lower doors (Model 6T87)
75704	Shell—Shell for connector RCA 75703
75708	Shell—Shell for connector RCA 75709
75711	Shell—Shell for connector RCA 75710
74736	Slide—Slide mechanism only for 33 1/3/78 phono compartment drawer (Model 6T87)
75546	Slide—Slide mechanism assembly for 33 1/3/78 RPM phono mounting frame (Models 6T84 and 6T86)
31364	Socket—Pilot lamp socket
72845	Spring—Retaining spring for knobs 73995 and 74959
14270	Spring—Retaining spring for knobs 73996, 73997, 73999, 74003, 74962 and 74969
30330	Spring—Retaining spring for knobs 74001 and 74963
74734	Spring—Retaining spring for knobs 75712, 75713, 75714 and 75715
73643	Spring—Spring clip for channel marker escutcheons
74966	Spring—Formed spring for kinescope masking panel
75691	Spring—Suspension spring (coil type) for main cable
72936	Stop—Cabinet door stop
75457	Washer—Felt washer—dark brown—between knob and channel marker escutcheon for mahogany or walnut instruments
75523	Washer—Felt washer—tan—between knob and channel marker escutcheon for oak instruments
75500	Washer—Felt washer for television compartment back cover
75146	Washer—"C" washer for 33 1/3/78 RPM phono (Model 6T87)

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Model 9T57
"York"
Mahogany, Walnut or Oak

RCA VICTOR

TELEVISION RECEIVERS
MODELS 9T57, 9T77, 9T79

Chassis Nos. KCS49, KCS49T, KCS49A or KCS49AT

—Mfr. No. 274—

SERVICE DATA

—1950 No. T16—

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Model 9T77
"Hillsdale"
Walnut, Mahogany or Oak

Model 9T79
"Northampton"
Walnut, Mahogany or Oak

GENERAL DESCRIPTION

Model 9T57, 9T77 and 9T79 receivers are deluxe "19 inch" television receivers. The receivers are identical except for cabinets, jewel lights and speakers.

Features of the television unit are: full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply. An auxiliary audio input jack is provided to permit the use of an external record playing attachment.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE ....204 square inches on a 19AP4A Kinescope

TELEVISION R-F FREQUENCY RANGE
All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range..±250 kc. on chan. 2, ± 650 kc. on chan. 13
Picture Carrier Frequency ....25.50 mc.
Sound Carrier Frequency ....21.00 mc.

VIDEO RESPONSE ....To 4 mc.

SWEEP DEFLECTION ....Magnetic

FOCUS ....Magnetic

POWER SUPPLY RATING ....115 volts, 60 cycles, 205 watts

AUDIO POWER OUTPUT RATING ....3.5 watts max.

CHASSIS DESIGNATIONS
KCS49 or KCS49T .... In Model 9T57
KCS49A or KCS49AT .... In Models 9T77 and 9T79

LOUDSPEAKERS
KCS49 ....(92580-4) 8" PM Dynamic, 3.2 ohms
KCS49A ....(92569-11) 12" PM Dynamic, 3.2 ohms

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside), 9T57	24¼	23¼	25
Cabinet (outside), 9T77	29	40¼	26¼
Cabinet (outside), 9T79	30¼	40	26¼

WEIGHT Model	Chassis with Tubes in Cabinet	Shipping Weight
9T57	127	154
9T77	135	159
9T79	136	164

RECEIVER ANTENNA INPUT IMPEDANCE
Choice: 300 ohms balanced or 72 ohms unbalanced.

RCA TUBE COMPLEMENT

Tube Used	Function
(1) RCA 6CB6	R-F Amplifier
(2) RCA 6J6	R-F Oscillator and Mixer
(3) RCA 6AU6	1st Sound I-F Amplifier
(4) RCA 6AU6	2nd Sound I-F Amplifier
(5) RCA 6AL5	Sound Discriminator
(6) RCA 6AV6	1st Audio Amplifier
(7) RCA 6K6GT	Audio Output
(8) RCA 6AU6	1st Picture I-F Amplifier
(9) RCA 6CB6	2nd Picture I-F Amplifier
(10) RCA 6AU6	3rd Picture I-F Amplifier
(11) RCA 6CB6	4th Picture I-F Amplifier
(12) RCA 6AL5	Picture 2nd Detector and AGC Detector
(13) RCA 12AU7	1st and 2nd Video Amplifier
(14) RCA 12AU7	DC Restorer and Sync Separator
(15) RCA 6J5	Vertical Sweep Oscillator
or RCA 6SN7GT	Sync Separator and Vertical Sweep Oscillator
(16) RCA 6K6GT	Vertical Sweep Output
(17) RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(18) RCA 6BG6G	Horizontal Sweep Output
(19) RCA 6W4GT	Damper
(20) RCA 1B3-GT/8016	High Voltage Rectifier
(21) RCA 19AP4A	Kinescope
(22) RCA 5U4G	Rectifier

Specifications continued on page 2

9T57, 9T77, 9T79 ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency .... 25.50 Mc.
Adjacent Channel Sound Trap .... 27.00 Mc.
Accompanying Sound Traps .... 21.00 Mc.
Adjacent Channel Picture Carrier Trap .... 19.50 Mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency .... 21.00 Mc.
Sound Discriminator Band Width between peaks .... 400 kc

VIDEO RESPONSE .... To 4 Mc.
FOCUS .... Magnetic
SWEEP DEFLECTION .... Magnetic
SCANNING .... Interlaced, 525 line
HORIZONTAL SWEEP FREQUENCY .... 15,750 cps
VERTICAL SWEEP FREQUENCY .... 60 cps
FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. See that the TV-PH switch on the rear apron is in the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Adjust the PICTURE and BRIGHTNESS controls for suitable picture contrast and brightness.

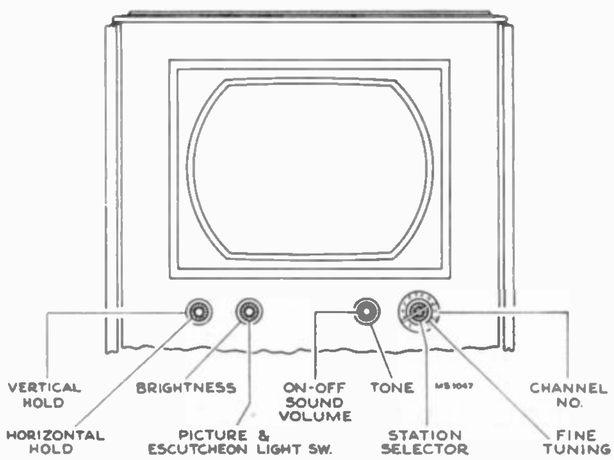


Figure 1—Receiver Operating Controls

9. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

10. In switching from one channel to another, it may be necessary to repeat steps 4 and 8.

11. When the set is turned on again after an idle period it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

12. If the positions of the controls have been changed, it may be necessary to repeat steps 2 through 8.

13. To use a record player, plug the record player output cable into the PHONO jack on the rear apron, and set the TV-PH switch to "PH."

14. On console type receivers, to turn on station escutcheon light, pull out on picture control knob, and push in to turn off.

THE CHASSIS USED IN MODELS 9T57, 9T77 AND 9T79 IS VERY SIMILAR TO THE CHASSIS USED IN MODELS 6T53, 6T64, 6T71, ETC. REFER TO PAGES 368 TO 385 FOR INSTALLATION INSTRUCTIONS, ALIGNMENT DATA AND WAVE FORM PHOTOGRAPHS.

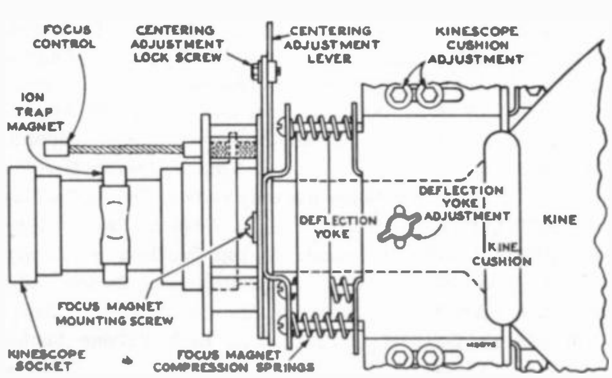


Figure 2—Yoke and Focus Magnet Adjustments

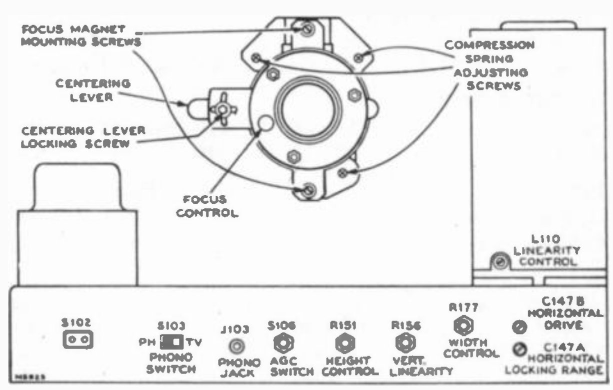


Figure 3—Rear Chassis Adjustments

CHASSIS TOP VIEW

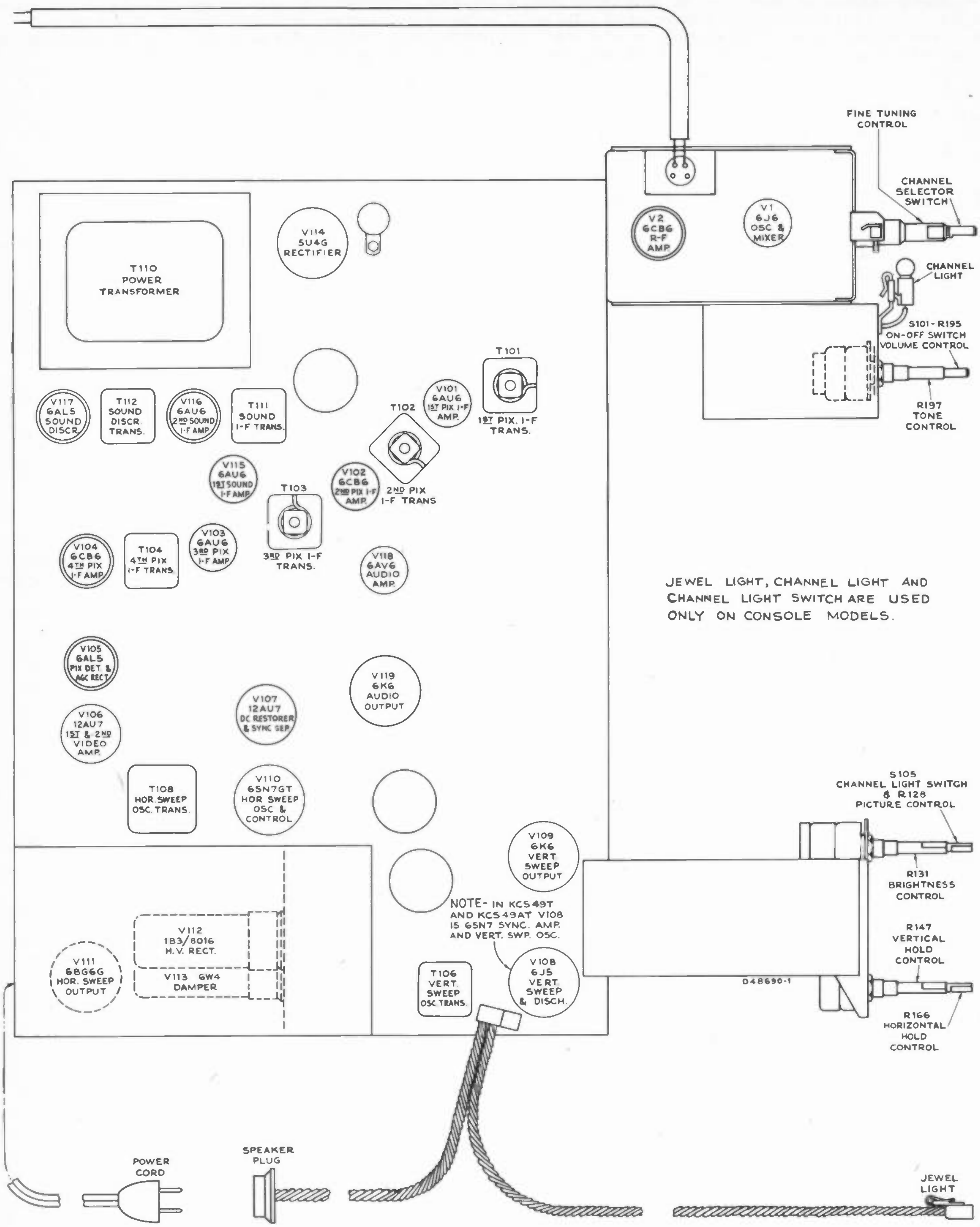


Figure 4—Chassis Top View

9T57, 9T77, 9T79

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition, a 2500 microvolt test pattern signal was fed into the receiver, the picture synced and the AGC control properly adjusted. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are read with a type WV79A senior "VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles, a-c. The symbol < means less than.

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6J6	Mixer	2500 Mu. V. Signal	2	144	—	—	7	0	5	−2.3	6.6	—	
			No Signal	2	135	—	—	7	0	5	−2.1	5.6	—	
V1	6J6	R-F Oscillator	2500 Mu. V. Signal	1	100	—	—	7	0	6	*−3.0	4.0	—	*Depending upon channel
			No Signal	1	96	—	—	7	0	6	*−2.7	3.9	—	
V2	6AG5	R-F Amplifier	2500 Mu. V. Signal	5	250	6	130	2	<0.1	1	−3.4	3.0	0.6	
			No Signal	5	166	6	84	2	0.4	1	−0.2	10.3	2.3	
V101	6AU6	1st Pix. I-F Amplifier	2500 Mu. V. Signal	5	195	6	222	7	0.3	1	−5.0	1.7	0.8	
			No Signal	5	121	6	135	7	0.8	1	−0.8	5.2	2.2	
V102	6CB6	2nd Pix. I-F Amplifier	2500 Mu. V. Signal	5	222	6	203	2	0.3	1	−5.0	2.0	0.7	
			No Signal	5	124	6	112	2	0.8	1	−0.8	5.5	1.6	
V103	6AU6	3d Pix. I-F Amplifier	2500 Mu. V. Signal	5	185	6	225	7	0.2	1	−5.0	1.7	0.7	
			No Signal	5	94	6	132	7	0.5	1	−0.75	4.9	2.0	
V104	6CB6	4th Pix. I-F Amplifier	2500 Mu. V. Signal	5	165	6	142	2	2.25	1	0	9.6	3.1	
			No Signal	5	118	6	132	2	2.1	1	0	9.0	3.1	
V105	6AL5	Picture 2d Det.	2500 Mu. V. Signal	7	−2.0	—	—	1	0	—	—	0.3	—	
			No Signal	7	−0.5	—	—	1	0	—	—	<0.1	—	
V105	6AL5	AGC Rectifier	2500 Mu. V. Signal	2	−9.5	—	—	5	0	—	—	<0.1	—	
			No Signal	2	−2.0	—	—	5	0	—	—	<0.1	—	
V106	12AU7	1st Video Amplifier	2500 Mu. V. Signal	1	100	—	—	3	1.2	2	−2.3	3.6	—	At maximum contrast
			No Signal	1	54	—	—	3	0.9	2	−0.5	2.6	—	
			2500 Mu. V. Signal	1	190	—	—	3	9.0	2	−2.6	0.9	—	At minimum contrast
			No Signal	1	122	—	—	3	6.9	2	−0.5	0.6	—	
V106	12AU7	2d Video Amplifier	2500 Mu. V. Signal	6	330	—	—	8	125	7	118	9.3	—	At maximum contrast
			No Signal	6	295	—	—	8	121	7	110	13.6	—	
			2500 Mu. V. Signal	6	300	—	—	8	131	7	120	12.9	—	At minimum contrast
			No Signal	6	295	—	—	8	121	7	110	13.6	—	
V107 A	12AU7 KCS49	D-C Rest. & Sync Sep.	2500 Mu. V. Signal	1	5.0	—	—	3	45.5	2	−4.7	<0.1	—	At maximum contrast
	KCS49		No Signal	1	5.5	—	—	3	8.5	2	−0.7	<0.1	—	
V107 B	12AU7 KCS49	Sync Sep. & Amplifier	2500 Mu. V. Signal	6	36	—	—	8	6.0	7	4.7	4.0	—	
	KCS49		No Signal	6	36	—	—	8	6.0	7	5.5	2.8	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V107	12AU7 KCS49T	DC Rest Sync Sep.	2500 Mu. V. Signal	1	10	—	—	3	45	2	–4.5	—	—	At maximum contrast
	KCS49T		No Signal	1	8	—	—	3	1.7	2	–0.4	—	—	
	KCS49T		2500 Mu. V. Signal	6	7.2	—	—	8	54	7	0	—	—	
	KCS49T		No Signal	6	7.0	—	—	8		7	0	—	—	
V108A	6SN7 GT	Sync Amplifier	2500 Mu. V. Signal	5	50	—	—	6	7.8	4	7.4	—	—	
	KCS49T		No Signal	5	46	—	—	6	7.0	4	7.0	—	—	
V108	6SN7 or 6J5	Vertical Oscillator	2500 Mu. V. Signal	2 or 3	*395	—	—	3 or 8	0	1 or 5	*–58	0.4	—	*Depends on Setting of height control
			No Signal	2 or 3	*395	—	—	3 or 8	0	1 or 5	*–58	0.4	—	
V109	6K6GT	Vertical Output	250 Mu. V. Signal	3	370	4	370	8	51	5	0	11.5	1.9	
			No Signal	3	365	4	365	8	51	5	0	11.4	1.9	
V110	6SN7 GT	Horizontal Osc. Control	2500 Mu. V. Signal	2	*160	—	—	3	*–4.6	1	*–14.6	0.32	—	*Depends on Setting of hold control
			No Signal	2	*152	—	—	3	*–4.4	1	*– 3.5	0.28	—	
V110	6SN7 GT	Horizontal Oscillator	2500 Mu. V. Signal	5	230	—	—	6	0	4	–82	1.8	—	
			No Signal	5	225	—	—	6	0	4	–85	1.8	—	
V111	6BG6G	Horizontal Output	2500 Mu. V. Signal	5	*630	8	335	3	7.2	5	–33	67	5.0	*6000 volt pulse present
			No Signal	5	*630	8	329	3	7.2	5	–33	67.1	4.9	
V112	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	*14500	—	—	0	—	*14500 volt pulse present
			Brightness Maximum	Cap	*	—	—	2 & 7	*12700	—	—	0.1	—	
V113	6W4 GT	Damper	2500 Mu. V. Signal	5	387	—	—	3	*391	—	—	69	—	*3000 volt pulse present
			No Signal	5	380	—	—	3	*387	—	—	70	—	
V114	5U4G	Rectifier	2500 Mu. V. Signal	4 & 6	*368	—	—	2 & 8	391	—	—	185	—	*AC measured with AC Voltmeter
			No Signal	4 & 6	*367	—	—	2 & 8	387	—	—	199	—	
V115	6AU6	1st Sound I-F Amp.	2500 Mu. V. Signal	5	120	6	120	7	0.8	1	–0.2	6.8	*2.9	
			No Signal	5	108	6	108	7	0.8	1	–0.1	6.2	2.8	
V116	6AU6	2d Sound I-F Amp.	2500 Mu. V. Signal	5	118	6	87	7	0	1	–1.3	4.9	2.8	
			No Signal	5	110	6	76	7	0	1	–0.5	6.9	3.1	
V117	6AL5	Sound Discrim.	2500 Mu. V. Signal	2	–7.2	—	—	5	0	—	—	<0.1	—	
			No Signal	2	–10.0	—	—	5	0	—	—	<0.1	—	
V118	6AV6	1st Audio Amplifier	2500 Mu. V. Signal	7	95	—	—	2	0	1	–0.5	0.5	—	
			No Signal	7	84	—	—	2	0	1	–0.4	0.4	—	
V119	6K6GT	Audio Output	2500 Mu. V. Signal	3	352	4	368	8	131	5	112	28.7	4.3	
			No Signal	3	348	4	360	8	134	5	108	28.8	4.2	
V120	19AP4	Kinescope	2500 Mu. V. Signal	Cone	14,000	10	384	11	100	2	46	<0.1	<0.1	
			No Signal	Cone	13,500	10	375	11	74	2	8.3	<0.1	<0.1	

