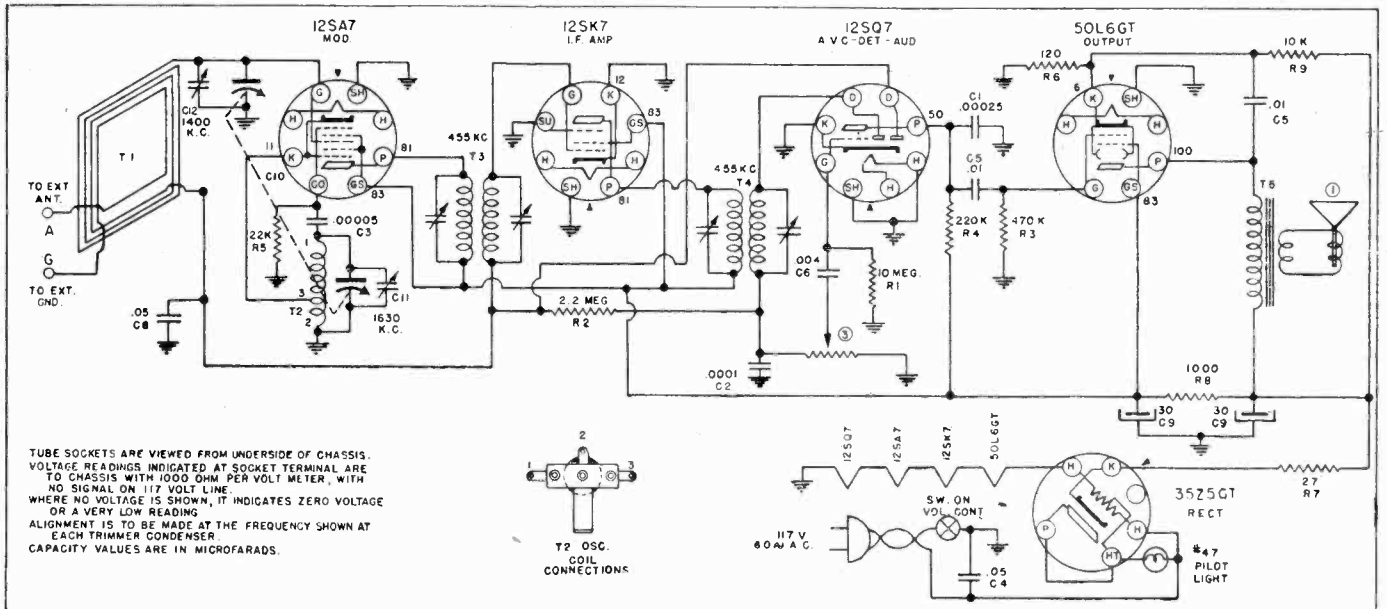
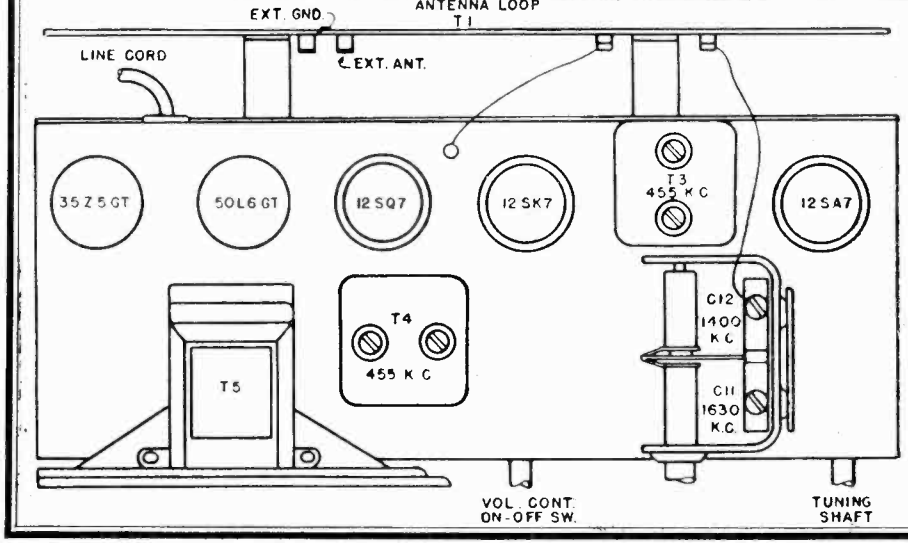


CODE	PART NO.	DESCRIPTION
R 1		10 MEGOHM 1/4 WATT RESISTOR
R 2		2.2 " " "
R 3		470K " " "
R 4		220K " " "
R 5		22 K " " "
R 6		120 " " "
R 7		27 " " "
R 8		1000 1/2 WATT "
R 9		10 K 1 WATT "

CODE	PART NO	DESCRIPTION
C 1		.00025 MFD MICA CONDENSER
C 2		.0001 " " "
C 3		.00005 " " "
C 4		.05 MFD. 400 V. TUBULAR CONDENSER
C 5		.01 " " "
C 6		.004 " " "
C 7		
C 8		.05 " 200 V. " "
C 9	18-266	30 X 30 MFD. 150 W.V ELECTROLYTIC
C 10	19-177	2 GANG VARIABLE CONDENSER (ALSO C11 & C12)

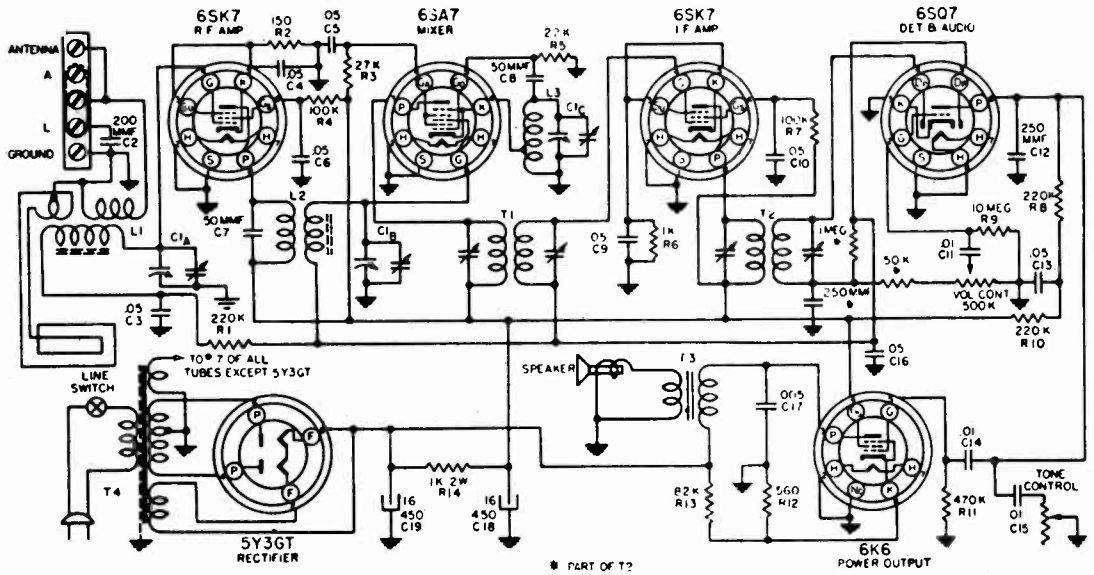
CODE	PART NO	DESCRIPTION
T 1	82-30	LOOP ANTENNA
T 2	10-394	OSCILLATOR COIL
T 3	10-369	1ST I.F. TRANSFORMER
T 4	10-370	2 ND I.F. TRANSFORMER
T 5	80-212	OUTPUT TRANSFORMER-USED WITH 79-307A SPR
(1)	8 79-339	5" P.M SPEAKER WITH 480-224 OUTPUT TRANS.
	79-307A	5" P.M SPEAKER
(3)	24-153	500 K OHM VOLUME CONTROL (WITH SW.)



ALIGNMENT PROCEDURE

CAUTION: This is an A.C./D. C. receiver and when aligning the set it is necessary to isolate the Signal Generator or the receiver from the line by use of a transformer, or place a .2 MFD. condenser in both test leads of the Signal Generator.

Connect the Signal Generator through a .1 MFD. condenser to the variable condenser side of the loop. Connect the ground side of the Signal Generator to the chassis. Adjust the Signal Generator to 455 Kilocycles and set the variable condenser of the receiver to minimum capacity (fully opened). With volume control full on and minimum output from the Signal Generator adjust the two trimmers on top of the 1st and 2nd I.F. transformers (T3-T4) for maximum output. Now connect the Signal Generator through a .00025 condenser to the external antenna connection on the back of the loop. Connect ground side of Signal Generator to terminal marked "G" on back of loop. Adjust frequency to 1630 K. C., set variable condenser at minimum capacity (fully opened) and adjust the oscillator trimmer (C11) for maximum output. Set Signal Generator to 1400 K.C., tune receiver to signal and adjust the Antenna trimmer (C12) on top of the variable condenser for maximum output.



Circuit Reference
C1A, C1B, C1C
C2
C3, C4, C9, C16
C5, C6, C10, C13
C7, C8
C11, C14, C15
C12
C17
C18
C19
R1, R8 & R10
R2
R3
R4, R7
R5
R6
R9
R11
R12
R13
R14
L1
L2
L3
T1
T2
T3
T4

Part No.	DESCRIPTION
B19-186	Variable condenser 200 MMF mica condenser (on Loop)
A16-152	.05 MFD. 200 volt tubular condenser
A16-158	.05 MFD. 400 volt tubular condenser
A15-175	50 MMF mica condenser
A16-156	.01 MFD. 400 volt tubular condenser
A15-178	250 MMF mica condenser
A16-153	.005 MFD. 600 volt tubular condenser
A18-279	16 MFD. 450 volt electrolytic condenser
A18-274	16 MFD. 450 volt electrolytic condenser
A60-667	220K ohm 1/3 watt resistor
A60-686	150 ohm 1/3 watt resistor
A60-692	27K ohm 1 watt resistor
A60-671	100K ohm 1/2 watt resistor
A60-659	22K ohm 1/3 watt resistor
A60-675	1K ohm 1/3 watt resistor
A60-663	10 megohm 1/3 watt resistor
A60-662	470K ohm 1/3 watt resistor
A60-701	560 ohm 1 watt resistor
A60-700	82K ohm 1 watt resistor
A60-699	1000 ohm 2 watt resistor
B10-451	Antenna coil
B10-452	R. F. coil
A10-446	Oscillator coil
B10-412	1st I.F. transformer
B10-444	2nd I.F. transformer
	Output transformer (part of speaker)
C80-223	Power transformer
S84-50	Loop antenna assembly (with mahogany back)
S84-52	Loop antenna assembly (with Ivory back)
B83-325	Baffle, cardboard
D42-379	Cabinet, bakelite (mahogany)
A42-401	Cabinet, bakelite (Ivory)
C67-482	Dial scale
A98-4	Grille cloth (for mahogany cabinet)
A98-5	Grille cloth (for ivory cabinet)
A52-187	Knob (mahogany)
A52-191	Knob (Ivory)
A58-48	Dial pointer
A83-292	Dial scale retainer, right
A83-293	Dial scale retainer, left
S84-49	6" P. M. Speaker assembly (includes speaker, output transformer and necessary mounting brackets)

With an output meter connected across the voice coil of the speaker, the output meter reading for ½ watt is 1.25 volts using a signal which is modulated 400 c.p.s. Follow through the procedure as outlined below for proper alignment.

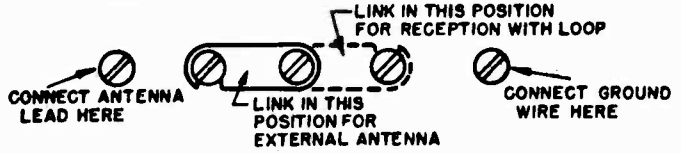
The alignment should be made with volume control fully on, and the output from the signal generator as low as possible, for accurate alignment.

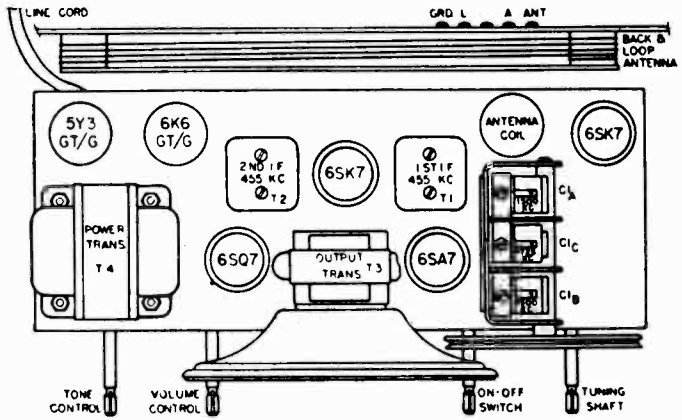
Position of Variable	Generator Freq.	Dummy Ant. mfd.	Generator Connections	Trimmer Adjustment	Trimmer Function
Fully Open	455 KC	.1	6SA7 Grid (Stator of C1B)	T1 T2	I. F.
Fully Open	1725 KC	.00025	*Ant. Terminal on Loop	C1C	Osc.
Tune in signal from Generator	1500 KC	.00025	*Ant. Terminal on Loop	C1B	R. F.
Tune in signal from Generator	1500 KC	.00025	*Ant. Terminal on Loop	C1A	Ant.

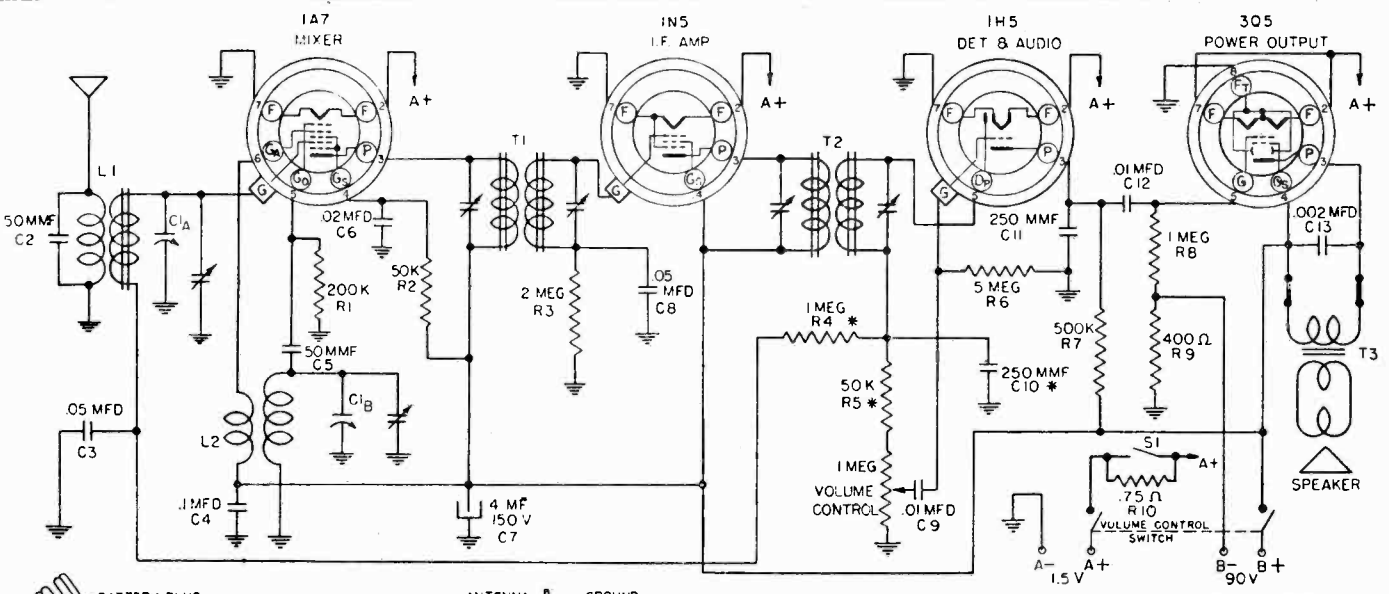
* Be sure coupling link is in correct position for external antenna operation. See illustration below.

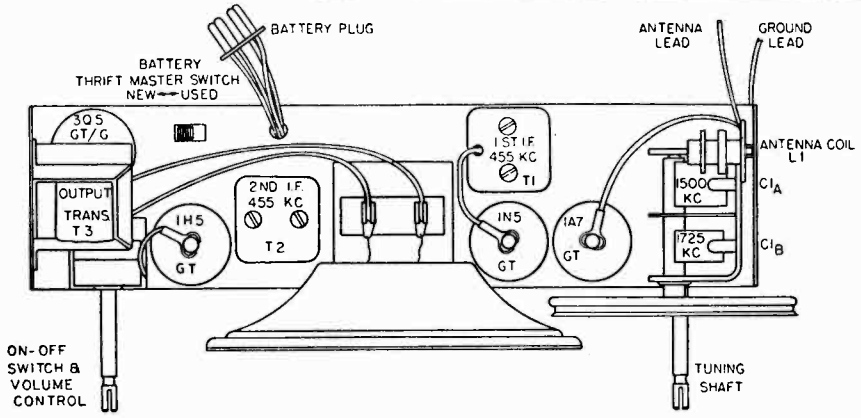
Repeat the above alignment procedure as a final check.

ANTENNA and GROUND CONNECTIONS









ALIGNMENT PROCEDURE

With an output meter connected across the voice coil of the speaker, the output meter reading for 50 milliwatts is .4 volts using a signal which is modulated 30% at 400 c.p.s. Follow through the procedure as outlined below for proper alignment.

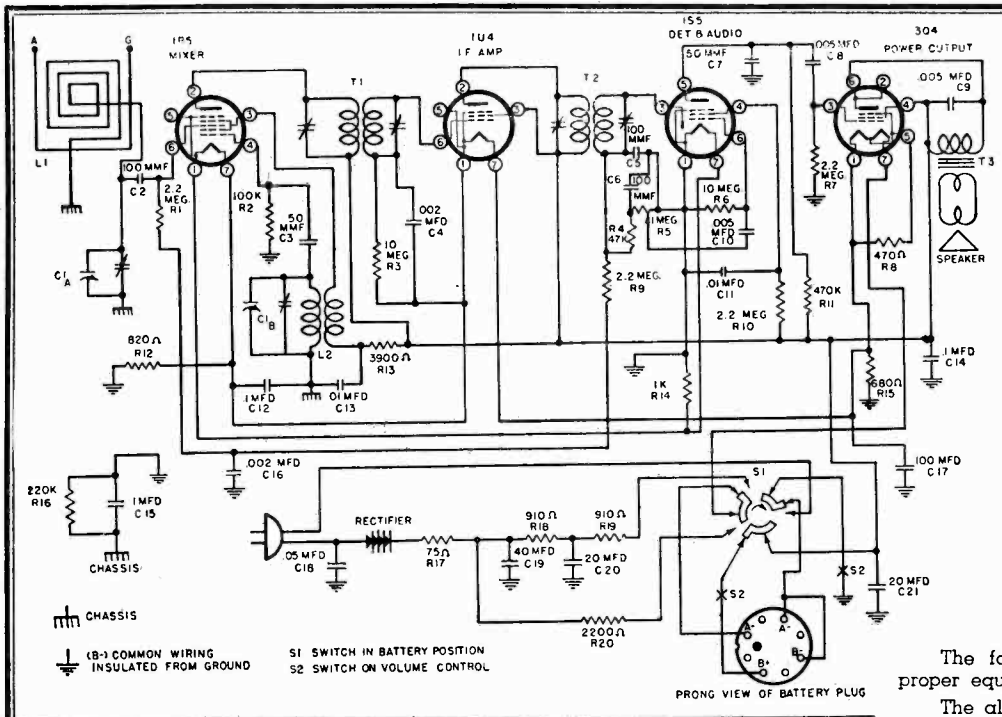
Connect the signal generator to the grid cap of the 1A7 GT Tube through a .1 MFD. Condenser. Connect the ground lead of the generator to the chassis. Adjust the signal generator to 455 K.C. and set the variable condenser of the receiver to minimum capacity (fully opened). With the volume control full on and minimum output from the signal generator adjust the two trimmers on top of the first and second I.F. transformers for maximum output.

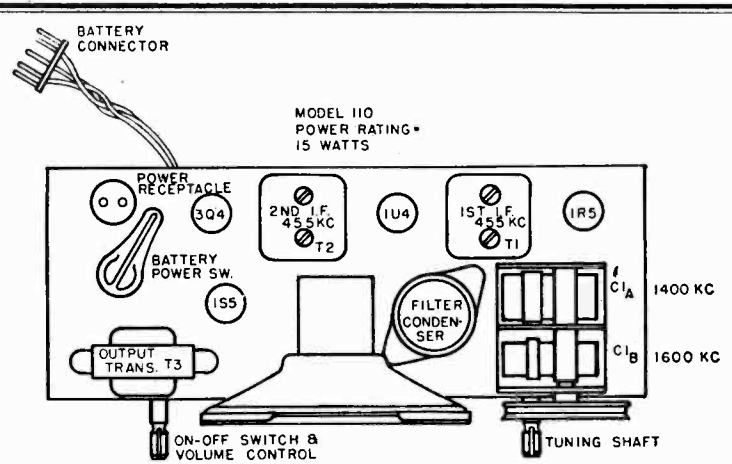
Now connect the signal generator to the antenna connection of the receiver through a .00025 condenser. Adjust the signal generator frequency to 1725 K. C. and set the variable condenser to minimum capacity (fully opened), and adjust the oscillator trimmer (C1B) for maximum output. Set signal generator to 1500 K. C. and tune receiver to signal. Adjust the antenna trimmer (C1A) on the variable condenser for maximum output.

Code	Part No.	DESCRIPTION
C1A C1B	B19-185	Variable Condenser
C2		50 MMFD Mica Condenser (Part of L-1)
C3, C8		.05 MFD. 200 V Tubular Condenser
C4		.1 MFD. 200 V Tubular Condenser
C5		50 MMFD Mica Condenser
C6		.02 MFD 400 V Tubular Condenser
C7	A18-273	4 MFD 150 V. Electrolytic Condenser
C9, C12		.01 MFD. 400 V Tubular Condenser
C10		250 MMFD Mica Condenser (Part of T-2)
C11		250 MMFD Mica Condenser
C13		.002 MFD 600 V Tubular Condenser

Code	Part No.	DESCRIPTION
R1		200 K Ohm 1/3 Watt Carbon Resistor
R2		50 K Ohm 1/3 Watt Carbon Resistor
R3		2 Megohm 1/3 Watt Carbon Resistor
R4		1 Megohm 1/3 Watt Carbon Resistor (Part of T-2)
R5		50 K Ohm 1/3 Watt Carbon Resistor (Part of T-2)
R6		5 Megohm 1/3 Watt Carbon Resistor
R7		500 K Ohm 1/3 Watt Carbon Resistor
R8		1 Megohm 1/3 Watt Carbon Resistor
R9		400 Ohm 1/3 Watt Carbon Resistor
R10	A60-691	.75 Ohm 1 Watt Resistor

Code	Part No.	DESCRIPTION
L1	A10-414	Antenna Coil
L2	A10-415	Oscillator Coil
T1	B10-416	1st I.F. Transformer
T2	B10-417	2nd I.F. Transformer
T3	A80-218	Speaker Output Transformer
S1	A69-164	Battery Thriftmaster Switch
	A24-165	Volume Control and Switch
	B79-335	Speaker





Code	Part No.	DESCRIPTION	Code	Part No.	DESCRIPTION
C1A, C1B	B19-188	Variable Condenser	R4	A60-685	47K Ohm ½ watt 20% Resistor
C2, C5, C6	A15-188	100 MMF Mica Condenser	R8	A60-707	470 Ohm ½ watt 20% Resistor
C3, C7	A15-175	50 MMF Mica Condenser	R11	A60-662	470K Ohm ½ watt 20% Resistor
C4, C16	A16-155	.002 MFD. 600 volt Condenser	R12	A60-709	820 Ohm ½ watt 10% Resistor
C8, C9, C10	A16-166	.005 MFD. 150 volt Condenser	R13	A60-710	3900 Ohm ½ watt 10% Resistor
C11, C13	A16-165	.01 MFD. 200 volt Condenser	R14	A60-675	1000 Ohm ½ watt 20% Resistor
C12, C15	A16-160	.1 MFD. 400 volt Condenser	R15	A60-708	680 Ohm ½ watt 10% Resistor
C14	A16-157	.1 MFD. 200 volt Condenser	R16	A60-667	220K Ohm ½ watt 20% Resistor
C18	A16-158	.05 MFD. 400 volt Condenser	R17	A60-712	75 Ohm 3 watt 5% Resistor
C17		100 MFD. 25 volt Electrolytic Condenser	R18, R19	A60-713	1820 Ohm 10 watt 5% Resistor (each section 910 ohms)
C19	A18-281	40 MFD. 150 volt Electrolytic Condenser	R20	A60-714	2200 Ohm ½ watt 10% Resistor
C20, C21		20 MFD. 150 volt Electrolytic Condenser	L2	B10-460	Oscillator Coil
R1, R7, R9, R10	A60-684	2.2 Megohm ½ watt 20% Resistor	T1	C10-462	1st I. F. Transformer
R2	A60-671	100K Ohm ½ watt 20% Resistor	T2	C10-463	2nd I. F. Transformer
R3, R6	A60-663	10 Megohm ½ watt 20% Resistor	R5	A24-170	Volume Control and Switch

Code	Part No.	DESCRIPTION
	10-470	Antenna Loading Coil
	A52-197	Knob, Tuning
	A52-198	Knob, Volume
	A52-196	Knob, Battery—AC-DC
	B67-496	Dial Scale
	A58-63	Dial Pointer
	A83-391	Selenium Rectifier
	A75-60	Tuning Shaft
	A68-27	AC Socket
	A68-28	Socket for AC cord
S1	B69-173	Switch, Battery—AC-DC
T3	A80-228	Output Transformer
	B79-350	Speaker, 5" P M
	A45-119	Plug, Battery
	D42-406	Cabinet
	D40-140	Escutcheon and Grille

ALIGNMENT PROCEDURE

The following alignment procedure is for use only by competent servicemen having the proper equipment.

The alignment should be made with volume control fully on, and the output from the signal generator as low as possible, to prevent A. V. C. action from interfering with correct alignment.

With the output meter connect across the voice coil of the speaker, the output meter reading for 50 milliwatts is .4 volts using a signal which is modulated 400 c.p.s.

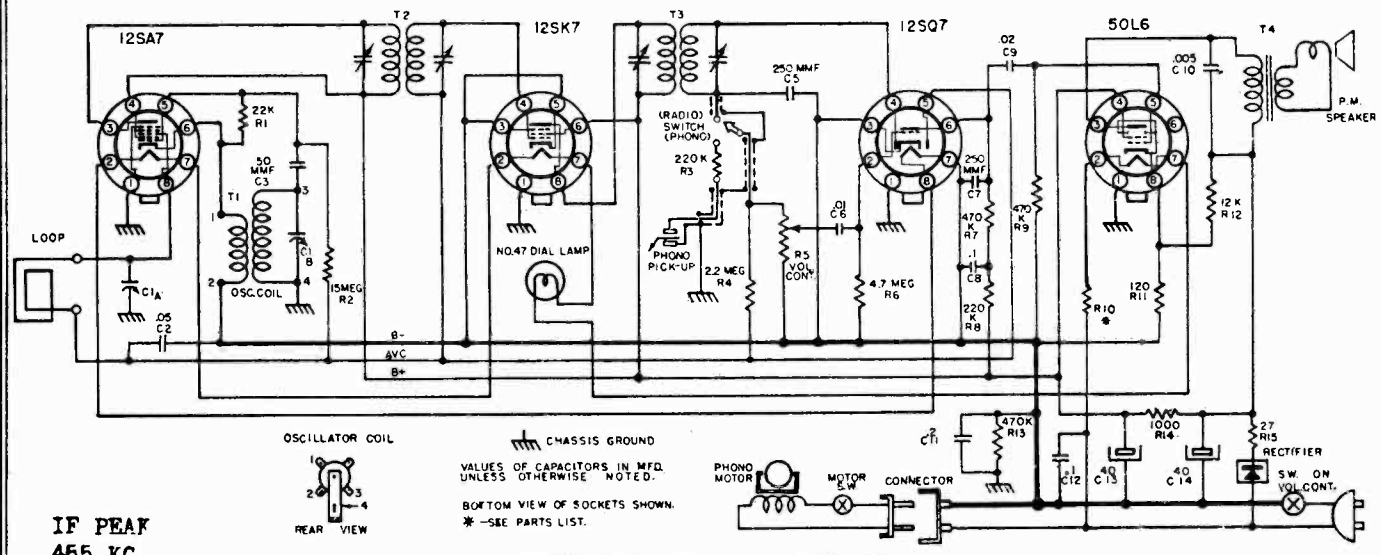
Adjust all trimmers for maximum output. Repeat alignment procedure given below as a final check.

CAUTION: This is an A.C.-D. C. receiver and if alignment is made with the receiver connected to 117 volts A. C. or D. C., it is necessary to isolate the signal generator or the receiver from the line by use of a transformer, or place a .2 M. F. D. condenser in both test leads of the Signal Generator.

Position of Variable	Generator Frequency	Dummy Ant. Mfd.	Generator Connections	Trimmer Adjustment	Trimmer Function
Fully open	455 KC	.1	*1R5 Grid (Stator of C1A)	T2	Output I. F.
Fully open	455 KC	.1	*1R5 Grid (Stator of C1A)	T1	Input I. F.
Fully open	1600 KC	.00025	**Ant. lead (Stapled to Cabinet)	C1B	Oscillator
Tune in signal from generator	1400 KC	.00025	**Ant. lead (Stapled to Cabinet)	C1A	Antenna

*Connect ground lead of signal generator to Common "B."
**Connect ground lead of signal generator to ground wire stapled to cabinet.

If it should become necessary to re-adjust the loop antenna loading coil tune in a weak station, between 600 and 650 Kilocycles, and adjust for maximum output.



IF PEAK
455 KC

* COMPENSATION CIRCUIT — PAT. APPLIED FOR

Code	Part No.	DESCRIPTION
C1A, C1B	B19-189	Variable Condenser
C2	A16-152	.05 MFD. 200 volt Condenser
C3	A15-175	50 MMFD. Mica Condenser.
C9	A16-150	.02 MFD. 400 volt Condenser
C5, C7	A15-178	250 MMFD. Mica Condenser
C6	A16-156	.01 MFD. 400 volt Condenser
C8	A16-157	.1 MFD. 200 volt Condenser
C10	A16-153	.005 MFD. 600 volt Condenser
C11	A16-154	.2 MFD. 400 volt Condenser
C12	A16-160	.1 MFD. 400 volt Condenser
C13, C14	A18-280	40 MFD. 150 volt Electrolytic Condenser
R1	A60-659	22K Ohm ½ watt 20% Resistor
R2	A60-664	15 Megohm ½ watt 20% Resistor
R3, R8	A60-667	220K Ohm ½ watt 20% Resistor
R4	A60-684	2.2 Megohm ½ watt 20% Resistor
R5	A24-164	500K Ohm Volume Control with Switch
R6	A60-669	4.7 Megohm ½ watt 20% Resistor
R7, R9, R13	A60-662	470K Ohm ½ watt 20% Resistor
R10	A60-719	Special Compensating Resistor, order only from the manufacturer
R11	A60-702	120 Ohm ½ watt 10% Resistor
R12	A60-720	12K Ohm 2 watt 10% Resistor
R14	A60-699	1000 Ohm 2 watt 10% Resistor
R15	A60-721	27 Ohm 1 watt 10% Resistor
T1	B10-411	Oscillator Coil
T2	A10-468	1st I. F. Transformer
T3	B10-454	2nd I. F. Transformer
T4	B80-230	Output Transformer
	A52-199	Knob, Volume
	A52-200	Knob, Tuning
	A52-201	Knob, Phono-Radio
	A59-172	Switch, Phono-Radio
	A39-279	Drum for Variable Condenser
	B79-352	5" P. M. Speaker
	A71-22	Cover for Volume Control
	A82-391	Selenium Rectifier
	A75-52	Tuning Shaft
	A83-303	Connector
	D42-407	Cabinet, Wood
	C71-37	Cover for Dial Plate
	B67-499	Dial Scale
	A58-53	Dial Pointer
	B83-408	Dial Scale Retainer
	C83-418	Cabinet Back
	C82-43	Loop Antenna
	A83-273	Dial Diffusing Plate

ALIGNMENT PROCEDURE

The following alignment procedure is for use only by competent servicemen having the proper equipment.

The alignment should be made with volume control fully on, and the output from the signal generator as low as possible, to prevent A.V.C. action from interfering with correct alignment.

With the output meter connected across the voice coil of the speaker, the output meter reading for 50 milliwatts is .4 volts using a signal which is modulated 400 c.p.s.

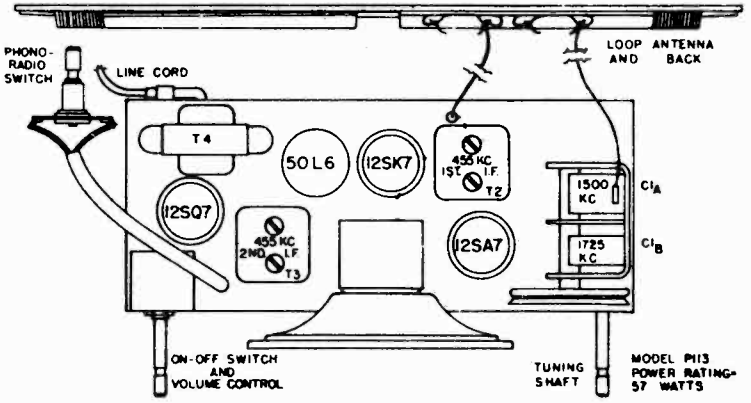
Adjust all trimmers for maximum output. Repeat alignment procedure given below as a final check.

CAUTION: This is an A.C.-D.C. receiver and when aligning the set it is necessary to isolate the Signal Generator or the Receiver from the line by use of a transformer, or place a .2 MFD. condenser in both test leads of the Signal Generator.

Position of Variable	Generator Frequency	Dummy Ant. Mid.	Generator Connections	Trimmer Adjustment	Trimmer Function
Fully open	455 KC	.1	* 12SA7 Grid (Stator of C1A)	T2	Input I.F.
Fully open	455 KC	.1	* 12SA7 Grid (Stator of C1A)	T3	Output I.F.
Fully open	1725 KC	.00025	* 12SA7 Grid (Stator of C1A)	C1B	Oscillator
Tune in signal from generator	1500 KC	.00025	**Loosely Coupled to Loop	C1A	Antenna

*Connect ground lead of signal generator to Common "B."

**Do not connect ground lead of signal generator.



ALIGNMENT PROCEDURE

The following alignment procedure is for use only by competent servicemen having the proper equipment.

The alignment should be made with volume control fully on, and the output from the signal generator as low as possible, to prevent A.V.C. action from interfering with correct alignment.

With the output meter connected across the voice coil of the speaker; the output meter reading for 50 milliwatts is .4 volts using a signal which is modulated 400 c.p.s.

Adjust all trimmers for maximum output. Repeat alignment procedure given below as a final check.

For alignment points refer to Figure No. 2.

CAUTION: This is an A.C.-D.C. receiver and if alignment is made with the receiver connected to 117 volts A.C. or D.C., it is necessary to isolate the signal generator or the receiver from the line by use of a transformer, or place a .2 M.F.D. condenser in both test leads of the Signal Generator.

Position of Variable	Generator Frequency	Dummy Ant. Mfd.	Generator Connections	Trimmer Adjustment	Trimmer Function
Fully open	455 KC	.1	*1R5 Grid (Stator of C1A)	T2	Output I.F.
Fully open	455 KC	.1	*1R5 Grid (Stator of C1A)	T1	Input I.F.
Fully open	1600 KC	.00025	*1R5 Grid (Stator of C1A)	C1B	Oscillator
Tune in signal from generator	1400 KC	—	Loosely coupled to loop	C1A	Antenna
**Tune in signal from generator	600 KC	—	Loosely coupled to loop	L1	600 KC Padder

*Connect ground lead of signal generator to chassis.

**When making this adjustment the variable should be rocked back and forth.

INSTALLATION

This receiver is shipped from the factory minus the batteries. To install the batteries, open the back cover of the case and place them in their proper positions. (Figure No. 2 clearly illustrates the correct position for the batteries). The batteries required are one 67-1/2 volt "B" battery such as Eveready No. 467, Burgess No. XX45, Ray-O-Vac No. 4367 or similar battery of the same voltage and size. The "B" battery connections are of the snap-on type and so constructed that they can only be installed in the correct position. Four No. 2 standard flash light dry cells are required for "A" batteries.

CAUTION: Be sure the "A" batteries are placed exactly as shown in Figure No. 2 otherwise the receiver will not operate.

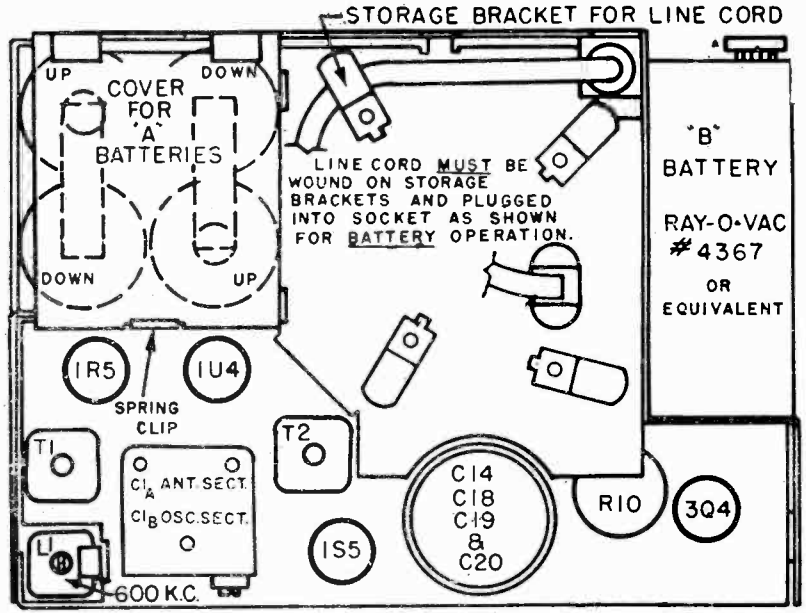
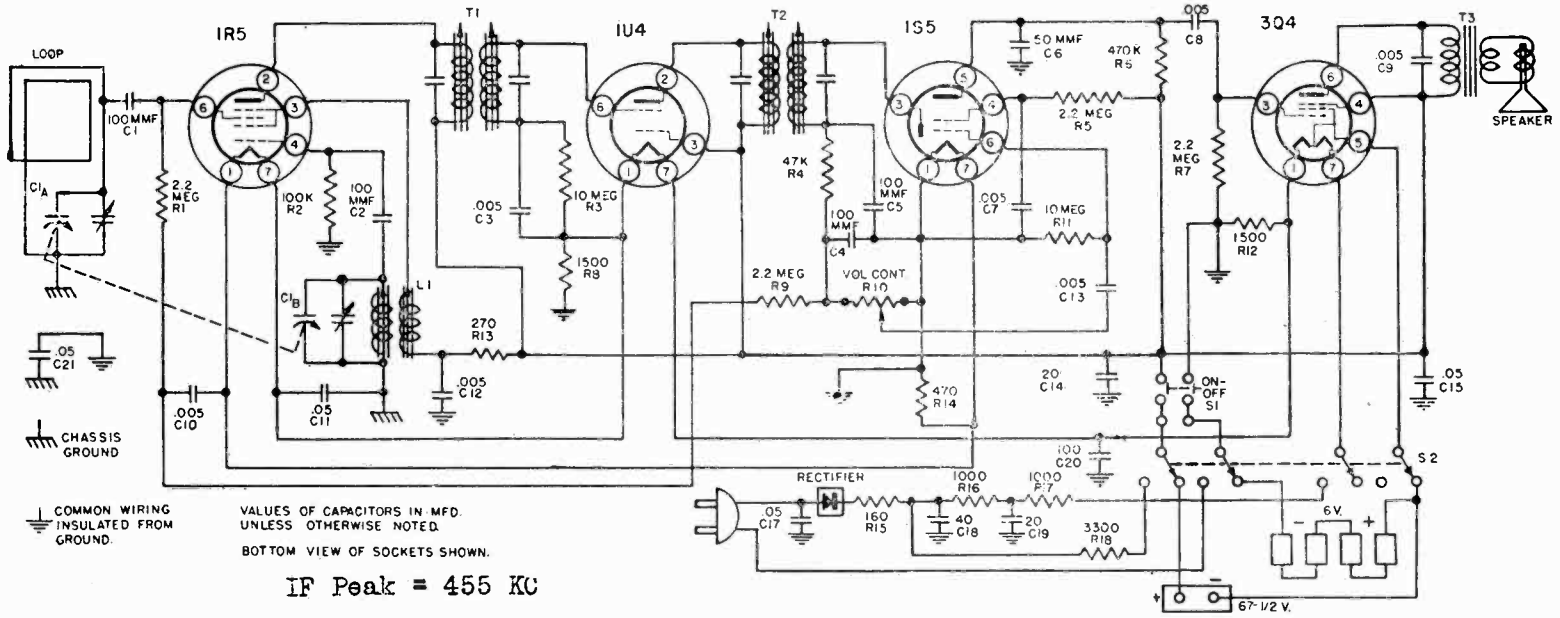


FIG. 2 PICTORIAL DIAGRAM



IF Peak = 455 KC

CODE NO.	PART NO.	DESCRIPTION
C1, C2, C4, C5	A15-190	100 MMF Mica Condenser
C1A, C1B	B19-190	Variable Condenser
C12, C13 C3, C7, C8, C9, C10,	A16-166	.005 MFD 150 volt Condenser
C6	A15-191	50 MMF Mica Condenser
C11, C17, C21	A16-179	.05 MFD 400 volt Condenser
C14, C19, C18, C20	A18-282	20 MFD 150 volt electrolytic Condenser 40 MFD 150 volt Electrolytic Condenser 100 MFD 25 volt electrolytic Condenser
C15	A16-170	.05 MFD 200 volt Condenser
R1, R5, R7, R9	A60-726	2.2 Megohm ½ watt Resistor
R2	A60-727	100K Ohm ½ watt Resistor
R3, R11	A60-728	10 Megohm ½ watt Resistor
R4	A60-730	47K Ohm ½watt Resistor
R6	A60-731	470K Ohm ½ watt Resistor
R8, R12	A60-729	1500 Ohm ½ watt Resistor
R10	A24-172	1 Megohm Volume Control
R13	A60-723	270 Ohm ½ watt Resistor
R14	A60-722	470 Ohm ½ watt Resistor
R15	A60-725	160 Ohm 3 watt Resistor
R16, R17	A60-713	2000 Ohm 10 watt Resistor (1000 Ohm each section)
R18	A60-724	3300 Ohm 1 watt resistor
T1, T2	C10-475	I. F. Transformer
T3	A80-231	Output Transformer
L1	B10-477	Oscillator Coil
	S84-112	Cover Assembly for "A" Batteries
	B52-218	Knob, On-off Switch
	A83-391	Selenium Rectifier
	B79-353	P.M. Speaker
	A69-174	AC-DC—Battery Switch
	A69-175	On-off Switch
	A76-34	Terminal for "B" Battery
	B23-154	Line Cord
	D21-108	End Cap for Handle
	B83-442	Handle
	C52-216	Knob, Tuning
	B52-217	Knob, Volume Control
	S84-126	Front Cover Assembly for Case, with Loop
	S84-111	Hub and Pointer Assembly
	S84-128	Rear Cover Assembly for Case

DESCRIPTION

Model 11411 is a 4-tube superheterodyne radio receiver designed for use on 117 volt AC-DC current or from self-contained batteries.

This receiver covers the frequency range from 545 kilocycles to 1600 kilocycles (K.C.).

The tubes used are:—

1R5—Mixer, Oscillator
1U4—I.F. Amplifier
1S5—Detector and first Audio
3Q4—Power output

No rectifier tube is required as a Selenium rectifier is used when operating on A.C. current.

ALIGNMENT PROCEDURE

The following alignment procedure is for use only by competent servicemen having the proper equipment.

The alignment should be made with volume control fully on, and the output from the signal generator as low as possible, to prevent A.V.C. action from interfering with correct alignment.

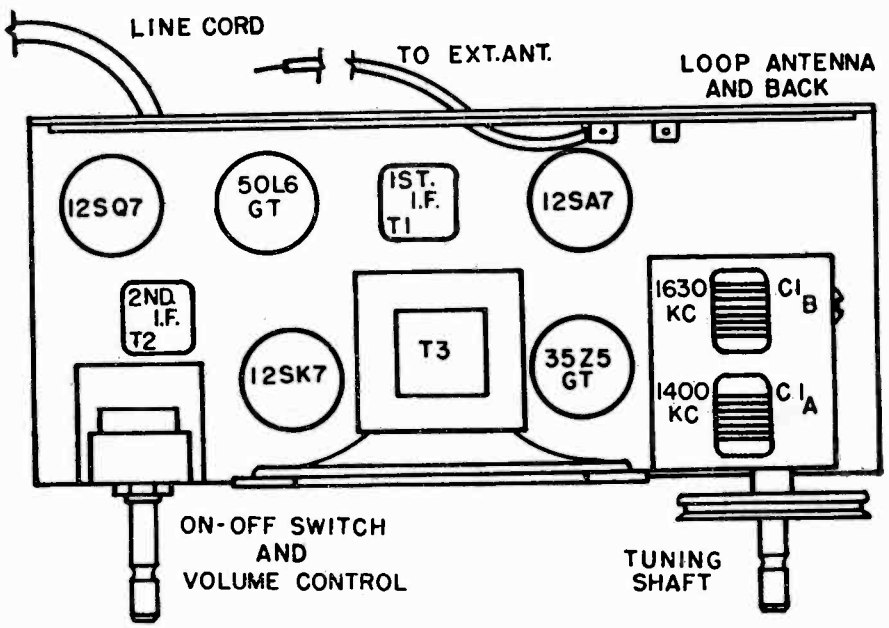
With the output meter connected across the voice coil of the speaker, the output meter reading for 50 milli-watts is .4 volts using a signal which is modulated 400 c.p.s.

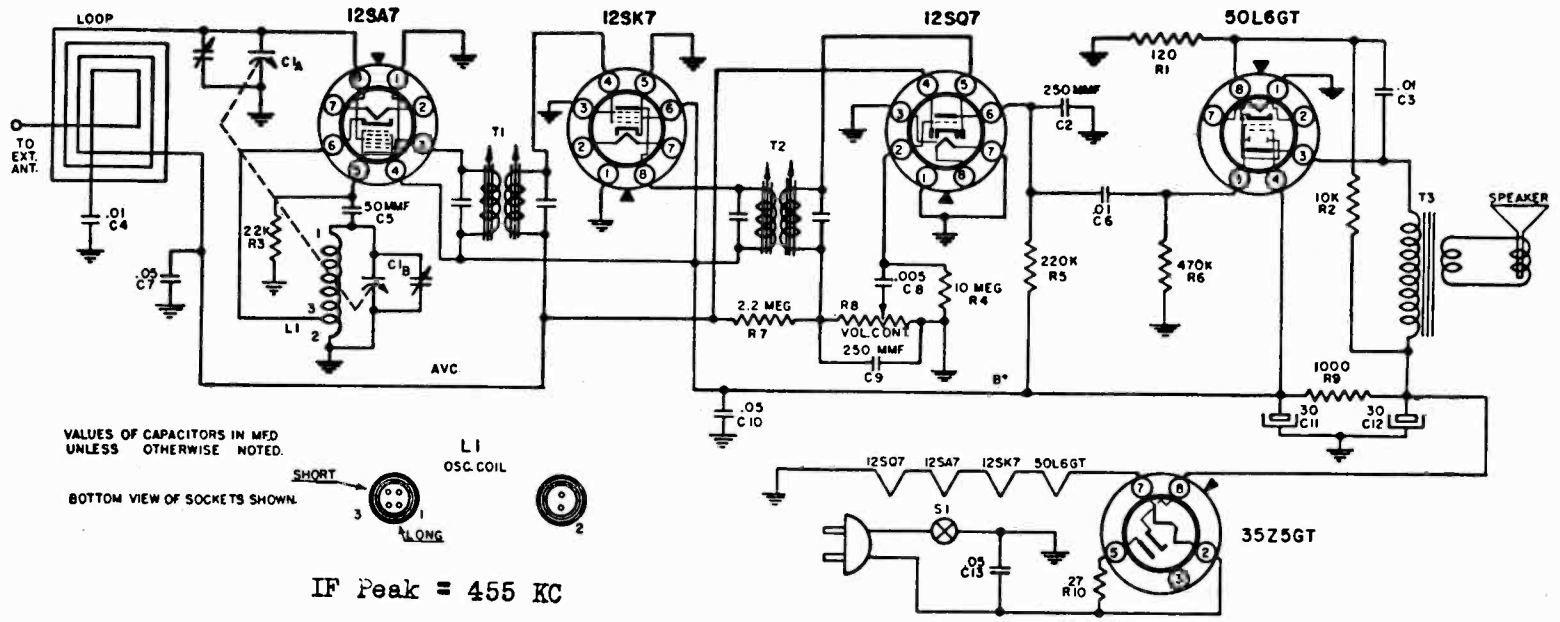
Adjust all trimmers for maximum output. Repeat alignment procedure given below as a final check.

CAUTION: This is an A.C.-D.C. receiver and when aligning the set it is necessary to isolate the Signal Generator or the Receiver from the line by use of a transformer, or place a .2 MFD. condenser in both test leads of the Signal Generator.

Position of Variable	Generator Frequency	Dummy Ant. Mfd.	Generator Connections	Trimmer Adjustment	Trimmer Function
Fully open	455 KC	.1	*12SA7 Grid (Stator of C1A)	T1	Input I.F.
Fully open	455 KC	.1	*12SA7 Grid (Stator of C1A)	T2	Output I.F.
Fully open	1630 KC	.00025	*12SA7 Grid (Stator of C1A)	C1B	Oscillator
Tune in signal from generator	1400 KC	.00025	*Ant. lead from loop	C1A	Antenna

*Connect ground lead of signal generator to chassis.





PARTS LIST

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION
C1A, C1B	19-173	Variable Condenser	R9	A60-732	1000 Ohm 1 watt Resistor
C2, C9	A-15-176	250 MMFD. Mica Condenser	R10	A60-690	27 Ohm ½ watt Resistor
C3, C4, C6	A16-156	.01 MFD. 400 volt Condenser	T1	A10-478	1st I. F. Transformer
C5	A15-175	50 MMFD. Mica Condenser	T2	A10-479	2nd I. F. Transforer
C7, C10	A16-152	.05 MFD. 200 volt Condenser	T3	A80-233	Output Transformer
C8	A16-153	.005 MFD. 600 volt Condenser	L1	B10-480	Oscillator Coil
C11, C12	B18-283	30x30 MFD. 150 volt Dual Electrolytic Condenser		48-34	Dial Crystal
C13	A16-158	.05 MFD. 400 volt Condenser		58-37	Dial Pointer
R1	A60-702	120 Ohm ½ watt Resistor		79-316	4-inch P.M. Speaker
R2	A60-698	10K Ohm 1 watt Resistor		C83-448	Cabinet Back
R3	A60-659	22K Ohm ½ watt Resistor		B82-46	Loop Antenna
R4	A60-663	10 Megohm ½ watt Resistor		42-320W	Cabinet, Molded Walnut
R5	A60-667	220K Ohm ½ watt Resistor		A42-420	Cabinet, Molded Ivory
R6	A60-662	470K Ohm ½ watt Resistor		67-462	Dial Scale
R7	A60-684	2.2 Megohm ½ watt Resistor		52-165W	Knob, Walnut
R8	24-157	Volume Control, 1 Megohm		A52-222	Knob, Ivory

Model 11801 is a 5 tube (including rectifier) superheterodyne radio receiver designed for use on 117 volts 60 cycle AC or 117 volts DC power supply.

The tubes used are:—

1—12SA7 Oscillator Converter
1—12SK7 I.F. Amplifier
1—35Z5GT Power Rectifier
1—12SQ7 AVC Detector and 1st Audio
1—50L6GT Power Output

This receiver covers the frequency range from 540 kilocycles to 1630 kilocycles (KC).

MODEL 13915 WARWICK MFG. CORP.

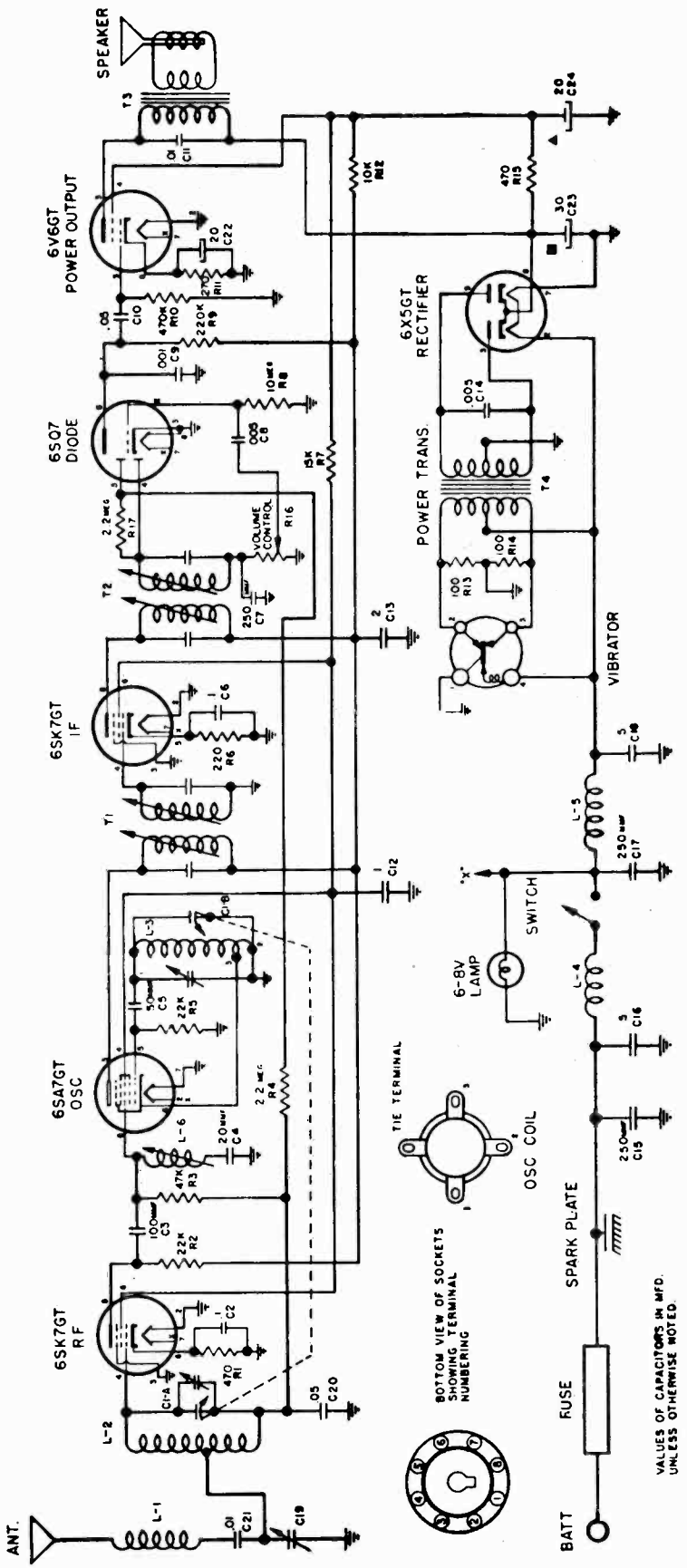


Fig. 3 Schematic Diagram

ELECTRICAL SPECIFICATIONS

Power Supply	6.3 volts DC
Current	4.8 amp. average
Frequency Range	540 to 1600 KC
I. F. Frequency	455 KC
Speaker	4" P. M.
Power Output	1.2 watts, undistorted 2.5 watts, maximum
Sensitivity	10 microvolts average for 1 watt output
Selectivity	20 KC broad at 1000 times signal, at 1000 KC

The tube compliment of this receiver is as follows:

1—6SK7GT—R. F. Amplifier.

1—6SA7GT—Converter.

1—6SK7GT—I.F. Amplifier.

1—6SQ7—Detector—AVC—1st audio.

1—6V6GT—Power output.

1—6X5GT—Rectifier.

SERVICE NOTES

Voltages taken from the different points of the circuit to the chassis are measured with volume control in maximum position, all tubes in their sockets, no signal applied, and with a volt meter having a resistance of 20,000 ohms per volt. These voltages are clearly shown on the voltage chart, (Fig. 4).

All voltages should be measured with an input voltage of 6.3 volts DC.

To check for open by-pass condensers, shunt each condenser with another one having the same capacity and voltage rating which is known to be good until the defective unit is located.

ALIGNING INSTRUCTION

Never attempt any adjustments on this receiver unless it becomes necessary to replace a coil or transformer, or the adjustments have been tampered with in the field. Always make certain that other circuit components, such as tubes, condensers, resistors, etc., are normal before proceeding with realignment.

If realignment is necessary follow the instructions given under the heading "ALIGNMENT PROCEDURE". After realignment has been completed repeat the procedure as a final check.

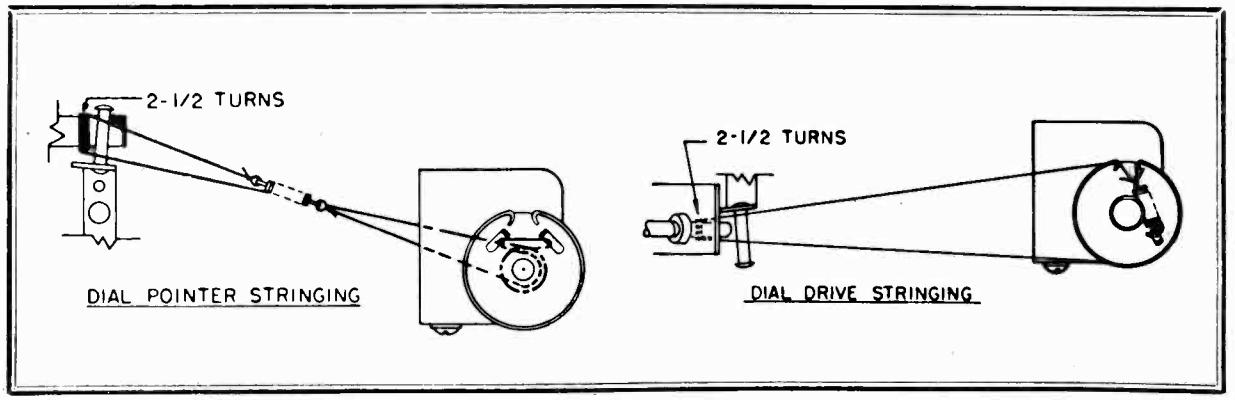
INSTRUCTIONS FOR REMOVING CHASSIS FROM THE CASE

The bottom cover (the one with the speaker louvers) can be removed to permit servicing of major components, such as tubes and vibrator, by removing the eight (8) screws holding it to the top cover. There are three (3) screws on each side, one (1) in the rear, and one (1) in the front.

CAUTION: Before attempting to remove the top cover, to service condensers, resistors, etc., the screw connecting the spark plate to the "A" terminal (inside case) must be removed. This is a round head screw, and is located on the rear of the case, close to the mounting stud bolt. It is recessed in a ½ inch hole in the case itself, thereby permitting contact with the spark plate.

After removing the spark plate screw, remove the two knobs by pulling forward and remove the eight (8) screws securing the cover to the chassis. Lift the chassis at the rear, at the same time moving it away from the front of the case so that the volume and tuning shafts will clear the holes in the cover.

NOTE: When reinstalling the chassis into the case, be sure the screw connecting the spark plate to the "A" terminal (inside case) is tightened very securely, otherwise the receiver will not operate properly.



ALIGNMENT PROCEDURE

Volume control—Maximum, all adjustments.

No signal applied to antenna.

Power input—6.3 volts.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil.

Connect ground lead of signal generator to chassis.

Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment:

Signal generator that will provide the test frequencies as listed.

Non-metallic screwdriver.

Output meter.

Dummy antennas—.1 MFD., .00025 MFD.

For alignment points refer to Figures 4 ad 5.

