

Most - Often - Needed

1963

VOLUME R-23

RADIO
DIAGRAMS

and Servicing Information



Compiled by

M. N. BEITMAN

VOLUME R-23

SUPREME PUBLICATIONS

PRICE **\$2⁵⁰**

Most - Often - Needed

1963

Volume R-23

RADIO
DIAGRAMS
and Servicing Information



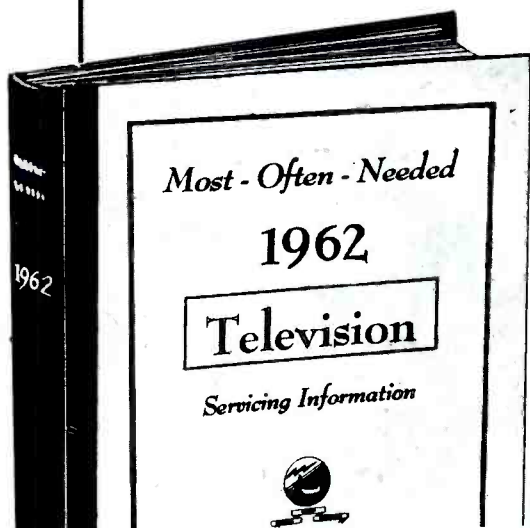
Compiled by
M. N. BEITMAN

SUPREME PUBLICATIONS

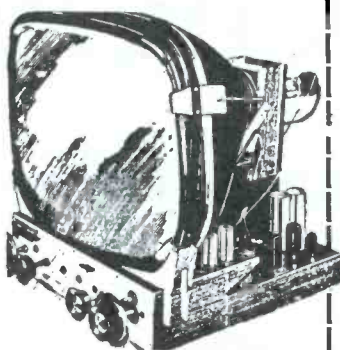
Supreme Publications for Faster Radio-Television Repairs

COVERS ALL POPULAR SETS

Here is your service data for faster, easier TV repairs. Lowest priced. Best by comparison. *Supreme* TV manuals have all needed service material on every popular TV set. Helpful, practical, factory-prepared data that will really make TV servicing easy for you. Benefit and save with these amazing values in service manuals. Only \$3 per large volume. Used by 184,000 wise servicemen for faster repairs. Join them; begin to make TV repairs easily and quickly.



The repair of any TV set is simple with **Supreme Television** service manuals. Every set is covered in a practical manner to simplify trouble-shooting and repair. With this help find toughest faults in a jiffy. Most \$3 TV volumes cover a whole year.



RADIO Manuals

Your best source for all needed RADIO diagrams and service data. Covers everything from most recent 1962 radios to pre-war old-timers; home radios, stereo, combinations, transistor portables, FM. Every manual has large schematics, all needed alignment facts, printed boards, voltages, trimmers, dial stringing, and hints. Volumes are big, 8 1/2 x 11 inches, about 190 pages. See coupon at right for list of SUPREME popular radio service manuals ▶

NO-RISK ORDER COUPON

TELEVISION SERVICE MANUALS

Supreme TV manuals are best for faster, easier TV repairs. Lowest priced. Factory data on practically all sets. Complete circuits, all needed alignment facts, wiring board views, waveforms, voltages, production changes, and double-page schematics. Only \$3 per large annual manual. Check volumes wanted.

- New Additional 1962 Television Servicing Manual . . . \$3.
- Early 1962 Television Servicing Manual, only \$3.
- 1961 TV Manual, \$3. 1960 TV Manual, \$3.
- Additional 1959 TV, \$3. Early 1959 TV, \$3.
- 1958 TV Manual, \$3. Additional 1957 TV, \$3.
- Early 1957 Television, \$3. 1956 TV Manual, \$3.
- Additional 1955 TV, \$3. Early 1955 TV, \$3.
- 1954 TV, \$3. 1953 TV, \$3. 1952 TV, \$3.
- 1951 TV, \$3. Master Index to all Manuals, 25¢

RADIO DIAGRAM MANUALS

Here are low-priced radio manuals that simplify repairing. Cover everything from most recent 1962 radios to pre-war old-timers; home radios, stereo, combinations, transistor portables, FM, auto sets. Large schematics, all needed alignment facts, printed boards, voltages, dial stringing, hints. Volumes are big, 8 1/2 x 11", about 190 pages, each.

\$2⁵⁰

- 1962, 1961, 1960, 1959, 1958, 1957,
- 1956, 1955, 1954, 1953, 1952, 1951,
- 1950, 1949, 1948, 1947, 1946, 1942,
- 1941, 1940, 1926-38 PRICE EACH, \$2.50

SUPREME PUBLICATIONS

1760 Balsam Road Highland Park, ILL.

Rush today TV and Radio manuals checked in no-risk order form of this ad. Send postpaid, I am enclosing full price. You guarantee my complete satisfaction or my money back.

Name: _____

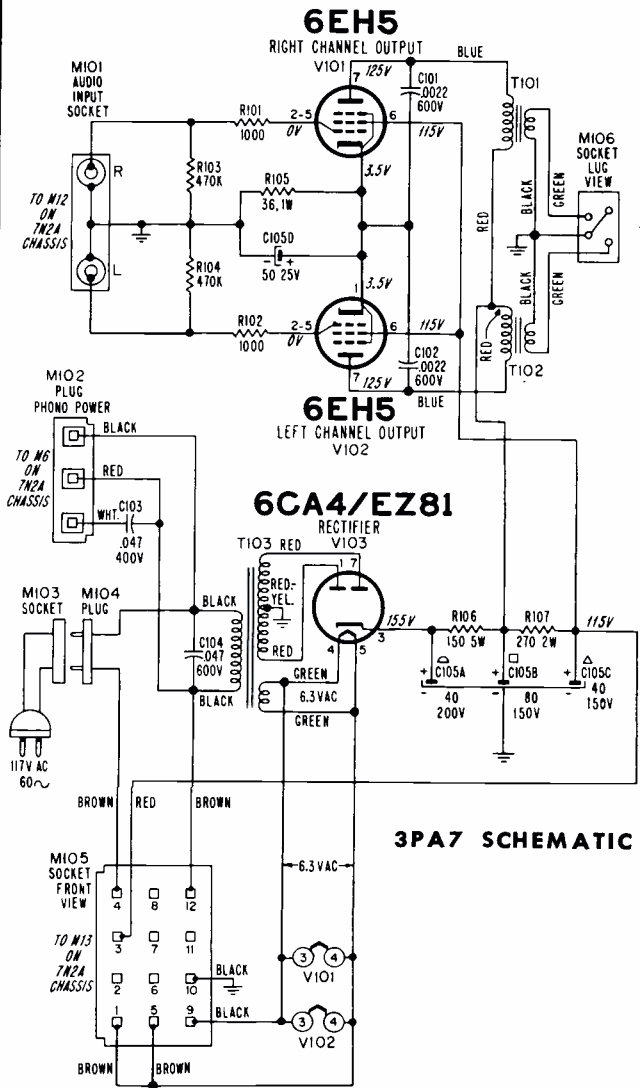
Address: _____

City: _____ State: _____

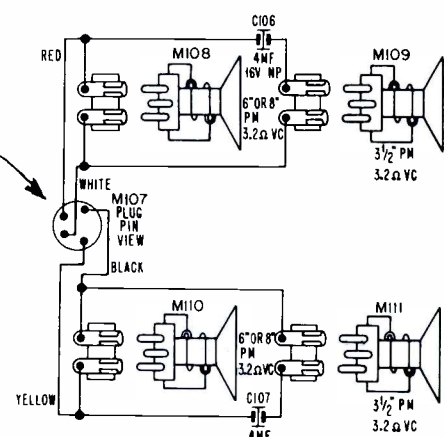
ADMIRAL

7N2, 7N2A Tuner, 3PA7 Amplifier
 Used in Models Y4461, A, Y4462, A,
 Y4463, A, Y4481, A, Y4482, A,
 Y4483, A, and Y4499, A.

Service material on pages 3 through 5

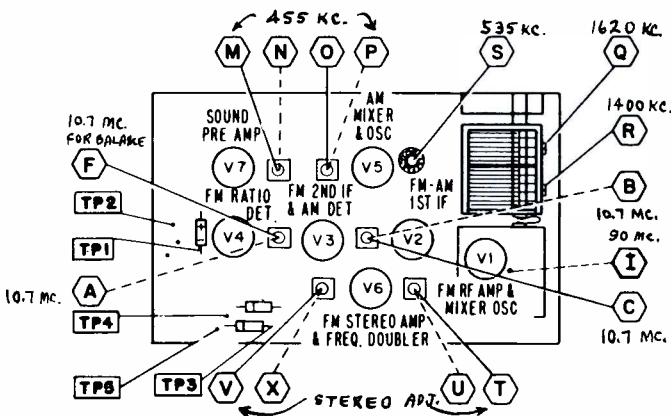
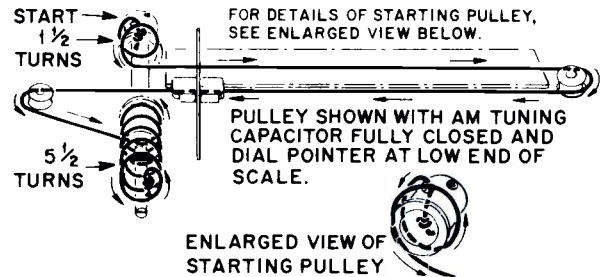


3PA7 SCHEMATIC

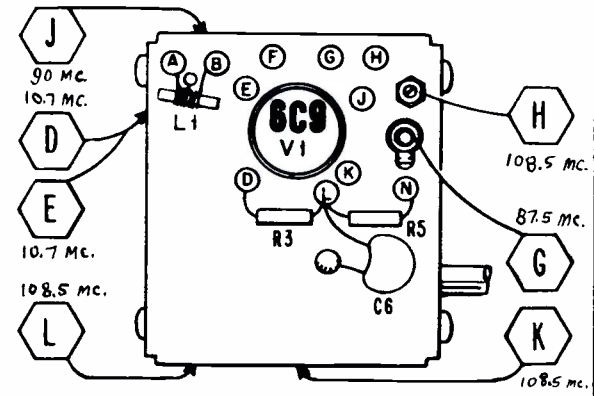


- NOTES:
 1. ALL VOLTAGES TAKEN WITH TUNER CONNECTED ±10%
 2. RED DOT SPEAKER TERMINAL SHOWN AS SOLID LINE.

DIAL STRINGING PROCEDURE

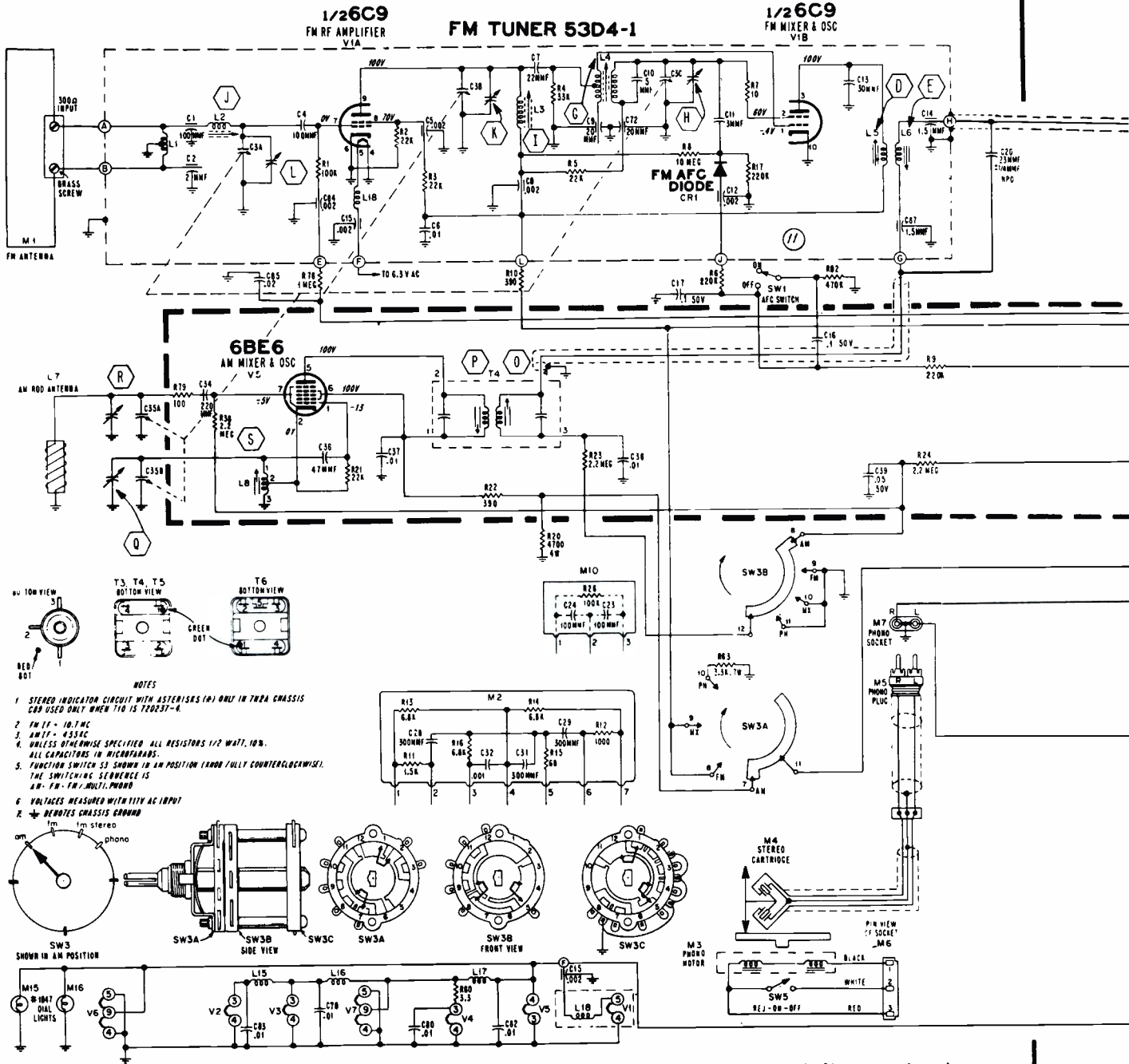


TOP VIEW OF 7N2A CHASSIS
 ADJUSTMENTS INDICATED BY DASHED LINES ARE UNDER CHASSIS



TOP VIEW OF FM TUNER SHOWING ALIGNMENT LOCATIONS
 D is located at rear of tuner.
 E is accessible through hole for D. E is the slug nearest the escutcheon.
 I is accessible through a hole in the bottom of the chassis (See chassis layout at left).

ADMIRAL Model 7N2A FM-AM Stereo Radio Tuner
(Diagram across pages 4 and 5, other data page 3)



SERVICING FM STEREO

Trouble shooting can be accomplished by making voltage measurements without a signal. Signal tracing is possible with an oscilloscope and an FM stereo generator applying a pilot signal to the antenna. Signal tracing is also possible by injecting a 19KC CW signal at pin 7 of V6A.

7N2 SCHEMATIC

The 7N2A schematic shown above can be used for servicing the 7N2 chassis if you will note the following exceptions: the 7N2 does not have transistor Q1, stereo indicator lamp M14, rectifier CR4 and other associated wiring and com-

ponents of the FM Stereo Indicator circuit.

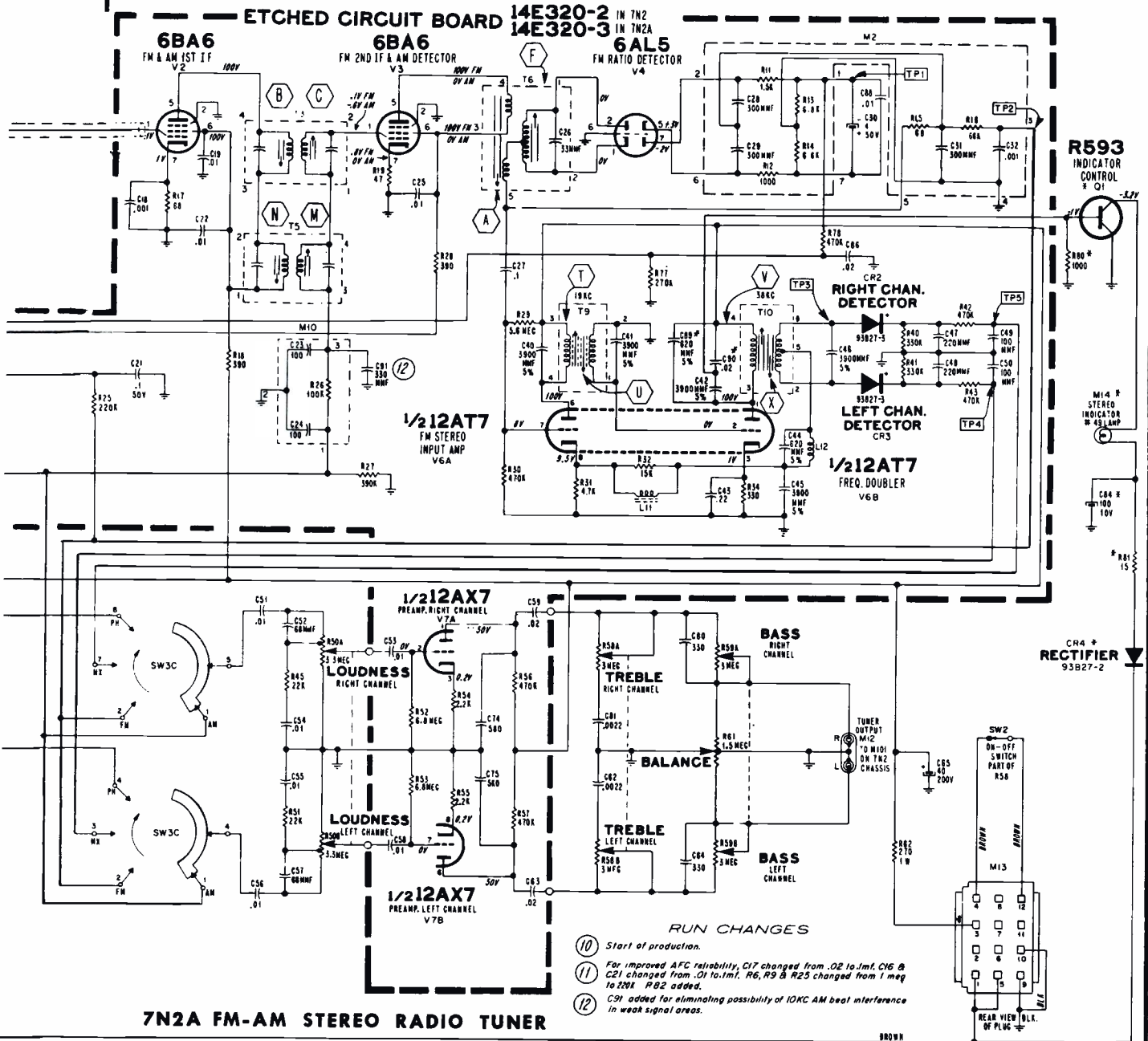
Addition of the FM Stereo Indicator circuit to the 7N2 chassis is not recommended.

7N2A SCHEMATIC NOTES

1. Stereo indicator circuit with asterisks (*) only in 7N2A chassis. C89 used only when T10 is 72D237-4.
2. Unless otherwise specified: all resistors 1/2 watt, 10%, all capacitors in microfarads.
3. All voltages measured with 117V AC input.

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

ADMIRAL Model 7N2A FM-AM Stereo Radio Tuner
(Diagram across pages 4 and 5, other data page 3)



4. Function switch, S3, shown in AM position (knob fully clockwise). The switching sequence is AM - FM - FM Stereo - Phono.

5. \perp denotes chassis ground.

RUN NUMBER CHANGES

7N2 chassis are not stamped with run numbers. 7N2A chassis were stamped RUN 10 at the start of production.

The following changes were made at RUN 11 for improved AFC reliability:

C17 was changed from .02 to .1 mf, 50V ceramic.

C16 and C21 were changed from .01 to .1 mf, 50V ceramic.

R6, R9 and R25 were changed from 1 megohm to 220,000 ohms, 1/2 watt.

R82, 470,000 ohms, 1/2 watt was added.

The following change was made at RUN 12 to eliminate possibility of 10KC AM beat interference in weak signal areas:

Added C91, 330 mmf ceramic disc.

ADMIRAL 5A6 • 5B6 CHASSIS

Y3100 • Y3104 • Y3107 • Y3109 • Y3012A • Y3016A • Y3019A MODELS

34GD5

OUTPUT
V4

18FY6

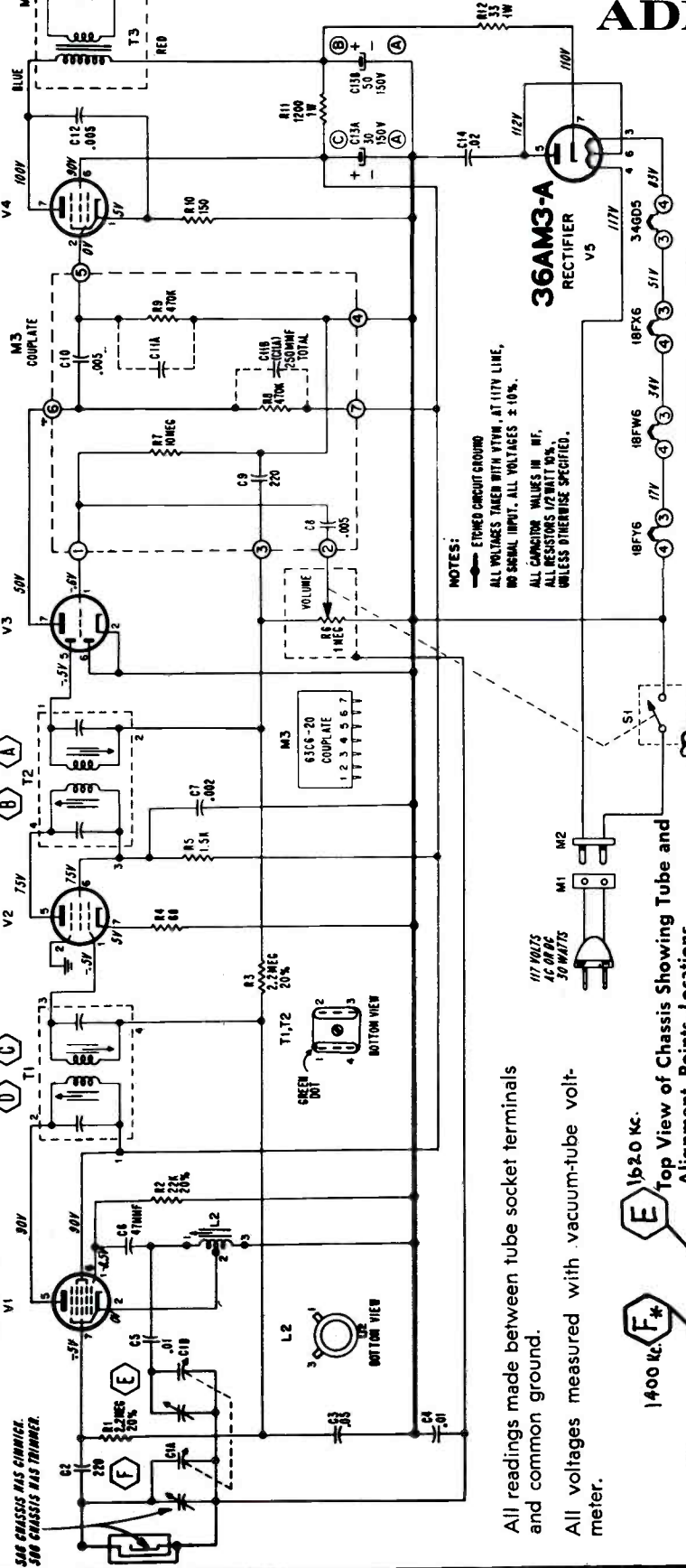
DETECTOR-AVC-AMP
V3

18FW6

IF
V2

18FX6

CONVERTER
V1



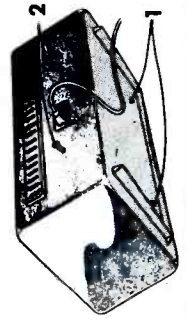
NOTES:
 - ETCHED CIRCUIT GROUND
 - ALL VOLTAGES TAKEN WITH VTVM, AT 117V LINE, NO SIGNAL INPUT. ALL VOLTAGES ± 10%.
 - ALL CAPACITOR VALUES IN MF, ALL RESISTOR VALUES IN Ω, UNLESS OTHERWISE SPECIFIED.

CHASSIS REMOVAL

Models Y3100, Y3104, Y3107 and Y3109 Only
 One chassis mounting screw is accessible only after removing the tuning knob. The other is accessible after removing the cabinet back.
 The cabinet back is held in four slots in the cabinet so is easily removed without the use of tools.

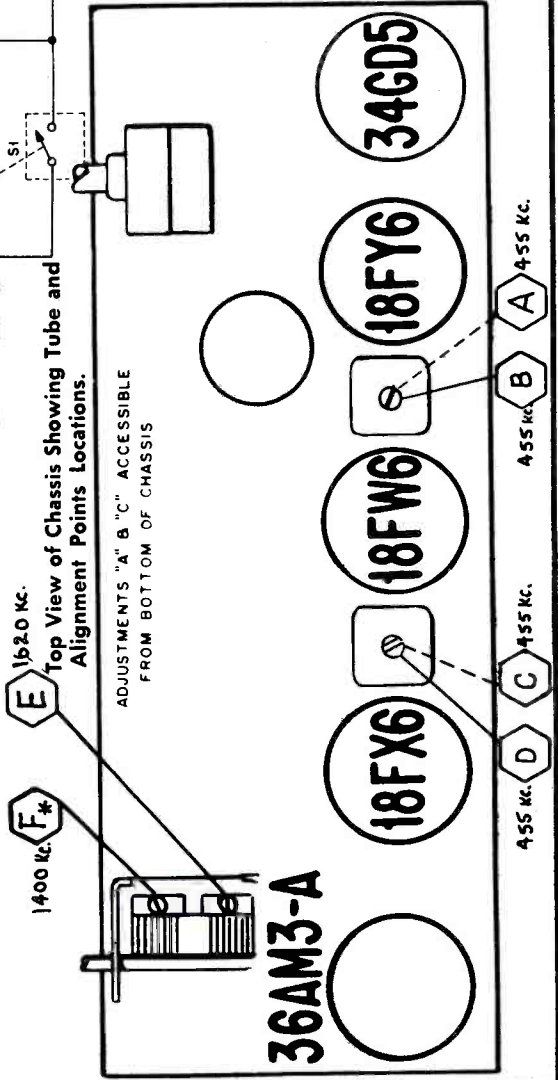
In Models Y3012A, Y3016A, and Y3019A Only, the cabinet is removed as shown in figure

LOOSEN THESE SCREWS UNTIL HELD ONLY BY LAST THREADS THEN PUSH AGAINST SCREWS WITH THUMBS. REMOVE SCREWS AFTER CHASSIS SLIDES FORWARD REMOVE THESE SCREWS



All readings made between tube socket terminals and common ground.

All voltages measured with vacuum-tube voltmeter.



*FOR CHASSIS WITHOUT TRIMMER "F" ADJUST GIMMICK ON LOOP ANT.

TO REMOVE CHASSIS FOR SERVICING TUBES

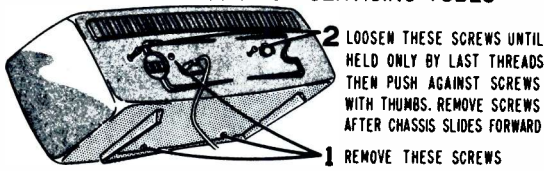


Figure 2. Rear View of Cabinet Showing Chassis Mounting Screws.

ADMIRAL

CHASSIS 5F6
MODELS Y3051A-Y3053A Y3058A

CHASSIS REMOVAL

1. Tilt cabinet forward and remove the two screws located on the bottom of cabinet. Also remove the center screw on the back. (The one just above the line cord socket.) See Figure 2.
2. Loosen the two screws remaining at the back until held only by their last threads. Apply enough pressure to these loosened screws with the thumbs, to break the AC interlock Connection inside the cabinet.
3. Remove screws completely and allow chassis, with attached front panel, to slide forward. Make certain that the Time Set Knob at the rear clears the hole provided in the cabinet back.

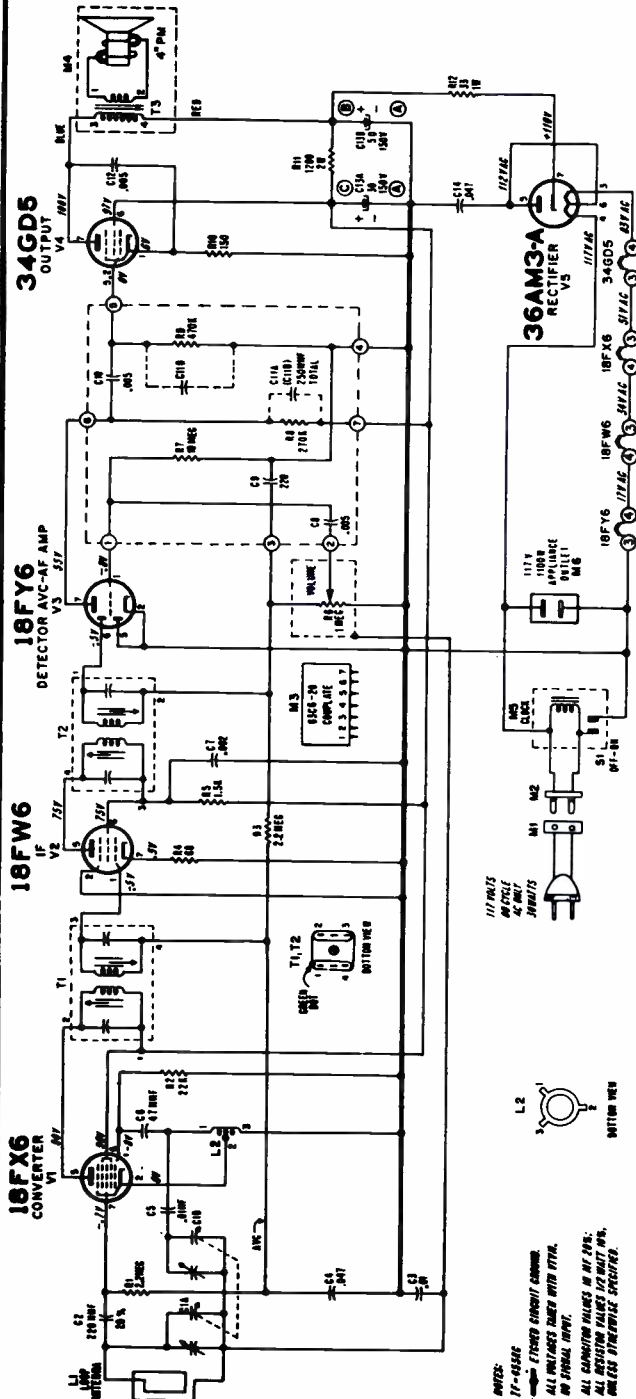
REMOVING THE CLOCK

1. Remove the cabinet (rear section) as instructed under Chassis Removal.
2. Remove the two knobs from the front and the four pushbuttons by pulling them straight off.
3. Remove the front crystal by pushing inward and then outward on the tabs located along the top and bottom edges. Remove the tuning and volume indicator discs.
4. Remove screw under tuning dial indicator.
5. Remove two screws holding volume control to cabinet front.
6. Remove two screws holding antenna brackets to cabinet front.
7. Remove the two nuts mounting the clock to the front panel. The clock is removable through front, after unsoldering leads.

GENERAL

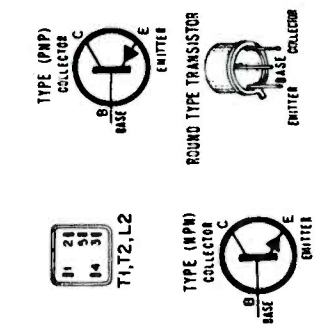
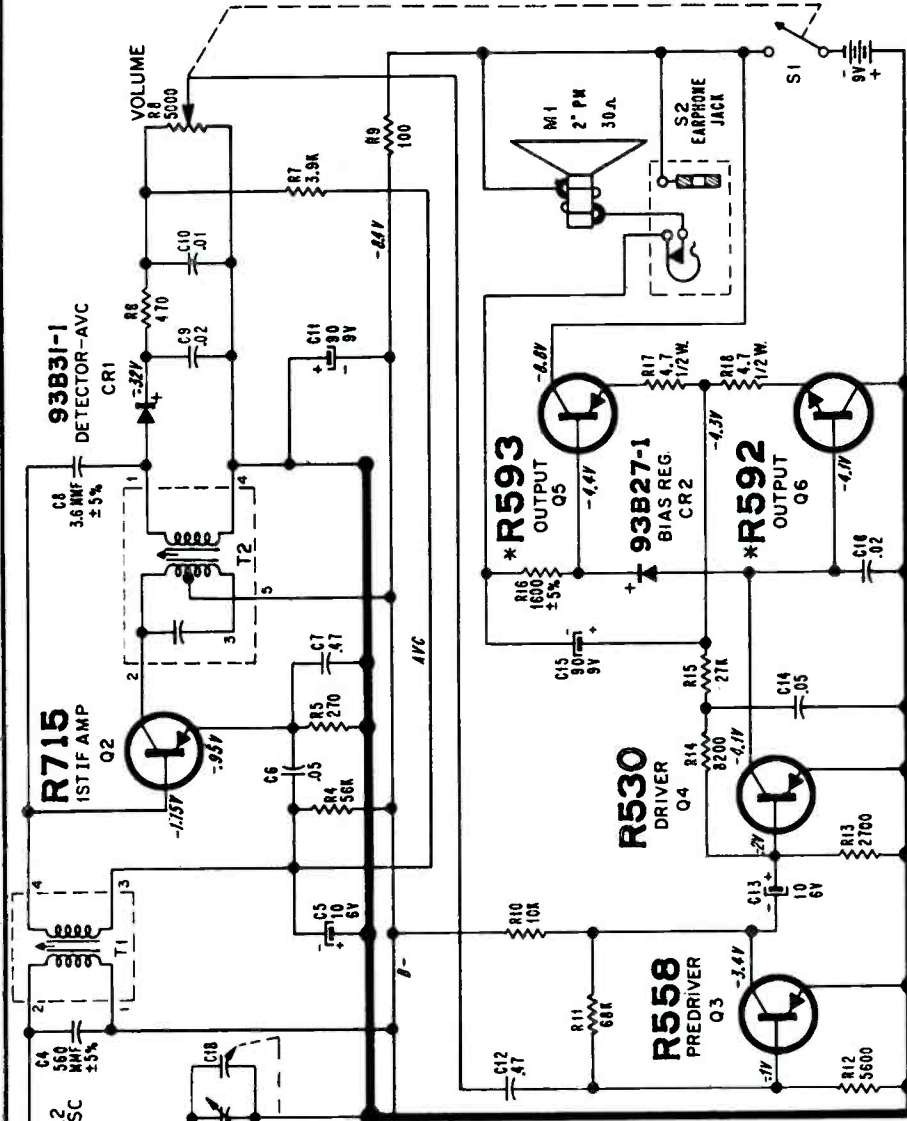
When the radio is "off," pushing the SLEEP button will cause the radio to play from 10 minutes up to an hour depending upon the number of times the knob is pushed; once for 10 minutes, twice for 30 minutes, 3 times for 45 minutes and 4 times for 1 hour. The fifth time is a neutral position that cancels any previous setting.

"SNOOZE ALARM"—When the buzzer alarm starts, it is possible to catch 40 winks more sleep by simply pushing down the SLEEP button. The buzzer will then be silent for a period of approximately 10 minutes for one push of the button, 30 minutes for two, 45 minutes for three, 60 minutes for four. *Note:* The fifth push is a neutral position which cancels the previous setting and turns the buzzer back "on".



ADMIRAL

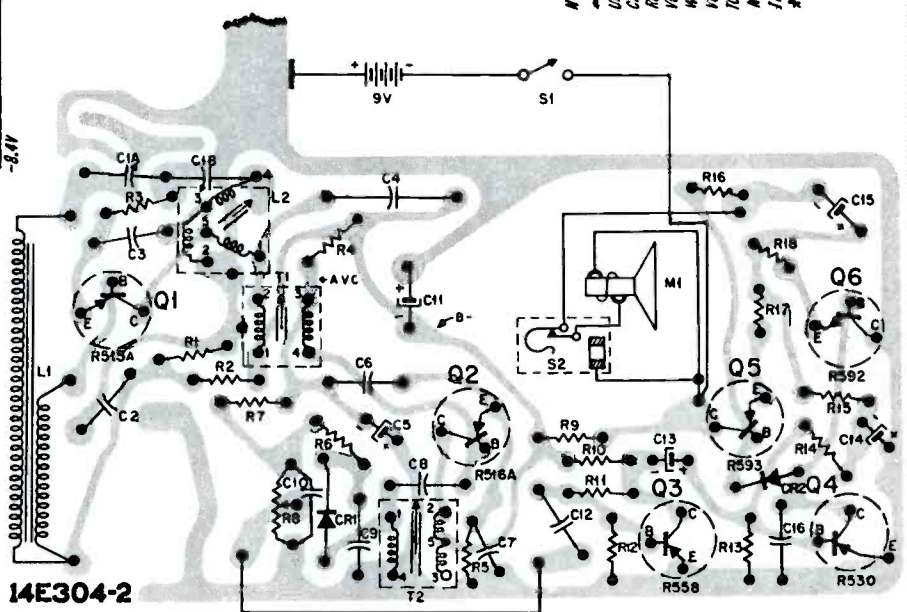
MODEL	CHASSIS
Y2231 Y2231GPS	6M3C
Y2232 Y2232GPS	
Y2238 Y2238GPS	6M3D
Y2301GP Y2301GPS	
Y2303GP Y2303GPS	
Y2307GP Y2307GPS	
Y2223A	6M3E



NOTES:
 * COMMON ETCHED CIRCUIT GROUND.
 UNLESS OTHERWISE SPECIFIED:
 CAPACITOR VALUES IN MICROFARADS.
 RESISTOR VALUES IN OHMS, 1/4 WATT, 10%.
 VOLTAGE AND CURRENT READINGS TAKEN
 WITH FRESH BATTERY, NO SIGNAL,
 VOLUME CONTROL MINIMUM.
 TOTAL CURRENT DRAIN.
 NO SIGNAL - 8 - 10 MA.
 IF - 455 KC.
 * MATCHED PAIR.

Etched Circuit Layout.

14E304-2



ADMIRAL

CHASSIS 6N3
MODEL Y3203

FREQUENCY RANGE: AM 535 KC to 1600 KC

FM 88 MC to 108 MC

INTERMEDIATE FREQUENCY: AM 455 KC

FM 10.7 MC

panel section visible through the elongated chassis mounting holes. A small elevation is provided on the section of the panel inside this slot for this purpose. After the AC interlock connection has been broken, the chassis with front panel attached will slide forward easily and out of the rear section.

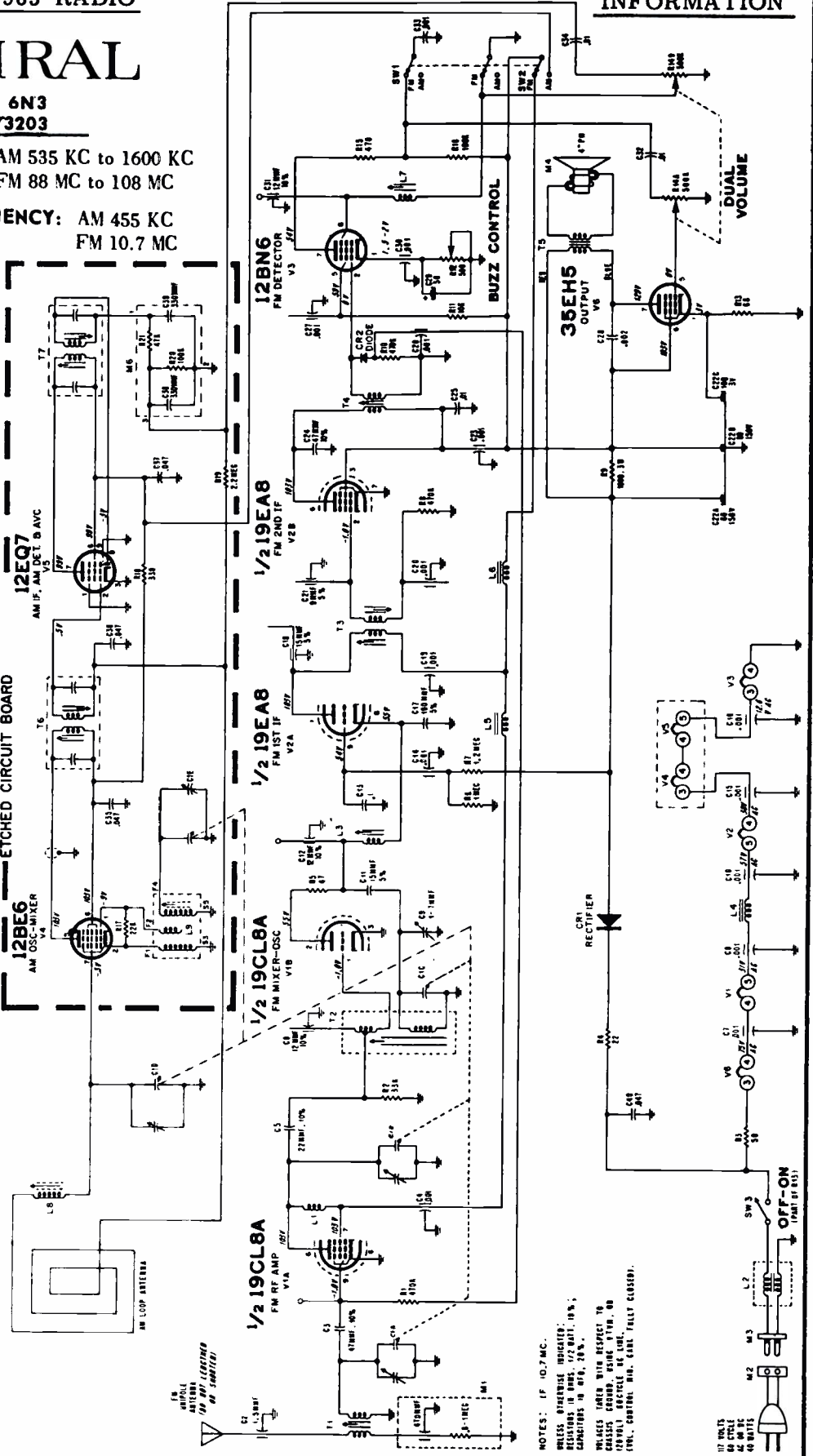
When replacing chassis into the cabinet rear, first thread the unipole antenna lead into the small hole provided in the rear of the cabinet.

CHASSIS REMOVAL

To remove the chassis from the cabinet it is necessary to remove only the rear cabinet section, since the front panel and knobs are attached to the chassis.

1. Remove two screws from the back of cabinet.
2. Remove two screws from the bottom of cabinet.
3. Turn set bottom side up and using a screw driver, force chassis forward by pushing on the front

ETCHED CIRCUIT BOARD



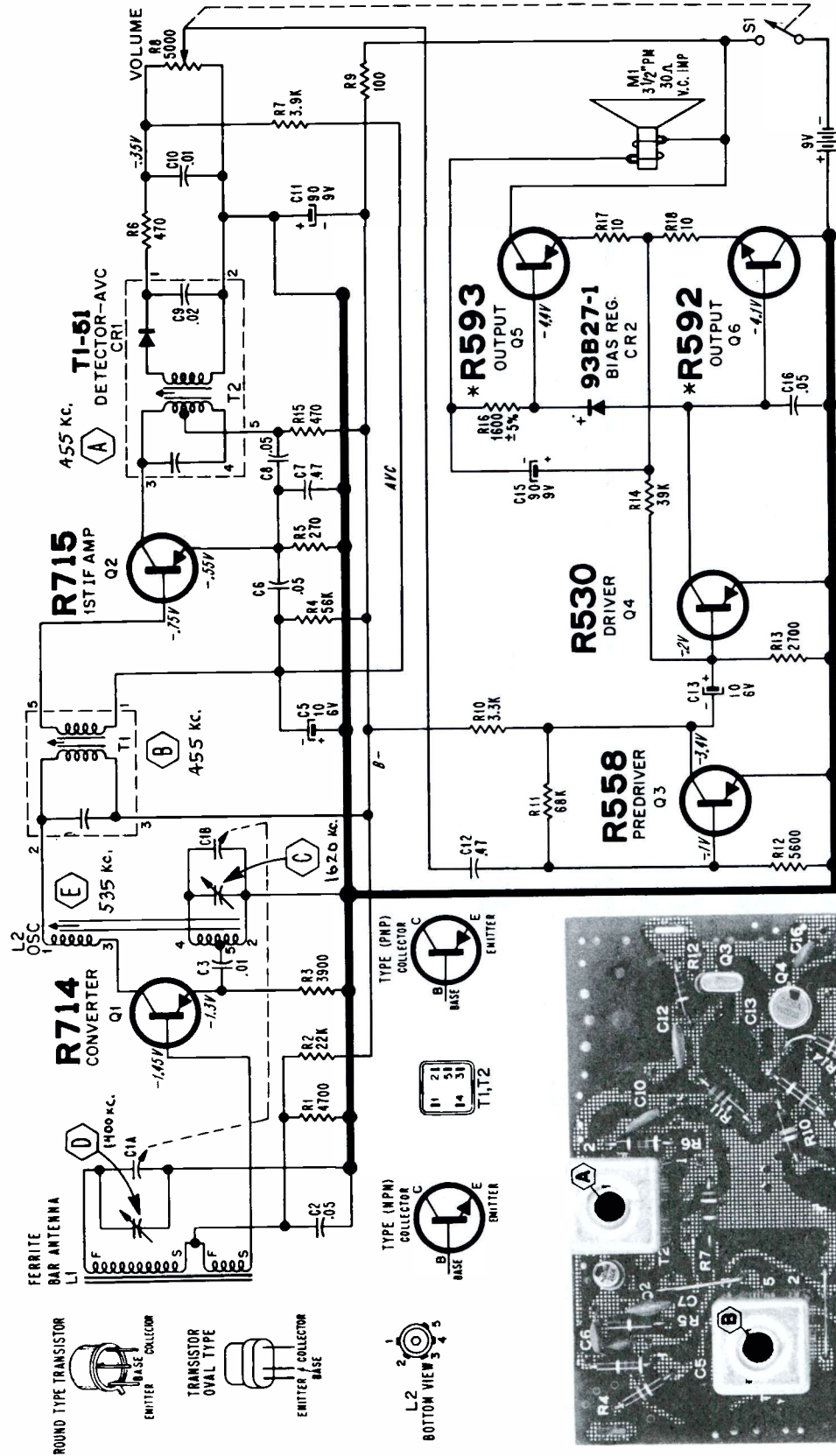
NOTES: IF 10.7 MC.
UNLESS OTHERWISE INDICATED, RESISTORS IN OHMS, CAPACITORS IN P.F., 10%.
WIRE VALUES WITH RESPECT TO CHASSIS CONNECTIONS ARE LINE, UNLESS OTHERWISE INDICATED.
PANEL CONTROLS MUST BE FULLY CLOSED.

INFORMATION

10 PUNCHES
44 CIRCLE
45 SQUARE
46 TRIANGLE
(PART OF BOX)

ADMIRAL

CHASSIS 6V3, MODELS Y2332, Y2333, Y2338



FREQUENCY RANGE: Standard broadcast band; 535 to 1620 KC.

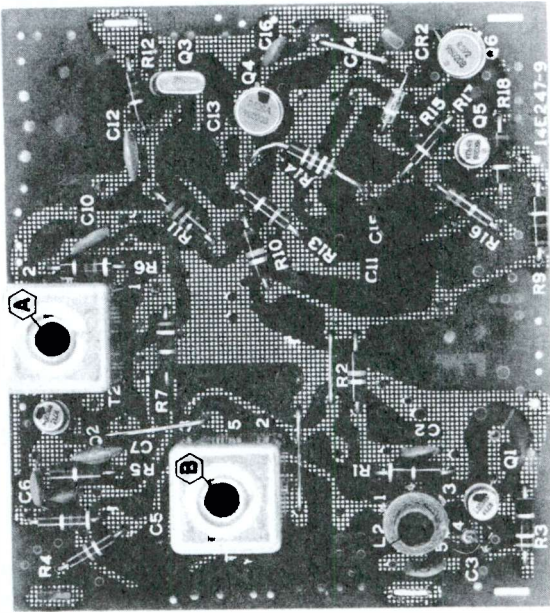
INTERMEDIATE FREQUENCY: 455 KC.

POWER SUPPLY: One 9 Volt battery (Eveready 246 or equivalent).

ADMIRAL

MODEL: Y2330 Series
CHASSIS: 6V3

- NOTES:
- COMMON ETCHED CIRCUIT GROUND.
 - UNLESS OTHERWISE SPECIFIED:
 - CAPACITOR VALUES IN MICROFARADS.
 - RESISTOR VALUES IN OHMS: 1/2 WATT, 10%.
 - VOLTAGE AND CURRENT READINGS TAKEN WITH FRESH BATTERY, NO SIGNAL.
 - VOLUME CONTROL MINIMUM.
 - TOTAL CURRENT DRAIN.
 - NO SIGNAL - 8 - 10 MA.
 - IF - 455 KC.
 - * MATCHED PAIR.

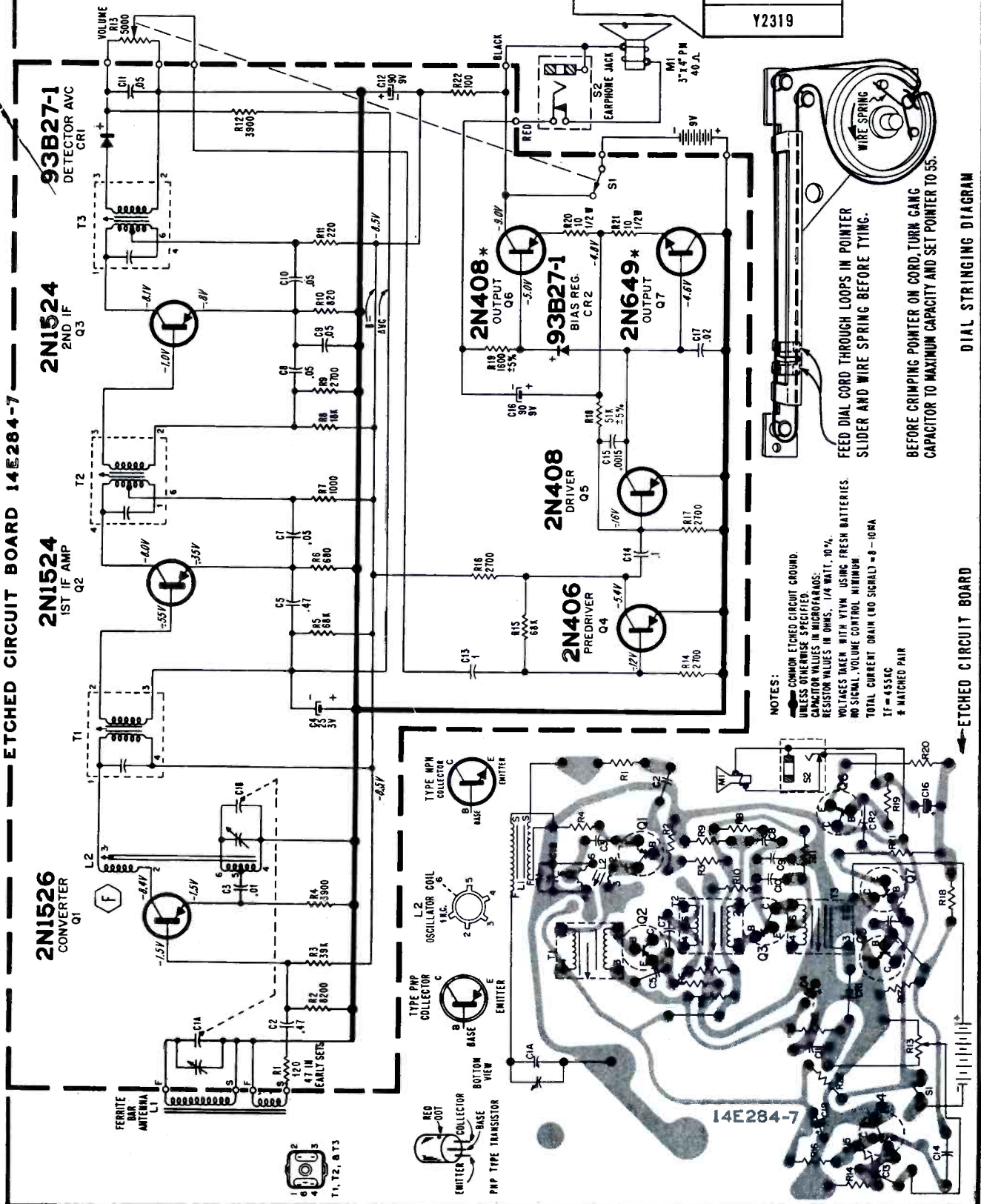


TOP VIEW OF ETCHED CIRCUIT BOARD SHOWING ALIGNMENT POINTS.

C AND D TRIMMERS ON GANG CAPACITOR

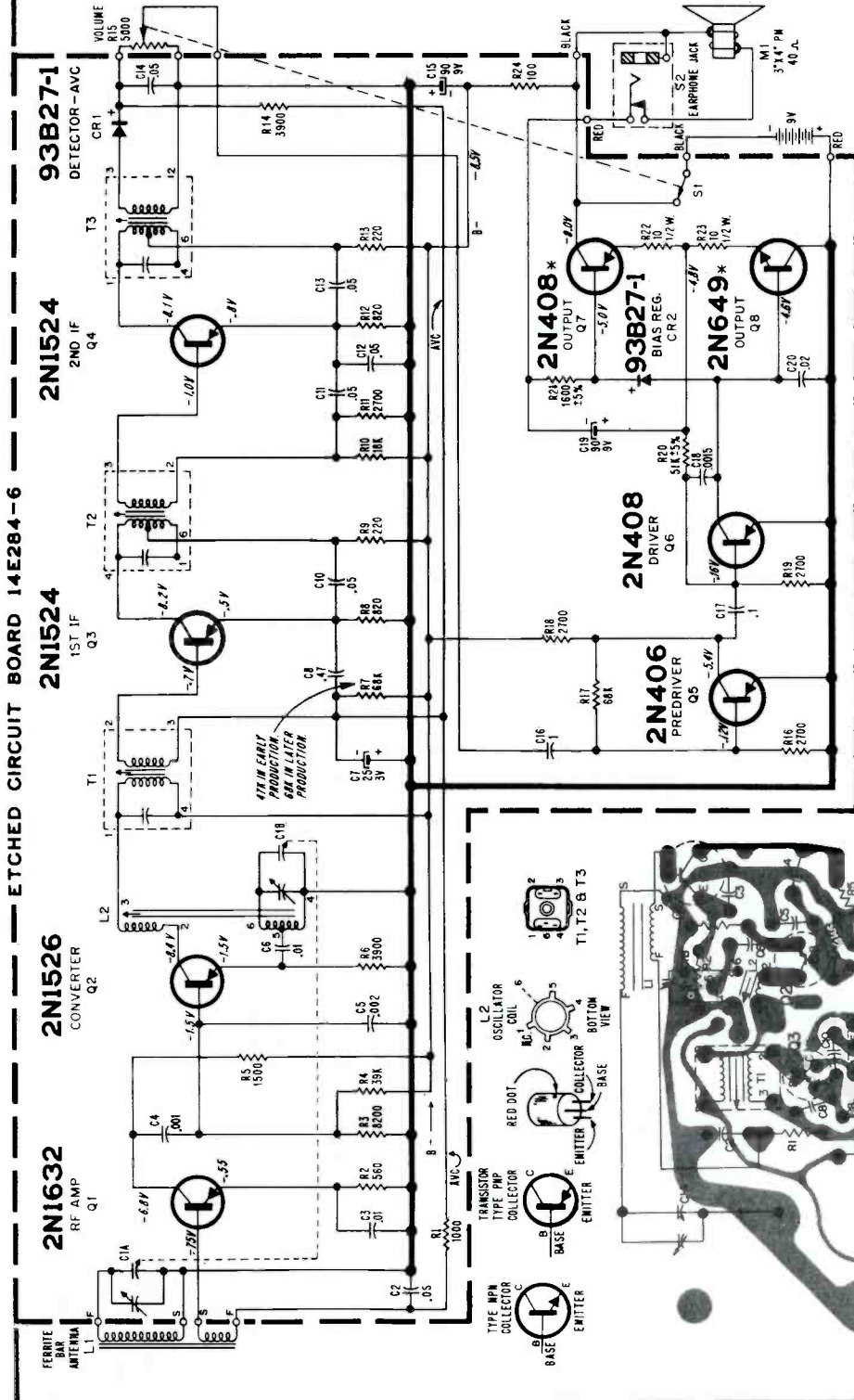
ADMIRAL

CHASSIS	MODEL
7K2	Y2311
	Y2312
	Y2319



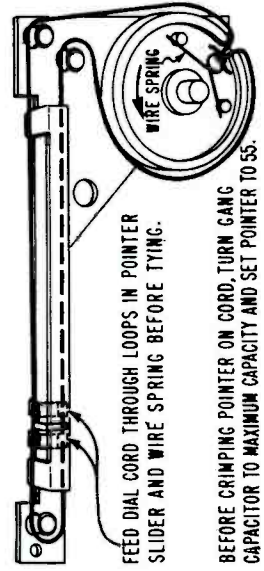
ADMIRAL

MODEL	COLOR	CHASSIS
Y2321	Black	8F2
Y2323	White	
Y2327	Brown	

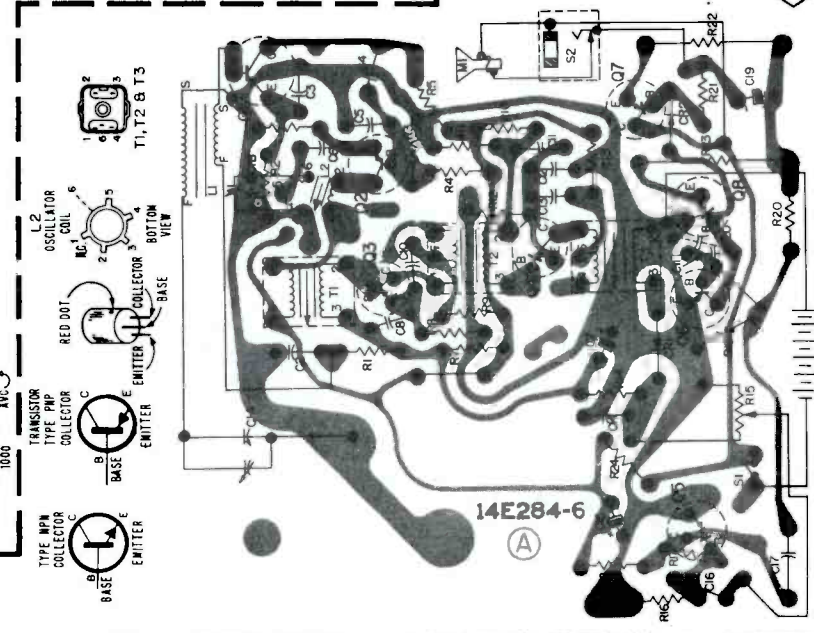


INTERMEDIATE FREQUENCY: 455 KC.

- NOTES:
- Common Etched Circuit Ground.
 - Unless otherwise specified:
 - Capacitor values are in microfarads.
 - Resistor values in ohms, 1/4 watt, 10%.
 - Voltage and current readings taken with fresh batteries, no signal.
 - Volume control minimum, IF-455 KC.
 - Total current drain no signal-9-11 mA.
 - * Matched pair.



DIAL STRINGING DIAGRAM

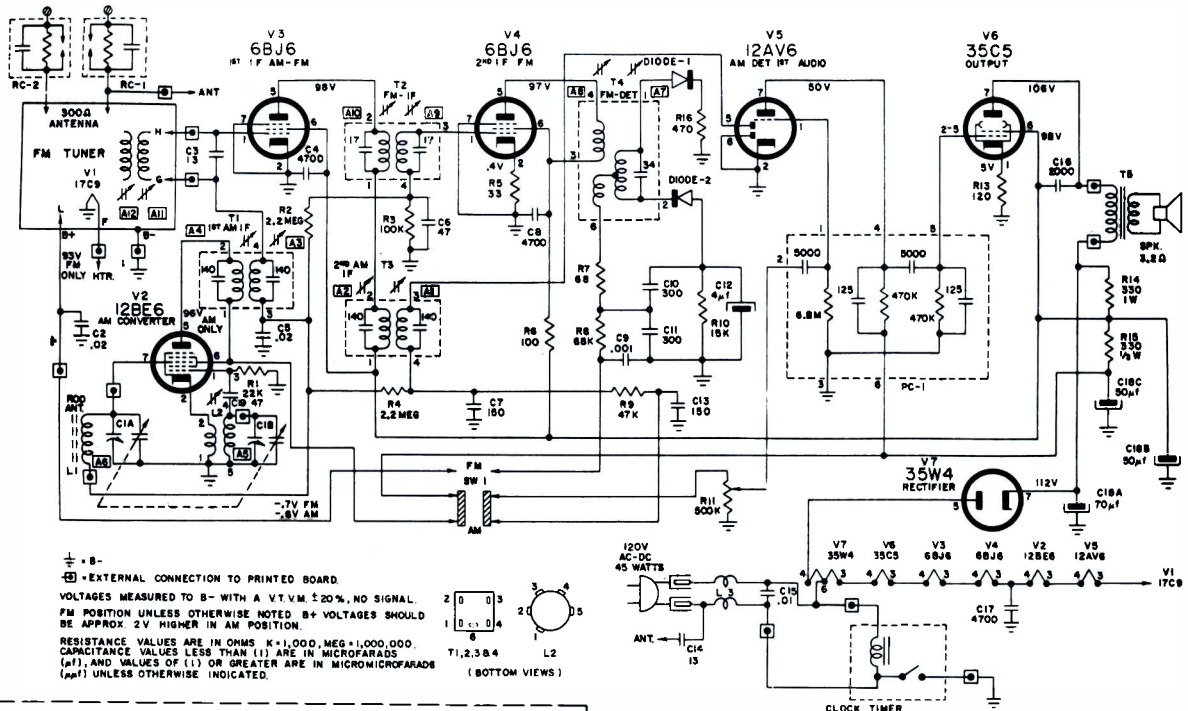


ETCHED CIRCUIT BOARD

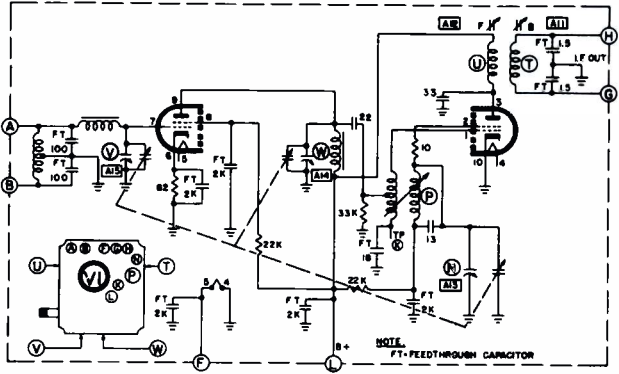
Arvin

MODELS 42R25 — 42R29

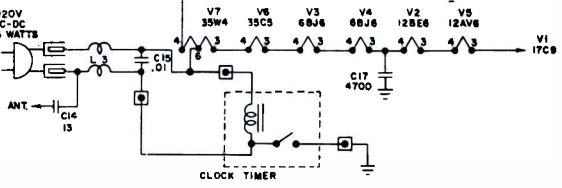
Model 42R77 is electrically identical and has in addition Appliance Outlets.
 Model 42R63 has Outlets, omits Clock, and is electrically identical in circuitry.



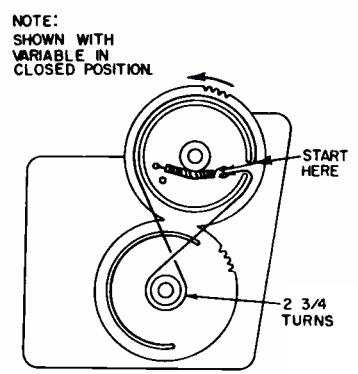
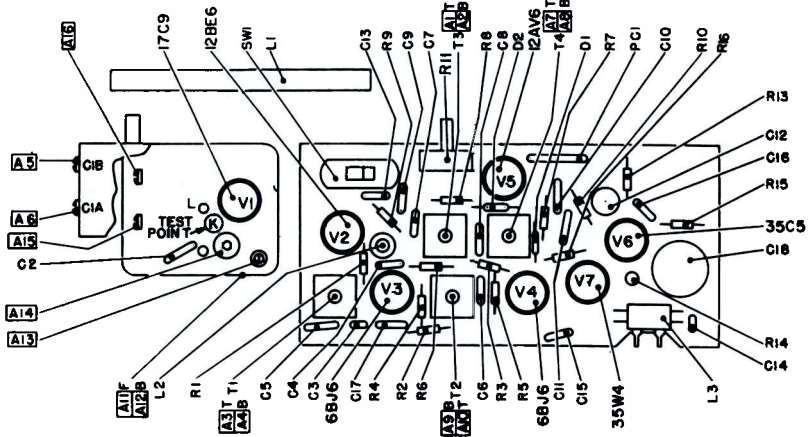
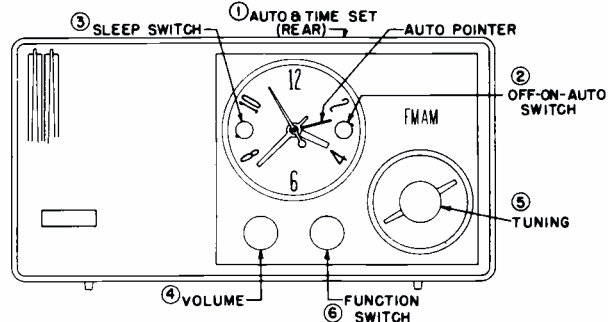
⊕ - B -
 ⊕ - EXTERNAL CONNECTION TO PRINTED BOARD.
 VOLTAGES MEASURED TO B - WITH A V.T.M. ±20%, NO SIGNAL.
 FM POSITION UNLESS OTHERWISE NOTED B+ VOLTAGES SHOULD BE APPROX. 2V HIGHER IN AM POSITION.
 RESISTANCE VALUES ARE IN OHMS K=1,000, MEG=1,000,000.
 CAPACITANCE VALUES LESS THAN (1) ARE IN MICROFARADS (μF), AND VALUES OF (1) OR GREATER ARE IN MICROMICROFARADS (μμF) UNLESS OTHERWISE INDICATED.



TUNER SCHEMATIC



AM I. F. 455 KC.
 FM I. F. 10.7 MC.



STRINGING DIAGRAM

Arvin

MODEL 62R09

CODE 1. 66601

TR-1
2N212
CONVERTER

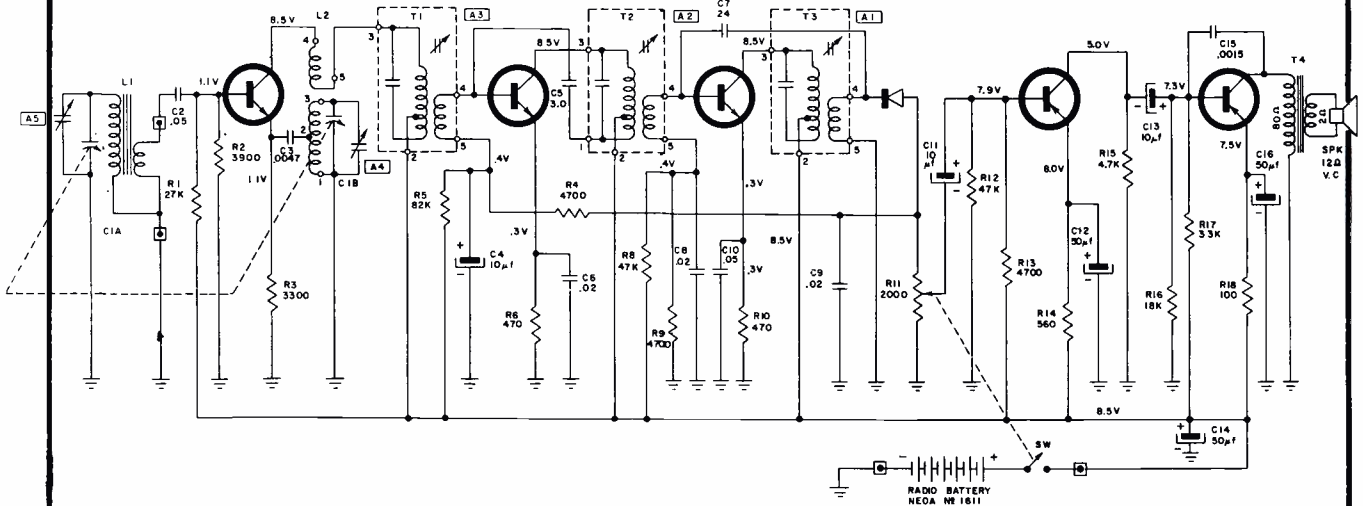
TR-2
2N94
1st I.F.

TR-3
2N233A
2nd I.F.

D-1
IN295
DIODE

TR-4
S95201
AUDIO DRIVER

TR-5
S95204
AUDIO OUTPUT



CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (μ f), AND VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS (μ mf) EXCEPT WHERE NOTED

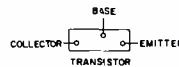
VOLTAGE READINGS TO COMMON GROUND ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS WITH TUNING CAPACITOR CLOSED AND VOLUME CONTROL AT MAXIMUM CLOCKWISE ROTATION

RESISTANCE VALUES ARE IN OHMS; K=1000.

⊕ COMMON GROUND SYMBOL

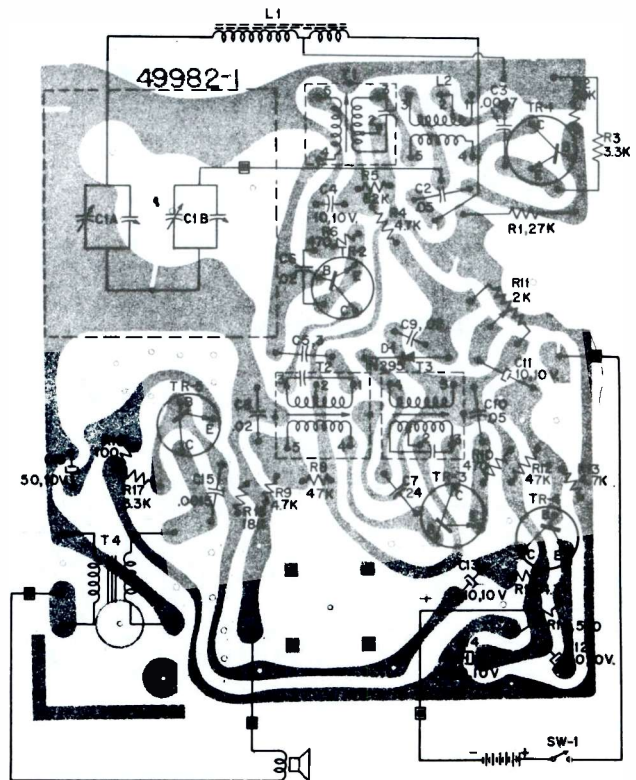
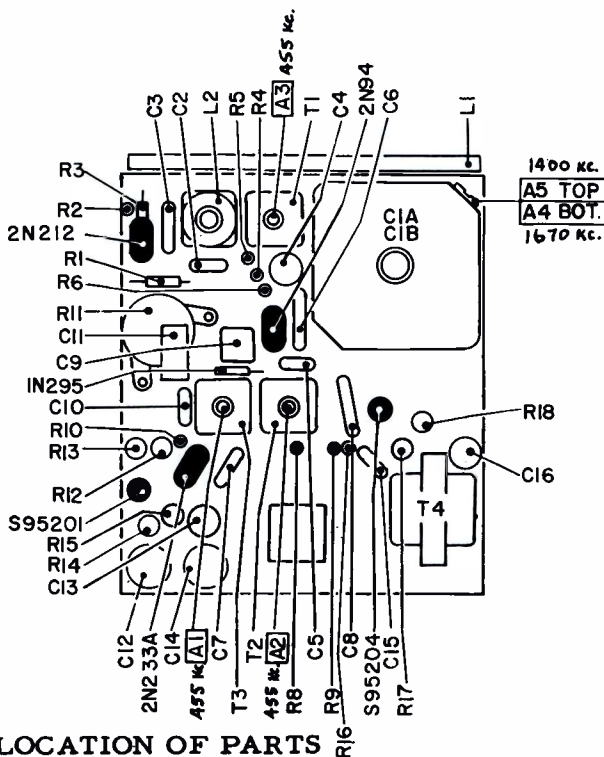
□ EXTERNAL CONNECTION TO PRINTED CIRCUIT

TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS, 10 TO 16 MA



LF TRANSFORMER & OSCILLATOR COIL (BOTTOM VIEW)

SIGNAL TEST POINTS	TEST FREQUENCY	SERIES CAPACITOR TO GENERATOR	INPUT FOR 5 MW OUTPUT (1.25V ACROSS 12 Ω)
TR-3 BASE	455 KC	.05 μ f	500 μ V
TR-2 BASE	485 KC	.05 μ f	50 μ V
TR-1 BASE	455 KC	.05 μ f	2 μ V
STANDARD LOOP	1000 K C	STANDARD LOOP	200 μ V / M

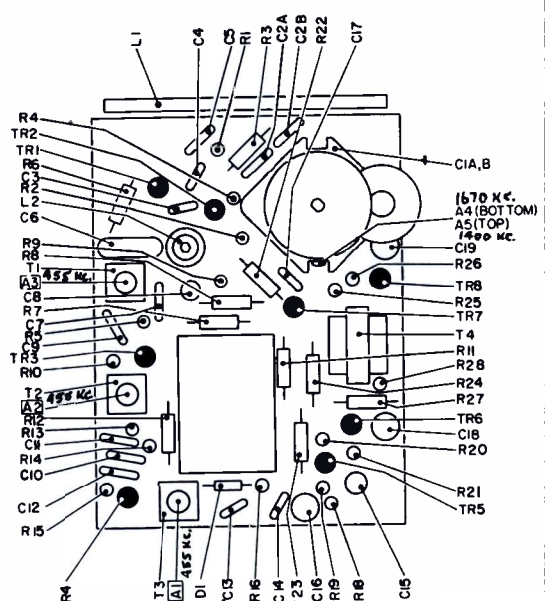
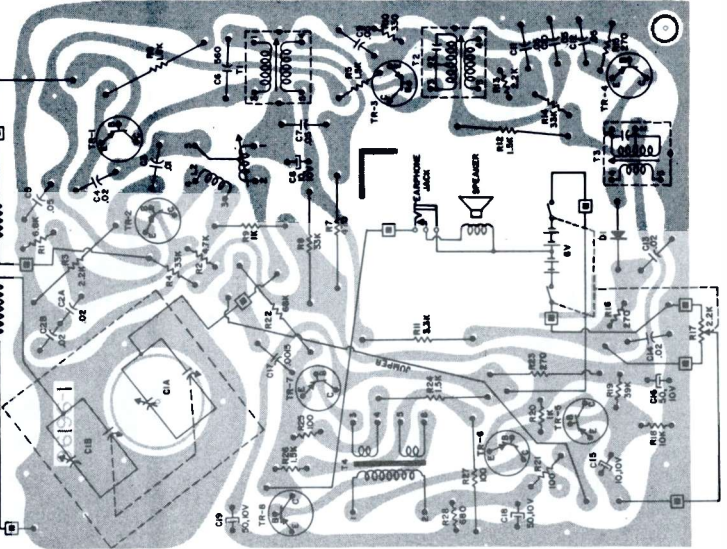
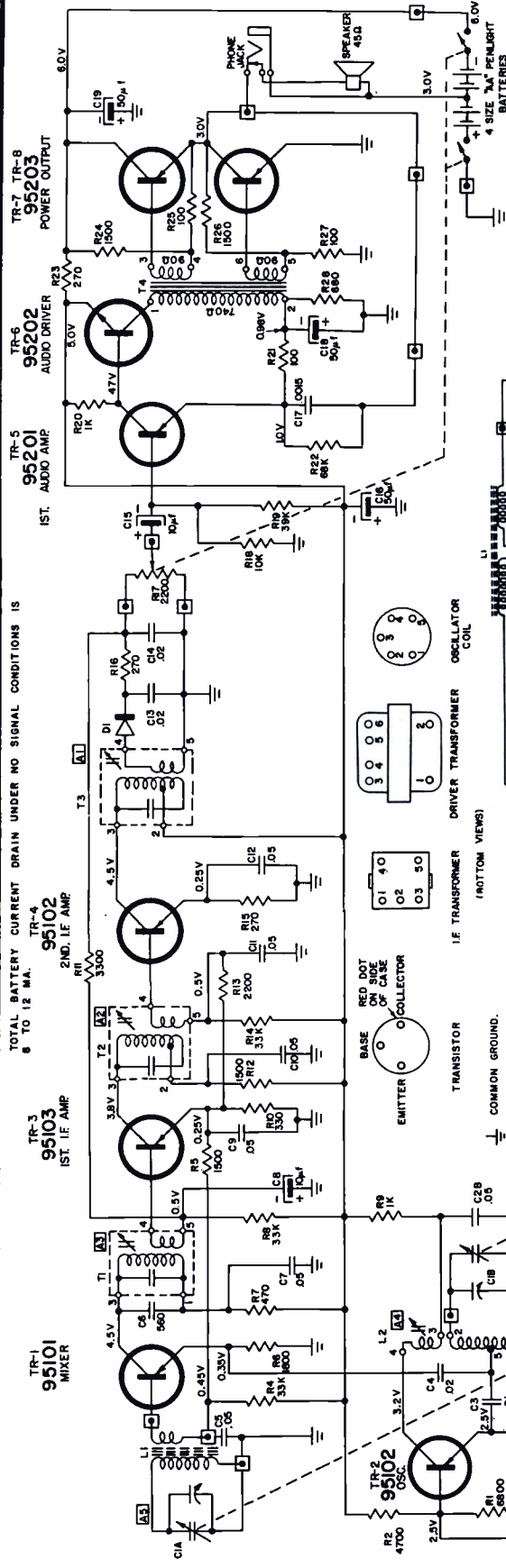


LOCATION OF PARTS



MODELS 62R48
62R49

CODE 1. 66401

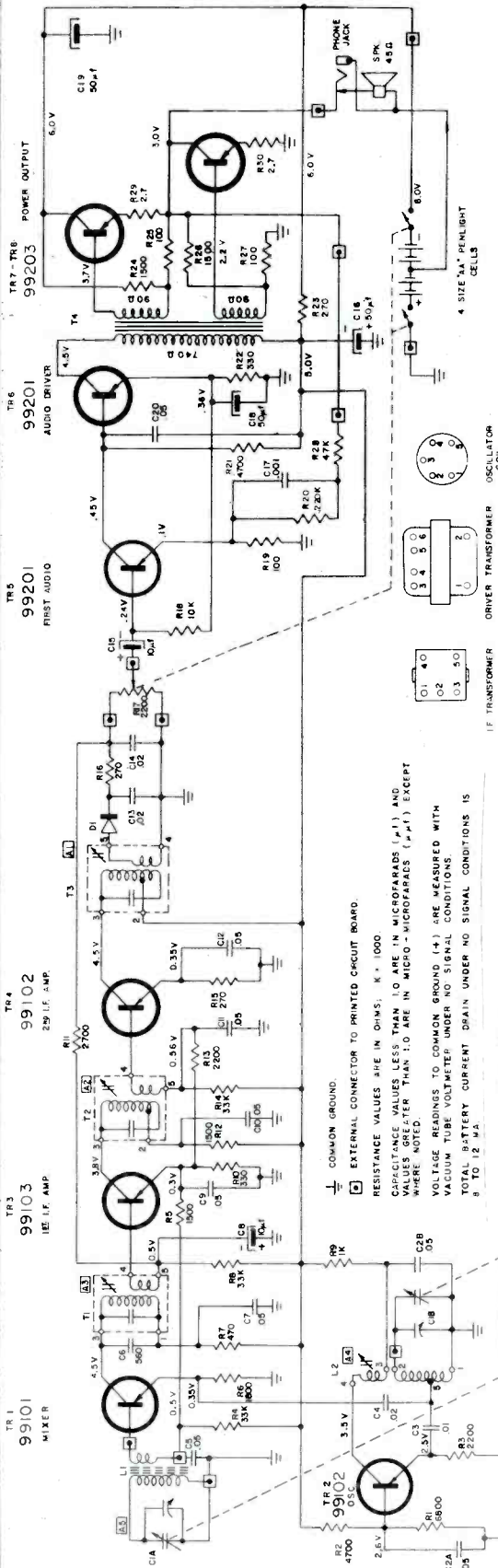




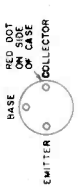
MODELS 62R48
62R49

CODE 1.66402

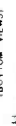
SIGNAL TEST POINTS	TEST FREQUENCY	SERIES CAPACITOR TO GENERATOR	INPUT FOR 50 MW OUTPUT (1.5V ACROSS P.S.D.)
TR-4 BASE	455 KC	05 μ F	650 μ V
TR-3 BASE	455 KC	05 μ F	30 μ V
TR-1 BASE	455 KC	05 μ F	8 μ V
STANDARD LOAD	1000 KC	STANDARD	200 μ V μ M



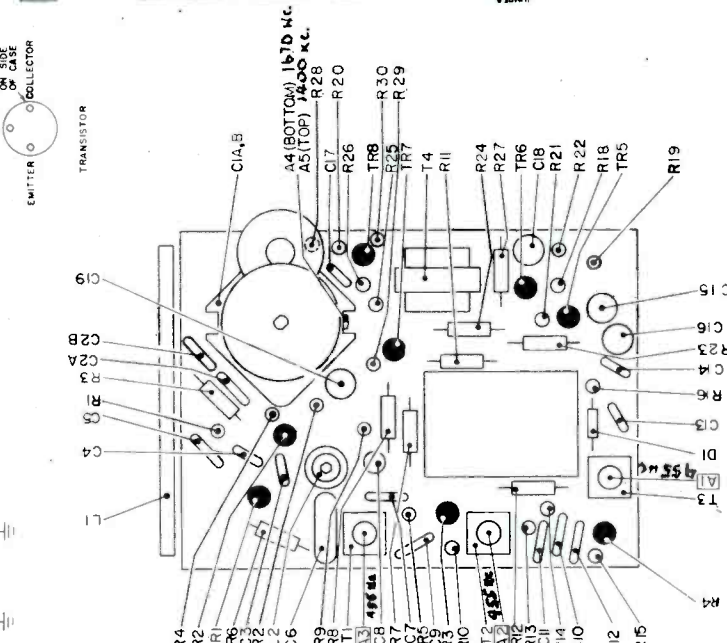
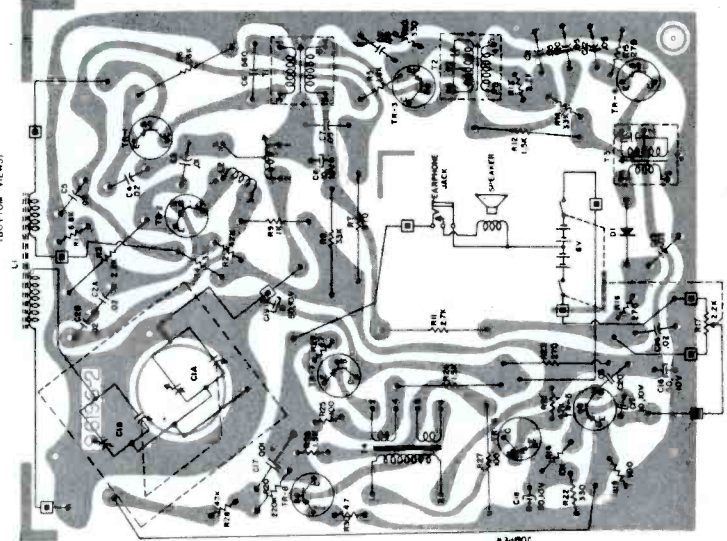
EXTERNAL CONNECTOR TO PRINTED CIRCUIT BOARD.
RESISTANCE VALUES ARE IN OHMS; K = 1000
CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (μ F) AND
VALUES GREATER THAN 1.0 ARE IN MICRO- MICROFARADS ($\mu\mu$ F) EXCEPT
WHERE NOTED.
VOLTAGE READINGS TO COMMON GROUND (4) ARE MEASURED WITH
VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS.
TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS IS
8 TO 12 MA.



IF TRANSFORMER DRIVER TRANSFORMER
OSCILLATOR COIL

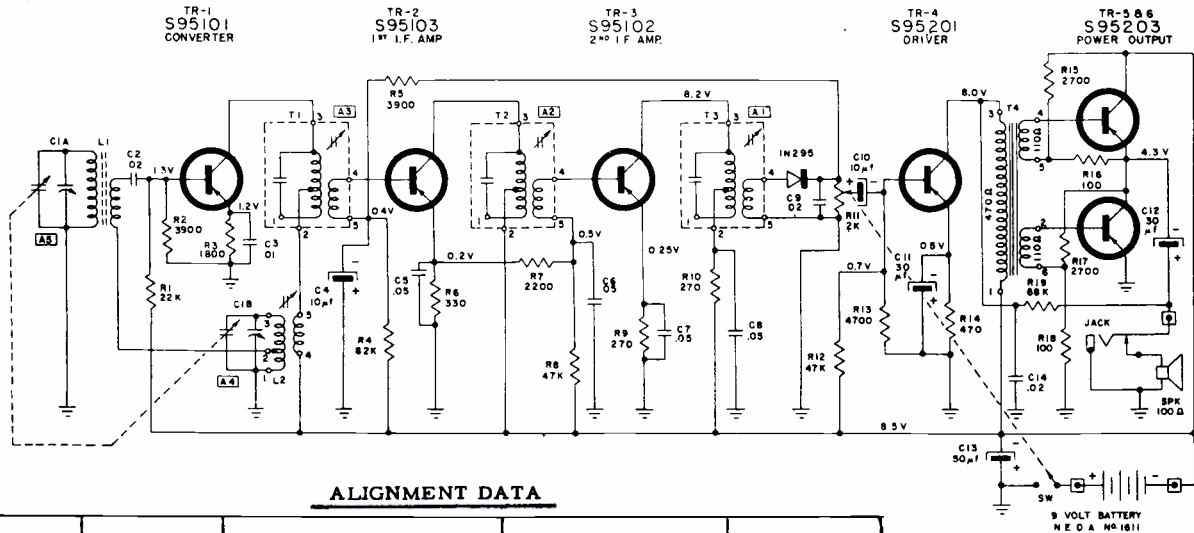


1 (BOTTOM VIEW)



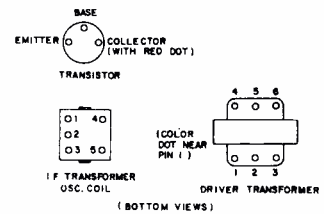
Arvin

MODELS 62R65, 62R69, CODE 1.66102

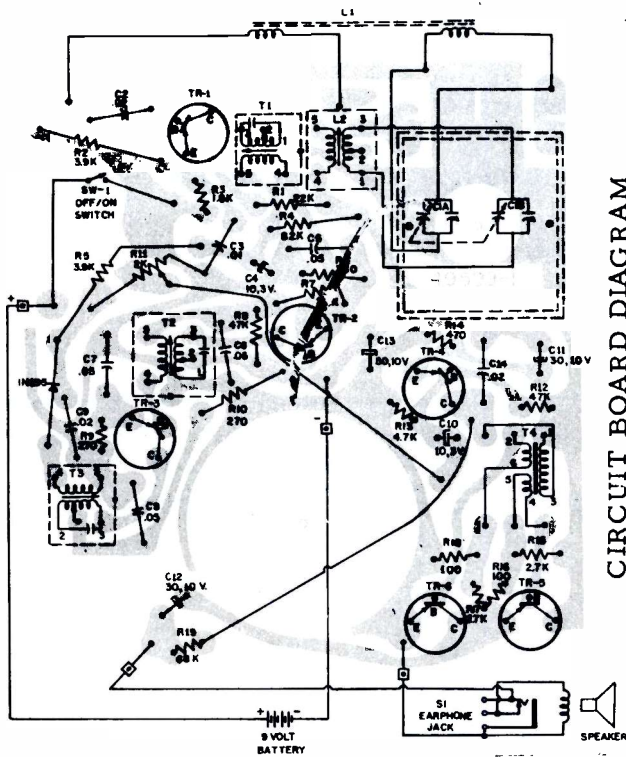


ALIGNMENT DATA

Position of Variable	Frequency of Generator	Dummy Antenna	Generator Output Connection	Trimmer Adj. in order shown for Max. Output	Functions of Trimmer
Open	455 Kc	.05 mf.	C1A	A1 (Top of T3) A2 (Top of T2) A3 (Top of T1) A4	I. F. I. F. I. F. Oscillator Antenna
Open	1670 Kc		*Test Loop	A5	
1400 Kc	1400 Kc		*Test Loop		
600 Kc	600 Kc		*Test Loop	Check Point	

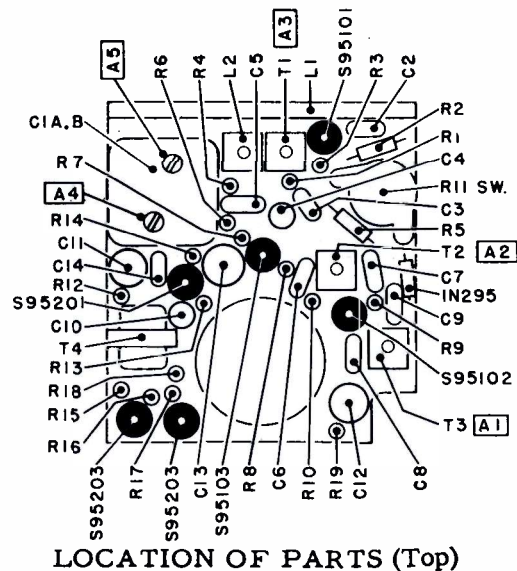


*Standard Hazeltine Test Loop Model 1150 or 3 turns of wire 6" in diameter placed about one foot from the receiver antenna.



CIRCUIT BOARD DIAGRAM

⊕ - COMMON GROUND
 □ - EXTERNAL CONNECTION TO PRINTED CIRCUIT
 RESISTANCE VALUES ARE IN OHMS; K = 1000.
 CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (μF) AND VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS (μμF) EXCEPT WHERE NOTED.
 VOLTAGE READINGS TO COMMON GROUND (+) ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS.
 TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS, 7 TO 10 MA.

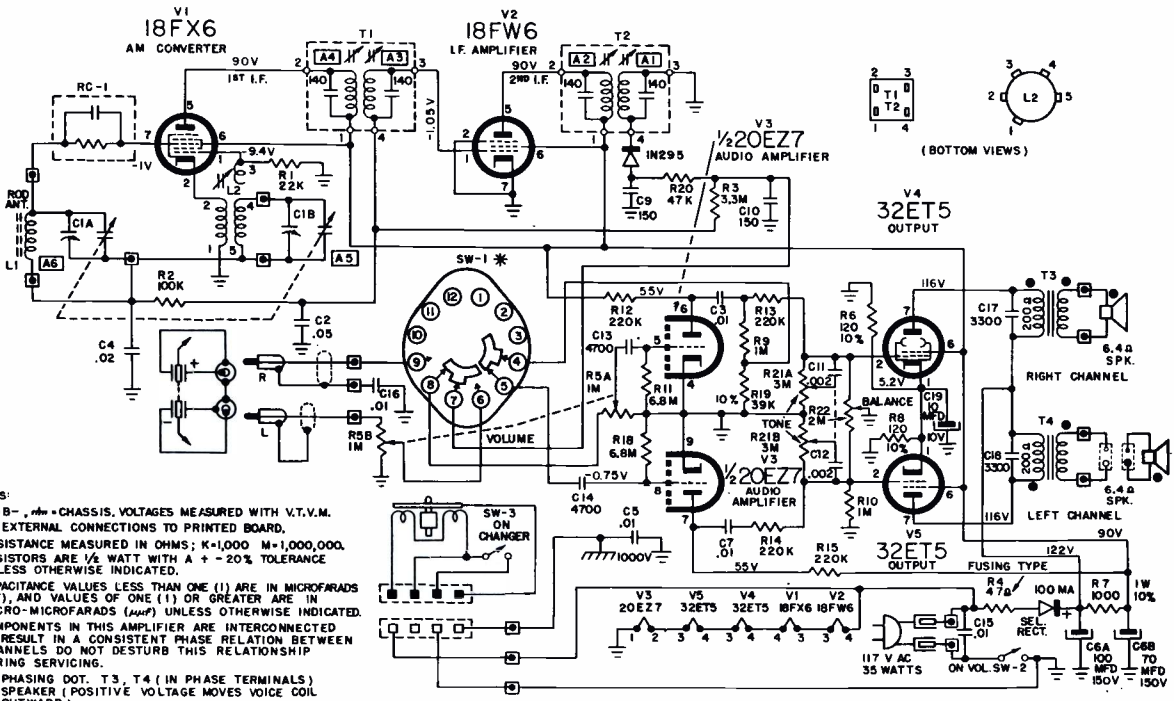


LOCATION OF PARTS (Top)

Arvin

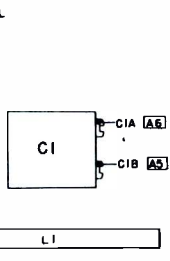
MODEL 72P25

CODE 1.69701



NOTES:

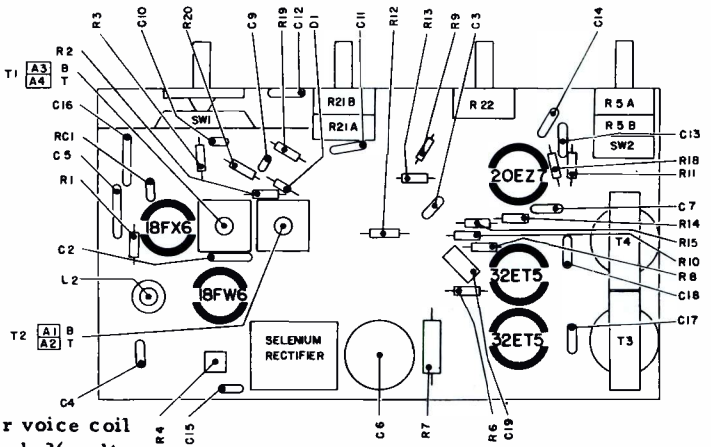
1. * - B - = CHASSIS. VOLTAGES MEASURED WITH V.T.V.M.
2. □ - EXTERNAL CONNECTIONS TO PRINTED BOARD.
3. RESISTANCE MEASURED IN OHMS; K=1,000 M=1,000,000.
4. RESISTORS ARE 1/2 WATT WITH A + - 20% TOLERANCE UNLESS OTHERWISE INDICATED.
5. CAPACITANCE VALUES LESS THAN ONE (1) ARE IN MICROFARADS (μF), AND VALUES OF ONE (1) OR GREATER ARE IN MICRO-MICROFARADS (μμF) UNLESS OTHERWISE INDICATED.
6. COMPONENTS IN THIS AMPLIFIER ARE INTERCONNECTED TO RESULT IN A CONSISTENT PHASE RELATION BETWEEN CHANNELS DO NOT DESTURB THIS RELATIONSHIP DURING SERVICING.
7. • - PHASING DOT. T3, T4 (IN PHASE TERMINALS) SPEAKER (POSITIVE VOLTAGE MOVES VOICE COIL OUTWARD).
- * 8. SELECTOR SWITCH VIEWED FROM FRONT IN FULL COUNTER CLOCKWISE, RADIO POSITION - 60° DETENT.



ALIGNMENT PROCEDURE

PRELIMINARY:

- Output meter connection Across speaker voice coil
- Output meter reading to indicate 500 milliwatts . . 1.26 volts
- Connection of generator ground lead Floating ground
- Generator modulation 30% 400 cycles
- Position of Volume Control Fully clockwise



Position of Variable	Frequency of Generator	Dummy Antenna	Generator Output Connection	Trimmers Adjusted in Order Shown* for Maximum Output	Function of Trimmer
Open	455 Kc	.05 μ fd	Pin 7 18FX6	A1, A2, A3, A4	I. F. Oscillator Antenna
Open	1670 Kc		* Test Loop	A5	
1400	1400 Kc		* Test Loop	A6	
1000	1000 Kc		* Test Loop	Fan C1A Plates	
600	600 Kc		* Test Loop	Fan C1A Plates	

*Standard Hazeltine Test Loop Model 1150 or a 6" diameter loop, composed of 3 turns of wire, placed about one foot from the set loop.
 The alignment procedure should be repeated in the original order for greatest accuracy. Always keep the output from the signal generator at its lowest possible value to make the AVC action of the receiver ineffective.

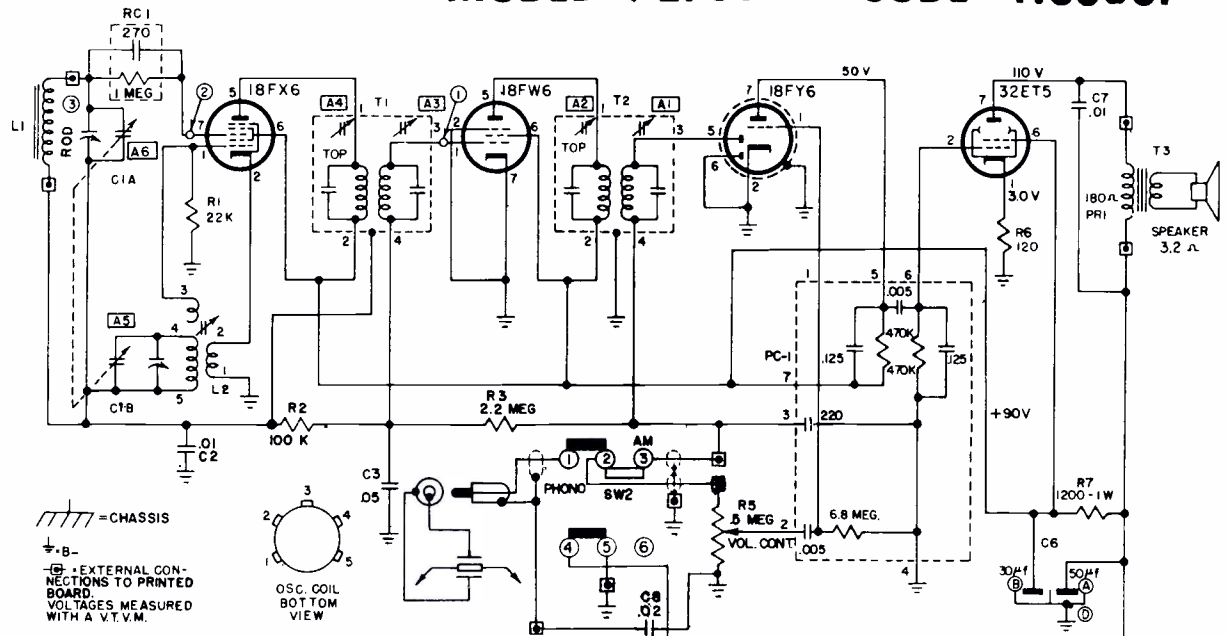
Arvin

MODEL 72P33

CODE 1.72401

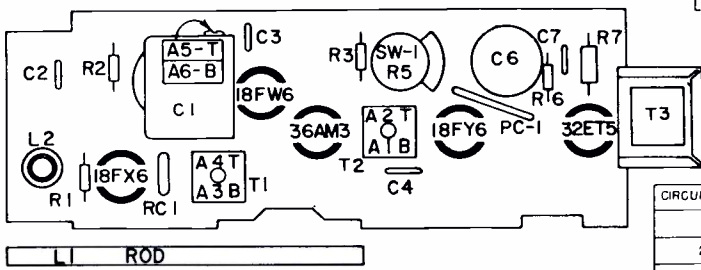
MODEL 72P03

CODE 1.68301



RESISTANCE VALUES ARE IN OHMS K=1,000 MEG=1,000,000.
CAPACITANCE VALUES LESS THAN (1) ARE IN MICROFARADS (μ f),
AND VALUES OF (1) OR GREATER ARE IN MICROMICROFARADS
(μ μ f), UNLESS OTHERWISE INDICATED.

RESISTANCE VALUES ARE IN OHMS K=1,000 MEG=1,000,000.
CAPACITANCE VALUES LESS THAN (1) ARE IN MICROFARADS (μ f),
AND VALUES OF (1) OR GREATER ARE IN MICROMICROFARADS
(μ μ f), UNLESS OTHERWISE INDICATED.



APPROXIMATE SENSITIVITIES

CIRCUIT POINT	DUMMY TO GENERATOR	INPUT FOR .05 WATT OUTPUT (1/4 VOLTS ACROSS VC)	INPUT FOR 5 WATT OUTPUT (1.0 VOLTS ACROSS VC)
1	.05μf AT 455 KC	2000μ V	5000μ V
2	.05μf AT 455 KC	6.0	150
3	STANDARD LOOP AT 1000 KC	200μ V/M	500μ V/M

ALIGNMENT PROCEDURE

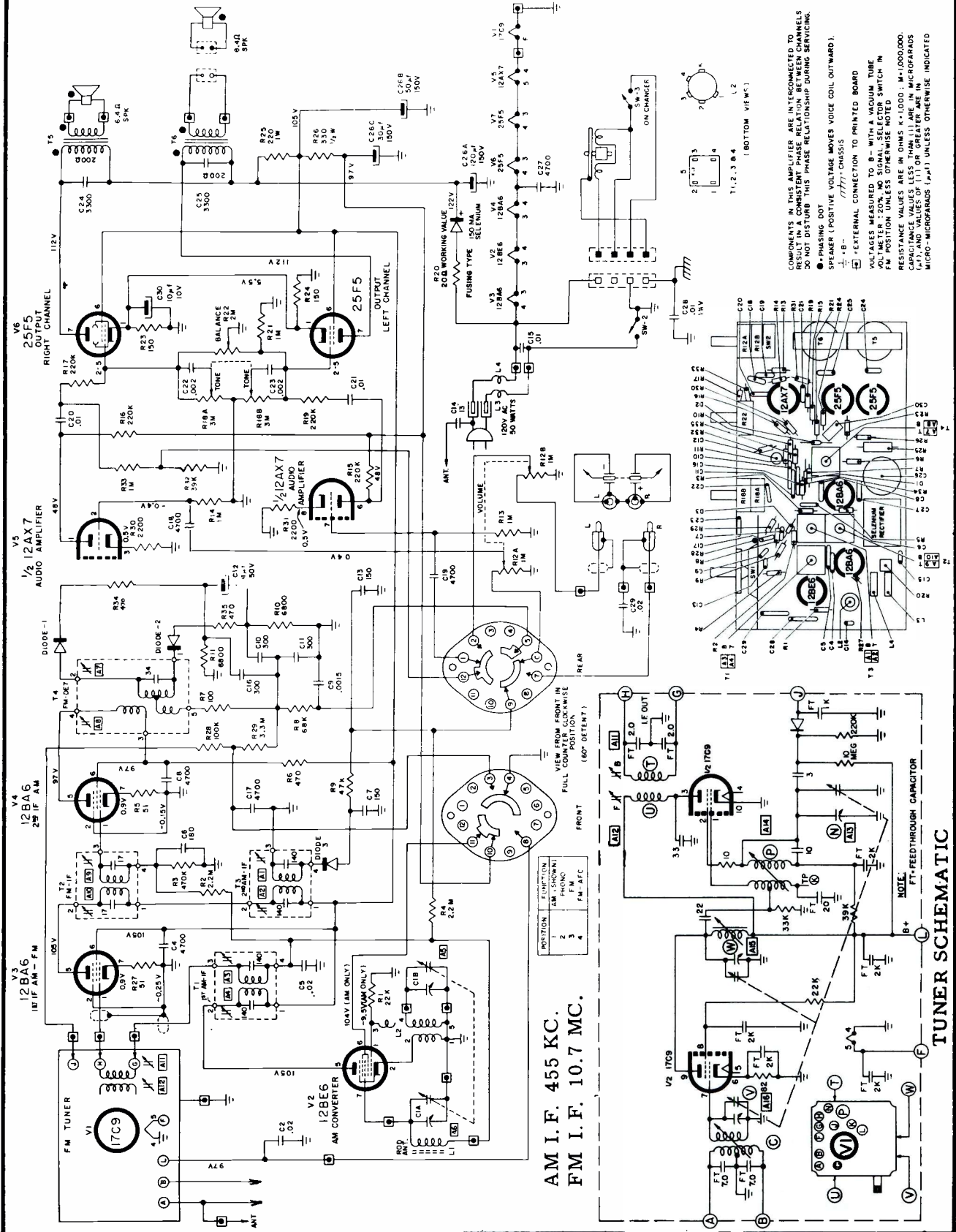
PRELIMINARY:

Output meter connection Across speaker voice coil
 Output meter reading to indicate 50 milliwatts (standard output) 1.26 volts
 Connection of generator ground lead Floating ground
 Generator modulation 30% 400 cycles
 Position of Volume Control Fully clockwise

Position of Variable	Frequency of Generator	Dummy Antenna	Generator Output Connection	Trimmers Adjusted in Order Shown for Maximum Output	Function of Trimmer
Open	455 Kc	.05 μ fd	Pin 7 18FX6	A1, A2, A3, A4	I. F.
Open	1640 Kc		* Test Loop	A5	Oscillator
1400	1400 Kc		* Test Loop	A6	Antenna
1000	1000 Kc		* Test Loop	Fan C1A Plates	
600	600 Kc		* Test Loop	Fan C1A Plates	

*Standard Hazeltine Test Loop Model 1150 or 3 turns of wire about 6" in diameter placed about one foot from the set loop.

ARVIN Models 72P59 and 72P68 (72P68 uses a 3-speaker system)

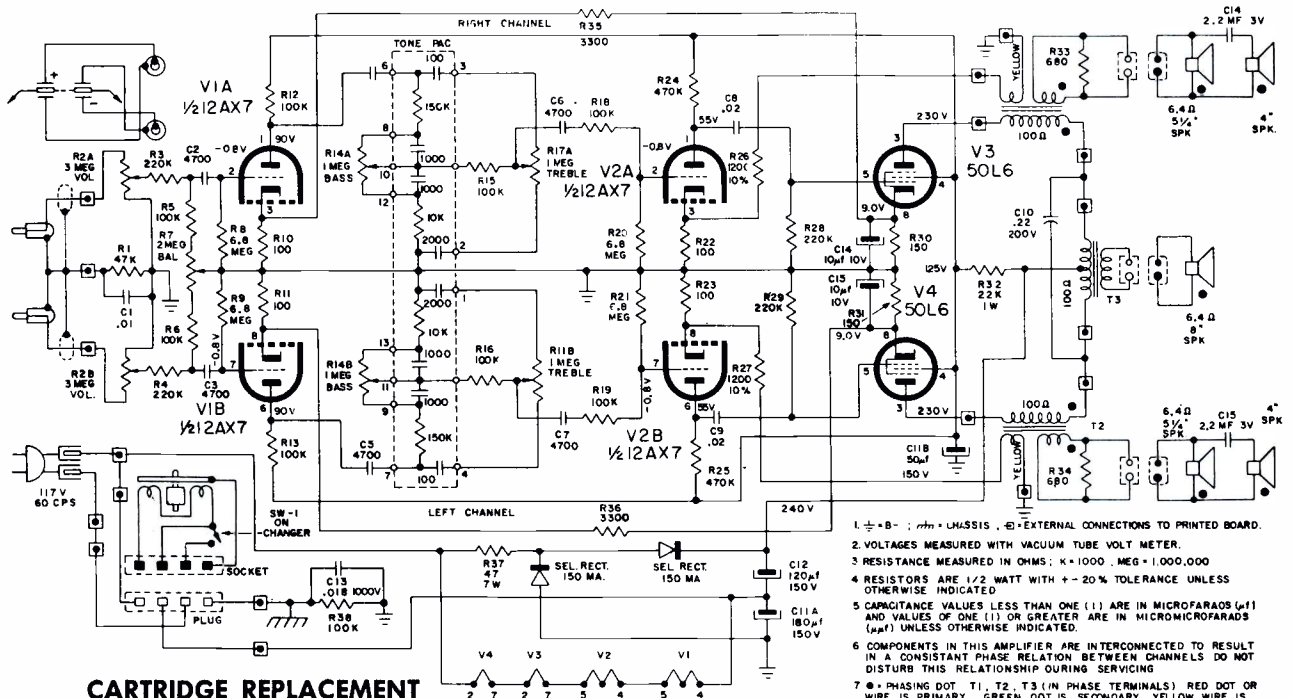


LOCATION OF PARTS

TUNER SCHEMATIC

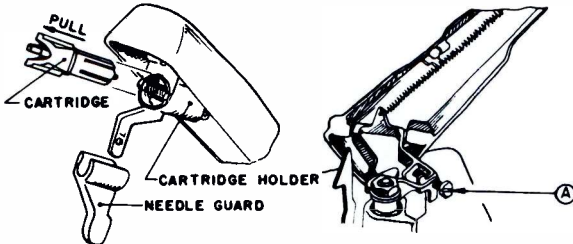
Arvin

MODEL 92P48 CODE 1.70601



CARTRIDGE REPLACEMENT

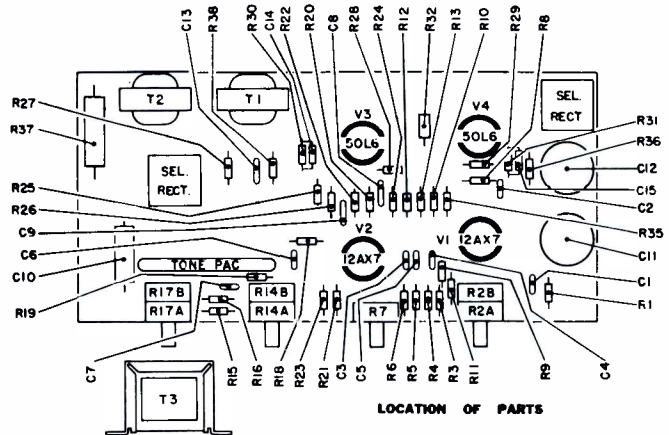
To remove cartridge grasp the top of the cartridge, and pull straight out. (See Illustration) To replace cartridge, align grooves in cartridge with grooves in cartridge holder and push in gently.



NEEDLE SET DOWN

Make needle set down adjustment only when necessary. To obtain the correct needle set down point, a screwdriver slot screw indicated by A (see illustration) is located at base of the tone arm. Turning screw clockwise moves the needle toward the outer edge of the record; counter-clockwise rotation moves the needle toward the center of the record.

1. ⊕ - B - : chassis, ⊕ - EXTERNAL CONNECTIONS TO PRINTED BOARD.
2. VOLTAGES MEASURED WITH VACUUM TUBE VOLT METER.
3. RESISTANCE MEASURED IN OHMS: K = 1000, MEG = 1,000,000
4. RESISTORS ARE 1/2 WATT WITH ± 20% TOLERANCE UNLESS OTHERWISE INDICATED
5. CAPACITANCE VALUES LESS THAN ONE (1) ARE IN MICROFARADS (μF) AND VALUES OF ONE (1) OR GREATER ARE IN MICROMICROFARADS (μμF) UNLESS OTHERWISE INDICATED.
6. COMPONENTS IN THIS AMPLIFIER ARE INTERCONNECTED TO RESULT IN A CONSISTANT PHASE RELATION BETWEEN CHANNELS DO NOT DISTURB THIS RELATIONSHIP DURING SERVICING
7. ⊙ - PHASING DOT. T1, T2, T3 (IN PHASE TERMINALS) RED DOT OR WIRE IS PRIMARY. GREEN DOT IS SECONDARY. YELLOW WIRE IS TERTIARY. SPEAKER (POSITIVE VOLTAGE MOVES VOICE COIL OUTWARD)
8. RESISTORS WITH THE SAME "R" NUMBER AND LETTERS FOLLOWING ARE GANGED TOGETHER

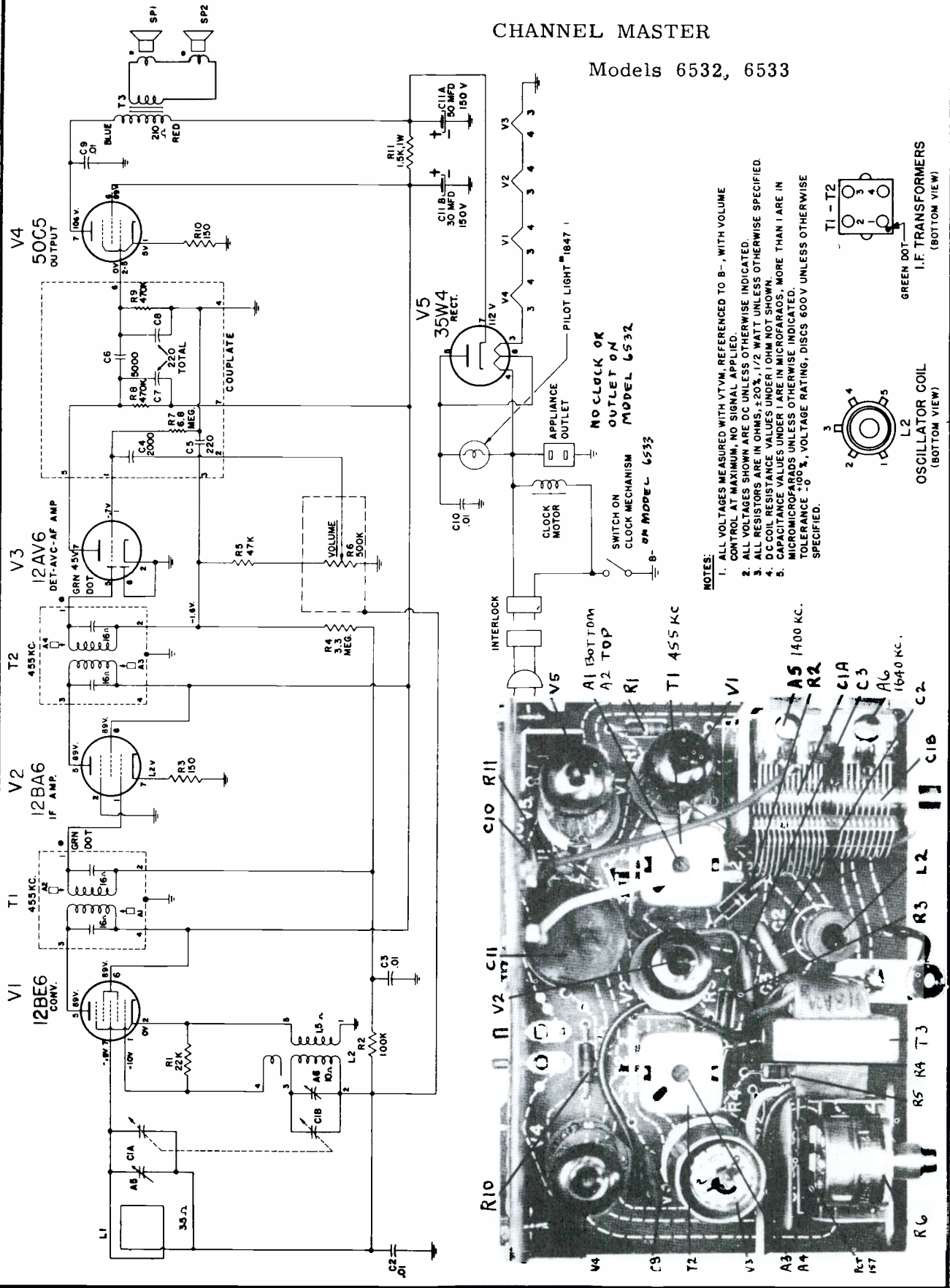


SCHEMATIC LOCATION	PART NO.	DESCRIPTION
CAPACITORS		
C1	43674-1	.01 uf., Disc.
C2, 3, 4, 5, 6, 7	43674-15	.0047 uf., Disc.
C8, 9	43674-7	.02 uf., Disc.
C10	45503-4	.22 uf., Paper Tubular
C11A, B	97711-8	180-50/150V., Elect.
C12	97711-3	120 uf/150V., Elect.
C13	41135-6	.02 uf., Disc., 1000V
C14, 15	44396-2	10 uf., 10V., Elect.
T1, 2	96430-3	Transformer, Output
T3	43393-7	Transformer, Output

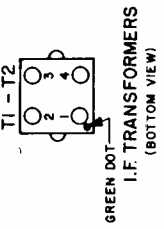
SCHEMATIC LOCATION	PART NO.	DESCRIPTION
RESISTORS		
R1	43687-473	470 ohm, 1/2W., 20%
R2A, B	47100-9	Control, Stereo, Dual 3 meg ohm
R3, 4, 28, 29	43687-224	220K ohm, 1/2W., 20%
R5, 6, 12, 13, 15, 16, 18, 19, 38	43687-104	100K ohm, 1/2W., 20%
R7	49000-14	Control, Balance, 2 meg ohm
R8, 9, 20, 21	43687-685	6.8 meg ohm, 1/2W., 20%
R10, 11, 22, 23	43687-101	100 ohm, 1/2W., 20%
R14A, B	47100-15	Control, Bass, Dual, 1 meg ohm
R17A, B	47100-15	Control, Treble, Dual, 1 meg ohm
R24, 25	43687-474	470K ohm, 1/2W., 20%
R26, 27	43689-122	1200 ohm, 1/2W., 10%
R30, 31	43687-151	150 ohm, 1/2W., 20%
R32	47325-223	22K ohm, 1W., 20%
R33, 34	43689-681	680 ohm, 1/2W., 10%
R35, 36	43687-332	3300 ohm, 1/2W., 20%
R37	47727-4	47 ohm, Fusing

CHANNEL MASTER

Models 6532, 6533



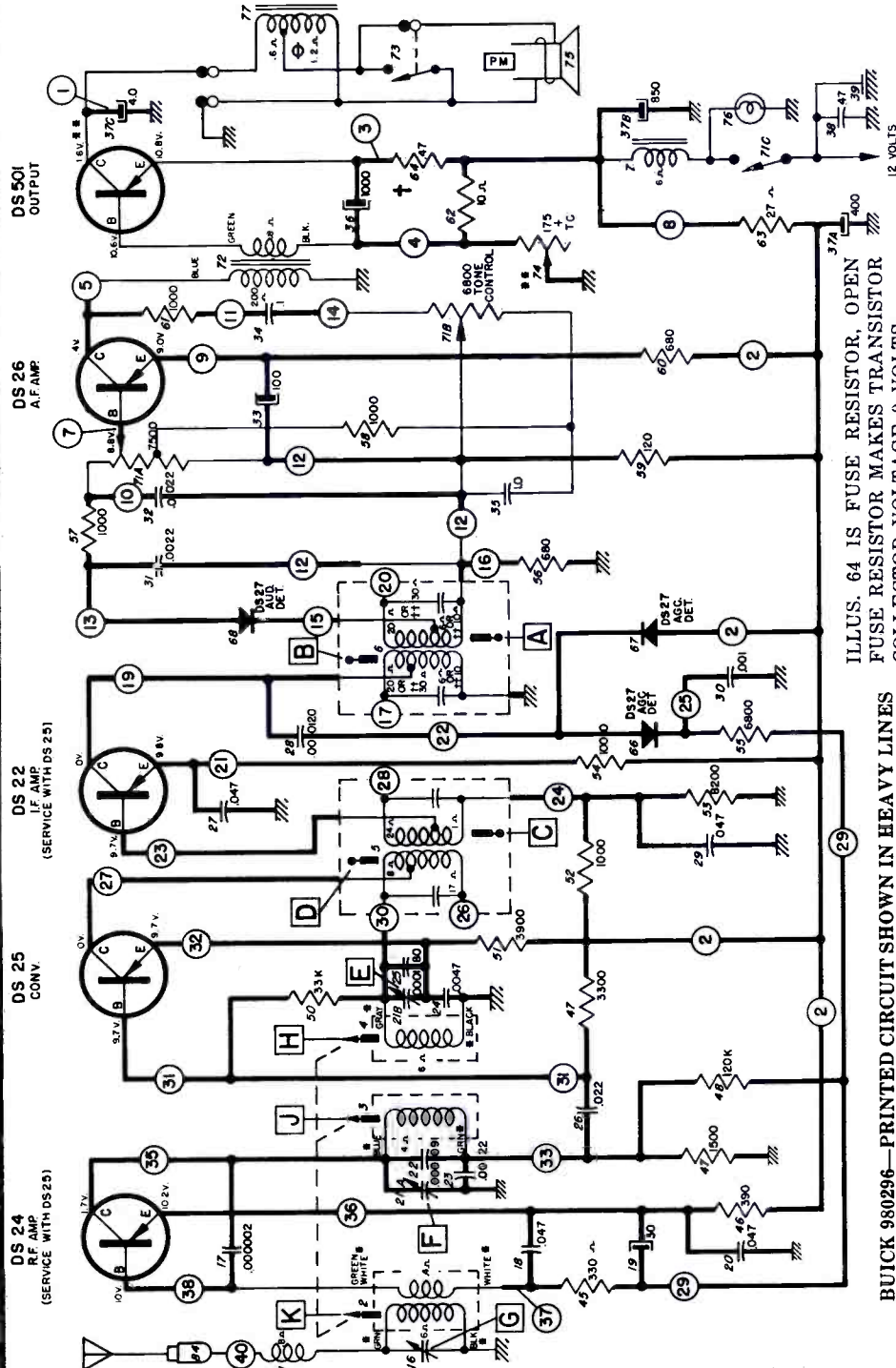
- NOTES:
1. ALL VOLTAGES MEASURED WITH VTVM, REFERENCED TO B-, WITH VOLUME CONTROL AT MAXIMUM, NO SIGNAL APPLIED.
 2. ALL VOLTAGES SHOWN ARE DC UNLESS OTHERWISE INDICATED.
 3. ALL RESISTORS ARE IN OHMS, ±20%, 1/2 WATT UNLESS OTHERWISE SPECIFIED.
 4. DC COIL RESISTANCE VALUES UNDER 1 OHM NOT SHOWN.
 5. CAPACITANCE VALUES UNDER 1 ARE IN MICROFARADS, MORE THAN 1 ARE IN MICROMICROFARADS UNLESS OTHERWISE INDICATED.
- TOLERANCE ±0%, VOLTAGE RATING, DISCS 600V UNLESS OTHERWISE SPECIFIED.



Delco

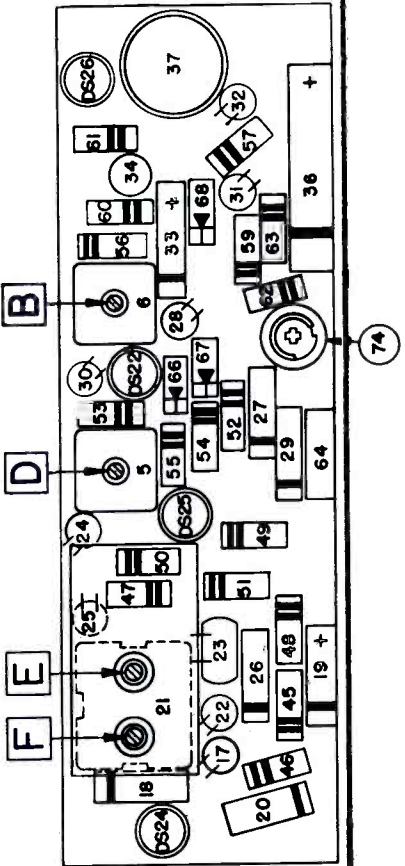
BUICK Model 980296
 CHEVROLET Model 985264
 PONTIAC Models 983579, 983687
 STUDEBAKER Models AC-3216, AC-3247, AC-3256

(Continued on pages 24 and 25)



BUICK 980296—PRINTED CIRCUIT SHOWN IN HEAVY LINES

ILLUS. 64 IS FUSE RESISTOR. OPEN FUSE RESISTOR MAKES TRANSISTOR COLLECTOR VOLTAGE 0 VOLTS.



VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VOM—NO SIGNAL AND 12.0 VOLTS AT ILLUS. 39.

TOTAL "A" DRAIN AT 12V.—1.2 AMPS.
 TOLERANCE ON VOLTAGES ± 10%.

*—INDICATES LEAD FROM TUNER COIL ASSY.

**—BEFORE MEASURING TRANSISTOR VOLTAGES, THE SHORTING TYPE SPEAKER SOCKET MUST BE OPENED AND A 4 OHM SPEAKER CONNECTED. IF TRANSISTOR IS REPLACED, ADJUST BIAS POTENTIOMETER (ILLUS. 74) TO OBTAIN PROPER COLLECTOR VOLTAGE WITH 12 VOLTS INPUT TO RADIO.

†—ILLUS. 64 IS A FUSE RESISTOR FOR THE TRANSISTOR. SERVICE WITH EXACT REPLACEMENT.

⊖—OUTPUT TRANSFORMER WILL APPEAR SHORTED IF SHORTING TYPE SPEAKER SWITCH IS NOT HELD OPEN.

Applicable alignment table is on page 26 under a similar Buick model.

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

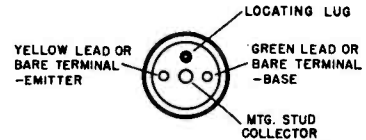
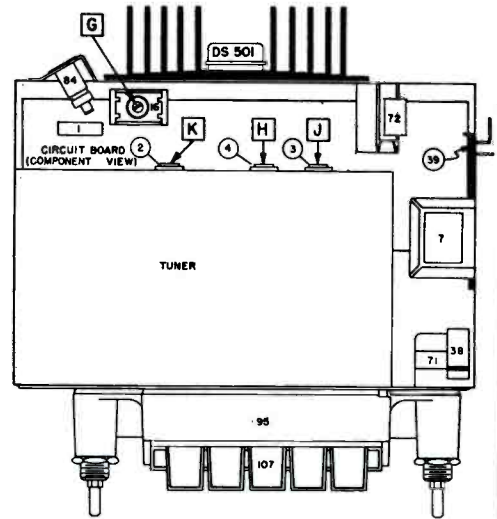
DELCO RADIO

BUICK Model 980296
 CHEVROLET Model 985264
 PONTIAC Models 983579, 983687
 STUDEBAKER Models AC-3216, AC-3247, AC-3256

(Continued from page 23. Applicable alignment table is on page 26, under another model.)

I. TROUBLESHOOTING PROCEDURE

1. Turn radio on (ear near speaker). If no "thump" is heard, suspect: open fuse, open "Fuse resistor," loose speaker plug, open speaker, or shorted DS501 transistor.
2. Isolate trouble to a stage (AF, IF, Conv., RF—see letters on circuit board below). Use a noise generator or other device at each point, starting with 1.
3. Measure voltages in defective stage. Note: Voltage between 10.8 V. line (conductor #2) & emitter (E) of each stage checks conduction of that stage.

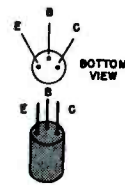


DS 501—Transistor Terminals

NOTE: Mtg. insulators, #1221642, not packaged with DS-501. These insulators are not required if radiator is insulated from case.



INJECT AT ANT. SOCKET (CHECK ANT. CIRCUIT)

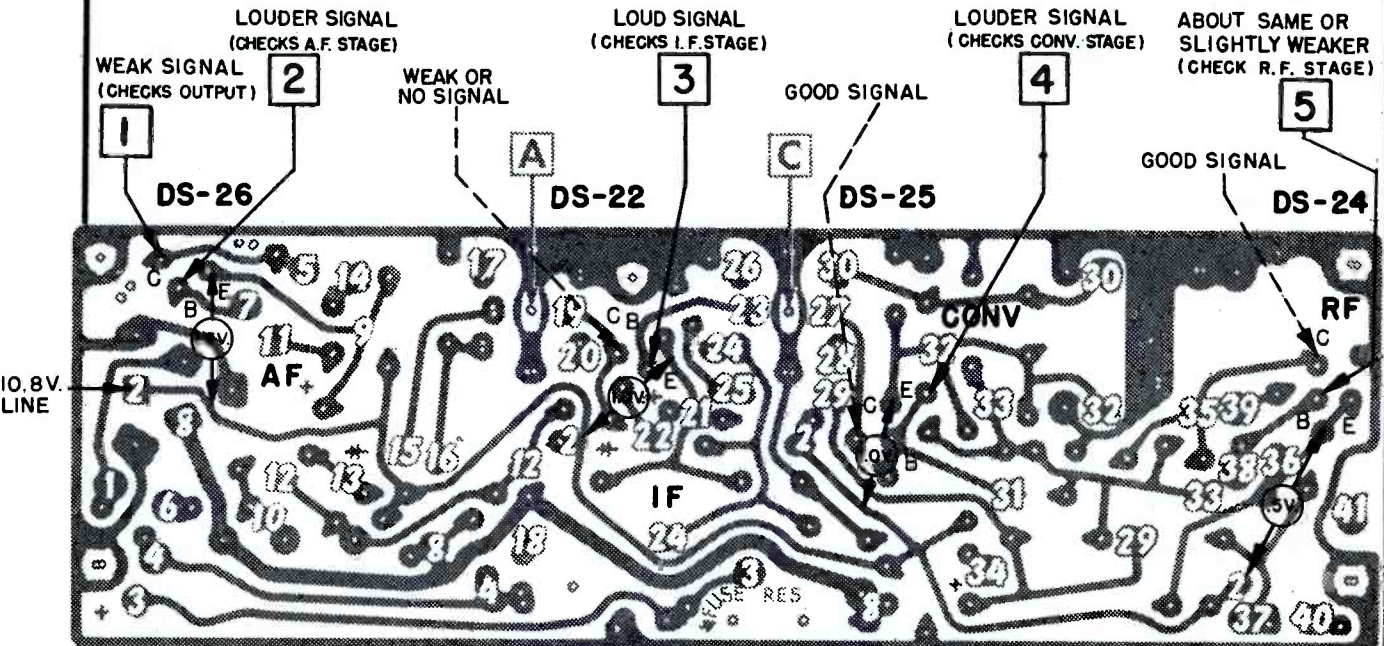


DS-22, 24, 25 and 26 Transistor Terminals

II. VOLTAGE AND TROUBLE HINTS

Stage Voltage (B, C, E, to ground)	Bias Voltage (B to E)	Defect	Quick Check to Confirm
Normal	Over .5 V.	Open small transistor	*Bridge good one across old one
Normal	Normal	Open capacitor	Bridge good one across old one
E is zero C is 11 V. E is very low. Normal	Wrong polarity Normal "0" or reversed Normal	Shorted emitter cap. Open collector circuit Open emitter circuit Defective IF	Ohmmeter Ohmmeter Ohmmeter Ohmmeter & try for peak.