R-F UNIT WIRING DIAGRAM

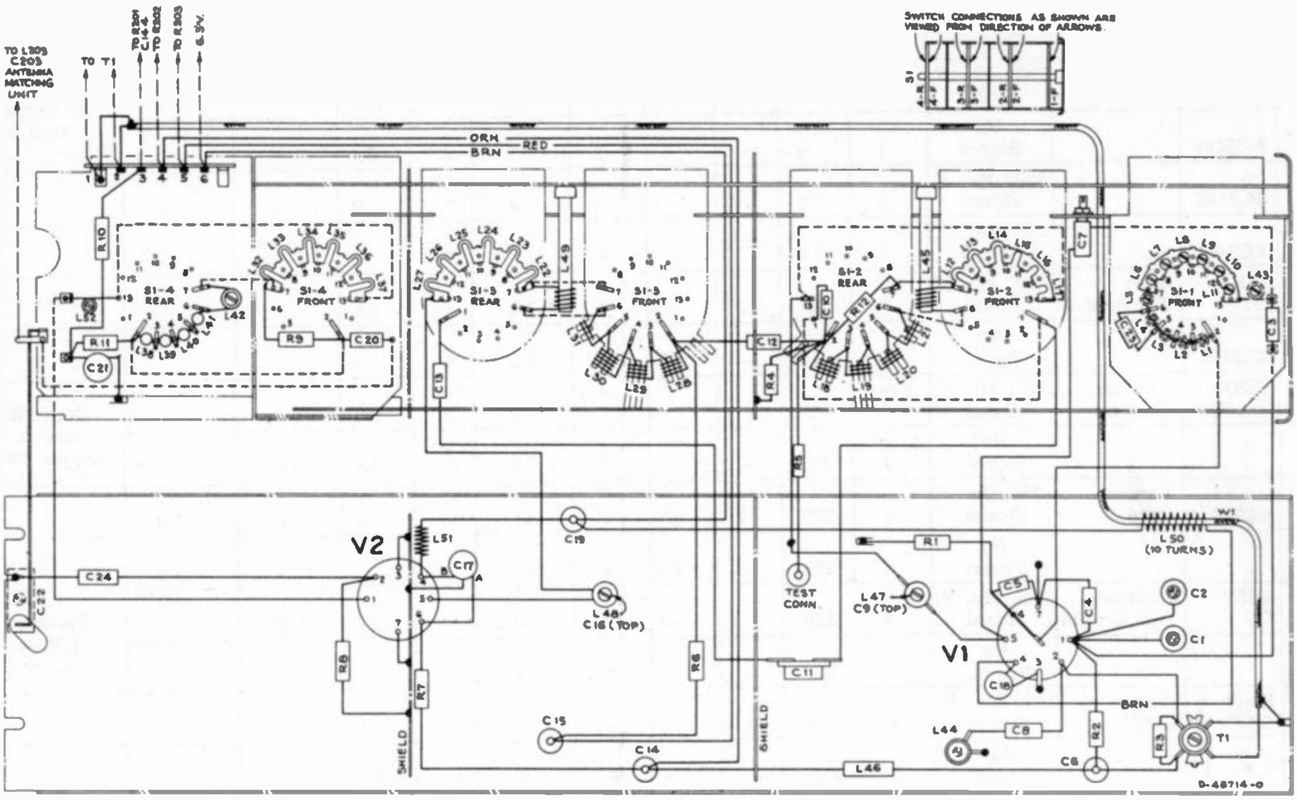
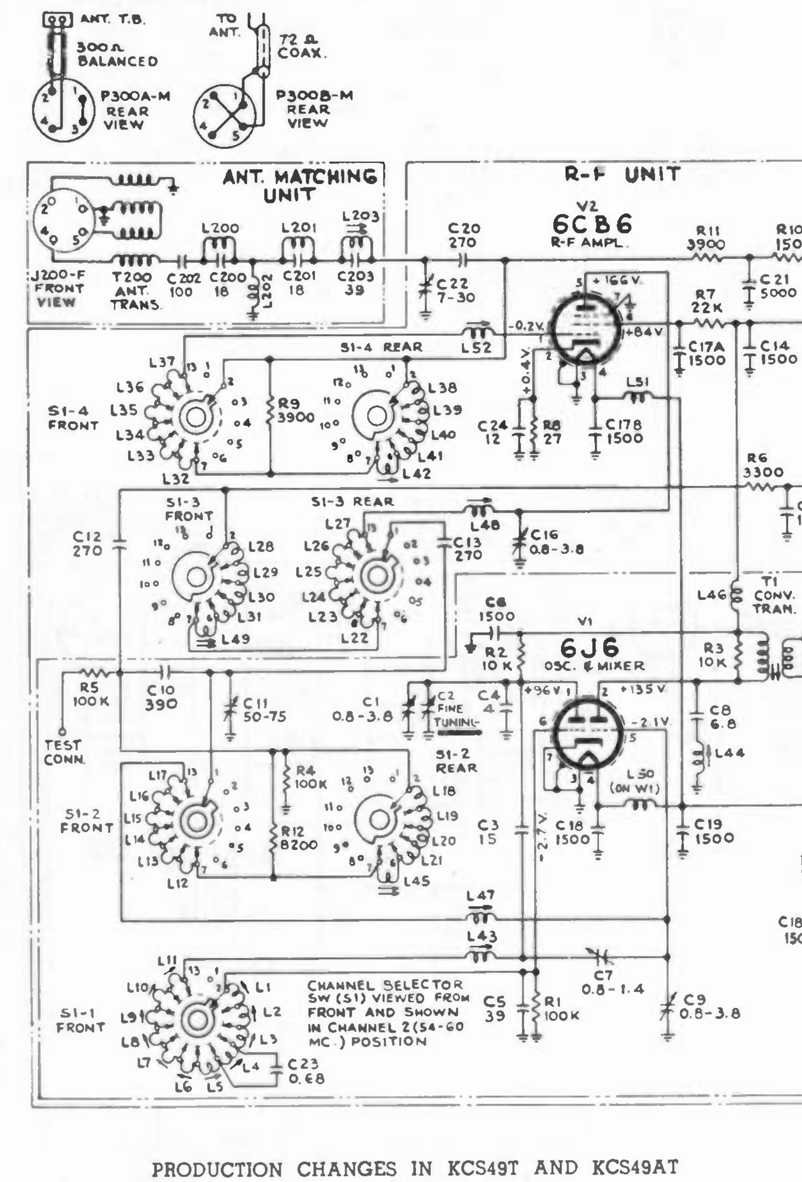


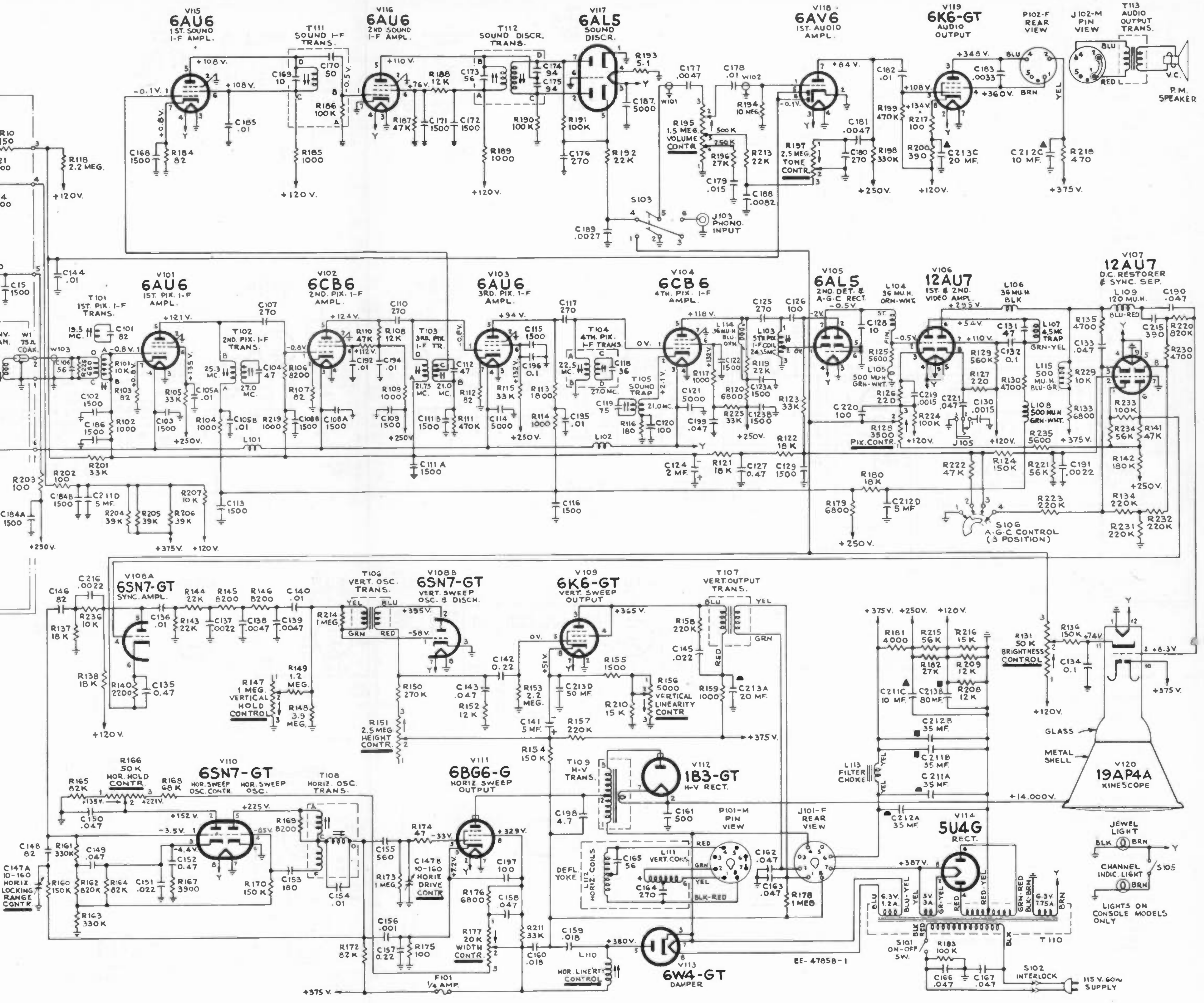
Figure 5—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. All leads in the picture and sound i-f circuits must be dressed as short and direct as possible with the exception of C106, C107, C110 and C117 which are to be dressed with enough slack so as not to have to move the body of the capacitor to align that particular stage.
2. Dress all 1500 mmf .005 mfd and .01 mfd capacitors in the i-f section with leads as short as possible.
3. Dress all wires between T101 and the r-f unit in clamp.
4. Dress C185 to act as shield for lead between pin 5 of V115 socket to T111D and picture i-f circuits.
5. Dress the bodies of resistors R106, R108, R113, R119, R191, R192 and capacitor C176 as close to tube pin as possible.
6. Dress L114 with coded end as close to pin 2 of U105 socket as possible.
7. The length of the bus wire from pin 2 of V116 to ground should not be shortened or rerouted.
8. Dress R194 as close to chassis with leads as short as possible.
9. Dress C199 with leads as short as possible and away from S106.
10. Keep the leads on C126 as short and direct as possible.
11. Dress all components connected to V106 socket up and away from the chassis except L104.
12. Keep the body and coded end of L104 as close to pin 2 of V105 socket as possible.
13. Dress the 4.5 mc trap L107 up and away from the chassis base.
14. Dress C132 up in the air and towards V105 socket.
15. Dress R125 with body as close as possible to pin 2 of V106 socket.
16. Keep body of R123 as close as possible to pin 2 of V105 socket.
17. Dress C133 and C190 away from C132, C151 and C153.
18. Dress the white wire from picture control R128-3 away from the chassis.
19. Dress all slack on kine socket leads under chassis. Dress brown wire away from any components associated with V105 or V106.
20. The green lead from the kinescope socket should be dressed away from all other leads and components and away from V106.
21. Dress R133 towards chassis rear apron.
22. Dress all leads in clamps on rear apron away from V117, V104, V105, V106 sockets and S103.
23. Dress green wire from C147A up and away from chassis.
24. Dress blue wire of T107 toward front apron of chassis.
25. Dress C153 down next to the chassis base.
26. Dress blue/white wire from height control R151-3 under R180.
27. Dress R161, R162, R163, R164 and R170 up and away from the chassis and with a half inch clearance from the soldering point.
28. Dress the yellow wire from pin 3 of V110 socket over C153.
29. Dress both leads of C198 away from the body of the capacitor.
30. Dress fuse in high voltage compartment so as not to short circuit to ground.
31. Dress blue and blue/yellow wire from power transformer in 3 clamps on chassis base and away from S103 and video section.
32. Dress both wires on S106 away from blue/yellow damper leads of T110.
33. Dress the brown wire from pin 8 of V114 socket away from V118 socket.
34. Dress all 2 watt resistors away from each other and away from all wires and other components.

KCS49T OR KCS49AT CIRCUIT SCHEMATIC DIAGRAM





PRODUCTION CHANGES IN KCS49T AND KCS49AT

In some receivers, R120 was 1000 ohms.

In some receivers, C196 was .01 mfd.

In some receivers, R103 and R107 were 120 ohms and point C of T103 was 5 turns down from top of coil on the actual transformer.

In some receivers, J105, C219, C220 and C221 were omitted. L105 was 120 Muh (Red/Blue) and C130 was connected between pin 8 of V106 and plus 125 volt bus.

In some receivers, R148 was 3.3 meg and C189 was .0015.

The following changes will be made on a few late production receivers but these changes are not shown in the schematic or wiring diagrams.

In a few late production chassis T111 will be replaced by a dual winding transformer with two adjustable cores for primary and secondary which are adjustable from the top and bottom of the chassis. R186 will be 22K and will be connected between terminal A of T111 and ground. A 100 mmf capacitor will be connected in parallel with R186. Terminal B of T111 will be connected to Pin 1 of V116. Connections to Terminals C and D of T111 will remain unchanged. For circuit diagram see Service Data, Model 9T105.

In a few late production receivers the following changes will be made. R118 will be changed to 10 meg and R201 will become 150K. The bleeder resistors, R208, R209 and R216 will be lifted from ground and a 220 ohm resistor R239 will be inserted between the old bleeder and ground. This will create a new 5.5 volt bus. The cathode of the AGC diode pin 5 of V105 will be lifted from ground and connected to this 5.5 volt bus. A .01 mfd capacitor, C224, will be connected from Pin 5 of V105 to ground. Video load resistors R133, R229, and L115 will be removed. A 2700 ohm resistor R139 will be connected to junction of L106 and L109. R133, a 4700 ohm resistor will be connected between R139 and the 375 volt bus. A 270 mmf. capacitor C223 will be connected from the junction of R133, R139 and to Pin 8 of V107. C130 will be changed to .0033 mfd. For circuit diagram, see the Service Data for Model 9T105.

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

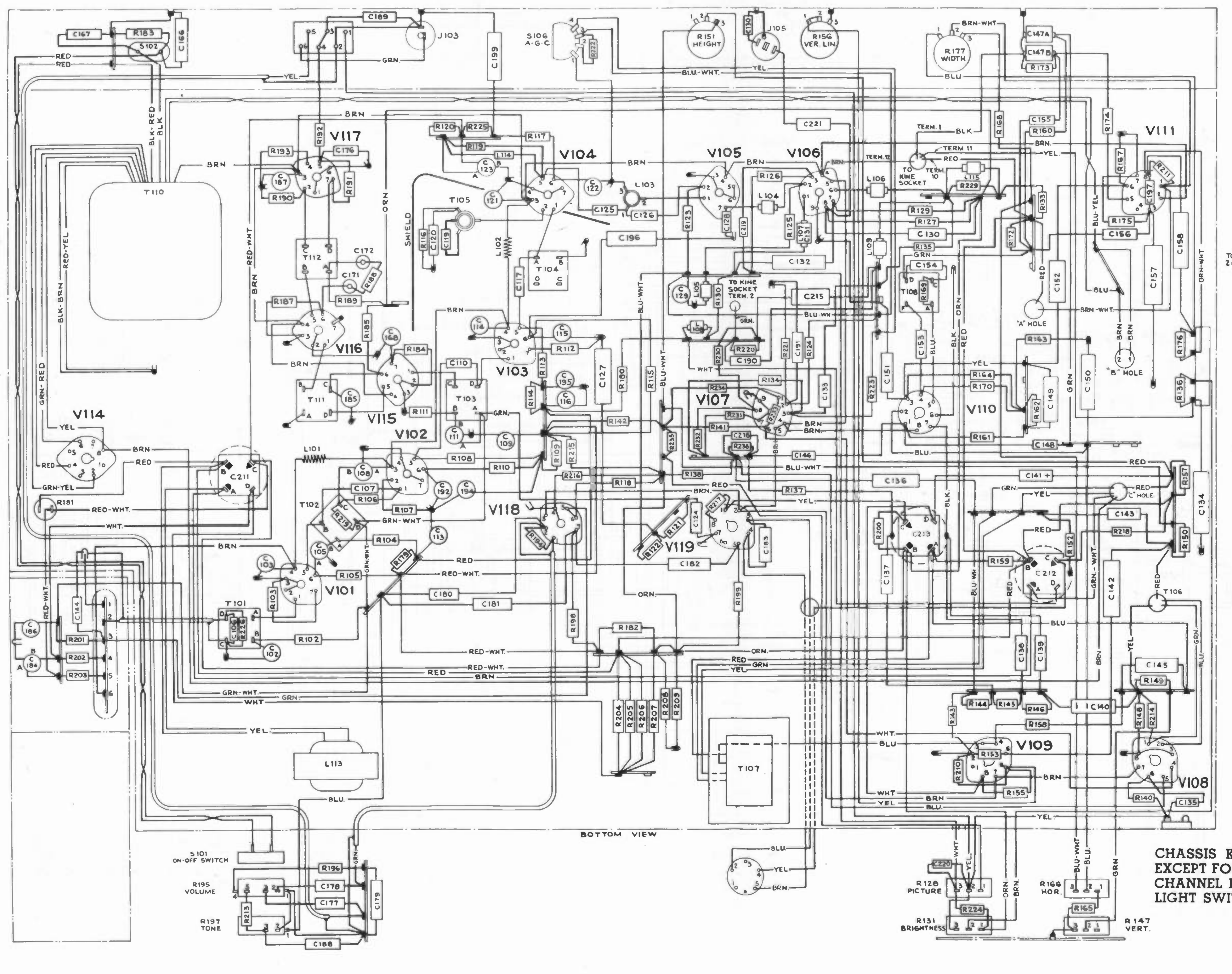
Direction of arrows at controls indicates clockwise rotation.