Dial Setting	*Generator Frequency*	*Dummy Ant.*	*Generator Connections*	*Trimmer Reference*	*Trimmer Adjustment*	*Trimmer Function*
Fully Open	455 KC	.1 MFD.	6SA7 Grid	T2	Maximum	Output I.F.
Fully Open	455 KC	.1 MFD.	6SA7 Grid	T1	Maximum	Input I.F.
Fully Open	455 KC	.00025 MFD.	Ant. lead	L6	Minimum	Wave trap
Fully Open	1600 KC	.00025 MFD.	Ant. lead	C1B	Maximum	Oscillator
Tune in signal from generator	1400 KC	.00025 MFD.	Ant. lead	C1A	Maximum	Antenna

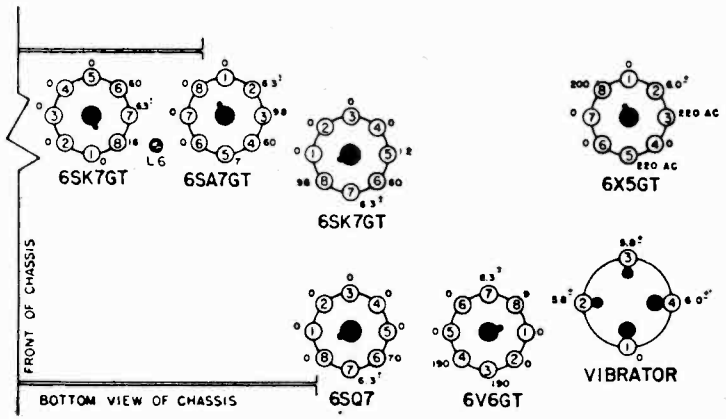


Fig. 4 Socket Voltages

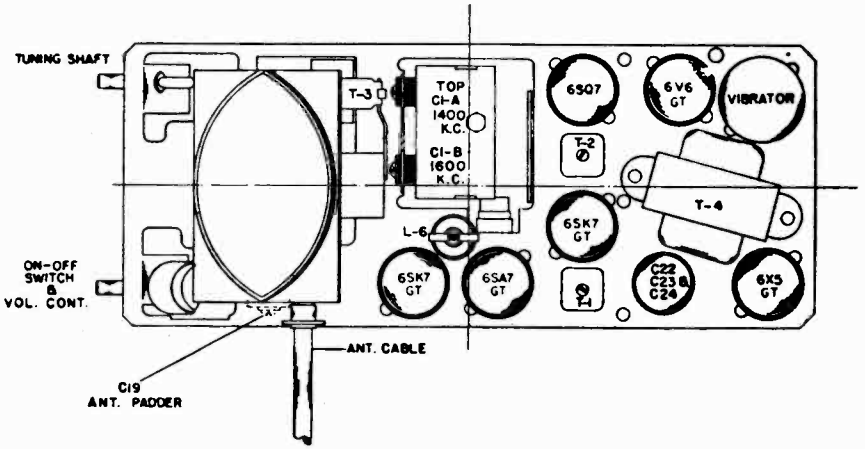


Fig. 5 Tube and Trimmer Locations

CONDENSERS

Schematic Diagram Reference	Part No.	Description
C1A, C1B	B19-196	Variable Condenser
C2, C6, C12	A16-187	.1 MFD. 400 Volt Condenser
C3	A15-196	100 MMFD Ceramic Condenser
C4	A15-202	20 MMFD Ceramic Condenser
C5	A15-204	50 MMFD Ceramic Condenser
C7, C15, C17	A15-176	250 MMFD Mica Condenser
C8	A16-190	.005 MFD. 600 Volt Condenser
C9	A16-195	.001 MFD. Ceramic Condenser
C10	A16-193	.05 MFD. 600 Volt Condenser
C11, C21	A16-192	.01 MFD. 400 Volt Condenser
C13	A16-188	.2 MFD. 400 Volt Condenser
C14	A16-185	.005 MFD. 1600 Volt Oil Filled Condenser
C16, C18	A16-184	.5 MFD. 100 Volt Condenser
C19	A20-145	Trimmer Condenser
C20	A16-189	.05 MFD. 400 Volt Condenser
C22	A18-289	20 MFD 25 Volt Electrolytic Condenser
C23		30 MFD 350 Volt Electrolytic Condenser
C24		20 MFD. 350 Volt Electrolytic Condenser

RESISTORS

R1	A60-722	470 Ohm ½ Watt 20% Resistor
R13, R14	A60-752	100 Ohm ½ Watt 10% Resistor
R2, R5	A60-744	22K Ohm ½ Watt 10% Resistor
R3	A60-685	47K Ohm ½ Watt 20% Resistor
R4, R17	A60-726	2.2 Megohm ½ Watt 20% Resistor
R6	A60-753	220 Ohm ½ Watt 10% Resistor
R7	A60-716	15K Ohm 1 Watt 10% Resistor
R8	A60-728	10 Megohm ½ Watt 20% Resistor
R9	A60-667	220K Ohm ½ Watt 20% Resistor
R10	A60-731	470K Ohm ½ Watt 20% Resistor
R11	A60-754	270 Ohm 1 Watt 10% Resistor
R12	A60-698	10K Ohm 1 Watt 10% Resistor
R15	A60-694	470 Ohm 1 Watt 10% Resistor
R16	A24-177	Volume Control, 500,000 Ohms, with Switch

COILS

L1	A10-513	Antenna Loading Coil
L2	B10-511	Antenna Coil
L3	A10-512	Oscillator Coil
L4	A33-229	Choke, "A" Line
L5	A33-228	Choke, Vibrator Hash
L6	A10-510	I.F. Trap Coil
T1	A10-508	1st I.F. Transformer
T2	A10-509	2nd I.F. Transformer

TRANSFORMERS

T3	B80-242	Output Transformer (Part of Speaker)
T4	B80-243	Power Transformer

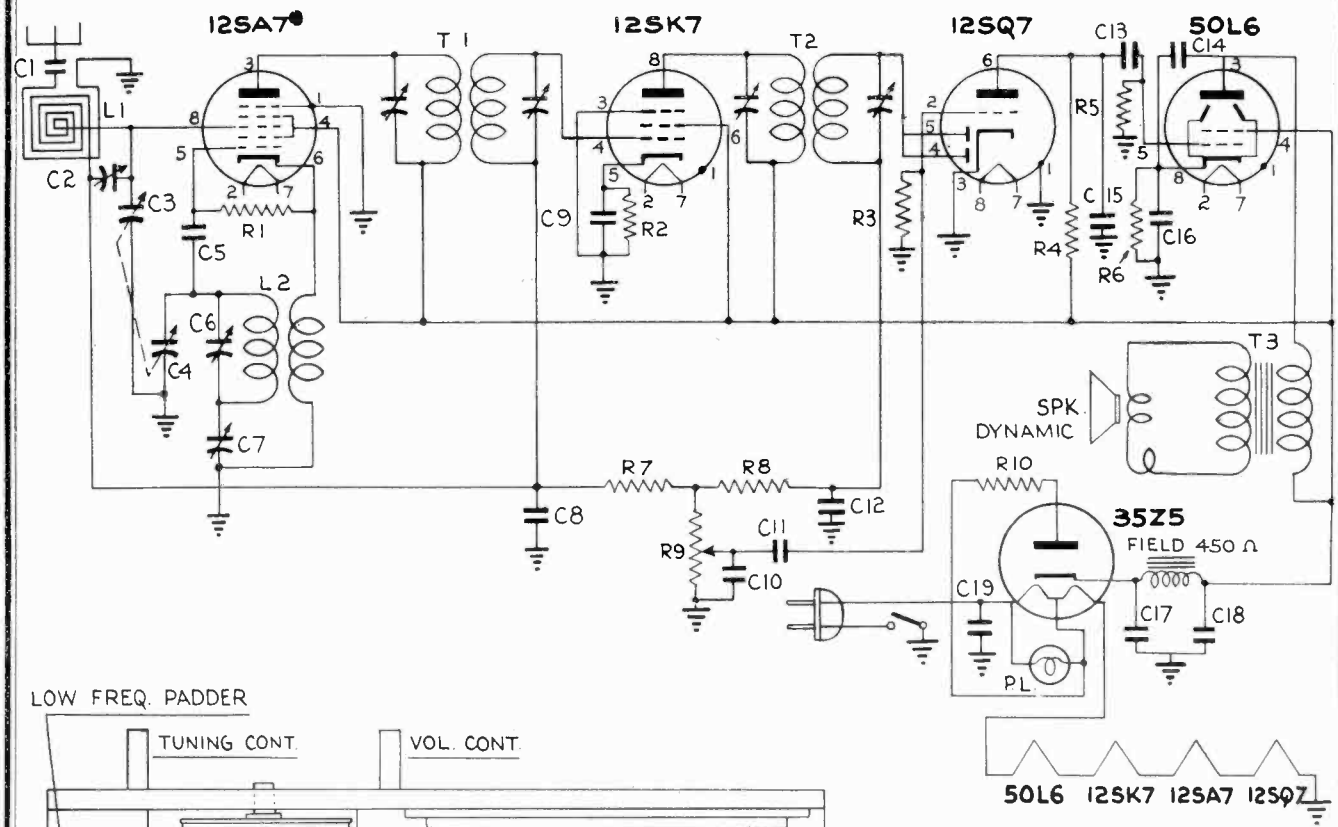
DIAL PARTS

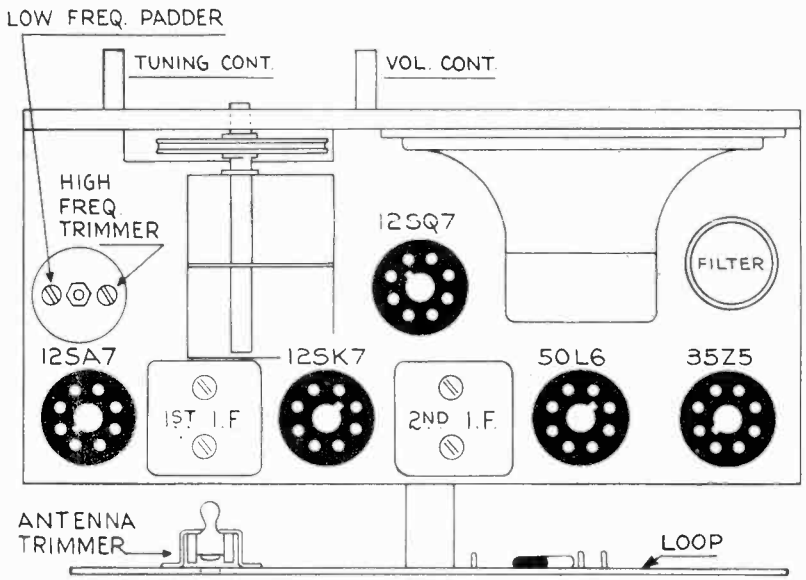
A11-303	Bracket, Dial Scale
A11-304	Bracket, String Guide
A72-29	Bushing, Tuning Shaft Bearing
A70-130	Clip, Spring, for Tuning Shaft
B48-44	Dial Crystal
A58-55	Dial Pointer
B67-525	Dial Scale
A28-101	Gasket for Speaker
A52-256	Knob
A89-10	Pilot Light, Type G.E. No. 422
A65-37	Rivet, Shoulder, for String Guide Bracket
A75-68	Shaft, Tuning
A75-67	Shaft, for Dial Pointer
A70-132	Spring, for Pilot Light Socket
A70-133	Spring, String Tension, Pointer Drive, and Tuning

MISCELLANEOUS

A83-421	Clip, I.F. Transformer Mounting
A83-517	Clip, Oscillator Coil Mounting
A43-10	Fuse, 15 Amp.
A47-112	Grommet, Rubber (for Mounting Speaker and Variable Condenser)
B31-134	Mounting Strap, Rear
A31-138	Mounting Plate, Front
S84-192	Mounting Parts Kit
A87-38	Receptacle, Antenna Cable
B79-362	Speaker, 4" P.M. (includes Output Transformer)
S84-193	Suppression Kit Assembly
A34-105	Vibrator
A83-519	Wiper, Grounding, for Case Covers

MODEL 4581 WATTERSON RADIO MFG. CORP.





CODE	PART NO	DESCRIPTION
C1	5W1	.001 MFD. COND.
C2	8W1	TRIMMER - 30 MMFD
C3	7WM1961	GANG CONDENSER - ANT.
C4	7WM1961	GANG COND. OSC. SECTION
C5	6W3	.0005 MFD. MICA COND.
C6	3W30	TRIMMER - OSC. - H.F.
C7	3W30	PADDER - OSC. - LOW FREQ.
C8	5W9	.05 MFD. 400 V. TUBULAR
C9	5W9	.05 MFD. 400 V. TUBULAR
C10	6W2	.00025 MFD. MICA COND.
C11	5W2	.005 MFD. 400V. TUBULAR
C12	6W2	.00025 MFD. MICA COND.
C13	5W21	.01 MFD. 600V. TUBULAR
C14	5W7	.02 MFD. 400 V. TUBULAR
C15	6W2	.00025 MFD. MICA COND.
C16	19W2	20 MFD. 25V. ELECTROLYTIC
C17	19W2	30 MFD. 150 V. ELECTROLYTIC
C18	19W2	20 MFD. 150 V. ELECTROLYTIC
C19	5W13	.1 MFD. 400 V. TUBULAR
R1	9W6	20,000 Ω - 1/4 WATT
R2	9W11	250 Ω - 1/4 WATT
R3	9W9	10 MEGOHM - 1/4 WATT
R4	9W5	200,000 Ω - 1/4 WATT
R5	9W3	500,000 Ω - 1/4 WATT
R6	9W2	150 Ω - 1/4 WATT
R7	9W8	2 MEGOHM - 1/4 WATT
R8	9W4	50,000 Ω - 1/4 WATT
R9	13W1	500,000 Ω - VOL. CONT.
R10	9W15	15 Ω - 1/4 WATT
T1	3W20	FIRST I.F.
T2	3W21	SECOND I.F.
T3	12W1	OUTPUT TRANS.
L1	3W31	LOOP
L2	3W30	OSC. COIL
SPK.	22W20	SPEAKER, DYNAMIC
P.L.	26W2	PILOT LT. 150 MILLS

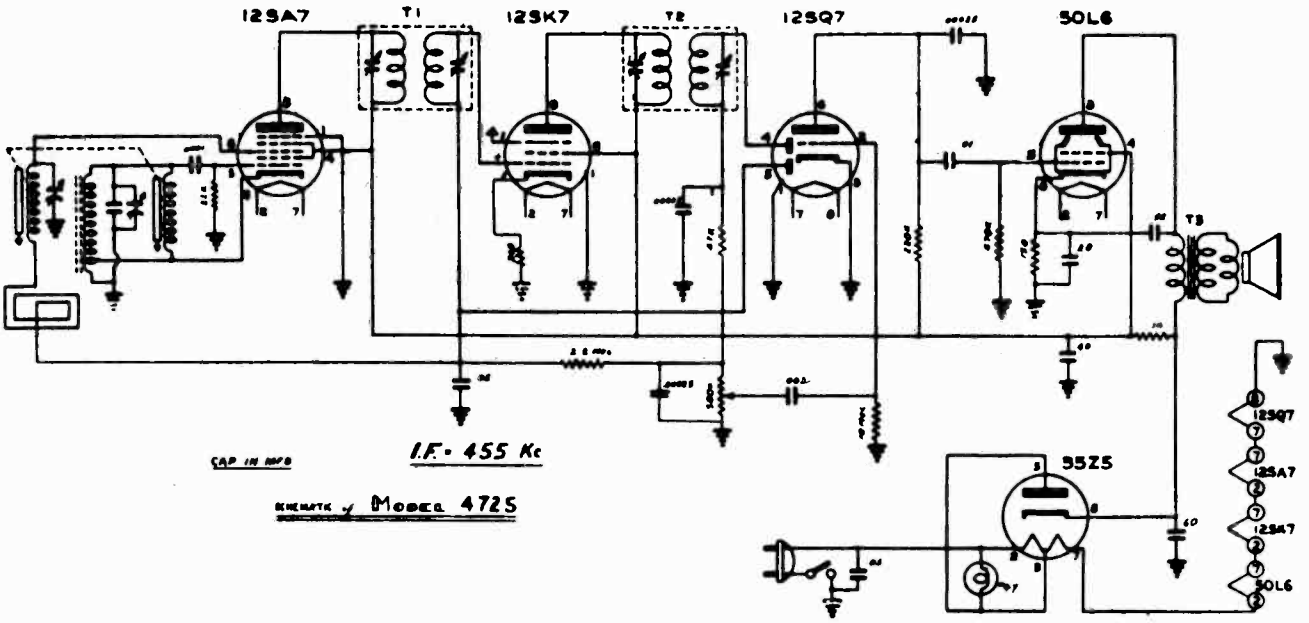
ALIGNMENT PROCEDURE

I.F. ALIGNMENT – SWING THE VARIABLE CONDENSER TO MINIMUM CAPACITY POSITION. FEED 455 K.C. SIGNAL TO GRID OF 12SA7 TUBE THRU .1 MFD. CONDENSER AND ADJUST FOUR I.F. TRIMMERS FOR MAXIMUM RESPONSE.

R.F. ALIGNMENT – SET DIAL POINTER TO 1400 K.C. ON DIAL. SET SIGNAL GENERATOR TO 1400 K.C. FEEDING OUTPUT INTO STANDARD RADIATING LOOP. ADJUST HIGH FREQUENCY TRIMMER FOR MAXIMUM OUTPUT THEN ADJUST ANT. TRIMMER LOCATED ON RECEIVER LOOP FOR MAXIMUM OUTPUT.

SET SIGNAL GENERATOR TO 600 K.C. AND WHILE ROCKING GANG, ADJUST LOW FREQUENCY TRIMMER FOR MAXIMUM OUTPUT. RETURN TO 1400 K.C. AND REPEAT HIGH FREQUENCY ADJUSTMENT.

MODEL 4725



FM Alignment:

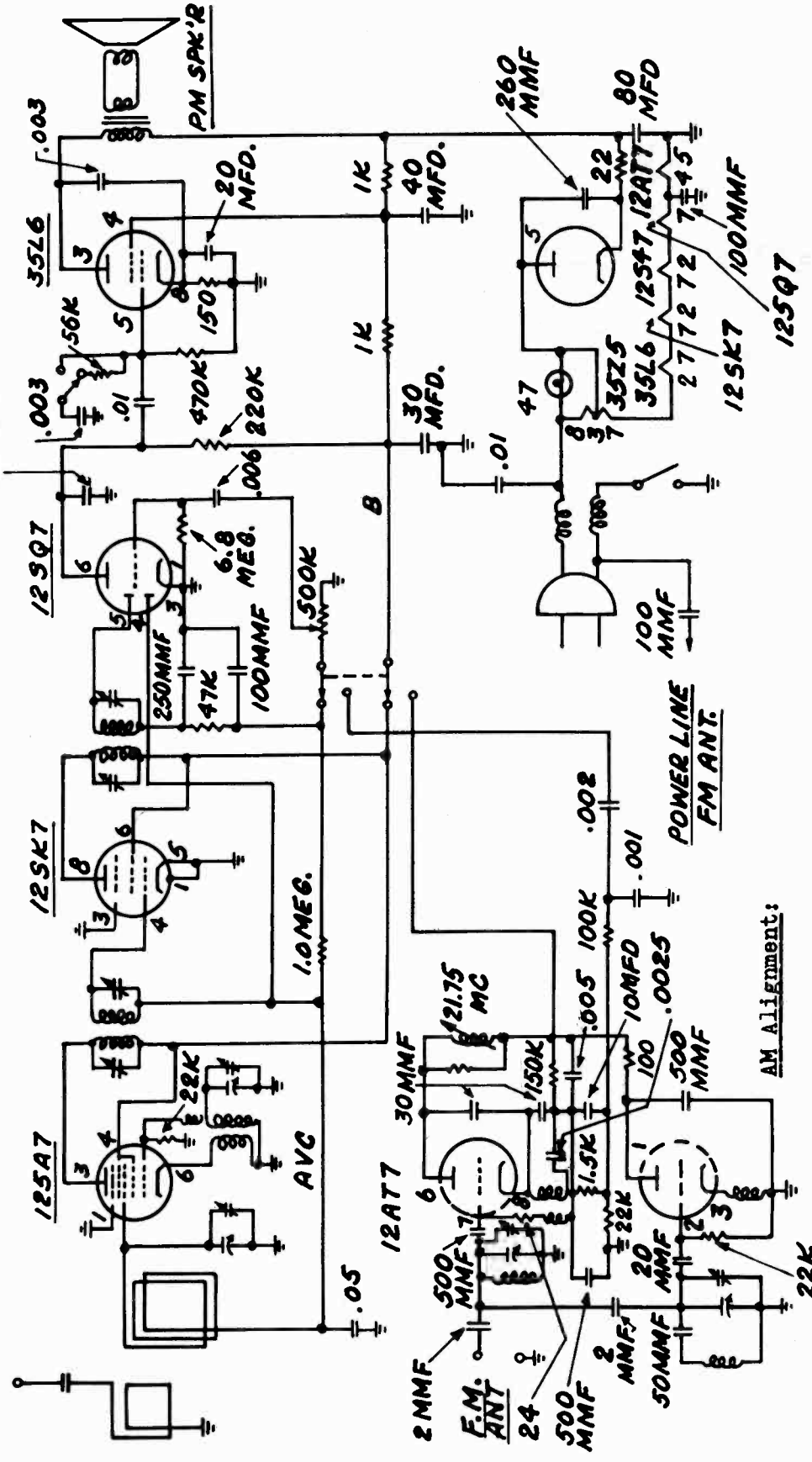
MODEL 4800
AM/FM

Use an unmodulated signal and tune for minimum noise in all FM adjustments.

1. Connect a signal generator to the FM ant. terminals. Using a 21.75 Mc. signal, tune the IF slug adjustment for minimum noise making sure slug is at the tuning point nearest top of can. There is another tuning point with the slug screwed farther down into the coil which produces unwanted coupling.

2. With a 150 ohm resistor in each lead, connect a high frequency generator to the FM ant. Terminals. Set ant. trimmer to maximum capacity. Use enough signal to give a definite dip in noise but do not block the receiver. Set the osc. section to track from 87.5 Mc. to 108.5 Mc. by trimming on the high end and adjusting the osc. coil spacing on the low end. Check each of these adjustments several times. Next, with the generator set at 103 Mc. Tune in this signal on the receiver. While rocking the dial slightly, tune the ant. trimmer for minimum noise. Use an insulated screw driver on all RF adjustments.

WATTERSON RADIO MFG. CORP. MODEL 4800

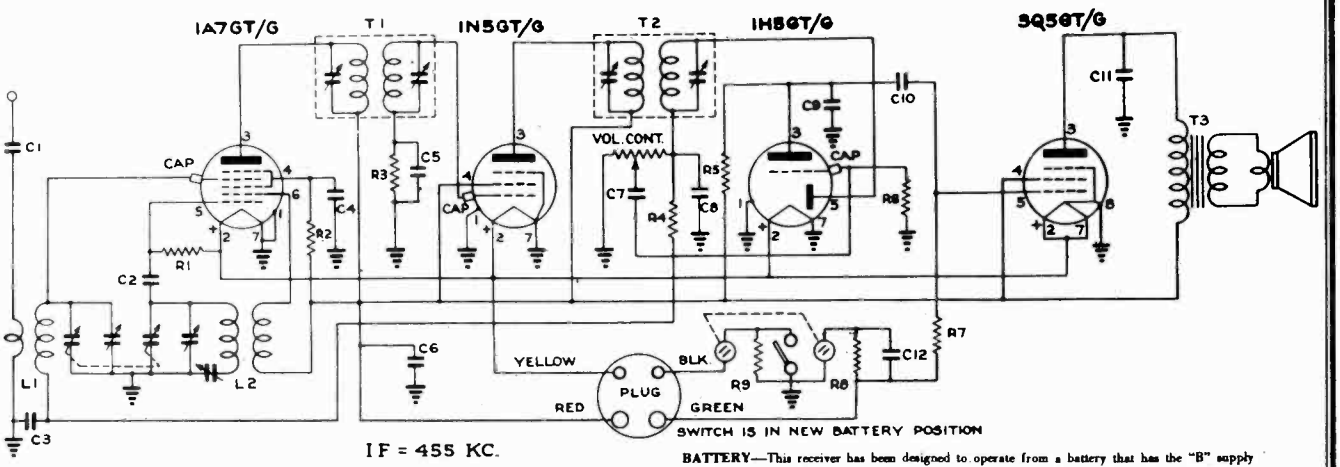


1. Connect a signal generator through a .1 Mfd. condenser to Pin 8 of the 12SA7. With only enough signal to give a good indication, peak the IF trimmers at 455Kc.

2. With the generator connected to a transmitting loop near the receiver, peak the osc. trimmer at 1620 Kc. with the receiver gang full open. Next, set the signal generator at 1400 Kc. and tune in this signal on the receiver. Peak the antenna trimmer.

MODEL 4782

WATTERSON RADIO MFG. CORP.



IF = 455 KC.

CODE	PART NO.	DESCRIPTION
C1	6W4	.00005 MICA CONDENSER
C2	6W3	.0005 MICA CONDENSER
C3	5WI3	.1 MFD. 400 V. TUBULAR
C4	5WI3	.1 MFD. 400 V. TUBULAR
C5	5W7	.02 MFD. 400 V. TUBULAR
C6	5WI4	.25 MFD. 400 V. TUBULAR
C7	5W2	.005 MFD. 400 V. TUBULAR
C8	6W2	.00025 MFD. MICA CONDENSER
C9	6WI	.0001 MFD. MICA CONDENSER
C10	5W6	.01 MFD. 400 V. TUBULAR
C11	5WI8	.002 MFD. 600 V. TUBULAR
C12	I9WII	10 MFD. 50 V. TUBULAR
R1	9W47	220,000 Ω - 1/2 WATT
R2	9W6	22,000 Ω - 1/2 WATT
R3	9W55	1 MEGOHM - 1/4 WATT
R4	9W55	1 MEGOHM - 1/4 WATT
R5	9W55	1 MEGOHM - 1/4 WATT
R6	9W69	10 MEGOHM - 1/2 WATT
R7	9W56	2.2 MEGOHM 1/2 WATT
R8	9W32	360 Ω - 1/4 WATT
R9	9WI2	.75 Ω 1/4 WATT
T1	3W24	1ST. I.F. TRANSFORMER
T2	3W25	2ND. I.F. TRANSFORMER
T3	I2W2	OUTPUT TRANSFORMER
L1	3W46	ANTENNA COIL
L2	3W45	OSCILLATOR COIL
SP.	22WI08	P.M. SPEAKER
VOL.	I3W2	VOLUME CONTROL - 500M Ω

BATTERY—This receiver has been designed to operate from a battery that has the "B" supply (90 volts) and the "A" supply (1½ volts) incorporated into a single pack. The batteries recommended to be used with this set are the following:

1. Ray-O-Vac—their No. "AB" 82 Power Pack.
2. Eveready—their No. 748 Power Pack.
3. Burgess—their No. 17G-D60 Power Pack.
4. General—their No. 60DL11L Power Pack.

Either of the above battery packs may be used in conjunction with this receiver, and is to be placed inside and to the rear of the cabinet and the 4 prong plug provided plugged into the socket of the battery pack.

ANTENNA—To obtain the excellent performance of which your Watterson Receiver is capable, a good outside antenna must be provided. For best results the antenna should be approximately 75 to 100 feet long, including the lead in, and should be connected to the colored wire coming out of the back of the cabinet. It should be erected as high as possible and as far from surrounding objects as practical.

GROUND—A ground connection must be used. A satisfactory ground can be made by connecting the black wire to a nearby cold water pipe by means of an approved clamp, or to a pipe or ground rod driven into the ground.

BATTERY AND TUBE SAVING SWITCH—Located on the back of the chassis is a slide type switch identified by the instruction tag "New Battery" and "Old Battery". When using an unused or new battery, the switch must be in the "New Battery" position. After approximately 100 hours of actual use of battery, this switch may be moved to the "Old Battery" position, and increased sensitivity and performance obtained.

OPERATION—There are two adjustable controls on the front panel of the receiver. The one on the left is the volume control. Turning the volume control knob in a clockwise direction turns the receiver on, and is also a means of adjusting the volume output of the receiver.

CAUTION—When not using the receiver, make certain that it is shut off by turning the volume control knob completely to the left until the on-off switch has been thrown. Failure to do this will cause the battery pack to run down.

The knob on the right is the tuning knob and is used to tune any desired station within the broadcast band.

I. F. Alignment

The I. F. frequency of this receiver is 455 K. C. For realignment, use the following procedure:

Open tuning condenser fully, and set volume control to maximum volume.

Couple an accurately calibrated signal generator to the grid of the 1A7 tube with a .1 mfd. condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 455 K. C. Attenuate the signal generator so that the signal is just audible in the speaker. If possible, an output meter should be used.

Adjust the 2nd I. F. transformer first. Each screw should be adjusted for maximum output. After the 2nd I. F. has been adjusted, the 1st I. F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck both transformers, making sure maximum output has been attained from both I. F.'s.

R. F. Alignment

To align the R. F. section of the receiver, proceed as follows:

1. Connect the "high" side of the signal generator to the antenna lead and the ground lead to radio chassis.

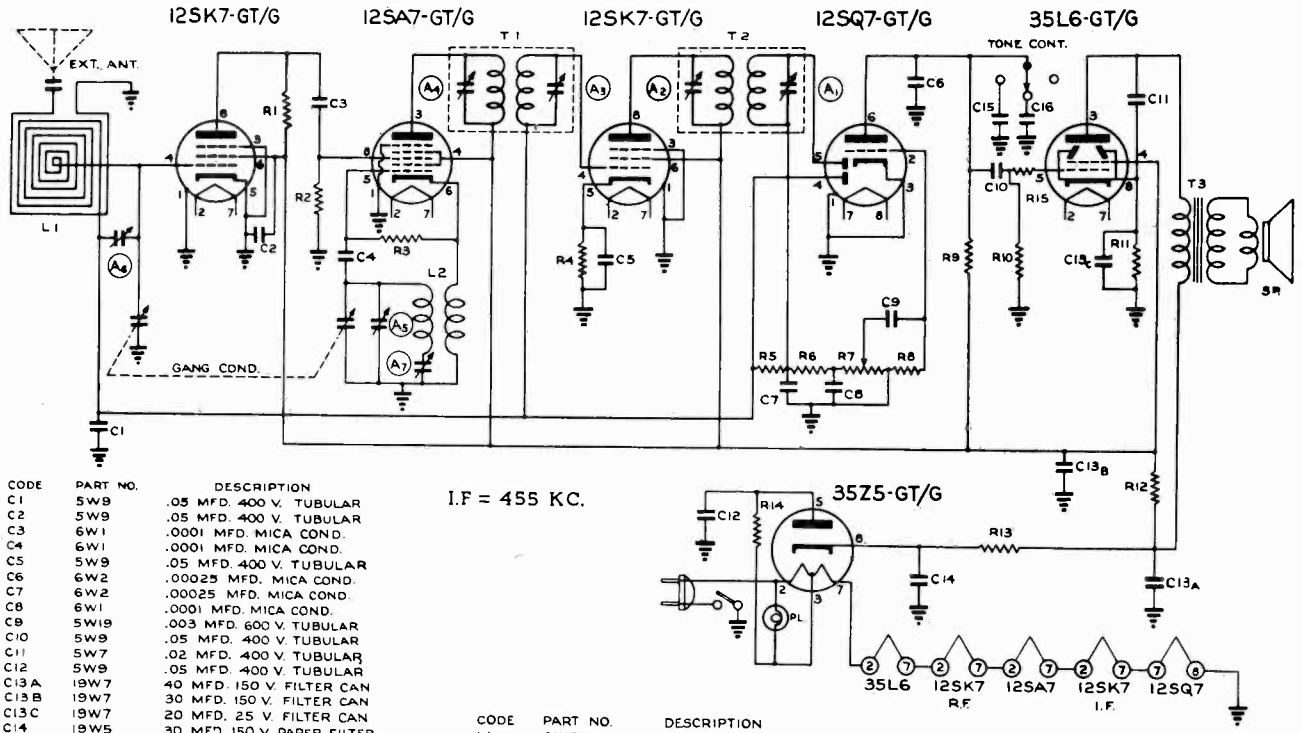
2. Set tuning dial to 1400 K. C. and while feeding a 1400 K. C. signal into receiver adjust the oscillator trimmer (inside adjustment) and antenna trimmer (on top of chassis) for maximum output.

3. Set tuning dial to approximately 600 K. C. and while "rocking" the dial adjust the oscillator padder (nearest edge of chassis) for maximum output.

4. Repeat steps 2 and 3 above.

MODEL 4790

WATTERSON RADIO MFG. CORP.



CODE	PART NO.	DESCRIPTION
C1	5W9	.05 MFD. 400 V. TUBULAR
C2	5W9	.05 MFD. 400 V. TUBULAR
C3	6W1	.0001 MFD. MICA COND.
C4	6W1	.0001 MFD. MICA COND.
C5	5W9	.05 MFD. 400 V. TUBULAR
C6	6W2	.00025 MFD. MICA COND.
C7	6W2	.00025 MFD. MICA COND.
C8	6W1	.0001 MFD. MICA COND.
C9	5W19	.003 MFD. 600 V. TUBULAR
C10	5W9	.05 MFD. 400 V. TUBULAR
C11	5W7	.02 MFD. 400 V. TUBULAR
C12	5W9	.05 MFD. 400 V. TUBULAR
C13A	19W7	40 MFD. 150 V. FILTER CAN
C13B	19W7	30 MFD. 150 V. FILTER CAN
C13C	19W7	20 MFD. 25 V. FILTER CAN
C14	19W5	30 MFD. 150 V. PAPER FILTER
C15	5W20	.006 MFD. 600 V TUBULAR
C16	5W17	.001 MFD. 600 V. TUBULAR
R1	9W37	2,200 Ω - 1/2 WATT RESISTOR
R2	9W28	100,000 Ω - 1/2 WATT
R3	9W64	22,000 Ω - 1/2 WATT
R4	9W72	1,000 Ω - 1/2 WATT
R5	9W56	2.2 MEGOHM - 1/2 WATT
R6	9W52	47,000 Ω - 1/2 WATT
R7	13W1	.5 MEGOHM VOL. CONT.
R8	9W63	10 MEGOHM - 1/2 WATT
R9	9W62	220,000 Ω - 1/2 WATT
R10	9W59	470,000 Ω - 1/2 WATT
R11	9W20	150 Ω - 1/2 WATT
R12	9W72	1000 Ω - 1/2 WATT
R13	9W47	220 Ω - 1 WATT
R14	9W61	22 Ω - 1/2 WATT

CODE	PART NO.	DESCRIPTION
L1	3W31	LOOP - 184 μh.
L2	3W28	OSCILLATOR COIL
T1	3W20	1ST. I.F. TRANSFORMER
T2	3W21	2ND. I.F. TRANSFORMER
T3	12W1	OUTPUT TRANSFORMER
PL.	26W2	PILOT LIGHT
SP.	22W22	SPEAKER
NOTE: R15	9W11	250 Ω - 1/2 WATT (OMITTED ON SOME MODELS)

ANTENNA—No external antenna is required for the Model 4790 except in remote localities where reception is poor. For proper performance in such a case, an outside antenna approximately 75 feet in length, including lead in, should be connected to the colored antenna lead extending from the back of the set.

OPERATION—The three controls on the front panel of the receiver are used as follows: the extreme left control is the on-off switch and volume control; the center control is the tuning control; and the extreme right control is the tone control.

I. F. Alignment

Connect the low side of an accurately calibrated signal generator through a .1 mfd condenser to the chassis of the receiver and the "high" side of the generator through a .1 mfd. condenser to the R. F. grid (pin 8) of the 12SA7 converter tube. Set the signal generator to 455 Kc. with just enough signal to be audible in the speaker with the receiver volume control full on. If possible, an output meter should be used.

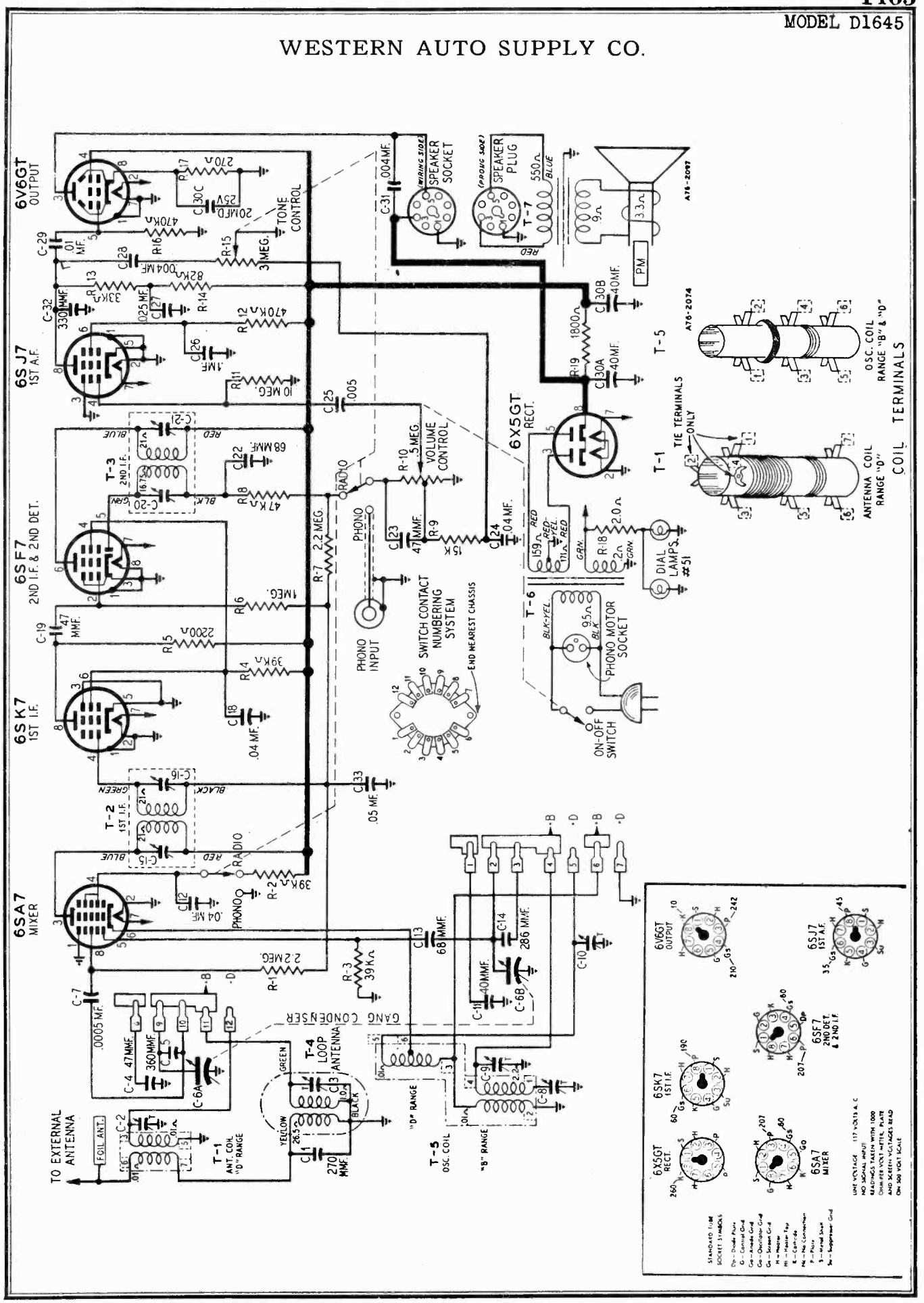
Adjust the second I. F. transformer (A_1 and A_2) and then the first I. F. transformer (A_3 and A_4) for maximum output. Recheck all adjustments.

R. F. Alignment

Connect "high" side of signal generator to the antenna lead of the receiver. Set dial pointer to 1400 Kc. on the receiver dial and turn volume control full on. Set signal generator to 1400 Kc. Adjust oscillator trimmer (A_5) and then the antenna trimmer (A_6) for maximum output. Set signal generator to 600 Kc. and receiver dial to approximately 600 Kc. While "rocking" receiver dial, adjust oscillator padder (A_7) for maximum output. Recheck adjustments at 1400 Kc.

MODEL D1645

WESTERN AUTO SUPPLY CO.



MODEL D1645

WESTERN AUTO SUPPLY CO.

REPLACEMENT PARTS LIST

NOTICE: There is a power rating label on the chassis. This label specifies the power supply on which the radio may be used, and identifies the radio as to chassis, dial and issue letter. When ordering parts or writing, give ALL information appearing on this label.

MISCELLANEOUS

12A436	8" P.M. Speaker Complete with Output Transformer
	Cone and Voice Coil Assembly (Specify part number and letters stamped on speaker)
	Output Transformer (Specify part number and letters stamped on speaker)
3A303	Tube socket-octal (8 prong) moulded
3A304	Phono motor socket
3A305	Phono socket—single pin tip
10A467	Knob (Tuning)
10A468	Knob (Off-On, Volume)
10A529	Knob (Tone, Radio-Phono)
10A469	Knob (SW-BC)
2A359	Band Change Switch
13X328	Line cord and plug assembly
9A1229	Counterpoise antenna

TRANSFORMERS AND COILS

T-1	9A1812	"D" Range Antenna Coil Assembly
T-2	9A1814	1st I.F. Coil Assembly
T-3	9A1815	2nd I.F. Coil Assembly
T-4	9A1821	"B" Range Loop Antenna
T-5	9A1813	"B" Range and "D" Range Oscillator Coil Assembly
T-6	53X282	117 Volt 60 Cycle Standard Power Transformer
T-6	53X283	117 Volt 25 Cycle Standard Power Transformer
T-6	53X284	117-234 Volt, 40-60 Cycle Universal Power Transformer

CAPACITORS

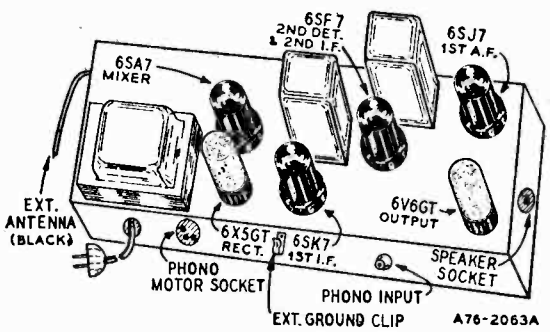
C-1	47X445	270 mmf		Moulded
C-2	17A164	5-50 mmf		Trimmer
C-3	17A235	2-12 mmf		Trimmer
C-4	47X473	47 mmf		Silvered mica
C-5	47X474	360 mmf		Silvered mica
C-6A, C-6B	14A184	Gang Condenser with drive pulley		
C-7	B66501	.0005 mf	200 V	Tubular
C-8	17A157	440-490 mmf		Trimmer
C-9, C-10	17A109	2.5-35 mmf		Dual Trimmer Condenser
C-11	47X472	40 mmf		Silvered mica
C-12, C-18	D66403	.04 mf	400 V	Tubular
C-13	47X466	68 mmf		Moulded
C-14	47X481	2B6 mmf		Silvered mica
C-15, C-16	Part of T-2 (1st I.F. Coil Assem.)			
C-19, C-23	47X463	47 mmf		Moulded
C-20, C-21	Part of T-3 (2nd I.F. Coil Assem.)			
C-22	47X471	68 mmf		Moulded
C-24	D64403	.04 mf	400 V	Tubular
C-25	D66502	.005 mf	400 V	Tubular
C-26	D66104	.10 mf	400 V	Tubular
C-27	D64253	.025 mf	400 V	Tubular
C-28, C-31	D66402	.004 mf	400 V	Tubular
C-29	D66103	.01 mf	400 V	Tubular
C-30A		40 mf	450 V	
C-30B	45X346	40 mf	450 V	3 Section Electrolytic
C-30C		20 mf	25 V	
C-32	47X470	330mmf		Moulded
C-33	B66503	.05 mf	200 V	Tubular

RESISTORS

B85225	R-1, R-7	2.2 megohms	0.5 W	Carbon
C84393	R-2, R-4	39 K ohms	1.0 W	Carbon
B84393	R-3	39 K ohms	0.5 W	Carbon
B84222	R-5	2200 ohms	0.5 W	Carbon
B85105	R-6	1 megohm	0.5 W	Carbon
B85473	R-8	47 K ohms	0.5 W	Carbon
B84153	R-9	15 K ohms	0.5 W	Carbon
36X358	R-10	.5 megohm	Volume control and line switch	
B85106	R-11	10 megohms	0.5 W	Carbon
B85474	R-12, R-16	470 K ohms	0.5 W	Carbon
B84333	R-13	33 K ohms	0.5 W	Carbon
B84823	R-14	82 K ohms	0.5 W	Carbon
40X276	R-15	3.0 megohms	Tone control & Radio-Phono switch	
C84271	R-17	270 ohms	1.0 W	Carbon
43X213	R-18	2.0 ohms	0.5 W	Wire wound
D84182	R-19	1800 ohms	2.0 W	Carbon

DIAL AND DRIVE ASSEMBLY

6X21	Rubber Grommet	Mtg. Gang Condenser
20X329	Cond. Cushion Stud	Mtg. Gang Condenser
57X176	Mounting Plate	Mtg. Gang Condenser
25X1488	Idler Bracket	
25X1489	Pulley Bracket (right)	
25X1490	Pulley Bracket (left)	
24X360	Idler Pulley	
26X485	Drive Shaft	
19X192	"C" Washer (for drive shaft)	
25X1491	Pointer Bracket	
15X229	Pointer	
	50" Drive Cord (18 lb. test)	
28X113	Tension Spring (Drive cord)	
30X517	Dial clamp	
4X915	Escutcheon, Dial (Right)	
4X916	Escutcheon, Dial (Left)	
4X931	Escutcheon Insert	
58X613	Dial Glass	
7A200	Pilot light socket assembly	
	No. 51 Pilot light	



SPECIFICATIONS

Power Consumption (at 117 Volts AC) ..... 40 Watts (normal) 65 Watts (phono operating)

Power Output ..... 4 Watts, Maximum 2.3 Watts, 10% Harmonics

Tuning Frequency Range

B Range ..... 540-1600 Kilocycles

D Range ..... 9-15.6 Megacycles

Speaker ..... 8" PM Dynamic

Intermediate Frequency ..... 455 KC

Selectivity ..... 40 KC Broad at 1000 Times Signal

Sensitivity (For 0.5 Watt Output, with External Antenna)

B Range ..... 9 Microvolts Average

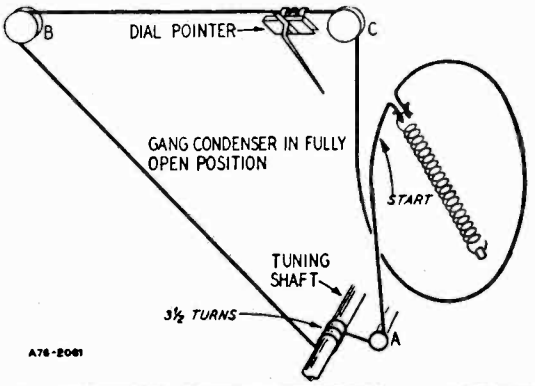
D Range ..... 20 Microvolts Average

WESTERN AUTO SUPPLY CO.

MODEL D1645

DRIVE CORD REPLACEMENT

The drive cord should be replaced as shown on the accompanying illustration using a 50" drive cord for the purpose. After the cord has been installed, stretch the tension spring and tie the free end of the cord to it, then cut off any excess string that may remain.



ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

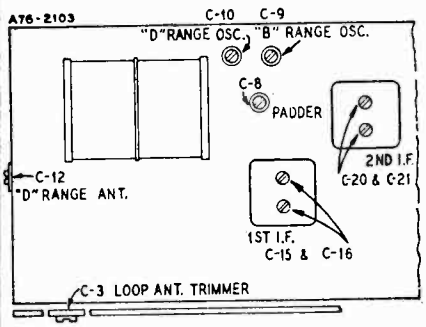
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning: An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	455 KC	Grid of 6SA7 Pin 8	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C15) & (C16) 2nd I.F. (C20) & (C21)
RANGE B	1620 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)
	1400 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Ant. Range B (C3)
	600 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Oscillator (C8) See Note B
	Repeat above steps at 1620 and 600 KC until readjusting the oscillator Range B Trimmer (C8) causes no further improvement of output.					
RANGE D	15,600 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
	15,600 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Ant. Range D (C2)
LOOP RANGE B	Reassemble chassis in cabinet.					
	1400 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output See Note A	Ant. Range B (C3)



NOTE A—Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn rotor back and forth and adjust the trimmer until peak of greatest intensity is obtained.

Before removing the chassis from the cabinet it will be necessary to detach the dial pointer from the dial string. To do this, spread the tabs on the pointer and pull the dial string off the pointer.

The dial lamp socket assemblies may be disengaged from the cabinet mounting by squeezing together and pulling away from the cabinet mounting, the spring bracket to which the dial lamp socket is mounted. Take care not to bend or damage the large drive pulley on the gang condenser while doing this.

When replacing the chassis in the cabinet it will be necessary to tune in a station of a known frequency and move the dial pointer until that frequency is indicated on the dial and then attach the pointer to the dial string. Take care not to scuff or cut the dial string or bend the pointer during this operation.

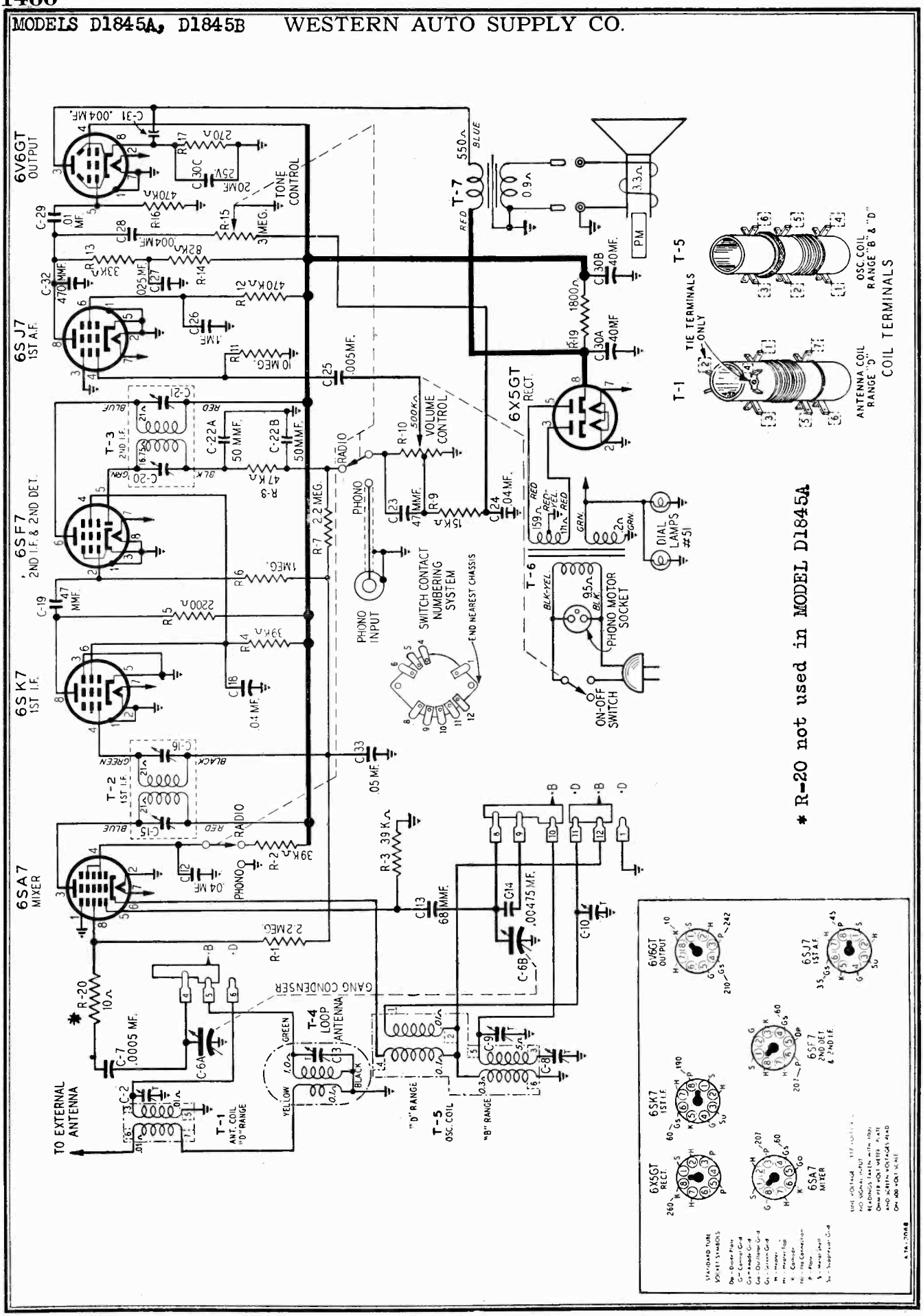
Truetone D1645, Issue C

The following changes appear in receivers of this issue.

The 68-$\mu\mu$f capacitor C22 is now connected from the junction of R7 and R8 to ground and a 100-$\mu\mu$f capacitor, C34, is connected from the other end of R8 to ground. The value of C32 is now 470 $\mu\mu$f instead of 330 $\mu\mu$f. C31, 0.004 μf is now connected from the plate of the 6V6GT output tube to terminal 8, the cathode of this same tube, instead of between the plate and terminal 3 of the speaker socket. A 0.2-μf tubular capacitor, C35, part #D67204 has been added from the screen-grid of the 6V6GT output tube to ground.

The following parts are used in some receivers only. Check part number on old part before ordering and order part originally used in the set. 40X281 tone control (substitute for 40X276); 25X1539 radio-phono switch lever, when 40X281 is issued; 2A161 d.p.d.t. switch when 40X281 is used.

MODELS D1845A, D1845B WESTERN AUTO SUPPLY CO.



ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

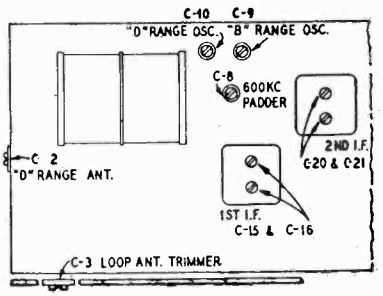
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning: An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 50 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	455 KC	Grid of 6SA7 Pin 8	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C15) & (C16) 2nd I.F. (C20) & (C21)
RANGE B	1620 KC	Antenna Lead	50 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)
	1400 KC	Antenna Lead	50 mmf.	B Range	Tune Rotor to Max. Output	Ant. Range B (C3)
	600 KC	Antenna Lead	50 mmf.	B Range	Tune Rotor to Max. Output	600 KC (C8) See Note B
	Repeat above steps at 1620 and 600 KC until readjusting the oscillator Range B Trimmer (C9) causes no further improvement in output.					
RANGE D	18.3 MC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
	16 MC	Antenna Lead	400 Ohm	D Range	Tune Rotor to Max. Output	Ant. Range D (C2) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet. 1400 KC	Antenna Lead	50 mmf.	B Range	Tune Rotor to Max. Output See Note A	Ant. Range B (C3)



NOTE A—Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn rotor back and forth and adjust the trimmer until peak of greatest intensity is obtained.

REMOVAL OF CHASSIS FROM CABINET

Before removing the chassis from the cabinet it will be necessary to detach the dial pointer from the dial string. To do this, spread the tabs on the pointer and pull the dial string off the pointer.

The dial lamp socket assemblies may be disengaged from the cabinet mounting by squeezing together and pulling away from the cabinet mounting, the spring bracket to which the dial lamp socket is mounted. Take care not to bend or damage the large drive pulley on the gang condenser while doing this.

When replacing the chassis in the cabinet it will be necessary to tune in a station of a known frequency and move the dial pointer until that frequency is indicated on the dial and then attach the pointer to the dial string. Take care not to scuff or cut the dial string or bend the pointer during this operation.

MISCELLANEOUS

12A477	8" P.M. Speaker	T-1
3A303	Tube Socket—Octal (8 prong) Moulded	T-2
3A304	Phono Motor Socket	T-3
3A305	Phono Socket—Single Pin Tip	T-4
10A689	Knob (Tuning)	T-5
10A690	Knob (Off-On Volume)	T-6
10A687	Knob (SW-BC)	T-7
10A688	Knob (Tone—R.P.)	
2A372	Band Change Switch	
13X328	Line Cord and Plug Assembly	
	No. 750 Phono-Console Cabinet	

TRANSFORMERS AND COILS

9A1917	"D" Range Antenna Coil Assembly
9A1814	1st I-F Coil Assembly
9A1815	2nd I-F Coil Assembly
26A442	"B" Range Loop Antenna
9A1918	Oscillator Coil Assembly
53X282	Power Transformer
51X134	Output Transformer

CAPACITORS

C-2	17A164	5-50 mmf		Trimmer
C-3	17A235	2-24 mmf		Trimmer
C-6A, C-6B	14A184	Gang Condenser with		Drive Pulley
C-7	B66501	.0005 mf	200 V	Tubular
C-8	17A155	350-430 mmf		Trimmer
C-9, C-10	17A109	2.5-35 mmf		Dual Trimmer
C-12, C-18	D66403	.04 mf	400 V	Tubular
C-13	47X466	68 mmf		Moulded
C-14	46X289	.00475 mf	180 V	Tubular
C-15, C-16	Part of T-2 (1st I-F Coil Assembly)			
C-19, C-23	47X463	47 mmf		Moulded
C-20, C-21	Part of T-3 (2nd I-F Coil Assembly)			
C-22A, C-22B	47X112	50-50 mmf		Dual Mica
C-24	D64403	.04 mf	400 V	Tubular
C-25	D66502	.005 mf	400 V	Tubular
C-26	D67104	.10 mf	400 V	Tubular
C-27	D64253	.025 mf	400 V	Tubular
C-28	D66402	.004 mf	400 V	Tubular
C-29	D66103	.01 mf	400 V	Tubular
C-30A		40 mf	450 V	
C-30B	45X346	40 mf	450 V	3 Section Electrolytic
C-30C		20 mf	25 V	
C-31	H66402	.004	800 V	Tubular
C-32	47X467	470 mmf		Moulded
C-33	B66503	.05 mf	200 V	Tubular

DIAL AND DRIVE ASSEMBLY

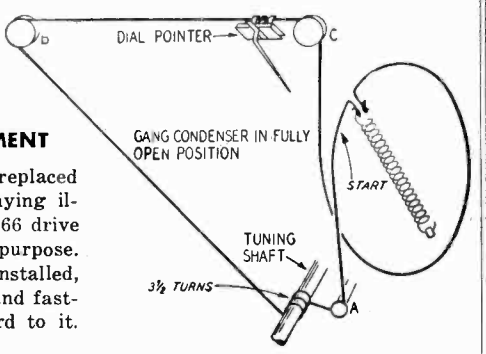
6X21	Rubber Grommet	Mtg. Gang Condenser
20X329	Cond. Cushion Stud	Mtg. Gang Condenser
25X1489	Pulley Bracket (Right)	
25X1490	Pulley Bracket (Left)	
26X485	Drive Shaft	
19X192	"C" Washer	
25X1491	Pointer Bracket	
15X229	Pointer	
10X66	Drive Cord Assembly	
28X113	Drive Cord Tension Spring	
30X517	Dial Clamp	
4X915	Escutcheon, Dial (Right)	
4X916	Escutcheon, Dial (Left)	
4X931	Escutcheon Insert	
58X694	Dial Glass	
7A200	Pilot Light Socket Assembly	
7A32	Pilot Light Bulb No. 51	

RESISTORS

B85225	R-1, R-7	2.2 megohms	0.5 W	Carbon
C84393	R-2, R-4	39 K ohms	1.0 W	Carbon
B84393	R-3	39 K ohms	0.5 W	Carbon
B84222	R-5	2200 ohms	0.5 W	Carbon
B85105	R-6	1 megohm	0.5 W	Carbon
B85473	R-8	47 K ohms	0.5 W	Carbon
B84153	R-9	15 K ohms	0.5 W	Carbon
36X358	R-10	500 K ohms	Volume Control and Line Switch	
B85106	R-11	10 megohms	0.5 W	Carbon
B85474	R-12, R-16	470 K ohms	0.5 W	Carbon
B84333	R-13	33 K ohms	0.5 W	Carbon
B84823	R-14	82 K ohms	0.5 W	Carbon
40X276	R-15	3.0 megohms	Tone Control & Radio Phono Switch	
C84271	R-17	270 ohms	1.0 W	Carbon
D84182	R-19	1800 ohms	2.0 W	Carbon
B85100	R-20	10 ohms	0.5 W	Carbon

DRIVE CORD REPLACEMENT

The drive cord should be replaced as shown on the accompanying illustration using a new 10X66 drive cord assembly for the purpose. After the cord has been installed, stretch the tension spring and fasten the free end of the cord to it.



SPECIFICATIONS

Power Consumption (at 117 Volts AC) ..... 45 Watts (normal) 70 Watts (phono operating)

Power Output ..... 4 Watts, Maximum 2.3 Watts, 10% Harmonics

Tuning Frequency Range

B Range ..... 540-1600 Kilocycles

D Range ..... 5.75-18.3 Megacycles

Speaker ..... 8" PM Dynamic

Intermediate Frequency ..... 455 KC

Selectivity ..... 40 KC Broad at 1000 Times Signal

Sensitivity (For 0.5 Watt Output, with External Antenna)

B Range ..... 9 Microvolts Average

D Range ..... 20 Microvolts Average

MODEL D1845B
MODEL D2616

WESTERN AUTO SUPPLY CO.

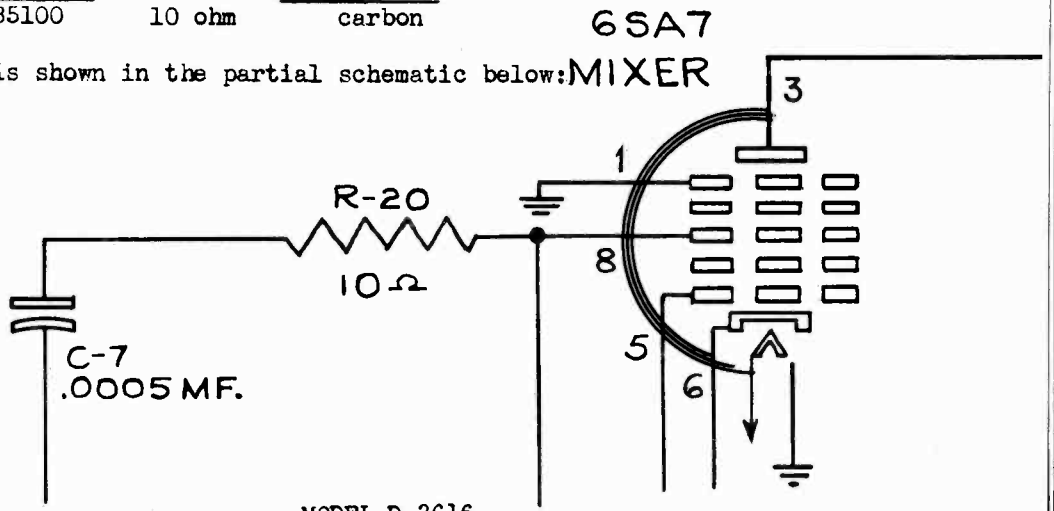
SUPPLEMENTARY SERVICE DATA

TRUETONE MODEL D1845B

A resistor has been added to the circuit to eliminate parasitics in the 6SA7 tube.

Ref. No.	Part No.		Description
R-20	B85100	10 ohm	carbon

The addition is shown in the partial schematic below:



MODEL D 2616

Ref. No.	*Part No.*	*Description*
		CAPACITORS*
C1	C-8D-10778	.002 mf. 600 volts, +40%−15%
C2,C5 C6,C11	C-8F3-8	100 mmf, 500 volts, 20%, mica
C-3A,B C4,C7	B-8A-10827	Two-gang condenser assembly, including antenna and oscillator trimmers. Range of gang: 15-452 mmf (ant.), 10-162 mmf (osc.).
C8	C-8D-10771	.1 mf, 200 volts, +20%−10%
C9,C18	C-8D-10770	.05 mf, 200 volts, 20%
C10,C13	C-8F3-10	220 mmf, 500 volts, 20%, mica
C12	C-8D-10788	.004 mf, 600 volts, 20%
C14	C-8D-10997	.025 mf, 400 volts, 10%
C15	C-8D-10935	.005 mf, 600 volts, +40%−15%
C16	C-8D-10775	.25 mf, 200 volts, +20%−10%
C17	C-8D-10761	.01 mf, 400 volts, 20%
C19,C21	C-8D-10760	.1 mf, 400 volts, +20%−10%
C20-A,B,C	A-8C-10077	Electrolytic, for 60-cycles: 40 mf x 150 volts, 20 mf x 150 volts, 20 mf x 150 volts
C20-A,B,C	A-8C-10946	Electrolytic, for 25 cycles; 60 mf x 150 volts, 40 mf x 150 volts, 40 mf x 150 volts
		RESISTORS*
R1	C-9B1-62	1000 ohms, ½ watt, 10%
R2	C-9B1-70	4700 ohms, ½ watt, 10%
R3	C-9B1-80	33,000 ohms, ½ watt, 10%
R4	C-9B1-78	22,000 ohms, ½ watt, 10%
R5	C-9B1-34	3.3 megohms, ½ watt, 20%
R6	C-9B1-64	1500 ohms, ½ watt, 10%
R7	C-9B1-82	47,000 ohms, ½ watt, 10%
R8,S1	A-10A-10642	Volume control (1 megohm) and on-off switch
R9	C-9B1-37	10 megohms, ½ watt, 20%
R10	C-9B1-77	18,000 ohms, ½ watt, 10%
R11	C-9B1-32	1.5 megohms, ½ wat, 20%
R12	C-9B1-91	270,000 ohms, ½ watt, 10%
R13	C-9B1-73	8200 ohms, ½ watt, 10%
R14	C-9B1-53	180 ohms, ½ watt, 10%
R15	C-9B1-94	470,000 ohms, ½ watt, 10%
R16	C-9B1-3	22 ohms, ½ watt, 20%
R17	C-9B2-63	1200 ohms, 1 watt, 10%
R18	C-9B2-62	1000 ohms, 1 watt, 10%
R19	C-9B1-90	220,000 ohms, ½ watt, 10%
R20	C-9B2-44	33 ohms, 1 watt, 10%
		COILS AND TRANSFORMERS
T1	C-201-10908	Loop antenna assembly (includes cabinet back, capacitor C1 and resistor R1)
T2	A-16A-12161	R.F. choke coil
T3	A-13D-10661	Oscillator coil
T4	B-13B-10091-1	Input I.F. transformer complete in can. Range of trimmers: 45-85 mmf each.
T5	B-13B-10794	Output I.F. transformer complete in can. Range of trimmers: 43-79 mmf each.
T6	B-12C-10623	Output transformer for speaker
T8	A-16A-10792	I.F. choke coil

NOTE ON TUBE REPLACEMENT

Replace a defective metal 12SK7 tube with another metal tube. Replace a glass 12SK7 tube with a metal tube or with an exact duplicate of the tube now in the set.