* Small transistors may be checked for open by bridging a good one across (without unsoldering old one). All three leads must be firmly connected. If radio starts playing, replace old one.



CIRCUIT BOARD (PRINTED VIEW)

NUMBERS IN SQUARES ARE MAJOR TEST POINTS FOR STAGE ISOLATION—INJECT SIGNAL

Delco

LATE PRODUCTION CHANGES

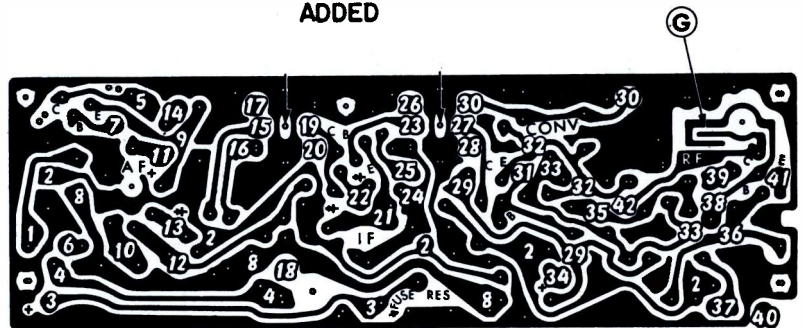
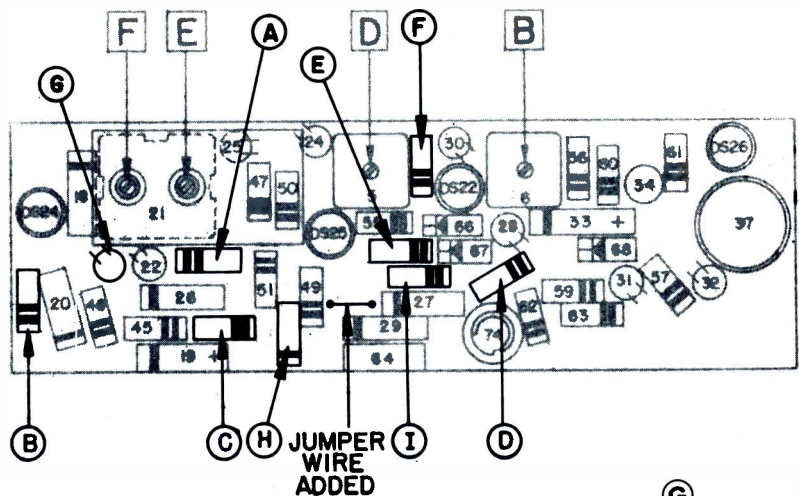
Models Involved

- Pontiac PB - 983579
- Tempest PB - 983687
- Buick PB - 980296
- Special PB - 980316
- Studebaker PB-AC-3216, AC-3247, AC-3256

Parts Added

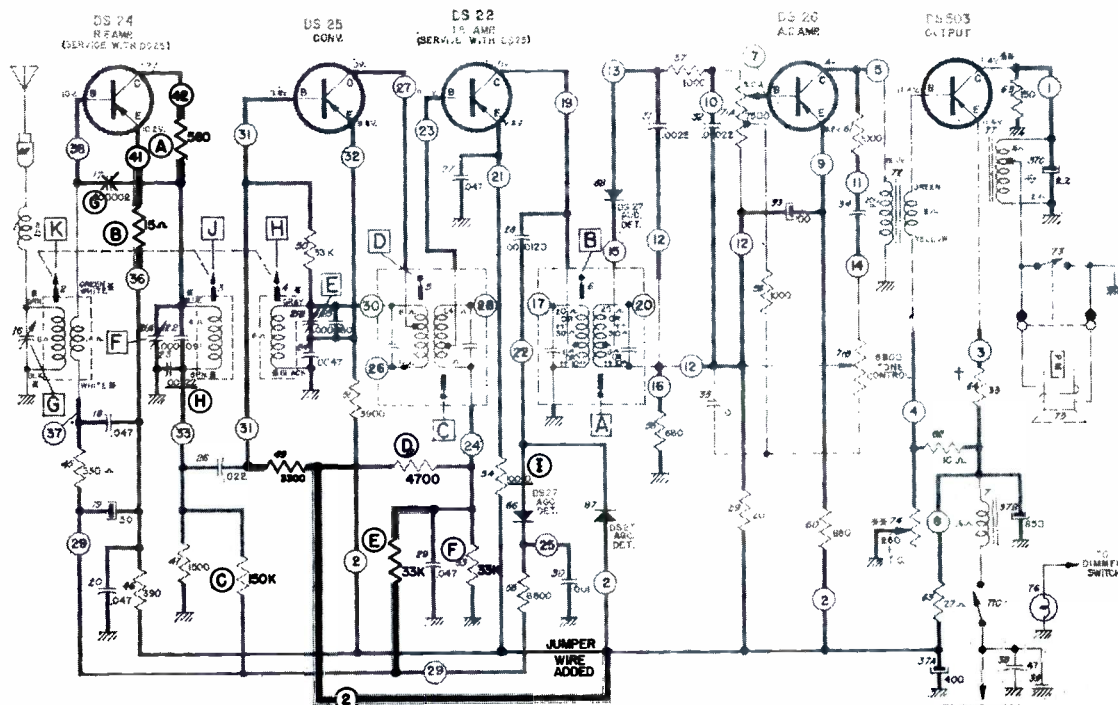
Description

- 560 ohm, ½ watt
- 15 ohm, ½ watt
- 33,000 ohm, ½ watt



Changes (Refer to component view.)

- A - Add 560 ohm resistor, ½ watt
 - B - Add 15 ohm resistor, ½ watt
 - C - Change from 120K to 150K ohms
 - D - Change from 1000 to 4700 ohms
 - E - Add 33K ohm resistor, ½ watt
 - F - Change from 8.2K ohm (6.8K ohm in models 983687 & 980316) to 33K ohm.
 - G - Remove .000002 mfd. capacitor (replaced by printed capacitor.)
 - H - .0022 mfd. tubular capacitor replaces disc type and is mounted in new location on the printed circuit board.
 - I - 1000 ohm resistor is mounted in new location on printed circuit board.
- Island #2 is separated into two parts, and interconnected with a jumper wire.

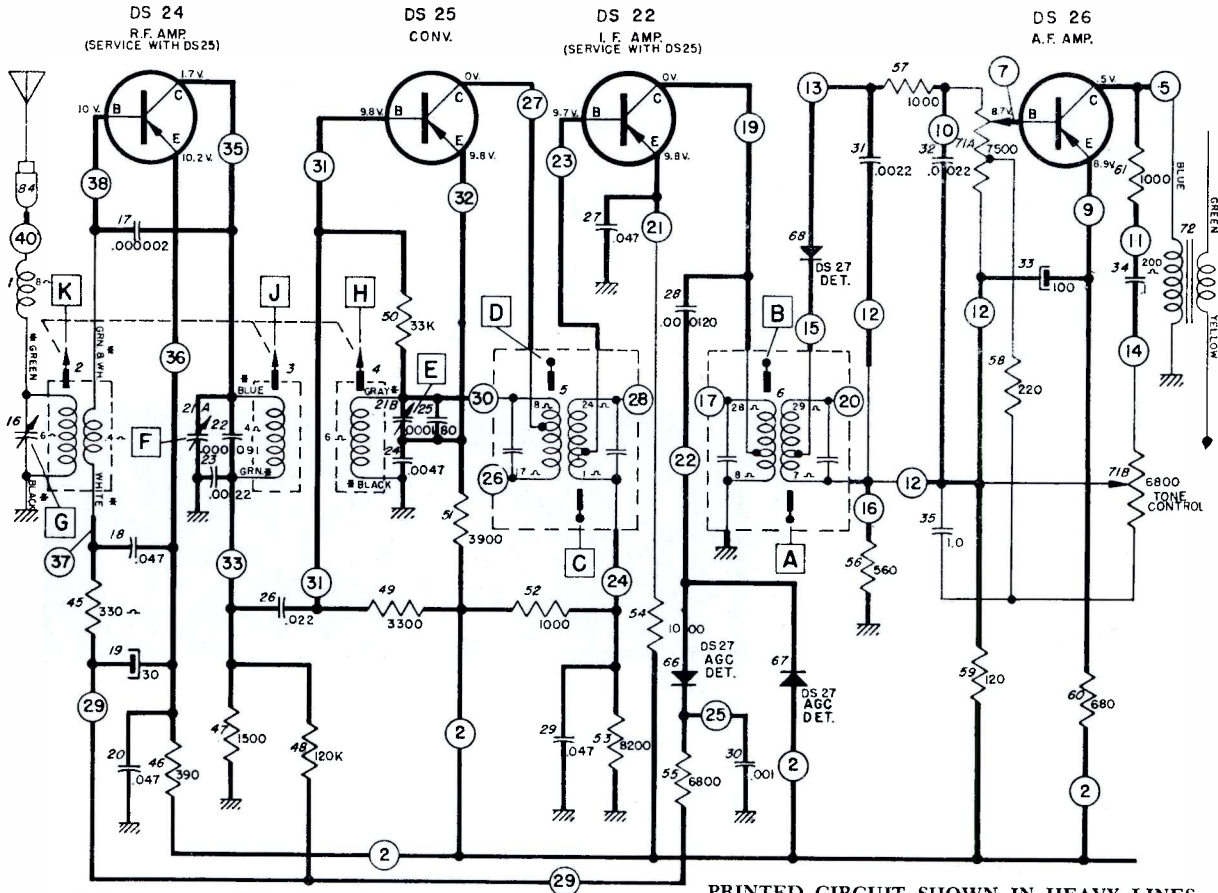


SCHEMATIC DIAGRAM—CHANGES IN SOLID LINES

Delco

BUICK MODEL 980316

(This set is very similar to 980296, etc., on pages 23, 24, and 25. Refer to these pages to supplement material on this page.)



(For balance of circuit see diagram on page 23)

ALIGNMENT PROCEDURE

- Output Meter Connections.....Across Voice Coil
- Generator Return.....To Receiver Chassis
- Dummy Antenna.....In Series With Generator
- Volume Control Position.....Maximum Volume
- Generator Output.....Minimum for Readable Indication

PRINTED CIRCUIT SHOWN IN HEAVY LINES.
 (For diagram notes see page 23)

STEPS	SERIES CAPACITOR OR DUMMY ANTENNA	CONNECT SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	TUNE RECEIVER TO	ADJUST IN SEQUENCE FOR MAX. OUTPUT
1	0.1 Mfd.	DS-25 Converter Base	262 KC.	High Frequency Stop	A, B, C, D
2	.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	*E, F, G
3	.000082 Mfd.	Antenna Connector	600 KC	Signal Generator Signal	J, K
4	.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	F, G
5	.000082 Mfd.	Antenna Connector	1100 KC	Signal Generator Signal	L**

*Before making this adjustment check mechanical setting of oscillator core "H". The rear of the core should be 1 1/2" from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form.) Core adjustment should be made with a non-metallic screw driver.

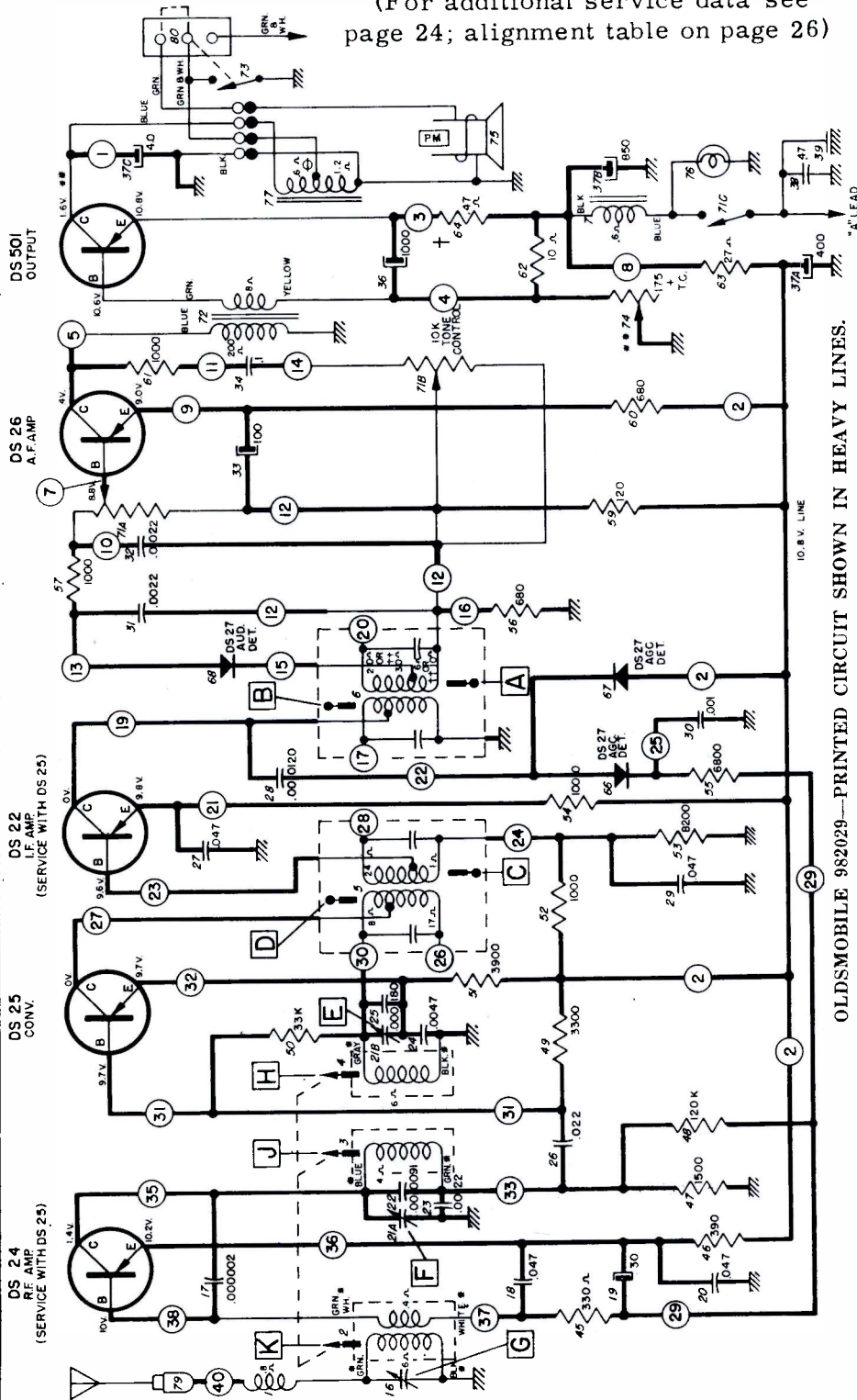
**L is the pointer adjustment screw which is on the connecting link, between the pointer assembly and the parallel guide bar. It should be adjusted so that the dial pointer corresponds with the 1100 K.C. mark on the dial.

With the radio installed and the car antenna plugged in adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station between 600 - 1000 KC (see sticker on case.)

Delco Radio

OLDSMOBILE DELUXE WITH PUSHBUTTON TUNING
MODEL 982029

(For additional service data see page 24; alignment table on page 26)



OLDSMOBILE 982029—PRINTED CIRCUIT SHOWN IN HEAVY LINES.

VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VOM—NO SIGNAL AND 12.0 VOLTS AT ILLUS. 39.

TOTAL "A" DRAIN AT 12V-1.2 AMPS.

TOLERANCE ON VOLTAGES ± 10%.

*—INDICATES LEAD FROM TUNER COIL ASS'Y.

**—BEFORE MEASURING TRANSISTOR VOLTAGES, THE SPEAKER AND TRANSFORMER ASS'Y MUST BE CONNECTED. IF TRANSISTOR IS REPLACED, ADJUST BIAS POTENTIOMETER (ILLUS. 74) TO OBTAIN PROPER COLLECTOR VOLTAGE WITH 12 VOLTS INPUT TO RADIO.

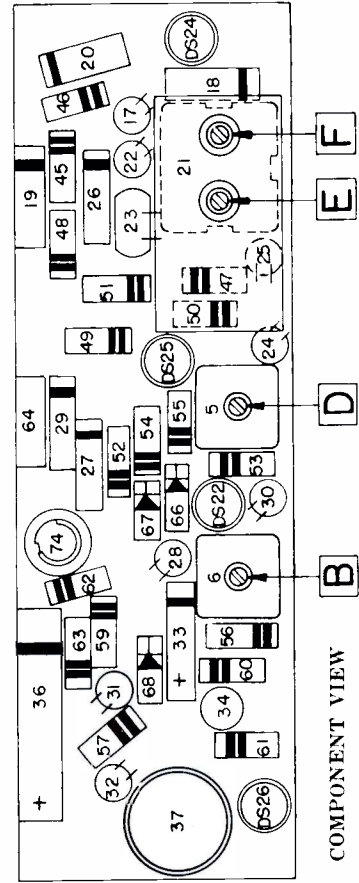
†—ILLUS. 64 IS A FUSE RESISTOR FOR THE TRANSISTOR. SERVICE WITH EXACT REPLACEMENT.

⊖—OUTPUT TRANSFORMER WILL APPEAR SHORTED IF SHORTING SWITCH IN REAR SPEAKER SOCKET IS NOT HELD OPEN.

††—WIRE SIZE CHANGED IN LATER PRODUCTION—COIL INTERCHANGEABLE.

Caution: Collector Voltage of DS-501 Transistor must be measured at transistor case (not at the heat radiator).

The Output Transformer is Mounted on Speaker. Do Not Operate Without it.



COMPONENT VIEW

Delco

BUICK WONDER BAR MODEL 980297
 PONTIAC DELUXE ELECTRAMATIC MODEL 983578

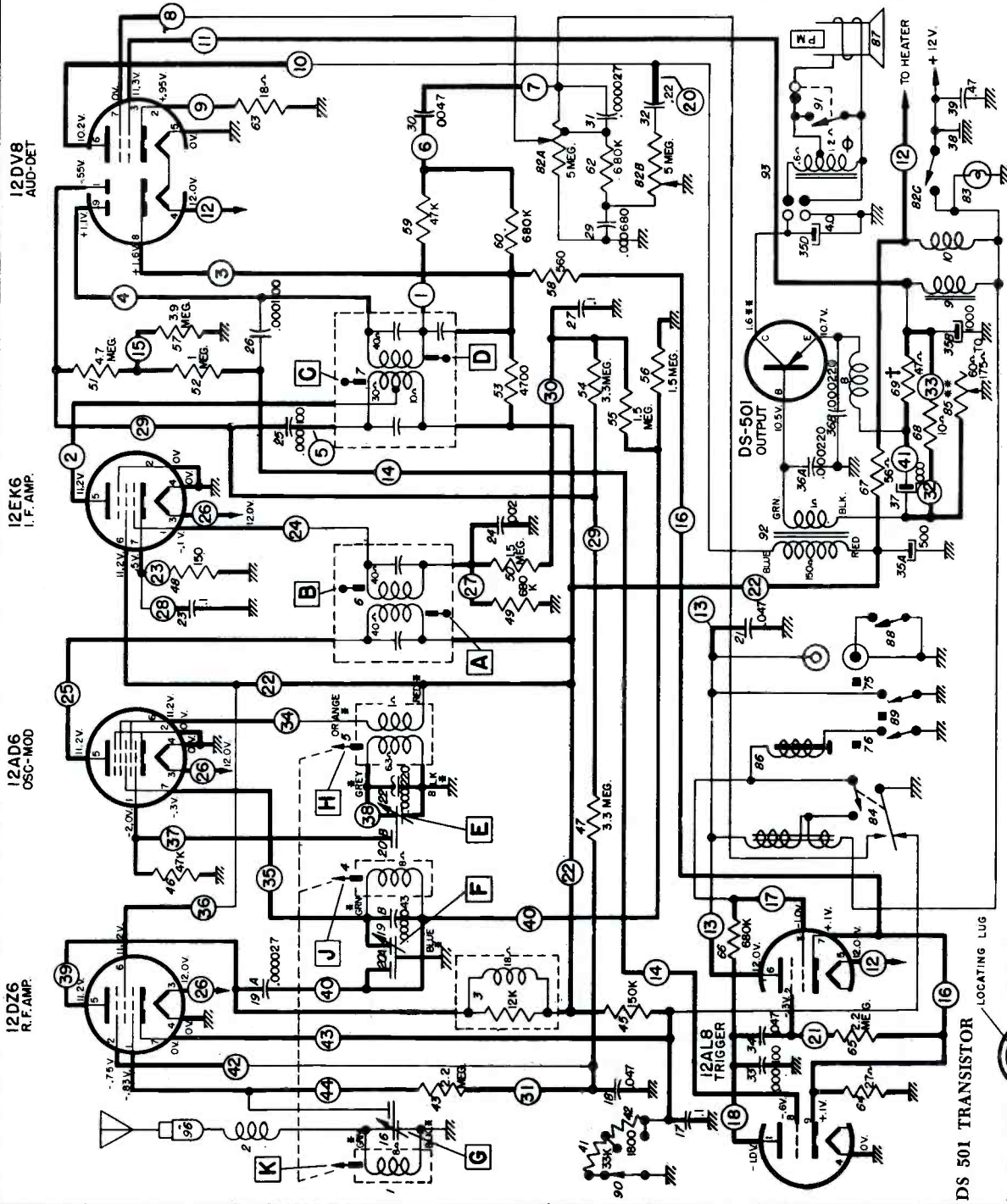
(Additional service data and alignment on page 29, adjacent at right)

BASIC TROUBLESHOOTING

1. Put ear next to speaker and turn radio on. If slight "thump" is heard as this is done, trouble is in tube stages—try new tubes.
2. If no "thump" at all is heard, measure voltage

from transistor case to radio chassis. If 1-2 volts is present, transistor is operating normally and trouble is either in speaker, speaker interlock socket, or one of the tube circuits.

3. If no voltage is present in step 2, check transistor circuit and particularly the transistor fuse resistor, Illustration No. 69.



The Output Transformer Is Mounted On Speaker. Do Not Operate Without It.

BUICK 980297
 PRINTED CIRCUIT SHOWN IN HEAVY LINES

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

DELCO - BUICK Model 980297, PONTIAC Model 983578, Continued

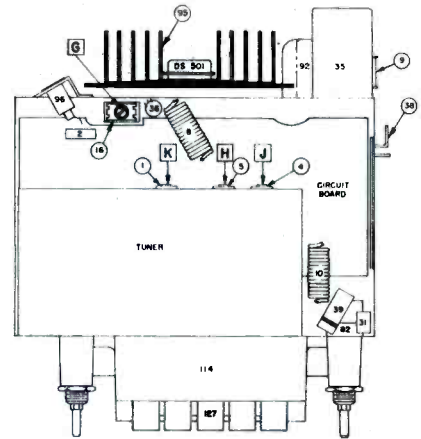
SCHEMATIC DATA

Voltages measured terminal to chassis with a VTVM - No signal and 12.0 volts at Illustration 38.

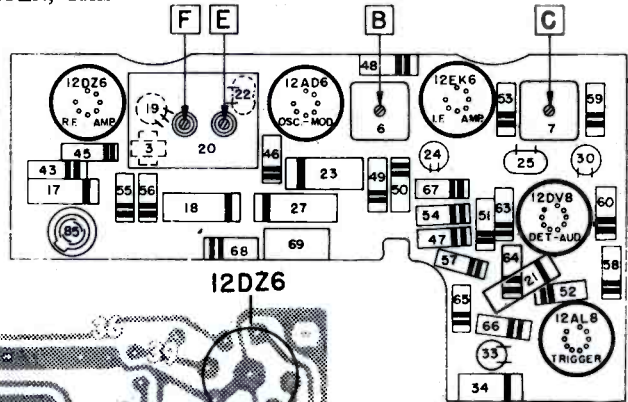
Oscillator grid voltage taken with set tuned to 1000 kc.
Total "A" drain at 12 volts - 2.6 amps.
Tolerance on voltage $\pm 10\%$.

- — Indicates lead from tuner coil assy.
- — Before measuring transistor voltages, the shorting type speaker socket must be opened and a 4 ohm speaker connected. If transistor is replaced, adjust bias potentiometer (Illustration 85) to obtain proper collector voltage with 12 volts input to radio. Speaker must be connected.
- + — Illustration 69 is a fuse resistor for the transistor.
- ⊖ — Output transformer may appear shorted if shorting type speaker socket is not held open.
- — F-3 tuner uses combination switch (Illus. #89), F-4 tuner uses separate switches.

WHITE NUMBERS ON PRINTED CIRCUIT DRAWING CORRESPOND TO THE ENCIRCLED NUMBERS ON SCHEMATIC.
ILLUSTRATION #69 IS A FUSE RESISTOR. IF THIS IS OPEN, THE TRANSISTOR VOLTAGE WILL BE "O."



TUBE VIEW

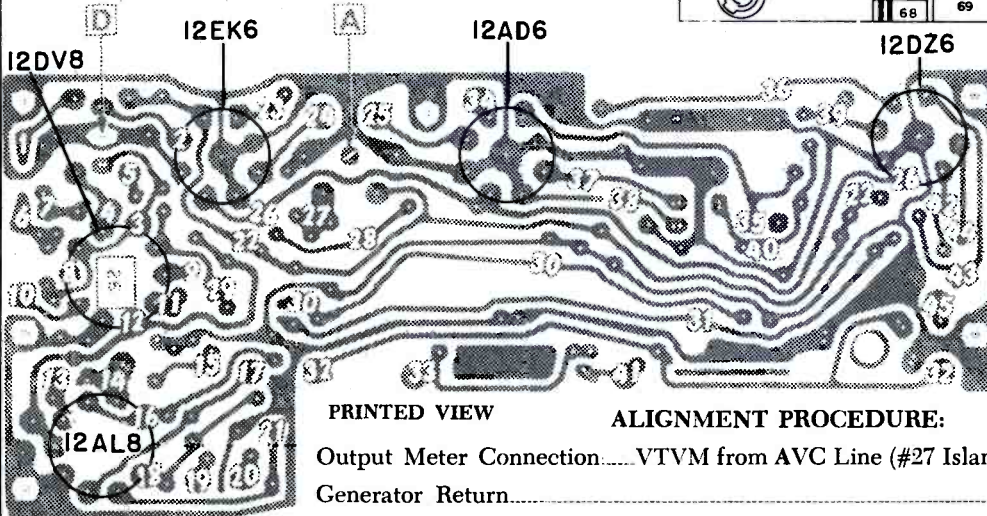


COMPONENT VIEW

IF RADIO IS POWERED BY BATTERY ELIMINATOR, USE 16 VOLTS FOR PROPER SOLENOID ACTION.

PUSHBUTTON SETUP PROCEDURE

Pull Pushbutton out. Tune in desired station manually. Push button all the way in.



PRINTED VIEW

ALIGNMENT PROCEDURE:

Output Meter Connection.....VTVM from AVC Line (#27 Island-Circuit Board) To Chassis
Generator Return.....Receiver Chassis

Step	Dummy Antenna	Connect Signal Generator To	Signal Generator Frequency	Tune Receiver To	Adjust in Sequence For Output Indicated
1	0.1 Mfd.	12AD6 Grid (Pin 7)	262 KC	• High Frequency Stop	A, B, C (Max.), D (Min.)
2	.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	**E, F, G (Max.)
3	.000082 Mfd.	Antenna Connector	600 KC	Signal Generator Signal	J, K (Max.)
4	.000082 Mfd.	Antenna Connector	1615 KC	Signal Generator Signal	F, G (Max.)
5	.000082 Mfd.	Antenna Connector	1100 KC	Signal Generator Signal	***L

*Tune manually towards the high frequency end of dial to the point where the solenoid switch closes.

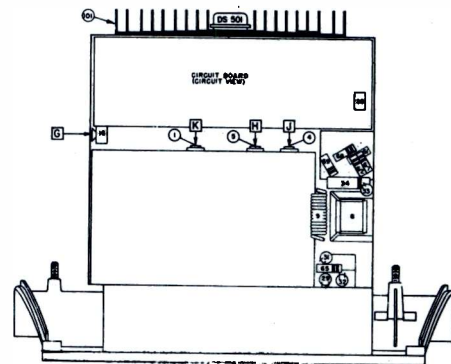
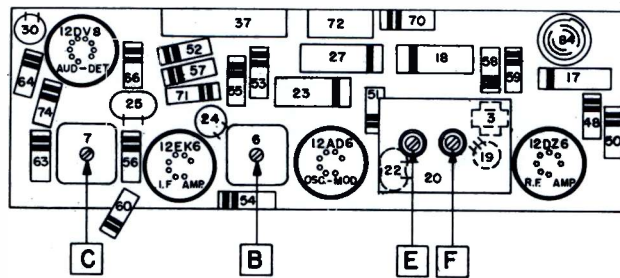
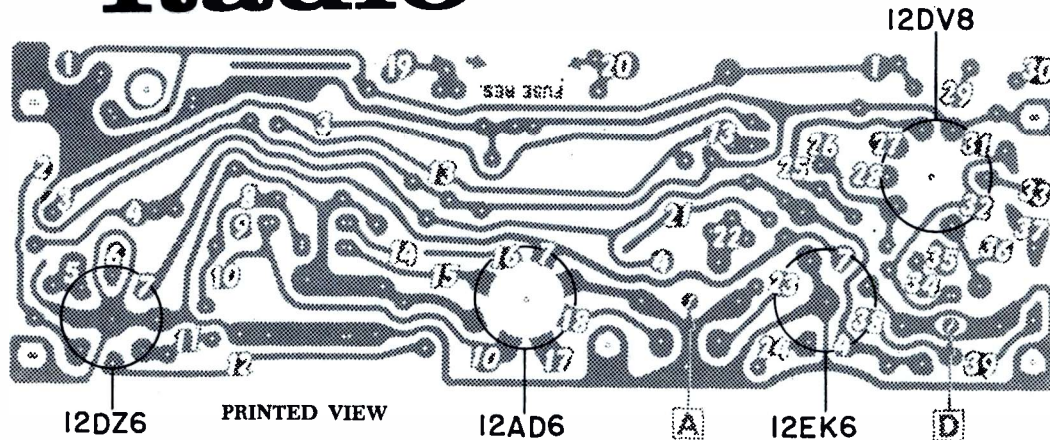
**Before making this adjustment, check the setting of oscillator core "H." The rear of the core should be 1/16" from the mounting end of the coil form. This measurement is readily made by inserting a suitable plug in the mounting end of the coil form. The core adjustment is made from the mounting end of the coil form with a non-metallic screwdriver.

***"L" is the pointer adjustment in the middle of the core guide bar—adjust so pointer reads 1100 KC. With the radio installed and the antenna plugged in, adjust the antenna trimmer "C" for maximum volume with the radio tuned to a weak station between 600 and 1000 KC (see sticker on case.)

Delco Radio

OLDSMOBILE RADIO MODEL 982030

(Circuit diagram on page 31, adjacent at right)



PUSHBUTTON SETUP PROCEDURE

Pull Pushbutton out. Tune in desired station manually. Push button all the way in.

SIGNAL SEEKING TUNER ALIGNMENT PROCEDURE:

NOTE: When aligning the signal seeker tuner type radio, be sure to use a vacuum tube voltmeter as indicated.

- Output Meter Connection.....VTVM From AVC Line (#22 Island-Circuit Board) To Chassis
- Generator Return.....Receiver Chassis
- Dummy Antenna.....In Series With Generator
- Sensitivity Control.....Maximum
- Volume Control.....Maximum Volume
- Tone Control.....Treble
- Generator Output.....Not to exceed 2 volts at VTVM

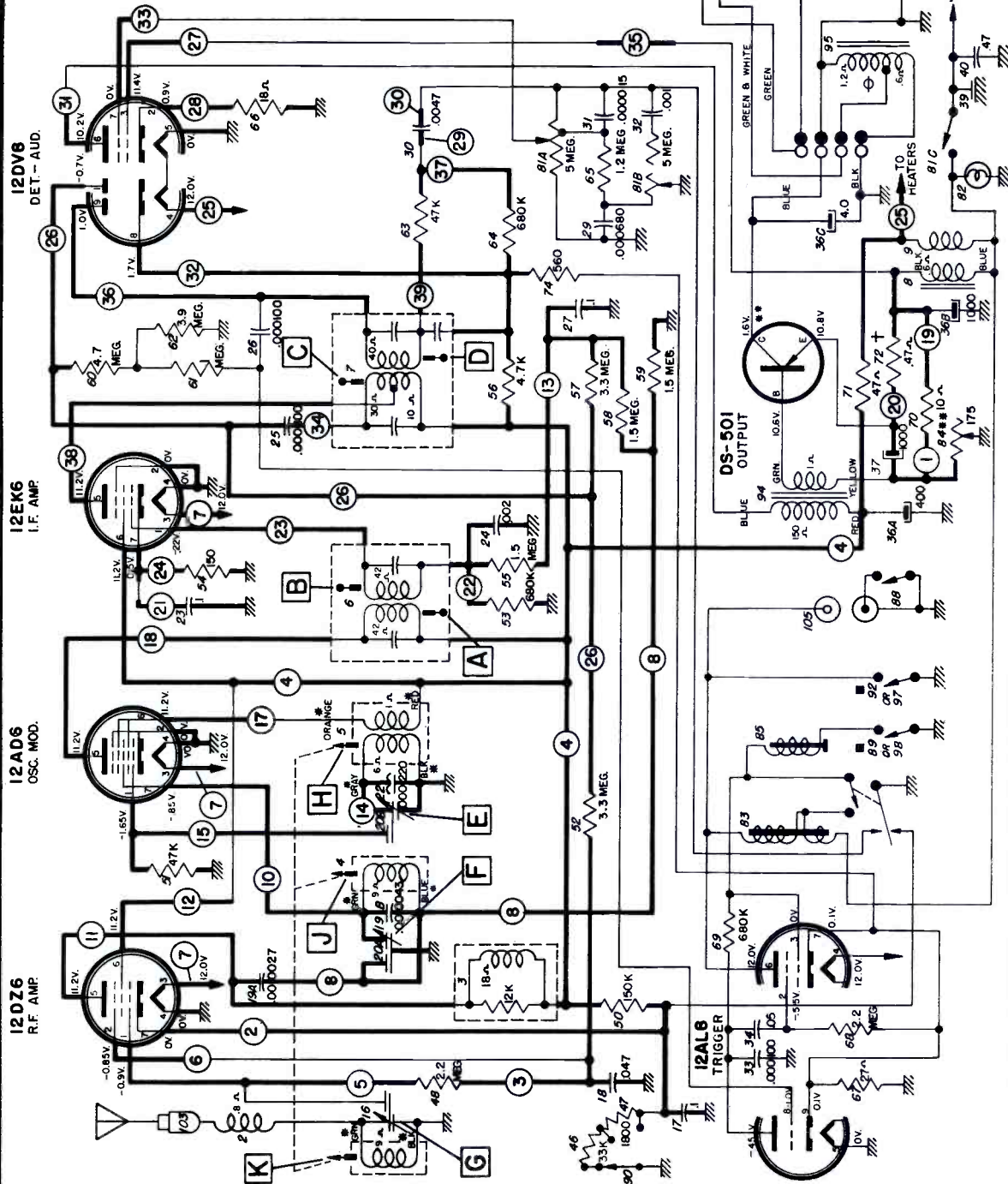
Step	Dummy Antenna	Connect Signal Generator To	Signal Generator Frequency	Tune Receiver To	Adjust In Sequence For Output Indicated
1	0.1 Mfd.	12AD6 Grid (Pin 7)	262 KC	*High Frequency Stop	A, B, C (Max.), D (Min.)
2	.000068 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	**E, F, G (Max.)
3	.000068 Mfd.	Antenna Connector	600 KC	Signal Generator Signal	J, K (Max.)
4	.000068 Mfd.	Antenna Connector	1615 KC	Signal Generator Signal	F, G (Max.)
5	.000068 Mfd.	Antenna Connector	1100 KC	Signal Generator Signal	***L

*Tune manually towards the high frequency end of dial and stop at the point where the solenoid switch closes.

**Before making this adjustment, check the setting of oscillator core "H." The rear of the core should be 1 1/2" from the mounting end of the coil form. This measurement is readily made by inserting a suitable plug in the mounting end of the coil form. The core adjustment is made from the mounting end of the coil form with a non-metallic screwdriver.

***"L" is the pointer adjustment slot on the pointer assembly—adjust so pointer reads 1100 KC. With the radio installed and the antenna plugged in, adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station between 600 and 1000 KC (see sticker on case.)

DELCO - OLDSMOBILE Model 982030
(Continued from page 30, at left)



OLDSMOBILE 982030

SCHMATIC DATA

Oscillator grid voltage taken tuned to 1000 kc.
Total "A" drain 2.6 amperes.

* Indicates lead from tuning coil assembly.

■—F3 and F4 tuner use different switches.

Volts measured terminal to chassis with a VTVM—No signal—12.0 volts at Illustration #39.

**—Before measuring transistor voltages be sure speaker and transformer are connected to radio. If transistor is replaced adjust bias potentiometer (Illustration #84 to obtain the proper collector voltage.)

†—Illustration #72 is a fuse resistor for the transistors. An open fuse resistor will give 0 volts collector voltage.

⊕—Output transformer may appear shorted if rear speaker control or jumper is not inserted into Illus. #106.

PRINTED CIRCUIT SHOWN IN HEAVY LINES

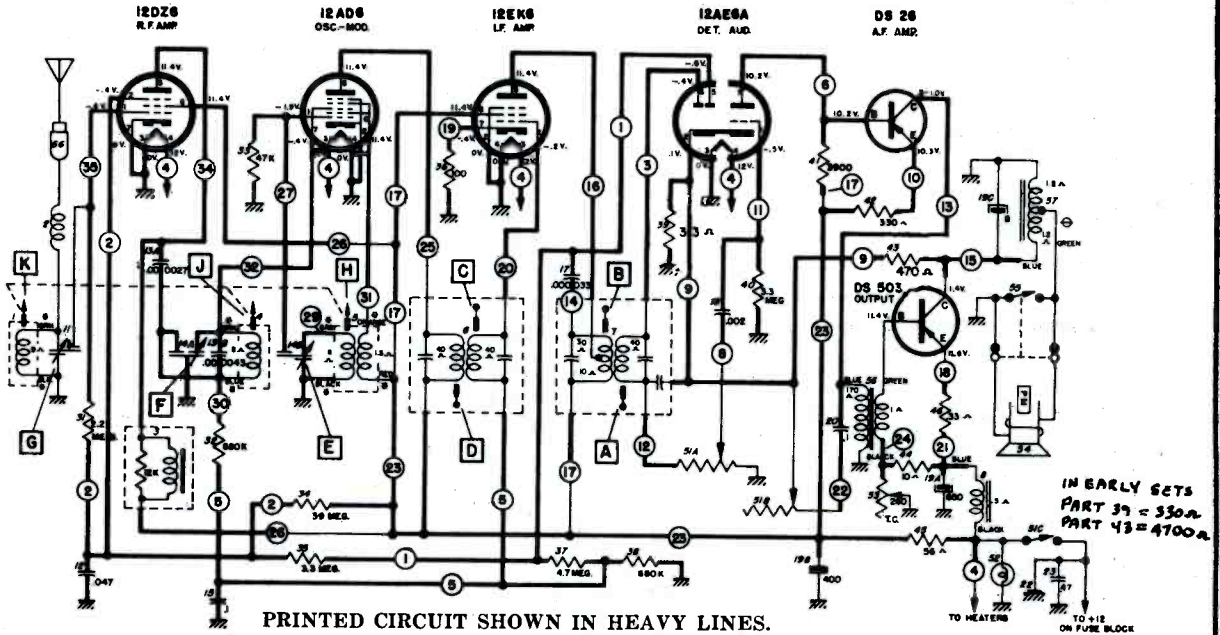
NUMBERS ON PRINTED CIRCUIT BOARD CORRESPOND WITH NUMBERS IN CIRCLES ON SCHEMATIC DIAGRAM.

NOTE: ILLUS. 72 IS FUSE RESISTOR. OPEN FUSE RESISTOR MAKES TRANSISTOR COLLECTOR VOLTAGE 0 VOLTS.

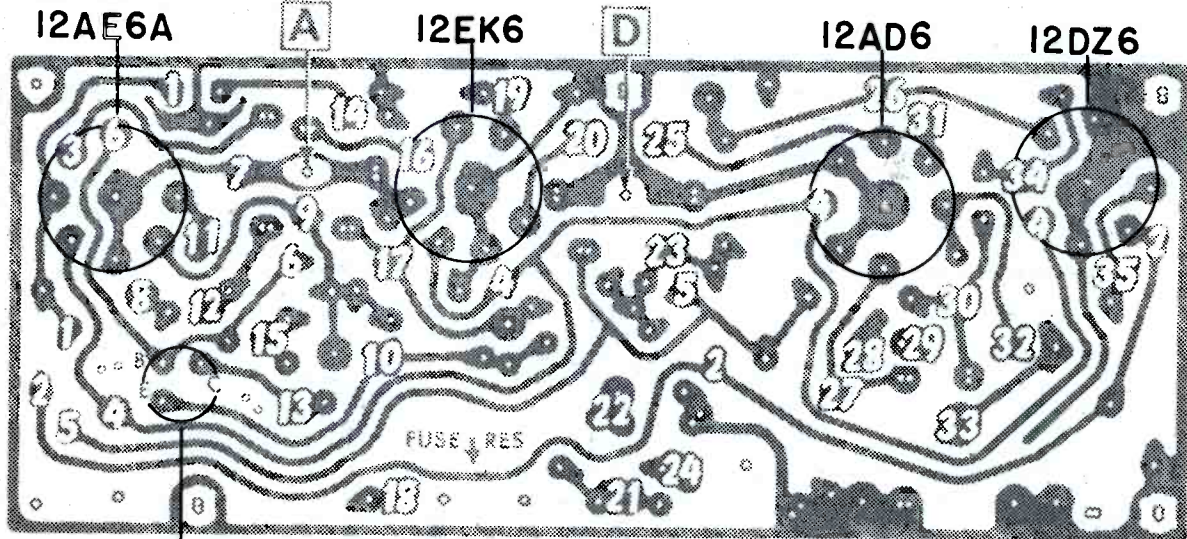
Delco

CHEVROLET RADIO MODEL 985332

CONVAIR Models 985158, 985159, 985189, and 985315 are practically identical to this 985332.



PRINTED CIRCUIT SHOWN IN HEAVY LINES.
VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VTVM—NO SIGNAL AND 12.0 VOLTS AT ILLUS. 22.



DS-26 CIRCUIT BOARD (PRINTED VIEW)

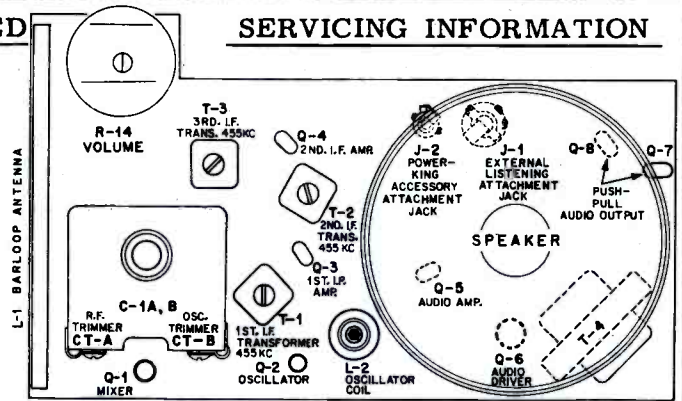
STEPS	SERIES CAPACITOR OR DUMMY ANTENNA	CONNECT SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	TUNE RECEIVER TO	ADJUST IN SEQUENCE FOR MAX. OUTPUT
1	0.1 Mfd.	12AD6 Grid (Pin #7)	262 KC	High Frequency Stop	A, B, C, D,
2	0.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	*E, F, G,
3	0.000082 Mfd.	Antenna Connector	600 KC	Signal Generator Signal	J, K
4	0.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	F, G

*Before making this adjustment check mechanical setting of oscillator core "H." The rear of the core should be 1 1/8" from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form.) Core adjustment should be made with a non-metallic screwdriver.

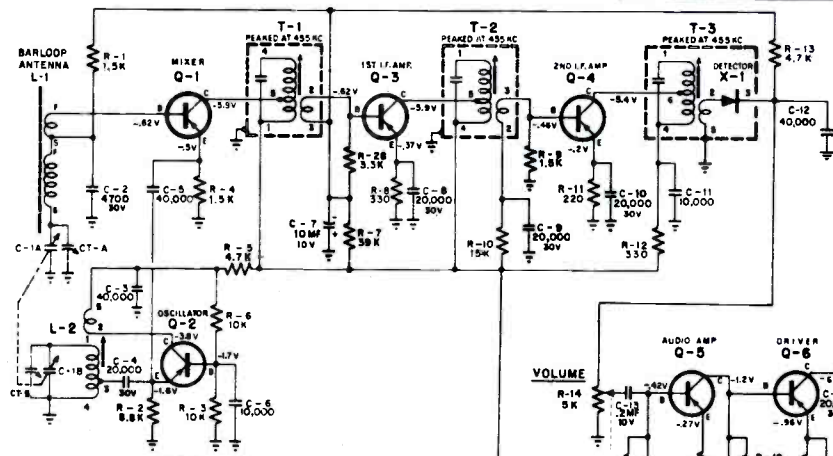
With the radio installed and the car antenna plugged in adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station between 600 and 1000 KC (see sticker on case).

Emerson

MODELS:
 888 "TITAN"
 888 "GALAXY"
 CHASSIS: 120655

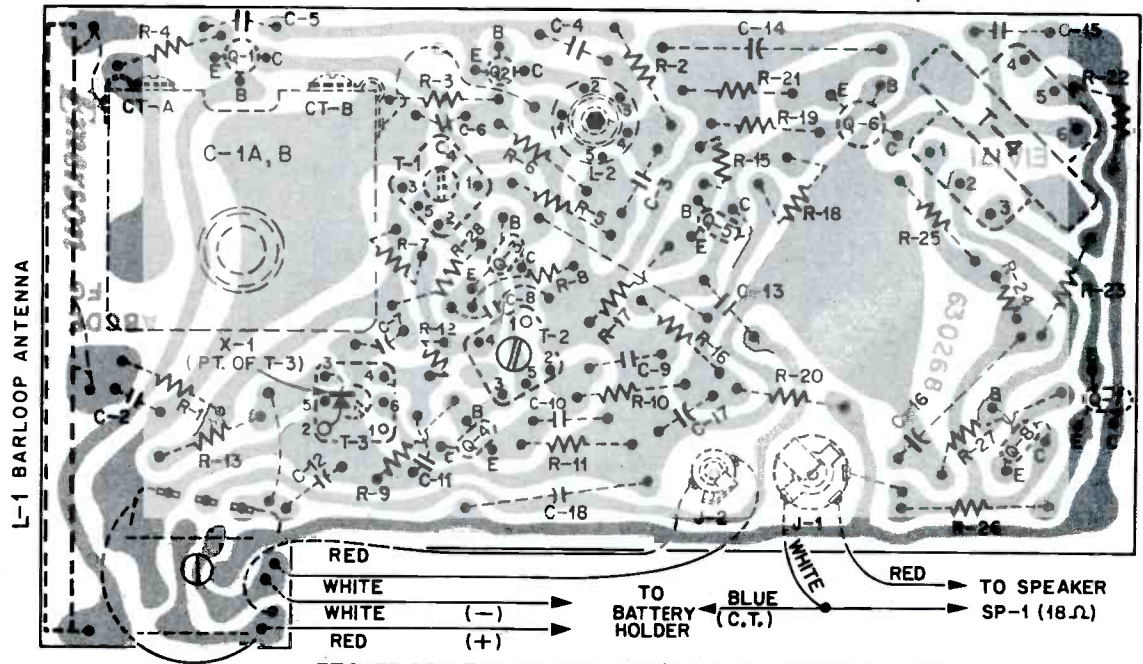
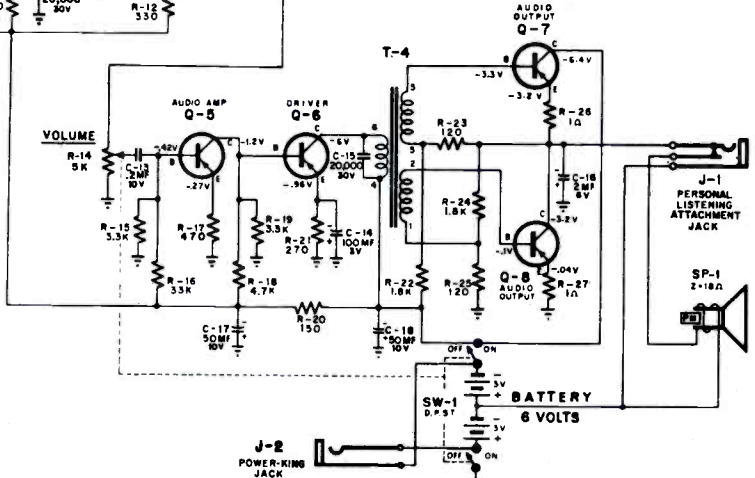


ALIGNMENT POINT LOCATION



⊥ CERAMIC CAPACITORS, CAPACITY IN PICOFARADS (PF) UNLESS NOTED.
 ⊥ TUBULAR CAPACITORS, CAPACITY IN MICROFARADS.
 RESISTORS IN OHMS (K=1000 OHMS) AND 1/2 WATT.

SYMBOL	PART NO.
Q-1	815109
Q-2	815101
Q-3	815107
Q-4	815108
Q-5	815055
Q-6	815056 (or) 815083 (or) 819089
Q-7, 8	815057 (or) 815099 (or) 815110



ETCHED PRINTED CIRCUIT, CHASSIS 120655 (BOTTOM VIEW)

EMERSON Models P-1904, P-1905, Chassis 120599B
(Main circuit diagram on page 35, at right)

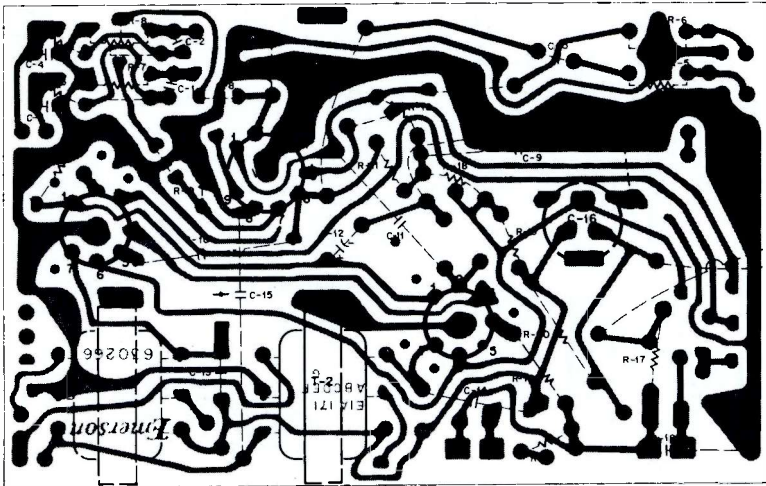


FIG. 2 - ETCHED PRINTED CIRCUIT, CHASSIS 120599B (Bottom View)

CONDITIONS FOR VOLTAGE AND RESISTANCE MEASUREMENTS, STEREO AMPLIFIER CHASSIS 120599-B.

- VOLTAGE MEASUREMENTS were taken under the following conditions, using an RCA "VoltOhmyst" or equivalent VTVM:
- 1) Line voltage maintained at 115 volts AC.
 - 2) Volume control set for minimum volume.
 - 3) All voltage measurements made between points indicated and B-neutral (negative side of electrolytic capacitor C-16) unless otherwise noted.

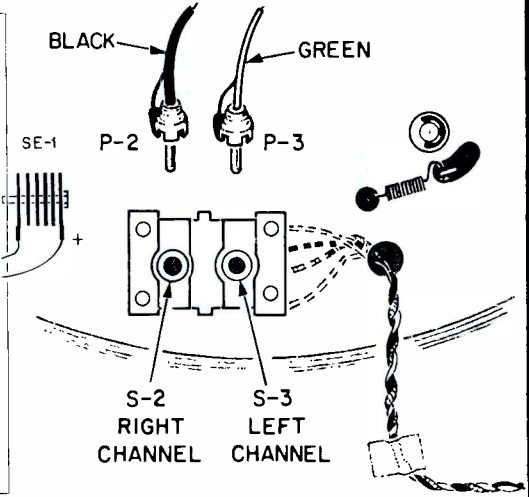


FIG. 5 - RECORD CHANGER 819180, UNDERSIDE VIEW

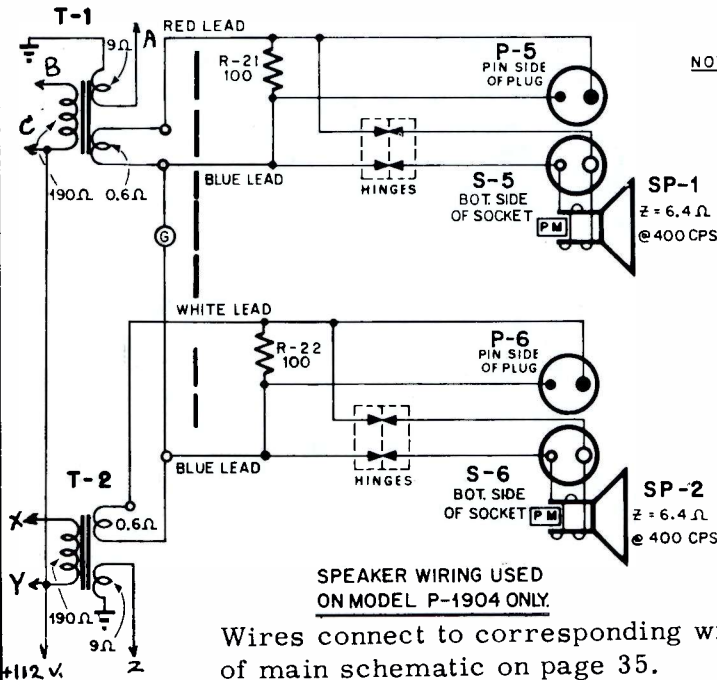
RESISTANCE MEASUREMENTS were made under the following conditions, using an RCA "VoltOhmyst" or equivalent VTVM:

- 1) ON-OFF switch (SW-1) in OFF position and line cord disconnected from AC outlet.
- 2) AC connector for record changer (P-4) disengaged from motor socket (S-4).
- 3) All resistance measurements made between points indicated and B-neutral (negative side of electrolytic capacitor C-16) unless otherwise noted.

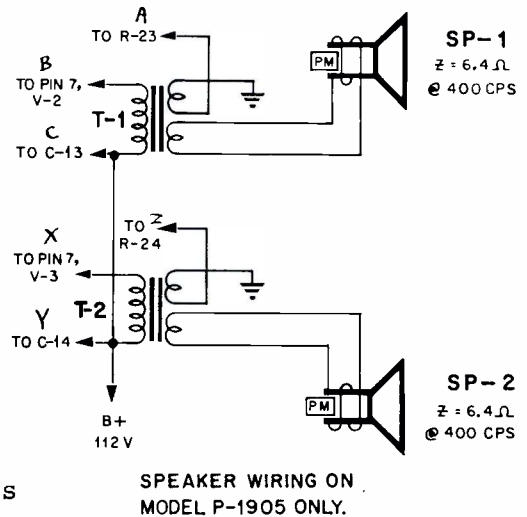
RESISTANCE READINGS, STEREO AMPLIFIER CHASSIS 120599B

SYM.	TUBE TYPE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V-1	12AX7	*570K	6.8 M	0	0	18	*570K	6.8 M	0	9
V-2	50EH5	33	30 to .5 M	18	64	30 to .5 M	*450	*370	-	-
V-3	50EH5	33	30 to .5 M	64	112	30 to .5 M	*450	*370	-	-

* MEASURED WITH COMMON LEAD OF METER CONNECTED TO POSITIVE SIDE OF SELENIUM RECTIFIER SE-1.



NOTE: CORRECT PHASING OF SPEAKERS MUST BE OBSERVED.

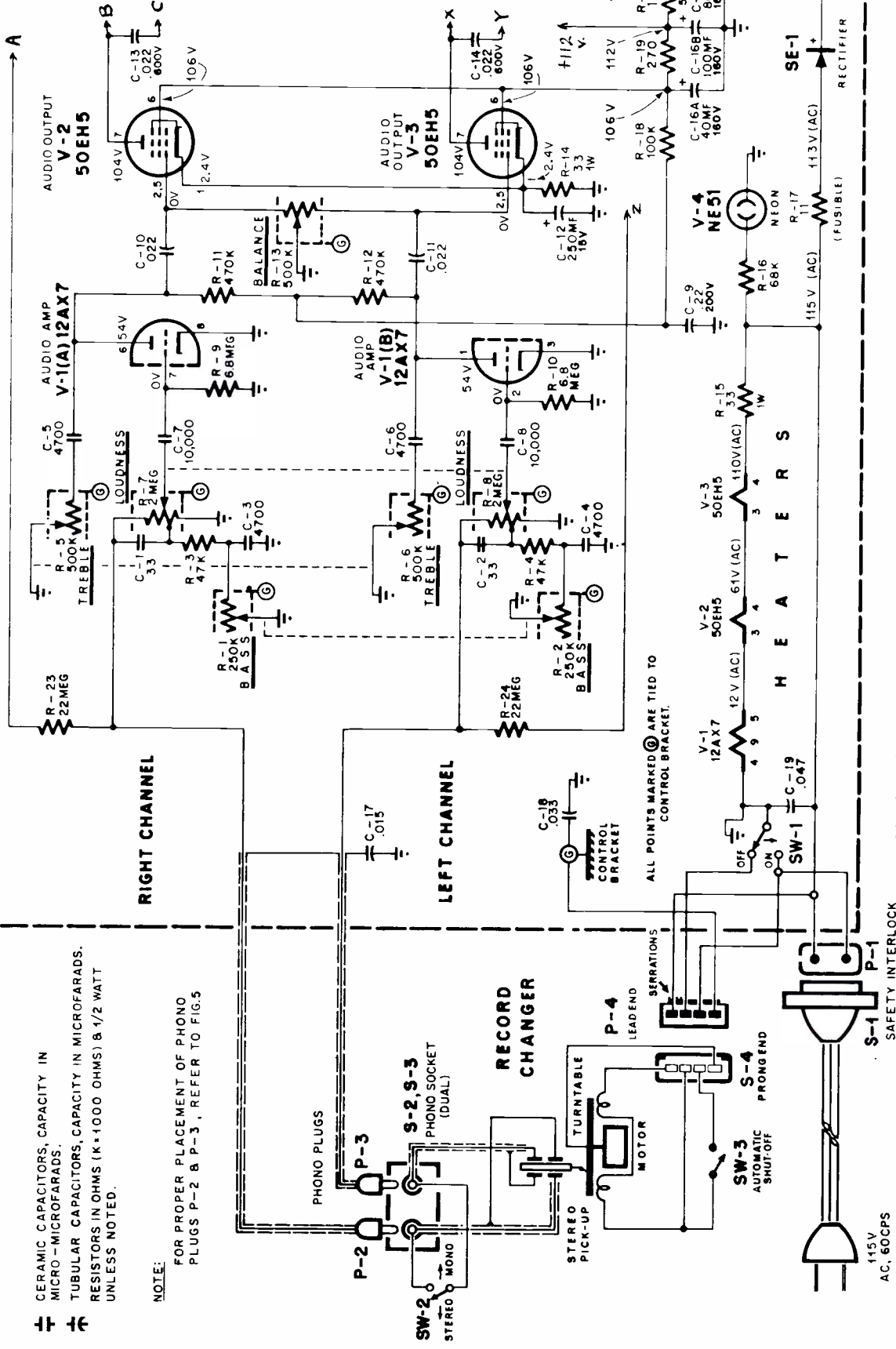


EMERSON Chassis 120599B

MONAURAL AND STEREO AMPLIFIER BOARD

CERAMIC CAPACITORS, CAPACITY IN MICRO-MICROFARADS.
TUBULAR CAPACITORS, CAPACITY IN MICROFARADS.
RESISTORS IN OHMS (K=1000 OHMS) & 1/2 WATT UNLESS NOTED.

NOTE:
FOR PROPER PLACEMENT OF PHONO PLUGS P-2 & P-3, REFER TO FIG. 5

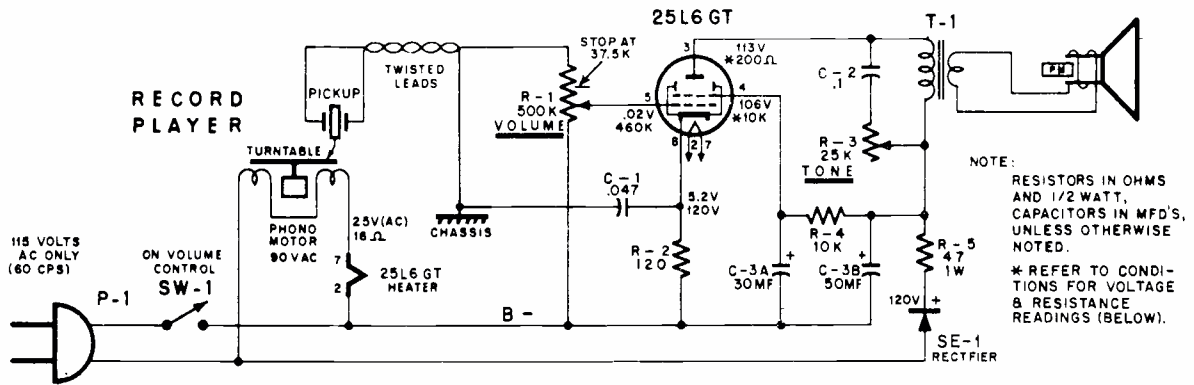


EMERSON Models P-1904, P-1905, Chassis 120599B

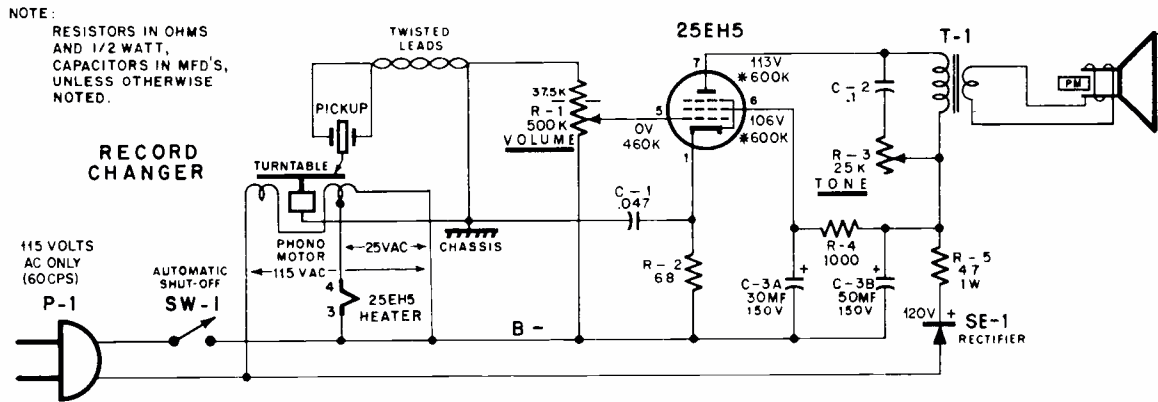
Continued from page 34. Correspondingly lettered wires of this circuit and circuits of page 34 connect together. Separation made for printing convenience only.

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

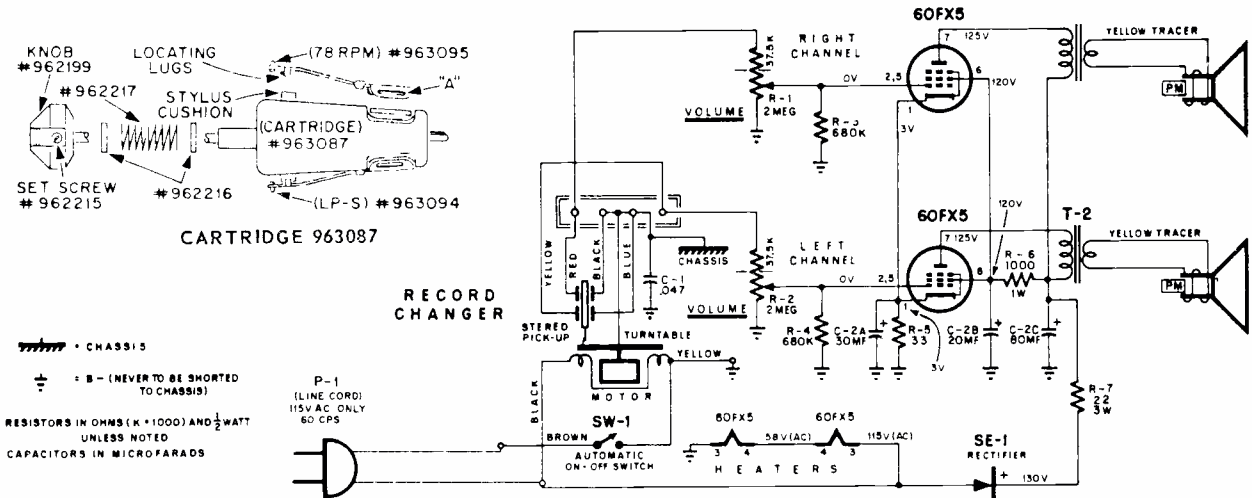
EMERSON Chassis 120547B, Models P-1908, P-1912



EMERSON Chassis 120548B, Models P-1907A, P-1916



EMERSON Chassis 120558B, Models P-1910, P-1917, P-1918

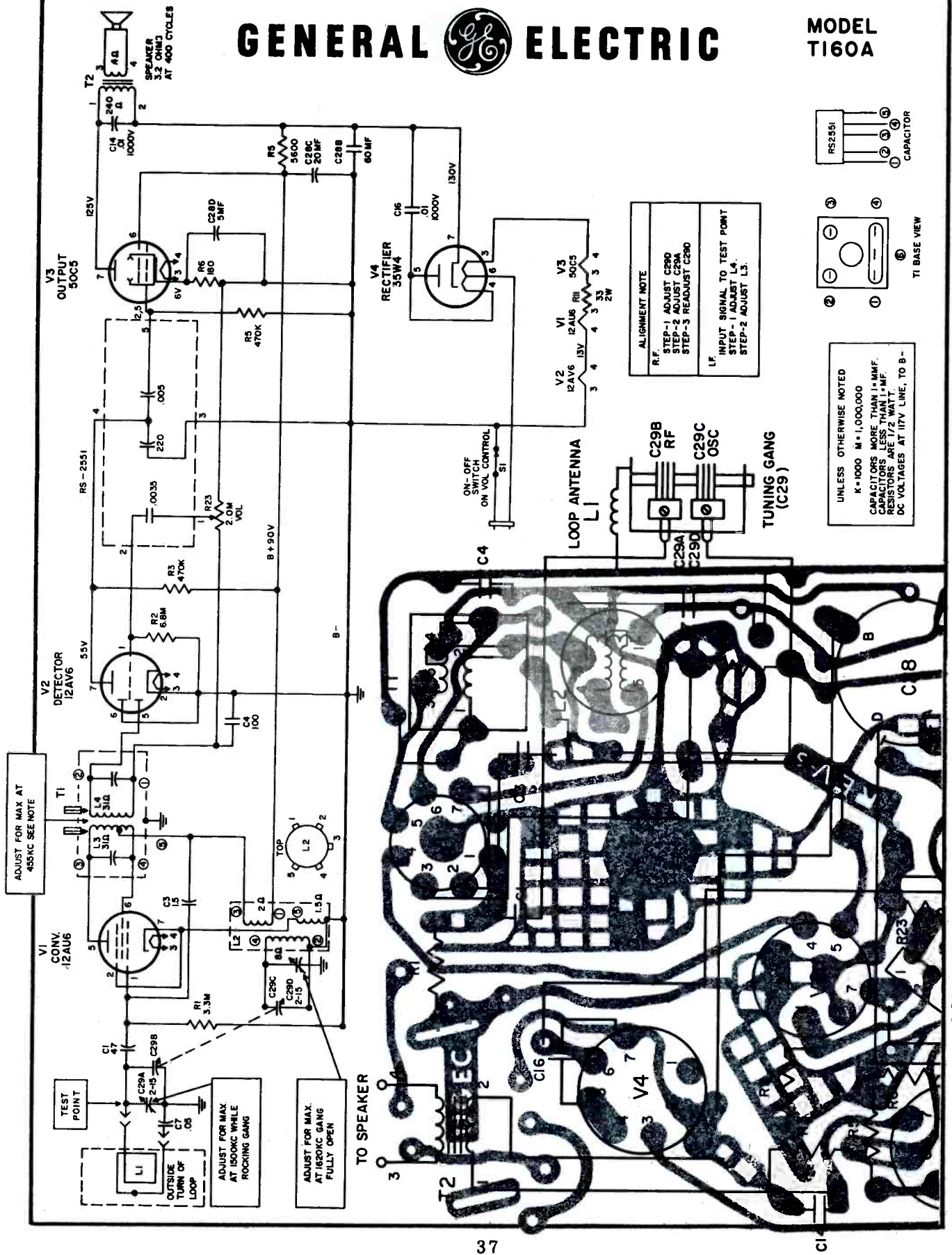


CONDITIONS FOR VOLTAGE AND RESISTANCE READINGS

1. Voltages indicated are positive d.c., resistances in ohms, unless otherwise indicated.
2. Measurements made with voltahmyst or equivalent.
3. All measurements taken from pin to B minus unless otherwise indicated.
4. Voltage measurements taken with:
 - a) Line voltage maintained at 115 volts a.c.
 - b) Volume control set for maximum volume.
5. Resistance measurements taken with:
 - a) Power line cord disconnected from outlet.
 - b) Volume control set for maximum volume.
6. Nominal tolerance on component values makes possible a variation of $\pm 15\%$ in voltage and resistance readings.
7. N.C. denotes no connection, K is kilohms, Meg. is megohms.
8. Resistances marked with * vary due to capacitor charge. Allow about 30 seconds for meter to settle.

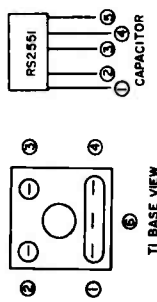
GENERAL ELECTRIC

MODEL
T160A



ALIGNMENT NOTE
 R.F.
 STEP-1 ADJUST C290
 STEP-2 ADJUST C29A
 STEP-3 READJUST C290
 L.F.
 INPUT SIGNAL TO TEST POINT
 STEP-1 ADJUST L4
 STEP-2 ADJUST L3

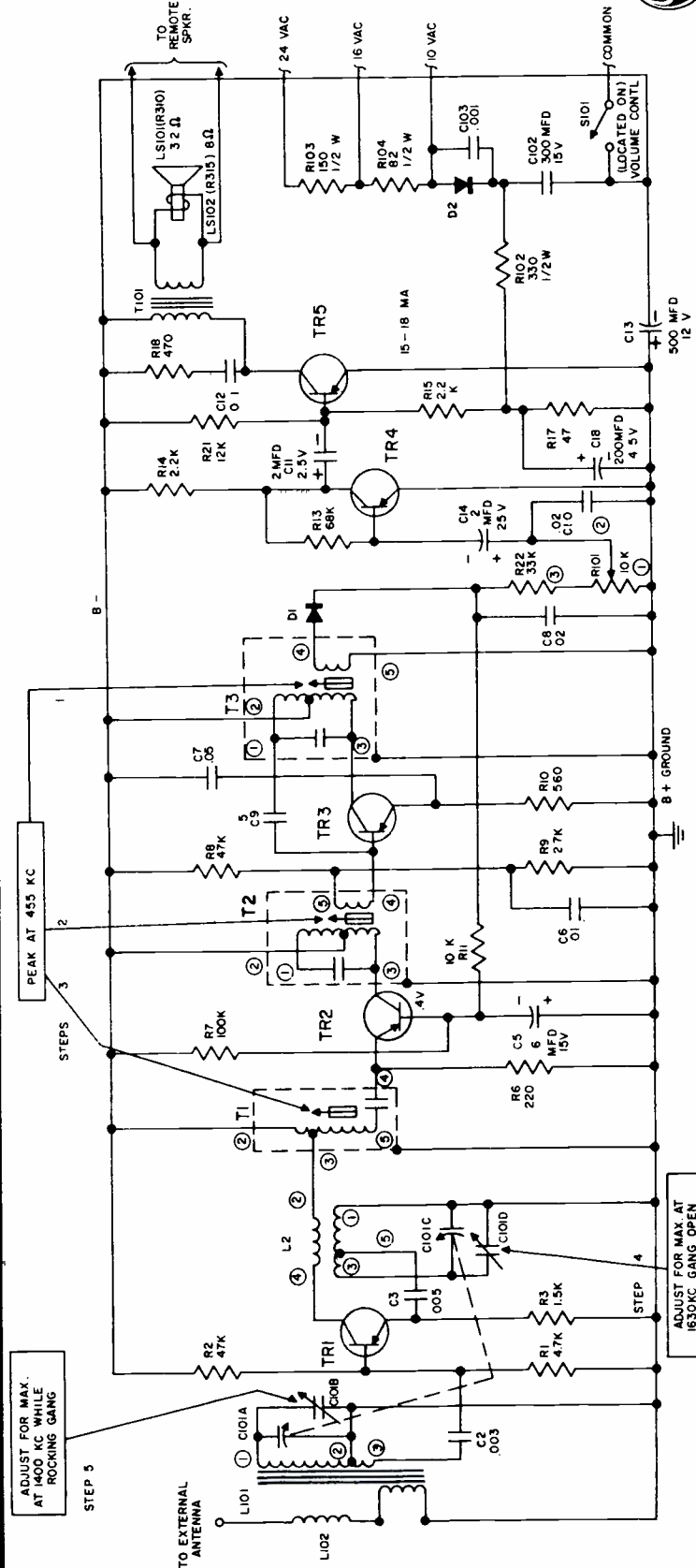
UNLESS OTHERWISE NOTED
 K = 1000 M = 1,000,000
 CAPACITORS MORE THAN 1-MMF.
 CAPACITORS LESS THAN 1-MMF.
 RESISTORS ARE 1/2 WATT.
 DC VOLTAGES AT IFTV LINE, TO B-



COMPONENT WIRING DIAGRAM

GENERAL ELECTRIC

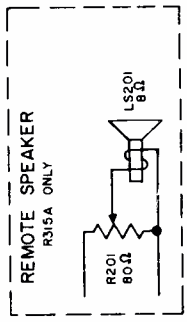
Radio Models
R310A
R315A



COLOR CODE FOR DIFFERENT TRANSFORMER OUTPUTS
When the transformer Use Power Leads From Radio Colored:

- 10 Volts A.C. Red and White
- 16 Volts A.C. Yellow and White
- 24 Volts A.C. Green and White

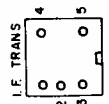
ALIGNMENT
SET VOLUME CONTROL AT MAXIMUM.
CONNECT OUTPUT METER OR SCOPE ACROSS VOICE COIL.
INDUCTIVELY COUPLE SIGNAL GENERATOR TO RECEIVER.



NOTES:
1. UNLESS OTHERWISE NOTED, CAPACITORS MORE THAN 1-MMF CAPACITORS LESS THAN 1-MMF RESISTORS ARE 1/4 WATT AND K-1000 VOLTAGES ARE CURRENT READING IN VOLTS. ALL VOLTAGES ARE NEGATIVE WITH RESPECT TO GROUND.
2. REPLACE WITH TRANSISTOR TYPES SHOWN.



TRANSISTORS
E • EMITTER
B • BASE
C • COLLECTOR



- MASTER RADIO REMOVAL**
1. Pull off tuning knob.
 2. Remove four screws which are used at the top and bottom of the cabinet to secure the radio to the wall box.
 3. Remove all wire nuts from transformer, antenna, and remote station leads, carefully labeling each wire. Then remove the master radio from the wall.

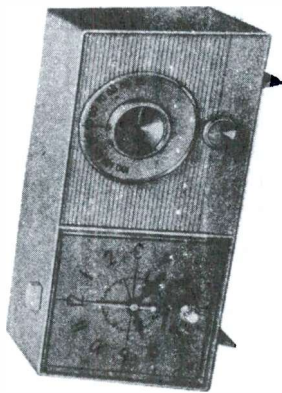
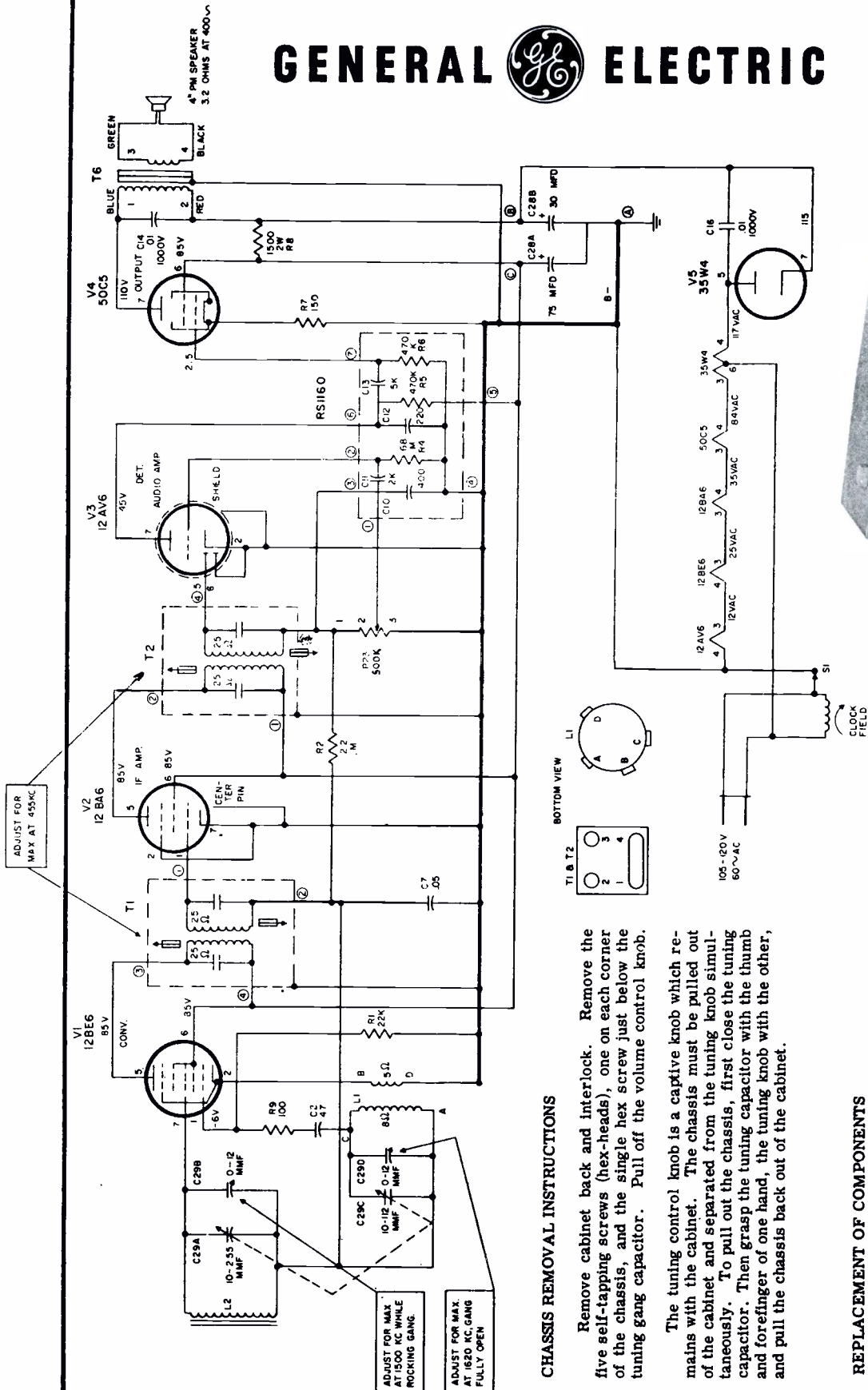
AVERAGE QUIESCENT TRANSISTOR VOL.

	TR1	TR2	TR3	TR4	TR5
E	.69	.31	.21	0	0
B	.64	.5	.37	.19	.19
C	7.4	7.4	7.4	2.8	7.0

- REMOTE STATION REMOVAL**
1. Remove the two knurled-head bolts appearing in the upper left and lower right corners on the remote station escutcheon.
 2. Remove wire nuts from wires going to the speaker.
 3. Remove remote unit from the wall.

GENERAL ELECTRIC

MODELS
C410A
C411A



model C410A

CHASSIS REMOVAL INSTRUCTIONS

Remove cabinet back and interlock. Remove the five self-tapping screws (hex-heads), one on each corner of the chassis, and the single hex screw just below the tuning gang capacitor. Pull off the volume control knob.

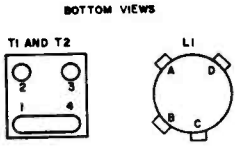
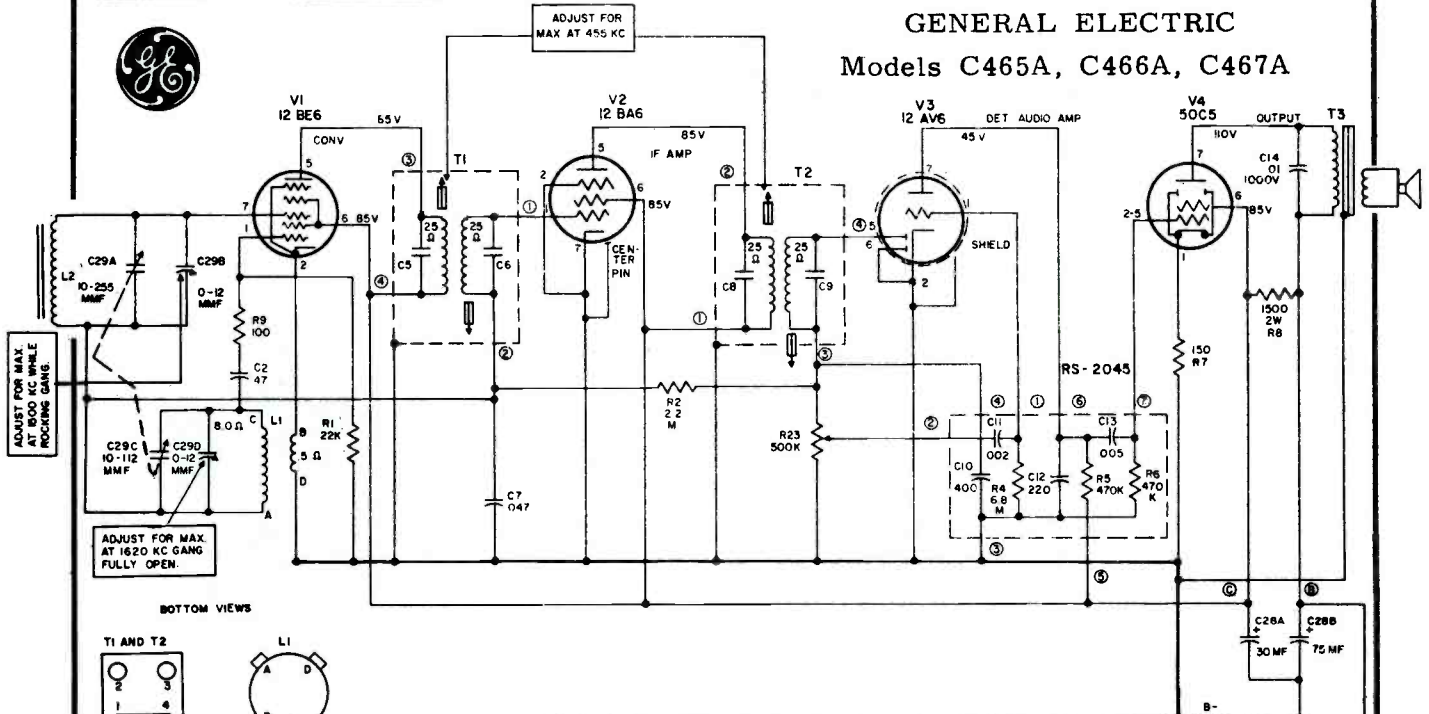
The tuning control knob is a captive knob which remains with the cabinet. The chassis must be pulled out of the cabinet and separated from the tuning knob simultaneously. To pull out the chassis, first close the tuning capacitor. Then grasp the tuning capacitor with the thumb and forefinger of one hand, the tuning knob with the other, and pull the chassis back out of the cabinet.

REPLACEMENT OF COMPONENTS

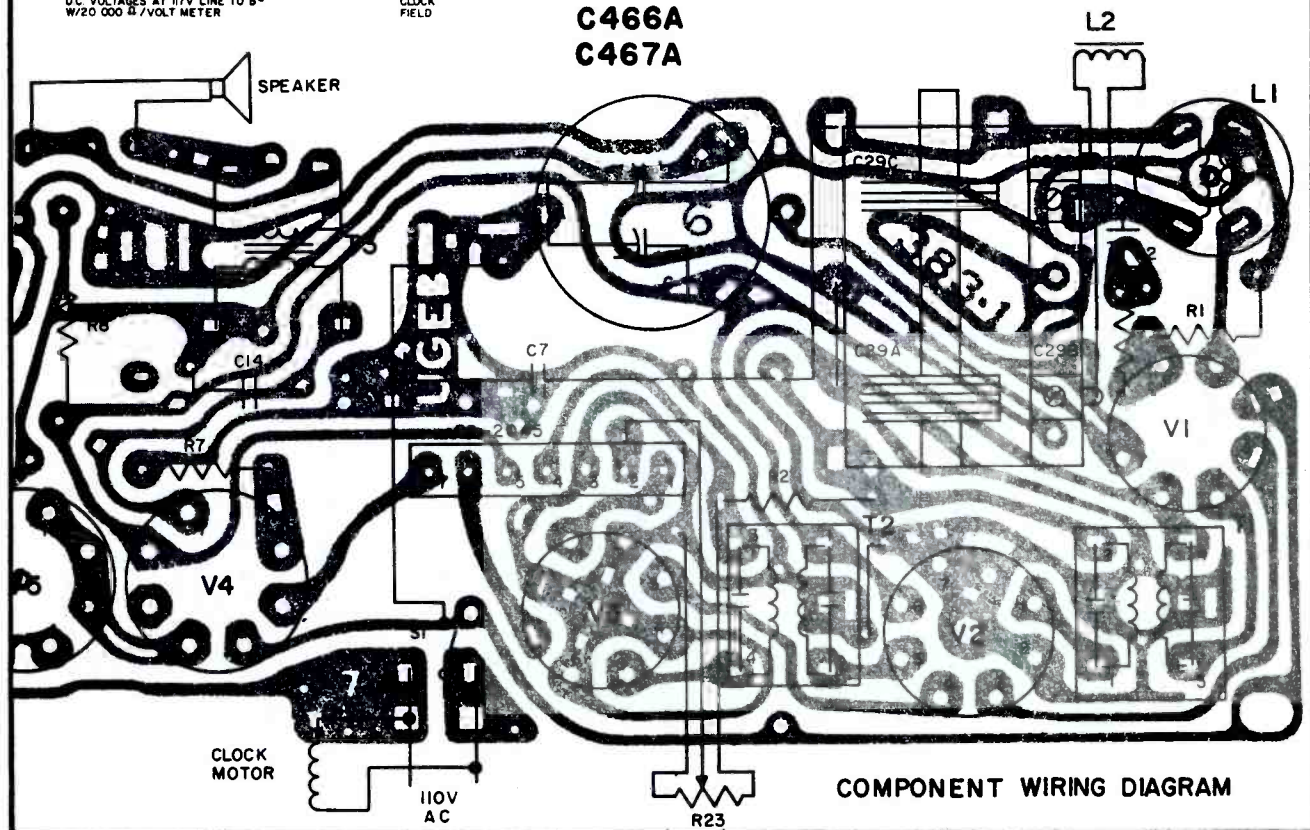
After removing a defective part, the mounting holes should be cleaned of all solder. The replacement part can be inserted more easily and a better soldering connection can be accomplished. It is important to use extreme care while soldering on this chassis. Only apply the soldering iron long enough to melt the solder and pull out the part being replaced. Too much heat on the chassis will cause the copper plating to become unbonded. Since too much heat may damage a component or unbond the copper pattern, a soldering iron of approximately 35 watts maximum is recommended.

UNLESS OTHERWISE DENOTED
CAPACITORS MORE THAN 1" M.F.
CAPACITORS LESS THAN 1" M.F.
RESISTOR - M = 1,000,000
- M = 1,000,000
DC VOLTAGE @ 117 V LINE TO B-
W/20,000Ω / VOLT METER

GENERAL ELECTRIC
Models C465A, C466A, C467A

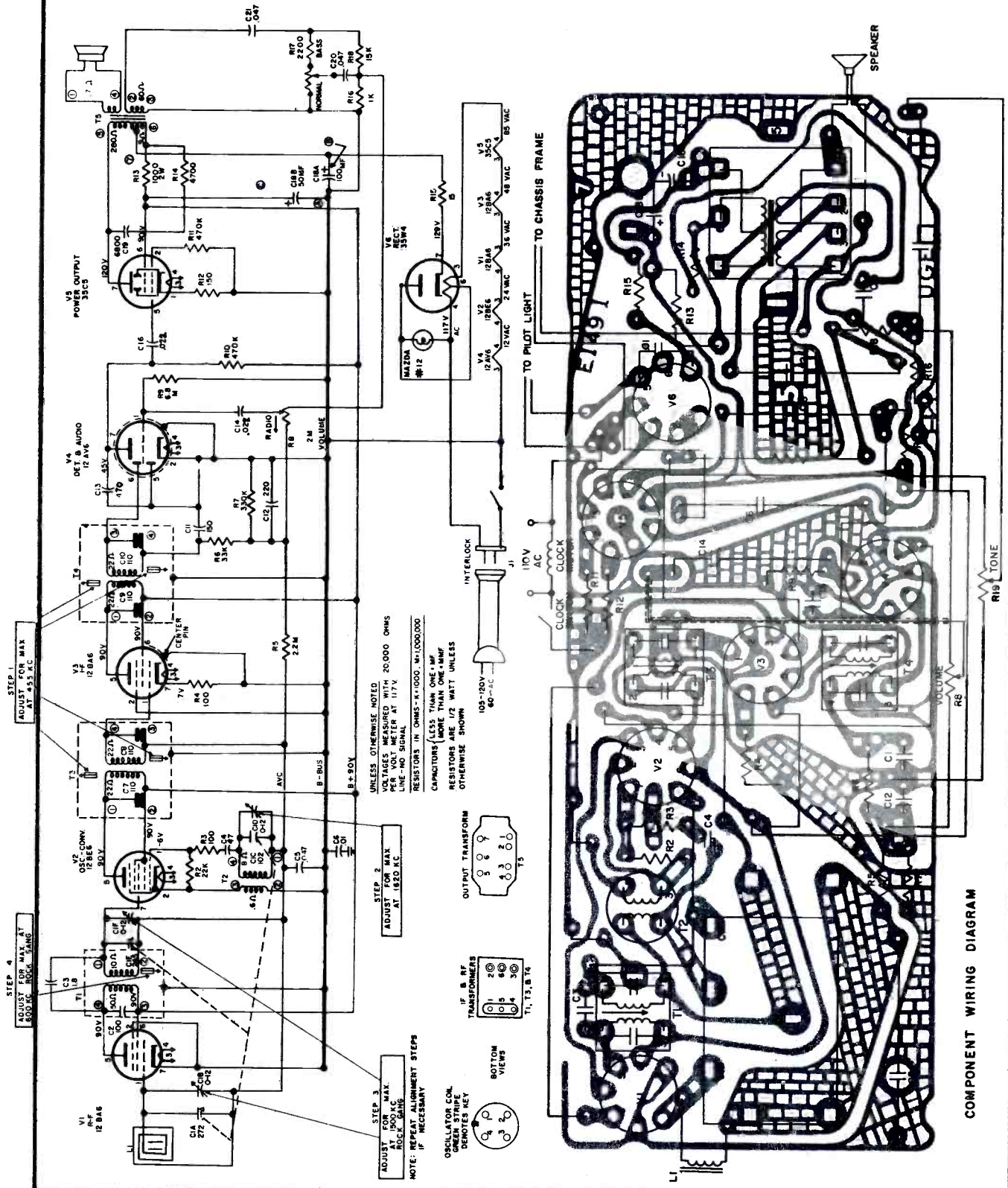


MODELS
C465A
C466A
C467A



GENERAL ELECTRIC

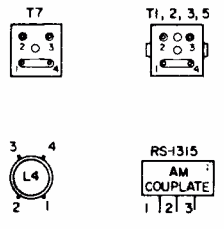
RADIO
MODEL
C470A



VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

GENERAL ELECTRIC Models T245A, T246A, T250A, T255A, T256A, C525A

BOTTOM VIEWS

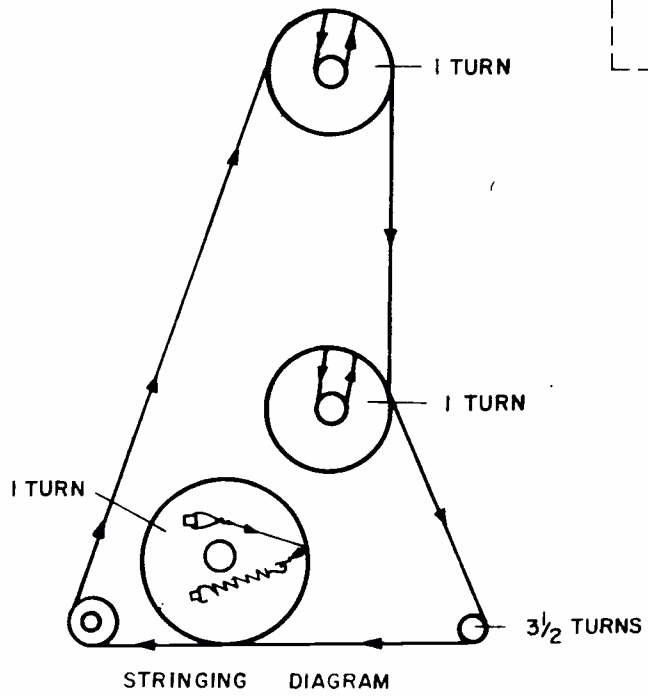
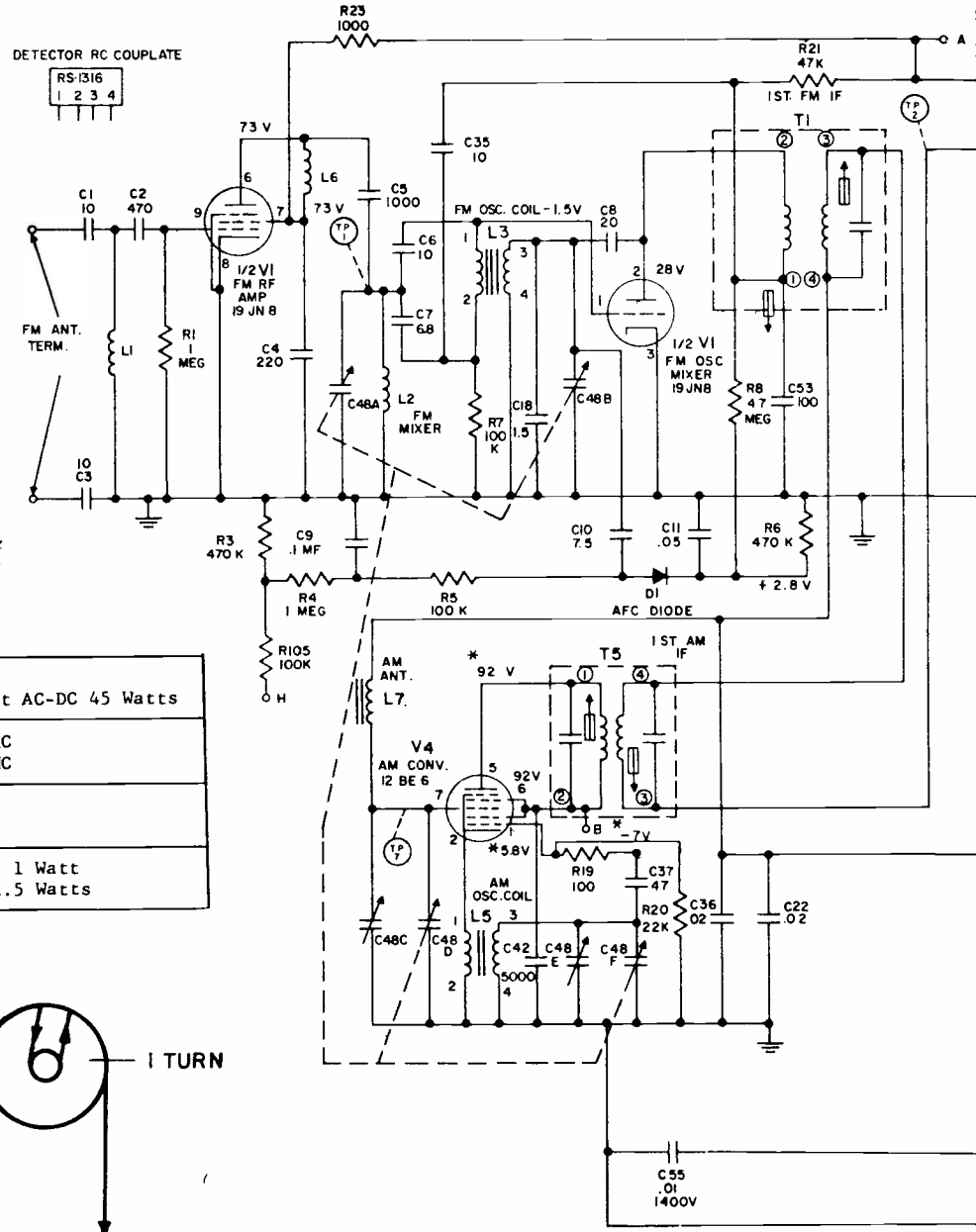


UNLESS OTHERWISE NOTED:
 K=1,000 M=1,000,000
 CAP MORE THAN 1 μMMF
 CAP LESS THAN 1 μMF

- VOLTAGE READING TAKEN WITH -VTVM
1. 120 VOLT AC INPUT
 2. SET IN FM POSITION
 3. VOLUME CONTROL AT MIN.
 4. TUNING GANG SET TO 108 MC
- * SET IN AM POSITION

- NOTE:
1. USED ON T250 AND T255 ONLY.
 2. USED ON T250, T255 AND C525 ONLY.
 3. USED ON T245, T250 AND T255 ONLY.
 4. USED ON C525 ONLY.

ELECTRICAL RATING:	105 - 120 Volt AC-DC 45 Watts
TUNING RANGE:	AM 540-1600 KC FM 88-108 MC
I. F. :	AM 455KC FM 10.7MC
POWER OUTPUT:	Undistorted: 1 Watt Maximum: 1.5 Watts



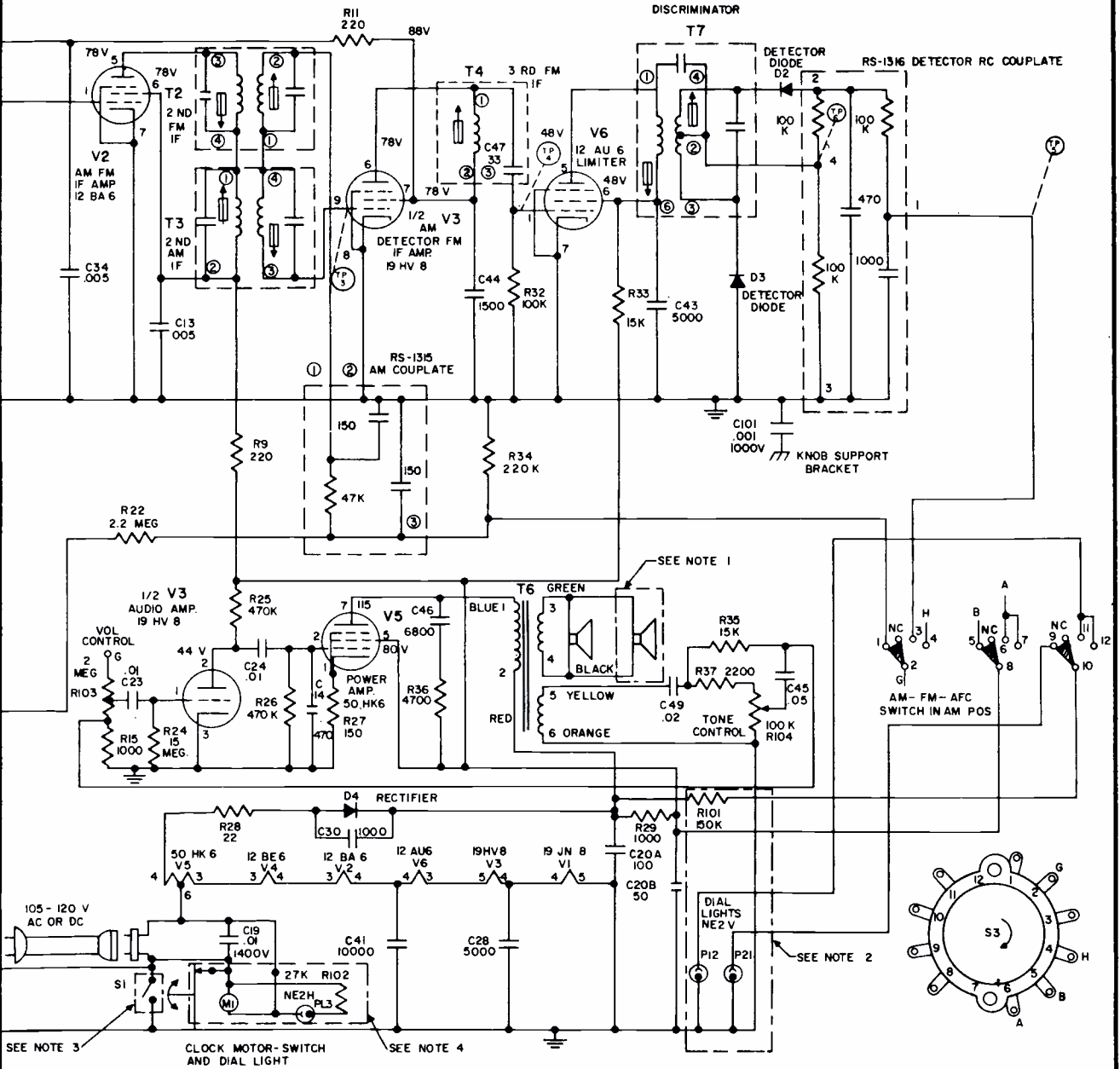
CHASSIS REMOVAL

1. Pull all knobs off control shafts on front of cabinet.
2. Remove two 1/4" hex-head screws from cabinet back.
3. Lift right hand side of cabinet back, disengaging interlock, and then slide out to the right and out.
4. Remove six hex-head screws from cabinet bottom securing chassis and output transformer to cabinet.
5. Label and unsolder wires going to the speaker and pilot light bulbs.
6. Slide out chassis.

(Diagram continued to next page)

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

GENERAL ELECTRIC Models T245A, T246A, T250A, T255A, T256A, C525A
(Diagram and material continued from preceding page, at left)



FM OSCILLATOR COIL

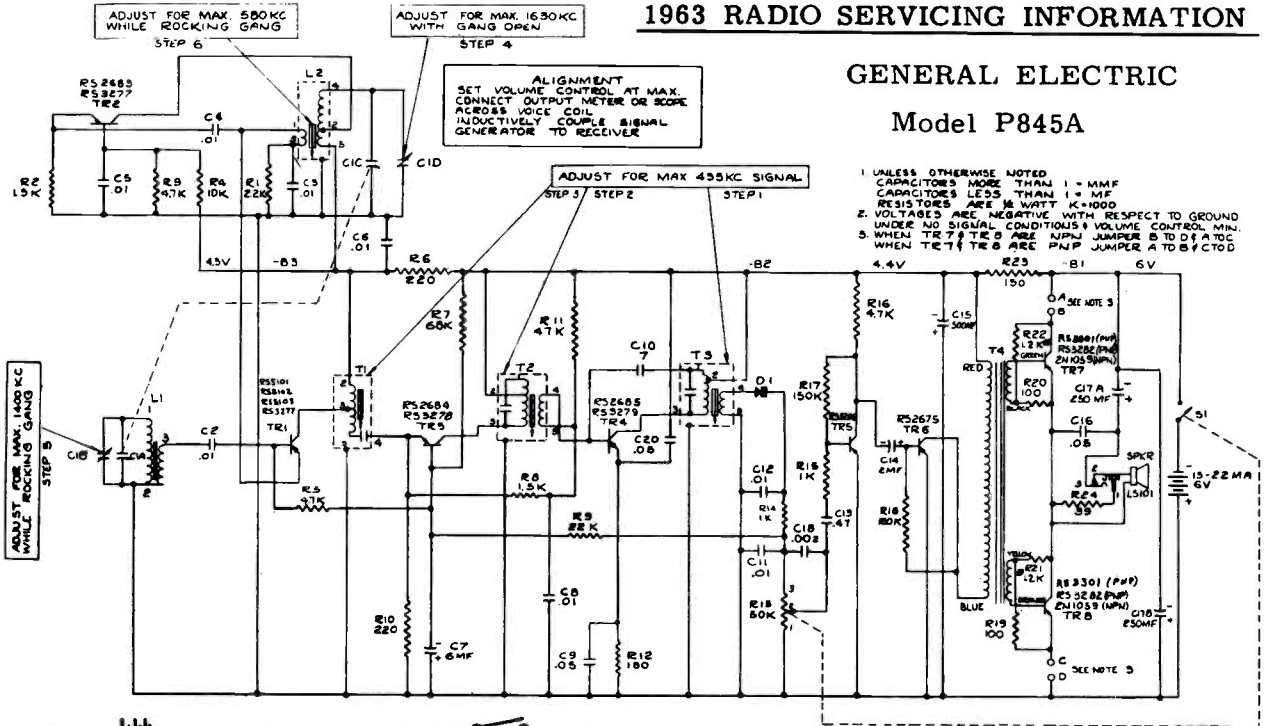
The FM oscillator coil, L3, may require adjustment if components, other than tubes, are changed in the FM oscillator-mixer section. Check the band end frequencies. If the set tunes through 108 and 88 MC do not touch the coil. If the oscillator frequency is low, adjust L3 by spreading the turns slightly. (This raises the dial reading.) If the oscillator frequency is high adjust L3 by squeezing the turns together slightly. (This lowers the dial reading.)

NOTE: A small change in the space between any 2 turns of L3 shifts the frequency approximately 1 MC.

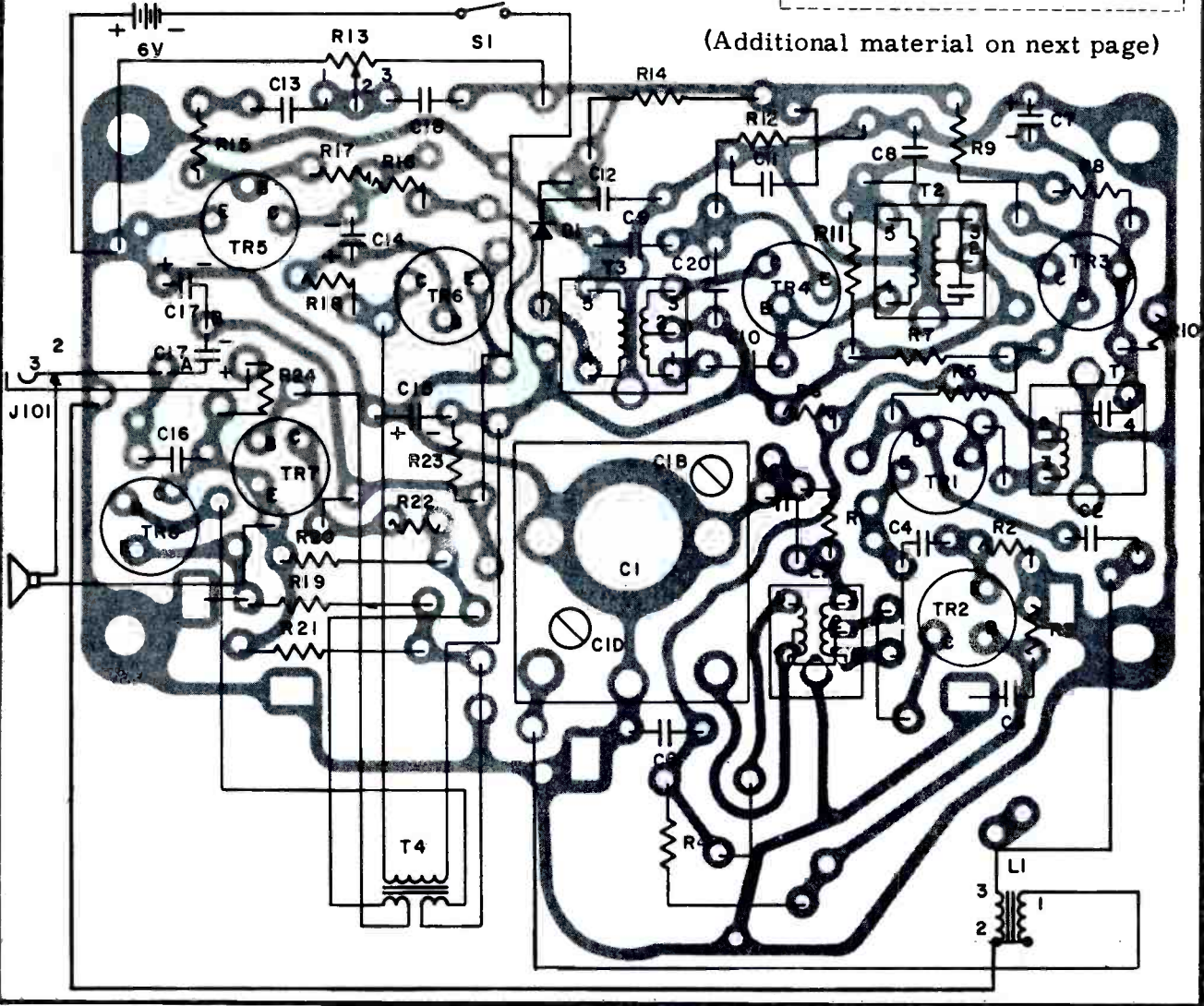
PILOT LIGHTS

NOTE: Radio model C-525 uses a type NE-2V bulb for band indication and dial lighting. A type NE-2H bulb is used for the clock face lighting. Since the NE-2H requires a higher firing voltage, it should never be substituted for the NE-2V bulb, since there is no assurance that the former will light on DC. Also, the NE-2V bulb cannot be used in series with the 27K resistor (R102) as too much voltage would be placed across the bulb, severely limiting its life.

GENERAL ELECTRIC
Model P845A



(Additional material on next page)



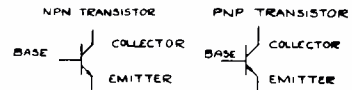
GENERAL ELECTRIC

Model P845A

(Material continued)

CHASSIS REMOVAL

1. Remove two phillips head screws located on the cabinet back.
2. Remove the screw holding the battery compartment door and remove the penlite batteries.
3. Remove the two phillips head screws located beneath the extreme right and left batteries.
4. Lift off cabinet back and remove four 1/4" hex-head bolts from the circuit board.
5. Carefully lift out chassis from cabinet.



TRANSISTOR MTG PATTERN



TABLE OF TRANSISTOR VOLTAGES				FUNCTION	
EMITTER	BASE	COLLECTOR			
TR1	.4	.45	4.3	OSCILLATOR	
TR2	.95	.95	4.4	1ST I.F.	
TR3	25 to 45	42 to 45	4.4	AMP. I.F.	
TR4	2 to 4	55 to 5	4.4	AMP. I.F.	
TR5	0	1.7 to 2	1.7 to 2.2	AUDIO AMPLIFIER	
TR6	0	.2	4.2	AUDIO DRIVER	
TR7	NPN	2.9	2.7	0	PUSH PUSH AUDIO OUTPUT
	PNP	2.9	3.1	0	
TR8		6	6.6	2.9	
	PNP	0	.2	2.9	

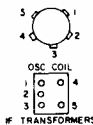
1.F. TRANSFORMER FOSC. COIL



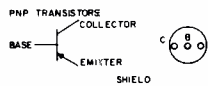
GENERAL ELECTRIC

Models P820C, P821C, P822C

CATALOG NO.	SYMBOL	DESCRIPTION	PRICE
*-RS-5101	TR1	Osc. Converter.....	2.10
*-RS-5201	TR2	1st I.F.....	2.10
*-RS-5301	TR3	2nd I.F.....	2.10
*-RS-5504	TR4	Driver.....	2.10
*-RS-5704	TR5, TR6	Outputs.....	2.10



TRANSFORMERS

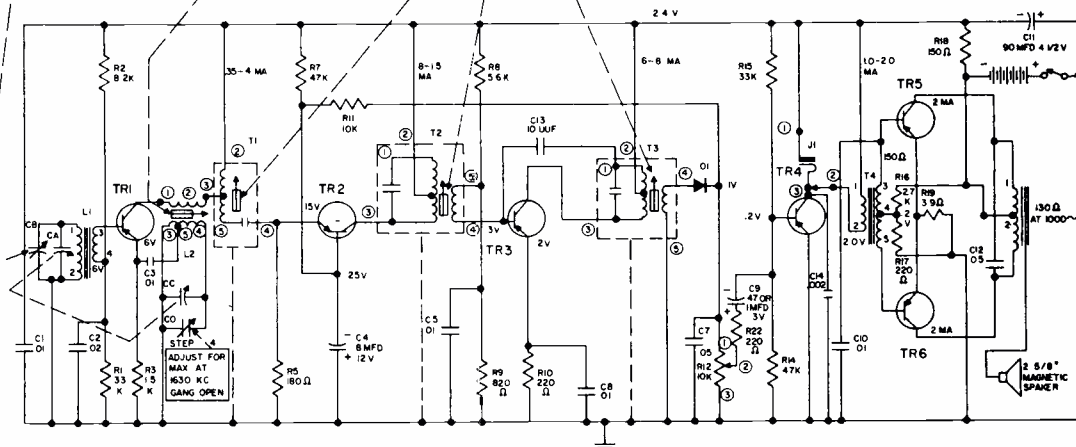


NOTES

- 1 UNLESS OTHERWISE NOTED CAPACITORS MORE THAN 1-μFDF CAPACITORS LESS THAN 1-μFDF RESISTORS ARE 1/2 WATT AND K=1000
- 2 VOLTAGES B CUPRINT READINGS ARE AVERAGE UNDER NO SIGNAL CONDITIONS VOLTAGES ARE NEGATIVE WITH RESPECT TO GROUND
- 3 REPLACE TRANSISTORS BY CATALOG NUMBERS LISTED IN PARTS LIST

ALIGNMENT
SET VOLUME CONTROL AT MAXIMUM. CONNECT OUTPUT METER OR SCOPE ACROSS VOICE COIL INDUCTIVELY COUPLE SIGNAL GENERATOR TO RECEIVER

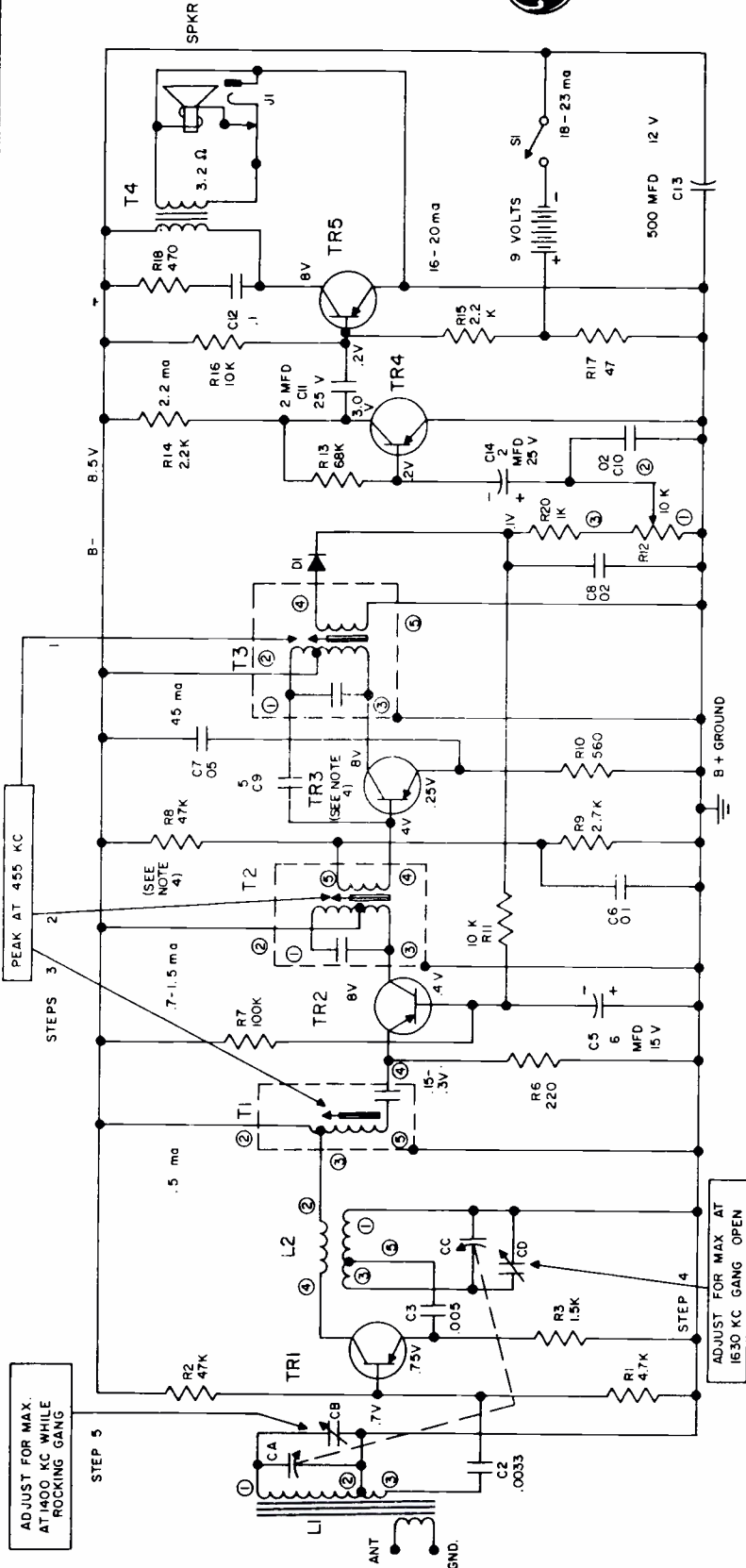
ADJUST FOR MAX AT 400 KC WHILE ROCKING GANG
ADJUST FOR MAX AT 580 KC WHILE ROCKING GANG
PEAK AT 455 KC



COMPONENT WIRING DIAGRAM

GENERAL ELECTRIC

MODELS
P810A
P811A

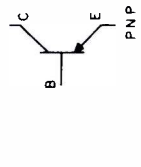


TROUBLESHOOTING

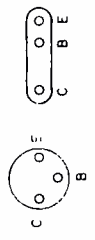
A check of battery condition and total current drain of the receiver should be made first. All current measurements are made at quiescence with the receiver turned on, volume control at minimum, tuning gang closed, and with no-signal conditions.

The total quiescent receiver current drain is from 18 to 23 ma. This is measured by inserting a milliammeter in series with the batteries.

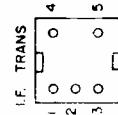
If an excessive total quiescent current drain is recorded, the individual collector currents of each transistor should be checked. An excessive current reading may mean a shorted transistor; no current will indicate that a transistor or associated circuit component is defective.



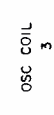
PNP TRANSISTORS



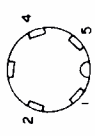
E = EMITTER
B = BASE
C = COLLECTOR



I.F. TRANS



OSC COIL



KEY

ALIGNMENT
SET VOLUME CONTROL AT MAXIMUM.
CONNECT OUTPUT METER OR SCOPE ACROSS VOICE COIL.
INDUCTIVELY COUPLE SIGNAL GENERATOR TO RECEIVER

NOTES:

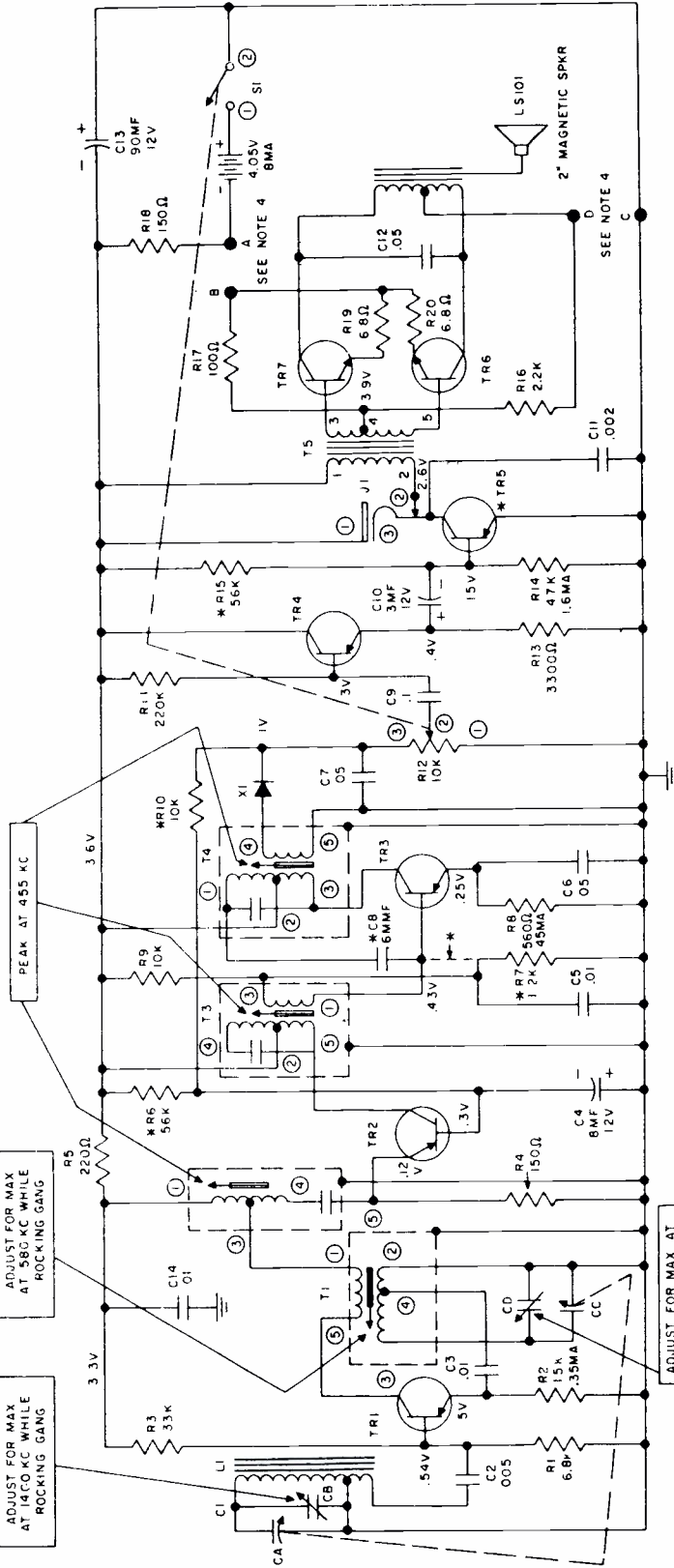
- UNLESS OTHERWISE NOTED, CAPACITORS MORE THAN 1=MMF, CAPACITORS LESS THAN 1=MF. RESISTORS ARE 1/4 WATT AND K=1000.
- VOLTAGES AND CURRENT READINGS ARE AVERAGE UNDER NO SIGNAL CONDITIONS. VOLTAGES ARE NEGATIVE WITH RESPECT TO GROUND.
- REPLACE WITH TRANSISTOR TYPES SHOWN IN PARTS LIST.
- R8 IS 33K WHEN TR3 IS RS-5304.

BOTTOM VIEWS

GENERAL ELECTRIC

MODELS
P852A
P853A
P8522A
P8523A

TRANSISTOR LIST	
GROUP 1	GROUP 2
TR1	RS3322
TR2	RS2691
TR3	RS2692
TR4	RS3308
TR5	RS2697
TR6	RS3316-1
TR7	RS3316-2



CHASSIS REMOVAL

1. Remove cabinet back (with 1/8" tip screwdriver).
2. Remove two hex-head screws holding circuit board to cabinet front (with 1/8" Xcelite P4 spintite or equivalent).
3. Remove earphone jack by unscrewing knurled nut counterclockwise on cabinet top.
4. Tilt up volume control side of chassis board and lift out of cabinet front.

NOTE: Earphone jack must be inserted through fishpaper insulator and bushings before mounting jack to cabinet.

TROUBLESHOOTING

A check of battery condition and total current drain of the receiver should be made first. All current measurements are made at quiescence with the receiver turned on, volume control at minimum, tuning gang closed, and with no-signal conditions. The total receiver current drain is 8 to 12 mls. This is measured by inserting a milliammeter in series with the batteries. If an excessive total current drain is recorded, the individual collector currents of each transistor should be checked.

* SPECIAL INSTRUCTIONS WHEN:

- TR1 IS RS 3322
- TR2 IS RS 3323
- TR3 IS RS 3324
- TR5 IS RS 3316-1 OR 2
- R6 - 39K
- R7 - 1.5K CONNECTED FROM GRND TO BASE OF TR3
- R10 - 6.8K
- R15 - .39K WHEN TR5 IS RS 3316-1 OR RS 3310
- R15 - .56K WHEN TR5 IS RS 3316-2

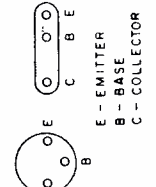
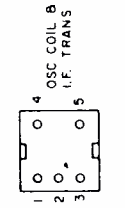
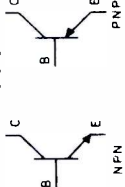
CB - DELETE

ALIGNMENT
SET VOLUME CONTROL AT MAXIMUM
CONNECT OUTPUT METER OR SCOPE
ACROSS VOICE COIL
INDUCTIVELY COUPLE SIGNAL
GENERATOR TO RECEIVER

NOTES

1. UNLESS OTHERWISE NOTED, CAPACITORS MORE THAN 1.0MF CAPACITORS LESS THAN 1.0MF RESISTORS ARE 1/4 WATT & K=1000
2. VOLTAGE CURRENT READINGS ARE TAKEN UNDER NO SIGNAL CONDITIONS. VOLTAGES ARE NEGATIVE WITH RESPECT TO GROUND.
3. REPLACE WITH TRANSISTOR TYPES SHOWN, OR ORDER BY CATALOG NUMBER AS LISTED IN PARTS LISTS.
4. TR6 & 7 PNP - CONNECT C TO D, A TO B. TR6 & 7 PNP - CONNECT A TO D, C TO B.
5. SCHEMATIC SHOWN FOR GRP 1 TRANSISTORS.