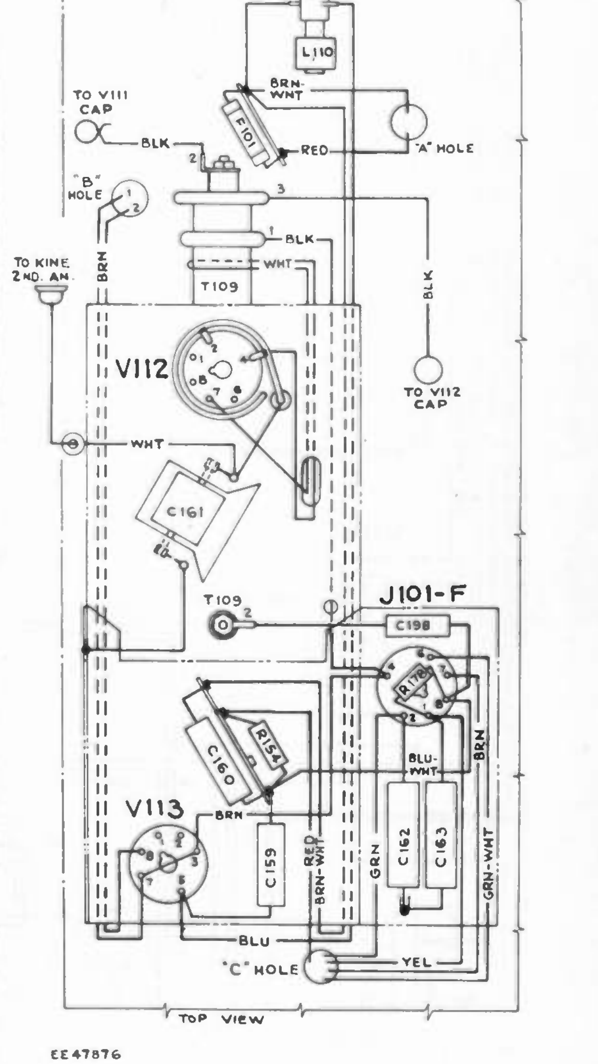
In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Figure 8—Circuit Schematic Diagram KCS49T or KCS49AT

KCS49T OR KCS49AT CHASSIS WIRING DIAGRAM

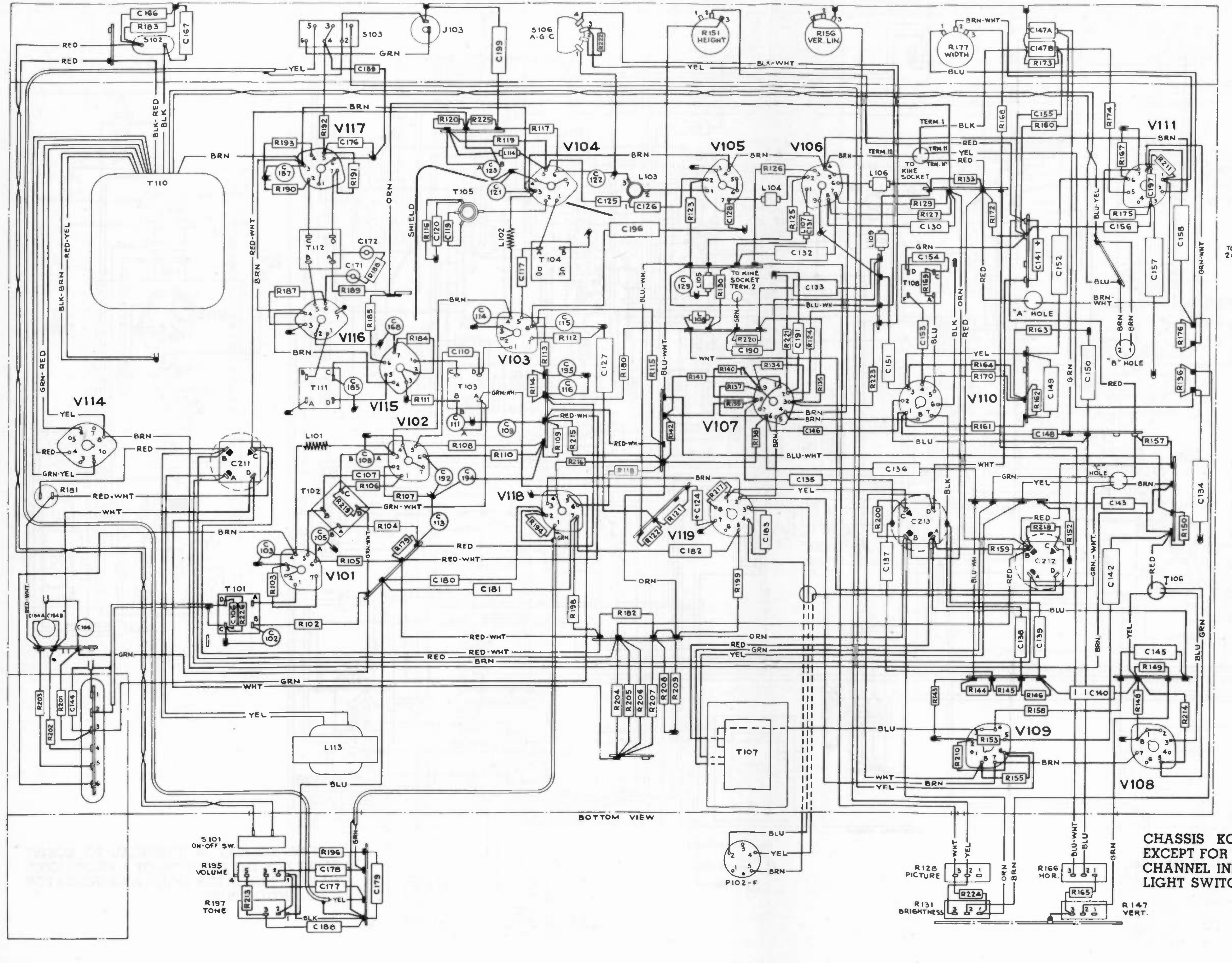


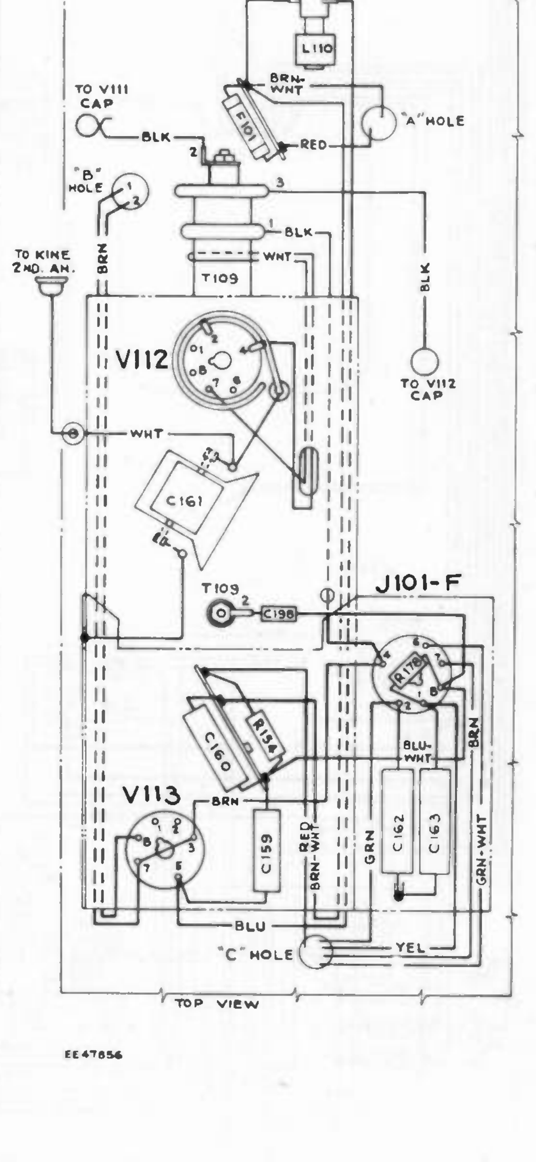


CHASSIS KCS49AT IS IDENTICAL TO KCS49T EXCEPT FOR THE ADDITION OF A PILOT LIGHT, CHANNEL INDICATOR LIGHT AND INDICATOR LIGHT SWITCH (S105).

Figure 9— KCS49T Chassis Wiring Diagram

KCS49 OR KCS49A CHASSIS WIRING DIAGRAM

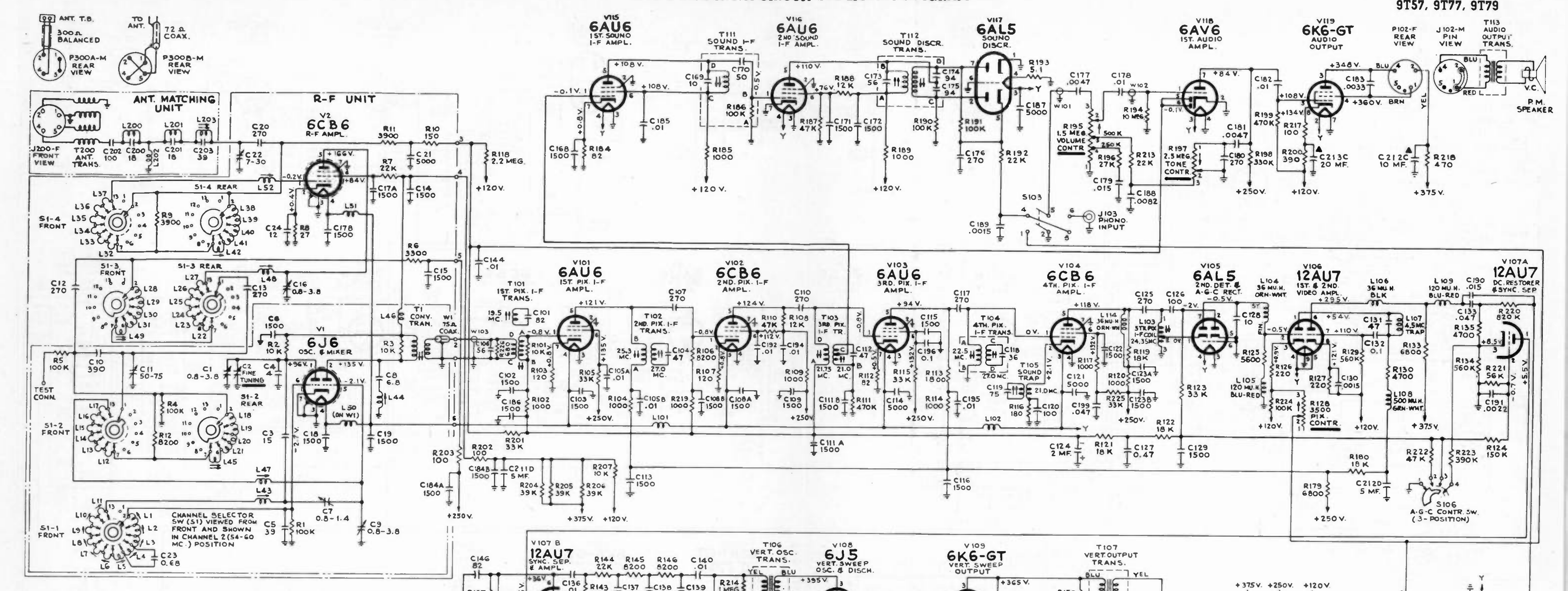


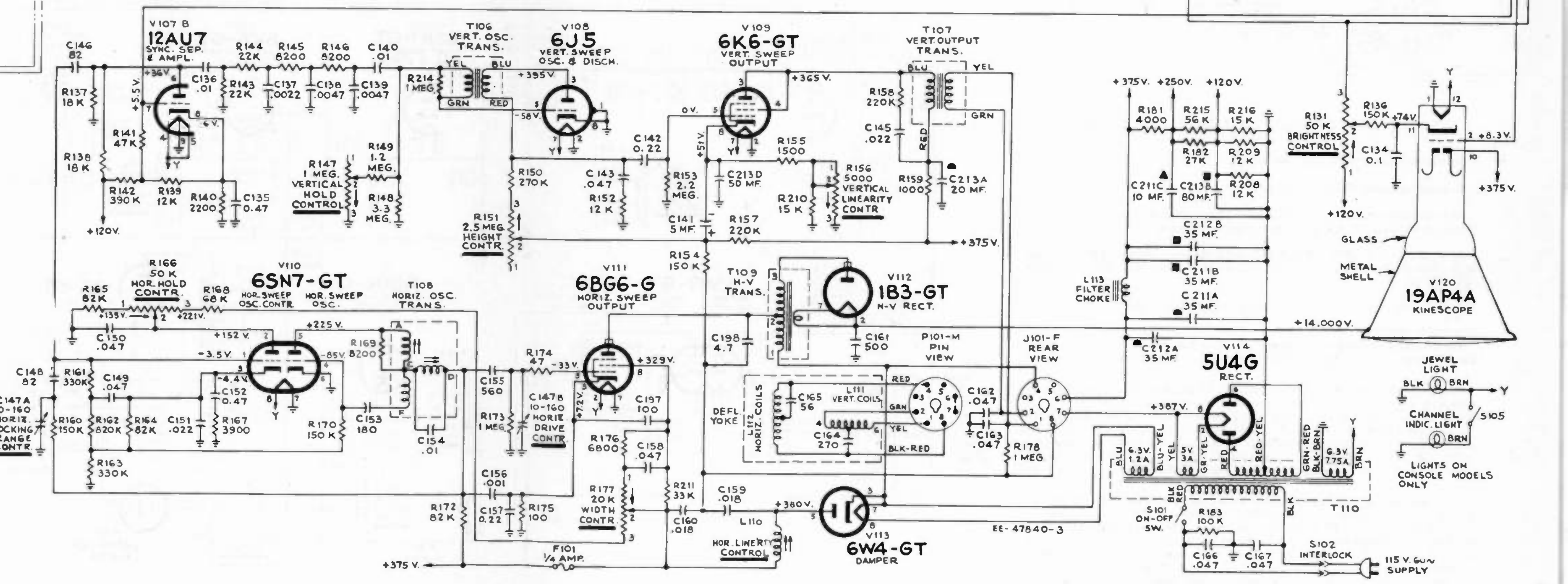


CHASSIS KCS49A IS IDENTICAL TO KCS49 EXCEPT FOR THE ADDITION OF A PILOT LIGHT, CHANNEL INDICATOR LIGHT AND INDICATOR LIGHT SWITCH (S105).

Figure 6—KCS49 Chassis Wiring Diagram

KCS49 OR KCS49A CIRCUIT SCHEMATIC DIAGRAM





PRODUCTION CHANGES IN KCS49 AND KCS49A

In some receivers C160 was .022, C161 was 250, C105A and C105B were 1,500, R129 was 390 k, R180 was 22 k, R176 was 8,200, C141 was connected between R151, R154 and plus 120 volts. C144 and R226 were omitted.

In some receivers the connections to terminals 1 and 3 of R177 were reversed.

In some receivers R142 was 1.2 meg and was connected to plus 250 volts.

In some receivers C198 was 4.7, R134 was 470 k; C190 was connected at, R135.

In some receivers R113 was 3900, R119 was 8,200, and L114 was omitted T104 bottom was tuned to 24.35MC and L103 was tuned to 22.5MC.

In some receivers C189 was omitted.

In some receivers R134 was 820 k, and R142 was connected to R104, C113, etc.

Due to a severe resistor shortage during the production of this series of receivers it was found necessary to substitute resistors of different values from the nominal value shown on the schematic. These substitutions were approved by the engineering department for each particular application in the circuit only if the change in value did not impair receiver operation. In some such instances, these substitutions involved a change in value of 5%, 10%, 20% or in a few instances even greater change.

In critical circuits where a change of value could not be tolerated, the proper resistance was obtained by the use of series, parallel or even series-parallel combinations of resistors in order to obtain the correct value of resistance or wattage.

If it should become necessary to replace a resistor or group of resistors, the values shown in the schematic and parts list should be employed.

If the value of the resistor to be replaced is different from the value shown in the schematic, and the schematic value is not available, then it is permissible to replace it with the value found in the receiver or some value between that and the value shown in the schematic. Some of the commercially available, low resistance value, molded body types are of wire wound construction. Such resistors should not be employed in the r-f unit, i-f or video sections as the inductive effect of these resistors may impair circuit operation.

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Figure 7—Circuit Schematic Diagram KCS49 or KCS49A

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES
	KRK 8B
10705	Ball—Steel ball for detent (8/32 dia.)
75188	Board—Terminal board, 5 contact and ground
75067	Bracket—Vertical bracket for holding oscillator tube shield
75201	Cable—75 ohms, coax cable (7¼") complete with coil (W1, L50)
75186	Capacitor—Ceramic, variable, for fine tuning—plunger type (C2)
75289	Capacitor—Ceramic, 4 mmf., ±0.5 mmf. (C4)
75189	Capacitor—Adjustable, 7-30 mmf. (C22)
75200	Capacitor—Ceramic, 12 mmf. (C24)
45465	Capacitor—Ceramic, 15 mmf. (C3)
75196	Capacitor—Ceramic, 39 mmf. (C5)
75174	Capacitor—Ceramic, trimmer, 50-75 mmf. (C11)
75199	Capacitor—Ceramic, 270 mmf. (C12, C13, C20)
75641	Capacitor—Ceramic, 390 mmf. (C10)
75166	Capacitor—Ceramic, 1500 mmf. (C6, C14, C15, C19)
75089	Capacitor—Ceramic, dual, 1500 mmf. (C17A, C17B)
73748	Capacitor—Ceramic, 1500 mmf. (C18)
73473	Capacitor—Ceramic, 5000 mmf. (C21)
75172	Capacitor—Tubular, steatite, adjustable, 0.8—1.4 mmf. (C7)
71504	Capacitor—Ceramic, 0.68 mmf. (C23)
75184	Capacitor—Ceramic, adjustable, 0.75-4 mmf., complete with adjusting stud (C1)
75197	Capacitor—Ceramic, 6.8 mmf. (C8)
75167	Clip—Tubular clip for mounting stand-off capacitors (C8)
75182	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment) for convertor section (C9, L47)
75183	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f section (L48, C16)
75185	Coil—Convertor plate loading coil (L44)
75202	Coil—Choke coil .56 muh (L46)
73477	Coil—Choke coil (L51)
75187	Core—Adjustable core for fine tuning capacitor C2
75162	Detent—Detent mechanism and fibre shaft
73453	Form—Coil form for L45 and L49
75165	Link—Link assembly for fine tuning
14343	Retainer—Fine tuning shaft retaining ring
	Resistor—Fixed, composition:—
	27 ohms, ±10%, ½ watt (R8)
	150 ohms, ±20%, ½ watt (R10)
	3300 ohms, ±10%, ½ watt (R6)
	3900 ohms, ±10%, ½ watt (R9, R11)
	8200 ohms, ±10%, ½ watt (R12)
	10,000 ohms, ±5%, ½ watt (R3)
	10,000 ohms, ±20%, ½ watt (R2)
	22,000 ohms, ±10%, ½ watt (R7)
	100,000 ohms, ±20%, ½ watt (R1, R4, R5)
75164	Rod—Actuating plunger rod (fibre) for fine tuning link
71476	Screw—No. 4-40 x ¼" binder head machine screw for adjusting L6, L7, L8, L9, L10, L11
75176	Screw—No. 4-40 x ⅜" fillister head screw for adjusting L5
75177	Screw—No. 4-40 x 5/16" fillister head screw for adjusting L1, L2, L3, L4, L43
74575	Screw—No. 4-40 x .359" adjusting screw for L42
73640	Screw—No. 4-40 x 7/16" adjusting screw for L52
75159	Shaft—Channel selector shaft and plate
75160	Shaft—Fine tuning shaft and cam
75168	Shield—Oscillator and converter sections shield for RF unit—snap-on type
75193	Shield—Tube shield for V1
75192	Shield—Tube shield for V2
75088	Socket—Tube socket, 7 contact, miniature, ceramic, saddle mounted
75191	Spacer—Insulating spacer for front plate (4 required)
75163	Spring—Friction spring (formed) for fine tuning cam
75068	Spring—Retaining spring for oscillator tube shield
74578	Spring—Retaining spring for adjusting screws
73457	Spring—Return spring for fine tuning control
30340	Spring—Hairpin spring for fine tuning link
75175	Stator—Oscillator section stator complete with rotor, segment, coils, adjusting screws and capacitors C3 and C23 (S1-1, C3, C23, L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L43)
75178	Stator—Convertor stator complete with rotor, coils, capacitors (C10 and C12) and resistors (R4 and R5) (S1-2, C10, C12, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L45, R4, R5, R12)
75179	Stator—R-F amplifier stator complete with rotor, coils, capacitor (C13) and resistor (R6) (S1-3, C13, L22, L23, L24, L25, L26, L27, L28, L29, L30, L31, L49, R6)
75180	Stator—Antenna stator complete with rotor, coils, capacitors (C20 and C21) and resistors (R9, R10, R11) (S1-4, C20, C21, L32, L33, L34, L35, L36, L37, L38, L39, L40, L41, L42, L52, R9, R10, R11)
75169	Strip—Coil segment mounting strip—RH center
75170	Strip—Coil segment mounting strip—LH lower
75171	Strip—Coil segment mounting strip—LH upper—less trimmer C7
75173	Stud—No. 6-32 x 13/16" adjusting stud for C7 trimmer
75446	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1 uncoded and coded "ER"
75447	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1 coded numerically and "Hi Q"
75181	Transformer—I-F convertor transformer
75190	Washer—Insulating washer (neoprene) for capacitor C7
75607	Washer—Insulating washer (hex)
	CHASSIS ASSEMBLIES
	KCS 49 OR KCS 49T—MODEL 9T57
	KCS 49A OR KCS 49AT—MODELS 9T77-9T79
75515	Bracket—Channel indicator lamp bracket
75228	Bracket—Focus magnet mounting bracket—upper
75229	Bracket—Focus magnet mounting bracket—lower
75646	Capacitor—Ceramic, 4.7 mmf., 5000 volts (C198)
75217	Capacitor—Mica trimmer, dual, 10-160 mmf. (C147A, C147B)
53511	Capacitor—Ceramic, 10 mmf. (C128)
75450	Capacitor—Ceramic, 39 mmf. (C203)
71924	Capacitor—Ceramic, 56 mmf. (C106)
73090	Capacitor—Mica, 82 mmf. (C146, C148)
75437	Capacitor—Ceramic, 100 mmf. (C202)
45469	Capacitor—Ceramic, 100 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C126, C197, C220, C222)