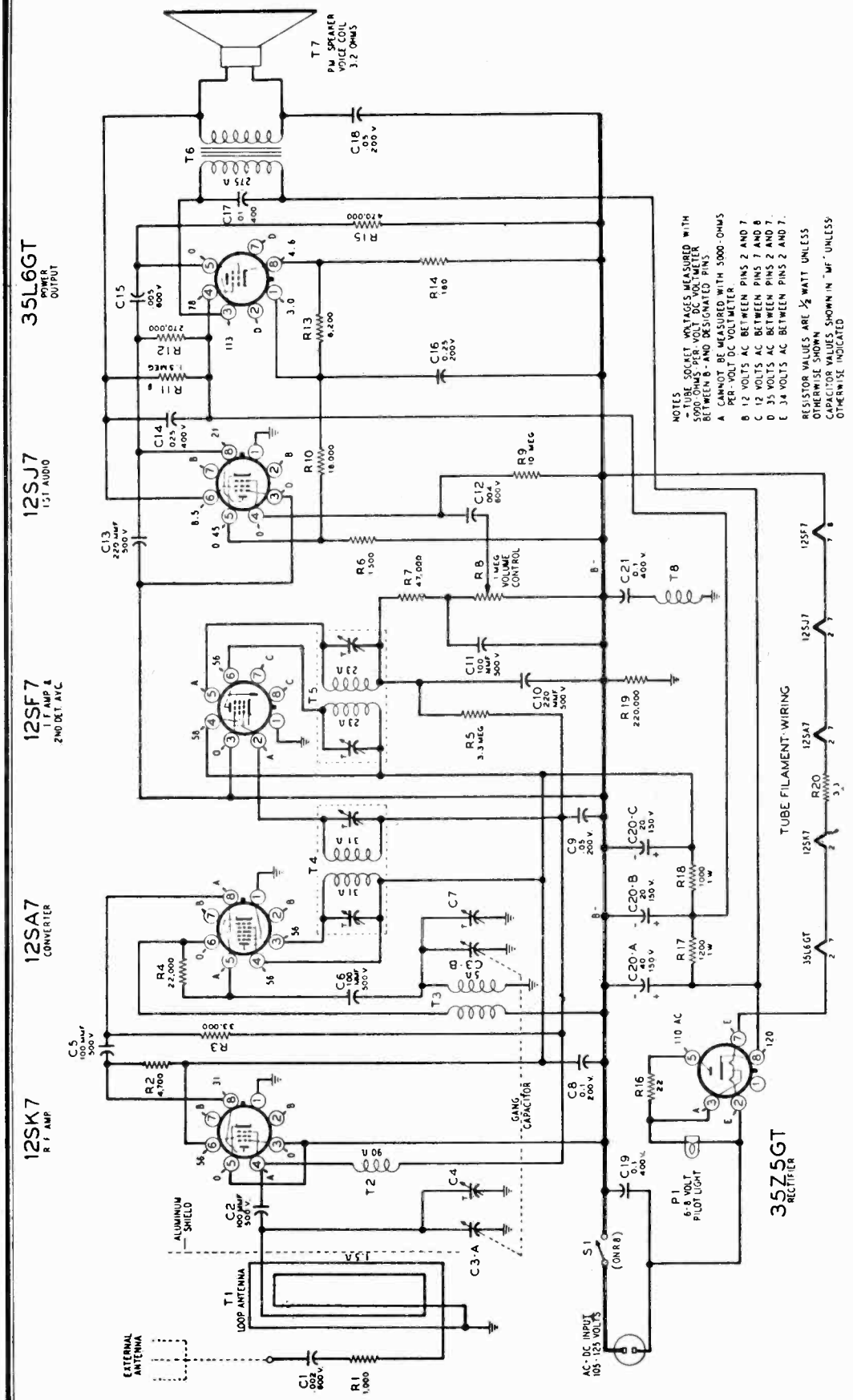
Ref. No.	*Part No.*	*Description*
		DIAL AND TUNING PARTS
	B-6D-10650	Dial scale
	A-6A-10609	Diffuser
	B-2M-7758	Snap-in rivet, for diffuser (2 used)
	A-2G-10639	Dial pointer
	B-53A-10989	String for dial pointer (60")
	A-49A-10887	Spring for dial pointer string
	A-55A-10093	Socket assembly, for dial light
P1	A-46A-10793	Dial light bulb, 6-8 volts, T-47
	A-3C-10641	Spacer, brass (on extreme left)
	A-3C-10640	Spacer, brass (5 used)
	A-2C-10658	Cam
	A-2C-10611	Washer, D-D, on sides of cams
	29E-1812	Spring washer, on cam shaft
	A-3F-10656	Locking screw for cams
	A-2C-10654	Retainer yoke
	A-2C-10655	Cam yoke
	A-2L-10610	Stop arm
	200-10653	Lever assembly (arm and roller)
	A-2C-10607	Gear segment
	A-3B-10643	Gear bushing
	A-3C-10636	Coupling pin on gear segment
	A-49A-10646	Drum spring, on gear coupling pin
	A-3A-10651	Tuning shaft
	A-3L-7192	Pinion gear on tuning shaft
	A-49A-10628	Lever spring
		MISCELLANEOUS
T7	B-18A-10647	P.M., 6" x 4" oval
	A-15B-10440	Socket, octal (for all tubes but 12SK7)
	A-15C-11201	Socket, octal, laminated (for 12SK7)
	B-15B-10076	Mounting plate, for electrolytic
	B-14M-10088	Line cord and plug
	B-2M-11205	Snap-in rivets, for mounting back (5 used)
	A-2M-10096	Split tee-pins, for mounting back (2 used)
	5C-10010-9	Cabinet
	B-5B-10016-8	Knob, volume and tuning
	B-5A-10648-8	Pushbutton
	A-25B-10736	Rubber feet for cabinet
	A-23L-10934	Station call letters, one set
	A-6C-10819	Acetate tabs, for pushbuttons
	A-2H-10715	Tube shield (used with metal-base 12SA7GT tube)
	A-2H-11271	Tube shield (used with bakelite-base 12SA7GT tube)

*The values of the resistors and mica capacitors listed above are based on RMA standards. Due to conditions beyond our control some receivers have been shipped with components of pre-standardized values. This receiver will operate equally well with components of either group. An illustration of the differences in both resistors and capacitors follows:

Pre-standardized value—50,000 ohms, 1/3 watt, 10%
RMA value—47,000 ohms, 1/2 watt, 10%
Pre-standardized value—200 mmf, 500 volts, 20%
RMA value—220 mmf, 500 volts, 20%

MODEL D2616

WESTERN AUTO SUPPLY CO.



Technical Data

Tuning range	530 to 1600 kc
Intermediate frequency	455 kc
Power consumption	30 watts
Selectivity	65 kc broad at 1000 x signal at 1000 kc
Sensitivity (for 0.05 watt output)	14 microvolts average
Power output (in voice coil)	
Undistorted	0.84 watts
Maximum	1.5 watts

MODEL D2616

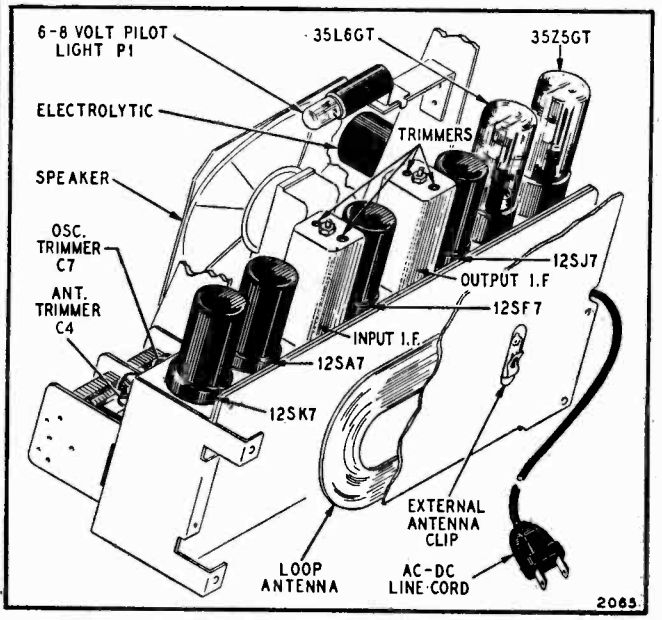
WESTERN AUTO SUPPLY CO.

ALIGNMENT PROCEDURE

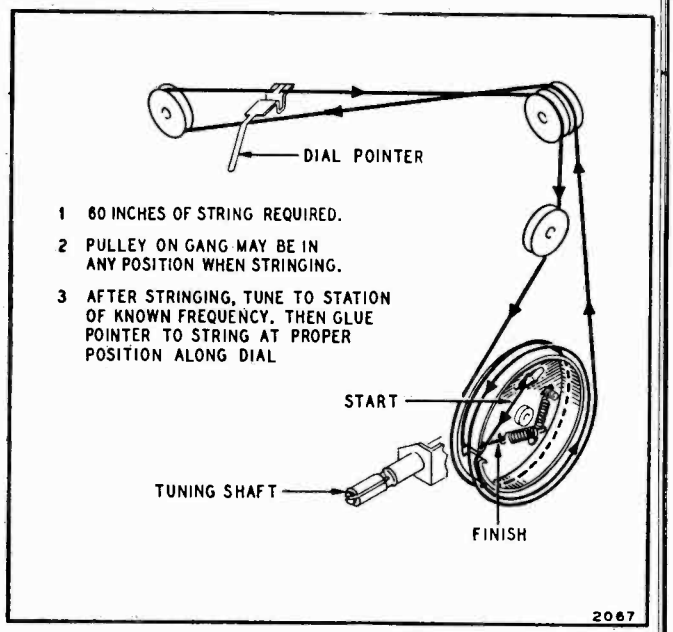
(Refer to Chassis View)

- Output meter across 3.2-ohm output load.
- Volume control at maximum.
- Connect ground post of signal generator to B— of radio.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

SIGNAL GENERATOR			*TUNER SETTING*	*ADJUST FOR MAXIMUM OUTPUT (in order shown)*
Frequency	*Dummy Antenna*	*Connection to Radio*		
455 kc	0.1 mf	Stator of antenna section of gang	Rotor full open (plates out of mesh)	Trimmers on output and input I.F. cans
1600 kc	0.1 mf	Stator of antenna section of gang	Rotor full open (plates out of mesh)	Oscillator trimmer C7
1400 kc	200 mmf	External antenna clip	1400 kc	Antenna trimmer C4



Chassis View



Replacing Dial Pointer Drive Cord

SETTING THE PUSHBUTTONS

The pushbuttons may be used, after proper adjustment, for the automatic tuning of any six stations which you select.

1. Turn on the radio.
2. Push out the call letters of the desired stations from the call-letter sheets supplied with this manual.
3. Insert one call letter tab in each of the pushbuttons, preferably but not necessarily in order of frequency (as obtained from your newspaper). Press an acetate tab (supplied in small envelope) into each of the buttons.
4. Rotate the tuning knob to the left (counterclockwise) as far as it will go.
5. On the bottom of the set is a hole through which the pushbutton locking screw can be adjusted. With a screwdriver, check to see if the screw is loose. If it is not, turn it several turns to the left. Then return the set to an upright position.
6. Press the first pushbutton down all the way. With one hand hold the button down firmly and with the other carefully tune in the desired station. Release the pushbutton.
7. Follow this procedure for each of the five other buttons, adjusting each one for a different station.
8. Rotate the tuning knob as far to the left as it will go. Now tighten the locking screw on the bottom of the radio. IT IS IMPORTANT THAT THIS SCREW BE TIGHTENED VERY FIRMLY.
9. The pushbuttons are now properly set for automatic tuning. Any of the six stations may now be tuned in simply by pressing the proper button down as far as it will go. If it is desired to reset any of the buttons for a new station, loosen the locking screw, set the pushbutton as described above, and re-tighten the locking screw.

WESTERN AUTO SUPPLY CO. MODEL D1650

ELECTRICAL SPECIFICATIONS

Power Supply.....105 to 125 volts, AC, 60-cycles; Chassis only 122 watts. With phono operation 150 watts.

Frequency Range....Broadcast Band—535 to 1620 kc. FM Band—88 to 108 mc.

Intermediate Freq...AM-455 kc; FM-10.7 mc.

Selectivity.....AM-48 kc. broad at 1000 times signal, measured at 1000 kc.
I.F. FM-180 kc. broad at 2 times down.
I.F. FM-320 kc. broad at 10 times down.

AM Sensitivity.....(For .5 watt output with external antenna)—3 microvolts average.

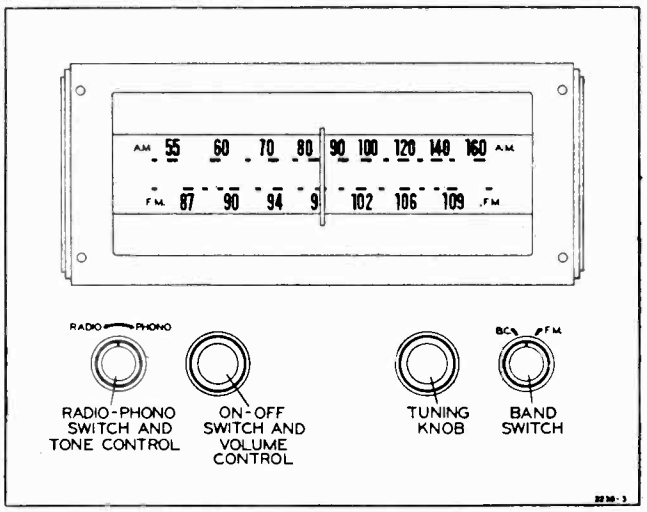
FM Sensitivity.....(For .5 watt output)—10 microvolts average.

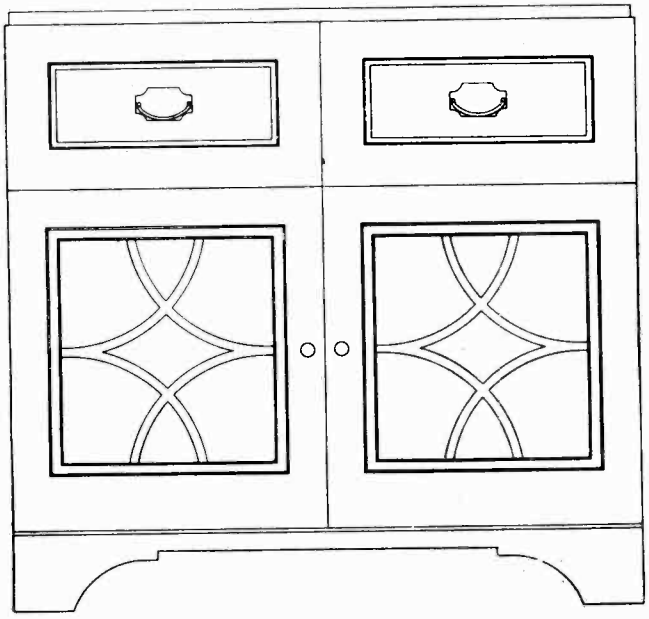
Power Output.....8 watts. 10% distortion. 10 watts maximum.

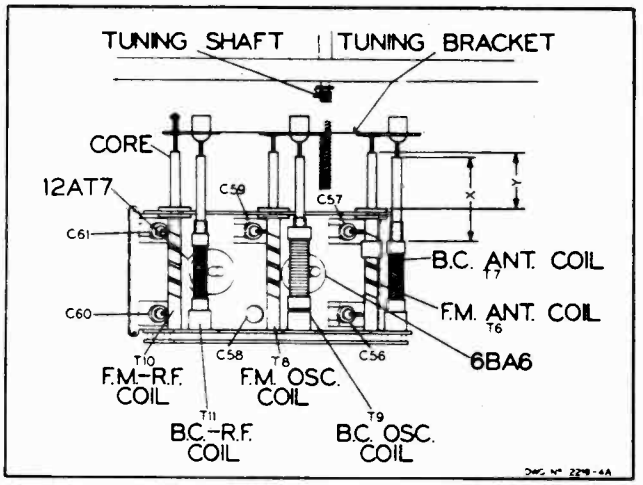
Loud Speaker.....12" electrodynamic. Voice coil impedance 3.2 ohms, 400 cycles.

Tube and Lamp Complement.....6BA6, FM—AM R.F. stage.
12AT7, FM—AM oscillator and mixer.
6BA6, FM—AM—1st I.F.
6BA6, FM—2nd I.F.
6AL5, FM—ratio detector.
6AT6, AM detector.
A. F. AMP. and A.V.C.
6SN7, Push-Pull. Driver and phase-inverter.
5U4G, rectifier.
6V6, output.
6V6, output.
T-44 dial lamp (2 used).

Automatic changer..Oak 6666 with P-93 Cartridge.

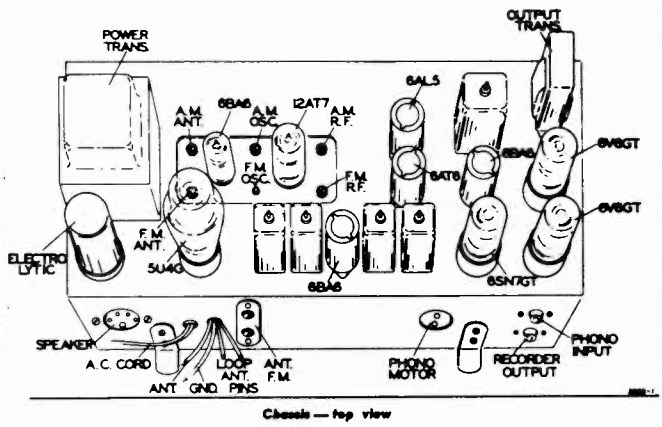






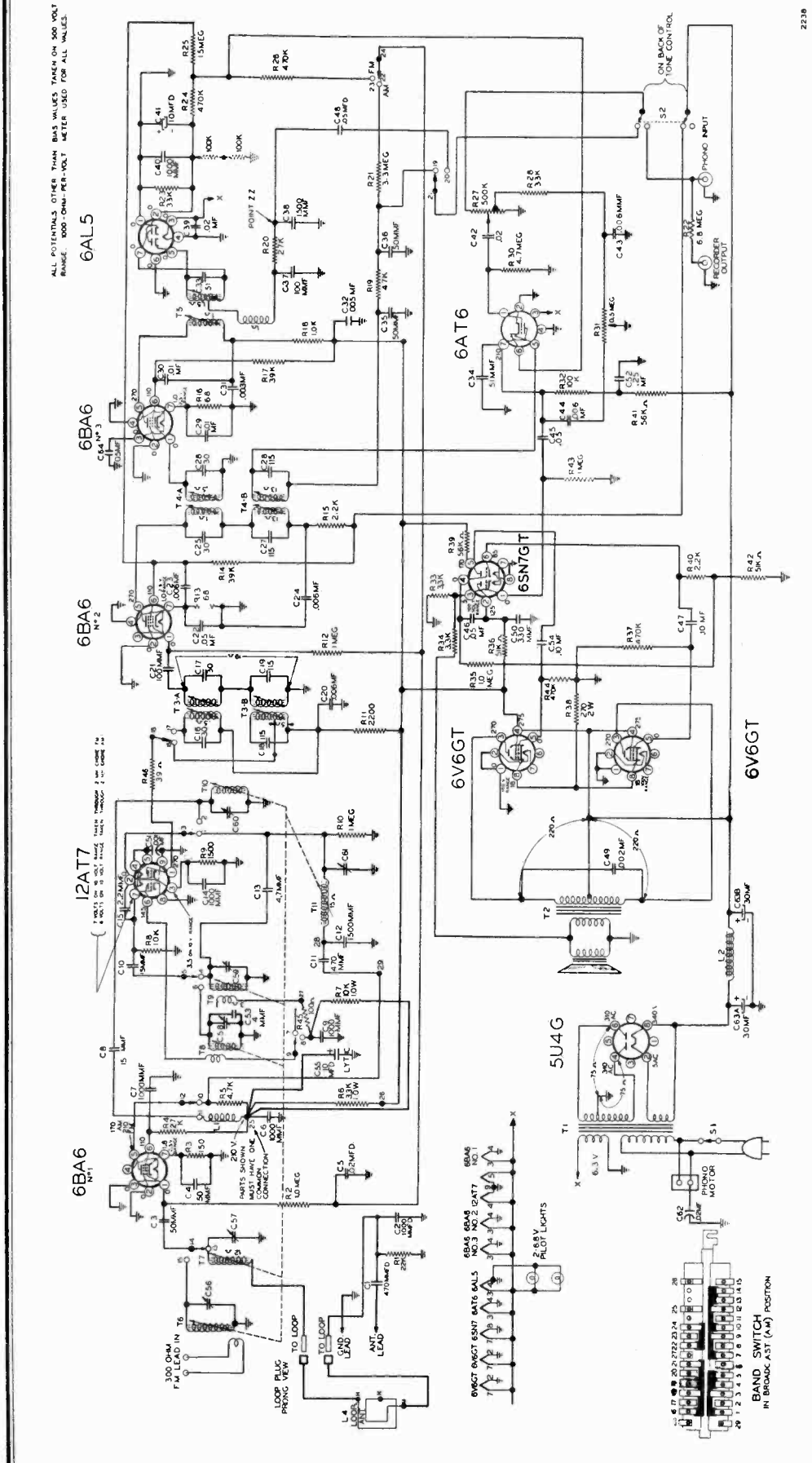
TUNER ADJUSTMENT

With tuner all the way out, dimension "X" should be 1½ inches. "Y" should be 1-1/32 inches. "X" is from the end of the slug to edge of the coil winding. Check these dimensions before R.F. alignment is attempted of either the AM or FM Band. No slug adjustment should be necessary since the slugs are properly set at the factory.



Chassis — top view

MODEL D1850 WESTERN AUTO SUPPLY CO.



NOTE: Two 100K ohm resistors in series from Pin No. 2 of the 6AL5 to ground are connected as shown only when aligning the FM I. F. Refer to FM I. F. alignment procedure.

NOTE: B.C. Oscillator Coil T9 and number 7 terminal of slide switch should be connected together.

NOTE: Resistor R22 removed; with shielded wire from recorder output jack to radio side of radio-phono switch S2 added.

WESTERN AUTO SUPPLY CO. MODEL D1850

ALIGNMENT PROCEDURE

Broadcast Band Section I.F. and R.F.

The alignment procedure below includes the sensitivities at the inputs of various stages. All signal input values are based on an output of ½ watt. This may be measured by disconnecting the speaker voice coil and substituting a 3.2-ohm resistor across the secondary winding of the output transformer. A reading of 1.3 volts AC across this resistor will be approximately equivalent to a ½-watt output with the speaker connected. The volume control must be set at maximum. The tone control must be set for maximum treble.

The signal source must be an accurately calibrated signal generator capable of supplying the frequencies designated, modulated 30% with a 400-cycle audio signal. A 400 cycle audio signal is required for the audio measurement. Variations in sensitivities of plus or minus 25% are usually permissable.

AM-I.F. ALIGNMENT

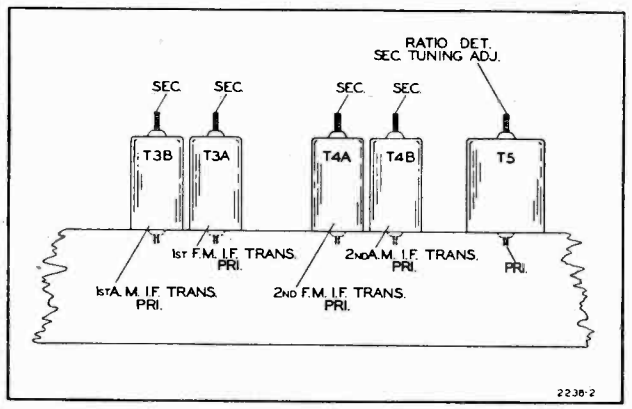
Band Switch in AM Position. Tune Set to 1400 *Kc. Dummy Antenna* .1 *Mfd.*

SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	ADJUSTMENTS TO BE MADE	ADJUST FOR
455 Kc. Use 1000 microvolts	Pin No. 1 of 6BA6 No. 2 and ground	Primary and Secondary of T4B AM windings See I. F. view	Maximum output Should be ½ watt.
455 Kc. Use 30 microvolts	Pin No. 2 of 12AT7 and ground	Primary and Secondary of T3B AM windings See I. F. view	Maximum output Should be ½ watt.
400 cycles. Use 28 millivolts	Hot end of volume control and ground	None	Maximum output Should be ½ watt.

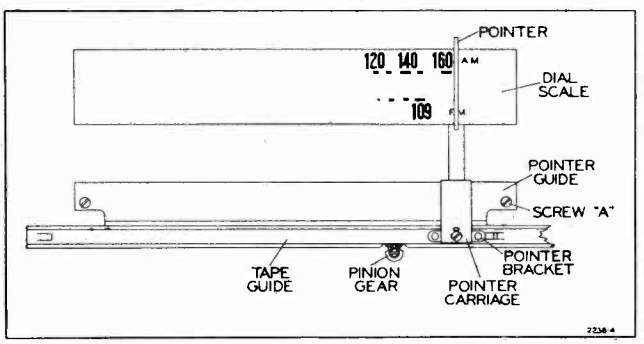
BROADCAST BAND-R.F. ALIGNMENT

Check pointer so that it coincides with the right hand marker to the extreme right when iron cores are all the way out.
For adjustment, see dial mechanism illustration.

SIGNAL GENERATOR FREQ.	CONNECTION TO RADIO	DUMMY ANTENNA	ADJUST
1620 Kc. Use 3 microvolts	AM Antenna and Ground	200 mmf.	C59, C57, C61. For maximum, ½ watt



I. F. VIEW



DIAL ADJUSTMENT VIEW

Loosen screw "A" so that teeth of tape can be properly meshed with pinion gear to give proper pointer travel.

ALIGNMENT PROCEDURE

FM Band Section I.F. and R.F.

A non-metallic alignment tool must be used.

IMPORTANT— No alignment of the FM section of this radio should be attempted unless you are positive that the circuits are in need of adjustment and you have the necessary equipment.

All components used in this radio are extremely stable and the tuned circuits should require no adjustment over a long period of time.

NOTE— The following alignment is based on the use of the new Simpson vacuum tube voltmeter which has a "floating ground". In other words, the meter, when used as a vacuum tube volt-meter, can have both the positive and negative sides connected to points above ground and still give true readings.

A standard AM signal generator is required.

FM-I.F. ALIGNMENT

Band Switch in FM Position. Dummy Antenna .1 Mfd.

SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	VACUUM TUBE VOLT METER CONNECTION TO RADIO	ADJUSTMENT TO BE MADE	ADJUST FOR
10.7 Mc. Use about .1 volt	Pin No. 1 of 6BA6 No. 3 and ground	Pin No. 2 of 6AL5 and ground	Primary of T5	Resonance should be about 3 volts
10.7 Mc. Use about .1 volt	Pin No. 1 of 6BA6 No. 3 and ground	See note "A"	Secondary of T5	Resonance should be about 3 volts
10.7 Mc. Use about 3300 microvolts	Pin No. 1 of 6BA6 No. 2 and ground	Pin No. 2 of 6AL5 and ground	Primary and Secondary of T4A 10.7 m.c. windings See I.F. view	Zero. Use zero center scale See note "B"
10.7 Mc. Use about 200 microvolts	Pin No. 2 of 12AT7 and ground	Pin No. 2 of 6AL5 and ground	Primary and Secondary of 10.7 m.c. windings of T3A See I.F. view	Resonance should be about 3 volts

NOTES ON FM — I. F. ALIGNMENT

NOTE "A" Connect two resistors, 100K OHMS each, from Pin No. 2 of 6AL5 to ground. These resistors must be matched within 5%. Connect as shown in dotted lines on schematic diagram. Connect vacuum tube voltmeter between the mid-point of the resistors and point zz.

NOTE "B" If T5 has been tampered with, it is possible that no crossover point will be found at first. Careful adjustment of both primary and secondary is necessary.

GENERAL: Input signals should be adjusted to give approximately 3 volts. The ratio detector is operating at reasonable level at this point and will give the truest indication of correct alignment with the procedure specified.

FM-R.F. ALIGNMENT

Check pointer so that it coincides with the right hand marker to the extreme right when iron cores are all the way out.
For adjustment, see dial mechanism illustration.

SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	DUMMY ANTENNA	ADJUST	VACUUM TUBE VOLT METER CONNECTION TO RADIO	ADJUST TO
100 Mc. Use about 10 microvolts	FM Antenna Terminals See note	300 ohms	C58 Osc. C60 R. F. C56 Ant.	Pin No. 2 of 6AL5 and Ground	Resonance about 3 volts

NOTE: If a signal generator with the above fundamental frequency is not available, it is sometimes possible to use harmonics. Use extreme care in picking harmonics. An alternate procedure is to use a local station carrier of known frequency to align the FM Band and to use the vacuum tube volt-meter as above for resonance indication. A weak carrier, however, will not produce 3 volts.

NOTE: Connect 300 ohms in series with hot side of generator and connect to one screw. Connect cold side of generator to other screw.

REPLACEMENT PARTS LIST

TUNER PARTS

Condensers

Ref. No.	Part No.	Description	Qty. Used
C58	A-8H-15444	Trimmer, FM oscillator	1
C56, 57, 59, 61	A-2M-12618	Trimmer plate, large	4
C60	A-2M-14368	Trimmer plate, small	1
	A-5M-12615	Locator, for trimmer plates	5
C59, C61	B-6M-12616-S-2	Silvered mica film	2
C56, 57, 60	A-6M-12616	Clear mica film	3
	A-3C-12617	Spacer, for trimmer plates	5
C1, C11	C-8G-11732	470 mmf, ceramic	2
C2	C-8G-13695	1000 mmf, ceramic	1
C6, 7, 9, 14, 51	C-8G-13201	1000 mmf, ceramic	5
C12	C-8G-11731	1500 mmf, ceramic	1
C10, C8	C-8G-13017	15 mmf, ceramic	2
C3, C4	C-8G-11484	50 mmf, ceramic	2
C13	A-8G-12495-6	4.7 mmf, ceramic	1
C15	A-8G-12495-4	2.2 mmf, ceramic	1
C53	C-8G-15859	4 mmf, ceramic	1
C5	C-8D-11304	.02 x 200 volts, paper	1

Resistors

R4	C-9B2-79	27K ohms, 1 watt	1
R1	C-9B1-21	22K ohms, ½ watt	1
R3	C-9B1-52	150 ohms, ½ watt	1
R5	C-9B1-17	4700 ohms, ½ watt	1
R8	C-9B1-19	10K ohms, ½ watt	1
R2, R10	C-9B1-31	1 megohm, ½ watt	2
R21	C-9B1-34	3.3 megohms, ½ watt	1
R45	C-9B1-50	100 ohms, ½ watt	1
R46	C-9B1-45	39 ohms, ½ watt	1
R9	C-9B1-64	1500 ohms, ½ watt	1
R6	C-9B2-6	3300 ohms, 1 watt	1
R7	C-9B2-74	10K ohms, 1 watt	1

Coils

T8	B-13D-13027-1	F.M. oscillator coil	1
—	B-51A-13056	Core for F.M. oscillator coil	1
T6	B-13E-13028	FM antenna coil	1
—	B-51A-13058	Core for FM antenna coil	1
T10	B-13C-13029	FM R.F. coil	1
—	B-51A-13057	Core for FM R.F. coil	1
T9	A-13D-15704	B.C. oscillator coil	1
—	B-51A-12722	Core for B.C. oscillator coil	1
T7	B-13E-13031	B.C. Antenna coil	1
T11	B-13C-13032	B.C. R.F. coil	1
—	B-51A-12723	Core for B.C. ant. and R.F. coil	2

Miscellaneous

	B-20B-15628	Slide switch	1
	A-15B-12997	7-prong min., tube socket	1
	A-15B-13430	9-prong min., tube socket	1
	B-3A-15415	Lead screw	1
	A-3J-12309	Pinion gear	1
	A-49A-14439	Drive pring	2
	A-49A-13228	Tension spring	1
	A-49A-12394	Spiral spring for slugs	3
	B-2J-13006	Rack tape with teeth and pointer bracket	1
	B-2D-15416	Guide for rack tape	1
	B-2D-15649	Pointer carriage	1
	A-5M-13741	Pointer	1
	32F4SE-11488	4-40 x ⅛" screw for pointer	2

MAIN CHASSIS PARTS

Condensers

C63A, C63B	B-8C-11629	Electrolytic filter condenser, 30 — 30 x 450 volts	1
C52	C-8D-13439	.25 mfd x 400 volts	1
C54, C47	C-8D-10760	.1 mfd x 400 volts	2
C31	C-8D-11013	.003 x 600 volts	1
C44, 43, 24, 23, 20	C-8D-10785	.006 x 600 volts	5
C29, C30	C-8D-10761	.01 x 400 volts	2
C46, C45	C-8D-10813	.05 x 400 volts	2
C49	C-8D-10789	.002 x 600 volts	1
C48, C22	C-8D-10770	.05 x 200 volts	2
C64	C-8D-15860	.05 x 200 volts	1
C41	A-8C-13132	Electrolytic, 10 mfd x 50 volts	1
C62	C-8J-11321	.02 x 600 volts, molded case	1
C35	A-8G-13962	.005 x 500 volts, ceramic	1
C21	C-8G-11734	100 mmf, ceramic	1
C38	C-8G-13059	1500 mmf, ceramic	1
C34	C-8G-13060	51 mmf, ceramic	1
C40	C-8G-13201	1000 mmf, ceramic	1
C50	C-8G-11741	330 mmf, ceramic	1
C37	C-8F3-225	100 mmf, mica	1
C39, C42	C-8D-11304	.02 x 200 volts, paper	2
C35, C36	A-8F-13047	Mica condenser, 50 mmf, dual	1
C55	A-8C-12154	Electrolytic, 10 mfd, 450 volts	1

Resistors

R27, S1	A-10A-13114	Volume control and switch, 500K ohms	1
R31, S2	A-11A-15645	Tone control and phono radio switch	1
R22	C-9B1-36	6.8 megohms, ½ watt	1
R32	C-9B1-86	100K ohms, ½ watt	1
R44, R37	C-9B1-94	470K ohms, ½ watt	2
R41, R39	C-9B1-83	56K ohms, ½ watt	2
R33, R34	C-9B1-68	3300 ohms, ½ watt	2
R30	C-9B1-35	4.7 megohms, ½ watt	1
R23, R28	C-9B1-80	33K ohms, ½ watt	2
R20	C-9B1-79	27K ohms, ½ watt	1
R13, R16	C-9B1-48	68 ohms, ½ watt	2
R14, R17	C-9B2-81	39K ohms, 1 watt	2
R24, R26	C-9B1-29	470K ohms, ½ watt	2
R25	C-9B1-302	15 megohms, ½ watt	1
R19	C-9B1-23	47K ohms, ½ watt	1
R12,R43,R35	C-9B1-31	1 megohm, ½ watt	3
R40	C-9B1-66	2200 ohms, ½ watt	1
R36, R42	C-9B1-200	51K ohms, ½ watt	2
R38	C-9B4-55	270 ohms, 2 watts	1
R18	C-9B1-13	1000 ohms, ½ watt	1
R11, R15	C-9B2-15	2200 ohms, 1 watt	2

Coils

	B-13A-15680	Input I.F. transformer, 455 kc.	1
	B-13B-15681	Output I.F. transformer, 455 kc.	1
	B-13A-15682	Input I.F. transformer, 10.7 megohms	1
	B-13B-15683	Second I.F. transformer, 10.7 megohms	1
	B-13M-15684	Ratio detector, 10.7 megs.	1
	C-13E-15687	Loop antenna assembly	1

Transformers

T1	B-12A-13038-1	Power transformer, 105-125 volts 50-60 cycles, primary	1
T2	B-12C-13042-1	Output transformer, for speaker	1

Speaker

	B-18B-13043-1	Electrodynamic speaker, 12-inch, less output transformer	1

Miscellaneous

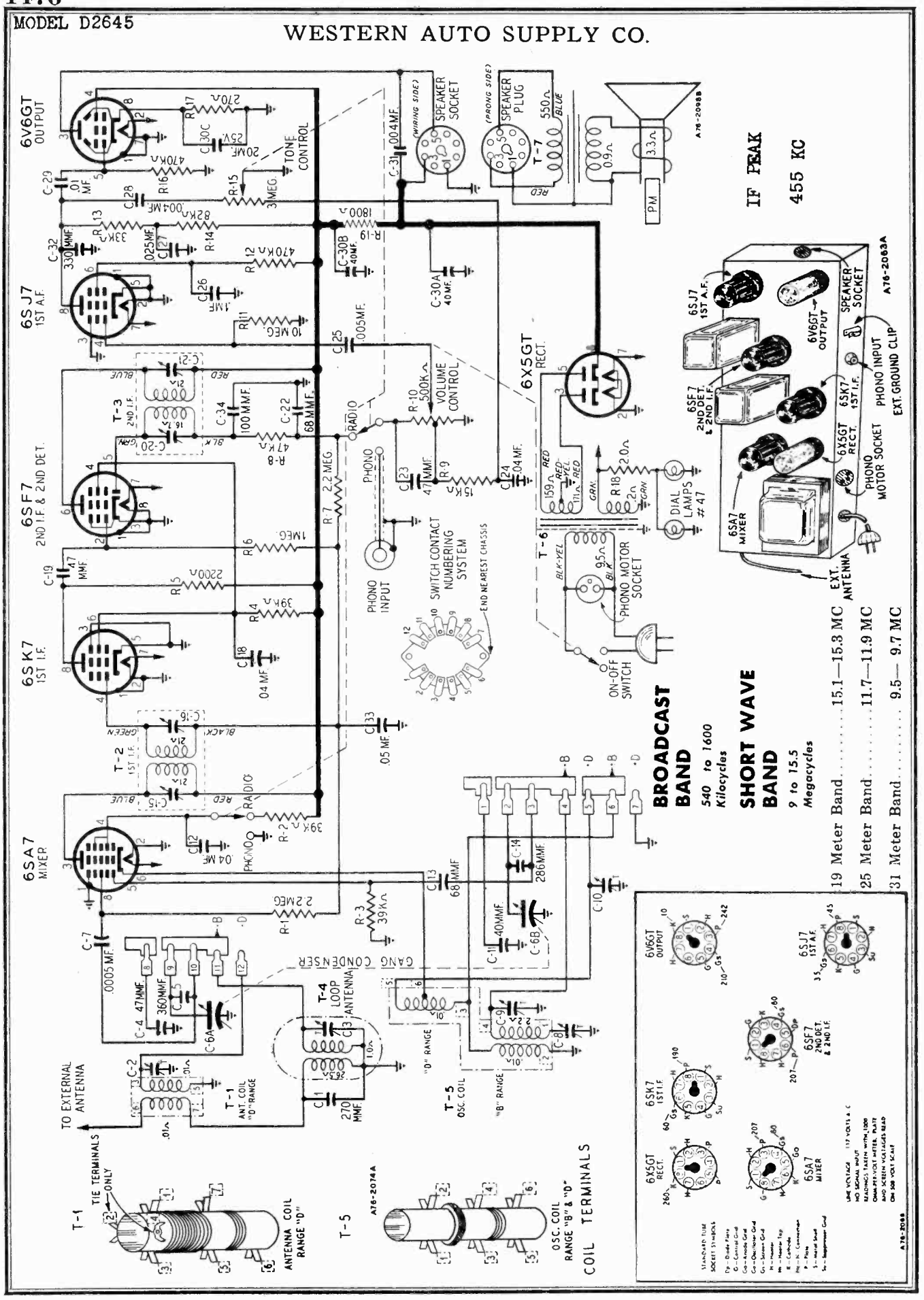
	C-30A-15686	Dial scale	1
	B-30B-13943	Dial glass	1
	2G-13696	Escutcheon	1
	56D2-12463	Screws for escutcheon	4
	B-5B-13737-37	Knob, mahogany—small with dot	2
	B-5B-13738-37	Knob, mahogany—large, without dot	2
	B-5B-13737-14	Knob, walnut—small, with dot	2
	B-5B-13738-14	Knob, walnut—large, without dot	2
	A-3A-15630	Shaft for band switch	1
	A-43D-12934	"U" speed clip	1
	A-55C-12935	Ball bearing	1
	B-47A-13801	Pilot lite assembly	1
	A-46A-11739	Pilot lite bulb, 6-8 volts	2
	A-2H-10974	Tube shield	4
	A-15C-13174	7-prong, min., tube socket	4
	A-15B-10440	8-prong, octal, socket	4
	A-7B-13050	FM dipole socket	1
	A-15B-11538	Speaker socket	1
	A-19B-12468	Phono-motor socket	1
	A-19B-11044	Recorder socket	1
	A-19B-12170	Phono input socket	1
	B-14M-11479	AC line cord	1
	32K10-14306	10-32 x 1 inch, chassis mounting screws	4

RECORD CHANGER

	B-201-15368	6666 Record Changer assembly, with P-93 crystal cartridge	1
	P-93	Crystal cartridge only	1

MODEL D2645

WESTERN AUTO SUPPLY CO.



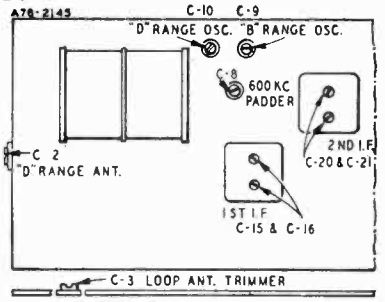
WESTERN AUTO SUPPLY CO. MODEL D2645

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

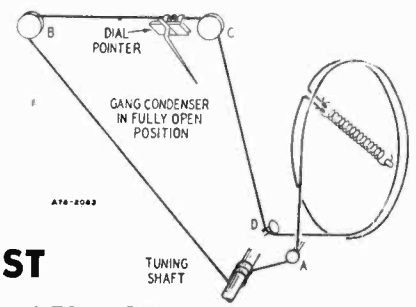
The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	455 KC	Grid of 6SA7 Pin 8	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C20) & (C21) 1st I.F. (C15) & (C16)
RANGE B	1620 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)
	1400 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output Set Pointer to 1400 KC (See Note A)	Ant. Range B (C3)
	600 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Oscillator (C8) Rock Rotor—See Note B
	Repeat above steps at 1620 and 600 KC until readjusting the oscillator Range B Trimmer (C9) causes no further improvement of output.					
RANGE D	15,600 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
	14,000 KC	Antenna Lead	400 Ohm	D Range	Tune Rotor to Max. Output	Ant. Range D (C2) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet. 1400 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Ant. Range B (C3)



NOTE A—Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn Rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.



DRIVE CORD REPLACEMENT

The drive cord should be replaced as shown on the accompanying illustration using a 46" drive cord for the purpose. Three turns are to be wound clockwise around the tuning shaft with the turns progressing away from the chassis. After the cord has been installed, stretch the tension spring and hook the free end to the tab on the drive pulley. Cut off any excess string that may remain.

REPLACEMENT PARTS LIST

NOTICE: There is a power rating label on the chassis. This label specifies the power supply on which the radio may be used, and identifies the radio as to chassis, dial and issue letter. When ordering parts or writing, give ALL information appearing on this label.

MISCELLANEOUS

12A442	6" P.M. Speaker Complete with Output Transformer
	Cone and Voice Coil Assembly (Specify part number and letters stamped on speaker)
	Output Transformer (Specify part number and letters stamped on speaker)
3A303	Tube socket-octal (8 prong) moulded
3A304	Phono motor socket
3A305	Phono socket—single pin tip
10A578	Knob (Tuning)
10A579	Knob (Off-On, Volume)
10A581	Knob (Tone, Radio-Phono)
10A580	Knob (SW-BC)
2A359	Band Change Switch
13X328	Line cord and plug assembly

TRANSFORMERS AND COILS

T-1 *	9A1812	"D" Range Antenna Coil Assembly
T-2	9A1814	1st I.F. Coil Assembly
T-3	9A1815	2nd I.F. Coil Assembly
T-4	9A1831	"B" Range Loop Antenna
T-5	9A1813	"B" Range and "D" Range Oscillator Coil Assembly
T-6	53X282	117 Volt 60 Cycle Standard Power Transformer
T-7		Output Transformer (See Miscellaneous)

CAPACITORS

C-1	47X445	270 mmf		Moulded
C-2	17A164	5-50 mmf		Trimmer
C-3	17A123	1-12 mmf		Trimmer
C-4	47X473	47 mmf		Silvered mica
C-5	47X474	360 mmf		Silvered mica
C-6A, C-6B	14A178	Gang Capacitor with drive pulley		
C-7	B66501	.0005 mf	200 V	Tubular
C-8	17A155	350-430 mmf		Trimmer
C-9, C-10	17A109	2.5-35 mmf		Dual Trimmer
C-11	47X472	40 mmf		Silvered mica
C-12, C-18	D66403	.04 mf	400 V	Tubular
C-13	47X466	68 mmf		Moulded
C-14	47X481	286 mmf		Silvered mica
C-15, C-16	Part of T-2 (1st I.F. Coil Assem.)			
C-19, C-23	47X463	47 mmf		Moulded
C-20, C-21	Part of T-3 (2nd I.F. Coil Assem.)			
C-22	47X471	68 mmf		Moulded
C-24	D66403	.04 mf	400 V	Tubular
C-25	D66502	.005 mf	400 V	Tubular
C-26	D66104	.10 mf	400 V	Tubular
C-27	D54253	.025 mf	400 V	Tubular
C-28, C-31	D66402	.004 mf	400 V	Tubular
C-29	D66103	.01 mf	400 V	Tubular
C-30A	45X346	40 mf	450 V	3 Section Electrolytic
C-30B		40 mf	450 V	
C-30C		20 mf	25 V	
C-32	47X470	330 mmf		Moulded
C-33	B66503	.05 mf	200 V	Tubular
C-34	47X476	100 mmf		Moulded

RESISTORS

B85225	R-1, R-7	2.2 megohms	0.5 W Carbon
C84393	R-2, R-4	39 K ohms	1.0 W Carbon
B84393	R-3	39 K ohms	0.5 W Carbon
B84222	R-5	2200 ohms	0.5 W Carbon
B85105	R-6	1 megohm	0.5 W Carbon
B85473	R-8	47 K ohms	0.5 W Carbon
B84153	R-9	15 K ohms	0.5 W Carbon
36X358	R-10	.5 megohm	Volume control and line switch
B85106	R-11	10 megohms	0.5 W Carbon
B85474	R-12, R-16	470 K ohms	0.5 W Carbon
B84333	R-13	33 K ohms	0.5 W Carbon
B84823	R-14	82 K ohms	0.5 W Carbon
*40X276	R-15	3.0 megohms	Tone control & Radio-Phono switch
C84271	R-17	270 ohms	1.0 W Carbon
43X213	R-18	2.0 ohms	0.5 W Wire wound
D84182	R-19	1800 ohms	2.0 W Carbon

DIAL AND DRIVE ASSEMBLY

26A400	Dial bracket assembly complete with dial glass, background, diffusers, etc.
7A202	Pilot light socket assembly
	No. 47 Pilot light
28X113	Drive cord tension spring
	46" Drive cord (18 lb. test)
15X150	Pointer
26X485	Drive Shaft
19X192	"C" Washer (for drive shaft)
6X21	Rubber Grommet
20X329	Cond. Cushion Stud } Mtg. Gang Capacitor

Speaker ..... 6" PM Dynamic

Selectivity ..... 40 KC Broad at 1000 Times Signal

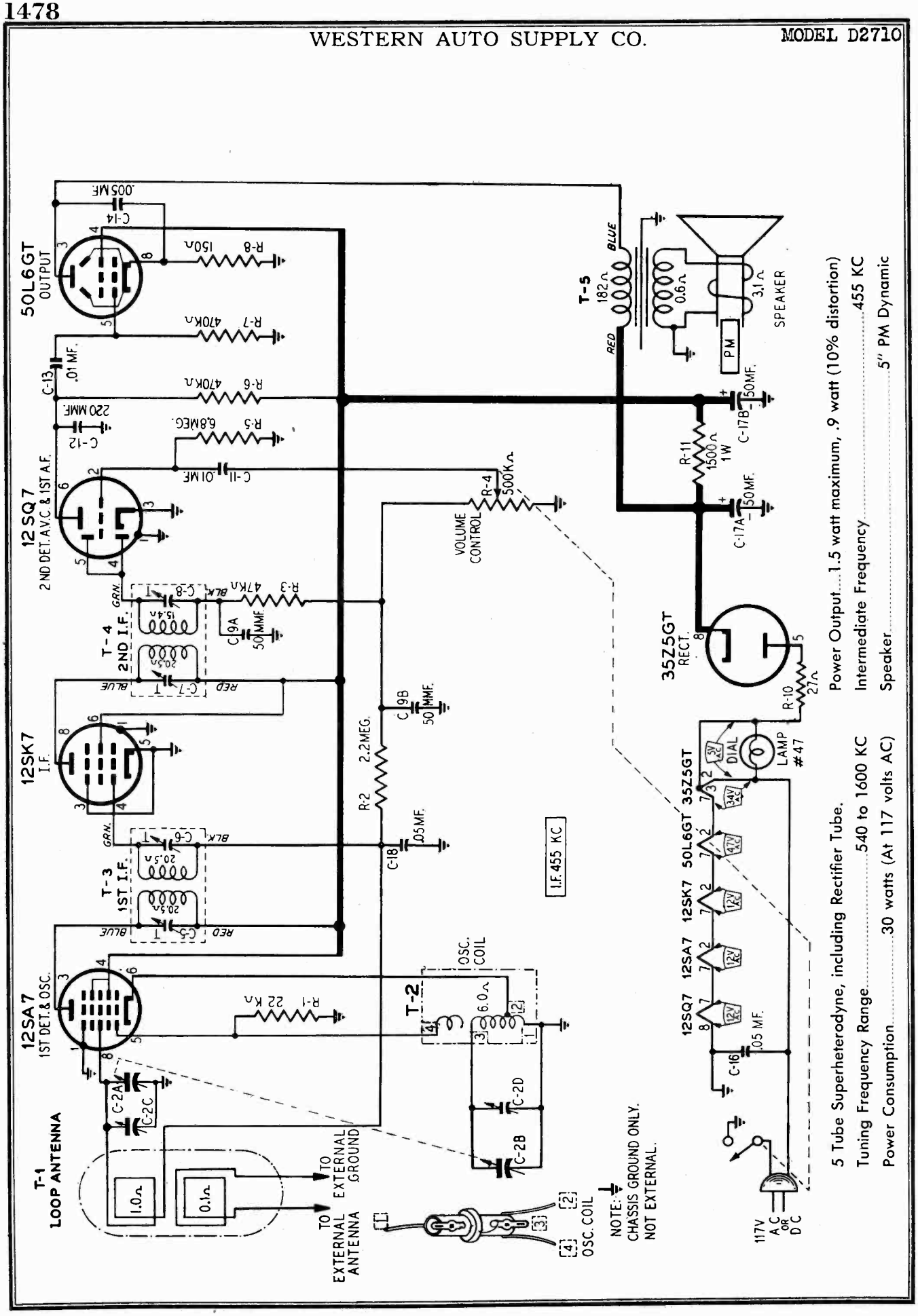
Sensitivity (For 0.5 Watt Output, with External Antenna)
B Range ..... 9 Microvolts Average
D Range ..... 20 Microvolts Average

Power Consumption
(at 117 Volts AC) ..... 40 Watts (normal)
60 Watts (phono operating)

Power Output ..... 4 Watts Maximum
2.3 Watts, 10% Harmonics

Tuning Frequency Range
B Range ..... 540-1600 Kilocycles
D Range ..... 9-15.5 Megacycles

WESTERN AUTO SUPPLY CO. MODEL D2710



5 Tube Superheterodyne, including Rectifier Tube.

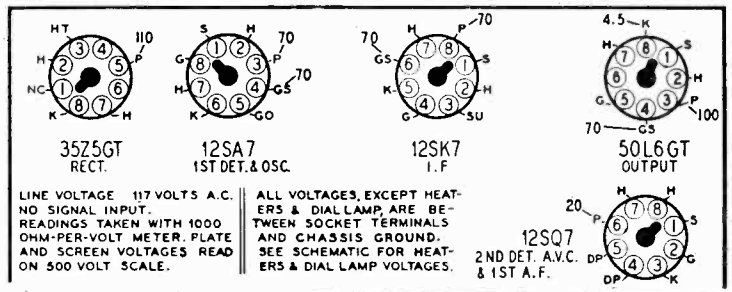
Tuning Frequency Range.....540 to 1600 KC

Power Consumption.....30 watts (At 117 volts AC)

Power Output....1.5 watt maximum, .9 watt (10% distortion)

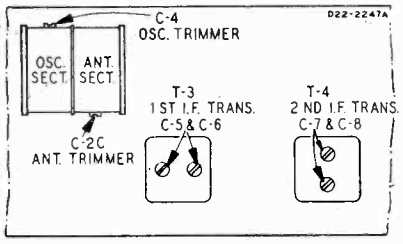
Intermediate Frequency.....455 KC

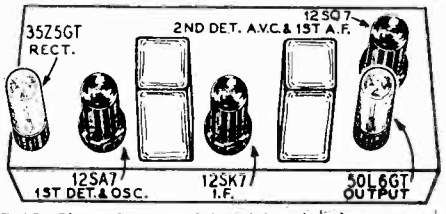
Speaker.....5" PM Dynamic



LINE VOLTAGE 117 VOLTS A.C. NO SIGNAL INPUT. READINGS TAKEN WITH 1000 OHM-PER-VOLT METER. PLATE AND SCREEN VOLTAGES READ ON 500 VOLT SCALE.

ALL VOLTAGES, EXCEPT HEATERS & DIAL LAMP, ARE BETWEEN SOCKET TERMINALS AND CHASSIS GROUND. SEE SCHEMATIC FOR HEATERS & DIAL LAMP VOLTAGES.

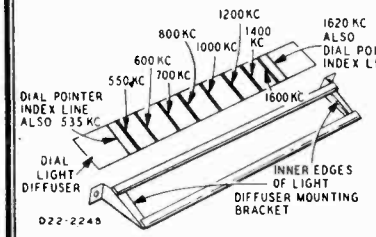




Note A—Use 1400 KC Index line on dial light diffuser. See DIAL CALIBRATION paragraph.

NOTICE: There is a model number label on the chassis. This label identifies the radio as to chassis, dial and issue letter. When ordering parts or writing, give ALL information appearing on this label.

DIAL CALIBRATION



MISCELLANEOUS

12A473	5" P.M. Speaker	
	Cone and Voice Coil Assembly (Specify Part Number and Letters Stamped on Speaker)	
3A303	Tube Socket (8 Prong) Molded	
55X262	Cabinet, Plastic	
14X411	Grille Cloth	
10A297	Knob	
2X289	Felt Washer	
13X328	Line Cord and Plug Assembly	

TRANSFORMERS AND COILS

9A1912	T-1	"B" Rnge Loop Antenna Assembly
9A1914	T-2	Oscillator Coil Assembly
9A1808	T-3	1st I-F Coil Assembly
9A1809	T-4	2nd I-F Coil Assembly
51X132	T-5	Output Transformer

ALIGNMENT PROCEDURE

Check dial pointer position, see DIAL CALIBRATION paragraph.
Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat Up" for several Minutes.
The equipment in column at right is required for aligning:
Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter: Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 50 mmf.
Blocking Condenser—.1 mf.

SIGNAL GENERATOR			DUMMY	GANG CONDENSER	ADJUST TRIMMERS TO MAXIMUM
FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	ANTENNA	SETTING	(See Trimmer Illustration)
455 KC	Control Grid 12SK7—I.F. Prong No. 4	Chassis Base Through .1 mf. Condenser	.1 mf.	Turn Rotor to full open	2nd I.F. (C7) & (C8)
455 KC	Control Grid 12SA7—1st Det. Prong No. 8	Same As Above	.1 mf.	Turn Rotor to full open	1st I.F. (C5) & (C6)
1620 KC	Control Grid 12SA7—1st Det. Prong No. 8	External Ground Clip On Loop	.1 mf.	Turn Rotor to full open	Oscillator (C-4)
1400 KC	External Antenna Clip On Loop	Same As Above	50 mmf.	Turn dial to 1400 KC. See Note A	Antenna (C-2C)

CAPACITORS

14A194	C-2A, C-2B, C-2C, C-2D	Gang Condenser Assembly		
	C-5, C-6	Part of T-3 (1st I-F Coil Assembly)		
	C-7, C-8	Part of T-4 (2nd I-F Coil Assembly)		
47X112	C-9A, C-9B	50-50 mmf		Dual Mica
B66103	C-11, C-13	.01 mf	200 V	Tubular
47X468	C-12	220 mmf		Molded
D66502	C-14	.005 mf	400 V	Tubular
D66503	C-16	.05 mf	400 V	Tubular
45X341	C-17A	50 mf	150 V	Dry
	C-17B	50 mf	150 V	Electrolytic
B66503	C-18	.05 mf	200 V	Tubular

RESISTORS

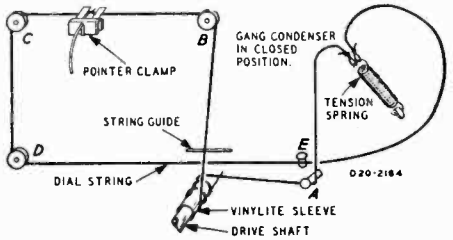
B84223	R-1	22,000 ohms	0.5 watt	Carbon
B85225	R-2	2.2 meg.	0.5 watt	Carbon
B85473	R-3	47,000 ohms	0.5 watt	Carbon
36X352	R-4	500,000 ohms	Volume control and switch	
B85685	R-5	6.8 meg.	0.5 watt	Carbon
B84474	R-6	470,000 ohms	0.5 watt	Carbon
B85474	R-7	470,000 ohms	0.5 watt	Carbon
B84151	R-8	150 ohms	0.5 watt	Carbon
B84270	R-10	27 ohms	0.5 watt	Carbon
C85152	R-11	1500 ohms	1.0 watt	Carbon

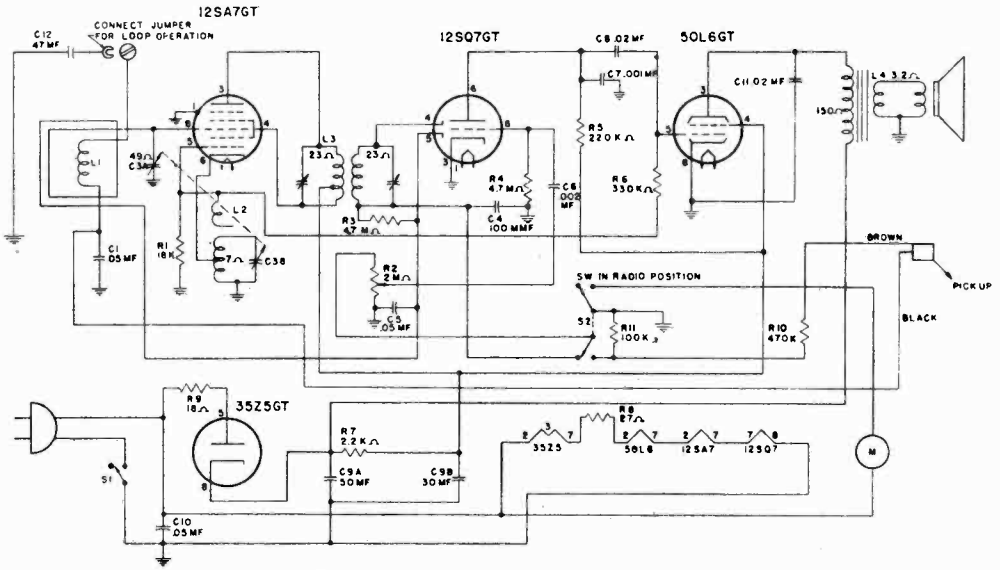
DIAL AND DRIVE ASSEMBLY

26A464	Pointer Bracket Assembly complete with light diffuser holder, string guide, idler pulleys, etc.
15X223	Pointer
6X21	Rubber Grommet (Mtg. gang
20X329	Cond. Cushion Stud) condenser
26X482	Drive shaft
19X192	"C" Washer
10X36	Drive cord assembly
28X95	Drive cord tension spring
7A213	Pilot light socket assembly No. 47 Pilot light
58X683	Dial
30X539	Dial clamp (upper)
30X540	Dial clamp (lower)

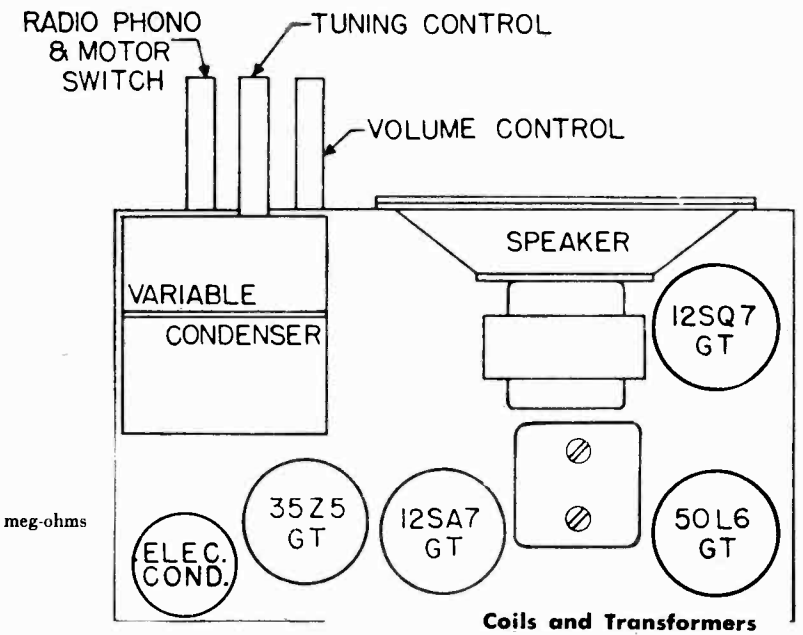
DRIVE CORD REPLACEMENT

Turn the large drive pulley to the maximum counterclockwise position. Use a new 10x36 drive cord assembly or a piece of cord 53 inches long and tie one end to the tension spring and fasten the other end of the spring to the drive pulley. Install the cord as shown in the illustration. Wind 2¾ turns counterclockwise around the tuning shaft with the turns progres-





TUBE LOCATION



Ref. No.	*Part No.*	*Description*
Capacitors		
C1-C10		Paper, .05 mfd 400 volts
C6		Paper, .002 mfd 400 volts
C8-C11		Paper, .02 mfd 400 volts
C5		Paper, .05 mfd 200 volts
C7		Paper, .001 mfd 500 volts
C4		Ceramic 100 mmfd 500 volts
C12		Ceramic 47 mmfd 500 volts
C3	1675	Variable Air—2 gang
C9	2073	Electrolytic, 50-30 mfd 150 volts
Resistors		
R2	2480	Control, volume with switch, 2 meg-ohms
R1		18,000 ohms, ¼ watt
R3, R4		4.7 meg ohms, ¼ watt
R5, R10		220,000 ohms, ¼ watt
R6		330,000 ohms, ¼ watt
R7		2200 ohms, 2 watts
R8		27 ohms, ½ watt
R9		18 ohms, ½ watt
R11		100,000 ohms, ¼ watt
Coils and Transformers		
L1	28186	Back cover with loop
L2	28184	Oscillator coil
L3	3376	I.F. transformer
L4	1300	Output transformer
Miscellaneous		
		Cord, line 6 ft.
	39160	Knob, tuning
	39161	Knob, volume or phono radio
	5877	Speaker
	T470	Cabinet, wood
	54314	Tuning knob washer
		Phono-needle
	346-5	Walsco back clips
	18110	Sockets, wafer octal
	3828	Switch, phono-radio
		Phono motor and 8-inch turntable
		Phono crystal, L-26

TECHNICAL DATA

Tuning range	530 to 1600 kc
Intermediate frequency	455 kc
Power consumption	30 watts
Selectivity	1. A.C.A.—3 to 1. 2. A.C.A.—12.5 to 1
Sensitivity (for 0.5 watt output):	
Loop	8000 microvolts per meter average
Antenna	800 microvolts average
Power output (in voice coil):	
Undistorted	0.8 watts
Maximum	2.5 watts

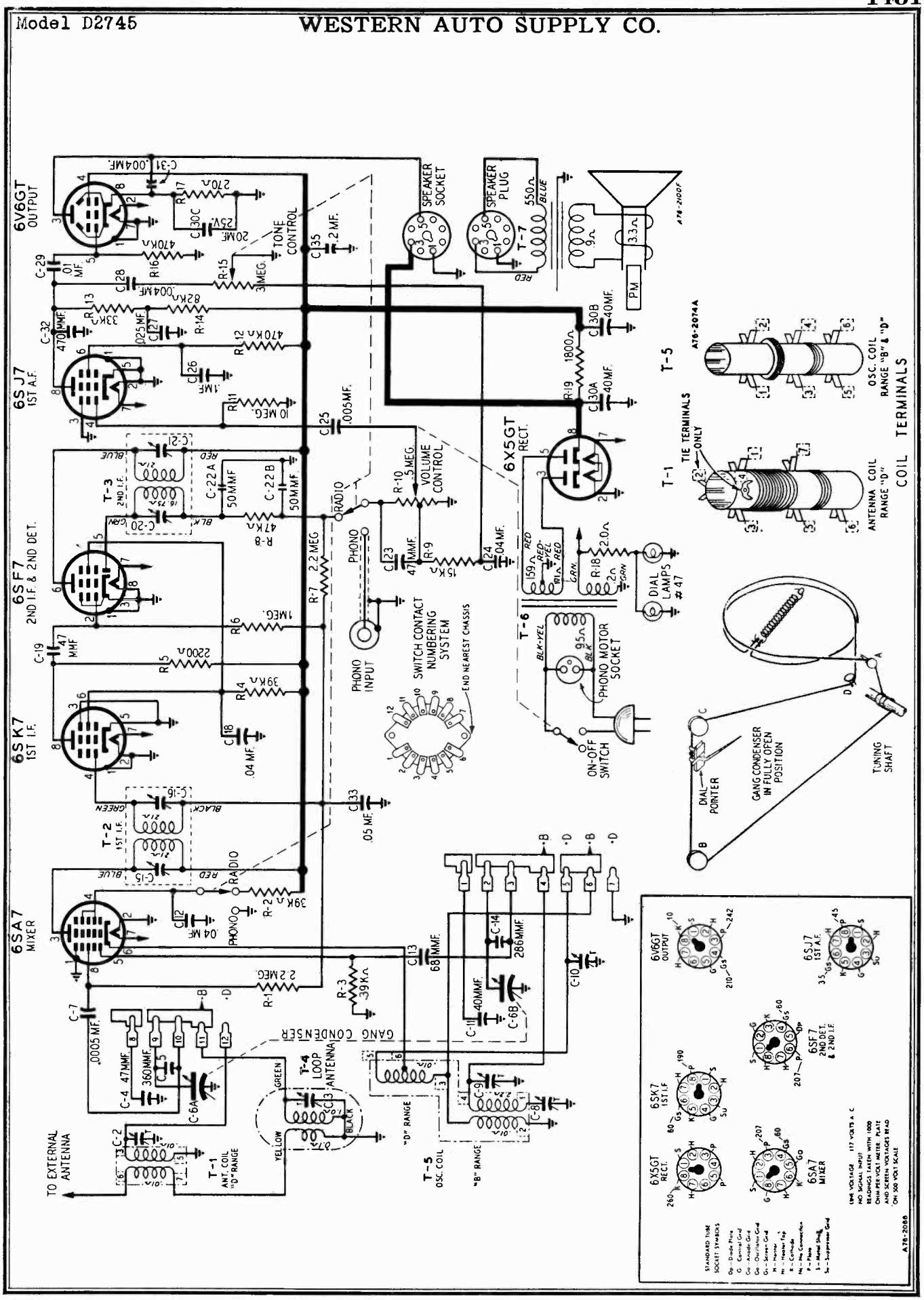
* Output meter across 3.2-ohm output load.
* Volume control at maximum.
* Align for maximum output. Reduce input as needed to keep output near 0.4 volts.
* Connect ground post of signal generator to chassis.