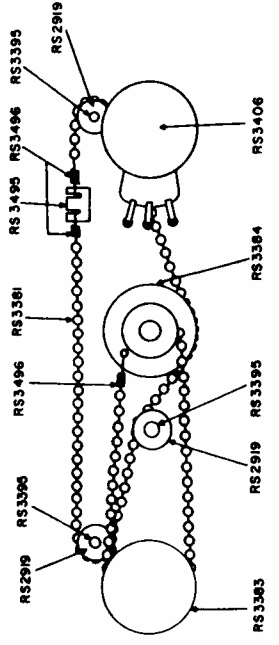
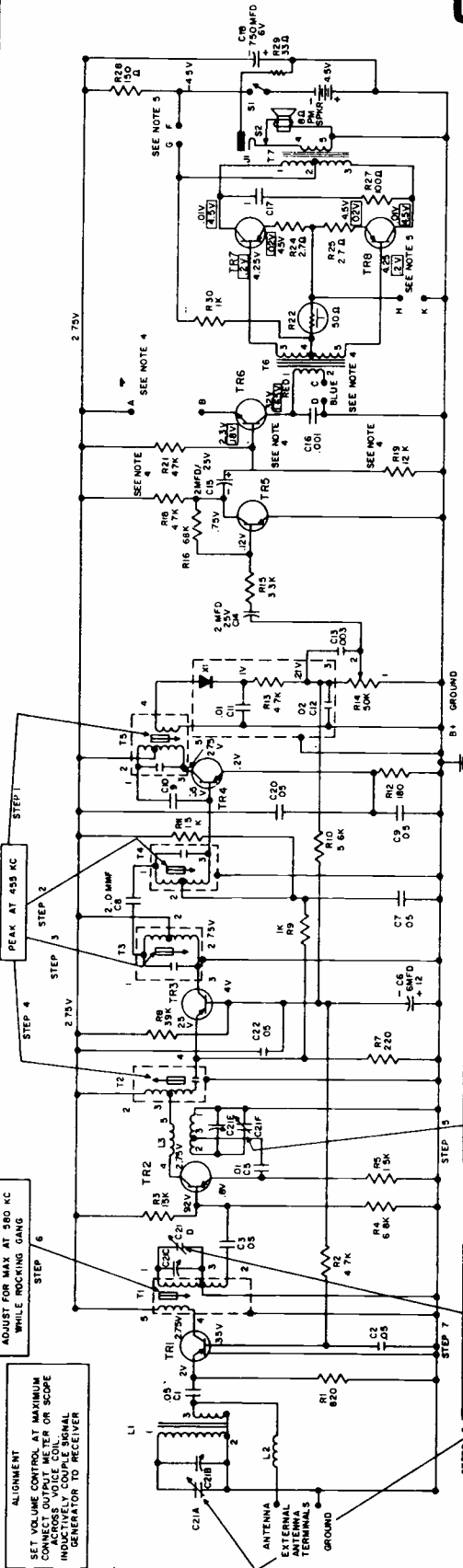
TRANSISTORS



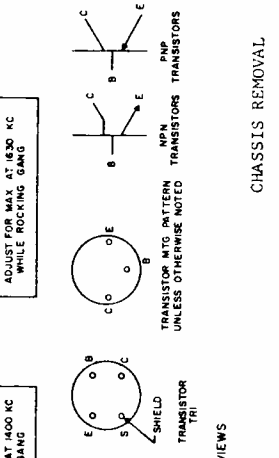
BOTTOM VIEWS

GENERAL ELECTRIC

MODEL P871A



DIAL CHAIN DIAGRAM



BOTTOM VIEWS

- CHASSIS REMOVAL**
1. Remove four screws holding cabinet back to cabinet front.
 2. Remove screw holding battery compartment door to cabinet bottom.
 3. Slide out cabinet back and clip stand.
 4. Remove volume knob and lockwasher.
 5. Remove 3 hex-head screws securing circuit board to brackets.
 6. Unsolder all connecting leads going to board.

TROUBLESHOOTING

A check of battery condition and total current drain of the receiver should be made first. All current measurements are made at quiescence with the receiver turned on, volume control at minimum, tuning gang closed, and with no signal conditions. The total receiver current drain is 25 to 30 mls. Current drain is measured with the receiver in the off position and a milliammeter inserted across S1. An excessive current reading may mean a shorted transistor; no current will indicate that a transistor or associated circuit component is defective.

- NO RECEPTION:**
1. Check battery voltage and battery contacts.
 2. Check on-off switch.
 3. Check all antenna lead connections.
 4. Check coil L3.

WEAK AUDIO:

1. Check battery voltage for 4.5 volts (B1 Ground).
2. Check receiver current.
3. Check alignment.

INTERMITTENT:

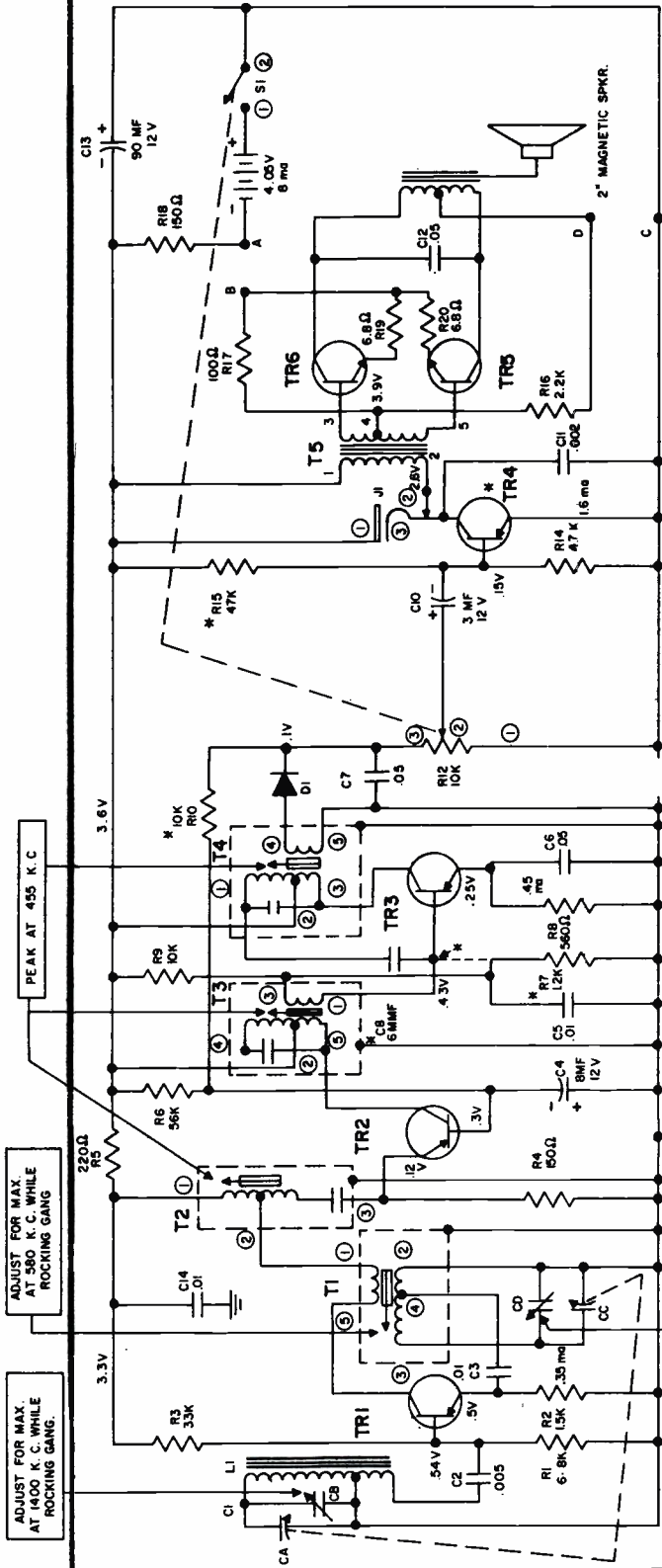
1. Check battery contacts for corrosion.
2. Check solder connections on dip-soldered side of circuit board.

ALIGNMENT

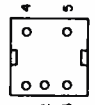
A built-in antenna is used in the carrying handle of this radio model. Best sensitivity will be obtained when the handle is swung away from the cabinet. At about a 45° angle away from the cabinet, you will feel the handle slip into a notch, or detent. This is the proper antenna position for RF alignment and maximum sensitivity.

- NOTES:**
1. UNLESS OTHERWISE NOTED CAPACITORS MORE THAN 1 μMF RESISTORS ARE 1/4 WATT 1% TOLERANCE UNLESS OTHERWISE NOTED
 2. VOLTAGES & CURRENT READINGS ARE AVERAGE UNDER NO SIGNAL CONDITIONS UNLESS OTHERWISE NOTED
 3. REPLACE WITH TRANSISTOR TYPES SHOWN IN PARTS LIST CATALOG NUMBER AS LISTED
 4. WHEN TR6 IS PNP SWITCH VALUES OF R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100, R101, R102, R103, R104, R105, R106, R107, R108, R109, R110, R111, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R122, R123, R124, R125, R126, R127, R128, R129, R130, R131, R132, R133, R134, R135, R136, R137, R138, R139, R140, R141, R142, R143, R144, R145, R146, R147, R148, R149, R150, R151, R152, R153, R154, R155, R156, R157, R158, R159, R160, R161, R162, R163, R164, R165, R166, R167, R168, R169, R170, R171, R172, R173, R174, R175, R176, R177, R178, R179, R180, R181, R182, R183, R184, R185, R186, R187, R188, R189, R190, R191, R192, R193, R194, R195, R196, R197, R198, R199, R200, R201, R202, R203, R204, R205, R206, R207, R208, R209, R210, R211, R212, R213, R214, R215, R216, R217, R218, R219, R220, R221, R222, R223, R224, R225, R226, R227, R228, R229, R230, R231, R232, R233, R234, R235, R236, R237, R238, R239, R240, R241, R242, R243, R244, R245, R246, R247, R248, R249, R250, R251, R252, R253, R254, R255, R256, R257, R258, R259, R260, R261, R262, R263, R264, R265, R266, R267, R268, R269, R270, R271, R272, R273, R274, R275, R276, R277, R278, R279, R280, R281, R282, R283, R284, R285, R286, R287, R288, R289, R290, R291, R292, R293, R294, R295, R296, R297, R298, R299, R300, R301, R302, R303, R304, R305, R306, R307, R308, R309, R310, R311, R312, R313, R314, R315, R316, R317, R318, R319, R320, R321, R322, R323, R324, R325, R326, R327, R328, R329, R330, R331, R332, R333, R334, R335, R336, R337, R338, R339, R340, R341, R342, R343, R344, R345, R346, R347, R348, R349, R350, R351, R352, R353, R354, R355, R356, R357, R358, R359, R360, R361, R362, R363, R364, R365, R366, R367, R368, R369, R370, R371, R372, R373, R374, R375, R376, R377, R378, R379, R380, R381, R382, R383, R384, R385, R386, R387, R388, R389, R390, R391, R392, R393, R394, R395, R396, R397, R398, R399, R400, R401, R402, R403, R404, R405, R406, R407, R408, R409, R410, R411, R412, R413, R414, R415, R416, R417, R418, R419, R420, R421, R422, R423, R424, R425, R426, R427, R428, R429, R430, R431, R432, R433, R434, R435, R436, R437, R438, R439, R440, R441, R442, R443, R444, R445, R446, R447, R448, R449, R450, R451, R452, R453, R454, R455, R456, R457, R458, R459, R460, R461, R462, R463, R464, R465, R466, R467, R468, R469, R470, R471, R472, R473, R474, R475, R476, R477, R478, R479, R480, R481, R482, R483, R484, R485, R486, R487, R488, R489, R490, R491, R492, R493, R494, R495, R496, R497, R498, R499, R500, R501, R502, R503, R504, R505, R506, R507, R508, R509, R510, R511, R512, R513, R514, R515, R516, R517, R518, R519, R520, R521, R522, R523, R524, R525, R526, R527, R528, R529, R530, R531, R532, R533, R534, R535, R536, R537, R538, R539, R540, R541, R542, R543, R544, R545, R546, R547, R548, R549, R550, R551, R552, R553, R554, R555, R556, R557, R558, R559, R560, R561, R562, R563, R564, R565, R566, R567, R568, R569, R570, R571, R572, R573, R574, R575, R576, R577, R578, R579, R580, R581, R582, R583, R584, R585, R586, R587, R588, R589, R590, R591, R592, R593, R594, R595, R596, R597, R598, R599, R600, R601, R602, R603, R604, R605, R606, R607, R608, R609, R610, R611, R612, R613, R614, R615, R616, R617, R618, R619, R620, R621, R622, R623, R624, R625, R626, R627, R628, R629, R630, R631, R632, R633, R634, R635, R636, R637, R638, R639, R640, R641, R642, R643, R644, R645, R646, R647, R648, R649, R650, R651, R652, R653, R654, R655, R656, R657, R658, R659, R660, R661, R662, R663, R664, R665, R666, R667, R668, R669, R670, R671, R672, R673, R674, R675, R676, R677, R678, R679, R680, R681, R682, R683, R684, R685, R686, R687, R688, R689, R690, R691, R692, R693, R694, R695, R696, R697, R698, R699, R700, R701, R702, R703, R704, R705, R706, R707, R708, R709, R710, R711, R712, R713, R714, R715, R716, R717, R718, R719, R720, R721, R722, R723, R724, R725, R726, R727, R728, R729, R730, R731, R732, R733, R734, R735, R736, R737, R738, R739, R740, R741, R742, R743, R744, R745, R746, R747, R748, R749, R750, R751, R752, R753, R754, R755, R756, R757, R758, R759, R760, R761, R762, R763, R764, R765, R766, R767, R768, R769, R770, R771, R772, R773, R774, R775, R776, R777, R778, R779, R780, R781, R782, R783, R784, R785, R786, R787, R788, R789, R790, R791, R792, R793, R794, R795, R796, R797, R798, R799, R800, R801, R802, R803, R804, R805, R806, R807, R808, R809, R810, R811, R812, R813, R814, R815, R816, R817, R818, R819, R820, R821, R822, R823, R824, R825, R826, R827, R828, R829, R830, R831, R832, R833, R834, R835, R836, R837, R838, R839, R840, R841, R842, R843, R844, R845, R846, R847, R848, R849, R850, R851, R852, R853, R854, R855, R856, R857, R858, R859, R860, R861, R862, R863, R864, R865, R866, R867, R868, R869, R870, R871, R872, R873, R874, R875, R876, R877, R878, R879, R880, R881, R882, R883, R884, R885, R886, R887, R888, R889, R890, R891, R892, R893, R894, R895, R896, R897, R898, R899, R900, R901, R902, R903, R904, R905, R906, R907, R908, R909, R910, R911, R912, R913, R914, R915, R916, R917, R918, R919, R920, R921, R922, R923, R924, R925, R926, R927, R928, R929, R930, R931, R932, R933, R934, R935, R936, R937, R938, R939, R940, R941, R942, R943, R944, R945, R946, R947, R948, R949, R950, R951, R952, R953, R954, R955, R956, R957, R958, R959, R960, R961, R962, R963, R964, R965, R966, R967, R968, R969, R970, R971, R972, R973, R974, R975, R976, R977, R978, R979, R980, R981, R982, R983, R984, R985, R986, R987, R988, R989, R990, R991, R992, R993, R994, R995, R996, R997, R998, R999, R1000

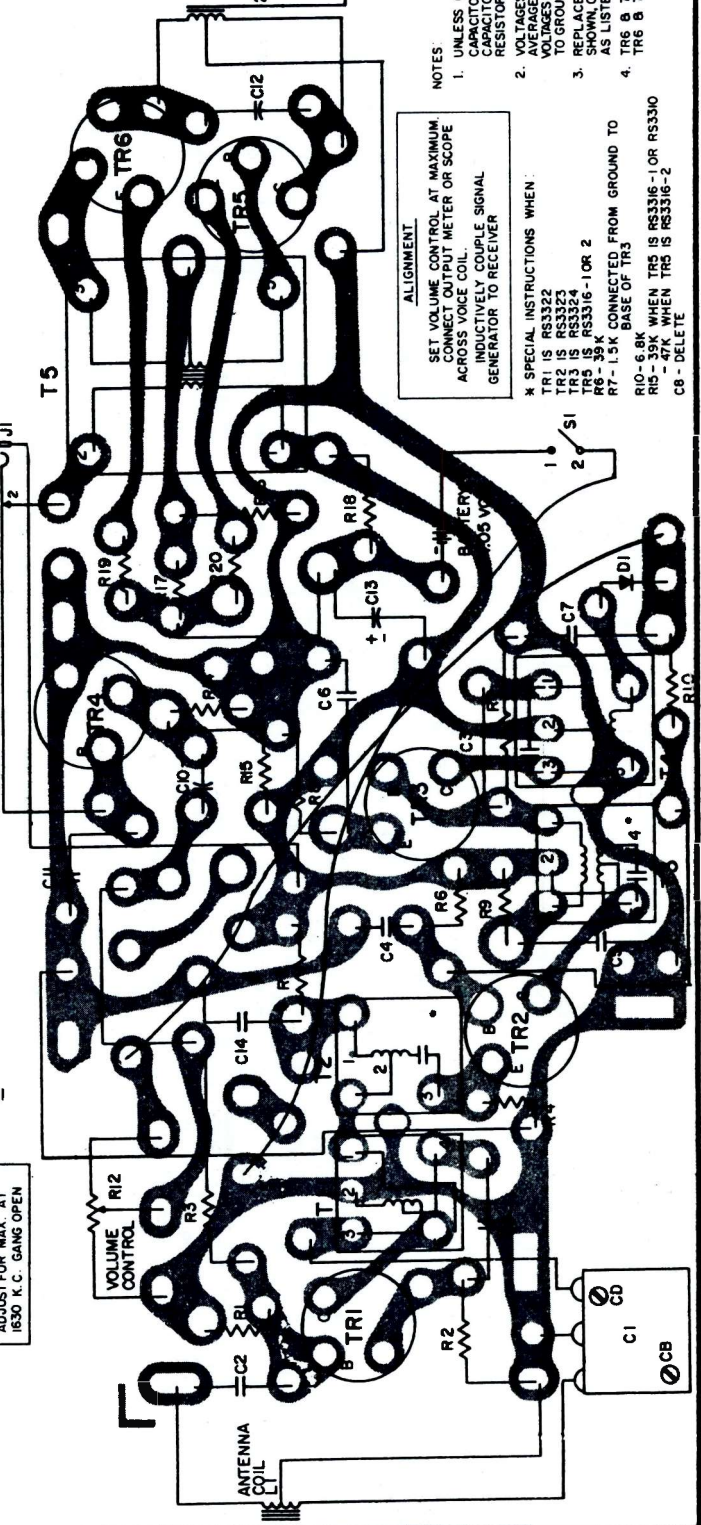
GENERAL ELECTRIC
Model P885B



TRANSISTOR LIST	GROUP 1	GROUP 2*
TR1	RS2609	RS3322
TR2	RS2651	RS3323
TR3	RS2652	RS3324
TR4	RS2669	RS3316-1
		RS3316-2
TR5	2N1009	2N1009
TR6	2N1009	2N1009
	545-1180	545-1180
	545-680	545-680
	-710	-710



- NOTES:
- UNLESS OTHERWISE NOTED:
CAPACITORS MORE THAN 1- μ MFD
CAPACITORS LESS THAN 1- μ MFD
RESISTORS ARE 1/4 WATT B K-1000
 - VOLTAGES & CURRENT READINGS ARE
FOR THE PARTS LISTED. ALL
VOLTAGES ARE NEGATIVE WITH RESPECT
TO GROUND.
 - REPLACE WITH TRANSISTOR TYPES
AS LISTED IN PARTS LIST.
 - TR6 B 7 NPN-CONNECT C TO D, A TO B
TR6 B 7 PNP-CONNECT A TO D, C TO B.



- ALIGNMENT
- SET VOLUME CONTROL AT MAXIMUM
CONNECT OUTPUT METER OR SCOPE
ACROSS VOICE COIL.
INDUCTIVELY COUPLE SIGNAL
GENERATOR TO RECEIVER
- * SPECIAL INSTRUCTIONS WHEN:
- TR1 IS RS3322
 - TR2 IS RS3323
 - TR3 IS RS3324
 - TR5 IS RS3316-1 OR 2
 - TR6 - 39K CONNECTED FROM GROUND TO
RT-1.5K BASE OF TR5
 - RT-6.8K WHEN TR5 IS RS3316-1 OR RS3330
 - RT-39K WHEN TR5 IS RS3316-2
 - RT-47K WHEN TR5 IS RS3316-2
 - CB - DELETE

GENERAL ELECTRIC

MODELS
P910A
P911A

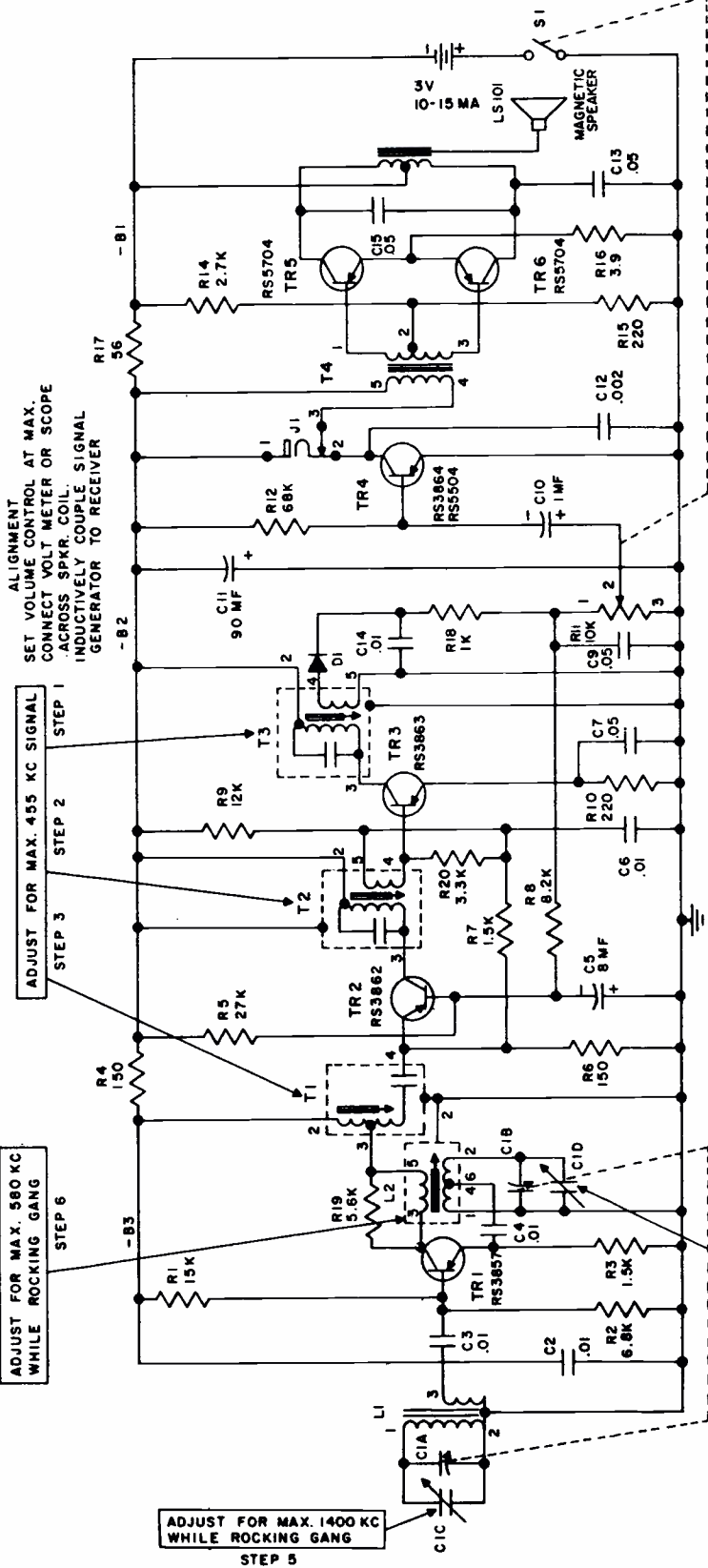
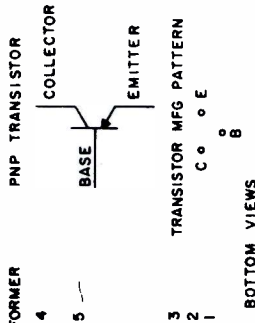


TABLE OF TRANSISTOR VOLTAGES

TRANSISTOR	EMITTER	BASE	COLLECTOR	FUNCTION
TR1	0	.65	2.5	OSC MIXER
TR2	.19 TO .29	.34 TO .4	2.6	1st I.F. AMP
TR3	.48 TO .3	.35 TO .43	2.6	2nd I.F. AMP
TR4	0	.2	2.6	AUDIO DRIVER
TR5	.04	.2	3	PUSH PULL
TR6	.04	.2	3	AUDIO OUTPUT



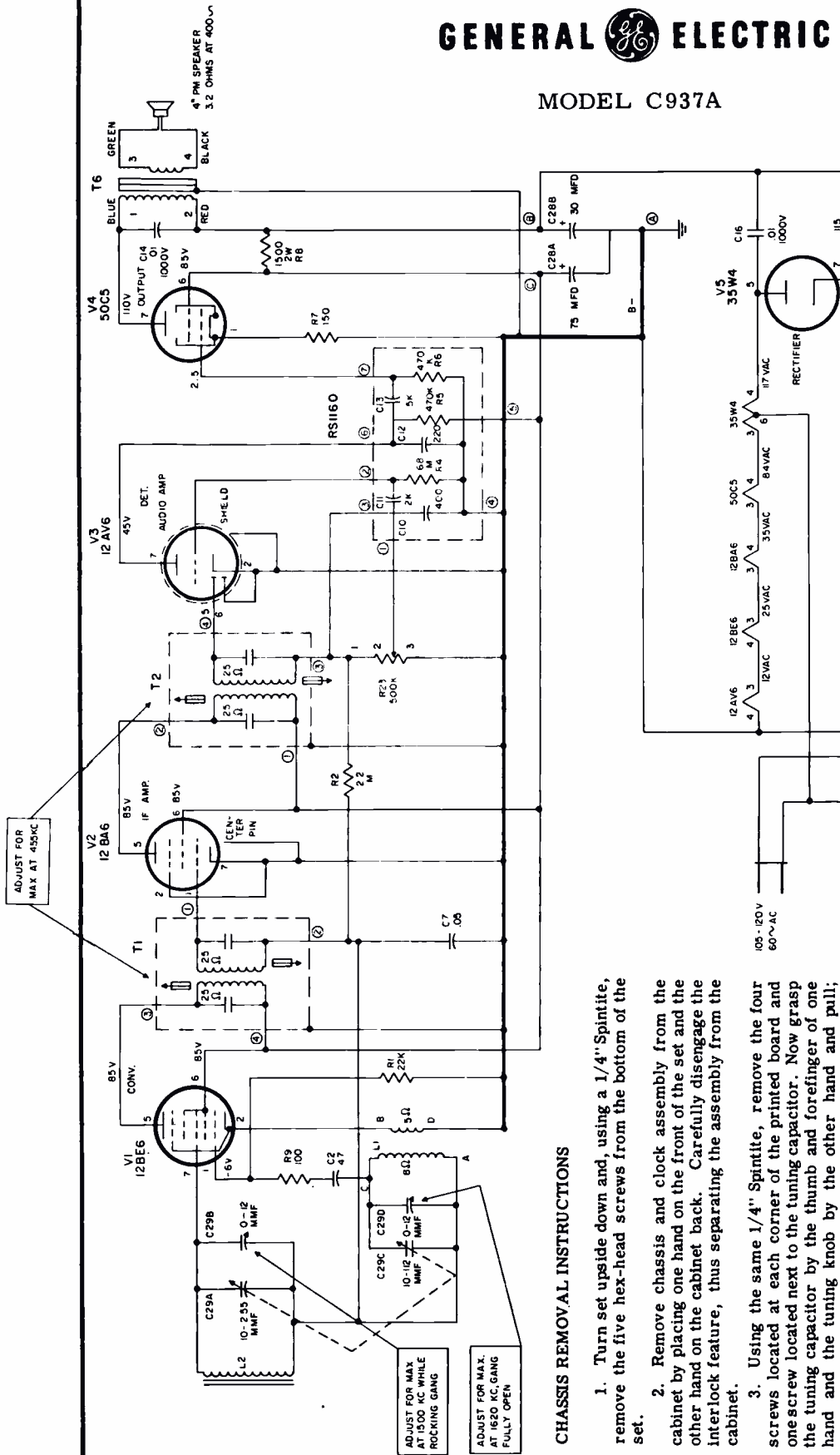
NOTES:
1. UNLESS OTHERWISE NOTED
CAP. MORE THAN 1 = M MF
CAP. LESS THAN 1 = MF
RES. ARE 1/2 WATT K=1000
2. VOLTAGES ARE NEGATIVE WITH RESPECT TO GND
UNDER NO SIGNAL CONDITIONS & VOL. CONTROL MIN.

CHASSIS REMOVAL

1. Remove the dial knob screw with a small Phillips screw driver and lift off the dial knob.
2. Remove cabinet back by inserting a coin in the slot on the bottom of the set, giving it a slight twist.
3. Remove two 1/8" Phillips-head screws located underneath the batteries.
4. Remove 1/8" Phillips-head screw located next to the tuning capacitor.
5. Slide out the circuit board in the direction of the cabinet bottom and lift out.



MODEL C937A



CHASSIS REMOVAL INSTRUCTIONS

1. Turn set upside down and, using a 1/4" Spintite, remove the five hex-head screws from the bottom of the set.
2. Remove chassis and clock assembly from the cabinet by placing one hand on the front of the set and the other hand on the cabinet back. Carefully disengage the interlock feature, thus separating the assembly from the cabinet.
3. Using the same 1/4" Spintite, remove the four screws located at each corner of the printed board and one screw located next to the tuning capacitor. Now grasp the tuning capacitor by the thumb and forefinger of one hand and the tuning knob by the other hand and pull; thereby removing the chassis; tuning knob remains on cabinet.

ALIGNMENT

When aligning, always connect the output lead of the signal generator to the grid of an IF tube through a .05 M.F. capacitor. This will prevent the output impedance of the generator from having a loading effect on the circuit. The signal input should be low and the volume control set at maximum so the AVC will not affect the output.

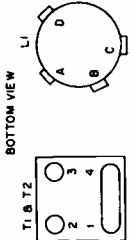
REPAIRING OF PRINTED BOARDS

In event that the copper foil has been damaged, the break can be repaired by flowing solder across the gap. If the gap is too large, it can be bridged by soldering a piece of hook-up wire across it. If the copper foil becomes raised from the board, clip off the raised portion and replace it with a section of wire.

REPLACEMENT OF COMPONENTS

After removing a defective part, the mounting holes should be cleaned of all solder. The replacement part can be inserted more easily and a better soldering connection can be accomplished. It is important to use extreme care while soldering on this chassis. Only apply the soldering iron long enough to melt the solder and pull out the part being replaced. Too much heat on the chassis will cause the copper plating to become unbonded. Since too much heat may damage a component or unbond the copper pattern, a soldering iron of approximately 35 watts maximum is recommended.

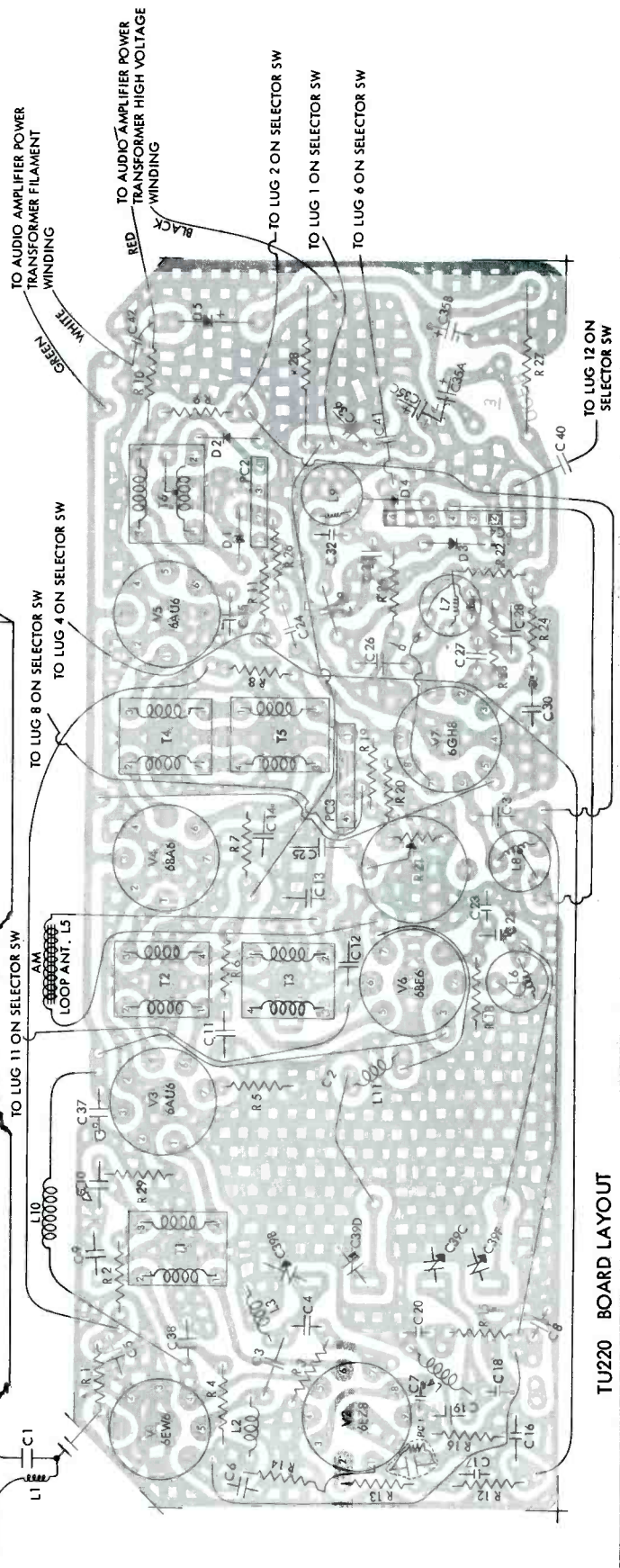
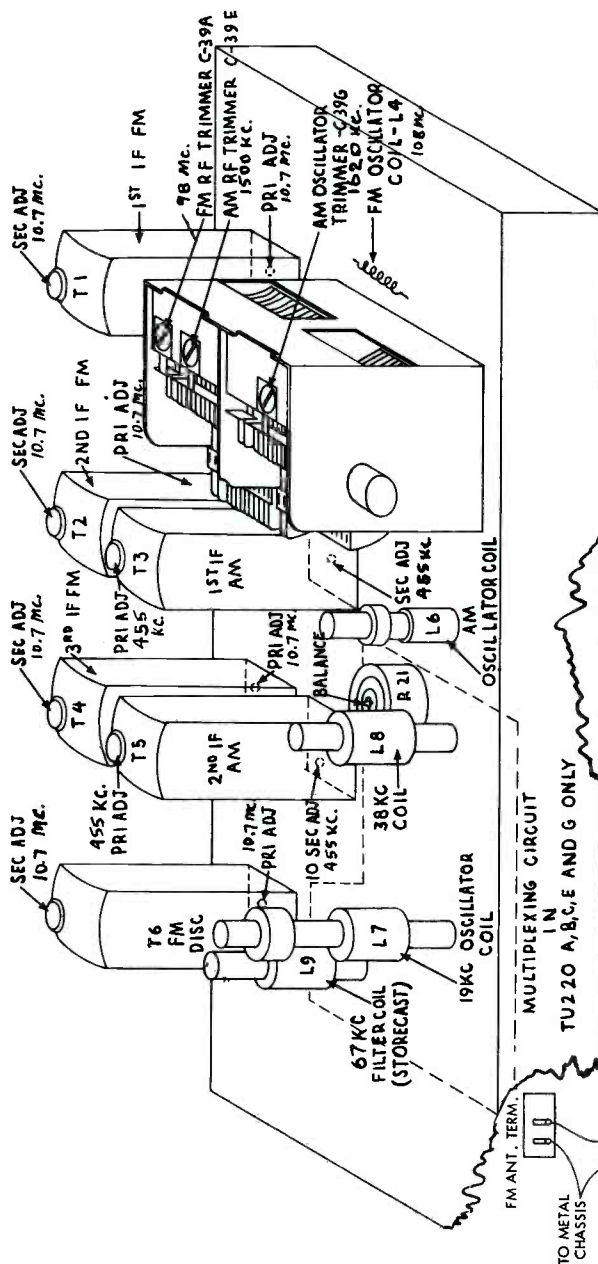
UNLESS OTHERWISE DEMOTED
CAPACITORS MORE THAN 10 MF
CAPACITORS LESS THAN 1 MF
RESISTOR - K=1,000
M=1,000,000
DC VOLTAGES AT 117 V LINE TO B-
W/20,000 Ω / VOLT METER



GENERAL ELECTRIC

TU220 WITH FM STEREO MODELS TU220A,B,C,E,G & H

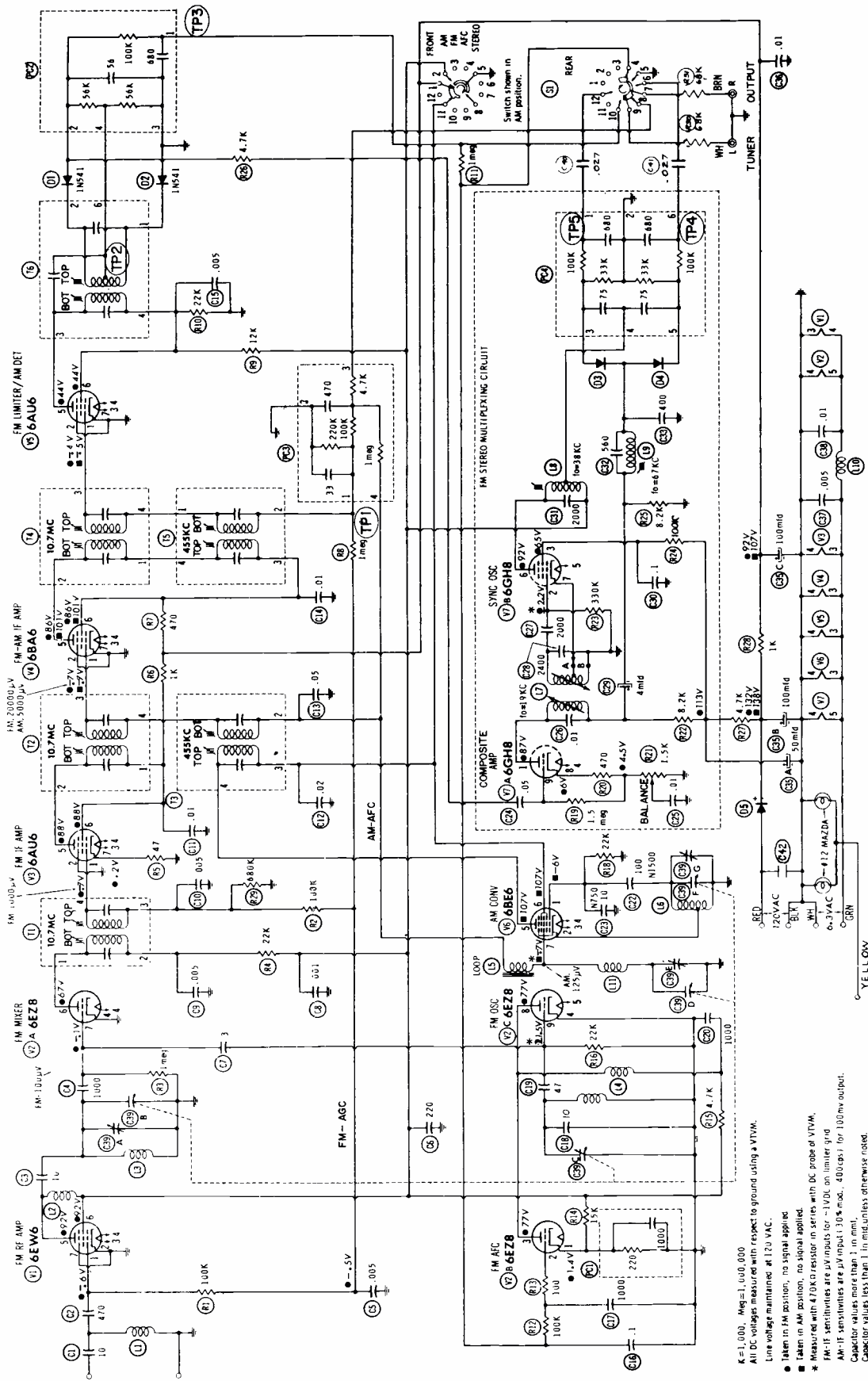
(Schematic diagram on the next page adjacent at right)



TU220 BOARD LAYOUT

GENERAL ELECTRIC Models TU220A, B, C, E, G, H

Schematic diagram, other material on preceding page.

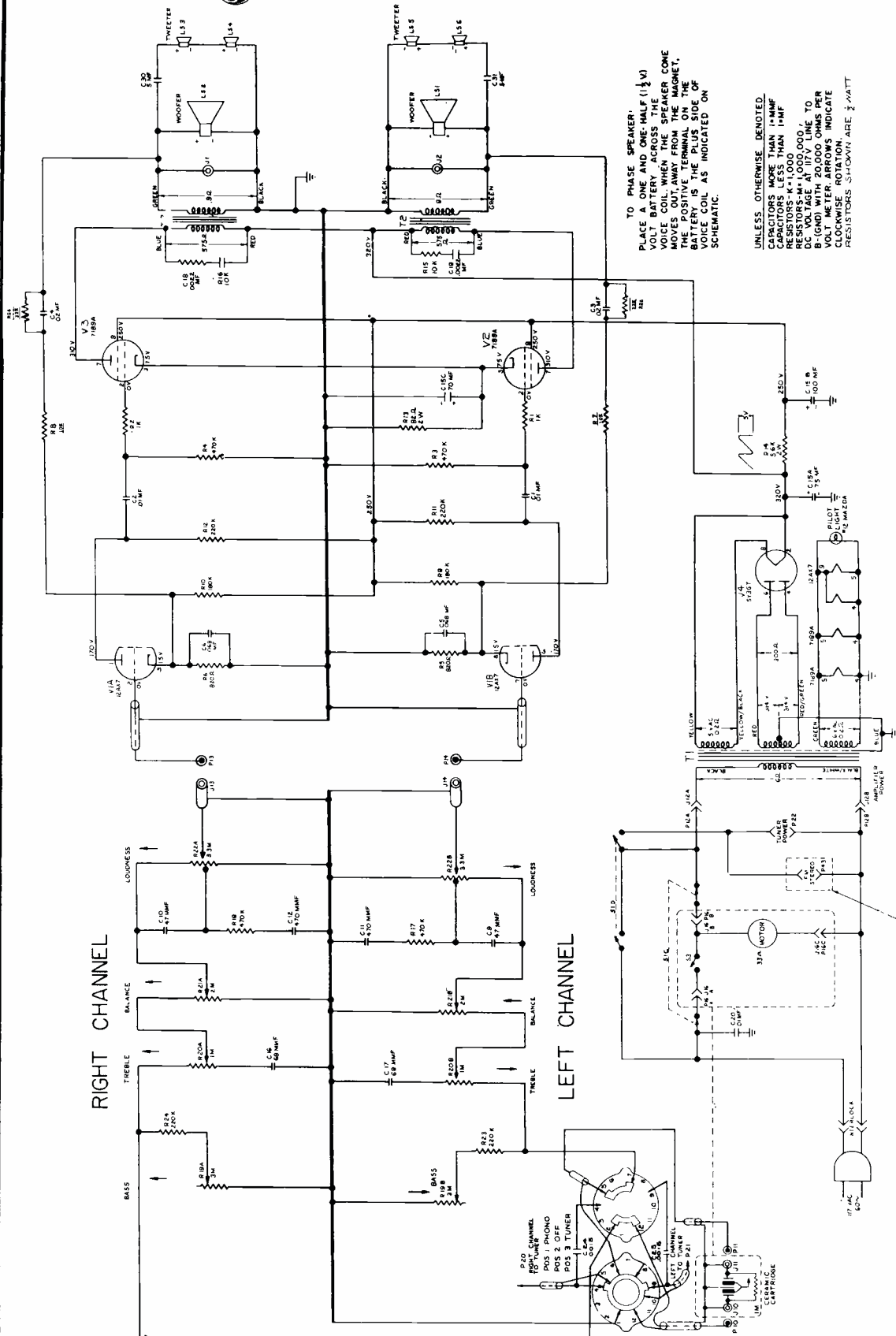


TU220A,B,C,E,G & H SCHEMATIC DIAGRAM

K=1,000, Meg=1,000,000
 All DC voltages measured with respect to ground using a VTVM.
 Line voltage maintained at 120 VAC.
 Taken in AM position, no signal applied.
 Measured with 470K resistor in series with DC probe of VTVM.
 FM-IF sensitivities are μV inputs for -1V0L on limiter grid.
 AM-IF sensitivities are μV input (30% mod., 400cps.) for 100mv output.
 Capacitor values more than 1 in mml.
 Capacitor values less than 1 in mml, unless otherwise noted.
 Resistor values are 10%, 1/2 watt, unless otherwise noted.

GENERAL ELECTRIC

RC3200, RC3210, RC3230 SCHEMATIC DIAGRAM



TO PHASE SPEAKERS:
PLACE A ONE AND ONE-HALF (1½ V)
VOLT BATTERY ACROSS THE
VOICE COIL WHEN THE SPEAKER COME
MOVES OUT, AWAY FROM THE MAGNET,
THE POSITIVE TERMINAL ON THE
VOICE COIL OF THE PHASE OF
VOICE COIL AS INDICATED ON
SCHEMATIC.

UNLESS OTHERWISE DENOTED
RESISTORS ARE IN OHMS
CAPACITORS ARE IN MICRO FARADS
RESISTORS - K=1,000
RESISTORS - M=1,000,000
RESISTORS - Ω=100,000
B= (Ω) WITH 20,000 OHMS PER
CLOCKWISE ROTATION.
RESISTORS SHOWN ARE ½ WATT

MODELS
RC3200, RC3210, RC3230
RC3201, RC3211, RC3231
RC3202, RC3212, RC3232
RC3205, RC3215, RC3235

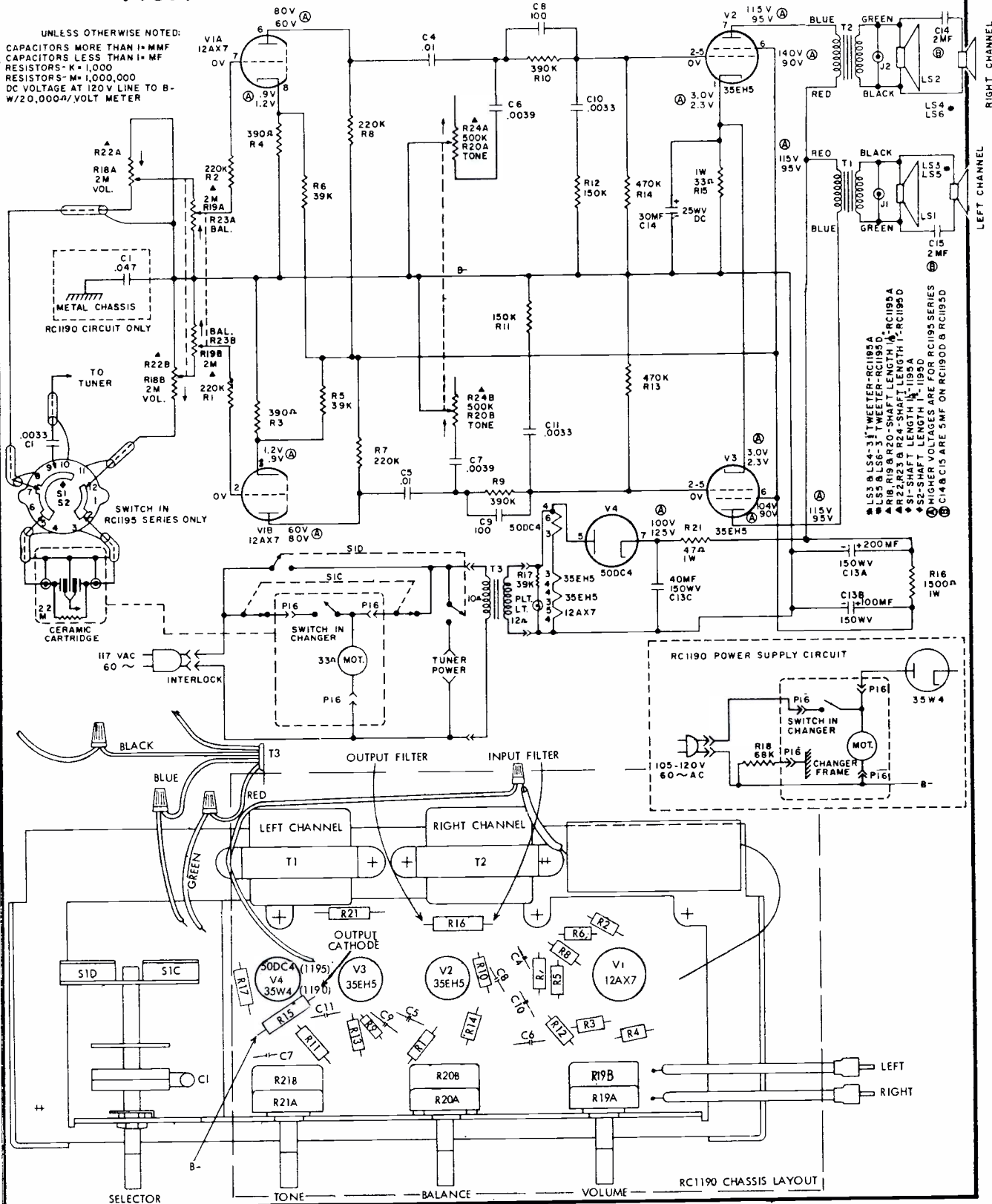
GENERAL ELECTRIC

GENERAL ELECTRIC

INCLUDES MODELS

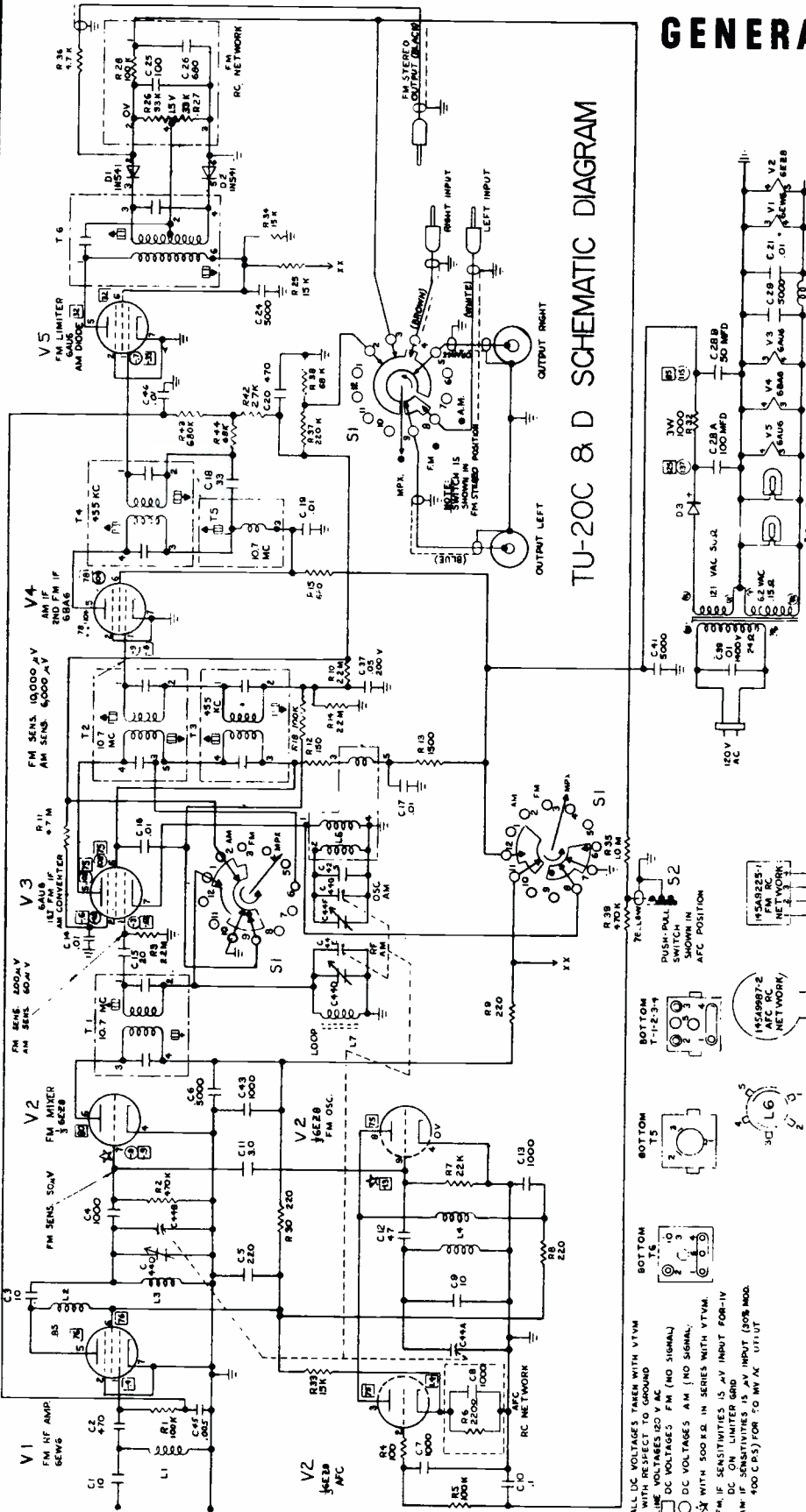
RC1190/RC1195

RC1190A,D,F,G / RC1195A,D,F,G,H
 RC1191 A,D,F,G / RC1196A,D,F,G,H
 RC1192A,D,F,G / RC1197A,D,F,G,H
 RC1193A,D,F,G / RC1198A,D,F,G,H



GENERAL  ELECTRIC

TU20 TUNER



TU-20C & D SCHEMATIC DIAGRAM

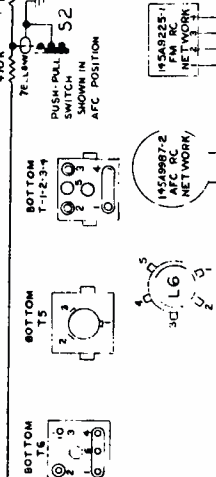
The basic Tuner TU-20 design consists of five tubes. All versions have two controls: (1) a TUNING control for selection of AM or FM stations (2) a SELECTOR control with AM, FM and FM (AFC) positions. Tuner versions (TU-20C, D) have four positions on the selector control (AM, FM, FM STEREO and FM (AFC)). The FM (AFC) on the four position SELECTOR control is actuated by a push-pull switch mounted on the SELECTOR control.

To eliminate signal overloading, an AGC circuit is being incorporated in the TU-20 tuners and is identified by the code A-31 stamped on the tuner chassis.

To incorporate AGC in the tuners in the field, requires the removal of R16 and the addition of five (5) components to the circuit. These components are designated on the schematics as R42, R43, R44, C45 and C46.

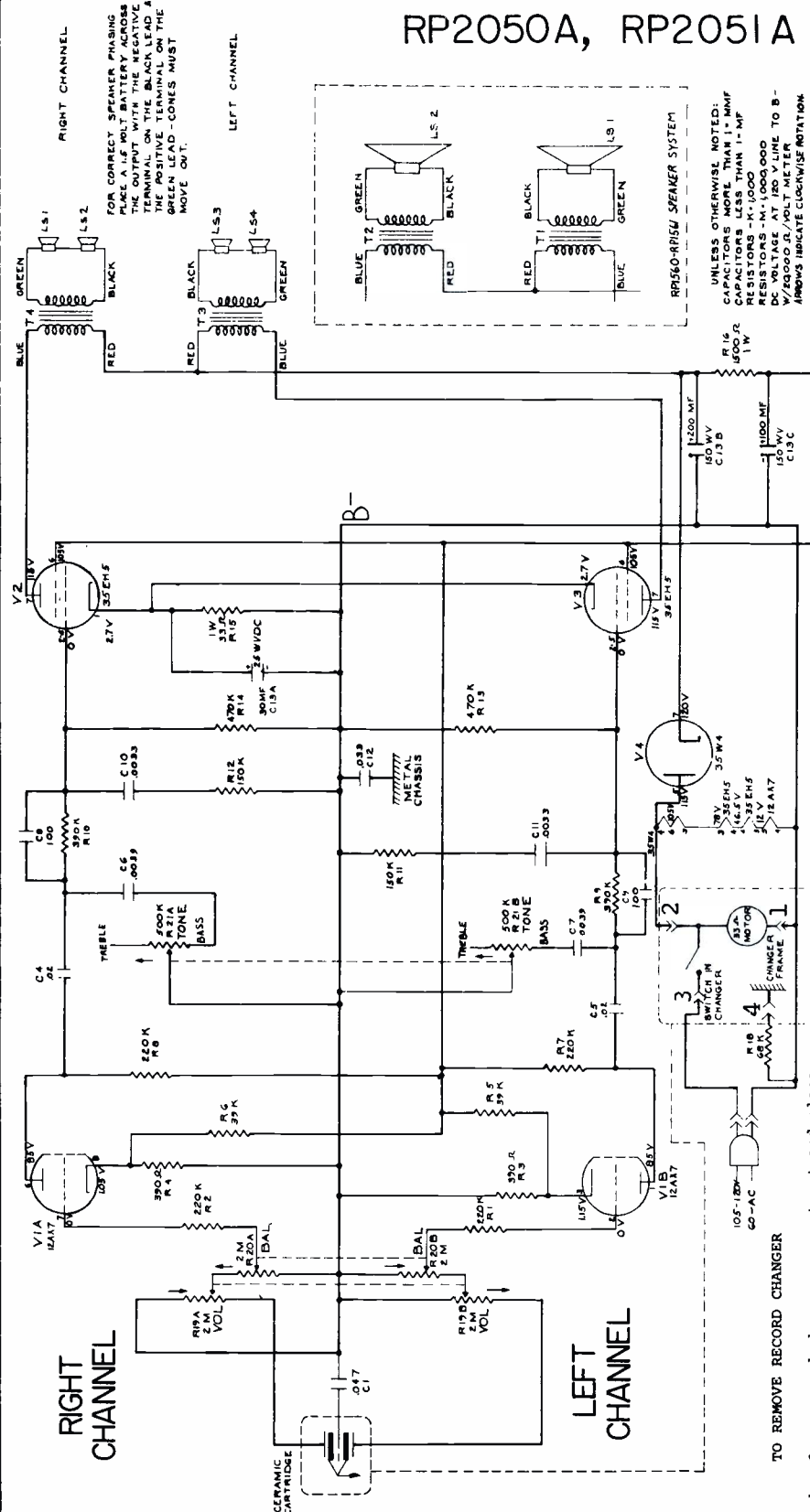
Also incorporated in the TU-20 tuners is the resistor R18, a 100K ohms. This is to widen the IF band width required for FM Stereo reception. Solder this resistor to bottom side of the chassis board because of the space limitations on the top.

ALL DC VOLTAGES TAKEN WITH VTVM WITH RESPECT TO GROUND
 LINE VOLTAGES 60 V AC
 DC VOLTAGES FM (NO SIGNAL)
 DC VOLTAGES AM (NO SIGNAL)
 * WITH 500 P.F. IN SERIES WITH VTVM.
 FM IF SENSITIVITIES IS μ V INPUT FOR -1V
 AM IF SENSITIVITIES IS μ V INPUT FOR -1V
 400 C P.S. FOR μ V AC UTILITY



GENERAL ELECTRIC RPI560, RPI561, RPI570,

RP2050A, RP2051A



1. Open record changer compartment and place record changer into playing position.
 2. Remove two (2) screws from the back cover and remove back cover.
 3. Place the shipping screw clips to a vertical position.
 4. Lift the record changer and tilt upwards until the plastic power plug and signal plugs are accessible. Remove plugs from record changer.
 5. Remove record changer from compartment.
- TO REMOVE AMPLIFIER**
1. Follow Steps 1 through 4 as described under "TO REMOVE RECORD CHANGER".
 2. Remove knobs from control panel.
 3. Free all wires from the metal lead dresser tabs.
 4. Slide the AC power receptacle from the bracket.
- TO REMOVE SPEAKER**
1. Unclasp speaker wing clamp and swing out speaker enclosure.
 2. Lift wing enclosure off hinges and place grille front on a soft cloth.
 3. Remove six (6) screws from speaker enclosure back and remove back.
 4. Unsolder and label speaker leads to assure proper phasing when reassembling.
 5. Remove nuts holding speaker to grille and remove speaker.
- TO REMOVE RECORD CHANGER**
5. Remove tape and wire nuts connecting the speaker leads. Be sure to label speaker leads to assure proper phasing when reassembling.
 6. Remove screw holding electrolytic.
 7. Remove three (3) nuts holding amplifier to cabinet and remove amplifier.

CARTRIDGE:	Sonotone 16T-S With Stylus - RPI560, RPI561, Cat. No. RS3476
	Sonotone 16T-SD With Stylus - RPI570 - Early Production Cat. No. RS3478
	G. E. C-100 Without Stylus - RPI560, RPI570 Series - Late Production Cat. No. RS3824
STYLUS:	Sonotone 16T-S, RPI560, RPI561
	Cat. No. RS3477 - Early Production
	Sonotone 16T-SD, RPI570 - Early Production Cat. No. RS3479
	G. E. C-100 Stylus - Sapphire/Diamond
	RP1570-Late Production Cat. No. RS3825
	G. E. C-100 Stylus - Sapphire/Sapphire
	RPI560, RPI561 - Late Production Cat. No. RS4154

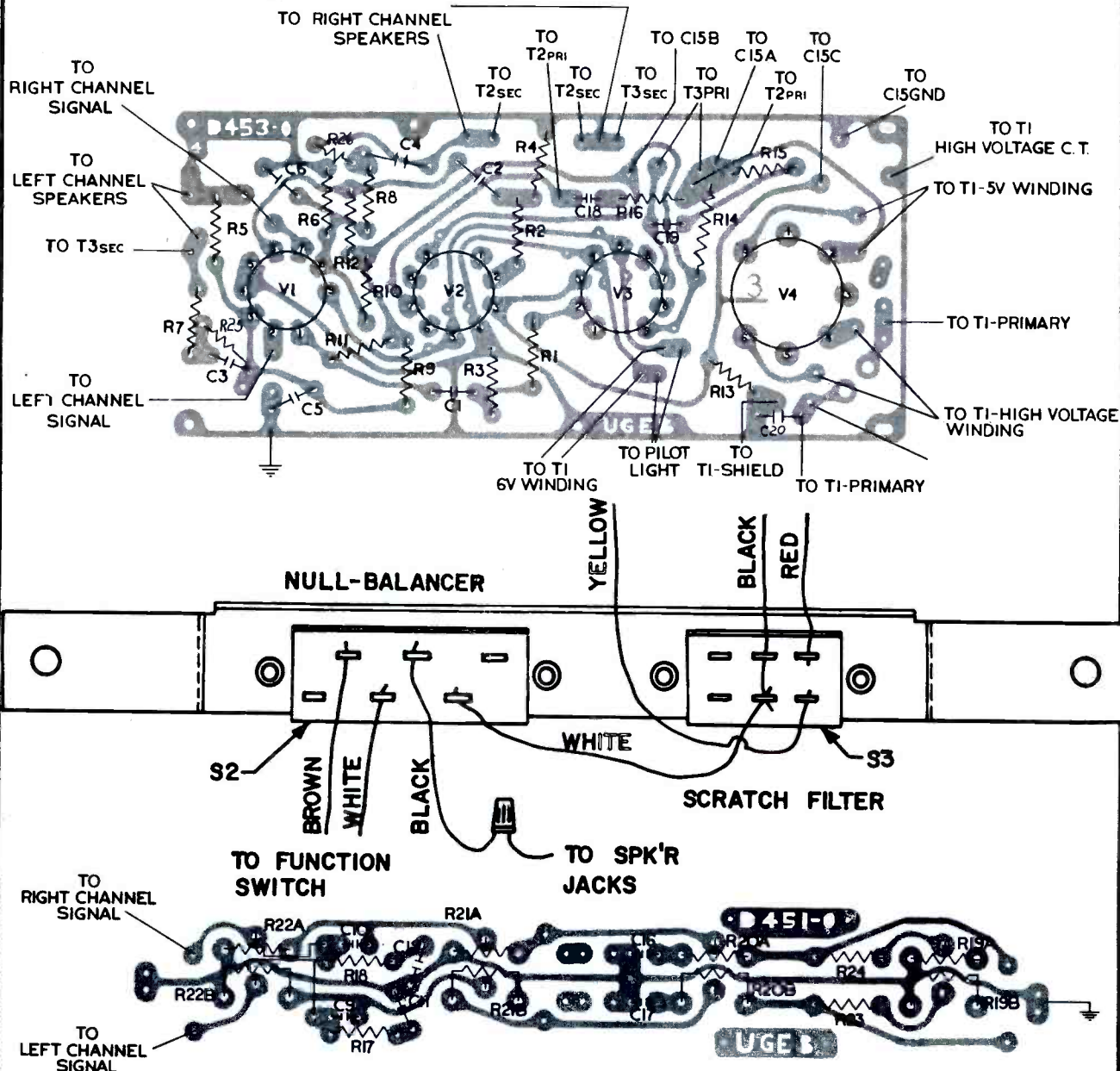
GENERAL ELECTRIC

MODELS RC1611A, RC1616A, RC1616B

(Circuit diagram on the next page, adjacent at right)

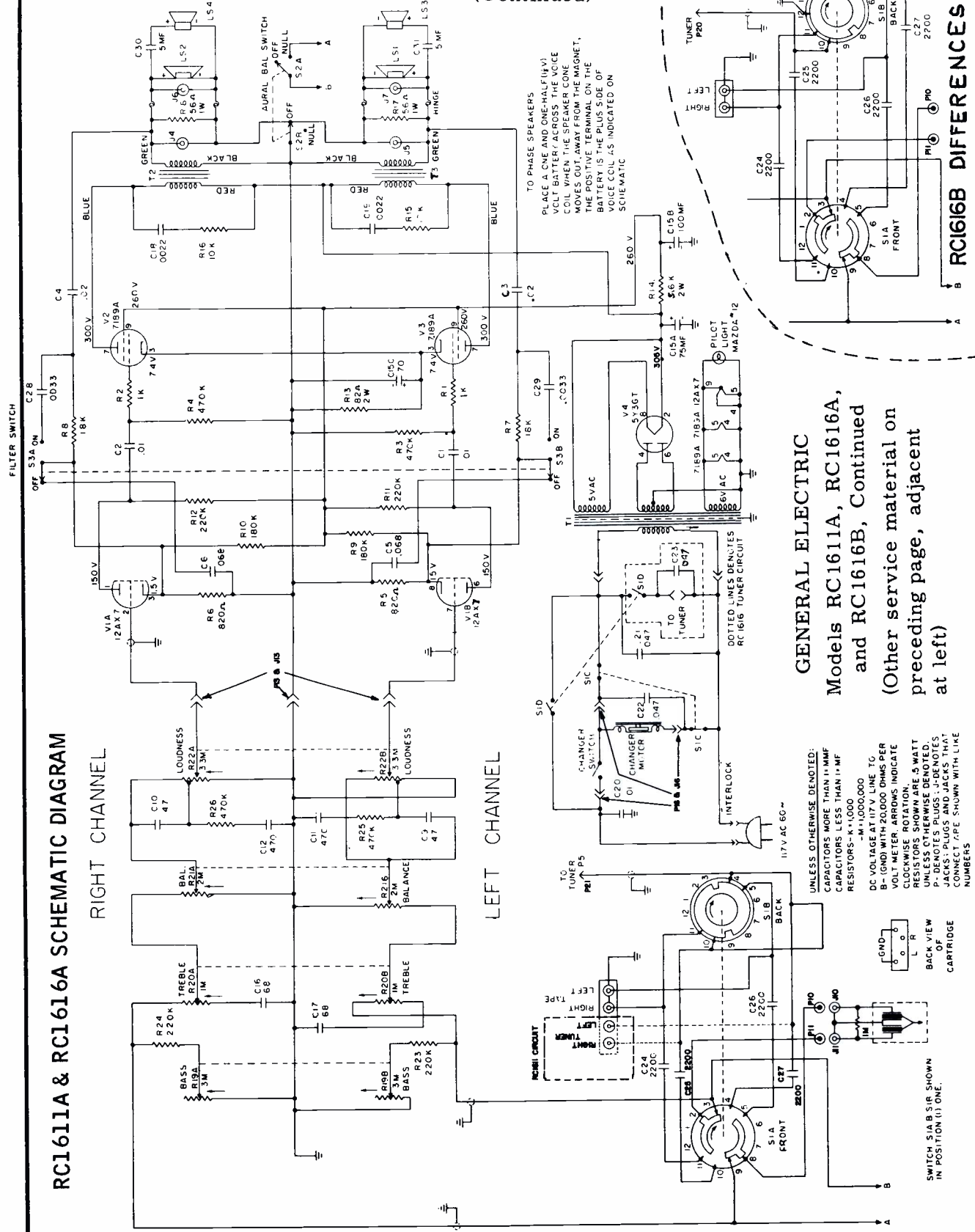
TUNER - The RC1616A series used the TU-20G tuner and the RC1616B series used the TU-20C tuner. The difference between the tuner models is the type of selector switch used. The TU-20G utilized a three position selector switch (AM, FM, FM-AFC) and the TU-20C tuner used a four position selector switch (AM, FM, FM Stereo, and FM-AFC). The FM-AFC position on the TU-20C tuner is actuated by a push-pull switch mounted on the selector control shaft. This places the FM stereo switching on the TU-20C tuner selector and changes the RC1616B function control switching to PHONO-OFF-TUNER-TAPE. This required a small wiring change to the function switching circuit as shown in the RC1616B schematic.

A modification to the scratch filter circuit has been incorporated in the RC1616B series beginning with serial number K294001. It results in the elimination of four cables to the scratch filter switch and better component assembly in the power amplifier.



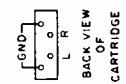
RC1611 & RC1616A & B SERIES COMPONENT LAYOUT

GENERAL ELECTRIC Models RC1611A, RC1616A, B
(Continued)



GENERAL ELECTRIC
Models RC1611A, RC1616A,
and RC1616B, Continued
(Other service material on
preceding page, adjacent
at left)

UNLESS OTHERWISE DENOTED:
CAPACITORS MORE THAN 10 MMF
CAPACITORS LESS THAN 10 MMF
RESISTORS - K=1,000
-M=1,000,000
DC VOLTAGE AT 117 V LINE TO
B-(GND) WITH 20,000 OHMS PER
VOLT METER. ARROWS INDICATE
CLOCKWISE ROTATION.
RESISTORS SHOWN IN WATT
RATINGS SHOULD BE NOTED.
P-DENOTES PLUGS; J-DENOTES
JACKS; PLUGS AND JACKS THAT
CONNECT 7-PE SHOWN WITH LIKE
NUMBERS

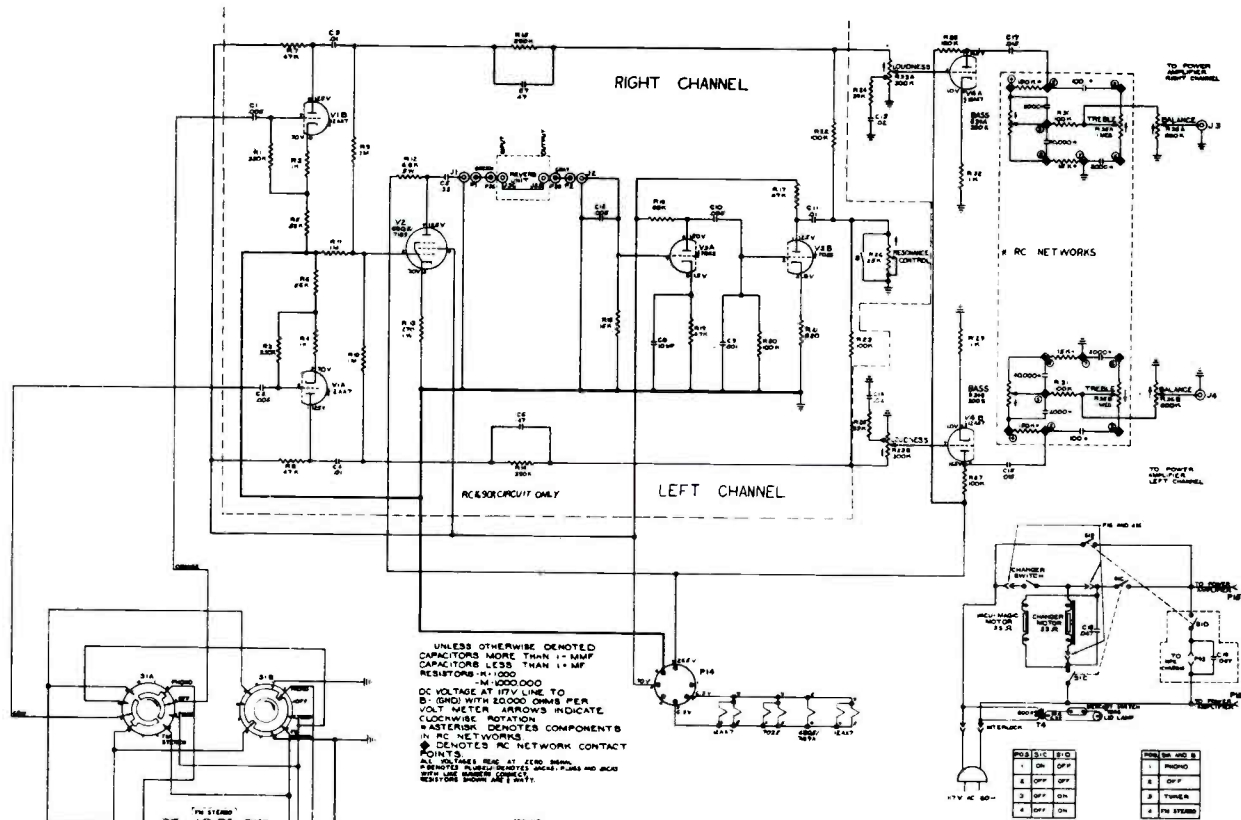


SWITCH S1A B.S.R. SHOWN
IN POSITION (1) ONE.
CARTRIDGE

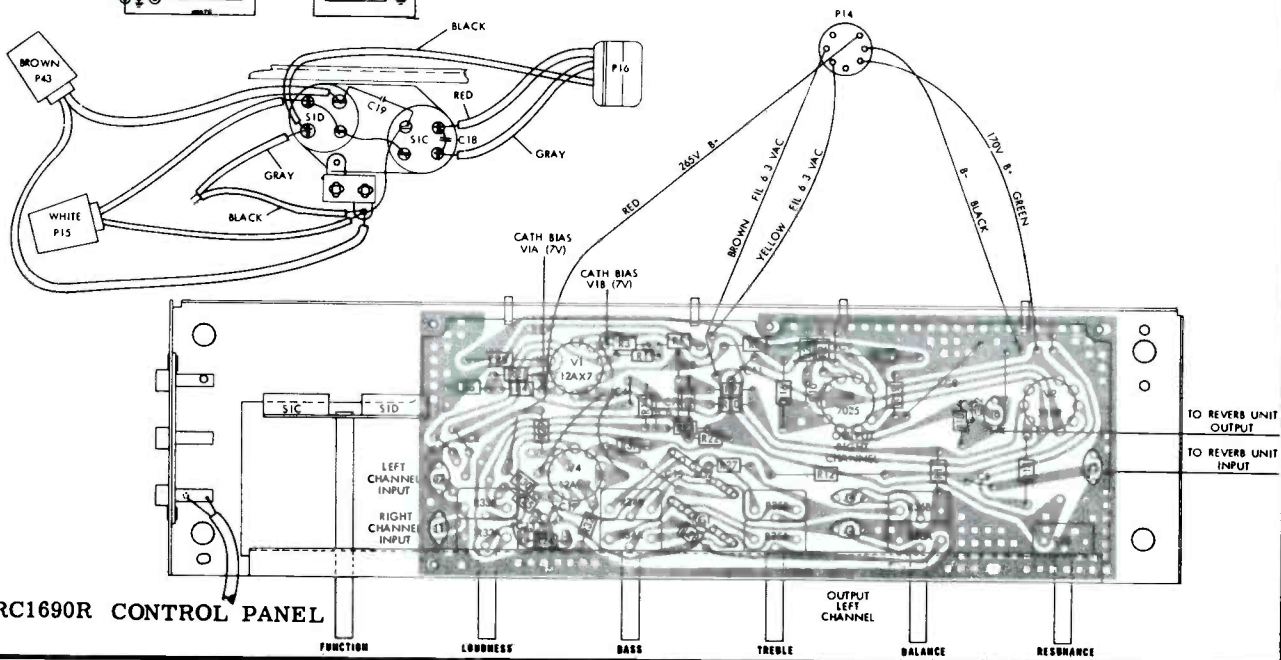
GENERAL ELECTRIC

RC1680A
RC1690A, AR, B, & BR
RC1691 A, AR, B, & BR
RC1692A, AR, B, & BR
RC1694A, AR, B, & BR

(Continued on the next page at right)

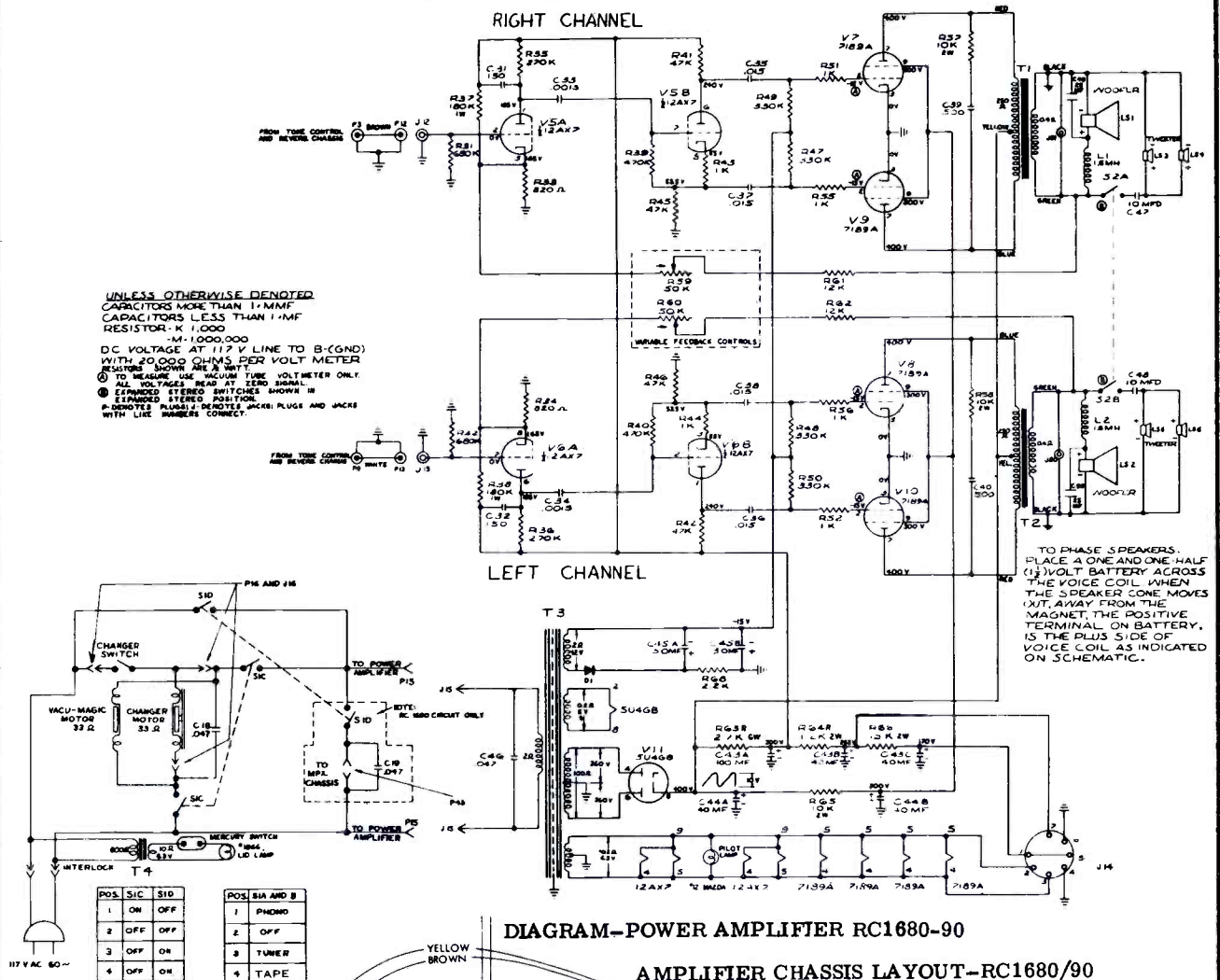


SCHEMATIC DIAGRAM-CONTROL PANEL RC1690R



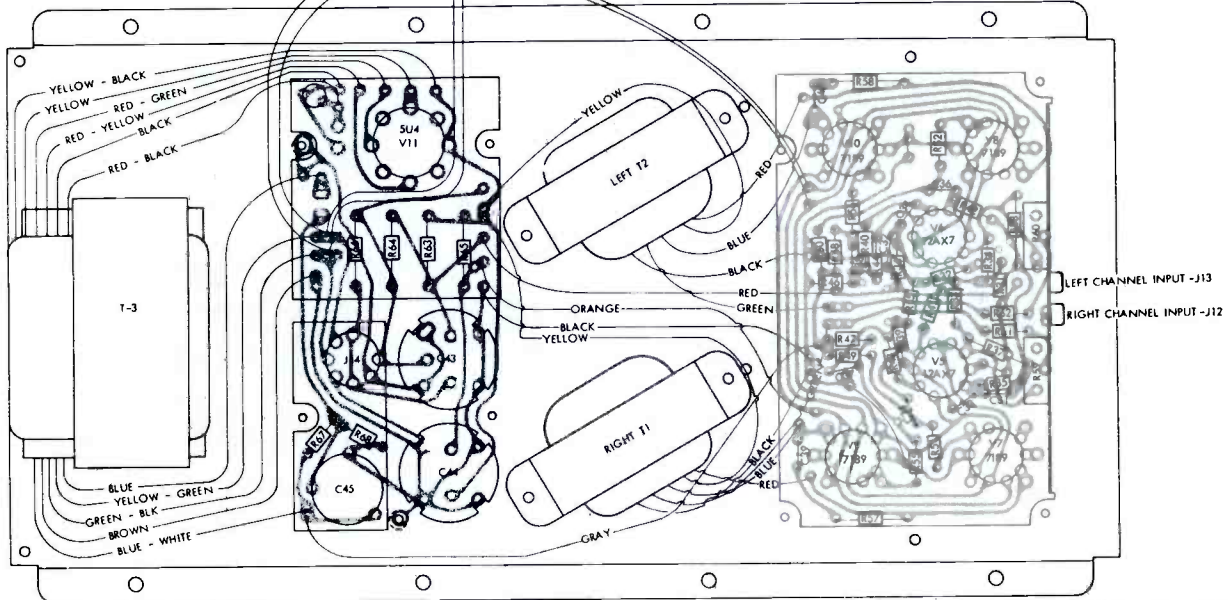
GENERAL ELECTRIC Series RC1680, RC1690, RC1691, RC1692, RC1694

(Continued from preceding page adjacent at left)



UNLESS OTHERWISE DENOTED
 CAPACITORS MORE THAN 1 μMF
 CAPACITORS LESS THAN 1 μMF
 RESISTOR: K 1,000
 -M- 1,000,000
 DC VOLTAGE AT 117 V LINE TO B-(GND)
 WITH 20,000 OHMS PER VOLT METER
 RESISTORS SHOWN ARE A WATT
 TO MEASURE USE VACUUM TUBE VOLT METER ONLY
 ALL VOLTAGES READ AT ZERO SIGNAL
 EXPANDED STEREO POSITION
 15-MINUTE PLUGS 1 DENOTES JACKS; PLUGS AND JACKS
 WITH LINE NUMBERS CONNECT.

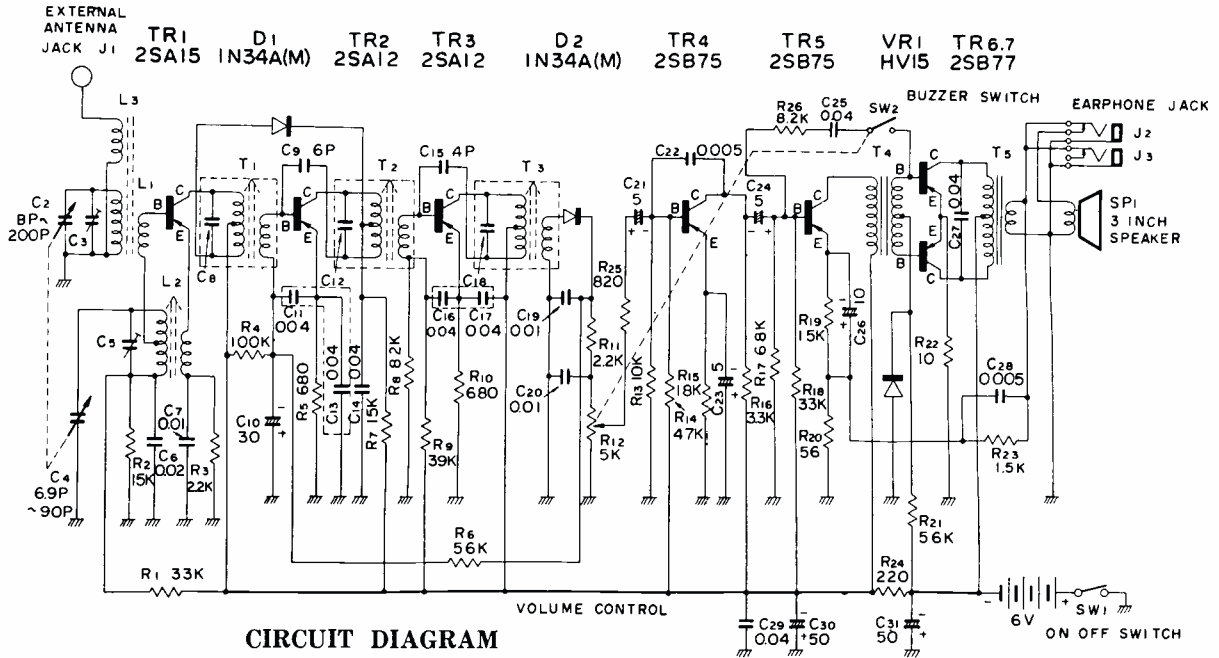
POS.	SIC	SID	POS.	SIA AND B
1	ON	OFF	1	PHONO
2	OFF	OFF	2	TUNER
3	OFF	ON	3	TAPE
4	OFF	ON		



Hitachi, Ltd.

MODEL T-728

(Continued on page 63, adjacent at right)



CIRCUIT DIAGRAM

Voltages of each transistor electrode (V)

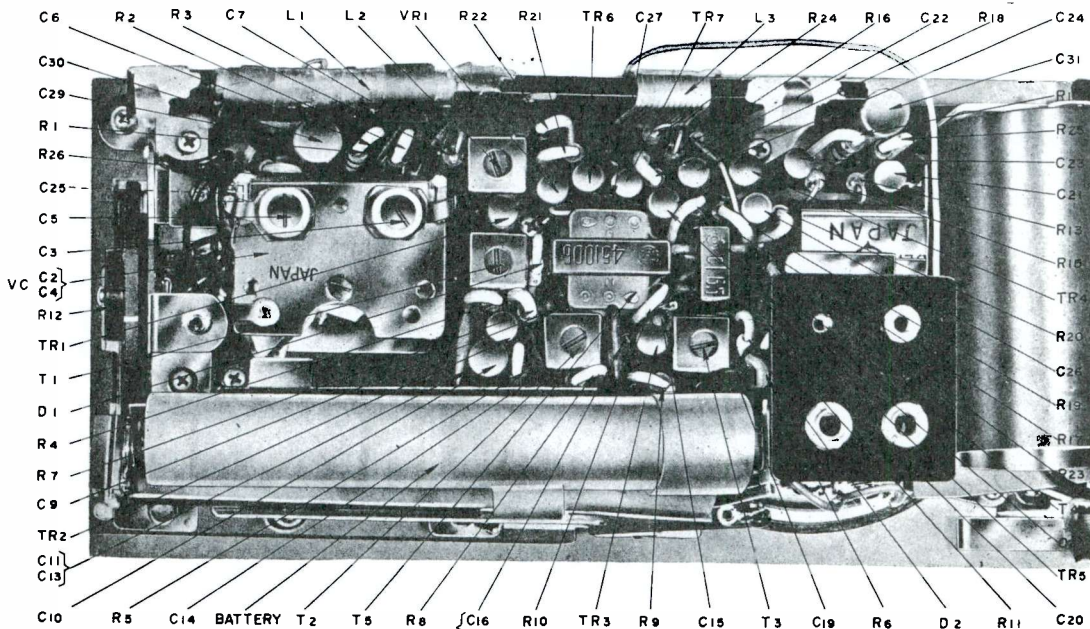
	TR ₁	TR ₂	TR ₃	TR ₄	TR ₅	TR ₆	TR ₇
Base	1.2	0.7	0.6	0.7	0.7	0.1	0.1
Emitter	1.4	0.7	0.6	0.6	0.7	0.15	0.15
Collector	4.7	4.7	4.7	3.3	4	4.7	4.7

I. F. 455 KC.

Resistance of transformer (Ω)

	T ₁	T ₂	T ₃	T ₄	T ₅
Primary	4.8	4.8	4.4	1.2K	30
Second	0.8	0.4	0.3	700	1

CHASSIS ASSEMBLY VIEW FROM COMPONENT SIDE

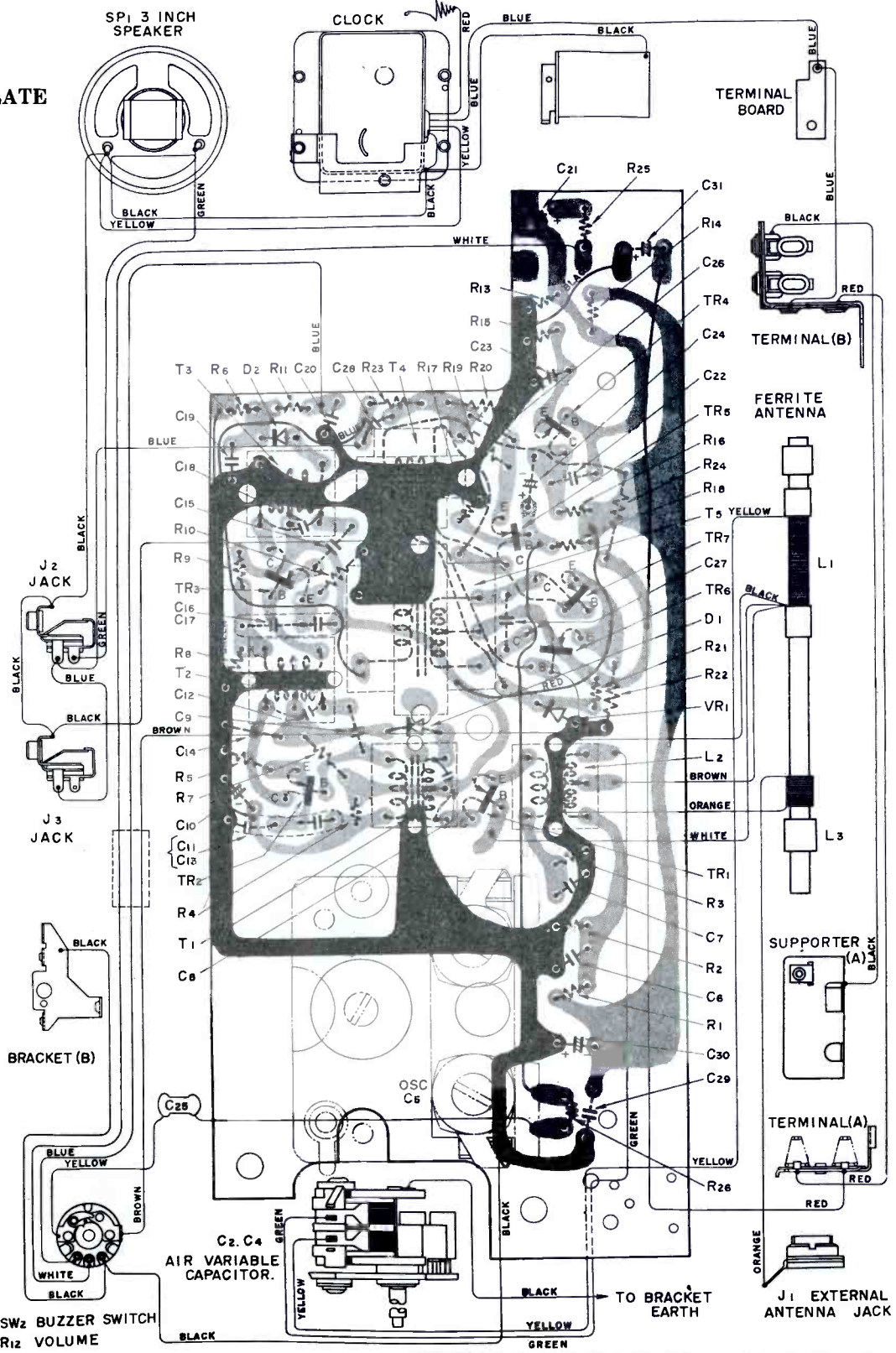


Hitachi, Ltd.

MODEL T-728

(Continued from page 62, at left)

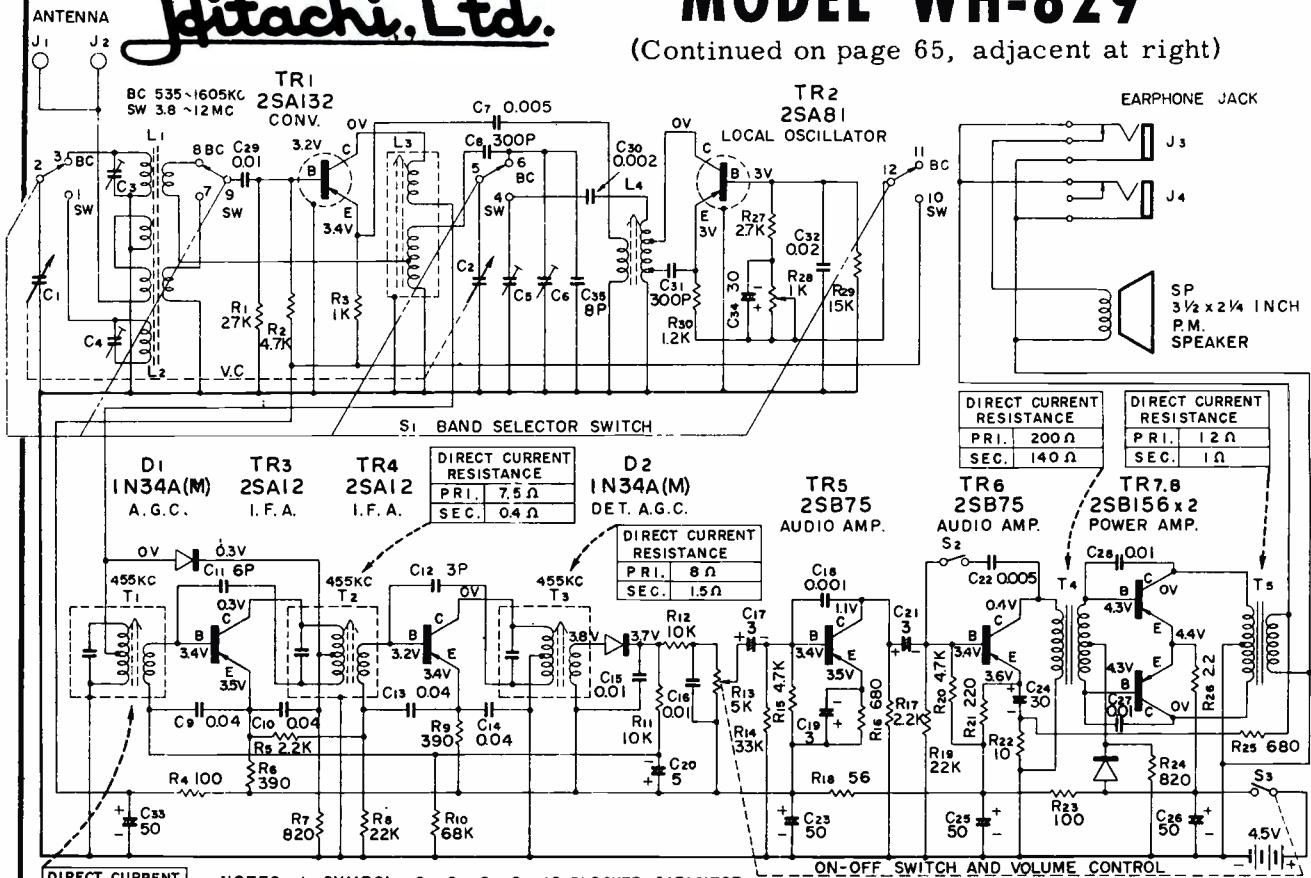
**PRINTED
BASE
PLATE**



Hitachi, Ltd.

MODEL WH-829

(Continued on page 65, adjacent at right)



DIRECT CURRENT RESISTANCE		DIRECT CURRENT RESISTANCE	
PRI.	200 Ω	PRI.	1.2 Ω
SEC.	140 Ω	SEC.	1 Ω

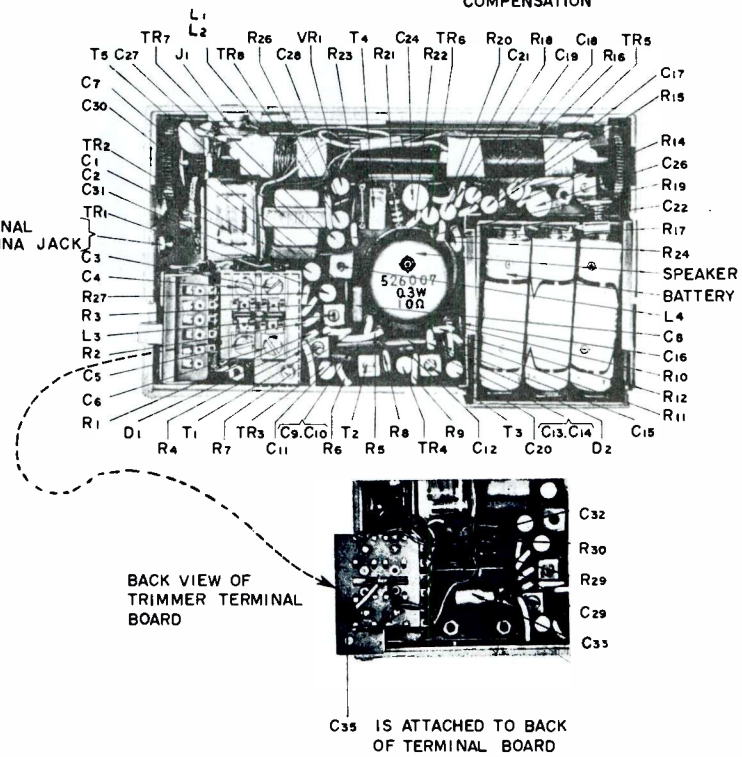
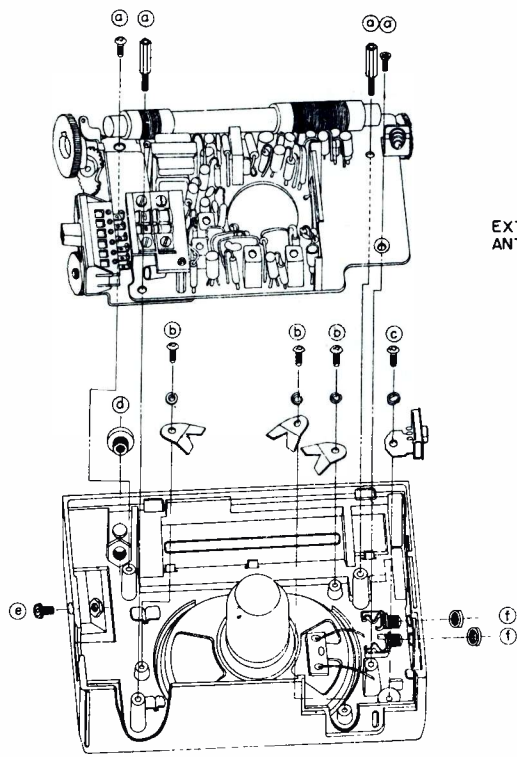
DIRECT CURRENT RESISTANCE	
PRI.	7.5 Ω
SEC.	0.4 Ω

DIRECT CURRENT RESISTANCE	
PRI.	8 Ω
SEC.	1.5 Ω

DIRECT CURRENT RESISTANCE	
PRI.	8 Ω
SEC.	0.4 Ω

- NOTES**
1. SYMBOL C₉, C₁₀, C₁₃, C₁₄ IS BLOCKED CAPACITOR
 2. BAND SWITCH SHOWN IN BC POSITION
 3. R₁ ADJUSTABLE

Circuit Diagram WH-829

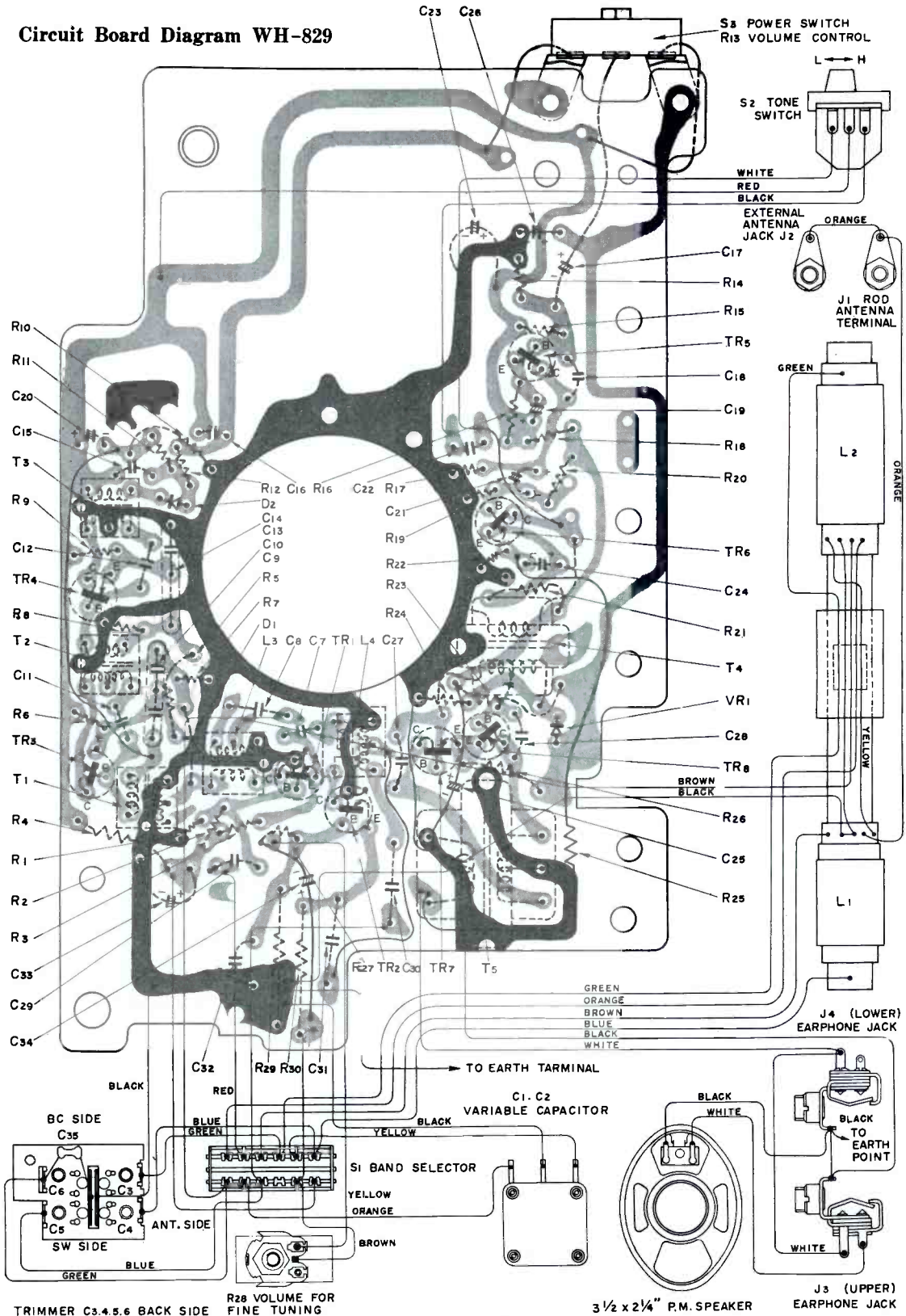


Hitachi, Ltd.

MODEL WH-829

(Continued from page 64, at left)

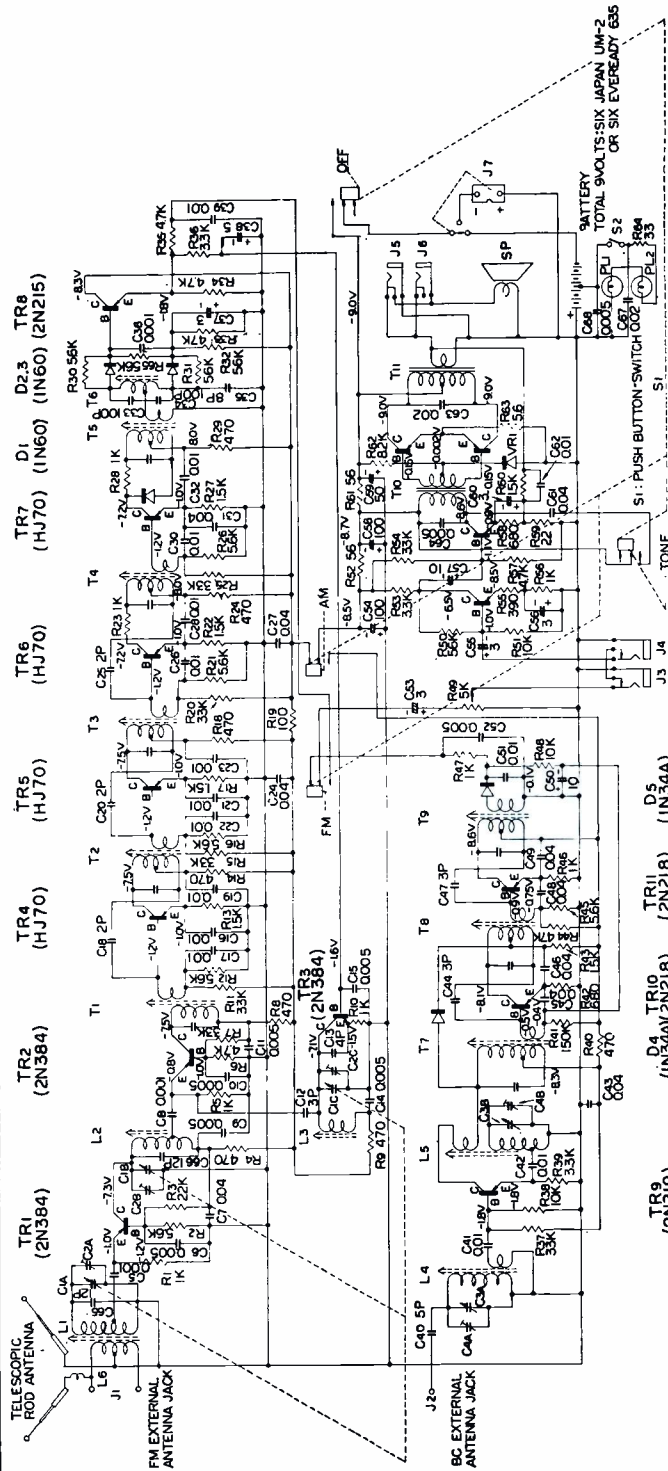
Circuit Board Diagram WH-829



Hitachi, Ltd.

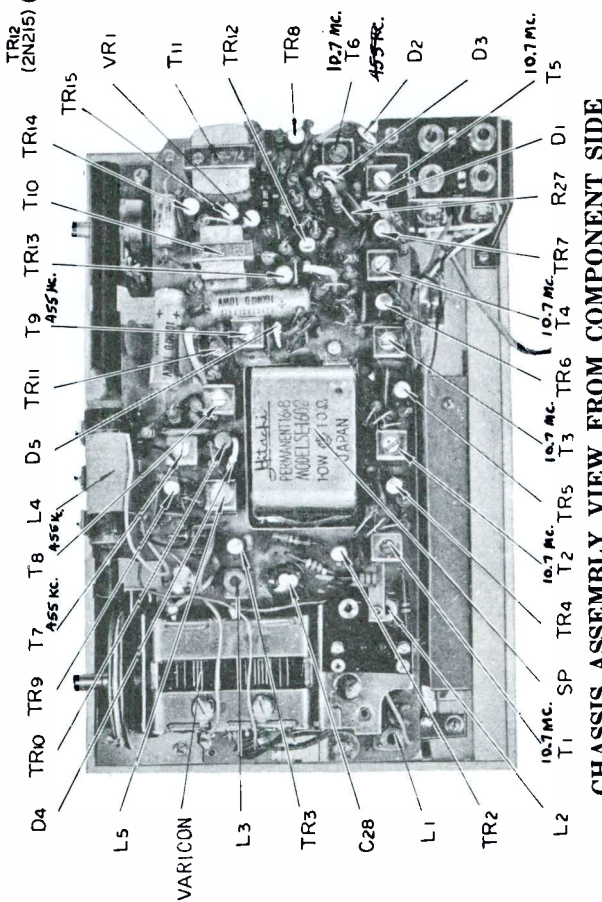
MODEL XH-1500

(Additional service information on page 67, adjacent at right)



SPECIFICATION

- TUNING RANGE.....AM 535~1,605 kc
FM 86.5~108 Mc
- TRANSISTOR COMPONENTS2N384 FM R-F Amp.
2N384 FM Local Osc.
2N384 FM Mix.
HJ 70×4 FM I-F Amp.
2N215 FM AFC Amp.
2N219 AM Frequency Conv.
2N218×2 AM I-F Amp.
2N215×2 A-F Amp.
2N217×2 Power Amp. Class B Push Pull Coupling
1N60 FM Limiter
1N60×2 FM Det.
1N34A AM Det. and AVC
1N34A AVC
- GERMANIUM DIODEHV 15 Temperature and Voltage Compensator
- VARIATOR180mW (Undistorted)
250mW (Maximum)
- POWER SOURCE.....9 Volt (6 Flashlight Batteries)
- SPEAKER.....3 inch×7 inch PM. Speaker
- EARPHONE JACK.....2 (Type EL-213 Hitachi Magnetic Earphone can be Plugged in)
- DIMENSIONS.....Width 8¼ inch×Height 5¼ inch×Depth 2½ inch



CHASSIS ASSEMBLY VIEW FROM COMPONENT SIDE

Hitachi, Ltd.

MODEL XH-1500

(Continued from page 66, at left)

CIRCUIT BOARD DIAGRAM

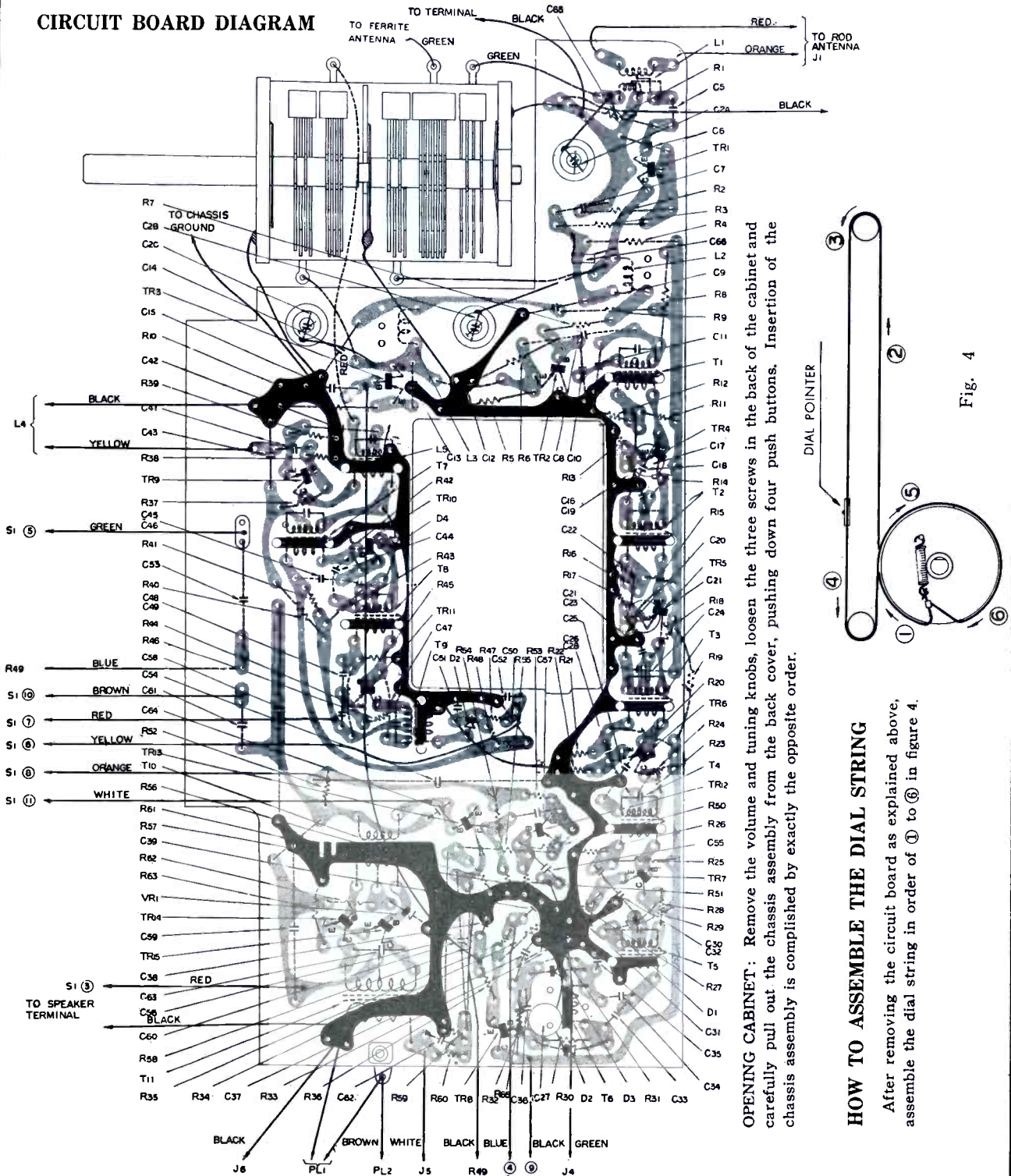


Fig. 4

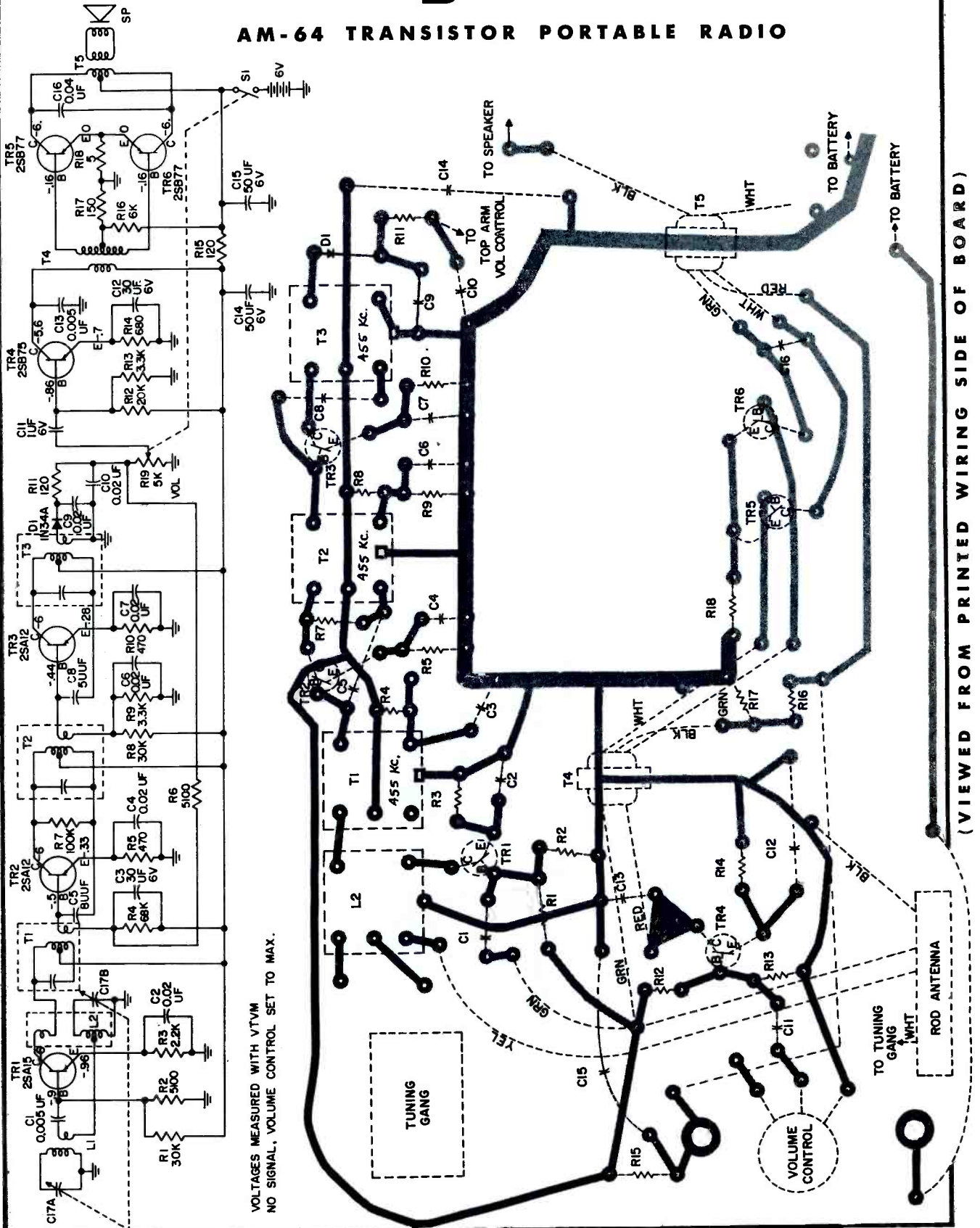
HOW TO ASSEMBLE THE DIAL STRING

After removing the circuit board as explained above, assemble the dial string in order of ① to ⑥ in figure 4.

110 Volt AC OPERATION: By use of an AC adapter the AM/FM radio model XH-1500 can be operated from normal 110 volt AC house current. A socket has been provided at the left end of the cabinet to permit use of an AC adapter. When the AC adapter is used there is no drain on the dry batteries.

Magnavox

AM-64 TRANSISTOR PORTABLE RADIO



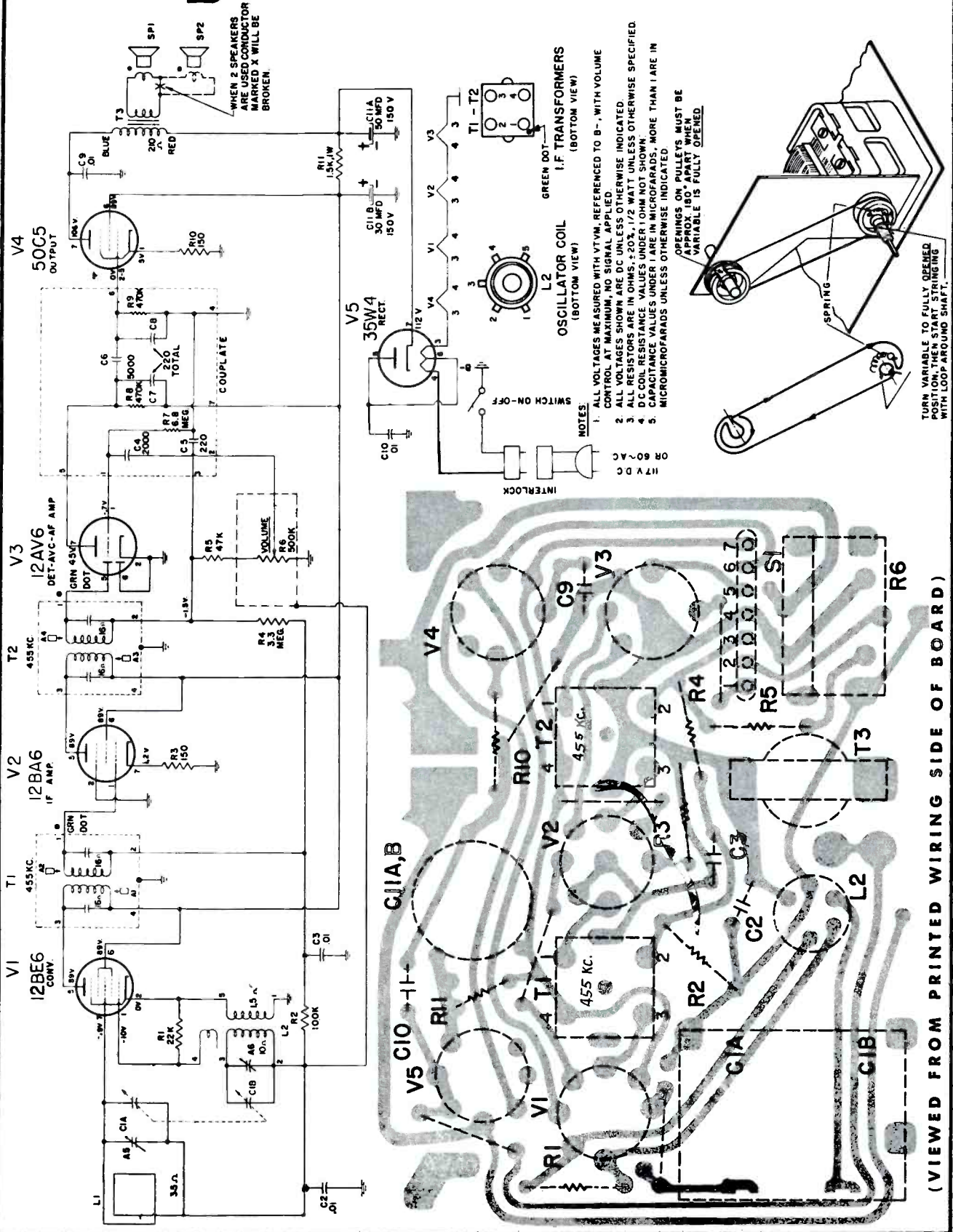
VOLTAGES MEASURED WITH VTVM
NO SIGNAL, VOLUME CONTROL SET TO MAX.

(VIEWED FROM PRINTED WIRING SIDE OF BOARD)

Magnavox

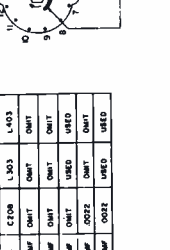
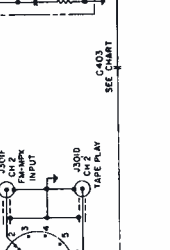
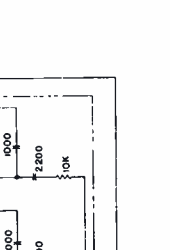
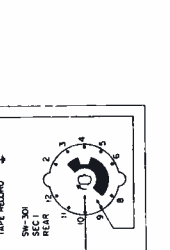
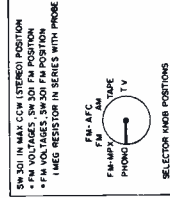
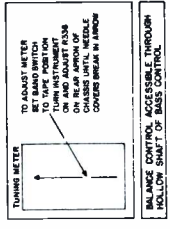
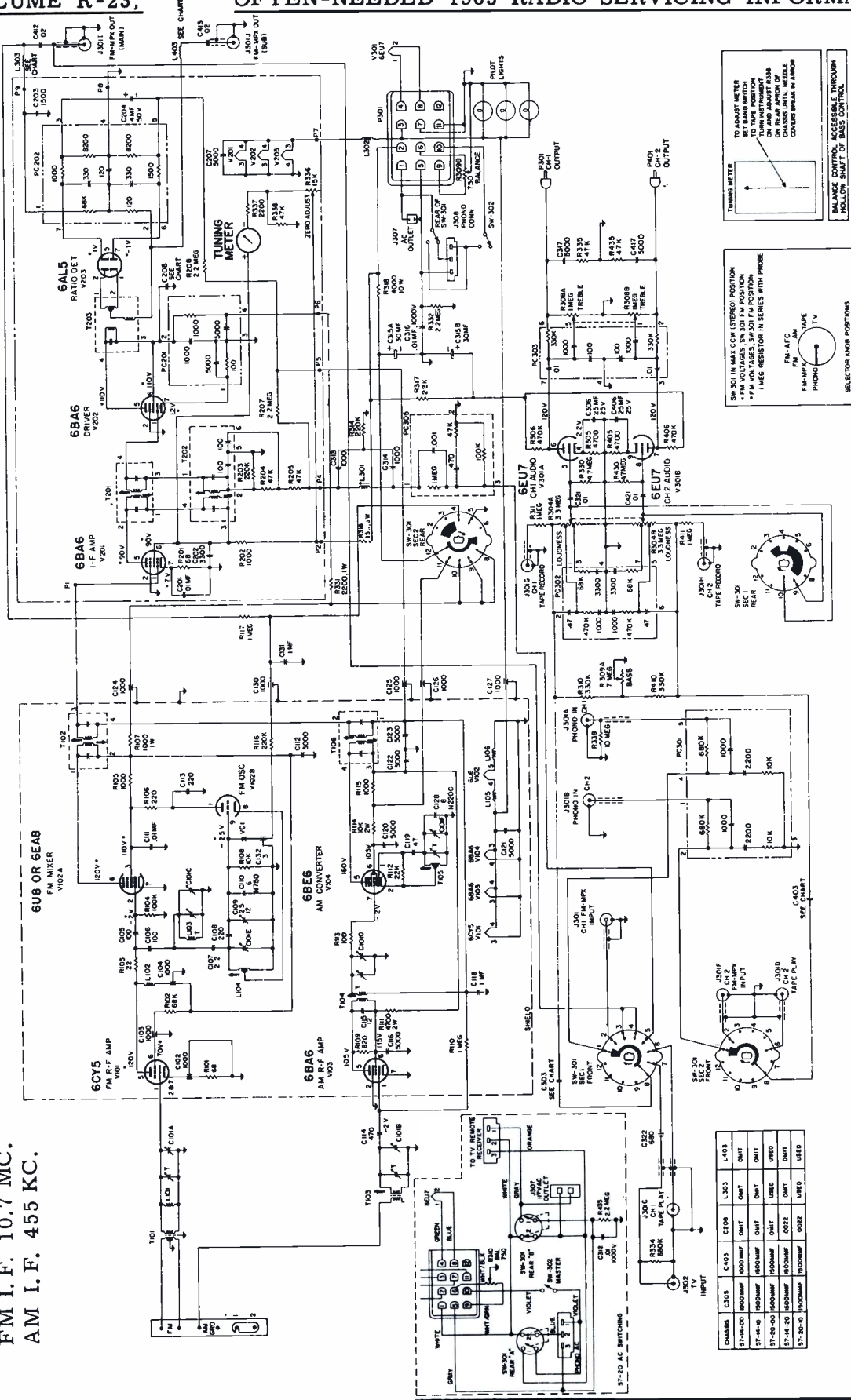
72 SERIES RADIO CHASSIS

SCHEMATIC DIAGRAM (72-01 AND 72-03)



SCHEMATIC DIAGRAM
(57-14-00, 57-14-10, 57-14-20, 57-20-00 & 57-20-10)

FM I. F. 10.7 MC.
 AM I. F. 455 KC.