9T57, 9T77, 9T79 REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
73102	Capacitor—Mica, 180 mmf. (C153)
75244	Capacitor—Ceramic, 270 mmf. (176)
39638	Capacitor—Mica, 270 mmf. (C180)
73091	Capacitor—Mica, 270 mmf. (C107, C110, C117, C125)
73094	Capacitor—Mica, 390 mmf. (C215) (in KCS49T and KCS49AT)
74947	Capacitor—Ceramic, 500 mmf., 20,000 volts (C161)
74250	Capacitor—Mica, 560 mmf. (C155)
75166	Capacitor—Ceramic, 1500 mmf. (C171, C172)
73748	Capacitor—Ceramic, 1500 mmf. (C102, C103, C109, C113, C115, C116, C122, C129, C168, C188)
75089	Capacitor—Ceramic, dual, 1500 mmf. (C108A, C108B, C111A, C111B, C123A, C123B, C184A, C184B)
73473	Capacitor—Ceramic, 5000 mmf. (C114, C121, C187)
73960	Capacitor—Ceramic, 10,000 mmf. (C144, C185, C192, C194, C195)
75877	Capacitor—Ceramic, dual, 10,000 mmf. (C105A, C105B)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C124)
28417	Capacitor—Electrolytic, 5 mfd., 450 volts (C141)
75511	Capacitor—Electrolytic, comprising 1 section of 20 mfd., 450 volts, 1 section of 80 mfd., 200 volts, 1 section of 20 mfd., 200 volts and 1 section of 50 mfd., 50 volts (C213A, C213B, C213C, C213D)
75510	Capacitor—Electrolytic, comprising 2 sections of 35 mfd., 450 volts, 1 section of 10 mfd., 450 volts and 1 section of 5 mfd., 450 volts (C211A, C211B, C211C, C211D, C212A, C212B, C212C, C212D)
75643	Capacitor—Tubular, moulded paper, oil impregnated, .001 mfd., 1000 volts (C156)
73598	Capacitor—Tubular, paper, oil impregnated, .0015 mfd., 600 volts (C130, C219)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd., 600 volts (C137, C191) (C216 in KCS49T and KCS49AT)
73599	Capacitor—Tubular, paper, oil impregnated, .0027 mfd., 600 volts (C189)
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd., 600 volts (C183)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 600 volts (C138, C139, C177, C181)
73808	Capacitor—Tubular, paper, oil impregnated, .0082 mfd., 1000 volts (C188)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C136, C178, C182)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd., 600 volts (C140, C154)
73797	Capacitor—Tubular, paper, oil impregnated, .015 mfd., 600 volts (C179)
74727	Capacitor—Tubular, paper, oil impregnated, .018 mfd., 1000 volts (C159, C160)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 400 volts (C145, C151)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C149, C199, C221)
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts (C166, C167)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 600 volts (C133, C150, C190)
73597	Capacitor—Tubular, moulded paper, oil impregnated, .047 mfd., 1000 volts (C143, C158, C162, C163)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C132, C196)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 600 volts (C134)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 400 volts (C157)
74957	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 600 volts (C142)
73787	Capacitor—Tubular, moulded paper, 0.47 mfd., 200 volts (C127, C135, C152)
73154	Choke—Filter choke (L113)
75167	Clip—Tubular clip for mounting stand-off capacitor No. 75166

STOCK No.	DESCRIPTION
75210	Coil—Fifth pix, i-f coil complete with adjustable core (L103)
71449	Coil—Horizontal linearity coil (L110)
73591	Coil—Antenna matching coil (2 required) (Part of T200)
75241	Coil—Antenna shunt coil (L202)
73477	Coil—Choke coil (L101, L102)
75299	Coil—Peaking coil (36 muh) (L104)
71793	Coil—Peaking coil (36 muh) (L106)
76285	Coil—Peaking coil (36 muh) (L114, R119)
75253	Coil—Peaking coil (120 muh) (L109)
75252	Coil—Peaking coil (500 muh) (L105, L108)
76132	Coil—Peaking coil (500 muh) (L115 in KCS49T and KCS49AT)
74594	Connector—2 contact male connector for power cord
38853	Connector—4 contact female connector for antenna transformer (J200)
5040	Connector—4 contact female connector for speaker cable
35383	Connector—8 contact male connector—part of deflection yoke (P101)
68592	Connector—8 contact female connector for deflection yoke leads (J101)
75517	Contact—Anode connector assembly contact only
75215	Control—Horizontal and vertical hold control (R147, R166)
75216	Control—Picture and brightness control for Model 9T57 (R128, R131)
75514	Control—Picture control, brightness control and channel light switch for Models 9T77 & 9T79, (R128, R131, S105)
75513	Control—Tone control, volume control and power switch (R195, R197, S101)
71441	Control—Vertical linearity control (R156)
71440	Control—Height control (R151)
75516	Control—Width control (R177)
71498	Core—Adjustable core and stud for F-M trap No. 75449
74956	Cushion—Rubber cushion for deflection yoke hood (2 required)
74839	Fastener—Push fastener to mount ceramic tube socket (2 required)
73600	Fuse—.25 amp., 250 volts (F101)
16058	Grommet—Rubber grommet for 2nd. anode lead exit
37396	Grommet—Rubber grommet to mount ceramic tube socket (2 required)
75445	Hood—Deflection yoke hood less rubber cushions
75644	Insulator—2nd. anode insulator
35787	Jack—Phono input jack (J103)
75482	Jack—Video jack (J105)
75504	Magnet—Focus magnet complete with adjustable plate and stud for standard 19AP4A tubes
75935	Magnet—Focus magnet complete with adjustable plate and stud for special 19AP4A tubes coded with a dot of green paint
78322	Magnet—Ion trap magnet (P.M.)
75518	Plate—Hi-voltage plate—bakelite less transformer, capacitor and tube socket
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R193)
75512	Resistor—Wire wound, 4000 ohms, 10 watts (R181)
	Resistor—Fixed, composition:—
	47 ohms, ±20%, ½ watt (R174)
	82 ohms, ±10%, ½ watt (R103, R107, R112, R184)
	100 ohms, ±10%, ½ watt (R217)
	100 ohms, ±20%, ½ watt (R202, R203)
	100 ohms, ±10%, 2 watts (R175)
	180 ohms, ±10%, ½ watt (R116)
	220 ohms, ±10%, ½ watt (R126, R127)
	390 ohms, ±10%, 1 watt (R200)
	470 ohms, ±10%, 1 watt (R218)
	680 ohms, ±10%, ½ watt (R226)

STOCK No.	DESCRIPTION
	1000 ohms, ±20%, ½ watt (R102, R104, R109, R114, R117, R159, R185, R189, R219)
	1500 ohms, ±10%, 1 watt (R155)
	1800 ohms, ±10%, ½ watt (R113)
	2200 ohms, ±20%, ½ watt (R140)
	3900 ohms, ±10%, ½ watt (R167)
	4700 ohms, ±5%, ½ watt (R130)
	4700 ohms, ±10%, ½ watt (R135) (R230 in KCS49T and KCS49AT)
	5600 ohms, ±5%, ½ watt (R125)
	5600 ohms, ±10%, ½ watt (R235) (in KCS49T and KCS49AT)
	6800 ohms, ±10%, 1 watt (R120, R176)
	6800 ohms, ±10%, 2 watts (R133, R179)
	8200 ohms, ±5%, ½ watt (R106, R169)
	8200 ohms, ±10%, ½ watt (R145, R146)
	10,000 ohms, ±10%, ½ watt (R236) (in KCS49T and KCS49AT)
	10,000 ohms, ±10%, 2 watts (R207)
	12,000 ohms, ±5%, ½ watt (R152)
	12,000 ohms, ±10%, ½ watt (R188) (R139 in KCS47 and KCS47A)
	12,000 ohms, ±5%, 1 watt (R108)
	12,000 ohms, ±10%, 2 watts (R208, R209)
	15,000 ohms, ±10%, ½ watt (R210)
	15,000 ohms, ±10%, 2 watts (R216)
	18,000 ohms, ±10%, ½ watt (R121, R122, R137)
	18,000 ohms, ±10%, 1 watt (R138, R180)
	22,000 ohms, ±10%, ½ watt (R143, R144, R186, R213)
	22,000 ohms, ±20%, ½ watt (R192)
	27,000 ohms, ±10%, ½ watt (R196)
	27,000 ohms, ±10%, 2 watts (R182)
	33,000 ohms, ±10%, ½ watt (R105, R115, R201, R211, R225)
	33,000 ohms, ±20%, ½ watt (R123)
	39,000 ohms, ±10%, 2 watts (R204, R205, R206)
	47,000 ohms, ±10%, ½ watt (R141, R187, R222)
	47,000 ohms, ±20%, ½ watt (R110)
	56,000 ohms, ±10%, ½ watt (R221) (R234 in KCS49T and KCS49AT)
	56,000 ohms, ±10%, 1 watt (R215)
	68,000 ohms, ±10%, 1 watt (R168)
	82,000 ohms, ±5%, 1 watt (R172)
	82,000 ohms, ±10%, 1 watt (R164, R165)
	100,000 ohms, ±5%, ½ watt (R190, R191)
	100,000 ohms, ±10%, ½ watt (R224) (R233 in KCS49T and KCS49AT)
	100,000 ohms, ±20%, 2 watts (R183)
	150,000 ohms, ±10%, ½ watt (R136, R154, R160)
	150,000 ohms, ±20%, ½ watt (R124)
	150,000 ohms, ±5%, 1 watt (R170)
	180,000 ohms, ±10%, ½ watt (R142 in KCS49T and KCS49AT)
	220,000 ohms, ±10%, ½ watt (R157, R158) (R134, R223, R231, R232 in KCS49T and KCS49AT)
	270,000 ohms, ±10%, ½ watt (R150)
	330,000 ohms, ±10%, ½ watt (R161, R198)
	330,000 ohms, ±5%, 1 watt (R183)
	390,000 ohms, ±10%, ½ watt (R142, R223 in KCS49 and KCS49A)
	470,000 ohms, ±10%, ½ watt (R111)
	470,000 ohms, ±20%, ½ watt (R199)
	560,000 ohms, ±10%, ½ watt (R129) (R134 in KCS49 and KCS49A)
	820,000 ohms, ±10%, ½ watt (R162, R220)

STOCK No.	DESCRIPTION
	1 megohm, ±10%, ½ watt (R173)
	1 megohm, ±20%, ½ watt (R178, R214)
	1.2 megohm, ±5%, ½ watt (R149)
	2.2 megohm, ±10%, ½ watt (R118, R153)
	3.9 megohm, ±5%, ½ watt (R148)
	10 megohm, ±20%, ½ watt (R194)
74602	Screw—No. 10-32 x 1¾" round head machine screw for focus magnet adjustment (3 required)
75236	Screw—No. 8-32 x ⅜" pan head screw (brass) to mount focus magnet (2 required)
75083	Screw—No. 8-32 x ¼" wing screw for mounting deflection yoke
73584	Shield—Tube shield
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
75223	Socket—Tube socket, 9 pin, miniature
73249	Socket—Tube socket, octal, ceramic, plate mounted
31319	Socket—Tube socket, octal, moulded
71508	Socket—Tube socket for 1B3/8016
68592	Socket—Tube socket, 6 contact, moulded for V113
74834	Socket—Kinescope socket
31364	Socket—Pilot light socket (Models 9T77 & 9T79)
75718	Socket—Channel indicator light socket (Mod 9T77 & 9T79)
75233	Spring—Compression spring for focus magnet adjustment (3 required)
75506	Support—Bakelite support only—part of hi-voltage shield
76010	Switch—AGC switch (S106)
33491	Switch—"TV Phono" switch (S103)
75508	Transformer—Power transformer 115 volts, 60 cycle (T110)
74950	Transformer—Vertical output transformer (T107)
74144	Transformer—Vertical oscillator transformer (T106)
74589	Transformer—First pix, i-f transformer (T101, C101, R101)
74590	Transformer—Second pix, i-f transformer (T102, C104)
76264	Transformer—Third pix, i-f transformer (T103, C112)
73574	Transformer—Fourth pix, i-f transformer (T104, C118)
75211	Transformer—Sound i-f transformer, single winding type (T111, C169, C170, R186)
71424	Transformer—Sound i-f transformer, dual winding type (T111, C169, C170)
75212	Transformer—Sound discriminator transformer (T112, C173, C174, C175)
75213	Transformer—Horizontal oscillator transformer (T108)
75509	Transformer—Antenna matching transformer complete with antenna connector, i-f and F-M traps and shunt coil (T200, C200, C201, C202, C203, J200, L200, L201, L202, L203)
75585	Transformer—Hi-voltage transformer (T109)
71778	Trap—Sound trap (T105, C119)
75251	Trap—4.5 mc trap (L107, C131)
75242	Trap—I-F trap (L200, L201, C200, C201)
75449	Trap—F-M trap complete with adjustable core and stud (L203, C203)
74952	Yoke—Deflection yoke complete with cable and connector (L111, L112, C164, C165, P101)
	SPEAKER ASSEMBLIES 92580-4 (For Model 9T57)
75023	Cap—Dust cap
75024	Cone—Cone complete with voice coil (3.2 ohms)
5039	Connector—4 contact male connector (J101)
75022	Speaker—8" P.M. speaker complete with cone and voice coil less plug and transformer

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
75520	Transformer—Output transformer (T112)
	NOTE:—If stamping on speaker in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	SPEAKER ASSEMBLIES 92569-11W RL 111 A2 (For Models 9T77, 9T79)
13867	Cap—Dust cap
74901	Cone—Cone and voice coil assembly (3.2 ohms)
5039	Connector—4 contact male connector for speaker (J102)
74974	Speaker—12" P.M. speaker complete with cone and voice coil less output transformer and connector
75520	Transformer—Output transformer (T113)
	NOTE:—If stamping on speaker in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	SPEAKER ASSEMBLIES 92569-11B (For Models 9T77, 9T79)
75875	Cone—Cone and voice coil assembly (3.2 ohms)
	SPEAKER ASSEMBLIES 92569-11K RMA-252 (For Models 9T77, 9T79)
75642	Cone—Cone and voice coil assembly (3.2 ohms)
	MODEL 9CB1 STAND (Used with 9T57 Instrument)
76008	Caster—Caster and socket assembly
76097	Catch—Door catch and strike (1 set)
76096	Hinge—Door hinge (1 set)
76095	Pull—Door pull
74113	Screw—No. 8-32 x 1" trimit head screw for door pull
	MISCELLANEOUS
75586	Back—Cabinet back complete with power cord and terminal board (Model 9T57)
75589	Back—Cabinet back complete with power cord and terminal board (Models 9T77 & 9T79)
75473	Board—"Ant" terminal board
75465	Bracket—Mounting brackets for deflection yoke and focus magnet support assembly (Models 9T57 & 9T77)
75524	Bracket—Mounting bracket for deflection yoke and focus magnet support assembly (Model 9T79)
71599	Bracket—Pilot lamp bracket (Models 9T77 & 9T79)
13103	Cap—Pilot lamp cap (Models 9T77 & 9T79)
71892	Catch—Bullet catch and strike for doors (Models 9T77 & 9T79)
X1917	Cloth—Grille cloth for mahogany or walnut instruments (Model 9T57)
X1918	Cloth—Grille cloth for oak instruments (Model 9T57)
X3093	Cloth—Grille cloth for oak instruments (Models 9T77 & 9T79)
X3144	Cloth—Grille cloth for mahogany or walnut instruments (Models 9T77 & 9T79)
39153	Connector—4 contact male connector for antenna cable
75474	Connector—Single contact male connector for antenna cable (2 required)
71457	Cord—Power cord and plug
75608	Cushion—Dust seal cushion—rubber
71984	Decal—"RCA Victor" decal (Models 9T57 & 9T77)
75618	Decal—Control function decal (Model 9T57)
75440	Decal—Control function decal for mahogany or walnut instruments (Models 9T77 & 9T79)
75441	Decal—Control function decal for oak instruments (Model 9T77)
74809	Emblem—"RCA Victor" emblem
75499	Escutcheon—Channel marker escutcheon—dark—for mahogany or walnut instruments (Model 9T57)
75501	Escutcheon—Channel marker escutcheon—light—for oak instruments (Model 9T57)

STOCK No.	DESCRIPTION
75455	Escutcheon—Channel marker escutcheon—dark—for mahogany or walnut instruments (Models 9T77 & 9T79)
75456	Escutcheon—Channel marker escutcheon—light—for oak instruments (Models 9T77 & 9T79)
72113	Foot—Rubber foot (Model 9T57)
75619	Glass—Safety glass
37396	Grommet—Rubber grommet for mounting speaker (4 required) (Models 9T77 & 9T79)
756[illegible]1	Hinge—Control panel hinges (1 set) (Model 9T57)
74308	Hinge—Cabinet door hinge (1 set) (Models 9T77 & 9T79)
74959	Knob—Fine tuning knob—maroon—for mahogany or walnut instruments (outer)
75461	Knob—Fine tuning knob—beige—for oak instruments (outer)
74960	Knob—Channel selector knob—maroon—for mahogany or walnut instruments (inner)
75462	Knob—Channel selector knob—beige—for oak instruments (inner)
74962	Knob—Tone control, brightness control or vertical hold control knob—maroon—for mahogany or walnut instruments (outer)
75463	Knob—Tone control, brightness control or vertical hold control knob—beige—for oak instruments (outer)
74963	Knob—Picture control, horizontal hold control or volume control and power switch knob—maroon—for mahogany or walnut instruments (inner)
75464	Knob—Picture control, horizontal hold control or volume control and power switch knob—beige—for oak instruments (inner)
11765	Lamp—Pilot or channel indicator lamp—Mazda 51 (Models 9T77 & 9T79)
75459	Mask—Channel indicator light mask—burgundy—for mahogany or walnut instruments (Models 9T77 & 9T79)
75460	Mask—Channel indicator light mask—gold—for oak instruments (Models 9T77 & 9T79)
73634	Nut—Speed nut for speaker mounting screws (4 required) (Models 9T77 & 9T79)
75622	Pull—Door pull (Model 9T77)
75624	Pull—Door pull for lower doors (Model 9T79)
75625	Pull—Door pull for upper doors (Model 9T79)
71456	Screw—No. 8-32 x 7/16" wing screw for deflection yoke and focus magnet mounting support
71623	Screw—No. 8-32 x 5/8" trimit head screw for door pull (Model 9T77)
74113	Screw—No. 8-32 x 1" trimit head screw for door pull on lower doors (Model 9T79)
75626	Screw—No. 8-32 x 1¼" trimit head screw for door pull on upper doors (Model 9T79)
73643	Spring—Spring clip for channel marker escutcheons
75587	Spring—Formed spring for mounting Kinescope masking panel
72845	Spring—Retaining spring for knobs 74959 & 75461
14270	Spring—Retaining spring for knobs 74960, 74962, 75462 & 75463
30330	Spring—Retaining spring for knobs 74963 & 7546
72936	Stop—Cabinet door stop (Models 9T77 & 9T79)
75500	Washer—Felt washer for cabinet back screws
75457	Washer—Felt washer—dark brown—between knob and channel marker escutcheon for mahogany or walnut instruments (Models 9T77 & 9T79)
75458	Washer—Felt washer—beige—between knob and channel marker escutcheon for oak instruments (Models 9T77 & 9T79)

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Model 9T89 "Sedgwick"
Walnut, Mahogany or Oak

RCA VICTOR

TELEVISION, AM-FM RADIO PHONOGRAPH COMBINATION MODEL 9T89

Chassis Nos. KCS60 or KCS60T and RC1092
Record Changers RP168 or RP190 and 960284
— Mfr. No. 274 —

SERVICE DATA

— 1950 No. T17 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model 9T89 is a deluxe television—AM-FM radio phonograph combination. The receiver employs 26 tubes plus 3 rectifiers and a 19 inch kinescope.