SIGNAL GENERATOR			*TUNER SETTING*	*ADJUST FOR MAXIMUM OUTPUT (in order shown)*
Frequency	*Dummy Antenna*	*Connection to Radio*		
455 kc	0.1 mf	Stator of antenna section of gang	Any	Trimmers on I.F. can
1590 kc	* *	* *	Rotor full open (plates out of mesh)	Oscillator trimmer
1590 kc	* *	* *	Rotor full open (plates out of mesh)	Antenna trimmer

* Run a wire from output terminal of the generator near the receiver. However, no connection is made between the signal generator and the receiver.

Model D2745

WESTERN AUTO SUPPLY CO.



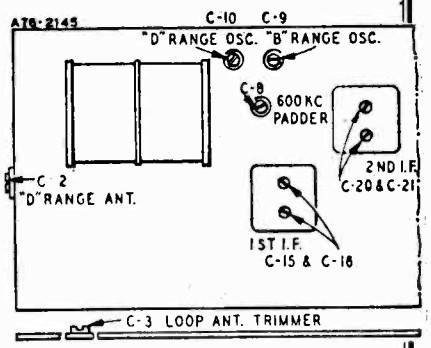
Model D2745 WESTERN AUTO SUPPLY CO.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 100 mmt., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	455 KC	Grid of 6BA7 Pin 8	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C20) & (C21) 1st I.F. (C15) & (C16)
RANGE B	1620 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)
	1400 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output Set Pointer to 1400 KC (See Note A)	Ant. Range B (C3)
	600 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Oscillator (C8) Rock Rotor—See Note B
	Repeat above steps at 1620 and 600 KC until readjusting the oscillator Range B Trimmer (C9) causes no further improvement of output.					
RANGE D	15,600 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
	14,000 KC	Antenna Lead	400 Ohm	D Range	Tune Rotor to Max. Output	Ant. Range D (C2) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet. 1400 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Ant. Range B (C3)



NOTE A—Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn Rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

MISCELLANEOUS

12A442	6" P.M. Speaker Complete with Output Transformer	
	Cone and Voice Coil Assembly (Specify part number and letters stamped on speaker)	
	Output Transformer (Specify part number and letters stamped on speaker)	
3A303	Tube socket-octal (8 prong) moulded	
3A304	Phono motor socket	
3A305	Phono socket—single pin tip	
10A578	Knob (Tuning)	
10A579	Knob (Off-On, Volume)	
10A581	Knob (Tone, Radio-Phono)	
10A580	Knob (SW-BC)	
2A359	Band Change Switch	
13X328	Line cord and plug assembly	

TRANSFORMERS AND COILS

T-1	9A1812	"D" Range Antenna Coil Assembly
T-2	9A1814	1st I.F. Coil Assembly
T-3	9A1815	2nd I.F. Coil Assembly
T-4	26A475	"B" Range Loop Antenna
T-5	9A1813	"B" Range and "D" Range Oscillator Coil Assembly
T-6	53X282	117 Volt 60 Cycle Standard Power Transformer
T-7		Output Transformer (See Miscellaneous)

CAPACITORS

C-2	17A164	5-50 mmf		Trimmer
C-3	17A251	1.5-12 mmf		Trimmer
C-4	47X473	47 mmf		Silvered mica
C-5	47X474	360 mmf		Silvered mica
C-6A, C-6B	14A178	Gang Capacitor with drive pulley		
C-7	B66501	.0005 mf	200 V	Tubular
C-8	17A155	350-430 mmf		Trimmer
C-9, C-10	17A109	2.5-35 mmf		Dual Trimmer
C-11	47X472	40 mmf		Silvered mica
C-12, C-18	D66403	.04 mf	400 V	Tubular
C-13	47X466	68 mmf		Moulded
C-14	47X481	286 mmf		Silvered mica
C-15, C-16	Part of T-2 (1st I.F. Coil Assem.)			
C-19, C-23	47X463	47 mmf		Moulded
C-20, C-21	Part of T-3 (2nd I.F. Coil Assem.)			
C-22A & B	47X112	50-50mmf		Dual Mica
C-24	D64403	.04 mf	400 V	Tubular
C-25	D66502	.005 mf	400 V	Tubular
C-26	D67104	.10 mf	400 V	Tubular
C-27	D64253	.025 mf	400 V	Tubular
C-28	D66402	.004 mf	400 V	Tubular
C-29	D66103	.01 mf	400 V	Tubular
C-30A	45X346	40 mf	450 V	3 Section Electrolytic
C-30B		40 mf	450 V	
C-30C		20 mf	25 V	
C-31	F66402	.004 mf	600 V	Tubular
C-32	47X467	470 mmf		Moulded
C-33	B66503	.05 mf	200 V	Tubular
C-35	D67204	.2 mf	400 V	Tubular

Sensitivity (For 0.5 Watt Output, with External Antenna)
B Range..... 9 Microvolts Average
D Range..... 20 Microvolts Average

RESISTORS

B85225	R-1, R-7	2.2 megohms	0.5 W	Carbon
C84393	R-2, R-4	39 K ohms	1.0 W	Carbon
B84393	R-3	39 K ohms	0.5 W	Carbon
B84222	R-5	2200 ohms	0.5 W	Carbon
B85105	R-6	1 megohm	0.5 W	Carbon
B85473	R-8	47 K ohms	0.5 W	Carbon
B84153	R-9	15 K ohms	0.5 W	Carbon
36X358	R-10	.5 megohm	Volume control and line switch	
B85106	R-11	10 megohms	0.5 W	Carbon
B85474	R-12, R-16	470 K ohms	0.5 W	Carbon
B84333	R-13	33 K ohms	0.5 W	Carbon
B84823	R-14	82 K ohms	0.5 W	Carbon
40X276	R-15	3.0 megohms	Tone control & Radio-Phono switch	
C84271	R-17	270 ohms	1.0 W	Carbon
43X213	R-18	2.0 ohms	0.5 W	Wire wound
D84182	R-19	1800 ohms	2.0 W	Carbon

DIAL AND DRIVE ASSEMBLY

26A400	Dial bracket assembly complete with dial glass, background, diffusers, etc.
7A202	Pilot light socket assembly
	No. 47 Pilot light
28X113	Drive cord tension spring
10X58	Drive cord assembly
15X150	Pointer
26X485	Drive Shaft
19X192	"C" Washer (for drive shaft)
6X21	Rubber Grommet
20X329	Cond. Cushion Stud } Mtg. Gang Capacitor

Power Output.....4 Watts Maximum
2.3 Watts, 10% Harmonics

Power Consumption (at 117 Volts AC).....40 Watts (normal)
60 Watts (phono operating)

Frequency Ranges
B Range.....540-1600 Kilocycles
D Range.....9-15.5 Megacycles

Intermediate Frequency.....455 KC

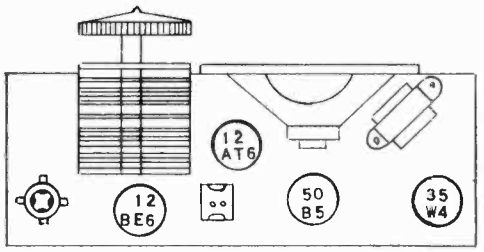
Selectivity .....40 KC Broad at 1000 Times Signal

Speaker .....6" PM Dynamic

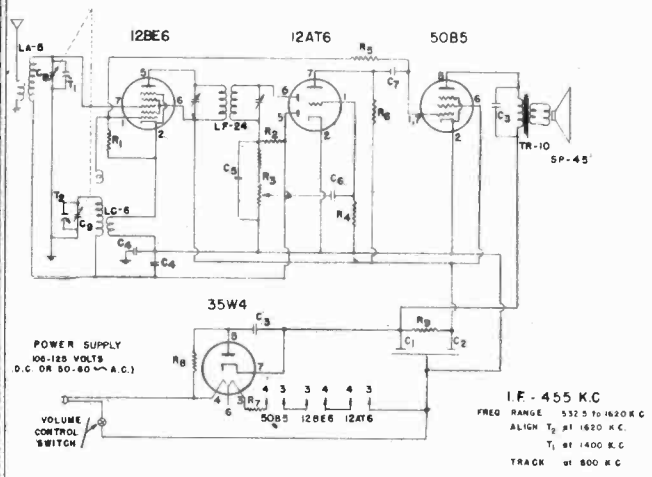
NOTICE: There is a Model Number label on the chassis. This label identifies the radio as to chassis, dial and issue letter. When ordering parts or writing, give ALL information appearing on this label.

MODELS D2806, D2807

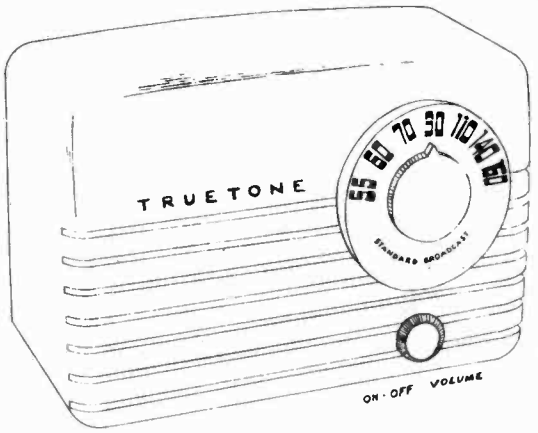
WESTERN AUTO SUPPLY CO.



Remove back to replace tubes



CHASSIS SERIES "AG"



ELECTRICAL SPECIFICATIONS

Power Supply	105-125 Volts D.C. or 50-60 Cycles A.C. 30 Watts
Frequency Range	532.5 to 1620 kc.
Intermediate Freq.	455 kc.
Tuning	Two gang capacitor
Speaker	4 inch PM 3.5 ohm voice coil impedance
Power Output	1 watt undistorted 1.5 watt maximum
Sensitivity	800 Microvolts at 50 milliwatts Output
Selectivity	120 kc broad at 1000 times signal at 1000 kc.

REPLACEMENT PARTS LIST

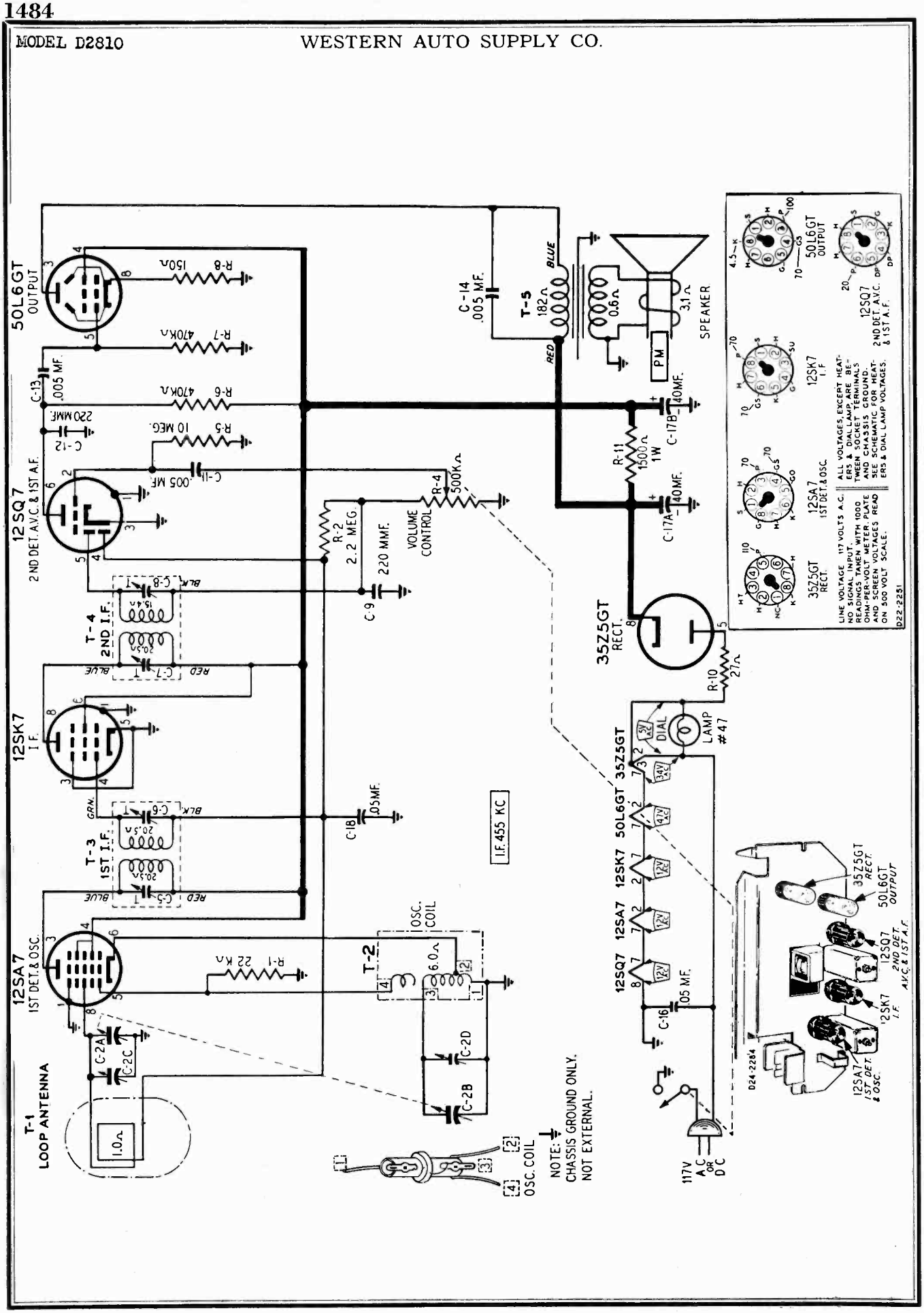
Ref. No.	*Part No.*	*Description*
		CAPACITORS
C1, C2	CE-15	2 x 40 mfd V. Elect
C3	CP203-1	.02 mfd 400V paper cond.
C4	CP503-4	.05 mfd 200V paper cond.
C5	CM151-1	.00015 mfd 500V paper cond.
C6	CP202-2	.002 mfd 400V paper cond.
C7	CP502-3	.005 mfd 200V paper cond.
C8, C9	CV-14	Variable Condenser (2 gang)
		RESISTORS
R1	RC183-2	18,000 ohms ½W 10%
R2	RC475-1	4.7 megohms ½W 20%
R3	VC-11	2 meg. vol. cont., 100 K Stop
R4	RC106-1	10 megohms ½W 20%
R5	RC334-1	330,000 ohms ½W 20%
R6	RC224-1	220,000 ohms ½W 20%
R7	RC390-4	39 ohms 1W 20%
R8	RC180-1	18 ohms ½W 20%
R9	RC222-4	2200 ohms 1W 20%
		COILS & TRANSFORMERS
	LA-5	Antenna Coil
	LC-6	Oscillator Coil
	LF-24	I.F. Transformer
	TR-10	Output Transformer
		MISCELLANEOUS
	CB-106	Cabinet (specify Ivory or Walnut)
	KN-20	Knob
	KN-21	Pointer Knob
	SP-45	4" PM Speaker

ALIGNMENT PROCEDURE

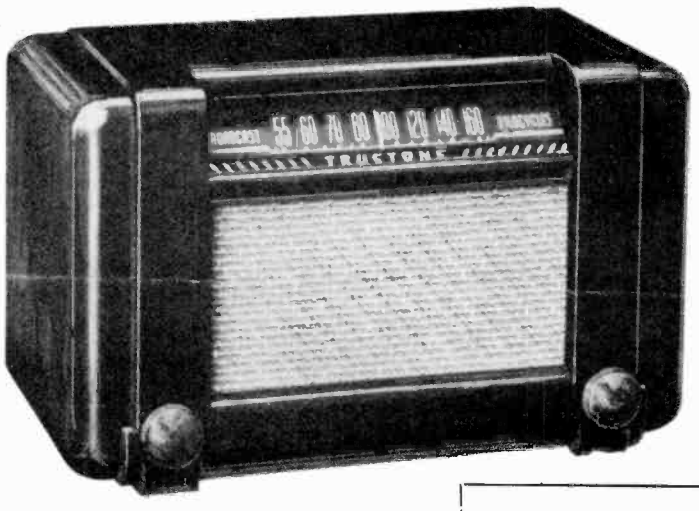
- Output meter across 3.5 ohm output load.
- Volume control at maximum for all adjustments.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

SIGNAL GENERATOR				*SETTING TUNER*	*ADJUST TRIMMERS TO MAXIMUM OUTPUT (in order shown)*
Frequency	*Coupling Factor*	*Connection to Receiver*	*Ground Connection*		
455 kc	.1 mfd	12BE6 Grid	B—	Rotor full open (Plates out of mesh)	Input and output trimmers on IF cans
1620 kc	.1 mfd	12BE6 Grid	B—	Rotor full open (Plates out of mesh)	Oscillator trimmer T2
1400 kc	75 mmf	Hank	B—	1400 kc	Antenna trimmer T1

MODEL D2810 WESTERN AUTO SUPPLY CO.



WESTERN AUTO SUPPLY CO. MODEL D2810



SPECIFICATIONS

Power Output....1.5 watt maximum, .9 watt (10% distortion)
Intermediate Frequency.....455 KC
Speaker.....5" PM Dynamic

5 Tube Superheterodyne, including Rectifier Tube.
Tuning Frequency Range.....540 to 1600 KC
Power Consumption.....30 watts (At 117 volts AC)

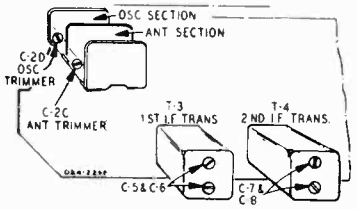
ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

The equipment in column at right is required for aligning:

Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter: Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 50 mmf.
Blocking Condenser—.1 mf.

SIGNAL GENERATOR					
FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	GANG CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
455 KC	Control Grid 12SK7—I.F. Prong No. 4	Chassis Base Through .1 mf. Condenser	.1 mf.	Turn Rotor to full open	2nd I.F. (C7) & (C8)
455 KC	Control Grid 12SA7—1st Det. Prong No. 8	Same As Above	.1 mf.	Turn Rotor to full open	1st I.F. (C5) & (C6)
1620 KC	Control Grid 12SA7—1st Det. Prong No. 8	Same as Above	.1 mf.	Turn Rotor to full open	Oscillator (C-2D)
1400 KC	Reassemble chassis in cabinet See Note B	Same As Above	50 mmf.	Set pointer to 1400 KC. See Note A	Antenna (C-2C)

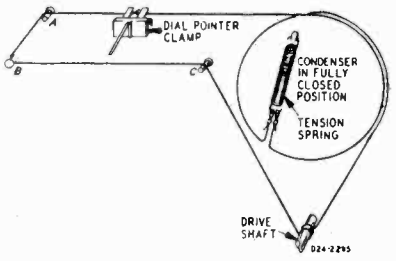


Note A—Attach pointer to drive cord and position at 1400 KC mark on dial scale.

Note B—Wind 2 turn loop of heavy enameled wire 6" diameter. Connect to signal generator. Place loop of wire 6" from loop on set and in the same plane.

DRIVE CORD REPLACEMENT

Turn the large drive pulley to the fully closed position. Use a new 10X66 drive cord assembly or a piece of cord 45 inches long and fasten one end to the tension spring and fasten the other end of the spring to the drive pulley. Install the cord as shown in the illustration. Wind 2¾ turns counterclockwise around the tuning shaft with the turns progressing toward the front of the chassis. After string is installed, stretch the tension spring and fasten free end of cord to spring.



REPLACEMENT PARTS LIST

NOTICE: There is a model number label on the chassis. This label identifies the radio as to chassis, dial and issue letter. When ordering parts or writing, give ALL information appearing on this label.

MISCELLANEOUS

			LIST PRICE
12A479	5" PM Speaker		$4.40
3A435	Molded Octal Tube Socket		.15
55X321	Cabinet, Plastic		4.90
14X411	Grille Cloth		.25
10A297	Knob		.10
13X328	Line Cord and Plug Assembly		.85

TRANSFORMERS AND COILS

T-1	9A1943	Loop Antenna Assembly	1.35
T-2	9A1914	Oscillator Coil Assembly	.85
T-3	9A1941	1st I-F Trans. Assembly	1.65
T-4	9A1942	2nd I-F Trans. Assembly	1.65
T-5	51X135	Output Transformer	1.50

R-4	36X373	500 K	Volume Control & Switch	
R-5	B85106	10 meg	0.5	Carbon
R-6, R-7	B84474	470 K	0.5	Carbon
R-8	B83151	150	0.5	Carbon
R-10	B83270	27	0.5	Carbon
R-11	C85152	1500	1.0	Carbon

DIAL AND DRIVE ASSEMBLY

15X242	Pointer	
26X508	Drive Shaft	
19X192	"C" Washer	
10X66	Drive Cord Assembly	
28X113	Drive Cord Tension Spring	
7A217	Pilot Light Socket Assembly	
7A103	No. 47 Pilot Light	
58X701	Dial Glass	

CAPACITORS

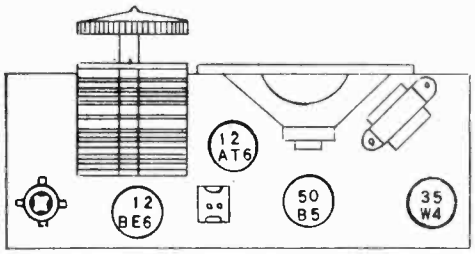
C-2A, C-2B, C-2C, C-2D	14A199	Gang Condenser Assembly	
C-5, C-6		Part of T-3 (1st I-F Trans. Assembly)	
C-7, C-8		Part of T-4 (2nd I-F Trans. Assembly)	
C-9, C-12	47X468	220 mmf	Molded
C-11, C-13	B66502	.005 mf 200 V	Tubular
C-14	D66502	.005 mf 400 V	Tubular
C-16	D66503	.05 mf 400 V	Tubular
C-17A, C-17B	45X363	40 mf 150 V Dry; 40 mf 150 V Electrolytic Con.	
C-18	B66503	.05 mf 200 V	Tubular

RESISTORS

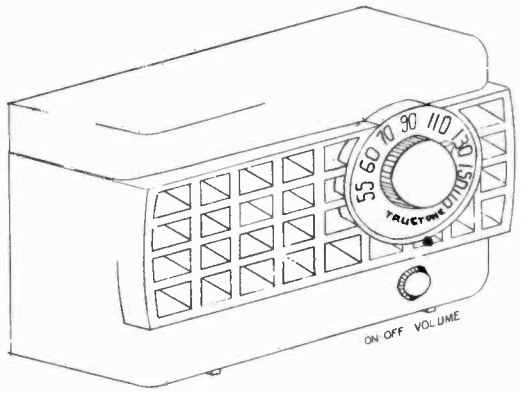
		OHMS	WATTS	
R-1	B84223	22 K	0.5	Carbon
R-2	B85225	2.2 meg.	0.5	Carbon

WESTERN AUTO SUPPLY CO.

MODELS D2906, D2907

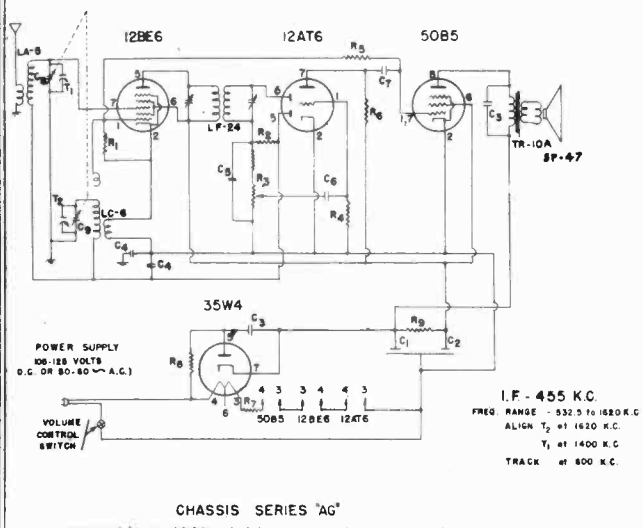


Remove back to replace tubes



ELECTRICAL SPECIFICATIONS

Power Supply	105-125 Volts D.C. or 50-60 Cycles A.C. 30 Watts
Frequency Range	532.5 to 1620 kc.
Intermediate Freq.	455 kc.
Tuning	Two gang capacitor
Speaker	4 inch PM 3.5 ohm voice coil impedance
Power Output	1 watt undistorted 1.5 watt maximum
Sensitivity	800 Microvolts at 50 milliwatts Output
Selectivity	120 kc broad at 1000 times signal at 1000 kc.



CHASSIS SERIES "AG"

REPLACEMENT PARTS LIST

Ref. No.	*Part No.*	*Description*
		CAPACITORS
C1, C2	CE-15	2 x 40 mfd V. Elect
C3	CP203-1	.02 mfd 400V paper cond.
C4	CP503-4	.05 mfd 200V paper cond.
C5	CM151-1	.00015 mfd 500V paper cond.
C6	CP202-2	.002 mfd 400V paper cond.
C7	CP502-3	.005 mfd 200V paper cond.
C8, C9	CV-14	Variable Condenser (2 gang)
		RESISTORS
R1	RC183-2	18,000 ohms ½W 10%
R2	RC475-1	4.7 megohms ½W 20%
R3	VC-11	2 meg. vol. cont., 100 K Stop
R4	RC106-1	10 megohms ½W 20%
R5	RC334-1	330,000 ohms ½W 20%
R6	RC224-1	220,000 ohms ½W 20%
R7	RC390-4	39 ohms 1W 20%
R8	RC180-1	18 ohms ½W 20%
R9	RC222-4	2200 ohms 1W 20%
		COILS & TRANSFORMERS
	LA-5	Antenna Coil
	LC-6	Oscillator Coil
	LF-24	I.F. Transformer
	TR-10	Output Transformer
		MISCELLANEOUS
	CB-106	Cabinet (specify Ivory or Walnut)
	KN-20	Knob
	KN-21	Pointer Knob
	SP-45	4" PM Speaker

ALIGNMENT PROCEDURE

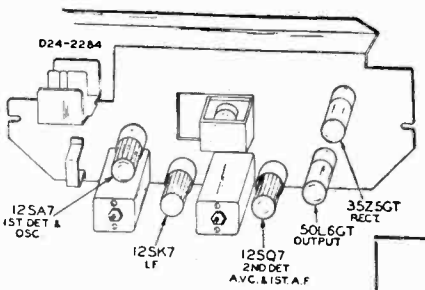
- Output meter across 3.5 ohm output load.
- Volume control at maximum for all adjustments.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

SIGNAL GENERATOR				*SETTING TUNER*	*ADJUST TRIMMERS TO MAXIMUM OUTPUT (in order shown)*
Frequency	*Coupling Factor*	*Connection to Receiver*	*Ground Connection*		
455 kc	.1 mfd	12BE6 Grid	B—	Rotor full open (Plates out of mesh)	Input and output trimmers on IF cans
1620 kc	.1 mfd	12BE6 Grid	B—	Rotor full open (Plates out of mesh)	Oscillator trimmer T2
1400 kc	75 mmf	Hank	B—	1400 kc	Antenna trimmer T1

WESTERN AUTO SUPPLY CO. MODEL D2910

SPECIFICATIONS

5 Tube Superheterodyne, Including Rectifier Tube	Power Output 1.5 watt maximum, 9 watt (10% distortion)
Tuning Frequency Range 540 to 1600 KC	Intermediate Frequency 455 KC
Power Consumption 30 watts (At 117 volts AC	Speaker 5" PM Dynamic



CHECK YOUR LINE VOLTAGE

Unless otherwise marked, this radio must be operated on a power supply of 105-125 volts AC, 50 to 60 cycles only, or 105-125 volts DC.

ALIGNMENT PROCEDURE

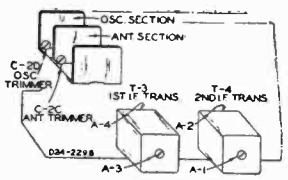
Volume Control—Maximum All Adjustjustments.

Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

The equipment in column at right is requqired for aligning:

Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter: Non-Metalic Screwdriver.
Dummy Antennas—.1 mf., 50 mmf.
Blocking Condenser—.1 mf.

SIGNAL GENERATOR FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	GANG CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
455 K C	Control Grid 12SK7—I. F. Prong No. 4	Chassis Base Through .1 mf. Condenser	.1 mf.	Turn Rotor to full open	2nd I. F. A2 & A1
455 K C	Control Grid 12SA7—1st Det. Prong No. 8	Same As Above	.1 mf.	Turn Rotor to full open	1st I. F. A4 & A3
1620 KC	Control Grid 12SA7—1st Det. Prong No. 8	Same As Above	.1 mf.	Turn Rotor to full open	Oscillator (C-2D)
1400 KC	Reassemble chassis in cabinet See Note B	Same As Above	50 mmf.	Set pointer to 1400 KC. See Note A	Antenna (C-2C)

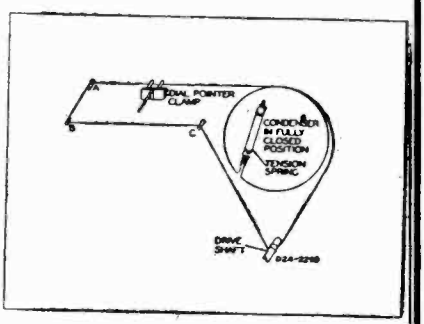


NOTE—Attach pointer to drive cord and position at 1400 KC mark on dial scale.

NOTE B—Wind 2 turn loop of heavy enameled wire 6" diameter connect to signal generator Place loop of wire 6" from loop on set and on the same plane.

DRIVE CORD REPLACEMENT

Turn the large drive pulley to the fully closed position. Use a new 10x66 drive cord assembly or a piece of cord 43 inches long and fasten one end to the tension spring and fasten the other end of the spring to the drive pulley. Install the cord as shown in the illustration. Wind 2¾ turns counterclockwise around the tuning shaft with the turns progressing toward the front of the chassis. After string is installed, stretch the tension spring and fasten free end of cord to spring.



Replacement Parts List

MISCELLANEOUS

2A479	5" PM Speaker	
3A435	Molded Octal Tube Socket	
55X321	Cabinet, Plastic	
14x411	Grille Cloth	
10A297	Knob	
13x328	Line Cord and Plug Assembly	

TRANSFORMERS AND COILS

T-1	9A1943	Loop Antenna Assembly
T-2	9A1914	Oscillat r Coil Assembly
T-3	X-1295	1st I-F Trans. Assembly
T-4	X-1296	2nd I-F Trans. Assembly
T-5	X-507	Output Transformer

CAPACITATORS

C-2A, C-2B			
C-2C, C-2D	14A199	Gang Condenser Assembly	
C-9, C-12	47x468	220 mmfd	
C-11, C13	B66502	.005 mf 200 V Tubular	
C-14	D66502	.005 mf 400 V Tubular	
C-16	D66503	.05 mf 400 V Tubular	
C-17A	45x363	50 mf 150 V Dry Electrolytic Con.	
C-17B			
C-18	B66503	.05 mf. 200 V Tubular	

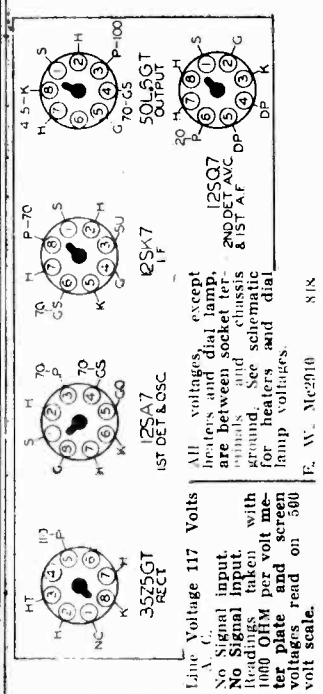
RESISTORS

		OHMS	WATTS	
R-1	B81223	22K	0.5	Carbon
R-2	B85225	2.2 meg	0.5	Carbon
R-4	36x373	500K Volume Control & Switch		
R-5	B85106	10 meg.	0.5	Carbon
R-6, R-7	B84474	470K	0.5	Carbon
R-8	B83151	150	0.5	Carbon
R-10	B83270	27	0.5	Carbon
R-11	C85152	1500	1.0	Carbon

DIAL AND DRIVE ASSEMBLY

15x242	Pointer	
26x508	Drive Shaft	
19x192	"C" Washer	doz
10x66	Drive Cord Assembly	
28x113	Drive Cord Tension Spring	doz.
7A217	Pilot Light Socket Assembly	
7A103	No. 47 Pilot Light	
58x701	Dial Glass	

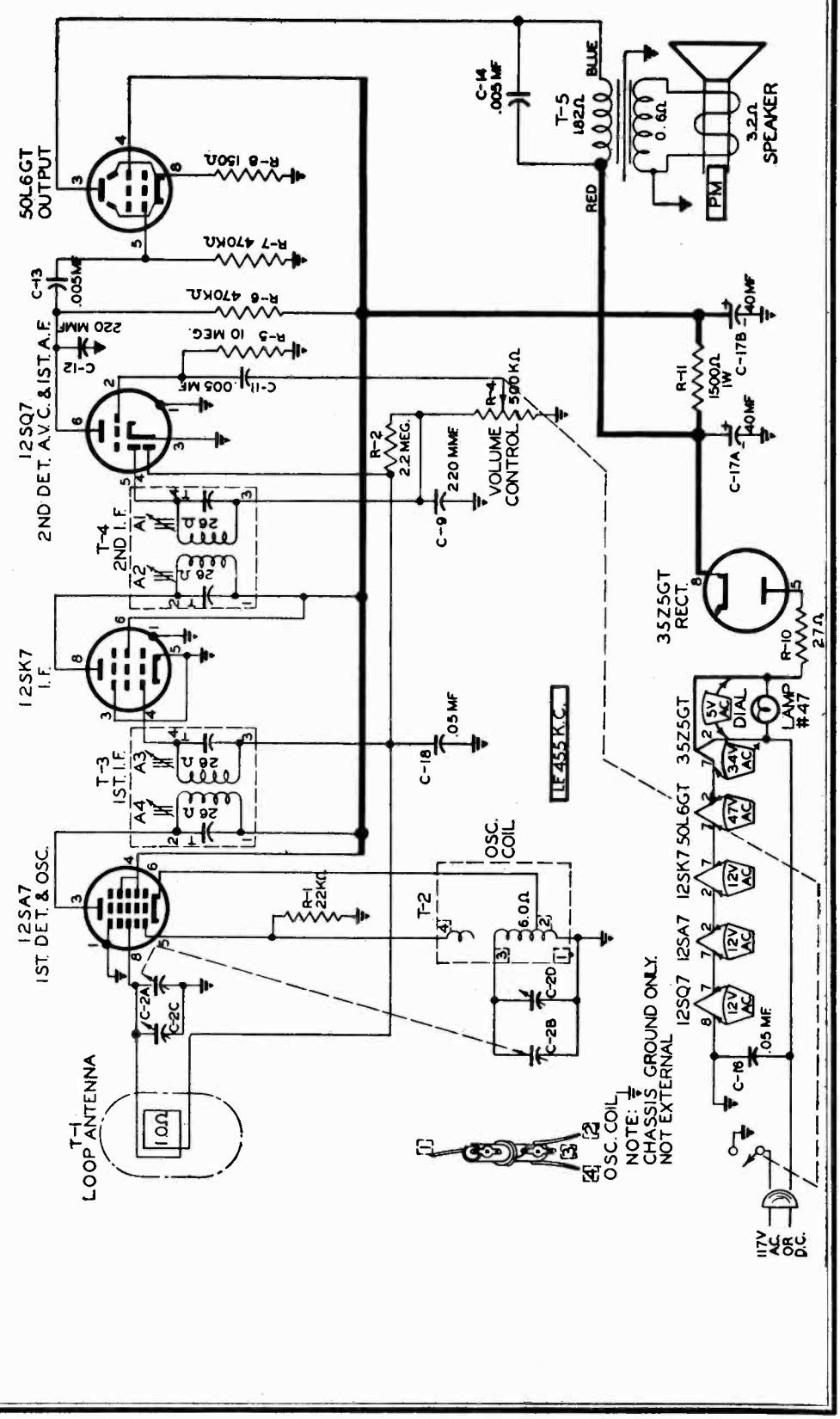
MODEL D2910 WESTERN AUTO SUPPLY CO.



Line Voltage 117 Volts A. C.
No Signal input.
No Signal input. Readings taken with 1000 OHM per volt meter plate and screen voltages read on 500 volt scale.

All voltages, except heaters and dial lamp, are between socket terminals and chassis ground. See schematic for heaters and dial lamp voltages.

F. W. Mc2910 81K



WESTERN AUTO SUPPLY CO.

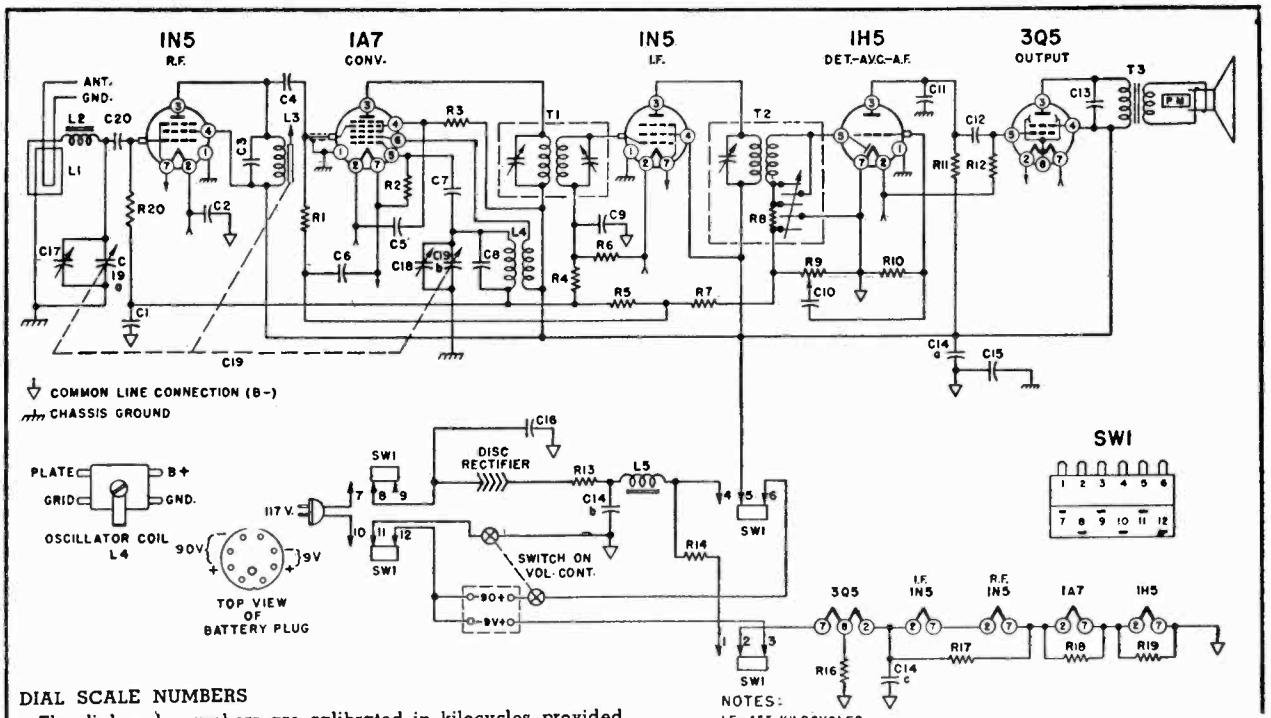
MODELS D3630, D3630N

POWER SUPPLY

This receiver is designed to operate on either a Battery Pack; or any AC (Alternating Current) power supply line of 105 tc 125 volts, 50 to 60 cycles; or DC (Direct Current) power supply line of 105 to 125 volts.

BATTERY

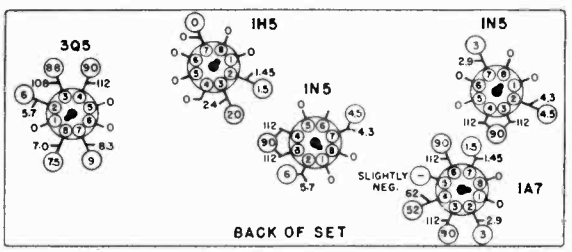
Any one of the following battery packs may be used in this portable radio: Western Auto Supply Wizard B6460 or B6470, Ensign AB50, Ensign AB49, General 60A-6F6-5, General 60B-6F6-5, Burgess F6A60, Burgess G6M60, Eveready 754, Ray-O-Vac AB878 or Ray-O-Vac AB994. For best results, use Western Auto Supply Wizard B6460 (Standard) or B6470 (Deluxe) battery packs for replacement.



DIAL SCALE NUMBERS

The dial scale numbers are calibrated in kilocycles provided one zero is added to the numbers indicated. For example, if the dial pointer is at 70, the radio is tuned to 700 kilocycles. The tuning range of this set is 535 to 1620 kilocycles.

VOLTAGE CHART



VOLTAGE DATA

1. Voltage readings circled (O) are for Battery Operation.
2. All readings made between Tube Socket Terminals and Pin No. 7 on the 1H5.
3. A.C. Voltages measured on a 117 Volt A.C. line.
4. Battery Voltages measured with a fresh battery.
5. Dial turned to low frequency end, no signal.
6. All Voltages measured with a 1000 ohm-per-volt meter.

REPLACEMENT PARTS

CONDENSERS

Symbol	Description	Part No.
C1	.05 Mfd., 200 Volt, Paper	64B1-32
C2	.25 Mfd., 200 Volt, Paper	64B1-28
C3	.00042 Mfd., Mica	65B1-13
C4, C11	.00025 Mfd., Mica	65B5-22
C5, C6, C9, C10, C12	.01 Mfd., 400 Volt, Paper	64B1-25
C7	.00005 Mfd., Mica	65B5-11
C8	.000015 Mfd., Mica	65B5-3
C13	.002 Mfd., 600 Volt, Paper	64B1-14
C14a	50 Mfd., 150 Volt Elect.	
C14b	30 Mfd., 150 Volt Elect.	67C7-42
C14c	100 Mfd., 25 Volt Cond.	
C15	.2 Mfd., 400 Volt, Paper	64A2-1
C16	.05 Mfd., 400 Volt, Paper	64B1-22
C17	Antenna Trimmer	66A12-5
C18	Oscillator Trimmer (Part of Gang)	
C19 (C19a, C19b)	Condenser, Gang	68B4
C20	.00025 Mfd., Mica	65B7-22

RESISTORS

Symbol	Description	Part No.
R1	100,000 Ohms, ½ Watt, Carbon	60B8-104
R2	220,000 Ohms, ½ Watt, Carbon	60B8-224
R3	47,000 Ohms, ½ Watt, Carbon	60B8-473
R4, R5	4.7 Megohms, ¼ Watt, Carbon	60B2-475
R6	4.7 Megohms, ¼ Watt, Carbon	60B2-475
R7	3.3 Megohms, ¼ Watt, Carbon	60B2-335
R8	47,000 Ohms, ½ Watt, Carbon	60B8-473
R9	1 Megohm Volume Control	75B1-10C
R10	15 Megohms, ¼ Watt, Carbon	60B2-156
R11, R20	1 Megohm, ¼ Watt, Carbon	60B2-105
R12	2.2 Megohms, ¼ Watt, Carbon	60B2-225
R13	68 Ohms, Wire Wound, 1 Watt	60B28-4
R14	2,275 Ohms, Wire Wound, 5 Watt	61A3-6
R16	1,500 Ohms, ½ Watt, Carbon	60B8-152
R17	560 Ohms, ½ Watt, Carbon	60B8-561
R18	220 Ohms, ½ Watt, Carbon	60B8-221
R19	120 Ohms, ½ Watt, Carbon	60B8-121

COILS and TRANSFORMERS

Symbol	Description	Part No.
L2	Coil, Loop Loading, (fixed)	AA114
	Coil, Loop Loading, (variable)	AA115
L3	Iron Slug for plate coil	71B1-3
	Coil, Plate	AB100-5
L4	Oscillator Coil	69A7
L5	Choke Filter	74A5
T1	1st I.F. Transformer	72B9-2

COILS and TRANSFORMERS

Symbol	Description	Part No.
T2	2nd I.F. Tranformer	72B10-2
T3	Transformer, Output	*
	* When ordering, specify all numbers on the speaker and transformer.	
SW1	Switch, Power Change D3630	77A6
	Switch, Power Change D3630N	77A10

MISCELLANEOUS

Description	Part No.
Dial Background	21A18-2
Dial Cord, 12"	50A1-3
Dial Cord Tension Spring	19A1-2
Escutcheon and Dial Scale	23C14
Knob, Tuning	33A14-6
Knob, Volume	33A14-5
Plug, Battery (9 prong)	88A3-3
Pointer, Cream Tenite	25A15-1
Rectifier, Selenium	93A1-2
Speaker and Output Transformer	78B8
Tube Shields	87A8

WESTERN AUTO SUPPLY CO.

MODELS D3630, D3630N

1. Be sure both set and signal generator are thoroughly warmed up before starting alignment.
2. Make alignment, using a battery whenever possible.
3. Disconnect Loop Antenna leads from clips on set and remove chassis from cabinet.
4. Connect a 50,000 ohm carbon resistor across the two clips from which the Loop Antenna was removed.
5. Connect Output Meter across the Voice Coil.
6. Connect a fresh battery to the set.
7. Turn receiver Volume Control full on.

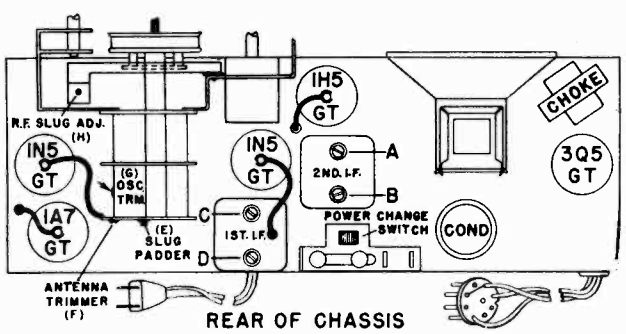
Step	Dummy Antenna Used in Series with Signal Generator	Connect High Side Signal Generator to	Signal Generator Frequency	Gang Condenser Setting	Trimmer Description and Designation	Type of Adjustment
1	.00025 Mfd. when using A.C. .1 Mfd. when using Battery	Grid Cap 1A7	455 K.C.	Any point where it does not affect Signal	2nd I.F. (A), (B). 1st I.F. (C), (D).	Maximum Deflection. Then repeat
2	.00025 Mfd. when using A.C. .1 Mfd. when using Battery	Grid Cap 1N5	1620 K.C.	Rotor full open (Plates out of mesh)	Oscillator Trimmer (G)	Maximum Deflection.
3	.00025 Mfd. when using A.C. .1 Mfd. when using Battery	Grid Cap 1N5	1400 K.C.	Tune in Generator Signal	R.F. Slug (H)	Maximum Deflection.
4	Replace Set in Cabinet					
5	.00025 Mfd.	Antenna and Ground Leads	1400 K.C.	Tune in Generator Signal	Antenna Trimmer (F)	Maximum Deflection.
6	Disregard the next two steps if the set being aligned is a model with a fixed loop loading coil (L2).					
7	.00025 Mfd.	Antenna and Ground Leads	600 K.C.	Tune in Generator Signal	Loop Loading Coil Slug (E)	Maximum Deflection.
8	.00025 Mfd.	Antenna and Ground Leads	1400 K.C.	Tune in Generator Signal	Reset Antenna Trimmer (F)	Maximum Deflection.

Seal adjusting screw on the loop loading coil with any quick drying cement.

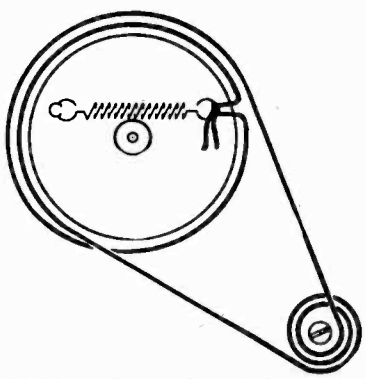
REPLACING R.F. TUNING SLUG

If the R.F. Tuning Slug has to be changed, use the following procedure. Set the gang condenser to the point where the plates are fully meshed. Screw the slug adjusting screw about halfway down. Place the slug in the coil in such a position that the top of the slug is flush with the top of the Coil. Solder the slug wire to the adjusting screw. Be sure that the position of the slug does not change during the soldering and that the slug wire is straight. Proceed to re-align the set as shown in the chart.

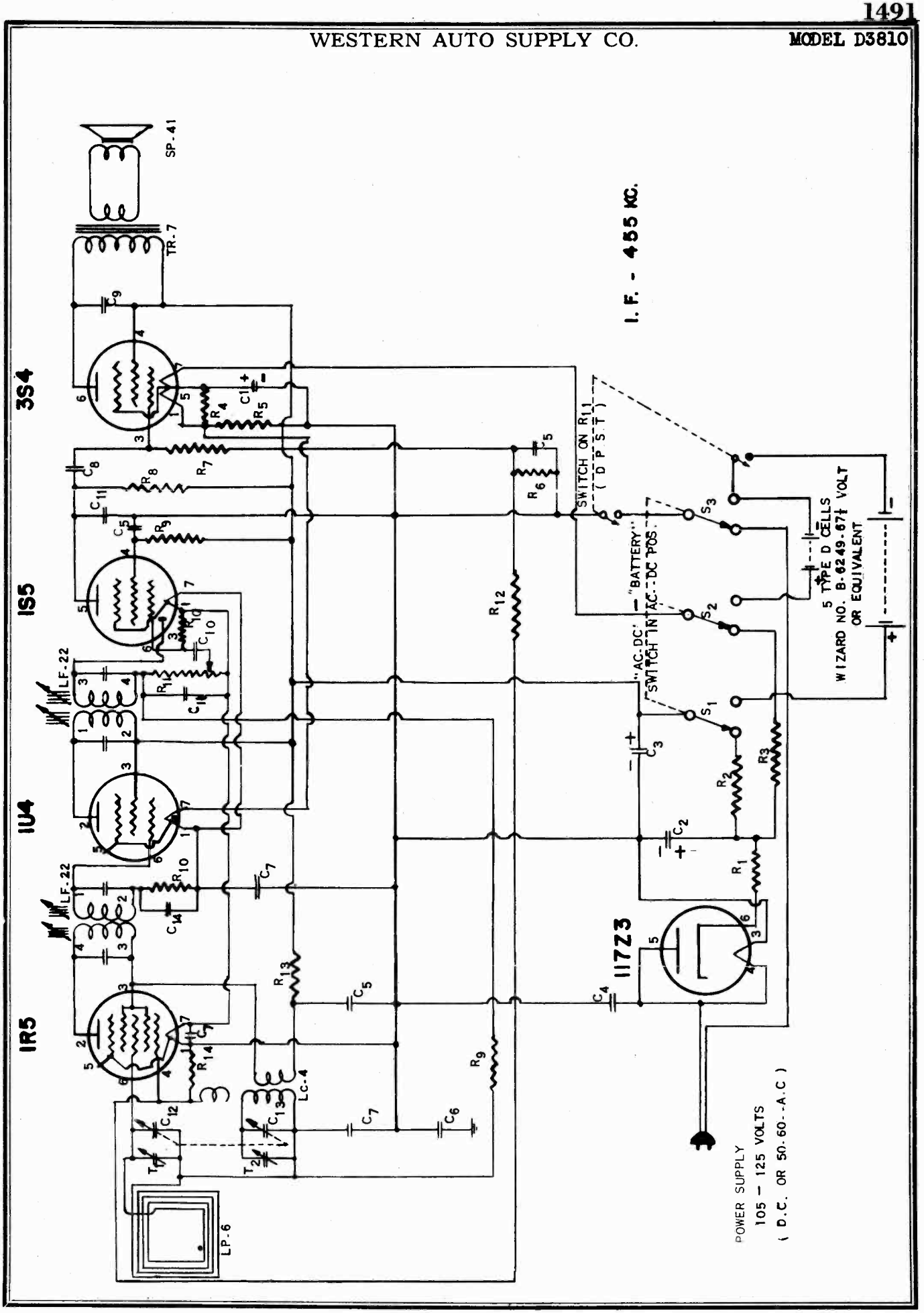
TUBE AND TRIMMER LAYOUT



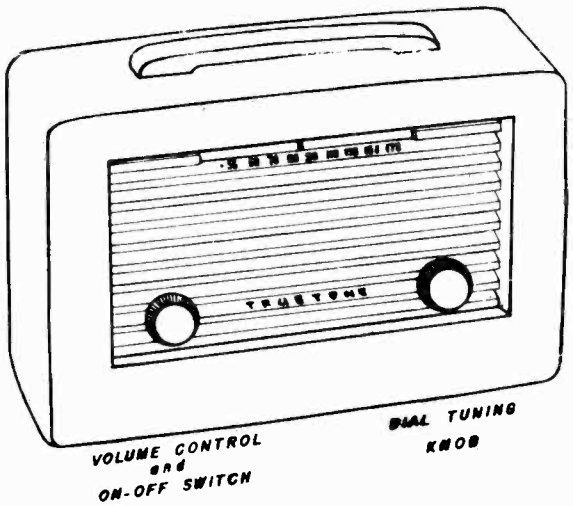
DIAL CORD STRINGING



WESTERN AUTO SUPPLY CO. MODEL D3810



MODEL D3810 WESTERN AUTO SUPPLY CO.



ALIGNMENT PROCEDURE

- Output meter across 3.5 ohm output load.
- Volume control at maximum for all adjustments.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

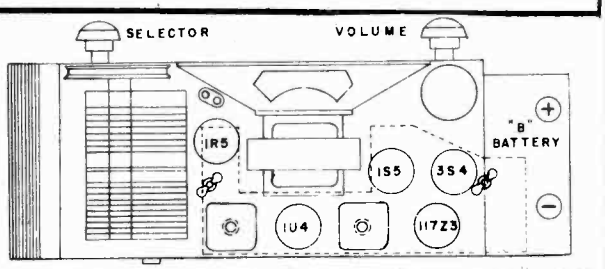
SIGNAL GENERATOR				*SETTING TUNER*	*ADJUST TRIMMERS TO MAXIMUM OUTPUT (in order shown)*
Frequency	*Coupling Factor*	*Connection to Receiver*	*Ground Connection*		
455 kc	.1 mfd	1R5 Grid	B—	Rotor full open (Plates out of mesh)	Input and output trimmers on IF cans
1700 kc	.1 mfd	1R5 Grid	B—	Rotor full open (Plates out of mesh)	Oscillator trimmer T2
1500 kc		Radiating Loop		1500 kc*	Antenna trimmer T1

* Five markings on the dial bracket represent respectively 530 kc., 600 kc., 1000 kc., 1500 kc., and 1700 kc., reading from left to right. These points are to be used for the alignment of the receiver.

POWER SUPPLY

This receiver is designed to operate on either an A.C. or D.C. power supply. The following operation ratings should be observed:

Voltages.....105 - 125 Volts, A.C. or D.C.

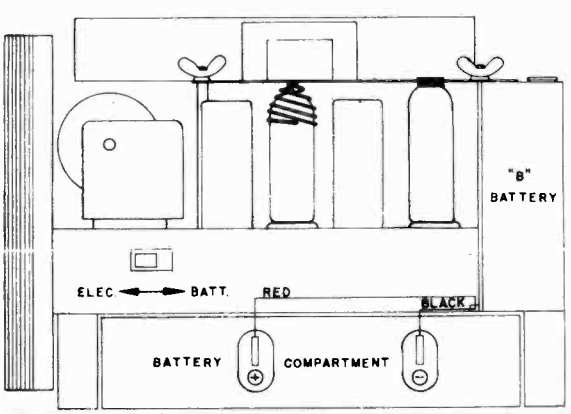


TO REPLACE TUBES, UNSCREW WING NUTS, AND REMOVE TUBE SPRING PLATE

The battery supply to be used with this receiver is as follows:

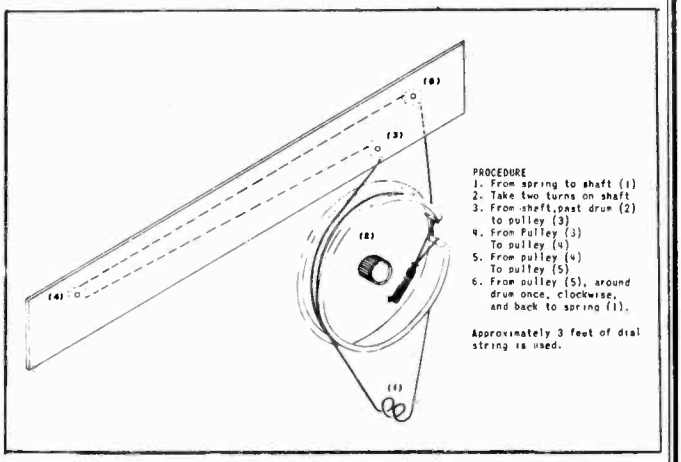
"A" supply ..... 7½ volts. Use five type "D" flashlight cells; Wizard No. B-6732 or Burgess No. 2 or Eveready No. 950 or equivalent.

"B" supply ..... 67½ volts. Use Wizard No. B-6249 or Burgess No. XX45 or Eveready No. 467 or equivalent.



ELECTRICAL SPECIFICATIONS

Power Supply	105-125 volts DC or 50-60 cycles AC 15 watts
Batteries	A—7½ volts. 50 ma. B—67½ volts. 8 ma. average.
Frequency Range	530 to 1700 kc.
Intermediate Freq.	455 kc.
Tuning	Two-gang capacitor
Antenna	Built-in loop
Speaker	4 inch PM; voice coil Impedance 3.5 ohms.
Power Output	80 milliwatts undistorted 140 milliwatts maximum
Sensitivity	500 microvolts per meter for 50 milliwatt output
Selectivity	55 kc broad at 1000 times signal at 1000 kc.



Replacement of Drive Cord

REPLACEMENT PARTS LIST

When ordering parts, specify part number, model number and series.