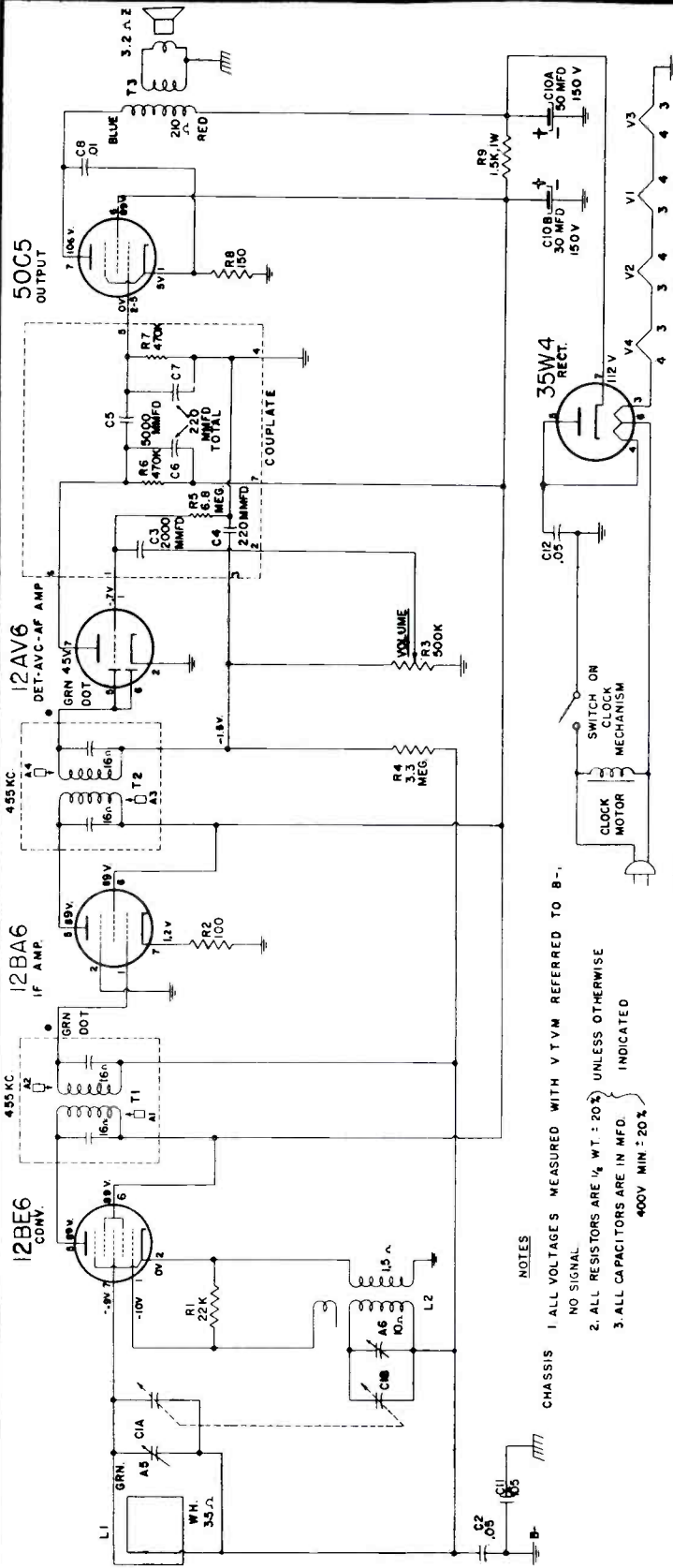


CHASSIS	C181	C182	C183	L403
57-14-00	1000MUF	1000MUF	OMIT	OMIT
57-14-10	1000MUF	1000MUF	OMIT	OMIT
57-14-20	1000MUF	1000MUF	OMIT	OMIT
57-20-00	1000MUF	1000MUF	OMIT	OMIT
57-20-10	1000MUF	1000MUF	OMIT	OMIT

Magnavox 57 SERIES RADIO CHASSIS

M O N T G O M E R Y W A R D

MODEL GEN 1819A



NOTES

- 1. ALL VOLTAGES MEASURED WITH V.T.V.M. REFERRED TO B-.
- 2. ALL RESISTORS ARE 1/4 W.T. ± 20% UNLESS OTHERWISE INDICATED
- 3. ALL CAPACITORS ARE IN MFD. 400V MIN. ± 20%

TIMER OPERATION

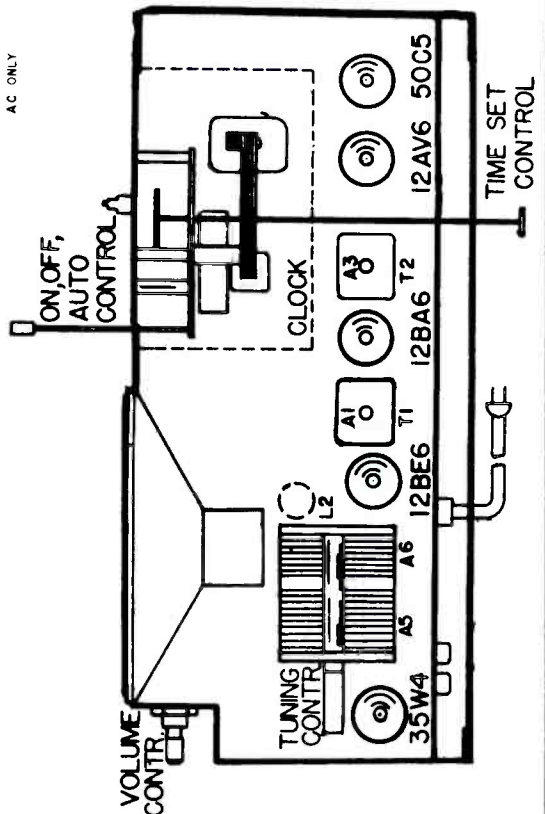
THE ELECTRIC CLOCK starts as soon as you plug the radio cord to any outlet supplying 105 to 120 volts, 60 cycle alternating current. To set the clock to the correct time, pull out and turn to the right the knurled disc of the time set control in the rear.

TO OPERATE THE RADIO, turn the clock selector knob to the left so its index points to "ON". Wait a few seconds for the tubes to warm up. Turn the tuning control knob to the desired station, tuning carefully for best and clearest reception.

TO TURN THE RADIO "OFF", turn the timer switch knob to the center position.

TO OPERATE THE RADIO AS A MUSICAL WAKE-UP ALARM during the next eleven hours:

1. Tune in the station which will carry the program desired.
2. Set the volume control knob at the level you want.
- 3) Push and lock the knurled disc of the time set control in the rear, and turn it to the right until the small white pointer indicates the time you want the radio to go on.
- 4) Turn timer switch to "AUTO". The radio will start to play by itself at the time set.

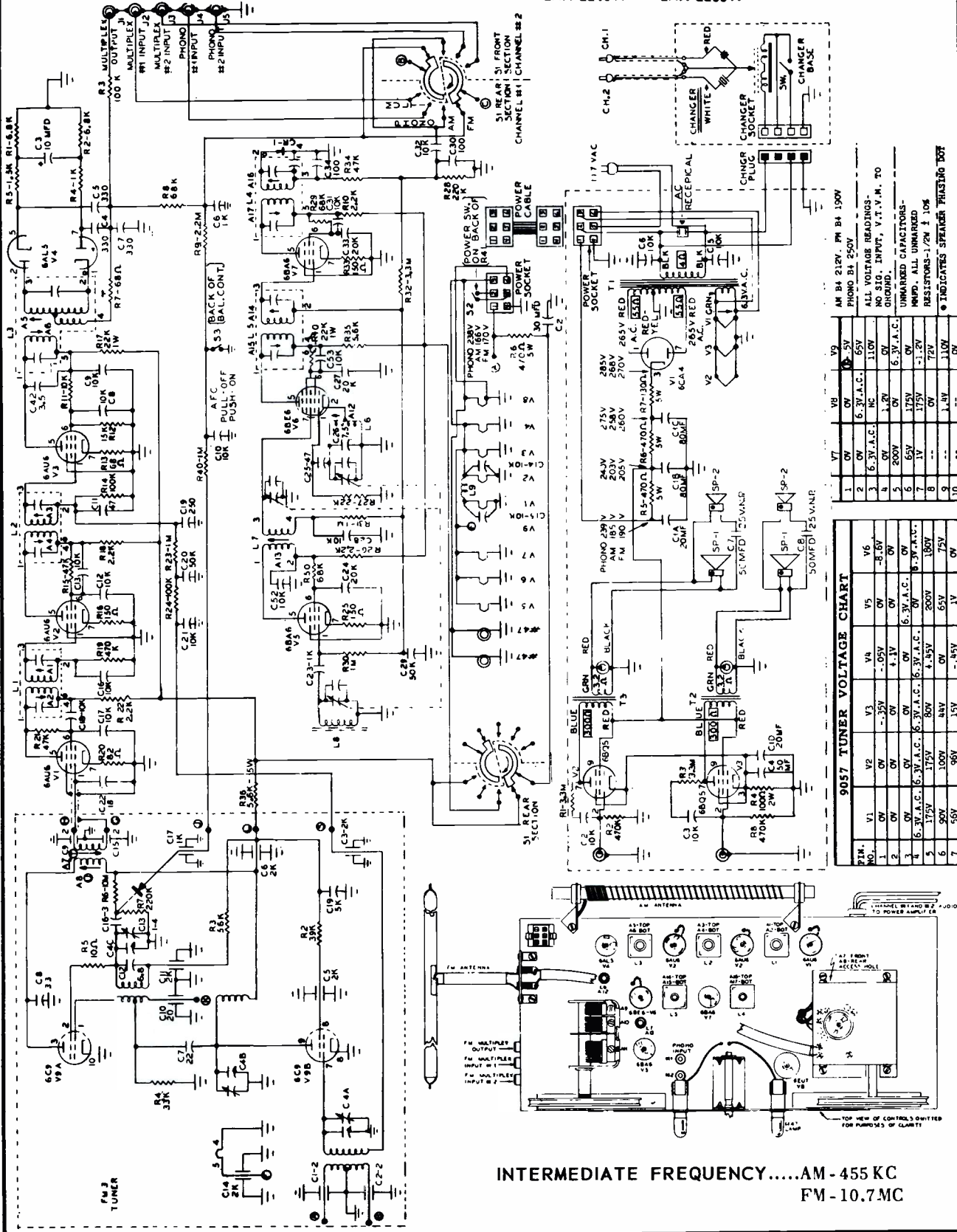


VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

MONTGOMERY WARD

MODELS

- GAA-2213 A
- GAA-2223 A
- GAA-2243 A
- GAA-2253 A



90S7 TUNER VOLTAGE CHART

PIA NO.	V1	V2	V3	V4	V5	V6
1	0V	0V	-35V	-05V	0V	-8.6V
2	0V	0V	0V	+1V	0V	0V
3	0V	0V	0V	0V	0V	0V
4	6.3V A.C.	6.3V A.C.	6.3V A.C.	6.3V A.C.	6.3V A.C.	6.3V A.C.
5	175V	175V	80V	+15V	200V	1.80V
6	90V	100V	115V	15V	0V	75V
7	50V	95V	15V	-15V	1V	0V

V7	V8	V9
0V	0V	AM BA 212V. PM BA 190V
0V	0V	PHONO BA 950V
6.3V A.C.	6.3V A.C.	5V
6.3V A.C.	6.3V A.C.	110V
1.0V	1.0V	0V
200V	0V	0V
175V	175V	0V
1V	1V	0V
0V	0V	72V
1.1V	1.1V	110V
0V	0V	0V

ALL VOLTAGE READINGS - NO SIG. INPUT, V.T.V.M. TO GROUND.
 UNMARKED CAPACITORS - 50MFD.
 UNMARKED RESISTORS - 1/2W 10K
 * INDICATES SPEAKER PHASING DOF

INTERMEDIATE FREQUENCY.....AM - 455 KC
 FM - 10.7 MC

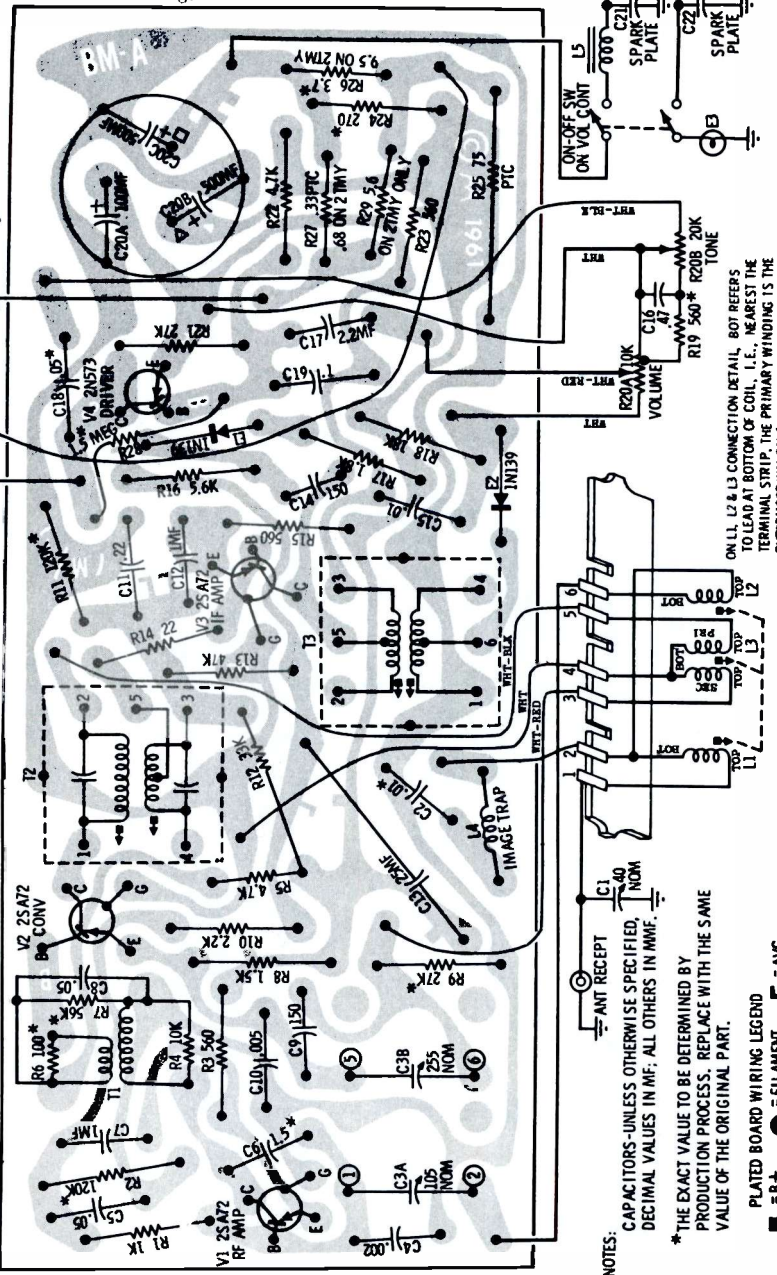
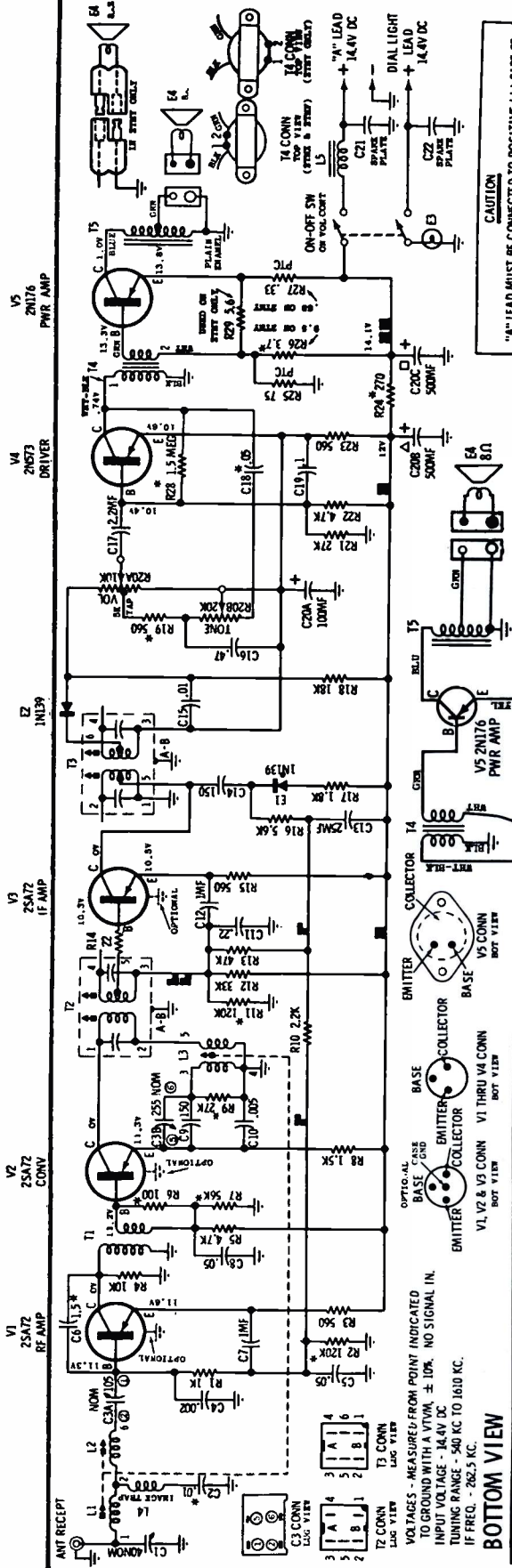
MOTOROLA

MOTOROLA FORD

2TMF.....C2AA-18806-M
 2TMX.....C2AA-18806-N
 2TMY.....C2YA-18806-E

PLATED CHASSIS BOARD DESCRIPTION - Motorola's placir chassis has plating on both sides of the chassis board. The exposed side contains the actual circuit connections while the plating on the component side of the chassis board provides a convenient chassis B-return for components and circuit wiring.

CAUTION
 "A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.



NOTES:
 ANT RECEPT C1 100 NOM
 CAPACITORS UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
 *THE EXACT VALUE TO BE DETERMINED BY PRODUCTION PROCESS. REPLACE WITH THE SAME VALUE OF THE ORIGINAL PART.
 PLATED BOARD WIRING LEGEND
 = B + = FILAMENT = AVC

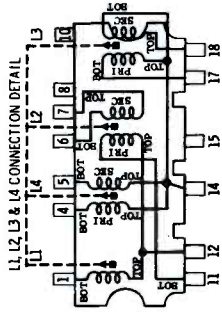
COMPONENTS SHOWN ARE ACTUALLY LOCATED ON OPPOSITE SIDE - COMPONENT SIDE OF PLATING CONTAINS GROUND CONNECTIONS ONLY

MOTOROLA

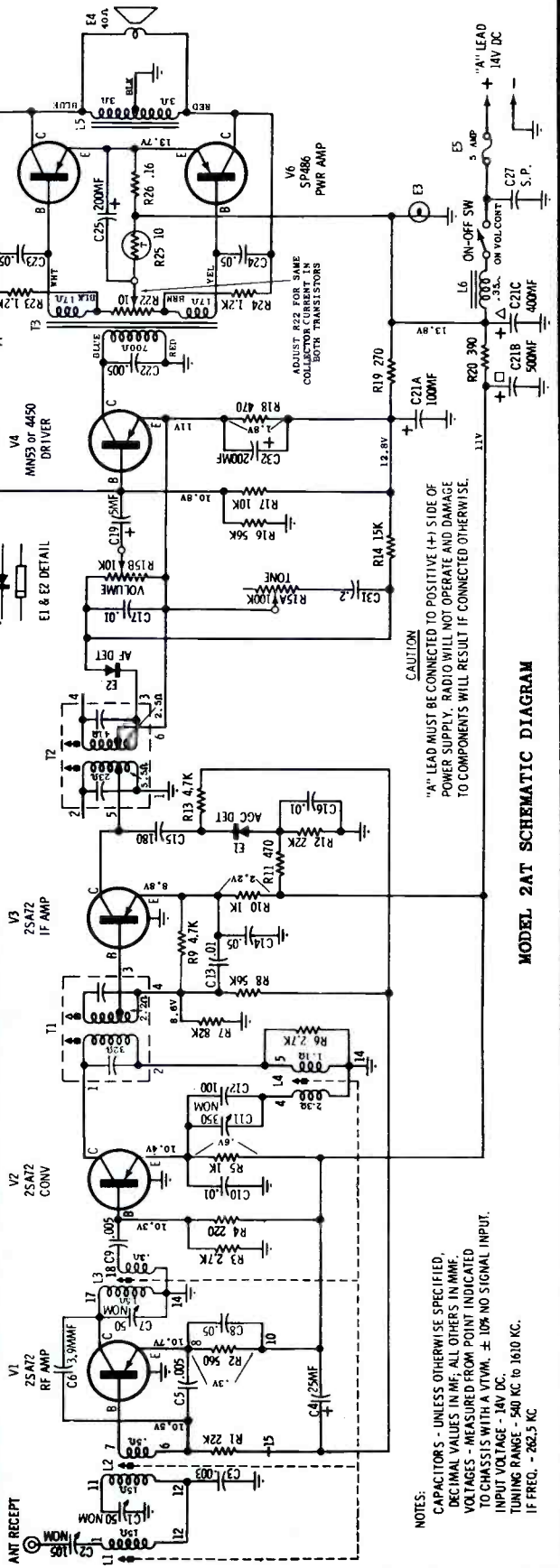
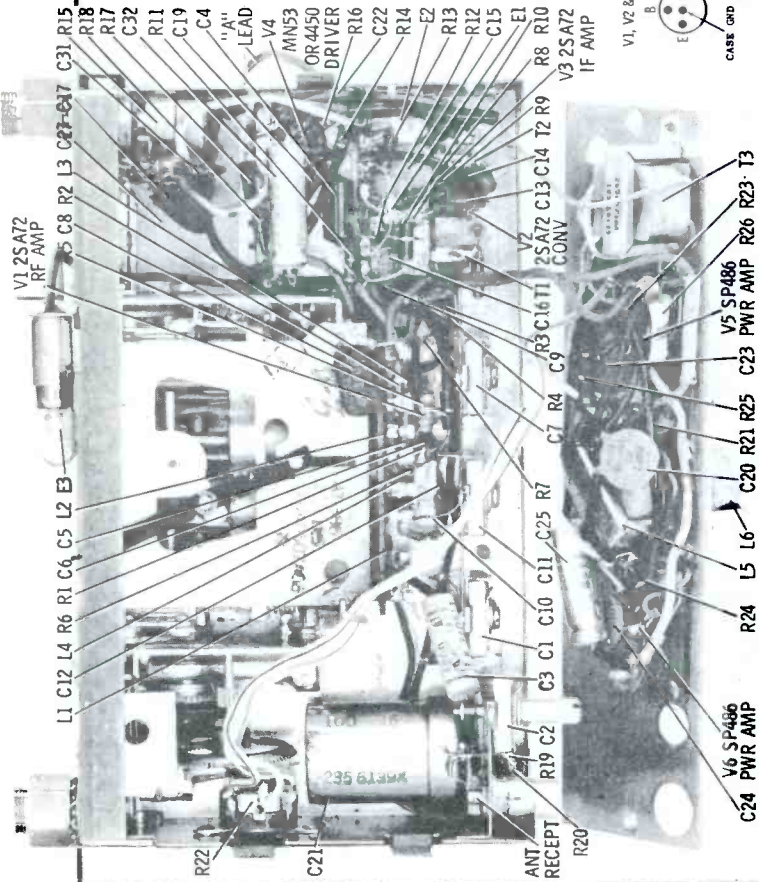
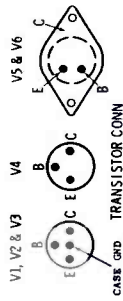
MODEL 2AT

MOTOROLA Model 2AT

(Alignment information on page 81)



NOTE: ON L1, L2, L3 & L4 CONNECTION DETAIL, BOT REFERS TO LEAD AT BOTTOM OF COIL. L1, L2, NEAREST THE TERMINAL STRIP, THE SECONDARY WINDING IS THE OUTERMOST WINDING.



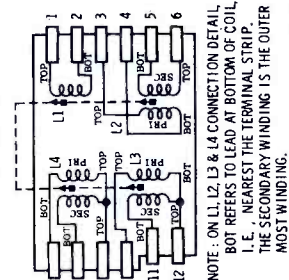
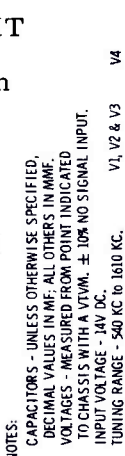
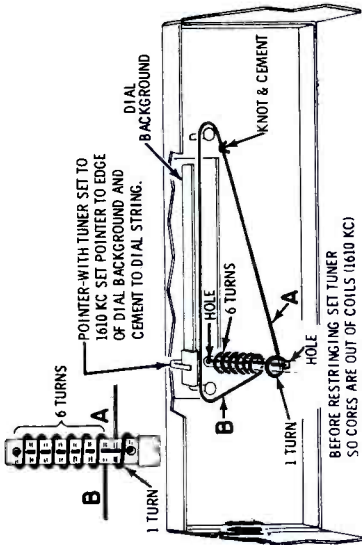
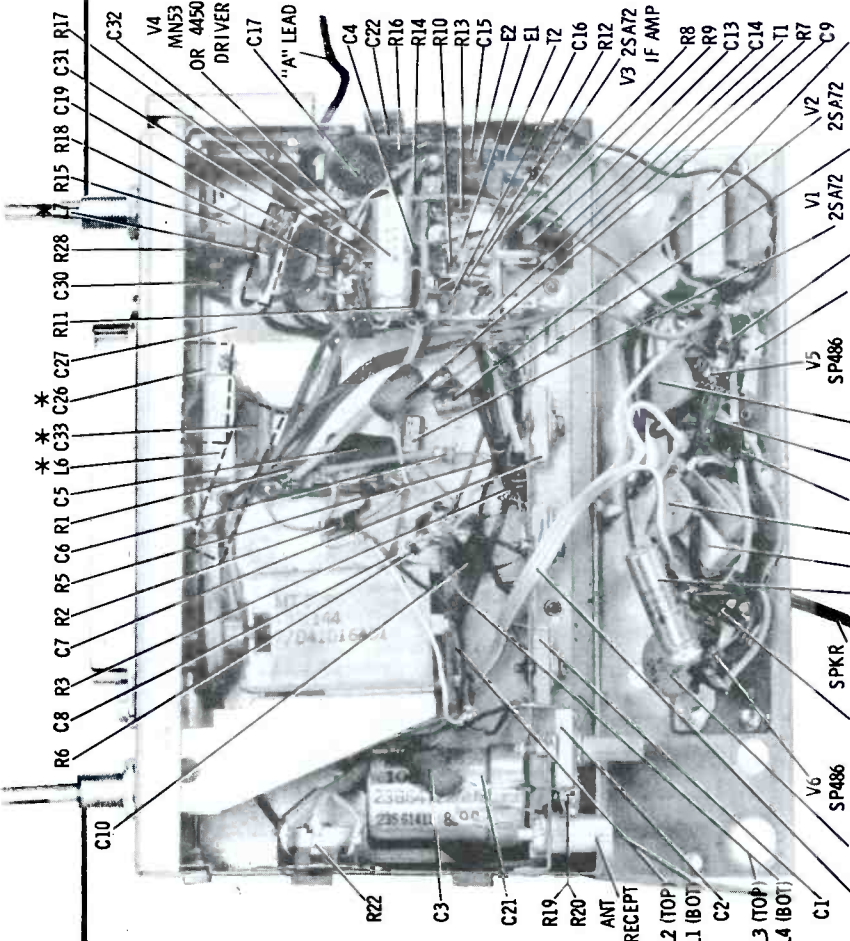
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

MODEL 2AT SCHEMATIC DIAGRAM

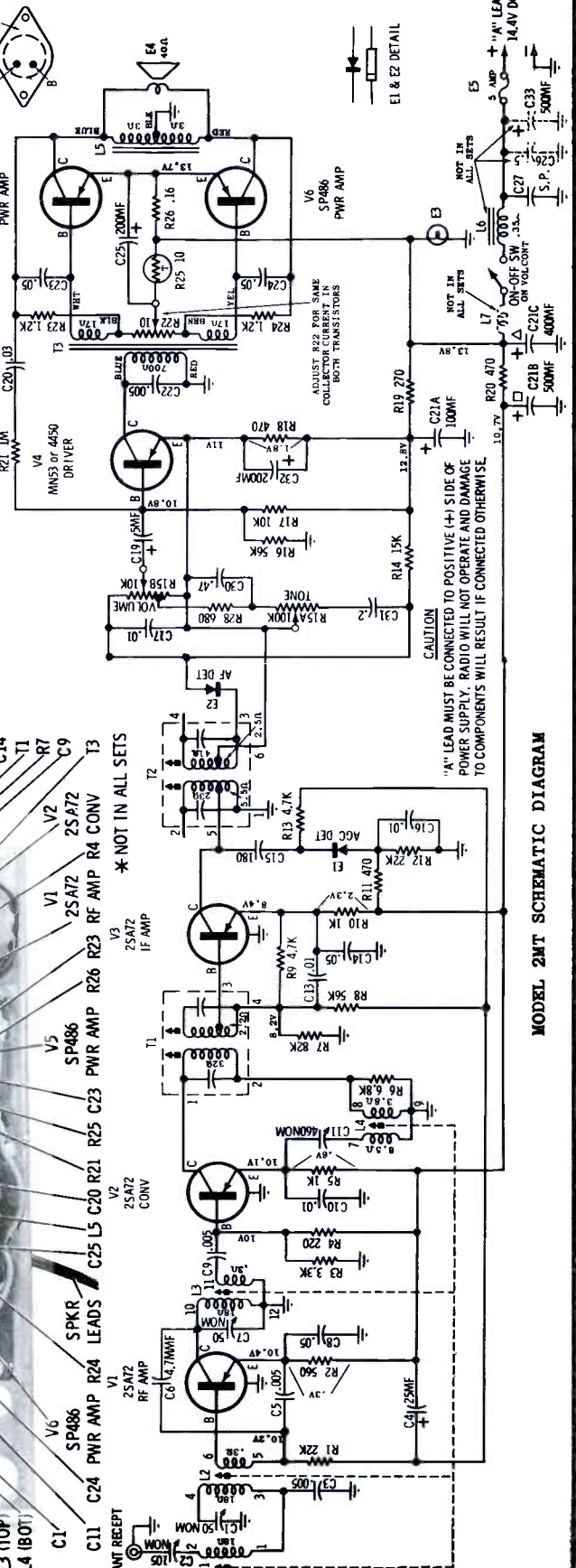
NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM, ± 10% NO SIGNAL INPUT.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540 KC TO 1610 KC.
IF FREQ. - 262.5 KC

MOTOROLA Model 2MT

(Alignment information is on page 81)

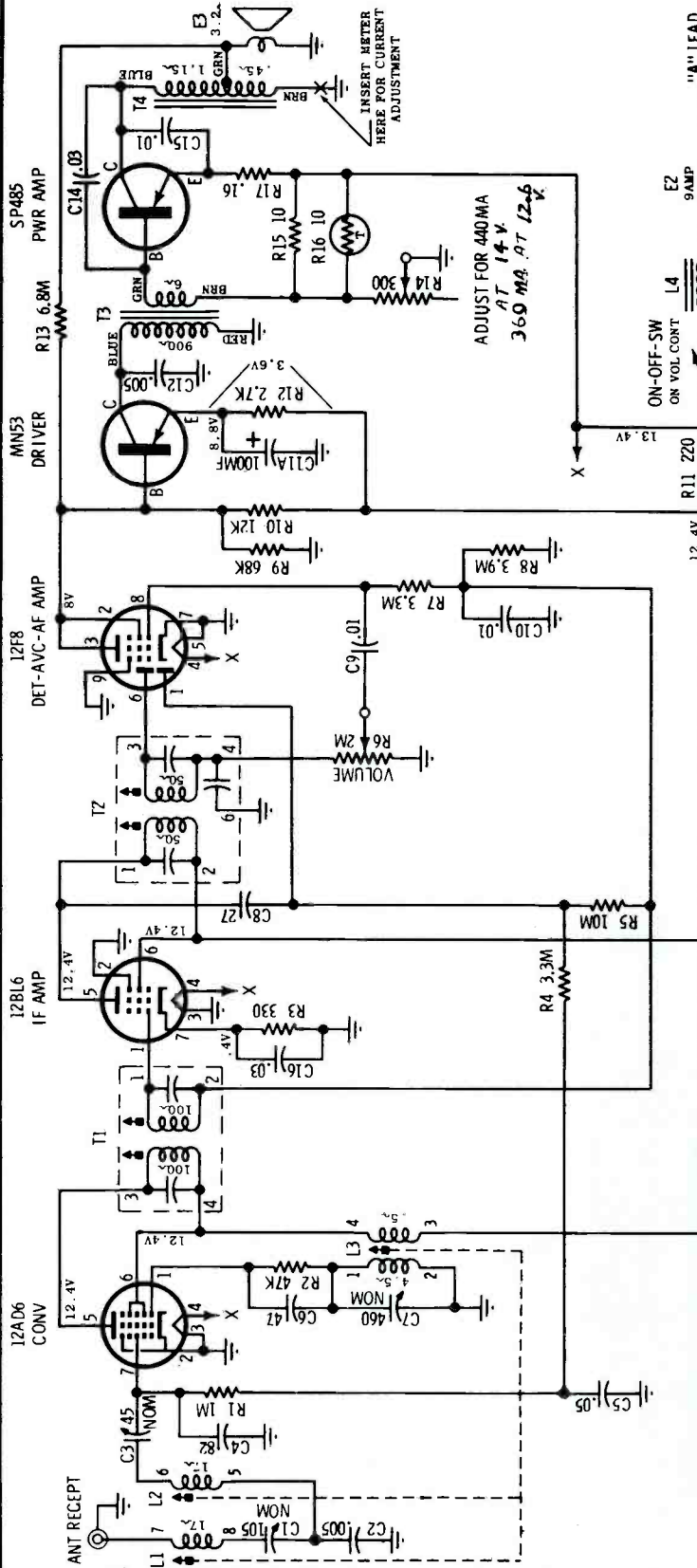


NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF. ALL OTHERS IN MMF.
 VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM, ± 10% NO SIGNAL INPUT.
 INPUT VOLTAGE - 14V DC.
 TUNING RANGE - 540 KC TO 1610 KC.
 IF FREQ. - 262.5 KC

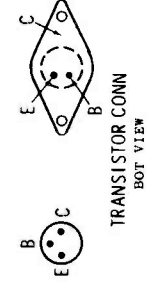


MODEL 2MT SCHEMATIC DIAGRAM

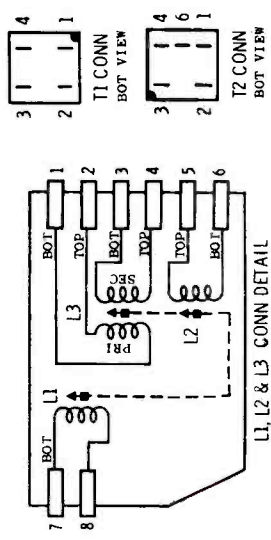
MOTOROLA Model 250X (See page 81 for alignment data)



MODEL 250X SCHEMATIC DIAGRAM

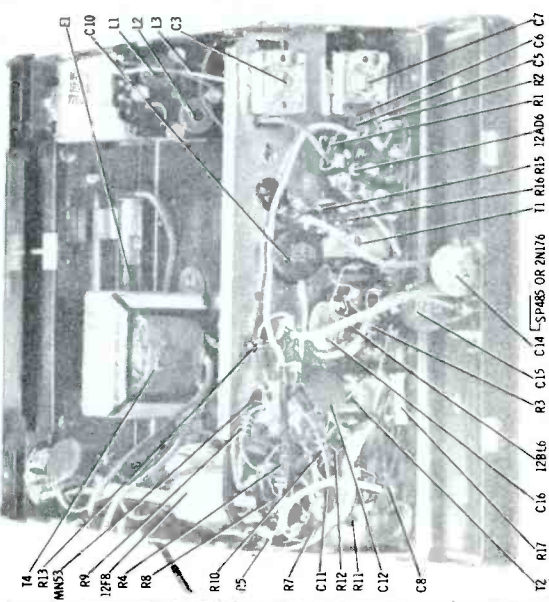


CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.



NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM, $\pm 10\%$ NO SIGNAL IN.
INPUT VOLTAGE - 14V DC
TUNING RANGE - 540KC TO 1610KC.
IF FREQ. - 262.5KC

NOTE: ON L1, L2, & L3 CONNECTION DETAIL, BOT REFERS TO LEAD AT BOTTOM OF COIL, I.E., NEAREST THE TERMINAL STRIP. THE SECONDARY WINDING IS THE OUTERMOST WINDING

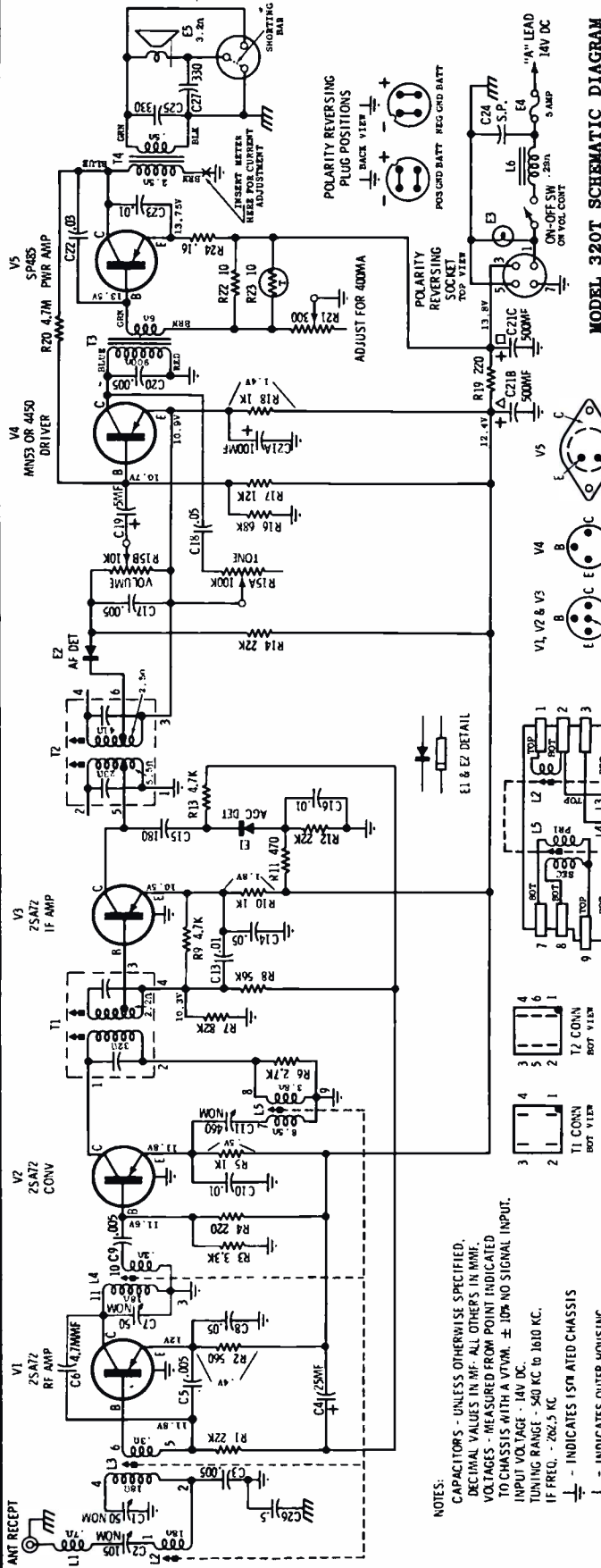


MODEL 250X PARTS LOCATION

MOTOROLA

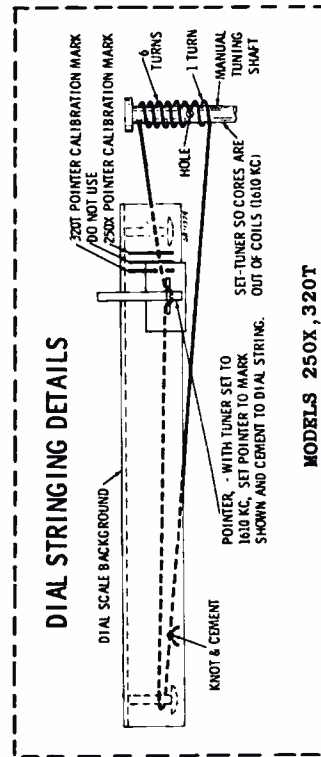
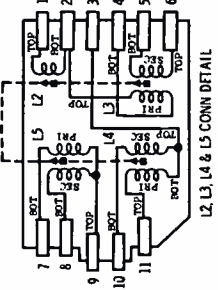
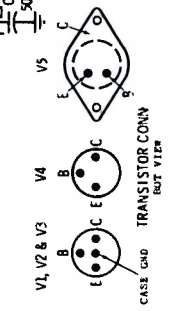
Model 320X

(Alignment information is on page 81)

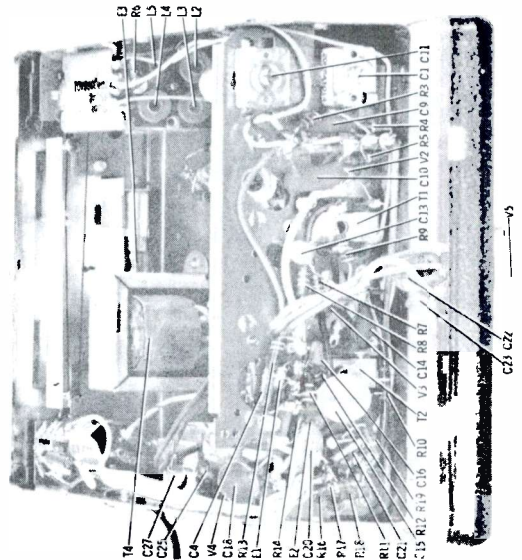


MODEL 320T SCHEMATIC DIAGRAM

CAUTION
BEFORE CONNECTING "A" LEAD BATTERY POLARITY SHOULD BE CHECKED AND POLARITY REVERSING PLUG SHOULD BE CHANGED CORRESPONDINGLY, OTHERWISE SET WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT.



MODELS 250X, 320T

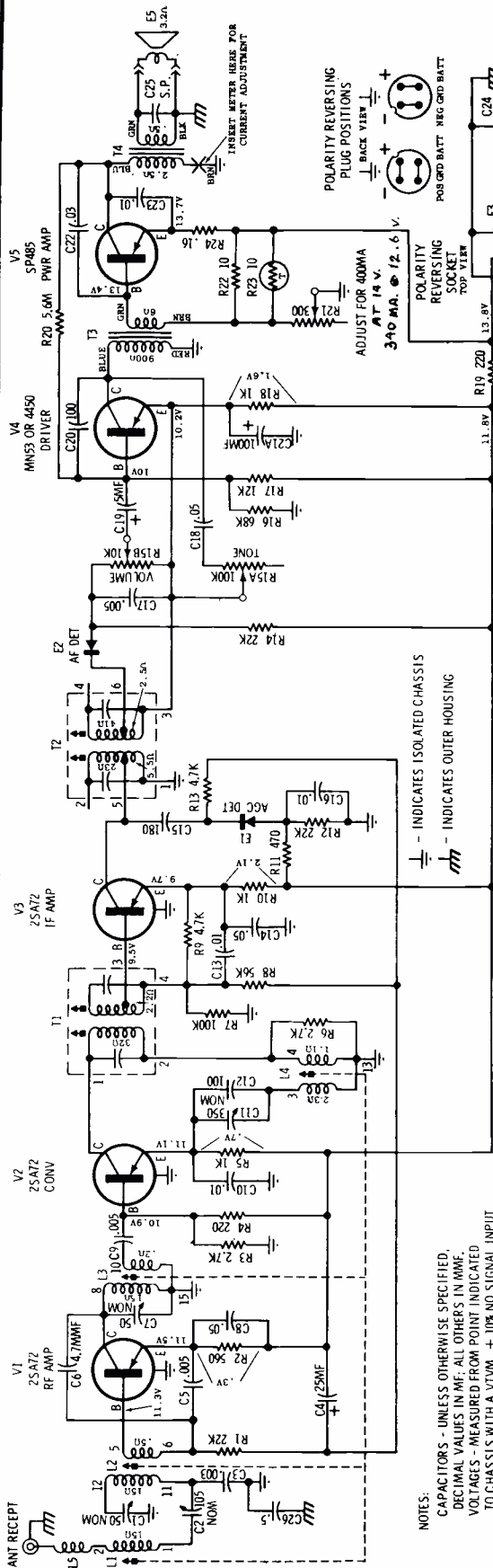


MODEL 320T PARTS LOCATION

NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF. ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM, ± 10% NO SIGNAL INPUT.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540 KC TO 1610 KC.
IF FREQ. - 262.5 KC
- INDICATES ISM RATED CHASSIS
- INDICATES OUTER HOUSING

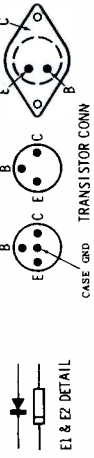
MOTOROLA Model 520T

(Alignment information is on page 81)

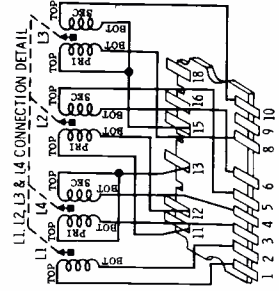
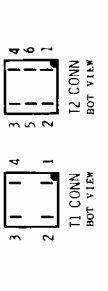


MODEL 520T SCHEMATIC DIAGRAM

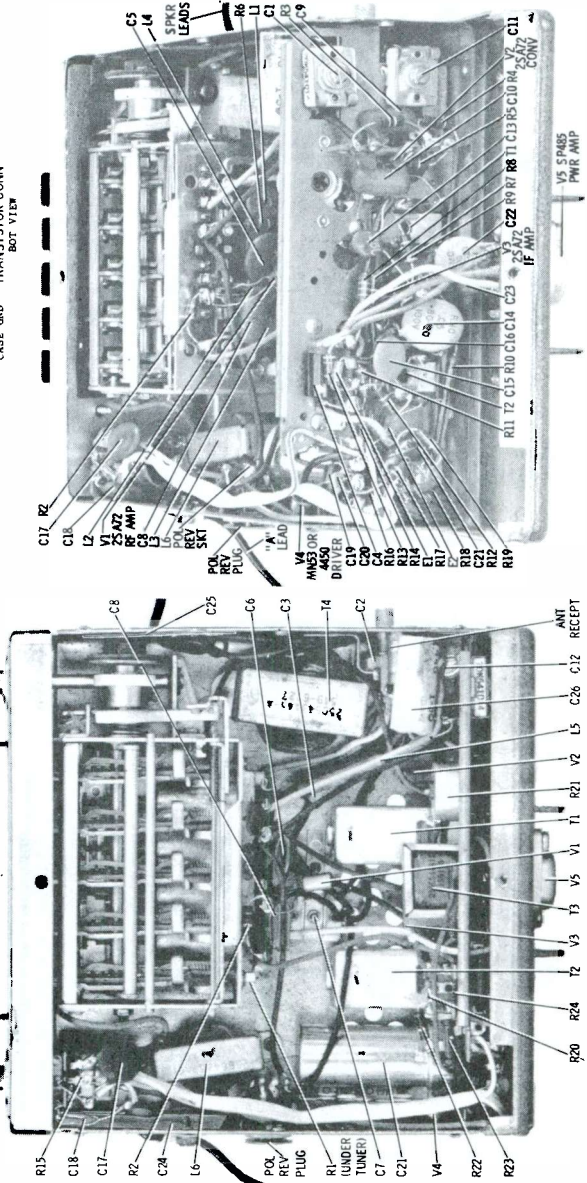
NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN µF. ALL OTHERS IN MMF.
 VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM. ± 10% NO SIGNAL INPUT.
 INPUT VOLTAGE - 14V DC.
 TUNING RANGE - 540 KC to 1610 KC.
 IF FREQ. - 262.5 KC



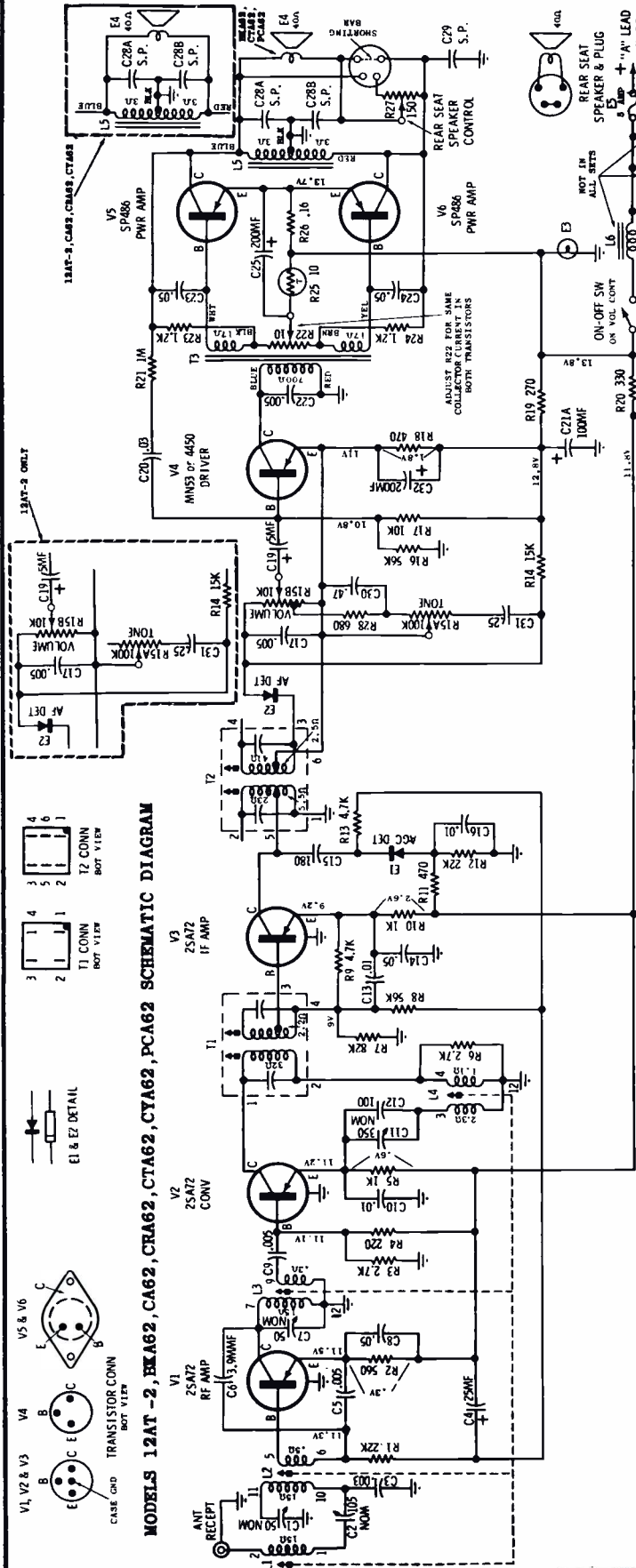
CAUTION
 BEFORE CONNECTING "A" LEAD, BATTERY POLARITY SHOULD BE CHECKED AND POLARITY REVERSING PLUG SHOULD BE CHANGED CORRESPONDINGLY. OTHERWISE SET WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT.



NOTE: ON L1, L2, L3 & L4 CONNECTION DETAIL, BOT REFERS TO LEAD AT BOTTOM OF COIL, T. E., NEAREST THE TERMINAL STRIP. THE SECONDARY WINDING IS THE OUTERMOST WINDING.

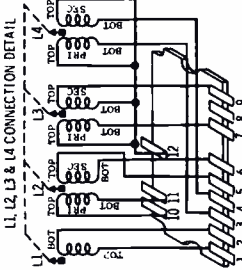


MODEL 520T PARTS LOCATION



CAUTION
 "A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
 VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM. ± 10% NO SIGNAL INPUT.
 INPUT VOLTAGE - 14V DC.
 TUNING RANGE - 540 KC TO 1610 KC.
 IF FREQ. - 286.5 KC

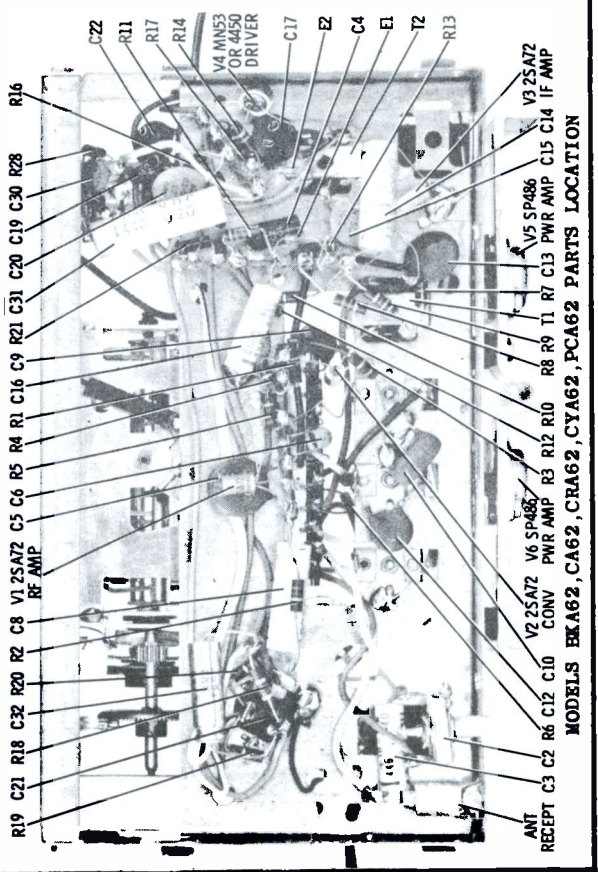


NOTE: ON L1, L2, L3 & L4 CONNECTION DETAIL, BOT REFERS TO LEAD AT BOTTOM OF COIL. I. E., NEAREST THE TERMINAL STRIP. THE SECONDARY WINDING IS THE OUTERMOST WINDING.

MOTOROLA

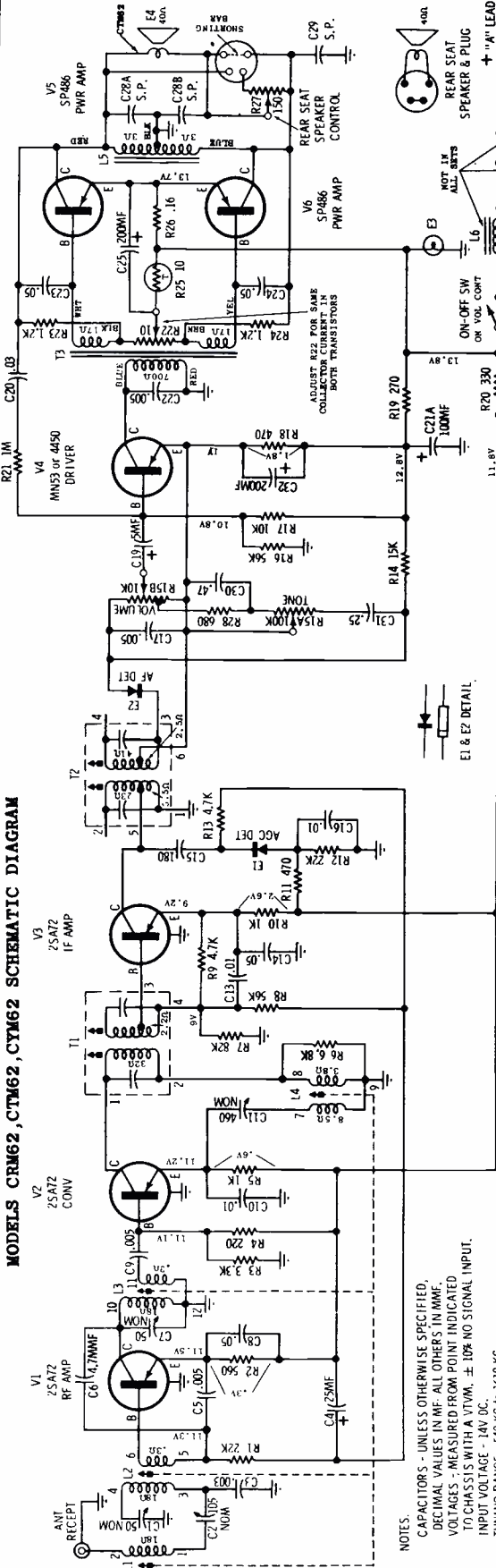
Models 12AT-2, BKA62, CA62, CRA62, CTA62, CYA62, PCA62

(Alignment information is on page 81)

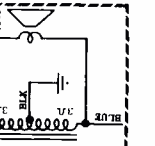
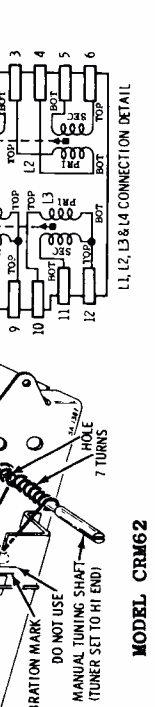
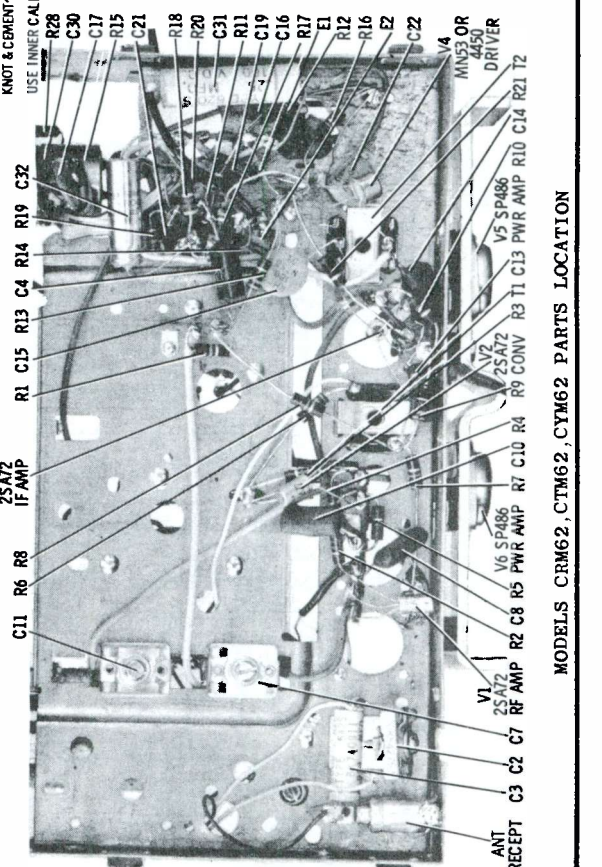
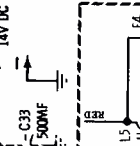
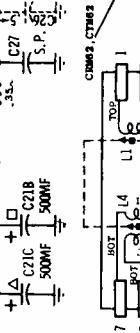
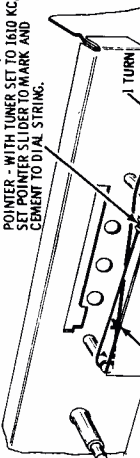
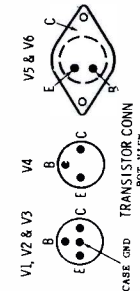


MODELS 12AT-2, BKA62, CA62, CRA62, CTA62, CYA62, PCA62 PARTS LOCATION

MODELS CRM62, CTM62, CYM62 SCHEMATIC DIAGRAM



NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED,
 DECIMAL VALUES IN MF-ALL OTHERS IN MMF.
 VOLTAGES - MEASURED FROM POINT INDICATED
 TO CHASSIS WITH A VTVM. ± 10% NO SIGNAL INPUT.
 INPUT VOLTAGE - 14V DC.
 TUNING RANGE - 540 KC TO 1610 KC.
 IF FREQ. - 262.5 KC



MOTOROLA
 Models CRM62, CTM62, CYM62
 (Alignment information is on page 81)

MODELS CRM62, CTM62, CYM62 PARTS LOCATION

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

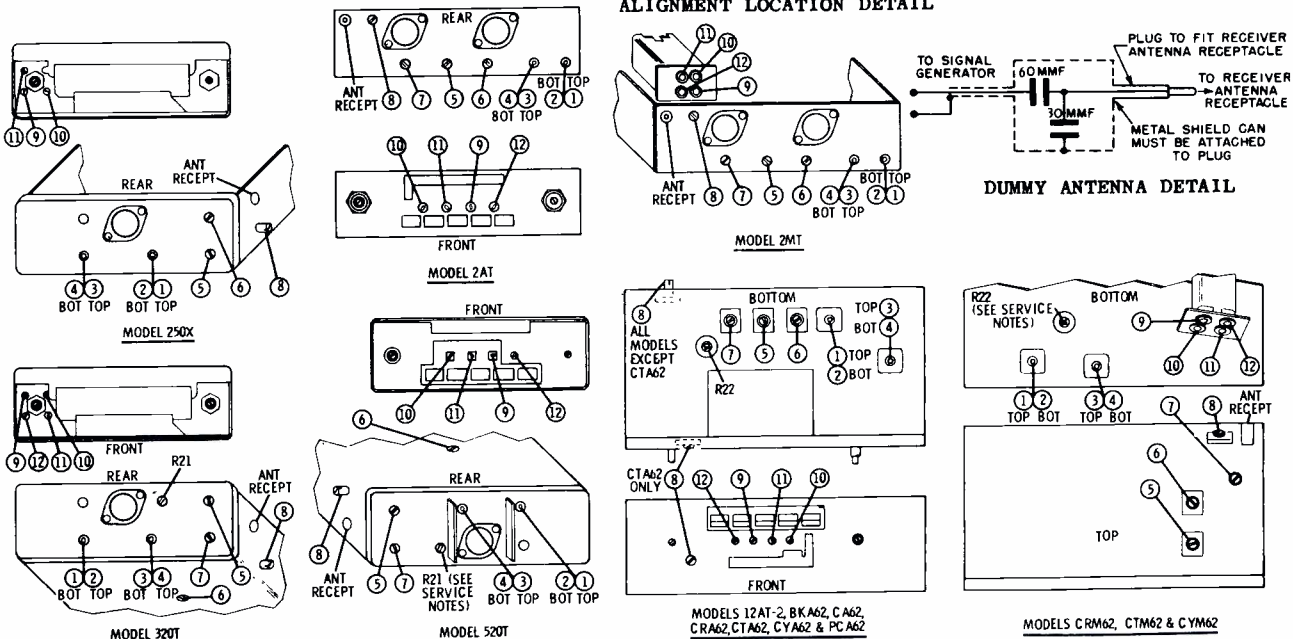
MOTOROLA Alignment Information for various auto sets covered on preceding pages

Connect an output meter across the speaker voice coil. Set volume to maximum and tone to treble. Attenuate signal generator output to maintain 1 watt (1.79 volts across a 3.2 ohm load for models 250X, 320T and 520T; 6.33 volts across a 40 ohm load for all other models) on output meter at all times.

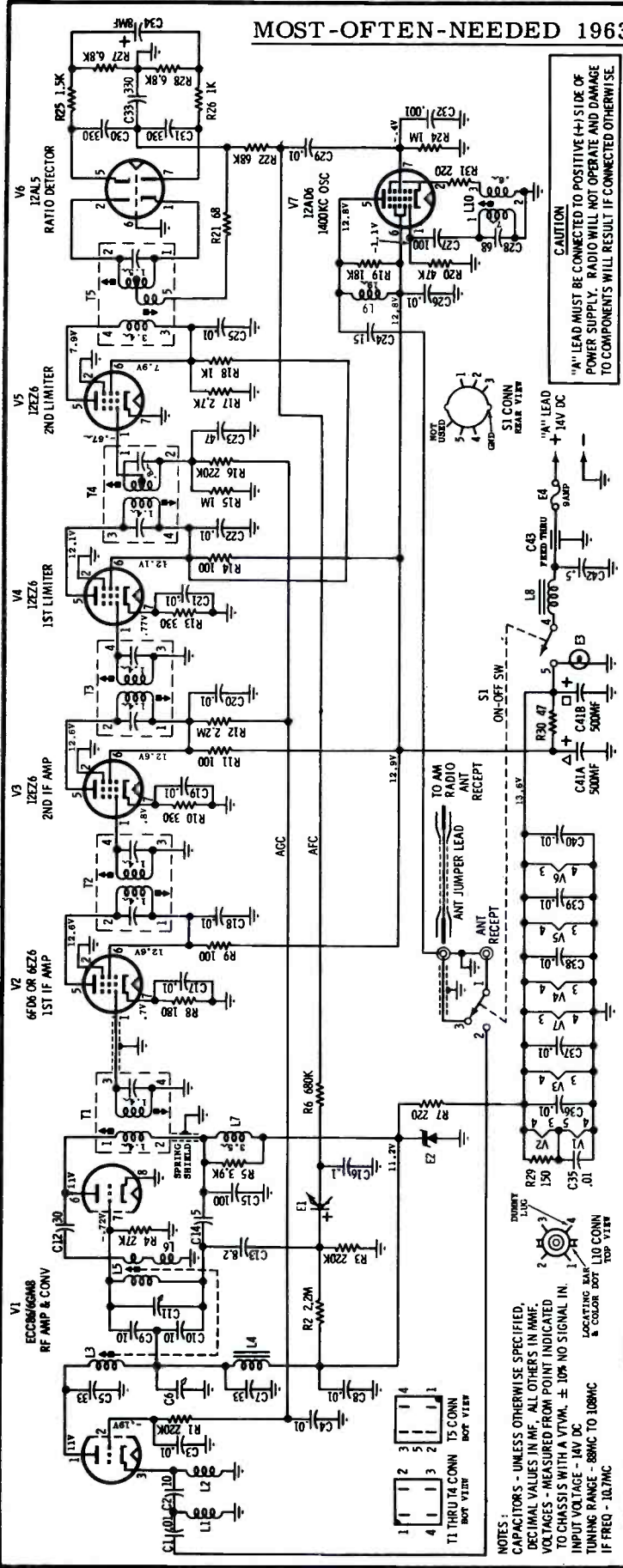
STEP	GENERATOR CONNECTION	GEN FREQ (400 cycle 30% mod)	TUNER SET TO	ADJUST	REMARKS
IF ALIGNMENT					
1.	To ant recept (250X) or collector of RF amp (all other models) thru .1mf & chassis	262.5 Kc	Hi end stop	1,2,3 & 4	Adjust for maximum
RF ALIGNMENT					
2.	Ant recept thru dummy (see figure)	1610 Kc	Hi end stop	5,6,7* & 8	Adjust for maximum
NOTE: Do not perform steps 3, 4, 5 & 6 unless the tuner has been tampered with or associated components have been replaced. If necessary, remove the escutcheon, dial background and the pilot light socket to expose the core screws. Before proceeding with step 3, back the tuning cores as far as possible out of the coils to eliminate their effect on trimmer adjustments.					
3.	Ant recept thru dummy (see figure)	1610 Kc	Hi end stop	5,6,7* & 8	Adjust for maximum
4.	"	1200 Kc (push-button models); 1020 Kc (manually tuned models)	Tuner carriage .285" (push-button models); .298" (manually tuned models) from Hi end stop	9,10,11 & 12*	Adjust for maximum
5.	"	1610 Kc	Hi end stop	5,6,7* & 8	Adjust for maximum
6.	Repeat steps 4 and 5 until no further increase; step 5 should be last step.				Then cement core screws in place.
ANTENNA TRIMMER					
7.			Weak station around 1400 Kc	8	Adjust for maximum with radio installed in car and antenna fully extended.

*Model 250X does not have adjustments 7 and 12.

ALIGNMENT LOCATION DETAIL



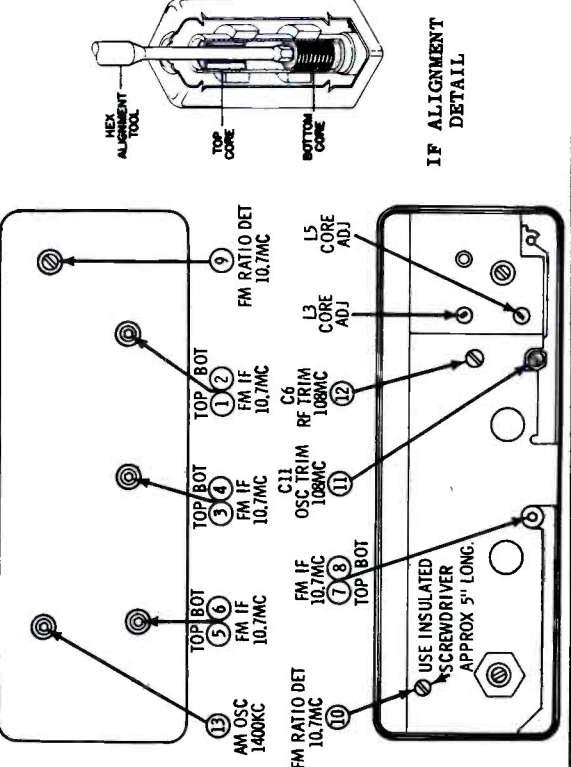
MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION



CAUTION
 "A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

CIRCUIT DESCRIPTION
 Model FMC62 is an Universal FM tuner for underdash installations in all cars with 12 volt-negative ground electrical systems and previously installed AM radios. The tuner receives FM signals, converts them to 1400 Kc AM which is, in turn, fed to the AM radio via the antenna input.

The tuner is a super-heterodyne FM receiver containing seven tubes with one RF, two IF, two limiters, a ratio detector and a 1400 Kc oscillator stage. After detection, the demodulated FM signal is applied to the 1400 Kc oscillator. The resultant AM signal is fed to the AM radio through its antenna input. An on-off switch on the tuner also controls the antenna switching. When the tuner is turned on, the antenna is automatically disconnected from the AM radio and connected to the FM tuner.



FMC62 ALIGNMENT LOCATION POINTS



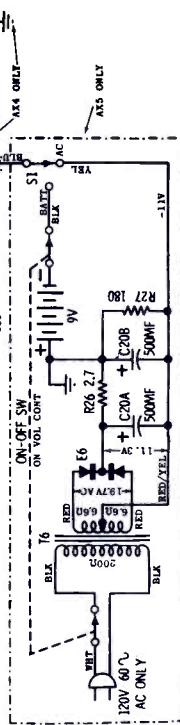
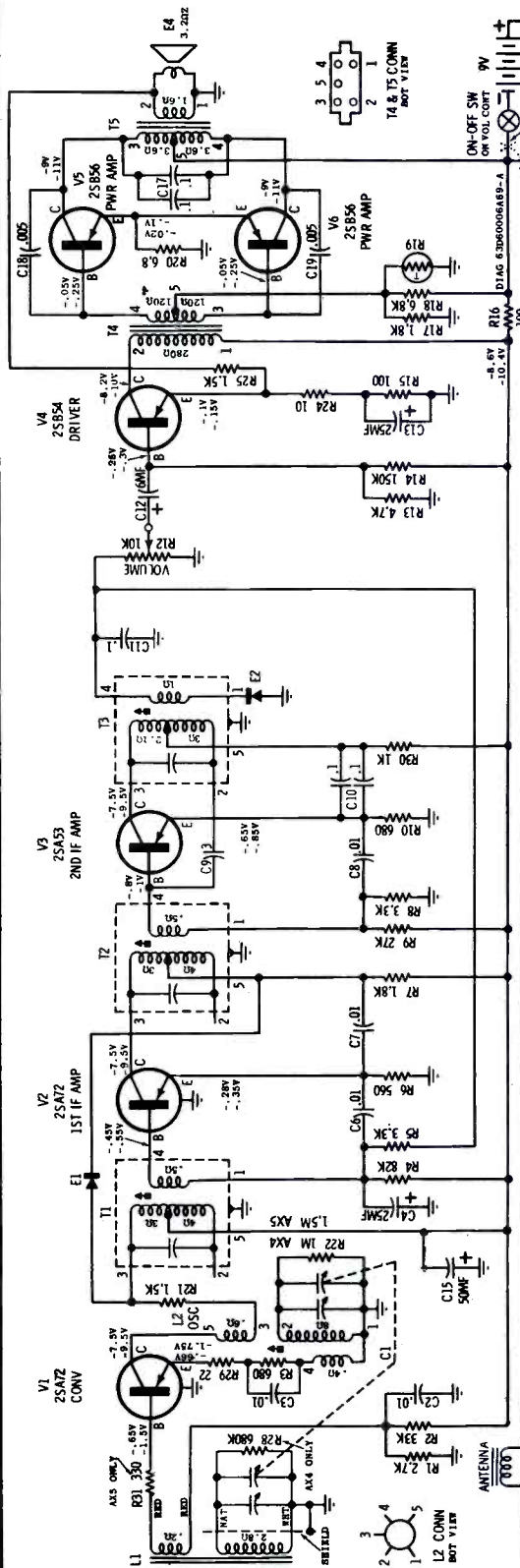
MOTOROLA

MODEL FMC 62

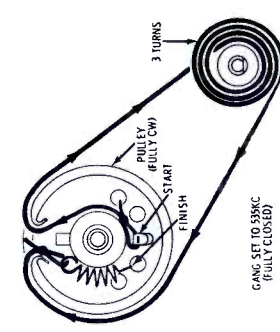
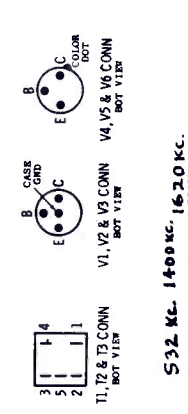
MODEL FMC62 TUNER PARTS LOCATION

MOTOROLA

MODELS AX4 HS-918
AX5 HS-919



NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF. ALL OTHERS IN MME.
 VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM, ± 10% NO SIGNAL IN, VOL AT MIN.
 TUNING RANGE - 535KC TO 1620KC
 IF - 455KC
 ZERO SIGNAL CURRENT - APPROX 13MA (MAIN VOL)
 V VOLTAGES TAKEN WITH 9V POWER SOURCE
 V VOLTAGES TAKEN WITH 120V AC POWER SOURCE AX5 ONLY



AX4, AX5 DIAL STRINGING

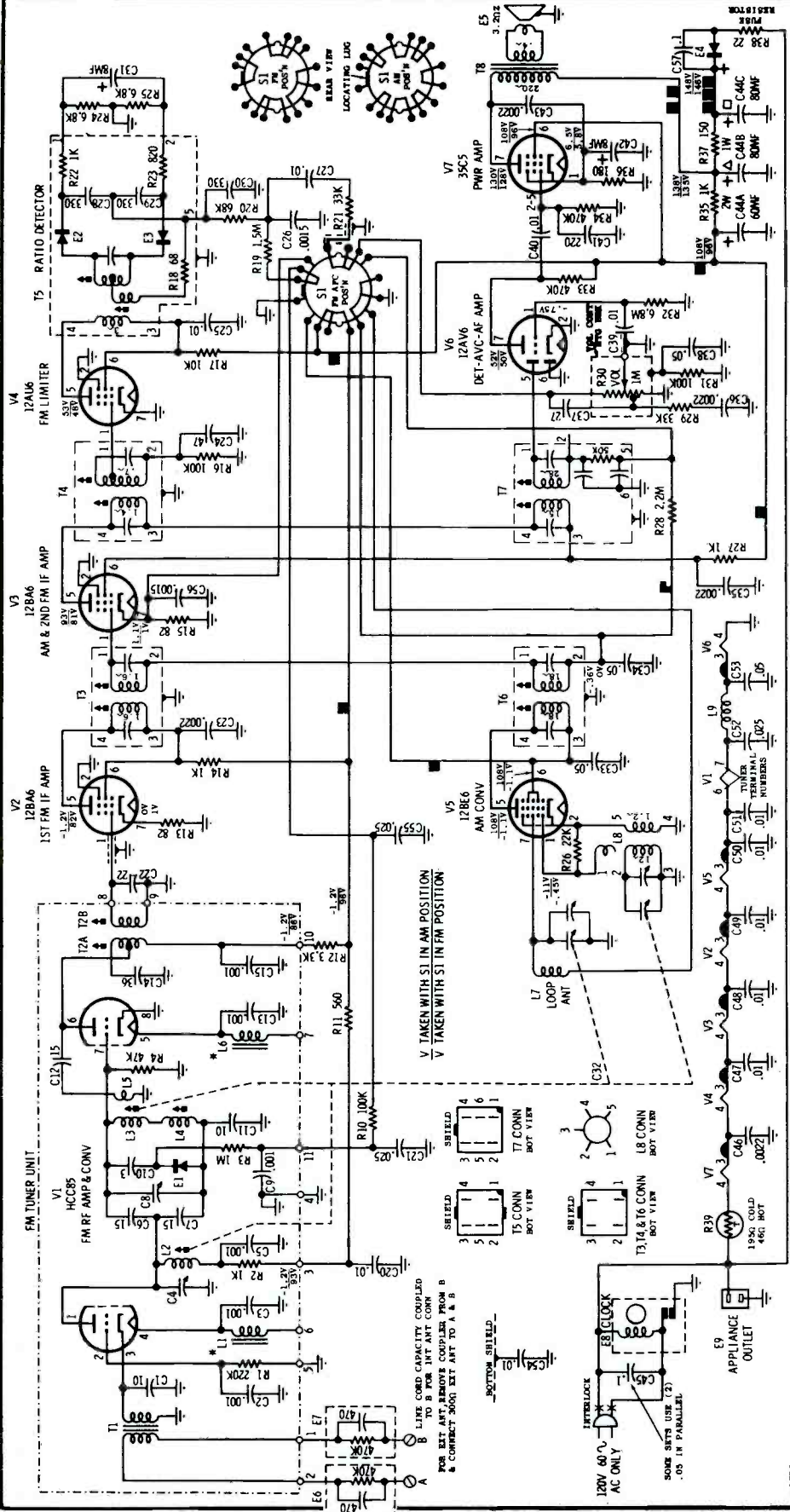


BOTTOM VIEW MODELS AX4, AX5
SIGNAL PATH FLOW & VOLTAGE READINGS TAKEN FROM BOTTOM SIDE OF CHASSIS

NOTES:
 VOLTAGES-TAKEN FROM POINT INDICATED TO GROUND (— ON SCHEMATIC) WITH A VTVM ±10% WITH 9V BATTERY AS A POWER SOURCE NO SIGNAL IN.
 SIGNAL PATH LEGEND —RF— —IF— —AUDIO—
 ALIGNMENT

MOTOROLA
MODEL CHASSIS
BC1 HS-923

(Service material continued on page 85, on the right)



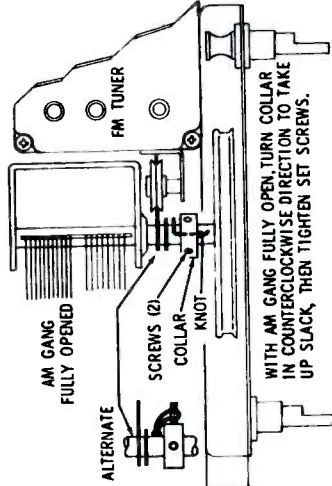
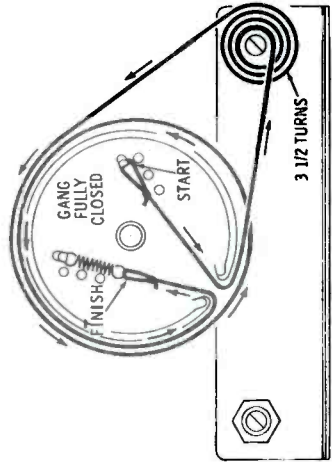
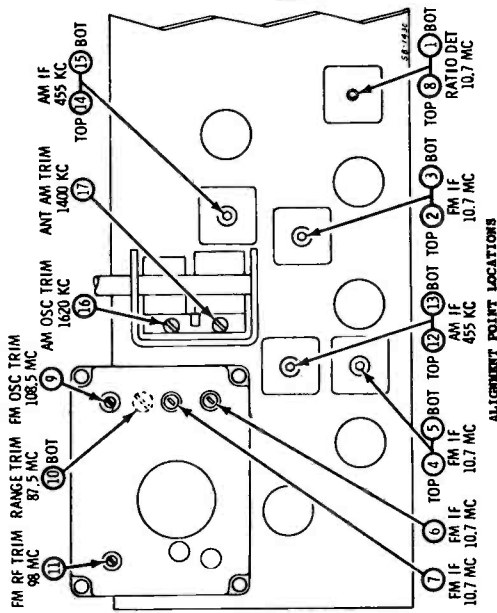
7. Remove dial pointer - pull straight out.
8. Remove 2 chassis mounting-pal-nuts from front of radio.
9. Unsolder speaker leads.
10. Unsolder lead of bottom shield.
11. Slide AM loop out of slots inside cabinet.
12. Slide chassis out of cabinet. (Clock & Appliance outlet leads need not be disconnected to work on chassis).

4. Remove two screws holding chassis support channel.
5. Remove two screws that mount the AM gang bracket to cabinet.
6. Remove dial crystal from cabinet - reach in back of set and push down plastic tabs with fingers. Crystal should slip forward at top. Bottom of crystal has tabs which fit into cabinet slots. Care should be taken to avoid damage to tabs.

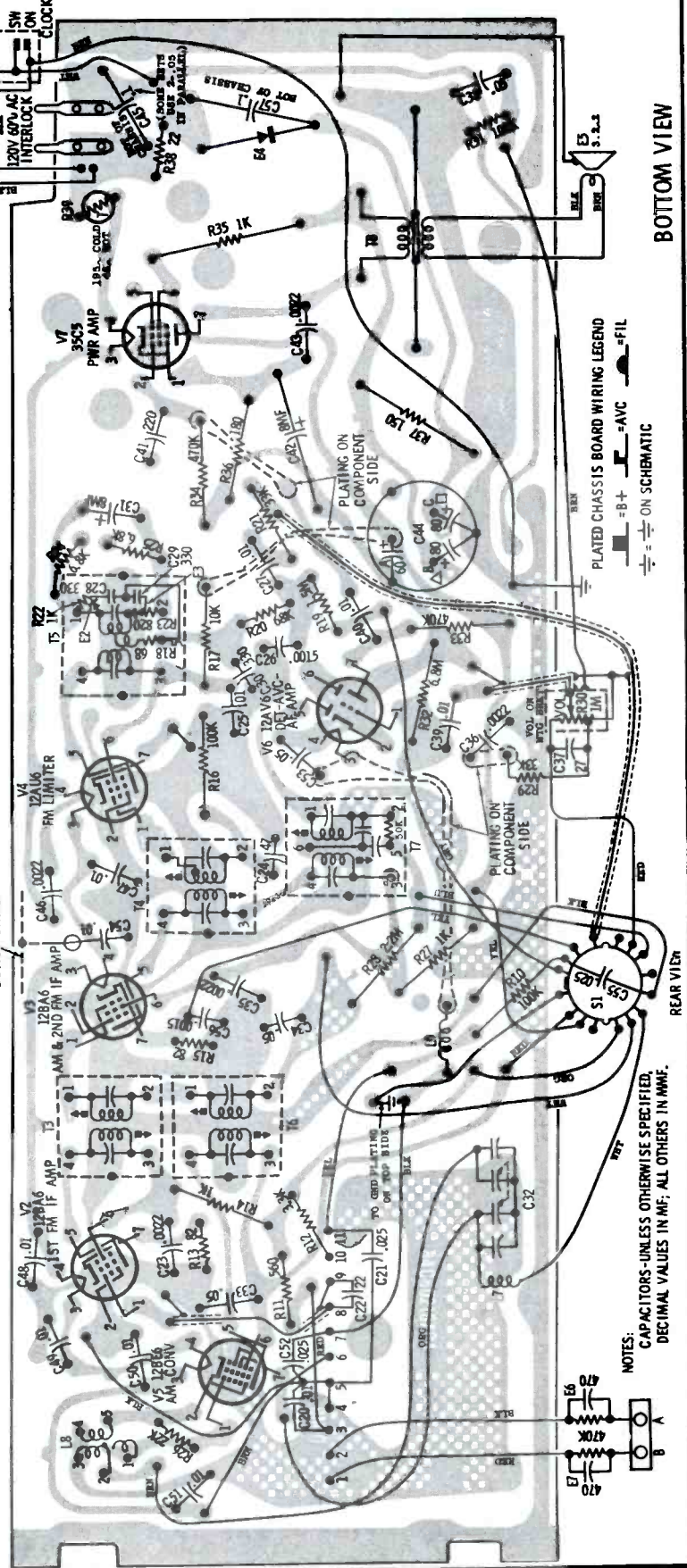
- TO REMOVE CHASSIS FROM CABINET**
1. Remove control knob - pull straight off.
 2. Remove 5 clutch head screws holding cabinet back to cabinet.
 3. Unsolder leads to cabinet back.

MOTOROLA
 Model BC1, Chassis HS-923
 (Continued)

MOTOROLA Model BC1, Chassis HS-923, Continued



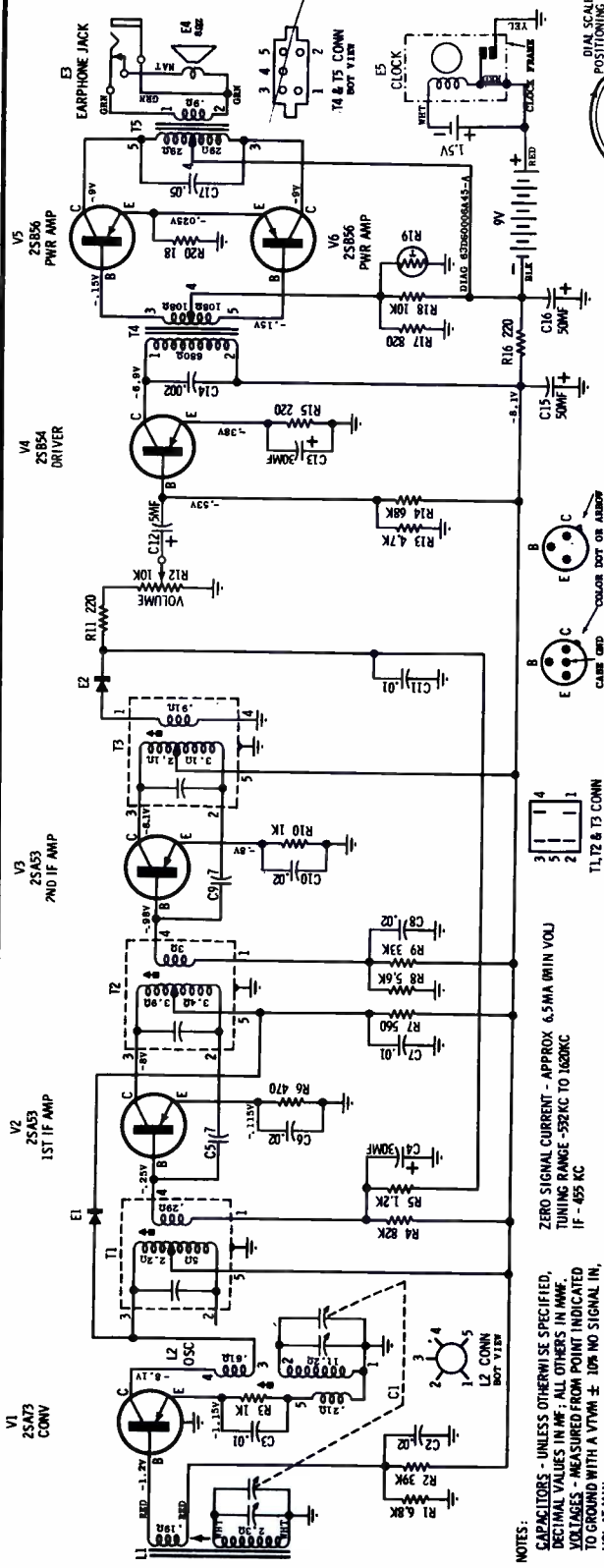
PLATED CHASSIS BOARD WIRING AS VIEWED FROM BOTTOM
 (COMPONENTS SHOWN ARE LOCATED ON OPPOSITE SIDE)



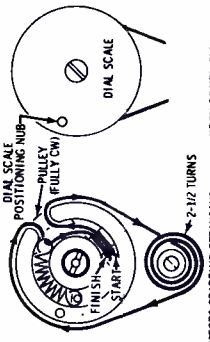
BOTTOM VIEW

MOTOROLA

MODEL CX1 CHASSIS HS-877



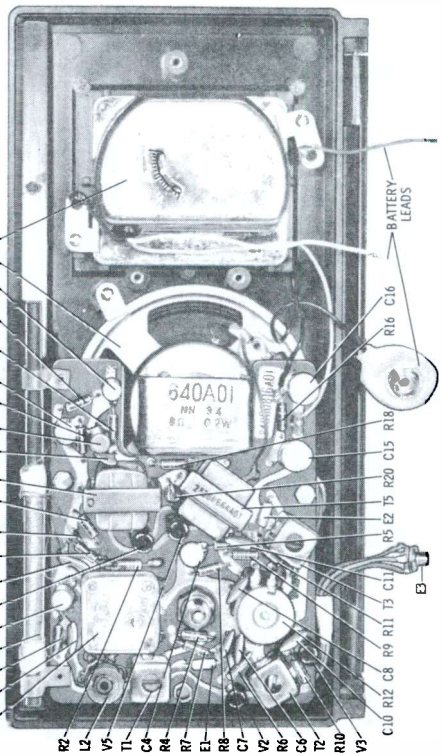
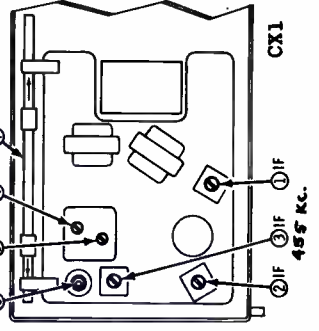
NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
 VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM ± 10% NO SIGNAL IN, VOL. AT MIN.
 ZERO SIGNAL CURRENT - APPROX. 6.5 MA (BAIN VOLU) TUNING RANGE - 55 KC TO 100 KC IF - 85 KC



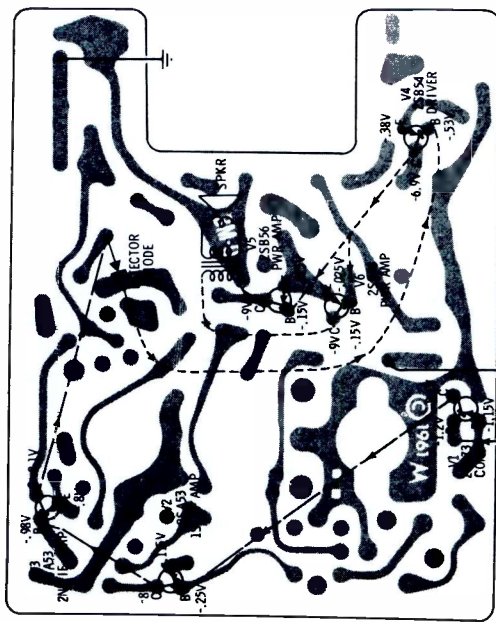
UPON COMPLETION OF DIAL STRINGING, INSTALL FULLY CLOCKWISE; THEY SHOULD BE IN POSITION AS SHOWN

CX1 DIAL STRINGING DETAIL

532 KC, 1400 KC - 1600 KC.
 OSC CORE TRIM ①
 ANT CORE TRIM ②
 ANT CORE ③
 600 KC



MOTOROLA Model CX1, Chassis HS-877

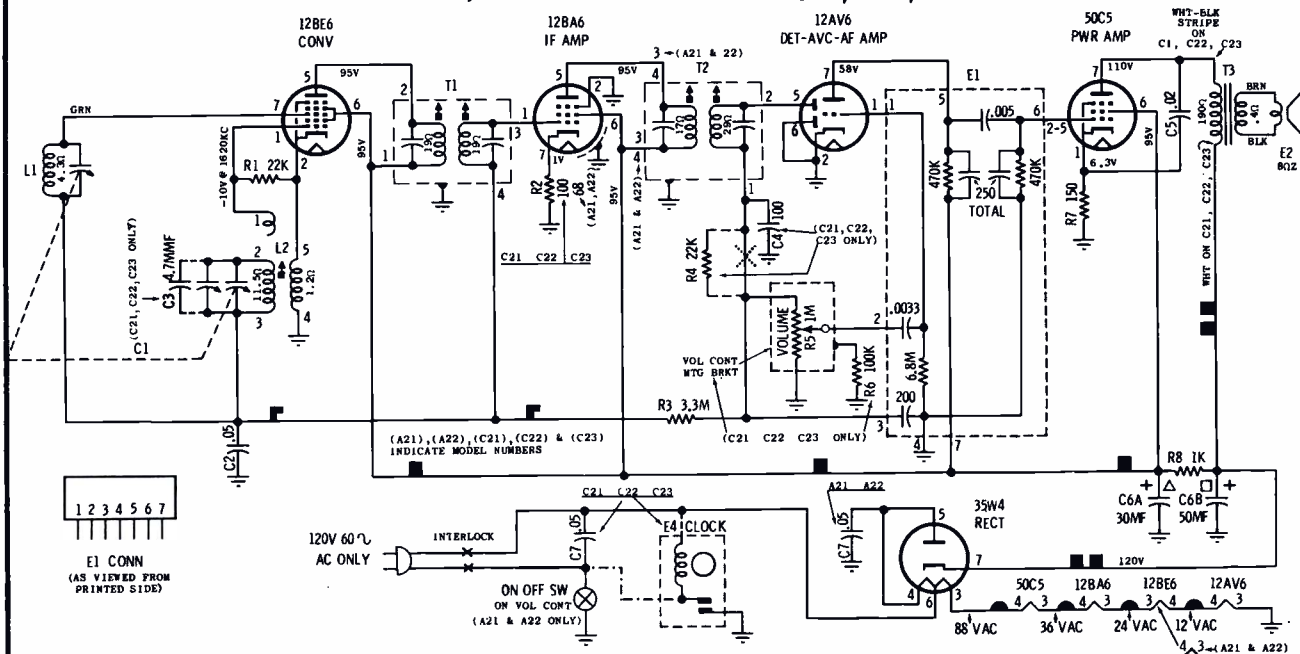


NOTES:
 VOLTAGES - TAKEN FROM POINT INDICATED TO GROUND (--- ON SCHEMATIC) WITH A VTVM, ± 10% NO SIGNAL IN.
 SIGNAL PATH LEGEND
 --- RF --- IF --- AUDIO

MOTOROLA

Chassis HS-939, HS-981

MODELS
A21, A22 SERIES
C21, C22, C23 SERIES



MODELS A21, A22, C21, C22, C23 SCHEMATIC DIAGRAM

CHASSIS REMOVAL

MODELS A21, A22

1. Remove cabinet back - 4 screws hold it in place.
2. Remove chassis mtg. screw at base of chassis and screw at tuning gang mtg bracket.
3. Pull off volume knob ONLY. (Do not pull captivated tuning knob).
4. From front, unscrew palnut under volume control knob.
5. Unsolder appropriate leads to slide chassis out of tuning knob and cabinet.

MODELS C21, C22, C23

1. Remove cabinet back - 2 screws hold it in place.
2. Pull off volume and tuning knobs.
3. From rear, remove chassis mtg. screw located on volume control mounting bracket.
4. Unsolder appropriate leads to slide chassis from cabinet.

NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF, ALL OTHERS IN MMF. VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM. ± 10% NO SIGNAL INPUT

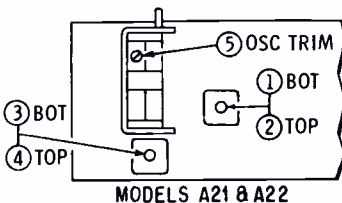
TUNING RANGE - 535KC TO 1620KC (IF - 455KC)

PLATED BOARD WIRING LEGEND

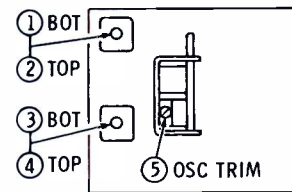
■ = B+ ◻ = AVC ◻ = FIL

① ② ③ ④ ⑤

L2 CONN BOT VIEW T1 & T2 CONN BOT VIEW ⊕ = B-



MODELS A21 & A22



MODELS C21, 22 & 23

ALIGNMENT DETAILS

ALIGNMENT

Use an isolation transformer between the power line and the receiver. If not available, connect low side of generator to B- through a .1 mf capacitor. Connect a low range output meter across speaker voice coil and set volume control to maximum. Attenuate generator output to maintain 50 milliwatts on output meter to prevent overloading (50 milliwatts is .64 volts across 8 ohm load).

STEP	GENERATOR CONNECTION	GENERATOR FREQUENCY (400 cycle mod)	GANG SETTING	ADJUST	REMARKS
IF ALIGNMENT					
1.	Grid of conv (pin 7, 12BE6) thru .1 mf & B-	455 Kc	Fully open	1, 2, 3 & 4	Adjust for maximum.
RF ALIGNMENT					
2.	Grid of conv (pin 7, 12BE6) thru .1 mf & B-	1620 Kc	Fully open	5	Adjust for maximum.

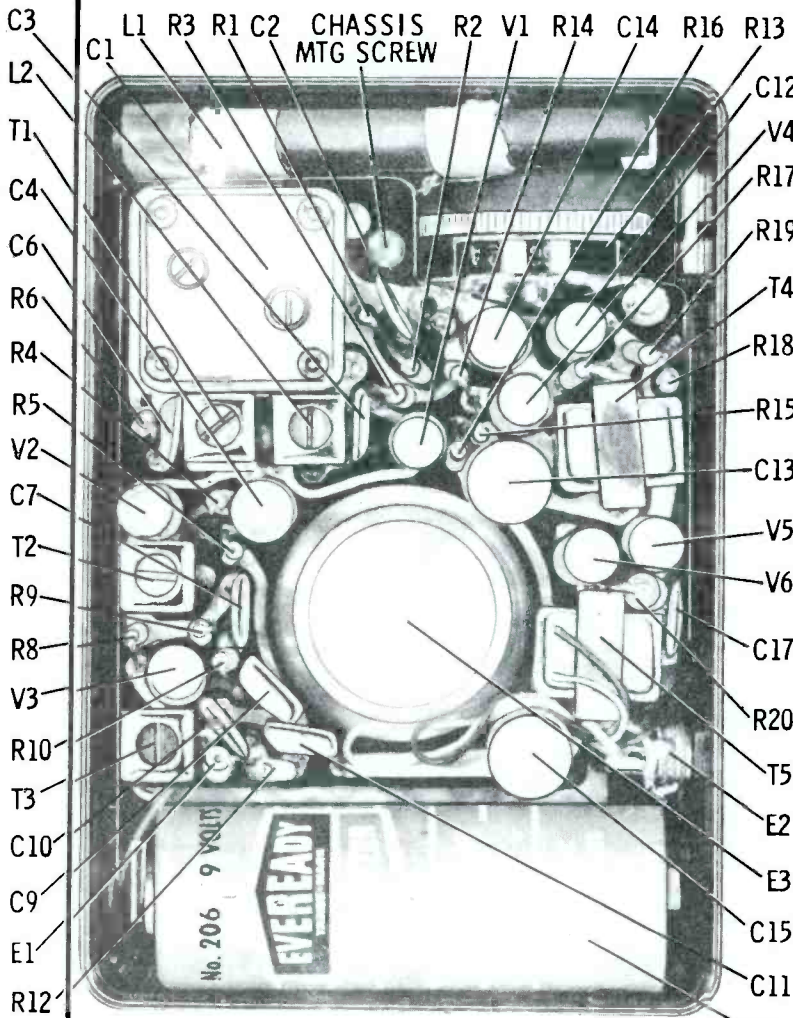
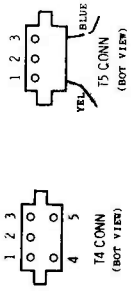
MOTOROLA

Model X34, Chassis HS-1060

(For alignment see data on X35 on the next page)

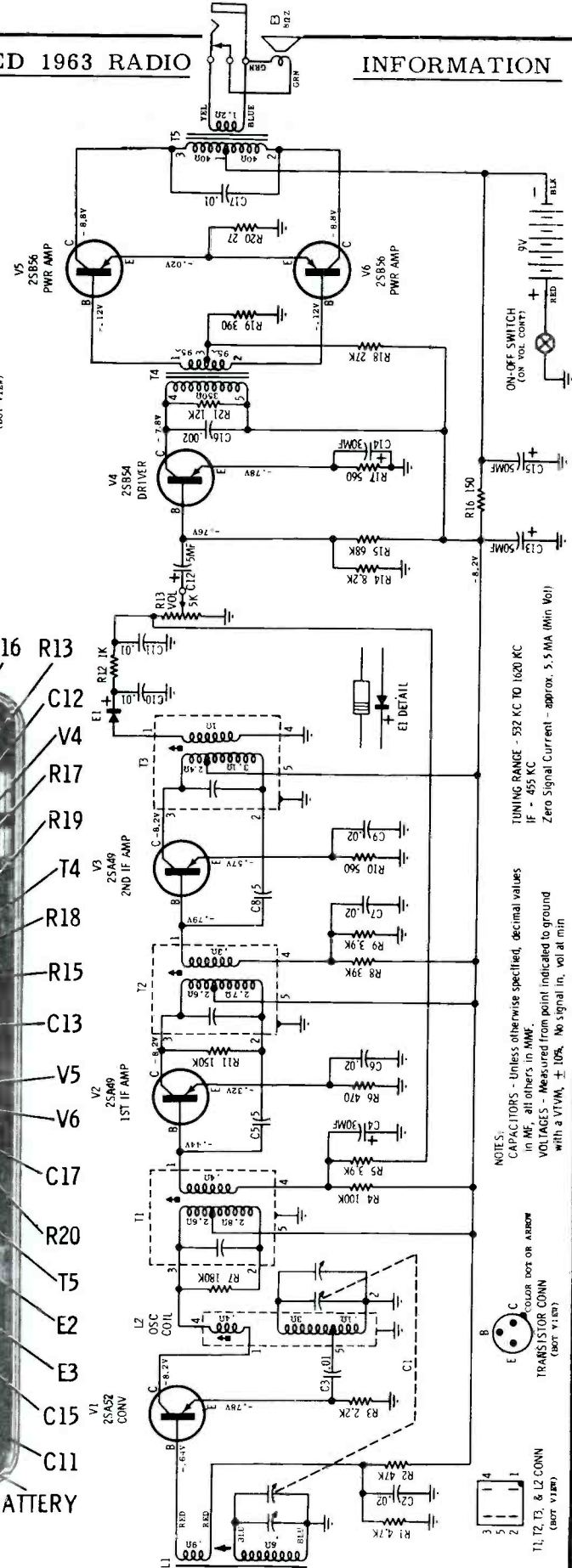
Chassis Removal

1. Remove tuning knob mounting screw (from front of radio), remove cabinet back and one (1) chassis mounting screw located next to tuning gang.
2. Spread cabinet slightly at sides until chassis is free from its four (4) chassis retainers (part of cabinet). Lift chassis up until it clears the retainers.
3. If necessary, unsolder all chassis connecting leads. If it becomes necessary to remove the earphone jack, unscrew the earphone jack mounting nut (a special tool is available, order Motorola Part No. 66A646211).



NOTE: C5, C8, C16, R7, R11 & R21 ARE LOCATED ON BOTTOM OF CHASSIS.

MODEL X34 PARTS LOCATION



TUNING RANGE - 530 KC TO 1620 KC
 IF - 455 KC
 Zero Signal Current - approx. 5.5 MA (Min Volt)

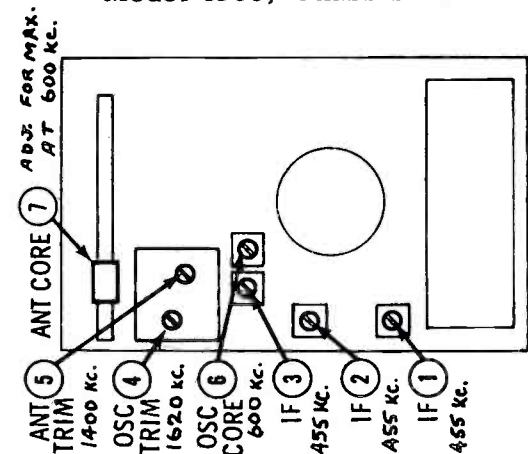
NOTE 5:
 CAPACITORS - Unless otherwise specified, decimal values in MF, all others in MMF.
 VOLTAGES - Measured from point indicated to ground with a VTVM, \pm 10%. No signal in. Vol at min.

OSCILLOSCOPE COIL
 L2

T1, T2, T3, & L2 CONN (BOT VIEW)
 3 4 1
 5 2 1

MOTOROLA

Model X35, Chassis HS-1003



CAPACITORS - NOTES: All capacitors are ceramic disc type unless otherwise specified.

VARIABLE: 2 section ganged

- C-1 19860499A01
- C-2 21K646412 .02 mf 25V
- C-3 21B60500A01 .01 mf 25V (USE 21B751992)
- C-4 23C60496A02 30 mf 3V electrolytic
- C-5 21K647702 6 mmf 25V
- C-6 21K646412 .02 mf 25V
- C-7 21K646412 .02 mf 25V
- C-8 21K645601 3 mmf 25V
- C-9 21K646413 .05 mf 25V
- C-10 21K646413 .05 mf 25V
- C-11 21K646413 .05 mf 25V
- C-12 23C60496A08 (USE 23C60496A03)
- C-13 23C60496A04 50 mf 10V electrolytic
- C-14 23C60496A02 30 mf 3V electrolytic
- C-15 23C60496A04 50 mf 10V electrolytic
- C-16 21B60500A04 .002 mf 25V (USE 21B646414)
- C-17 21B60500A01 .01 mf 25V (USE 21B751992)
- C-18 **21K647834 .01 mf 25V

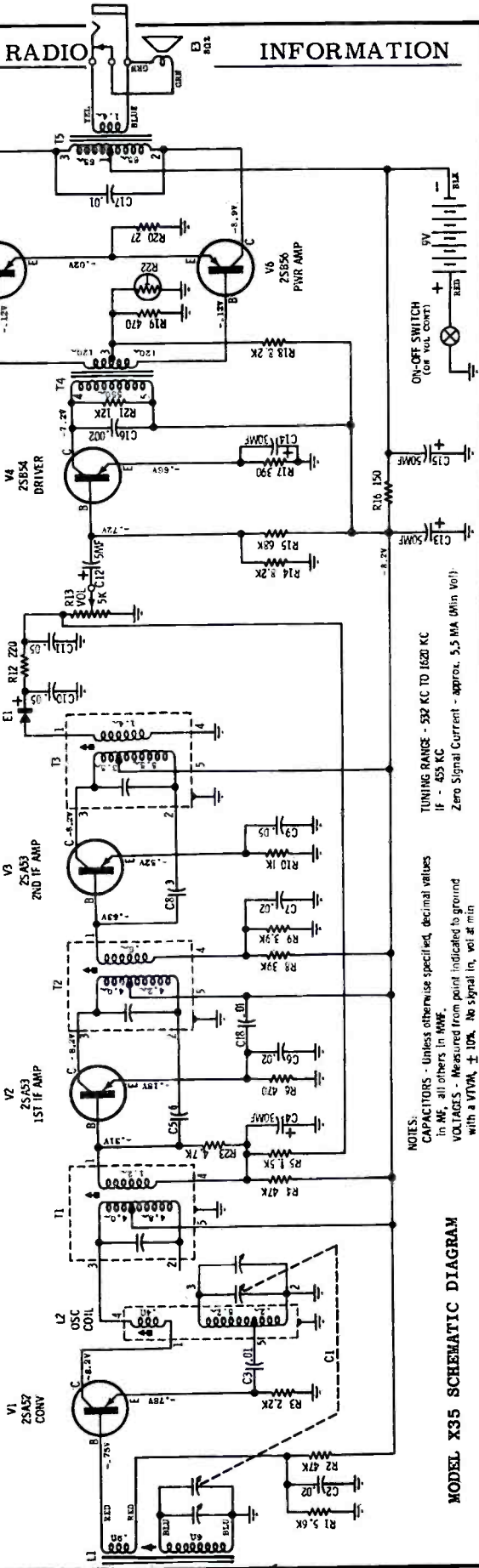


MODELS X34, X35 ALIGNMENT LOCATIONS



BOTTOM VIEW
SIGNAL PATH FLOW AND VOLTAGE READINGS
TAKEN FROM BOTTOM SIDE OF CHASSIS

NOTES:
VOLTAGES - TAKEN FROM POINT INDICATED TO GROUND (⊕) ON SCHEMATIC WITH A VTVM ± 10%. NO SIGNAL IN.
SIGNAL PATH LEGEND:
RF ———— IF ———— AUDIO



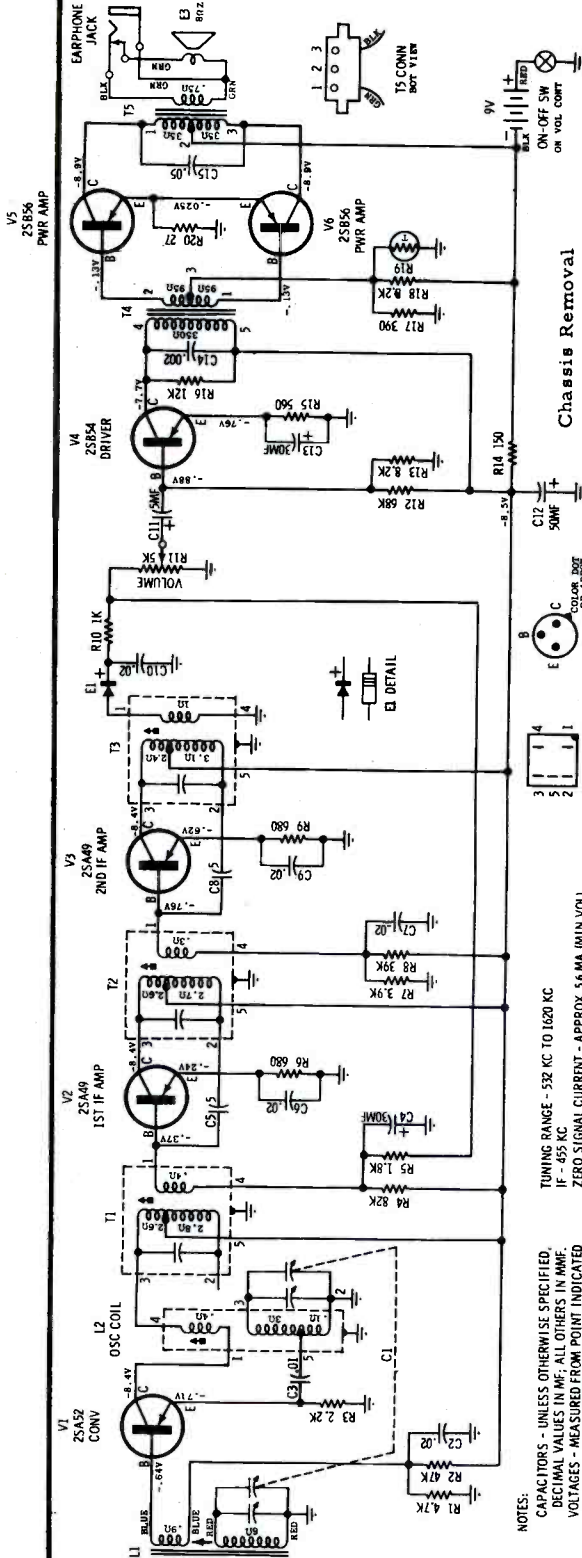
NOTES:
CAPACITORS - Unless otherwise specified, decimal values in μ F, all others in M μ F.
VOLTAGES - Measured from point indicated to ground with a VTVM, ± 10%. No signal in, vol. at min.

MODEL X35 SCHEMATIC DIAGRAM

MOTOROLA

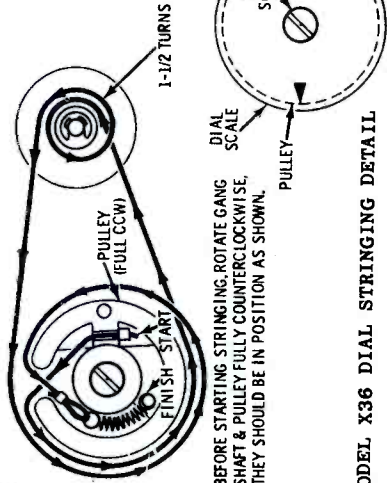
MODEL X36

Chassis HS-1004



Chassis Removal

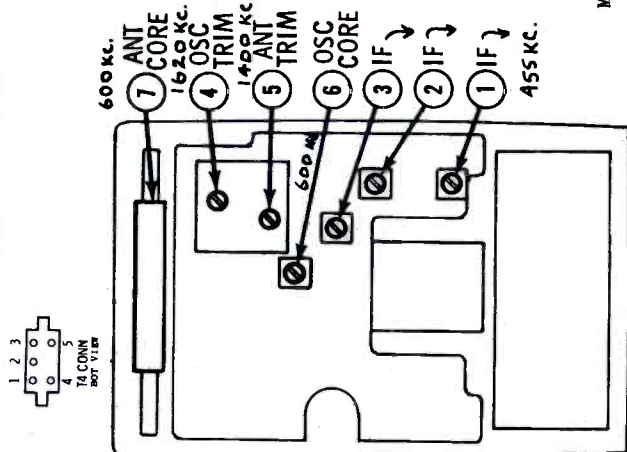
1. Insert a coin into the slot on bottom of cabinet and twist in either direction; lift off cabinet back.
2. Remove three (3) chassis mounting screws and lift up chassis.
3. If necessary, unsolder all chassis connecting leads. If it becomes necessary to remove the earphone jack, unscrew the earphone jack mounting nut (a special tool is available - order Motorola Part No. 66A646211).



MODEL X36 DIAL STRINGING DETAIL

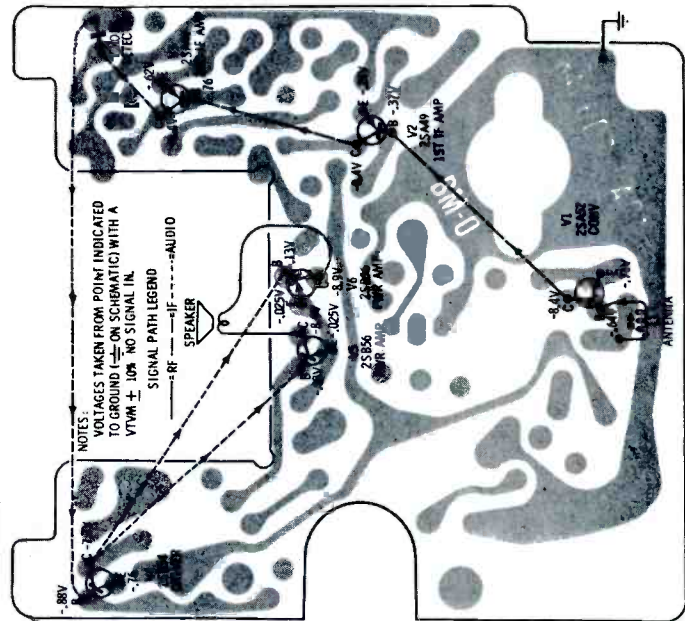
BEFORE INSTALLING DIAL SCALE, REMOVE MTG SCREW BUT HOLD ONTO PULLEY.

MODEL X36 SCHEMATIC DIAGRAM



MODEL X36 ALIGNMENT LOCATIONS

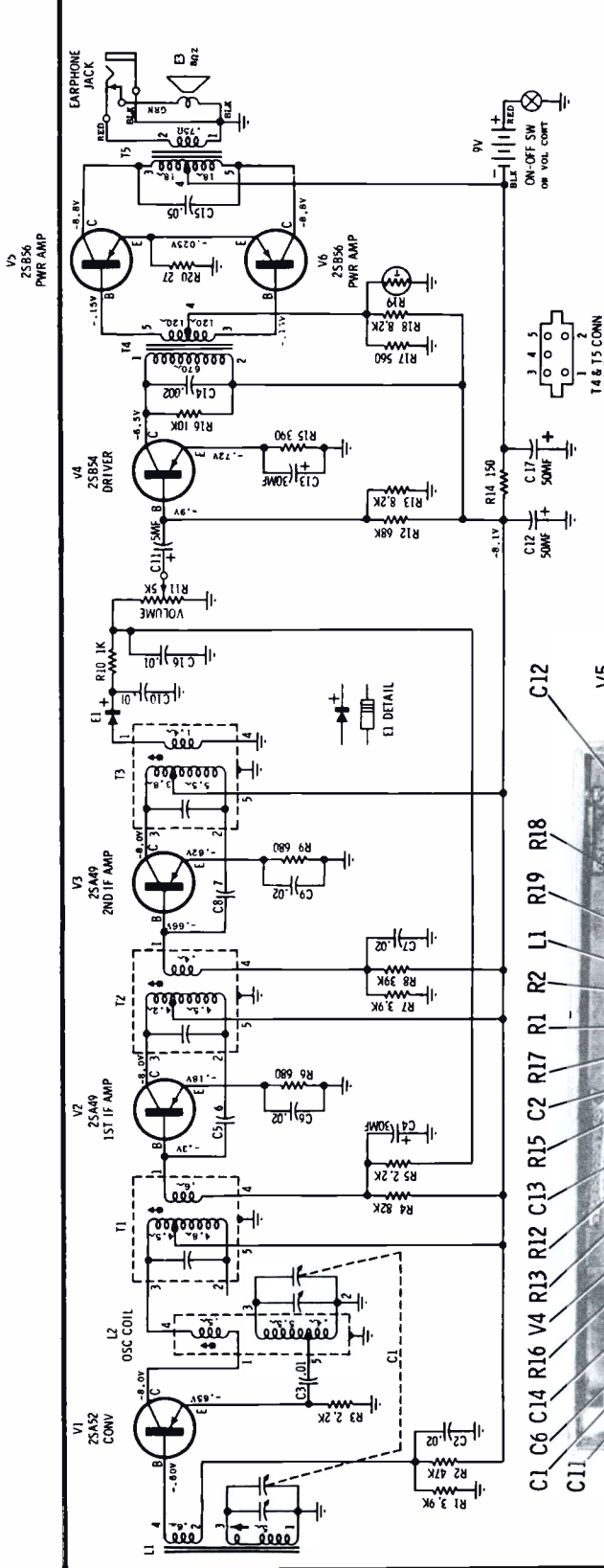
NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED
 DECIMAL VALUES IN MF; ALL OTHERS IN MMF
 VOLTAGES - MEASURED FROM POINT INDICATED
 TO GROUND WITH A VTVM, $\pm 10\%$ NO SIGNAL IN,
 VOL AT MIN.
 TUNING RANGE - 532 KC TO 1620 KC
 IF - 455 KC
 ZERO SIGNAL CURRENT - APPROX 5.6 MA (MIN VOL)



SIGNAL PATH FLOW AND VOLTAGE READINGS
 TAKEN FROM BOTTOM SIDE OF CHASSIS

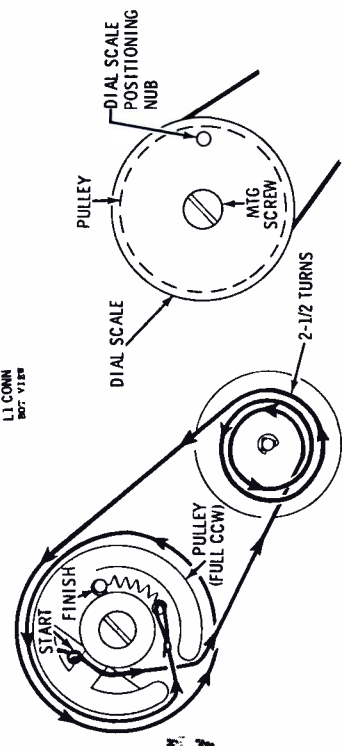
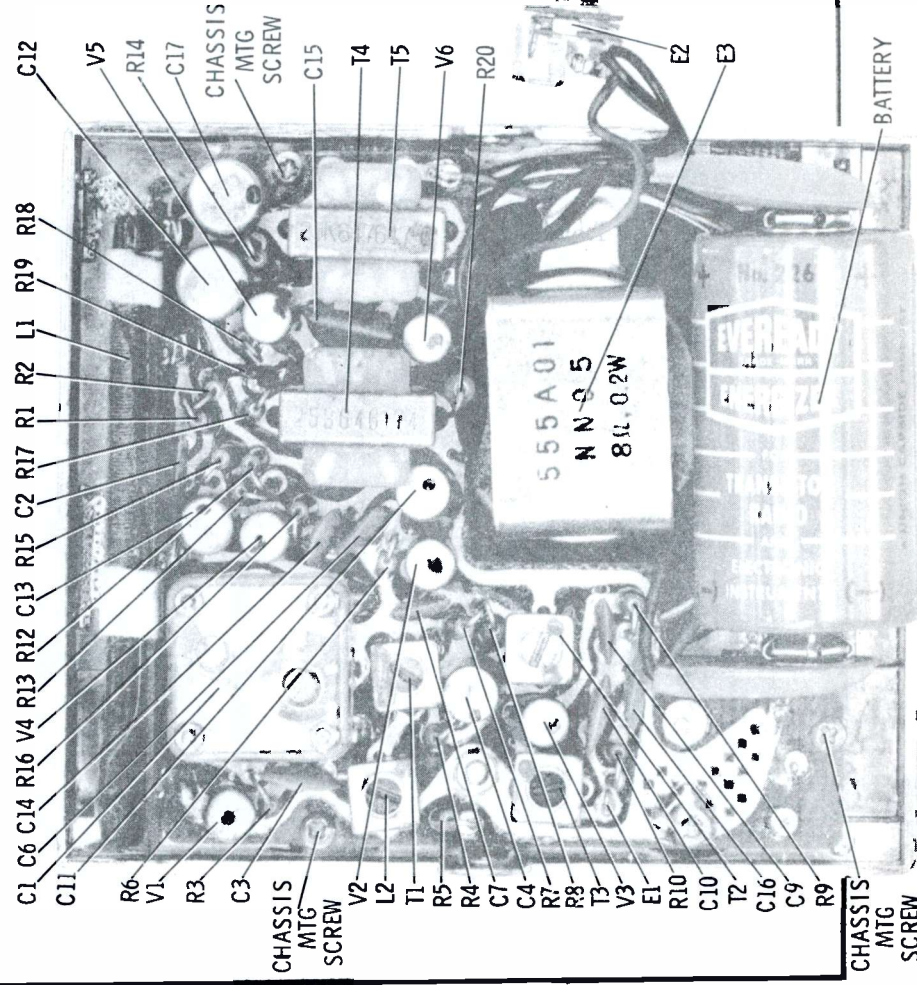
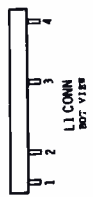
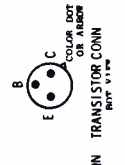
MOTOROLA

MODEL X37 Chassis HS-1005



MODEL X37 SCHEMATIC DIAGRAM

NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM. ± 10% NO SIGNAL IN VOL AT MIN.
TUNING RANGE - 532 KC TO 1620 KC
IF - 455 KC
ZERO SIGNAL CURRENT - APPROX 5.5 MA (MIN VOL)



BEFORE STARTING STRINGING, ROTATE GANG SHAFT & PULLEY FULLY COUNTERCLOCKWISE; THEY SHOULD BE IN POSITION AS SHOWN.

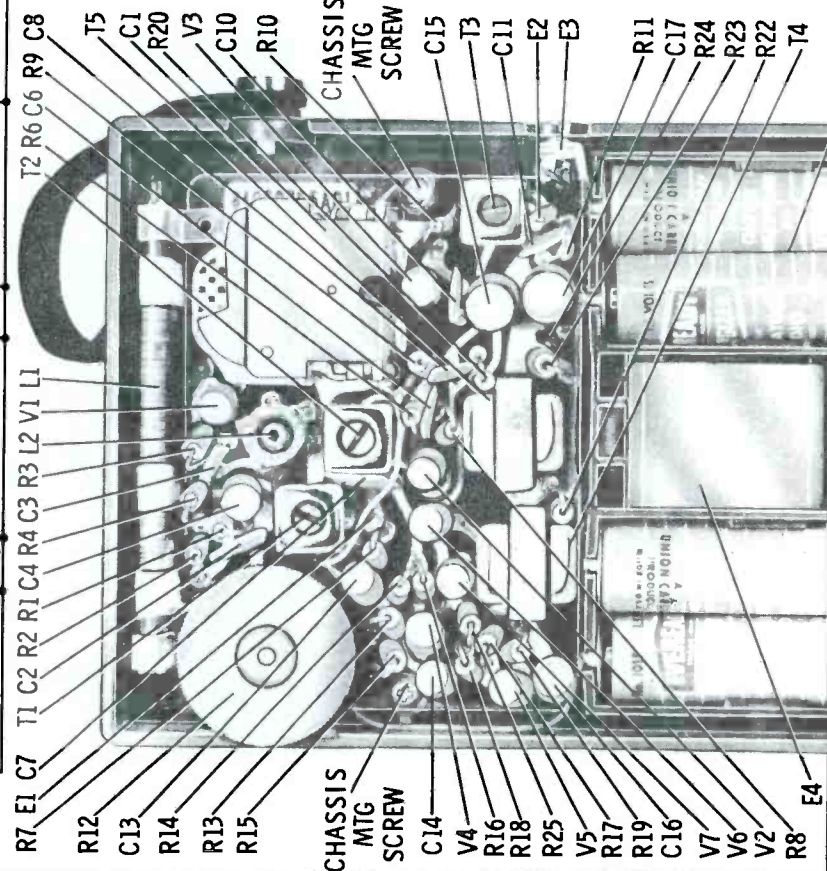
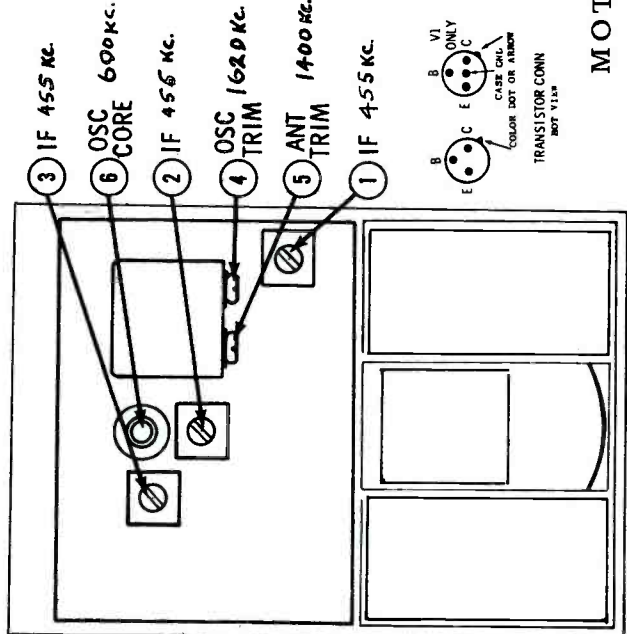
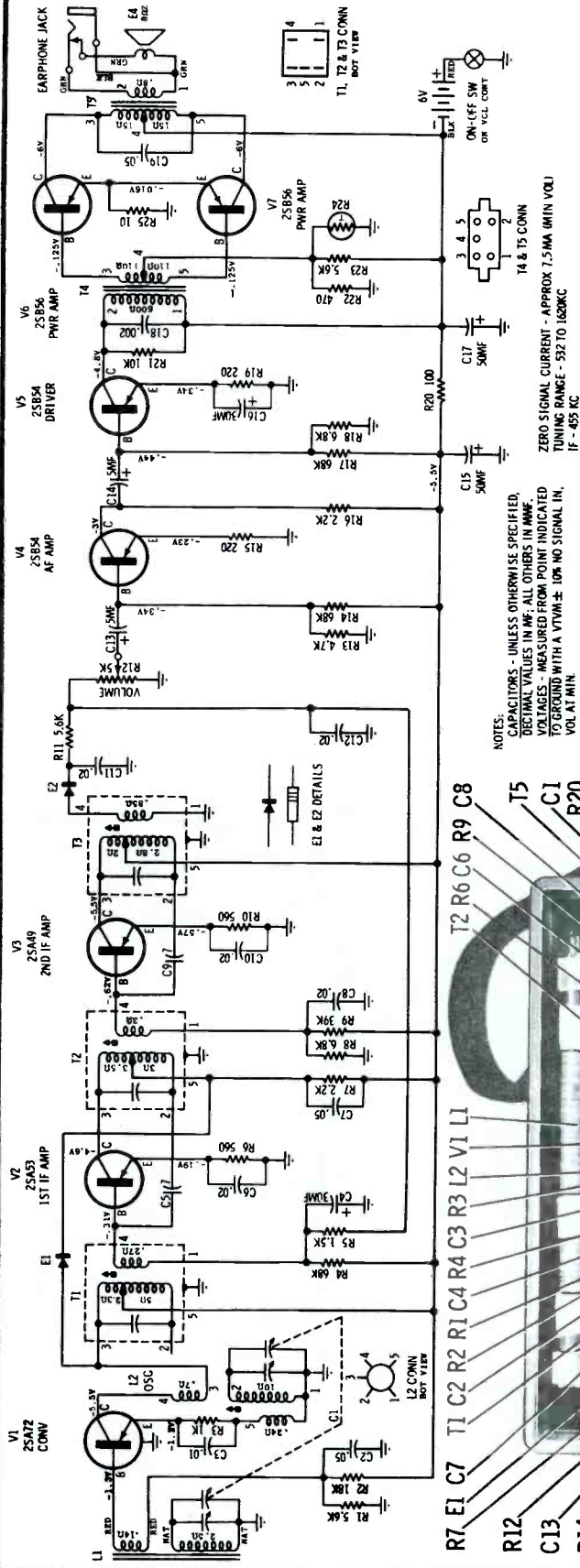
MODEL X37 DIAL STRINGING DETAIL

MODEL X37 PARTS LOCATION

MOTOROLA

Model X 38
Chassis HS-1006

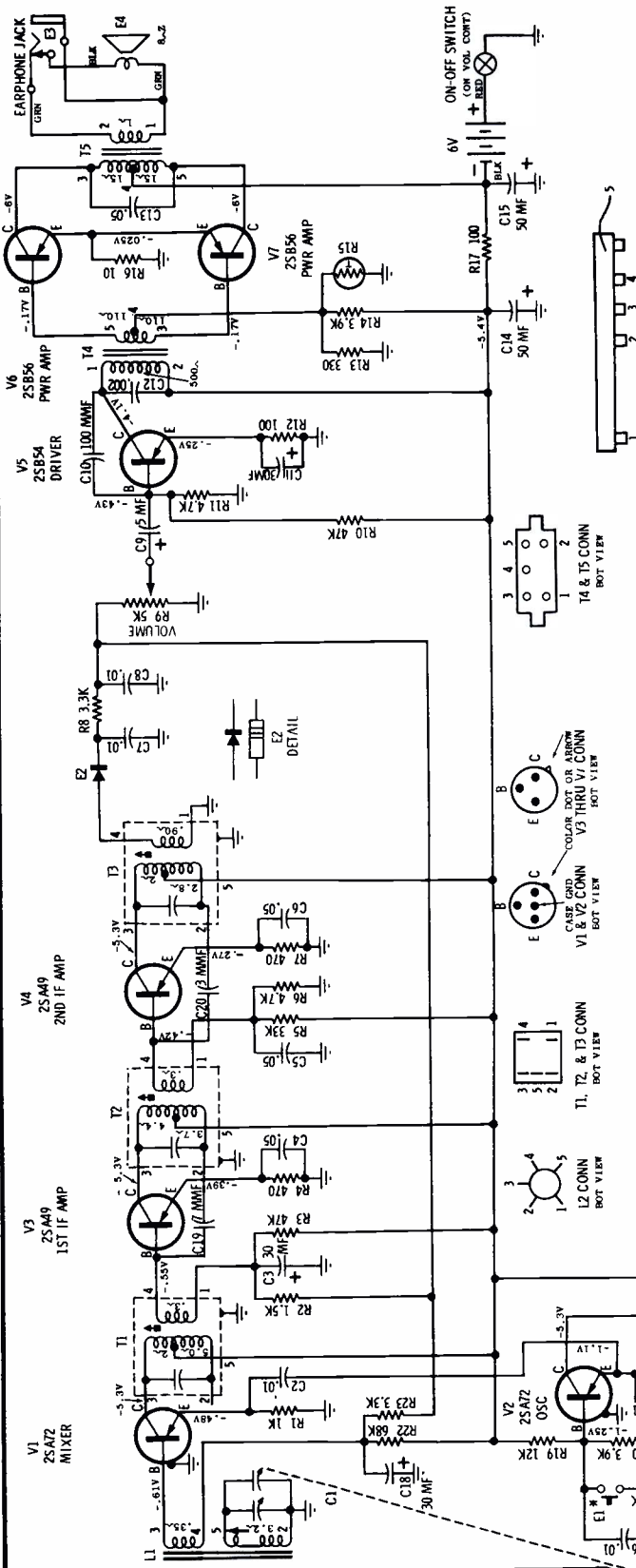
MOTOROLA
Model X38



MODEL X38 ALIGNMENT LOCATIONS

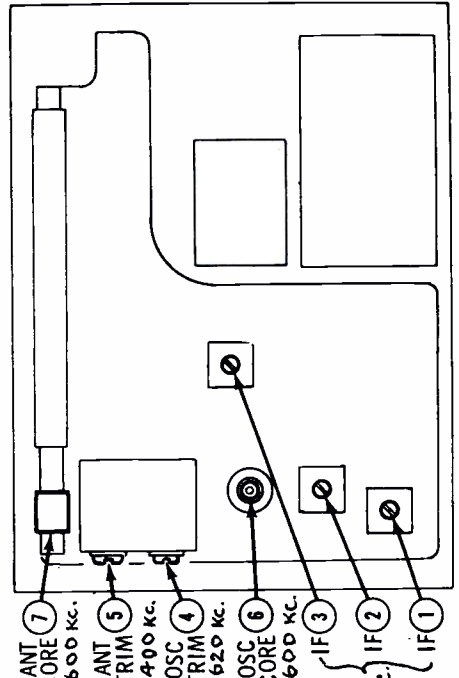
MODEL X38 PARTS LOCATION

MOTOROLA Model X39, Chassis HS-1007



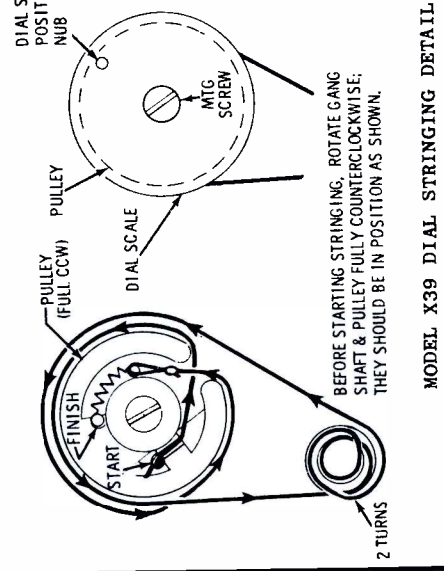
NOTES:
 * CAPACITORS—UNLESS OTHERWISE SPECIFIED, IS LOCATED ON FRONT OF RADIO - PUSH TO CLOSE ZERO SIGNAL CURRENT - APPROX 10.5 MA (MIN VOL) TO GROUND WITH A VTVM, $\pm 10\%$. NO SIGNAL IN VOL AT MIN.
 † PUSHBUTTON SWITCH (BATTERY LIFE INDICATOR) IS LOCATED ON FRONT OF RADIO - PUSH TO CLOSE ZERO SIGNAL CURRENT - APPROX 10.5 MA (MIN VOL) TUNING RANGE - 532 KC TO 1620 KC IF - 455 KC

MODEL X39 SCHEMATIC DIAGRAM



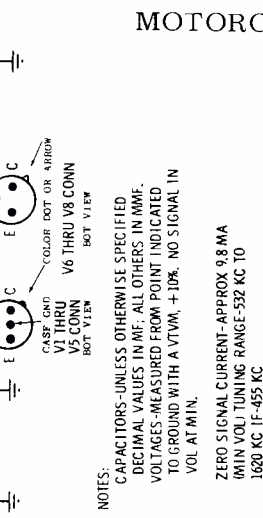
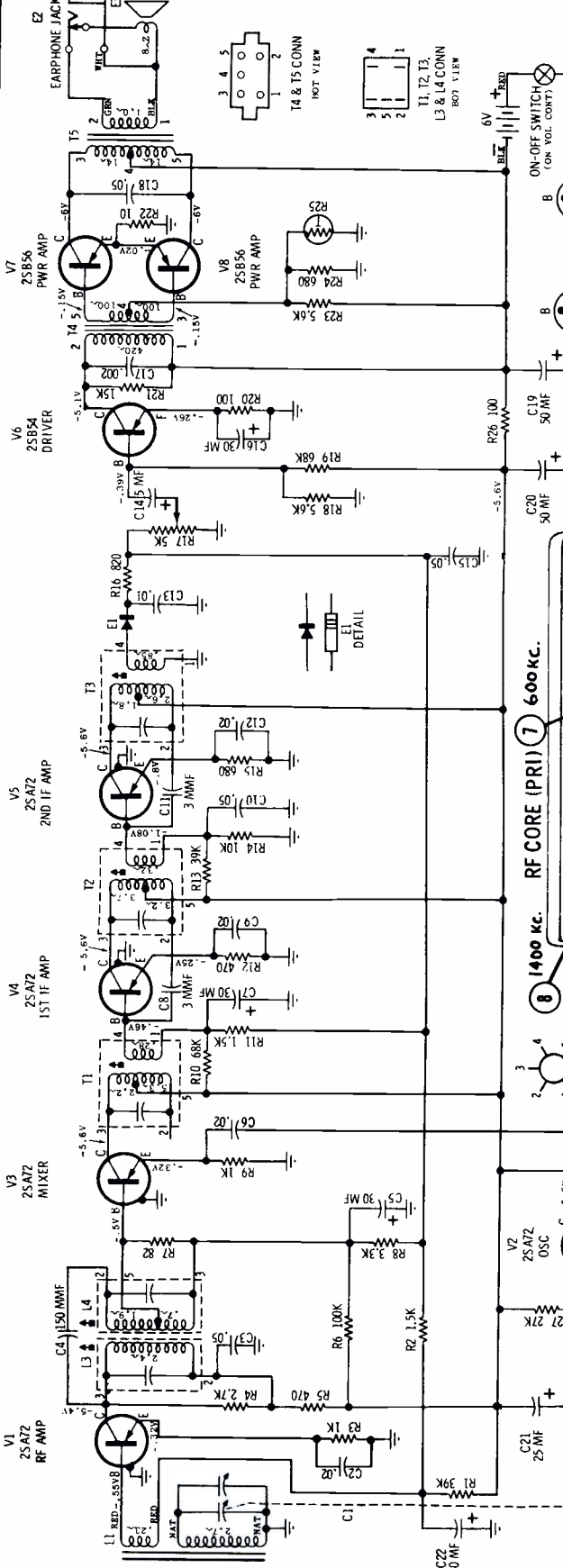
MODEL X39 ALIGNMENT LOCATIONS

- Chassis Removal
1. From rear of cabinet, unscrew the earphone jack mounting nut.
 2. Lift up carrying handle and remove two (2) screws from sides of cabinet.
 3. Lift out escutcheon and chassis as an assembly from cabinet rear.
 4. If it becomes necessary to remove chassis from escutcheon, first remove the two control knobs and three chassis mounting screws, then unsolder all chassis connecting leads (to speaker, etc.).