Two record changers are provided to play 45 and 78/33⅓ RPM records.

The receiver is provided with cabinet antennas for AM, FM and TV where local conditions permit their use.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE..........204 square inches on a 19AP4A kinescope

TELEVISION R-F FREQUENCY RANGE
All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range....±250 kc. on chan. 2, ±650 kc. on chan. 13
Picture Carrier Frequency ....25.50 mc.
Sound Carrier Frequency ....21.00 mc.

RADIO TUNING RANGE
Broadcast ....540-1,600 kc.
Frequency Modulation ....88-108 mc.
Intermediate Frequency—AM ....455 kc.
Intermediate Frequency—FM ....10.7 mc.

POWER SUPPLY RATING ....115 volts, 60 cycles, 315 watts

AUDIO POWER OUTPUT RATING ....11 watts max.

CHASSIS DESIGNATIONS
Television Chassis ....KCS60 or KCS60T
Radio Chassis RC1092
78/33⅓ RPM Record Changer 960284
45 RPM Record Changer ....RP168 or RP190
Refer to Service Data 960284 or RP168 or RP190 for information on the record changers.

LOUDSPEAKER—92569-12 ....12 inch PM Dynamic
Voice Coil Impedance ....3.2 ohms at 400 cycles

WEIGHT
Chassis with Tubes in Cabinet ....222 lbs.
Shipping Weight ....277 lbs.

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside)	43⅝	41½	27¼
TV Chassis (Overall)	19¼	12	21

RECEIVER ANTENNA INPUT IMPEDANCE
Choice: 300 ohms balanced or 72 ohms unbalanced.

RCA TUBE COMPLEMENT

	Tube Used	Television Chassis Function
(1)	RCA 6CB6	R-F Amplifier
(2)	RCA 6J6	R-F Oscillator and Mixer
(3)	RCA 6AU6	1st Sound I-F Amplifier
(4)	RCA 6AU6	2nd Sound I-F Amplifier
(5)	RCA 6AL5	Sound Discriminator
(6)	RCA 6AV6 (KCS60T)	Bias Clamp
(7)	RCA 6AU6	1st Picture I-F Amplifier
(8)	RCA 6CB6	2nd Picture I-F Amplifier
(9)	RCA 6AU6	3rd Picture I-F Amplifier
(10)	RCA 6CB6	4th Picture I-F Amplifier
(11)	RCA 6AL5	Picture 2nd Detector and AGC Detector
(12)	RCA 12AU7	1st and 2nd Video Amplifier
(13)	RCA 12AU7	DC Restorer and Sync Separator
(14)	RCA 6SN7 (KCS60)	Vert. Sweep Osc. & Bias Clamp
	or RCA 6SN7GT	Sync. Amp. & Vert. Swp. Osc.
(15)	RCA 6K6GT	Vertical Sweep Output
(16)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(17)	RCA 6BG6G	Horizontal Sweep Output
(18)	RCA 6W4GT	Damper
(19)	RCA 1B3-GT/8016	High Voltage Rectifier
(20)	RCA 19AP4A	Kinescope
(21)	RCA 5U4G	Rectifier

(RC1092 Radio Chassis)

	Tube Used	Function
(1)	RCA 6CB6	R-F Amplifier
(2)	RCA 6J6	Oscillator and Mixer
(3)	RCA 6BA6	I-F Amplifier
(4)	RCA 6AV6	Driver
(5)	RCA 6AL5	Ratio Detector
(6)	RCA 6AV6	AM Det., AVC and Audio Amplifier
(7)	RCA 6C4	Phase Inverter
(8)	RCA 6V6GT (2 tubes)	Audio Output
(9)	RCA 5Y3GT	Rectifier

Specifications continued on page 2

ELECTRICAL AND MECHANICAL SPECIFICATIONS
(Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency .... 25.50 Mc.
Adjacent Channel Sound Trap .... 27.00 Mc.
Accompanying Sound Traps .... 21.00 Mc.
Adjacent Channel Picture Carrier Traps .... 19.50 Mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency .... 21.00 Mc.
Sound Discriminator Band Width between peaks .... 400 kc.

VIDEO RESPONSE .... To 4 Mc.
FOCUS .... Magnetic
SWEEP DEFLECTION .... Magnetic
SCANNING .... Interlaced, 525 line
HORIZONTAL SWEEP FREQUENCY .... 15,750 cps
VERTICAL SWEEP FREQUENCY .... 60 cps
FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. Turn the radio FUNCTION switch to TV.
2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.
3. Set the STATION SELECTOR to the desired channel.
4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.
5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.
6. Adjust the VERTICAL hold control until the pattern stops vertical movement.
7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.
8. Adjust the PICTURE and BRIGHTNESS controls for suitable picture contrast and brightness.
9. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.
10. In switching from one channel to another, it may be necessary to repeat steps 4 and 8.
11. When the set is turned on again after an idle period it should not be necessary, to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step No. 4 is generally sufficient.
12. If the positions of the controls have been changed, it may be necessary to repeat steps 1 through 8.

RADIO OPERATION

1. Turn the radio FUNCTION switch to AM.
2. Tune in the desired station with the TUNING control.

PHONOGRAPH OPERATION

1. Turn the radio FUNCTION switch to 78-33 for operation of the 78/33⅓ RPM changer or to 45 for operation of the 45 RPM changer.
2. Place a record on the appropriate changer and slip the changer power switch to "ON."

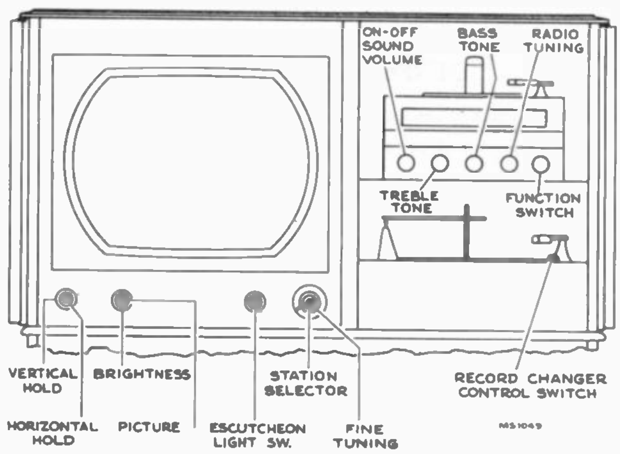


Figure 1—Receiver Operating Controls

THE TELEVISION CHASSIS USED IN MODEL 9T89 IS VERY SIMILAR TO THE CHASSIS USED IN MODELS 6T53, 6T64, 6T71, ETC. REFER TO PAGES 372 TO 385 FOR TELEVISION ALIGNMENT DATA AND WAVEFORM PHOTOGRAPHS.

THE RADIO CHASSIS USED IN MODEL 9T89 IS IDENTICAL TO THE RADIO CHASSIS (RC-1092) USED IN MODELS 6T86 AND 6T87. REFER TO PAGES 418, 419, 420, 421 AND 422 FOR SERVICE INFORMATION ON CHASSIS NO. RC-1092.

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

Connect the antenna transmission line to the receiver antenna terminals. Plug a power cord into the 115-volt a-c power source and into the receiver interlock receptacle. Turn the receiver power switch to the "on" position, the brightness control fully clockwise, and the picture control counter-clockwise.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2. Starting from this position immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Turn the focus control (shown in Figure 2) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches of this adjustment should be made with the brightness control at the maximum clockwise position with which good line focus can be maintained.

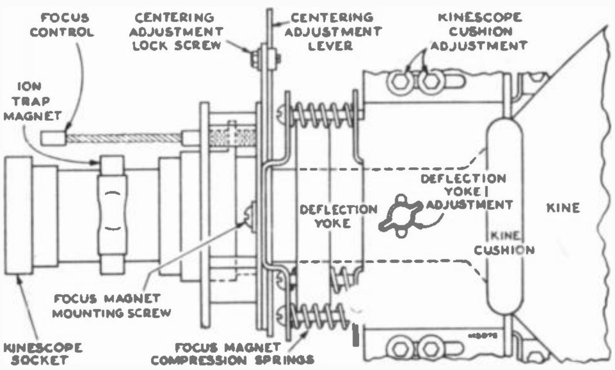


Figure 2—Yoke and Focus Magnet Adjustments

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn S106 on the rear apron (see Figure 3) counter-clockwise until the set operates normally and the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 2 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull-in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Magnet Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments.

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T108 horizontal frequency adjustment on top of the chassis until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Locking Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. The picture may remain in sync. If so turn the T108 top core slightly and momentarily switch off channel. Repeat until the picture falls out of sync with the diagonal lines sloping down to the left. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 2 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C147A slightly clockwise. If less than 2 bars are present, adjust C147A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 2 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure. For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

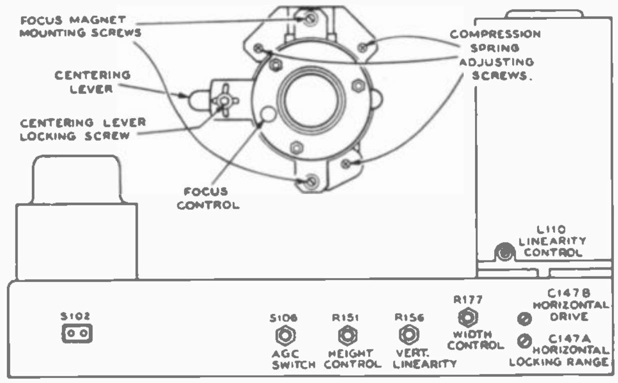


Figure 3—Rear Chassis Adjustments

FOCUS MAGNET ADJUSTMENT.—The focus coil should be adjusted so that there is approximately three-eighths inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus magnet. This spacing gives best average focus over the face of the tube.

The axis of the hole through the magnet should be parallel with the axis of the kinescope neck with the kinescope neck through the middle.

CENTERING ADJUSTMENT.—No electrical centering controls are provided. Centering is accomplished by means of a separate plate on the focus magnet. Some centering plates include a locking screw which must be loosened before centering, and others are held in adjustment by friction. Up and down adjustment of the plate moves the picture side to side and sidewise adjustment moves the picture up and down.

If a corner of the raster is shadowed, check the position of the ion trap magnet. Reposition the magnet within the range of maximum raster brightness to eliminate the shadow and recenter the picture by adjustment of the focus magnet plate. In no case should the magnet be adjusted to cause any loss of brightness since such operation may cause immediate or eventual damage to the tube. In some cases it may be necessary to shift the position of the focus magnet in order to eliminate a corner shadow.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage hence the brightest and best focused picture, adjust horizontal drive counter-clockwise as far as possible without stretching the left side of the picture As a first adjustment, set the horizontal drive trimmer C147B one-half turn out from maximum capacity.

Turn the horizontal linearity coil out until appreciable loss in width occurs, then in until nearly maximum width and the best linearity is obtained.

Adjust the width control R177 to obtain correct picture width.

A slight readjustment of these three controls may be necessary to obtain the best linearity.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R151 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R156 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

FOCUS.—Adjust the focus magnet for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

On focus magnets using two shunts, the one with the cable is the "fine adjustment" and the other is the "focus range" adjustment. In general, the two shunts should be adjusted to approximately equal positions.

Recheck the position of the ion trap magnet to make sure that maximum brightness is obtained.

Check to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

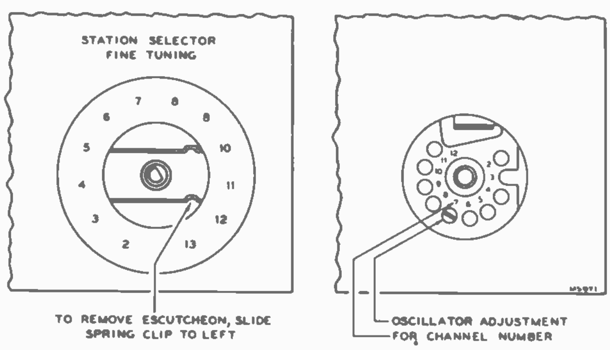


Figure 4—R-F Oscillator Adjustments

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure. The adjustments for channels 2 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment of channel 13 is on top of the chassis.

AGC CONTROL.—The AGC control switch is provided as an installation adjustment. The normal position for strong signal areas is with the switch in the number 1 or counterclockwise position. If impulse type of interference is experienced, turn the switch to the number 2 or center position. In very weak signal areas in which impulse type interference is experienced, turn the switch to position number 3 or fully clockwise. In this position, all AGC is removed and the receiver will overload if the input signal exceeds 200 microvolts. However, for signals under 200 microvolts, this position of the AGC control switch gives best noise immunity of sync.

FM TRAP ADJUSTMENT.—In some instances interference may be encountered from a strong FM station signal. A trap is provided to eliminate this type of interference. To adjust the trap tune in the station on which the interference is observed and adjust the L203 core on top of the r-f unit for minimum interference in the picture.

CAUTION.—In some receivers, the FM trap L203 will tune down into channel 6 or even into channel 5. Needless to say, such an adjustment will cause greatly reduced sensitivity on these channels. If channels 5 or 6 are to be received, check L203 to make sure that it does not affect sensitivity on these two channels.

Replace the cabinet back and reconnect the receiver antenna leads to the cabinet back. Tighten the back retaining screws securely otherwise the back may rattle or buzz when the receiver is operated at high volume.

RADIO OPERATION.—Turn the receiver function switch to the AM and FM positions and check the radio for proper operation. In switching from radio to television or from television to radio, approximately 30 seconds warm-up time is required.

RECORD CHANGER OPERATION.—Turn the receiver function switch to each phono position and check each record player for proper operation.

CABINET ANTENNA.—A cabinet antenna is provided for use in strong signal areas in which no reflections are experienced. The leads from the antenna are brought out near the receiver antenna terminal board. To connect the cabinet antenna, attach the leads to the terminal board. If reception is satisfactory, no other antenna is necessary. However, if reception is unsatisfactory, it will be necessary to employ an outdoor antenna or an indoor antenna which can be oriented

CHASSIS REMOVAL.—To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the control knobs, the cabinet back, unplug the speaker cable, the kinescope socket, the antenna cable, the yoke and high voltage cable. Remove the yoke frame grounding strap. Take out the six chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet.

KINESCOPE HANDLING PRECAUTION.—Do not install, remove, or handle the kinescope in any manner, unless shatterproof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope from the cabinet, take out the four screws and one wing screw which hold the yoke frame to the cabinet. Remove the kinescope, the yoke frame with yoke and focus magnet as an assembly.

INSTALLATION OF KINESCOPE.—Handle this tube by the metal rim at the edge of the screen. Do not cover the glass bell of the tube with fingermarks as it will produce leakage paths which may interfere with reception. If this portion of the tube has inadvertently been handled, wipe it clean with a soft cloth moistened with "dry" carbon tetrachloride.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and fingermarks with a soft cloth moistened with "Windex" or similar cleaning agent.

Turn the tube so that the key on the base of the tube will be down and insert the neck of the kinescope through the deflection coil and focus magnet. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Replace the kinescope and yoke frame assembly in the cabinet. Insert the four screws and wing screw and tighten.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible. If this is not done, difficulty will be encountered in adjusting the ion trap and focus magnets because of shadows on the corner of the raster.

Slide the chassis into the cabinet, then insert and tighten the six chassis bolts.

Slip the ion trap magnet over the neck of the kinescope.

Connect the kinescope socket to the tube base and connect the high voltage lead clip from the rim of the kinescope into the high voltage bushing on the high voltage compartment.

Reconnect all other cables. Perform the entire set-up procedure beginning with Ion Trap Magnet Adjustment.