CAPACITORS

Ref. No.	Part No.	Description
C1, C2, C3,	CE 12	{125 mfd, 10 volt} Electrolytic {25 mfd, 150 volt} condenser
C4	CP 503-5	.05 mfd, 400 volt, paper
C5	CP 103-2	.01 mfd, 150 volt, paper
C6	CP 104-2	.1 mfd, 200 volt, paper
C7	CP 503-2	.05 mfd, 150 volt, paper
C8	CP 202-3	.002 mfd, 200 volt, paper
C9	CP 502-2	.005 mfd, 400 volt, paper
C10	CP 102-3	.001 mfd, 200 volt, paper
C11	CM 101-1	.0001 mfd, 300 volt, mica
C12, C13	CV 10	Variable condenser, 2 gang
C14	CP 103-4	.01 mfd, 100 volt, paper

RESISTORS

R1	RC 180-1	18 ohms,	½ watt 20%
R2	RC 682-5	6800 ohms,	1 watt 10%
R3	RP 3	2650 ohms,	10 watt 5%
R4	RC 471-1	470 ohms,	½ watt 20%
R5	RC 821-2	820 ohms,	½ watt 10%
R6	RC 274-2	270,000 ohms,	½ watt 10%
R7	RC 225-1	2.2 megohms,	½ watt 20%
R8	RC 105-1	1 megohm,	½ watt 20%
R9	RC 335-1	3.3 megohms,	½ watt 20%
R10	RC 106-1	10 megohms,	½ watt 20%
R11	VC 6	1 meg. vol. control with switch	
R12	RC 105-2	1 megohm,	½ watt 10%
R13	RC 153-1	15,000 ohms,	½ watt 20%
R14	RC 104-2	100,000 ohms,	½ watt 10%

COILS AND TRANSFORMERS

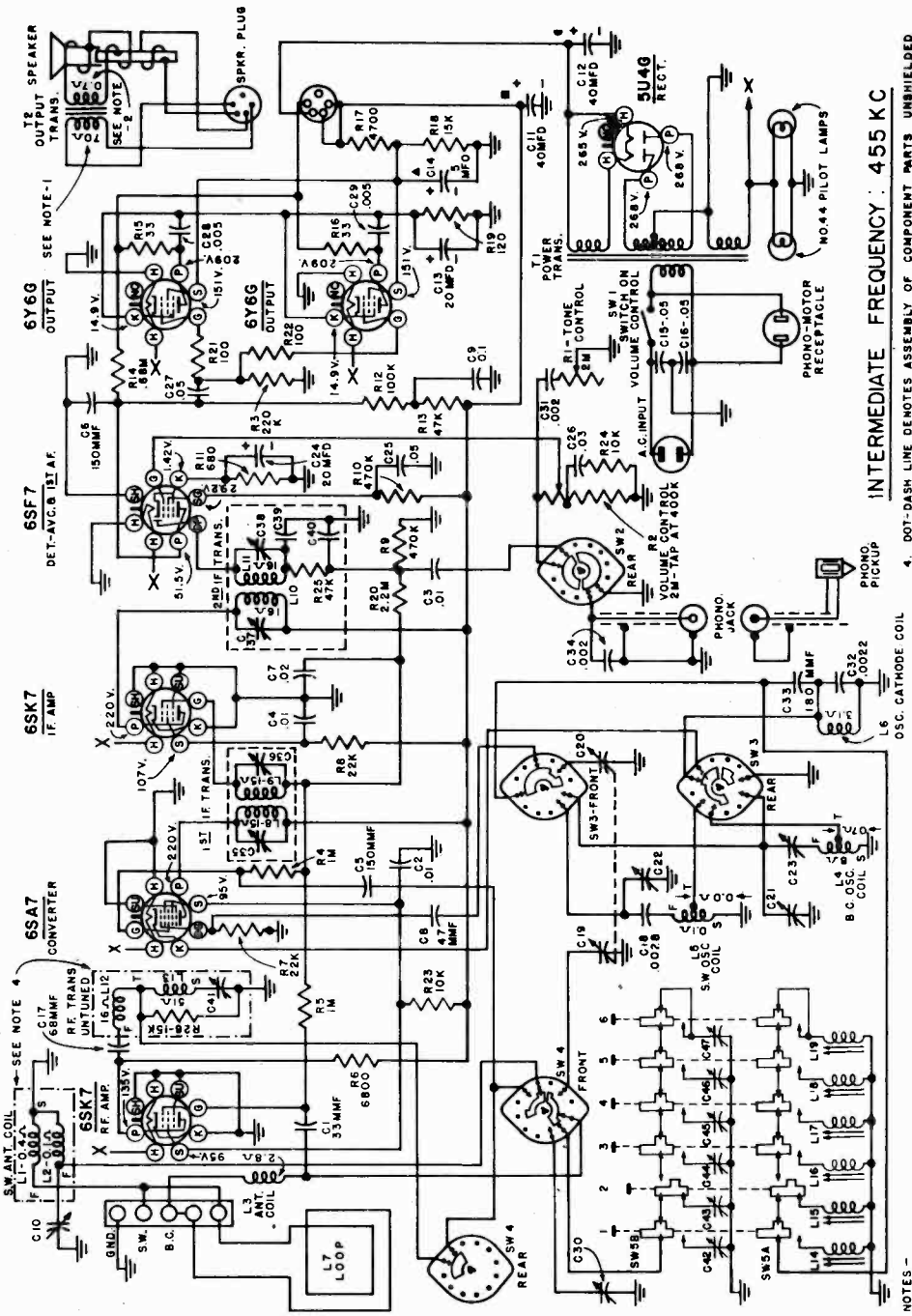
Ref. No.	Part No.	Description
	LC-4	Oscillator coil
	LF-22	IF transformer
	LP- 6	Loop antenna
	TR- 7	Output transformer

MISCELLANEOUS

Ref. No.	Part No.	Description
S1, S2, S3	SW-10	Three Pole Single Throw Switch
	SP-41	4 inch P.M. speaker
	PN-6	Pointer
	CR-2	Drive cord
	SG-1	Spring for drive cord
	KN-20-4	Knob
	BK- 20	Cabinet back (with hardware)
	CB-104A	Assembled cabinet (without back and handle)
	HA-2	Handle for cabinet (with springs and pins)
	AS-1	Assembled battery box

MODELS H104,H105,H107, H108,H110,H111,H137, H138

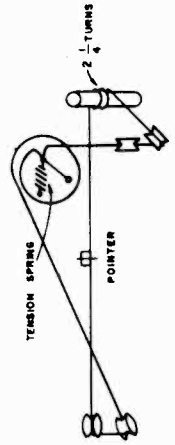
WESTINGHOUSE ELECTRIC CORP.



NOTES –
1. SPEAKER PLUG REMOVED.
2. VOICE COIL DISCONNECTED.
3. SWITCH SW2-3-4 SHOWN AS VIEWED FROM FRONT OF SET IN P.B.-B.C. POSITION.
   EXTREME COUNTER CLOCKWISE POSITION IS PHONO.
   SECOND POSITION CLOCKWISE IS P.B.-B.C.
   THIRD POSITION CLOCKWISE IS MANUAL B.C. BAND.
   FOURTH POSITION CLOCKWISE IS S.W. BAND.
4. DOT-DASH LINE DENOTES ASSEMBLY OF COMPONENT PARTS UNSHIELDED.
5. ALL VOLTAGES MEASURED FROM CHASSIS (GND.) USING 20,000 OHMS/VOLT METER. LINE VOLTAGE 117 V.A.C. MAX. VOLUME CONTROL SETTING AT NO SIGNAL CONDITIONS FOR THE BROADCAST BAND.
   READINGS SHOULD APPROXIMATE THE VALUES SHOWN WITHIN 20 PERCENT.

INTERMEDIATE FREQUENCY: 455 KC

Tuning Drive Ratio ..... 30 to 1



DIAL DRIVE MECHANISM

PUSH BUTTONS

Push buttons 1 to 3 are designed to receive stations from 900 to 1600 kc; push buttons 4 to 6 are designed to receive stations from 540 to 900 kc.

1. Turn on radio and allow it to warm up for five minutes.
2. Set the phono-band switch on "BROADCAST." Tune in the desired station in the frequency range 900 to 1600 kc.
3. Reset the phono-band switch on "PUSH BUTTON" and depress the first push button (right button, viewed from the front). Adjust L14, using a small long-handled screwdriver, to receive the station. Adjust C42 for maximum volume on the station.
4. Return the band switch to "BROADCAST" to make sure that the push button has been set to the desired station.
5. Adjust remaining push buttons in the same manner.

WESTINGHOUSE ELECTRIC CORP.

MODELS H104, H105, H107, H108, H110, H111, H137, H138

SPECIAL PROVISIONS:

H-137 & H-138 ..... Phonograph, FM and television sound input. 110 volt A-C outlet for phonograph motor at rear of chassis.

H-110 & H-111 ..... FM and television sound input at rear of chassis.

SPECIAL PROVISIONS:

H-104 & H-105 ..... Phonograph, F.M. and television sound input. 110 volt A-C outlet for phonograph motor at rear of chassis.

H-107 & H-108 ..... F.M. and television sound input at rear of chassis.

FREQUENCY RANGES:

Standard Broadcast	550 to 1600 kc.
International Short Wave	5.0 to 18 mc.

POWER CONSUMPTION:

H-104 & H-105	145 watts
H-107 & H-108	185 watts

POWER CONSUMPTION:

H-137 & H-138	145 watts
H-110 & H-111	185 watts

PILOT LAMPS: (2),
Westinghouse No. 44, 6.3 volts, 0.25 amps.

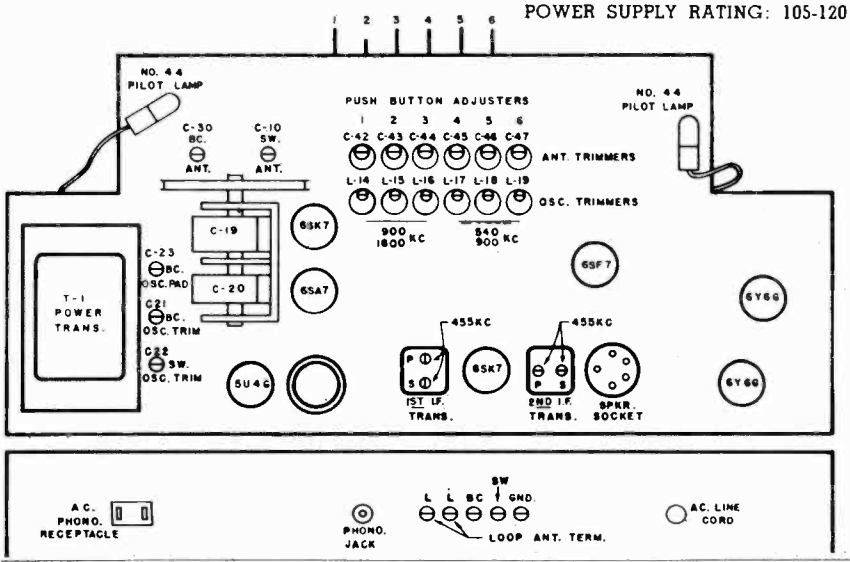
POWER OUTPUT:

Undistorted (radio)	10 watts
Undistorted (phonograph)	10 watts
Maximum	15 watts

LOUDSPEAKER:

Type	Electro-dynamic
Field Resistance	200 ohms
Voice Coil Impedance	3.2 ohms
Size (H-104 & H-105)	6 inches
Size (H-107 & H-108)	8 inches

POWER SUPPLY RATING: 105-120 volts, 50-60 cycles A-C



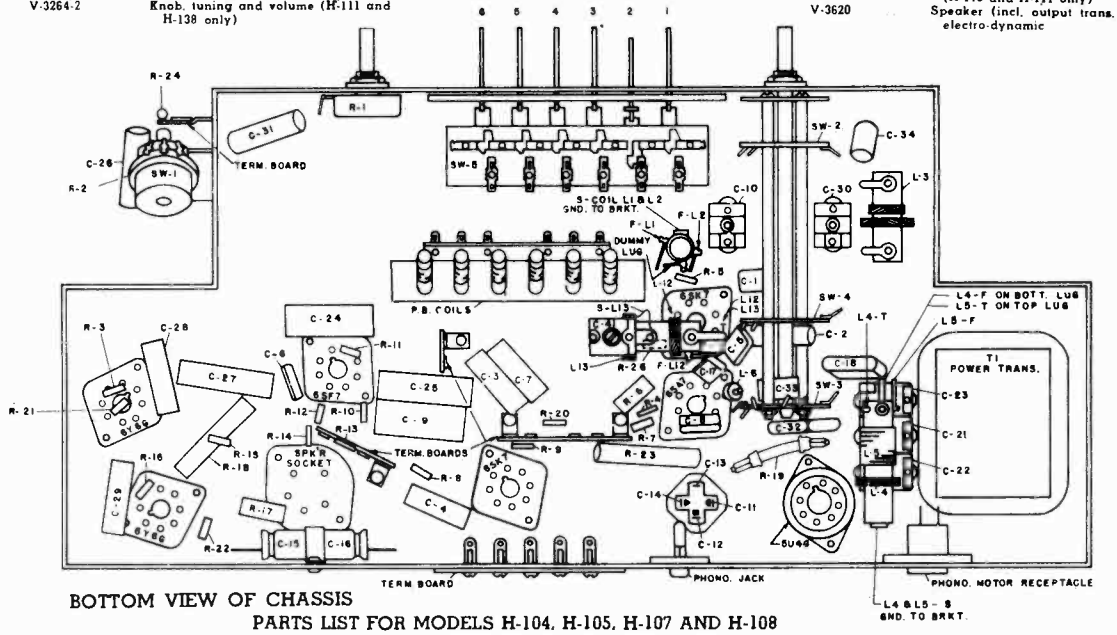
Steps	Connect Signal Generator to—	Adjust Signal Generator to—	Tune Radio Dial to —	Adjust
1	6SK7, i-f amplifier, control grid through a 0.1 mfd. capacitor	455 kc	550 kc	secondary trimmer of 2nd i-f transformer for maximum output
2	6SK7, i-f amplifier, control grid through a 0.1 mfd. capacitor	455 kc	550 kc	primary trimmer of 2nd i-f transformer for maximum output
3	6SA7, converter, control grid through a 0.1 mfd. capacitor	455 kc	550 kc	secondary trimmer of 1st i-f transformer for maximum output
4	6SA7, converter, control grid through a 0.1 mfd. capacitor	455 kc	550 kc	primary trimmer of 1st i-f transformer for maximum output
5	6SA7, converter, control grid through a 0.1 mfd. capacitor	455 kc	550 kc	"peak" all i-f trimmers for maximum output
6	6SK7, r-f amplifier, control grid through a 0.1 mfd. capacitor	455 kc	550 kc	i-f rejection trap trimmer for minimum output
7	"B.C." antenna terminal through a 200 mmfd. capacitor	600 kc	600 kc	broadcast band "oscillator padder" for maximum output
8	"B.C." antenna terminal through a 200 mmfd. capacitor	1620 kc	minimum capacity stop	broadcast band "oscillator trimmer" for maximum output
9	recheck steps 7 and 8 in order given			
10	radiated signal (no actual connection)	1400 kc	1400 kc	broadcast band "antenna trimmer" for maximum output
11	set phono-band switch on position "4"			
12	"S.W." antenna terminal through 400 ohm resistor	18.5 mc	minimum capacity stop	short wave "oscillator trimmer" for maximum output
13	radiated signal (no actual connection)	16 mc	16 mc	short wave "antenna trimmer" for maximum output

MODELS H104, H105, H107, H108, H110, H111, H137, H138 WESTINGHOUSE ELECTRIC CORP.

PARTS LIST FOR MODELS H-110, H-111, H-137 AND H-138

The parts listed below for the MODELS H-104, H-105, H-107and H-108 apply to MODELS H-110, H-111, H-137 and H-138 with the following exceptions;

V-3390	Decal, band (H-110 and H-111 only)
V-3792	Decal, band (H-137 and H-138 only)
V-3197	Decal, tone (H-110 and H-111 only)
V-3791	Decal, tone (H-137 and H-138 only)
V-3262-1	Knob, tone (H-110 and H-137 only)
V-3262-2	Knob, tone (H-111 and H-138 only)
V-3262-3	Knob, band (H-110 and H-137 only)
V-3262-4	Knob, band (H-111 and H-138 only)
V-3264-1	Knob, tuning and volume (H-110 and H-137 only)
V-3264-2	Knob, tuning and volume (H-111 and H-138 only)
V-3832-1	Cardboard and grille cloth assy., speaker section (H-110 only)
V-3832-2	Cardboard and grille cloth assy., speaker section (H-111 only)
V-3833-1	Cardboard and grille cloth assy., record storage section (H-110 only)
V-3833-2	Cardboard and grille cloth assy., record storage section (H-111 only)
V-3686-1	Grille cloth, speaker (H-137 only)
V-3686-2	Grille cloth, speaker (H-138 only)
V-3283-1	Loop assembly (L7)
V-3229-2	Moulding, dial
V-3534	Plate, front glass (H-110 only)
V-3819	Plate, front glass (H-111 only)
V-3813	Plate, front glass (H-137 only)
V-3685	Plate, front glass (H-138 only)
V-3639-1	Slide mechanism, left hand unit (H-110 and H-111 only)
V-3639-2	Slide mechanism, right hand unit (H-110 and H-111 only)
V-3620	Speaker (incl, output trans, T2) 10" electro-dynamic



BOTTOM VIEW OF CHASSIS

PARTS LIST FOR MODELS H-104, H-105, H-107 AND H-108

When ordering parts specify model number of set in addition to part number and description of part.

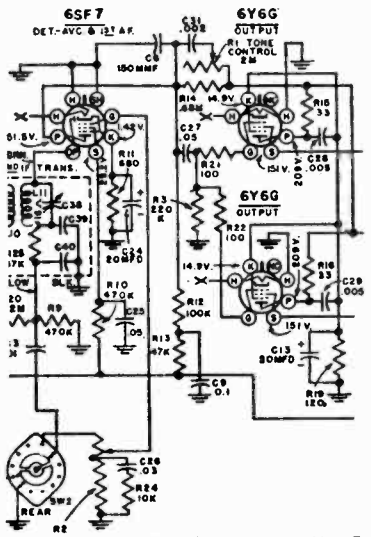
Part No.	Description
V-3615	Asbestos sheet (H-104 and H-105 only)
V-3186	Background, felt
V-3532S	Bar, flat, for phono mtg. (H-107 and H 108 only).
V-3336	Bracket assembly, dial background
V-3185	Bracket, dial light
V-1102-1	Cabinet (H-104 only)
V-1102-2	Cabinet (H-105 only)
RCM20A330M	Capacitor, 33 mmf mica (C1)
RCP10W4103A	Capacitor, 0.01 mfd 400 v. (C2, C3, C4)
RCM20A151M	Capacitor, 150 mmf mica (C5, C6)
RCP10W4203A	Capacitor, 0.02 mfd 400 v. (C7)
RCM20B470M	Capacitor, 47 mmf mica (C8)
RCP10W4104A	Capacitor, 0.1 mfd 400 v. (C9)
V-3170	Capacitor, S.W. ant. trimmer (C10)
V-3216	Capacitor, electrolytic, 40 mfd 350 v. (C11), 40 mfd 350 v. (C12), 20 mfd 25 v. (C13), 5 mfd 250 v. (C-14)
V-3241	Capacitor, dual line filter (C15, C16)
RCM20A680M	Capacitor, 68 mmf mica (C17)
RCM30C282H	Capacitor, 0.0028 mfd S.W. padder (C18)
V-3233	Capacitor, variable, 2-gang (C19, C20)
V-3217	Capacitor, 3-gang trimmer (C21, C22, C23)
V-3236	Capacitor, electrolytic, 20 mfd 25 v. (C24)
RCP10W4503A	Capacitor, 0.05 mfd 400 v. (C25)
RCP10W4303A	Capacitor, 0.03 mfd 400 v. (C26)
RCP10M4503A	Capacitor, 0.05 mfd 400 v. (C27)
RCP10M6502A	Capacitor, 0.005 mfd 600 v. (C28, C29)
V-3191	Capacitor, B.C. ant. trimmer (C30)
RCP10W6202A	Capacitor, 0.002 mfd 600 v. (C31)
RCM30B222M	Capacitor, 0.0022 mfd mica (C32)
RCM20C181J	Capacitor, 180 mmf mica (C33)
RCP10W6202M	Capacitor, 0.002 mfd 600 v. (C34)
V-3183	Clip, speed
V-3224	Coil, S.W. ant. (L1, L2)
V-3238	Coil, ant. loading (L3)
V-3243	Coil, B.C. and S.W. osc. (L4, L5)
V-3313	Coil, osc. cathode (L6)
V-3254	Connector, phono
V-3222	Control, tone, 2 megohms (R1)
V-3221	Control, volume and power, 2 megohms tapped at 400,000 ohms (R2) and switch (SW1)
V-3219S-1	Cord, dial drive
V-3239	Cord, power A-C
V-3421	Cover, back (H-107 and H-108 only)
V-3390	Decal, band
V-3197	Decal, tone
V-3263	Dial
V-3364	Escutcheon, push button
V-3348-1	Grille cloth, speaker (H-107 only)
V-3348-2	Grille cloth, speaker (H-108 only)
V-3924-1	Panel and grille cloth assy., cabinet door (H-107 only)
V-3924-2	Panel and grille cloth assy., cabinet door (H-108 only)
V-3268	Grommet, var. cond. mounting
V-3274S	Holder, tube
V-3262-3	Knob, band (H-104 and H-107 only)
V-3262-4	Knob, band (H-105 and H-108 only)
V-3262-1	Knob, tone (H-104 and H-107 only)
V-3262-2	Knob, tone (H-105 and H-108 only)
V-3264-1	Knob, tuning and volume (H-104 and H-107 only)
V-3264-2	Knob, tuning and volume (H-105 and H-108 only)
(W) No. 44	Lamp, pilot light 6.3 v.
V-3394	Loop assembly (L7) (H-104 and H-105 only)
V-3283-1	Loop assembly (L7) (H-107 and H-108 only)
V-3229-1	Moulding, dial (H-104 and H-105 only)
V-3229-2	Moulding, dial (H-107 and H-108 only)
V-3414	Plate, glass front (H-104 only)
V-3817	Plate, glass front (H-105 only)
V-3194	Plate, glass front (H-107 only)
V-3818	Plate, glass front (H-108 only)
V-3178	Pointer assembly
V-3166S	Pulley, 7 16 dia.
V-3398-1	Push button with spring (H-104 and H-107 only)
V-3398-2	Push button with spring (H-105 and H-108 only)
V-3181	Rail, pointer
RC10AE224M	Resistor, 220K 1/4 w. (R3)
RC10AE105M	Resistor, 1M 1/4 w. (R4, R5)
RC41AE682K	Resistor, 6800 ohms 2 w. (R6)
RC10AE223M	Resistor, 22K 1/4 w. (R7, R8)
RC10AE474M	Resistor, 470K 1/4 w. (R9, R10)
RC10AE681M	Resistor, 680 ohms, 1/4 w. (R11)
RC10AE104M	Resistor, 100K 1/4 w. (R12)
RC10AE473M	Resistor, 47K 1/4 w. (R13)
RC10AE684M	Resistor, 0.68M 1/4 w. (R14)
RC10AE330K	Resistor, 33 ohms 1/4 w. (R15, R16)
RC41AE472M	Resistor, 4700 ohms 2 w. (R17)
RC41AE153M	Resistor, 15K 2 w. (R18)
V-3282	Resistor, 120 ohms 3 w. (R19)
RC10AE225M	Resistor, 2.2M 1/4 w. (R20)
RC10AE101M	Resistor, 100 ohms 1/4 w. (R21, R22)
RC41AE103M	Resistor, 10K 2 w. (R23)
RC10AE103M	Resistor, 10K 1/4 w. (R24)
V-3164	Shaft, tuning
V-3353-1	Slide mechanism, left hand unit (H-107 and H-108 only)
V-3353-2	Slide mechanism, right hand unit (H-107 and H-108 only)
V-3220	Socket, A-C power
V-3275S	Socket, moulded octal
V-3246S	Socket, octal
V-3252-2	Socket, pilot light
V-3162S	Socket, speaker input
V-3294	Speaker (incl, output trans, T2) 6" electro-dynamic (H-104 and H-105 only)
V-3244	Speaker (incl, output trans, T2) 8" electro-dynamic (H-107 and H-108 only)
V-3248S	Spring, dial drive
V-3167S-1	Stud, pulley—threaded (short)
V-3167S-2	Stud, pulley—threaded (long)
V-3261-1	Switch, push button (SW5A, SW5B)
V-3289	Switch, selector (SW2, SW3, SW4)
V-3395	Tabs, station
V-3431	Window, station tab
V-3255	Terminal board, ant, gnd.
V-3228S-2	Terminal board, 2 lugs
V-3231	Terminal board, 3 lugs
V-3232	Terminal board, 5 lugs
V-3218	Transformer, 1st I-F (L8, L9, C35, C36)
V-3249	Transformer, 2nd I-F (L10, L11, C37, C38, C39, C40, R25)
V-3250	Transformer, power (T1)
V-3245	Transformer, untuned R-F (L12, L13, C41, R26)
V-3317	Tuner, push button (L14 to L19, and C42 to C47 incl.)
V-3237	Washer, cup
V-3184S	"C" washer
V-3215S	Washer, spring

WESTINGHOUSE ELECTRIC CORP.

WESTINGHOUSE H-104, H-105, H-107, H-108

In later productions of Westinghouse Models H-104, H-105, H-107, H-108 the tone-control circuit was modified to provide greater tonal range. In chassis incorporating this change, the chassis number was changed from V-2102 to V-2102-1. This change is shown in the accompanying diagram. The same two components that comprised the tone-control circuit in the early production models, C31 (0.002-μf) and tone control R1 (2 megohms), are also used in the later revised models. The former tone-control circuit was removed from the connection it had to the volume control, R2, and wired to the plate circuit of the 6SF7 first audio tube as follows:

One end of capacitor C31 is connected to the plate of the 6SF7 tube and the other end to the variable arm of the tone control, R1. One end of the tone control is connected between resistors R14 and R15, or between resistors R14 and R16, (since R14 is tied to one end of either of the other resistors), and the other end of the tone control left open.



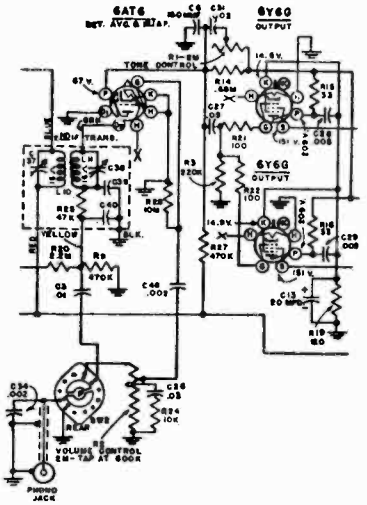
Courtesy Westinghouse Elec. Corp.

Tone-control circuit in Westinghouse chassis V-2102-1 showing changes.

Westinghouse H-104A, H-105A, H-107A, H-108A

These models are modified versions of the same model numbers without the suffix A. The chassis number of the models carrying the suffix A is V-2102-2.

The major difference in this latest chassis is the substitution of a 6AT6 tube for the 6SF7 detector, avc, and first a-f amplifier. This necessitates the introduction of C48, (0.002 μf, 600 volts) between the control-grid of the 6AT6 and the movable arm of the volume control. The cathode and one end of the heater are connected to ground and to a 10,000-ohm resistor, R28, the other side of which goes to C48. R27, a 470,000-ohm, 0.25-watt resistor has been substituted for R12 and R13, thus eliminating C9 (0.1 μf). These changes are shown in the accompanying partial schematic, in which it should also be noted that now there is 67 volts on the plate of the 6AT6 instead of 51.5 as in the case of the 6SF7.



Modified Westinghouse chassis V-2102-2, showing changes due to use of 6AT6.

Westinghouse H-110A, H-111A, H-137A, and H-138A, Chassis V-2102-2

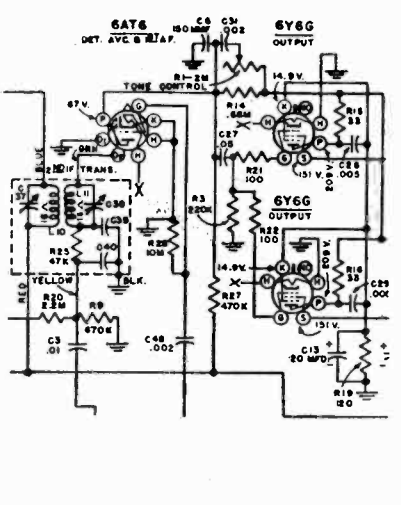
These models are the same as Model H-104 , except that the tone control circuit has been modified and a 6AT6 miniature tube replaces the 6SF7 tube used originally. The tube layout is the same, but certain components have been added, as may be seen in the accompanying diagrams.

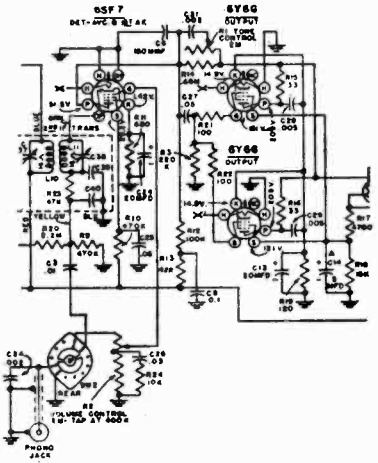
The following parts should be added to the parts list.

Part No.	Description
RCP10W6202A	Capacitor, 0.002 μf, 600 v. (C48)
RC10AE474M	Resistor, 470K ¼ w, (R27)
RC10AE106M	Resistor, 10M ¼ w. (R28)

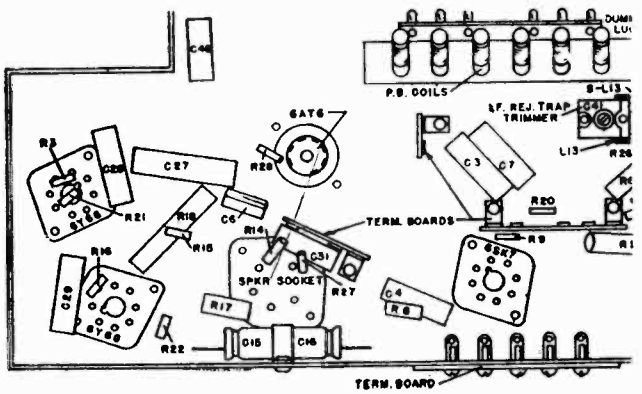
Westinghouse H-110, H-111, H-137, and H-138, Chassis V-2102-1

These models are the same as Model H-104 , except that the tone control circuit has been modified. This change is illustrated in the accompanying diagram.





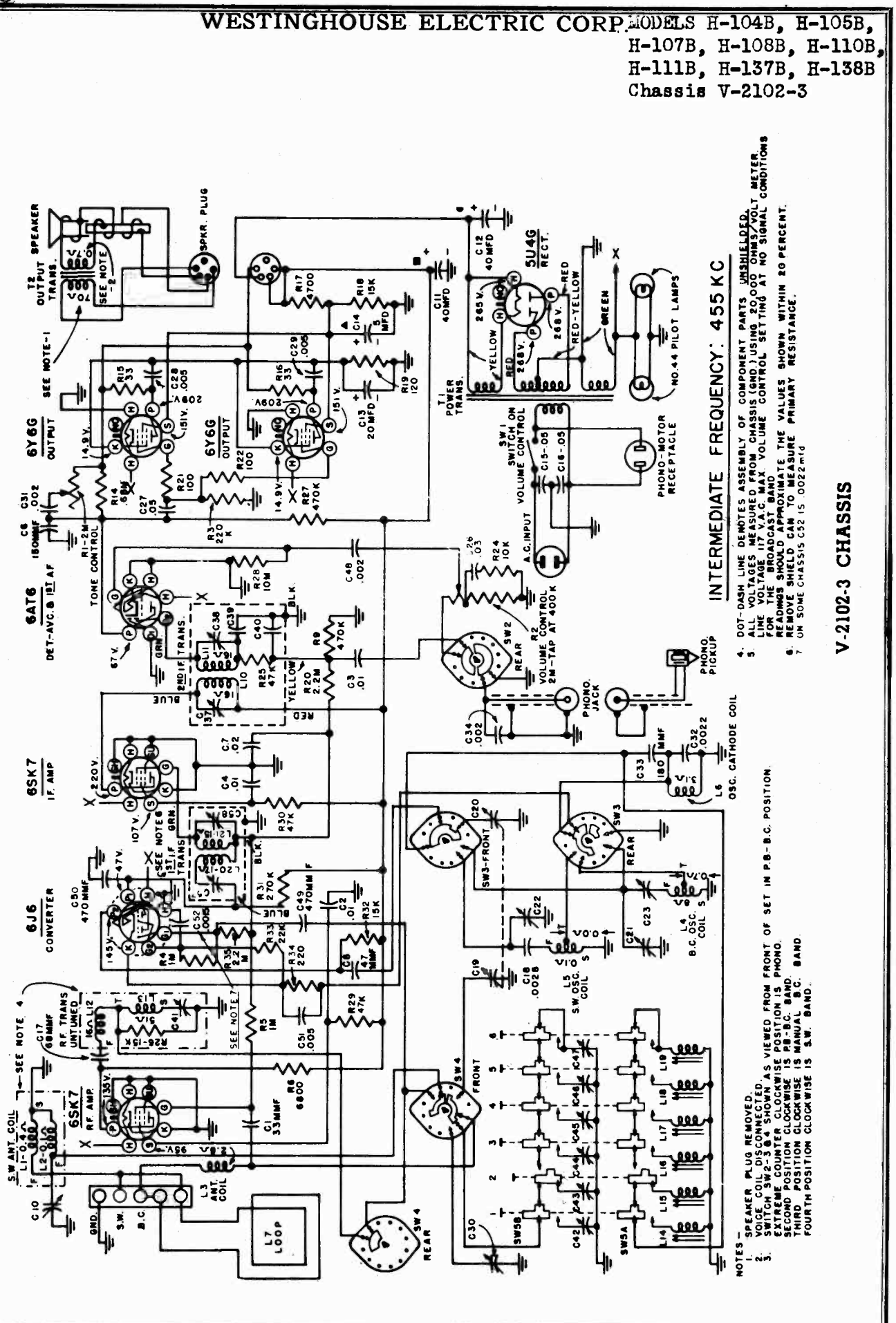
The modified tone control circuit of the Westinghouse Chassis V-2102-1.



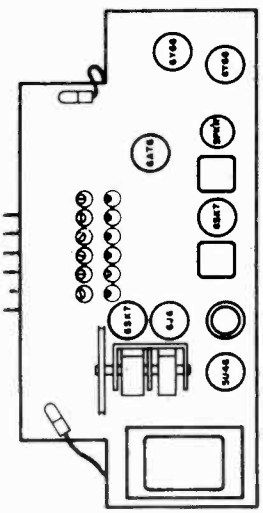
Changes in the tone control circuit, above, and in the parts layout, left, of the Westinghouse Chassis V-2102-2.

WESTINGHOUSE ELECTRIC CORP.

MODELS H-104B, H-105B,
H-107B, H-108B, H-110B,
H-111B, H-137B, H-138B
Chassis V-2102-3



WESTINGHOUSE ELECTRIC CORP. MODELS H-104B, H-105B, H-107B, H-108B, H-110B, H-111B, H-137B, H-138B Chassis V-2102-3



TUBE LAYOUT, V-2102-3 AND V-2102-5 CHASSIS

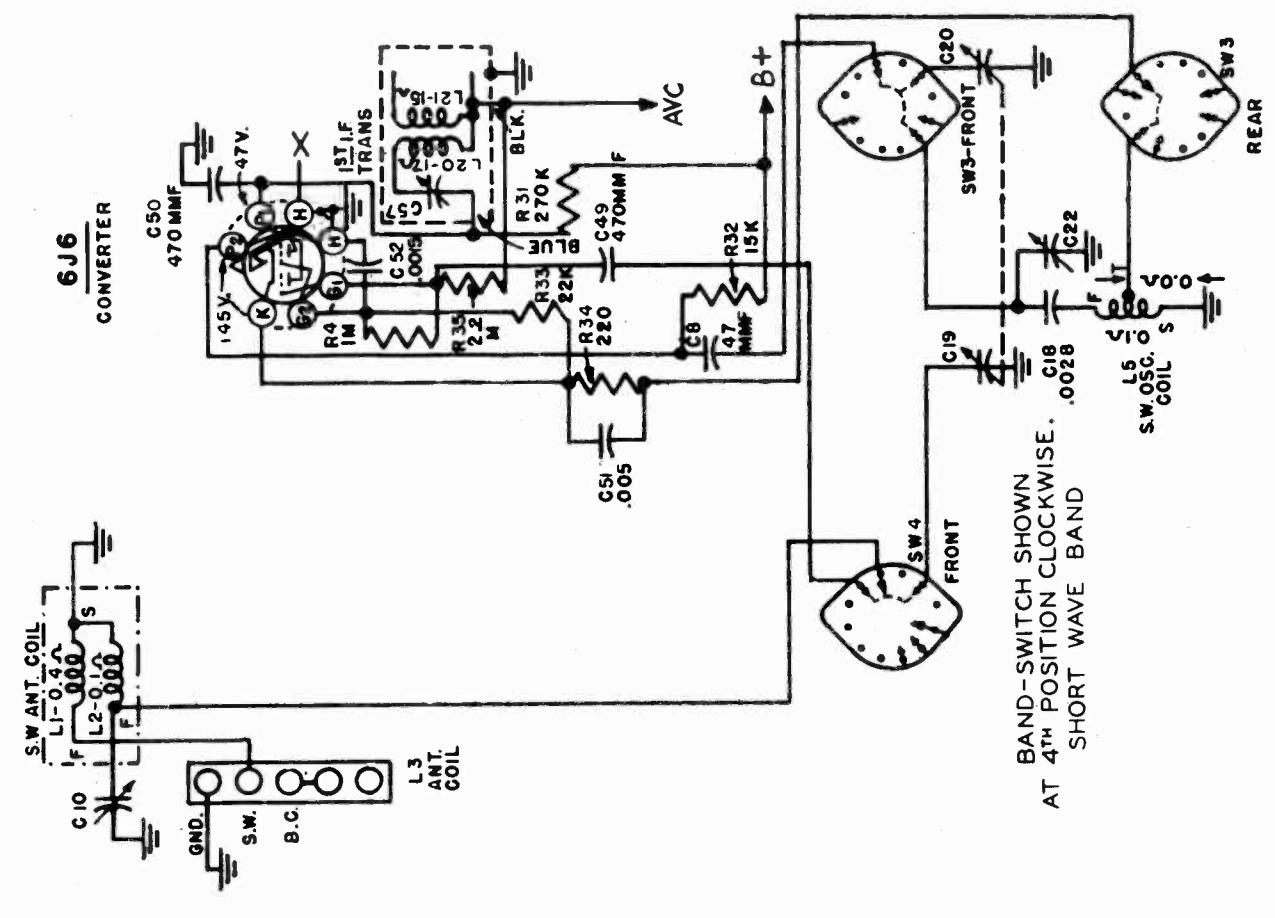
PARTS LIST ADDITIONS FOR MODELS H-104B, H-105B, H-107B AND H-108B H-110B, H-111B, H-137B AND H-138B

PART NO.	DESCRIPTION
RCP10W6202A	Capacitor, .002 mfd 600 v. (C48)
RCM20A471M	Capacitor, 470 mmf mica (C49, C50)
RCP10W6502A	Capacitor, .005 mfd 600 v. (C51)
RCM30B222M	Capacitor, .0022 mfd mica (C52)
RCM20A221M	Capacitor, 220 mmf mica (C53)
RCM30B102M	Capacitor, .001 mfd mica (C54)
RCM20C201J	Capacitor, 200 mmf mica (C55)
RCP10W4503A	Capacitor, .05 mfd 400 v. (C56)
RCP10W4203A	Capacitor, .02 mfd 400 v. (C61)
V-4317	Coil, B.C. and S.W. osc. (L24, L25)—V-2102-5 Chassis only
V-4316	Coil, osc. cathode (L26)—V-2102-5 Chassis only
RC10AE474K	Resistor, 470K ¼ w. (R27)
RC10AE106M	Resistor, 10M ¼ w. (R28)
RC20AE473K	Resistor, 47K ½ w. (R29, R30)
RC20AE274K	Resistor, 270K ½ w. (R31)
RC41AE153K	Resistor, 15K 2 w. (R32)
RC10AE223K	Resistor, 22K ¼ w. (R33)
RC10AE221K	Resistor, 220 ohms ¼ w. (R34, R40)
RC10AE225M	Resistor, 2.2M ¼ w. (R35)
RC10AE105M	Resistor, 1M ¼ w. (R36)
RC30AE183K	Resistor, 18K 1 w. (R37)
RC10AE394K	Resistor, 390K ¼ w. (R38)
RC30AE333K	Resistor, 33K 1 w. (R39)
RC10AE683K	Resistor, 68K ¼ w. (R41)
RC10AE680M	Resistor, 68 ohms ¼ w. (R42)
V-4169-2	Shield, 6J6 tube
V-4162-1	Socket Assy., 6AT6 tube (including adapter plate)
V-4162-3	Socket Assy., 6J6 tube (including adapter plate and shield base)
V-4180	Transformer, 1st I-F (L20, L21, C57, C58)—V-2102-3 Chassis only
V-4345	Transformer, 1st I-F (L22, L23, C59, C60)—V-2102-5 Chassis only

ADDITION TO V-3269-1 RECORD CHANGER PARTS LIST

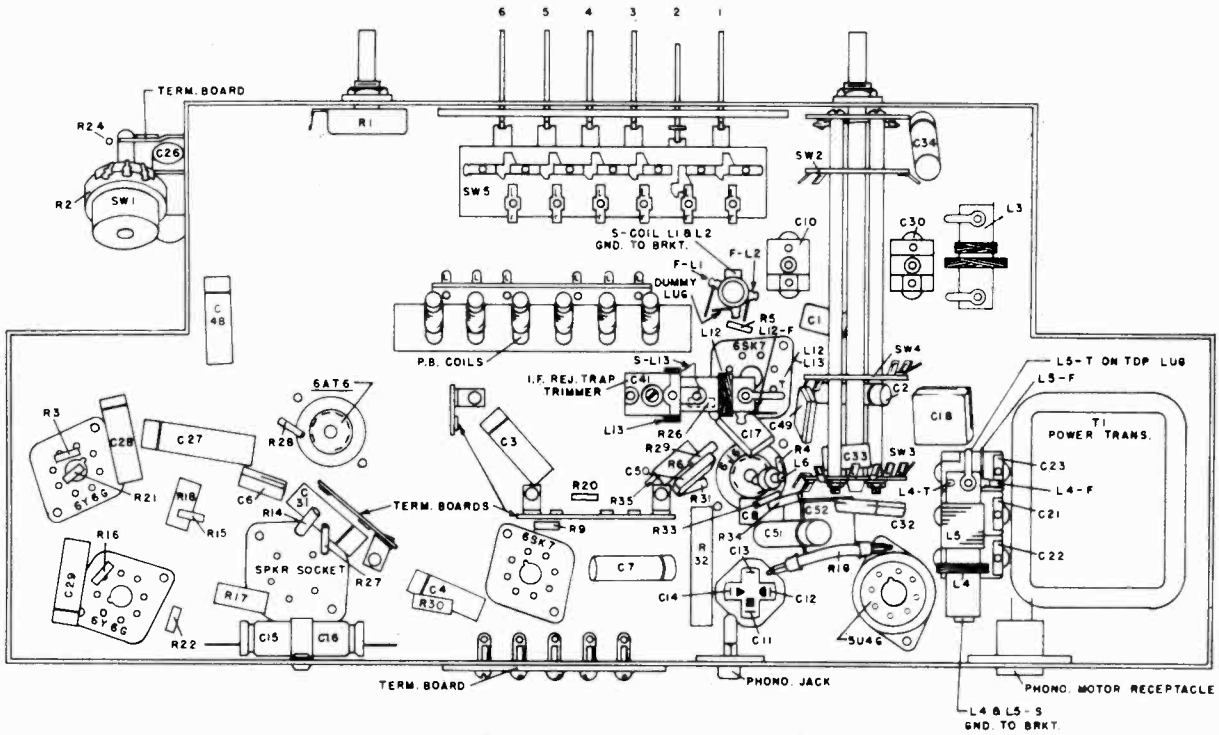
This item should be added to the V-3269-1 Record Changer parts list given in the "Models H-104, H-105, H-107 and H-108 Service Notes."

PART NO.	DESCRIPTION
V-4152	Cord, pickup (shielded)

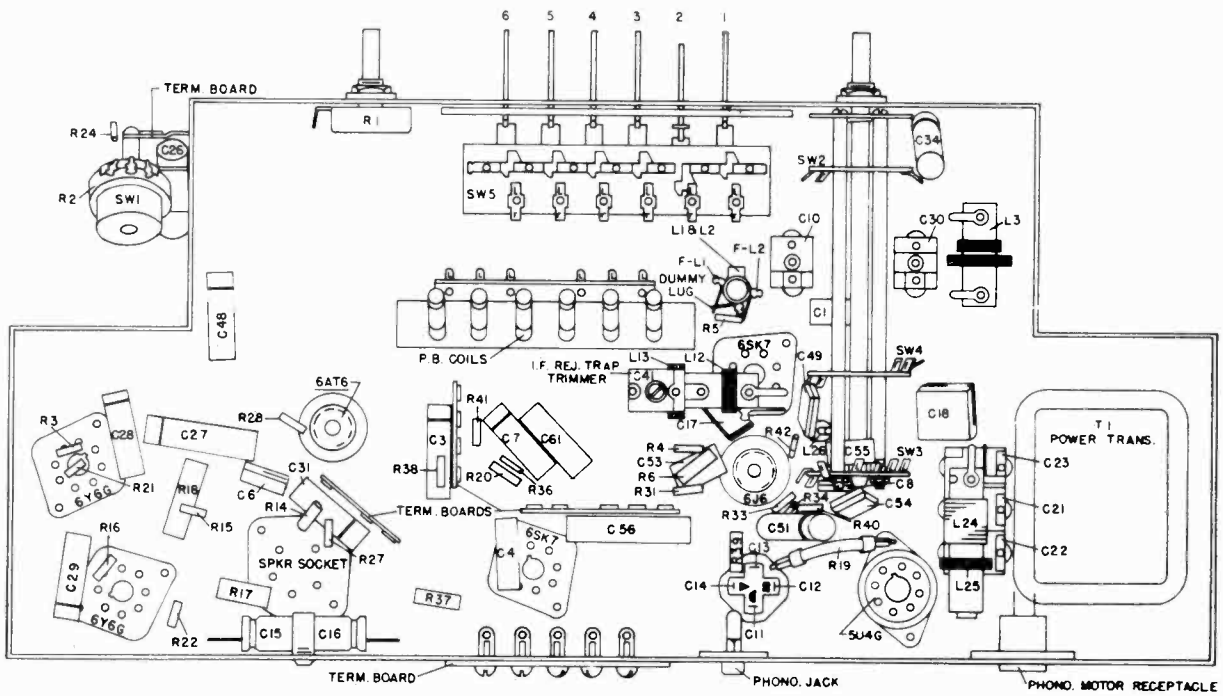


MODELS H-104B, H-105B, H-107B, H-108B, H-110B, H-111B, H-137B, H-138B
Chassis V-2102-3, V-2102-5

WESTINGHOUSE ELECTRIC CORP.

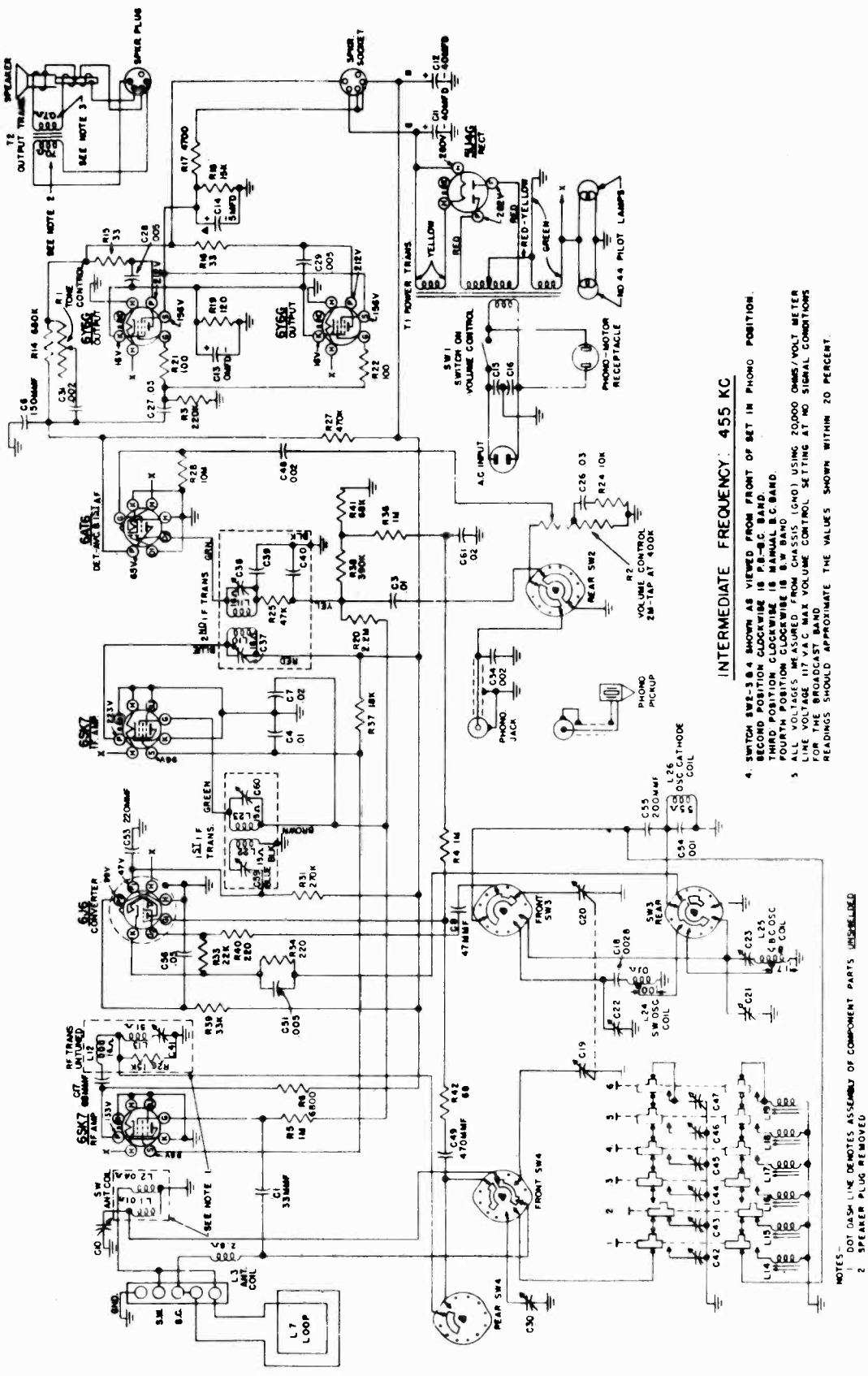


BOTTOM VIEW OF V-2102-3 CHASSIS



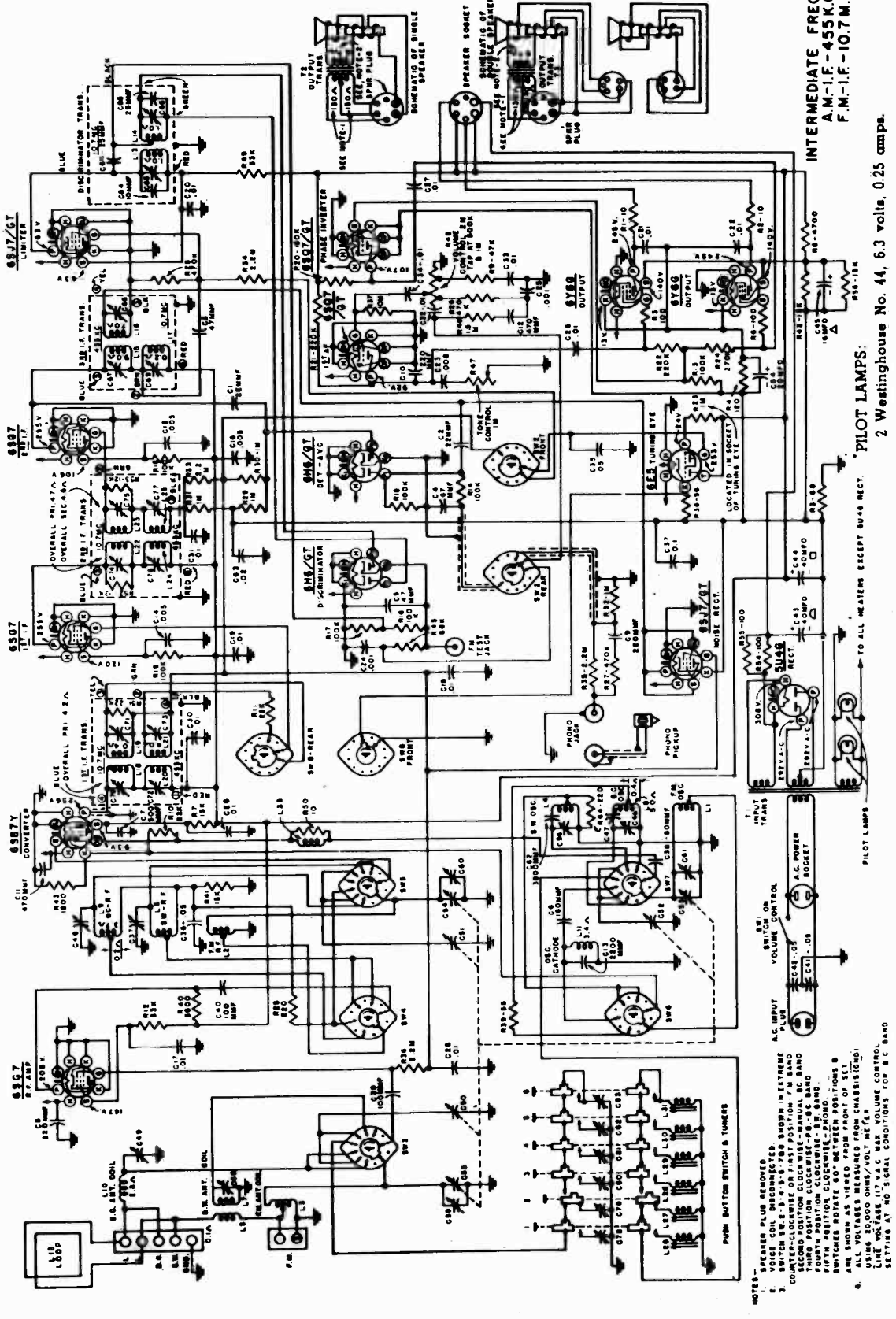
BOTTOM VIEW OF V-2102-5 CHASSIS

WESTINGHOUSE ELECTRIC CORP. MODELS H-104B, H-105B, H-107B, H-108B, H-110B, H-111B, H-137B, H-138B
Chassis V-2102-5

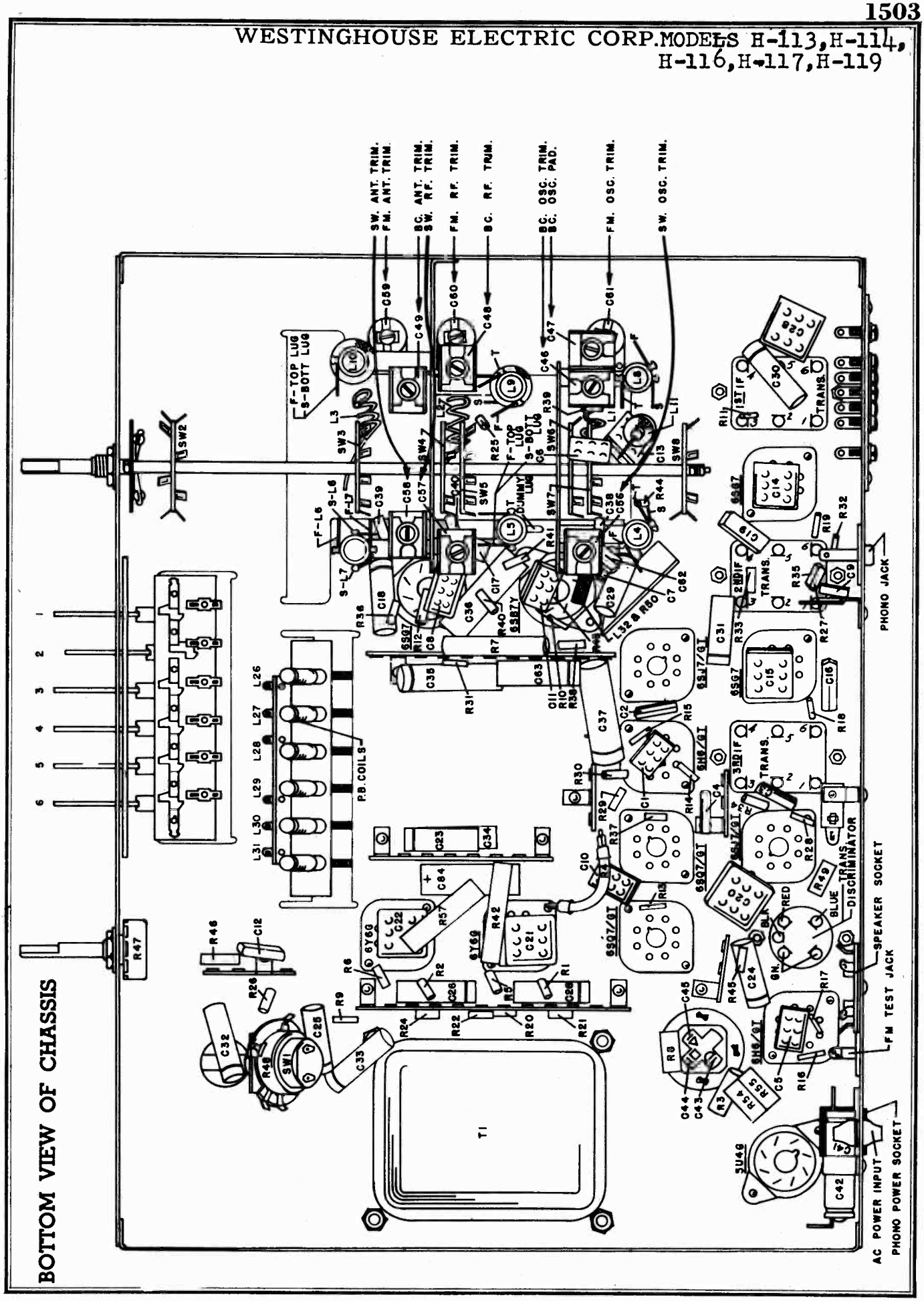


WESTINGHOUSE ELECTRIC CORP.

MODELS H-113, H-114, H-116, H-117, H-119



WESTINGHOUSE ELECTRIC CORP. MODELS H-113, H-114, H-116, H-117, H-119



ALIGNMENT

BROADCAST AND SHORT WAVE BANDS
AMPLITUDE MODULATION

Connect an output meter across the speaker voice coil.

With the volume control set for maximum output and the signal from the generator attenuated to avoid A.V.C. action, proceed as follows:

Step	Connect Signal Generator to—	Signal Generator Frequency	Radio Dial Setting	Adjust
1	Set Phono-Band switch to "BC"			
2	6SG7, 2nd I-F, control grid through a 0.1 mfd capacitor	455 kc	550 kc	455 kc secondary and primary trimmers of 3rd I-F transformer for maximum output.
3	6SG7, 1st I-F, control grid through a 0.1 mfd. capacitor	455 kc	550 kc	455 kc secondary and primary trimmers of 2nd I-F transformer for maximum output.
4	6SB7Y, converter, control grid through a 0.1 mfd capacitor	455 kc	550 kc	455 kc secondary and primary trimmers of 1st I-F transformer for maximum output.
5	6SB7Y, converter, control grid through a 0.1 mfd capacitor	455 kc	550 kc	carefully "peak" all 455 kc I-F transformer trimmers for maximum output.
6	BC antenna terminal through a 200 mmf capacitor	600 kc	600 kc	BC oscillator padder for maximum output.
7	BC antenna terminal through a 200 mmf capacitor	1600 kc	1600 kc	BC oscillator trimmer for maximum output.
8	Re-check steps 6 and 7			
9	Radiated signal (no connection)	1400 kc	1400 kc	BC R-F and ANT trimmers for maximum output.
10	Set Phono-Band switch to "S.W."			
11	SW antenna terminal through a 400 ohm resistor	18.0 mc	18.0 mc	SW oscillator trimmer for maximum output. NOTE: If the signal is heard at two different trimmer settings, the one nearest minimum capacity is correct—the other is the image.
12	Radiated signal (no connection)	16.0 mc	16.0 mc	SW R-F and ANT trimmers for maximum output.

F. M. BAND

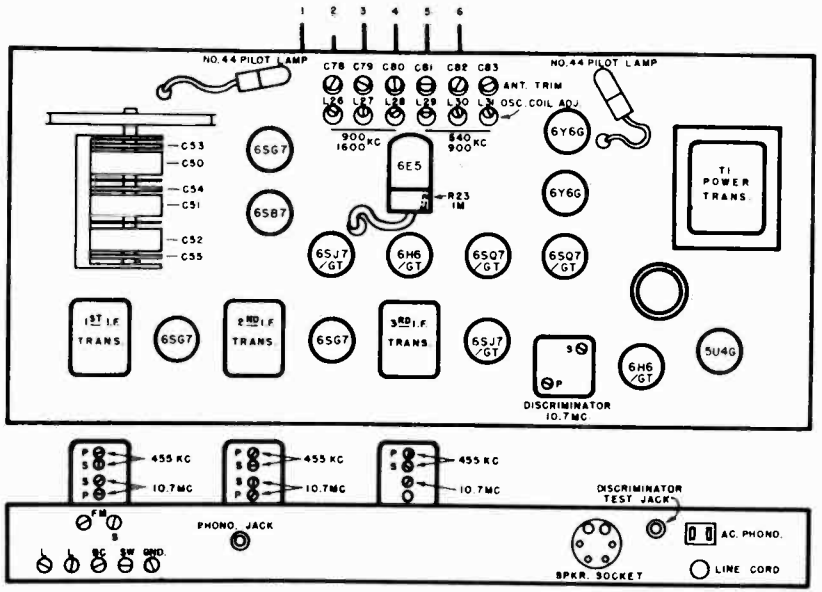
FREQUENCY MODULATION

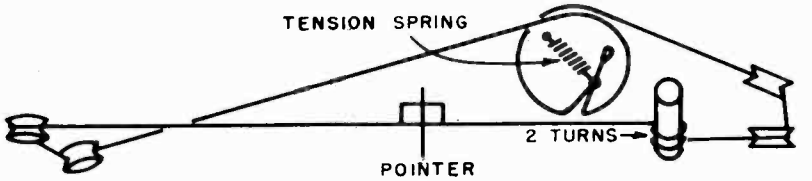
Connect a 20,000 ohms-per-volt or Vacuum Tube Voltmeter between the Discriminator Test Jack and the chassis.

With the volume control set for maximum output and the signal from the generator attenuated to avoid A.V.C. action, proceed as follows:

Step	Connect Signal Generator to—	Signal Generator Frequency	Radio Dial Setting	Adjust
1	Set Phono-Band switch to "F.M."			
2	Detune secondary trimmer of discriminator transformer.			
3	6SG7, 2nd I-F, control grid through a .01 mfd mica capacitor	UNMODULATED 10.7 mc	88 mc	10.7 mc primary trimmer of 3rd I-F trans. for maximum voltage.
4	6SG7, 1st I-F, control grid through a .01 mfd mica capacitor	UNMODULATED 10.7 mc	88 mc	10.7 mc secondary and primary trimmers of 2nd I-F trans. for maximum voltage.
5	Fixed plates of the FM converter tuning capacitor through a .01 mfd mica capacitor	UNMODULATED 10.7 mc	88 mc	10.7 mc secondary and primary trimmers of 1st I-F transformer for maximum voltage.
6	Fixed plates of the FM converter tuning capacitor through a .01 mfd mica capacitor	UNMODULATED 10.7 mc	88 mc	carefully "peak" all 10.7 mc I-F trimmers for maximum voltage.
7	FM antenna terminal through a non-inductive 300 ohm resistor	UNMODULATED 105 mc	105 mc	FM oscillator trimmer for maximum voltage.
8	FM antenna terminal through a non-inductive 300 ohm resistor	UNMODULATED 105 mc	105 mc	FM R-F and ANT trimmers for maximum voltage.
9	Fixed plates of the FM converter tuning capacitor through a .01 mfd mica capacitor	UNMODULATED 10.7 mc	88 mc	Primary trimmer of discriminator transformer for maximum voltage.
10	Fixed plates of the FM converter tuning capacitor through a .01 mfd mica capacitor	UNMODULATED 10.7 mc	88 mc	Secondary trimmer of discriminator transformer for zero voltage. The voltage will change polarity as the trimmer is tuned through resonance. Tune carefully for zero voltage.
11	Re-check steps 9 and 10.			

CHASSIS LAYOUT





DIAL DRIVE MECHANISM

LOUDSPEAKER:

H-113, H-114, H-119:
- Size and Type ..... (1) 12" Electro-Dynamic
- Field Resistance ..... 250 ohms
- Voice Coil Impedance ..... 8 ohms

H-116, H-117:
- Size and Type ..... (2) 8" Electro-Dynamic
- Field Resistance ..... 500 ohms
- Voice Coil Impedance ..... 3.2 ohms

POWER OUTPUT
- Undistorted ..... 14 watts
- Maximum ..... 25 watts

FREQUENCY RANGES:
- Standard Broadcast ..... 550 to 1700 kc.
- International Short Wave ..... 5.0 to 18.0 mc.
- Frequency Modulation ..... 88 to 108 mc.

SPECIAL PROVISIONS:

H-113, H-114:
Phonograph, playback of wire recording and television sound input connection. A-C outlet for phonograph motor at rear of chassis.

H-116, H-117, H-119:
Playback of wire recording and television sound input connection at rear of chassis.