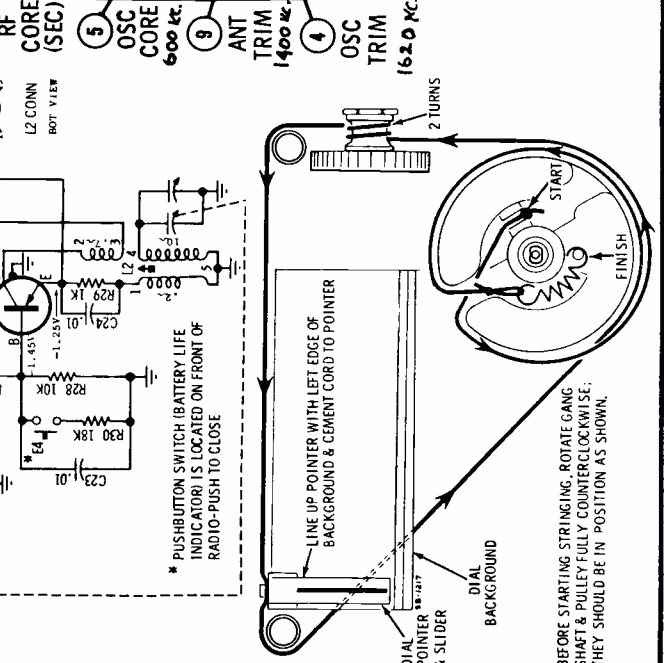
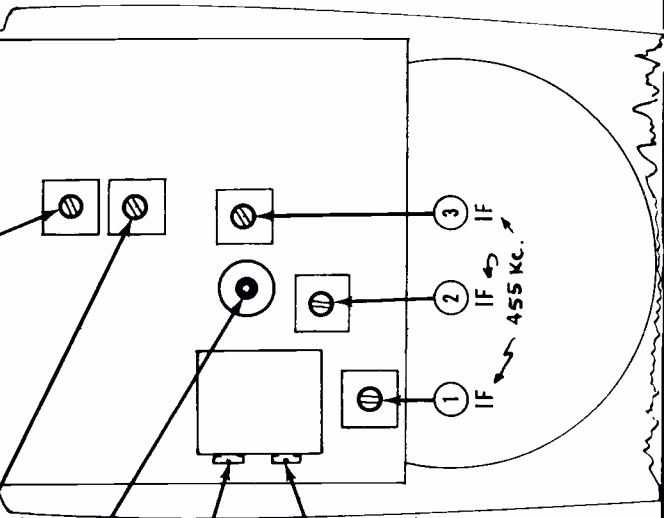


MODEL X39 DIAL STRINGING DETAIL

MOTOROLA Model X40
Chassis HS-1008



- Chassis Removal**
1. Rotate cabinet stand (on bottom of cabinet) out of way, then insert coin into slot on bottom of cabinet and twist in either direction; lift off battery compartment cover.
 2. Remove one (1) cabinet back mounting screw (at bottom of battery compartment), unsnap control cover and lift up cabinet back.
 3. Remove two (2) chassis mounting screws and lift up chassis.
 4. If necessary, unsolder all chassis connecting leads.

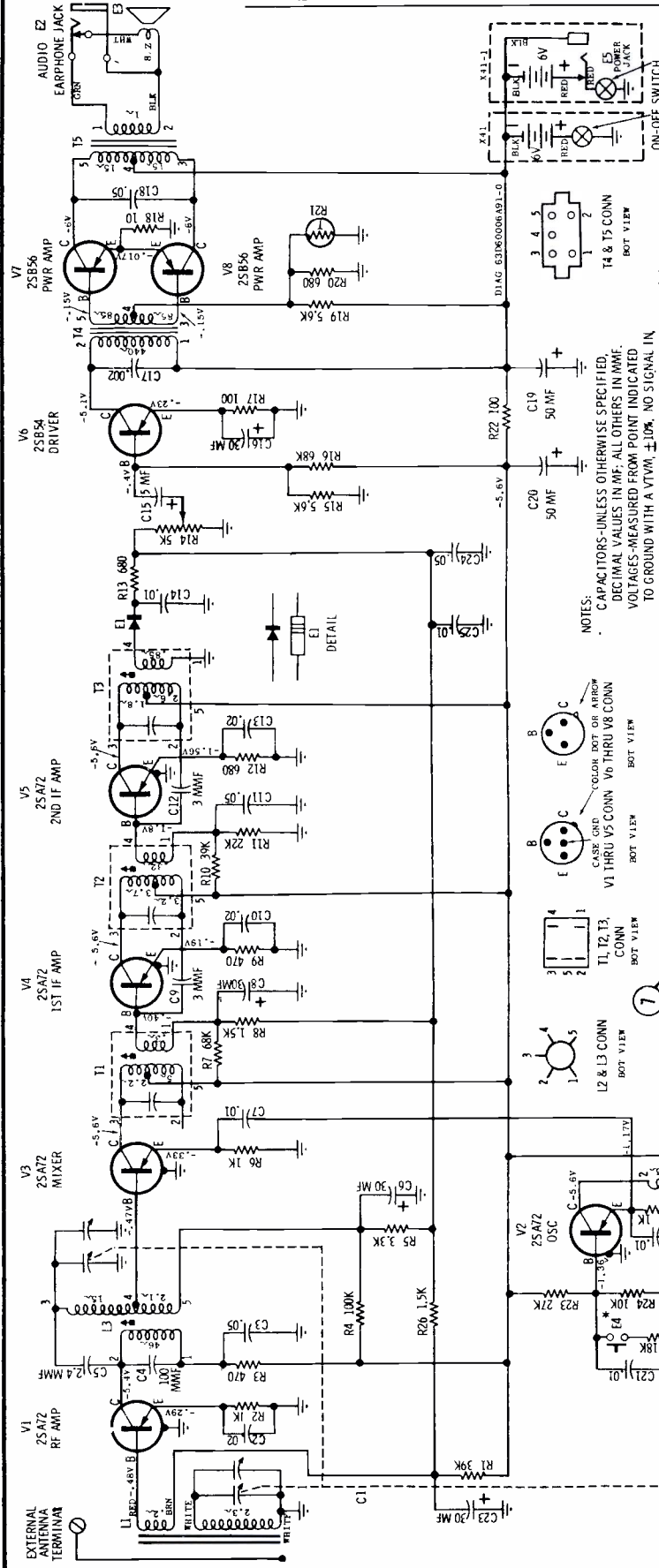


MODEL X40 ALIGNMENT LOCATIONS

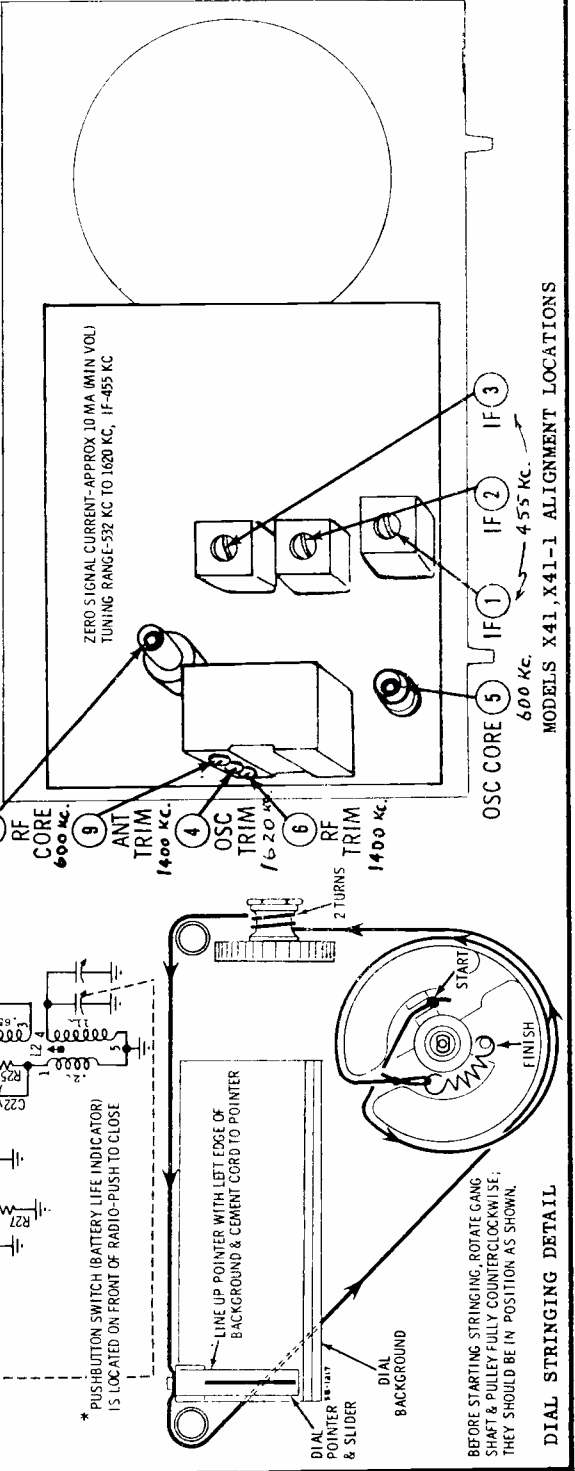
MODEL X40 DIAL STRINGING DETAIL

MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

MOTOROLA
Models X41, X41-1
Chassis HS-1009



NOTES:
CAPACITORS—UNLESS OTHERWISE SPECIFIED,
DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
VOLTAGES—MEASURED FROM POINT INDICATED
TO GROUND WITH A VTVM, $\pm 10\%$, NO SIGNAL IN.



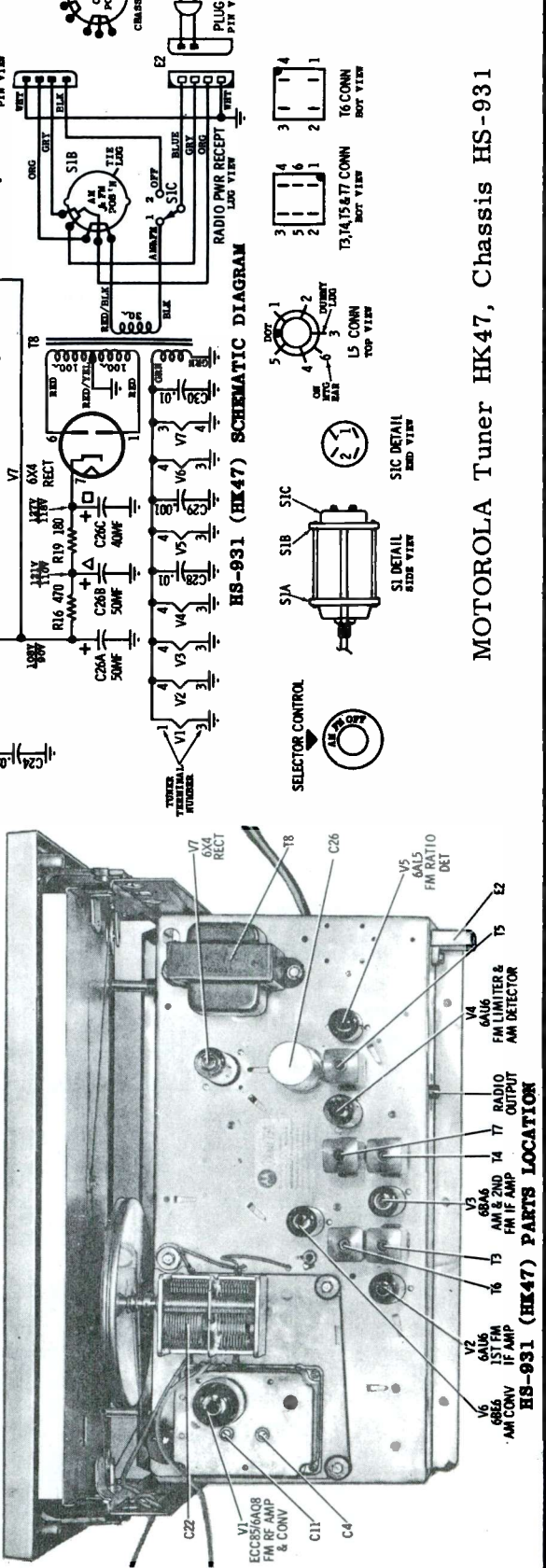
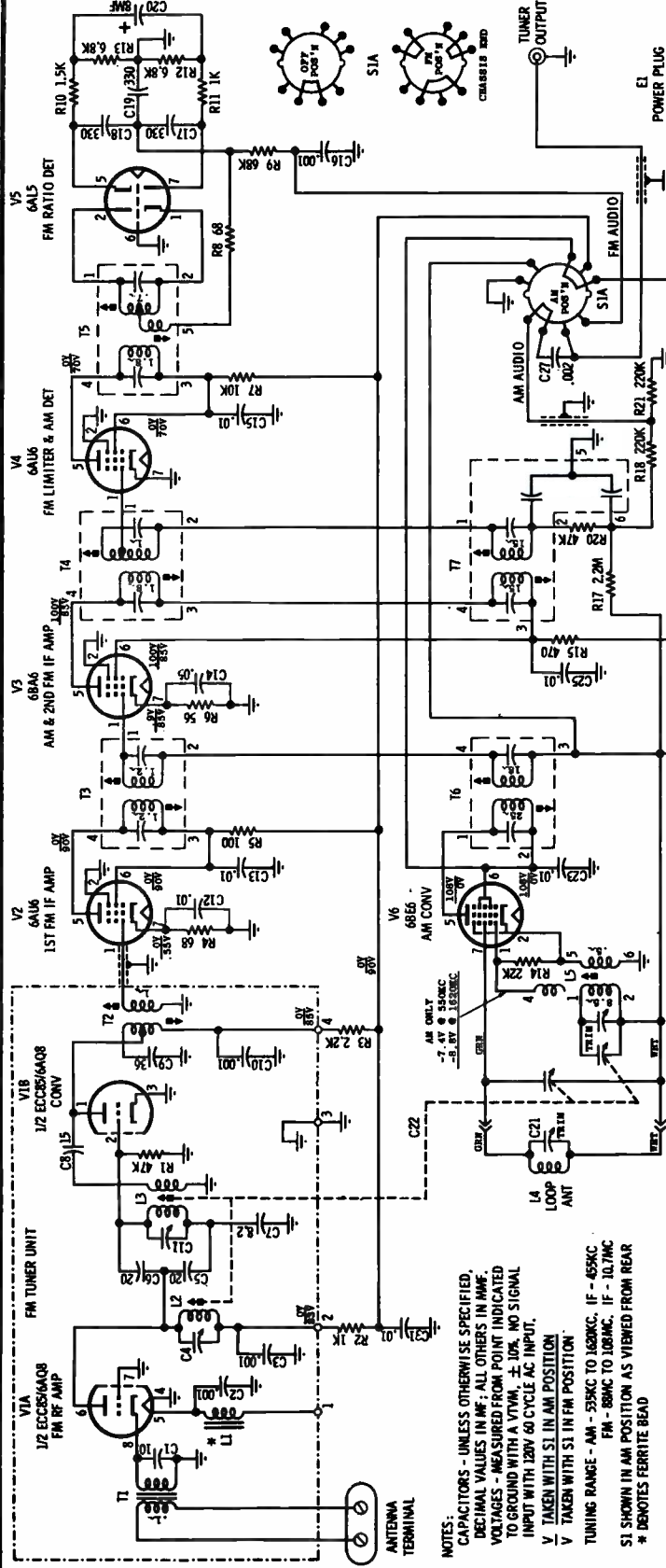
MODELS X41, X41-1 ALIGNMENT LOCATIONS

DIAL STRINGING DETAIL

* PUSHBUTTON SWITCH (BATTERY LIFE INDICATOR)
IS LOCATED ON FRONT OF RADIO—PUSH TO CLOSE

BEFORE STARTING STRINGING, ROTATE GANG
SHAFT & PULLEY FULLY COUNTERCLOCKWISE;
THEY SHOULD BE IN POSITION AS SHOWN.

MOTOROLA Tuner HK47, Chassis HS-931



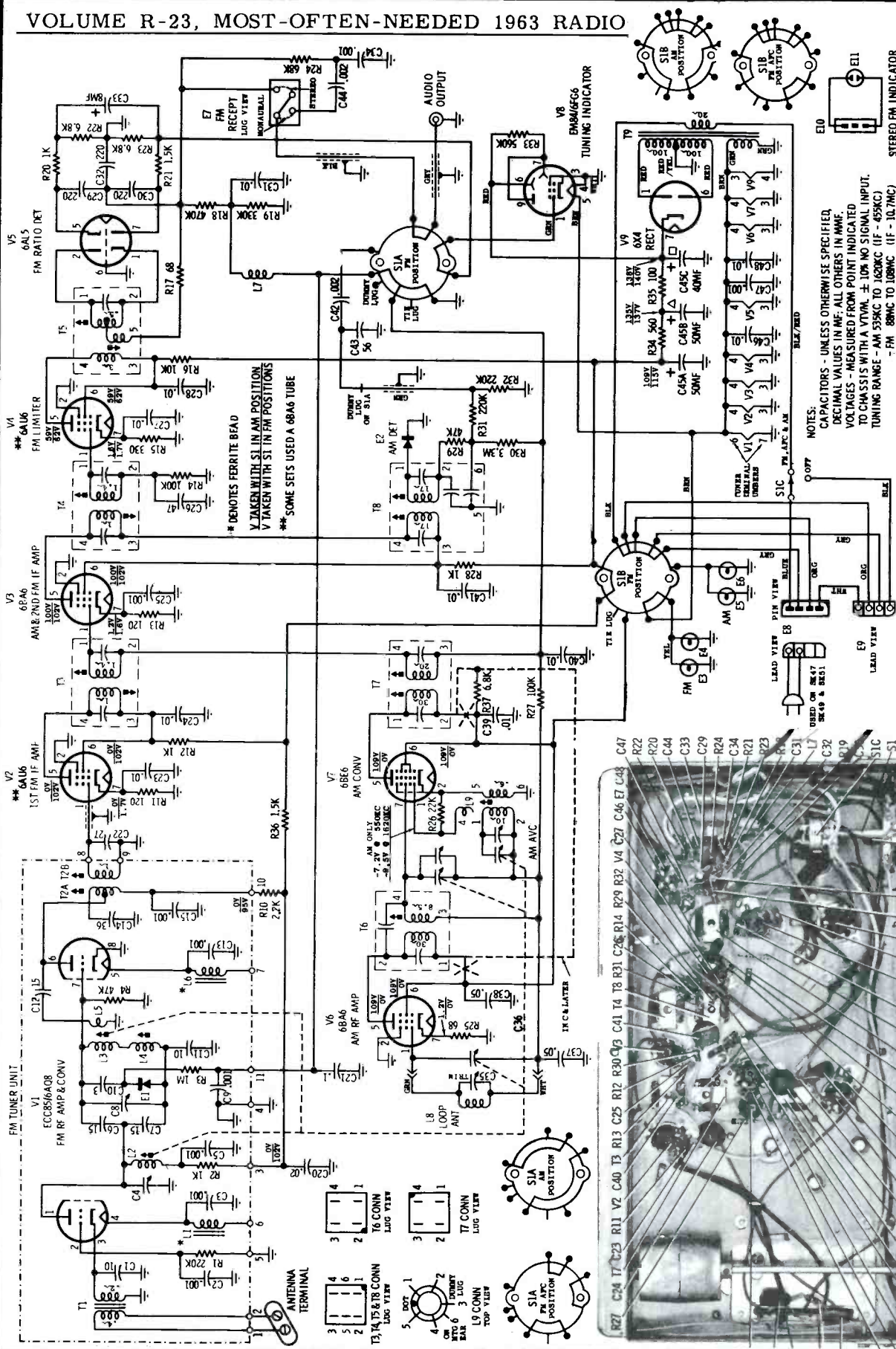
NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
 VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM, $\pm 10\%$, NO SIGNAL INPUT WITH 120V 60 CYCLE AC INPUT.
 V TAKEN WITH S1 IN AM POSITION
 V TAKEN WITH S1 IN FM POSITION
 TUNING RANGE - AM - 535KC TO 1620KC, IF - 455KC
 FM - 88MC TO 108MC, IF - 10.7MC
 S1 SHOWN IN AM POSITION AS VIEWED FROM REAR
 * DENOTES FERRITE BEAD

MOTOROLA Tuner HK47, Chassis HS-931

HS-931 (HK47) PARTS LOCATION

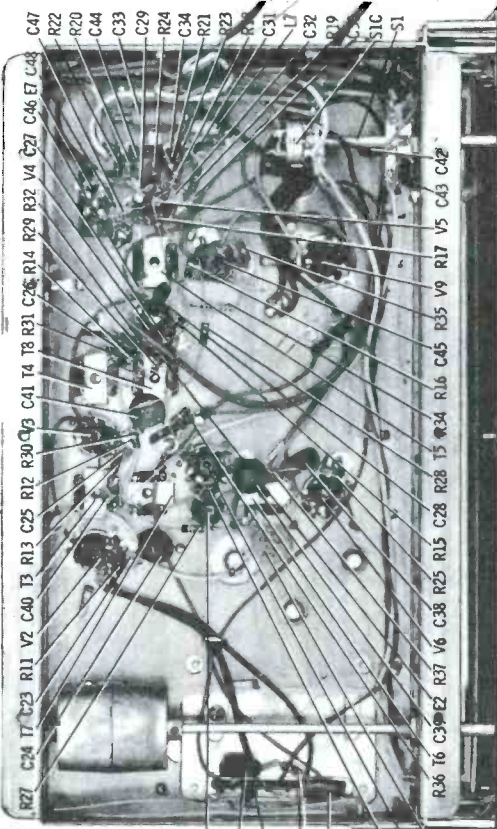
VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO

HS-997 (HK45-3) SCHEMATIC DIAGRAM



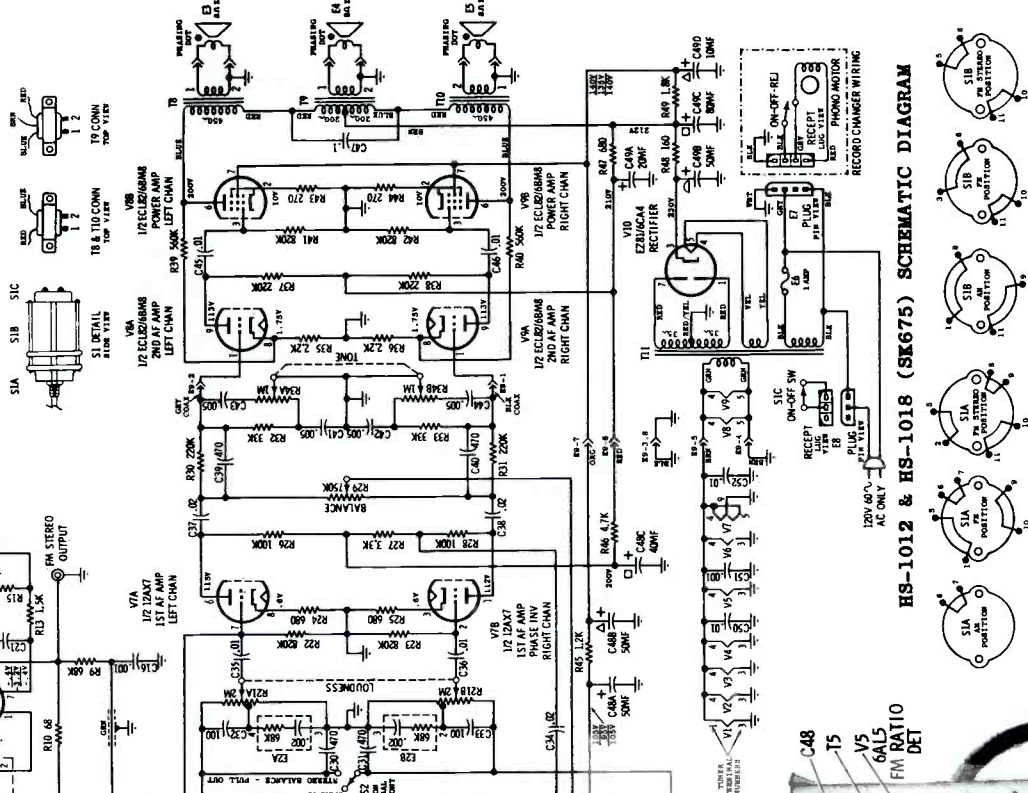
NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED,
DECIMAL VALUES IN μF; ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED
TO CHASSIS WITH A VTVM, ± 10% NO SIGNAL INPUT.
TUNING RANGE - AM 535KC TO 1600KC (IF - 455KC)
- FM 88MHC TO 108MHC (IF - 10.7MHC)

MOTOROLA Tuner HK 45-3, Chassis HS-997



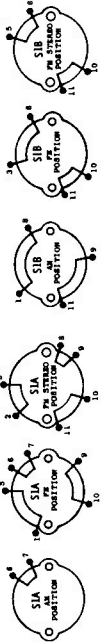
HS-997 (HK45-3) PARTS LOCATION

MOTOROLA Model SK 675
Chassis HS-1012 & HS-1018



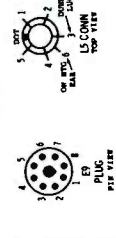
HS-1012 & HS-1018 (SK675) SCHEMATIC DIAGRAM

MOTOROLA Model SK 675
Chassis HS-1012 & HS-1018



HS-1012 (SK675) PARTS LOCATION

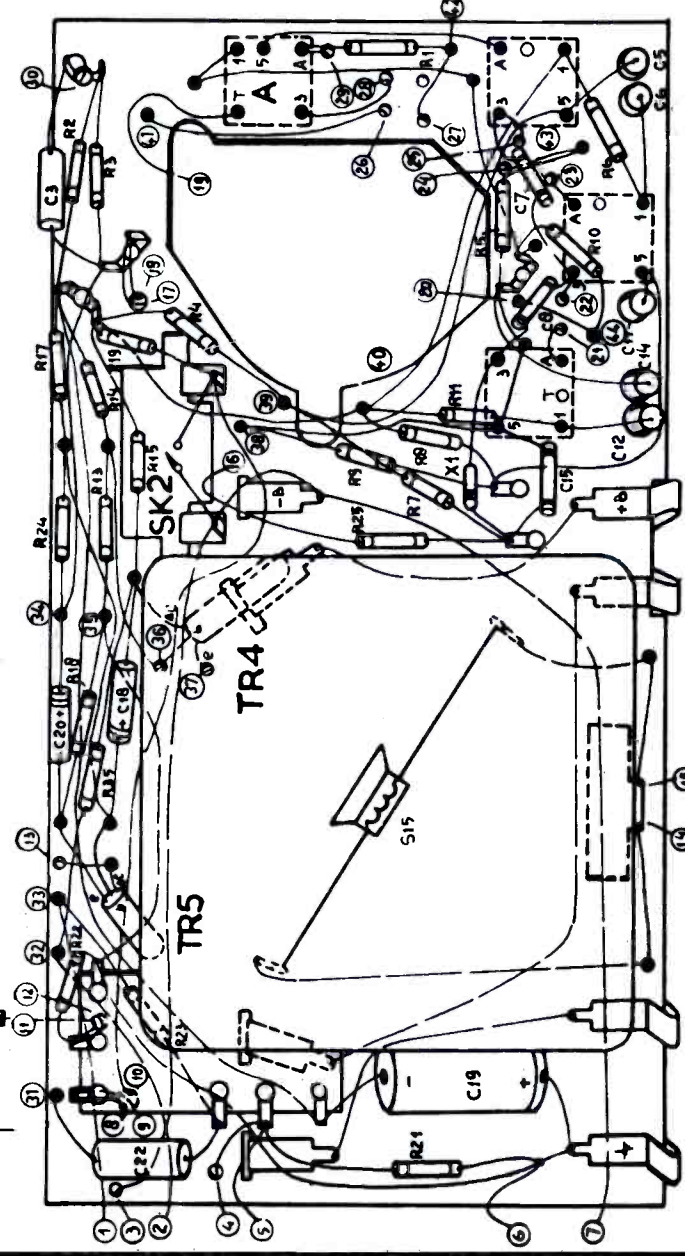
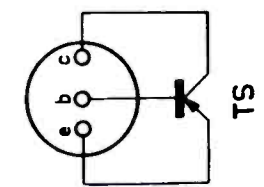
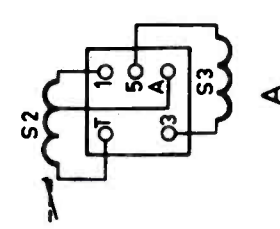
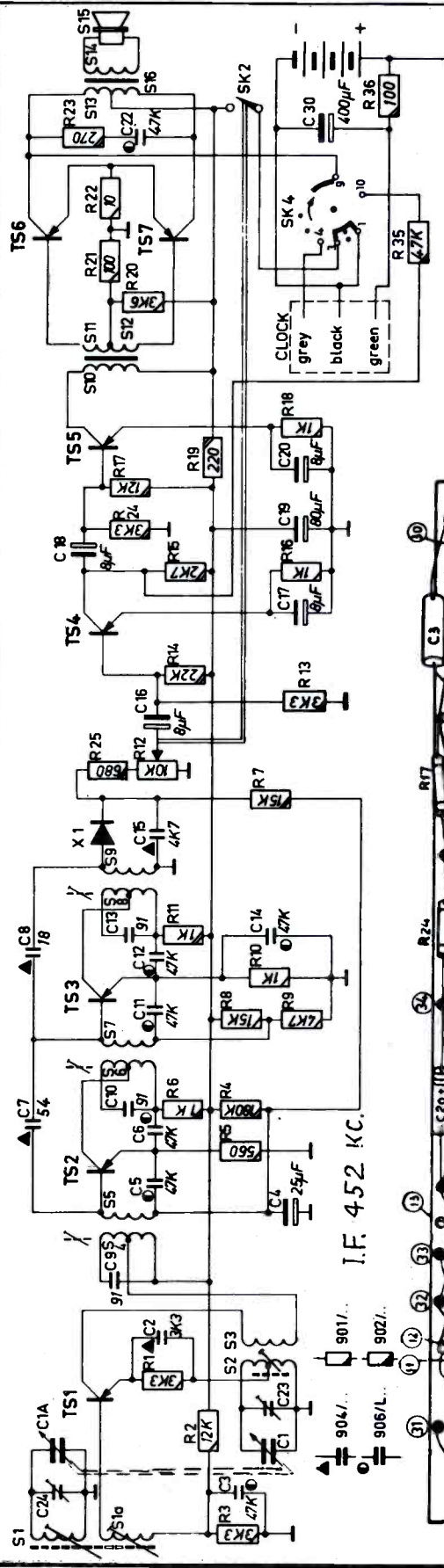
NOTES:
CAPACITORS - Unless otherwise specified, use the values in the table in the chassis with a V7M. μ is microfarad, p is picofarad.
Tuning Range - AM 530K to 1620K (IF-650K);
Tuning Range - FM 88K to 108K (IF-10.7K);
*Denotes remote base.
†Tubes with S1 in pin position.
‡Tubes with S1 in pin position.
§Tubes with S1 in pin position.



NORTH AMERICAN PHILIPS CO.

Norelco L2X97T

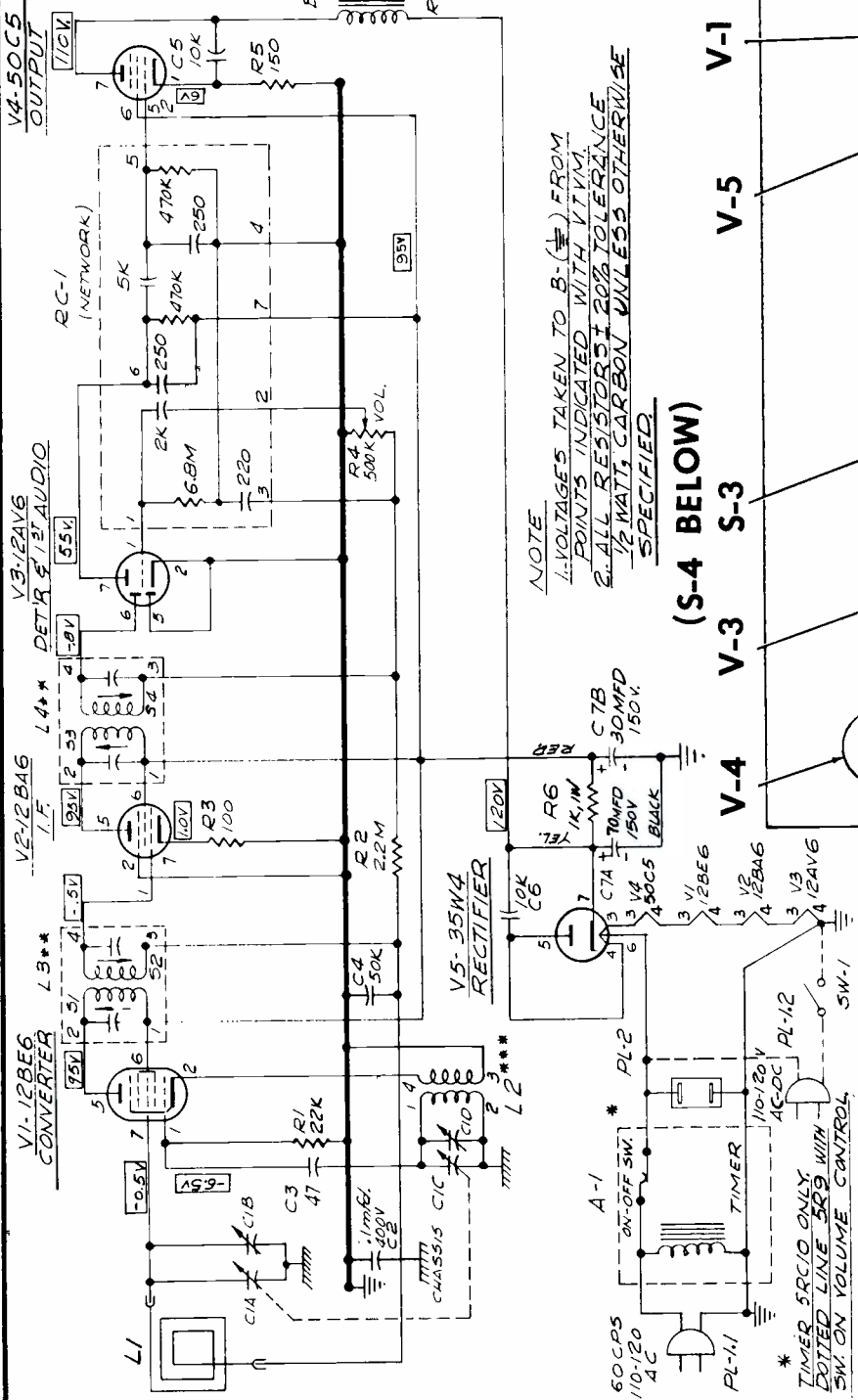
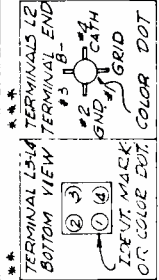
S	1.10.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
C	243	1.10.	23	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
R	3	2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36



S	15	15	12	14	11	8	3	7	6	5													
C	22	19	20	18	15	12	14	11	8	3	7	6	5										
R	21	23	22	35	18	25	24	13	7	15	9	8	11	14	17	19	4	10	5	2	3	6	1

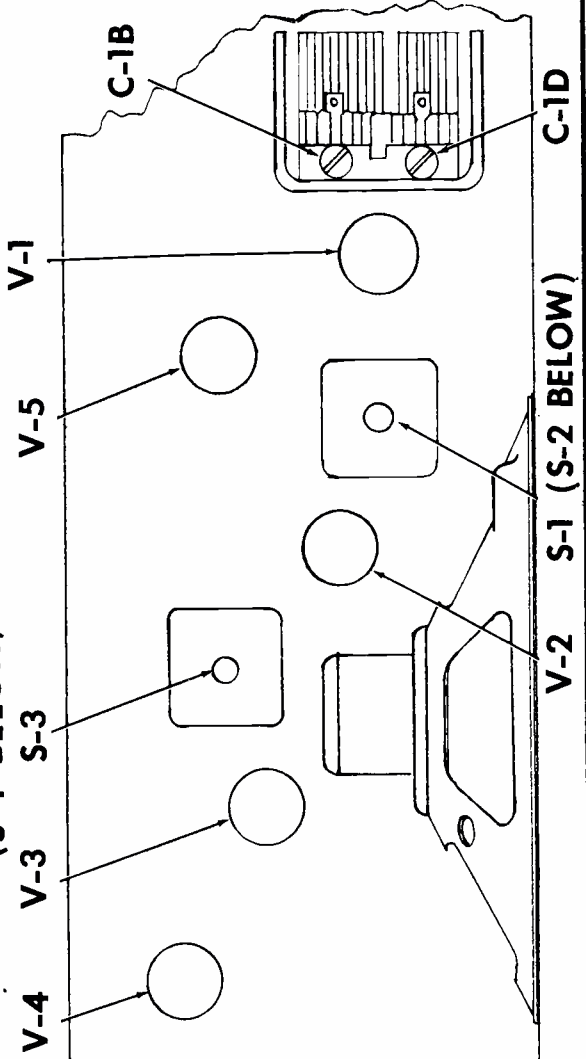
Packard Bell

TABLE MODEL RADIO 5R9
CLOCK RADIO MODEL 5RC10



NOTE
1. VOLTAGES TAKEN TO B- () FROM POINTS INDICATED WITH V1-V5.
2. ALL RESISTORS 20% TOLERANCE 1/2 WATT CARBON UNLESS OTHERWISE SPECIFIED.

(S-4 BELOW)



ALIGNMENT PROCEDURE

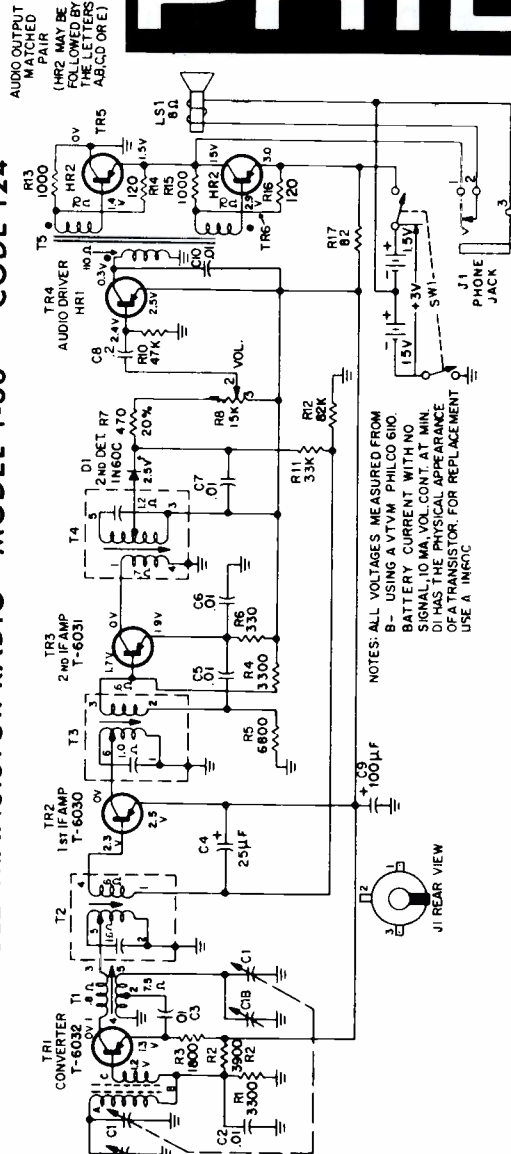
Each adjustment should be made using a minimum input signal. Connect test oscillator through a .01 mfd capacitor to the point indicated below. Connect ground lead of oscillator to B minus bus.

Step	Connect Test Oscillator to	Test Osc Frequency	Radio Dial Setting	Adjust
1	Pin 7, V-1 (12BE6)	455 kc	1620 kc	S-1, S-2, S-3, & S-4 for Maximum
2	Loose-couple to antenna	1620 kc	1620 kc	C1-D for Maximum
3	Loose-couple to antenna	1500 kc	Tune to oscillator	C1-B for Maximum

PHILCO

TRANSISTOR PORTABLE MODEL T-63 CODE 124

PORTABLE TRANSISTOR RADIO—MODEL T-63 CODE 124



SERVICE NOTES

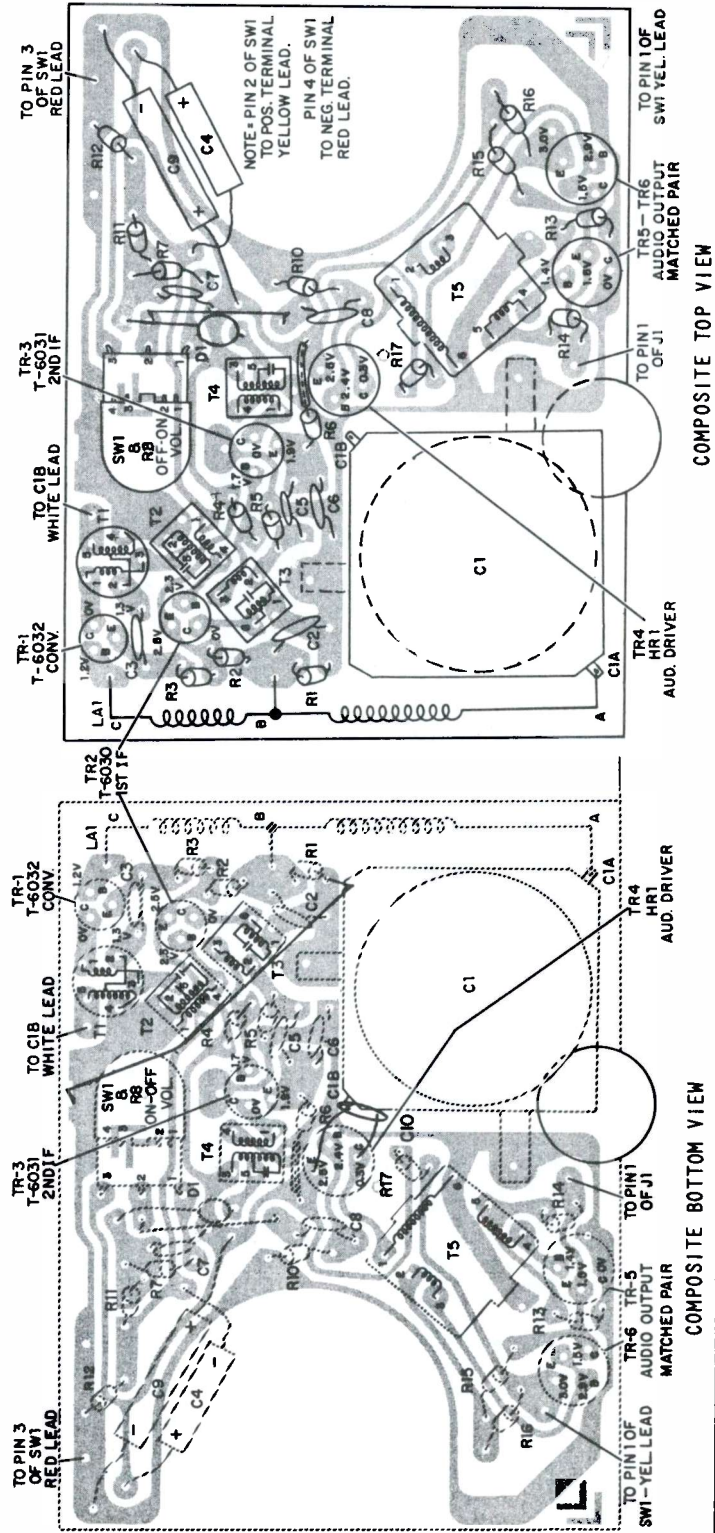
When signal tracing, inject signal at transistor collector and limit input to keep signal across speaker below .6 volt.

Normally, the transistors should be the last item suspected. If C9 opens serious audio oscillation will result.

FREQUENCY COVERAGE—535 to 1620 KC.
INTERMEDIATE FREQUENCY—455 KC.

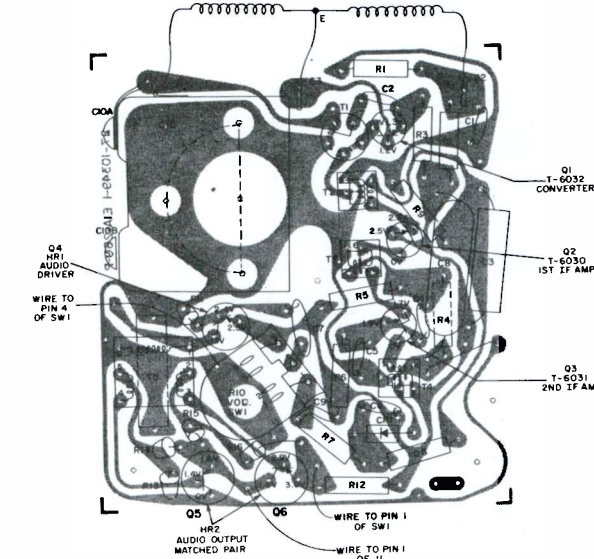
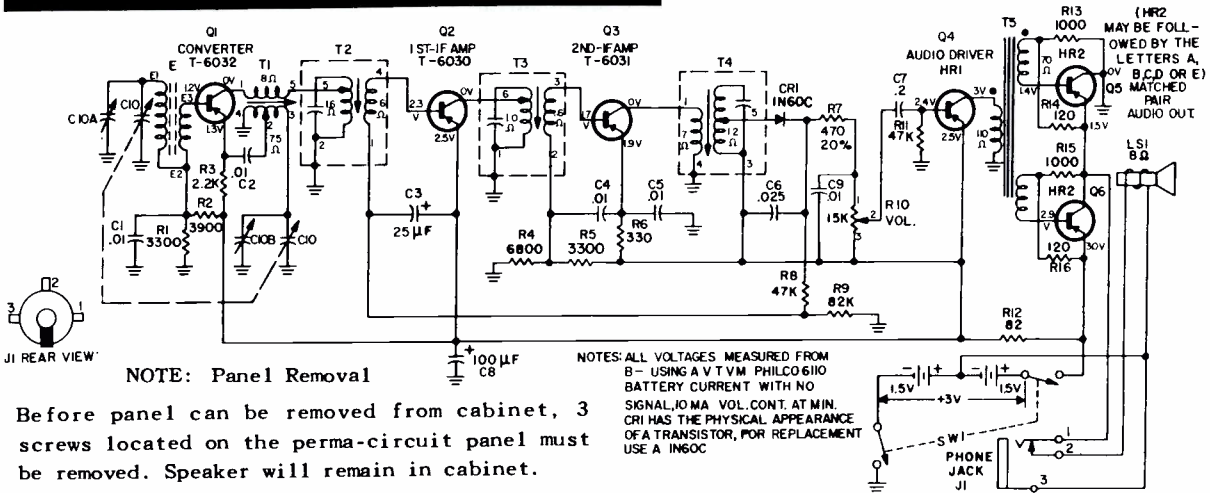
Note: Panel Removal

Before panel can be removed from cabinet, a screw located next to the 2nd I-F transformer must be removed. Then depress clips on each side of cabinet. Speaker will remain in cabinet.

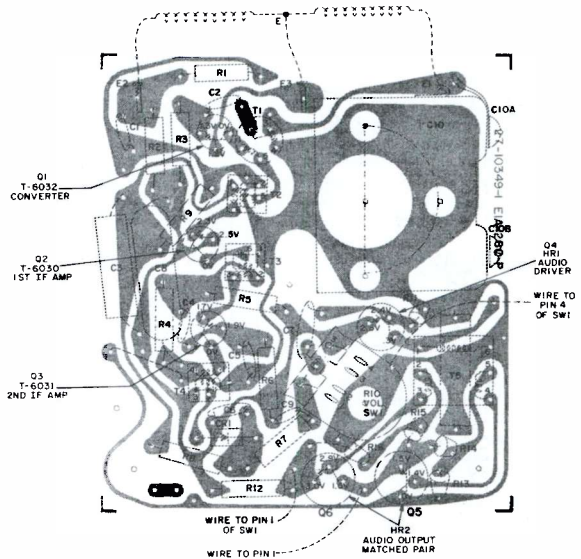


PHILCO

TRANSISTOR PORTABLE MODEL T-64 CODE 124



Composite Top View



Composite Bottom View

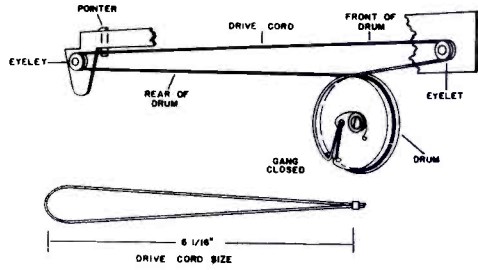
ALIGNMENT PROCEDURE

Step	Signal Generator		Radio		
	Connection to Radio	Dial Setting	Dial Setting	Special Instructions	Adjust
1	Connect signal generator through a .1 μ f condenser to ant. section of gang.	455 kc	Tuning gang fully open.	Adjust for maximum output in order given.	T4—3rd IF T3—2nd IF T2—1st IF
2	Use radiating loop. (See NOTE 1 below)	600 kc	600 kc	Adjust for maximum output. Rock tuning gang while making this adjustment.	T1—osc. core
3	Same as Step 2.	1620 kc	1620 kc (Tuning gang fully open)	Adjust for maximum output.	C10B—osc. trimmer.
4	Same as Step 2.	1400 kc	1400 kc	Adjust for maximum output.	C10A—antenna trimmer.
5	Repeat Steps 2, 3, and 4 until no further improvement is obtained. Always stop on Step 4.				

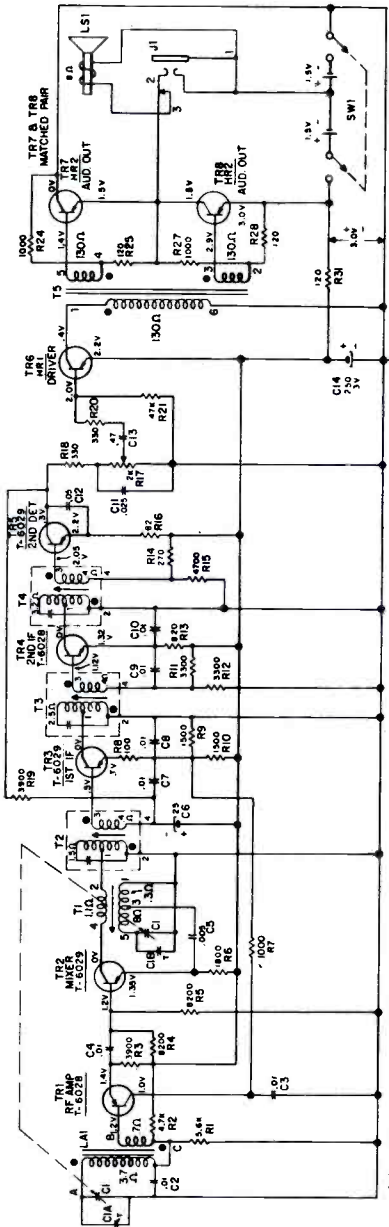
NOTE: Use a 6 to 8 turn, 6-inch diameter loop made up of insulated wire. Connect to generator terminals, and place about one foot from radio loop.

PHILCO

TRANSISTOR PORTABLE MODEL T-89



DIAL CORD ARRANGEMENT

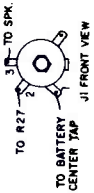


Model T-89, Code 124

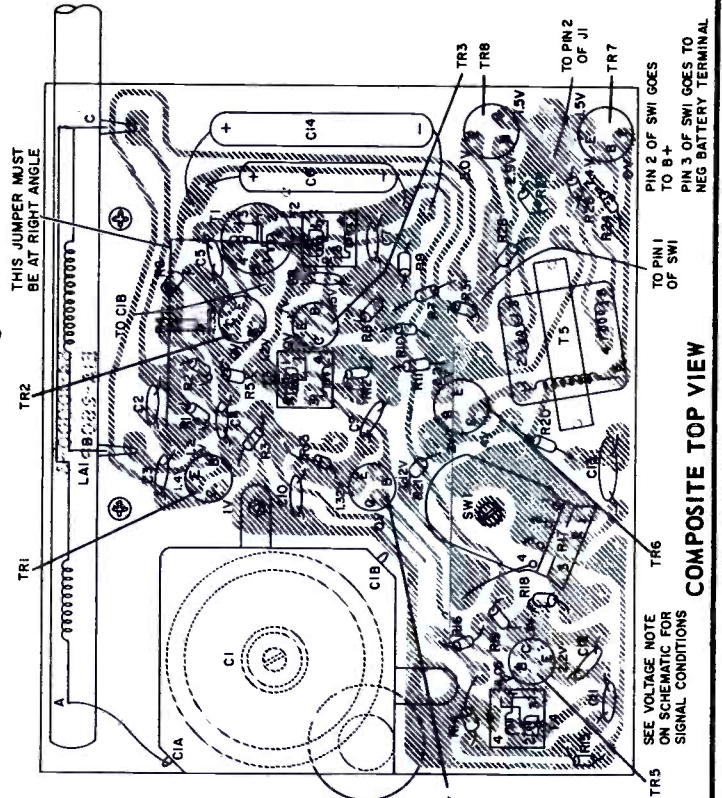
WITH NO SIGNAL VOL. CONTROL AT MINIMUM, CURRENT: 11 MA
VOLTAGES READ UNDER NO SIGNAL CONDITIONS, VOLUME CONTROL AT MINIMUM, WITH A 1.5 V.M. PHILCO MODEL 700

INTERMEDIATE FREQUENCY — 455 KC.

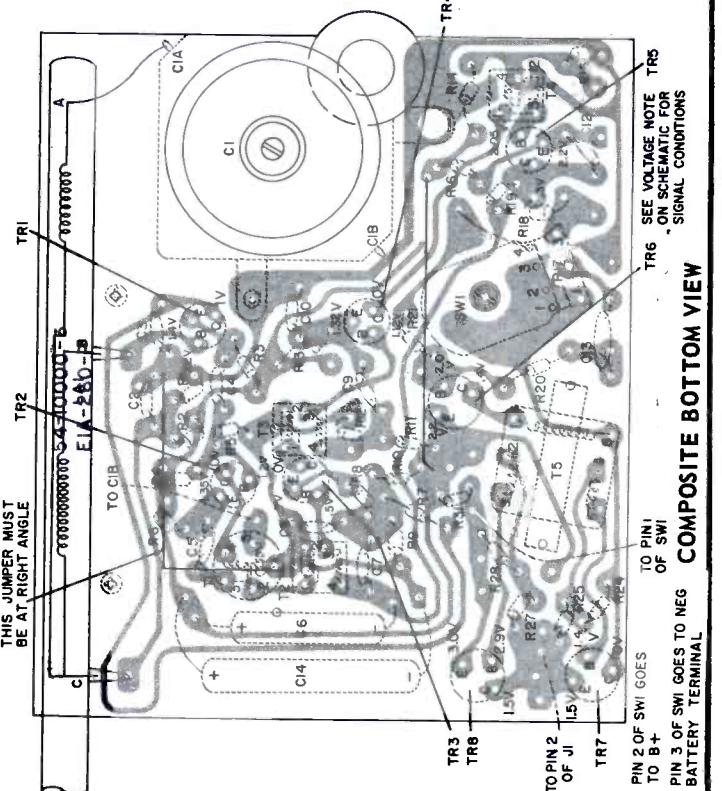
THIS JUMPER MUST BE AT RIGHT ANGLE



To remove panel from cabinet, first remove knob from front of cabinet. Next remove the screw mounted through the flange of the tuning gang (C1) (graph location D3) which holds the panel to the front of the cabinet. Depress the bottom of the cabinet so that the panel clears the teeth at bottom of cabinet. Lift panel up and out. The speaker will remain in the cabinet.



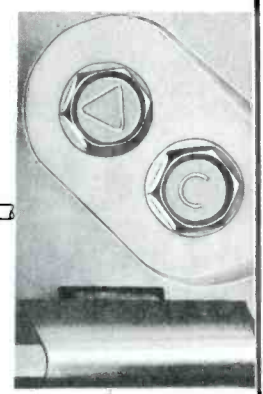
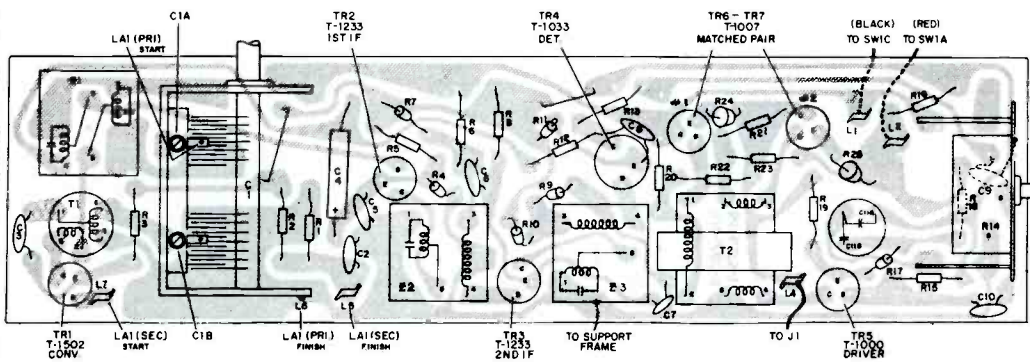
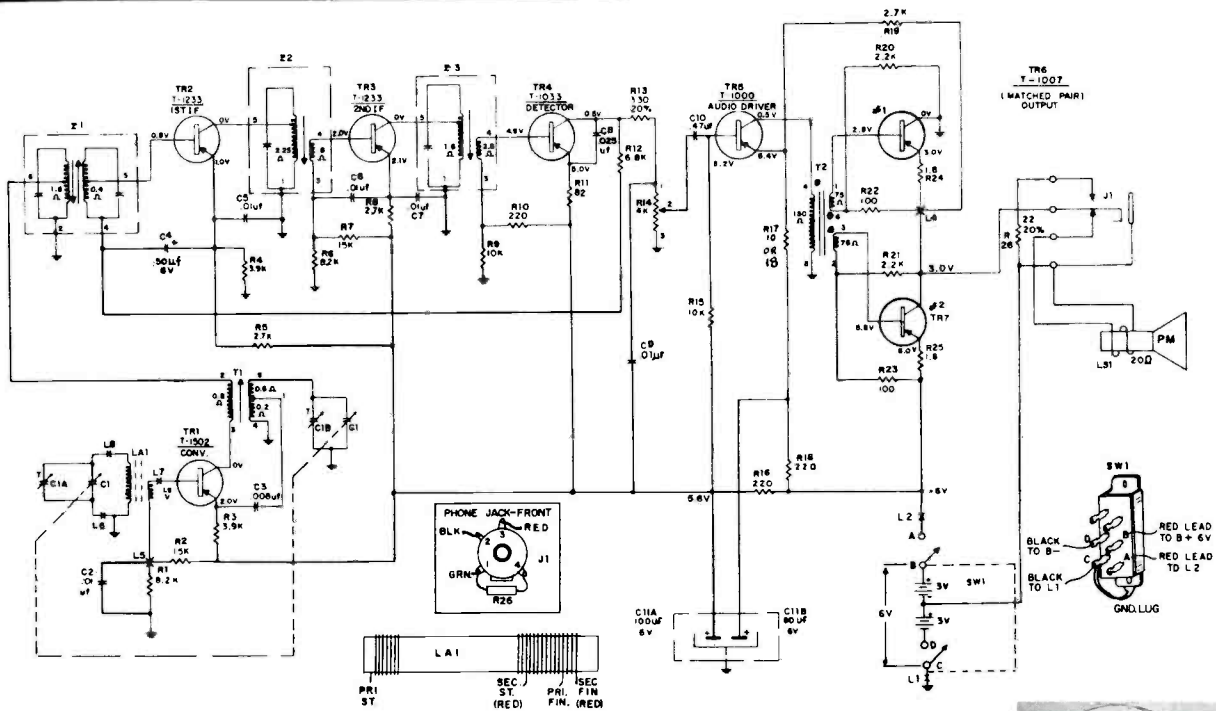
COMPOSITE TOP VIEW



COMPOSITE BOTTOM VIEW

PHILCO

TRANSISTOR PORTABLE MODEL T-702 CODE 124



Top Composite View of Perma-Circuit Panel

Sheet metal screws with triangles marked on their heads are removed during disassembly.

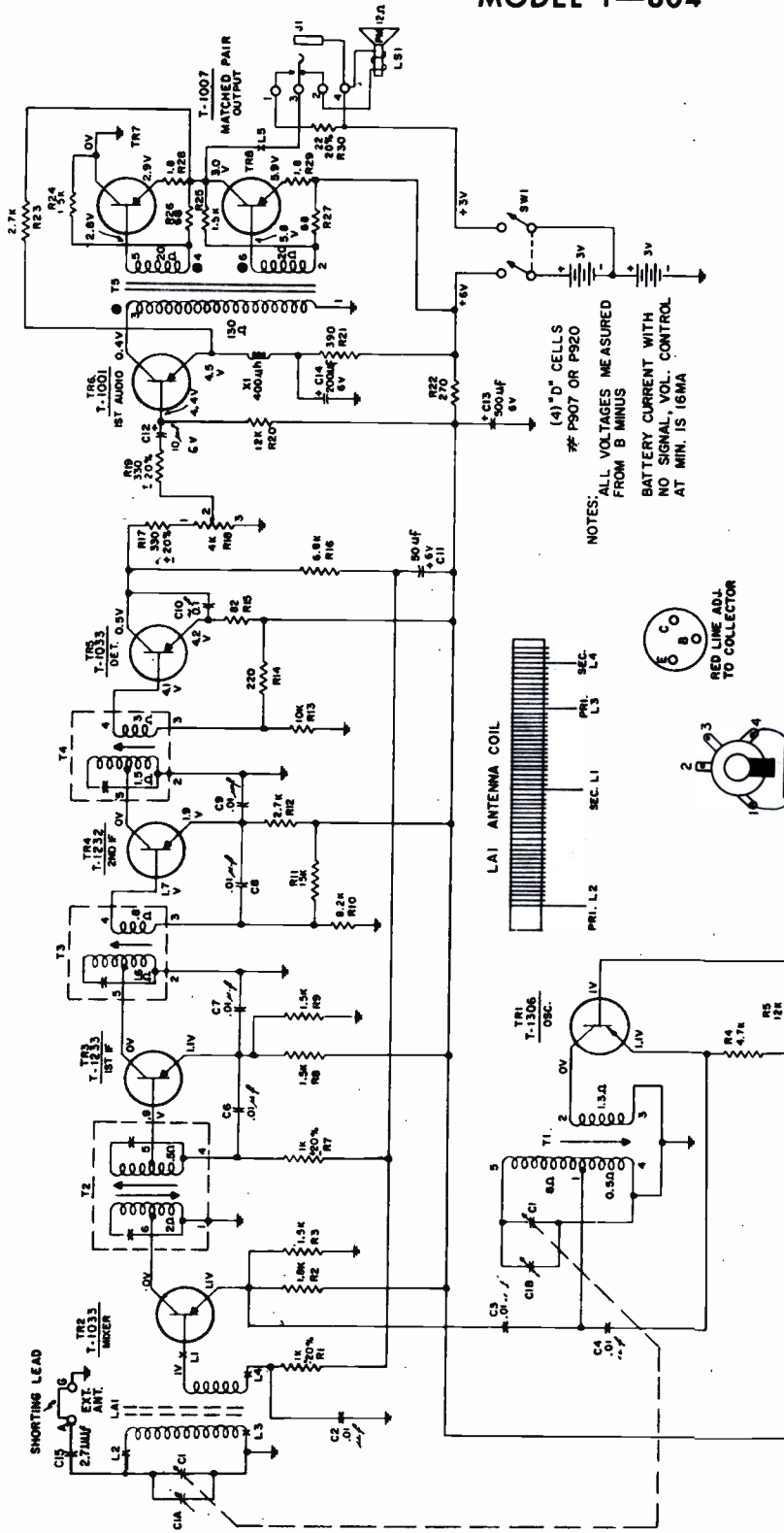
ALIGNMENT PROCEDURE

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Connect signal generator through a .1-uf. condenser to ant. section of gang.	455 kc.	Tuning gang fully open.	Adjust for maximum output in order given.	Z3—3rd i-f Z2—2nd i-f Z1—1st i-f
2	Use radiating loop. (See NOTE 1 below)	600 kc.	600 kc.	Adjust for maximum output. Rock tuning gang while making this adjustment.	T1—osc. core
3	Same as step 2.	1620 kc.	1620 kc. (Tuning gang fully open)	Adjust for maximum output.	C1B—osc. trimmer
4	Same as step 2.	1400 kc.	1400 kc.	Adjust for maximum output.	C1A—antenna trimmer
5	Repeat steps 2, 3 and 4 until no further improvement is obtained. Always stop on step 4.				

NOTE 1. Use a 6-to-8-turn, 6-inch-diameter loop made up of insulated wire. Connect to generator terminals, and place about one foot from radio loop.

PHILCO

MODEL T-804



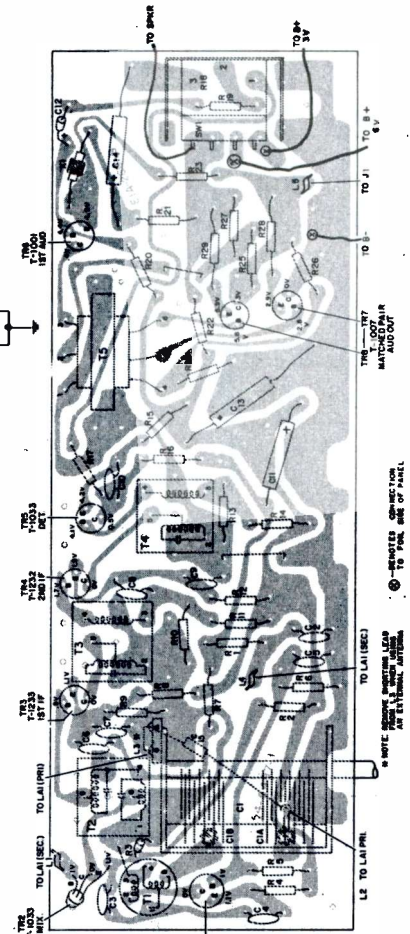
NOTES:
 ALL VOLTAGES MEASURED FROM B MINUS
 BATTERY CURRENT WITH NO SIGNAL, VOL. CONTROL AT MIN. IS 16MA



ALIGNMENT CHART

STEP	SIGNAL GENERATOR CONNECTION TO RADIO	RADIO		ADJUST
		DIAL SETTING	DIAL SETTING	
1	Connect signal generator through a .1-uf. condenser to ant. section of gang.	455 kc.	Tuning gang fully open.	T4—3rd i-f pri. T3—2nd i-f pri. T2—bot. core T1—top core
2	Use radiating loop. (See NOTE 1 below).	600 kc.	600 kc.	T1—osc. core
3	Same as step 2.	1620 kc.	1620 kc. (Tuning gang fully open)	C1B—osc. trim.
4	Same as step 2.	1400 kc.	1400 kc.	C1A—ant. trim.
5	Repeat steps 2, 3 and 4 until no further improvement is obtained.			

NOTE 1. Use a 6-to-8-turn, 6-inch diameter loop made up of insulated wire.

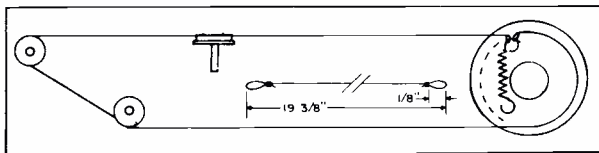
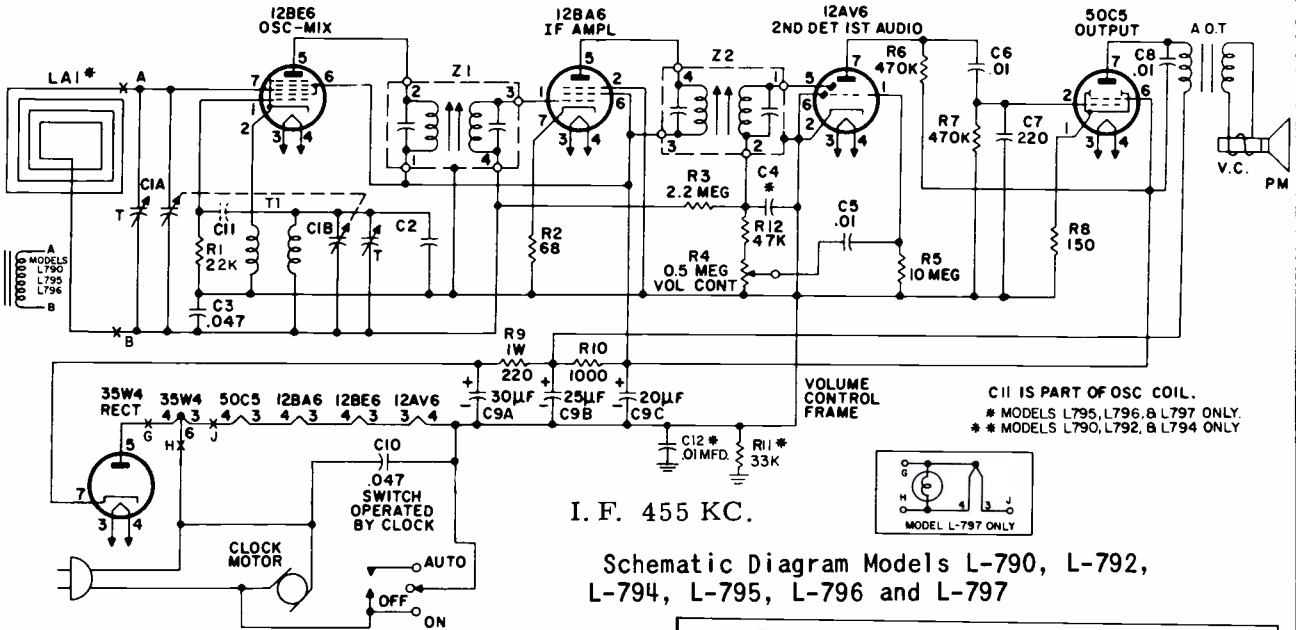
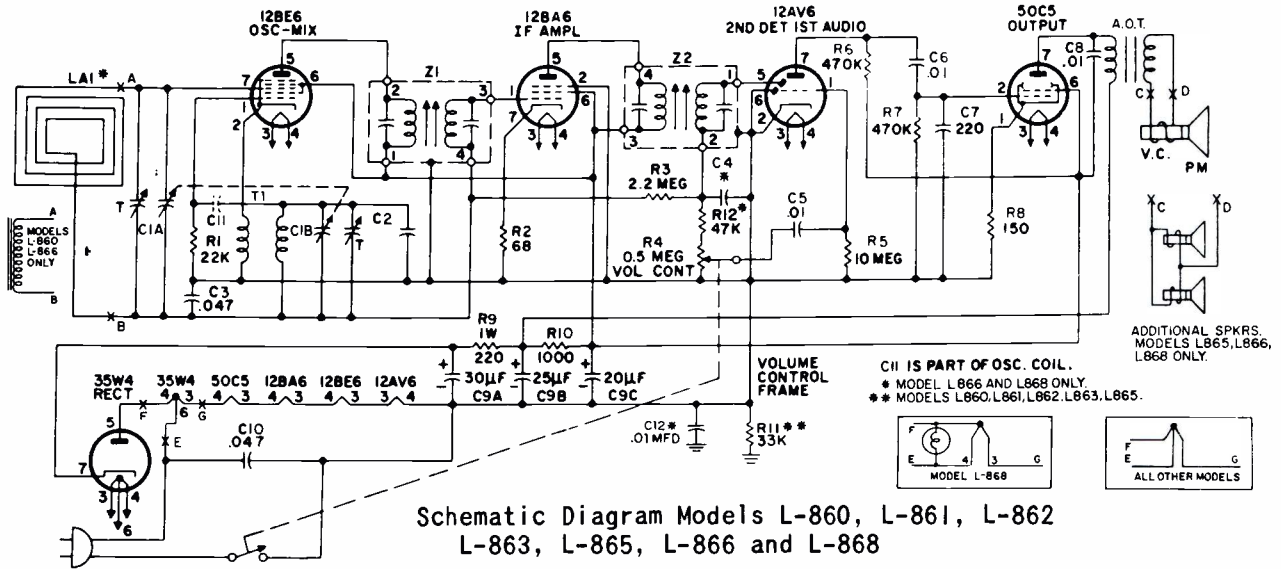


Component Layout, Bottom View

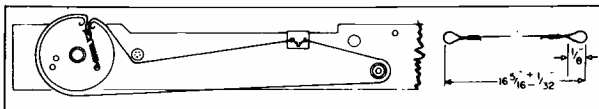
PHILCO

TABLE/CLOCK RADIO L790, L792, L794, L795, L796, L797, L860, L861, L862, L863, L865, L866, AND L868

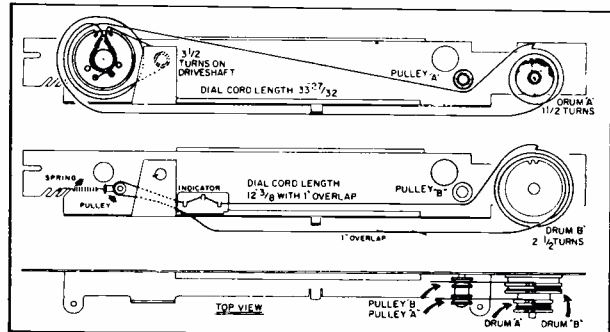
(Continued on the next page at right)



Dial Stringing Models L-794, L-863, L-865



Dial Stringing Models L-795, L-796, and L-866

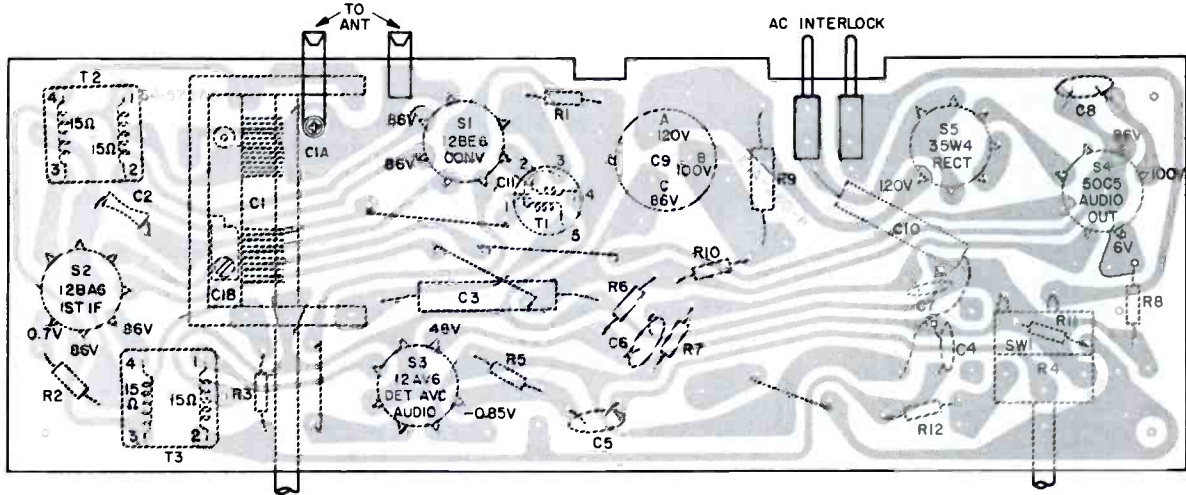


Dial Stringing Models L-797, L-868

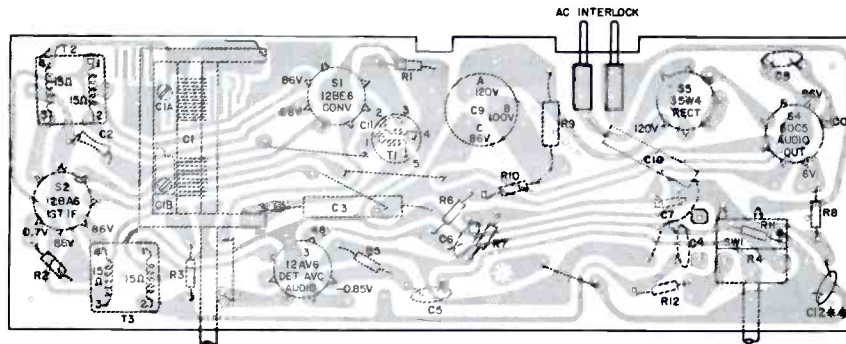
PHILCO

TABLE/CLOCK RADIO L790, L792, L794, L795, L796, L797, L860, L861, L862, L863, L865, L866, AND L868

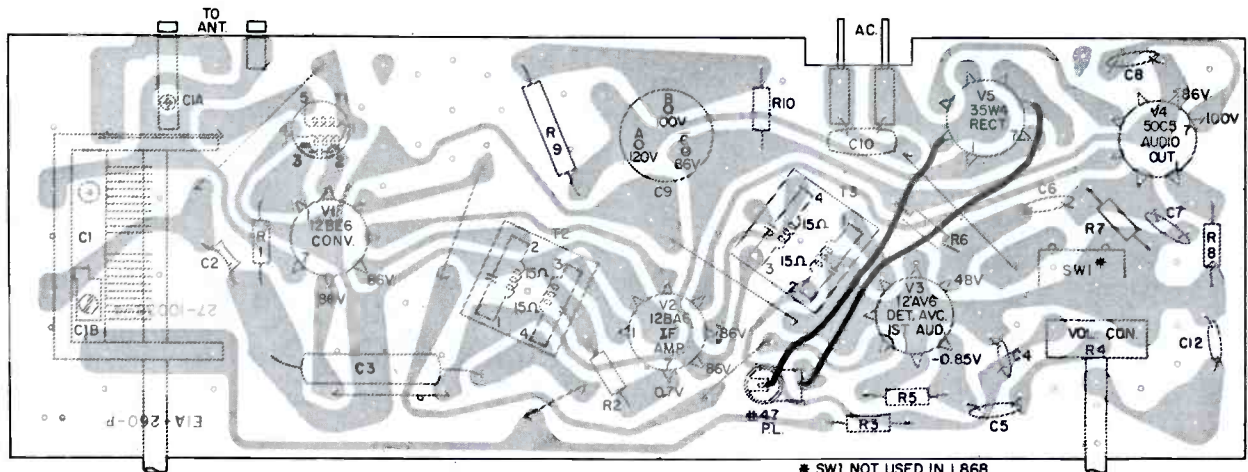
(Continued from preceding page at left)



Component Layout, Foil Side of Perma-Circuit Panel Models L-792, L-794, L-861, L-862, L-863 and L-865



Component Layout, Foil Side of Perma-Circuit Panel, Models L-790, L-795, L-796, L-860, and L-866

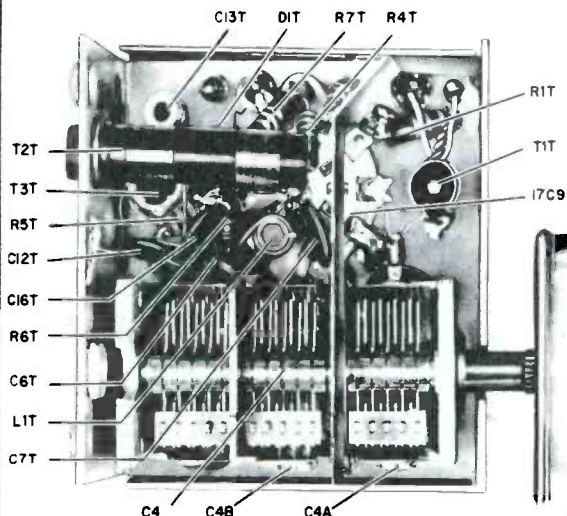


Component Layout, Foil Side of Perma Circuit Panel Models L-797, L-868

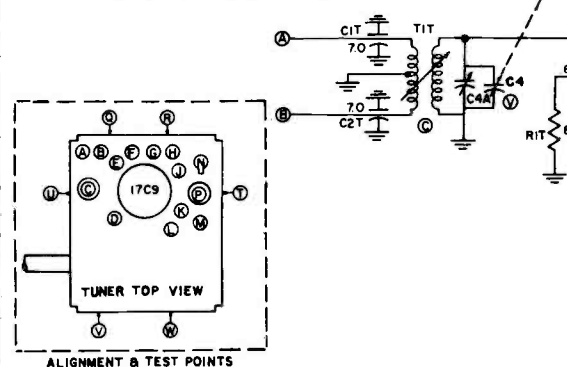
PHILCO

TABLE/CLOCK AM-FM RADIO L799, L926, L927, L928, & L929

(See page 109 for schematic and other service information)



FM Tuner, Bottom View,

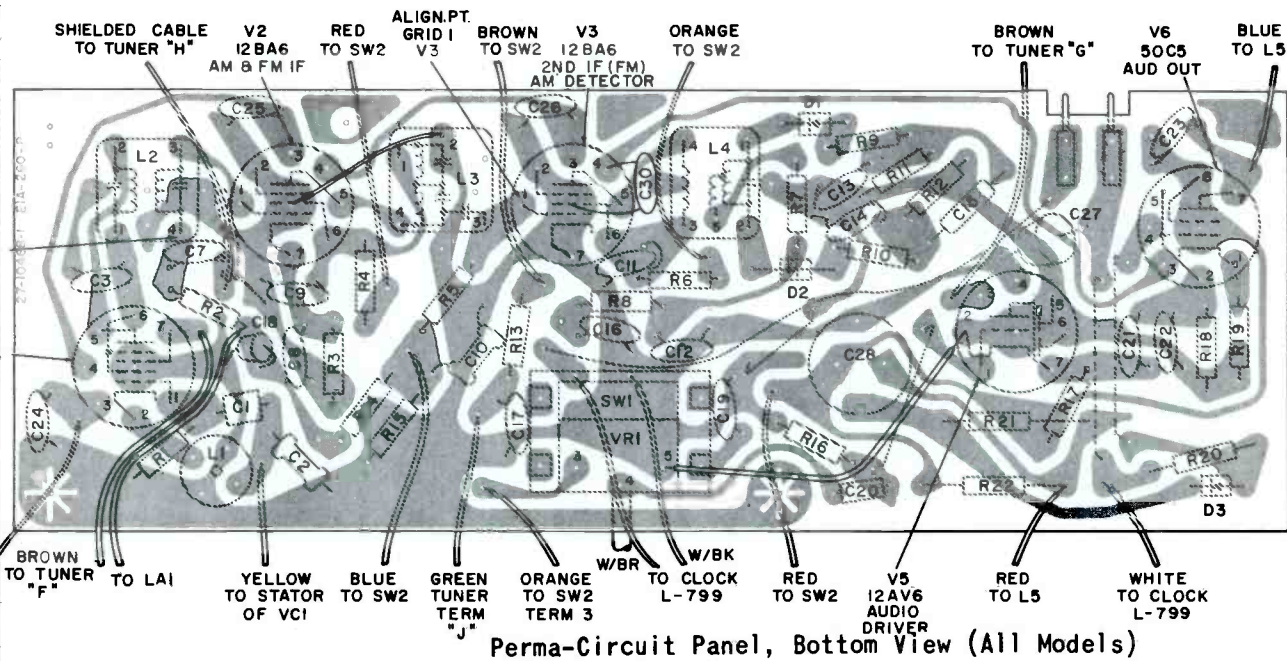


Schematic Diagram, FM Tuner (All Models)

CLOCK REMOVAL

Model L-799

1. Remove all knobs from front panel.
2. Remove clear plastic front by gently releasing the mounting tab at the bottom center with a screwdriver.
3. Remove clock hands being especially careful of the minute hand.
4. Remove connecting leads from the clock assembly.
5. Using a narrow blade screwdriver, gently remove the four clock mounting clips.

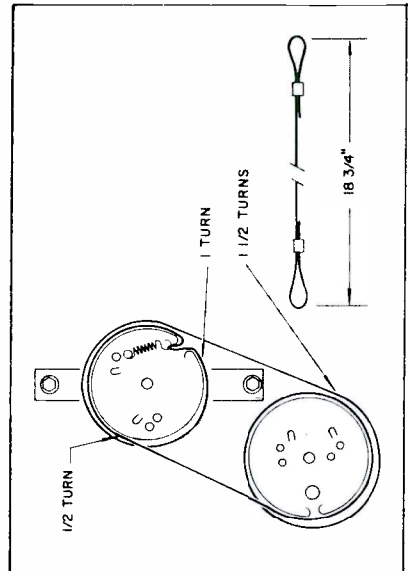
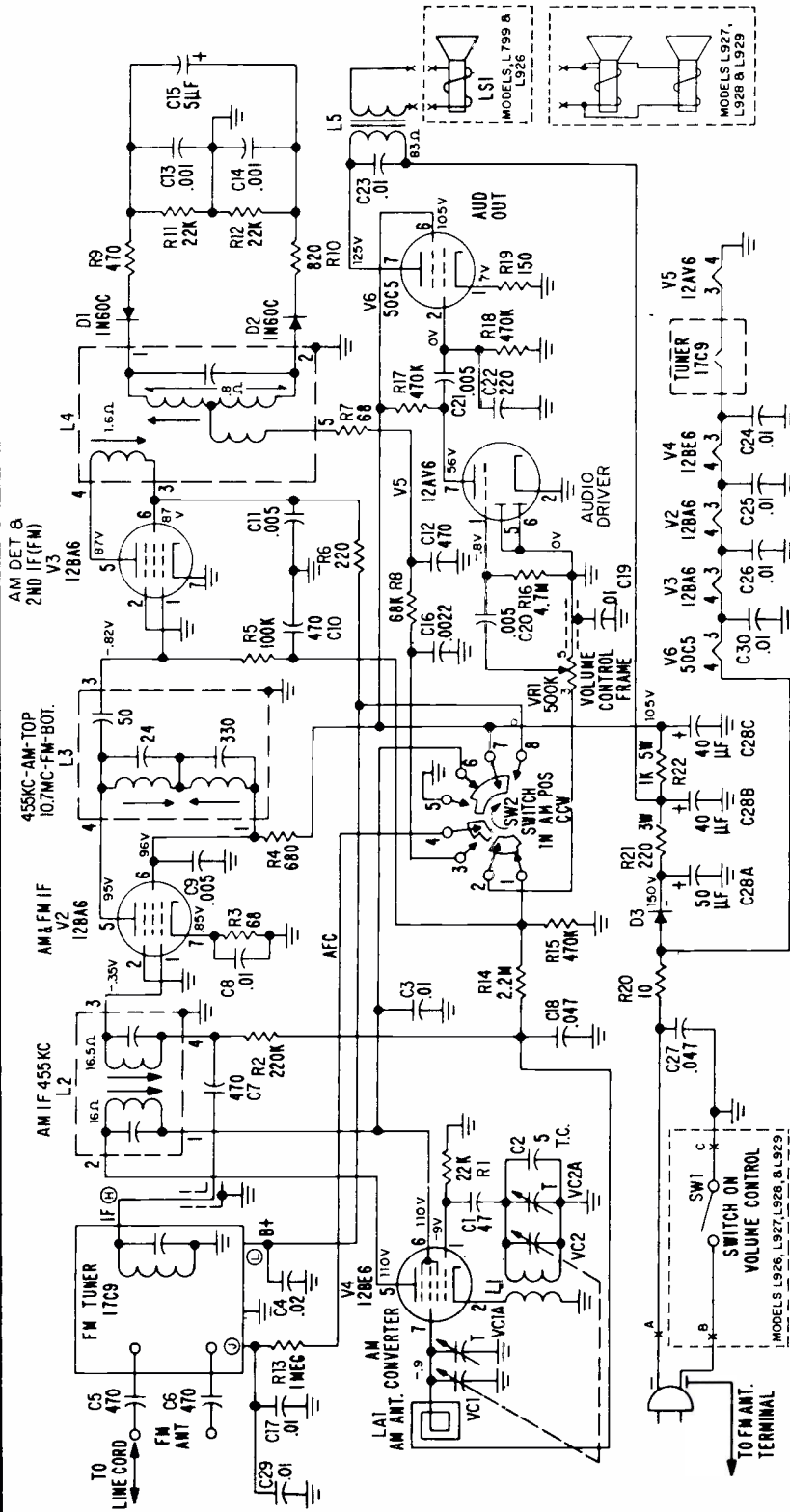


Perma-Circuit Panel, Bottom View (All Models)

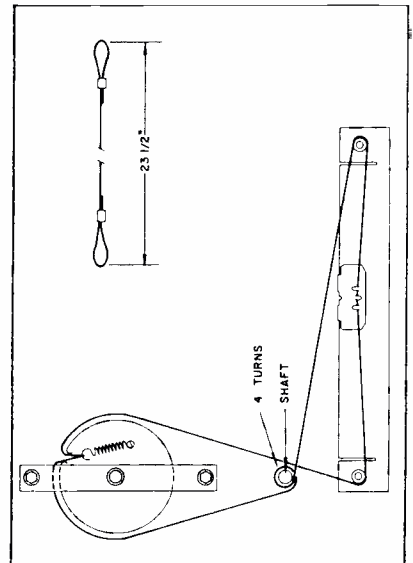
PHILCO

TABLE/CLOCK AM-FM RADIO L799, L926, L927, L928, & L929

(Continued from page 108.
Refer to that page for additional service material.)

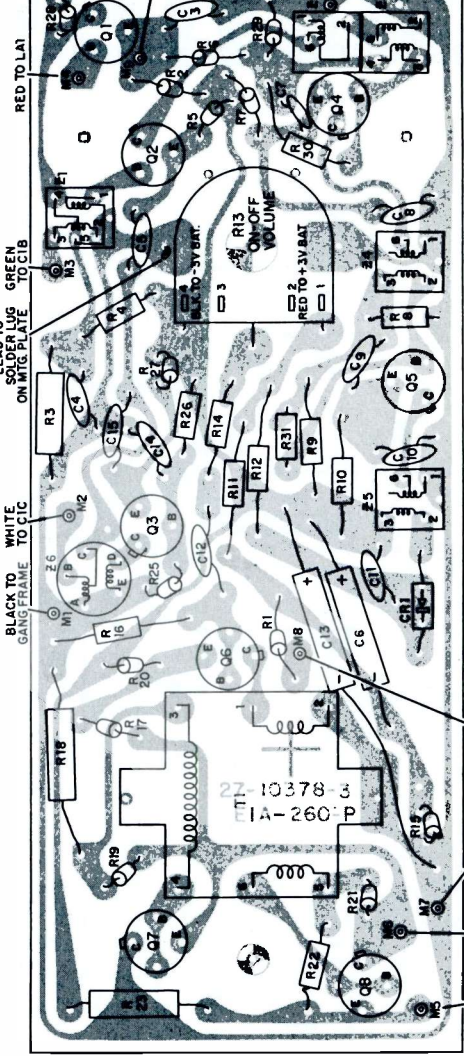
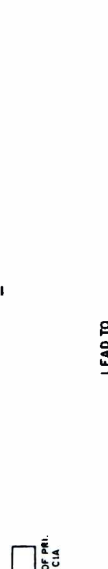
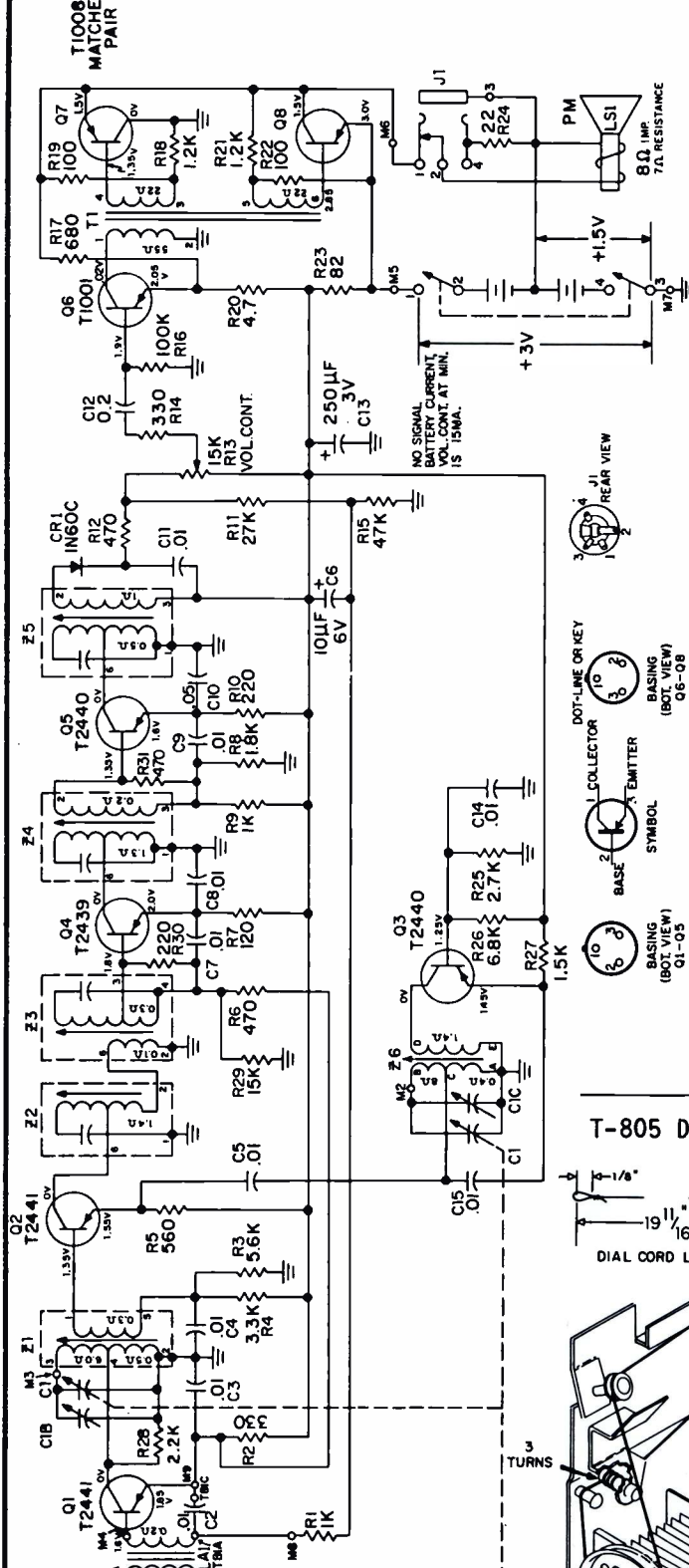


Tuner Dial Cord Stringing



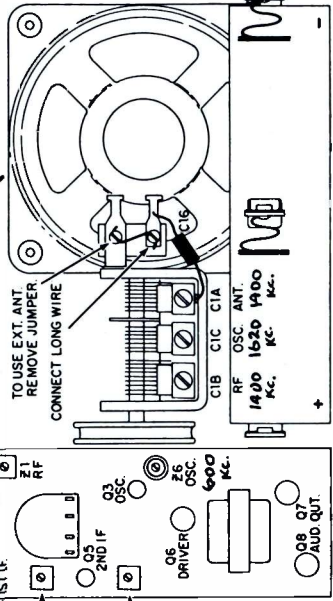
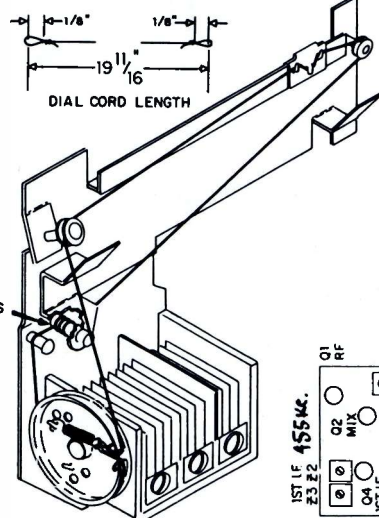
Main Dial Cord Stringing

PHILCO MODEL T-805



Bottom Composite View of T-805 Perma-Circuit Panel

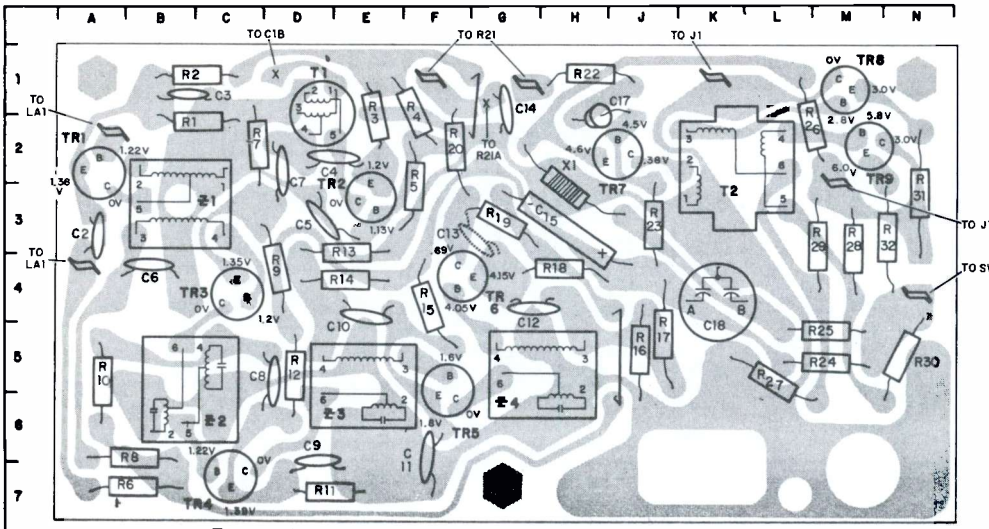
T-805 Dial Stringing



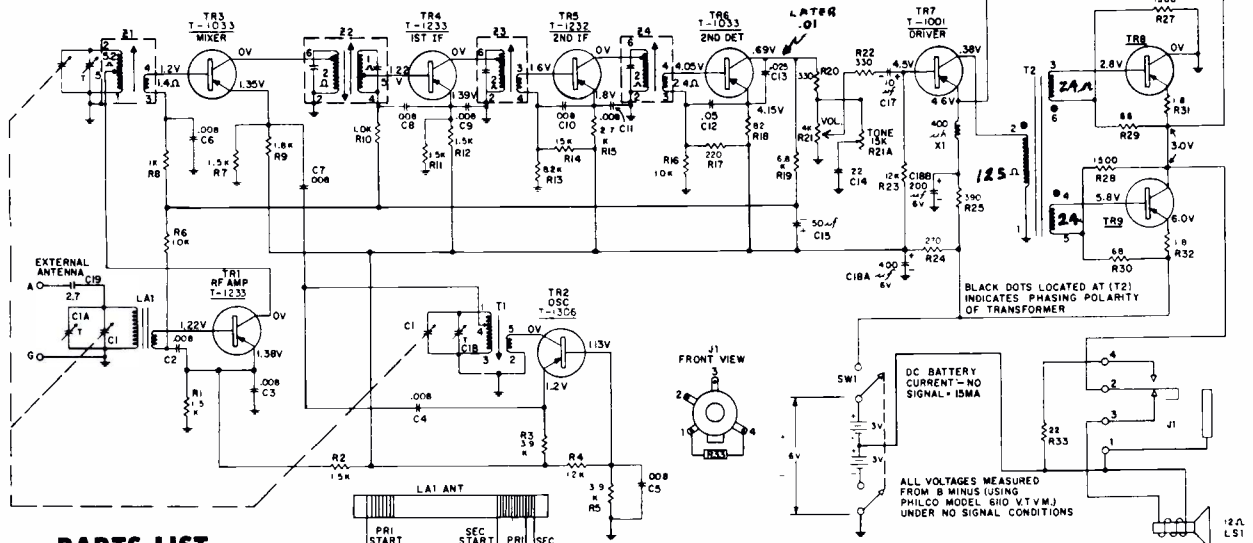
T-805 Alignment Point Identification

**PHILCO
MODEL T-902**

I. F. 455 KC.



Perma Circuit Panel, Top View Showing Parts Location

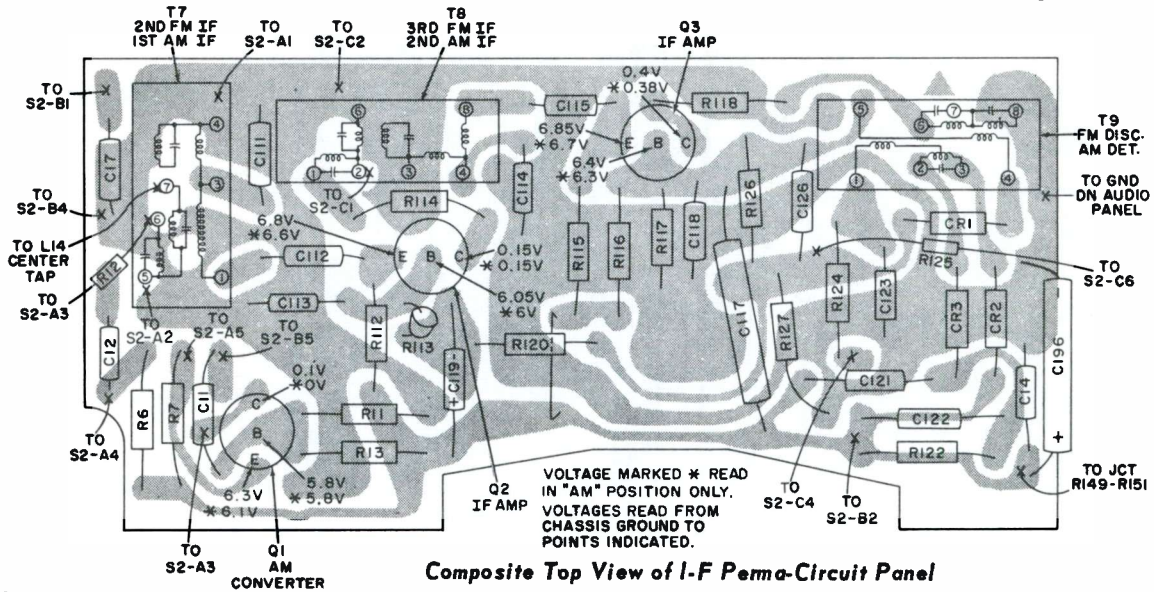


PARTS LIST

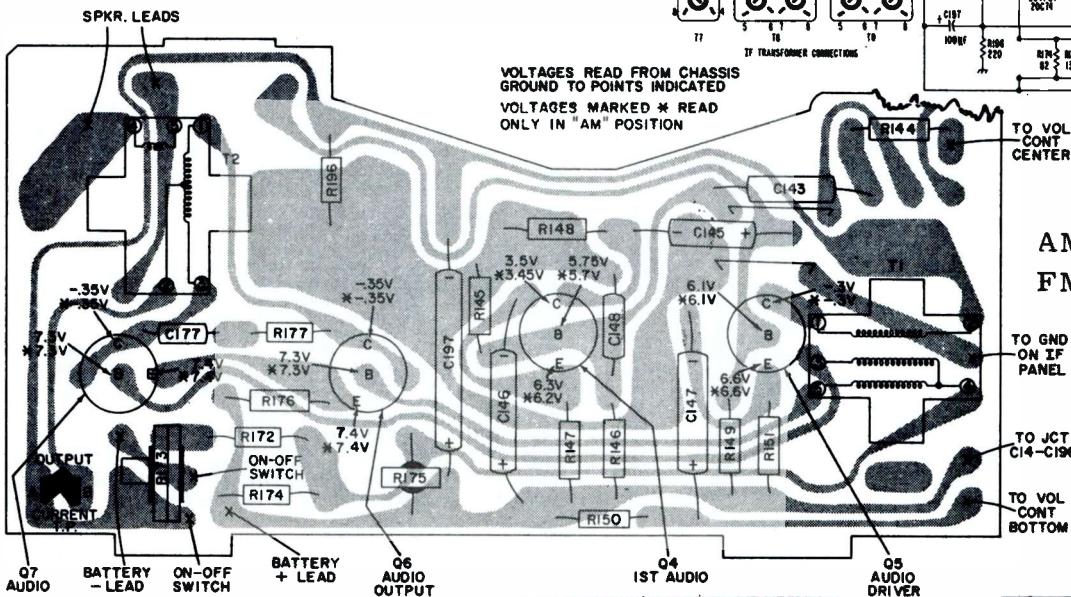
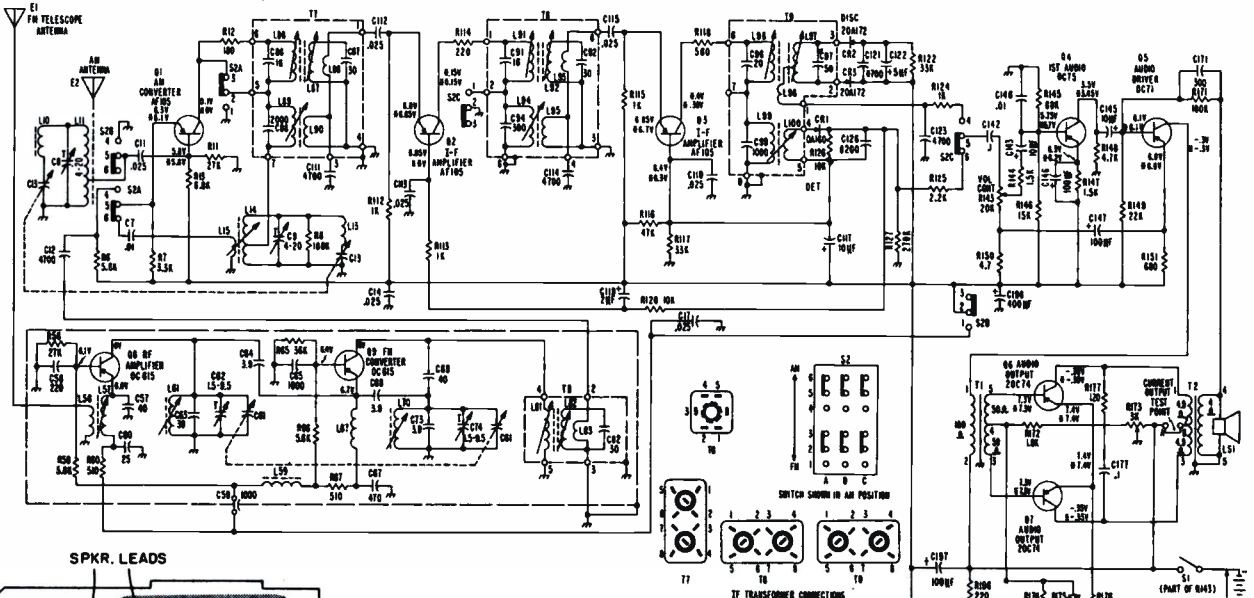
Symbol	Location	Description	Service Part No.
C1		Capacitor, variable tuning	31-2791-3
C2	A3	Capacitor, .008 mf, RF base	30-1262-31
C3	B1	Capacitor, .008 mf, RF emitter	30-1262-31
C4	D2	Capacitor, .008 mf, osc. emitter	30-1262-31
C5	D3	Capacitor, .008 mf, osc. base	30-1262-31
C6	B4	Capacitor, .008 mf, mixer base	30-1262-31
C7	D2	Capacitor, .008 mf, mixer emitter	30-1262-31
C8	C5	Capacitor, .008 mf, 1st IF emitter	30-1262-31
C9	D6	Capacitor, .008 mf, 1st IF emitter	30-1262-31
C10	E4	Capacitor, .008 mf, 2nd IF emitter	30-1262-31
C11	F6	Capacitor, .008 mf, 2nd IF emitter	30-1262-31
C12	G4	Capacitor, .05 mf, 2nd det. emitter	30-1279-1
C13	G3	Capacitor, .025 mf, det. collector	30-1272-4
C14		Capacitor, .22 mf, tone control	30-1274-2
C15	H3	Capacitor, electrolytic, 50 mf, 6V	30-2588-11
C17	H1	Capacitor, electrolytic, 10 mf, 6V	30-2591-9
C18	K4	Capacitor, electrolytic, 400 mf - 200mf, 6V	30-2602-3
C19		Capacitor, 2.7 mmdf, external ant.	30-1221-18
LS1		Speaker, 12Ω V.C., 4-inch	36-1675-13
R1	C2	Resistor, 1.5K, RF amp. emitter	66-2158340
R2	C1	Resistor, 1.5K, RF amp. emitter	66-2158340
R3	E1	Resistor, 3.9K, osc. emitter	66-2398340
R4	F1	Resistor, 12K, osc. base	66-3128340
R5	F2	Resistor, 3.9K, osc. base	66-2398340
R6	B7	Resistor, 1K, RF amp. base	66-2108340
R7	C2	Resistor, 1.5K, mixer emitter	66-2158340
R8	A6	Resistor, 1K, mixer base	66-2108340
R9	D4	Resistor, 1.8K, mixer emitter	66-2188340
R10	A5	Resistor, 1K, 1st IF base	66-2108340
R11	D7	Resistor, 1.5K, 1st IF emitter	66-2158340
R12	D5	Resistor, 1.5K, 1st IF emitter	66-2158340
R13	E3	Resistor, 8.2K, 2nd IF base	66-2828340
R14	E4	Resistor, 15K, 2nd IF base	66-3158340
R15	F4	Resistor, 2.7K, 2nd IF emitter	66-2278340
R16	J5	Resistor, 10K, 2nd det. base	66-3108340

Symbol	Location	Description	Service Part No.
R17	J5	Resistor, 220 ohms, 2nd det. base	66-1228340
R18	H4	Resistor, 82 ohms, 2nd det. emitter	66-0828340
R19	G3	Resistor, 6.8K, 2nd det. collector	66-2688340
R20	F2	Resistor, 330 ohms, 2nd det. collector	66-1338340
R21		Resistor, variable vol. cont., 4K	33-5588-19
R21A		Resistor, variable tone control, 15K	33-5572-50
R22	H1	Resistor, 330 ohms, driver input fil.	66-1338340
R23	J3	Resistor, 12K, driver base	66-3128340
R24	M5	Resistor, 270 ohms, B+ filter	66-1278340
R25	M4	Resistor, 390 ohms, audio driver	66-1398340
R26	L1	Resistor, 2.7K, audio feed back	66-2278340
R27	L5	Resistor, 1500 ohms, audio out. collector	66-2158340
R28	M3	Resistor, 1500 ohms, audio out. collector	66-2158340
R29	M3	Resistor, 68 ohms, audio out. base	66-0688340
R30	N5	Resistor, 68 ohms, audio out. base	66-0688340
R31	N2	Resistor, 1.8 ohms, audio out. emitter	66-9183360
R32	N3	Resistor, 1.8 ohms, audio out. emitter	66-9183360
R33	N3	Resistor, 22 ohms, listening jack	66-0228340
SW1		Switch (Part of Vol. Cont. R21)	
T1	D1	Transformer, osc.	32-4669-8
T2	K2	Transformer, audio interstage	32-8946-1
TR1	A2	Transistor, RF amp., T-1233	34-6000-12
TR2	E2	Transistor, osc., T-1306	34-6000-17
TR3	C4	Transistor, mixer T-1033	34-6000-3
TR4	C7	Transistor, 1st IF, T-1233	34-6000-12
TR5	F5	Transistor, 2nd IF, T-1232	34-6000-11
TR6	F4	Transistor, 2nd det., T-1933	34-6000-3
TR7	J2	Transistor, audio driver, T-1001	34-6001-16
TR8/9	M2	Transistors, audio output, matched pair T-1007	34-6000-8
X1	H2	Choke, 400 MH	32-4685-1
Z1	B3	Transformer, RF	32-4793-1
Z2	B6	Transformer, 1st IF	32-4738-1
Z3	E5	Transformer, 2nd IF	32-4738-11

PHILCO PORTABLE AM-FM RADIO TRANSISTOR MODEL T-90S



Composite Top View of I-F Perma-Circuit Panel

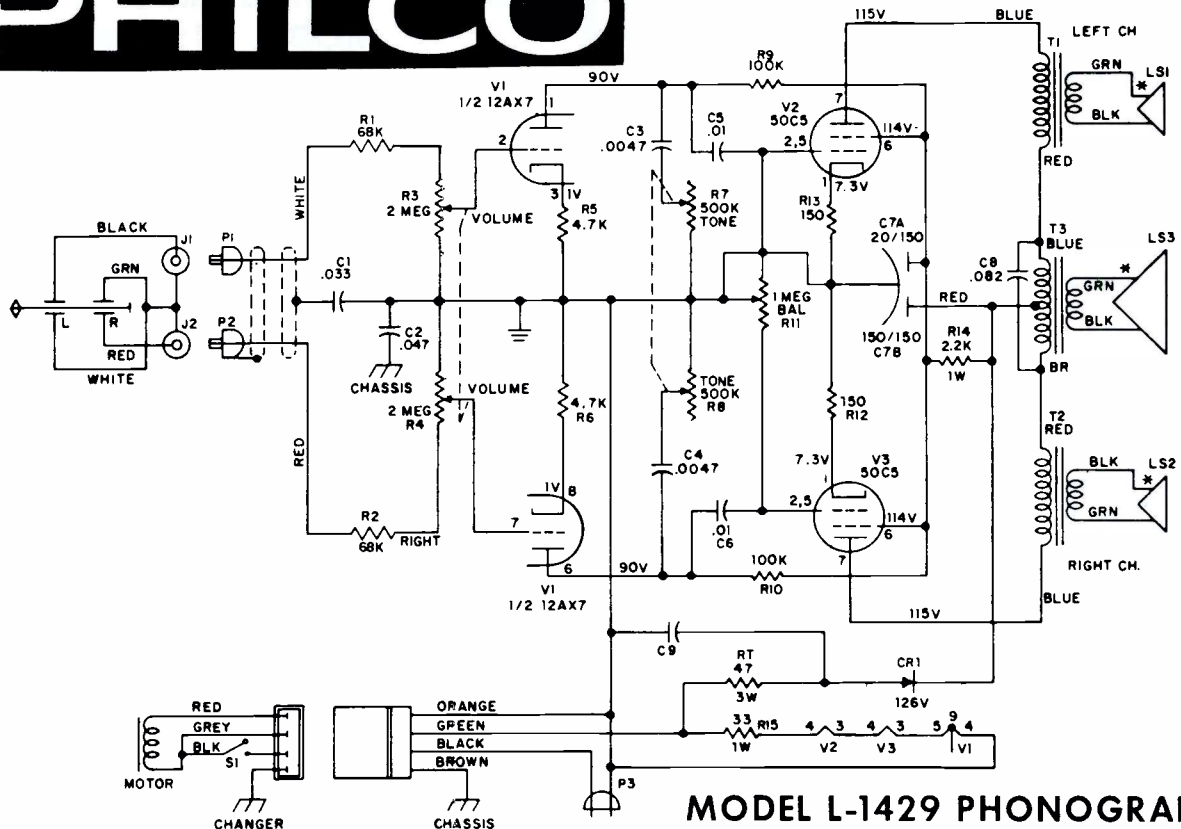


AM IF 460 KC.
FM IF 10.7 MC.

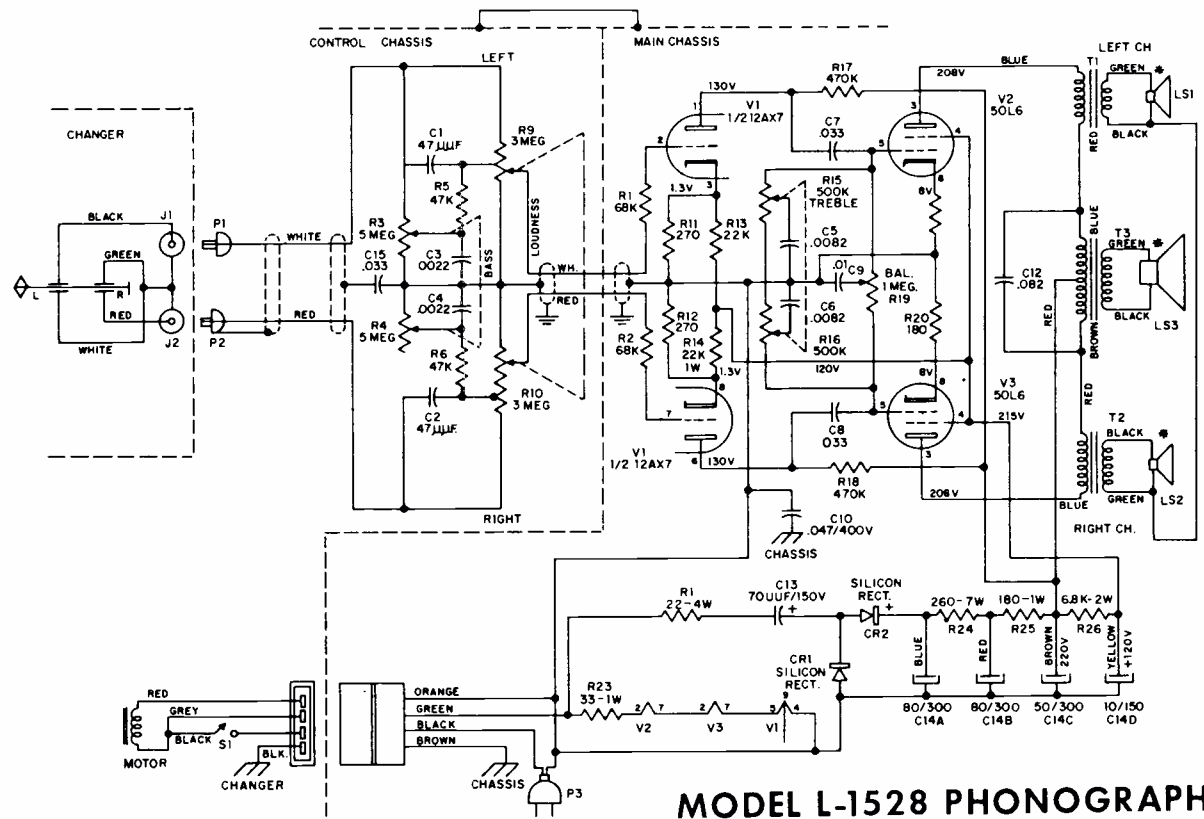


Composite Top View of Audio Perma-Circuit Panel

PHILCO



MODEL L-1429 PHONOGRAPH



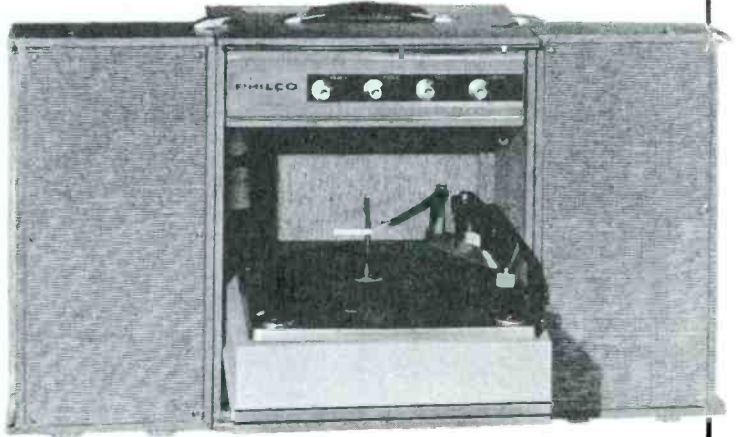
MODEL L-1528 PHONOGRAPH

PHILCO

HI-FI STEREO MODEL L-1532

AMPLIFIER REMOVAL

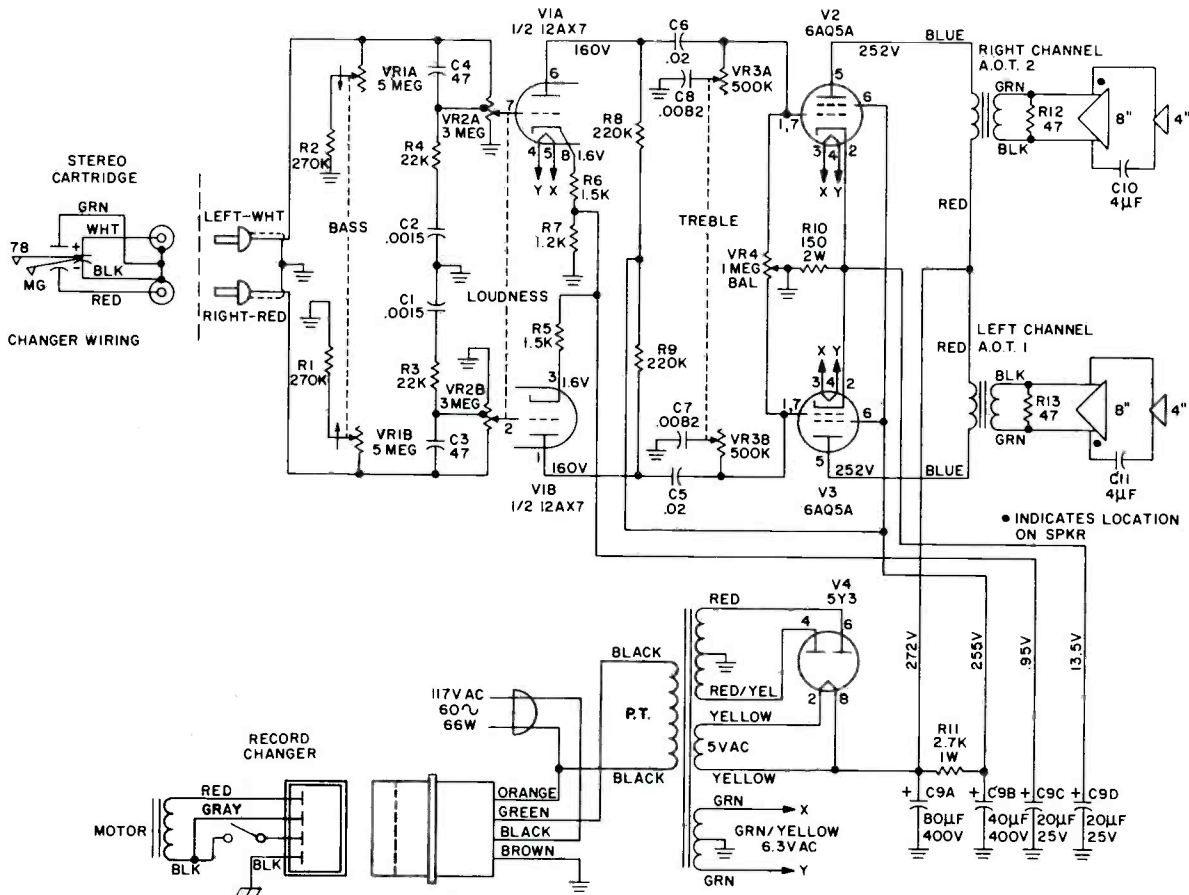
1. Remove two Phillips screws from back of cabinet. Do not remove two screws that fasten grille to cabinet back.
2. Remove plug on right side of changer base. Grasp washer on changer, hold down screw with long nose pliers. Grasp washer on side opposite washer opening through hole in right side of changer bin.
3. Lift right side of changer and slide changer to the right in order to free left side.
4. Unplug phono power and phono input cables. Set changer aside.
5. With a short screw driver, remove the two Phillips screws holding the amplifier compartment in the cabinet. These screws are located at the top of the changer compartment and run through the changer bin stop blocks.
6. Loosen phono power and phono input cable hold downs.
7. Slide amplifier compartment out of cabinet guiding all cables through openings in side and back of cabinet.
8. Remove knobs and T-nuts located on controls behind knobs.