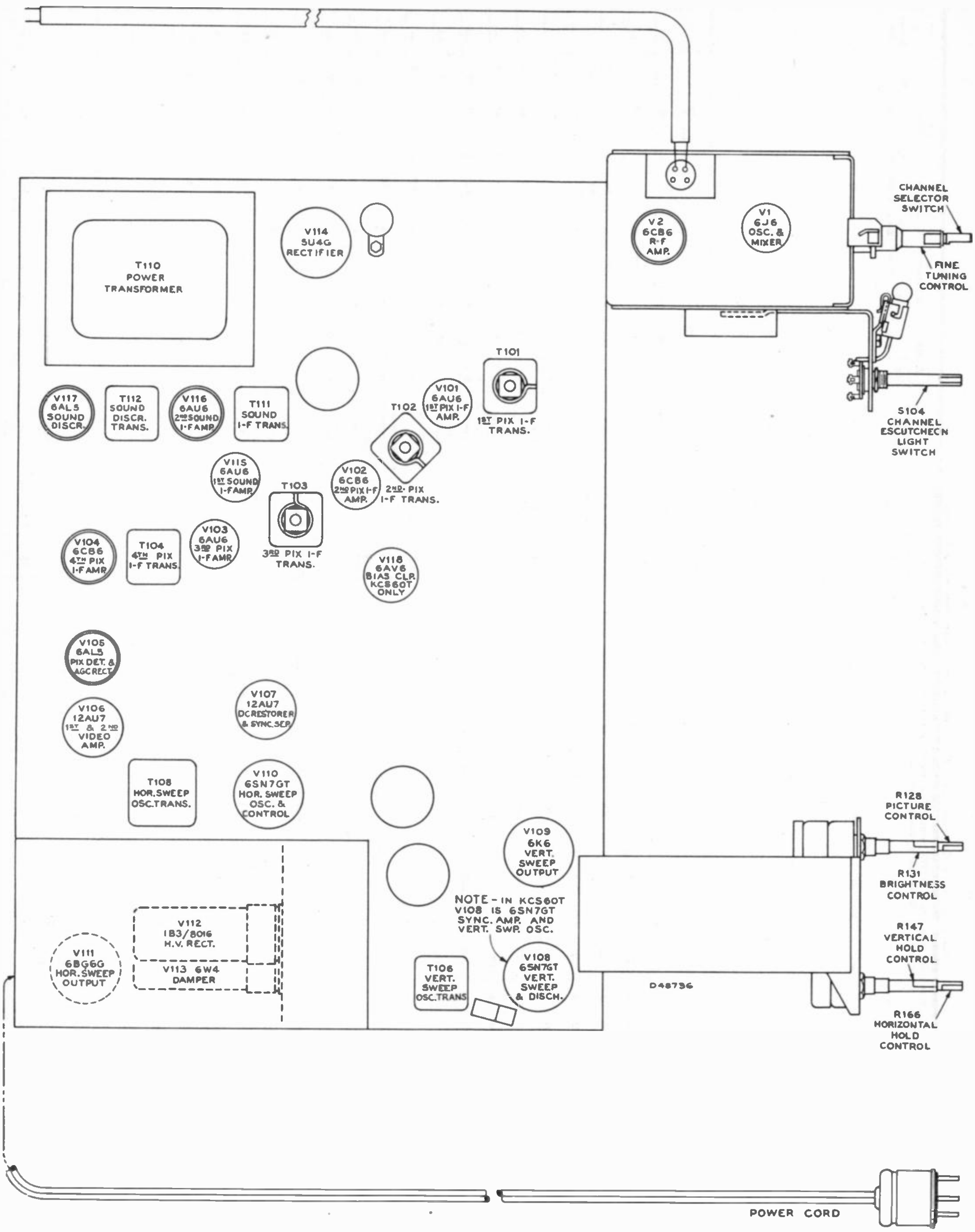


Figure 5—Chassis Top View

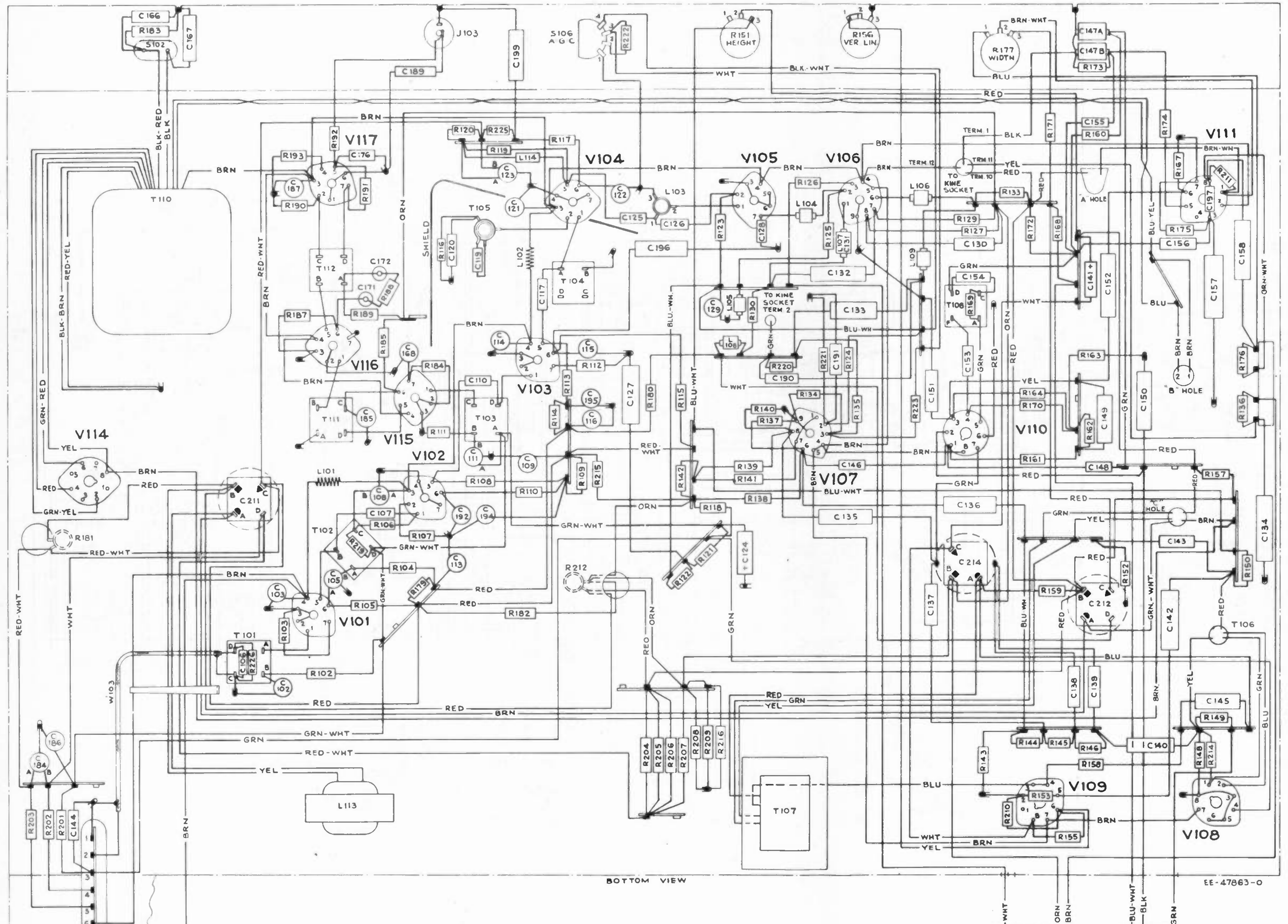
VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition, a 2500 microvolt test pattern signal was fed into the receiver, the picture synced and the AGC control properly adjusted. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are read with a WV97A Senior "VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles, a-c. The symbol < means less than.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma)	Notes on Measurements
V1	6J6	Mixer	2500 Mu. V. Signal	2	144	—	—	7	0	5	-2.3	6.8	—	
			No Signal	2	135	—	—	7	0	5	-2.1	5.6	—	
V1	6J6	R-F Oscillator	2500 Mu. V. Signal	1	100	—	—	7	0	6	-3.0	4.0	—	* Depending upon channel
			No Signal	1	95	—	—	7	0	6	-2.7	3.9	—	
V2	6AG5	R-F Amplifier	2500 Mu. V. Signal	5	250	6	130	2	0.1	1	-3.4	3.0	0.6	
			No Signal	5	166	6	84	2	0.4	1	-0.2	10.3	2.3	
V101	6AU6	1st Pix. I-F Amplifier	2500 Mu. V. Signal	5	195	6	222	7	0.3	1	-5.0	1.7	0.8	
			No Signal	5	121	6	135	7	0.8	1	-0.8	5.2	2.2	
V102	6CB6	2nd Pix. I-F Amplifier	2500 Mu. V. Signal	5	222	6	203	2	0.3	1	-5.0	2.0	0.7	
			No Signal	5	124	6	112	2	0.8	1	-0.6	5.5	1.6	
V103	6AU6	3d Pix. I-F Amplifier	2500 Mu. V. Signal	5	185	6	225	7	0.2	1	-5.0	1.7	0.7	
			No Signal	5	94	6	132	7	0.5	1	-0.75	4.9	2.0	
V104	6CB6	4th Pix. I-F Amplifier	2500 Mu. V. Signal	5	165	6	142	2	2.25	1	0	9.6	3.1	
			No Signal	5	118	6	132	2	2.1	1	0	9.0	3.1	
V105	6AL5	Picture 2d Det.	2500 Mu. V. Signal	7	-2.0	—	—	1	0	—	—	0.3	—	
			No Signal	7	-0.5	—	—	1	0	—	—	<0.1	—	
V105	6AL5	AGC Rectifier	2500 Mu. V. Signal	2	-9.5	—	—	5	0	—	—	<0.1	—	
			No Signal	2	-2.0	—	—	5	0	—	—	<0.1	—	
V106	12AU7	1st Video Amplifier	2500 Mu. V. Signal	1	100	—	—	3	1.2	2	-2.3	3.6	—	At maximum contrast
			No Signal	1	54	—	—	3	0.9	2	-0.5	2.6	—	
			2500 Mu. V. Signal	1	190	—	—	3	9.0	2	-2.8	0.9	—	At minimum contrast
			No Signal	1	122	—	—	3	6.9	2	-0.5	0.6	—	
V106	12AU7	2d Video Amplifier	2500 Mu. V. Signal	6	330	—	—	8	125	7	118	9.3	—	At maximum contrast
			No Signal	6	295	—	—	8	121	7	110	13.6	—	
			2500 Mu. V. Signal	6	300	—	—	8	131	7	120	12.9	—	At minimum contrast
			No Signal	6	295	—	—	8	121	7	110	13.6	—	
V107 A	12AU7 KCS60	D-C Rest. & Sync Sep.	2500 Mu. V. Signal	1	5.0	—	—	3	45.5	2	-4.7	<0.1	—	At maximum contrast
	KCS60		No Signal	1	5.5	—	—	3	8.5	2	-0.7	<0.1	—	
V107 B	12AU7 KCS60	V. Sep. & Amplifier	2500 Mu. V. Signal	6	36	—	—	8	6.0	7	4.7	4.0	—	
	KCS60		No Signal	6	36	—	—	8	6.0	7	5.5	2.8	—	

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V107	12AU7 KCS60T	D-C Rest. & Sync Sep.	2500 Mu. V. Signal	1	10	—	—	3	45	2	-4.5	—	—	At maximum contrast
	KCS60T		No Signal	1	8	—	—	3	1.7	2	-0.4	—	—	
	KCS60T		2500 Mu. V. Signal	6	7.2	—	—	8	54	7	0	—	—	
	KCS60T		No Signal	6	7.0	—	—	8		7	0	—	—	
V108 A	6SN7 KSC60T	Sync Amplifier	2500 Mu. V. Signal	5	50	—	—	6	7.6	4	7.4	—	—	
	KCS60T		No Signal	5	46	—	—	6	7.0	4	7.0	—	—	
V108	6SN7 GT	Vertical Oscillator	2500 Mu. V. Signal	2	*395	—	—	3	0	1	*-58	0.4	—	*Depends on setting of height control
			No Signal	2	*395	—	—	3	0	1	*-58	0.4	—	
V109	6SN7 GT	Vertical Output	2500 Mu. V. Signal	3	370	4	370	8	51	5	0	11.5	1.9	
			No Signal	3	365	4	365	8	51	5	0	11.4	1.9	
V110	6K6 GT	Horizontal Osc. Control	2500 Mu. V. Signal	2	*160	—	—	3	*-4.8 25.0	1	*-14.6 -2.0	0.32	—	*Depends on setting of hold control
			No Signal	2	*152 181	—	—	3	*-4.4 18.3	1	*-3.5 -2.9	0.28	—	
V110	6SN7 GT	Horizontal Oscillator	2500 Mu. V. Signal	5	230	—	—	6	0	4	-82	1.8	—	
			No Signal	5	225	—	—	6	0	4	-85	1.8	—	
V111	6BG6G	Horizontal Output	2500 Mu. V. Signal	5	*630	8	325	3	7.2	5	-33	67	5.0	*6000 volt pulse present
			No Signal	5	*630	8	329	3	7.2	5	-33	67.1	4.9	
V112	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	*14,500	—	—	.0	—	*14,500 volt pulse present
			Brightness Maximum	Cap	*	—	—	2 & 7	*12,700	—	—	0.1	—	
V113	6W4 GT	Damper	2500 Mu. V. Signal	5	387	—	—	3	*	—	—	69	—	*3000 volt pulse present
			No Signal	5	380	—	—	3	*	—	—	70	—	
V114	5U4G	Rectifier	2500 Mu. V. Signal	4 & 6	*368	—	—	2 & 8	391	—	—	185	—	*AC measured with AC voltmeter
			No Signal	4 & 6	*367	—	—	2 & 8	387	—	—	199	—	
V115	6AU6	1st Sound I-F. Amp.	2500 Mu. V. Signal	5	120	6	120	7	0.6	1	-0.2	6.8	2.9	
			No Signal	5	108	6	108	7	0.6	1	-0.1	6.2	2.8	
V116	6AU6	2d Sound I-F Amp.	2500 Mu. V. Signal	5	118	6	67	7	0	1	-1.3	4.9	2.8	
			No Signal	5	110	6	76	5	0	1	-0.5	6.9	3.1	
V117	6AL5	Sound Discrim.	2500 Mu. V. Signal	2	-7.2	—	—	5	0	—	—	<0.1	—	
			No Signal	2	-10.0	—	—	5	0	—	—	<0.1	—	
V118	6AV6 KCS60T	Bias Clamp	2500 Mu. V. Signal	7	0	—	—	2	0	1	-3.4	—	—	
	KCS60T		No Signal	7	0	—	—	2	0	1	-0.2	—	—	
V120	19AP4	Kinescope	2500 Mu. V. Signal	Cone	14,000	10	384	11	100	2	46	<0.1	<0.1	
			No Signal	Cone	13,500	10	375	11	74	2	8.3	<0.1	<0.1	

KCS60 CHASSIS WIRING DIAGRAM



FOR R-F UNIT WIRING AND TELEVISION LEAD DRESS—SEE PAGE 424.

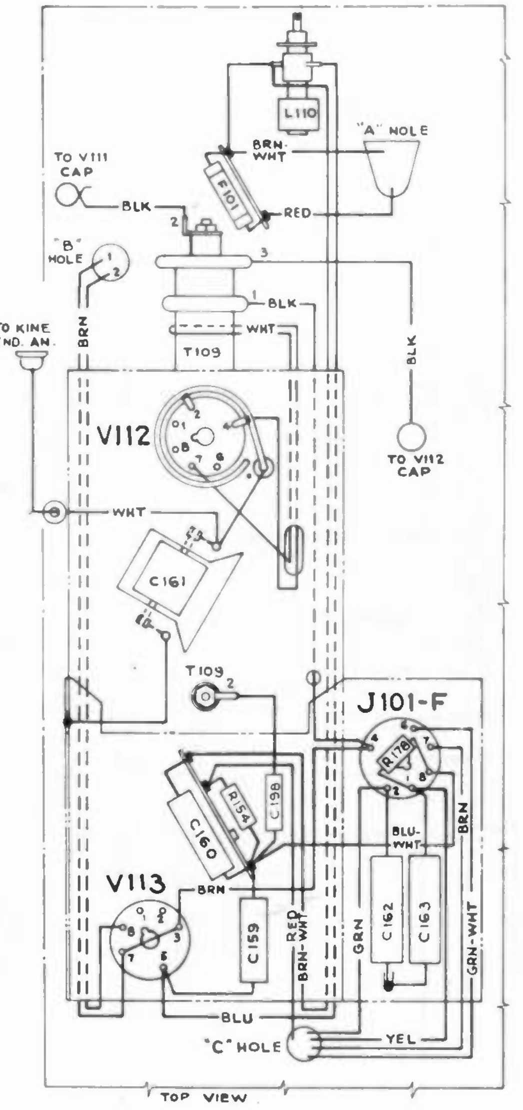
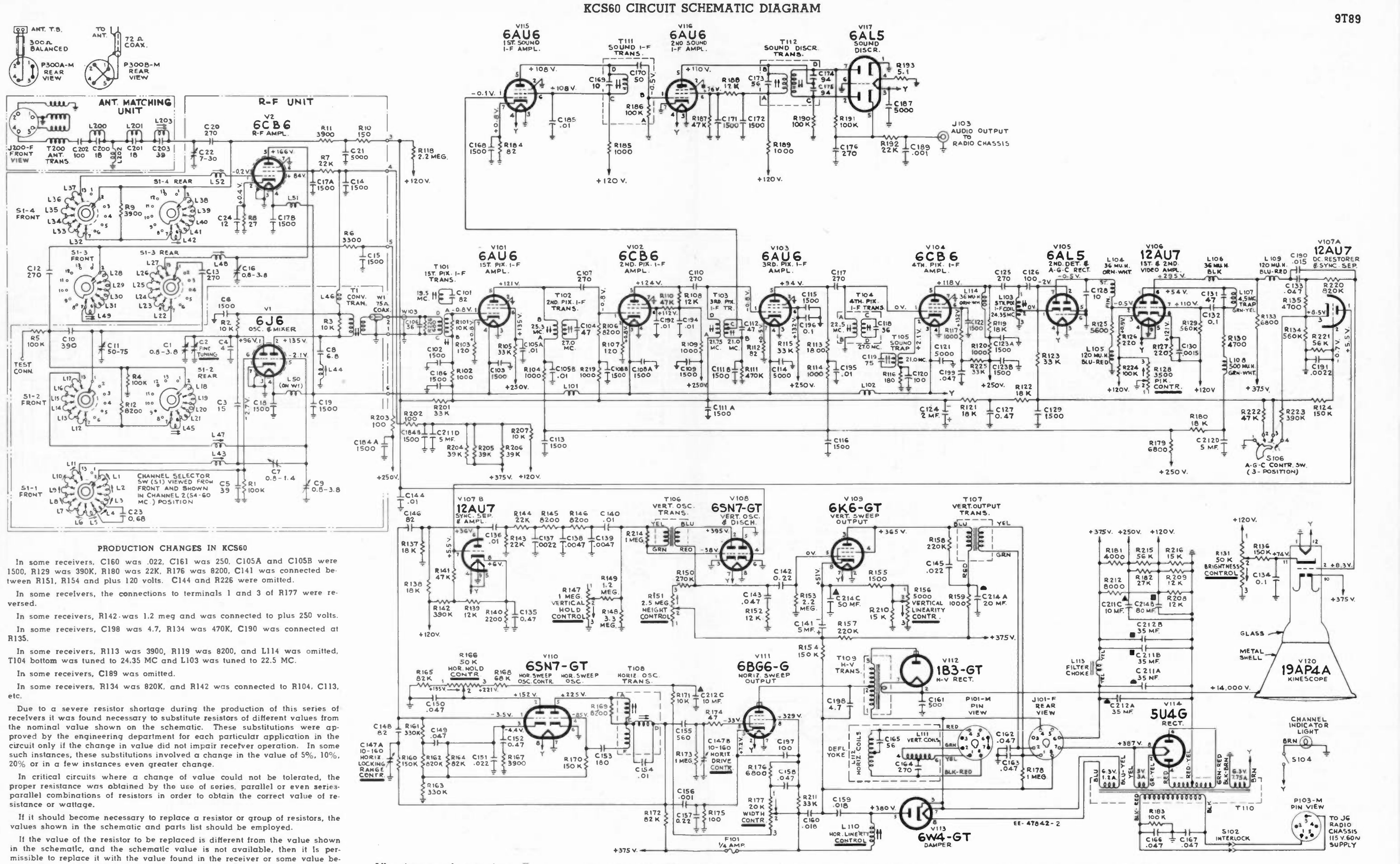


Figure 6—KSC60 Chassis Wiring Diagram

KCS60 CIRCUIT SCHEMATIC DIAGRAM



PRODUCTION CHANGES IN KCS60

In some receivers, C160 was .022, C161 was 250, C105A and C105B were 1500, R129 was 390K, R180 was 22K, R176 was 8200, C141 was connected between R151, R154 and plus 120 volts. C144 and R226 were omitted.

In some receivers, the connections to terminals 1 and 3 of R177 were reversed.

In some receivers, R142 was 1.2 meg and was connected to plus 250 volts.

In some receivers, C198 was 4.7, R134 was 470K, C190 was connected at R135.

In some receivers, R113 was 3900, R119 was 8200, and L114 was omitted, T104 bottom was tuned to 24.35 MC and L103 was tuned to 22.5 MC.

In some receivers, C189 was omitted.

In some receivers, R134 was 820K, and R142 was connected to R104, C113, etc.

Due to a severe resistor shortage during the production of this series of receivers it was found necessary to substitute resistors of different values from the nominal value shown on the schematic. These substitutions were approved by the engineering department for each particular application in the circuit only if the change in value did not impair receiver operation. In some such instances, these substitutions involved a change in the value of 5%, 10%, 20% or in a few instances even greater change.

In critical circuits where a change of value could not be tolerated, the proper resistance was obtained by the use of series, parallel or even series-parallel combinations of resistors in order to obtain the correct value of resistance or wattage.

If it should become necessary to replace a resistor or group of resistors, the values shown in the schematic and parts list should be employed.

If the value of the resistor to be replaced is different from the value shown in the schematic, and the schematic value is not available, then it is permissible to replace it with the value found in the receiver or some value between that and the value shown in the schematic. Some of the commercially available, low resistance value, molded body types are of wire wound construction. Such resistors should not be employed in the r-f unit, i-f or video sections as the inductive affect of these resistors may impair circuit operation.

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

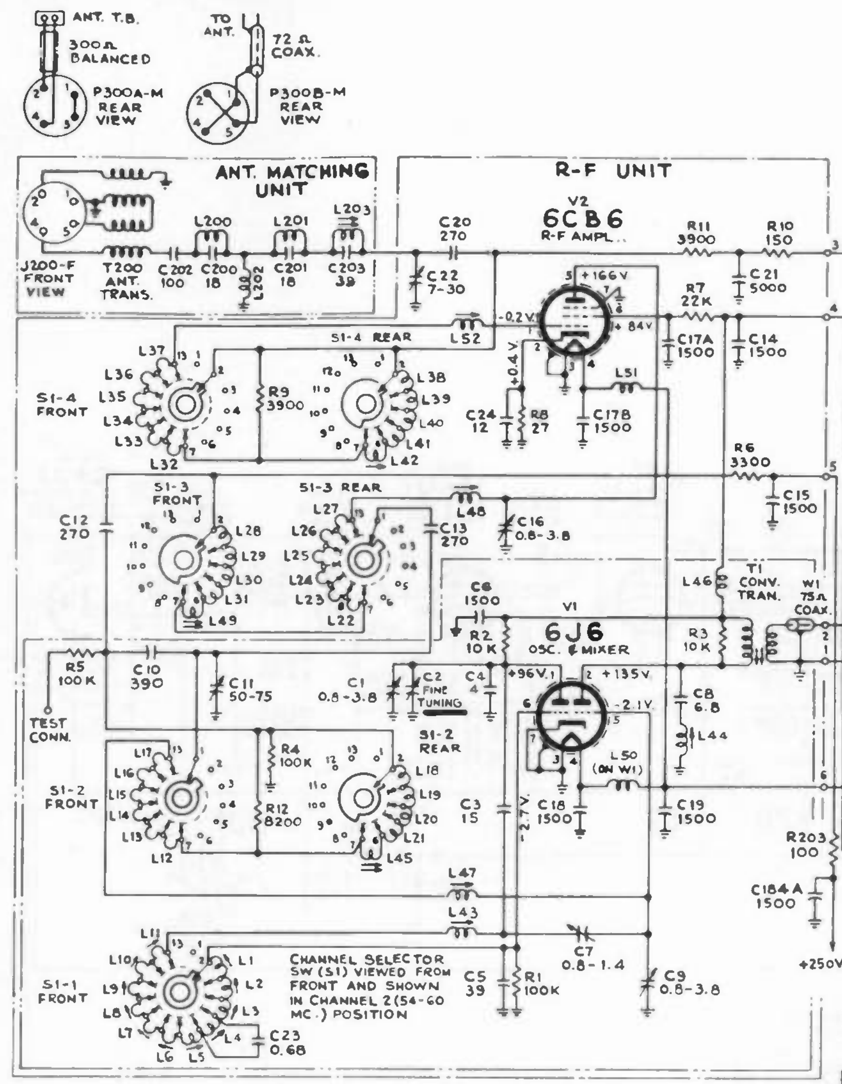
Direction of arrows at controls indicates clockwise rotation.