POWER SUPPLY RATING: 105-120 volts, 50-60 cycles A-C

POWER CONSUMPTION (radio sect. only): ... 175 watts

Part No.	Description
V-3420	Background, felt
V-3532S	Bar, flat for phono. mtg. (H-116, H-117)
V-3429S-4	Bolt, chassis mtg.
V-3185	Bracket, dial light (short)
V-3357	Bracket, dial light (long)
V-4086-1	Bracket, motorboard stop, R.H. (H-116, H-117)
V-4086-2	Bracket, motorboard stop, L.H. (H-116, H-117)
V-3671	Bracket, variable capacitor mtg. (rear)
V-3672	Bracket, variable capacitor mtg. (front)
V-3374	Bracket, volume control mtg.
V-3507	Bracket & Clip Assy. (tuning eye)
RCM20C220K	Capacitor, 22 mmf. mica (C1, C2)
RCM20B470K	Capacitor, 47 mmf. mica (C3, C4, C5)
RCM20C181J	Capacitor, 180 mmf. mica (C6)
V-3714-4	Capacitor, fixed ceramic, 500 mmf. (C7)
RCM20B221M	Capacitor, 220 mmf. mica (C8, C9, C10)
RCM20B471M	Capacitor, 470 mmf. mica (C11, C12)
RCM30B222M	Capacitor, 2200 mmf. mica (C13)
RCM30B512M	Capacitor, .005 mfd. mica (C14, C15, C16)
RCM30B103M	Capacitor, .01 mfd. mica (C17, C18, C19, C20, C21, C22)
RCP10M6602M	Capacitor, .006 mfd. 600 v. (C23)
RCP10M6102M	Capacitor, .001 mfd. 600 v. (C24, C25)
RCP10M4103A	Capacitor, .01 mfd. 400 v. (C26, C27)
RCP10W4103A	Capacitor, .01 mfd. 400 v. (C28, C29, C30, C31, C32, C33, C34)
RCP10W4503A	Capacitor, .05 mfd. 400 v. (C35)
RCP10M4503A	Capacitor, .05 mfd. 400 w. (C36)
RCP10W4104A	Capacitor, 0.1 mfd. 400 v. (C37)
V-3714-1	Capacitor, fixed ceramic, 50 mmf. (C38)
V-3714-2	Capacitor, fixed ceramic, 100 mmf. (C39, C40)
V-3241	Capacitor, dual line filter, .05 - .05 mfd. 600 v. (C41, C42)
V-3302	Capacitor, electrolytic 40 mfd. 450 v. (C43) 40 mfd. 400 v. (C44) 16 mfd. 350 v. (C45)
V-3424	Capacitor, 2 gang trimmer (C46 & C47)
V-3306-1	Capacitor, trimmer (C48)
V-3423-1	Capacitor, trimmer (C49)
V-3296	Capacitor, variable, 3 gang (C50, C51, C52, C53, C54, C55)
V-3423-2	Capacitor, trimmer (C56, C57)
V-3306-2	Capacitor, trimmer (C58)
V-3713-1	Capacitor, variable ceramic (C59, C61)
V-3713-2	Capacitor, variable ceramic (C60)
RCM30C382G	Capacitor, 3800 mmf. mica (C62)
RCP10W4263A	Capacitor, .02 mfd. 400 v. (C63)
V-3181	Rail, pointer
RC20AE100K	Resistor, 10 ohms ½ w. (R1, R2)
RC40AE680J	Resistor, 68 ohms 2 w. (R3)
V-3282	Resistor, 120 ohms 3 w. (R4)
RC20AE101K	Resistor, 100 ohms ½ w. (R5, R6)
RC40AE153K	Resistor, 15K 2 w. (R7)
RC40AE472M	Resistor, 4700 ohms 2 w. (R8)
RC10AE473M	Resistor, 47K ¼ w. (R9)
RC10AE223K	Resistor, 22K ¼ w. (R10, R11)
RC20AE333M	Resistor, 33K ½ w. (R12)
RC10AE104K	Resistor, 100K ¼ w. (R13, R14, R15, R16, R17, R18, R19)
RC10AE154K	Resistor, 150K ¼ w. (R20)
RC10AE224K	Resistor, 220K ¼ w. (R21, R22)
RC10AE105K	Resistor, 1 meg. ¼ w. (R23, R29, R30, R31)
RC10AE274K	Resistor, 270K ¼ w. (R24)
RC10AE221M	Resistor, 220 ohms ¼ w. (R25)
RC10AE474M	Resistor, 470K ¼ w. (R26, R27)
RC10AE474K	Resistor, 470K ¼ w. (R28)
RC10AE105M	Resistor, 1 meg. ¼ w. (R32)
RC10AE225K	Resistor, 2.2 meg. ¼ w. (R33)
RC10AE225M	Resistor, 2.2 meg. ¼ w. (R34, R35, R36)
RC10AE106M	Resistor, 10 meg. ¼ w. (R37)
RC20AE560K	Resistor, 56 ohms ½ w. (R38, R39)
RC20AE562K	Resistor, 5600 ohms ½ w. (R40)
RC10AE153M	Resistor, 15K ¼ w. (R41)
RC41AE153K	Resistor, 15K 2 w. (R42, R56)
RC20AE182K	Resistor, 1800 ohms ½ w. (R43)
RC10AE221K	Resistor, 220 ohms ¼ w. (R44)
RC10AE683K	Resistor, 68K ¼ w. (R45)
RC10AE155M	Resistor, 1.5 meg. ¼ w. (R46)
RC30AE333K	Resistor, 33K 1 w. (R49)
RC40AE560K	Resistor, 56 ohms 2 w. (replaces R54 & R55)
V-3805	Shield, spiral, 4" long

Part No.	Description
V-3236	Capacitor, electrolytic, 20 mfd, 25 v. (C84)
V-4156	Choke Assy., parasitic suppressor (L32, R50)
V-3337	Clamp, tuning eye cable
V-3183	Clip, speed (dial mtg.)
V-3361	Coil Assy., F.M. osc. (L1)
V-3418	Coil Assy., F.M. R.F. (L2)
V-3485	Coil Assy., F.M. ant. (L3)
V-3524	Coil, S.W. osc. (L4)
V-3526	Coil, S.W. R.F. (L5)
V-3525	Coil, S.W., ant. (L6 & L7)
V-3512	Coil, B.C. osc. (L8)
V-3527	Coil, B.C. R.F. (L9)
V-3528	Coil, B.C. ant. (L10)
V-3313	Coil, osc. cathode (L11)
V-3254	Connector, phono
V-3305	Control, tone 1 meg. (R47)
V-3293	Control, volume and power, 2 meg. tapped at 500K and 1M (R48), and switch (SW1)
V-3239	Cord, A-C power
V-4157S-60	Cord, dial drive
V-3632	Cover, back (H-116, H-117)
V-3362	Decal, band
V-3609	Decal, tone
V-3422	Dial, glass
V-3354	Dripboard (H-116, H-117)
V-3364	Escutcheon, push button
V-3631	Escutcheon, tuning eye (H-116, H-117, H-119)
V-3276-1	Grille Cloth, speaker (H-113)
V-3276-2	Grille Cloth, speaker (H-114)
V-3616-1	Grille Cloth, speaker (H-116)
V-3616-2	Grille Cloth, speaker (H-117)
V-3617-1	Grille Cloth, speaker (H-119)
V-3345S-4	Grommet, var. cond. mtg.
V-3197S-1	Grommet, rubber, chassis mtg.
V-4318	Hinge, door (submit sample with order)
V-3359	Insulator, filter capacitor
Form RM32	Instruction Book (H-113, H-114)
Form RM33	Instruction Book (H-116, H-117)
Form RM48	Instruction Book (H-119)
V-3483	Jack, discriminator test
V-3264-1	Knob, tuning & volume (H-113, H-116, H-119)
V-3262-1	Knob, tone (H-113, H-116, H-119)
V-3262-3	Knob, band (H-113, H-116, H-119)
V-3264-2	Knob, tuning & volume (H-114, H-117)
V-3262-2	Knob, tone (H-114, H-117)
V-3262-4	Knob, band (H-114, H-117)
V-4320-1	Knob, door (H-119)
(W) No. 44	Lamp, dial, 6.3 v.
V-3283-2	Loop Assembly (L12)
V-3703	Mask, tuning eye (H-116, H-117, H-119)
V-3613	Speaker, 8" Electro Dynamic with receptacle (H-116, H-117)
V-3248S	Spring, dial drive
V-3258S	Spring, knob
V-3397	Spring, push button
V-3167S-1	Stud, pulley (threaded)
V-3430	Support, volume control shaft
V-3261-2	Switch Assy., push button
V-3310	Switch, selector (SW2 to SW8 incl.)
V-3395	Tabs, station (for push buttons)
V-3482	Teenut (H-116, H-117)
V-3643	Teenut (H-119),
V-3351	Terminal Board, 2 lugs
V-3484	Terminal Board, 1 lug
V-3487	Terminal Board, 11 lugs
V-3349	Terminal Board, 8 lugs
V-3675	Terminal Board, 3 lugs (no lugs grounded)
V-3488	Terminal Board, 12 lugs
V-3486	Terminal Board, 3 lugs (one lug grounded)
V-3255	Terminal Board, ANT-GND
V-3417	Terminal Board F.M. ANT.
V-3411	Transformer, discriminator
V-3419	Transformer, 3rd, I-F
V-3426	Transformer, 1st, I-F
V-3427	Transformer, 2nd, I-F
V-3295	Transformer, power
V-3274S	Tube holder (5U4G)
V-3317	Tuner, push button (C78 to C83 and L26 to L31 incl.)
V-3415	Tuning Shaft & Bracket Assy.
V-3668S	Washer, felt
V-3506S-1	Washer, neoprene, chassis mtg.
V-3267S-3	Washer, steel, chassis mtg.
V-3431	Windows, station tab

Part No.	Description
V-3229-3	Moulding, dial (H-113, H-114, H-116, H-117)
V-3229-4	Moulding, dial (H-119)
V-3490	Nameplate (H-119)
V-3366S-2	Pin, escutcheon
V-3841-1	Plate Assy., front glass (H-113)
V-3841-2	Plate Assy., front glass (H-114)
V-3841-3	Plate Assy., front glass (H-116)
V-3841-4	Plate Assy., front glass (H-117)
V-3841-5	Plate Assy., front glass (H-119)
V-3399	Pointer Assy.
V-4319-3	Pull, drawer (H-116, H-117)
V-4319-2	Pull, drawer (H-119)
V-3166S	Pulley, 7 16" dia.
V-3398-1	Push Button with Spring (H-113, H-116, H-119)
V-3398-2	Push Button with Spring (H-114, H-117)

Part No.	Description
V-3344-2	Sleeve, cond. mtg.
V-3639-1	Slide Mechanism, left hand unit (H-116, H-117, H-119)
V-3639-2	Slide Mechanism, right hand unit (H-116, H-117, H-119)
V-3393-2	Socket, A-C outlet
V-3289S	Socket, 6 contact tube
V-3290	Socket, moulded octal tube (6SB7Y, 6SG7)
V-3275S	Socket, moulded octal tube (5U4G)
V-3246S	Socket, octal tube
V-3252-2	Socket, pilot light
V-3308	Socket, tuning eye (with R23)
V-3292	Speaker, 12" Electro Dynamic, incl. output trans. T2 (H-113, H-114, H-119)
V-3612	Speaker, 8" Electro Dynamic with cord, plug and output trans. T3 (H-116, H-117)

PUSH BUTTONS

Push buttons 1 to 3 are designed to receive stations from 900 to 1600 kc; push buttons 4 to 6 are designed to receive stations from 540 to 900 kc.

Refer to CHASSIS LAYOUT drawing for location of push button adjusters, and then proceed as follows:

1. Turn on radio and allow it to warm up for five minutes.
2. Set the Phono-Band switch on "BC," and tune in the desired station in the frequency range 900 to 1600 kc.
3. Re-set the Phono-Band switch on "P.B.", and depress the first push button (right button viewed from the front).
4. Adjust C78 for maximum receiver output (either a station or static will be heard depending on the setting of L26). Now adjust L26 until the desired station is heard. It will be necessary to re-adjust C78 at intervals to maintain maximum output.
5. Make a final adjustment of L26 for proper tuning and C78 for maximum output.
6. Return the band switch to "B.C." to make certain that the push button has been set to the desired station.
7. Adjust the remaining push buttons in the same manner.

MODEL H-113, H-114

MODEL H-116, H-117

MODEL H-119

WESTINGHOUSE ELECTRIC CORP.

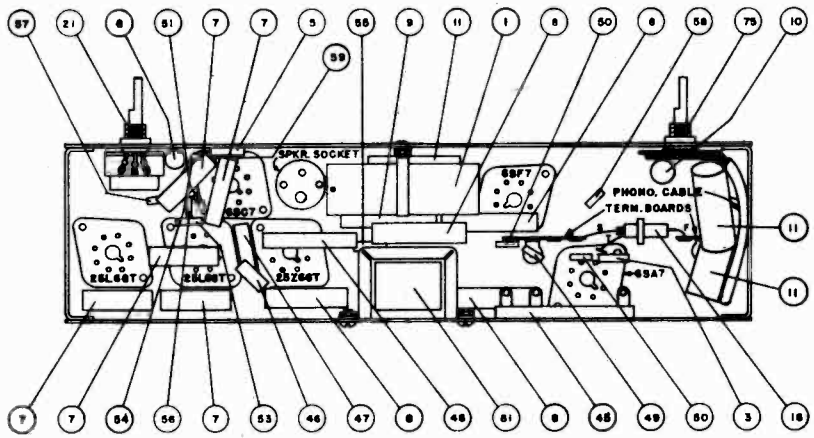
MODELS H-122, H-130

H-153, H-155, H-156, H-171, H-171A, H-171C, H-184

PARTS LIST FOR H-122 AND H-130

When ordering parts specify model number of set in addition to part number and description of part.

Item No.	Part No.	Description of Part
1	V-3304	Capacitor, electrolytic
1A	Part of Item 1	Capacitor, 30 mfd.
1B	Part of Item 1	Capacitor, 50 mfd.
2	V-3535	Capacitor, variable two-gang
2A	Part of Item 2	Capacitor, loop tuning
2B	Part of Item 2	Capacitor, oscillator tuning
2C	Part of Item 2	Capacitor, oscillator trimmer
3	RCM20A680M	Capacitor, 68 mmfd.
5	RCM20A301M	Capacitor, 300 mmfd.
6	RCP10W6502A	Capacitor, .005 mfd.
7	RCP10W4103A	Capacitor, .01 mfd.
8	RCP10W4503A	Capacitor, .05 mfd.
9	RCP10W4204K	Capacitor, 0.2 mfd.
10	RCP10W6202A	Capacitor .002 mfd.
11	RCP10W4104A	Capacitor, 0.1 mfd.
16	V-3382	Coil, oscillator
20	V-3303	Control, tone
21	V-3298	Control, volume and switch
21A	Part of Item 21	Control, variable resistor
21B	Part of Item 21	Control, switch
24	V-3392	Cord, power a.c. long (H-122 only)
25	V-3372-122	Cord, power short (H-122 only)
25	V-3372-130	Cord, power (H-130 only)
28	Westinghouse No. 47	Light, pilot
31	V-3660	Loop, antenna (H-122 only)
31	V-3666	Loop, antenna (H-130 only)
31A	Part of Item 31	Loop, winding
31B	Part of Item 31	Loop, trimmer
31C	Part of Item 31	Phono socket
35	V-3379	Receptacle
39A		Phonograph pickup (See Service Notes, V-3269-2 Record Changer)
39B		Phonograph motor and switch (See Service Notes, V-3269-2 Record Changer)
45	V-3311	Resistor, ballast
46	RC20AE220M	Resistor, 22 ohms ½ watt
47	RC30AE910J	Resistor, 91 ohms 1 watt
48	RC40AE152M	Resistor, 1,500 ohms 2 watts
49	RC10AE332M	Resistor, 3,300 ohms ¼ watt
50	RC10AE223M	Resistor, 22,000 ohms ¼ watt
51	RC10AE823K	Resistor, 82,000 ohms ¼ watt
53	RC20AE184K	Resistor, 180,000 ohms ½ watt
54	RC20AE224K	Resistor, 220,000 ohms ½ watt
55	RC10AE224M	Resistor, 220,000 ohms ¼ watt
56	RC10AE274K	Resistor, 270,000 ohms ¼ watt
57	RC10AE334K	Resistor, 330,000 ohms ¼ watt
58	RC10AE225M	Resistor, 2.2 megohms ¼ watt
59	RC10AE106M	Resistor, 10 megohms ¼ watt
65	V-3398-1	Socket, regular a.c. power
66	V-3299	Socket, speaker
70	V-3291	Speaker, 6" PM
75	V-3301	Switch, radio phono
79	V-3328	Transformer, 1st i-f
80	V-3329	Transformer, 2nd i-f



81	V-3297	Transformer, output
	V-3219S-1	Cord, dial drive
	V-3343	Pointer assembly
	V-3321	Rail, pointer
	V-3335	Socket, pilot light
	V-3246S	Socket
	V-3248S	Spring, dial drive
	V-1109-1	Cabinet (radio section H-122 only)
	V-1110-1	Cabinet (less radio section H-122 only)
	V-1111-2	Cabinet (H-130 only)
	V-3425	Dial (H-122 only)
	V-3647-2	Dial (H-130 only)
	V-3413	Knob, tone (H-122 only)
	V-3262-2	Knob, tone (H-130 only)
	V-3413	Knob, tuning (H-122 only)
	V-3262-2	Knob, tuning (H-130 only)
	V-3331-1	Knob assembly, volume (H-122 only)
	V-3667-2	Knob assembly, volume (H-130 only)
	V-3331-2	Knob assembly, radio-phono (H-122 only)
	V-3667-4	Knob assembly, radio-phono (H-130 only)
	V-3333S-1	Medallion

Power Output:

Undistorted (radio) ..... 3 watts
Undistorted (phonograph) ..... 3.5 watts
Maximum ..... 5 watts

Loudspeaker:

Type ..... 6½" dia. P.M. dynamic
Voice Coil Impedance ..... 3.2 ohms

Power Supply Rating:

H-122 combination ..... 105 - 120 volts, 50 - 60 cycles a.c.
H-130 or radio section of H-122 only ..... 105 - 120 volts d.c. or 105 - 120 volts, 50 - 60 cycles a.c.

Power Consumption:

H-122 combination ..... 150 watts
H-130 or radio section of H-122 ..... 60 watts

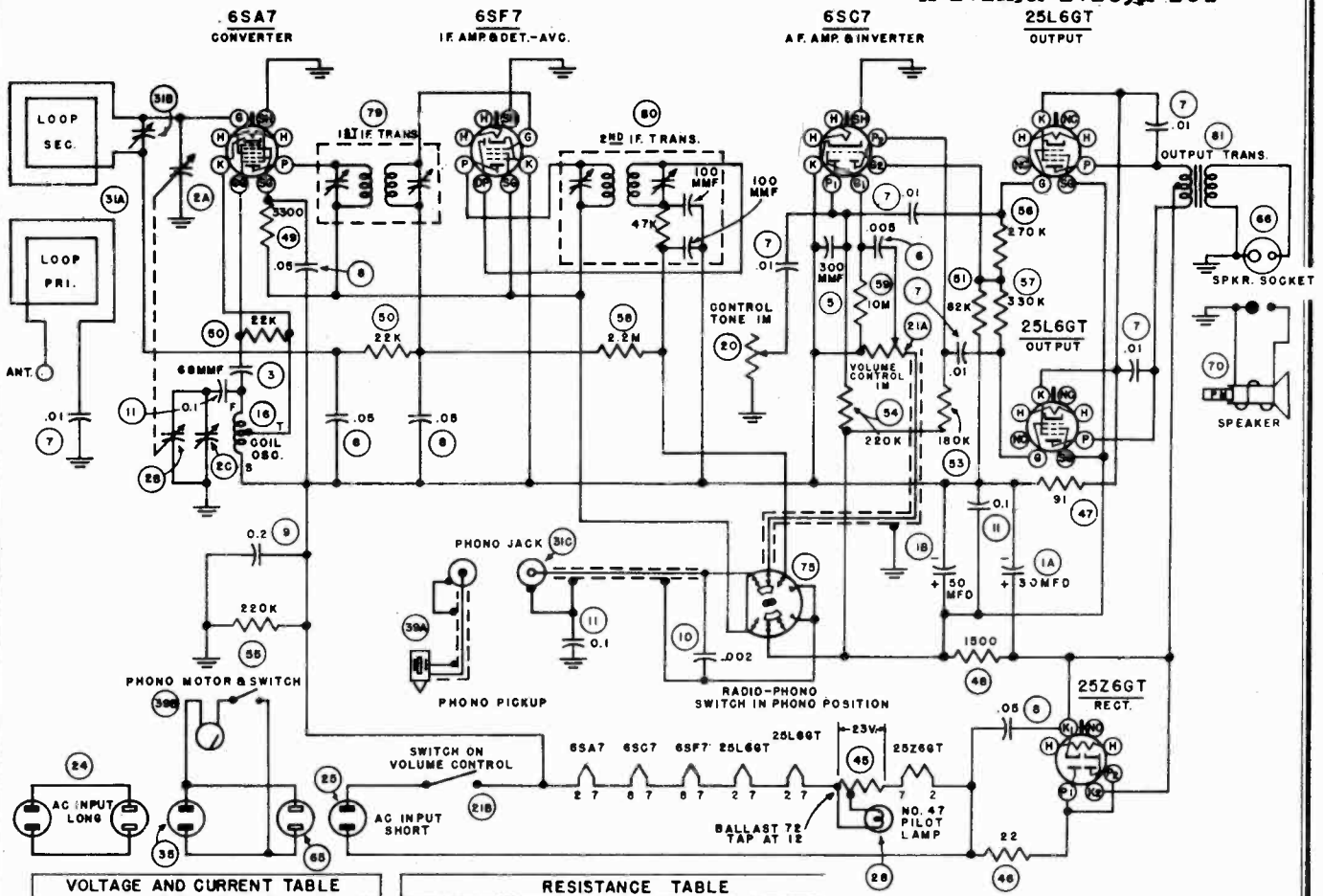
Special Provisions:

H-130: Phonograph, FM, and television sound input connection at rear of cabinet
H-122: FM and television sound input connection at rear of cabinet

MODELS H-122, H-130

WESTINGHOUSE ELECTRIC CORP.

H-153, H-155, H-156, H-171, H-171A, H-171C, H-184



VOLTAGE AND CURRENT TABLE

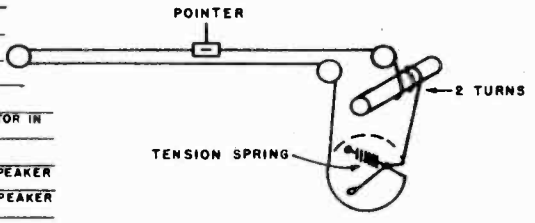
ALL VOLTAGES ARE MEASURED FROM THE NEGATIVE SIDE OF THE DUAL FILTER CAPACITOR USING A 20,000 OHMS PER VOLT METER. ALL CURRENTS ARE MEASURED FROM TOP OF TUBE SOCKETS USING A BREAK-IN ADAPTER. LINE VOLTAGE 117 V.A.C. SIGNAL VOLTAGE ZERO.

TUBE	SOCKET TERMINAL K		SG	P	I_K ma.
6SA7	ZERO		65	82	
6SC7	ZERO			NO.1-44 NO.2-30	
6SF7	ZERO		82	82	
25L6GT	5.4		82	120	60
25Z6GT	125				84

READINGS SHOULD APPROXIMATE THE ABOVE WITHIN 20 PERCENT.

RESISTANCE TABLE

ITEM	PRIMARY OHMS	SECONDARY OHMS	REMARKS
31A	$\frac{1}{8}$	$1\frac{1}{2}$	
16	"T" TO "S" $\frac{1}{2}$	"T" TO "F" $3\frac{1}{2}$	"F" TO "S" $4\frac{1}{4}$ OHMS
79	28	28	
80	19	19	
80		47,000	INCLUDES INTERNAL RESISTOR IN SERIES WITH SECONDARY.
81	285		PLATE TO PLATE
81		$\frac{1}{2}$	PLUGS REMOVED FROM SPEAKER SOCKET
70		3.2	PLUGS REMOVED FROM SPEAKER SOCKET



Pilot Lamp: (1) ..... Westinghouse No. 47, 6.3 volts, .15 ampere

Frequency Range:

Standard Broadcast ..... 550 to 1600 kc
Intermediate Frequency ..... 455 kc

Phonograph Specifications:

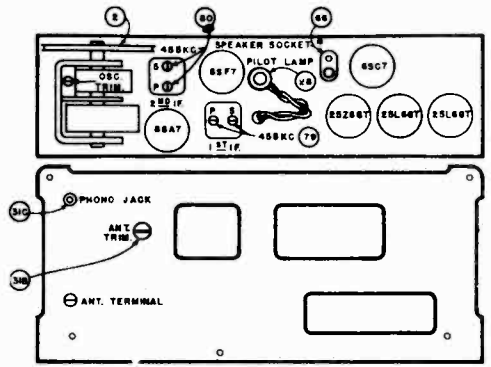
1. Automatic record changer, single button control.
2. Plays either 12 ten-inch or 10 twelve-inch records automatically.
3. Balanced tone arm.
4. Voltage and frequency of motor - 105 - 120 volts, 50 - 60 cycles, single phase a.c.
5. Type of cartridge - high impedance crystal.
6. Type of needle - straight shank steel or semi-permanent sapphire.

Alignment Procedure

The overall sensitivity and selectivity of these models is affected to a great extent by the alignment of the i-f and r-f circuits. In general, a complete realignment of both circuits is unnecessary. If realignment is required, however, the following procedure must be used:

1. Disconnect the receiver from the 105-120 volt power source.
2. Remove the rear cover - loop assembly as outlined above.
3. Pull off the four knobs at the front of the cabinet.
4. Remove the pilot lamp socket from the speaker bracket. Remove the speaker plug from its socket. This socket is located at the front of the chassis near the 6SC7 tube.
5. To release the chassis, remove the two screws from the bottom of the cabinet.
6. Reconnect the speaker. Place the power plug in the 105-120 volt a-c or d-c convenience outlet and set the controls on the front as follows:
   a. Volume control and a-c switch - full on.
   b. Radio-phonograph switch - in RADIO position (extreme counter clockwise).
   c. Tone control - HIGH position (extreme clockwise).
   d. Tuning dial - 1600 kc position.
7. Connect the signal generator to the control grid of the 6SF7 i-f amplifier tube through a series capacitor of 0.1 mfd. Adjust the signal generator for an output frequency of 455 kc; keep the signal reduced to avoid a.v.c. action.
8. Connect an a-c output meter across the speaker voice coil; place the meter range switch on the highest output scale position for the preliminary adjustments.
9. Using an alignment tool, adjust the secondary trimmer of the second i-f transformer for the maximum output indication on the meter. As the circuits come into alignment, it will be necessary to further reduce the test signal amplitude in order to prevent a.v.c. action. Always use the lowest range on the meter which will give at least one-half scale deflection. Adjust the primary trimmer of the second i-f transformer for maximum output indication.
10. Connect the signal generator output to the control grid of the 6SA7 mixer tube, and adjust in turn, the secondary and primary trimmers of the first i-f transformer for maximum output indication.
11. Leave the signal generator connected to the control grid of the 6SA7 mixer tube. Reduce the test signal to the lowest perceptible value and carefully "peak" each adjustment in Steps 9 and 10 for maximum output indication.
12. Connect the signal generator to the antenna terminal on the back cover - loop assembly through a capacitor of approximately 200 mmfd.; adjust the signal generator to an output frequency of 1615 kc. Rotate the tuning condenser until the minimum capacity stop is reached, and adjust the oscillator trimmer for the maximum response on the output meter.
13. Disconnect the signal generator test lead from the antenna terminal. Turn attenuator on the signal generator for full output. Adjust the signal generator for 1400 kc. Bring the output lead near, but do not connect to, the loop antenna. Tune in the test signal as accurately as possible on the radio. If the test signal is too strong, move the lead farther away. Adjust the antenna trimmer for maximum output on the meter.

    Note: The antenna trimmer must be readjusted after the chassis is replaced in the cabinet as the metal chassis and speaker affect the inductance of the loop.
14. Check on radio stations at selected points for calibration and sensitivity.



The foregoing alignment procedure is condensed in the following table as a convenience for the service technician.

Steps	Connect Signal Generator to—	Adjust Signal Generator to—	Tune Radio Dial to—	Adjust
1	6SF7 control grid through 0.1 mfd. capacitor	455 kc	1600 kc	secondary trimmer of 2nd i-f transformer for maximum output
2	6SF7 control grid through 0.1 mfd. capacitor	455 kc	1600 kc	primary trimmer of 2nd i-f transformer for maximum output
3	6SA7 control grid through 0.1 mfd. capacitor	455 kc	1600 kc	secondary trimmer of 1st i-f transformer for maximum output
4	6SA7 control grid through 0.1 mfd. capacitor	455 kc	1600 kc	primary trimmer of 1st i-f transformer for maximum output
5	antenna terminal through 200 mmfd. capacitor	1615 kc	gang at minimum	trimmer of oscillator section, tuning capacitor for maximum output
6	radiated signal (no actual connection)	1400 kc	1400 kc	antenna trimmer for maximum output

Power Supply Polarity:

When the receiver is operated on 105-120 volts 60 cycles a.c., a slight hum may be heard if the power plug is inserted in such a manner that the "hot" side of the supply line is connected nearest to the chassis. To eliminate this trouble, reverse the plug in the convenience outlet.

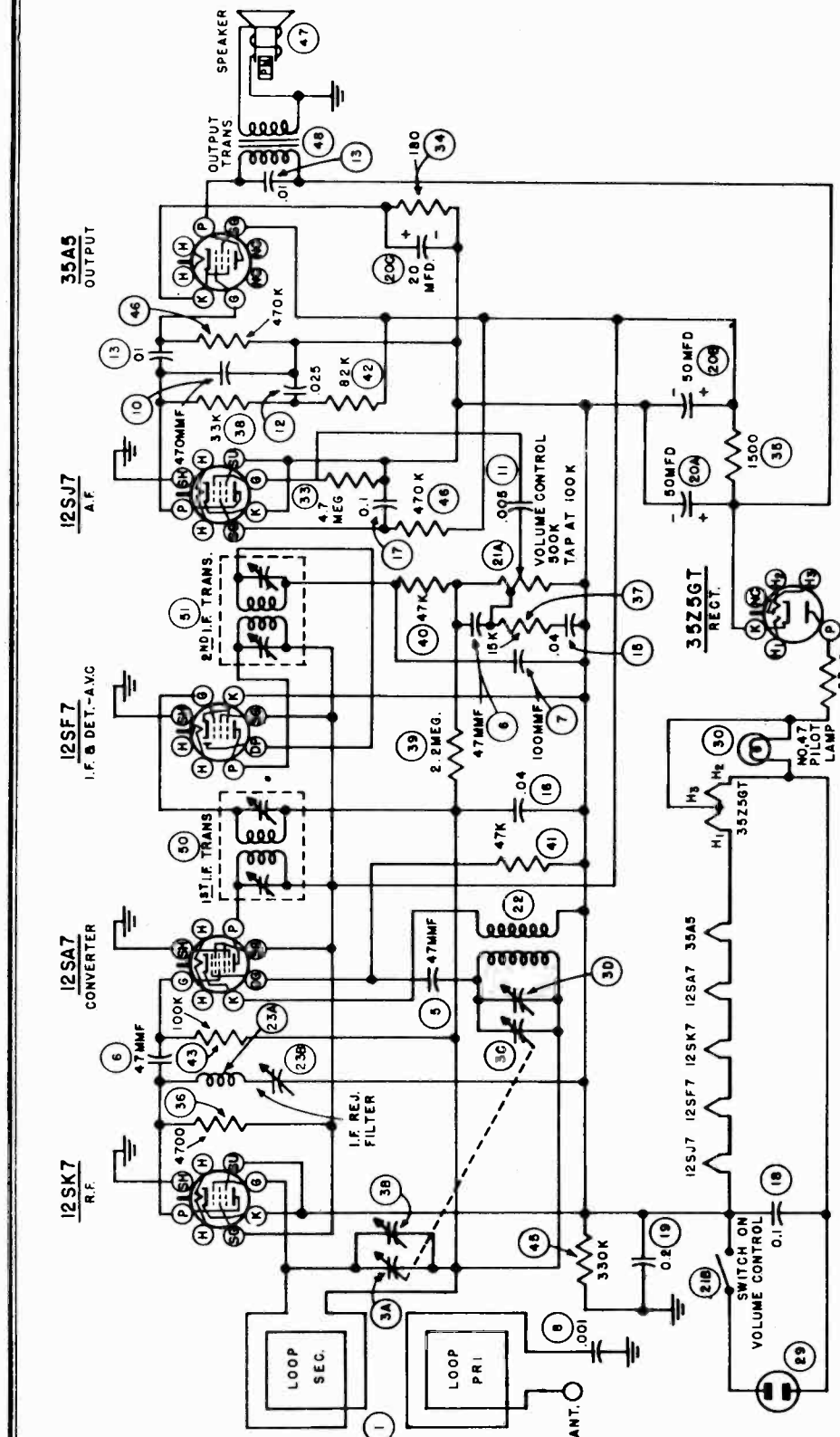
When operated on direct current, the set will not function at all if the power plug polarity is reversed with respect to the line voltage. If it does not function within one minute after it is turned on, reverse the plug.

Ground Connection:

The use of an external ground is not recommended for two reasons: First, the r-f circuits are returned to ground through the a-c or d-c supply line; second, the radio chassis is connected to one side of the supply line through a 220,000 ohm resistor and a capacitor of 0.2 mfd. If the power plug is inserted in such a manner that the "hot" side of the supply line is connected nearest to the chassis, the use of an external ground would place the 105-120 volt supply voltage directly across the resistor-capacitor combination. This might cause a loud hum or, under certain conditions, actual damage to the receiver.

MODELS H-125, H-126

WESTINGHOUSE ELECTRIC CORP.



RESISTANCE TABLE

ITEM	PRIMARY OHMS	SECONDARY OHMS	REMARKS
1		2	
22	½	7	
23A	50		
50	27	26	
51	27	23	
47		2.95	VOICE COIL DISCONNECTED
48	375	¼	VOICE COIL DISCONNECTED

VOLTAGE AND CURRENT TABLE

ALL VOLTAGES ARE MEASURED FROM THE NEGATIVE SIDE OF THE DUAL FILTER CAPACITOR USING A 20,000 OHMS PER VOLT METER. LINE VOLTAGE IS 117 V.A.C. SIGNAL VOLTAGE IS ZERO.

TUBE	SOCKET TERMINAL K	SG	P	Ik ma
12SK7	ZERO	70	31	
12SA7	ZERO	70	69	
12SF7	ZERO	70	69	
12SJ7	ZERO	19	26	0.5
35A5	4.25	70	115	24.0
35Z5GT	122			58.0

READINGS SHOULD APPROXIMATE THE ABOVE WITHIN 20 PERCENT.

Loudspeaker:

Type ..... 5" dia. P.M. dynamic

V.C. Impedance ..... 3.2 ohms at 400 cps

Power Output:

Undistorted ..... 0.85 watt

Maximum ..... 1.25 watts

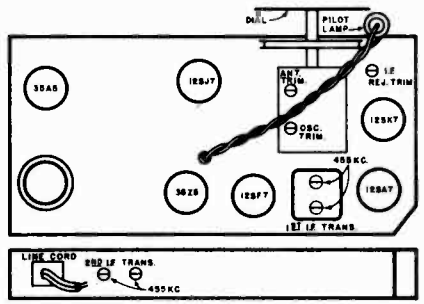


Fig. 1

Alignment Procedure (Refer to Fig. 1):

The overall sensitivity and selectivity of the Little Jewel are affected to a great extent by the alignment of the i-f and r-f circuits. In general, a complete realignment of both circuits is unnecessary. If realignment is required, however, the following procedure is recommended:

1. Remove the knobs, the plastic cover, and the loop as outlined above.
2. Remove the Allen head screw from the left-hand plastic cover and carefully lift off the cover.
3. Turn on the receiver and tune to a quiet spot near 1600 kc.
4. Connect an a-c output meter across the speaker voice coil. Turn the meter range switch to a high-voltage position.
5. Connect the outer conductor of the signal generator test lead to the common negative (this is the metal can enclosing the filter capacitors). Reduce the output of the signal generator to prevent a.v.c. action during the alignment procedure.
6. Connect the inner conductor of the signal generator test lead to the 12SF7 i-f amplifier control grid through a capacitance of 0.01 mfd. Adjust the signal generator frequency to 455 kc.
7. With an insulated screwdriver or neutralizing tool, adjust the second i-f transformer **secondary** trimmer for maximum reading on the output meter. Use the lowest practicable scale on the meter and, as the circuits come into alignment, reduce the signal generator output to prevent a.v.c. action.
8. Repeat operation 7, this time adjusting the second i-f transformer **primary** trimmer.
9. Connect the signal generator output, through the 0.01 mfd. capacitor, to the control grid of the 12SA7 converter tube. Repeat operations 7 and 8, this time adjusting the secondary and primary trimmers of the **first** i-f transformer.
10. Connect the signal generator output, adjusted to 455 kc, to the antenna terminal at the bottom of the cabinet. Tune the radio dial to 600 kc. Adjust the i-f rejection trimmer for **minimum** reading on the output meter.
11. Connect the test oscillator output through a capacitance of 50 mmfd. to the antenna terminal at the bottom of the cabinet. Adjust the signal generator frequency to 1615 kc. Tune the receiver tuning condenser to minimum. Adjust the trimmer on the oscillator section of the main tuning condenser for **maximum** reading on the output meter.
12. Adjust the signal generator to 1400 kc. Bring the output lead near the receiver input but do not make an actual connection. Tune in the test signal on the receiver dial and adjust the antenna trimmer for maximum output as read on the output meter.

The foregoing alignment procedure is condensed in the following table as a convenience for the service technician:

Steps	Connect Signal Generator to—	Adjust Signal Generator to—	Tune Radio Dial to—	Adjust for Maximum Output
1	12SF7 grid in series with a .01 mfd. capacitor	455 kc	quiet point near 1600 kc.	primary and secondary 2nd i-f transformer
2	12SA7 grid in series with a .01 mfd. capacitor	455 kc	quiet point near 1600 kc.	primary and secondary 1st i-f transformer
3	12SA7 grid in series with a .01 mfd. capacitor	455 kc	quiet point near 1600 kc.	repeat 1 and 2
4	antenna terminal	455 kc	600 kc	adjust i-f rejection trimmer for minimum output
5	antenna terminal in series with a 50 mmfd. capacitor	1615 kc	gang at minimum	oscillator trimmer
6	radiated signal from signal generator	1400 kc	1400 kc	adjust antenna trimmer

Power Supply Polarity:

When the receiver is operated on 110 volts 60 cycles a.c., a slight hum may be heard if the power plug is inserted in such a manner that the "hot" side of the supply line is connected nearest to the chassis. To eliminate this trouble, reverse the supply plug in the convenience outlet.

When operated on direct current, the set will not function at all if the power plug polarity is reversed with respect to the line voltage. If it does not operate within one minute after it is turned on, reverse the plug in the convenience outlet.

Tube Replacement:

When replacing tubes this procedure must be followed to prevent damage to the loop and other delicate parts:

1. Disconnect the power plug from the 110-volt service outlet.
2. Pull the knobs and remove the Phillips head screw from the right-hand plastic cover.
3. Carefully remove the plastic cover and handle.
4. Lift the loop assembly and tilt it forward until the tubes are accessible.
5. Turn the tuning dial to 550 kc to avoid damage to the rotor plates of the tuning condenser.

PARTS LIST FOR H-125 AND H-126

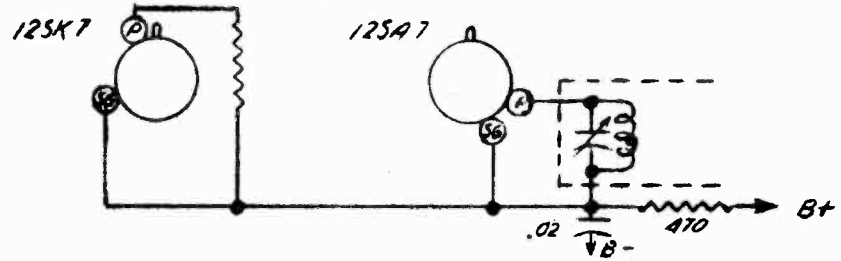
When ordering parts specify model number of set in addition to part number and description of part.

Item No.	Part No.	Description of Part
1	V-3466	Loop antenna
3	V-3474	Capacitor, variable
3A	Part of Item 3	Capacitor, antenna tuner
3B	Part of Item 3	Capacitor, antenna trimmer
3C	Part of Item 3	Capacitor, oscillator tuner
3D	Part of Item 3	Capacitor, oscillator trimmer
5	RCM20A470K	Capacitor, 47 mmfd.
6	RCM20A470M	Capacitor, 47 mmfd.
7	RCM20A101M	Capacitor, 100 mmfd.
.8	RCP10W6102A	Capacitor, 1,000 mmfd.
'0	RCM20A471M	Capacitor, 470 mmfd.
11	RCP10W6502A	Capacitor, .005 mfd.
12	RCP10W2253K	Capacitor, .025 mfd.
13	RCP10W2103A	Capacitor, .01 mfd.
15	RCP10W2403K	Capacitor, .04 mfd.
16	RCP10W2403A	Capacitor, .04 mfd.
17	RCP10W2104A	Capacitor, .10 mfd.
18	RCP10W4104A	Capacitor, .10 mfd.
19	RCP10W2204A	Capacitor, .20 mfd.
20	V-3470	Capacitor, electrolytic
20A	Part of Item 20	Capacitor, 50 mfd. 150 volts electrolytic
20B	Part of Item 20	Capacitor, 50 mfd. 150 volts electrolytic
20C	Part of Item 20	Capacitor, 20 mfd. 25 volts electrolytic
21	V-3476	Control, volume and switch
21A	Part of Item 21	Control, variable resistor
21B	Part of Item 21	Control, switch
22	V-3473	Coil, oscillator
23	V-3465	Coil, trap assembly
23A	Part of Item 23	Coil
23B	Part of Item 23	Trap trimmer
29	V-3477	Cord, power A.C.
30	Westinghouse Type No. 47	Light, pilot
31	RC20AE270K	Resistor, 27 ohms 0.5 watt
33	RC20AE475M	Resistor, 4.7 megohms 0.5 watt
34	RC20AE181J	Resistor, 180 ohms 0.5 watt
35	RC30AE152K	Resistor, 1,500 ohms 1 watt
36	RC20AE472K	Resistor, 4,700 ohms 0.5 watt
37	RC20AE153K	Resistor, 15,000 ohms 0.5 watt
38	RC20AE333K	Resistor, 33,000 ohms 0.5 watt
39	RC20AE225M	Resistor, 2.2 megohms 0.5 watt
40	RC20AE473M	Resistor, 47,000 ohms 0.5 watt
4!	RC20AE473K	Resistor, 47,000 ohms 0.5 watt
42	RC20AE823K	Resistor, 82,000 ohms 0.5 watt
43	RC20AE104K	Resistor, 100,000 ohms 0.5 watt
45	RC20AE334M	Resistor, 330,000 ohms 0.5 watt
46	RC20AE474K	Resistor, 470,000 ohms 0.5 watt
47	V-3475	Speaker, 5 inch permanent magnet
48	V-3496	Transformer, output
50	V-3471	Transformer, 1st i-f
51	V-3472	Transformer, 2nd i-f
	V-3219S-1	Cord, dial drive
	V-3455-1	Dial (for Model H-125 only)
	V-3455-2	Dial (for Model H-126 only)
	V-3449	Drive shaft bearing
	V-3480	Shaft, drive
	V-3468	Socket, molded octal tube
	V-3469	Socket, molded octal tube (shielded)
	V-3499	Socket, pilot light
	V-3448	Spring, dial drive
	V-3435	Bumper, felt (screw type)
	V-3501-1	Case assembly, center
	V-3461-1	Cover, left-hand (H-125 only)
	V-3459-1	Cover, right-hand (H-125 only)
	V-3498-1	Handle assembly (H-125 only)
	V-3481-1	Knob (H-125 only)
	V-3491	Terminal strip assembly
	V-3461-2	Cover, left-hand (H-126 only)
	V-3459-2	Cover, right-hand (H-126 only)
	V-3498-2	Handle assembly (H-126 only)
	V-3481-2	Knob (H-126 only)
	V-3711-1	Baffle and Grille Cloth Assembly (H-125)
	V-3711-2	Baffle and Grille Cloth Assembly (H-126)
	V-3333S-1	Medallion (H-125 only)
	V-3333S-2	Medallion (H-126 only)
	V-3745	Socket, lock-in

SUBJECT: CIRCUIT CHANGE, H-125 and H-126 Radios

Effective July 11, 1946, all Model H-125 and H-126 radios which have the letter "C" stamped on the end of the chassis directly below the output tube, have been changed as follows:

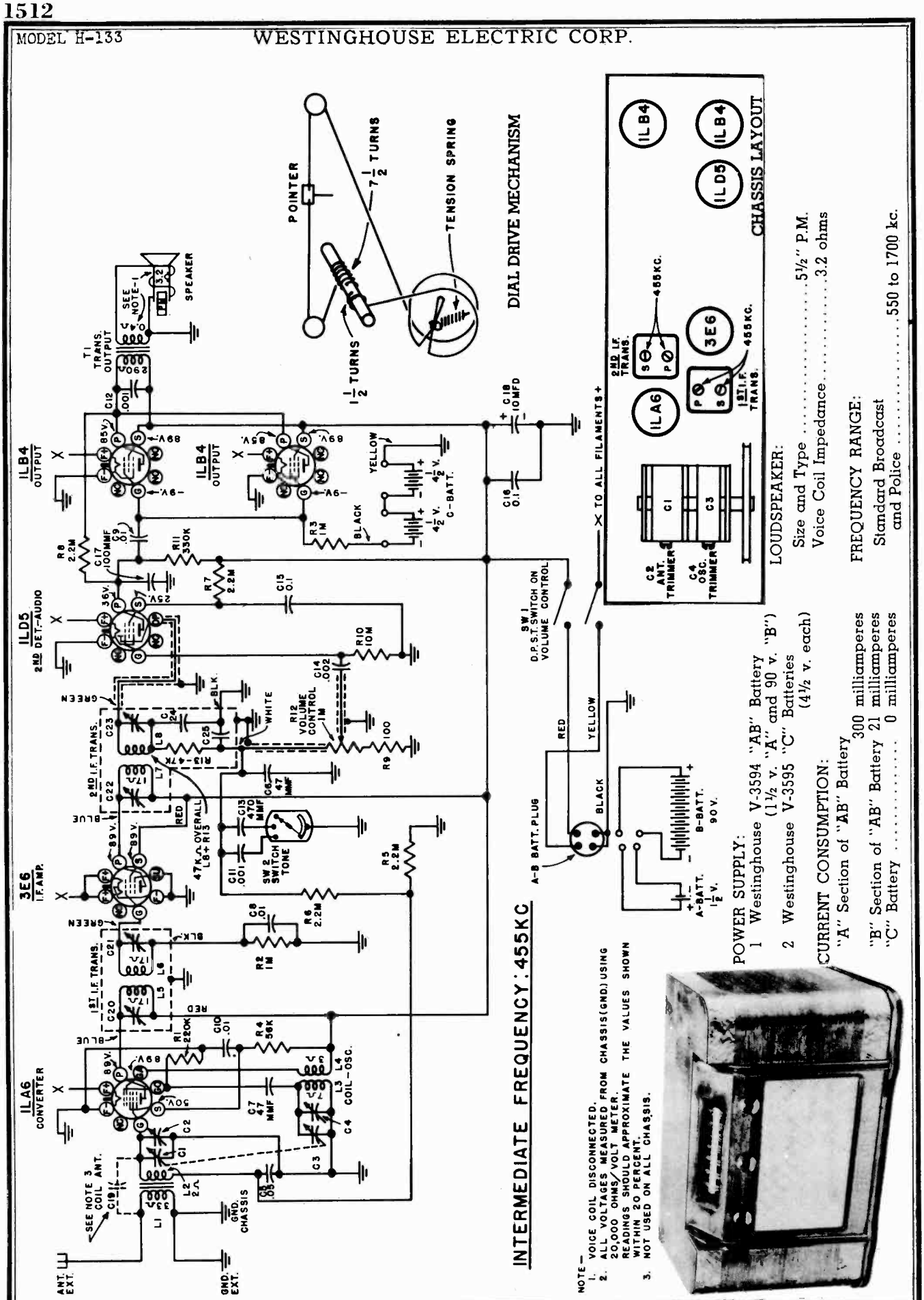
A 470 ohm 1/4 watt isolating resistor has been inserted in the plate and screen supply line for the R.F. and converter stages, and a .02 mfd, 200 volt paper by-pass capacitor has been connected from the tube side of this resistor to the common negative line. These connections are shown below.



Where this change has been incorporated in the radio, voltages at the R.F. and converter tube sockets will differ slightly from the values given in the original Service Notes. Approximate voltages when the change is incorporated are as follows: 12SK7 screen grid 66 V., plate 30 V.; 12SA7 screen grid 66 V., plate 65 V.

Procurement difficulties with respect to certain components make the change advisable at this time.

MODEL H-133 WESTINGHOUSE ELECTRIC CORP.



POWER SUPPLY:
1 Westinghouse V-3594 "AB" Battery (1½ v. "A" and 90 v. "B")
2 Westinghouse V-3595 "C" Batteries (4½ v. each)

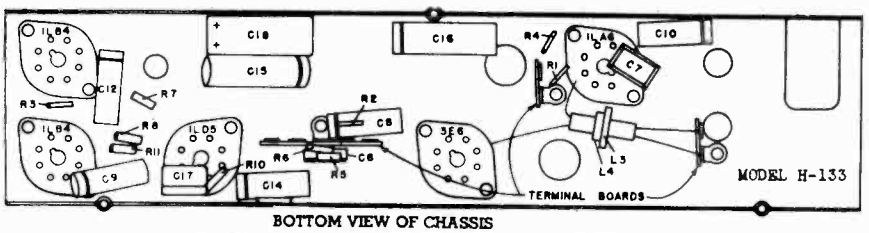
CURRENT CONSUMPTION:
"A" Section of "AB" Battery 300 milliamperes
"B" Section of "AB" Battery 21 milliamperes
"C" Battery ..... 0 milliamperes

LOUDSPEAKER:
Size and Type ..... 5½" P.M.
Voice Coil Impedance ..... 3.2 ohms

FREQUENCY RANGE:
Standard Broadcast and Police ..... 550 to 1700 kc.

MODEL H-133
MODEL H-148

WESTINGHOUSE ELECTRIC CORP.



BOTTOM VIEW OF CHASSIS

MODEL H-133 **ALIGNMENT** MODEL H-148

Before beginning alignment, make certain that the dial pointer aligns with the dot on the extreme high-frequency end of the dial when the tuning capacitor is set for minimum capacity.

Connect an output meter across the speaker voice coil.

While making the following adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid A.V.C. action.

Step	Connect Signal Generator to—	Signal Generator Frequency	Radio Dial Setting	Adjust
1	3E6 control grid through 0.1 mfd capacitor	455 kc	550 kc	Secondary and Primary trimmers of 2nd I-F trans. for max. output.
2	1LA6 control grid through 0.1 mfd capacitor	455 kc	550 kc	Secondary and Primary trimmers of 1st I-F trans. for max. output.
3	Antenna terminal through 200 mmf capacitor	455 kc	550 kc	"Peak" all I-F trimmers.
4	Antenna terminal through 200 mmf capacitor	* 1700 kc	*1700 kc	Oscillator trimmer for max. output.
5	Antenna terminal through 200 mmf capacitor	1400 kc	1400 kc	Antenna trimmer for max. output.

*1600 KC for Model H-148; rest of alignment the same

When ordering parts specify model number of set in addition to part number and description of part.

MODEL H-133

Part Number	Description
V-3603	Background, dial
V-4521	Baffle and Grille Cloth Assy.
V-3594	Battery, "A-B" (1½ v. & 90 v.)
V-3595	Battery, "C" (4½ v.)
V-3580	Bracket, var. cap. mtg.
V-1112-2	Cabinet
V-3569	Capacitor, variable, 2 gang (C1, C2, C3, C4)
RCP10W2503A	Capacitor, 0.05 mfd. 200 v. (C5)
RCM20A470K	Capacitor, 47 mmf. (C6, C7)
RCP10W4103A	Capacitor, 0.01 mfd. 400 v. (C8, C9, C10)
RCP10W8102K	Capacitor, 0.001 mfd. 600 v. (C11, C12)
RCM20A471K	Capacitor, 470 mmf. (C13)
RCP10W6202A	Capacitor, 0.002 mfd. 600 v. (C14)
RCP10W2104A	Capacitor, 0.1 mfd. 200 v. (C15, C16)
RCM20A101M	Capacitor, 100 mmf. (C17)
V-3581	Capacitor, electrolytic, 10 mfd. 150 v. (C18)
V-4723	Capacitor, 4.7 mmf. (C19—not used on all chassis)
V-3562	Clamp, dial mtg.
V-3567	Coil, antenna (L1, L2)
V-3582	Coil, oscillator (L3, L4)
V-3564	Control, volume, 1 meg. (R12) with switch (SW1)
V-4157S-66	Cord, dial drive
V-3596	Decal, OFF
V-3660	Decal, TONE
V-3662	Decal, STATIONS
V-3665	Decal, WESTINGHOUSE
V-3559	Dial, glass

Part Number	Description
V-3489	Foot, felt
V-3268	Grommet, variable cap. mtg.
V-3602	Jumper, "C" battery
V-3331-1	Knob, volume (including spring)
V-3331-2	Knob, tuning (including spring)
V-3331-3	Knob, tone (including spring)
Form RM86	Operating Instructions
V-3585	Plug, battery cable
V-3587	Plug and Cable Assy., battery
V-3558	Pointer Assy.
V-3166S	Pulley, 7/16" dia.
RC10AE224M	Resistor, 220K ¼ w. (R1)
RC10AE105M	Resistor, 1.0 meg. ¼ w. (R2, R3)
RC10AE563M	Resistor, 56K ¼ w. (R4)
RC10AE225M	Resistor, 2.2 meg. ¼ w. (R5, R6, R7, R8)
RC10AE101M	Resistor, 100 ohms ¼ w. (R9)
RC10AE106M	Resistor, 10 meg. ¼ w. (R10)
RC10AE334M	Resistor, 330K ¼ w. (R11)
V-3755S-10	Screw, chassis mtg.
V-3573	Socket, loctal tube
V-3601	Speaker, 5¼" P.M.
V-3248S	Spring, dial drive
V-3551	Stud and Bracket Assy., pulley
V-3563	Switch, tone control (SW2)
V-3574	Terminal Board, 2 lugs
V-3575	Terminal Board, 5 lugs
V-3576	Transformer, output (T1)
V-3577	Transformer, 1st I.F.
V-3578	Transformer, 2nd I.F.
V-3237	Washer, cup, var. cap. mtg.
V-3752S	Washer, felt
V-3267S-4	Washer, chassis mtg.

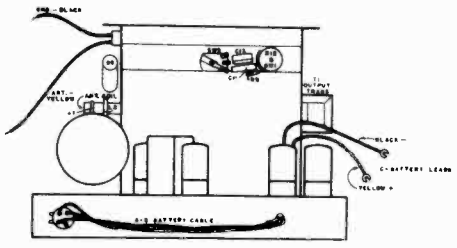


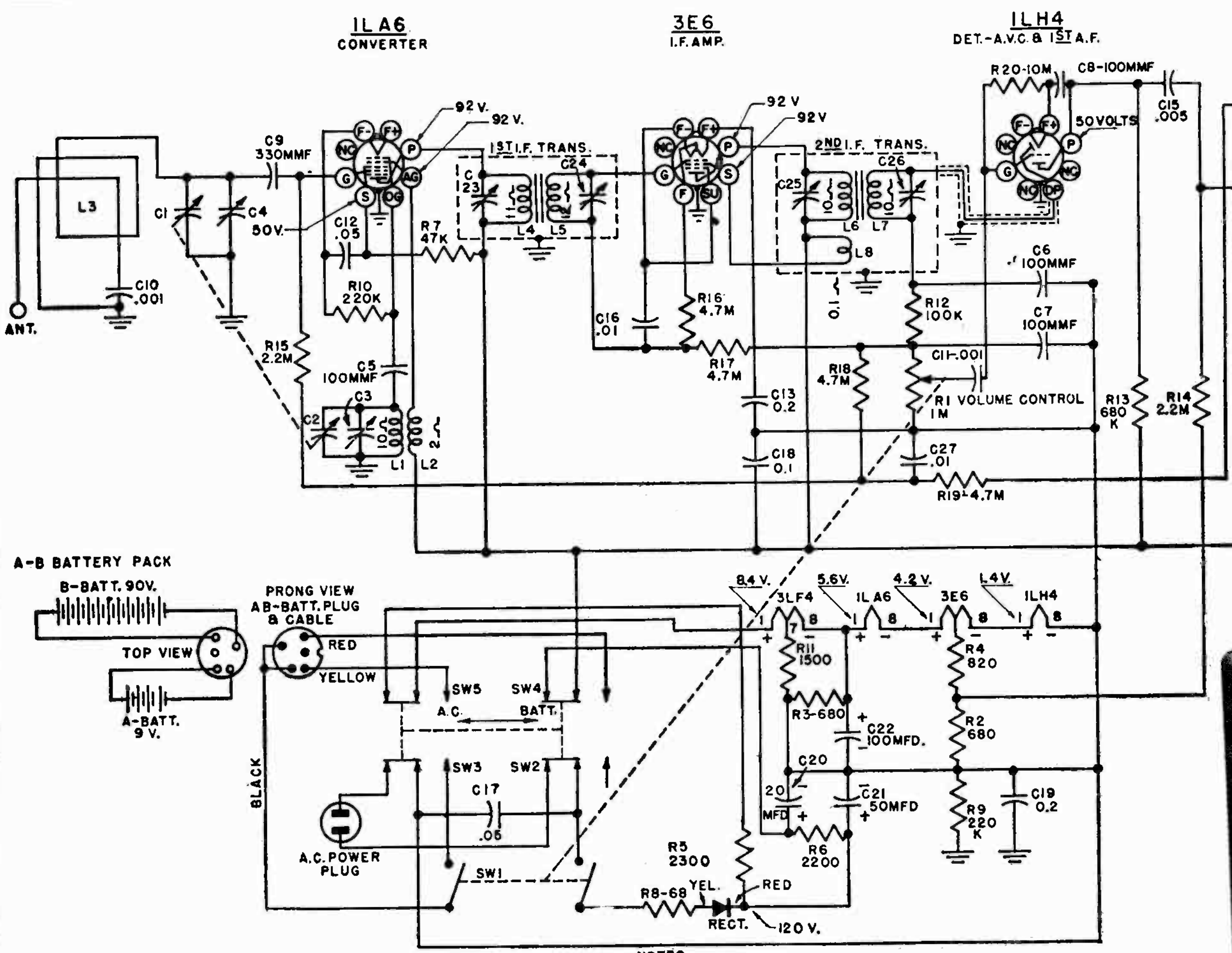
FIG. 3—REAR VIEW OF CHASSIS

V-3909	Strip, plastic, loop mtg.
V-3872	Switch, battery AC-DC (SW2, SW3, SW4, SW5)
V-4116S	Terminal Board, 1 lug
V-3864	Terminal Board, 2 lugs
V-3842	Terminal Board, 3 lugs
V-3865	Terminal Board, 4 lugs
V-3877	Transformer, 1st I-F (L4, L5, C23, C24)
V-3876	Transformer, 2nd I-F (L6, L7, C25, C26)
V-3868	Transformer, output
V-3867	Washer, phenolic (resistor mtg.)
V-3752S	Washer, felt
V-3919	Washer, flat (chassis mtg.)

MODEL H-148

PART NO.	DESCRIPTION
V-3881	Baffle and Grille Cloth Assy.
V-3920	Battery Pack, "AB" (9 v. and 90 v.)
V-3323	Bearing, tuning shaft
V-3844	Bracket Assy. (OFF-ON)
V-3857	Bracket, variable capacitor mtg.
V-1114	Cabinet
V-3858	Capacitor, variable 2 gang (C1, C2, C3)
V-4542	Capacitor, Antenna trimmer (C4)
RCM20A101M	Capacitor, 100 mfd mica (C5, C6, C7, C8)
RCM20A331M	Capacitor, 330 mfd mica (C9)
RCP10W6102A	Capacitor, .001 mfd 600 v. (C10, C11)
RCP10W2503A	Capacitor, .05 mfd 200 v. (C12)
RCP10W2204A	Capacitor, 0.2 mfd 200 v. (C13)
RCP10W6502A	Capacitor, .005 mfd 600 v. (C14, C15)
RCP10W4103A	Capacitor, .01 mfd 400 v. (C16, C27)
RCP10W4503A	Capacitor, .05 mfd 400 v. (C17)
RCP10W4104A	Capacitor, 0.1 mfd 400 v. (C18)
RCP10W4204K	Capacitor, 0.2 mfd 400 v. (C19)
V-3861	Capacitor, electrolytic 20 mfd 150 v. (C20) 50 mfd 150 v. (C21)
V-3866	Capacitor, electrolytic cartridge 100 mfd 25 v. (C22)
V-3897	Channel, decorative strip mtg.
V-3337	Clamp, cable
V-3886	Clamp, handle
V-3862	Clamp, spring (electrolytic cap. mtg.)
V-3845	Coil, oscillator (L1, L2)
V-3852	Control, volume (R1) with switch (SW1)
V-4349-1	Cord, A-C power
V-4157S-15	Cord, dial drive
V-3678	Decal, OFF-ON
V-3859	Dial
V-3885	Foot, felt
V-3898	Grille
V-3766	Grommet, fiber
V-3880	Grommet, rubber, square
V-3901	Handle
V-3912	Knob, tuning and volume
V-3914	Label, tube layout
V-5265	Latch Assy., back cover
V-3915	Loop, antenna (L3)
V-3894	Name Plate
V-3904	Panel, metal
V-3874	Plug and Cable, Assy., battery
V-4115	Rectifier, selenium
RC10AE681K	Resistor, 680 ohms ¼ w. (R2, R3)
RC10AE821K	Resistor, 820 ohms ¼ w. (R4)
V-3869	Resistor, ballast, 2300 ohms 5 w. (R5)
RC20AE222K	Resistor, 2200 ohms ½ w. (R6)
RC10AE473K	Resistor, 47K ¼ w. (R7)
RC40AE680M	Resistor, 68 ohms 2 w. (R8)
RC10AE224M	Resistor, 220K ¼ w. (R9, R10)
RC10AE152K	Resistor, 1500 ohms ¼ w. (R11)
RC10AE104K	Resistor, 100K ¼ w. (R12)
RC10AE684K	Resistor, 680K ¼ w. (R13)
RC10AE225M	Resistor, 2.2M ¼ w. (R14, R15)
RC10AE475K	Resistor, 4.7M ¼ w. (R16, R17, R18, R19)
RC10AE106M	Resistor, 10M ¼ w. (R20)
V-3560	Shaft, tuning
V-3899	Shield, plastic front
V-3871	Shield, spiral
V-3870-1	Socket, lock in
V-3299	Socket, speaker
V-4114	Spacer, sleeve
V-3917	Speaker, 4" P.M.
V-3850	Spring, OFF-ON
V-3855	Spring, coil, for OFF-ON switch
V-3248S	Spring, dial drive
V-3900	Strip, decorative power and tuning

INTERMEDIATE FREQUENCY 455 KC.



NOTES.

1. SWITCHES "SW. 2-3-4-5" ARE SHOWN IN A.C. POSITION.
2. VOLTAGES MEASURED FROM COMMON NEGATIVE USING A 20,000 OHM/VOLT METER. (A.C. OPERATION — 115 V. LINE.)