9. Remove two speed nuts from studs on amplifier rear flange. Lift amplifier to clear studs and pull away from compartment.

TUBE REMOVAL

Remove grille on cabinet back in order to check or replace tubes.

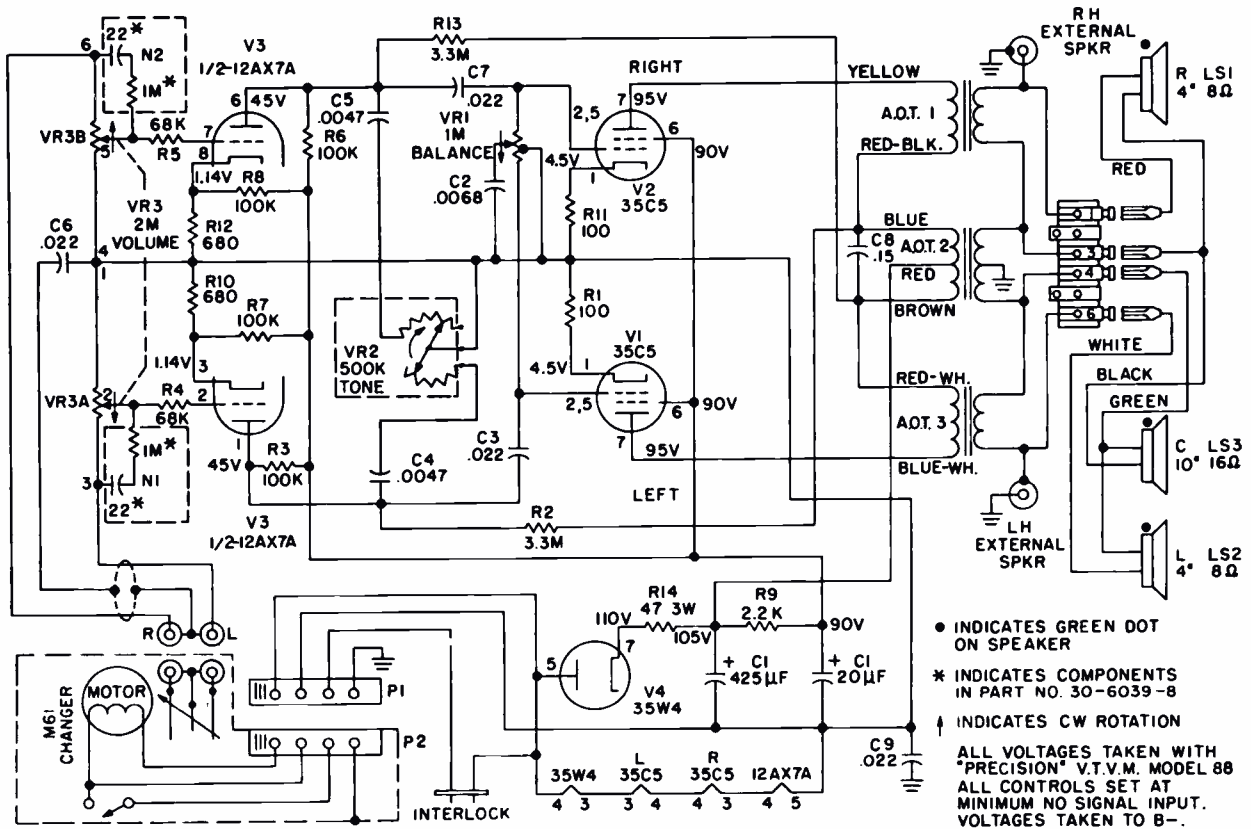


PHILCO

HI-FI STEREO MODEL L-1650

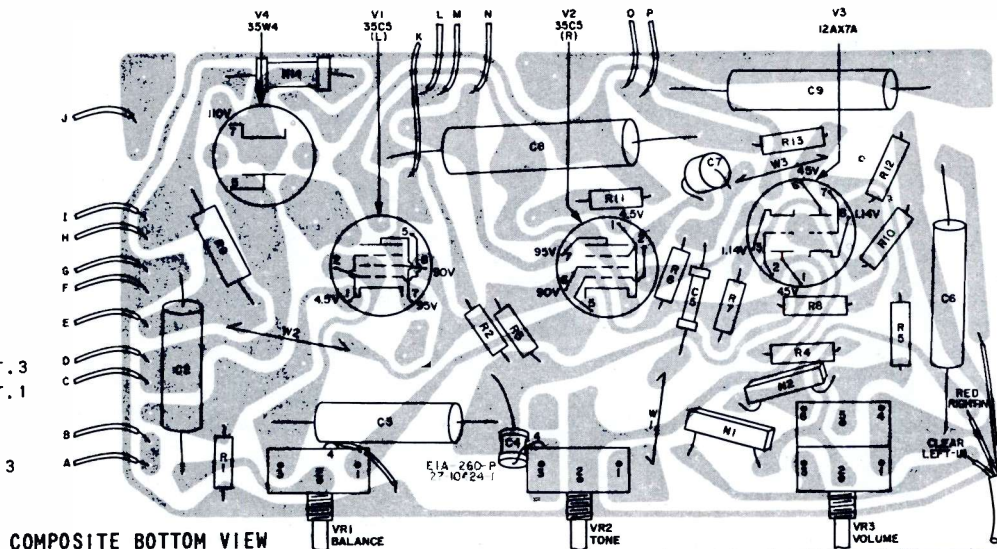
AMPLIFIER REMOVAL

The L-1650 is mounted in the cabinet by two deep T-nuts. The T-nuts screw onto the volume and balance controls that project through the turntable base board. The a-c interlock panel is fastened to the back of the cabinet by two wood screws. The speaker wires, phono power jack and audio jacks are all socket connections.



LEGEND FOR PANEL WIRING

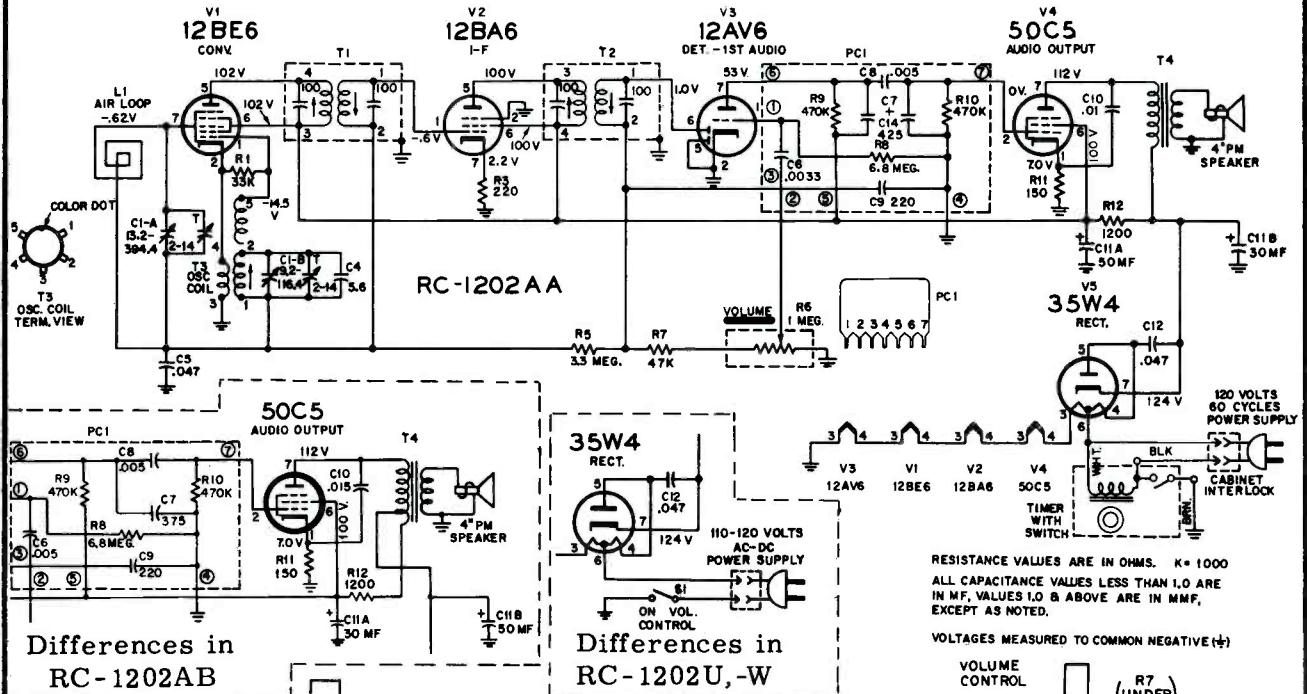
- A. WH.-YEL. TO P2
- B. WH. TO L.C. 2
- C. WH. TO L.C. 1
- D. WH.-RED. TO P2
- E. BLUE. TO C1
- F. WH.-GY. TO P2
- G. BLK. TO C1
- H. RED. TO A.O.T. 2
- I. OR. TO C1
- J. WH.-BLK. TO P2
- K. BLUE-WH. TO A.O.T. 3
- L. RED-BLK. TO A.O.T. 1
- M. BLUE TO A.O.T. 2
- N. YELLOW TO A.O.T. 1
- O. RED-WH. TO A.O.T. 3
- P. BRWN. TO A.O.T. 2



COMPOSITE BOTTOM VIEW

RCA VICTOR

3-RD-1 Series, Model 3-RD-10, Chassis RC-1202AA,
 3-RD-3 Series, Models 3-RD-30, 3-RD-35, 3-RD-37, Chassis RC-1202AB,
 3-RA-1 Series, Model 3-RA-16, Chassis RC-1202W,
 3-RA-2, Series, Models 3-RA-20, 3-RA-25, 3-RA-27, Chassis RC-1202U.

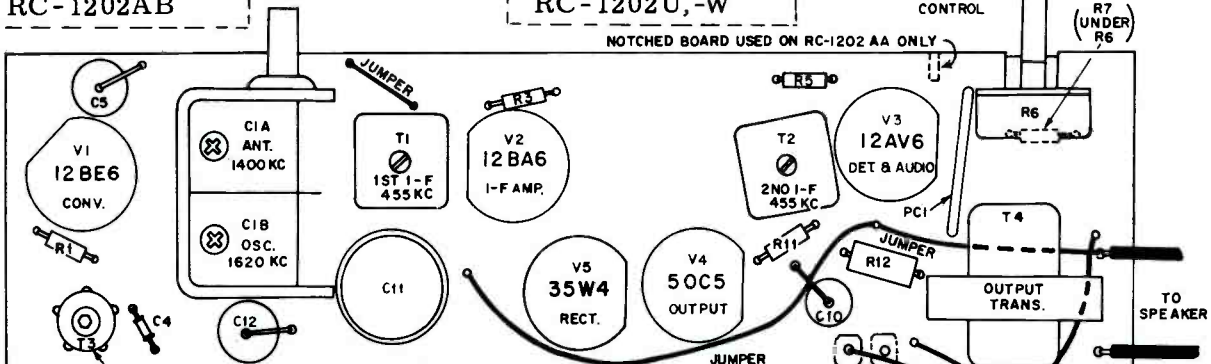


RESISTANCE VALUES ARE IN OHMS. K = 1000
 ALL CAPACITANCE VALUES LESS THAN 1.0 ARE
 IN MF, VALUES 1.0 & ABOVE ARE IN MMF,
 EXCEPT AS NOTED.

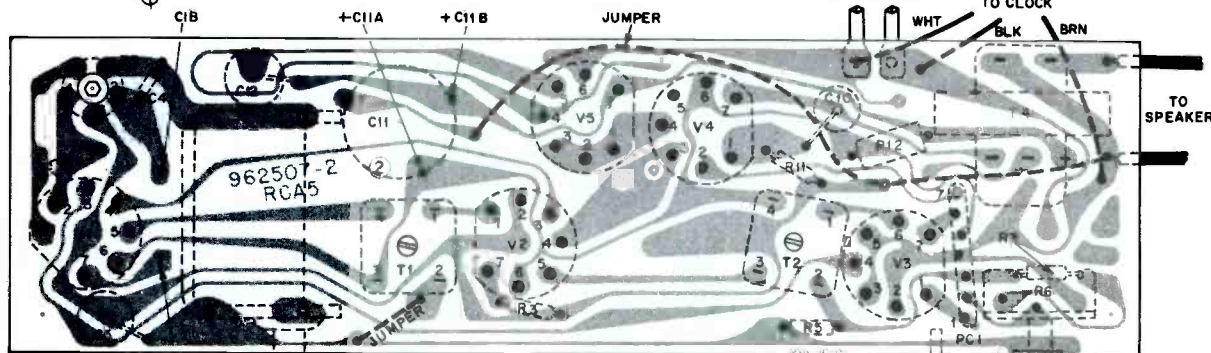
VOLTAGES MEASURED TO COMMON NEGATIVE (⊖)

Differences in
 RC-1202AB

Differences in
 RC-1202U, -W



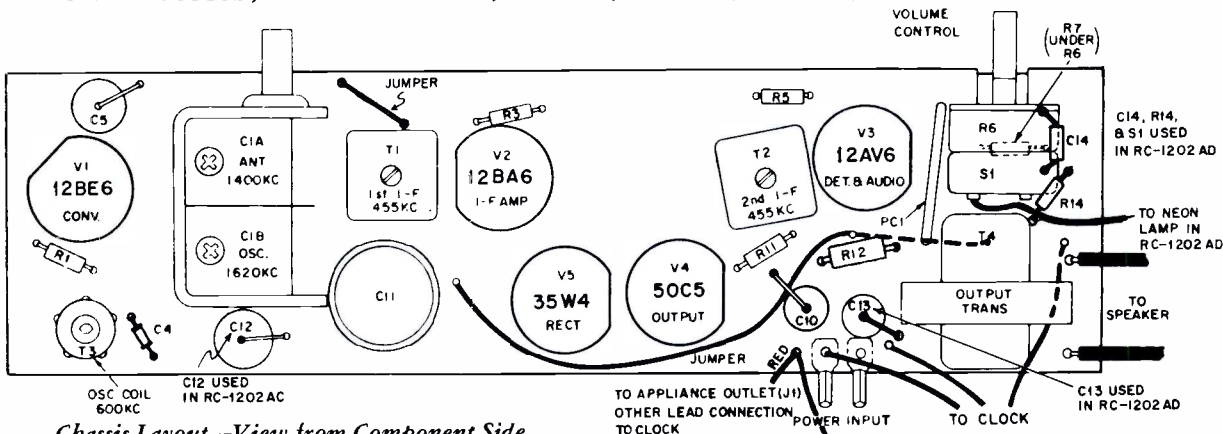
Chassis Layout—View from Component Side



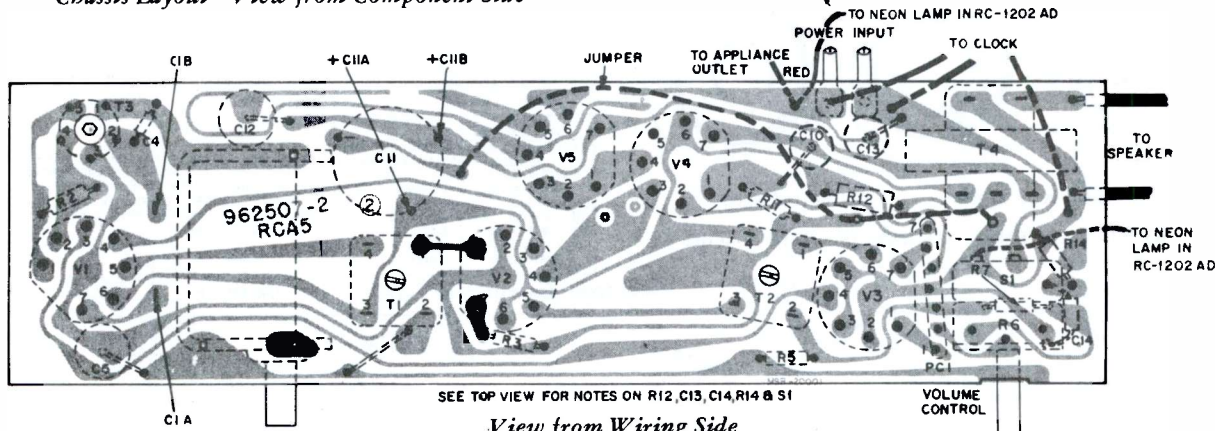
Chassis Wiring and Components—View from Wiring Side

RCA VICTOR

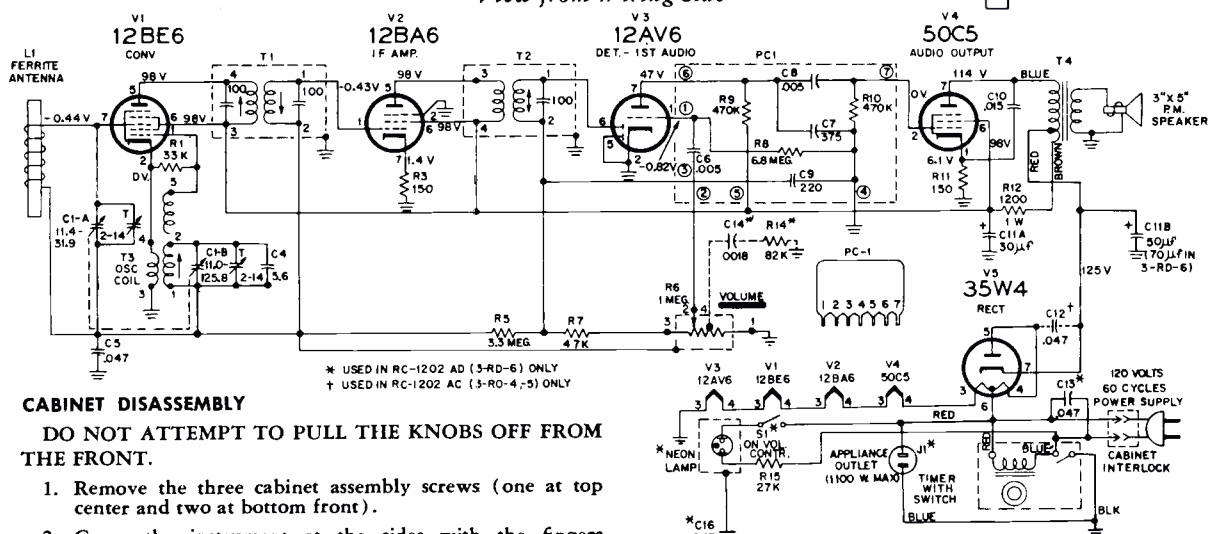
3RD4 Series, Models 3RD40, 3RD41, 3RD45, 3RD49, Chassis RC-1202AC, 3RD5 Series, Models 3RD50, 3RD52, 3RD54, 3RD57, Chassis RC-1202AC, 3RD6 Series, Models 3RD61, 3RD65, 3RD67, 3RD69, Chassis RC-1202AD.



Chassis Layout—View from Component Side



View from Wiring Side



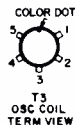
CABINET DISASSEMBLY

DO NOT ATTEMPT TO PULL THE KNOBS OFF FROM THE FRONT.

1. Remove the three cabinet assembly screws (one at top center and two at bottom front).
2. Grasp the instrument at the sides with the fingers extending around the front edge and onto the front.
3. Hold the cabinet face down and shake with a vertical motion until the sections separate. (fingers will catch the front section)
4. Set the instrument upright and complete the removal of the front section from the hood back.

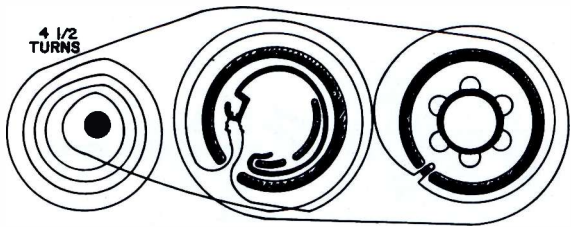
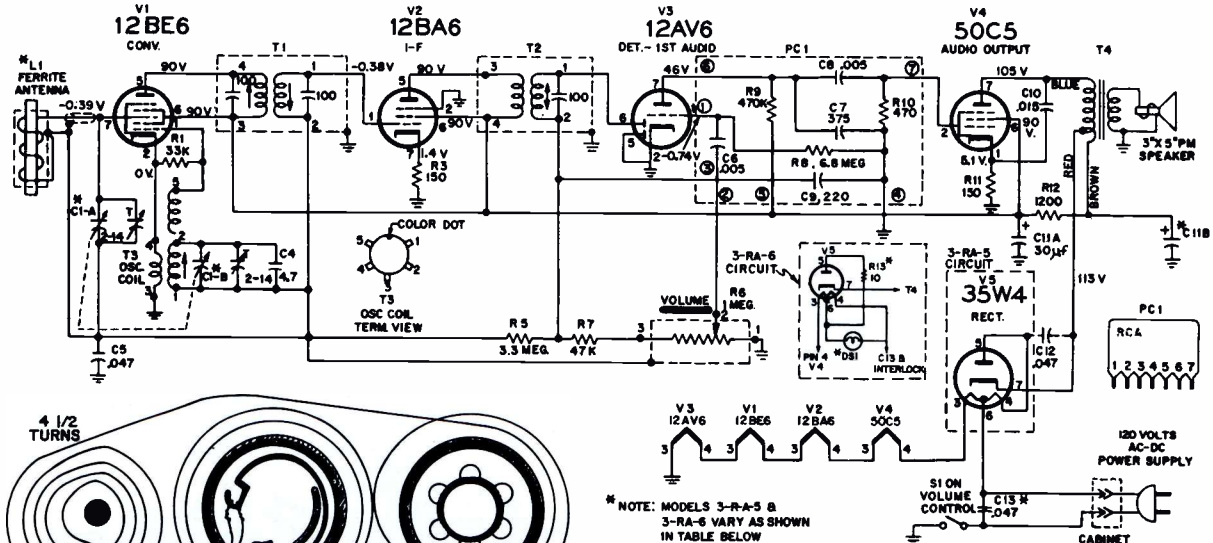
RESISTANCE VALUES ARE IN OHMS K = 1000
ALL CAPACITANCE VALUES LESS THAN 1.0 ARE IN μF, VALUES 1.0 AND ABOVE ARE IN μμF, EXCEPT AS NOTED.

VOLTAGES MEASURED TO COMMON NEGATIVE (⊕) WITH "VOLTOHMYST" AND SHOULD HOLD WITHIN ± 20% WITH RATED LINE VOLTAGE.



RCA VICTOR

3RA5 Series, Models 3RA50, 3RA51, 3RA52, 3RA54, Chassis RC-1202AE,
 3RA6 Series, Models 3RA60, 3RA61, 3RA63, 3RA65, Chassis RC-1202AF.



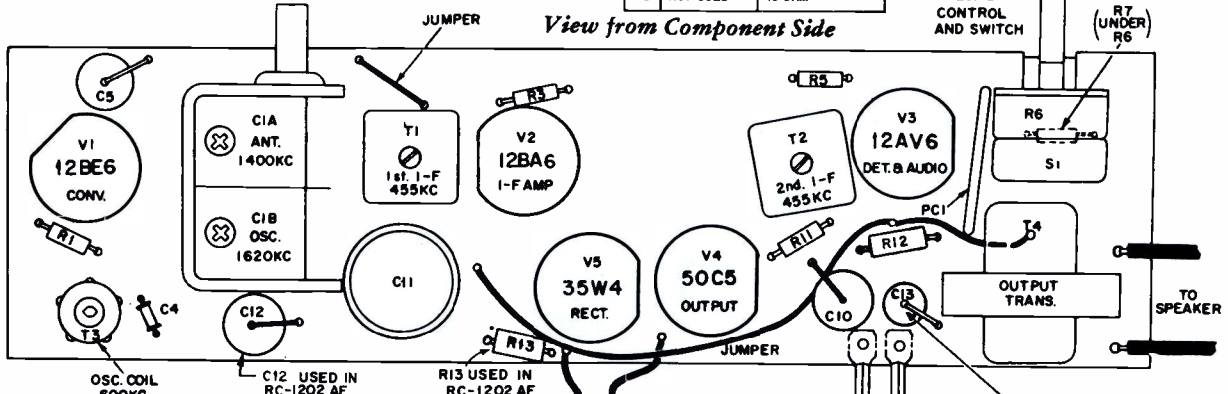
DIAL CORD LENGTH - 30" TO LOOP ENDS

DO NOT ATTEMPT TO REMOVE THE KNOBS

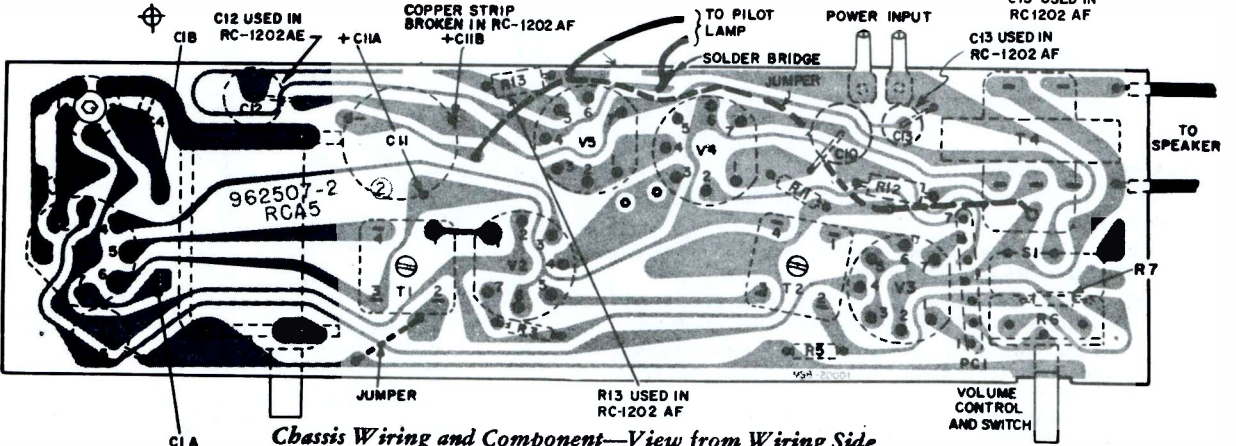
* NOTE: MODELS 3-RA-5 & 3-RA-6 VARY AS SHOWN IN TABLE BELOW

	3-RA-5 RL-1202 AE	3-RA-6 RL-1202 AF
L1	FERRITE ROD	"FILTERAMIC" (SHIELD IS ON "FILTERAMIC ONLY")
C1-A	13.4-312.9	(5.2-396.4
C1-B	13.0-127.8	112-116.4
C1B	50 μF	70 μF
C12	0.47 μF	NOT USED
C13	NOT USED	0.47 μF
DS1	NOT USED	GE.759
R13	NOT USED	10 OHM

ALL RESISTANCE VALUES IN OHMS. ALL CAPACITANCE VALUES LESS THAN 1.0 IN μF. VALUES ABOVE 1.0 IN μF UNLESS OTHERWISE INDICATED. VOLTAGES MEASURED TO COMMON NEGATIVE (⊖) WITH "VOLTOMYST" AND SHOULD HOLD WITHIN ± 20% WITH 120 VOLT INPUT.



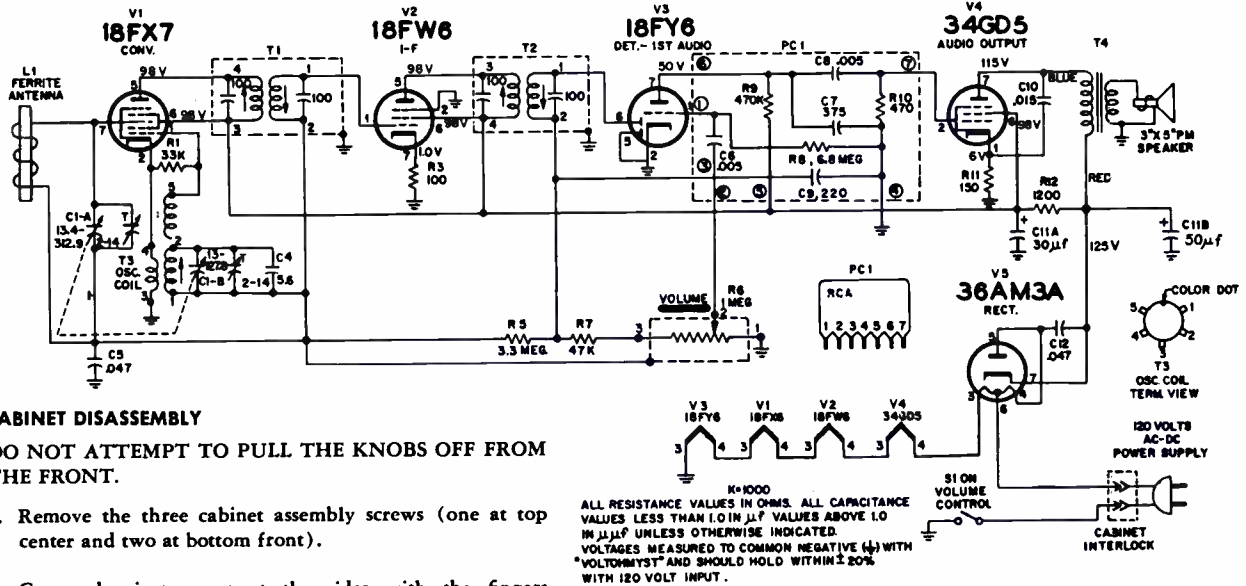
View from Component Side



Chassis Wiring and Component—View from Wiring Side

RCA VICTOR

3RA3 Series, Models 3RA30, 3RA31, 3RA32, 3RA34, Chassis RC-1202AH



CABINET DISASSEMBLY

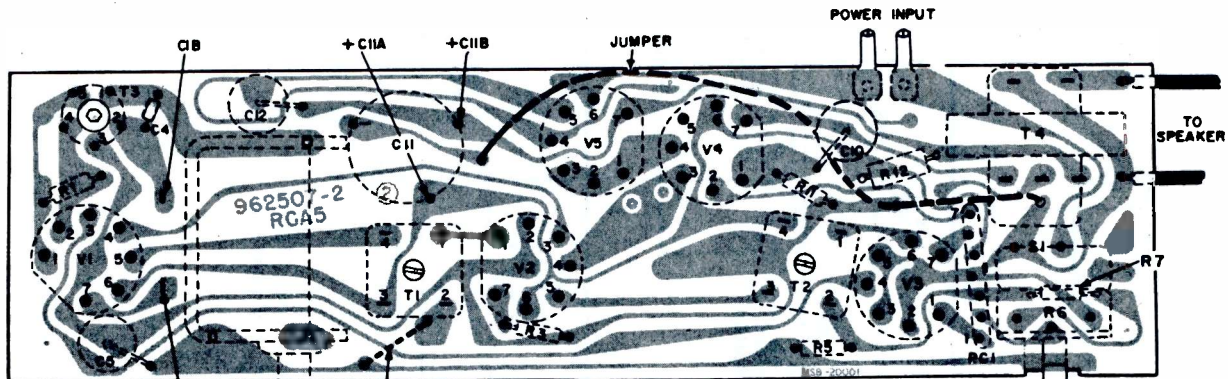
DO NOT ATTEMPT TO PULL THE KNOBS OFF FROM THE FRONT.

1. Remove the three cabinet assembly screws (one at top center and two at bottom front).
2. Grasp the instrument at the sides with the fingers extending around the front edge and onto the front.
3. Hold the cabinet face down and shake with a vertical motion until the sections separate. (fingers will catch the front section)
4. Set the instrument upright and complete the removal of the front section from the hood back.

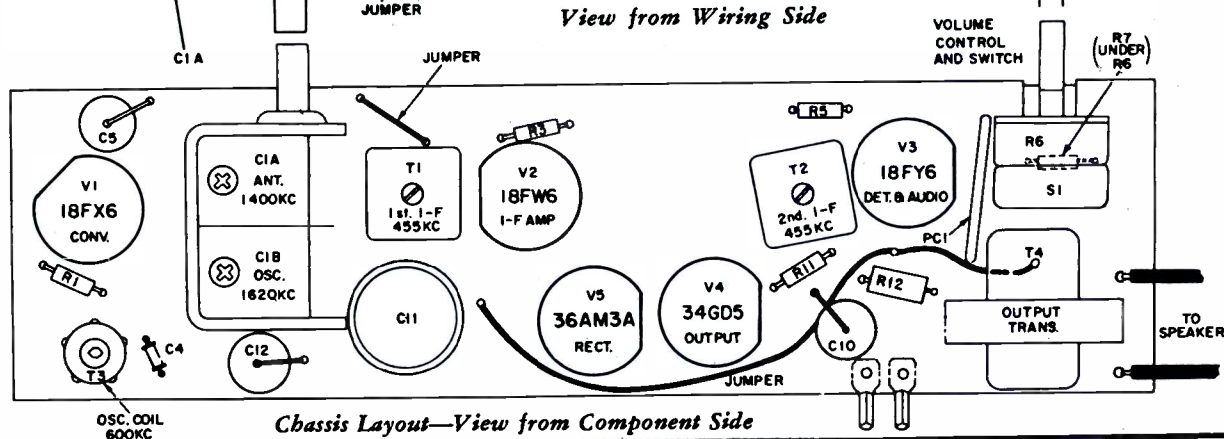
ALL RESISTANCE VALUES IN OHMS. ALL CAPACITANCE VALUES LESS THAN 1.0 IN μ F VALUES ABOVE 1.0 IN μ F UNLESS OTHERWISE INDICATED. VOLTAGES MEASURED TO COMMON NEGATIVE (⊖) WITH "VOLTOHMYST" AND SHOULD HOLD WITHIN \pm 20% WITH 120 VOLT INPUT.

CAPTIVE CONTROL KNOBS

The control knobs of this instrument are held captive to the cabinet by means of retaining clips on the knob shafts inside of the cabinet. If it should become necessary to unmount the chassis, the chassis should be pulled out of the knobs.



View from Wiring Side

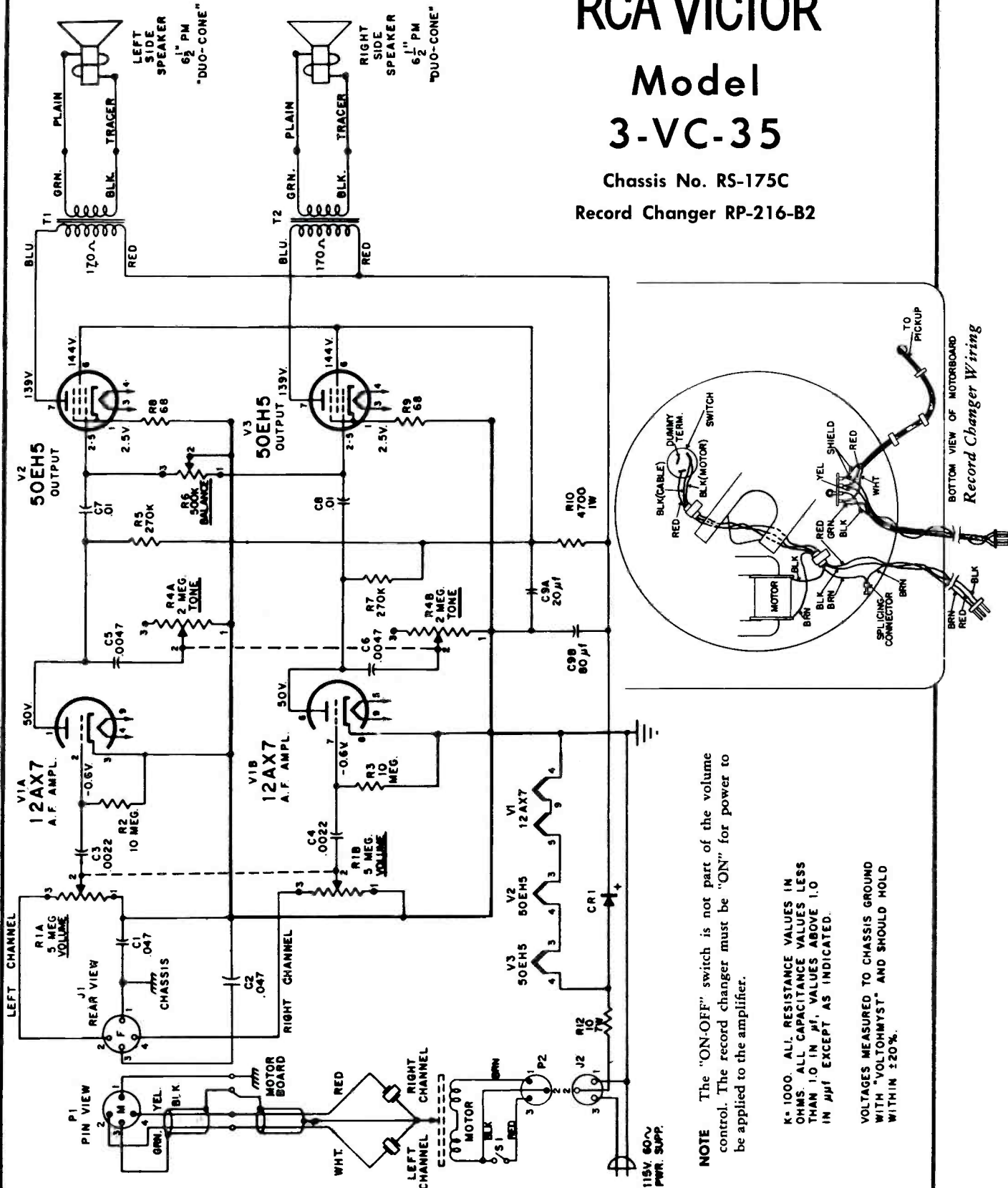


Chassis Layout—View from Component Side

RCA VICTOR

Model 3-VC-35

Chassis No. RS-175C
Record Changer RP-216-B2



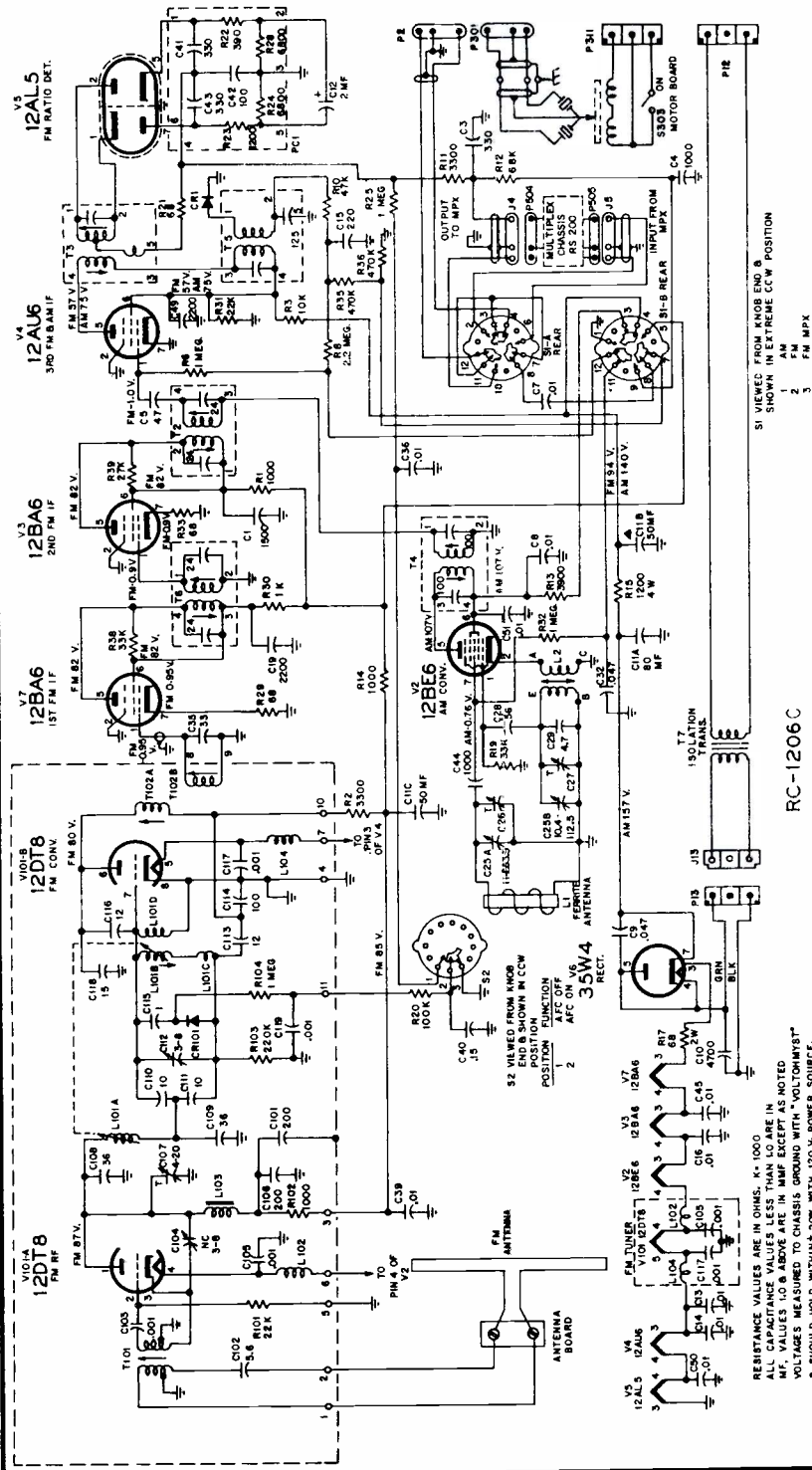
NOTE The "ON-OFF" switch is not part of the volume control. The record changer must be "ON" for power to be applied to the amplifier.

K = 1000. ALL RESISTANCE VALUES IN OHMS. ALL CAPACITANCE VALUES LESS THAN 1.0 IN μF. VALUES ABOVE 1.0 IN μF EXCEPT AS INDICATED.

VOLTAGES MEASURED TO CHASSIS GROUND WITH "VOLTHOMYST" AND SHOULD HOLD WITHIN ±20%.

RCA VICTOR

The various models listed at right use Tuner Chassis RC-1206C that has the circuit shown on this page, or Chassis RC-1206F which is very similar. Other service material and FM-Stereo Chassis RS-200C circuit is on the next page, over, and material on Amplifier Chassis RS-193A, B, D, E, F, is on the following page.



- 3-VE-0 Series
- 3-VE-1 Series
- 3-VE-2 Series
- 3-VF-0 Series
- 3-VF-1 Series
- 3-VF-2 Series
- 3-VF-1X Series
- 3-VF-2X Series

Tuner Chassis RC-1206C, F
 FM-Stereo Chassis RS-200C
 Amplifier Chassis
 RS-193A, B, D, E, F

MODEL	NAME	STYLING
3-VE-075	Tenor	Contemporary
3-VE-086	Soprano	Danish
3-VE-04	Barcarolle	Early American
3-VE-105	Bolero	Contemporary
3-VE-106	Bolero	Contemporary
3-VE-107	Bolero	Contemporary
3-VE-205	Largo	Contemporary
3-VE-207	Largo	Contemporary
3-VE-226	Humoresque	Danish
3-VE-244	Tanglewood	Early American
3-VF-065	Baritone	Contemporary
3-VF-066	Baritone	Contemporary
3-VF-105	Bolero	Contemporary
3-VF-105X	Bolero	Contemporary
3-VF-106	Bolero	Contemporary
3-VF-106X	Bolero	Contemporary
3-VF-107	Bolero	Contemporary
3-VF-107X	Bolero	Contemporary
3-VF-205	Largo	Contemporary
3-VF-205X	Largo	Contemporary
3-VF-207	Largo	Contemporary
3-VF-207X	Largo	Contemporary
3-VF-226	Humoresque	Danish
3-VF-226X	Humoresque	Danish
3-VF-244	Tanglewood	Early American
3-VF-244X	Tanglewood	Early American

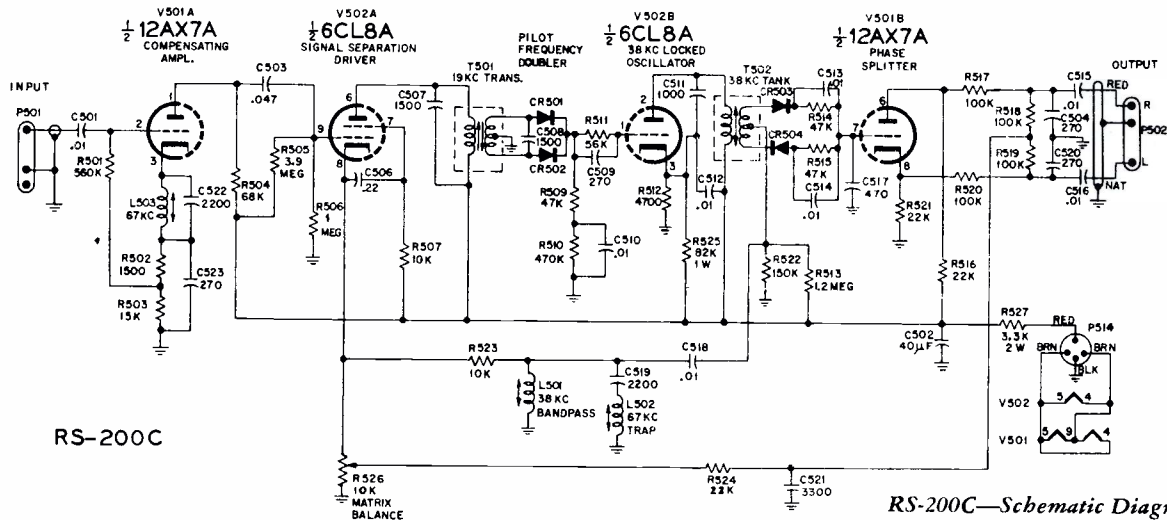
(See related material on the next two pages.)

RCA VICTOR

3-VE-0, -1, -2 Series
3-VF-0, -1, -1X, -2, -2X Series

(Continued)

RS-200C Schematic Diagram and other Service Information on RC-1206C, F, etc.



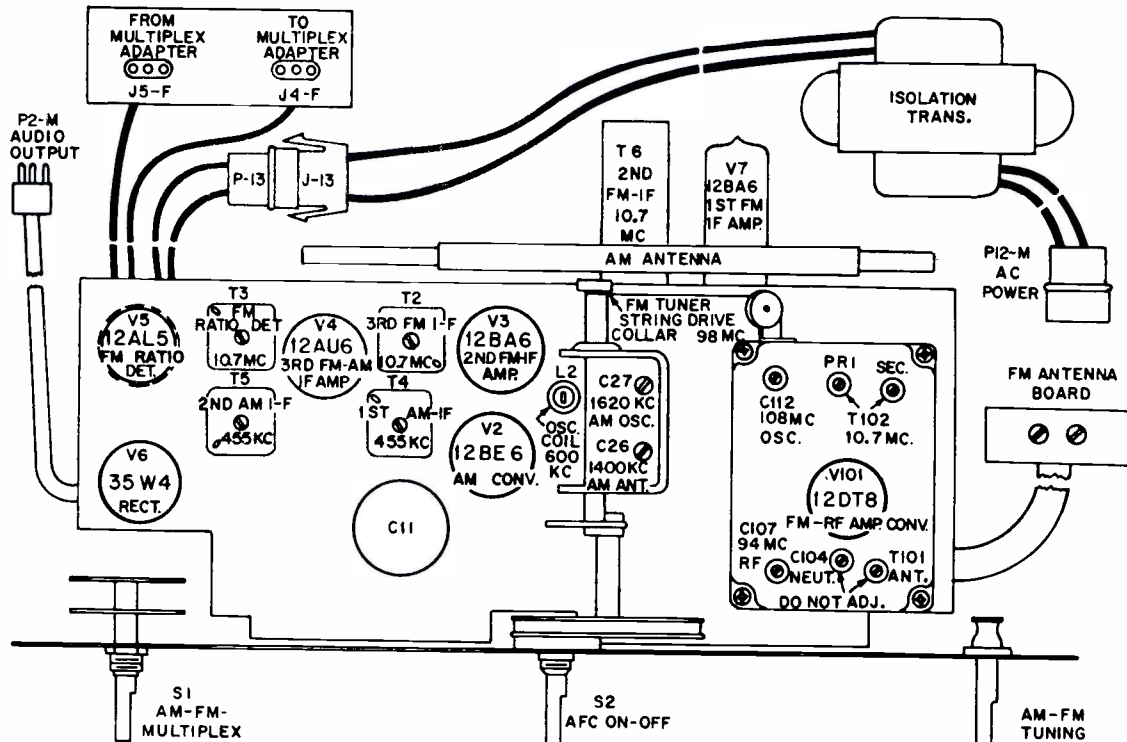
CRITICAL LEAD DRESS

Chassis RC-1206C, F

- 10.7 mc IF grid and plate wiring must be short and dressed close to chassis.
- Connect AVC side of AM antenna to top side of tuning gang, and dress clear of 12BE6 and 12BA6 tubes.
- Dress heater lead which connects to pin 4 of 12BE6 along rear apron and to rear of 12BA6 socket.
- B+ lead from pin 6 of 12BE6 to T4 must be short and dressed along chassis.
- All RF bypass capacitor leads must be short and direct.
- All heater leads must be close to chassis.

Chassis RS-193A, B, D, E, F

- Dress all heater leads close to chassis and away from all grid connections.
- Dress all green and white leads against front apron.
- Dress all leads to pins 6 and 8 of V204(5Y3) close to chassis.
- Dress all leads from T202 and T203 against back apron.
- Dress R8 and R17 (3900Ω) close to back apron keeping leads as short as possible.
- Bend terminal 2 away from terminals 1 and 3 of J211 on RS-193B amplifier.
- Dress leads away from all power resistors.

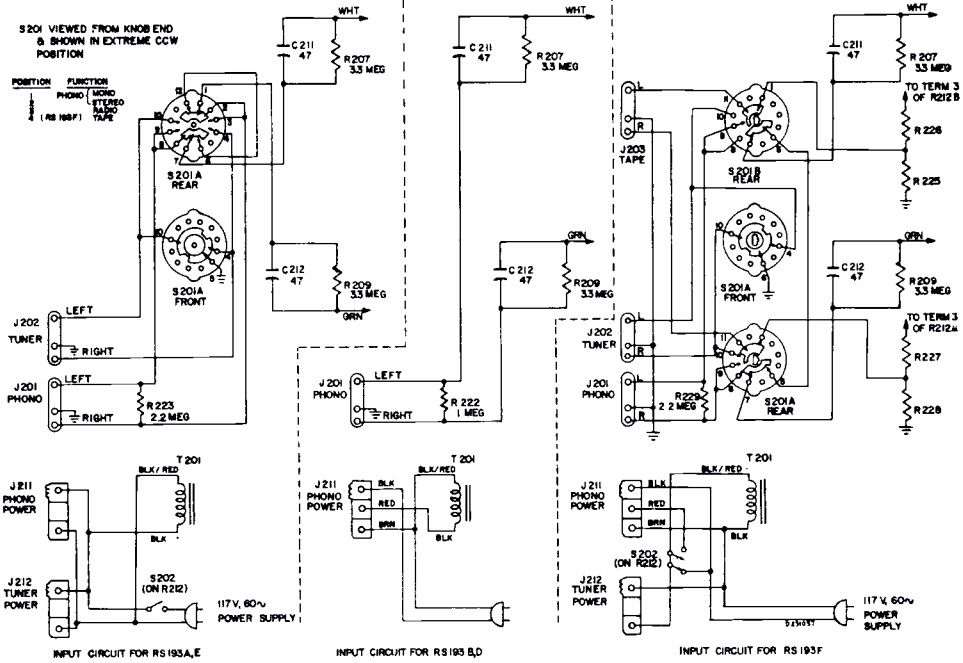


RCA VICTOR

3-VE-0, -1, -2 Series
3-VF-0, -1, -1X, -2, -2X Series

(Continued)

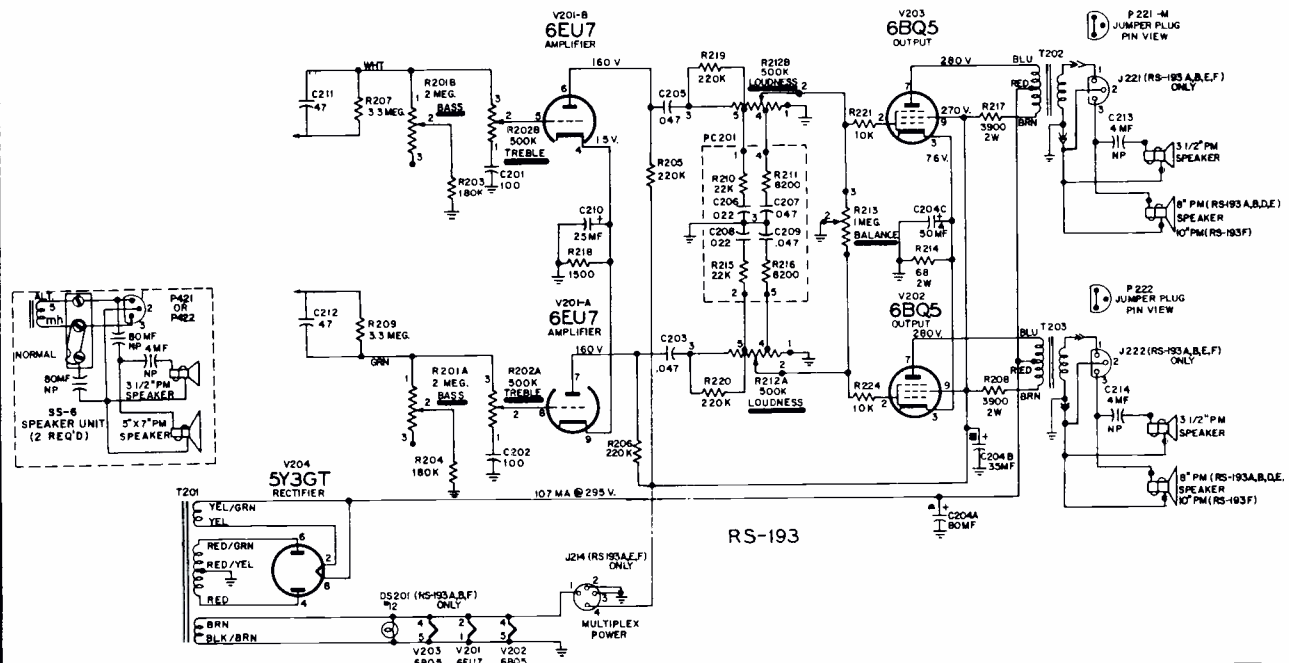
Circuit Diagrams of RS-193A, B, D, E, F, Amplifier Chassis



INPUT CIRCUIT FOR RS-193A,E

INPUT CIRCUIT FOR RS-193B,D

INPUT CIRCUIT FOR RS-193F



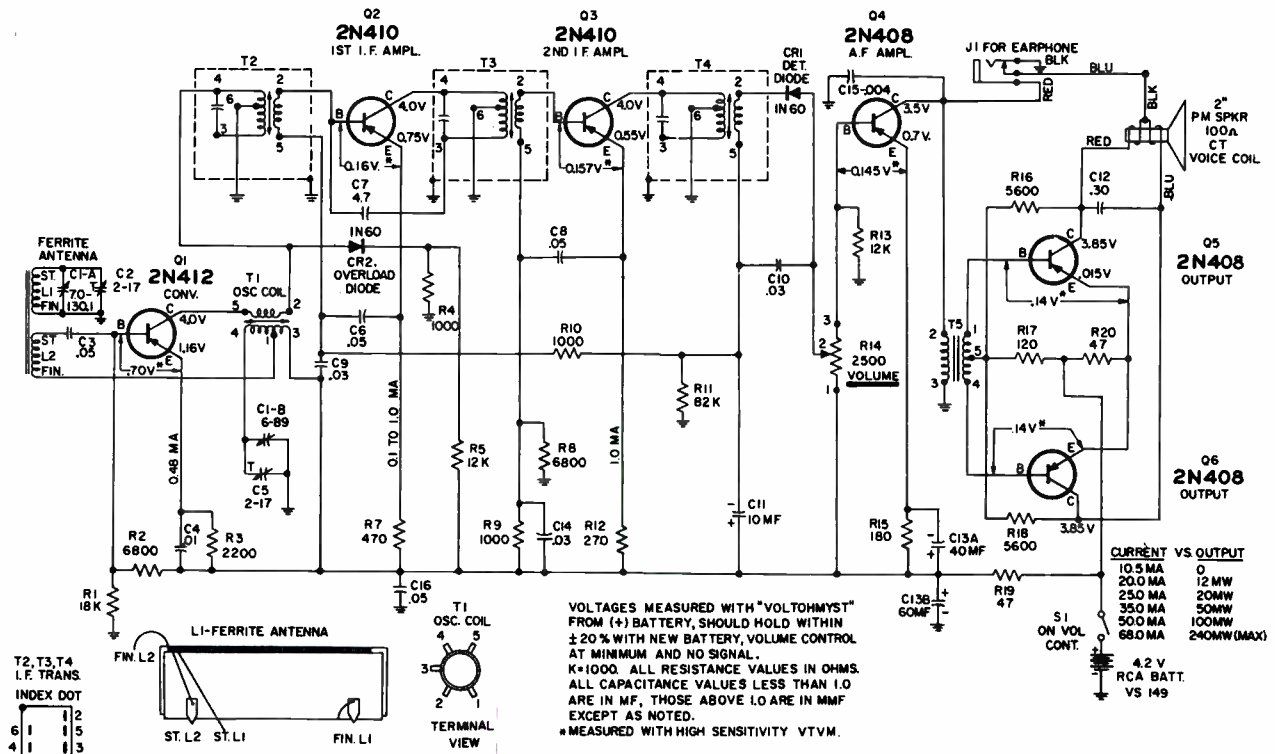
RS-193

MODEL SERIES	TUNER CHASSIS	FM-STEREO CHASSIS	RECORD CHANGER	AMPLIFIER CHASSIS	JACKS PROVIDED FOR CONNECTION OF---				
					TUNER	TAPE	"TOTAL SOUND" SPKRS.	FM-STEREO	PILOT LAMP
3-VE-0	.....	.....	RP-216B-2	RS-193D	.....	.....	.....	.....	.....
3-VE-1	.....	.....	RP-216B-2	RS-193B	.....	.....	Yes	.....	Yes
3-VE-2	.....	.....	RP-216B-1	RS-193F	Yes	Yes	Yes	.....	Yes
3-VF-06	RC-1206F	RS-200C	RP-216B-2	RS-193E	Equipd.	.....	Yes	Equipd.	.....
3-VF-1	RC-1206C,F	.....	RP-216B-2	RS-193A	Equipd.	.....	Yes	Yes	Yes
3-VF-1X	RC-1206F	RS-200C	RP-216B-2	RS-193A	Equipd.	.....	Yes	Equipd.	Yes
3-VF-2	RC-1206C,F	.....	RP-216B-1	RS-193F	Equipd.	Yes	Yes	Yes	Yes
3-VF-2X	RC-1206F	RS-200C	RP-216B-1	RS-193F	Equipd.	Yes	Yes	Equipd.	Yes

RCA VICTOR

3RH1 Series, Model 3RH10; 3RH2 Series, Models 3RH21, 3RH22, Chassis RC-1199D; and 3RH3 Series, Models 3RH31, 3RH32, 3RH34, Chassis RC-1204E, -F, -J.

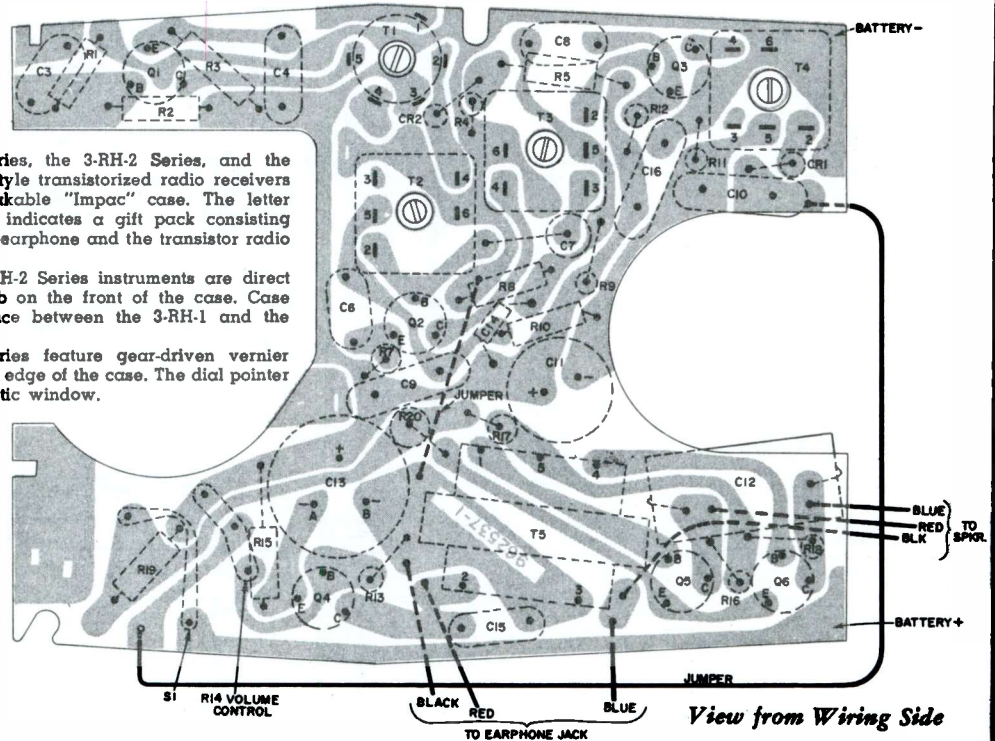
(See next page adjacent at right for alignment and other service data)



Instruments of the 3-RH-1 Series, the 3-RH-2 Series, and the 3-RH-3 Series are small pocket style transistorized radio receivers housed in a two-piece non-breakable "Impac" case. The letter "G" following a model number indicates a gift pack consisting of a carrying case, a battery, an earphone and the transistor radio contained in a gift box.

The 3-RH-1 Series and the 3-RH-2 Series instruments are direct tuned by means of a large knob on the front of the case. Case appearance is the only difference between the 3-RH-1 and the 3-RH-2 Series.

Instruments of the 3-RH-3 Series feature gear-driven vernier tuning with the tuning knob at the edge of the case. The dial pointer is covered by a transparent plastic window.



RCA VICTOR

3RH1 Series, Model 3RH10, 3RH2 Series, Models 3RH21, 3RH22, Chassis RC-1199D, 3RH3 Series, Models 3RH31, 3RH32, 3RH34, Chassis RC-1204E, -F, -J, Continued

(See page adjacent at left for circuit diagram and other service data)

CHASSIS REMOVAL

1. Unsolder the battery spring contacts from the circuit board. DO NOT ATTEMPT TO REMOVE CONTACTS FROM CASE. The battery contacts are heat sealed to the plastic case front.
2. Pull the dial knob off of tuning condenser shaft (3-RH-1, -2 only).
3. Remove the knurled nut holding the earphone jack to the case.
4. Remove the two screws holding the circuit board to the case.
5. Lift up on battery end of chassis. (This will pull tuning capacitor out of dial pointer in 3-RH-3.) Chassis may then be slid out of case.
6. If necessary to separate chassis and speaker, unsolder speaker leads from wiring side of board. AVOID UNSOLDERING LEADS AT SPEAKER TERMINALS SINCE EXCESSIVE HEAT WILL DAMAGE VOICE COIL LEADS.

When reassembling 3-RH-1, -2 Series reverse the above procedure. When reassembling 3-RH-3 Series, the dial window must first be removed. The above procedure is then followed. Finally the dial pointer is placed on the tuning gang shaft and the dial window reinstalled.

CRITICAL LEAD DRESS

1. Dress lead from diode to volume control between speaker magnet and top of battery.
2. Keep leads to earphone jack as short as possible.
3. Dress leads from output transistors to speaker towards the edge of the board (away from speaker pot) so as to provide sufficient room for 0.3 mf capacitor.

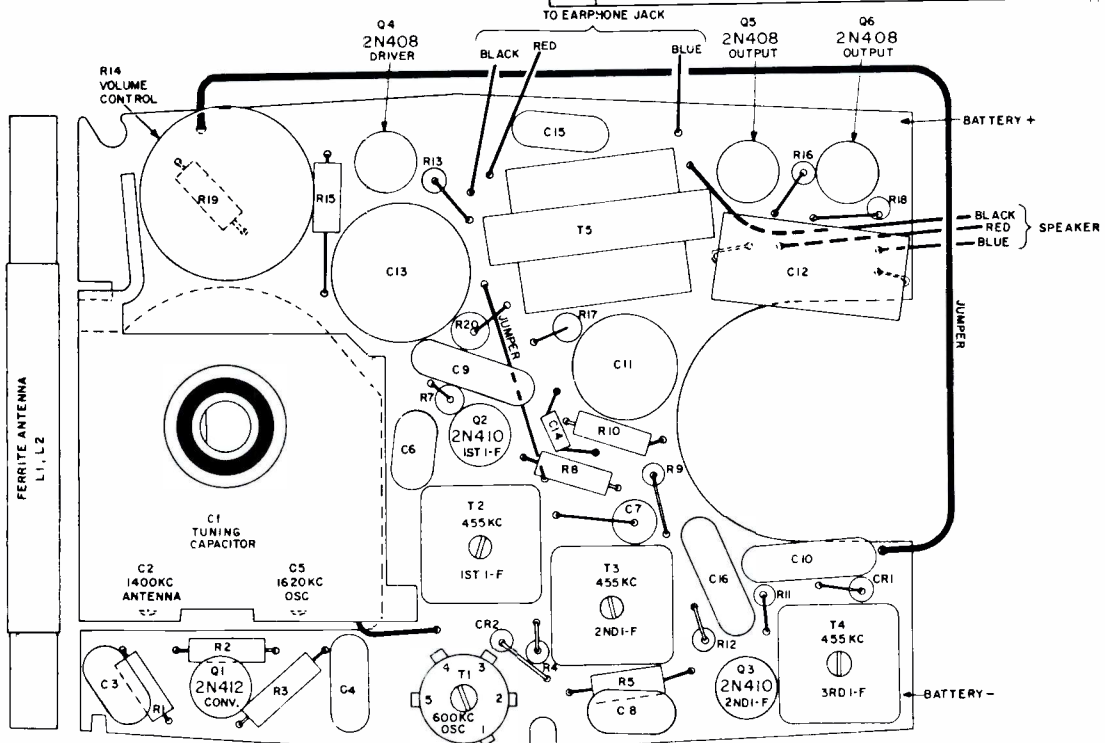
ALIGNMENT PROCEDURE

For all alignment operations, connect the low side of the signal generator to the "common negative" wiring and keep the generator output as low as possible to avoid AVC action.

Connect output meter across voice coil. Clip onto extreme ends of speaker terminals only, to avoid damage to voice coil leads.

Step	Connect High Side of Signal Generator to—	Signal Gen. Output	Dial Pointer Setting	Adjust for Max. Output
1				T4 (3rd I-F)
2	Antenna gang stator CIA thru .01 mf capacitor	455 kc	Gang fully open	T3 (2nd I-F)
3				T2 (1st I-F)
4	Repeat Steps 1, 2, and 3			
5	Short wire placed near antenna for radiated signal	1620 kc	Gang fully open	Oscillator trimmer C5
6		1400 kc	1400 kc (rock gang if necessary)	Antenna trimmer C2
7		600 kc	600 kc (rock gang)	T1 osc. coil
8	Repeat Steps 5, 6, and 7.			

USE PROPER ALIGNMENT TOOL FOR MAKING ADJUSTMENTS. CORES ARE EASILY BROKEN BY IMPROPER HANDLING. MAKING NECESSARY REPLACEMENT OF ENTIRE COIL OR TRANSFORMER.



Chassis Layout—View from Component Side

RCA VICTOR

3RG1 Series, Model 3RG14, Chassis RC-1208C;
 3RG3 Series, Models 3RG31, 3RG32, 3RG33, 3RG34, Chassis RC-1208D;
 3RG6 Series, Models 3RG61, 3RG64, Chassis RC-1208H.

(Continued on the next page adjacent at right where circuit diagrams are shown)

DESCRIPTION

Instruments of the 3-RG-1 Series and the 3-RG-3 Series are pocket style radio receivers which use Chassis RC-1208C (3-RG-1 Series) and RC-1208D (3-RG-3 Series). Both series are housed in vertically styled "Impac" cases which are similar in appearance.

A two-section printed wiring board is used. One section contains the battery clips and the speaker clips (an earphone jack and one capacitor are also on this section in the RC-1208D and RC-1208H Chassis). The second section contains the remaining components. The first section is mounted in the case with the component side down, and the second section is mounted with the component side up.

BATTERY REPLACEMENT

3-RG-1 Series, 3-RG-3 Series

1. Swing easel handle to the front by bringing handle around the bottom of the case. DO NOT FORCE HANDLE AROUND THE TOP AS THIS WILL DAMAGE THE CASE.
2. Insert a coin in the slot on the bottom of the case and twist. This will "snap" the two sections apart.
3. Replace batteries, observing correct polarity.

3-RG-6 Series

1. Unsnap two leather tabs and lift up case back.
2. Replace batteries, observing correct polarity.

EARPHONE CONNECTION

Only a high impedance earphone (2000 ohms) should be connected into the earphone jack. RCA accessory earphone Number RK-299 is recommended.

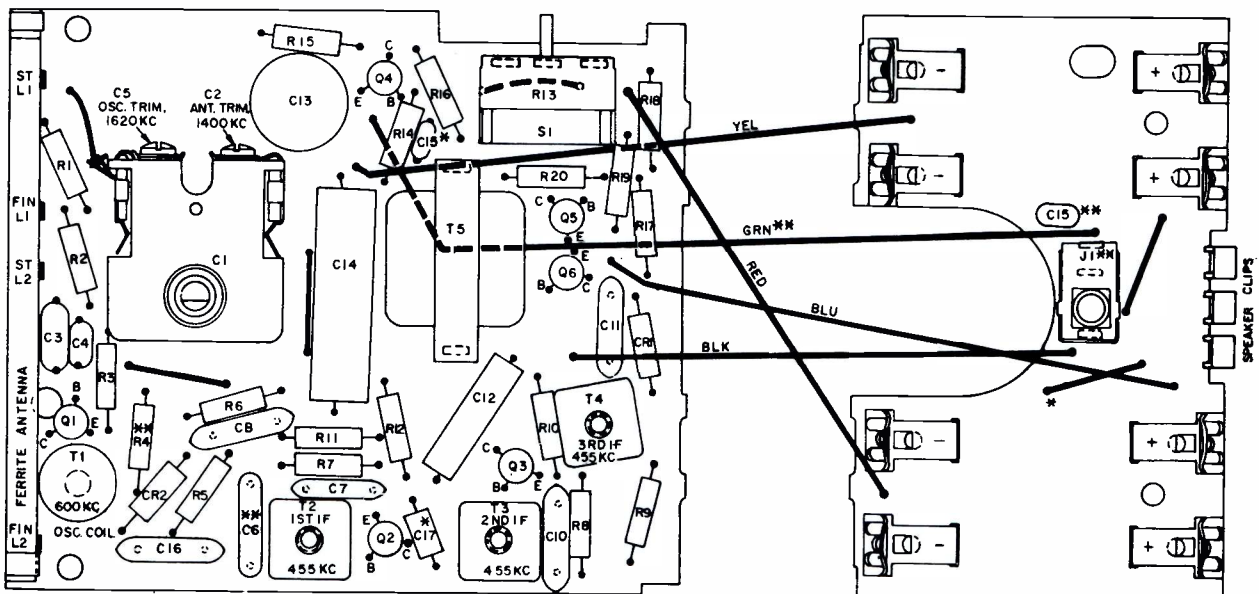
ALIGNMENT PROCEDURE

For all alignment operations, connect the low side of the signal generator to the "common negative" wiring and keep the oscillator output as low as possible to avoid AVC action.

Connect output meter across voice coil. Set volume control at maximum.

USE PROPER ALIGNMENT TOOL FOR MAKING ADJUSTMENTS. CORES ARE EASILY BROKEN BY USE OF AN IMPROPER TOOL, MAKING REPLACEMENT OF ENTIRE COIL OR TRANSFORMER NECESSARY.

Step	Connect High Side of Signal Gen. to—	Signal Gen. Output	Dial Pointer Setting	Adjust for Max. Output
1	Antenna gang stator thru .01 mf capacitor	455 kc	Gang fully open	T4 (3rd I-F)
2				T3 (2nd I-F)
3				T2 (1st I-F)
4	Repeat Steps 1, 2, and 3.			
5	Short wire placed near antenna for radiated signal	1620 kc	Gang fully open	Oscillator trimmer C5
6		1400 kc	1400 kc (rock gang if necessary)	Antenna trimmer C2
7		600 kc	600 kc (rock gang)	T1 osc. coil
8	Repeat Steps 5, 6, and 7.			



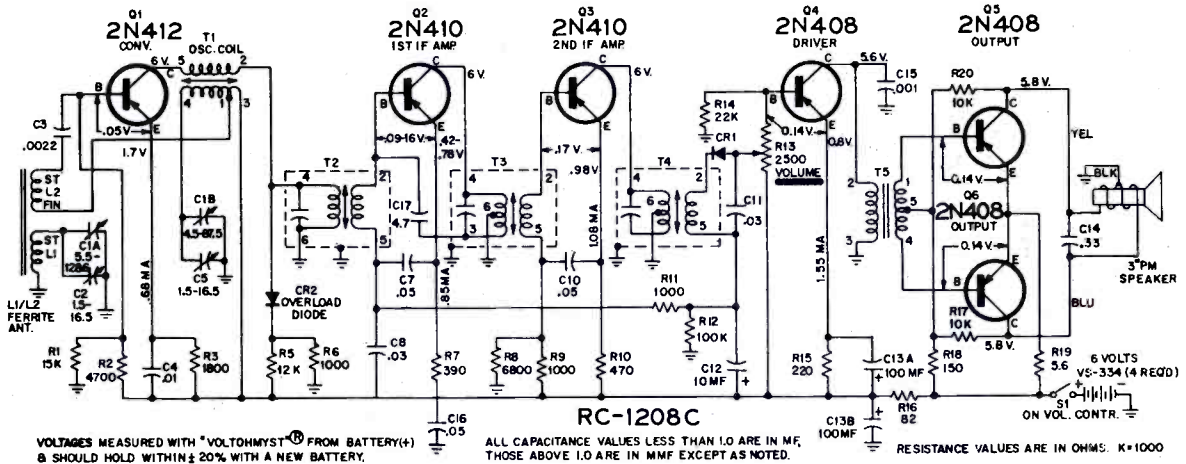
* USED ON RC-1208C ONLY
 ** USED ON RC-1208D & RC-1208H

Chassis Layout—View from Component Side (Removed from Case)

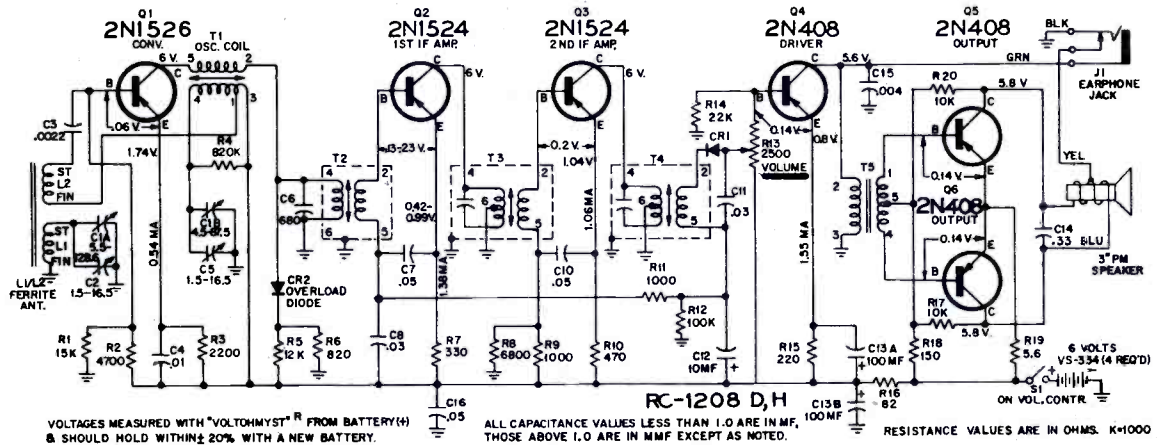
RCA VICTOR

3-RG-1 Series, 3-RG-3 Series, 3-RG-6 Series

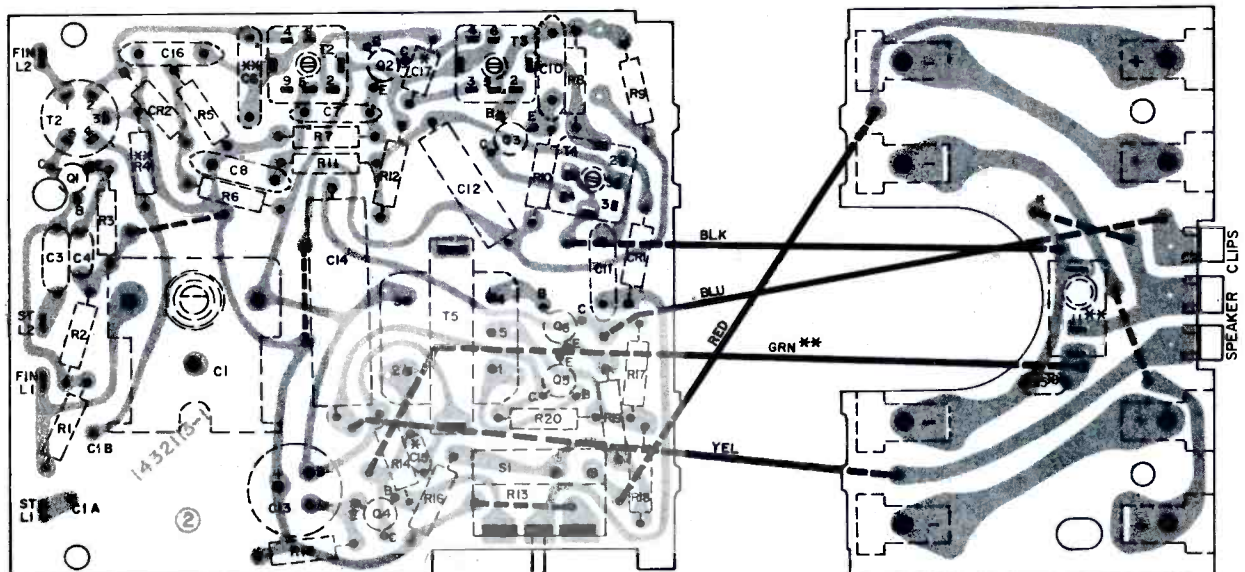
(Continued from preceding page)



Schematic Diagram—3-RG-1 Series



Schematic Diagram—3-RG-3 Series and 3-RG-6 Series

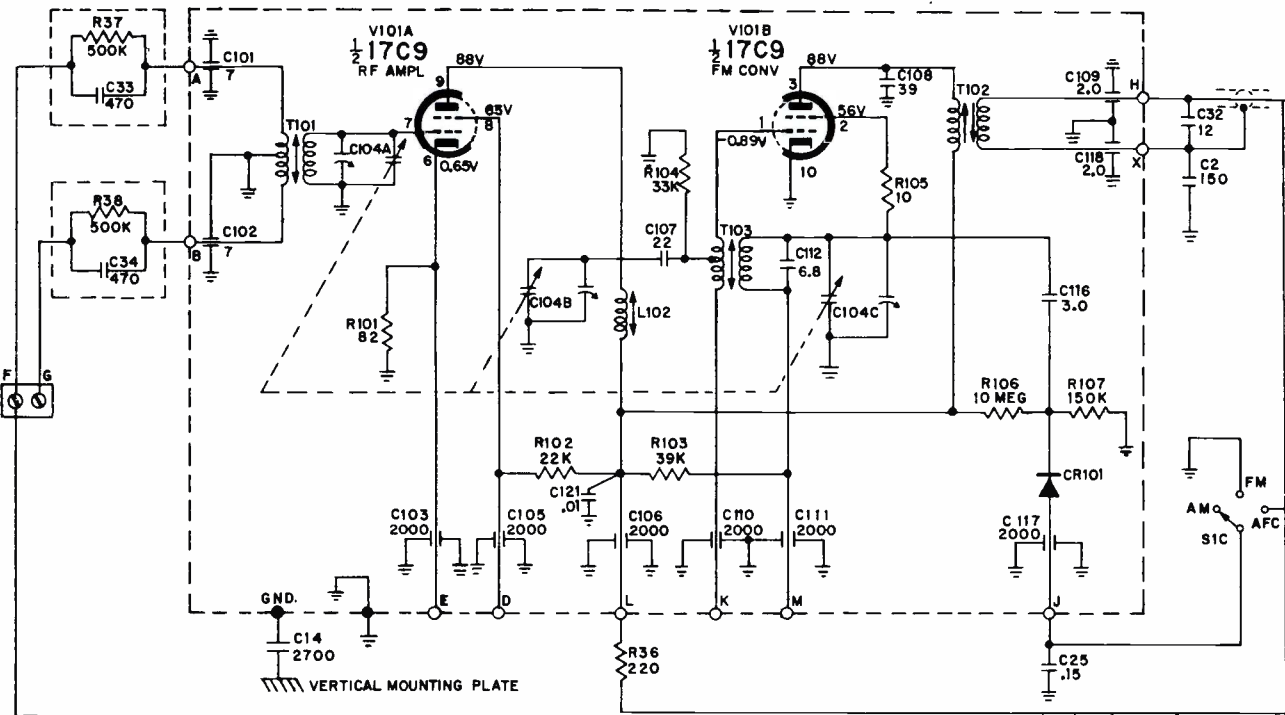


* USED ON RC1208C ONLY
** USED ON RC-1208D & RC-1208H

Chassis Wiring and Components—View from Wiring Side (Removed from Case)

RCA VICTOR

3RC4, 3RC5, 3RC7 Series, Chassis RC-1209A, -B, -C,
 Models 3RC41, 3RC42, 3RC44, 3RC51, & 3RC76.
 (Continued on the next page adjacent at right)

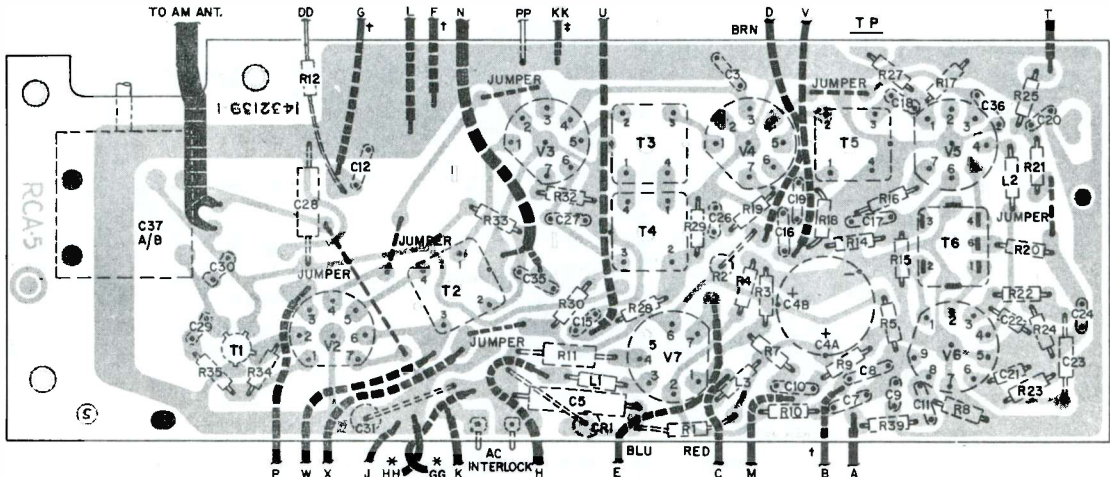
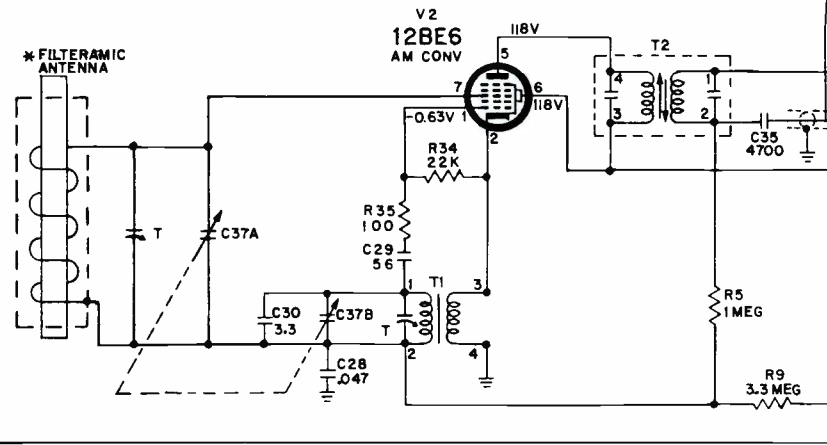


K=1000.

ALL RESISTANCE VALUES IN OHMS.

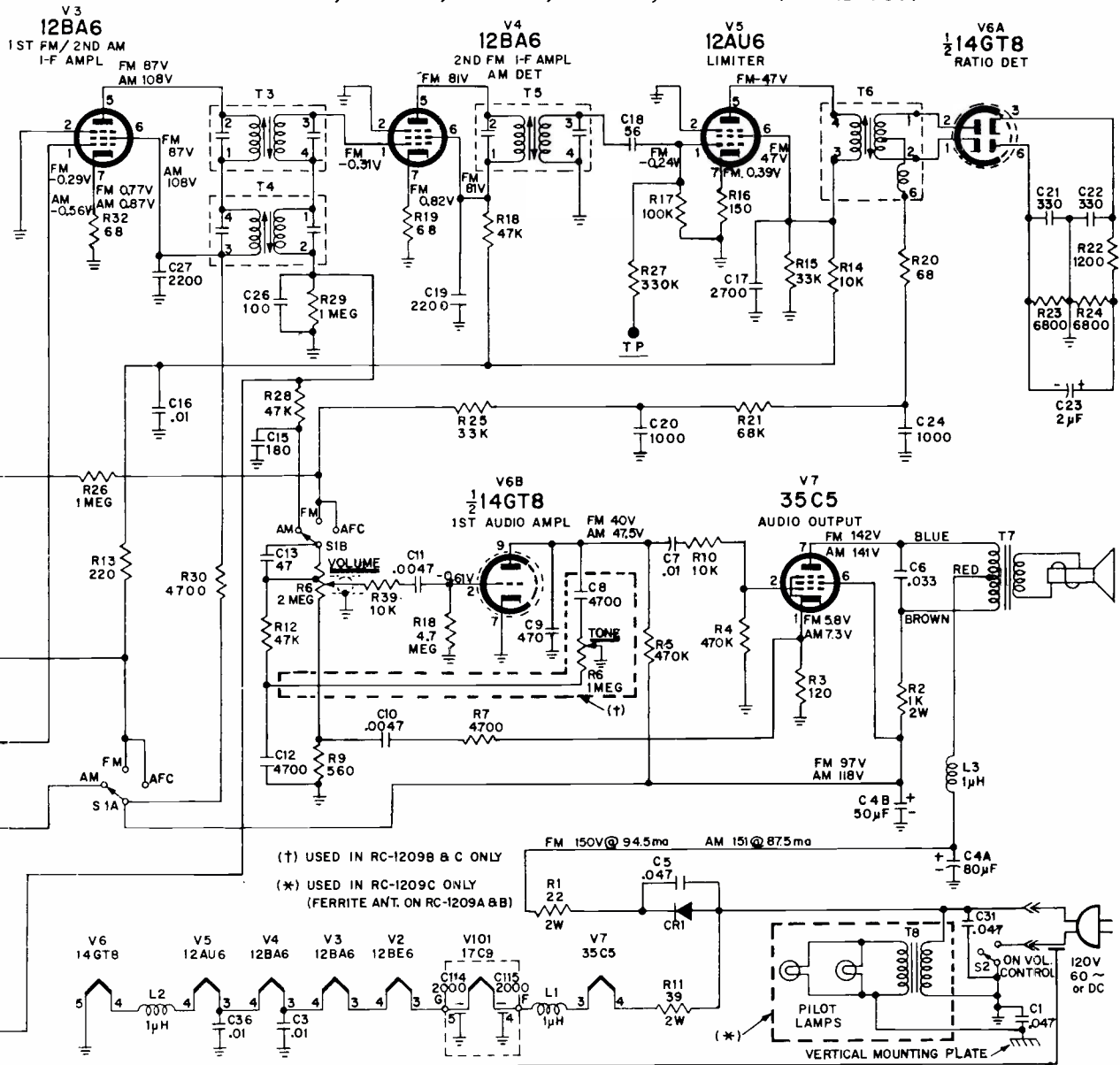
ALL CAPACITANCE VALUES LESS THAN 1.0 IN μF ; VALUES ABOVE 1.0 IN μM F UNLESS OTHERWISE INDICATED.

VOLTAGES MEASURED TO COMMON NEG. ($\frac{1}{2}$) WITH "VOLTOHMYST" AND SHOULD HOLD WITHIN $\pm 20\%$ WITH 120 VOLT INPUT.



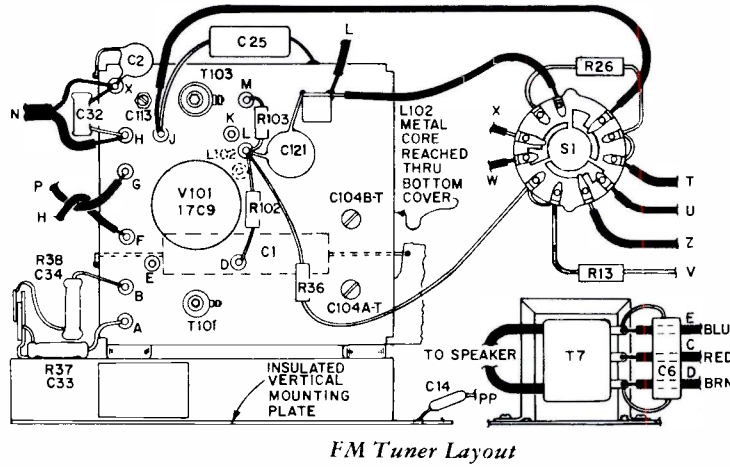
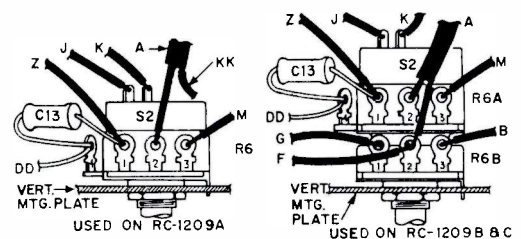
VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

RCA Victor 3RC4, 3RC4, 3RC7 Series, Chassis RC-1209A, -B, -C, Models 3RC41, 3RC42, 3RC44, 3RC51, 3RC76 (Continued)



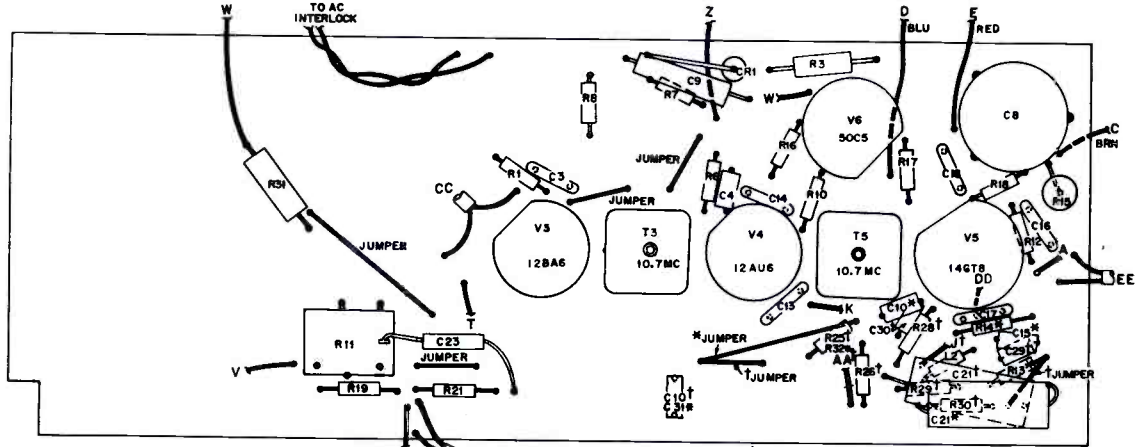
FREQUENCY RANGES	Tuning	IF
AM	530-1620 kc	455 kc
FM	87.5-108.5 mc	10.7 mc

POWER SUPPLY RATING
 RC-1209A, B, 105-125V, 50-60 cy. or DC36 watts
 RC-1209C, 105-125V, 50-60 cycle only40 watts



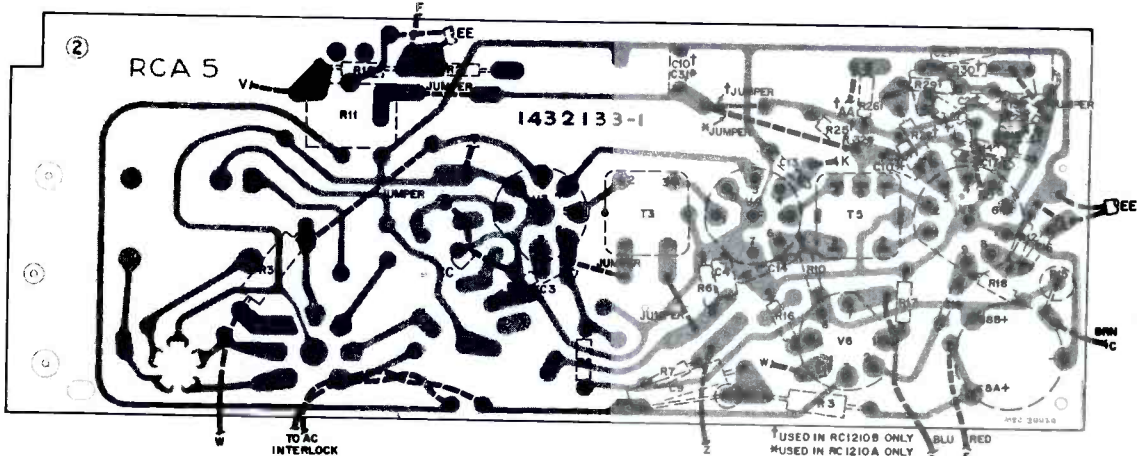
RCA VICTOR

3-RB-1 Series, 3-RB-3 Series (Continued from page at left)



Chassis Layout—View From Component Side

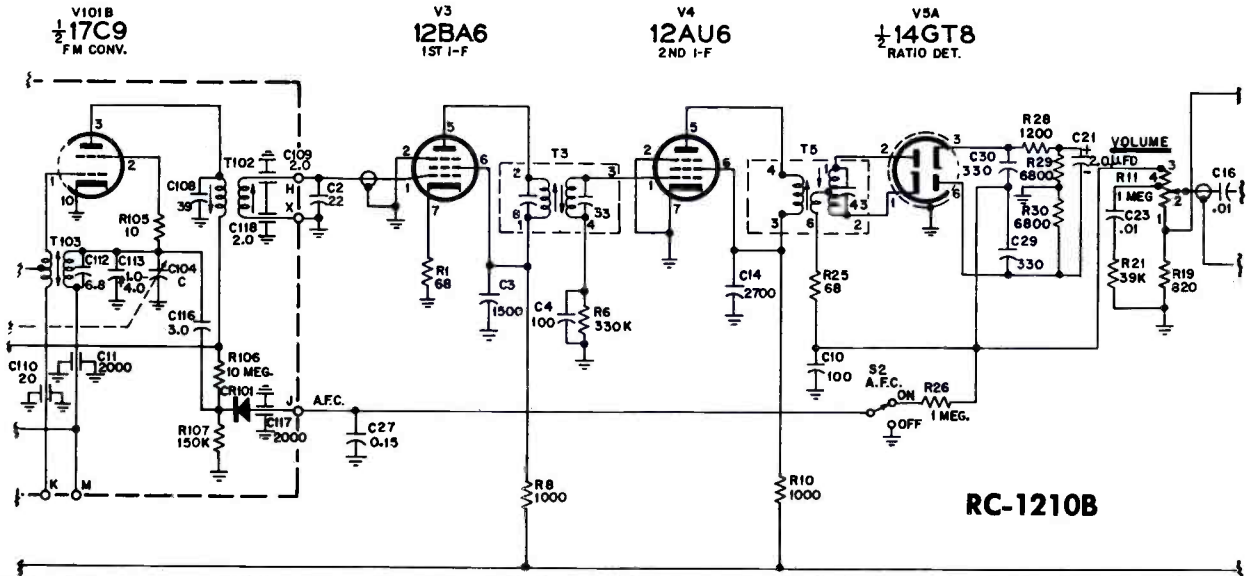
↑ USED IN RC1210B ONLY
* USED IN RC1210A ONLY



Chassis Wiring and Components—View from Wiring Side

↑ USED IN RC1210B ONLY
* THIS CONNECTION IN RC1206B ONLY

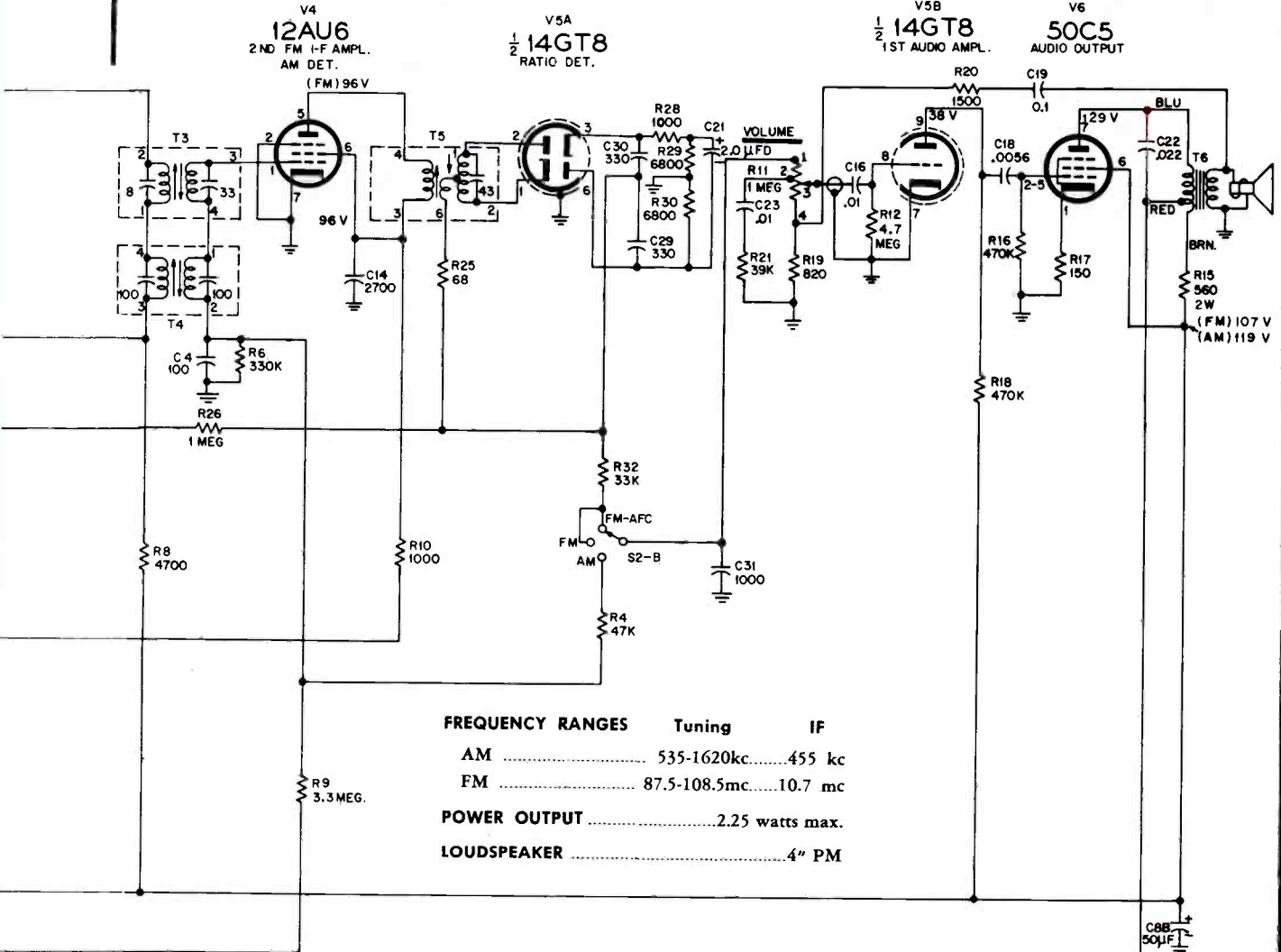
Partial schematic diagram of Chassis RC-1210B, to show differences from RC-1210A



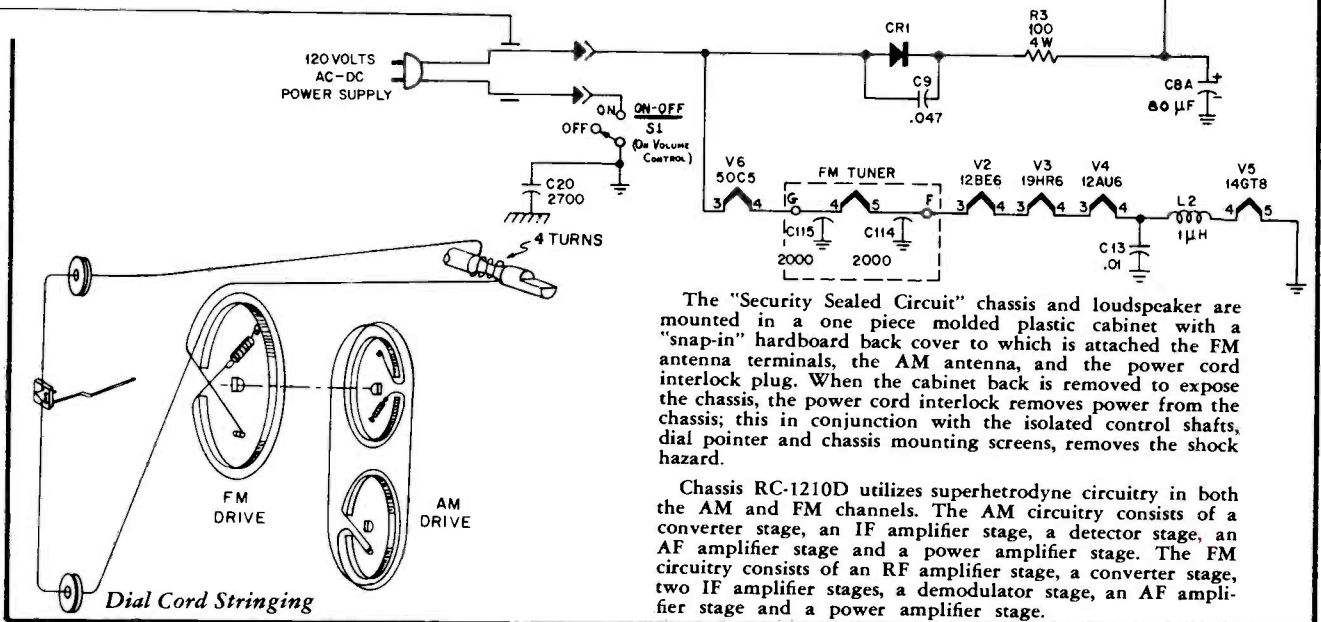
RC-1210B

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

RCA Victor 3RC2 Series, Models 3RC21, 3RC24, Chassis RC-1210D, Continued



FREQUENCY RANGES	Tuning	IF
AM	535-1620kc	455 kc
FM	87.5-108.5mc	10.7 mc
POWER OUTPUT	2.25 watts max.	
LOUDSPEAKER	4" PM	

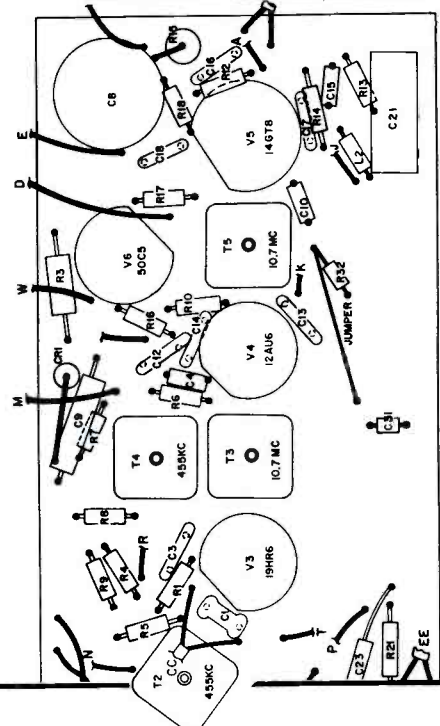
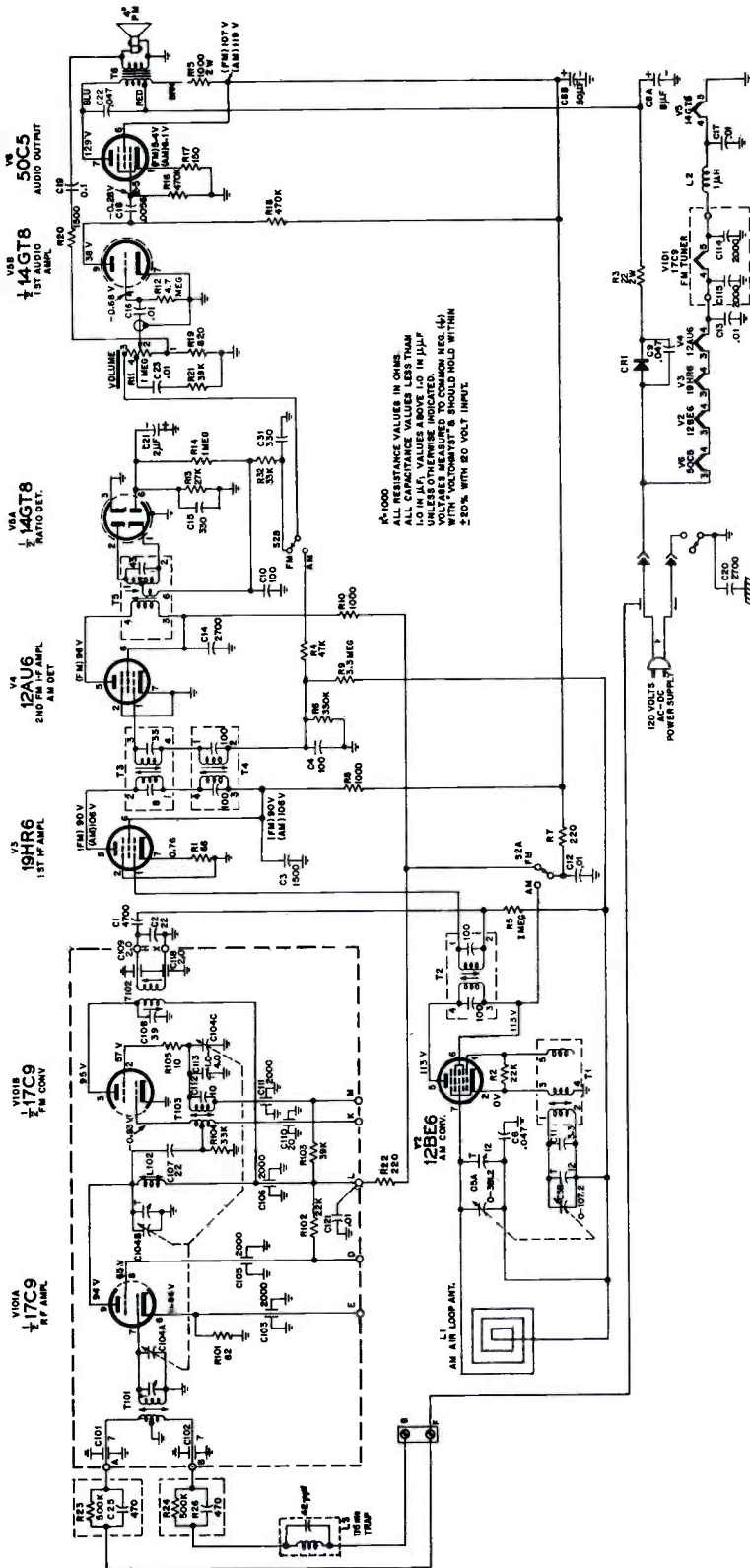


The "Security Sealed Circuit" chassis and loudspeaker are mounted in a one piece molded plastic cabinet with a "snap-in" hardboard back cover to which is attached the FM antenna terminals, the AM antenna, and the power cord interlock plug. When the cabinet back is removed to expose the chassis, the power cord interlock removes power from the chassis; this in conjunction with the isolated control shafts, dial pointer and chassis mounting screens, removes the shock hazard.

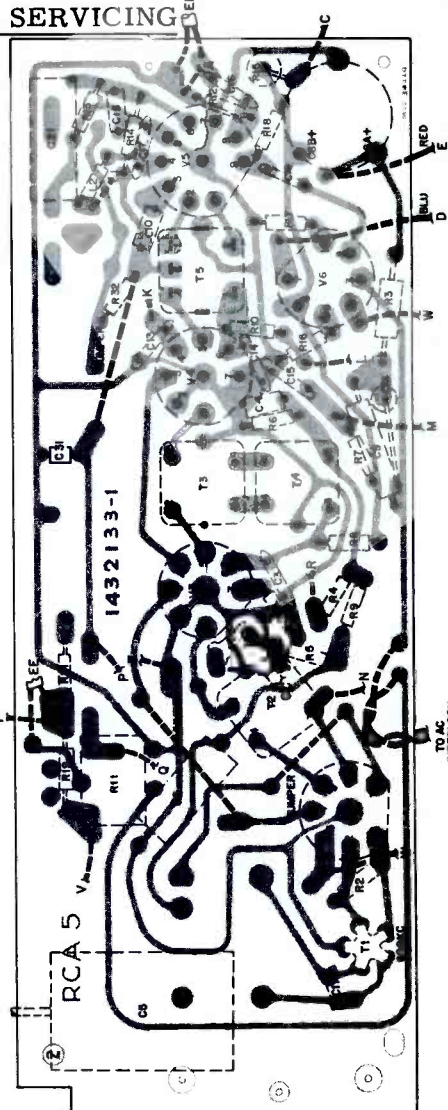
Chassis RC-1210D utilizes superhetrodyne circuitry in both the AM and FM channels. The AM circuitry consists of a converter stage, an IF amplifier stage, a detector stage, an AF amplifier stage and a power amplifier stage. The FM circuitry consists of an RF amplifier stage, a converter stage, two IF amplifier stages, a demodulator stage, an AF amplifier stage and a power amplifier stage.

RCA VICTOR

3RC1 Series,
Models 3RC11, 3RC14,
Chassis RC-1210C



Chassis Layout—View From Component Side



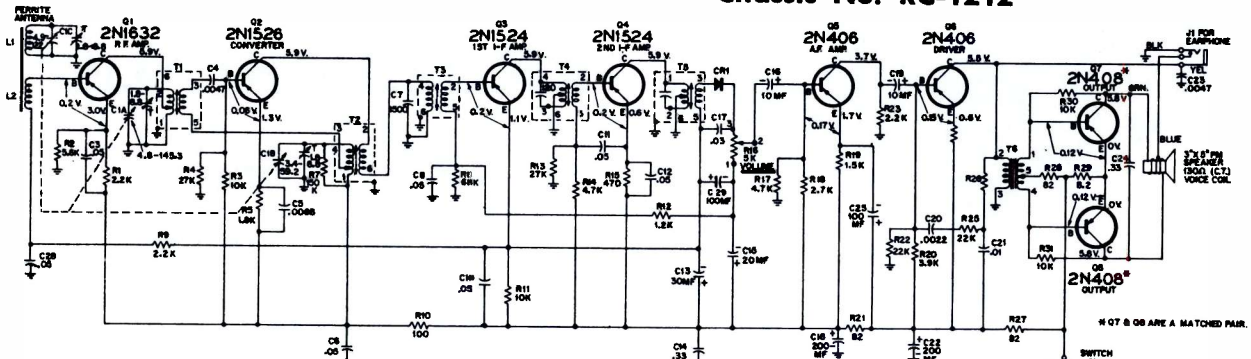
Chassis Wiring and Components—View from Wiring Side

RCA VICTOR

3-RG-8 Series—The "Globe Trotter"

Model 3-RG-81—Chrome/Black

Chassis No. RC-1212



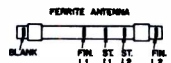
GENERAL ALIGNMENT CONDITIONS

1. Connect output indicator across speaker voice coil.
2. Connect low side of signal source to common ground. (battery negative)
3. Signal input should be kept as low as possible to avoid AGC action (Set output indicator to highest sensitivity)
4. Standard modulation is 400 cycles at 30% amplitude.
5. Volume control should be turned to maximum.



ALL RESISTANCE VALUES ARE IN OHMS. K-1000 CAPACITANCE VALUES LESS THAN 1.0 ARE IN MF. VALUE 1.0 & ABOVE ARE IN MMF EXCEPT AS NOTED. VOLTAGES MEASURED FROM POSITIVE (+) SIDE OF BATTERY.

CURRENT DRAIN VS. AUDIO OUTPUT	MILLIAMPERES	POWER OUTPUT (MILLIWATTS)
1L5	0	0
2S	20	20
3S	40	40
4S	100	100
5S	200	200
6S	300	300
7S	450	450

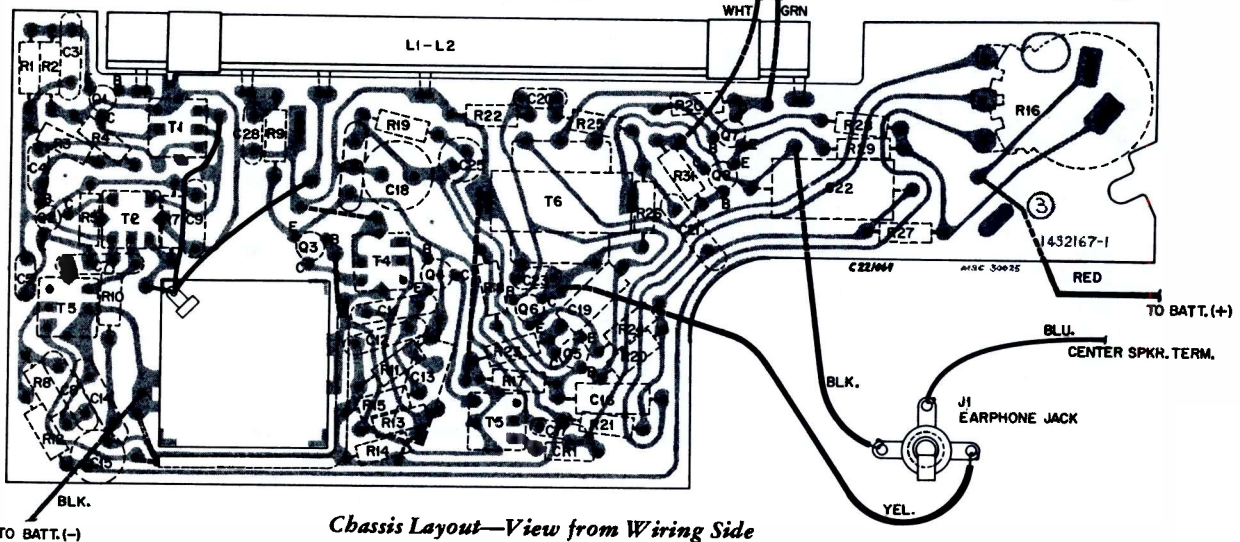
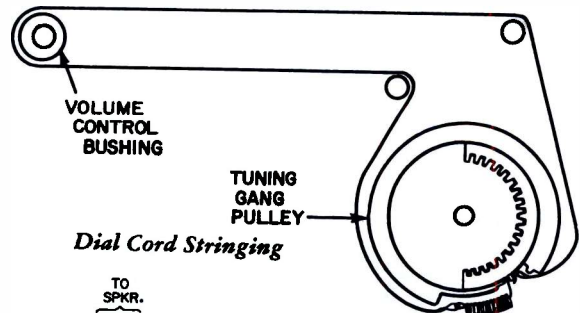


NOTE: CHASSIS MUST BE MOUNTED TO FRONT PANEL WHEN BEING ALIGNED.

Step	Connect Signal Source To—	Set Signal Source To—	Set Radio Dial To—	Adjust— for maximum
1	Stator of CIA (RF gang) through a 0.01 μ f capacitor	455 kc	gang fully open	T5 (3rd IF)
2				T4 (2nd IF)
3				T3 (1st IF)
4	Standard Loop or short wire placed near antenna	1620 kc	1620 kc (gang open)	C1B-T (Osc. Trimmer)
5		1400 kc	1400 kc	C1A-T (RF Trimmer)
6		1400 kc	1400 kc	C1C-T (Ant. Trimmer)
7				T2 (Osc. Coil)
8		600 kc	600 kc (rock gang)	T1 (RF Coil)
9	Repeat above steps as necessary for best sensitivity.			

BATTERY REPLACEMENT

1. Insert a coin in slot located in center of back near bottom, (top of battery compartment cover) and twist. Cover will "snap" out.
2. Replace batteries, observing correct polarity.
3. To replace cover, position the three lugs at the bottom of the cover in the three small slots in the bottom of the case. Press downward and inward on top of cover. Cover will "snap" into place.



Chassis Layout—View from Wiring Side



Figure 1—Model RP-218-1

RCA VICTOR RECORD CHANGER

RP-217 Series RP-218 Series

(Continued below and on the next 17 pages)

SPECIFICATIONS

- TURNTABLE SPEED**.....16 2/3, 33 1/3, 45, or 78 RPM
- RECORD CAPACITY**.....Twelve—10 inch (1/4" centerhole)
 Ten—12 inch (1/4" centerhole)
 Ten—10" and 12" intermixed (1/4" centerhole)
 Ten—7", 10" and 12" intermixed (1/4" centerhole)
 Twelve—7 inch (1 1/2" centerhole)
- 1 1/2" CENTERPOST**....Not interchangeable with previous models.
 The Stabilizer arm must be employed
 when using the 1 1/2" centerpost.
- STYLUS FORCE** (all models except RP-217-3,4) ..4 to 7 grams
- STYLUS FORCE RP-217-3,4**.....9 to 11 grams
- POWER REQUIREMENTS**.....117 volts, 60 cycles AC, 15 watts

Model	Stereo/ Mono	Cartridge	Stylus 78 MG	Turn- table
RP-217-1.....	Stereo	Ceramic	Sapphire-Diamond	12"
RP-217-2.....	Stereo	Ceramic	Sapphire-Sapphire	12"
RP-217-3.....	Mono	Crystal	Sapphire-Sapphire	9"
RP-217-4.....	Stereo	Crystal	Sapphire-Sapphire	9"
RP-218-1.....	Stereo	Ceramic	Sapphire-Diamond	12"

GENERAL DESCRIPTION

The RP-217 and RP-218 series record changers are four-speed mechanisms designed to play in automatic sequence, 7, 10, and 12 inch records. Manual operation is also provided. Records with 1/4 inch centerholes may be intermixed in any sequence of 7 inch, 10 inch and 12 inch diameters. A detachable centerpost is provided for playing records having 1 1/2 inch centerholes.

The pickup arm is coupled to the mechanism through a friction clutch arrangement which permits handling of the pickup arm in or out of cycle without damage to the mechanism. A full 90° lift of the pickup arm is possible for ease of stylus and cartridge replacement.

Record separation is accomplished by means of a push-off finger and shelf at the centerhole of the records. The stabilizer arm must be employed for proper record separation when playing either 1/4 inch or 1 1/2 inch centerhole records.

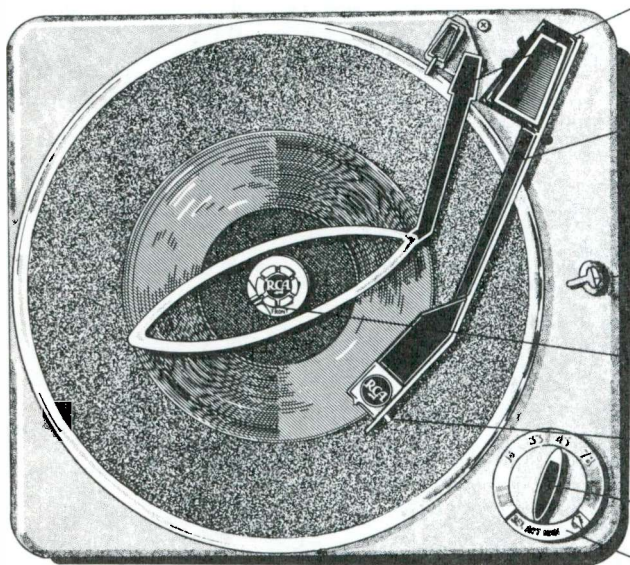


Figure 2—Controls

STABILIZER ARM To load or remove records, lift and turn the stabilizer arm off to the side. After loading, place the stabilizer arm so that it rests on the record stack.

PICKUP ARM May be handled manually when in "MAN" position of function control—the pickup arm returns to the pickup arm rest and the mechanism shuts off automatically after playing the last record.

PICKUP ARM REST Pickup arm may be pressed down on pickup arm rest for positive holding of the pickup arm.

1 1/2" CENTERHOLE SPINDLE Used when playing records having 1 1/2" centerholes.

STYLUS SELECTOR Slide action lever for selecting 78 rpm or MG stylus.

SPEED CONTROL Selects 16 2/3, 33 1/3, 45 or 78 rpm turntable speeds.

FUNCTION CONTROL Provides for selection of "MAN" (manual), "SEL" (select), "AUT" (automatic), and "OFF" positions.

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

CONTROLS

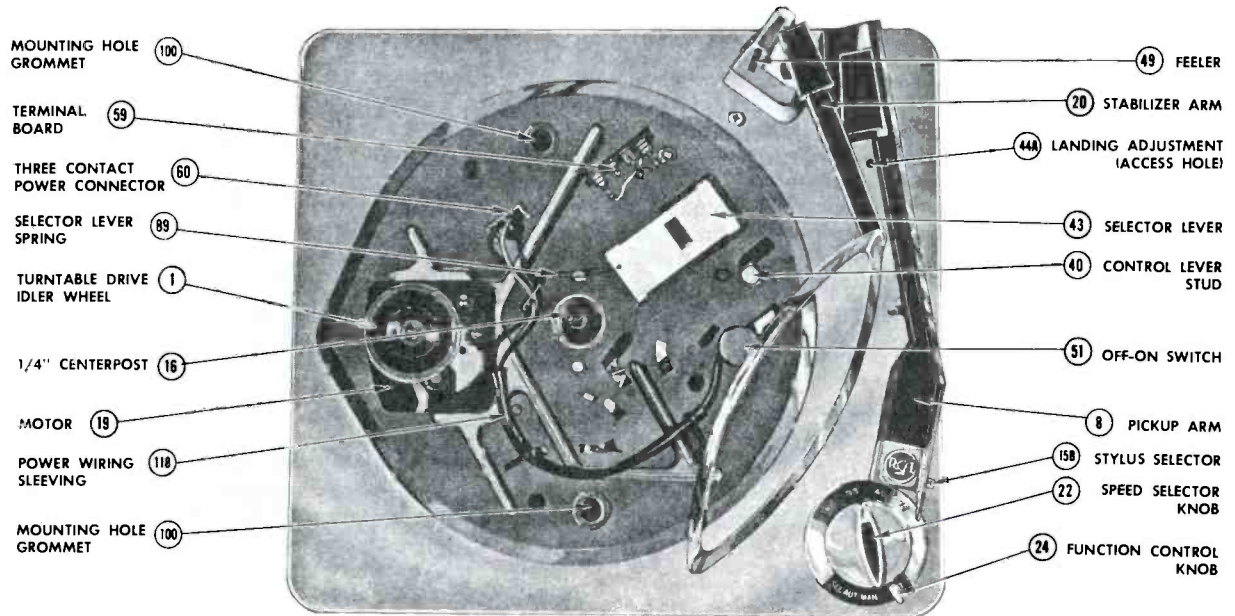


Figure 3—Top View of RP-218 With Turntable Removed

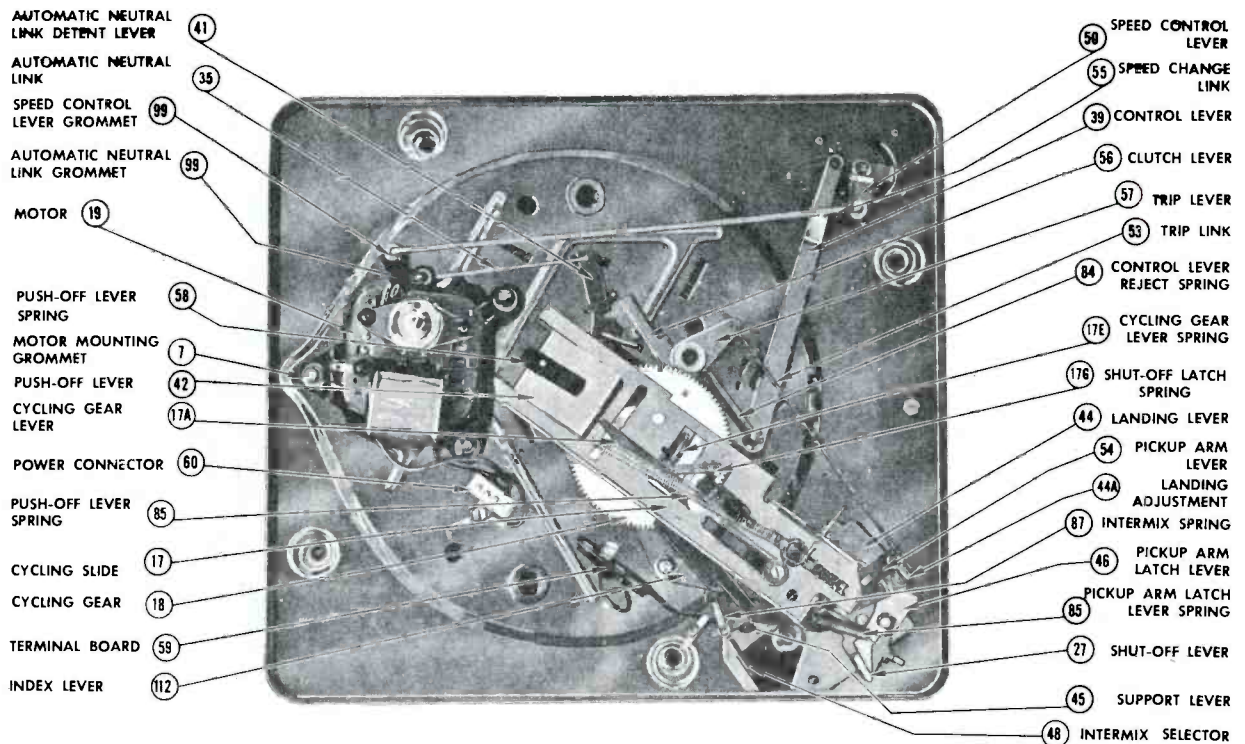


Figure 4—Bottom View of RP-218 Mechanism

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

ADJUSTMENTS

LANDING ADJUSTMENT

The landing position of the stylus is adjusted by means of an eccentric landing adjustment screw. When adjusted for correct landing on one size record (12 inch preferably), the landing position for each of the other two sizes is automatically established.

The landing adjustment screw (44A) is accessible from the underside of the record changer, or through an access hole provided in the motorboard. Disconnect the power cord from the instrument and place a 12 inch record on the centerpost with the stabilizer in place. Turn the function knob to "SEL" and rotate the turntable by hand until the record drops and the stylus is poised above the starting grooves of the record. Then turn the landing adjustment screw so the stylus will land on the record midway between the outer edge and the recorded portion.

Connect the power and cause the mechanism to go through cycle several times while observing the landing position.

Slight "touch up" of this adjustment may be necessary so that the pickup will land correctly for all three record sizes.

HEIGHT ADJUSTMENT

Two height adjustment screws are provided on the RP-217 and RP-218 series mechanisms.

Height adjustment screw (67) on the cycling slide is adjusted with the mechanism OUT OF CYCLE for a gap of from .065" to .075", (about the thickness of a penny) between the landing lever (44) and the pickup arm lever (54).

Height adjustment screw (11) in the pickup arm is adjusted with the mechanism IN CYCLE with the pickup arm at its full height. Adjust the height adjustment screw (11) so that the stylus is 1 3/16 inches above the turntable mat.

These adjustments will prevent the stylus from touching the motorboard out of cycle; and, further, enable the stylus to land properly on a full stack of records.

STYLUS FORCE

There is no adjustment provided for stylus force in the RP-217 and RP-218 series record changers.

The stylus force for all models except the RP-217-3 and RP-217-4 is 4 to 7 grams. The stylus force for the RP-217-3 and RP-217-4 is 9 to 11 grams.

If the stylus force is incorrect, the pickup arm counterweight spring (12) should be checked or replaced.

STYLUS REPLACEMENT

Removal of the "clip-in" stylus assembly and servicing of the cartridge is facilitated by the full 90° lift provided for the pickup arm. To remove the stylus grasp the stylus selector and pull away from the pickup body by 1/8", then pull the stylus assembly forward and out of the pickup.