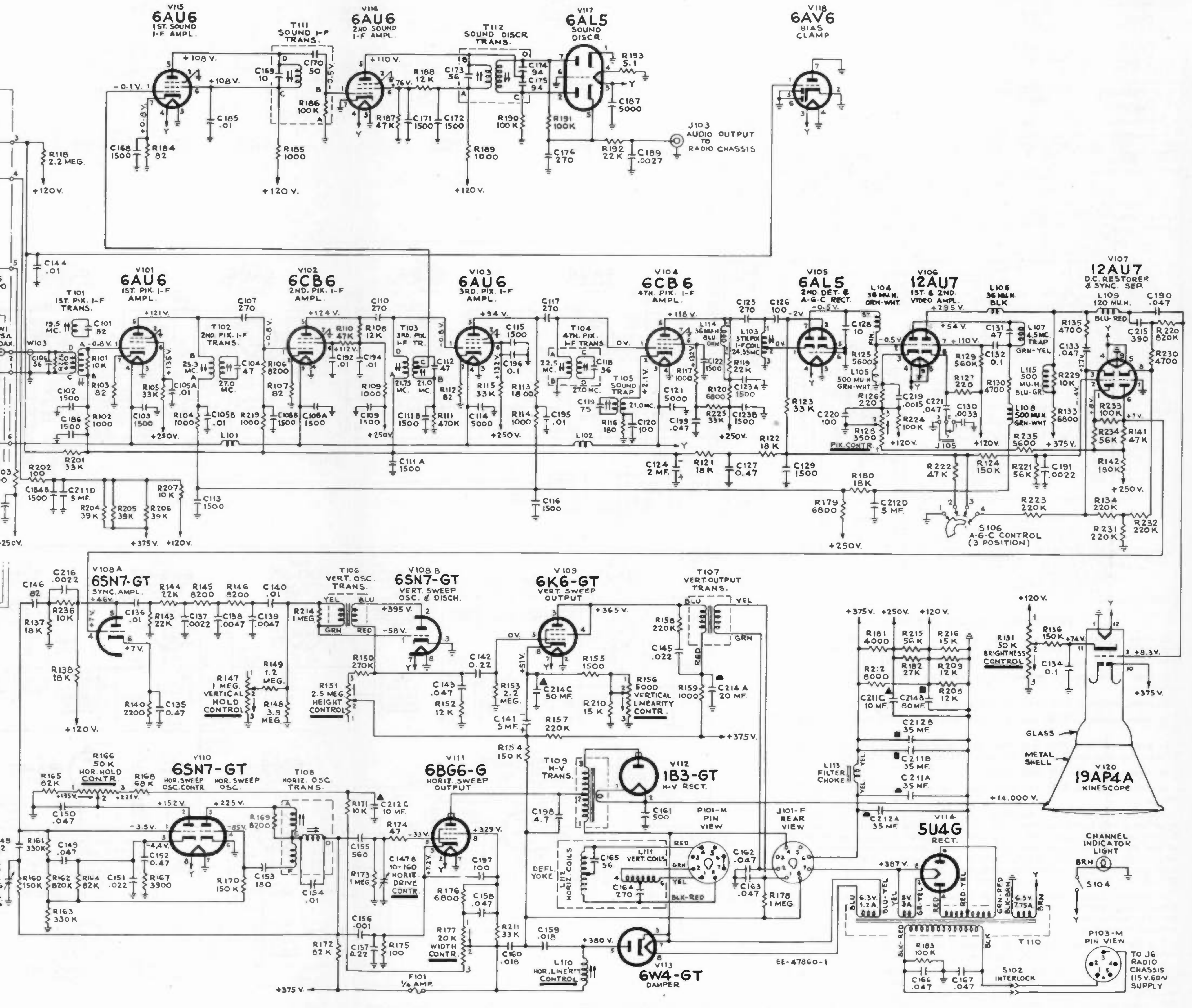
In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Figure 7—Circuit Schematic Diagram for KCS60 chassis

KCS60T CIRCUIT SCHEMATIC DIAGRAM





PRODUCTION CHANGES IN KCS60T

In some receivers, R120 was 1000 ohms.

In some receivers, C196 was .01 mfd.

In some receivers, R103 and R107 were 120 ohms and point C of T103 was 5 turns down from top of coil on the actual transformer.

In some receivers, J105, C219, C220 and C221 were omitted. L105 was 120 Muh (Red/Blue) and C130 was connected between Pin 8 of V106 and plus 125 volt bus.

In some receivers, R148 was 3.3 meg and C189 was .0015.

The following changes will be made on a few late production receivers but these changes are not shown in the schematic or wiring diagrams.

In a few late production chassis T111 will be replaced by a dual winding transformer with two adjustable cores for primary and secondary which are adjustable from the top and bottom of the chassis. R186 will be 22K and will be connected between terminal A of T111 and ground. A 100 mmf capacitor C222 will be connected in parallel with R186. Terminal B of T111 will be connected to Pin 1 of V116. Connections to Terminals C and D of T111 will remain unchanged. For circuit diagram see Service Data, Model 9T147.

In a few late production receivers the following changes will be made. R118 will be changed to 10 meg and R201 will become 150K. The bleeder resistors R208, R209 and R216 will be lifted from ground and a 220 ohm resistor R239 will be inserted between the old bleeder and ground. This will create a new 5.5 volt bus. The cathode of the AGC diode Pin 5 of V105 will be lifted from ground and connected to this 5.5 volt bus. A .01 mfd capacitor C224 will be connected from Pin 5 of V105 to ground. Video load resistorc R133, R229 and L115 will be removed. A 2700 ohm resistor R139 will be connected to junction of L106 and L109. R133 a 4700 ohm resistor will be connected between R139 and the 375 volt bus. A 270 mmf capacitor C223 will be connected from the junction of R133, R139 and to Pin 8 of V107. C130 will be changed to .0033 mfd. For circuit diagram, see the Service Data for Model 9T147.

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

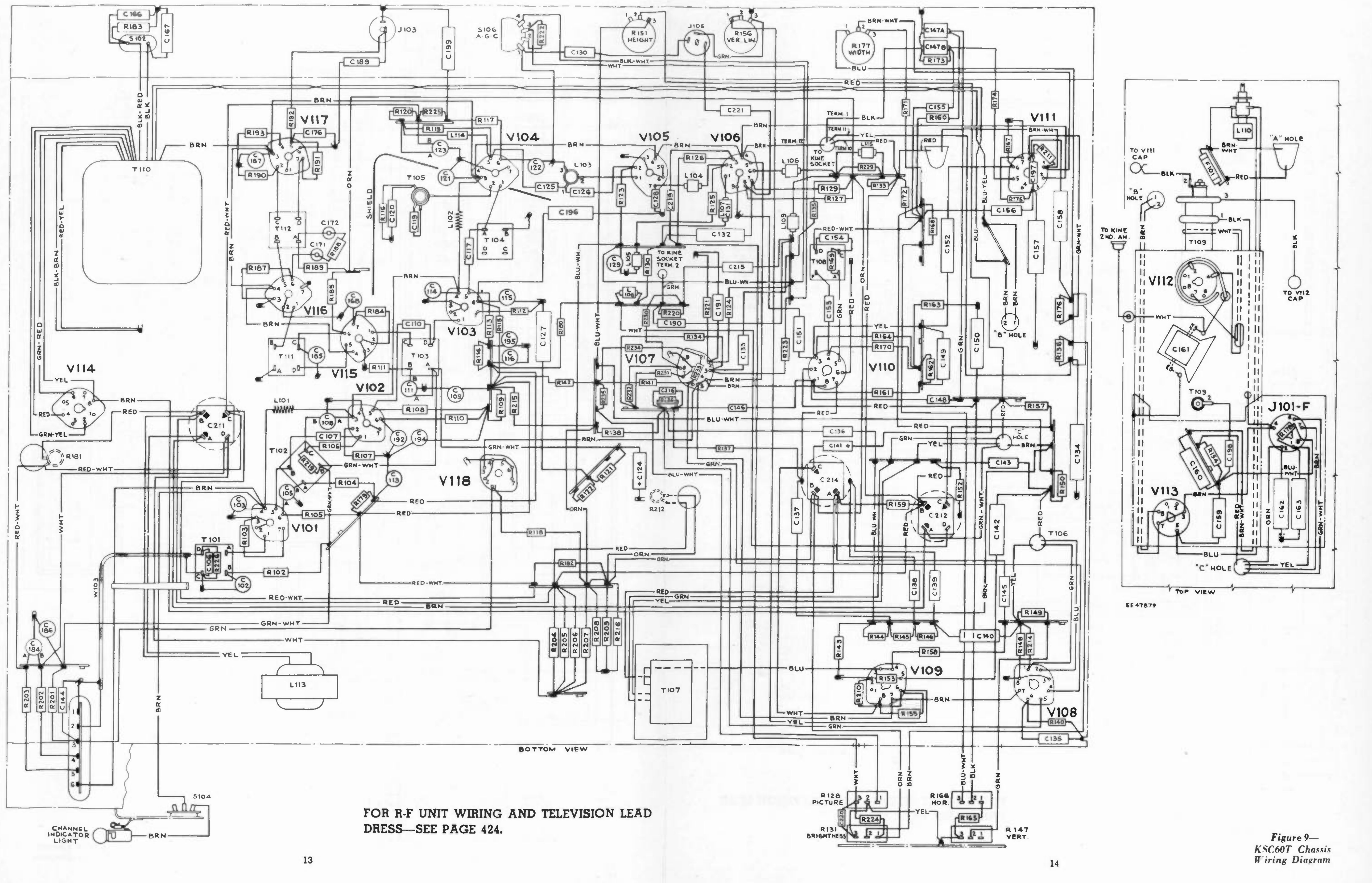
Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Figure 8—Circuit Schematic Diagram for KCS60T chassis

KCS60T CHASSIS WIRING DIAGRAM



FOR R-F UNIT WIRING AND TELEVISION LEAD DRESS—SEE PAGE 424.

Figure 9—KSC60T Chassis Wiring Diagram

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES KRK8B
10705	Ball—Steel ball for detent (5/32" dia.)
75188	Board—Terminal board, 5 contact and ground
75067	Bracket—Vertical bracket for holding oscillator tube shield
75201	Cable—75 ohms, coax cable (7¼") complete with coil (W1, L50)
75186	Capacitor—Ceramic, variable, for fine tuning—plunger type (C2)
75289	Capacitor—Ceramic, 4 mmf., ∓0.5 mmf. (C4)
75189	Capacitor—Adjustable, 7-30 mmf. (C22)
75200	Capacitor—Ceramic, 12 mmf. (C24)
45465	Capacitor—Ceramic, 15 mmf. (C3)
75196	Capacitor—Ceramic, 39 mmf. (C5)
75174	Capacitor—Ceramic, trimmer, 50-75 mmf. (C11)
75199	Capacitor—Ceramic, 270 mmf. (C12, C13, C20)
75641	Capacitor—Ceramic, 390 mmf. (C10)
75166	Capacitor—Ceramic, 1500 mmf. (C6, C14, C15, C19)
75089	Capacitor—Ceramic, dual, 1500 mmf. (C17A, C17B)
73748	Capacitor—Ceramic, 1500 mmf. (C18)
73473	Capacitor—Ceramic, 5000 mmf. (C21)
75172	Capacitor—Tubular, steatite, adjustable, 0.8-1.4 mmf. (C7)
71504	Capacitor—Ceramic, 0.68 mmf. (C23)
75184	Capacitor—Ceramic, adjustable, 0.75-4 mmf., complete with adjusting stud (C1)
75197	Capacitor—Ceramic, 6.8 mmf. (C8)
75167	Clip—Tubular, clip for mounting stand-off capacitors
75182	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment) for convertor section (C9, L47)
75183	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f section (L48, C16)
75185	Coil—Converter plate loading coil (L44)
75202	Coil—Choke coil .56 muh. (L46)
73477	Coil—Choke coil (L51)
75187	Core—Adjustable core for fine tuning capacitor C2
75162	Detent—Detent mechanism and fibre shaft
73453	Form—Coil form for L45 and L49
75165	Link—Link assembly for fine tuning
14343	Retainer—Fine tuning shaft retaining ring
	Resistor—Fixed, composition:
	27 ohms, ±10%, ½ watt (R8)
	150 ohms, ±20%, ½ watt (R10)
	3300 ohms, ±10%, ½ watt (R6)
	3900 ohms, ±10%, ½ watt (R9, R11)
	8200 ohms, ±10%, ½ watt (R12)
	10,000 ohms, ±5%, ½ watt (R3)
	10,000 ohms, ±20%, ½ watt (R2)
	22,000 ohms, ±10%, ½ watt (R7)
	100,000 ohms, ±20%, ½ watt (R1, R4, R5)
75164	Rod—Actuating plunger rod (fibre) for fine tuning link
71476	Screw—No. 4-40 x ¼" binder head machine screw for adjusting L6, L7, L8, L9, L10, L11
75176	Screw—No. 4-40 x 3/8" fillister head screw for adjusting L5
75177	Screw—No. 4-40 x 5/16" fillister head screw for adjusting L1, L2, L3, L4, L43
74575	Screw—No. 4-40 x .359" adjusting screw for L42
73640	Screw—No. 4-40 x 7/16" adjusting screw for L52
75159	Shaft—Channel selector shaft and plate
75160	Shaft—Fine tuning shaft and cam
75168	Shield—Oscillator and convertor sections shield for R-F unit—snap-on type
75193	Shield—Tube shield for V1
75192	Shield—Tube shield for V2
75088	Socket—Tube socket, 7 contact, miniature, ceramic saddle mounted
75191	Spacer—Insulating spacer for front plate (4 req'd)
75163	Spring—Friction spring (formed) for fine tuning cam
75068	Spring—Retaining spring for oscillator tube shield
74578	Spring—Retaining spring for adjusting screws
73457	Spring—Return spring for fine tuning control
30340	Spring—Hair pin spring for fine tuning link
75175	Stator—Oscillator section stator complete with rotor, segment, coils, adjusting screws and capacitors C3 and C23 (S1-1, C3, C23, L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L43)

STOCK No.	DESCRIPTION
75178	Stator—Convertor stator complete with rotor, coils, capacitors (C10 and C12) and resistors (R4 and R5) (S1-2, C10, C12, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L45, R4, R5, R12)
75179	Stator—R-F amplifier stator complete with rotor, coils, capacitor (C13) and resistor (R6) (S1-3, C13, L22, L23, L24, L25, L26, L27, L28, L29, L30, L31, L49, R6)
75180	Stator—Antenna stator complete with rotor, coils, capacitors (C20 and C21) and resistors (R9, R10, R11) (S1-4, C20, C21, L32, L33, L34, L35, L36, L37, L38, L39, L40, L41, L42, L52, R9, R10, R11)
75169	Strip—Coil segment mounting strip—RH center
75170	Strip—Coil segment mounting strip—LH lower
75171	Strip—Coil segment mounting strip—LH upper—less trimmer C7
75173	Stud—No. 6-32 x 13/16" adjusting stud for C7 trimmer
75446	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1 uncoded and coded "ER"
75447	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1 coded numerically and "Hi Q"
75181	Transformer—Convertor transformer
75190	Washer—Insulating washer (neoprene) for capacitor C7
75607	Washer—Insulating washer (hex)
	TELEVISION CHASSIS ASSEMBLIES KCS60
75515	Bracket—Channel indicator lamp bracket
75228	Bracket—Focus magnet mounting bracket—upper
75229	Bracket—Focus magnet mounting bracket—lower
75646	Capacitor—Ceramic, 4.7 mmf., 5000 volts (C198)
53511	Capacitor—Ceramic, 10 mmf. (C128)
75217	Capacitor—Mica trimmer, dual 10-160 mmf. (C147A, C147B)
75450	Capacitor—Ceramic, 39 mmf. (C203)
71924	Capacitor—Ceramic, 56 mmf. (C106)
73090	Capacitor—Mica, 82 mmf. (C146, C148)
75437	Capacitor—Ceramic, 100 mmf. (C202)
45469	Capacitor—Ceramic, 100 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C126, C197, C220)
73102	Capacitor—Mica, 180 mmf. (C153)
75244	Capacitor—Ceramic, 270 mmf. (C176)
73091	Capacitor—Mica, 270 mmf. (C107, C110, C117, C125)
73094	Capacitor—Mica, 390 mmf. (C215 in KCS60T)
74947	Capacitor—Ceramic, 500 mmf. 20,000 volts (C161)
74250	Capacitor—Mica, 560 mmf. (C155)
75166	Capacitor—Ceramic, 1500 mmf. (C171, C172)
73748	Capacitor—Ceramic, 1500 mmf. (C102, C103, C109, C113, C115, C116, C122, C129, C168, C186)
75089	Capacitor—Ceramic, dual, 1500 mmf. (C108A, C108B, C111A, C111B, C123A, C123B, C184A, C184B)
73473	Capacitor—Ceramic, 5000 mmf. (C114, C121, C187)
73960	Capacitor—Ceramic, 10,000 mmf. (C144, C185, C192, C194, C195)
75877	Capacitor—Ceramic, dual, 10,000 mmf. (C105A, C105B)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C124)
28417	Capacitor—Electrolytic, 5 mfd., 450 volts (C141)
75592	Capacitor—Electrolytic comprising 1 section of 20 mfd., 450 volts, 1 section of 80 mfd., 200 volts and 1 section of 50 mfd., 50 volts (C214A, C214B, C214C)
75510	Capacitor—Electrolytic comprising 2 sections of 35 mfd., 450 volts, 1 section of 10 mfd., 450 volts and 1 section of 5 mfd., 450 volts (C211A, C211B, C211C, C211D, C212A, C212B, C212C, C212D)
75643	Capacitor—Tubular, moulded paper, oil impregnated, .001 mfd., 1000 volts (C156)
73598	Capacitor—Tubular, paper, oil impregnated, .0015 mfd., 600 volts (C130, C219)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd., 600 volts (C137, C191, C216 in KCS60T)
73599	Capacitor—Tubular, paper, oil impregnated, .0027 mfd., 600 volts (C189)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 600 volts (C138, C139)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C136)