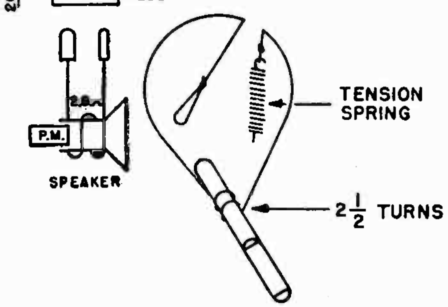
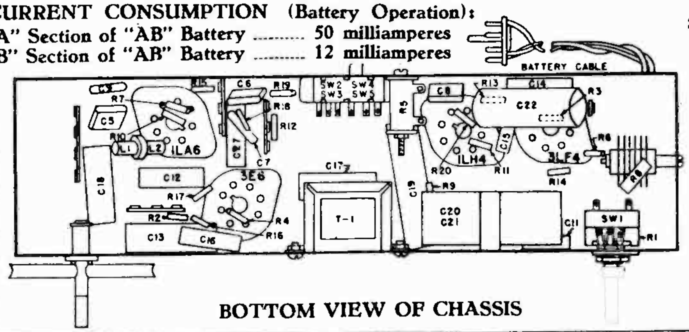
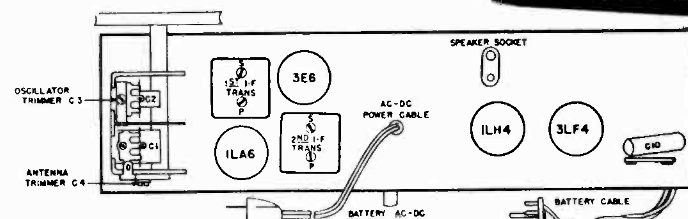


Fig. 3 -- DIAL DRIVE MECHANISM

CURRENT CONSUMPTION (Battery Operation):
"A" Section of "AB" Battery .... 50 milliamperes
"B" Section of "AB" Battery .... 12 milliamperes



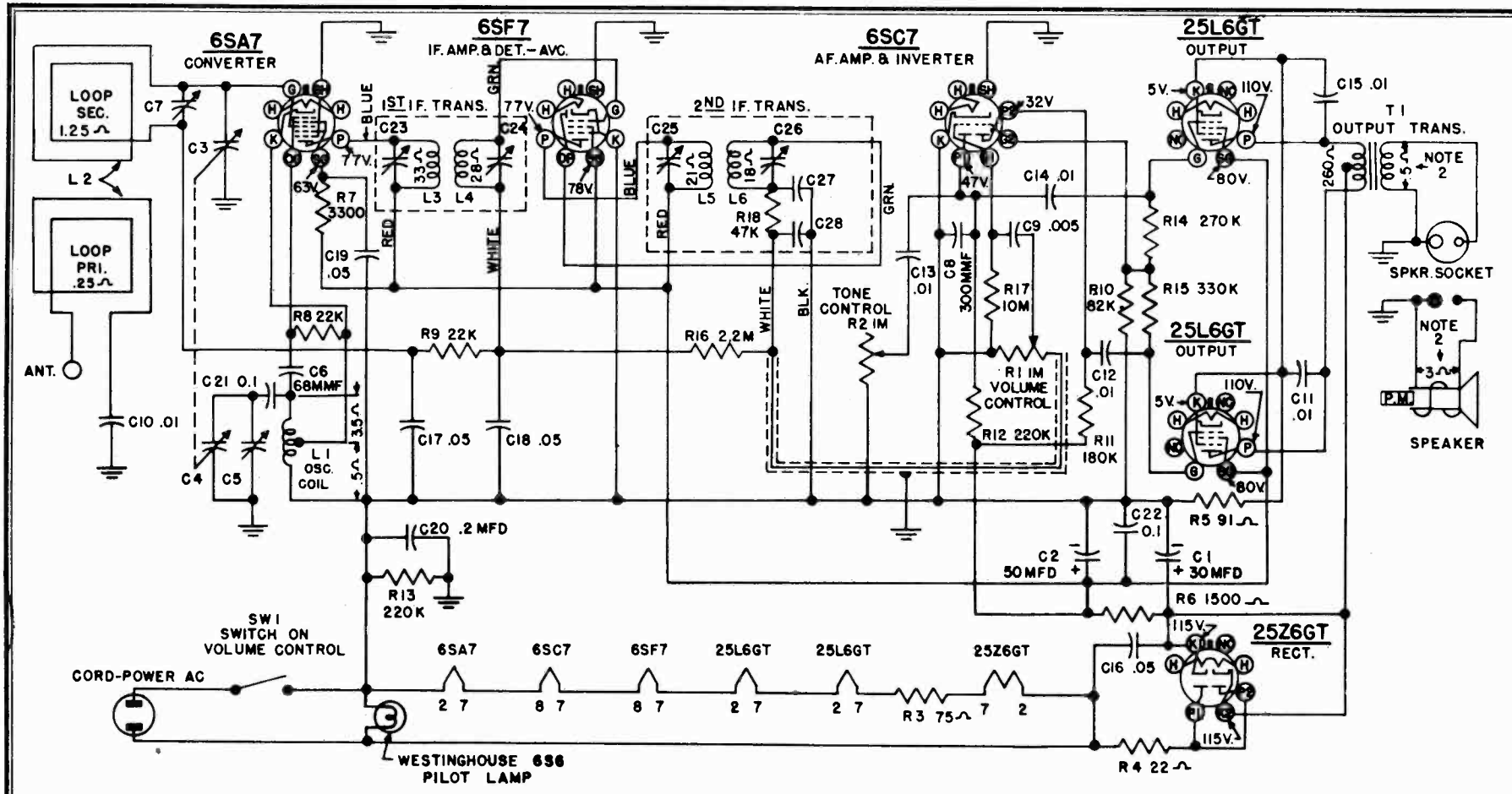
BOTTOM VIEW OF CHASSIS



CHASSIS LAYOUT

POWER OUTPUT:
Undistorted .... 200 milliwatts
Maximum .... 400 milliwatts

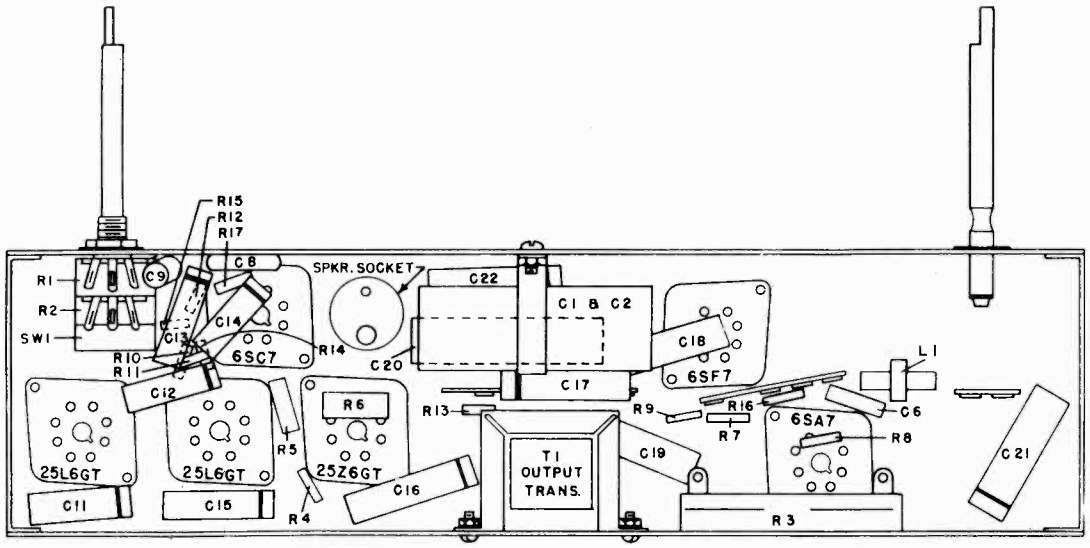
LOUDSPEAKER:
Size and Type .... 4" P. M.
Voice Coil Impedance .... 3.2 ohms



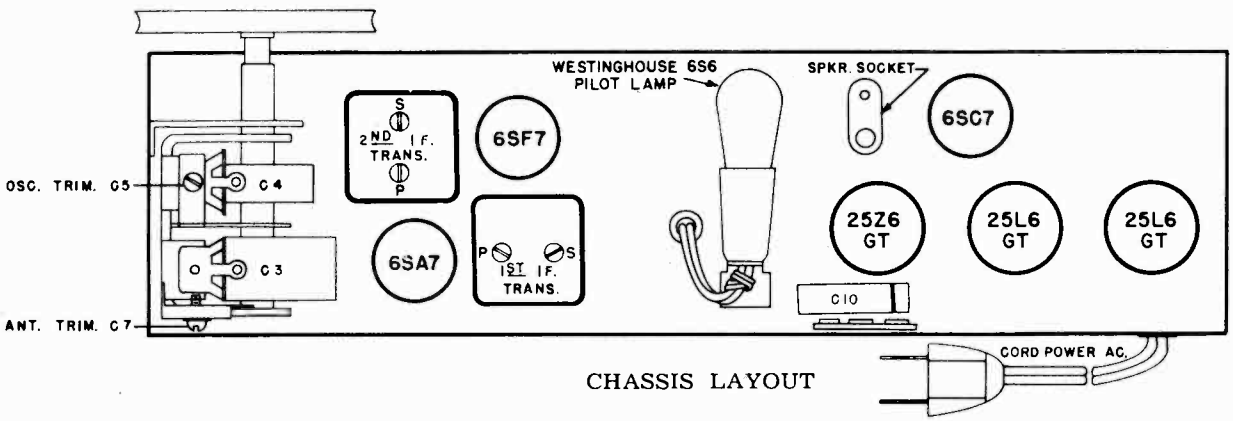
NOTE: 1. ALL VOLTAGES MEASURED FROM COMMON NEGATIVE USING A 20,000 OHMS PER VOLT METER – LINE VOLTAGE 117 VOLTS A-C. VOLTAGES SHOULD BE AS SHOWN ± 20 %.
2. SPEAKER PLUG REMOVED.

SPECIFICATIONS

FREQUENCY RANGE:
Standard Broadcast ..... 540 to 1600 kc
INTERMEDIATE FREQUENCY: ..... 455 kc
POWER OUTPUT:
Undistorted ..... 2.75 watts
Maximum ..... 5 watts
LOUDSPEAKER:
Size and Type ..... 5"x 7" oval P. M.
Voice Coil Impedance ..... 3.2 ohms
OPERATING VOLTAGE: ..... 105 to 120 volts 50-60 cycles A-C or 105 to 120 volts D-C
POWER CONSUMPTION: ..... 60 watts



BOTTOM VIEW OF CHASSIS



CHASSIS LAYOUT

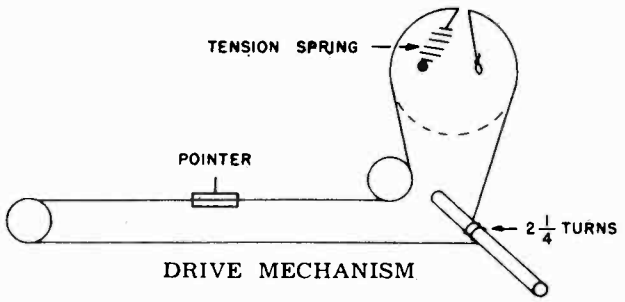
ALIGNMENT

Before beginning alignment, make certain that the dial pointer is correctly positioned.

Connect an output meter across the speaker voice coil.

While making the following adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.

Step	Connect Signal Generator to—	Signal Generator Frequency	Radio Dial Setting	Adjust
1	6SF7 control grid through 0.1 mfd capacitor	455 kc	1600 kc	Primary and secondary trimmers of 2nd I-F trans. for max. output
2	6SA7 control grid through 0.1 mfd capacitor	455 kc	1600 kc	Primary and secondary trimmers of 1st I-F trans. for max. output
3	Antenna terminal through 200 mmf capacitor	455 kc	1600 kc	"Peak" all I-F trimmers for max. output
4	Antenna terminal through 200 mmf capacitor	1615 kc	gang at minimum	Oscillator trimmer for max. output
5	Radiated signal (no actual connection)	1400 kc	1400 kc	Antenna trimmer for max. output



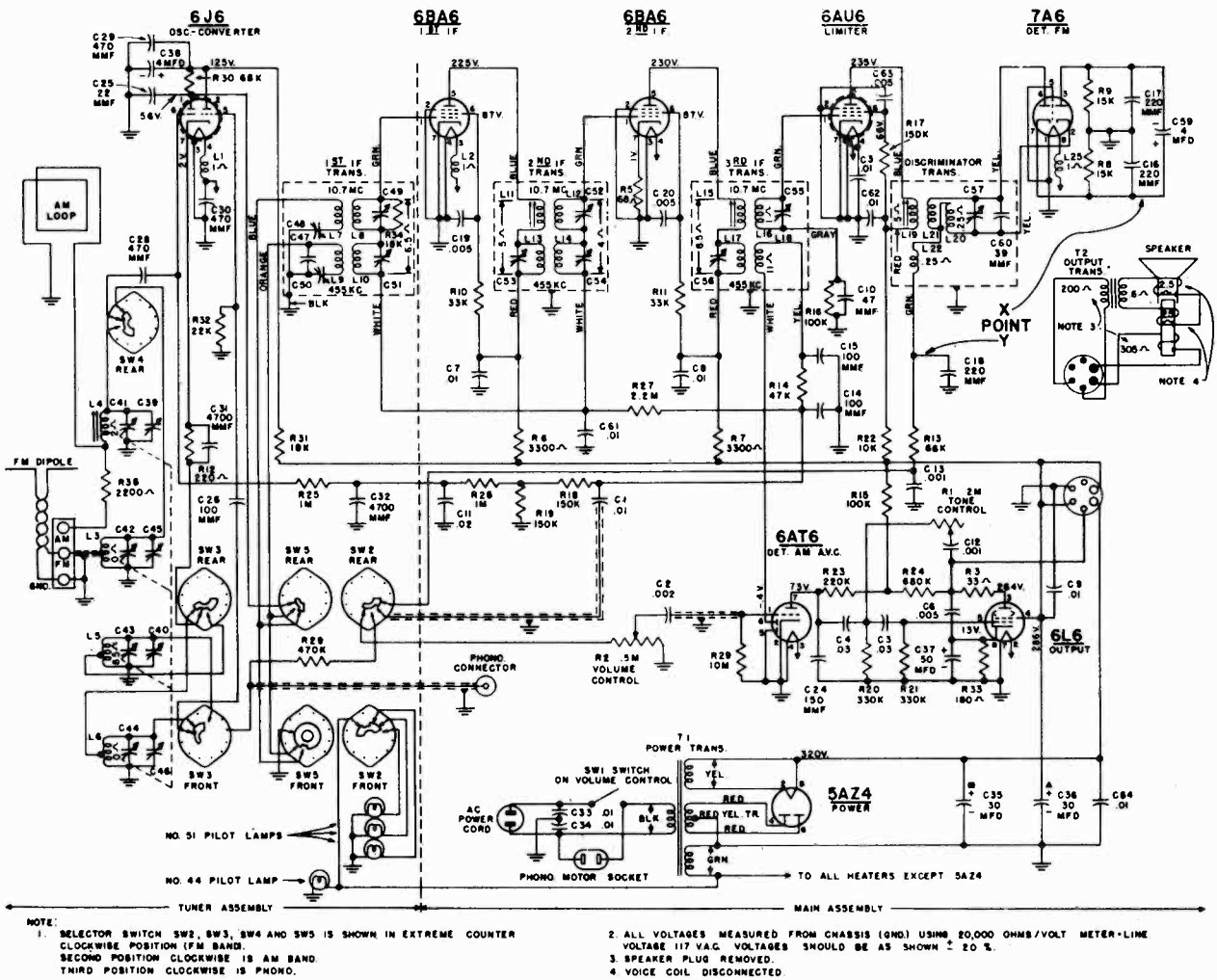
DRIVE MECHANISM

PARTS LIST

Part No.	Description
V-5019	Asbestos Sheet
V-5268	Background, dial
V-5021	Baffle and Grille Cloth Assy.
V-4997	Bracket, dial background
V-4991	Bracket, var. capacitor mtg.
V-5352	Bracket, volume control
V-1139-1	Cabinet, mahogany
V-3304	Capacitor, electrolytic 30 mfd 150 v. (C1) 50 mfd 150 v. (C2)
V-4993	Capacitor, var. 2-gang (C3, C4, C5)
RCM20A680M	Capacitor, 68 mmf mica (C6)
V-4992	Capacitor, trimmer (C7)
RCM20A301M	Capacitor, 300 mmf mica (C8)
RCP10W6502A	Capacitor, .005 mfd 400 v. (C9)
RCP10W4103A	Capacitor, .01 mfd 400 v. (C10, C11, C12, C13, C14, C15)
RCP10W4503A	Capacitor, .05 mfd 400 v. (C16, C17, C18, C19)
RCP10W4204K	Capacitor, .2 mfd 400 v. (C20)
RCP10W4104A	Capacitor, .1 mfd 400 v. (C21, C22)
V-4763	Clamp, dial
V-3382	Coil, oscillator (L1)
V-4982	Control, volume (R1), tone (R2) and switch (SW1)
V-4349-1	Cord, A-C power
V-4304S-10	Cord, dial drive (incl. clip)
V-5024	Cover, back
V-4983	Dial Scale
V-4072-1	Fastener, back cover clip
V-4893	Foot, rubber
V-3345S-5	Grommet, var. capacitor mtg.
V-4362-3	Knob, ON-OFF and tone
V-5039-1	Knob, tuning
V-5028-1	Knob, volume
No. 6S6	Lamp, pilot
V-5031	Loop, antenna (L2)
V-5043	Nameplate, Westinghouse
V-5022	Nameplate, Stations
V-5023	Nameplate, Volume
V-5033	Plate, front glass
V-4986	Pointer, dial
V-3166S	Pulley, 7/16" dia.
V-4987	Rail, pointer (incl. pulley studs)
V-4994	Resistor, ballast, 75 ohms (R3)
RC20AE220M	Resistor, 22 ohms ½ w. (R4)
RC30AE910J	Resistor, 91 ohms 1 w. (R5)
RC40AE152M	Resistor, 1500 ohms 2 w. (R6)
RC10AE332M	Resistor, 3300 ohms ¼ w. (R7)
RC10AE223M	Resistor, 22K ¼ w. (R8, R9)
RC10AE823K	Resistor, 82K ¼ w. (R10)
RC20AE184K	Resistor, 180K ½ w. (R11)
RC20AE224K	Resistor, 220K ½ w. (R12)
RC10AE224M	Resistor, 220K ¼ w. (R13)
RC10AE274K	Resistor, 270K ¼ w. (R14)
RC10AE334K	Resistor, 330K ¼ w. (R15)
RC10AE225M	Resistor, 2.2M ¼ w. (R16)
RC10AE106M	Resistor, 10M ¼ w. (R17)
V-4988	Shaft, tuning
V-3344S-1	Sleeve, spacer, var. Capacitor mtg.
V-3246S	Socket, octal
V-3163S	Socket, octal (pin No. 1 GND)
V-4989	Socket, pilot lamp
V-3299S	Socket, speaker
V-5034	Speaker, 5"x 7" P. M.
V-3248S	Spring, dial drive
V-3909	Strip, plastic, loop mtg.
V-3228S-1	Terminal Board, 2 lugs
V-4776	Terminal Board, 3 lugs
V-5041	Terminal Board, 4 lugs
V-3375S	Terminal Board, 5 lugs
V-3328	Transformer, 1st I-F (L3, L4, C23, C24)
V-3329	Transformer, 2nd I-F (L5, L6, C25, C26, C27, C28, R18)
V-3297	Transformer, output (T1)
V-3752S	Washer, felt (for knobs)
V-3267S-4	Washer, flat (chassis mtg.)

MODELS H-161, H-168, H-168A, H-168B Revised

WESTINGHOUSE ELECTRIC CORP.



NOTE:
1. SELECTOR SWITCH SW2, SW3, SW4 AND SW5 IS SHOWN IN EXTREME COUNTER CLOCKWISE POSITION (FM BAND). SECOND POSITION CLOCKWISE IS AM BAND. THIRD POSITION CLOCKWISE IS PHONO.
2. ALL VOLTAGES MEASURED FROM CHASSIS (GND.) USING 20,000 OHMS/VOLT METER-LINE VOLTAGE 117 VAC. VOLTAGES SHOULD BE AS SHOWN ± 20 %.
3. SPEAKER PLUG REMOVED.
4. VOICE COIL DISCONNECTED.

CHANGES IN V-2118 CHASSIS

Improved performance was obtained in later production of the V-2118 chassis by incorporating the changes listed below. A schematic diagram of the revised chassis is shown on the back of this sheet, and parts list additions appear below.

1. The connection between the antenna loading coil (L4) and the bandswitch (SW4) was moved to the top of the coil.
2. A resistor (R35) was inserted in place of C27 in the AM antenna circuit.
3. Capacitor (C58) in the AM antenna circuit was deleted.
4. R32 now connects between the 6J6 oscillator grid and ground instead of between the 6J6 oscillator grid and cathode.
5. Filament choke (L25) was added to the 7A6 heater circuit.
6. C64 was added across the power supply filter circuit.
7. C6 now connects between resistor (R3) and 6L6 cathode instead of between 6L6 plate and cathode.
8. A phono motor power socket was mounted on the rear of the chassis.

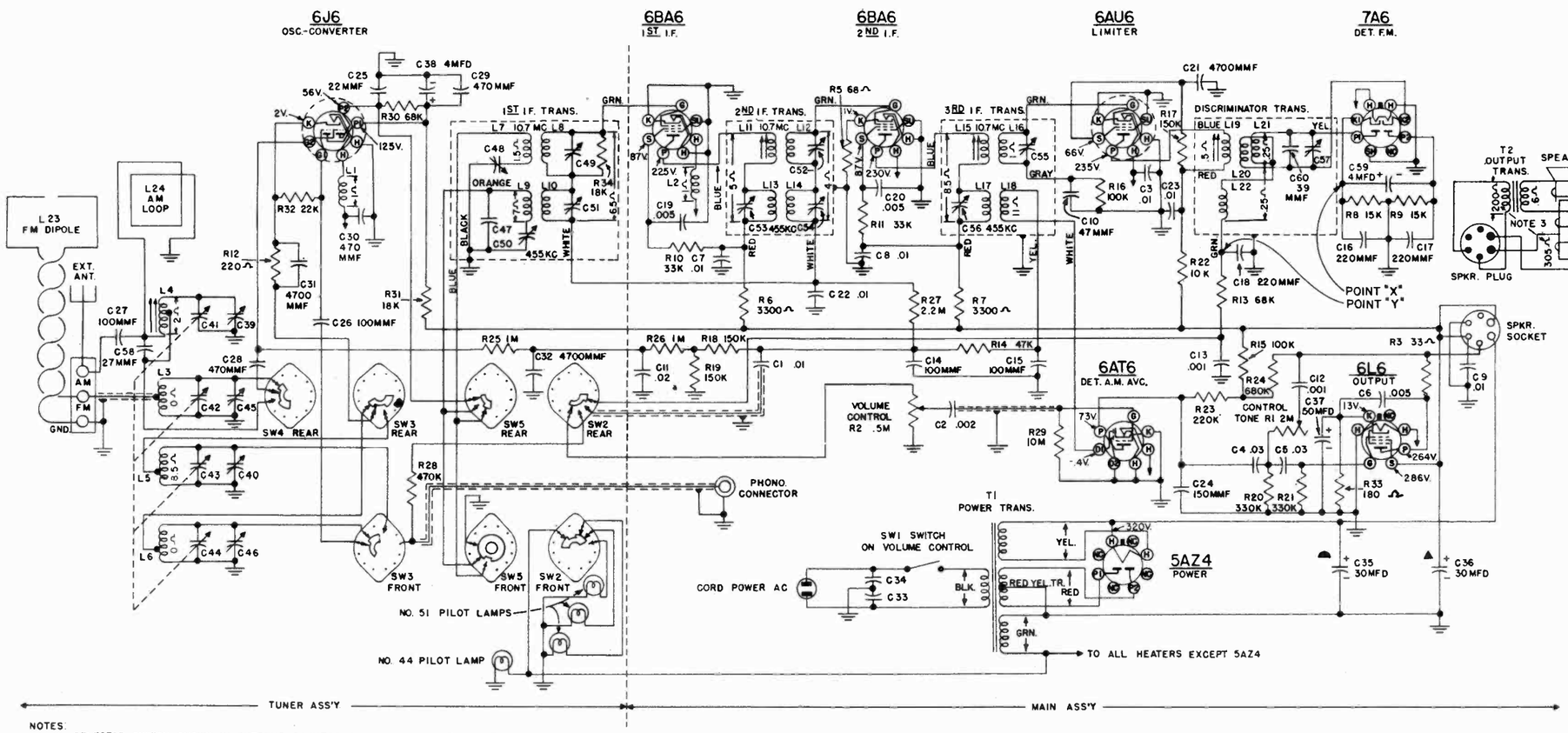
These parts should be added to the parts list in the original service notes. The list will then apply to both the original and the revised chassis.

PARTS LIST ADDITIONS

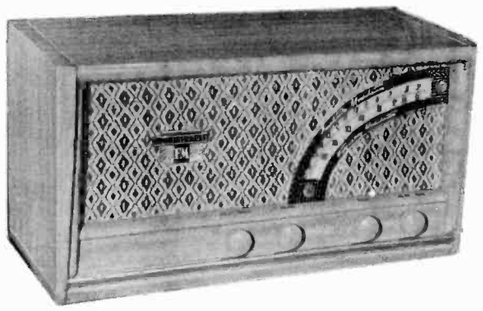
Part No.	Description
RC10AE222M	Resistor, 2200 ohms 1/4 w. (R35) .....
V-5040-15	Capacitor, .01 mfd 600 v. (C61, C62) .
V-5040-11	Capacitor, .005 mfd 600 v. (C63) .....
RCP10W6103M	Capacitor, .01 mfd 600 v. (C64) .....
V-4638	Choke, filament (L25) .....
V-5405	Socket, phono motor power .....

WESTINGHOUSE ELECTRIC CORP.

MODELS H-161, H-168,
H-168A, H-168B
CHASSIS V2118



NOTES:
1. SELECTOR SWITCH SHOWN IN EXTREME COUNTER CLOCKWISE POSITION (F.M. BAND).
SECOND POSITION CLOCKWISE IS AM BAND.
THIRD POSITION CLOCKWISE IS PHONO.
2. ALL VOLTAGES MEASURED FROM CHASSIS (GND) USING 20,000 OHMS/VOLT METER—LINE VOLTAGE 117 V.A.C.
VOLTAGES SHOULD BE AS SHOWN ± 20 PERCENT.
3. SPEAKER PLUG REMOVED.
4. VOICE COIL DISCONNECTED.



H-161
MAHOGANY AND BLONDE

SPECIFICATIONS

FREQUENCY RANGES:

Standard Broadcast	540 to 1615 kc.
Frequency Modulation	88 to 108 mc.

INTERMEDIATE FREQUENCIES:

Amplitude Modulation	455 kc.
Frequency Modulation	10.7 mc.

TUBE COMPLEMENT:

1	6J6	Converter
2	6BA6	1st and 2nd I-F Amp.
1	6AU6	Limiter (FM)
1	7A6	Ratio Det. (FM)
1	6AT6	Det. (AM), AVC and 1st A-F Amp.
1	6L6 or 6L6G	Output Amp.
1	5AZ4	Rectifier

PILOT LAMPS:

1 Westinghouse No. 44	6.3 v., 0.25 amp.
3 Westinghouse No. 51	6.3 v., 0.20 amp.

POWER OUTPUT:

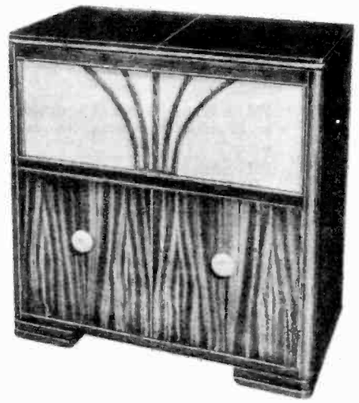
Undistorted	6 watts
Maximum	9 watts

LOUDSPEAKER:

Size and Type (H-161)	8" Electro Dynamic
Size and Type (H-168 and H-168A)	10" Electro Dynamic
Field Resistance	305 ohms
Voice Coil Impedance	3.2 ohms

OPERATING VOLTAGE . . . 105 to 120 volts, 50-60 cycles A-C

POWER CONSUMPTION (radio section) . . . . . 110 watts



H-168 and H-168A
MAHOGANY AND BLONDE

ALIGNMENT

BROADCAST BAND—AMPLITUDE MODULATION

Connect an output meter across the speaker voice coil.

While making the following adjustments, keep the volume control set for maximum output, the tone control set on treble, and the signal generator output attenuated to avoid AVC action.

Step	Connect Signal Generator to—	Signal Gen. Freq.	Radio Dial	Adjust for Maximum Output
1.	Set Phono-Band Switch to "AM"			
2.	6BA6, 2nd I-F, control grid through a 0.1 mfd capacitor	455 kc	540 kc	455 kc primary trimmer of 3rd I-F transformer.
3.	6BA6, 1st I-F, control grid through a 0.1 mfd capacitor	455 kc	540 kc	455 kc primary and secondary trimmers of 2nd I-F trans.
4.	6J6, converter, control grid through a 0.1 mfd capacitor	455 kc	540 kc	455 kc primary and secondary trimmers of 1st I-F trans.
5.	6J6, converter, control grid through a 0.1 mfd capacitor	455 kc	540 kc	Peak all 455 kc I-F transformer trimmers.
6.	Radiated signal (no actual connection)	1600 kc	1600 kc	AM oscillator trimmer.
7.	Radiated signal	600 kc	600 kc	AM antenna padder.
8.	Radiated signal	1400 kc	1400 kc	AM antenna trimmer.
9.	Recheck steps 7 and 8 in order given. "Rock" tuning capacitor while adjusting AM antenna trimmer.			

FM BAND—FREQUENCY MODULATION

Do not align the 10.7 mc I-F circuits until all 455 kc I-F adjustments have been completed.

Step	Connect Signal Generator to—	Signal Gen. Freq.	Radio Dial	Adjust—
1.	Set Phono-Band switch to "FM."			
2.	Connect a vacuum tube voltmeter between point X (see Figs. 3 and 4) and ground (chassis).			
3.	6BA6, 2nd I-F, control grid through a .001 mfd mica capacitor	Unmodulated 10.7 mc	88 mc	10.7 mc primary and secondary of 3rd I-F trans. and primary of discriminator trans. for max. voltage.
4.	6BA6, 1st I-F, control grid through a .001 mfd mica capacitor	Unmodulated 10.7 mc	88 mc	10.7 mc primary and secondary of 2nd I-F trans. for max. voltage.
5.	Stator of FM tuning capacitor (C42) through a .01 mfd mica capacitor	Unmodulated 10.7 mc	88 mc	10.7 mc primary and secondary of 1st I-F trans. for max. voltage.
6.	Connect the vacuum tube voltmeter between point Y (Figs. 3 and 4) and chassis.			
7.	Stator of FM tuning capacitor (C42) through a .01 mfd mica capacitor	Unmodulated 10.7 mc	88 mc	Secondary of discriminator trans. for zero voltage. The voltage will change polarity as the trimmer is tuned through resonance. Tune carefully for zero voltage.
8.	Connect the vacuum tube voltmeter between point X and chassis.			
9.	Stator of FM tuning capacitor (C42) through a .01 mfd mica capacitor	Unmodulated 10.7 mc	88 mc	Primary of discriminator trans. for max. voltage.
10.	FM antenna terminal through a 72 ohm non-inductive resistor	Unmodulated 105 mc	105 mc	FM oscillator trimmer for max. voltage.*
11.	FM antenna terminal through a 72 ohm non-inductive resistor	Unmodulated 105 mc	105 mc	FM antenna trimmer for max. voltage*— "rock" tuning capacitor while adjusting.
12.	Check dial calibration and tracking at 90 mc.**			

* The FM oscillator and antenna trimmers can be adjusted by using the thumb and forefinger to rotate the outside drum of the capacitor. Hand capacity effects may be reduced by holding the heel of the hand against the 1st I-F trans. can.

** After the radio has been aligned at 105 mc., check calibration by tuning to a 90 mc. signal from the generator. If the dial pointer indicates 90 mc., no further adjustments are necessary. If the pointer is on the high frequency side of 90 mc., slightly *expand* the length of oscillator coil (L6) and repeat steps 10, 11, and 12 above until dial calibration is correct. If the pointer is on the low frequency side of 90 mc., slightly *compress* length of oscillator coil (L6) and repeat steps 10, 11, and 12 until dial calibration is correct.

After calibration has been checked and the antenna circuit has been "peaked" at 105 mc., check the antenna circuit tracking by tuning to a 90 mc. signal and rotating the FM antenna trimmer. If the "peak" setting is the same at 90 mc. as it was at 105 mc., no further adjustments are necessary. If the trimmer capacitance must be increased to obtain maximum output at 90 mc., slightly compress the length of antenna coil (L3) and repeat steps 11 and 12 until correct tracking is obtained. If the trimmer capacitance must be decreased to obtain maximum output at 90 mc., slightly expand the length of antenna coil (L3) and repeat steps 11 and 12 until correct tracking is obtained.

PARTS LIST FOR MODELS H-161, H-168 AND H-168A

Part No.	Description
V-4924-1	Antenna, FM Dipole (L23) (H-161)
V-4924-2	Antenna, FM Dipole (L23) (H-168 and H-168A)
V-4686	Antenna, AM Loop (L24) (H-161)
V-4951	Antenna, AM Loop (L24) (H-168 and H-168A)
V-4687	Background, front glass plate (H-161)
V-5293	Background, front glass plate (H-168 and H-168A)
V-4688	Baffle & Grille Cloth Assy. (H-161)
V-4169-1	Base, shield, miniature tube
V-4668	Bearing, tuning shaft and plate assy.
V-4631	Bracket, left dial mounting
V-4632	Bracket, right dial mounting
V-4633	Bracket Assy., main dial mounting
V-4657	Bracket Assy., pointer mounting
V-4689	Bracket, speaker mounting (H-161)
V-5070	Bracket, shock mounting (H-168 and H-168A)
V-4655	Bracket, dial light
V-4836S-4	Button, hole plug
V-1131-1	Cabinet (H-161 Mahogany)
V-1131-2	Cabinet (H-161 Blonde)
V-1137-1	Cabinet (H-168 Mahogany)
V-1137-2	Cabinet (H-168 Blonde)
V-1148-1	Cabinet (H-168A Mahogany)
RCP10W4103A	Capacitor, .01 mfd 400 v. (C1)
RCP10W6202A	Capacitor, .002 mfd 600 v. (C2)
V-5040-13	Capacitor, .01 mfd 200 v. (C3)
RCP10W4303A	Capacitor, .03 mfd 400 v. (C4, C5)
RCP10M6502A	Capacitor, .005 mfd 600 v. (C6)
V-5040-15	Capacitor, .01 mfd 600 v. (C7, C8, C9)
RCM20A470M	Capacitor, 47 mmf mica (C10)
RCP10W4203A	Capacitor, .02 mfd 400 v. (C11)
RCP10W6102A	Capacitor, .001 mfd 600 v. (C12, C13)
RCM20A101M	Capacitor, 100 mmf mica (C14, C15)
RCM20A221K	Capacitor, 220 mmf mica (C16, C17, C18)
V-5040-11	Capacitor, .005 mfd 600 v. (C19, C20)
RCM30A472M	Capacitor, 4700 mmf mica (C21)
RCM30A103M	Capacitor, .01 mfd mica (C22, C23)
RCM20A151M	Capacitor, 150 mmf mica (C24)
RCM20B220K	Capacitor, 22 mmf mica (C25)
R3CC32CG101K	Capacitor, 100 mmf ceramic (C26)
R3CC26SL101M	Capacitor, 100 mmf ceramic (C27)
RCM20A471M	Capacitor, 470 mmf mica (C28)
R5CC20ZY471M	Capacitor, 470 mmf ceramic (C29, C30)
R5CC36ZY472M	Capacitor, 4700 mmf ceramic (C31, C32)
V-4634	Capacitor, dual line filter .01-.01 mfd 600 v. (C33, C34)
V-4635	Capacitor, dual filter, electrolytic 30-30 mfd 450 v. (C35, C36)
V-4636	Capacitor, electrolytic 50 mfd 25 v. C37
V-4885	Capacitor, electrolytic 4 mfd 450 v. (C38, C59)
V-4671	Capacitor, AM antenna trimmer (C39)
V-4672	Capacitor, AM oscillator trimmer (C40)
V-4673	Capacitor, variable 2 gang (C41, C42, C43, C44, C45, C46)
R3CC25CG270J	Capacitor, 27 mmf ceramic (C58)
V-5307-1	Cardboard & Grille Cloth Assy. L.H. side (H-168, H-168A Mahogany)
V-5307-2	Cardboard & Grille Cloth Assy L.H. side (H-168 Blonde)
V-4898	Catch, bullet
V-5071	Channel, rubber (H-168, H-168A)
V-4638	Choke, filament, 1.1 microhenries (L1, L2)
V-4877	Clamp, power cord, closed
V-3337S	Clamp, power cord, open

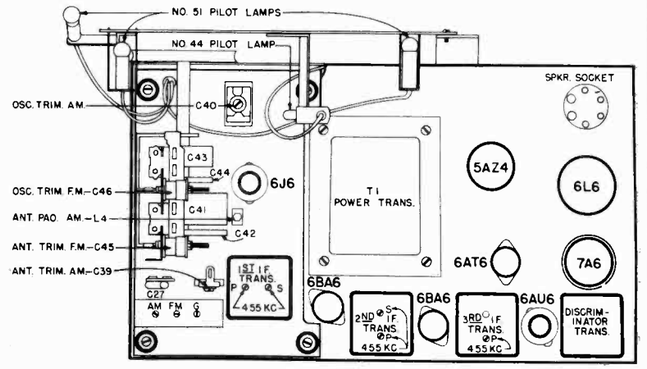


FIG. 1—CHASSIS LAYOUT

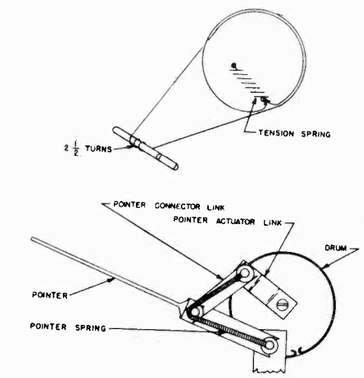


FIG. 2—DIAL DRIVE MECHANISM

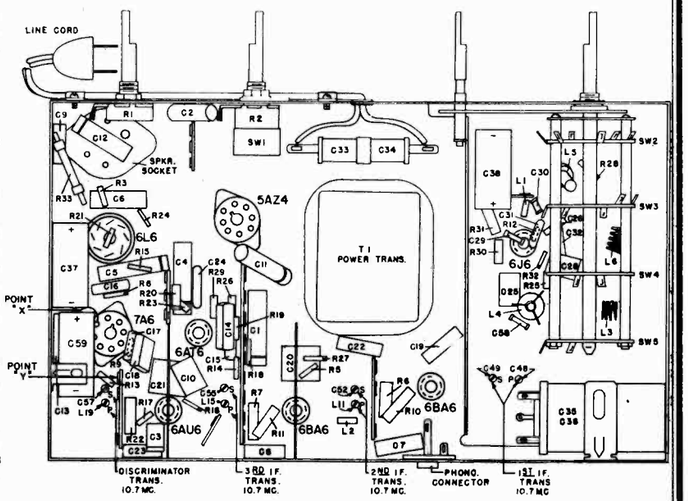


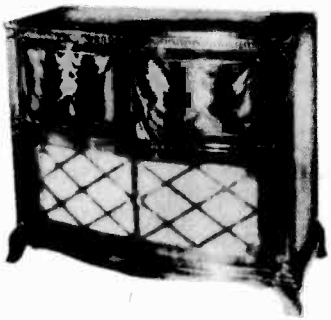
FIG 3—BOTTOM VIEW OF CHASSIS

PARTS LIST FOR MODELS H-161, H-168 AND H-168A

Part No.	Description
RC30AE103K	Resistor, 10,000 ohms 1 w. (R22)
RC10AE224K	Resistor, 220,000 ohms ¼ w. (R23)
RC10AE684K	Resistor, 680,000 ohms ¼ w. (R24)
RC10AE105M	Resistor, 1 megohm ¼ w. (R25, R26)
RC10AE225M	Resistor, 2.2 megohms ¼ w. (R27)
RC10AE474M	Resistor, 470,000 ohms ¼ w. (R28)
RC10AE106M	Resistor, 10 megohms ¼ w. (R29)
RC20AE683K	Resistor, 68,000 ohms ½ w. (R30)
RC30AE183K	Resistor, 18,000 ohms 1 w. (R31)
RC10AE223K	Resistor, 22,000 ohms ¼ w. (R32)
V-4648	Resistor, cathode 180 ohms 2 w. (R33)
V-3755S-11	Screw, chassis mounting (H-161)
V-3570S-5	Screw, tuner assembly mounting
V-3570S-11	Screw, Hex head, chassis mtg. (H-168 and H-168A)
V-3755S-9	Screw, Phillips head, chassis mtg. (H-168 and H-168A)
V-4678	Shaft, tuning
V-4649-3	Shield, spiral (2¾ inches long)
V-4649-2	Shield, spiral (7½ inches long)
V-4884	Shield, loktal tube
V-4861	Shield, flat steel (under chassis)
V-4169-2	Shield, miniature tube
V-3344S-2	Sleeve, spacer, tuner assy. mounting
V-3288S	Socket, speaker
V-3870-1	Socket, lock-in tube
V-3275S	Socket, molded octal tube
V-4292S-1	Socket, miniature molded
V-4679	Socket, dial light
**V-4702	Speaker, 8" Electro Dynamic for H-161
**V-4945	Speaker, 10" Electro Dynamic for H-168 and H-168A
V-4650	Spring, pointer
V-4057	Spring, dial drive
V-3258S	Spring, knob
V-4900	Strike, bullet catch
V-4651	Stud, trimount, plastic dial mounting
V-5295-1	Support, lid, L.H. (Mahogany)
V-5295-2	Support, lid, L.H. (Blonde)
V-5295-3	Support, lid, R.H. (Mahogany)
V-5295-4	Support, lid, R.H. (Blonde)
V-4682	Switch, selector (SW2, SW3. SW4, SW5)
V-4704	Tab, AM
V-4705	Tab, FM
V-3643	Teenut, record changer mounting
V-4684	Terminal Board, ANT-GND
V-4667	Terminal Board, 1 lug
V-4664	Terminal Board, 2 lugs
V-3486	Terminal Board, 3 lugs
V-4665	Terminal Board, 9 lugs
V-4627	Transformer, 1st I-F (L7, L8, L9, L10, R34, C47, C48, C49, C50, C51)
V-4628	Transformer, 2nd I-F (L11, L12, L13, L14, C52, C53, C54)
V-4629	Transformer, 3rd I-F (L15, L16, L17, L18, C55, C56)
V-4630	Transformer, discriminator (L19, L20, L21, L22, C57, C60)
V-4653	Transformer, power (T1)
V-4945-1	Transformer, output for V-4945 speaker stamped 285
V-4945-3	Transformer, output for V-4945 speaker stamped 191
V-4702-1	Transformer, output for V-4702 speaker stamped 285
V-3267S-1	Washer, chassis mounting, small
V-3267S-6	Washer, chassis mounting, large
V-3267S-10	Washer, record changer mounting
V-3668S	Washer, felt
V-4904-1	Washer, finishing (H-168 and H-168A Mahogany)
V-4904-2	Washer, finishing (H-168 Blonde)

Part No.	Description
V-4685	Clamp, spring, filter capacitor mtg.
V-5296	Clip, front glass plate mtg.
V-4883	Coil, FM antenna (L3)
V-4675	Coil, antenna loading (L4)
V-4676	Coil, AM oscillator (L5)
V-4882	Coil, FM oscillator (L6)
V-4945-2	Cone & Voice Coil Assy. for V-4945 speaker stamped 285
V-4945-4	Cone & Voice Coil Assy. for V-4945 speaker stamped 191
V-4702-2	Cone & Voice Coil Assy. for V-4702 speaker stamped 285
V-3254S	Connector, phono
V-4639	Control, tone, 2 megohms (R1)
V-4640	Control, volume, .5 megohms (R2) and switch (SW1)
V-4349-2	Cord, Power A-C
V-4304S-7	Cord Assembly, dial drive
V-4958	Cord, A-C power assy. (H-168 and H-168A)
V-4525-3	Cushion, chassis (H-168 and H-168A)
V-3885	Cushion, lid (H-168 and H-168A)
V-4690	Decal, band
V-4691	Decal, tone
V-4692	Decal, tuning
V-4693	Decal, volume
V-4642	Dial, plastic
V-4643	Eyelet, chassis mtg. (H-161)
V-3371	Foot, recessed (H-161)
V-4902	Glide, furniture (H-168 and H-168A)
V-4948-1	Grille Cloth, R.H. side (H-168 and H-168A)
V-3345S-4	Grommet, tuner assembly mounting
V-4644	Grommet, plain, chassis mounting
V-4852	Grommet, chassis mounting (T shaped)
V-4903-1	Hinge, door (H-168 and H-168A Mahogany)
V-4903-2	Hinge, door (H-168 Blonde)
V-3510	Hinge, lid (H-168 and H-168A Mahogany)
V-4321	Hinge, lid (H-168 Blonde)
V-4697S-1	Knob, volume, tuning and tone (Mahogany)
V-4697S-3	Knob, volume, tuning and tone (Blonde)
V-4697S-2	Knob, band (Mahogany)
V-4697S-4	Knob, band (Blonde)
No. 44	Lamp, pilot, background
No. 51	Lamp, pilot, AM, FM, edge
V-4645	Link, pointer connector
V-4660	Link Assembly, pointer actuator
V-4696	Nameplate, Westinghouse FM
√-5303	Needle, phono, sapphire tip
V-3926	Nut, speed, ⅛ inch, nameplate mtg.
V-4701	Plate, front glass (H-161)
V-5297	Plate, front glass (H-168 and H-168A)
V-4647	Pointer Assembly
V-5294	Pull, door (H-168 and H-168A)
RC10AE330K	Resistor, 33 ohms ¼ w. (R3)
RC10AE680K	Resistor, 68 ohms ¼ w. (R5)
RC30AE332K	Resistor, 3300 ohms 1 w. (R6, R7)
RC10AE153J	Resistor, 15,000 ohms ¼ w. (R8, R9)
RC30AE333K	Resistor, 33,000 ohms 1 w. (R10, R11)
RC10AE221K	Resistor, 220 ohms ¼ w. (R12)
RC10AE683M	Resistor, 68,000 ohms ¼ w. (R13)
RC10AE473M	Resistor, 47,000 ohms ¼ w. (R14)
RC10AE104K	Resistor, 100,000 ohms ¼ w. (R15, R16)
RC20AE154K	Resistor, 150,000 ohms ½ w. (R17)
RC10AE154M	Resistor, 150,000 ohms ¼ w. (R18, R19)
RC10AE334K	Resistor, 330,000 ohms ¼ w. (R20, R21)

MODELS H-164, H-166, H-167, H-166A WESTINGHOUSE ELECTRIC CORP.



H-166 & H-166A

H-164

H-167

For H-166 and H-167 record changer information, refer to V-4914 Automatic Record Changer Service Notes.

For information on the V-5699 record changer used in the Model H-166A, refer to V-4944 Automatic Record Changer Service Notes. The V-5699 and V-4944 record changers are similar except that the pickup arms, pickup cartridges, and power cords are different.

SPECIFICATIONS

FREQUENCY RANGES:
- Standard Broadcast ..... 540 to 1600 kc.
- Frequency Modulation ..... 88 to 108 mc.

INTERMEDIATE FREQUENCIES:
- Amplitude Modulation ..... 455 kc.
- Frequency Modulation ..... 10.7 mc.

TUBE COMPLEMENT:
- 1 7F8 ..... R-F Amp. (FM)
- 1 7F8 ..... Osc.-converter
- 2 6BA6 ..... 1st and 2nd I-F Amp.
- 1 6AU6 ..... Limiter (FM)
- 1 6H6GT ..... Ratio Det. (FM)
- 1 6AT6 ... Det. (AM), AVC and 1st A-F Amp.
- 1 6AT6 ..... Phase Inverter
- 2 6Y6G ..... Output Amp.
- 1 5U4G ..... Rectifier
- 1 6SC7 Phono. Pre-Amp. (H-166, H-166A and (H-167)

PILOT LAMPS:
- 2 Westinghouse No. 44 .... 6.3 v., 0.25 amp.

POWER OUTPUT:
- Undistorted ..... 15 watts
- Maximum ..... 18 watts

LOUDSPEAKER: ..... 12" Electro-dynamic

OPERATING VOLTAGE: 105 to 120 volts, 50-60 cycles A-C

POWER CONSUMPTION(radio section): 150 watts

WESTINGHOUSE ELECTRIC CORP. MODELS H-164, H-166, H-167, H-166A

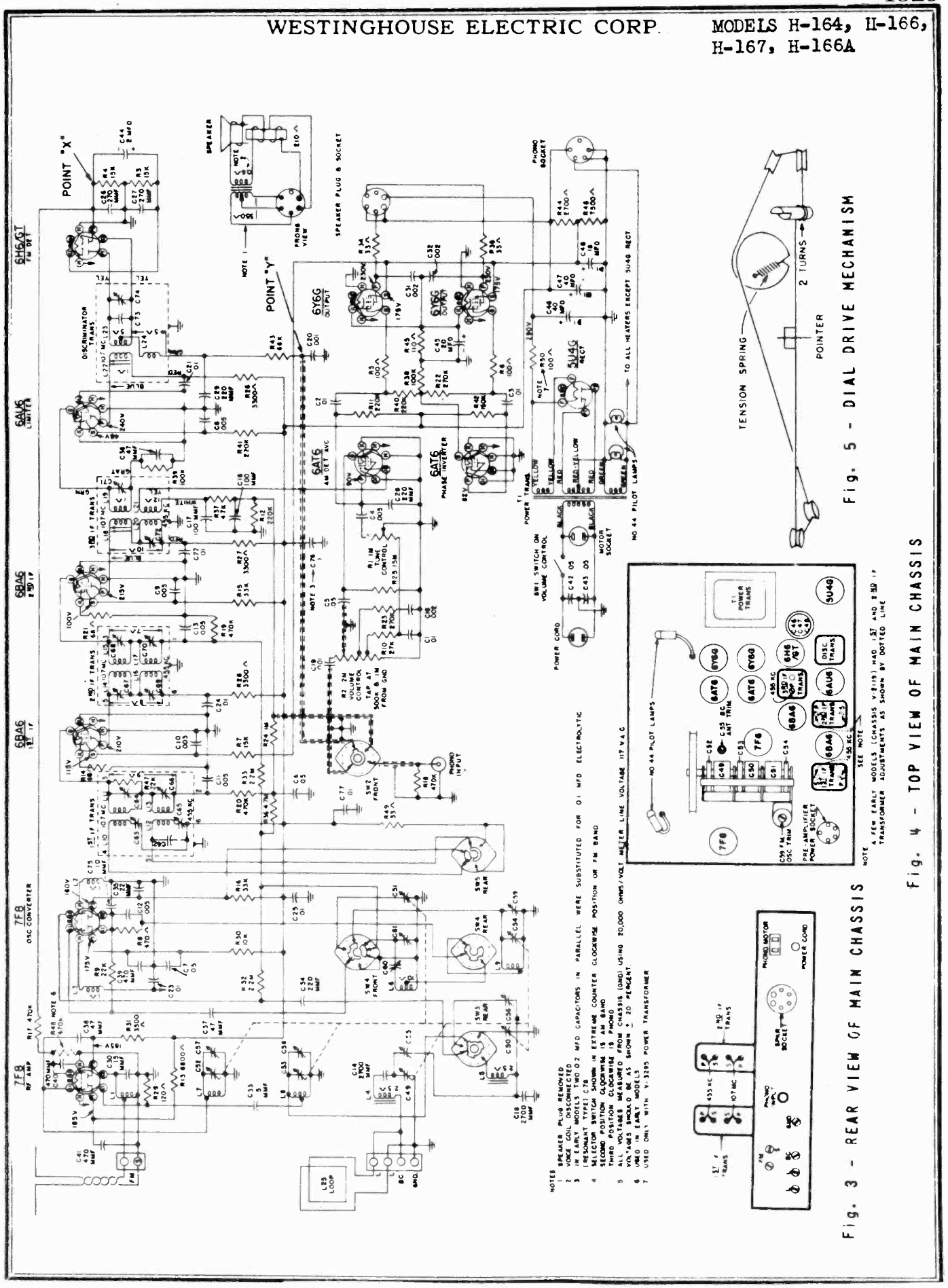


Fig. 3 - REAR VIEW OF MAIN CHASSIS

Fig. 4 - TOP VIEW OF MAIN CHASSIS

Fig. 5 - DIAL DRIVE MECHANISM

MODELS H-164, H-166, H-167, H-166A — WESTINGHOUSE ELECTRIC CORP.

ALIGNMENT

BROADCAST BAND — AMPLITUDE MODULATION

Connect an output meter across the speaker voice coil

While making the following adjustments, keep the volume control set for maximum output, the tone control set on treble, and the signal generator output attenuated to avoid AVC action.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial	Adjust for Maximum Output
1.	Set PHONO-BAND switch to "AM"			
2.	Pin No. 1 of 6BA6, 2nd I-F, through a 0.1 mfd capacitor	455 kc	550 kc	455 kc primary trimmer of 3rd I-F trans.
3.	Pin No. 1 of 6BA6, 1st I-F, through a 0.1 mfd capacitor	455 kc	550 kc	455 kc secondary and primary trimmers of 2nd I-F trans.
4.	Pin No. 1 of 7F8, converter, through a 0.1 mfd capacitor	455 kc	550 kc	455 kc secondary and primary trimmers of 1st I-F trans.
5.	Radiated signal (no actual connection)	1500 kc	1500 kc	BC osc. trimmer (C61) (make certain that loop antenna is connected to "L" terminals)
6.	Radiated signal (no actual connection)	1400 kc	1400 kc	BC converter (C56) and BC antenna (C55) trimmers
7.	Radiated signal (no actual connection)	600 kc	600 kc	BC oscillator padder (C60) ("rock-in" adjustment)
8.	Repeat steps 5, 6, and 7			

FM BAND — FREQUENCY MODULATION

Do not align the 10.7 mc. I-F circuits until all 455 kc I-F adjustments have been completed.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial	Adjust
1.	Set PHONO-BAND switch to "FM"			
2.	Connect a vacuum tube voltmeter between point "X" (See Figs. 1 and 2) and ground (chassis).			
3.	Place a temporary short between rotor and stator of FM osc. section of tuning capacitor (C54).			
4.	*Detune* 10.7 mc. secondary trimmers of 1st, 2nd, and 3rd I-F transformers and secondary trimmer of discriminator transformer by turning screws ½ turn toward tight position.			

WESTINGHOUSE ELECTRIC CORP. MODELS H-164, H-166, H-167, H-166A

FM BAND — FREQUENCY MODULATION — CONTINUED

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial	Adjust
5.	Stator of FM converter tuning capacitor (C53) through a .001 mfd mica capacitor	UNMODULATED 10.7 mc	88 mc	10.7 mc primary trimmers of discriminator, 3rd I-F, 2nd I-F, and 1st I-F transformers (in order given) for maximum voltage
6.	Stator of FM converter tuning capacitor (C53) through a .001 mfd mica capacitor	UNMODULATED 10.7 mc	88 mc	10.7 mc secondary trimmers of 1st, 2nd, and 3rd I-F transformers (in order given for maximum voltage. NOTE: *Do not* re-peak the primary trimmers.
7.	Connect the vacuum tube voltmeter between point "Y" (Figs. 1 and 2) and chassis.			
8.	Stator of FM converter tuning capacitor (C53) through a .001 mfd mica capacitor	UNMODULATED 10.7 mc	88 mc	Secondary of discriminator trans. for zero voltage. The voltage will change polarity as the trimmer is tuned through resonance. Tune carefully for zero voltage.
9.	Connect the vacuum tube voltmeter between point "X" and chassis.			
10.	Remove the short from the FM oscillator tuning capacitor.			
11.	FM antenna terminal through a 72 ohm resistor	UNMODULATED 105 mc	105 mc	FM oscillator trimmer (C59) for max. voltage*
12.	FM antenna terminal through a 72 ohm resistor	UNMODULATED 98 mc	98 mc	FM converter (C58) and FM R-F (C57) trimmers for max. voltage**

* After adjusting the oscillator trimmer at 105 mc., check dial calibration by tuning the receiver to a 90 mc. signal from the generator. If the dial pointer indicates 90 mc., no further oscillator adjustments are necessary. If the pointer is on the high frequency side of 90 mc., slightly expand the length of the oscillator coil (L9); if the pointer is on the low frequency side of 90 mc., slightly compress the oscillator coil. Re-adjust the oscillator trimmer (C59) at 105 mc., and again check the calibration. Repeat this process until calibration is correct.

** After adjusting the trimmers at 98 mc., check tracking by tuning the receiver to a 90 mc. signal from the generator and re-adjusting the trimmers for max. voltage. If the "peak" setting is the same at 90 mc. as it was at 98 mc., no further adjustments are necessary. If the capacitance of either trimmer must be increased to obtain maximum output at 90 mc., slightly compress the coil across that trimmer (either L7 or L8); if the capacitance of either trimmer must be decreased to obtain maximum output at 90 mc., slightly expand the coil across that trimmer. Re-adjust the converter and R-F trimmers (C57 and C58) at 98 mc., and again check the tracking. Repeat this process until tracking is correct.

MODELS H-164, H-166, H-167, H-166A

WESTINGHOUSE ELECTRIC CORP.

PRE-AMPLIFIERS

A phonograph pre-amplifier is used in Models H-166, H-166A and H-167. Either of the pre-amplifier chassis shown below may be used. The chassis number is stamped on the chassis of all pre-amplifiers for identification.

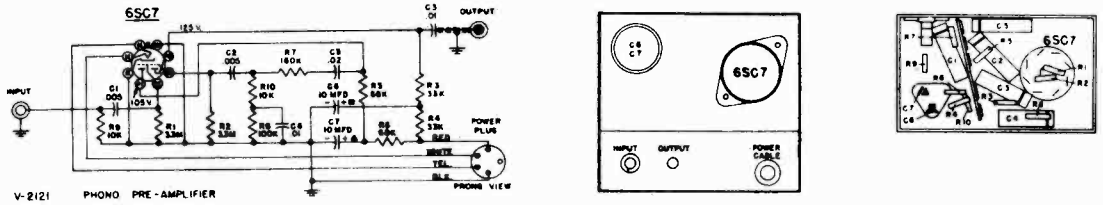


Fig. 6 - V-2121 PHONOGRAPH PRE-AMPLIFIER

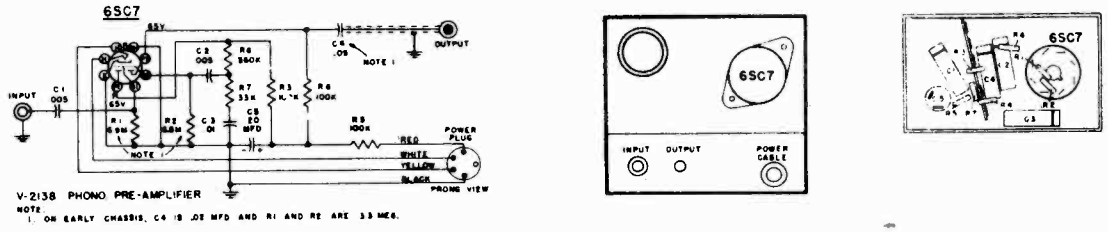
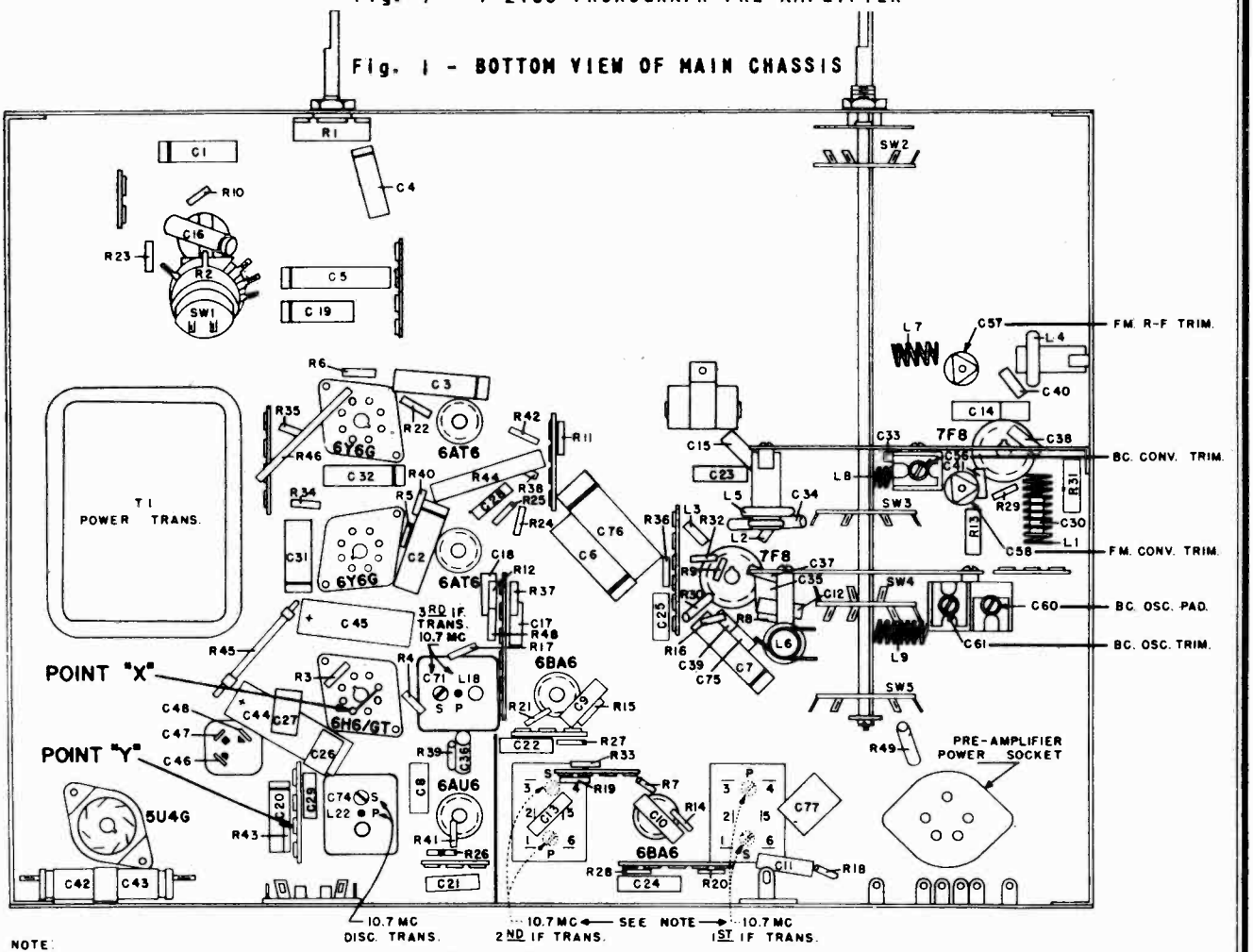


Fig. 7 - V-2138 PHONOGRAPH PRE-AMPLIFIER

Fig. 1 - BOTTOM VIEW OF MAIN CHASSIS



NOTE:
1. A FEW EARLY MODELS (CHASSIS V-2119) HAD 1ST AND 2ND IF TRANSFORMER ADJUSTMENTS AS SHOWN BY DOTTED LINE.