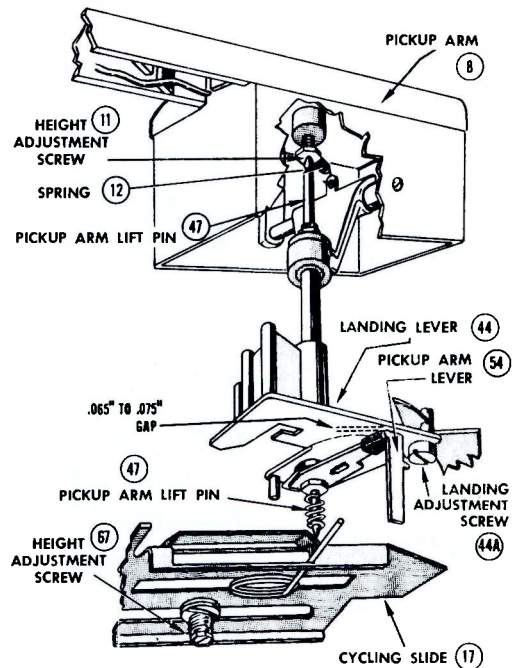


Figure 6—Adjustments

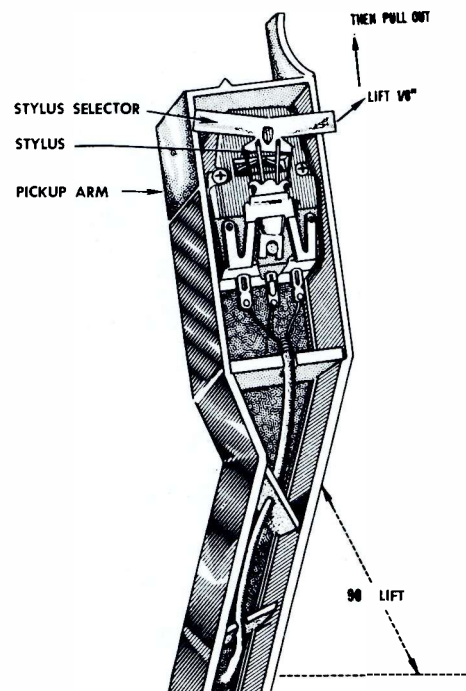


Figure 7—Stylus Replacement

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

CYCLE OF OPERATION

NOTE: In the cycle of operation it is assumed the mechanism has stopped automatically with the pickup arm on the rest.

PRELIMINARY PROCEDURE

Lift the stabilizer arm and place a stack of 1/4" centerhole records (7"-10"- and 12") on the spindle (intermixed if so desired). Place the record stabilizer arm so it rests on the records.

OR

If playing records with 1 1/2" centerhole, first place the large centerpost over the regular spindle. Place the record stabilizer arm so it rests on the records.

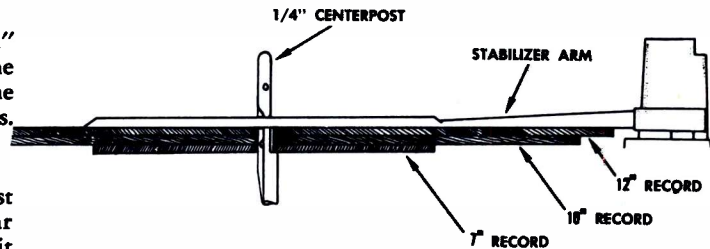


Figure 8—Preliminary Procedure

FUNCTION KNOB TURNED TO "MAN" (MANUAL) POSITION

Control lever (39) moves closing "OFF-ON" switch (51), and motor starts. The opposite end of the control lever actuates the automatic neutral link detent lever (41) and through the automatic neutral link engages the drive wheel to the motor shaft. Turntable starts turning.

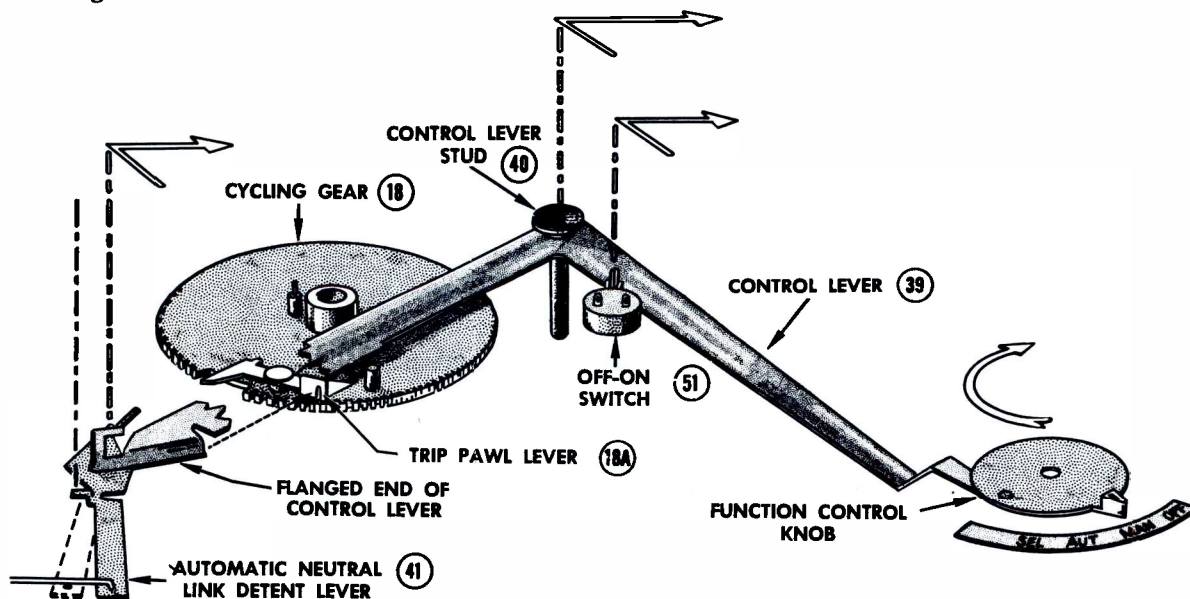


Figure 9—Manual Position

FUNCTION KNOB TURNED TO "SEL" (SELECT) POSITION

Further movement of the control lever (39) (now a lateral motion due to the control lever stud (40) following the right angle slot in the motorboard) causes flanged end of the control lever to strike the tab end of the trip pawl lever (18A). This causes the trip pawl to advance into the path of the projection on the turntable hub. Cycling gear (18) starts rotating when the projection on turntable hub arrives to strike trip pawl.

SERVICE HINTS

Failure to turn on may be caused by bent tab on control lever (39) not engaging switch (51). Binding of knobs or sticking in "SEL" position can be corrected by light lubrication of the knob shafts.

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

CYCLE OF OPERATION

CYCLING STARTS

As the cycling gear rotates, the cycling slide (17) starts its outward motion—this is accomplished by the pin extending downward from the cycling gear traveling in the elongated slot in the cycling slide. During the change cycle, the cycling gear will complete one revolution and the cycling slide will perform one complete excursion (outward and inward) of travel.

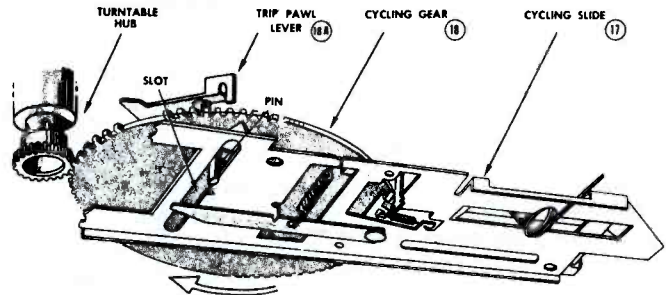


Figure 10—Cycling Starts

PICKUP ARM RISES (A)

Feeler (49) starts moving out as the cycling slide (17) continues its outward motion. Further outward motion of cycling slide causes pickup arm lift pin (47) to ride up the inclined portion of the lance on the cycling slide. Vertical motion of pickup arm lift pin causes the pickup arm (8) to rise, and also causes engagement of pickup arm lever (54) with landing lever (44) through the pressure of the rubber surface of pickup arm lever and the metal surface of the landing lever.

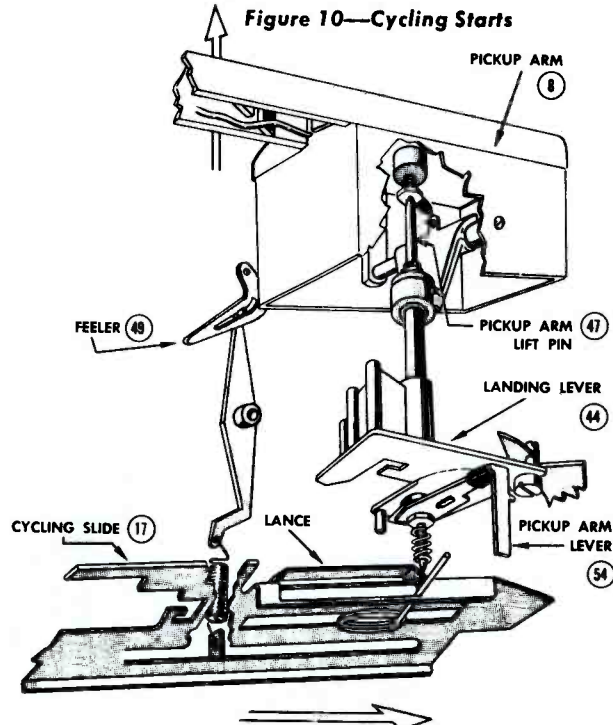


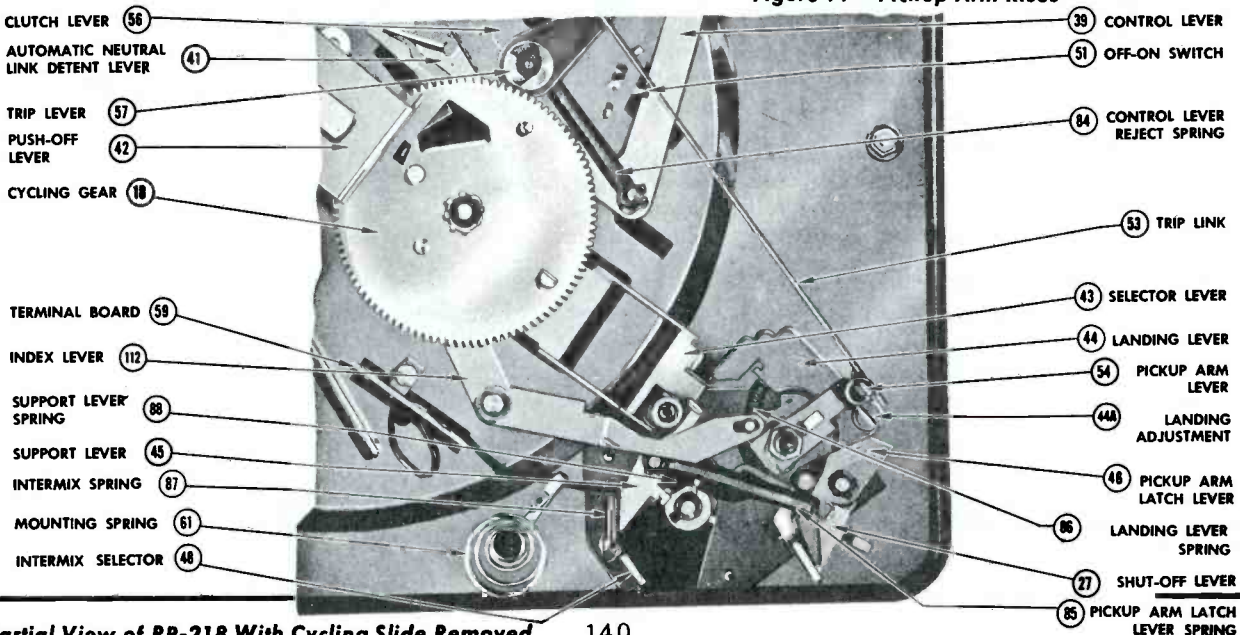
Figure 11—Pickup Arm Rises

SERVICE HINTS

If cycling fails to start, check condition of trip pawl (18A). If mechanism stalls or slows down in cycle, check for bent or binding cycling gear (18).

The lift pin (47) must be free to travel vertically and the ends smooth and rounded for proper lift of the pickup arm.

Failure of the feeler to operate smoothly may be due to screw (97) being too tight. See Figures 34 and 35.



Partial View of RP-218 With Cycling Slide Removed

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

CYCLE OF OPERATION

PICKUP ARM RISES (B)

Further outward movement of the cycling slide (17) causes pickup arm lift pin (47) to arrive at the flat portion of lance on cycling slide completing the vertical rise of pickup arm (8). Continued outward movement of the cycling slide causes the vertical tab on the shut-off latch actuator (17C) to contact the tab on the shut-off lever (27). This starts the unlatching of the pickup arm latch lever (46) and the landing lever (44).

Continued rotation of the cycling gear causes the vertical tab on the selector lever (43) to contact the triangular tab of the cycling gear (18). This starts the vertical rise of the selector lever.

SERVICE HINTS

Failure of the selector lever to rise may be caused by the vertical tab on the selector lever failing to contact the triangular tab. Check for missing springs (87) and (88) if feeler fails to rise from intermix housing.

PICKUP ARM MOVES OUT

Further rotation of the cycling gear (18) and further outward movement of the cycling slide (17) results in the contact of actuator spring (17D) with the pickup arm lever (54) causing the pickup arm (8) to start its outward travel.

At this time the selector lever (having risen to full upward position) rests on the 7" step of the support lever (45). The feeler (49) reaches its full outward position and is now prepared to sense the diameter of a dropping record.

The pickup arm latch lever (46) and the landing lever (44) become fully unlatched at this time.

The selector lever continues to rest upon the 7" step of the support lever even after the triangular tab of the cycling gear has passed the vertical tab extending downward from the selector lever. This is because the support lever is forced against the selector lever by the support lever spring (88).

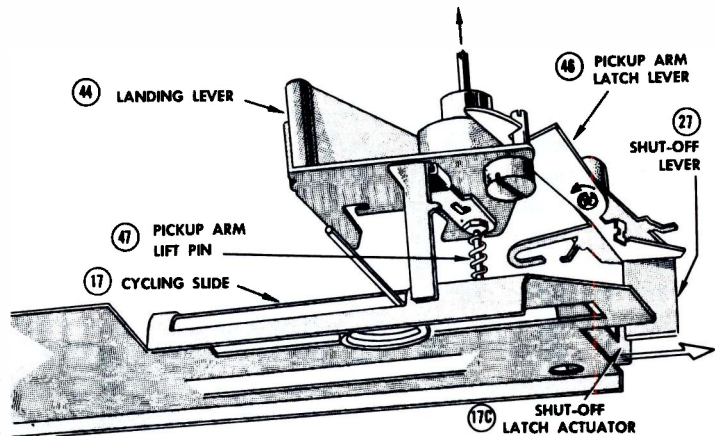


Figure 12—Pickup Arm Rises

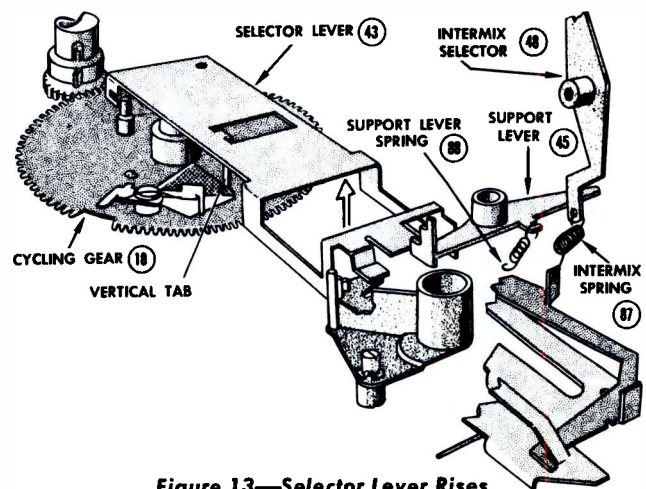


Figure 13—Selector Lever Rises

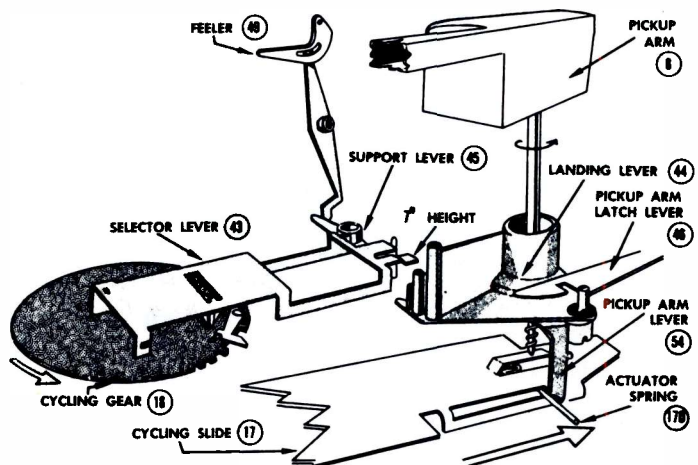


Figure 14—Pickup Arm Moves Out

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

CYCLE OF OPERATION

PICKUP ARM APPROACHES FULL OUTWARD POSITION

Continued outward motion of the cycling slide (17) causes the pickup arm lever (54) and the pickup arm (8) to approach full outward position and finally reach maximum outward position determined by contact of the upper part of the landing lever eccentric stud (44A) with the throat of the pickup arm latch lever (46). The additional outward movement of the cycling slide causes actuator spring (17D) to bend back and absorb this motion and does not result in any further outward movement of the pickup arm. At this time the bent tab projecting downward from the cycling gear (18) comes into contact with the push-off lever (42).

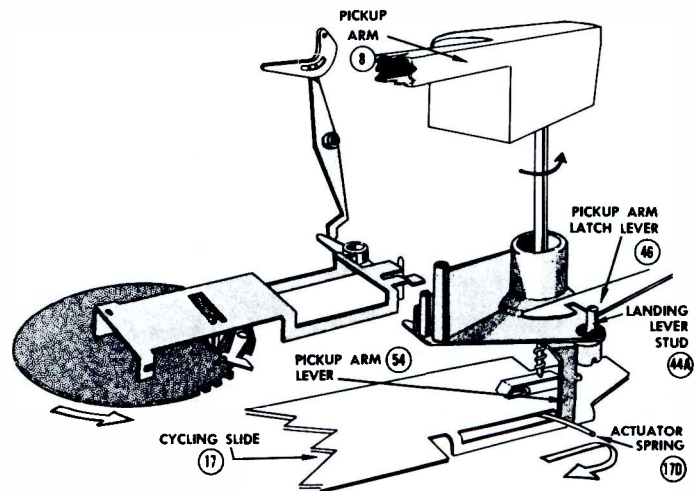


Figure 15—Full Outward Position

RECORD DROPS

Additional rotation of the cycling gear (18) results in further movement of the push-off lever (42). This motion results in the movement of the push-off finger in the spindle assembly (16) which causes the record to drop. The feeler (49) senses the record diameter—a 7" record causes no deflection; a 10" record causes partial deflection; and a 12" record causes full deflection of the feeler. As a result of the deflection of the feeler, the selector lever (43) falls to the appropriate step of the support lever (45), thus establishing the proper height of the selector lever for that record diameter. At this time, full 180 degree rotation of the cycling gear is accomplished and full outward motion of the cycling slide is reached.

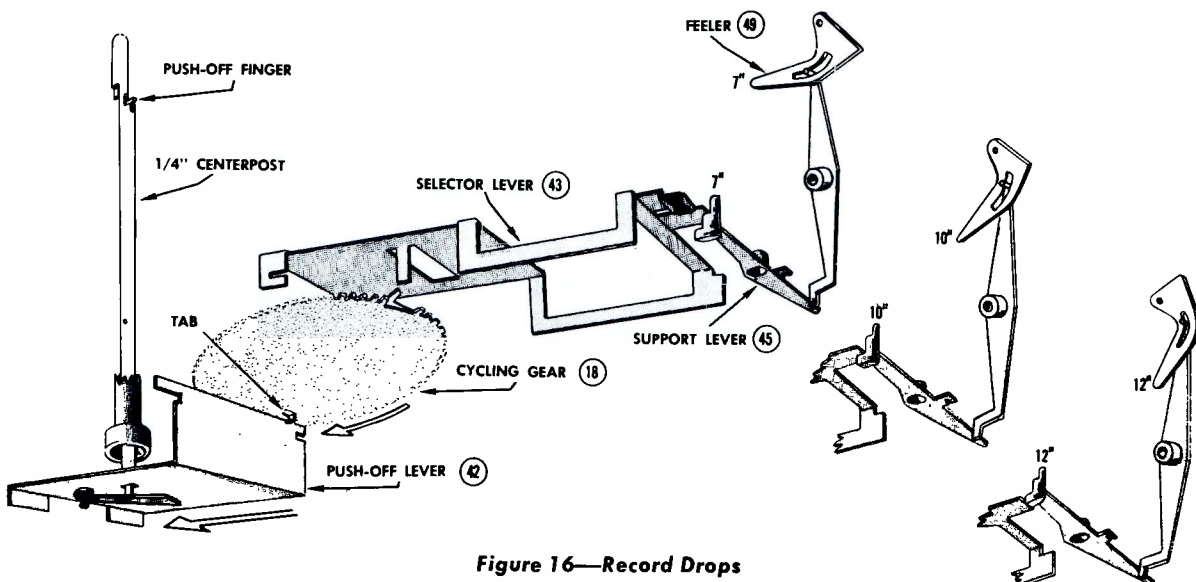


Figure 16—Record Drops

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

CYCLE OF OPERATION

PICKUP ARM MOVES IN

The cycling slide (17) starts its inward travel as the cycling gear (18) continues its rotation. The actuator spring (17D) guides the pickup arm back as the landing lever (44) moves toward landing position. (The pickup arm follows the landing lever due to the pressure between the pickup arm lever (54) and the landing lever.) Spring action (86) on the landing lever is the force which moves the landing lever at this time. The receding cycling slide merely directs the movement of the pickup arm lever. Push-off lever (42) returns to normal position. The unlatched condition of the pickup arm latch lever (46) and the landing lever (44) permits the free inward motion of the pickup arm.

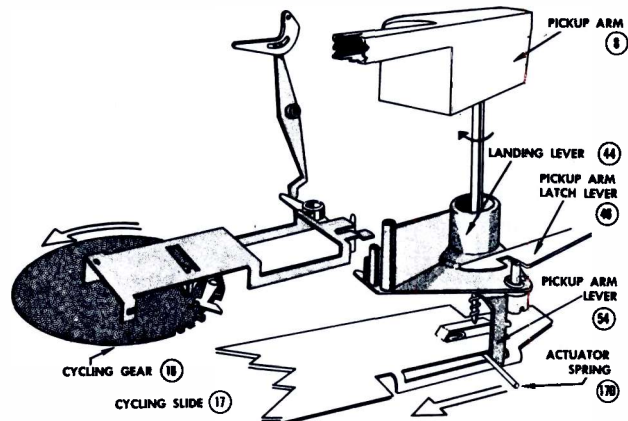


Figure 17—Pickup Arm Moves In

PICKUP ARM ARRIVES OVER LANDING POSITION

As the cycling slide (17) continues its inward travel the landing lever (44) contacts the selector lever (43) at the appropriate step previously determined by the height of the selector lever. Slack in the selector lever (lateral motion) is taken up by this contact and a positive position of the pickup arm above the starting grooves of the record is established.

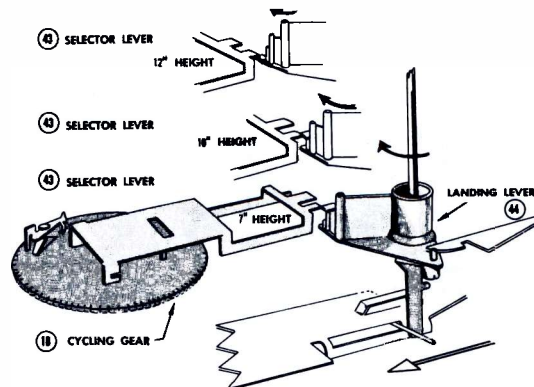


Figure 18—Landing Position Established

PICKUP ARM DESCENDS TO RECORD

Lift pin (47) rides down the inclined portion of the lance on the cycling slide (17) as the cycling slide continues its inward motion. The feeler (49) starts its return to the housing (6A). At this time the engagement pawl (18A) is reset by striking the casting on the turntable hub mounting assembly (26). The pickup arm lever (54) becomes disengaged from the landing lever (44) due to the relaxing of the brake tension between these two components.

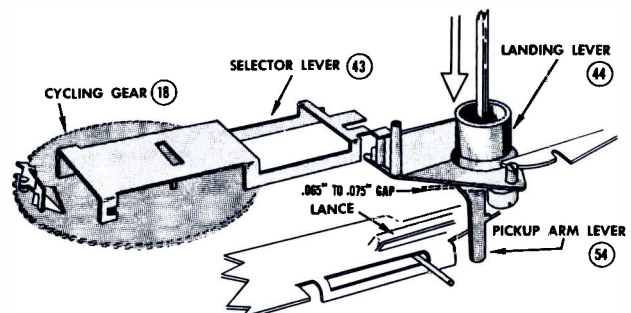


Figure 19—Pickup Arm Descends To Record

SERVICE HINTS

If erratic landing is encountered check for proper placement of actuator spring (17D) in cycling slide. Make sure the metal surface of the landing lever (44) is clean and dry. Improper HEIGHT adjustment can cause erratic LANDING.

CYCLE OF OPERATION

PICKUP ARM TOUCHES RECORD

The stud extending above the cycling gear (18) resets the clutch lever (56). The landing lever (44) moves away from the selector lever (43) due to the action of the index lever (112). The selector lever simply drops to the lowest step on the landing lever as the landing lever moves away and finally becomes latched to the pickup arm latch lever (46). The "helper" lever (17A) assists in the completion of the last portion of the cycle of operation. The feeler recedes fully into the housing (6A). At this time the cycling gear completes 360 degrees of rotation and the cycling slide completes its inward travel.

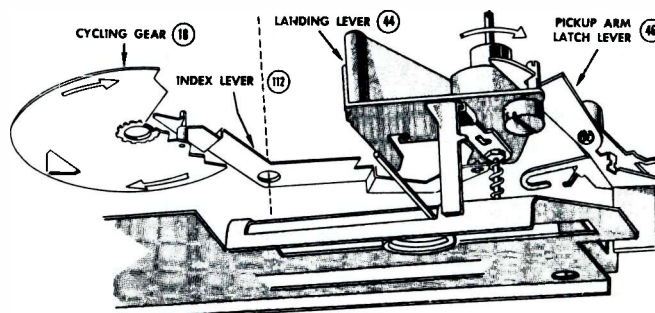


Figure 20—Landing Lever Re-Latches

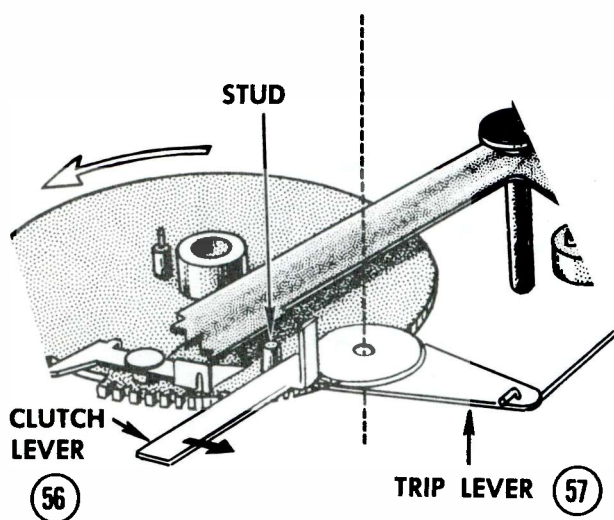


Figure 21—Clutch Lever Re-Set

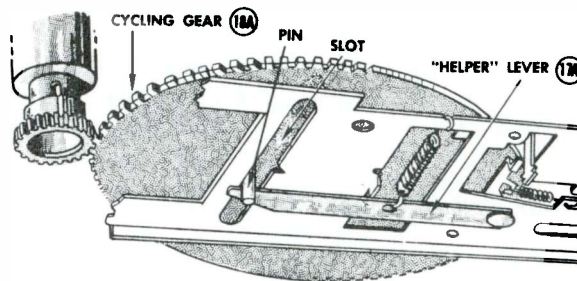


Figure 22—"Helper" Lever Action

RECORD PLAYS

The pickup arm, having descended to the record, causes contact of the stylus with the record starting grooves. The pickup arm is now directed solely by the grooves on the record; the only mechanical engagement is that of the trip link (53) connecting the pickup arm lever (54) to the trip lever.

As the record plays and finally comes to the spiral lead-in grooves, the trip link (operated by the inward travel of the pickup arm lever) causes the trip lever to move the clutch lever (56) into contact with the trip pawl lever (18A) on the cycling gear. This causes the cycle of operation to repeat.

SERVICE HINTS

Continuous trip may be caused by failure of the clutch lever (56) to re-set. Check for oil or loose assembly. If stylus skips grooves or fails to become free at the time of "touchdown" check action of index lever (112) and check for proper clearance between landing lever (44) and pickup arm lever (54). See Figure 6.

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

LAST RECORD PROCEDURE

As the last record falls, the stabilizer arm (20) drops also, with the shaft end resting on the extended portion of the shut-off latch actuator (17C). This does not affect the playing of the last record; however, at the completion of the change cycle which caused the last record to drop, the stabilizer arm shaft drops further and forms an obstruction to the free movement of the cycling slide.

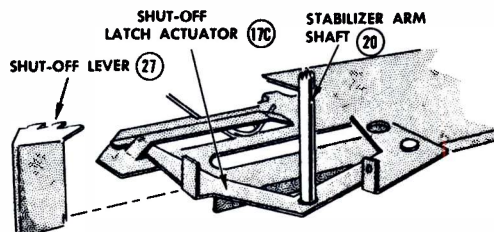


Figure 23—Stabilizer Drops

SHUT-OFF CYCLE STARTS

At the completion of the last record the cycle of operation starts to repeat. Since the stabilizer arm shaft is now in the downward position, the shut-off latch actuator (17C) is forced inward as the cycling slide (17) moves outward. This causes the shut-off latch actuator to miss the shut-off lever (27) as the cycling slide moves out. The pickup arm lever (54) and the landing lever (44) remain latched.

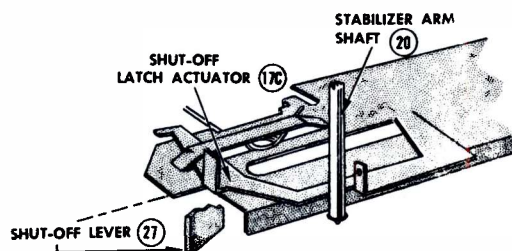


Figure 24—Stabilizer Arm Drops Further

PICKUP ARM DESCENDS TO REST POSITION

As the cycling slide starts its inward travel, the latched condition of the pickup arm lever (54) to the landing lever (44) prevents the pickup arm from following the receding actuator spring on the cycling slide. The pickup arm then descends to the rest position.

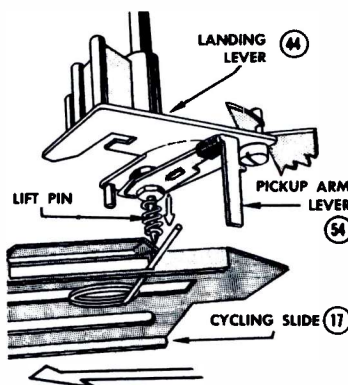


Figure 25—Pickup Arm Descends to Rest Position

LAST RECORD CYCLING COMPLETED

Further inward travel of the cycling slide (17) causes the shut-off latch to contact the control lever stud (40) and thereby push the control lever to the off position. The control lever also actuates the off-on switch, which shuts off the motor, and actuates the automatic neutral link detent lever (41), which causes the drive system to come to an automatic neutral condition.

SERVICE HINTS

Stabilizer arm shaft must be lubricated and free to drop for proper last record action. Check for free motion of control lever (39) if mechanism stalls at the time of shut-off. To check automatic neutral operation, turntable should be free to turn in either direction after mechanism has completely stopped.

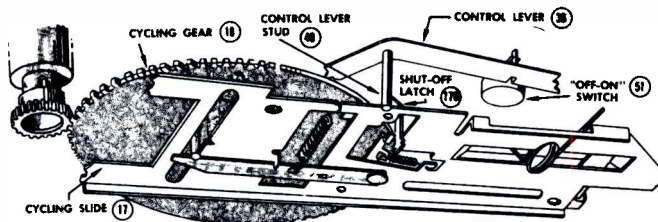


Figure 26—Shut-Off Occurs

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

MANUAL OPERATION

FUNCTION KNOB TURNED TO "MAN" POSITION

As the function knob is turned to the manual position the control lever (39) closes the "off-on" switch (51) causing the motor to start, and through the automatic neutral link detent lever (41) causes the drive system to engage the turntable (13).

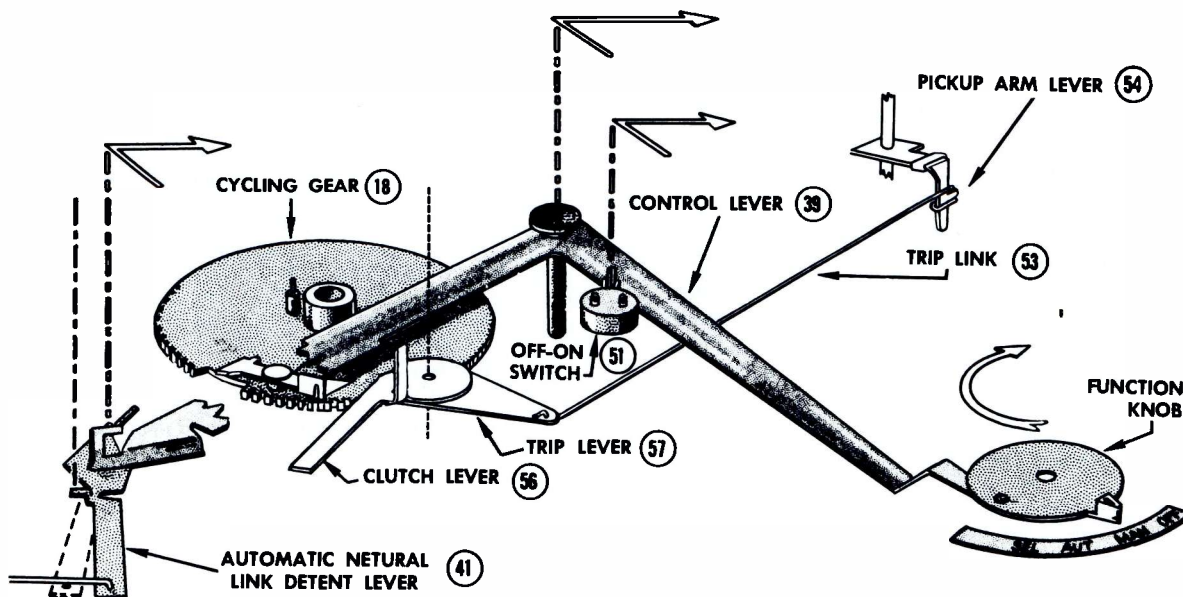


Figure 27—Manual Operation

CONDITIONS EXISTING IN "MAN" POSITION

The control lever linkage is in such a position as to prevent the inward movement of the clutch lever (56). This prevents automatic trip at the end of the record.

The cycling gear (18) and the cycling slide (17) remain stationary.

The pickup arm lever (54) and the landing lever (44) remain disengaged.

PLAYING RECORDS MANUALLY

The pickup arm may be manually raised and placed upon the starting grooves of any size record (or placed at any point in the recorded portion of any size record). At the end of the record no automatic trip occurs. The pickup arm must be manually lifted and placed on the rest. Additional record selections are manually re-placed on turntable and pickup arm placed on starting grooves for each record selection.

SERVICE HINTS

If mechanism trips in manual, check for bent ear on clutch lever (56). Also check trip pawl lever (18A) for freedom of motion. If pickup arm fails to become free for manual handling, check for proper clearance between landing lever (44) and pickup arm lever (54). See Height Adjustment, Figure 6.

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

REPLACEMENT PARTS

ILL. NO.	STOCK NO.	DESCRIPTION
PICKUP AND ARM ASSEMBLY		
6	110985	Arm—pickup arm shell with cable, date brown, for RP-217-1, -2
6	111194	Arm—pickup arm shell with cable, RP-217-3
6	111195	Arm—pickup arm shell with cable, RP-217-4
6	110986	Arm—pickup arm shell with cable, black for RP-218-1
9	110987	Bracket—pickup arm swivel, for RP-217-1, -2, -3, -4
9	110988	Bracket—pickup arm swivel, for RP-218-1
10	110906	Shaft—pickup arm pivot, for RP-218-1
10	110989	Shaft—pickup arm pivot, for RP-217-1, -2, -3, -4
11	110990	Screw—pickup arm height adjustment, #6-32 x 0.38 long for Ill. #12
12	110992	Spring—pickup arm counterweight, 0.195" O. D., 0.018" wire diameter, 0.54" long for Ill. #6 RP-217-1, -2
12	111202	Spring—pickup arm counterweight, 0.195 O. D., x 0.62" long, RP-217-3, -4
13	110993	Cable—pickup arm cable assembly, RP-217-1, -2
13	111200	Cable—pickup arm cable assembly, RP-217-3
13	111201	Cable—pickup arm cable assembly, RP-217-4
14	108537	Screw—pickup mounting, #4-40 x .38 long, RP 217-1, -2

ILL. NO.	STOCK NO.	DESCRIPTION
15	110023	Pickup—complete with 3 mil synthetic sapphire and 0.7 mil diamond styli (pickup stamped RMP 200-9) RP-217-1, RP-218-1
15	110021	Pickup—complete with 3 mil and 0.7 mil synthetic sapphire "snap in" styli (pickup stamped RMP 200-8) RP-217-2
15	111196	Pickup—with sapphire synthetic 1 mil and 3 mil styli, complete with spring, RP-217-3
15	111197	Pickup—with dual sapphire synthetic 3 mil and 0.7 mil styli, with spring, RP-217-4
15A	110022	Stylus—3 mil synthetic sapphire and 0.7 mil diamond stylus assembly for (pickup stamped RMP 200-9) RP-217-1 and RP-218-1
15A	103331	Stylus—1 mil synthetic sapphire, RP-217-3
15A	108719	Stylus—0.7 mil synthetic sapphire, RP-217-4
15A	110020	Stylus—dual 3 mil and 0.7 mil sapphire stylus for pickup stamped RMP 200-8, RP-217-2
15B	105483	Stylus—3 mil synthetic, RP-217-3, -4
21	111199	Knob—stylus selector knob and retainer cap, RP-217-3, -4
22	111198	Spring—0.147 O. D. x 0.27" long for pickup RP-217-3, -4
27	110994	Shield—hum RP-217-1, -2, RP-218-1

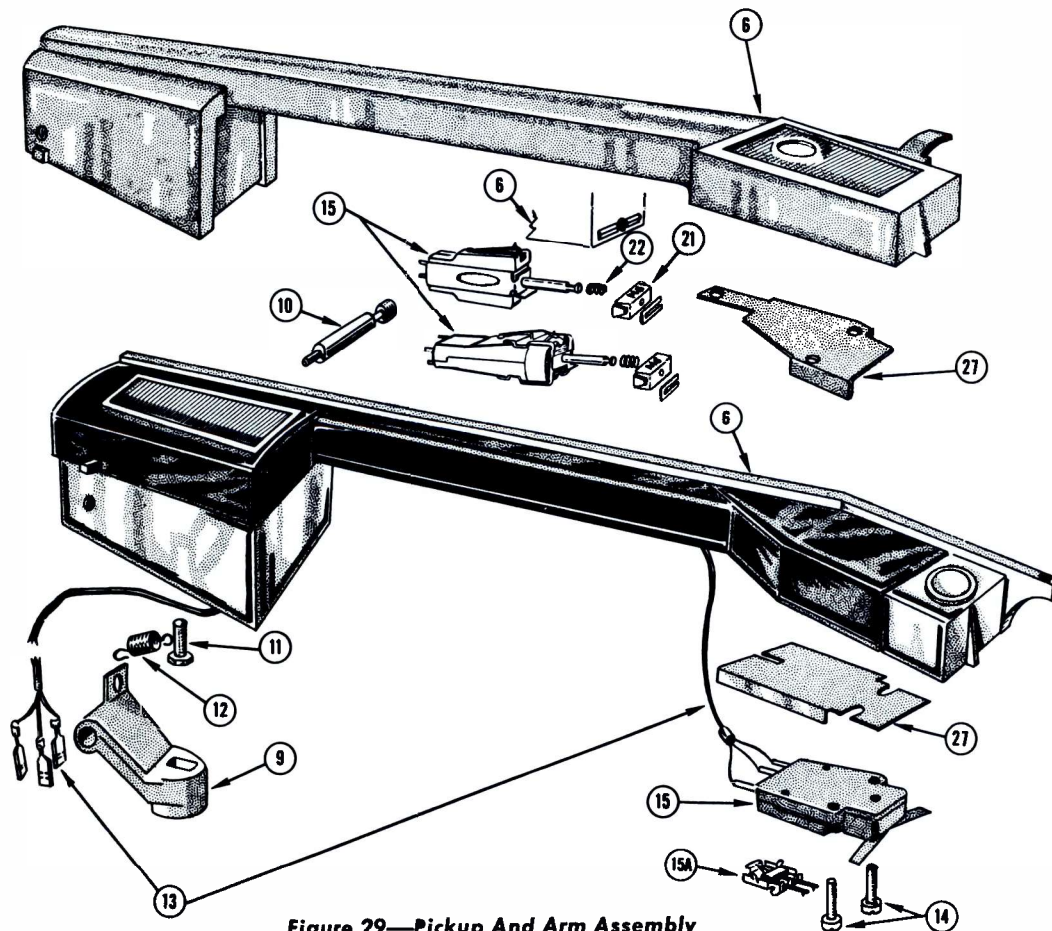


Figure 29—Pickup And Arm Assembly

LUBRICATION

The mechanism is properly lubricated when it leaves the factory; additional lubrication should not be necessary for a long period of time.

A light machine oil (Singer Sewing Machine Oil or equivalent) should be used to lubricate the stabilizer arm shaft, pickup lift rod and the bearings of the drive motor.

On all other bearing surfaces use *STA-PUT No. 320 or equivalent heavy oil sparingly.

Apply a medium weight clinging type of grease to sliding surfaces such as: control lever stud (40), automatic neutral link detent lever (41), elongated slot in cycling slide, push-off lever and the points upon which the cycling slide travels. COSMOLUBE No. 1 (or equivalent) may be used for this application.

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

SERVICE HINTS

ERRATIC LANDING

(Pickup lands off record, or on recorded portion of record)	<i>Figure</i>
Landing adjustment incorrect	6
Landing adjustment stud (44A) loose	6
Pickup arm wiring interferes with pickup	29
Pickup arm lever brake cushion (54C) out of place or oily	19
Pickup arm shaft binding in intermix housing support (6A)	34 & 35
Actuator spring (17D) improperly positioned	17
Height adjustment (67) incorrect	6

IMPROPER LANDING

(Pickup lands for wrong diameter record)	
Selector lever (43) bent	18
Landing lever (44) binding on shaft	18
Support lever (45) binding on intermix selector (48)	16
Intermix selector (48) binding or feeler (49) binding in housing	34
Pickup arm wiring interferes with support lever movement	29
Intermix spring (87) missing	35
Support spring (88) missing	35
Selector spring (89) missing	34
Retainer ring (72) on cycling gear (18) not seated properly	16

PREMATURE TRIP—FAILURE TO TRIP — CONTINUOUS TRIP

Ear on clutch lever (56) bent	21
Trip lever spring (78) missing or trip lever bent	35
Clutch lever (56) bent or inside surface not smooth	21
Trip link (53) bent or binding on pickup arm lever (54)	21
Grease between clutch lever (56) and trip lever (57)	21
Function knob sticking in "select" position	34
Trip pawl lever (18A) rounded at point of engagement	21
Clutch lever mounting stud (in motorboard) bent	35

FAILURE TO TRACK RECORDS

(Pickup skips grooves)	
Incorrect stylus being used	29
Pickup wiring interferes with free movement of pickup arm	29
Binding of pickup arm shaft (54A) in housing	34 & 35
Spiral wrap of trip link (53) binding on pickup arm lever (54)	21

TRIPS IN MANUAL

Ear on clutch lever (56) bent	27
End of trip pawl lever (18A) bent	27

FAILURE TO TURN ON—NO POWER

Cable connections, wiring, soldered connections open circuited	
Actuator on switch (51) not engaging tab on control lever (39)	9

FAILURE TO DROP RECORDS

Stabilizer arm and shaft (20) bent or binding	<i>Figure</i> 24
Push off lever (42) binding or improperly assembled ..	16
Lever in spindle assembly (16) binding or bent	16
Tab on cycling gear (18) bent or not engaging push of lever (42)	16
¼ inch spindle assembly mounting nut (76) loose	35
(For 1½ inch centerhole records) 1½ inch spindle not seated	30

STALLS OR SLOWS DOWN IN CYCLE

Cycling gear (18) bent or binding	10
Turntable bearing binding	34
Motor idler greasy, or slipping on turntable rim	32
Motor or motor linkage jammed	32

PICKUP ARM STRIKES BOTTOM OF RECORD STACK

Improper height adjustment (11)	6
---------------------------------------	---

STYLUS DRAGGING TOP OF RECORD STACK

(On Turntable)	
Improper height adjustment (11)	6
Stylus improperly installed in pickup	7

FAILURE TO SHUT OFF AFTER LAST RECORD OR IMPROPER SHUT OFF

Stabilizer arm shaft (20) not lubricated, or binding	24
Shut off latch (27) bent or not assembled properly	24
Switch actuator ear on control lever (39) bent	26
Height adjustment (67) incorrect—set too low	6

LOW SPEED—RUMBLE—WOW

Grease or oil on turntable drive surface or on motor idler	32 & 34
Motor bearings binding	32
Rubber motor mounting grommets improperly assembled, missing, worn	32
Turntable support (26) mounting screws loose or missing	34
Neoprene washer or turntable bearing washers not lubricated, missing	34
Turntable (13) bent	34
Obstruction touching underside of turntable	35
Bump or cut on motor idler (1)	32
Spindle assembly (16) not tight	34
Motor shaft bent	32

CLEANING

It is important that the drive motor spindle, rubber idler wheel and the inside rim of the turntable be kept clean and free of oil and grease.

Chlorothene (Dow Chemical Co.), naphtha or isopropyl alcohol are recommended cleaning agents for cleaning rubber and metal parts of the mechanism.

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

16-2/3—45 RPM CENTERPOST

REPLACEMENT PARTS (Cont.)

ILL. NO.	STOCK NO.	DESCRIPTION
104	110905	45 R.P.M. CENTERPOST Centerpost—45 rpm centerpost assembly—complete

OPERATION OF 16 2/3 — 45 RPM CENTERPOST

When playing records with 1½ inch centerholes, the detachable 1½ inch centerpost is employed. The records rest upon a shelf formed by the centerpost body assembly and the nose cap. The records are also supported by a retractable shelf at a point just opposite the formed shelf.

At the time of record drop, the "movable shelf-push off slide" is actuated by the push off finger in the ¼ inch centerpost. This causes the retractable shelf to recede into the centerpost body, and at the same time the push off slide forces the bottom record off the formed shelf causing the record to drop. The other records in the stack remain in position due to the opposition of the retainer in the nose cap. The centerpost should always be installed or removed with a STRAIGHT VERTICAL MOTION with the word FRONT facing the front of the record changer. The STABILIZER ARM should always be employed when using the centerpost.

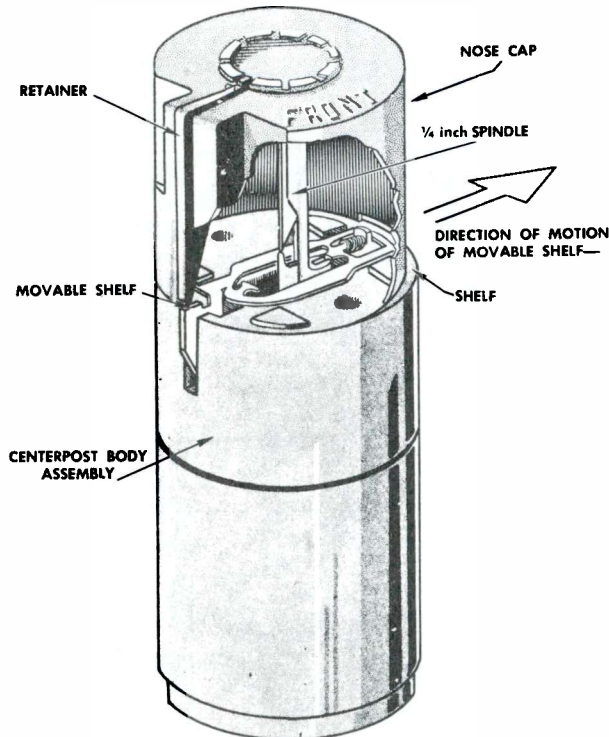


Figure 30—Centerpost Operation

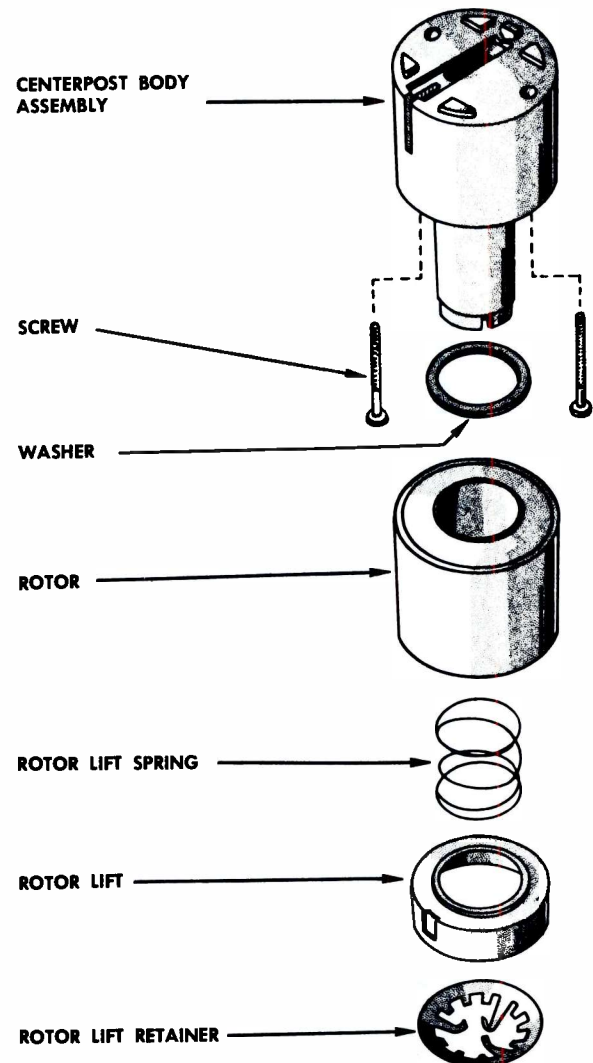
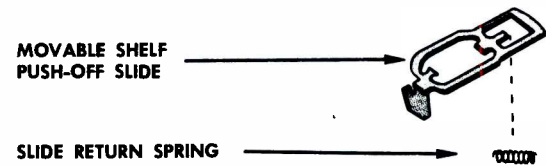
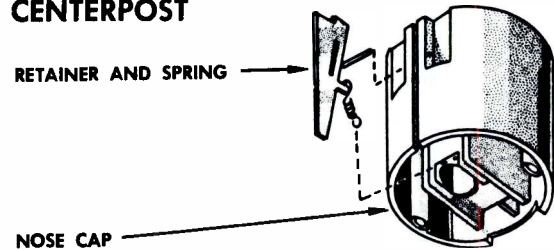


Figure 31—16 2/3—45 rpm Centerpost

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

REPLACEMENT PARTS (Cont.)

ILL. NO.	STOCK NO.	DESCRIPTION
MOTOR ASSEMBLY Stamped 1096251-1, Code 190 105/125 v., 60 cycle		
1	108602	Wheel—Turntable drive idler
2	108603	Arm—Idler
3	108601	Link—Toggle
4		Spring—Compression for Ill. #3
5	102595	Washer—Cup, for idler pulley support stud
6	108606	Spring—Detent, 0.187" O. D. x 1.937" long
7	75761 78374	Grommet—Motor mounting Spring—Idler wheel tension, 0.185/0.200" O. D. x 0.570" long
8	111058	Motor—Complete
9	20165A	Washer—"C" retaining ring, 0.375" O. D. x 0.122" I. D. x 0.025" thick
11	108604	Washer—Fiber, 0.192" I. D. x 0.312" O. D. x 0.015" thick
12	78647	Washer—Shim, 0.375" O. D. x 0.188"/0.192" I. D. x 0.008/0.010" thick

ILL. NO.	STOCK NO.	DESCRIPTION
MOTOR ASSEMBLY Stamped: 1096251-1, CODE 107 105/125 v., 60 cycle		
1	103445	Washer—"C" retaining washer 0.094" I. D. x 0.230" O. D. x 0.013" thk.
2	108607	Washer—Flat Metal, 1/4" O. D. x 0.130"/0.127" I. D. x 0.008" thk.
3	108608	Washer—Fiber, 5/16" O. D. x 0.123"/0.121" I. D. x 0.015" thk.
4	110040	Wheel—Turntable drive idler wheel
5	108610	Spring—For idler link, 0.125" O. D. x 21/32" length, 0.012" wire
6	108611	Link—Idler link with screw (111 #6A) and nylon insert (111 #6B)
6A		Screw—Set screw
6B		Insert—For idler link set screw
7		Plate—Idler plate assembly
8	108613	Spring—For idler plate, 5/32" O. D. x 3/4" length, 0.008" wire
9	108614	Spring—Detent spring, 0.171" O. D. x 1/2" length, 0.022" wire
10	75761	Grommet—Motor mounting grommet
11	111058	Motor—Phono motor assembly complete

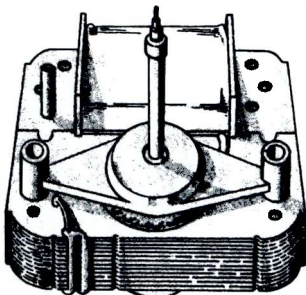
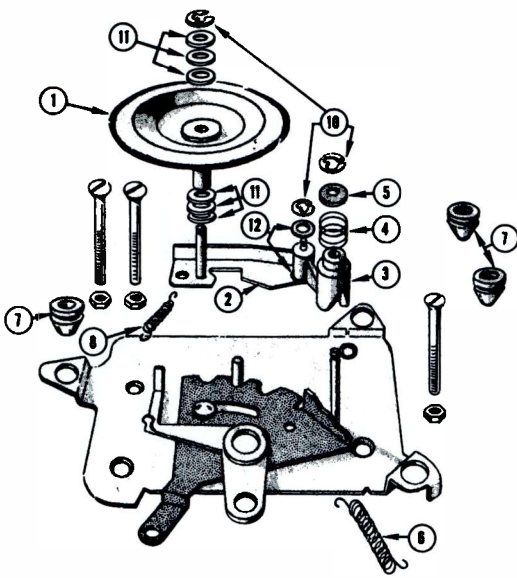


Figure 32—Motor Assembly Stamped 1096251-1 190

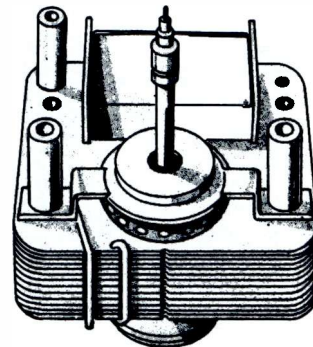
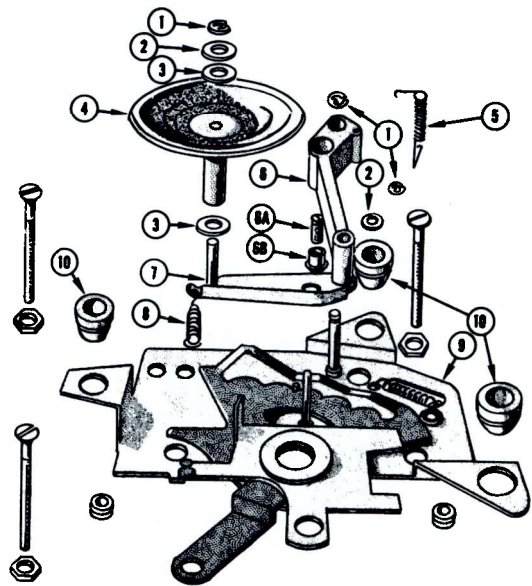


Figure 33—Motor Assembly Stamped 1096251-1 107

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

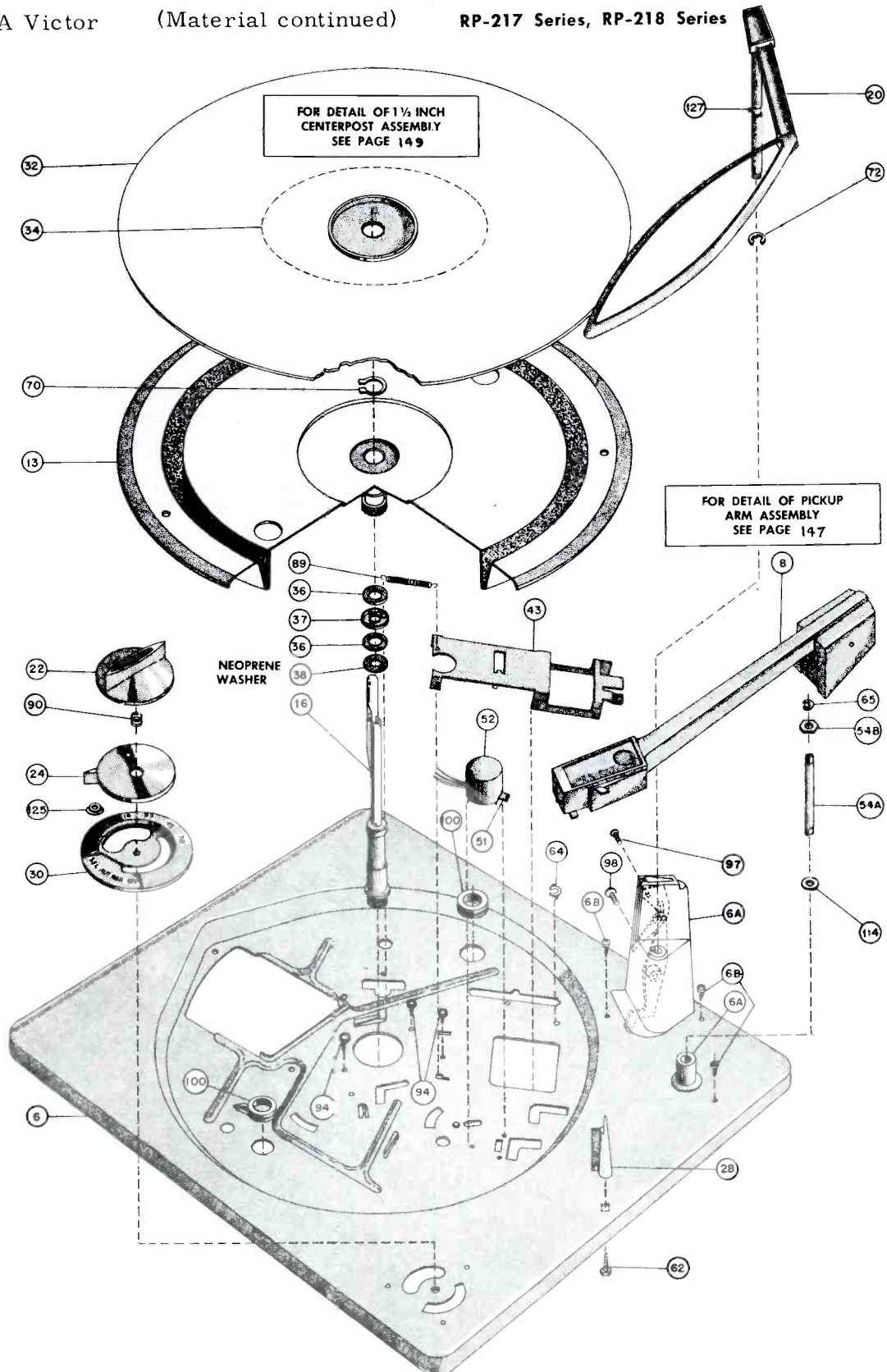


Figure 34—Exploded View RP-217-1 Top

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

RCA Victor

(Material continued)

RP-217 Series, RP-218 Series

REPLACEMENT PARTS (Cont.)

ILL. NO.	STOCK NO.	DESCRIPTION
6	110835	Motorboard—Sub-assembly with welded and staked parts—and intermix housing—champagne gold—for RP-217-1, -2, -3 and -4
6	110904	Motorboard—Sub-assembly with welded and staked parts—and intermix housing—frost aluminum—for RP-218-1
6A		Support—Intermix housing stabilizer arm and tone arm pivot—champagne gold—for RP-217-1, -2, -3 and -4
6A		Support—Intermix housing stabilizer arm and tone arm pivot—frost aluminum—for RP-218-1
6B		Screw—#8-32 x 3/8" long for Support 6A
8		Pickup arm assembly
13	110907	Turntable—Complete with bearing and pinion—RP-217-1
13	110908	Turntable—Complete with bearing and pinion—RP-218-1
13	111191	Turntable—9" diameter—complete with bearing and pinion—RP 217-3 and -4
16	110909	Spindle—Assembly—1/4" diameter
17	111174	Slide—Cycling—complete with latch—lever and springs
17A		Lever—Cycling gear
17B		Latch—Shut-off
17C		Actuator—Shut-off latch
17D	110911	Spring—Actuator—0.60" diameter—music wire
17E	110912	Spring—Cycling gear lever—0.218" O. D. x 0.81" long
17F	110296	Spring—Shut-off latch actuator—0.23" O. D. x 0.56" long
17G	110101	Spring—Shut-off latch—0.200" O. D. x 5/8" long
18	111172	Gear—Cycling—complete with staked parts
18A		Lever—Trip pawl
18B	111173	Spring—Straight music wire—for trip pawl
19	111058	Motor—Assembly
20	110915	Arm—Stabilizer—RP-217-1, -2, -3 and -4
20	110916	Arm—Stabilizer—RP-218-1
22	110917	Knob—Speed selector with shaft—RP-217-1, -2, -3 and -4
22	110918	Knob—Speed selector with shaft—RP-218-1
24	110919	Knob—Function Control—RP-217-1, -2, -3 and -4
24	110920	Knob—Function control—RP-218-1
26	110921	Support—Turntable
27	110922	Lever—Shut-off
28	110923	Rest—Pickup arm—RP-217-1, -2, -3 and -4
28	110924	Rest—Pickup arm—RP-218-1
30	110925	Escutcheon—Control—RP-217-1, -2, -3 and -4
30	110926	Escutcheon—Control—RP-218-1
32	110927	Mat—Turntable—RP-217-1, -2
32	111192	Mat—Turntable—RP-217-3 and -4
32	110928	Mat—Turntable—RP-218-1
34	110929	Insert—Turntable mat—RP-218-1
35	110930	Link—Automatic neutral
36	78720	Washer—Bearing—0.410" I. D., 0.685" O. D.
37	78660	Bearing—Turntable thrust
38	110931	Washer—Oil resistant sheet rubber
39	110933	Lever—Control
40	110932	Stud—Control lever
41	110934	Lever—Automatic neutral link detent
42	110935	Lever—Push-off
43	110936	Lever—Selector—with vinyl tubing
44	110937	Lever—Landing
44A	110938	Stud—Landing lever eccentric
44B	74431	Retainer—Landing lever
45	111142	Lever—Support
46	110940	Lever—Pickup arm latch
47	110941	Lift Pin—Pickup arm—RP-217-1, -2, -3 and -4
47	111193	Lift pin—Pickup arm—RP-218-1
48	110942	Lever—Intermix selector
49	110943	Feeler—(Intermix indexing lever)
50	111175	Lever—Speed control
51	108457	Switch
52		Cover—Switch
53	110945	Link—Trip—5.96" long with looped end
54	110946	Lever—Pickup arm
54A	110947	Shaft—Pickup arm lever
54B	103402	Nut—Shaft retainer
54C	110948	Cushion—Pickup arm lever brake
55	111176	Link—Motor speed change
56	110949	Lever—Clutch

ILL. NO.	STOCK NO.	DESCRIPTION
57	110950	Lever—Trip
58	110951	Spring—Flat—push-off lever—for Ill. #42
59		Board—Terminal
60	109440	Connector—Three-contact female—for phono power
61	110176	Spring—Mounting
62		Screw—#10 x .44" long—hex head—for Ill. #28
63	33726	Washer—"C" type retaining—for Ill. #19, 50, 67
64	74431	Washer—Spring—for Ill. #40, 112
65	77269	Washer—"C" type retaining—for Ill. #24, 47, 56
66	204043	Washer—"C" type retaining—for Ill. #113
67	110952	Screw—Slide assembly height adjustment—0.164-32 x 0.875" long—for Ill. #17
68	110953	Spring—Pickup arm torque
69		Eyelet—Slide assembly height adjustment screw—Ill. #67
70	78654	Ring—Retaining—for Ill. #13
71	101517	Ring—Retaining—for Ill. #26, 88
72	101500	Ring—Retaining—for Ill. #18, 46, 45, 84
73	110954	Ring—Retaining—for Ill. #27
74	110955	Ring—Retaining—for Ill. #44
75		Eyelet—Push-off lever—Ill. #42
76	100342	Nut—Spindle retaining—.300-32—for Ill. #6
77	103402	Nut—Pickup arm retaining, 0.250-32—for Ill. #8
78	110956	Spring—Trip clutch—for Ill. #57
79	110957	Spring—Height adjustment—five active turns—0.031" wire diameter, 0.187" I. D.—for Ill. #67
80	110958	Spring—Lift pin, 3/2 active turns—0.018" wire diameter, 0.250" x .50" long—for Ill. #47
81	110959	Spring—Push-off lever—0.218" I. D. x .38" long—four turns—0.031 wire diameter—for Ill. #42
82		Terminal—Support lever spring—for Ill. #88
84	110961	Spring—Control lever reject spring—0.250" O. D. x 1.75" long—for Ill. #39
85	110962	Spring—Push-off lever—and tone arm latch return—.250" O. D. x 1.84" long—for Ill. #17, 46
86	111056	Spring—Landing lever—0.187" O. D. x 0.75" long—for Ill. #44
87	110963	Spring—Intermix—0.195" O. D. x 1.02" long—for Ill. #48
88	110964	Spring—Support lever—0.190" O. D. x 0.50" long—for Ill. #45
89	110965	Spring—Selector lever—0.190" O. D. x 0.61" long—for Ill. #43
90	110966	Spring—Speed shift knob—two active turns—0.016 wire diameter—0.12" I. D.—for Ill. #22
93	79240	Washer—0.140" I. D.—0.300" O. D., 0.010" thick—for Ill. #42, 56
94		Screw—Turntable support—#8 x 0.19" long—for #26
95		Screw—Terminal board—#6 x .25" long—for Ill. #59
96		Screw—#6 x .62" long—for Ill. #60
97		Screw—#4 x 40, .38" long—for Ill. #49
98		Screw—Intermix selector—#6-32, 0.75" long—for Ill. #48
99	106620	Grommet—Motor and speed control lever—Ill. #19, 50
100		Grommet—Motorboard—Ill. #6
109		Spacer—Knob
110		Washer—Adjusting screw—0.172" I. D., 0.500" O. D., 0.018" thick—for Ill. #67
112	110967	Lever—Index
113	110968	Stud—Lever index—for Ill. #112
114	78649	Washer—Pickup arm lever—for Ill. #54
115		Wire—1.5" long—for Ill. #59
116		Washer—0.156" I. D., 0.375" O. D.—for Ill. #60
117		Washer—Landing lever assembly—0.515 I. D., 0.75 O. D.—for Ill. #44
119		Washer—Spring—0.260" I. D., 3/16" O. D.—for Ill. #113
120		Lug—Mounting spring—for Ill. #61
121	75740	Washer—Motor—0.190" I. D. 3/8" O. D., 0.0299" thick—for Ill. #19, 48
122	75752	Washer—Pickup arm torque spring—0.500" O. D., 0.252" I. D., 0.015" thick—for Ill. #68
123	100173	Washer—"C" type retaining—0.230" O. D., 0.094" I. D.—for Ill. #47
125		Bushing—Knob—for Ill. #22
127		Pin—Stabilizer arm
129		Lug—Connector—for Ill. #60
131	78652	Washer—"C" type retaining—for Ill. #67

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA Victor (Material continued)

RP-217 Series, RP-218 Series

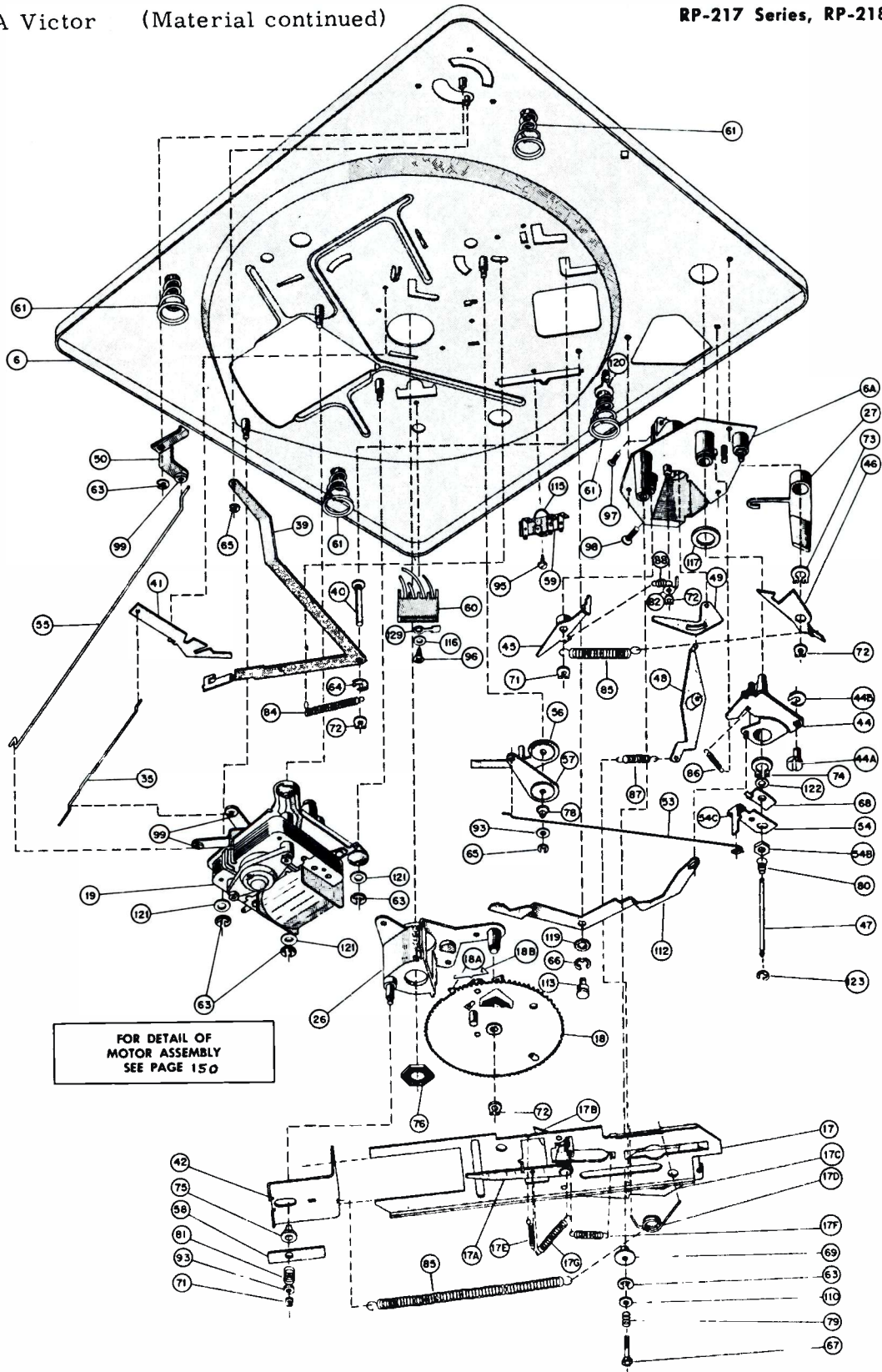
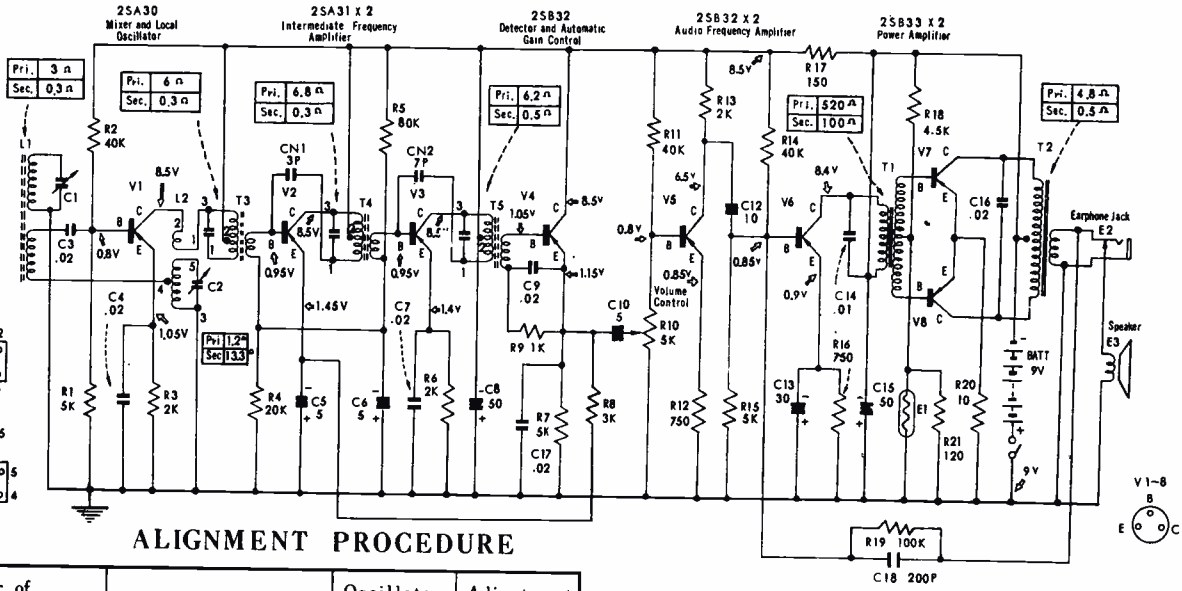


Figure 35—Exploded View RP-217-1 Bottom

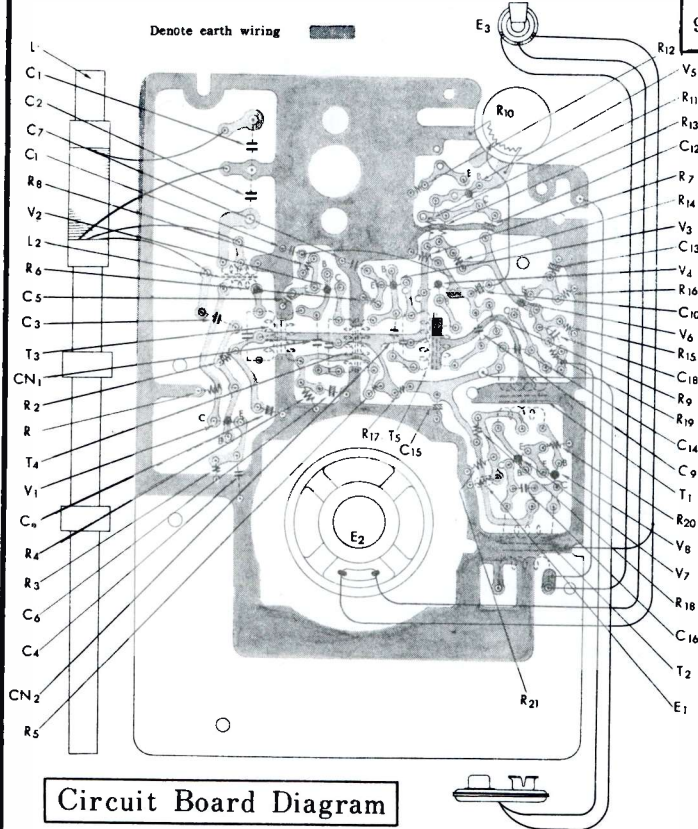
SAMPSON MODEL BT 85



ALIGNMENT PROCEDURE

Order of Adjustment	Dial pointer Setting	Oscillator Frequency	Adjustment Point
1.	Gang fully open	455KC	T5
2.	Gang fully open	455KC	T4
3.	Gang fully open	455KC	T3
4.		Repeat	5-3

Order of Adjustment	Dial pointer Setting	Oscillator Frequency	Adjustment Point
5.	Gang fully open	530KC	L2
6.	Gang fully open	1650KC	C2
7.			Repeat 5 and 6
8.	600KC	600KC	Adjust L1 position
9.	1400KC	1400KC	C1

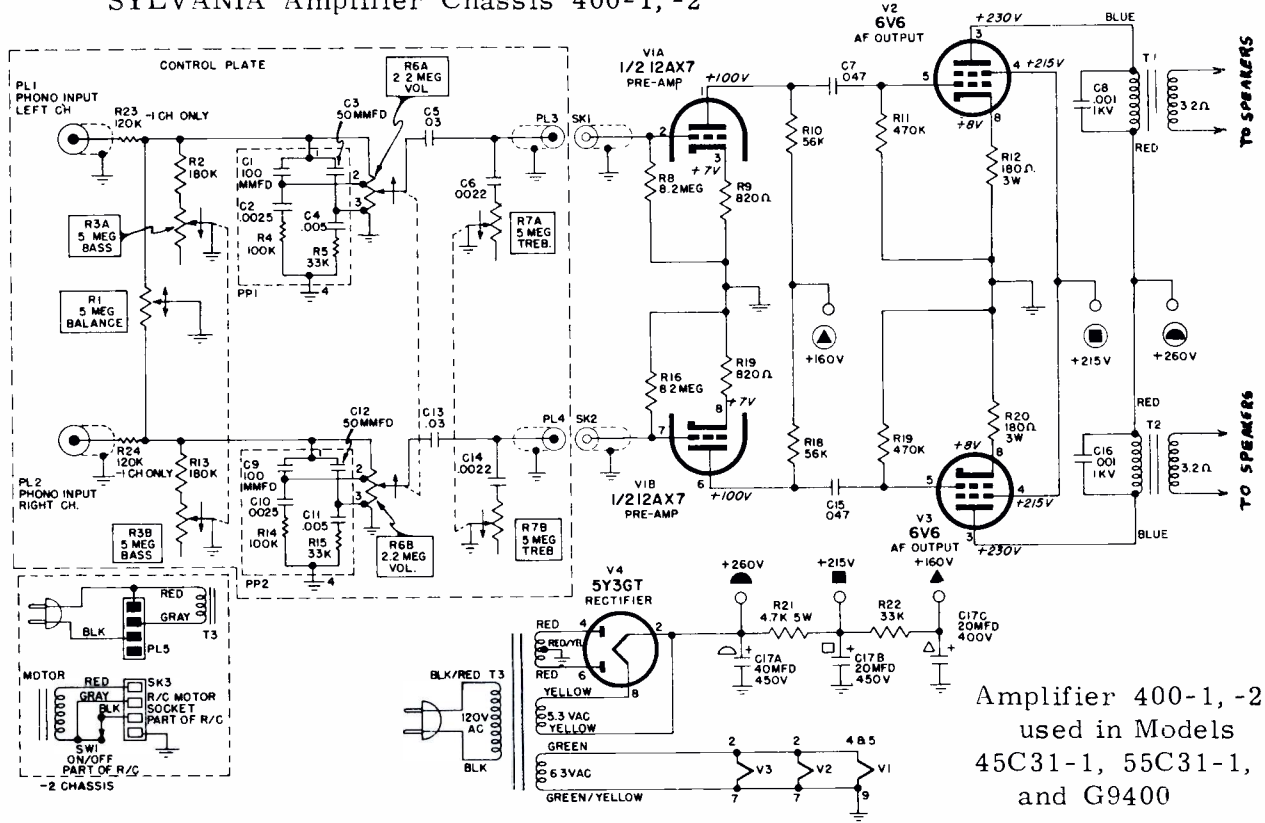


Circuit Board Diagram

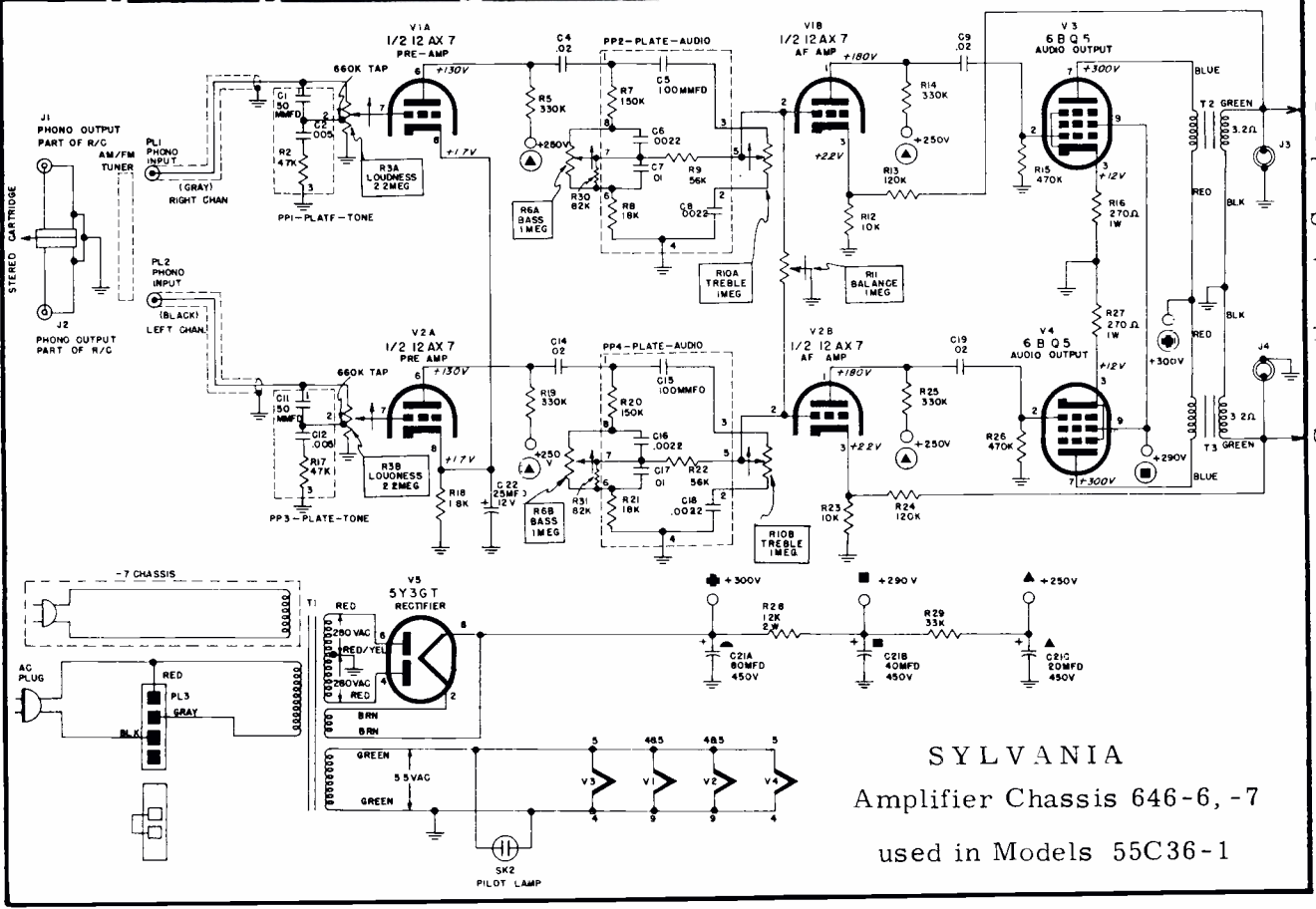
- C14 - 0.01μfd., Ceramic Capacitor
- C3, 4, 7, 9, 16, 17 - 0.02μfd., Ceramic Capacit
- C18 - 200μfd., Ceramic Capacitor
- C5, 6, 10 - 3V, 5μfd., Elec. Capacitor
- C13 - 3V 30μfd., Elec. Capacitor
- C12 - 10V, 10μfd., Elec. Capacitor
- C8, 15 - 10V, 50μfd., Elec. Capacitor
- R20 - 10 Ohm, 1/4 W. Res.
- R21 - 120 Ohm, 1/4 W. Res.
- R17 - 150 Ohm, 1/4 W. Res.
- R12, 16 - 750 Ohm, 1/4 W. Res.
- R8 - 3,000 Ohm, 1/4 W. Res.
- R3, 6, 13 - 2,000 Ohm, 1/4 W. Res.
- R9 - 1,000 Ohm, 1/4 W. Res.
- R18 - 4,500 Ohm, 1/4 W. Res.
- R1, 7, 15 - 5,000 Ohm, 1/4 W. Res.
- R4 - 20,000 Ohm, 1/4 W. Res.
- R2, 11, 14 - 40,000 Ohm, 1/4 W. Res.
- R5 - 80,000 Ohm, 1/4 W. Res.
- R19 - 100,000 Ohm, 1/4 W. Res.
- R10 - 5,000 Ohm, Volume Control
- V1 - 2SA30 Transistor
- V2, 3 - 2SA31 Transistor
- V4, 5, 6 - 2SA32 Transistor
- V7, 8 - 2SA33 Transistor
- E1 - KD-13 Thermistor

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

SYLVANIA Amplifier Chassis 400-1, -2



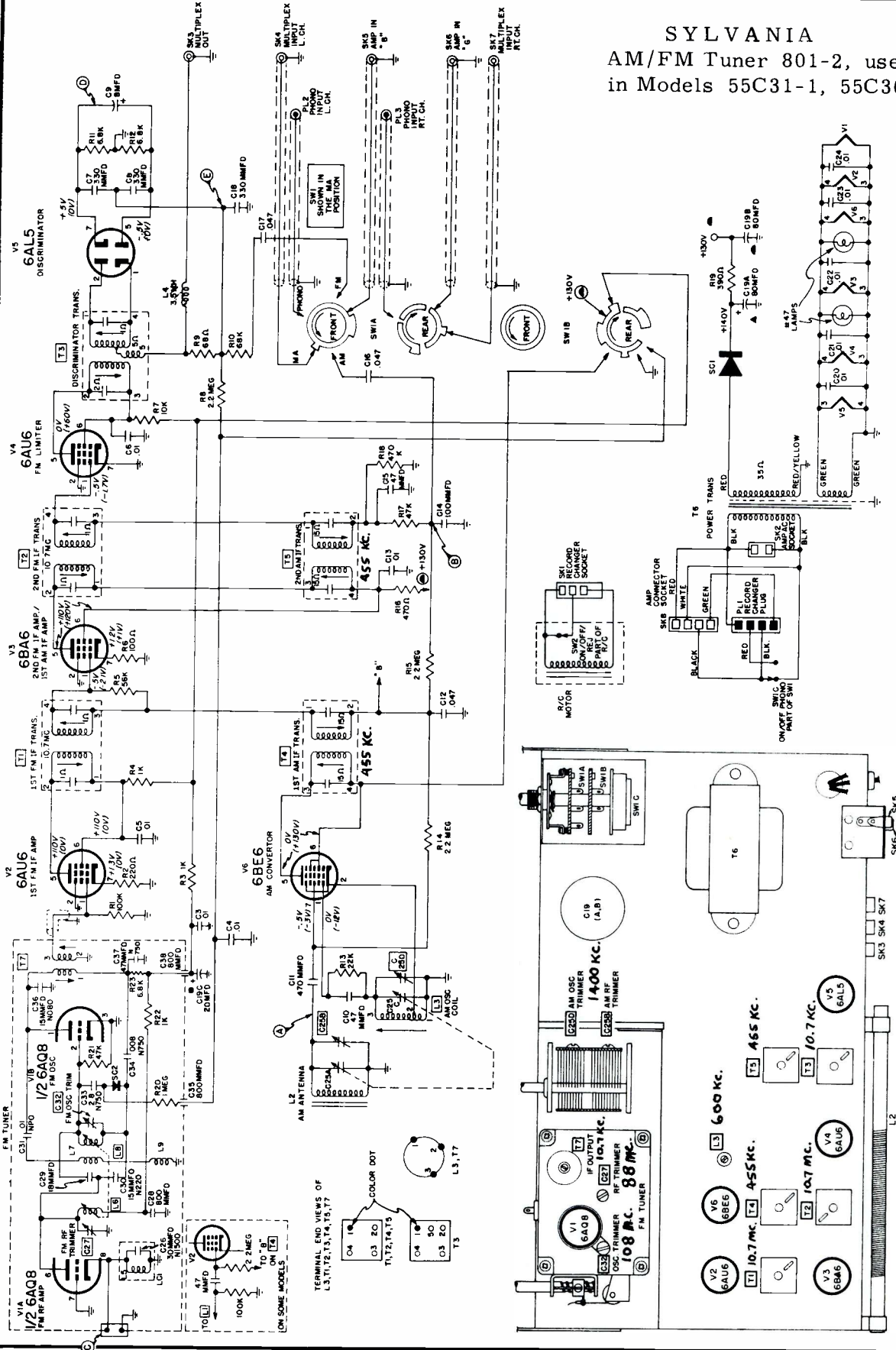
Amplifier 400-1, -2, used in Models 45C31-1, 55C31-1, and G9400



SYLVANIA Amplifier Chassis 646-6, -7 used in Models 55C36-1

Connections to Speakers

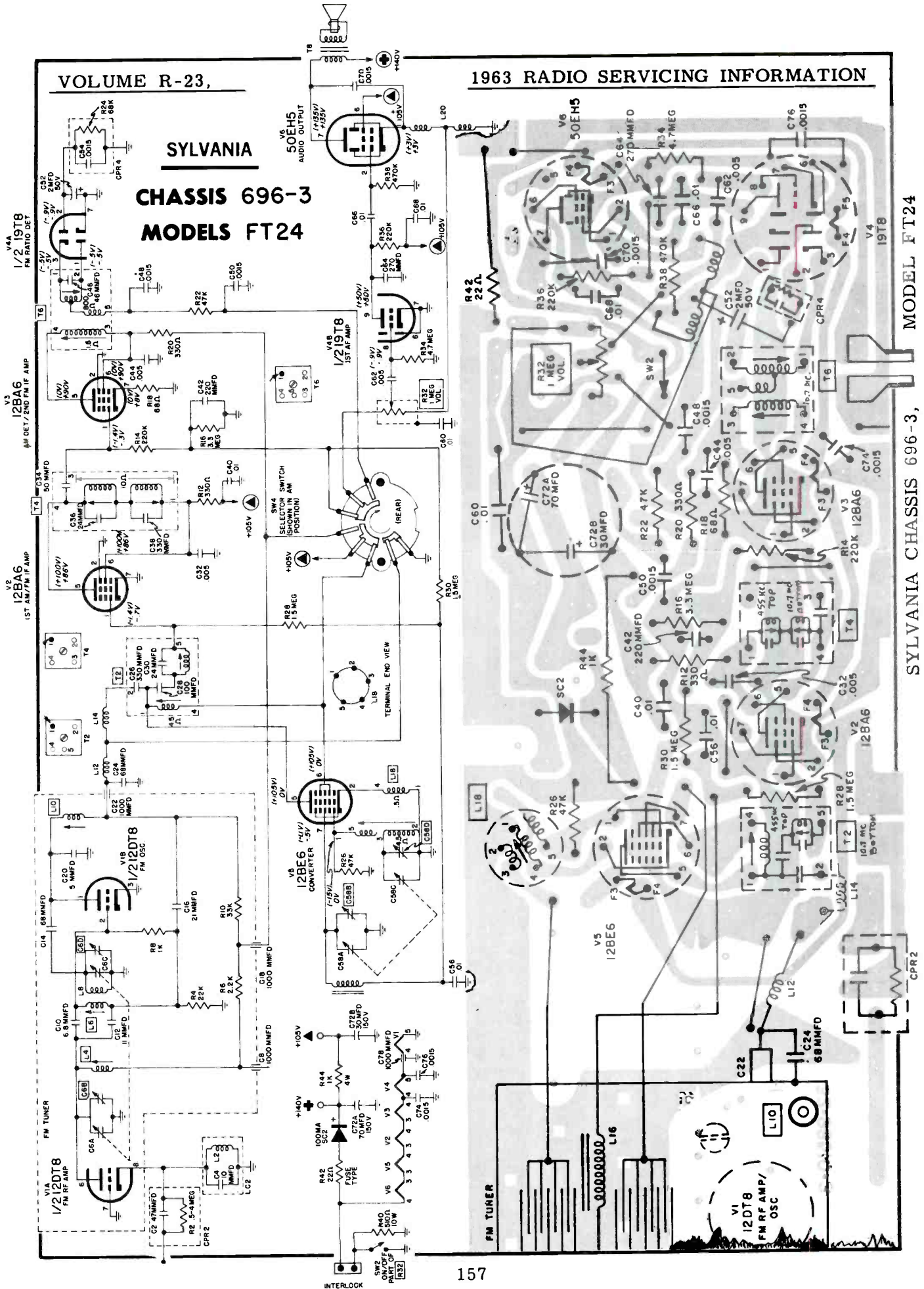
SYLVANIA
AM/FM Tuner 801-2, used
in Models 55C31-1, 55C36-1



SYLVANIA AM/FM Tuner 801-2, used in Models 55C31-1, 55C36-1
(See next page for amplifier diagrams used with these models)

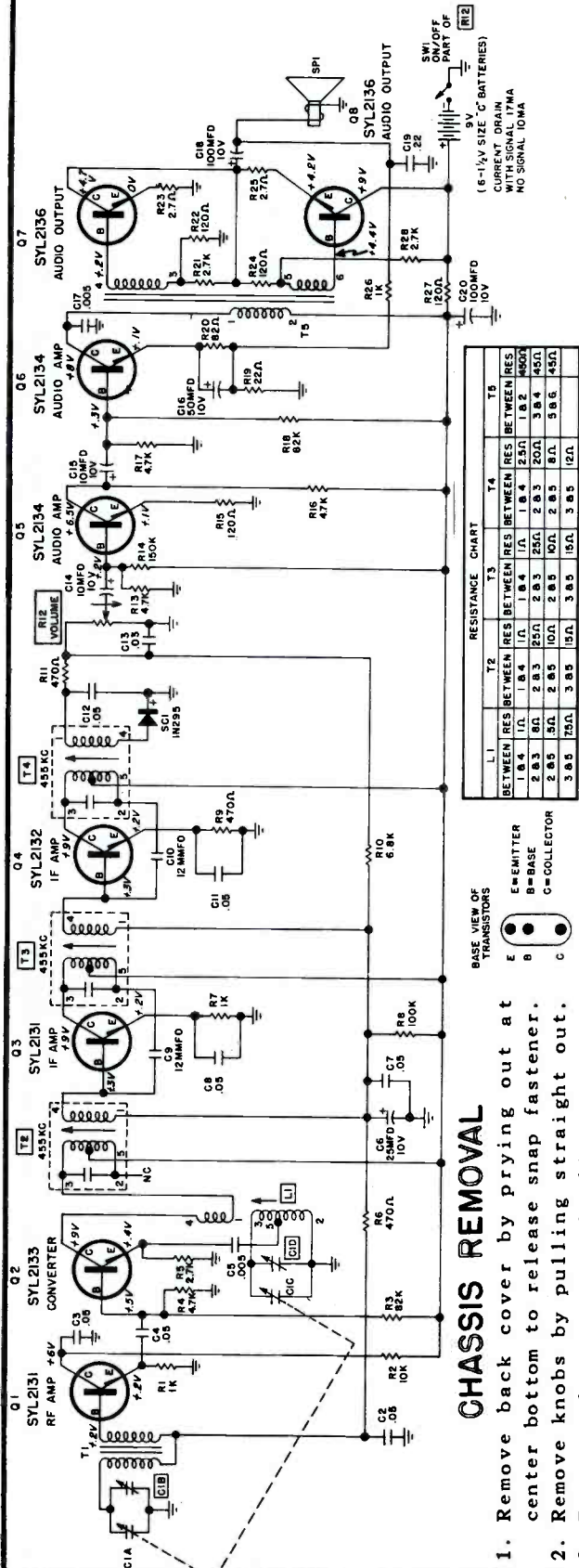
SYLVANIA

CHASSIS 696-3
MODELS FT24



SYLVANIA CHASSIS 696-3, MODEL FT24

SYLVANIA Chassis 700-4, Model TH20



RESISTANCE CHART

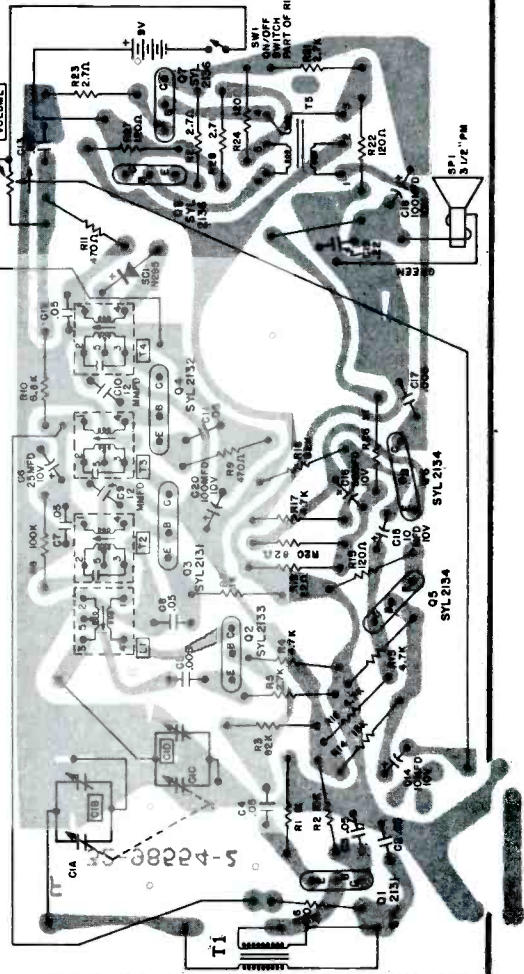
	T2	T3	T4	T5
BETWEEN RES BETWEEN RES BETWEEN RES BETWEEN RES	1.0 4	1.0 4	1.0 4	1.0 4
1.0 4	1.0 4	1.0 4	1.0 4	1.0 4
2.0 3	2.0 3	2.0 3	2.0 3	2.0 3
2.0 3	2.0 3	2.0 3	2.0 3	2.0 3
3.0 5	3.0 5	3.0 5	3.0 5	3.0 5

SCHEMATIC NOTES

1. VOLTAGES MEASURED TO CHASSIS GROUND, WITH RECEIVER NOT TUNED TO ANY SPECIFIC STATION.
2. BATTERY VOLTAGE WITH RECEIVER OPERATING 9 VOLTS.
3. VOLTAGES SHOWN ARE AVERAGE READINGS. VARIATIONS MAY BE NOTED DUE TO NORMAL PRODUCTION TOLERANCE.
4. COIL AND TRANSFORMER RESISTANCE ARE TAKEN WITH COMPONENTS CONNECTED IN THE CIRCUIT.
5. ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
6. INTERMEDIATE FREQUENCY (IF), 455KC.
7. \perp DESIGNATES CHASSIS GROUND.

CHASSIS REMOVAL

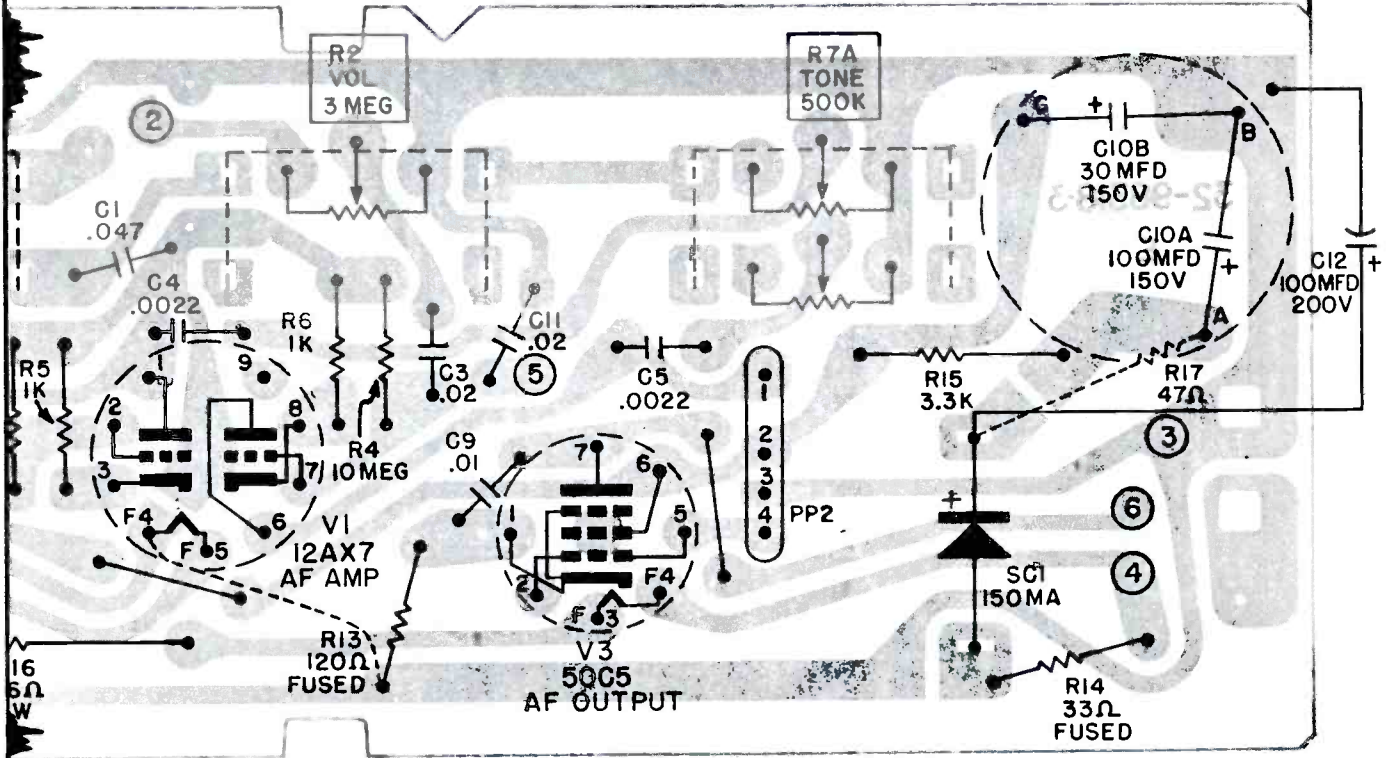
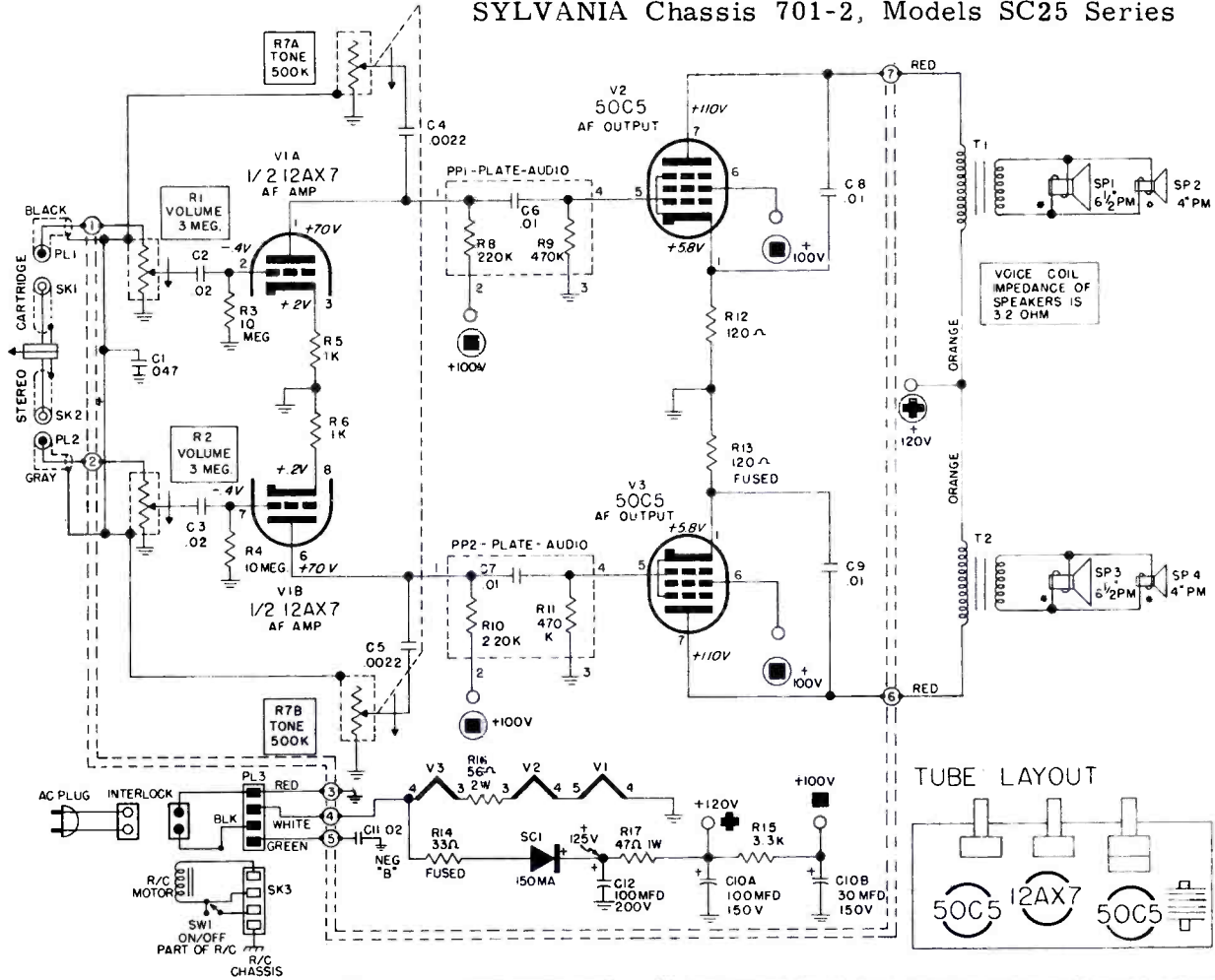
1. Remove back cover by prying out at center bottom to release snap fastener.
2. Remove knobs by pulling straight out.
3. Remove the screw and clip securing chassis to cabinet.
4. Remove the two (2) screws securing volume/on/off control to cabinet, located on bottom of cabinet.
5. Slide chassis back until clear from cabinet.



SYLVANIA

CHASSIS: 700-4 MODEL TH20

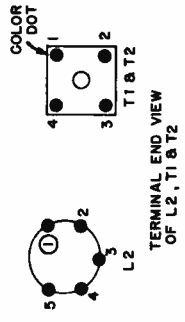
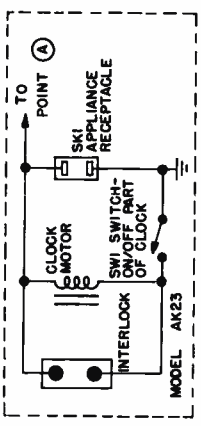
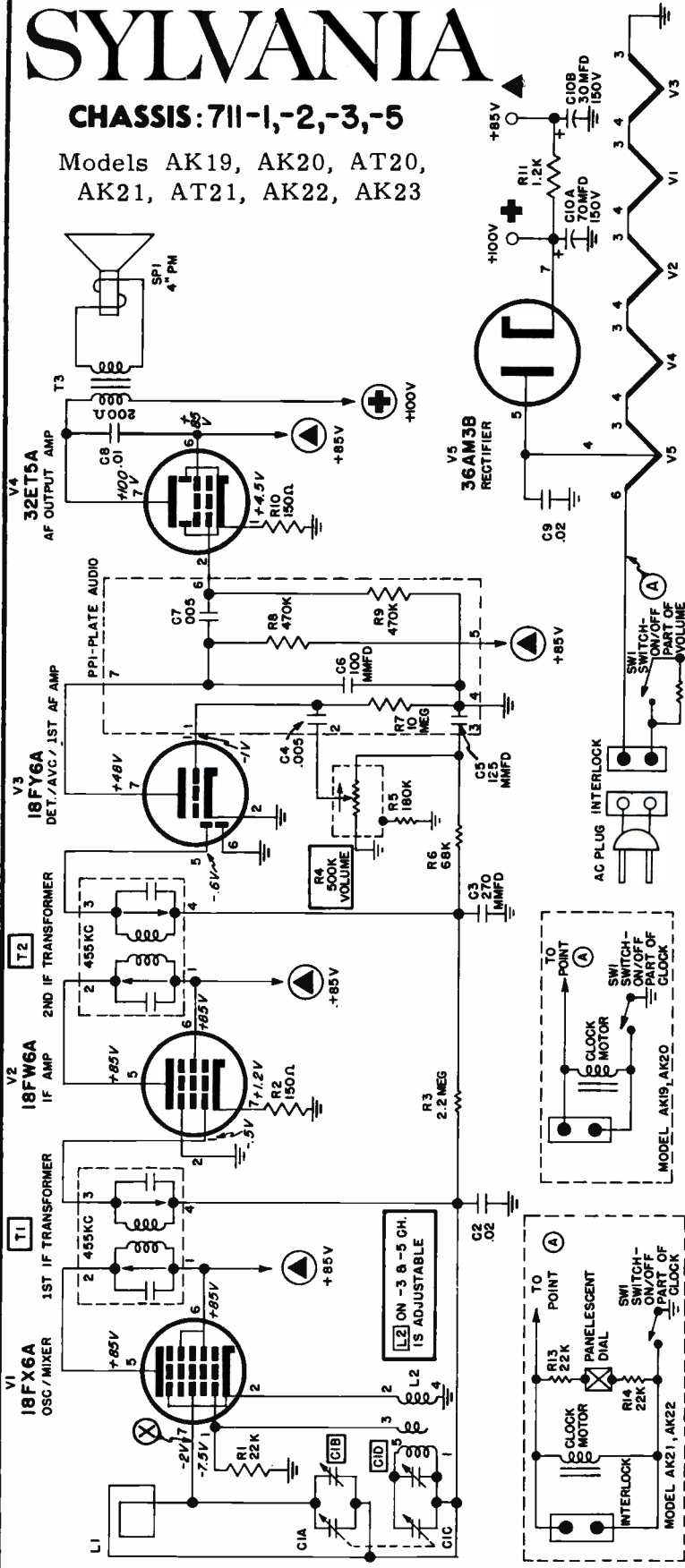
SYLVANIA Chassis 701-2, Models SC25 Series



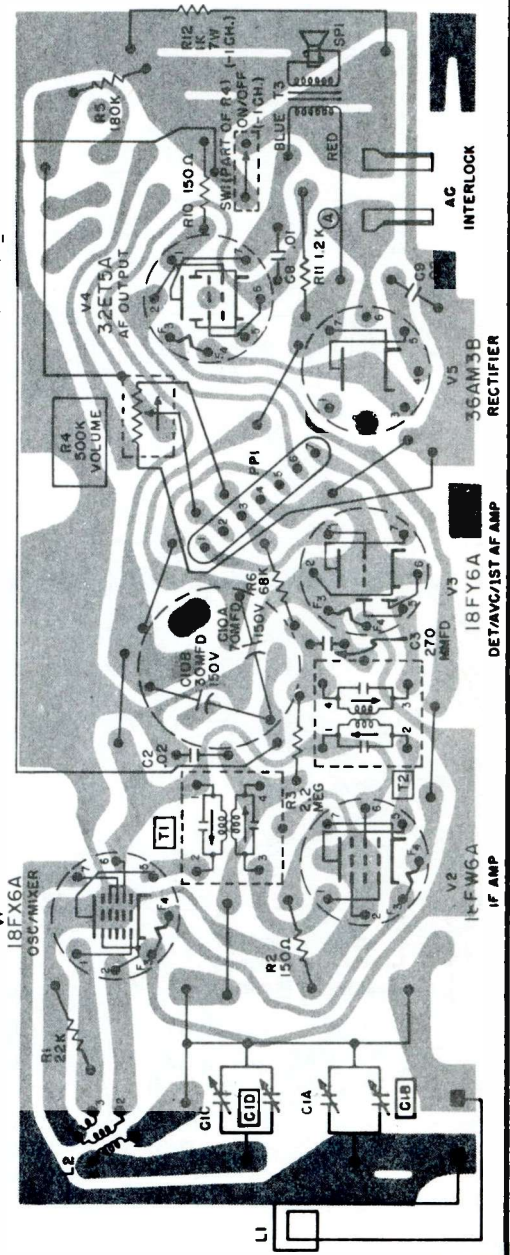
SYLVANIA

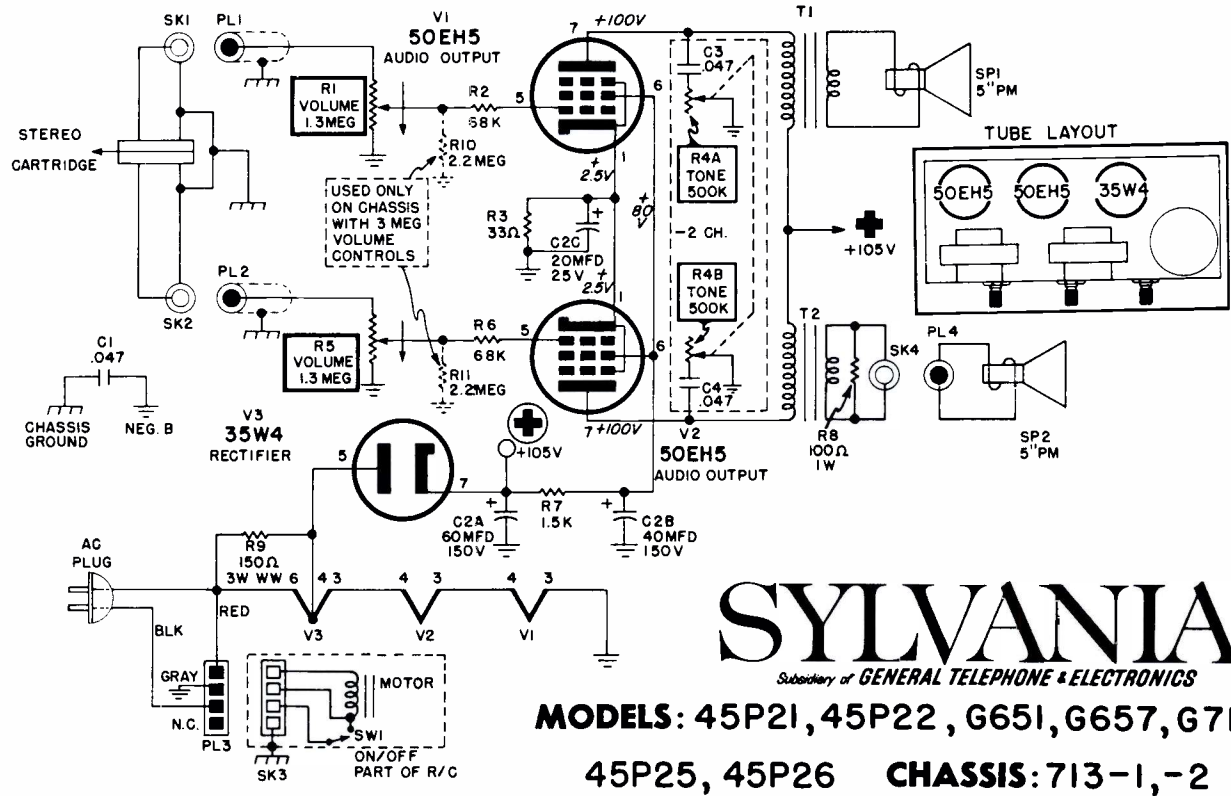
CHASSIS: 711-1,-2,-3,-5

Models AK19, AK20, AT20, AK21, AT21, AK22, AK23

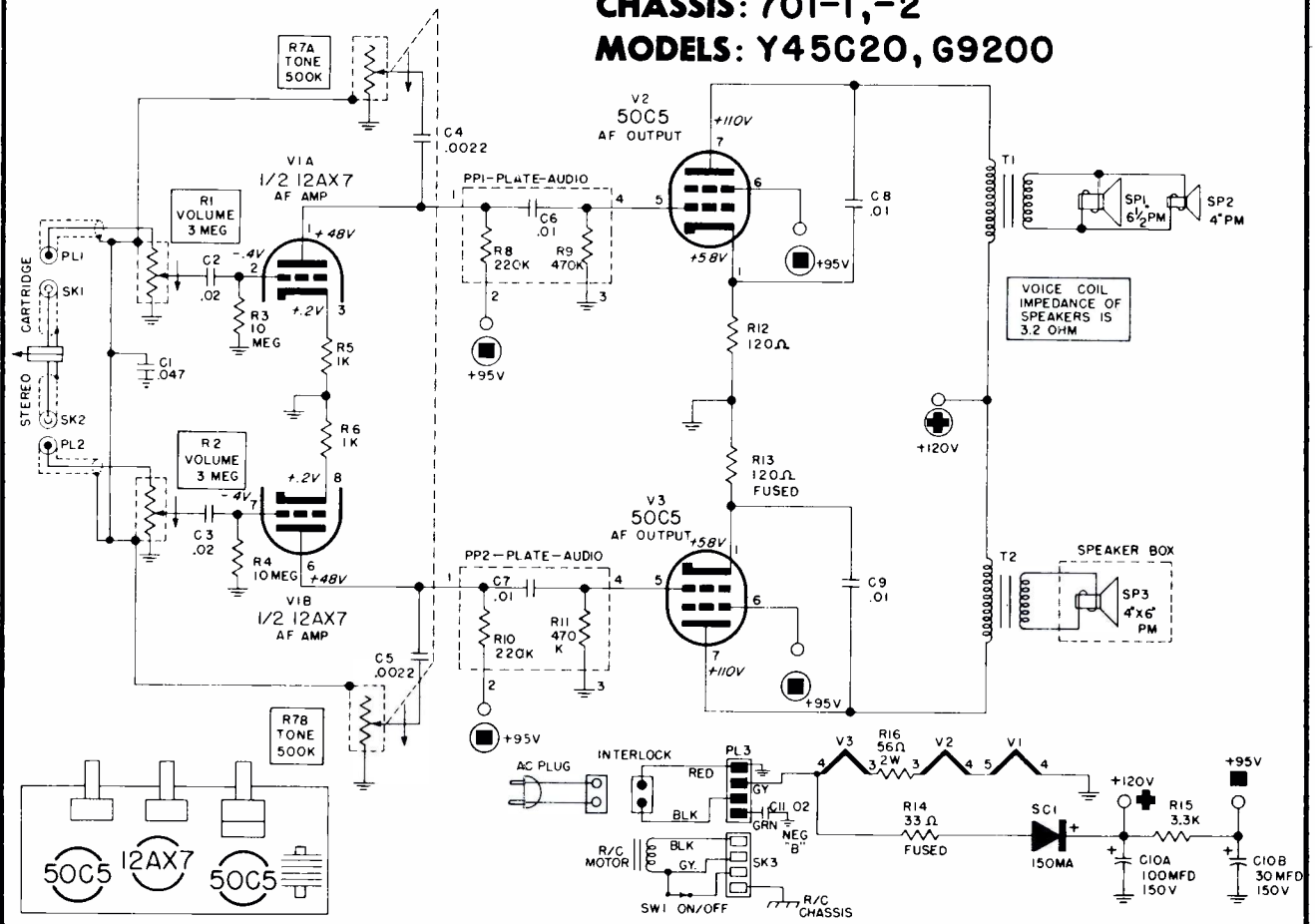


RESISTANCE CHART	
L1	T2
BETWEEN RES. BETWEEN	BETWEEN RES.
1 & 5	1 & 2
2 & 4	3 & 4
	15Ω
	15Ω



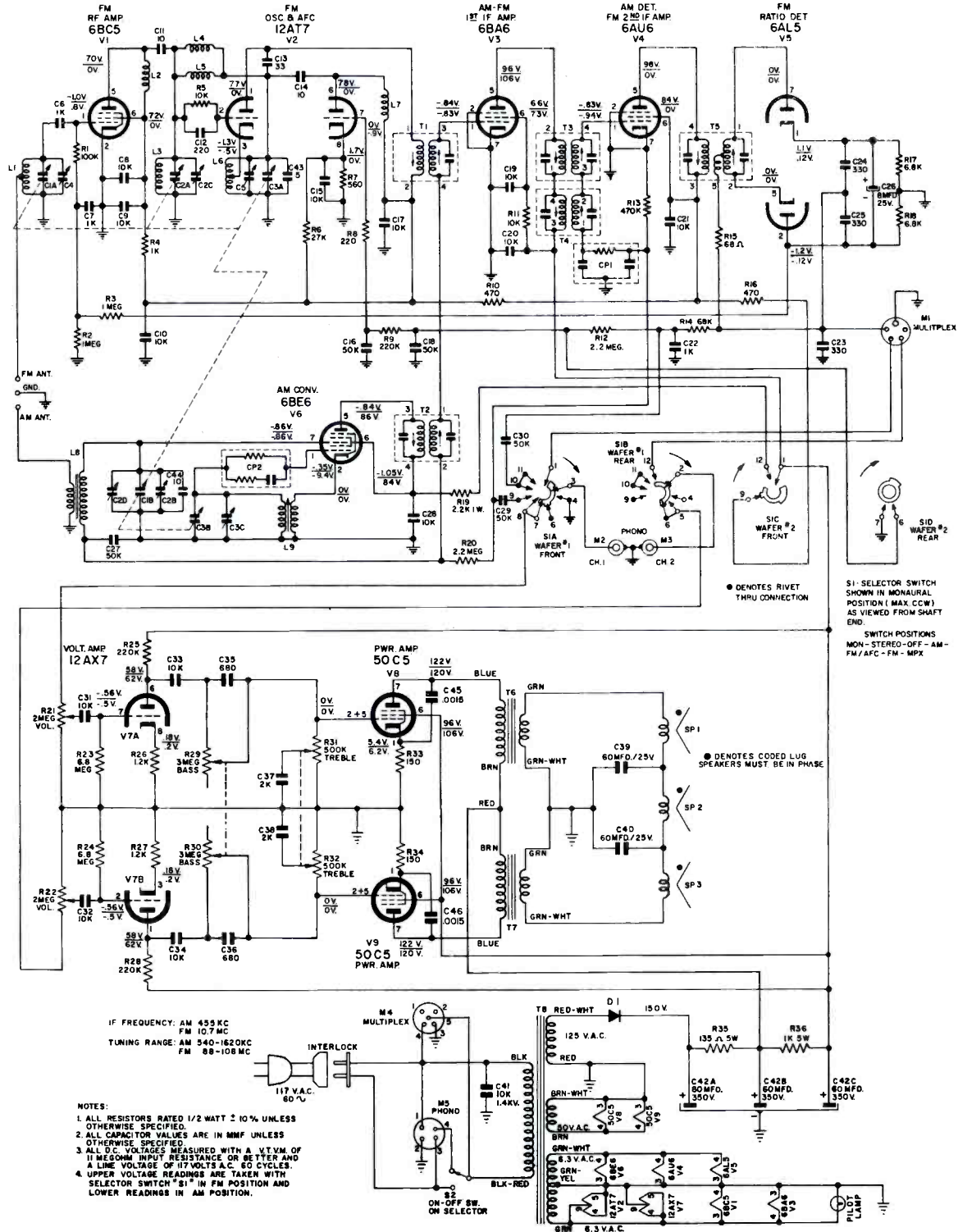


CHASSIS: 701-1, -2
MODELS: Y45C20, G9200



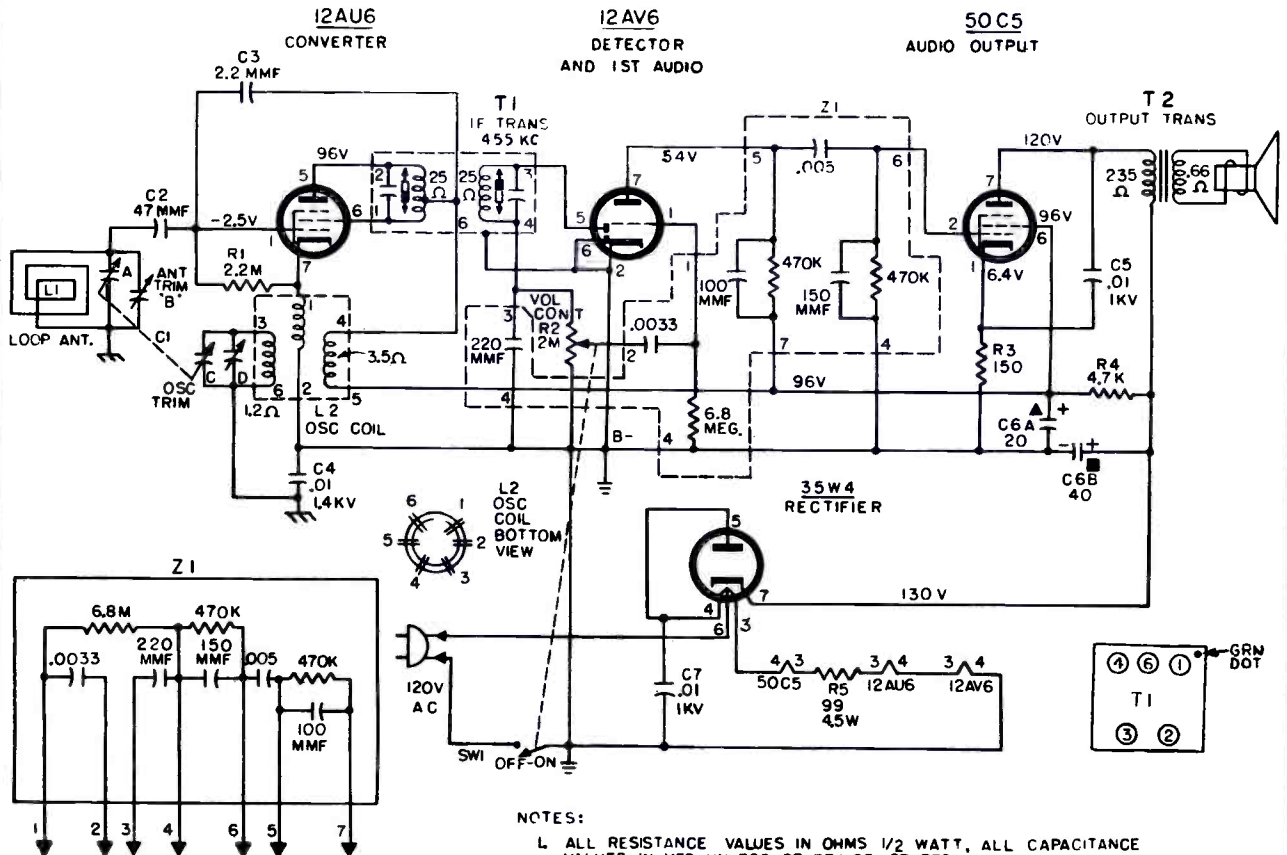
WEBCOR

Model 1296



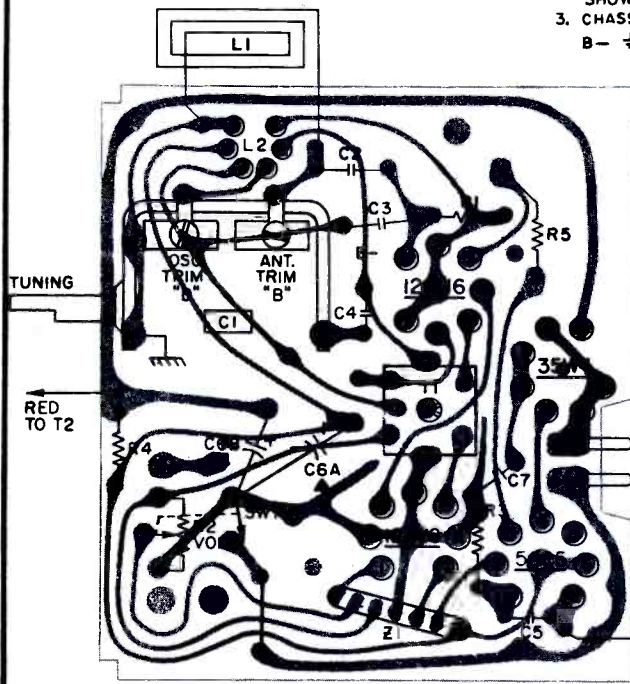
Westinghouse

MODEL H-782T4
CHASSIS V-2420-3

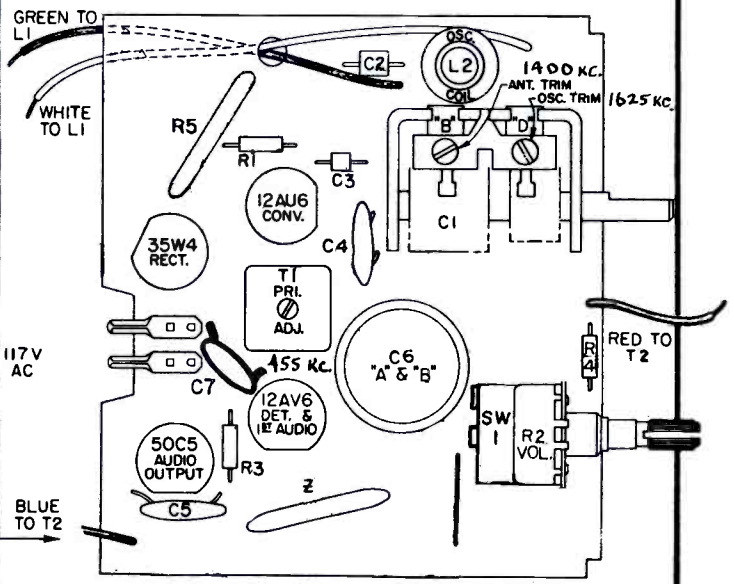


NOTES:

1. ALL RESISTANCE VALUES IN OHMS 1/2 WATT, ALL CAPACITANCE VALUES IN MFD UNLESS OTHERWISE STATED.
 2. ALL VOLTAGES MEASURED FROM B- TO POINTS INDICATED WITH V.T.V.M. LINE VOLTAGE SET AT 120 V.A.C. READINGS SHOULD BE AS SHOWN $\pm 20\%$
 3. CHASSIS GROUND $\text{---}\text{---}$
- B- \perp



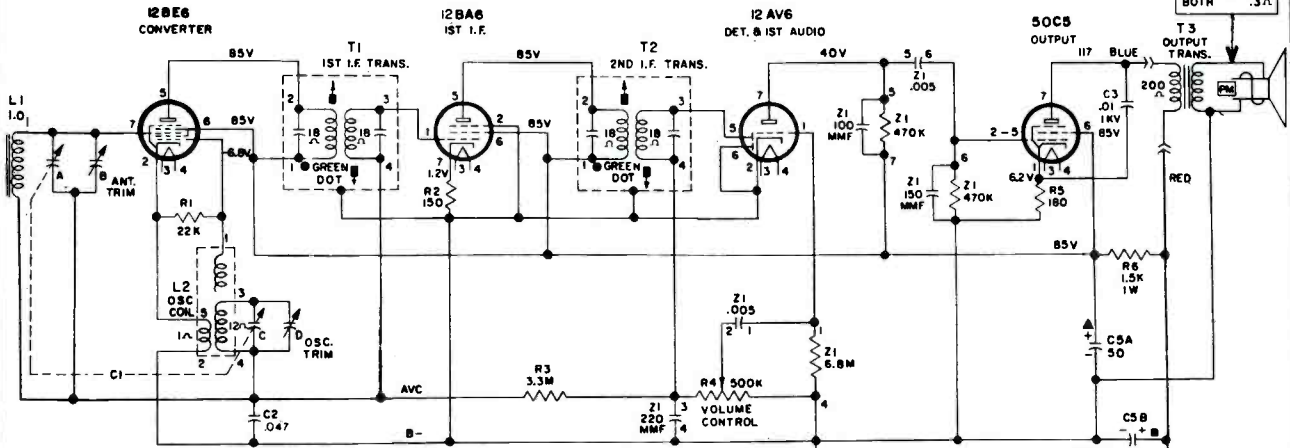
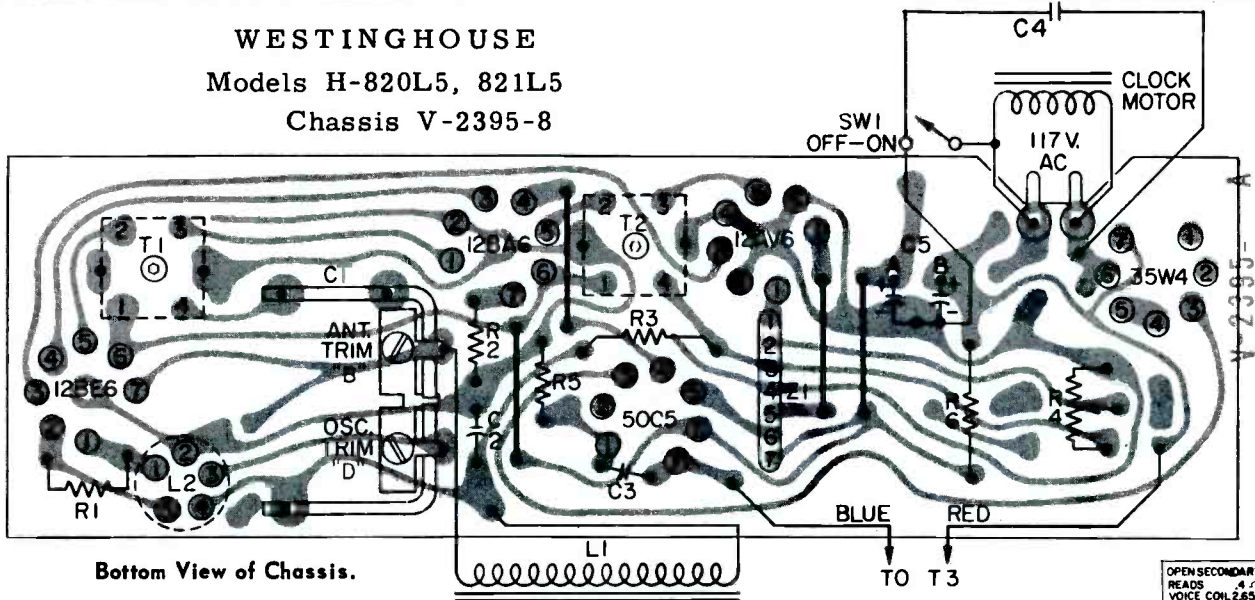
Bottom View Of Chassis



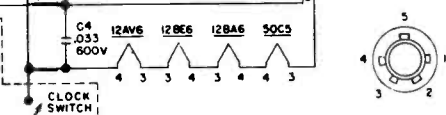
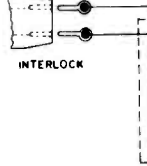
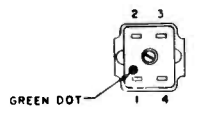
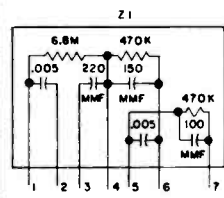
Top View Of Chassis

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

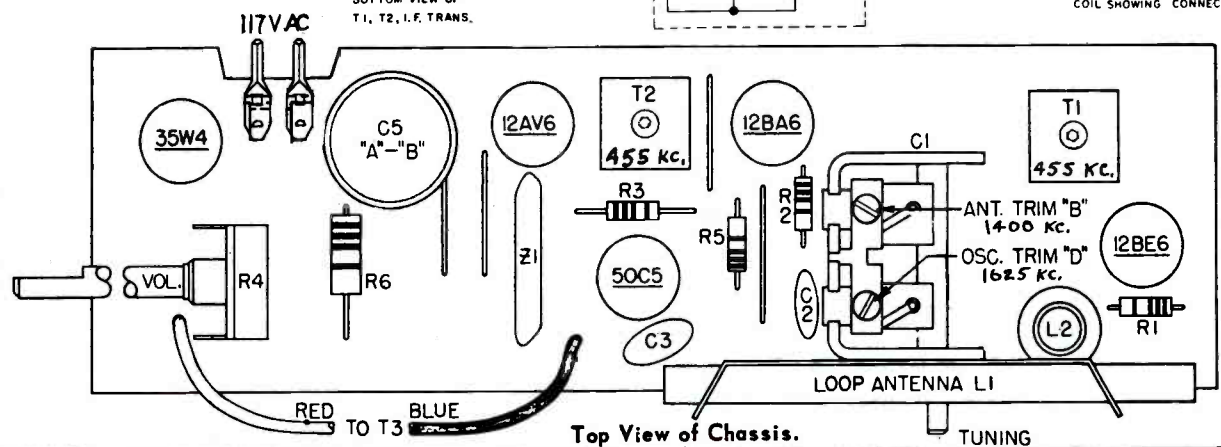
WESTINGHOUSE
Models H-820L5, 821L5
Chassis V-2395-8



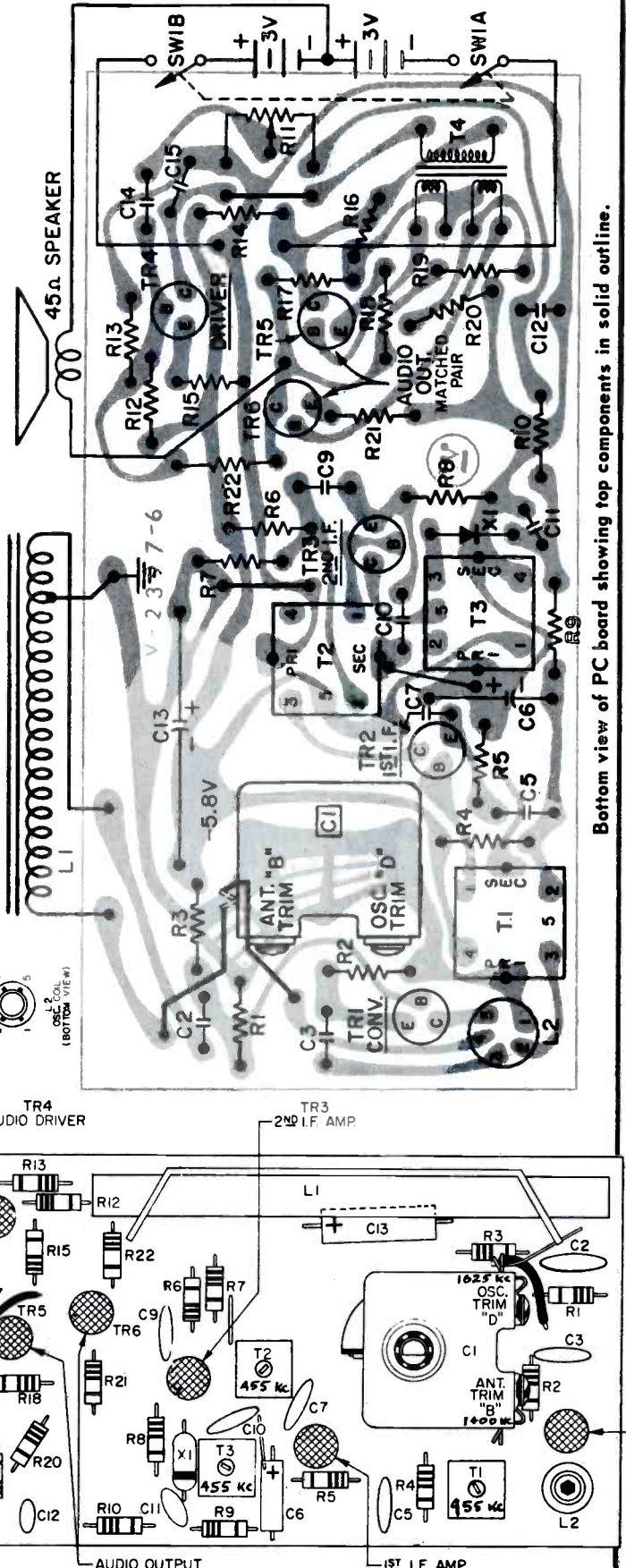
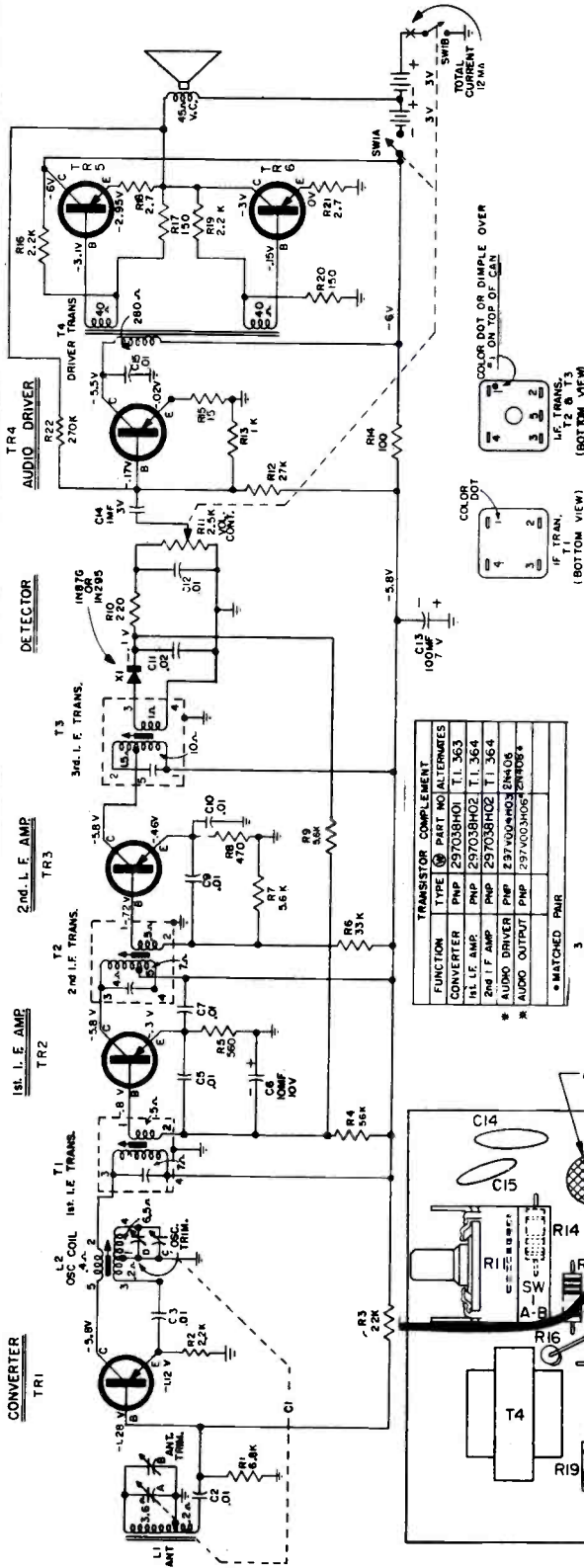
ALL VOLTAGES MEASURED FROM COMMON NEGATIVE USING A V.T.V.M., VOLUME CONTROL AT MINIMUM, TUNING CAPACITOR AT MAXIMUM LINE VOLTAGE SET AT 117 V.A.C. READINGS SHOULD BE AS SHOWN $\pm 20\%$. ALL CAPACITANCE VALUES IN MFD. AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.