STOCK No.	DESCRIPTION
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd., 600 volts (C140, C154)
74727	Capacitor—Tubular, paper, oil impregnated, .018 mfd., 1000 volts (C159, C160)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 400 volts (C145, C151)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C149, C199, C221)
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts (C166, C167)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 600 volts (C133, C150, C190)
73597	Capacitor—Tubular, moulded paper, oil impregnated, .047 mfd., 1000 volts (C143)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C132, C196)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 600 volts (C134)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 400 volts (C157)
74957	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 600 volts (C142)
73787	Capacitor—Tubular, moulded paper, 0.47 mfd., 200 volts (C127, C135, C152)
73154	Choke—Filter choke (L113)
75167	Clip—Tubular, clip for mounting stand-off capacitor 75166
75210	Coil—Fifth pix, i-f coil complete with adjustable core (L103)
71449	Coil—Horizontal linearity coil (L110)
73591	Coil—Antenna matching coil (2 req'd) (Part of T200)
75241	Coil—Antenna shunt coil (L202)
73477	Coil—Choke coil (L101, L102)
75299	Coil—Peaking coil (36 muh) (L104)
71793	Coil—Peaking coil (36 muh) (L106)
76285	Coil—Peaking coil (36 muh) (L114, R119)
75253	Coil—Peaking coil (120 muh) (L109)
75252	Coil—Peaking coil (500 muh) (L105, L108)
76132	Coil—Peaking coil (500 muh) (L115 in KCS60T)
35787	Connector—Single contact female connector for audio cable (J103)
74594	Connector—2 contact male connector for power cord
35383	Connector—8 contact male connector—part of deflection yoke (P101)
68592	Connector—8 contact female connector for deflection yoke leads (J101)
38853	Connector—4 contact female connector for antenna transformer (J200)
75517	Contact—Anode connector contact only
75215	Control—Horizontal and vertical hold control (R147, R166)
75216	Control—Picture and brightness control (R128, R131)
71441	Control—Vertical linearity control (R156)
71440	Control—Height control (R151)
75516	Control—Width control (R177)
71498	Core—Adjustable core and stud for FM trap 75449
74956	Cushion—Rubber cushion for deflection yoke hood (2 req'd)
74839	Fastener—Push fastener for mounting ceramic tube socket (2 req'd)
73600	Fuse—.25 amp., 250 volts (F101)
16058	Grommet—Rubber grommet for 2nd anode lead exit
37396	Grommet—Rubber grommet to mount ceramic tube socket (2 req'd)
75445	Hood—Deflection yoke hood less rubber cushions
75644	Insulator—2nd anode insulator assembly
75482	Jack—Video jack (J105)
76322	Magnet—Ion trap magnet (P.M.)
75504	Magnet—Focus magnet complete with adjustable plate and stud for standard 19AP4A tubes
75935	Magnet—Focus magnet complete with adjustable plate and stud for special 19AP4A tubes coded with a dot of green paint
75518	Plate—Hi-voltage plate—bakelite—less transformer, capacitor and tube socket
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R193)
75512	Resistor—Wire wound, 4000 ohms, 10 watts (R181)
75593	Resistor—Wire wound, 8000 ohms, 15 watts (R212)
	Resistor—Fixed composition:
	47 ohms, ±20%, ½ watt (R174)
	82 ohms, ±10%, ½ watt (R103, R107, R112, R184)
	100 ohms, ±20%, ½ watt (R202, R203)
	100 ohms, ±10%, 2 watts (R175)
	180 ohms, ±10%, ½ watt (R116)
	220 ohms, ±10%, ½ watt (R126, R127)
	680 ohms, ±10%, ½ watt (R226)
	1000 ohms, ±20%, ½ watt (R102, R104, R109, R114, R117, R159, R185, R189, R219)
	1500 ohms, ±10%, 1 watt (R155)
	1800 ohms, ±10%, ½ watt (R113)
	2200 ohms, ±20%, ½ watt (R140)
	3900 ohms, ±10%, ½ watt (R167)
	4700 ohms, ±5%, ½ watt (R130)
	4700 ohms, ±10%, ½ watt (R135) (R230 in KCS60T)
	5600 ohms, ±5%, ½ watt (R125)
	5600 ohms, ±10%, ½ watt (R235 in KCS60T)
	6800 ohms, ±10%, 1 watt (R120, R176)
	6800 ohms, ±10%, 2 watts (R133, R179)
	8200 ohms, ±5%, ½ watt (R106, R169)
	8200 ohms, ±10%, ½ watt (R145, R146)
	10,000 ohms, ±10%, ½ watt (R171) (R236 in KCS60T)
	10,000 ohms, ±10%, 2 watts (R207)
	12,000 ohms, ±5%, ½ watt (R152)
	12,000 ohms, ±10%, ½ watt (R188) (R139 in KCS60)
	12,000 ohms, ±5%, 1 watt (R108)
	12,000 ohms, ±10%, 2 watts (R208, R209)
	15,000 ohms, ±10%, ½ watt (R210)
	15,000 ohms, ±10%, 2 watts (R216)
	18,000 ohms, ±10%, ½ watt (R121, R122, R137)
	18,000 ohms, ±10%, 1 watt (R138, R180)
	22,000 ohms, ±10%, ½ watt (R143, R144)
	22,000 ohms, ±20%, ½ watt (R192)
	27,000 ohms, ±10%, 2 watts (R182)
	33,000 ohms, ±10%, ½ watt (R105, R115, R201, R211, R225)
	33,000 ohms, ±20%, ½ watt (R123)
	39,000 ohms, ±10%, 2 watts (R204, R205, R206)
	47,000 ohms, ±10%, ½ watt (R141, R187, R222)
	47,000 ohms, ±20%, ½ watt (R110)
	56,000 ohms, ±10%, ½ watt (R221) (R234 in KCS60T)
	56,000 ohms, ±10%, 1 watt (R215)
	68,000 ohms, ±10%, 1 watt (R168)
	82,000 ohms, ±5%, 1 watt (R172)
	82,000 ohms, ±10%, 1 watt (R164, R165)
	100,000 ohms, ±5%, ½ watt (R190, R191)
	100,000 ohms, ±10%, ½ watt (R224) (R233 in KCS60T)
	100,000 ohms, ±20%, 2 watts (R183)
	150,000 ohms, ±10%, ½ watt (R136, R154, R160)
	150,000 ohms, ±20%, ½ watt (R124)
	150,000 ohms, ±5%, 1 watt (R170)
	180,000 ohms, ±10%, ½ watt (R142 in KCS60T)
	220,000 ohms, ±10%, ½ watt (R157, R158) (R134, R223, R231, R232 in KCS60T)
	270,000 ohms, ±10%, ½ watt (R150)
	330,000 ohms, ±10%, ½ watt (R161)
	330,000 ohms, ±5%, 1 watt (R163)
	390,000 ohms, ±10%, ½ watt (R142, R223 in KCS60)
	470,000 ohms, ±10%, ½ watt (R111)
	560,000 ohms, ±10%, ½ watt (R129) (R134 in KCS60)
	820,000 ohms, ±10%, ½ watt (R162, R220)
	1 megohm, ±10%, ½ watt (R173)
	1 megohm, ±20%, ½ watt (R178, R214)
	1.2 megohm, ±5%, ½ watt (R149)
	2.2 megohm, ±10%, ½ watt (R118, R153)
	3.9 megohm, ±5%, ½ watt (R148)
75083	Screw—No. 8-32 x ¼" wing screw for mounting deflection yoke
75236	Screw—No. 8-32 x ⅜" pan head screw (brass) to mount focus magnet (2 req'd)
74602	Screw—No. 10-32 x 1¾" round head machine screw for focus magnet adjustment (3 req'd)
73584	Shield—Tube shield
31251	Socket—Tube socket, octal, wafer
31319	Socket—Tube socket, octal moulded

STOCK No.	DESCRIPTION
73117	Socket—Tube socket, 7 pin, miniature
75223	Socket—Tube socket, 9 pin, miniature
73249	Socket—Tube socket, octal, ceramic, plate mounted
71508	Socket—Tube socket for 1B3/8016
68592	Socket—Tube socket, 6 contact, moulded for V113
74834	Socket—Kinescope socket
75718	Socket—Channel indicator lamp socket
75233	Spring—Compression spring for focus magnet adjustment (3 req'd)
75506	Support—Bakelite support only—part of hi-voltage shield
75594	Switch—Channel indicator lamp switch (S104)
76010	Switch—AGC switch (S106)
75508	Transformer—Power transformer 115 volt, 60 cycle (T110)
74950	Transformer—Vertical output transformer (T107)
74144	Transformer—Vertical oscillator transformer (T106)
74589	Transformer—First pix, i-f transformer (T101, C101, R101)
74590	Transformer—Second pix, i-f transformer (T102, C104)
76264	Transformer—Third pix, i-f transformer (T103, C112)
73574	Transformer—Fourth pix, i-f transformer (T104, C118)
75211	Transformer—Sound i-f transformer, single winding type (T111, C169, C170, R186)
71424	Transformer—Sound i-f transformer—dual winding type (T111, C169, C170)
75212	Transformer—Sound discriminator transformer (T112, C173, C174, C175)
75213	Transformer—Horizontal oscillator transformer (T108)
75509	Transformer—Antenna matching transformer complete with antenna connector, i-f and FM traps and shunt coil (T200, C200, C201, C202, C203, J200, L200, L201, L202, L203)
75585	Transformer—Hi-voltage transformer (T109)
71778	Trap—Sound trap (T105, C119)
75242	Trap—I-f trap (L200, C200, L201, C201)
75449	Trap—FM trap complete with adjustable core and stud (L203, C203)
75251	Trap—4.5 mc. trap (L107, C131)
74952	Yoke—Deflection yoke complete with cable and connector (L111, L112, C164, C165, P101)
	RADIO CHASSIS ASSEMBLIES RC 1092
75567	Capacitor—Variable tuning capacitor complete with drive drum (C1-1, C1-2, C1-3, C1-4, C1-5, C1-6)
76423	Capacitor—Ceramic, 3 mmf. (C10)
75613	Capacitor—Ceramic, 5 mmf. (C13)
39044	Capacitor—Ceramic, 15 mmf. (C12)
75609	Capacitor—Ceramic, 47 mmf. (C45)
75612	Capacitor—Ceramic, 68 mmf. (C9, C11)
39396	Capacitor—Ceramic, 100 mmf. (C4)
75437	Capacitor—Ceramic, 100 mmf. (C31)
75614	Capacitor—Ceramic, 150 mmf. (C14, C30, C43, C54)
75611	Capacitor—Ceramic, 220 mmf. (C3)
39640	Capacitor—Mica, 330 mmf. (C37, C38)
72571	Capacitor—Mica, 470 mmf. (C7)
75610	Capacitor—Ceramic, 1500 mmf. (C19)
74850	Capacitor—Ceramic, 1800 mmf. (C17)
73473	Capacitor—Ceramic, 5000 mmf. (C2, C5, C6, C15, C24, C25, C27, C28, C29, C34, C36)
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts (C33)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C40)
72052	Capacitor—Electrolytic, comprising 1 section of 30 mfd., 450 volts, 1 section of 30 mfd., 350 volts, and 1 section of 40 mfd., 25 volts (C23A, C23B, C23C)
73801	Capacitor—Tubular, paper, .001 mfd., 400 volts (C8)
70642	Capacitor—Tubular, paper, .001 mfd., 1000 volts (C42, C44)
71926	Capacitor—Tubular, paper, .005 mfd., 200 volts (C26, C39, C41)
71925	Capacitor—Tubular, paper, .01 mfd., 400 volts (C32)
72120	Capacitor—Tubular, paper, .015 mfd., 200 volts (C22)
58476	Capacitor—Tubular, paper, oil impregnated, .018 mfd., 400 volts (C21)
74010	Capacitor—Tubular, paper, .02 mfd., 400 volts (C20, C35)

STOCK No.	DESCRIPTION
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts (C16)
73935	Clip—Mounting clip for AM i-f transformer
75627	Clip—Clip for main cable—on rear of chassis
75569	Coil—Oscillator coil—AM—complete with adjustable screws (L3, L4, L5)
75570	Coil—R-F coil — AM — complete with adjusting screws (L6, L7)
75615	Coil—FM antenna coil (L1)
71942	Coil—Filament choke coil (L9)
74817	Coil—FM oscillator coil (L8)
74815	Coil—FM r-f coil (L2)
35787	Connector—Single contact female connector for record changer's pickup cables and television (J2, J3, J5)
75542	Connector—8 contact male connector for power input cable (J4)
75543	Connector—2 contact female connector for 45 RPM motor cable (P1)
74879	Connector—2 contact female connector for antenna leads
75537	Control—Volume control and power switch (R22, S2)
75581	Control—Tone control—L.F. (R19)
75582	Control—Tone control—H.F. (R34)
72953	Cord—Drive cord—250 ft. (approx. 66" overall length required)
75564	Coupling—Spring coupling for function switch extension shaft
75556	Cover—Insulating cover for electrolytic
74839	Fastener—Push fastener for mounting R-F shelf (4 req'd)
16058	Grommet—Rubber grommet for mounting R-F shelf (4 req'd)
75547	Grommet—Rubber grommet to mount slides to bottom—rear (2 req'd)
75548	Grommet—Rubber grommet to mount slides to bottom—front (2 req'd)
11765	Lamp—Dial lamp—Mazda 51
75544	Nut—Rivnut to fasten screw for mounting chassis (4 req'd)
18469	Plate—Bakelite mounting plate for electrolytic
75535	Plate—Dial back plate complete with three (3) pulleys
75536	Pointer—Station selector pointer
72602	Pulley—Drive cord pulley
72323	Resistor—Wire wound, 3 ohms, ½ watt (R25)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R24)
	Resistor—Fixed, composition:
	68 ohms, ±10%, ½ watt (R1, R26)
	100 ohms, ±10%, ½ watt (R15, R38, R43)
	120 ohms, ±10%, ½ watt (R27)
	270 ohms, ±5%, 2 watts (R42)
	390 ohms, ±10%, ½ watt (R9)
	680 ohms, ±10%, ½ watt (R4)
	680 ohms, ±20%, ½ watt (R30, R31)
	1000 ohms, ±10%, ½ watt (R6)
	1200 ohms, ±5%, ½ watt (R46)
	3300 ohms, ±5%, ½ watt (R40, R45)
	8200 ohms, ±10%, 1 watt (R3)
	15,000 ohms, ±10%, ½ watt (R44)
	18,000 ohms, ±10%, ½ watt (R7, R20)
	22,000 ohms, ±10%, ½ watt (R28, R29)
	27,000 ohms, ±10%, ½ watt (R18, R21)
	39,000 ohms, ±5%, ½ watt (R47)
	56,000 ohms, ±10%, ½ watt (R32)
	68,000 ohms, ±10%, ½ watt (R39)
	82,000 ohms, ±10%, ½ watt (R36)
	120,000 ohms, ±10%, ½ watt (R8, R16)
	150,000 ohms, ±10%, ½ watt (R12, R14)
	220,000 ohms, ±20%, ½ watt (R11)
	270,000 ohms, ±10%, ½ watt (R35)
	470,000 ohms, ±10%, ½ watt (R2, R37, R41, R48)
	1.5 megohm, ±10%, ½ watt (R17, R51)
	2.2 megohm, ±20%, ½ watt (R5, R10, R13)
	10 megohm, ±20%, ½ watt (R23)
	22 megohm, ±20%, ½ watt (R33)
75540	Shaft—Tuning knob shaft
75565	Shaft—Extension shaft for function switch
73584	Shield—Tube shield
75546	Slide—Slide mechanism complete for radio chassis bottom
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature

STOCK No.	DESCRIPTION
74179	Socket—Tube socket, 7 pin, miniature for V1 and V2
31364	Socket—Dial lamp socket
75563	Spring—Retaining spring for function switch extension shaft
76332	Spring—Drive cord tension spring
74847	Support—Polystyrone support for FM oscillator coil complete with mounting bracket
75568	Switch—Function switch (S1-1, S1-2, S1-3, S3)
75557	Transformer—Output transformer (T7)
73743	Transformer—Radio detector transformer (T5)
75558	Transformer—First i-f transformer (AM) complete with adjustable cores (T2)
75559	Transformer—First i-f transformer (FM) complete with adjustable cores (T1)
73037	Transformer—Second i-f transformer (AM) complete with adjustable cores (T4)
75560	Transformer—Second i-f transformer (FM) complete with adjustable cores (T3)
75586	Transformer—Power transformer 117 volts, 60 cycles (T6)
33726	Washer—"C" washer for tuning knob shaft
	RADIO ROLLOUT CARRIAGE
75573	Decal—Function decal for radio controls
75572	Dial—Polystyrene dial scale
75571	Frame—Moulded frame (maroon) for mounting radio chassis and 45 RPM changer for mahogany or walnut instruments
75551	Handle—Metal pull-out handle for mounting frame
75555	Screw—No. 8-32 x ⅝" cross recessed pan head machine screw to mount radio chassis (4 req'd)
	SPEAKER ASSEMBLY 92569-12W RMA 274 RL 111-A1
13867	Cap—Dust cap
75682	Cone—Cone and voice coil assembly (3.2 ohms)
75681	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms)
	NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
75705	Antenna—Antenna loop less cable
75688	Back—Back cover for radio—45 RPM phono compartment—assembled to cabinet
75692	Back—Back cover for radio—45 RMP phono compartment—assembled to rollout
75772	Back—Back complete with terminal board, power cord and connector for television chassis compartment
75473	Board—TV antenna terminal board (2 contact) part of back
75707	Board—"A—F-M" antenna terminal board (3 contact)
75694	Bracket—Stop bracket less rubber bumper for radio—45 RPM phono rollout mechanism
71599	Bracket—Lamp bracket
75696	Bumper—Rubber bumper for radio — 45 RPM phono rollout stop bracket
72447	Cable—Shielded audio cable complete with two (2) pin plugs
74545	Cable—Shielded pickup cable complete with pin plug for 33/78 RPM phono
72437	Cable—Shielded pickup cable complete with pin plug for 45 RPM phono
13103	Cap—Pilot lamp cap
71892	Catch—Bullet catch and strike for doors
X3188	Cloth—Grille cloth
75703	Connector—5 contact male connector — part of back assembly
74882	Connector—2 contact (polarized) male connector for radio antenna loop cable
75709	Connector—8 contact female connector—part of main cable—less shell
75710	Connector—5 contact female connector—part of main cable—less shell
30868	Connector—2 contact female connector—part of main cable

STOCK No.	DESCRIPTION
30870	Connector—2 contact male connector for motor leads for 45 RPM phono
75474	Connector—Single contact male connector for television antenna or speaker cable
74752	Connector—2 contact male connector for F-M antenna leads
39153	Connector—4 contact male connector for television antenna cable
75702	Cord—Power cord and two contact female connector less 5 contact male connector
70392	Cord—Power cord and plug—part of main cable
75608	Cushion—Dust seal cushion (rubber) for kinescope mask
74273	Decal—Trade mark decal (Victrola)
71984	Decal—Trade mark decal (RCA Victor)
75640	Decal—Television controls function decal
74809	Emblem—"RCA Victor" emblem
75455	Escutcheon—Channel marker escutcheon
75619	Glass—Safety glass
74838	Grommet—Power cord strain relief (1 set)
37396	Grommet—Rubber grommet for mounting speaker (4 req'd)
75697	Grommet—Rubber grommet for mounting 45 RPM phono (3 req'd)
74308	Hinge—Cabinet door hinge (1 set) for radio-phono compartment, television compartment (L.H. door) or record storage compartments
36817	Hinge—Cabinet door hinge (1 set) for television compartment (R.H. door)
75636	Hinge—Cabinet door hinge (1 set) for speaker compartment—R.H.
75637	Hinge—Cabinet door hinge (1 set) for speaker compartment—L.H.
74959	Knob—Television fine tuning control knob—maroon (outer)
73996	Knob—Television channel selector knob—maroon (inner)
74962	Knob—Television brightness control or vertical hold control knob—maroon (outer)
74969	Knob—Television channel marker light switch knob—maroon
74963	Knob—Television picture control or horizontal-hold control knob—maroon (inner)
75712	Knob—Radio tone control, tuning control or volume control and power switch knob—maroon
75714	Knob—Function switch knob—maroon
11765	Lamp—Pilot or channel indicator lamp—Mazda 51
75459	Mask—Channel indicator light mask
73634	Nut—Speed nut for speaker mounting screws
75638	Pull—Door pull for upper doors
75639	Pull—Door pull for lower doors
71456	Screw—No. 8-32 x $^7/_{16}$" wing screw for deflection yoke and focus magnet mounting support
75623	Screw—No. 8-32 x ⅝" trimit head screw for door pull
74279	Screw—No. 8-32 x ⅞" trimit head screw for door pull
75704	Shell—Shell for 5 contact male connector 75703
75708	Shell—Shell for 8 contact female connector 75709
75711	Shell—Shell for 5 contact female connector 75710
74736	Slide—Slide mechanism complete for 33/78 RPM changer drawer
31364	Socket—Pilot lamp stocket
72845	Spring—Retaining spring for knob 74959
14270	Spring—Retaining spring for knobs 73996, 74962 and 74969
30330	Spring—Retaining spring for knob 74963
73643	Spring—Spring clip for channel marker escutcheon
75587	Spring—Formed spring for kinescope masking panel
74734	Spring—Retaining spring for knobs 75712 and 75714
75691	Spring—Suspension spring (coil type) for main cable
72936	Stop—Door stop
75500	Washer—Felt washer for television chassis back assembly
75146	Washer—"C" washer for 33⅓/78 RPM changer mounting
75457	Washer—Felt washer between knob and channel marker escutcheon

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

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