BOTTOM VIEW OF L2 OSC. COIL SHOWING CONNECTIONS



WESTINGHOUSE
Model H-793P6GPA
Chassis V-2397-6



Bottom view of PC board showing top components in solid outline.

WESTINGHOUSE Chassis V-2399-6, Models H-712P9A, H-713P9A
(Alignment Information on the next page at right)

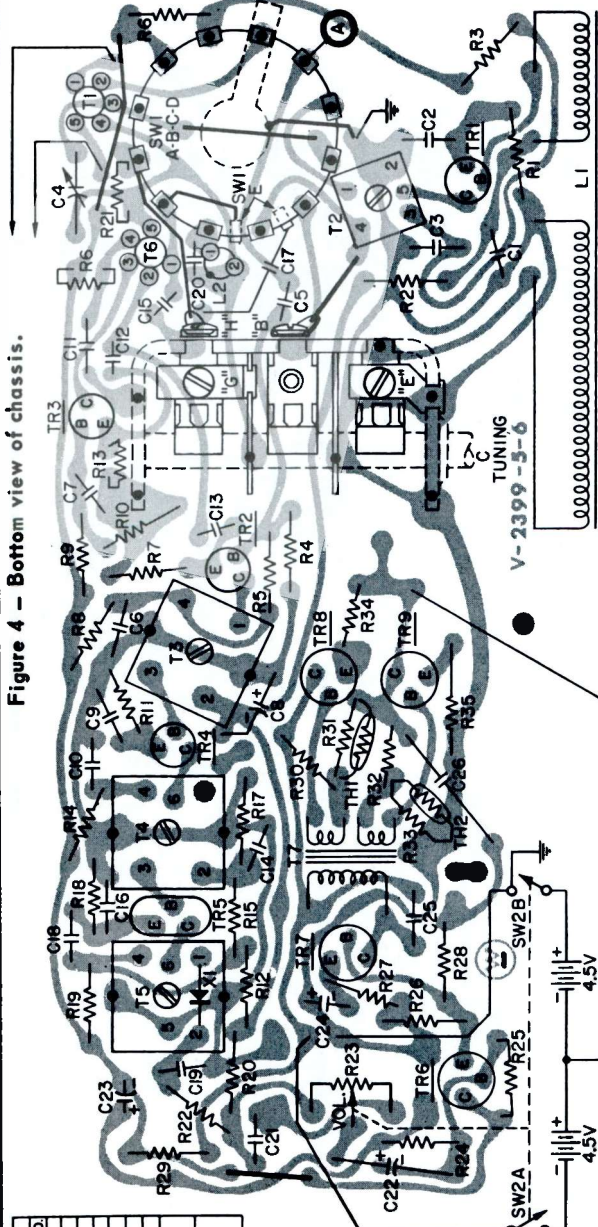


Figure 4 - Bottom view of chassis.

TRANSISTOR COMPLIMENT		
FUNCTION	TYPE PART NO.	ALT. TRANS. NO. / ALT. TYPE NO.
RF AMP	BC	27YV0800A / 27YV0800
OSC	BC	27YV0800A / 27YV0800
1ST I.F. AMP	BC	27YV0800A / 27YV0800
2ND I.F. AMP	BC	27YV0800A / 27YV0800
1ST AUDIO DRIVER	BC	27YV0800A / 27YV0800
2ND AUDIO DRIVER	BC	27YV0800A / 27YV0800
AUDIO OUTPUT	BC	27YV0800A / 27YV0800
MATCHED PAIR 8		
MATCHED PAIR 9		
MATCHED PAIR 10		
MATCHED PAIR 11		
MATCHED PAIR 12		
MATCHED PAIR 13		
MATCHED PAIR 14		
MATCHED PAIR 15		
MATCHED PAIR 16		
MATCHED PAIR 17		
MATCHED PAIR 18		
MATCHED PAIR 19		
MATCHED PAIR 20		
MATCHED PAIR 21		
MATCHED PAIR 22		
MATCHED PAIR 23		
MATCHED PAIR 24		
MATCHED PAIR 25		
MATCHED PAIR 26		
MATCHED PAIR 27		
MATCHED PAIR 28		
MATCHED PAIR 29		
MATCHED PAIR 30		
MATCHED PAIR 31		
MATCHED PAIR 32		
MATCHED PAIR 33		
MATCHED PAIR 34		
MATCHED PAIR 35		
MATCHED PAIR 36		
MATCHED PAIR 37		
MATCHED PAIR 38		
MATCHED PAIR 39		
MATCHED PAIR 40		
MATCHED PAIR 41		
MATCHED PAIR 42		
MATCHED PAIR 43		
MATCHED PAIR 44		
MATCHED PAIR 45		
MATCHED PAIR 46		
MATCHED PAIR 47		
MATCHED PAIR 48		
MATCHED PAIR 49		
MATCHED PAIR 50		
MATCHED PAIR 51		
MATCHED PAIR 52		
MATCHED PAIR 53		
MATCHED PAIR 54		
MATCHED PAIR 55		
MATCHED PAIR 56		
MATCHED PAIR 57		
MATCHED PAIR 58		
MATCHED PAIR 59		
MATCHED PAIR 60		
MATCHED PAIR 61		
MATCHED PAIR 62		
MATCHED PAIR 63		
MATCHED PAIR 64		
MATCHED PAIR 65		
MATCHED PAIR 66		
MATCHED PAIR 67		
MATCHED PAIR 68		
MATCHED PAIR 69		
MATCHED PAIR 70		
MATCHED PAIR 71		
MATCHED PAIR 72		
MATCHED PAIR 73		
MATCHED PAIR 74		
MATCHED PAIR 75		
MATCHED PAIR 76		
MATCHED PAIR 77		
MATCHED PAIR 78		
MATCHED PAIR 79		
MATCHED PAIR 80		
MATCHED PAIR 81		
MATCHED PAIR 82		
MATCHED PAIR 83		
MATCHED PAIR 84		
MATCHED PAIR 85		
MATCHED PAIR 86		
MATCHED PAIR 87		
MATCHED PAIR 88		
MATCHED PAIR 89		
MATCHED PAIR 90		
MATCHED PAIR 91		
MATCHED PAIR 92		
MATCHED PAIR 93		
MATCHED PAIR 94		
MATCHED PAIR 95		
MATCHED PAIR 96		
MATCHED PAIR 97		
MATCHED PAIR 98		
MATCHED PAIR 99		
MATCHED PAIR 100		

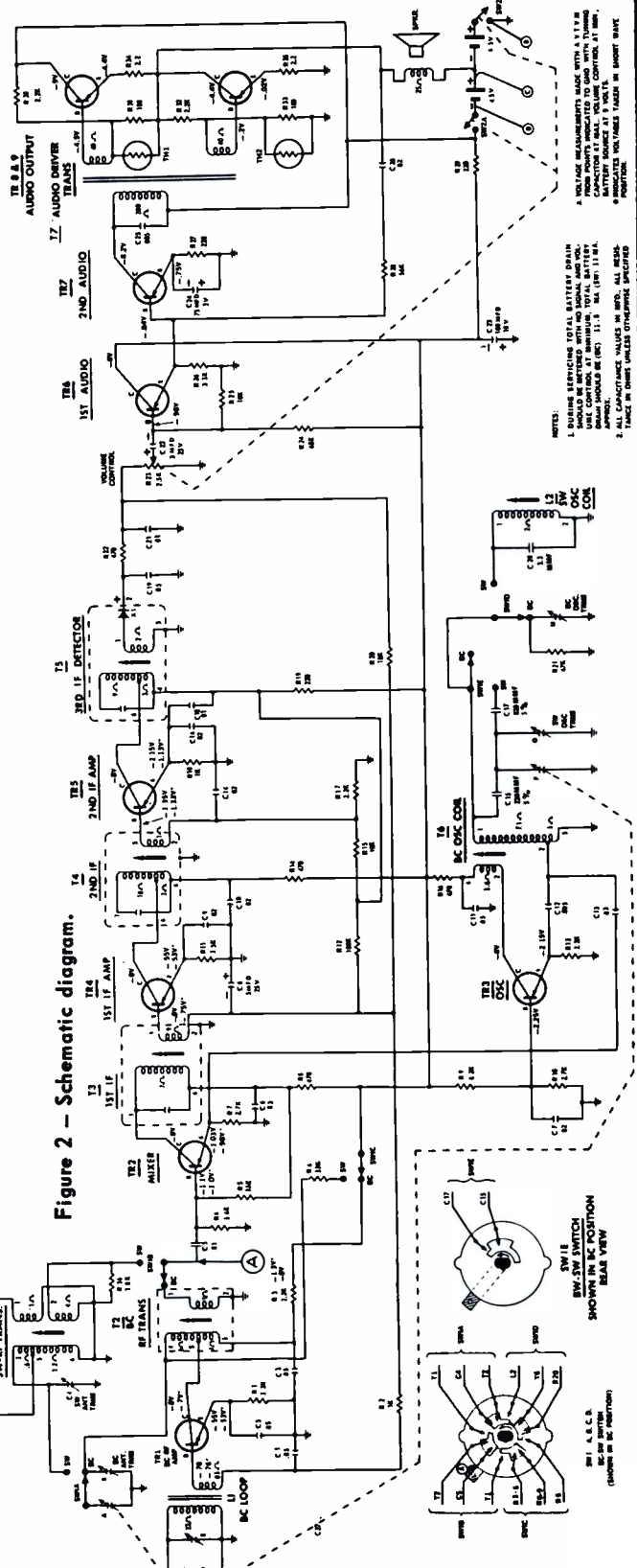
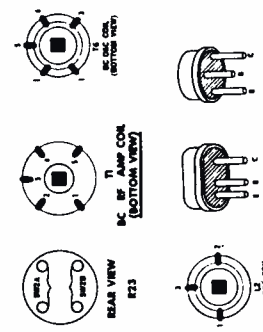


Figure 2 - Schematic diagram.

NOTES:
1. DURING SERVICING TOTAL BATTERY DRAIN SHOULD BE LIMITED TO 10 HOURS. BATTERY SHOULD BE RECHARGED AT 10 AMP. APPROX. 10 HOURS.
2. CHECK ALL RESISTOR VALUES IN THIS SCHEMATIC AGAINST THE VALUES LISTED IN THE PARTS LIST.
3. CHECK ALL CAPACITOR VALUES IN THIS SCHEMATIC AGAINST THE VALUES LISTED IN THE PARTS LIST.
4. CHECK ALL SOCKET VALUES IN SCHEMATIC AGAINST THE VALUES LISTED IN THE PARTS LIST.
5. CHECK ALL SOCKET VALUES IN SCHEMATIC AGAINST THE VALUES LISTED IN THE PARTS LIST.
6. CHECK ALL SOCKET VALUES IN SCHEMATIC AGAINST THE VALUES LISTED IN THE PARTS LIST.
7. CHECK ALL SOCKET VALUES IN SCHEMATIC AGAINST THE VALUES LISTED IN THE PARTS LIST.
8. CHECK ALL SOCKET VALUES IN SCHEMATIC AGAINST THE VALUES LISTED IN THE PARTS LIST.
9. CHECK ALL SOCKET VALUES IN SCHEMATIC AGAINST THE VALUES LISTED IN THE PARTS LIST.
10. CHECK ALL SOCKET VALUES IN SCHEMATIC AGAINST THE VALUES LISTED IN THE PARTS LIST.

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

WESTINGHOUSE Chassis V-2399-6, Models H-712P9A, H-713P9A, Continued

SIGNAL GENERATOR - Use generator which provides modulated 455KC, 530-1600KC and 2.4-7.5MC frequencies. Signal output should be modulated 30%. Keep output low enough to just give an indication to avoid AVC action.

INDICATOR - Connect VTVM across speaker voice coil.

ALIGNMENT TOOLS - Use insulated aligning tool that snugly fits slots in ferrite cores to prevent chipping of ferrite. A square tool (see figure 5) is required for all slug adjustments.

RECEIVER - Remove chassis, speaker and battery holder from cabinet. The dial background must be removed from chassis. Locate speaker close to chassis and T1. Be sure batteries are at rated voltage (under load). Set volume control to maximum. The oscillator adjustments are critical and therefore screws and slugs should be rotated very slowly to exact alignment point. Be sure during RF alignment that hand or any metal objects on bench do not come in close contact with antenna loop.

Step	Connect Signal Generator To:	Generator Frequency	C27 Setting	SW1 Setting	Adjust For Maximum:
1.	Test point "A" (T.P. "A")	455KC	open	BC	Top slugs of T5, T4 & T3 in order. (Reduce generator output if necessary for T4 & T3 adjustments)
2.	"	6.5MC	"	SW	Rotate C27G maximum clockwise then back-off 1/2 turn. Adjust L2.
3.	"	7.41MC	"	"	Increase generator output until image signal is heard. If not heard, oscillator is tuned to low side of incoming signal and L2 must be rotated counter-clockwise until image signal is heard.
4.	"	6.5MC	"	"	C27G
5.	"	2.4MC	closed	"	L2
6.	Repeat steps 4 and 5 until no further change is noted.				
7.	Test point "A"	1625KC	open	BC	C27H
8.	"	530KC	closed	"	T6
9.	Repeat steps 7 and 8 until no further change is noted.				
10.	Lead from T1 through 15 mmf capacitor.	5.8MC	Tune until signal is heard.	SW	C4
11.	"	2.6MC	"	"	T1
12.	Repeat steps 10 and 11 until no further change is noted.				
13.	Lead from L1 through 200 mmf capacitor.	1400KC	Tune until signal is heard.	BC	C27E and C27B
14.	"	600KC	"	"	T2
15.	"	1400KC	"	"	C27B

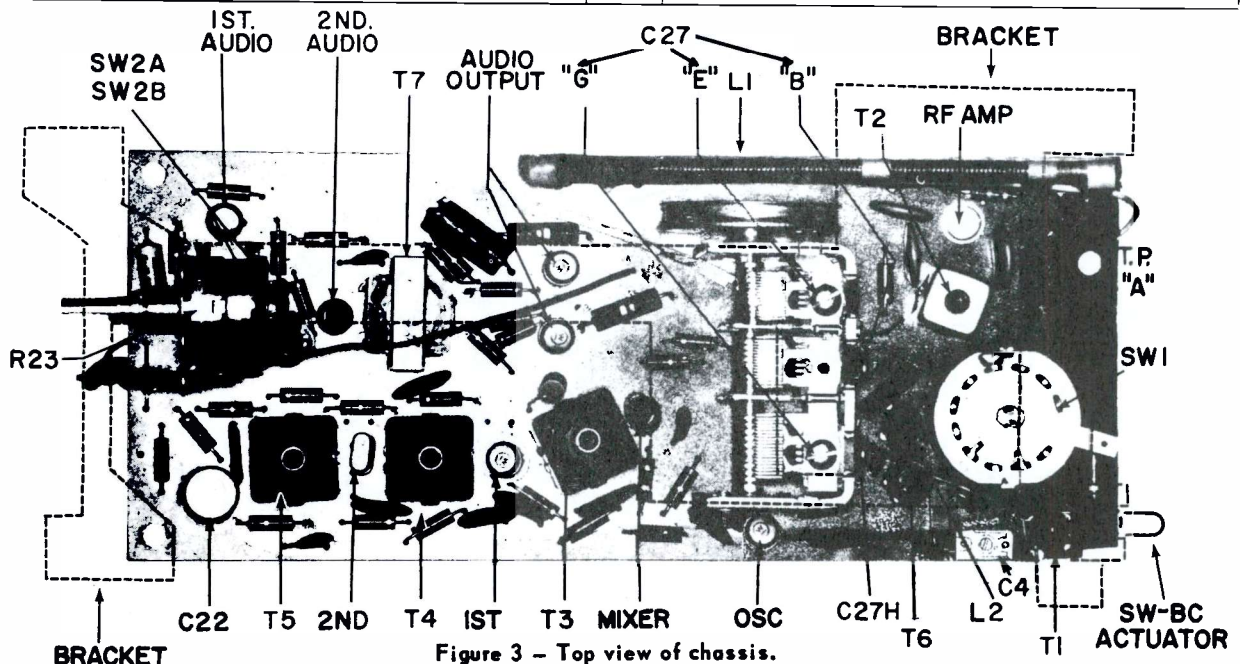
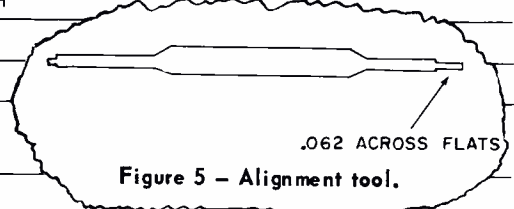
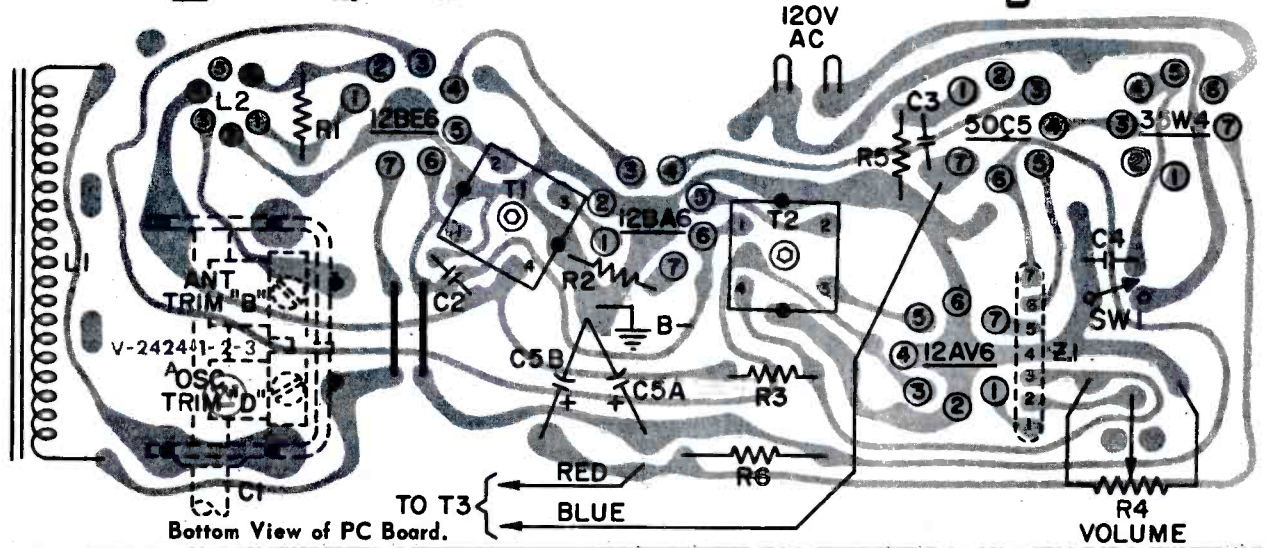
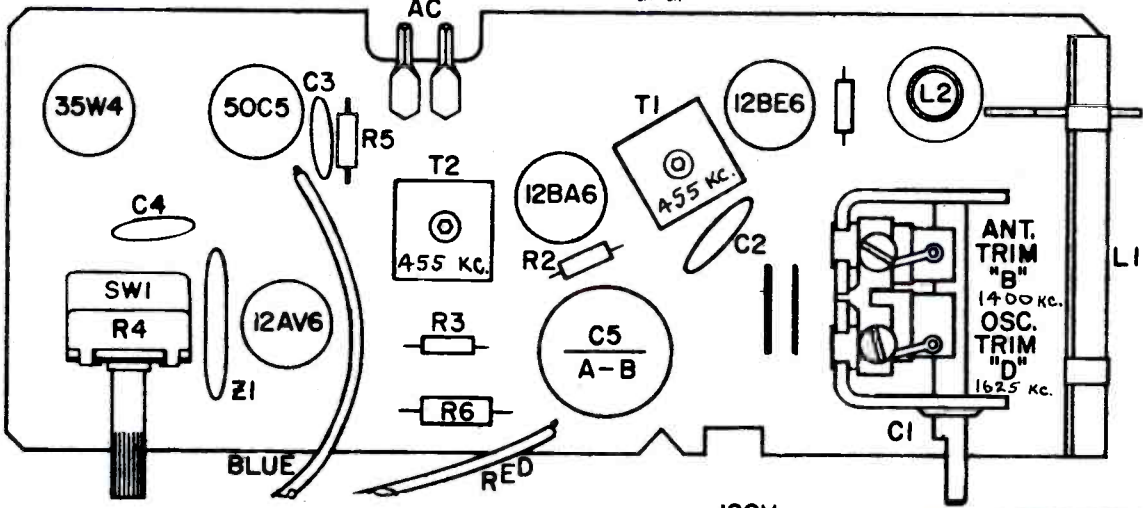
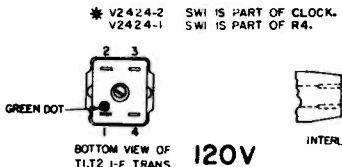
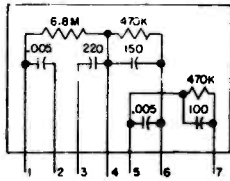
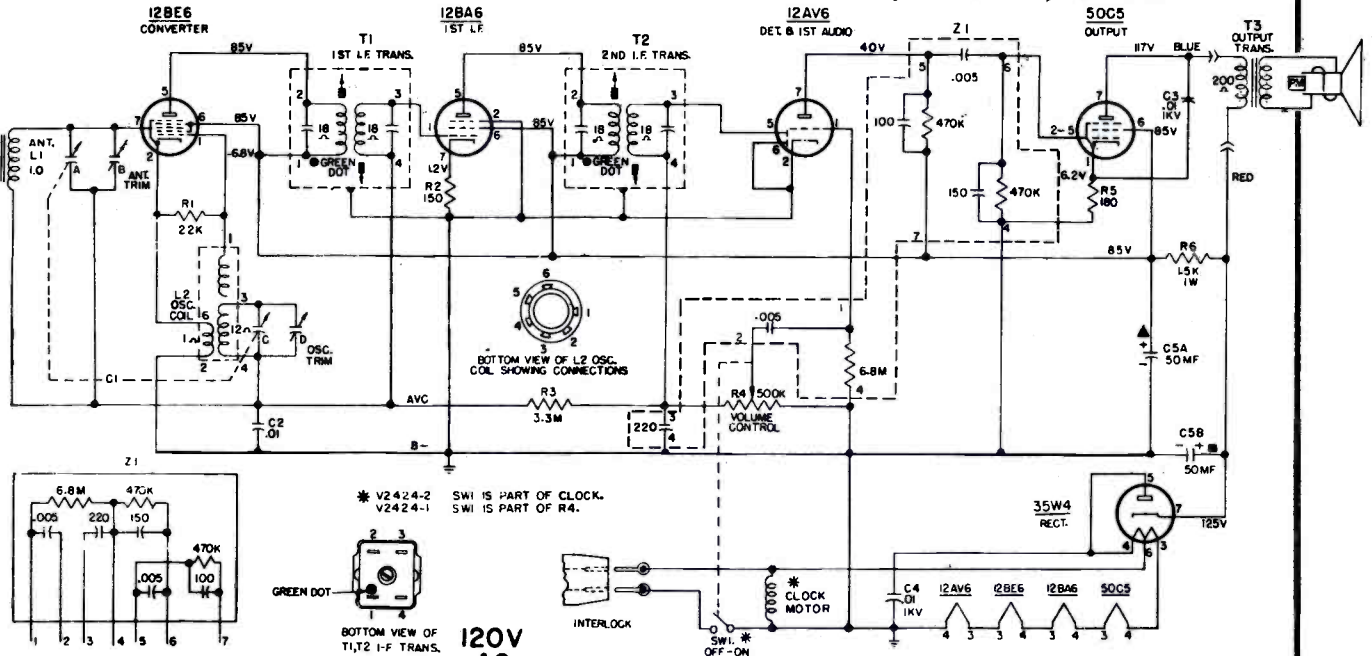


Figure 3 - Top view of chassis.

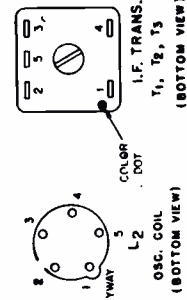
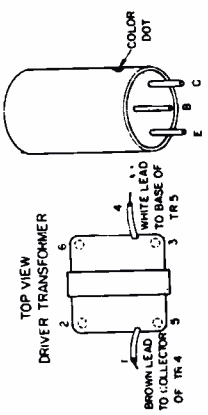
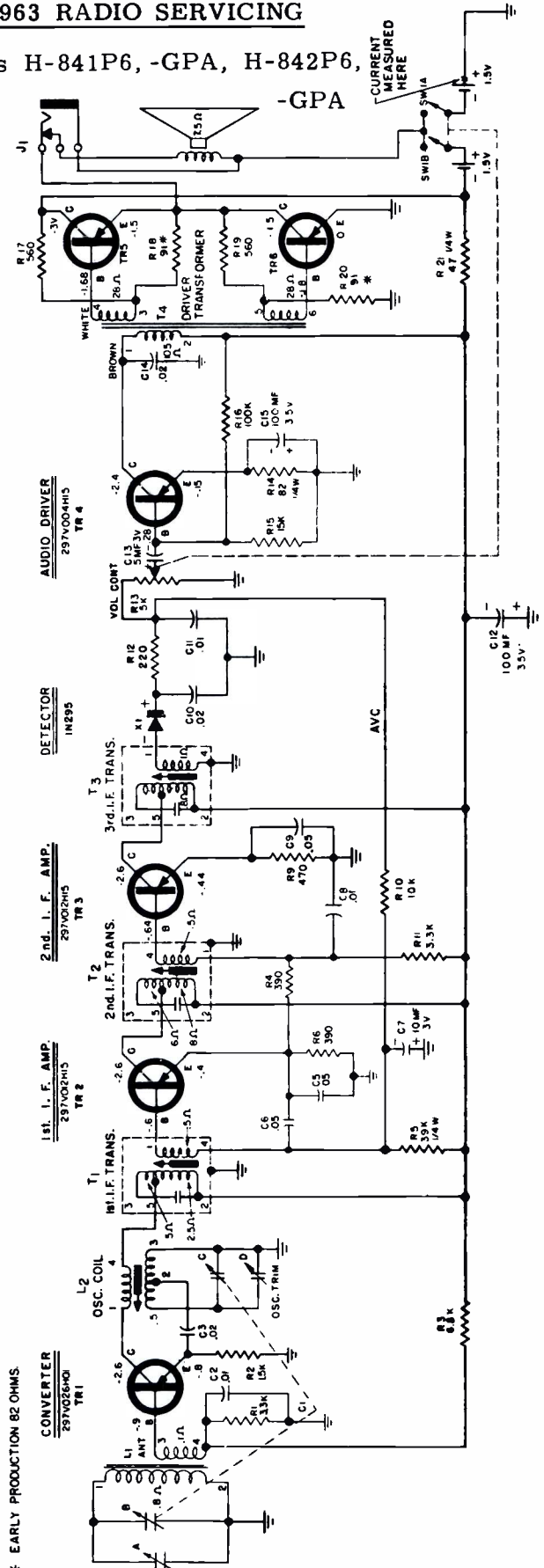
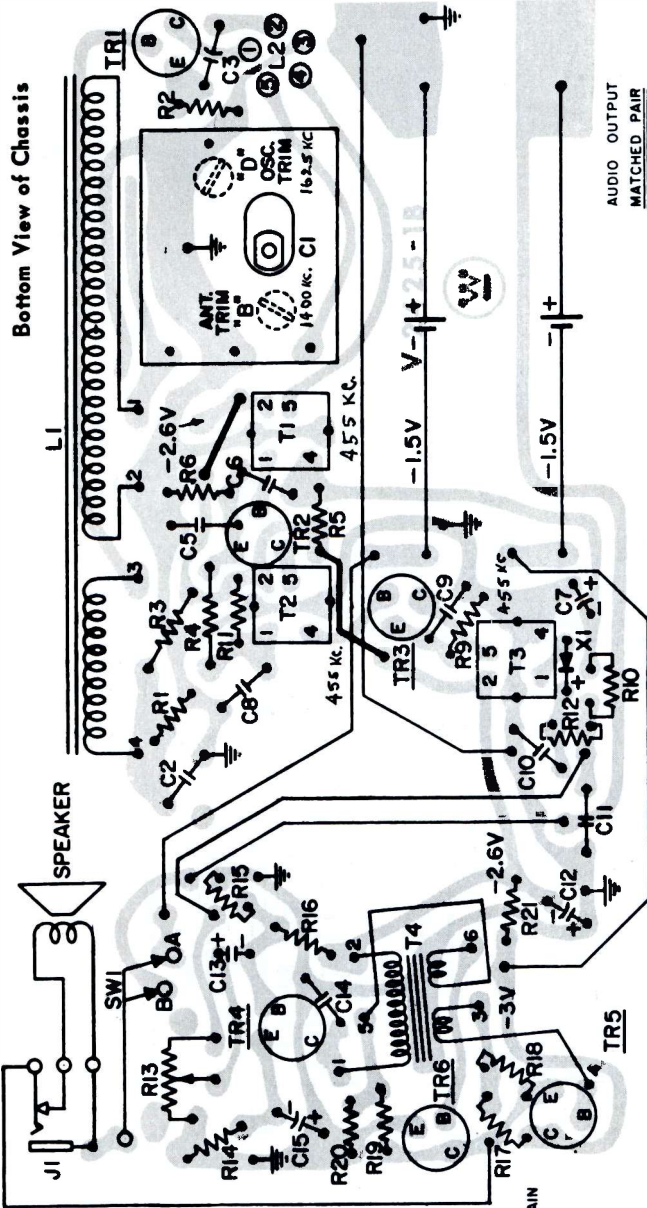
VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

WESTINGHOUSE Chassis V-2424-1, -2, Models H-830T5, H-831T5, H-832T5, H-835L5, H-837L5, H-838L5



VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING

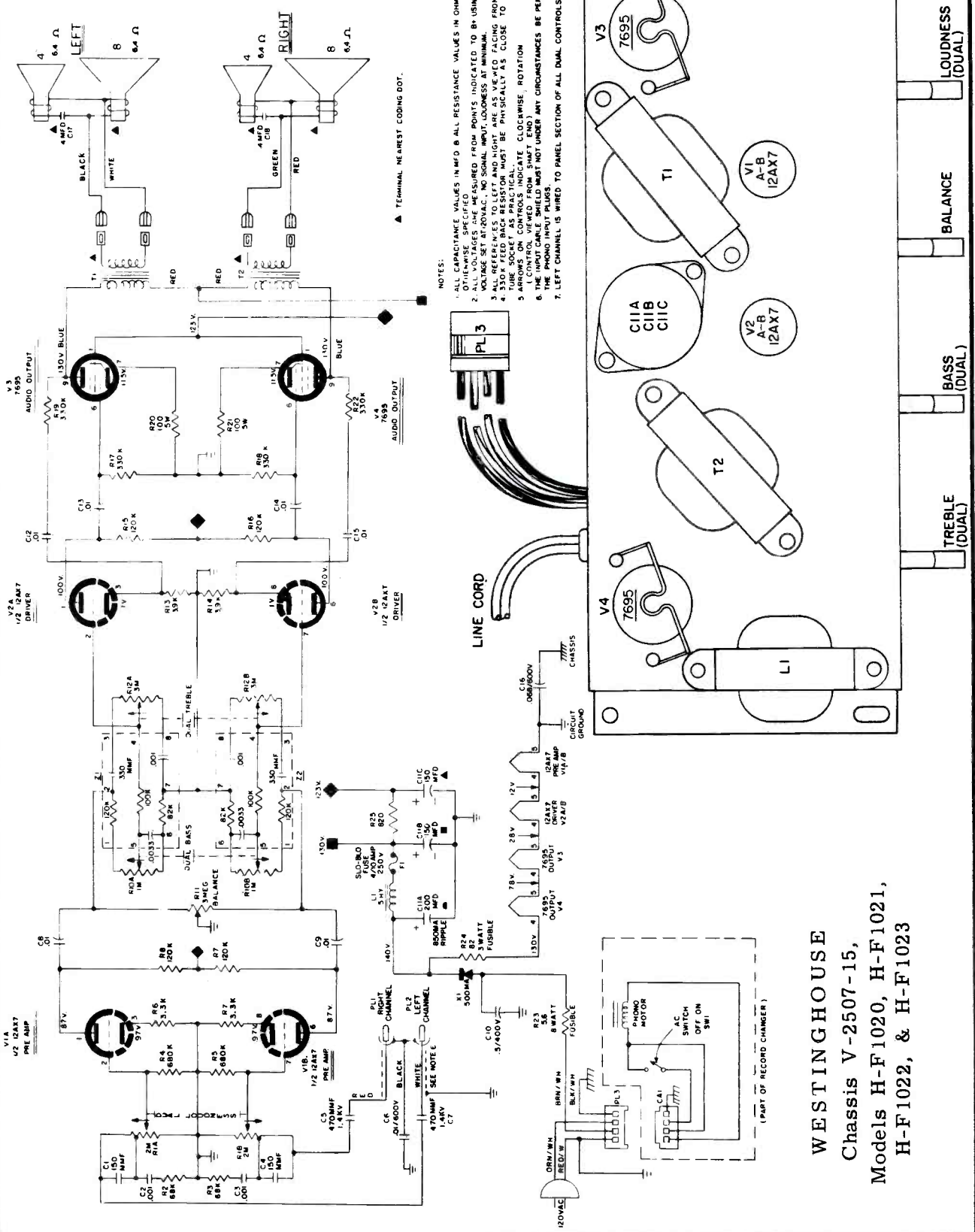
WESTINGHOUSE Chassis V-2425-1, Models H-841P6, -GPA, H-842P6,



- NOTES:
1. DURING SERVICING, BATTERY DRAIN SHOULD BE METERED. WITH NO SIGNAL AND VOL. CONT. AT MINIMUM, CURRENT DRAIN AT POINT SHOWN SHOULD BE 15 MA. APPROX.
 2. ALL CAPACITANCE VALUES LESS THAN 1 ARE IN MFD. AND VALUES GREATER THAN 1 ARE IN UF.
 3. VOLTAGE MEASUREMENTS MADE WITH A VTVM FROM POINTS INDICATED TO GND. WITH TUNING CAPACITOR AT MAX. VOLUME CONTROL AT MIN. (NO SIGNAL INPUT) BATTERY SOURCE AT 3 VOLTS.

* EARLY PRODUCTION 82 OHMS.

WESTINGHOUSE Chassis V-2507-15,
Models H-F1020 through H-F1023

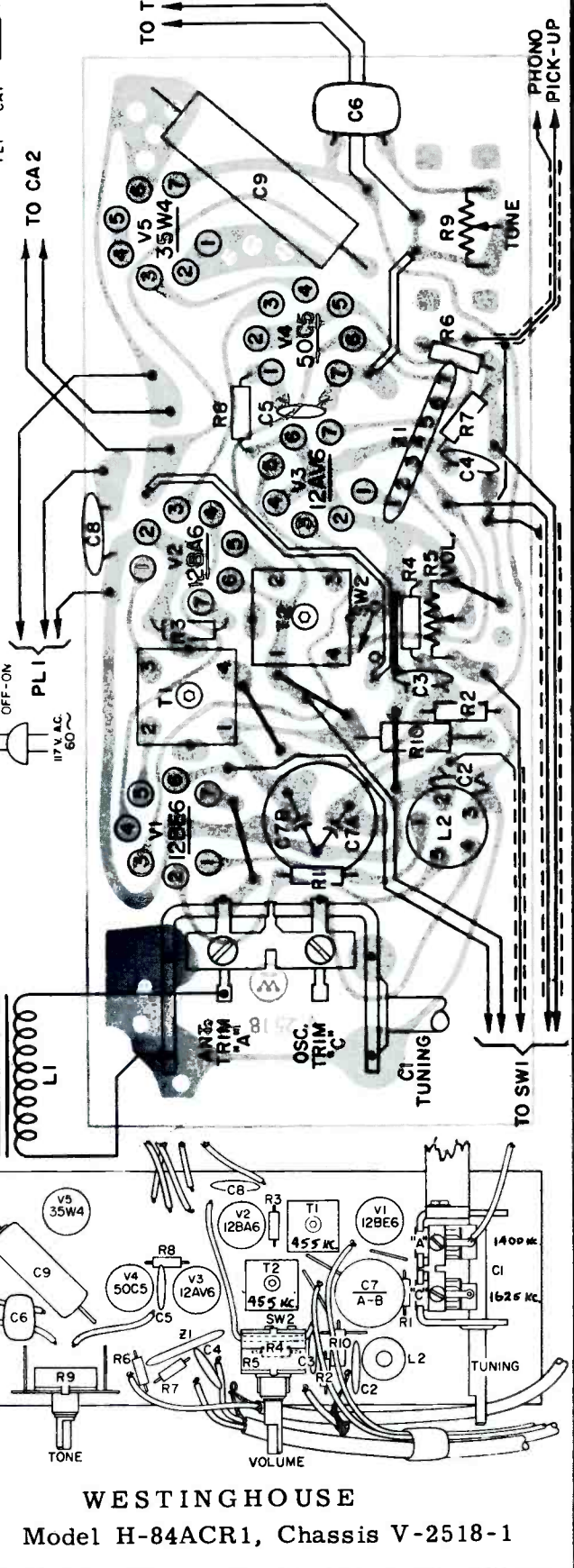
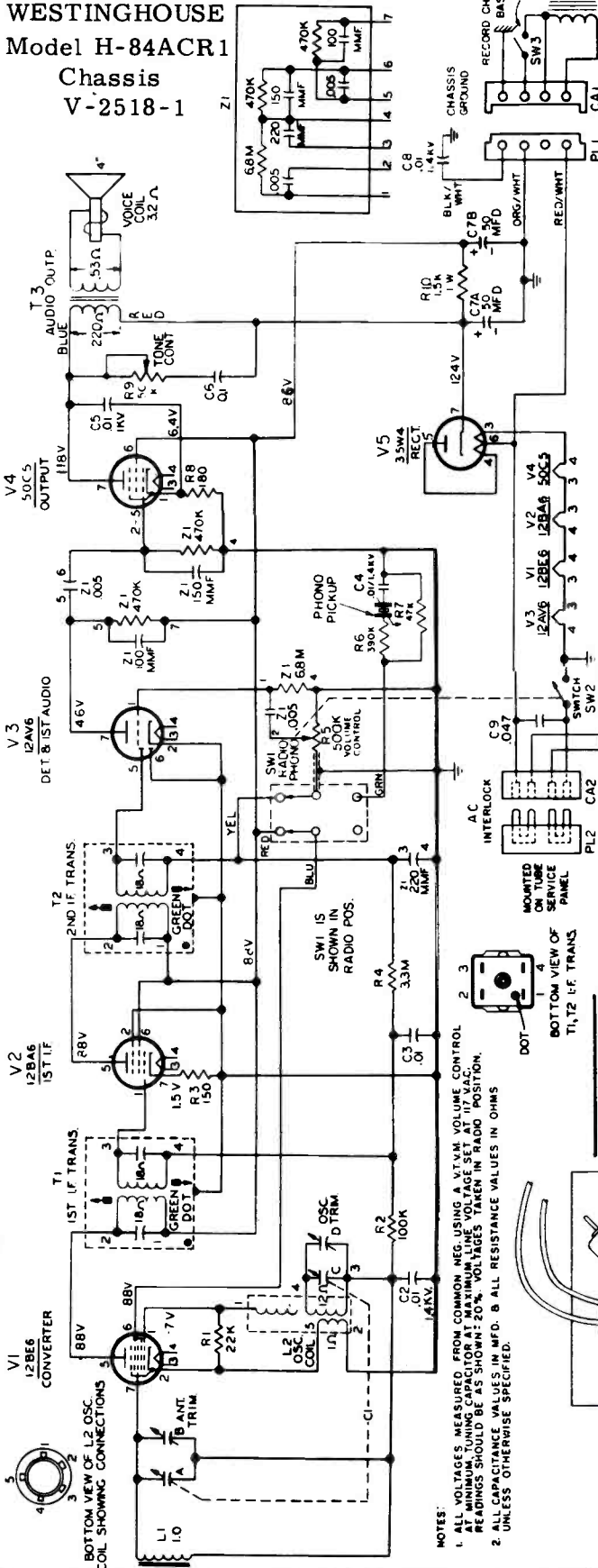


- NOTES:
1. ALL CAPACITANCE VALUES IN MFD & ALL RESISTANCE VALUES IN OHMS 1/2 W UNLESS OTHERWISE SPECIFIED.
 2. CONTROL SETTINGS INDICATED FROM POINTS INDICATED TO B+ USING A VIRTUAL LINE VOLTAGE SET AT 20VAC. NO SIGNAL INPUT, LOUDNESS AT MINIMUM.
 3. ALL REFERENCES TO LEFT AND RIGHT ARE AS VIEWED FACING FRONT OF SET
 4. 330K FEED BACK RESISTOR MUST BE PHYSICALLY AS CLOSE TO PIN 9 OF OUTPUT
 5. ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION
 6. THE PHONO MOTOR MUST NOT UNDER ANY CIRCUMSTANCES BE PERMITTED TO CONTACT THE LEFT CHANNEL IS WIRED TO PANEL SECTION OF ALL DUAL CONTROLS.

▲ TERMINAL NEAREST CODING DOT.

WESTINGHOUSE
Chassis V-2507-15,
Models H-F1020, H-F1021,
H-F1022, & H-F1023

WESTINGHOUSE
Model H-84ACR1
Chassis
V-2518-1



NOTES:
1. ALL VOLTAGES MEASURED FROM COMMON NEG. USING A VOM. VOLUME CONTROL READINGS SHOULD BE AS SHOWN; 20% VOLTAGES TAKEN IN RADIO POSITION.
2. ALL CAPACITANCE VALUES IN MFD. & ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.

WESTINGHOUSE
Model H-84ACR1, Chassis V-2518-1

Bottom View of PC Board.

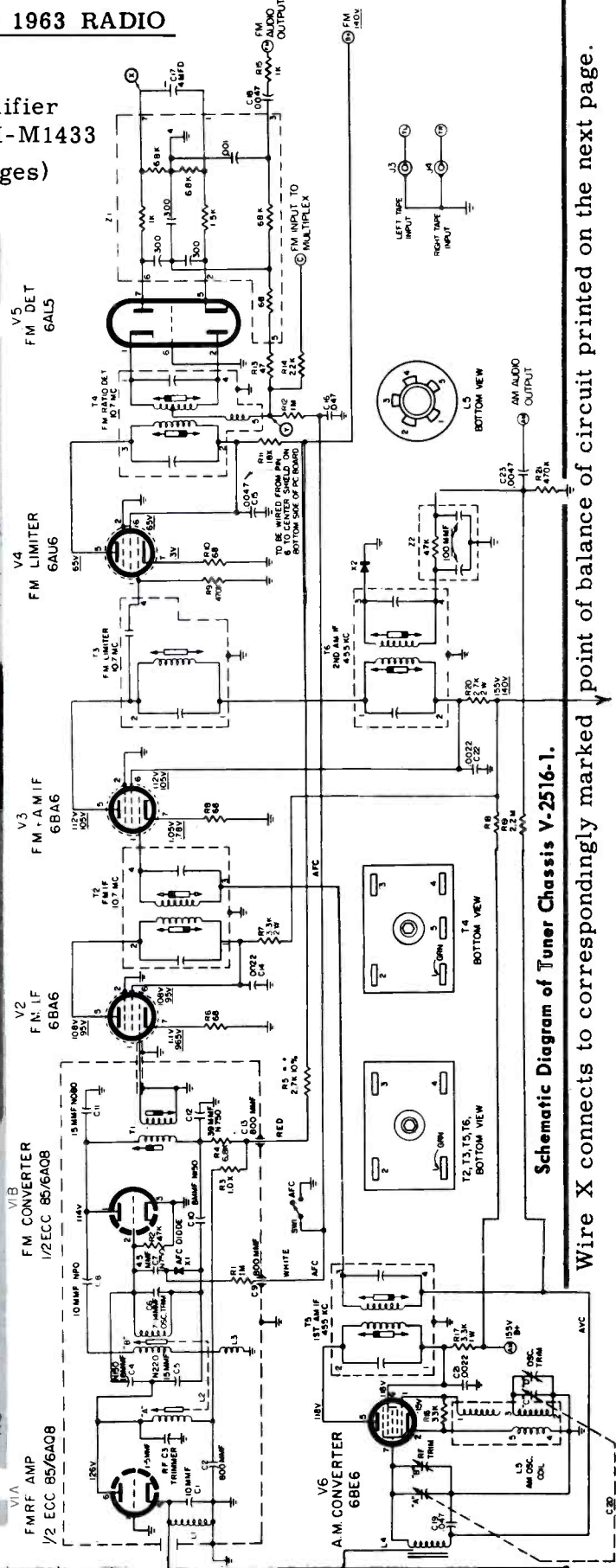
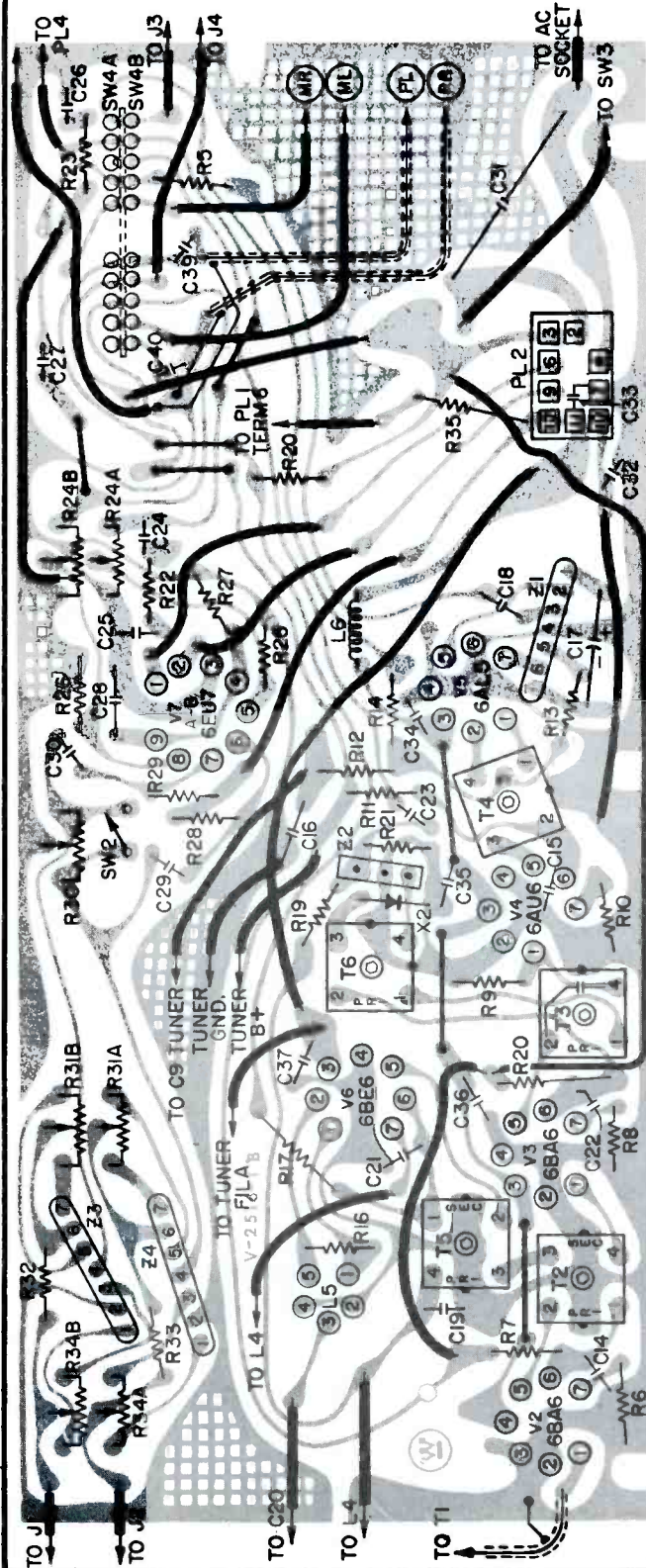
VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO

WESTINGHOUSE

Chassis V-2516-1 Tuner, V-2510-14 Amplifier
Models H-M1430, H-M1431, H-M1432, H-M1433

(Material below and on the next two pages)

Bottom view of Tuner V-2516-1 PC board showing location of top components in solid outline. Tube pin numbering is for bottom of socket.



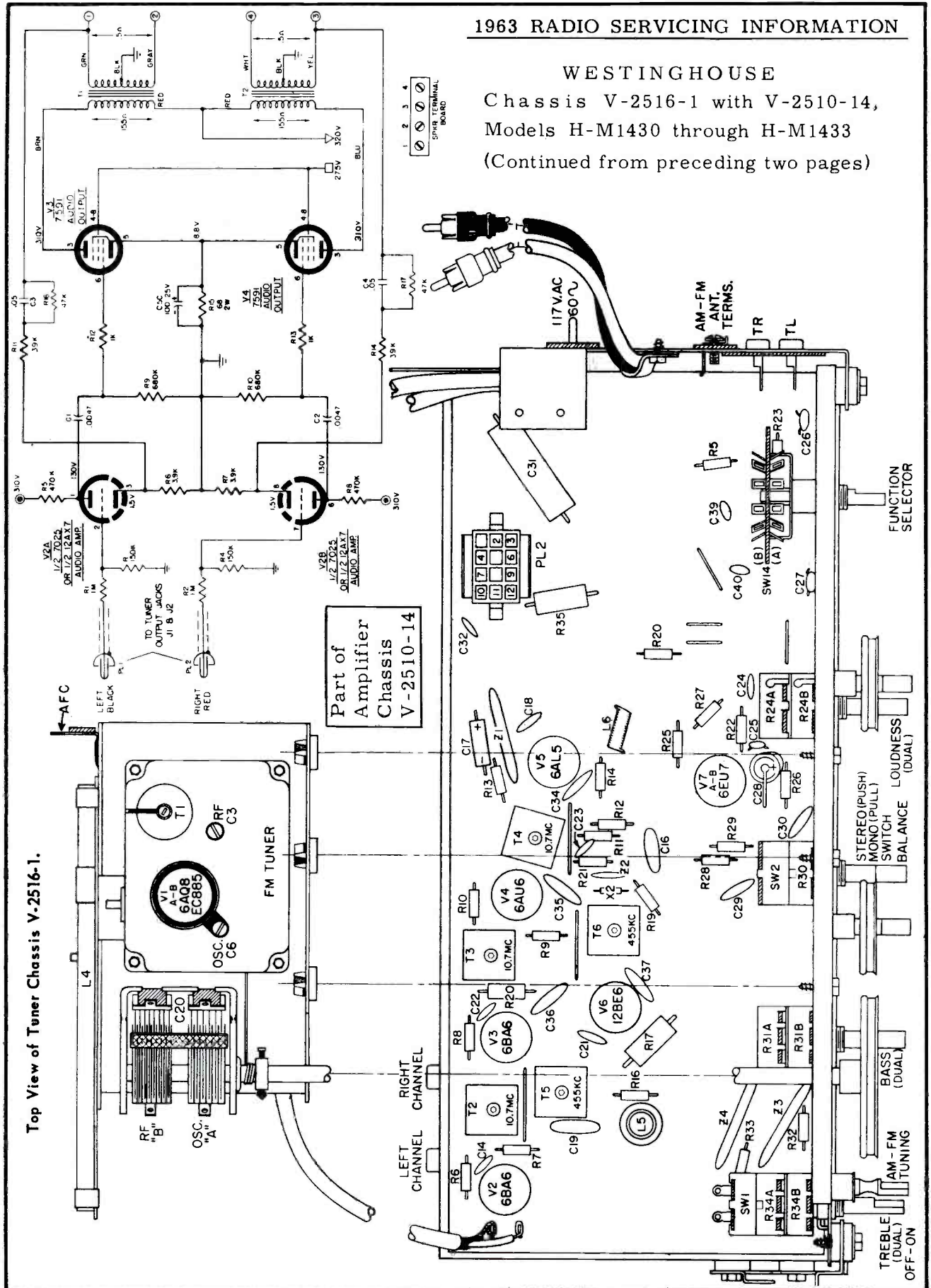
Wire X connects to correspondingly marked point of balance on the next page.

1963 RADIO SERVICING INFORMATION

WESTINGHOUSE

Chassis V-2516-1 with V-2510-14,
Models H-M1430 through H-M1433

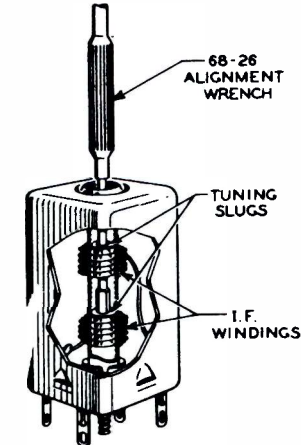
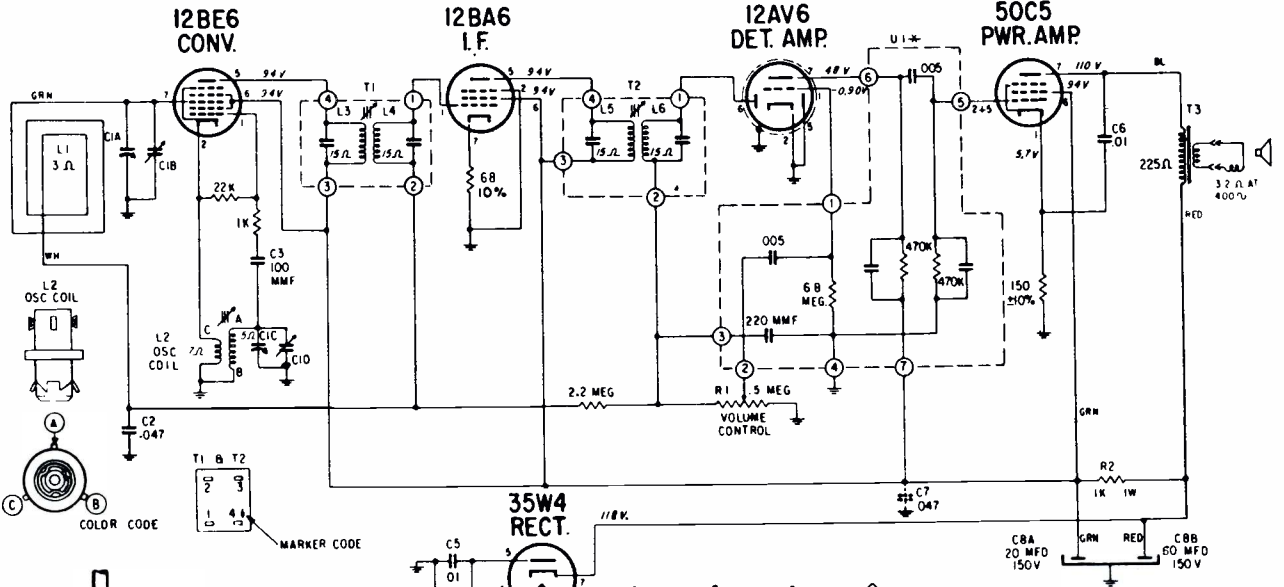
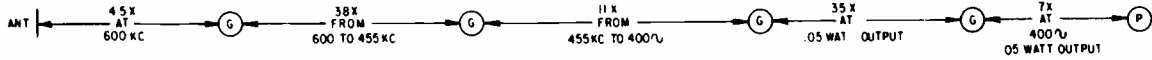
(Continued from preceding two pages)



ZENITH RADIO CORPORATION

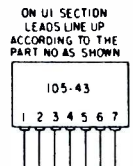
MODELS J506G, J508B, BA, C, P, AND W, CHASSIS 5FO5

Models K510BA, -GA, -LA, using Chassis 5K10, use circuitry shown on this page, but use a different chassis placement of parts.

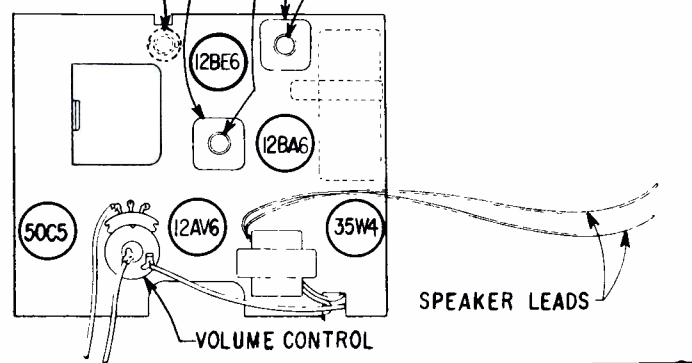
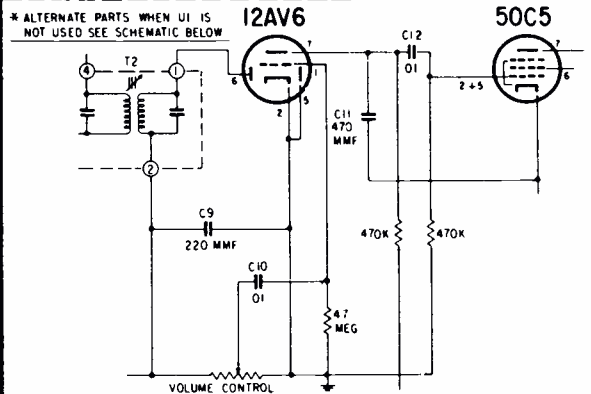
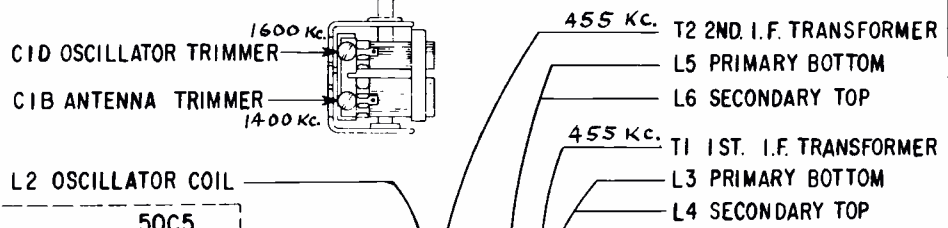


68-26 ALIGNMENT WRENCH
TUNING SLUGS
I.F. WINDINGS

DENOTES CHASSIS



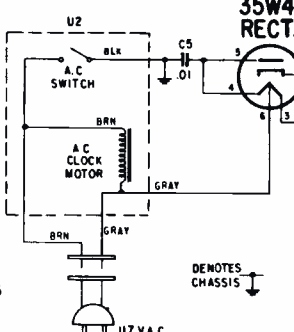
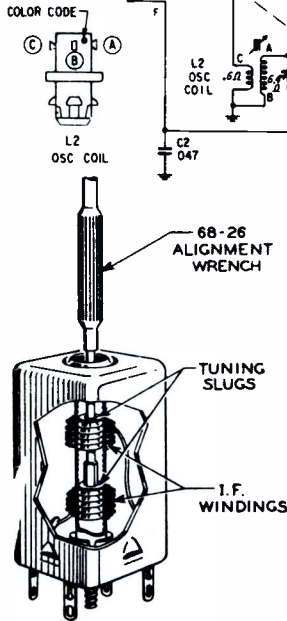
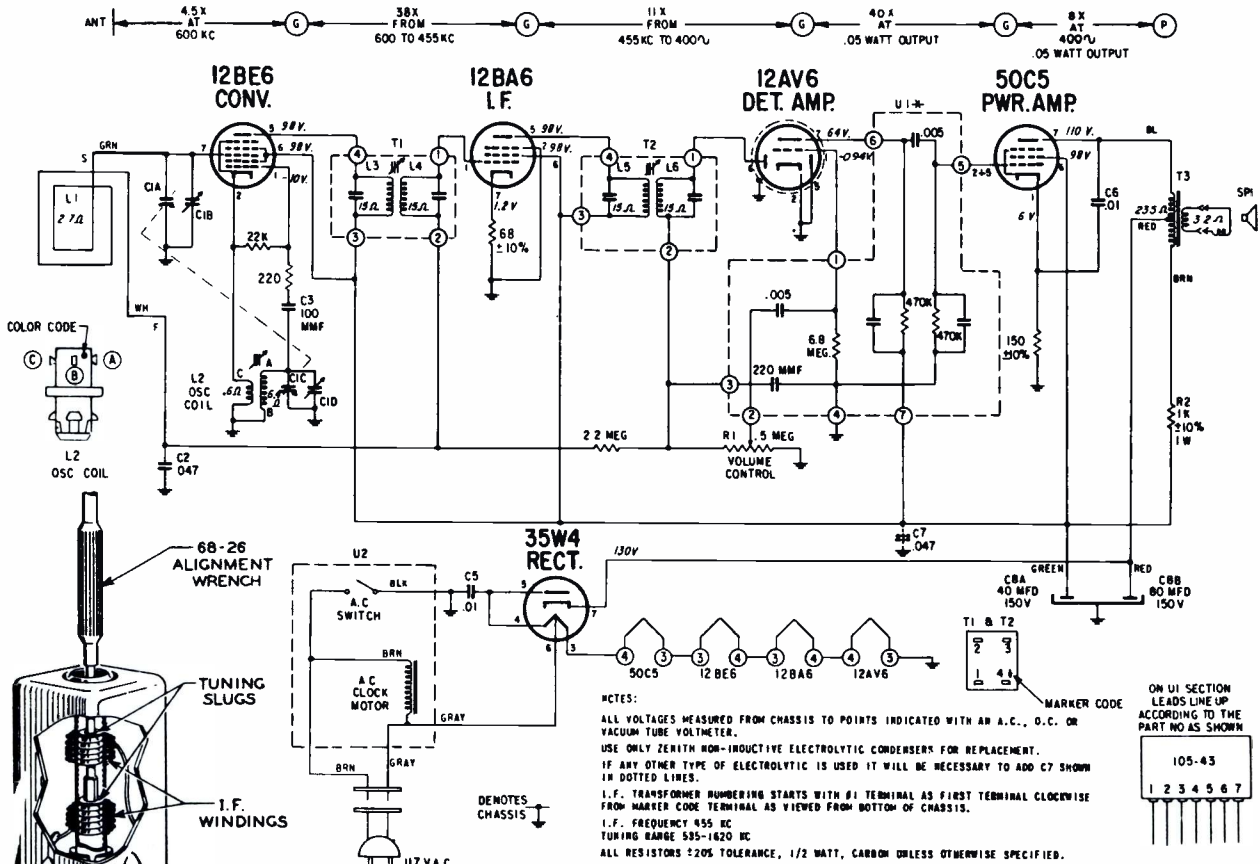
NOTES:
ALL VOLTAGES MEASURED FROM CHASSIS TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT.
IF ANY OTHER TYPE OF ELECTROLYTIC IS USED IT WILL BE NECESSARY TO ADD C7 SHOWN IN DOTTED LINES.
I.F. TRANSFORMER NUMBERING STARTS WITH #1 TERMINAL AS FIRST TERMINAL CLOCKWISE FROM MARKER CODE TERMINAL AS VIEWED FROM BOTTOM OF CHASSIS.
I.F. FREQUENCY 455 KC
TUNING RANGE 535-1620 KC
ALL RESISTORS ±20% TOLERANCE, 1/2 WATT, CARBON UNLESS OTHERWISE SPECIFIED.



VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

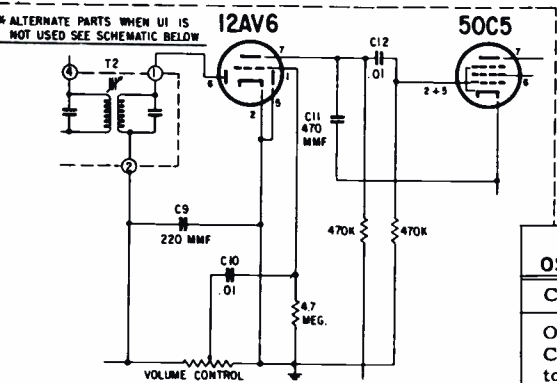
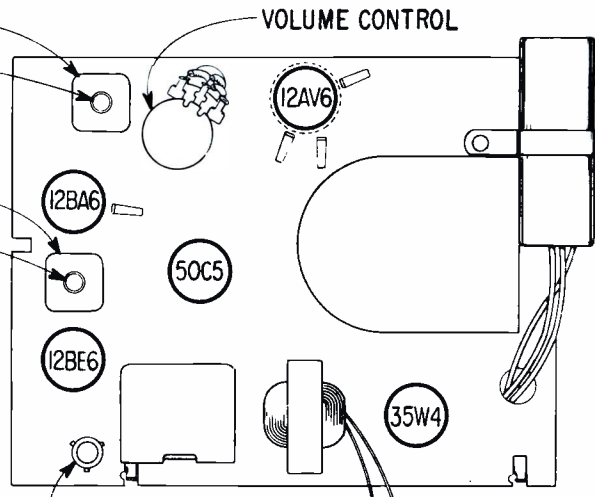
ZENITH RADIO CORPORATION MODELS J513C, F, G, L, CHASSIS 5J02

MODELS J514F, G, L, & W, CHASSIS 5J04 uses identical circuitry.



NOTES:
 ALL VOLTAGES MEASURED FROM CHASSIS TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
 USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT.
 IF ANY OTHER TYPE OF ELECTROLYTIC IS USED IT WILL BE NECESSARY TO ADD C7 SHOWN IN DOTTED LINES.
 I.F. TRANSFORMER NUMBERING STARTS WITH #1 TERMINAL AS FIRST TERMINAL CLOCKWISE FROM MARKER CODE TERMINAL AS VIEWED FROM BOTTOM OF CHASSIS.
 I.F. FREQUENCY 455 KC
 TUNING RANGE 535-1620 MC
 ALL RESISTORS ±20% TOLERANCE, 1/2 WATT, CARBON UNLESS OTHERWISE SPECIFIED.

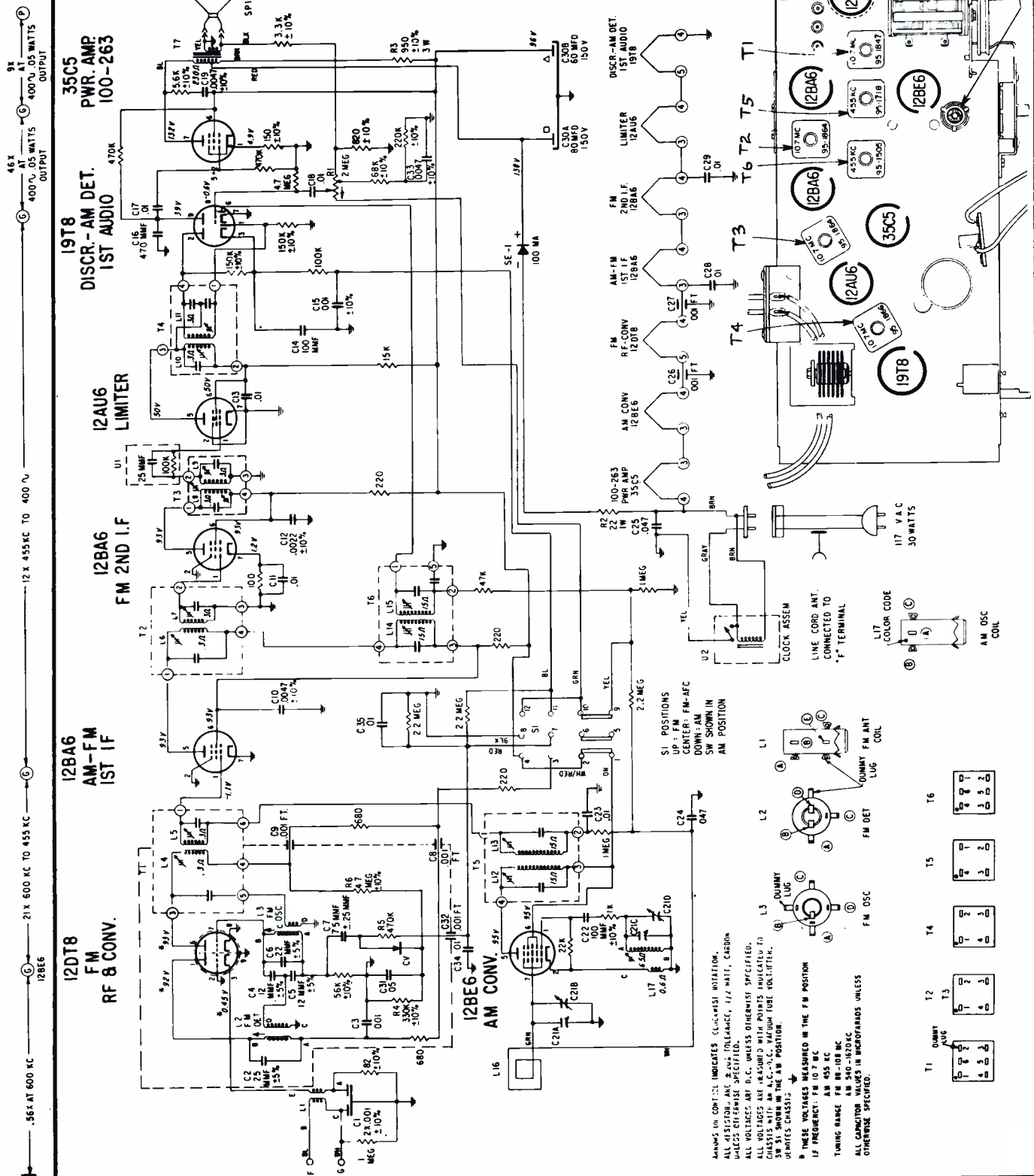
T2-2ND I.F. TRANSFORMER
 L5 PRIMARY BOTTOM
 L6 SECONDARY TOP
 T1-1ST I.F. TRANSFORMER
 L3 PRIMARY BOTTOM
 L4 SECONDARY TOP
 Top view Chassis J513



ALIGNMENT PROCEDURE

CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS
Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3,L4,L5,L6
One Turn Loop Coupled Loosely to Wave magnet	-	1600 Kc.	1600 Kc.	C1D
	-	1400 Kc.	1400 Kc.	C1B

ZENITH RADIO CORPORATION
MODEL J727C, F&W, CHASSIS 7J04



ZENITH RADIO CORP.

MODELS ROYAL 40-50K-60

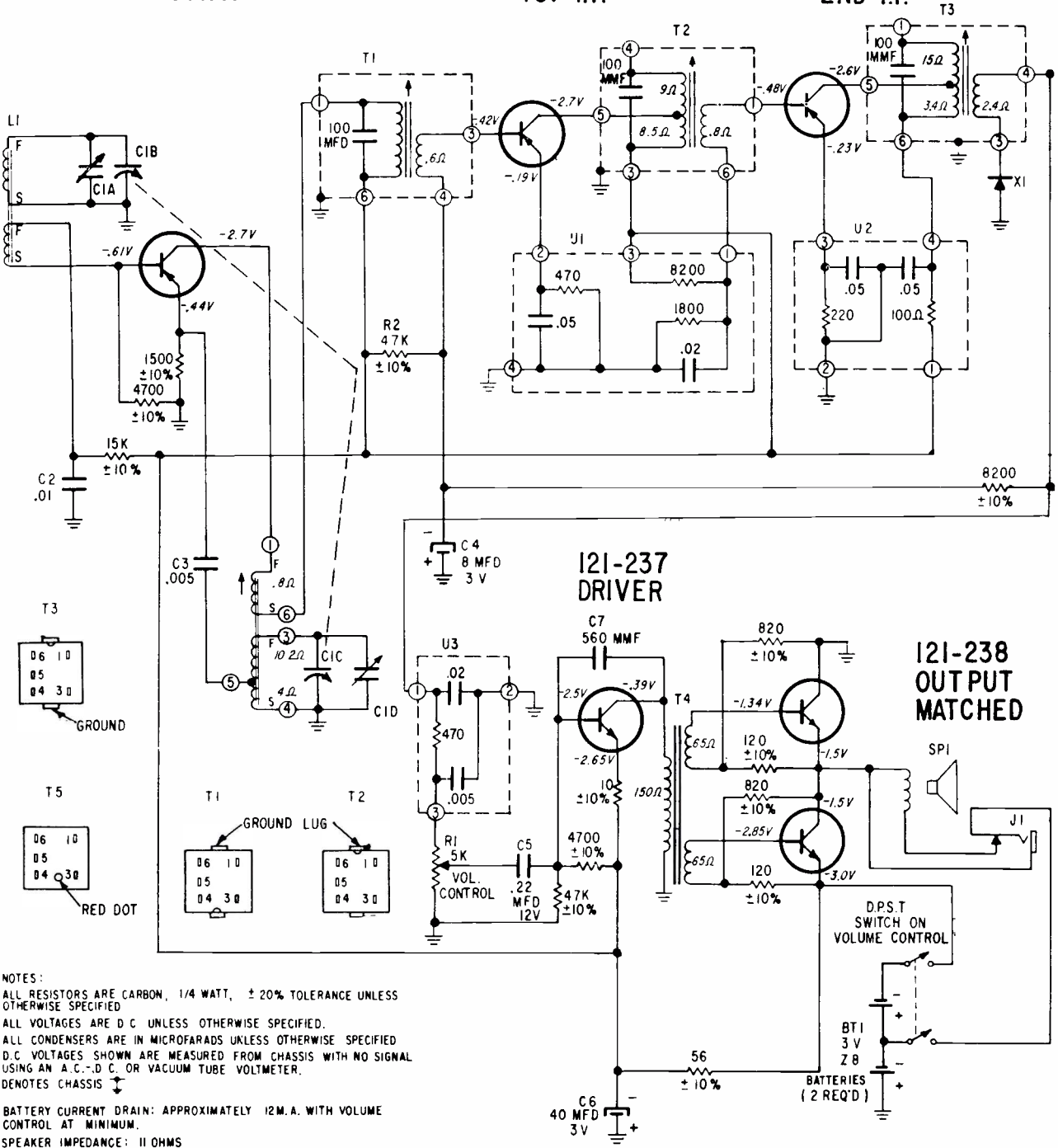
CHASSIS 6KT43Z1 & 6KT44Z1

(For chassis wiring view see next page adjacent at right)

121-234
CONV.

121-235
1ST I.F.

121-236
2ND I.F.



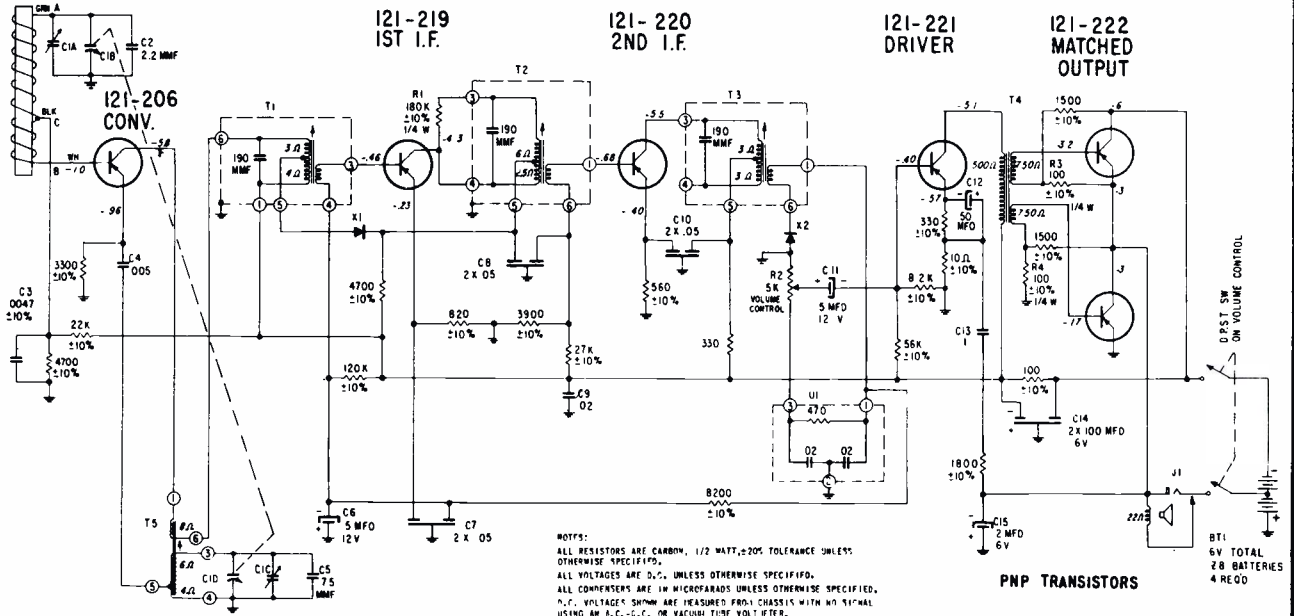
NOTES:
 ALL RESISTORS ARE CARBON, 1/4 WATT, ± 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
 ALL CONDENSERS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
 D.C. VOLTAGES SHOWN ARE MEASURED FROM CHASSIS WITH NO SIGNAL USING AN A.C.-D.C. OR VACUUM TUBE VOLTMETER.
 DENOTES CHASSIS
 BATTERY CURRENT DRAIN: APPROXIMATELY 12M.A. WITH VOLUME CONTROL AT MINIMUM.
 SPEAKER IMPEDANCE: 11 OHMS



CHASSIS 6JT45Z1

MODEL "ROYAL 650"

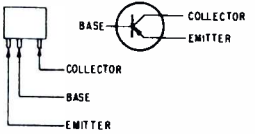
(Additional service material on the next page)



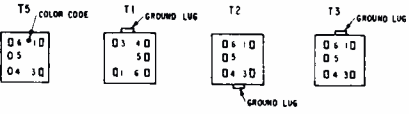
NOTES:
 ALL RESISTORS ARE CARBON, 1/2 WATT, ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 ALL VOLTAGES ARE D.C., UNLESS OTHERWISE SPECIFIED.
 ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
 A.C. VOLTAGE MEASUREMENTS ARE MEASURED FROM CHASSIS WITH AN A.C. VOLT METER USING AN R.C.-C.C. OR VACUUM TUBE VOLT METER.

REMARKS:
 BATTERY CURRENT DRAIN APPROX. 6.5 MA WITH VOLUME CONTROL AT MINIMUM.
 SPEAKER 1 WATT/1000 Ω 2 Ω AT 400 CPS

PNP TRANSISTORS



DRIVER	MATCHED OUTPUT
121-221	121-222
1 BROWN	7 VIOLET
2 RED	6 BLUE
3 ORANGE	5 GREEN
4 YELLOW	4 YELLOW



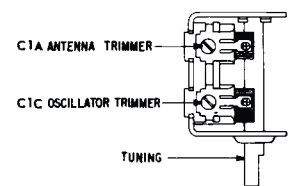
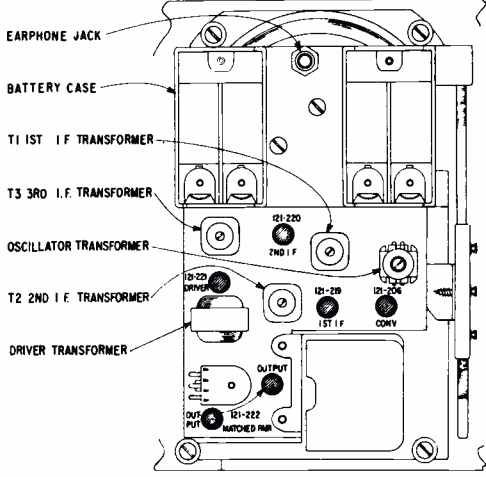
THE MATCHING IDENTIFICATION WILL BE A COLORED DOT
 THE MATCHING OF TRANSISTORS WILL BE AS INDICATED IN THE ABOVE CHART

CHASSIS INFORMATION CHART

Transistor Layout Label Color	Part No.	Conv.	1st. I.F.	2nd. I.F.	Crystal Diode Detector	Driver	Output-Output	Supplier
Black 102-8292	Zenith E1A Type	121-206 PNP	121-219 PNP	121-220 PNP	103-19 1N87G	121-221 PNP	121-222 Matched Pair PNP	Texas Instrument

ALIGNMENT PROCEDURE

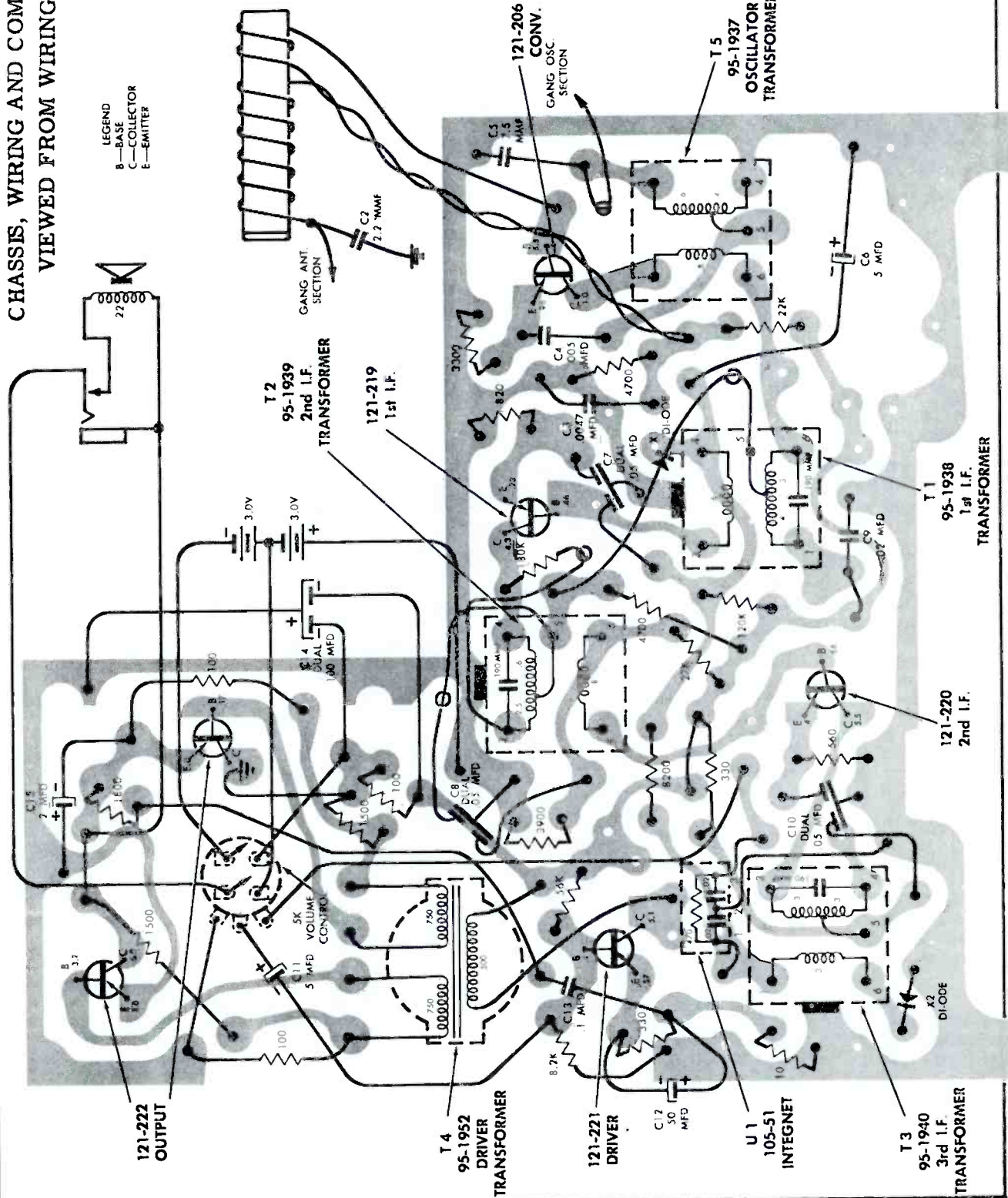
Operation	Input Signal Frequency	Connect Inner Conductor From Oscillator To	Connect Outer Shield Conductor From Oscillator To	Set Dial At	Trimmers	Purpose
1	455 KC	ONE TURN LOOSELY COUPLED TO WAVEMAGNET	Chassis	600 KC	Adj. T1, T2, T3 for maximum output.	For I.F. Alignment
2	1620 KC		—	Gang wide open.	C1C	Set Oscillator to dial scale.
3	600 KC		—	Near 600 KC	Adjust slug in T5	While rocking gang, adjust T5 for maximum output regardless of dial accuracy.
4	1260 KC		—	1260 KC	C1A	Align loop ant.
5	REPEAT STEPS 2, 3, & 4		—	—	—	—



ZENITH Model "Royal 650", Chassis 6JT45Z1, Continued

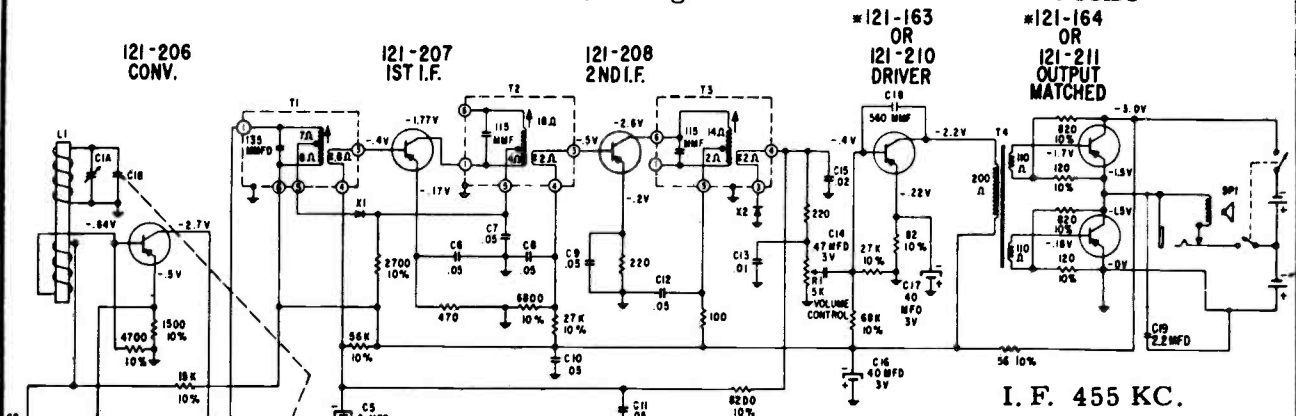
CHASSIS, WIRING AND COMPONENTS
VIEWED FROM WIRING SIDE

LEGEND
B—BASE
C—COLLECTOR
E—EMITTER



VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

ZENITH Models 90 and 125, using Chassis 6JT40Z1 and 6J41Z1

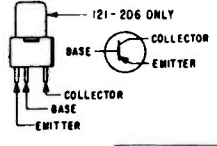


NOTES:
 ALL RESISTORS ARE CARBON, 1/4 WATT, 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
 ALL CONDENSERS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
 D.C. VOLTAGES SHOWN ARE MEASURED FROM CHASSIS WITH NO SIGNAL USING AN A.C.-D.C. OR VACUUM TUBE VOLTMETER.
 DENOTES CHASSIS

BATTERY CURRENT DRAIN: APPROXIMATELY 12 M.A. WITH VOLUME CONTROL AT MINIMUM
 SPEAKER IMPEDANCE: 11 OHMS

*121-210 DRIVER TRANSISTOR MUST BE USED WITH 121-211 OUTPUT TRANSISTORS
 WHEN 121-210 DRIVER TRANSISTOR WITH YELLOW DOT IS USED,
 121-211 OUTPUT TRANSISTORS MUST HAVE MATCHING COLOR DOT
 *121-163 DRIVER TRANSISTOR MUST BE USED WITH 121-164 OUTPUT TRANSISTORS.

PNP TRANSISTOR

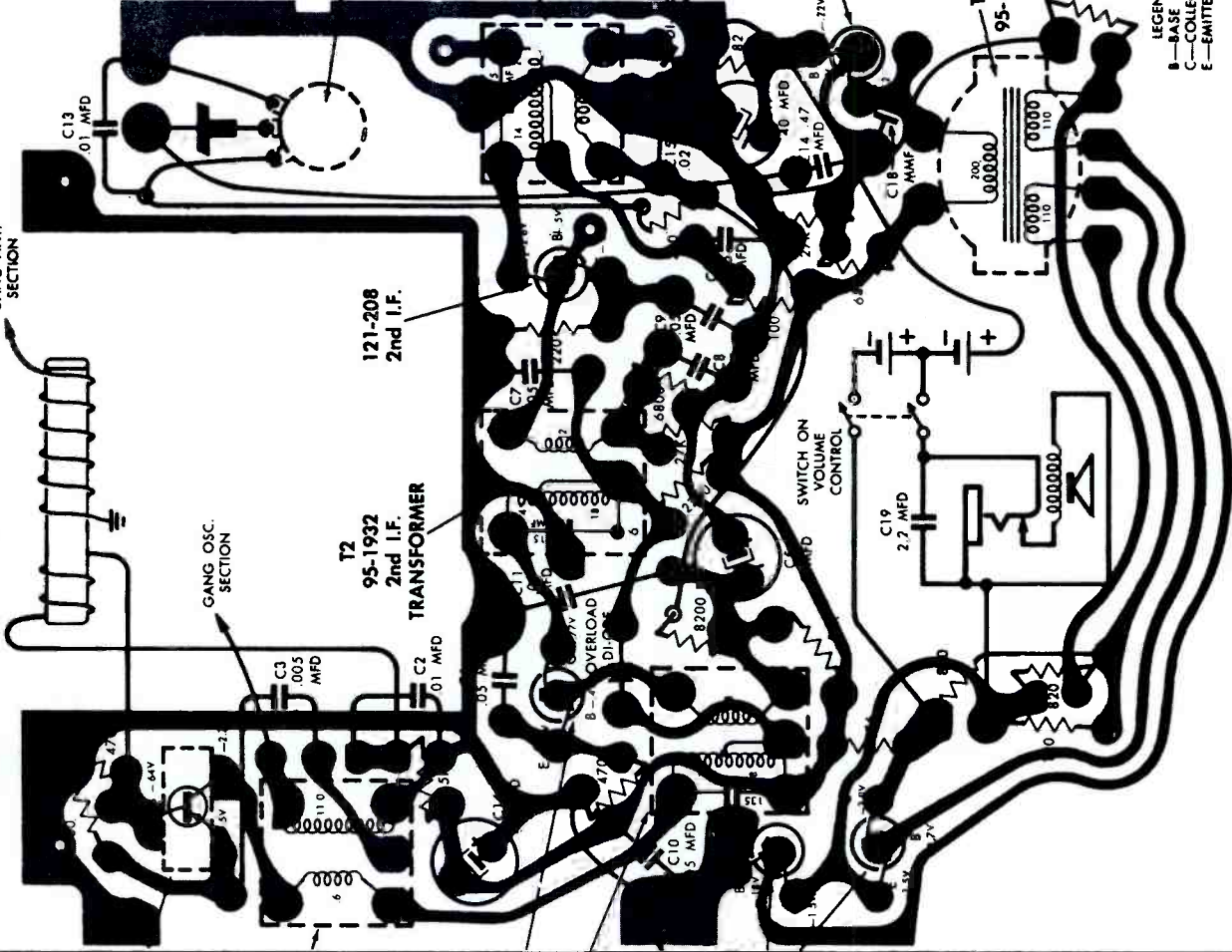


SOLDER IN TYPE TRANSISTOR (121-163 TO 121-211)

RED DOT

GROUND LUG

GROUND JUMPER

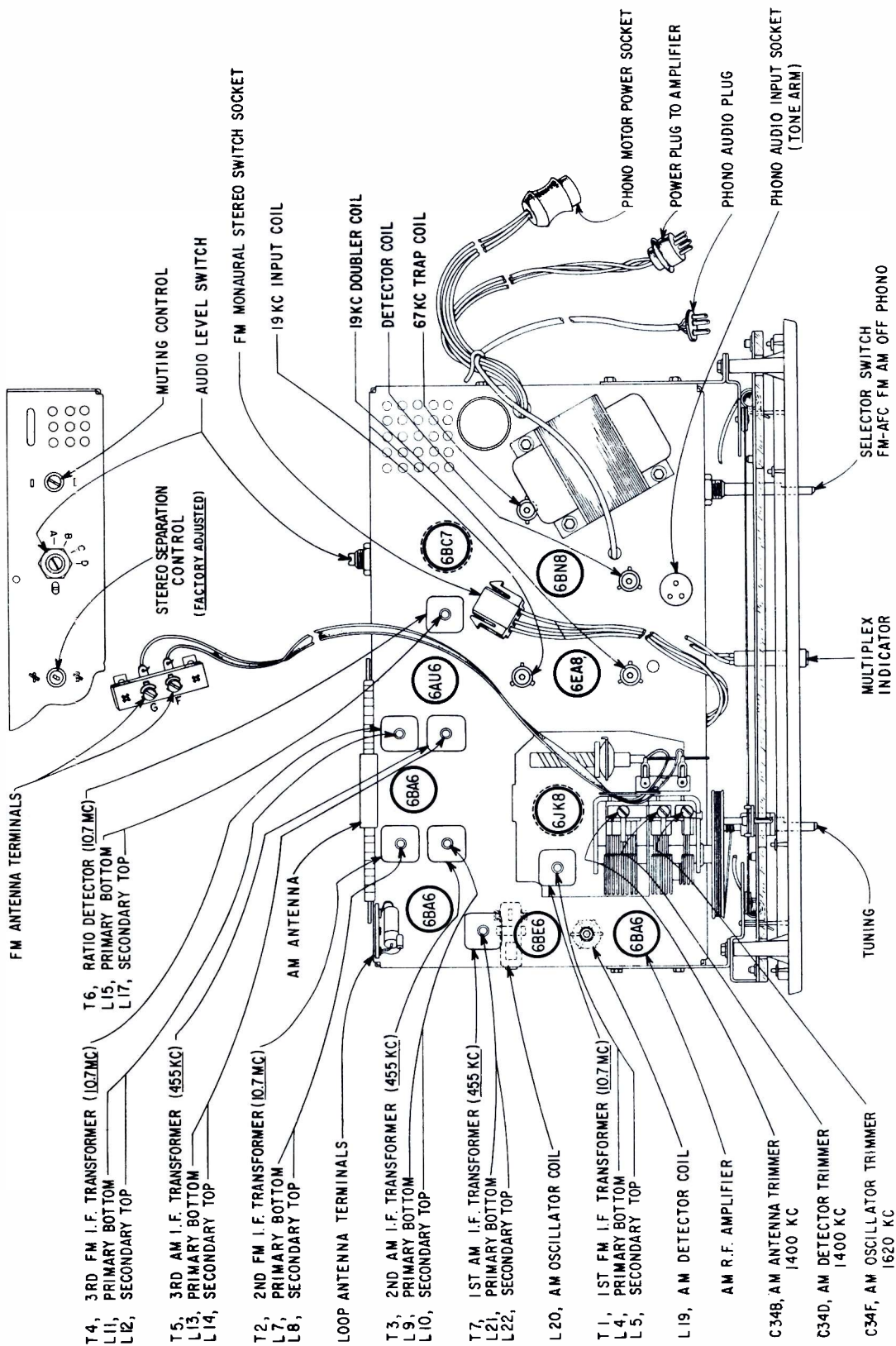


CHASSIS, WIRING AND COMPONENTS VIEWED FROM WIRING SIDE

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

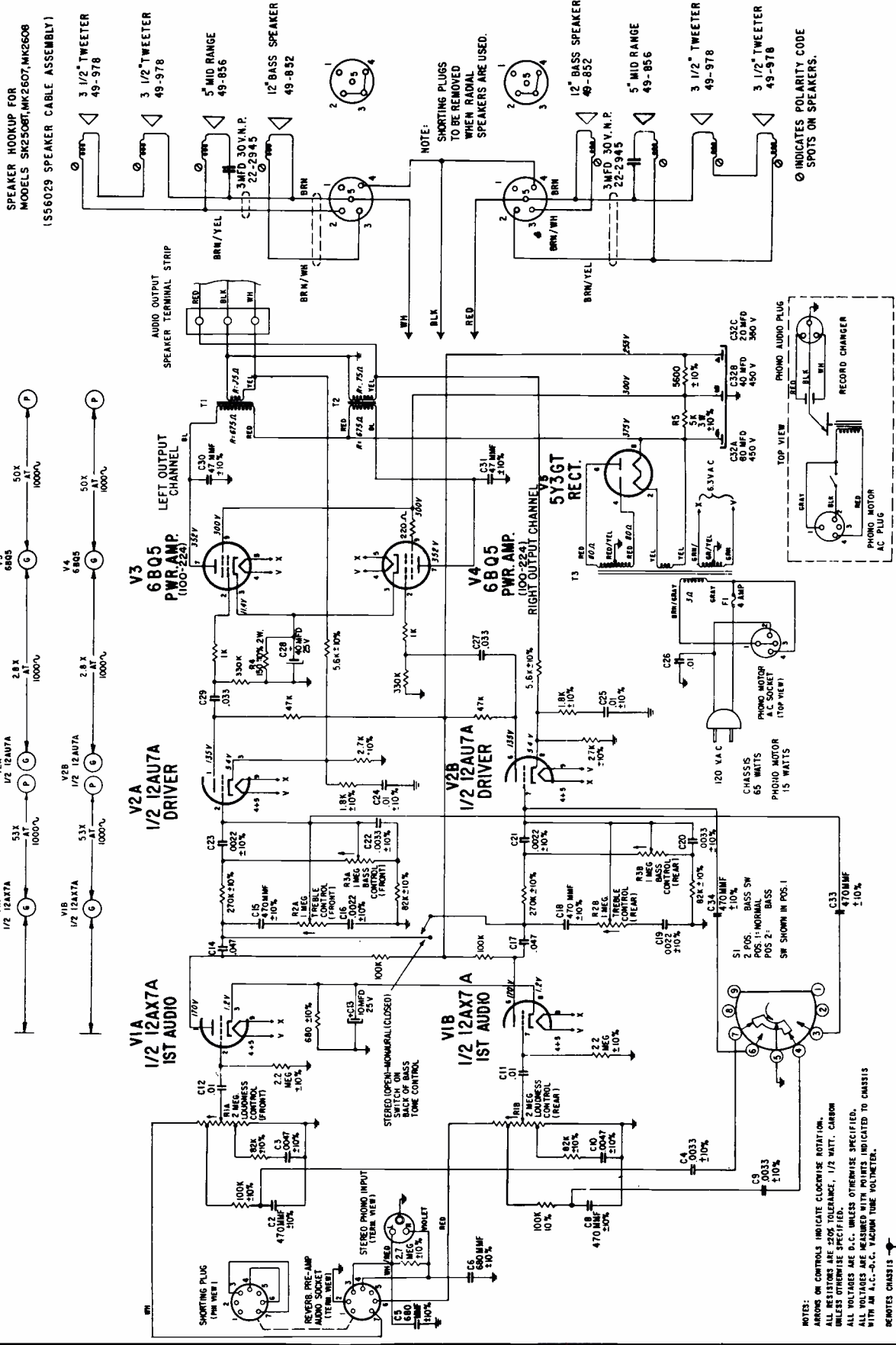
Chassis 9H20LZ1, used in Models MP500, MP505, MT1970, MK2602, MK2603, MK2606, MK2608, MK2786, MK2787, MK2789, MK3386, MK3388.

(Continued from preceding page adjacent at left)



9H20LZ1 TUBE TRIMMER LAYOUT FOR MODELS MP500, MP505, MT1970, MK2602, MK2603, MK2606, MK2608, MK2786, MK2787, MK2789, MK3386 & MK3388

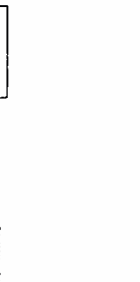
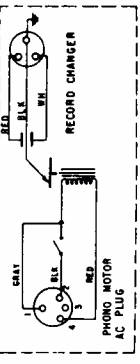
VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION



ZENITH RADIO 5K29 SCHEMATIC FOR MODELS SK2508T, MK2606, MK2607, SK2508T & MK2608

⊙ INDICATES POLARITY CODE SPOTS ON SPEAKERS.

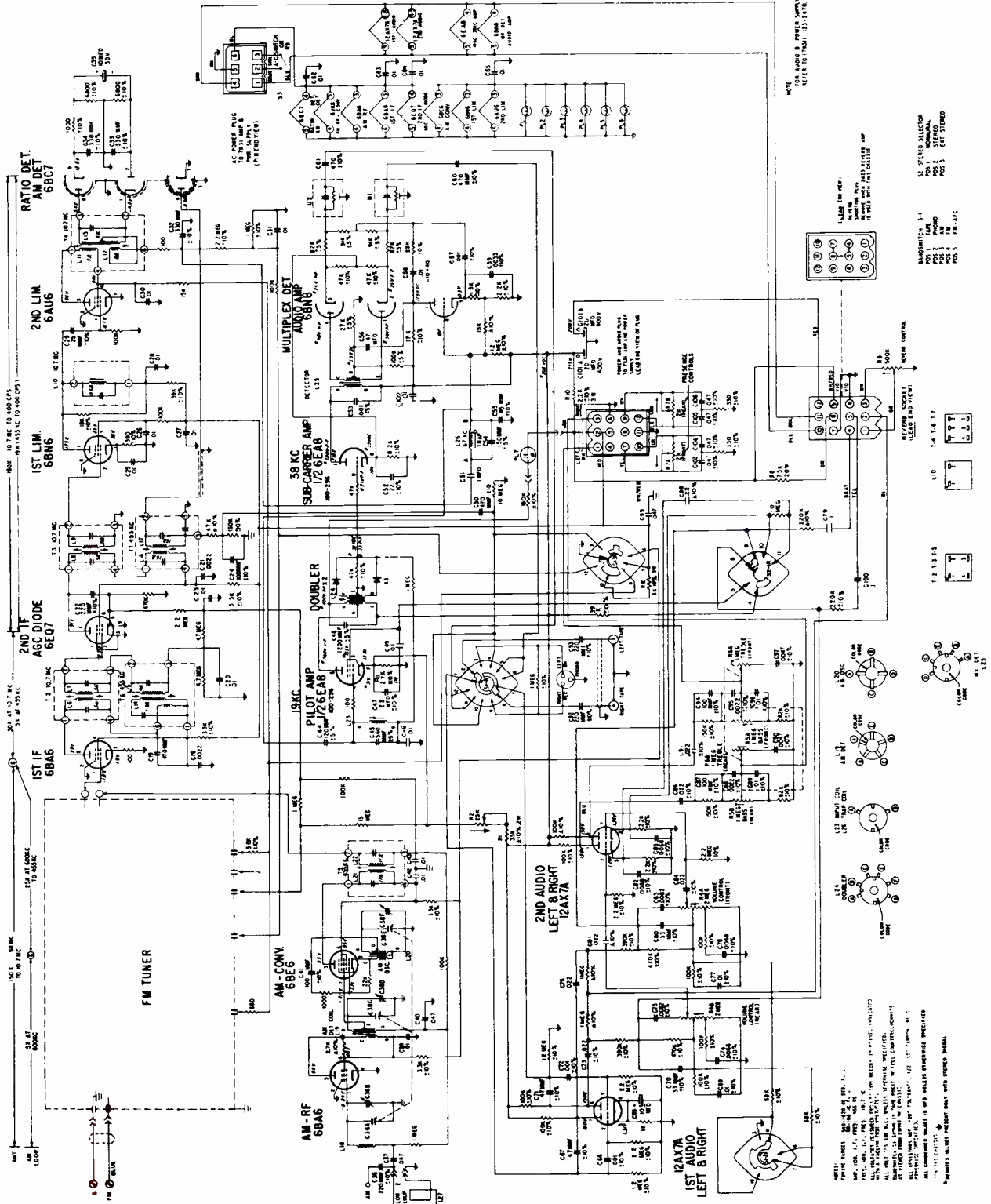
NOTE: SHORTING PLUGS TO BE REMOVED WHEN RADIAL SPEAKERS ARE USED.



NOTES:
 ARROWS ON CONTROLS INDICATE COUNTERWISE ROTATION.
 ALL RESISTORS ARE 20% TOLERANCE, 1/2 WATT, CARBON UNLESS OTHERWISE SPECIFIED.
 ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
 WITH AN A.C.-D.C. VACUUM TUBE VOLTMETER.
 ⚡ REMOTES CHASSIS

ZENITH RADIO CORPORATION

12K25 SCHEMATIC FOR MODELS MK2670, MK2675, MK2685 & 7500



VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

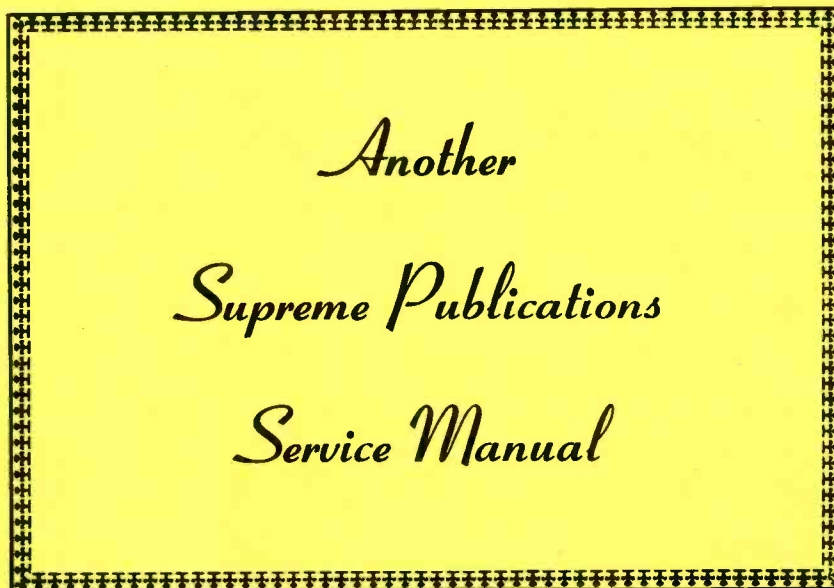
Index

Admiral Corp.		Arvin, Cont.		Emerson, Cont.		G. E. Continued		Motorola, Cont.	
5A 6	6	72P03	19	P-1917	36	RC1616A, B	58	CA62	79
5B6	6	72P25	18	P-1918	36	RC1680A	60	CRA62	79
5F6	7	72P33	19	120547B	36	RC1690A, +	60	CRM62	80
6M3C	8	72P59	20	120548B	36	RC1691A, +	60	CTA62	79
6M3D	8	72P68	20	120558B	36	RC1692A, +	60	CTM62	80
6M3E	8	92P48	21	120599B	34	RC1694A, +	60	CYA62	79
6N3	9	1.66102	17	120655	33	RP2050A	57	CYM62	80
6V3	10	1.66401	15			RP2051A	57	FMC62	82
7K2	11	1.66402	16	Ford		RC3200	54	PCA62	79
7N2, A	3	1.66601	14	2TMF	73	RC3210	54	250X	76
8F2	12	1.68301	19	2TMX	73	RC3230	54	320X	77
Y2223A	8	1.69701	18	2TMY	73	P8522A	47	520T	78
Y2231, +	8	1.70601	21	C2AA-18806	73	P8523A	47	SK675	98
Y2232, +	8	1.72401	19	C2YA-18806	73			HS-877	36
Y2238, +	8					Hitachi, Ltd.		HS-918	83
Y2301GP(S)	8	Buick		General		T-728	62	HS-919	83
Y2303GP(S)	8	980296	23	Electric		WH-829	64	HS-923	84
Y2307GP(S)	8	980297	28	TU20, +	56	XH-1500	66	HS-931	96
Y2311	11	980316	26	T160A	37			HS-939	87
Y2312	11			TU220, +	52	Magnavox		HS-981	87
Y2319	11	Channel Master		T245A	42	57 Series	70	HS-997	97
Y2321	12	6532	22	T246A	42	AM-64	68	HS-1003	89
Y2323	12	6533	22	T250A	42	72 Series	69	HS-1004	90
Y2327	12	Chevrolet		T255A	42			HS-1005	91
Y2332	10	985158	32	T256A	42	Montgomery		HS-1006	92
Y2333	10	985159	32	R310A	38	Ward		HS-1007	93
Y2338	10	985189	32	R315A	38	GEN-1819A	71	HS-1008	94
Y3012A	6	985189	32	C410A	39	GAA-2213A	72	HS-1009	95
Y3016A	6	985264	23	C411A	39	GAA-2223A	72	HS-1012	98
Y3019A	6	985315	32	C465A	40	GAA-2243A	72	HS-1018	98
Y3051A	7	Delco		C466A	40	GAA-2253A	72	HS-1060	88
Y3053A	7	AC-3216	23	C467A	40			Norelco	
Y3058A	7	AC-3247	23	C470A	41	Motorola		L2X97T	99
Y3100	6	AC-3256	23	P810A	46	BC1	84	Oldsmobile	
Y3104	6	980296	23	P811A	46	CX1	86	982029	27
Y3107	6	980297	28	P820C	45	2AT	74	982030	30
Y3109	6	980316	26	P821C	45	2MT	75		
Y3203	9	982029	27	P822C	45	2TMF	73	Packard-Bell	
Y4461, A	3	982030	30	P845A	44	2TMX	73	5R9	100
Y4462, A	3	983578	28	C525A	42	2TMY	73	5RC10	100
Y4463, A	3	983579	23	P852A	47	AX4	83		
Y4482, A	3	983687	23	P853A	47	AX5	83	Philco Corp.	
Y4483, A	3	985158	32	P871A	48	12AT-2	79	T-63	101
Y4489, A	3	985159	32	P885B	49	A21	87	T-64	102
		985189	32	P910A	50	C21	87	T-89	103
Arvin		985264	23	P911A	50	A22	87	T-89	103
42R25	13	985315	32	C937A	51	C22	87	T-702	104
42R29	13	985332	32	RC1190A, +	55	C23	87	L790	106
42R63	13	Emerson Radio		RC1191A, +	55	X34	88	L792	106
42R77	13	888	33	RC1192A, +	55	X35	89	L794	106
62R09	14	P-1904	34	RC1193A, +	55	X36	90	L796	106
62R48	15-16	P-1905	34	RC1195A, +	55	X37	91	L797	106
62R49	15-16	P-1907A	36	RC1196A, +	55	X38	92	L799	108
62R65	17	P-1908	36	RC1197A, +	55	X39	93	T-804	105
62R69	17	P-1908	36	RC1198A, +	55	X40	94	T-805	110
		P-1910	36	RP1560	57	X41, -1	95	L860	106
		P-1912	36	RP1561	57	HK45-3	97	L861	106
		P-1916	36	RP1570	57	HK47	96	L862	106
				RC1611A	58	BKA62	79		

VOLUME R-23, MOST-OFTEN-NEEDED 1963 RADIO SERVICING INFORMATION

INDEX Continued

Philco, Cont.	RCA Continued	RCA Continued	Sylvania, Cont.	Zenith Radio	
L863	106	3RC41 128	RP-218 136	701-1,-2 161	3K01 185
L865	106	3RC42 128	RC-1199D 124	701-2 159	3K02 185
L866	106	3RC44 128	RC-1202AA 116	711-1,-2 160	5F05 177
L868	106	3RC51 128	RC-1202AB 116	711-3,-5 160	5J02 178
T-902	111	3RC76 128	RC-1202AC 117	713-1,-2 161	5J04 178
T-905	112	3RD1 116	RC-1202AD 117	G718 161	5K10 177
L926	108	3RD3 116	RC-1202AE 118	801-2 156	5K29 188
L927	108	3RD4 117	RC-1202AF 118	G9200 161	6JT40Z1 184
L928	108	3RD5 117	RC-1202AH 119	G9400 155	6JT41Z1 184
L929	108	3RD6 117	RC-1202U 116		6JT45Z1 182
L-1429	113	3RD10 116	RC-1202W 116	<u>Webcor</u>	6KT43Z1 180
L-1528	113	3RD30 116	RC-1204E,+ 124	1296 162	6KT44Z1 180
L-1532	114	3RD35 116	RC-1206C 121		7J04 179
L-1650	115	3RD37 116	RC-1206F 121	<u>Westinghouse</u>	7K31 190
		3RD40 117	RC-1208C,D 126	H-70ACS1A 171	9H20LZ1 186
<u>Pontiac</u>		3RD41 117	RC-1208H 126	H-70ACS3A 171	12K25 189
983578	28	3RD45 117	RC-1209A,B 128	H-70ACS4A 171	40 180
983579	23	3RD49 117	RC-1209C 128	H-84ACR1 173	50K 180
983687	23	3RD50 117	RC-1210A 130	H-712P9A 166	60 180
		3RD52 117	RC-1210B 130	H-713P9A 166	KPS-80 185
<u>RCA Victor</u>		3RD54 117	RC-1210C 134	H-782T4 163	90 184
3RA1	116	3RD57 117	RC-1210D 132	H-793P6+ 165	125 184
3RA2	116	3RD61 117	RC-1212 135	H-820L5 164	MP500 186
3RA3	119	3RD65 117		H-821L5 164	MP505 186
3RA5	118	3RD67 117	<u>Sampson</u>	H-827T4 168	J506G 177
3RA6	118	3RD69 117	BT85 154	H-828T4 168	J508B,+ 177
3RA16	116	3RG1 126		H-829T4 168	K510BA,+ 177
3RA20	116	3RG3 126	<u>Studebaker</u>	H-830T5 169	J513C,+ 178
3RA25	116	3RG6 126	AC-3216 23	H-831T5 169	J514F,+ 178
3RA27	116	3RG8 135	AC-3247 23	H-832T5 169	650 182
3RA30	119	3RG14 126	AC-3256 23	H-833L4 168	J727C,+ 179
3RA31	119	3RG31 126		H-835L5 169	MT1950-1 185
3RA32	119	3RG32 126	<u>Sylvania</u>	H-837L5 169	ST1950T-1 185
3RA34	119	3RG33 126	AK19 160	H-838L5 169	MT1954 185
3RA50	118	3RG34 126	AK20 160	H-841P6,+ 170	ST1954T 185
3RA51	118	3RG61 126	AT20 160	H-842P6,+ 170	MT1970 186
3RA52	118	3RG64 126	TH20 158	H-F1020 172	SKH2500T 185
3RA54	118	3RG81 135	AK21 160	H-F1021 172	SF2501T 185
3RA60	118	3RH1 124	AT21 160	H-F1022 172	SK2506T 188
3RA61	118	3RH2 124	AK22 160	H-F1023 172	SK2508T 188
3RA63	118	3RH3 124	AK23 160	H-M1430 174	MH2600 185
3RA65	118	3RH10 124	FT24 157	H-M1431 174	RK2600 185
3RB1	130	3RH21 124	SC25 159	H-M1432 174	MK2601 185
3RB3	130	3RH22 124	45C31-1 155	H-M1433 174	MK2602 186
3RB16	130	3RH31 124	45P21 161	V-2395-8 164	MK2603 186
3RB31	130	3RH32 124	45P22 161	V-2397-6 165	MK2606 186
3RB32	130	3RH34 124	45P25 161	V-2399-6** 166	see also 188
3RB34	130	3-VC-35 120	45P26 161	V-2420-3 163	MK2607 188
3RC1	134	3-VE-0 121	Y45C20 161	V-2423-1 168	MK2670 189
3RC2	132	3-VE-1 121	55C31-1 155	V-2423-2A 168	MK2675 189
3RC4	128	3-VE-2 121	55C36-1 155	V-2424-1,2 169	MK2685 189
3RC5	128	3-VF-1,X 121	400-1,-2 155	V-2425-1 170	MK2786 186
3RC7	128	3-VF-2,X 121	646-6,-7 155	V-2507-14 171	MK2787 186
3RC11	134	RS-175C 120	G651 161	V-2507-15 171	MK2789 186
3RC14	134	RS-193A,+ 123	G657 161	V-2510-14 174	MK3386 186
3RC21	132	RS-200C 122	696-3 157	V-2516-1 174	MK3388 186
3RC24	132	RP-217 136	700-4 158	V-2518-1 173	7500 189



Another
Supreme Publications
Service Manual

Supreme Publications are Available at All Leading Radio Jobbers