MAIN CHASSIS AND CABINET LIST

Part No.	Description of Part	List price Each
	40 mfd 400 v. (C47) 16 mfd 350 v. (C48)	
V-4750	Capacitor, variable 3 gang (with brackets) (C49, C50, C51, C52, C53, C54)	
V-4746	Capacitor, trimmer, B.C. antenna (C55)	
V-4747	Capacitor, trimmer, B.C. converter (56)	
V-4748	Capacitor, trimmer, F.M. antenna (C57, C58, C59)	
V-4749	Capacitor, 2 gang B.C. oscillator padder (C60) B.C. oscillator trimmer (C61)	
R2CC21UJ100F	Capacitor, fixed ceramic 10 mmf (C75)	
V-5442-1	Capacitor, resonant type .1 mfd 400 v. (C76)	
V-5040-15	Capacitor, .01 mfd 600 v. (C77)	
V-4898	Catch, bullet, blonde (H-166, H-167)	
V-5064-1	Catch, bullet, cordovan (H-167)	
V-5312	Choke Assembly Antenna input, F.M. (L1) R2CC21CH150J Capacitor, ceramic 15 mmf (C30)	
V-4886	Choke, filament (L2, L3)	
V-4763	Clamp, dial	
V-4193S	Clamp, dial drive	
V-4785	Clamp, dial moulding	
V-3337S	Clamp, power cord, for pre-amplifier (H-166, H-167)	
V-4764	Clip, spring, dial mounting	
V-4751	Coil, B.C. antenna (L4)	
V-4752	Coil, B.C. converter (L5)	
V-4753	Coil, B.C. oscillator (L6)	
V-5048	Coil, F.M. R-F (L7)	
V-4755	Coil, F.M. converter	
V-4756	Coil, F.M. oscillator (L9)	
V-4784-2	Cone and voice coil assembly, for V-4784 speaker stamped 252	
V-4784-4	Cone and voice coil assembly, for V-4784 speaker stamped 189	
V-4784-6	Cone and voice coil assembly, for V-4784 speaker stamped 285	
V-3254S	Connector, phono	
V-3305	Control, tone, 1 megohm (R1)	
V-3293	Control, volume, 2 megohms (R2) with switch (SW1)	
V-4304S	Cord, dial drive, with clamp	
V-3239	Cord, power A-C	
V-4966-1	Cord, record changer, A-C power (H-166, H-167)	
V-4525-2	Cushion, chassis mounting	
V-4690	Decal, band	
V-4691	Decal, tone	
V-4765	Dial, glass	
V-4902	Glide, furniture	
V-5298-5	Grille Cloth Assembly, record storage, cordovan (H-167)	
V-4934	Grille Cloth Assembly, record storage (H-166)	
V-5298-1	Grille Cloth Assembly, record storage, blonde (H-167)	
V-5298-3	Grille cloth assembly, record storage, silver walnut (H-167)	
V-5298-6	Grille cloth assembly, speaker, cordovan (H-167)	
V-4954	Grille cloth assembly, speaker (H-166)	
V-5298-2	Grille cloth assembly, speaker, blonde (H-167)	
V-5298-4	Grille cloth assembly, speaker, silver walnut (H-167)	
V-4778-1	Grille cloth assembly, speaker (H-164)	
V-3345S-5	Grommet, rubber	
V-3345-10	Grommet, socket mounting	
V-3345S-4	Grommet, variable capacitor mounting	
V-5358-1	Hinge, upper L.H. (H-166)	
V-5359-1	Hinge, upper R.H. (H-166)	
V-5066-1	Hinge, upper L.H. blonde (H-167)	
V-5066-2	Hinge, upper R.H. blonde (H-167)	
V-5066-5	Hinge, upper L.H. cordovan (H-167)	
V-5066-6	Hinge, upper R.H. cordovan (H-167)	
V-4697S-2	Knob, band switch, cordovan (H-166, H-167) and mahogany (H-164)	
V-4697S-4	Knob, band switch, blonde and silver walnut (H-167)	
V-5316	Knob, door (H-166)	
V-4910	Knob, door, lower, blonde and silver walnut (H-167)	
V-5301	Knob, door, upper, blonde and silver walnut (H-167)	
V-4697S-3	Knob, tone, blonde and silver walnut (H-167)	
V-4697S-1	Knob, tone, mahogany and cordovan	
V-4888S-2	Knob, volume and tuning, blonde and silver walnut (H-167)	
V-4888S-1	Knob, volume and tuning, mahogany and cordovan	
No. 44	Lamp, pilot	
V-3283-3	Loop, B.C. (L25)	
V-4781	Moulding dial	
V-4786	Moulding, dial	
V-4696	Nameplate, Westinghouse-FM	
V-3926	Nut, speed, FM-nameplate mounting	
V-4783-1	Plate, front glass, mahogany (H-164, H-166), walnut (H-164) and cordovan (H-167)	
V-4783-2	Plate, front glass, blonde and silver walnut (H-167)	
V-3399	Pointer assembly	
V-4967	Pull, drawer (H-166)	
V-3166S	Pulley, 7/16 dia.	
V-3181	Rail, pointer	
RC20AE153J	Resistor, 15,000 ohms ½ w. (R3, R4)	
RC20AE101M	Resistor, 100 ohms ½ w. (R5, R6)	
RC20AE153K	Resistor, 15,000 ohms ½ w. (R7)	

MODELS H-164, H-166, H-167, H-166A WESTINGHOUSE ELECTRIC CORP.

MAIN CHASSIS AND CABINET PARTS LIST

Part No.	Description of Part
RC20AE471K	Resistor, 470 ohms ½ w. (R8)
RC20AE223K	Resistor, 22,000 ohms ½ w. (R9)
RC20AE273K	Resistor, 27,000 ohms ½ w. (R10)
RC20AE224M	Resistor, 220,000 ohms ½ w. (R11, R12)
RC30AE682K	Resistor, 6800 ohms 1 w. (R13, R31)
RC20AE680K	Resistor, 68 ohms ½ w. (R14, R21)
RC20AE333K	Resistor, 33,000 ohms ½ w. (R15, R16)
RC20AE474M	Resistor, 470,000 ohms ½ w. (R17, R18, R19, R20, R48)
RC20AE274K	Resistor, 270,000 ohms ½ w. (R22, R23)
RC20AE105M	Resistor, 1.0 megohms ½ w. (R24)
RC20AE156M	Resistor, 15 megohms ½ w. (R25)
RC20AE332M	Resistor, 3300 ohms ½ w. (R26, R27, R28)
RC20AE121K	Resistor, 120 ohms ½ w. (R29)
RC30AE103M	Resistor, 10,000 ohms 1 w. (R30)
RC20AE225M	Resistor, 2.2 megohms ½ w. (R32, R33)
RC20AE330M	Resistor, 33 ohms ½ w. (R34, R35, R49)
RC20AE475M	Resistor, 4.7 megohms ½ w. (R36)
RC20AE473M	Resistor, 47,000 ohms ½ w. (R37)
RC20AE104K	Resistor, 100,000 ohms ½ w. (R38, R39)
RC20AE224K	Resistor, 220,000 ohms ½ w. (R40, R41)
RC20AE154M	Resistor, 150,000 ohms ½ w. (R42)
RC20AE683M	Resistor, 68,000 ohms ½ w. (R43)
RC41AE272K	Resistor, 2700 ohms 2 w. (R44)
V-4758 ...	Resistor, 110 ohms 3 w. (R45)
V-4759 ...	Resistor, 7500 ohms 5 w. (R46)
V-3429S-9 .	Screw, #10-32 chassis mounting
V-3806S-5 .	Screw, speaker mounting ...
V-3164 ...	Shaft, tuning .....
V-5595 ...	Shield, plate .....
V-4168 ...	Shield, tube socket .....
V-3344S-2 .	Sleeve, spacer, variable capacitor mounting .....
V-3353-3 .	Slide mechanism, left hand
V-3353-4 .	Slide mechanism, right hand
V-3252-2 .	Socket, pilot light (10-3/4" lead) .....
V-3252-4 .	Socket, pilot light (8½" lead)
V-3162S ..	Socket, 5 contact .....
V-3288S ..	Socket, 6 contact .....
V-4832-1 ..	Socket, lock-in tube .....
V-4292S-1 .	Socket, miniature molded ...
V-3275S ..	Socket, molded octal tube
V-3246S ..	Socket, octal tube .....
V-3393-2 ..	Socket, phono, A-C power
V-4784 ...	Speaker, 12" Electro-dynamic
V-3258S ..	Spring, knobs .....
V-3248S ..	Spring, dial drive .....
V-3740S-1 .	Strap, ground flexible .
V-4900 ...	Strike, bullet catch, mahogany (H-166) and blonde and silver walnut (H-167) .....
V-5065-1 ..	Strike, bullet catch, cordovan (H-167) .....
V-3167S-1 .	Stud, pulley, threaded .
V-3430 ...	Support, volume control shaft
V-4760 ...	Switch, selector (SW2, SW3, SW4, SW5) .....
V-4771 ...	Terminal board, ANT.-GND.
V-3417 ...	Terminal board, FM antenna
V-4784-1 ..	Transformer, output for V-4784 speaker stamped 252 .
V-4784-3 ..	Transformer, output for V-4784 speaker stamped 189 .
V-4784-5 ..	Transformer, output for V-4784 speaker stamped 285 .
V-5367 ...	Transformer, 1st I-F (V-2119-1 chassis only) (C62, C63, C64 C65, C66, L10, L11, L12, L13, R47) .....
V-4621 ...	Transformer, 1st I-F (V-2119 chassis only) (C62, C63, C64, C65, C66, L10, L11, L12, L13, R47 .....
V-5368 ...	Transformer, 2nd I-F (V-2119-1 chassis only) (C67, C68, C69, C70, L14, L15, L16, L17)
V-4622 ...	Transformer, 2nd I-F (V-2119 chassis only (C67, C68, C69, C70, L14, L15, L16, L17)
V-4623 ...	Transformer, 3rd I-F (C71, C72, L18, L19, L20, L21) ....
V-4624 ...	Transformer, discriminator (C73, C74, L22, L23, L24)
V-4761 ...	Transformer, power (T1) ..
V-3295 ...	Transformer, power (T1) (used on *some* V-2119 chassis)
V-3274S ...	Tube holder .....
V-3506S-1 .	Washer, chassis mounting, Neoprene .....
V-5055 ...	Washer, capacitor trimmer, Phenolic .....
V-3668S ...	Washer, felt (knobs) .....
V-3267S-3 .	Washer, flat, chassis mounting
V-3267S-10	Washer, flat, 1" dia. .....
V-3267S-1	Washer, front glass plate mounting

PARTS FOR V-5699 RECORD CHANGER
(Used in Model H-166A —

When ordering replacement parts for the V-5699 record changer, order these parts rather than the parts shown under these Loc. numbers in the V-4944 Record Changer Service Notes.

Loc.	Part No.	Description
9	V-7342	Cable, pickup .....
10	V-7341	Pickup arm assembly ...
		Pickup, magnetic (13)
		Cable, pickup (9)
		Arm, pickup (10)
		Strengthener, pickup arm (3)
		Screws
10	V-4976	Arm, pickup .....
13	V-7017	Pickup, magnetic (with mtg. screws)

PARTS LIST FOR MODELS H-164, H-166, H-166A AND H-167

When ordering parts, specify model number of set in addition to part number and description of part.

V-2121 PHONO PRE-AMPLIFIER PARTS LIST

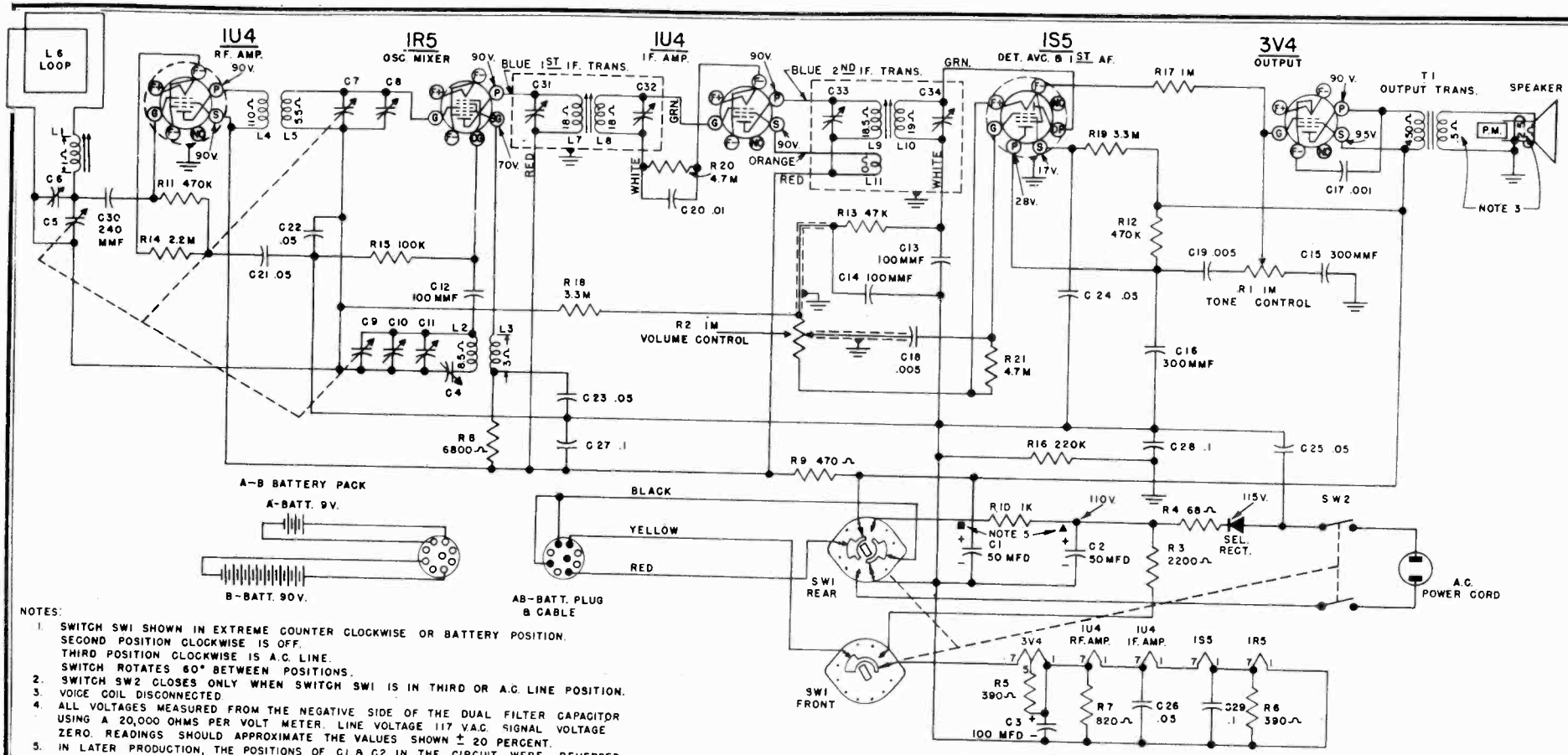
Part No.	Description of Part
V-4931	Cable, output
V-4930	Cable, power
RCP10W6502A	Capacitor, .005 mfd 600 v. (C1, C2)
RCP10W4103A	Capacitor, .01 mfd 400 v. (C3, C4)
RCP10W4203A	Capacitor, .02 mfd 400 v. (C5)
V-4928	Capacitor, dry electrolytic, dual 10 mfd 450 v. (C6, C7)
V-3254S	Connector, phono
V-3345S-5	Grommet, power cord
V-3345S-10	Grommet, socket mounting
RC20AE335M	Resistor, 3.3 megohms ½ w. (R1, R2)
RC20AE333K	Resistor, 33,000 ohms ½ w. (R3, R4)
RC20AE683K	Resistor, 68,000 ohms ½ w. (R5, R6)
RC20AE184K	Resistor, 180,000 ohms ½ w. (R7)
RC20AE104K	Resistor, 100,000 ohms ½ w. (R8)
RC20AE103M	Resistor, 10,000 ohms ½ w. (R9)
RC20AE103K	Resistor, 10,000 ohms ½ w. (R10)
V-4933	Socket, molded octal

V-2138 PHONO PRE-AMPLIFIER PARTS LIST

Part No.	Description of Part
V-4931	Cable, output
V-4930	Cable, power
RCP10W6502A	Capacitor, .005 mfd 600 v. (C1, C2)
RCP10W4103A	Capacitor, .01 mfd 400 v. (C3)
RCP10W4503A	Capacitor, .05 mfd 400 v. (C4)
V-5765	Capacitor, dry electrolytic, 20 mfd 300 v. (C5)
V-3254S	Connector, phono
V-3345S-5	Grommet, power cord
V-3345S-10	Grommet, socket mounting
RC20AE685M	Resistor, 6.8 megohms ½ w. (R1, R2)
RC20AE104M	Resistor, 100,000 ohms ½ w. (R3, R4, R5)
RC20AE564K	Resistor, 560,000 ohms ½ w. (R6)
RC20AE333M	Resistor, 33,000 ohms ½ w. (R7)
V-4933	Socket, molded octal

MAIN CHASSIS AND CABINET PARTS LIST

V-4777-2	Antenna Assembly, FM dipole (H-166, H-167)
V-4777-1	Antenna Assembly, FM dipole (built-in H-164)
V-4762	Background, felt
V-4745	Bracket Assembly, dial background
V-3409	Bracket and Stud Assembly, dial background
V-3415	Bracket and Tuning Shaft Assembly
V-3672	Bracket, capacitor mounting (front)
V-3671	Bracket, capacitor mounting (rear)
V-3185	Bracket, dial light
V-3357	Bracket, dial light (large)
V-3374	Bracket, volume control mounting
V-4965-1	Cable, record changer to pre-amp., phono (H-166, H-167)
RCP10W4103A	Capacitor, .01 mfd 400 v. (C1)
RCP10M4103A	Capacitor, .01 mfd 400 v. (C2, C3)
RCP10W6502A	Capacitor, .005 mfd 600 v. (C4)
RCP10W4503A	Capacitor, .05 mfd 400 v. (C5, C6, C7)
RCM30B512M	Capacitor, .005 mfd mica (C8, C9, C10, C11, C12, C13)
RCM30C272G	Capacitor, 2700 mmf mica (C14, C15)
RCP10W6202M	Capacitor, .002 mfd 600 v. (C16)
RCM20B101M	Capacitor, 100 mmf mica (C17, C18)
RCP10W6102K	Capacitor, .001 mfd 600 v. (C19, C20)
RCM30B103M	Capacitor, .01 mfd mica (C21, C22, C23, C24, C25)
RCM20B271J	Capacitor, 270 mmf mica (C26, C27)
RCM20B221M	Capacitor, 220 mmf mica (C28, C29)
RCP10M6202M	Capacitor, .002 mfd 600 v. (C31, C32)
R2CC21CH050D	Capacitor, fixed ceramic 5 mmf (C33)
R2CC36SL221M	Capacitor, fixed ceramic 220 mmf (C34)
R2CC21PJ220K	Capacitor, fixed ceramic 22 mmf (C35)
R2CC26PJ470K	Capacitor, fixed ceramic 47 mmf (C36, C37, C38)
R5CC21ZY471M	Capacitor, fixed ceramic 470 mmf (C39, C40, C41)
V-3241	Capacitor, dual line filter .05-.05 mfd 600 v. (C42, C43)
V-4880	Capacitor, electrolytic 2.0 mfd 50 v. (C44)
V-3236	Capacitor, electrolytic cartridge, 20 mfd 25 v. (C45)
V-3302	Capacitor, electrolytic 40 mfd 450 v. (C46)



NOTES:

1. SWITCH SW1 SHOWN IN EXTREME COUNTER CLOCKWISE OR BATTERY POSITION. SECOND POSITION CLOCKWISE IS OFF. THIRD POSITION CLOCKWISE IS A.C. LINE. SWITCH ROTATES 60° BETWEEN POSITIONS.
2. SWITCH SW2 CLOSES ONLY WHEN SWITCH SW1 IS IN THIRD OR A.C. LINE POSITION.
3. VOICE COIL DISCONNECTED.
4. ALL VOLTAGES MEASURED FROM THE NEGATIVE SIDE OF THE DUAL FILTER CAPACITOR USING A 20,000 OHMS PER VOLT METER. LINE VOLTAGE 117 V.A.C. SIGNAL VOLTAGE ZERO. READINGS SHOULD APPROXIMATE THE VALUES SHOWN ± 20 PERCENT.
5. IN LATER PRODUCTION, THE POSITIONS OF C1 & C2 IN THE CIRCUIT WERE REVERSED.

SPECIFICATIONS

FREQUENCY RANGE:
- Standard Broadcast ..... 550 to 1600 kc

INTERMEDIATE FREQUENCY ..... 455 kc

TUBE COMPLEMENT:
- 2 1U4 ..... R-F Amp. and I-F Amp.
- 1 1R5 ..... Oscillator-mixer
- 1 1S5 ..... Det., AVC and 1st A-F Amp.
- 1 3V4 ..... Output Amp.

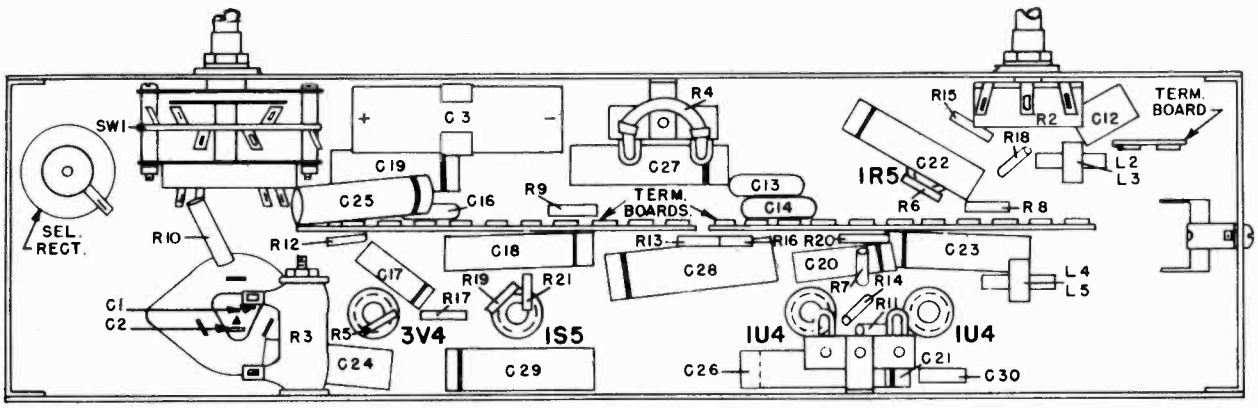
POWER OUTPUT:
- Undistorted ..... 200 milliwatts
- Maximum ..... 350 milliwatts

LOUDSPEAKER:
- Size and Type ..... 4"x 6" P. M.
- Voice Coil Impedance ..... 3.2 ohms

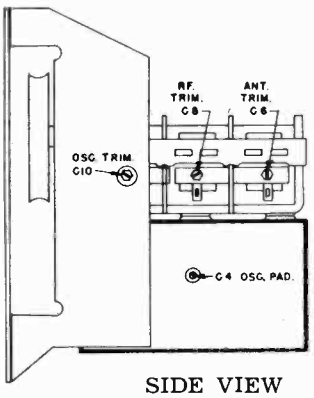
POWER SUPPLY:
- Battery Operation ..... 1 Westinghouse V-3920 "AB" Battery (9 v. "A" and 90 v. "B").
- Line Operation ..... 105 to 120 volts, 50-60 cycles A-C, or D-C.

CURRENT CONSUMPTION (Battery Operation):
- "A" Section of "AB" Battery ..... 05 amp.
- "B" Section of "AB" Battery ..... 012 amp.

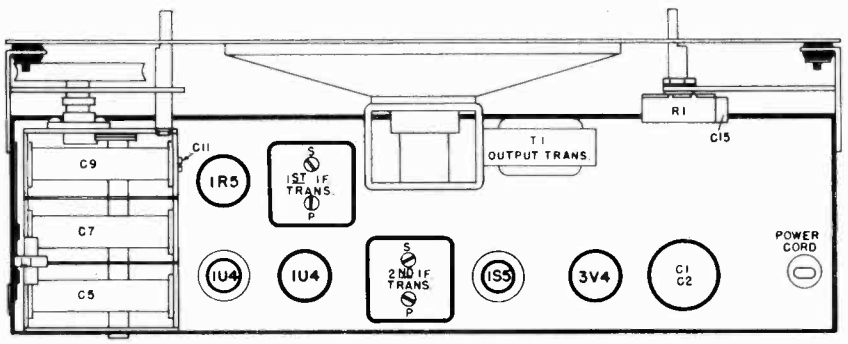
POWER CONSUMPTION:
- (Line Operation) ..... 12 watts



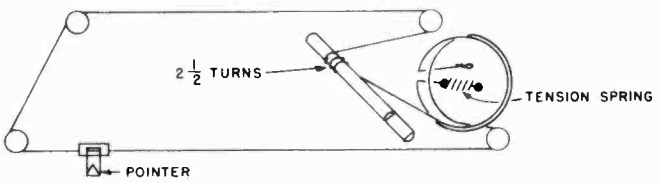
BOTTOM VIEW OF CHASSIS



SIDE VIEW



CHASSIS LAYOUT



DIAL DRIVE

ALIGNMENT

Before beginning alignment, make certain that the dial pointer is properly orientated with respect to the dial scale.

Connect an output meter across the speaker voice coil.

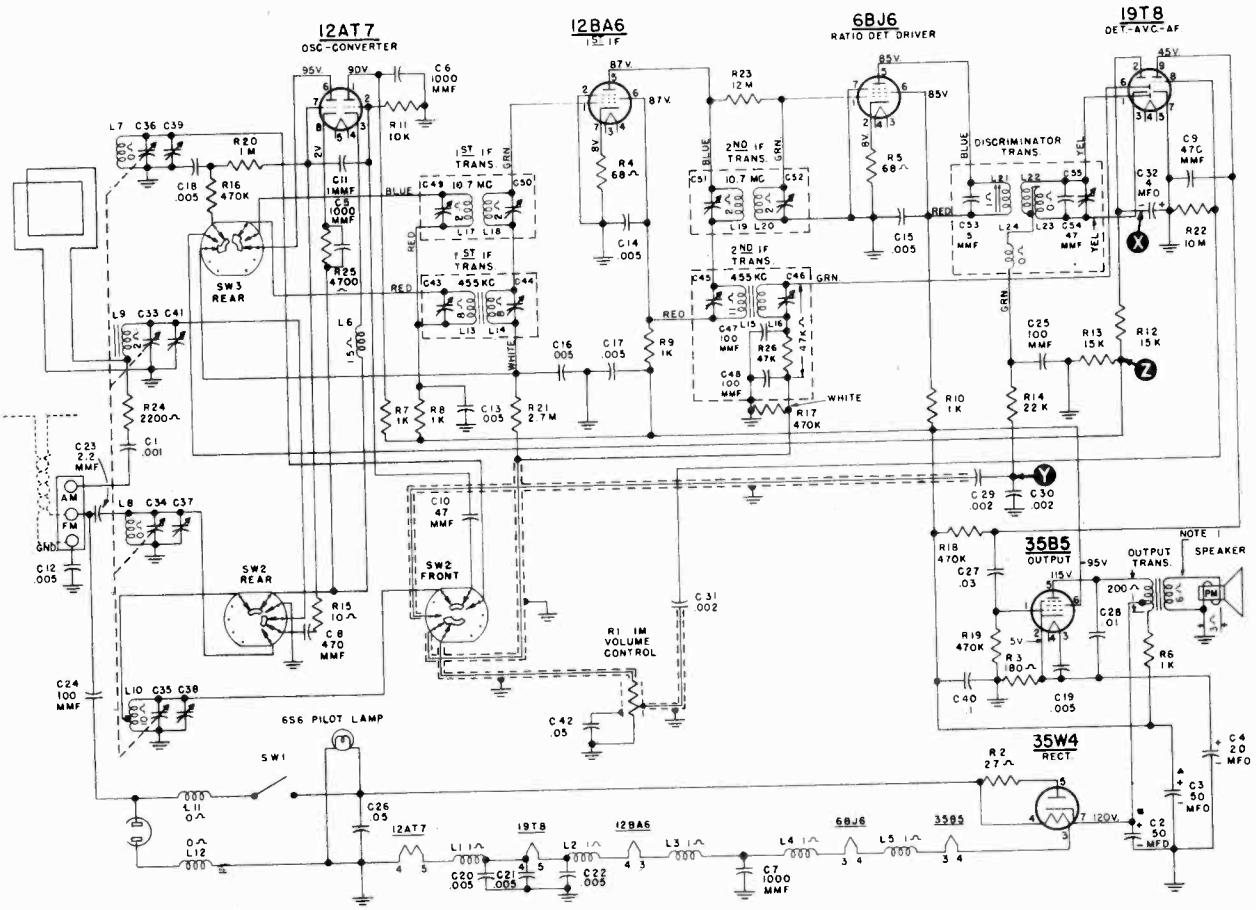
While making the following adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid A. V. C. action.

Step	Connect Signal Generator to—	Signal Generator Frequency	Radio Dial Setting	Adjust for Maximum Output
1	1U4, I-F Amp., control grid through a 0.1 mfd capacitor	455 kc	550 kc	Primary and secondary trimmers of 2nd I-F trans.
2	1R5, Converter, control grid through a 0.1 mfd capacitor	455 kc	550 kc	Primary and secondary trimmers of 1st I-F trans.
3	Stator of R-F section (C7) of tuning capacitor through a 0.1 mfd capacitor	455 kc	550 kc	"Peak" all I-F trimmers
4	Same as above	600 kc	600 kc	Oscillator padder (C4)
5	Same as above	1600 kc	1600 kc	Oscillator trimmer (C10)
6	Repeat steps 4 and 5			
7	Radiated signal (no actual connection)	1400 kc	1400 kc	R-F trimmer (C8) and ant. trimmer (C6)

PARTS LIST

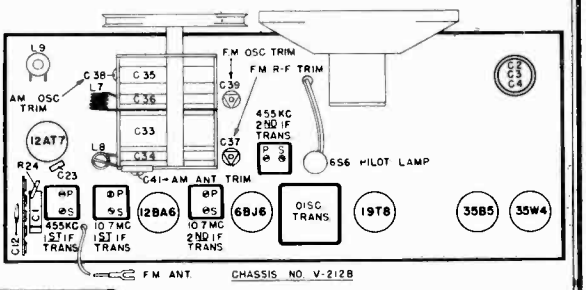
Part No.	Description
V-4865	Background, pointer
V-4869	Baffle and Grille Cloth Assembly
V-4169-1	Base, shield, miniature tube
V-3920	Battery Pack, "A-B"
V-4790-1	Bracket Assy., R.H. (control)
V-4790-2	Bracket Assy., L.H. (control)
V-4818	Bracket, chassis mounting
V-4789	Bracket, rail pointer
V-4835	Bracket, shield mounting
V-4893	Bumper, door
V-4836-2	Button, hole plug
V-4242	Button, back cover
V-1134	Cabinet
V-3874	Cable, battery
V-4791	Capacitor, dry electrolytic, dual 50 mfd 150 v. (C1, C2)
V-3866	Capacitor, electrolytic cartridge, 100 mfd 25 v. (C3)
V-4792	Capacitor, oscillator padder (C4)
V-4793	Capacitor, variable 3 gang (C5, C6, C7, C8, C9, C10, C11)
RCM20A101M	Capacitor, 100 mmfd mica (C12)
RCM20A101K	Capacitor, 100 mmfd mica (C13, C14)
RCM20A301M	Capacitor, 300 mmfd mica (C15, C16)
RCP10W6102A	Capacitor, .001 mfd 600 v. (C17)
RCP10W6502A	Capacitor, .005 mfd 600 v. (C18, C19)
RCP10W4103A	Capacitor, .01 mfd 400 v. (C20)
RCP10W4503A	Capacitor, .05 mfd 400 v. (C21, C22, C23, C24, C25, C26)
RCP10W4104A	Capacitor, 0.1 mfd 400 v. (C27, C28, C29)
RCM20A241K	Capacitor, 240 mmfd mica (C30)
V-4849	Catch, door, front cover
V-4202S	Clamp, power cord
V-4874	Clamp, spring (electrolytic capacitor mounting)
V-4794	Coil, antenna loading (L1)
V-4795	Coil, oscillator (L2, L3)
V-4813	Coil, R-F (L4, L5)
V-4796	Control, tone, 1.0 megohms (R1)
V-4797	Control, volume, 1.0 megohms (R2)
V-4304S-6	Cord, dial drive
V-4349-1	Cord, power A-C
V-4825	Cover Assembly, back
V-4826	Cover Assembly, front, with knob and catch
V-3371	Foot, rubber
V-4798	Grille, front
V-3766	Grommet, fibre
V-3345-5	Grommet, rubber
V-4828	Handle
V-4833	Hinge, back
V-3437	Insulator, electrolytic capacitor
V-4840	Knob, battery-off-line
V-4848	Knob, door catch, front
V-4839	Knob, volume, tuning, tone
V-4856	Latch, back cover
V-4831	Loop, antenna (L6)
V-4846	Molding, front cover
V-3894	Nameplate
V-3891	Nut, speed, back cover, 3/16"
V-4800S-1	Nut, speed, grille mounting
V-4876S-1	Nut, speed, speaker mounting
V-5045	Paper, fish, switch insulating
V-3873	Plug, battery cable
V-4801	Pointer
V-3166S	Pulley, 7/16 dia.
V-4115	Rectifier, selenium
V-4872	Resistor, ballast, 2200 ohms (R3)
V-4807	Resistor, 68 ohms fusible (R4)
RC10AE391K	Resistor, 390 ohms ¼ w. (R5, R6)
RC20AE821K	Resistor, 820 ohms ½ w. (R7)
RC20AE682K	Resistor, 6800 ohms ½ w. (R8)
RC20AE471M	Resistor, 470 ohms ½ w. (R9)
RC30AE102M	Resistor, 1000 ohms 1 w. (R10)
RC10AE474M	Resistor, 470,000 ohms ¼ w. (R11, R12)
RC10AE473M	Resistor, 47,000 ohms ¼ w. (R13)
RC10AE225M	Resistor, 2.2 megohms ¼ w. (R14)
RC10AE104K	Resistor, 100,000 ohms ¼ w. (R15)
RC10AE224M	Resistor, 220,000 ohms ¼ w. (R16)
RC20AE105K	Resistor, 1 megohm ½ w. (R17)
RC10AE335M	Resistor, 3.3 megohms ¼ w. (R18, R19)
RC20AE475M	Resistor, 4.7 megohms ½ w. (R20, R21)
V-4802-4	Screw, speaker mounting
V-4805	Shaft, tuning
V-4169-2	Shield, miniature tube
V-4806	Shield, mounting plate (under chassis)
V-5521	Shield, selenium rectifier
V-3344-1	Sleeve, spacer, grille mounting and variable capacitor mounting
V-4292S-1	Socket, miniature tube
V-4809**	Speaker, 4x6" P.M.
V-4057	Spring, dial drive
V-3258S	Spring, knob
V-3909	Strip, plastic, loop mounting
V-3892-2	Stud, back cover
V-4829	Stud, handle mounting
V-4803	Switch, battery-off-line (SW1, SW2)
V-3351	Terminal Board, 2 lugs
V-3228S-2	Terminal Board, 2 lugs, 1 lug grounded
V-3487	Terminal Board, 11 lugs
V-4810	Terminal Strip, 2 lugs, R.H. control bracket assembly
V-4811	Transformer, 1st I-F (L7, L8, C31, C32)
V-4812	Transformer, 2nd I-F (L9, L10, L11, C33, C34)
V-3752S	Washer, felt, knob mounting
V-4853	Washer, felt, upper front cover
V-3267S-4	Washer, flat, back cover latch mtg.
V-4896	Washer, flat, foot mounting
V-3867	Washer, phenolic, ballast mounting

MODEL H-182 WESTINGHOUSE ELECTRIC CORP.

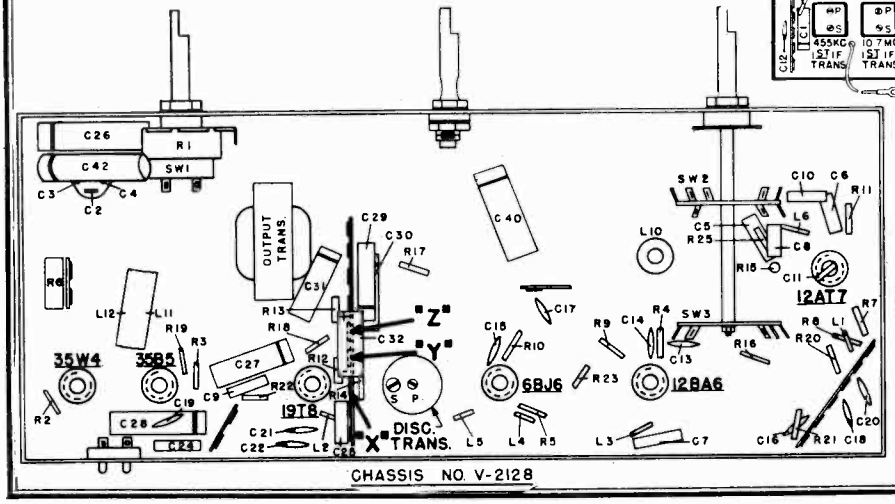


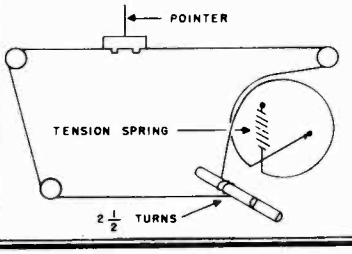
NOTE
1. VOICE COIL DISCONNECTED.
2. SELECTOR SWITCH SW2 AND SW3 IS SHOWN IN EXTREME COUNTER-CLOCKWISE POSITION OR AM BAND. SECOND POSITION CLOCKWISE IS FM BAND.
3. ALL VOLTAGES MEASURED FROM CHASSIS (GND) USING 20,000 OHMS/VOLT METER — LINE VOLTAGE 117 V.A.C. READINGS SHOULD BE AS SHOWN ± 20 %.
4. THE RATINGS OF SOME COMPONENTS USED IN PRODUCTION MAY VARY SLIGHTLY FROM THOSE SHOWN ABOVE.

CHASSIS NO. V-2128



CHASSIS NO. V-2128





ALIGNMENT

BROADCAST BAND

Connect an output meter across the speaker voice coil

While making the following adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial Setting	Adjust
1.	Set Band Switch to AM			
2.	Pin #1 of 12BA6 tube through a 0.1 mfd capacitor	455 kc	1615 kc	Pri. and sec. of 455 kc 2nd I-F trans. for max. output
3.	Stator of tuning capacitor (C33) through a 0.1 mfd capacitor	455 kc	1615 kc	Pri. and sec. of 455 kc 1st I-F trans. for max. output
4.	Radiated signal (no actual connection)	1400 kc	1400 kc	AM osc. trimmer for max. output
5.	Radiated signal (no actual connection)	1400 kc	1400 kc	AM ant. trimmer for max. output (rock in adjustment)
6.	Recheck steps 4 and 5			

FM BAND

Do not align 10.7 mc I-F circuits until all 455 kc I-F adjustments have been completed.

1.	Set Band Switch to FM			
2.	Connect a VTVM between point "X" and ground. (See Figs. 1 and 3.)			
3.	Pin #1 of 12BA6 tube through a .002 mfd mica capacitor	UNMODULATED 10.7 mc	108 mc	Discriminator trans. primary and 10.7 mc. 2nd I-F trans. pri. and sec. for max. voltage.
4.	Reconnect VTVM between points "Y" and "Z". (See Figs. 1 and 3.)			
5.	Pin #1 of 12BA6 tube through a .002 mfd mica capacitor	UNMODULATED 10.7 mc	108 mc	Discriminator trans. secondary for *zero* voltage. The voltage will change polarity as the trimmer is tuned through resonance — tune carefully for zero.
6.	Reconnect VTVM between point "X" and ground.			
7.	Pin #1 of 12BA6 tube through a .002 mfd mica capacitor	UNMODULATED 10.7 mc	108 mc	Discriminator trans. primary and 10.7 mc. 2nd I-F trans. pri. and sec. for max. voltage.
8.	Place a temporary short across C34 (FM R-F tuning capacitor).			
9.	Pin #7 of 12AT7 tube through a .002 mfd mica capacitor	UNMODULATED 10.7 mc	108 mc	Pri. and sec. of 10.7 mc 1st I-F trans. for max. output
10.	Remove short from C34.			
11.	FM ant. terminals through a 300 ohm non-inductive resistor	UNMODULATED 108 mc	108 mc	FM osc. trimmer for max. output
12.	FM ant. terminals through a 300 ohm non-inductive resistor	UNMODULATED 98 mc	98 mc	FM R-F trimmer for max. output (rock in adjustment).
13.	Place a dab of thermal cement on the FM osc. and R-F trimmers to lock adjustment.			

TUBE COMPLEMENT:

1 12AT7 ..... Osc.-Converter
1 12BA6 ..... I-F Amp.
1 6BJ6 ..... Ratio Det. Driver (FM)
1 19T8 ..... Det., AVC, A-F Amp.
1 35B5 ..... Output Amp.
1 35W4 ..... Rectifier

OPERATING VOLTAGE:

105 to 120 volts 50-60 cycles A-C or 105 to 120 volts D-C.

POWER CONSUMPTION: ..... 30 watts

MODEL H-182 WESTINGHOUSE ELECTRIC CORP.

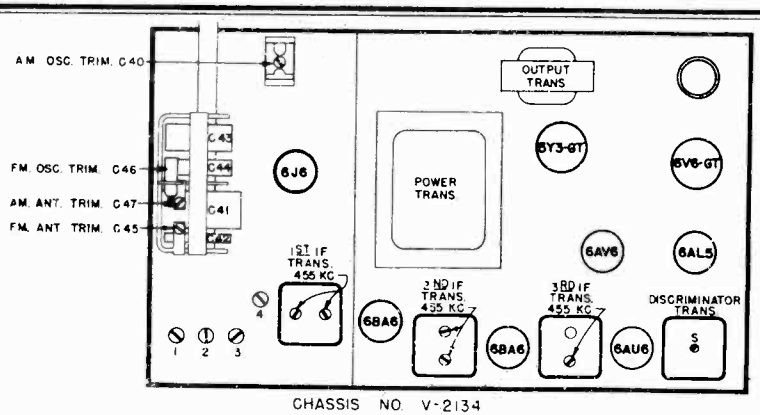
Part No.	Description
V-5608	Background, dial .....
V-5528-1 ..	Baffle and Grille Cloth Assembly .....
V-5607	Bracket Assembly, dial background .....
V-5600	Bracket, cover, back .....
V-5599	Bracket, dial .....
V-5527	Bushing, insulator, control
V-5437S-1 ..	Button, plug .....
V-1153-2 ..	Cabinet, plastic, brown ...
V-1153-1 ..	Cabinet, plastic, ivory ...
RCP10M6102M	Capacitor, .001 mfd 600 v. (C1)
V-5493	Capacitor, dry electrolytic, 50 mfd 150 v. (C2) ..... 50 mfd 150 v. (C3) 20 mfd 25 v. (C4)
R5CC26ZY102M	Capacitor, ceramicon, 1000 mmf (C5, C6, C7) .....
R5CC21ZY471M	Capacitor, ceramicon, 470 mmfd (C8, C9) .....
R1CC21SL470K	Capacitor, ceramicon, 47 mmf (C10) .....
V-5658-1 ..	Capacitor, 1 mmf (C11) ....
V-5596	Capacitor, Hi-Kap .005 mfd (C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22)
V-5658-2 ...	Capacitor, 2.2 mmfd (C23) .
RCM20A101K .	Capacitor, mica, 100 mmf (C24, C25) .....
RCP10M6503M	Capacitor, .05 mfd 600 v. (C26) .....
RCP10M4303M	Capacitor, .03 mfd 400 v. (C27)
RCP10M6103M	Capacitor, .01 mfd 600 v. (C28)
RCP10M6202M	Capacitor, .002 mfd 600 v. (C29, C30, C31) .....
V-4637	Capacitor, electrolytic 4 mfd 50 v. (C32) .....
V-5494	Capacitor, variable, 2 gang (C33, C34, C35, C36, C37, C38, C39) .....
RCP10M4104M	Capacitor, 0.1 mfd 400 v. (C40)
V-4992	Capacitor, trimmer (C41) .
RCP10M4503M	Capacitor, .05 mfd 400 v. (C42)
V-4638	Choke, filament (L1, L2, L3, L4, L5) .....
V-4193S-1 ..	Clamp, dial cord .....
V-4886	Coil, filament (L6) .....
V-5545	Coil, oscillator, FM (L7) .
V-5546	Coil, RF, FM (L8) .....
V-5605	Coil, antenna loading (L9)
V-5514	Coil, oscillator, AM (L10)
V-5743	Coil, choke, antenna (L11, L12)
V-5517	Control, volume, 1.0 megohm (R1) and switch (SW1)
V-4304-14 ..	Cord Assembly, dial drive
V-5522	Cord, power, A-C (including socket) .....
V-5610-1 ..	Cover Assembly, back for brown cabinet (including loop, hinge, terminals, cord and socket)
V-5610-2 ..	Cover Assembly, back for ivory cabinet (including loop, hinge, terminals, cord and socket
V-5523	Dial .....
V-4236	Gasket, felt, speaker .....

Part No.	Description
V-5602-1 ..	Hinge, cover, for brown cabinet .....
V-5602-2 ..	Hinge, cover, for ivory cabinet .....
V-5603	Insulator, retainer for power cord .....
V-5560-1 ..	Knob, FM-AM .....
V-5558-1 ..	Knob, tuning .....
V-5559-1 ..	Knob, volume .....
No. 6S6 ...	Lamp, pilot light .....
V-5638	Loop Assembly, antenna .....
V-3891	Nut, speed, baffle mounting
V-5721S ...	Palnut, 3/8-32 .....
V-5549	Plug, power cord (mounted on chassis) .....
V-4213	Pointer, dial .....
V-4187	Pulley .....
RC20AE270K .	Resistor, 27 ohms ½ w. (R2)
RC20AE181J .	Resistor, 180 ohms ½ w. (R3)
RC20AE680J .	Resistor, 68 ohms ½ w. (R4, R5)
RC40AE102M .	Resistor, 1000 ohms 2 w. (R6)
RC20AE102M .	Resistor, 1000 ohms ½ w. (R7, R8, R9, R10) .....
RC20AE103K .	Resistor, 10,000 ohms ½ w. (R11)
RC20AE153J .	Resistor, 15,000 ohms ½ w. (R12, R13) .....
RC20AE223M .	Resistor, 22,000 ohms ½ w. (R14)
RC20AE100K .	Resistor, 10 ohms ½ w. (R15)
RC20AE474M .	Resistor, 470,000 ohms ½ w. (R16, R17, R18, R19) .....
RC20AE105M .	Resistor, 1 megohm ½ w. (R20)
RC20AE275M .	Resistor, 2.7 megohms ½ w. (R21)
RC20AE106M .	Resistor, 10 megohms ½ w. (R22)
RC20AE126K .	Resistor, 12 megohms ½ w. (R23)
RC20AE222K .	Resistor, 2200 ohms ½ w. (R24)
RC20AE472K .	Resistor, 4700 ohms ½ w. (R25)
V-5050S-101	Screw #10-32, chassis mounting
V-5530	Shaft Assembly, dial drive
V-3344-2 ..	Sleeve, spacer, variable capacitor mounting .....
V-4292S-1 .	Socket, miniature molded, 7 prong .....
V-5556-1 ..	Socket, miniature molded, 9 prong .....
V-4989	Socket, pilot light .....
V-5533	Speaker, 5" P.M. .....
V-3248S	Spring, dial drive .....
V-5534	Switch, selector (SW2, SW3)
V-5587	Teenut .....
V-4684	Terminal Board, ANT-GND ....
V-5537	Transformer, output .....
V-5535	Transformer, 1st I-F, AM (C43, C44, L13, L14) .....
V-5539	Transformer, 2nd I-F, AM (C45, C46, C47, C48, L15, L16, R26) .....
V-5540	Transformer, 1st I-F, FM (C49, C50, L17, L18) ....
V-5540	Transformer, 2nd I-F, FM (C51, C52, L19, L20) .....
V-5538	Transformer, discriminator (C53, C54, C55, L21, L22, L23, L24) .....
V-5606-1 ..	Washer, felt, for knobs ....
V-5526	Washer, insulator, for controls

CAUTION: One side of the power line is connected directly to the chassis in this model. Care must be exercised to avoid contacting the radio chassis and ground at the same time — ***serious shock may result.*** When making repairs or adjustments to the radio, it is recommended that the chassis be isolated from the power line by means of an isolation transformer.

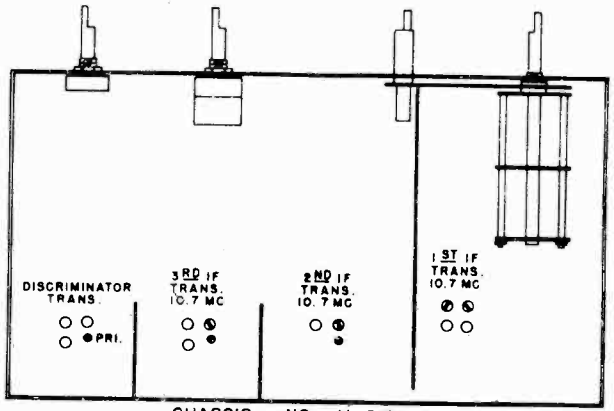
H-190

H-191 & H-191A



CHASSIS NO. V-2134

— TOP VIEW



CHASSIS NO. V-2134 BOTTOM VIEW

BOTTOM VIEW

SPECIFICATIONS

FREQUENCY RANGES:

Standard Broadcast ..... 540 - 1600 kc.
Frequency Modulation ..... 88 - 108 mc.

INTERMEDIATE FREQUENCIES:

Amplitude Modulation ..... 455 kc.
Frequency Modulation ..... 10.7 mc.

TUBE COMPLEMENT:

1 6J6 ..... Osc. - Converter
2 6BA6 ..... 1st and 2nd I-F Amp.
1 6AU6 ..... Limiter (FM)
1 6AV6 ..... Det. (AM) and 1st A-F Amp.
1 6AL5 ..... Ratio Det. (FM)
1 6V6GT ..... Output Amp.
1 5Y3GT ..... Rectifier

PILOT LAMPS:

...2 Westinghouse No. 44, 6.3 v., 0.25 amp.

POWER OUTPUT:

Undistorted ..... 3.5 watts
Maximum ..... 5 watts

LOUDSPEAKER:

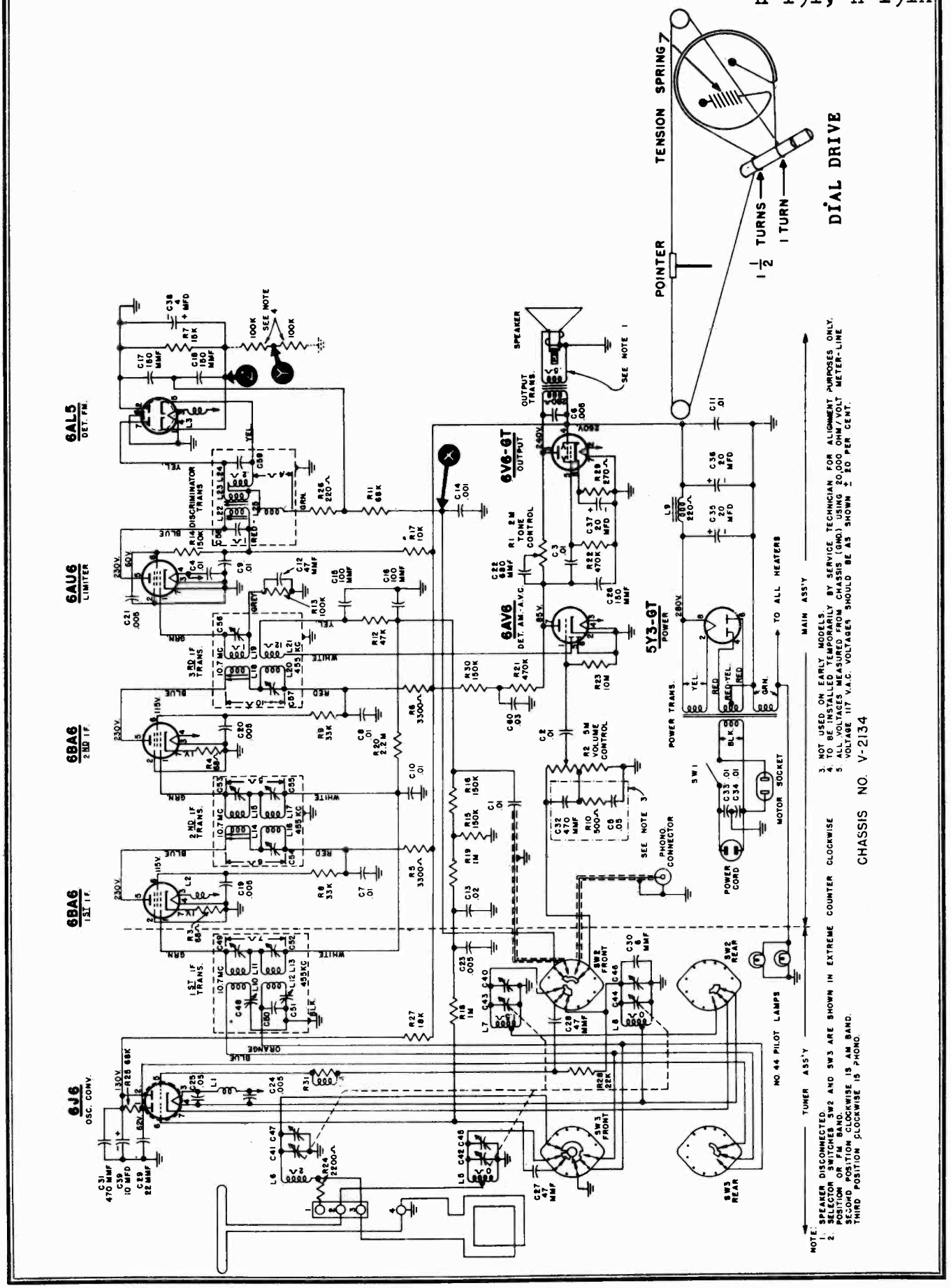
H-190 ..... 8" P.M.
H-191 and H-191A ..... 10" P.M.

OPERATING VOLTAGE:

..... 105 to 120 volts, 60 cycles A-C

POWER CONSUMPTION ..... 150 watts

WESTINGHOUSE ELECTRIC CORP. MODELS H-190, H-191, H-191A



MODELS H-190, H-191, H-191A — WESTINGHOUSE ELECTRIC CORP.

ALIGNMENT

BROADCAST BAND

Completely mesh the tuning capacitor plates and set the dial pointer to the end mark on the dial scale.

Connect an output meter across the speaker voice coil.

While making the following adjustments, keep the volume control set for maximum output, the tone control set for maximum treble, and the signal generator output attenuated to avoid A.V.C. action.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial Setting	Adjust
1	Set the band switch to AM.			
2	Stator of tuning capacitor (C41) through a 0.1 mfd capacitor	455 kc	maximum capacity	455 kc. pri. of 3rd I-F trans., sec. and pri. of 2nd I-F trans., and sec. and pri. of 1st I-F trans. for max. output

NOTE: If the I-F transformers are badly mis-aligned, it may be impossible to obtain sufficient output using the above system. In this event, it will be necessary to align each transformer separately. Start with the last I-F transformer and work forward, connecting the signal generator to the control grid of the tube preceding the transformer under alignment.

3	Radiated signal (no actual connection)	1600 kc	1600 kc	AM osc. trimmer (C40) for max. output
4	Radiated signal (no actual connection)	1400 kc	tune to signal	AM ant. trimmer (C47) for max. output (rock-in adjustment)

FM BAND

Do not align the 10.7 mc. I-F circuits until all 455 kc. I-F adjustments have been completed.

1	Set the band switch to FM.			
2	Connect two 100,000 ohm resistors (the resistances must be equal within 5 percent) between pin #1 of the 6AL5 tube and ground as shown in Fig. 4.			
3	Connect a V.T.V.M. between points "X" and "Y" (see Fig. 4).			
4	Pin #1 of the 6BA6, 1st I-F amp. through a .001 mfd mica capacitor	10.7 mc	maximum capacity	Sec. of discriminator trans. for *zero* voltage (the voltage will go positive on one side of the correct setting and negative on the other side)
5	Connect the V.T.V.M. between point "Z" and ground.			
6	Pin #1 of the 6BA6, 1st I-F amp. through a .001 mfd mica capacitor	10.7 mc	maximum capacity	Pri. of discriminator trans., 10.7 mc. sec. and pri. of 3rd I-F trans., and 10.7 mc. sec. and pri. of 2nd I-F trans. for max. voltage
7	Using the same sig. generator and V.T.V.M. connections as in Step 6, adjust the sig. generator output until the V.T.V.M. indicates 4 volts. Use this sig. generator setting to perform Step 9.			
8	Reconnect the V.T.V.M. between points "X" and "Y".			
9	Pin #1 of the 6BA6, 1st I-F amp. through a .001 mfd mica capacitor	10.7 mc	maximum capacity	Sec. of discriminator trans. for *zero* voltage. The voltage will change polarity as the sec. is tuned through resonance — tune carefully for exact zero
10	Remove the two 100,000 ohm resistors which were inserted in Step 2.			
11	Reconnect the V.T.V.M. between point "Z" and ground.			
12	Pin #1 of the 6BA6, 1st I-F amp. through a .001 mfd mica capacitor	10.7 mc	maximum capacity	Recheck pri. of discriminator trans. for max. voltage
13	Stator of FM tuning capacitor (C42) through a .01 mfd mica capacitor	10.7 mc	maximum capacity	Sec. and pri. of 10.7 mc. 1st I-F trans. for max. voltage
14	Ant. terminal #2 through a 300 ohm resistor	108 mc	108 mc	FM osc. trimmer (C46) for max. voltage*
15	Ant. terminal #2 through a 300 ohm resistor	105 mc	tune to signal	FM ant. trimmer (C45) for max. voltage (rock-in adjustment)**

*After adjusting the oscillator trimmer at 108 mc., check dial calibration by tuning the receiver to an 88 mc. signal from the generator. If the dial pointer indicates 88 mc., no further oscillator adjustments are necessary. If the pointer is on the high frequency side of 88 mc., slightly expand the length of the oscillator coil (L8); if the pointer is on the low frequency side of 88 mc., slightly compress the oscillator coil. Re-adjust the oscillator trimmer at 108 mc., and again check the calibration. Repeat this process until calibration is correct.

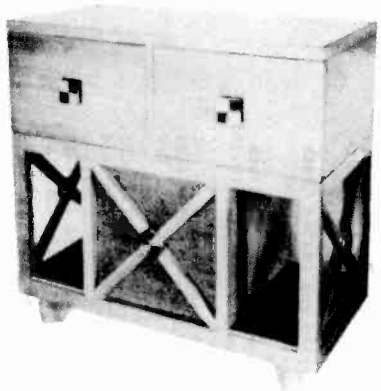
**After adjusting the antenna trimmer at 105 mc., check tracking by tuning to a 90 mc. signal from the generator and re-adjusting the antenna trimmer for max. output. If the peak setting is the same at 90 mc. as it was at 105 mc., no further adjustments are necessary. If the trimmer capacitance must be increased to obtain max. output at 90 mc., slightly compress the antenna coil (L5); if the capacitance must be decreased, slightly expand the coil. Re-adjust the antenna trimmer at 105 mc., and again check the tracking. Repeat this process until tracking is correct.

Part No.	Description
V-5803	Coil, antenna loading (L6)
V-5804	Coil, oscillator (L7)
V-4674	Coil, FM antenna (L5)
V-6076	Coil, FM oscillator (L8)
V-3254S	Connector, phono
V-5790	Control, tone, 2 megohms (R1)
V-5791	Control, volume-off-on, .5 megohm (R2) and switch (SW1)
V-4304-17	Cord, dial drive
V-[illegible]	Crystal Cartridge (Shure P-93) (H-190)
V-7689	Crystal Cartridge (Shure P-30) (H-191 and H-191A)
V-4690	Decal, band
V-4691	Decal, tone
V-4692	Decal, tuning
V-4693	Decal, volume
V-4474	Decal, Westinghouse (H-190)
V-5820	Dial
V-5998-1	Grille Cloth, speaker (H-190)
V-5363-1	Hinge, L.H.
V-5363-2	Hinge, R.H.
V-3667-7	Knob Assembly, band switch
V-3667-5	Knob Assembly, tone-volume-tuning
No. 44	Lamp, pilot light
V-5869	Molding, decals
V-7682	Motorboard (H-190)
V-4696	Nameplate, Westinghouse-FM (H-191 and H-191A
V-3712	Needle, phono (H-190)
V-7690	Needle, phono (H-191 and H-191A)
V-5793	Pointer, dial
V-6000-1	Pull, door, phono (H-190)
V-5877-2	Pull, door, phono (H-191 and H-191A)
V-5999-1	Pull, door, record compartment (H-190)
V-5877-1	Pull, door, record compartment (H-191 and H-191A)
V-4886-3	Reactor, R-F (L1, L2, L3)
V-4886-7	Reactor, R-F (L4, R31)
V-5794	Reactor, filter choke (L9)
RC10AE680K	Resistor, 68 ohms ½ w. (R3, R4)
RC30AE332K	Resistor, 3300 ohms 1 w. (R5, R6)
RC10AE153K	Resistor, 15,000 ohms ½ w. (R7)
RC30AE333K	Resistor, 33,000 ohms 1 w. (R8, R9)
RC10AE152M	Resistor, 1500 ohms ½ w. (R10)
RC10AE683M	Resistor, 68,000 ohms ½ w. (R11)
RC10AE473M	Resistor, 47,000 ohms ½ w. (R12)
RC10AE104K	Resistor, 100,000 ohms ½ w. (R13)
RC20AE154K	Resistor, 150,000 ohms ½ w. (R14)
RC10AE154M	Resistor, 150,000 ohms ½ w. (R15, R16, R30)
RC30AE103K	Resistor, 10,000 ohms 1 w. (R17)
RC10AE105M	Resistor, 1 megohm ½ w. (R18, R19)

Part No.	Description
**V-5982-1	Antenna Assembly, AM loop (H-190)
**V-5875-1	Antenna Assembly, AM loop (H-191 and H-191A)
**V-5986-1	Antenna Assembly, FM dipole (H-190)
**V-5986-2	Antenna Assembly, FM dipole (H-191 and H-191A)
V-5812	Background, dial
V-5860-2	Cable Assembly, speaker (H-190)
V-5860-1	Cable Assembly, speaker (H-191 and H-191A)
V-4965-2	Cable, phono input (H-191 only)
RCP10W4103A	Capacitor, .01 mfd 400 v. (C1, C2, C3)
V-5040-13	Capacitor, .01 mfd 200 v. (C4)
RCP10W2503M	Capacitor, .05 mfd 200 v. (C5)
RCP10M6502A	Capacitor, .005 mfd 600 v. (C6)
V-5040-15	Capacitor, .01 mfd 600 v. (C7, C8, C9, C10, C11)
RCM20A470M	Capacitor, 47 mmf mica (C12)
RCP10W4203A	Capacitor, .02 mfd 400 v. (C13)
RCP10W6102A	Capacitor, .001 mfd 600 v. (C14)
RCM20A101M	Capacitor, 100 mmf mica (C15, C16)
RCM20A151J	Capacitor, 150 mmf mica (C17, C18)
V-5040-11	Capacitor, .005 mfd 600 v. (C19, C20, C21)
R5CC25ZY681M	Capacitor, 680 mmf ceramicon (C22)
V-5596	Capacitor, .005 mfd 450 v. (C23, C24, C25)
RCM20A151M	Capacitor, 150 mmf mica(C26)
R3CC21SL470K	Capacitor, 47 mmf ceramicon (C27, C28)
RCM20B220K	Capacitor, 22 mmf mica (C29)
R3CC20UK060G	Capacitor, 6 mmf ceramicon (C30)
R5CC20ZY471M	Capacitor, 470 mmf ceramicon (C31)
RCM20A471M	Capacitor, 470 mmf mica (C32)
V-4634	Capacitor, dual line filter (C33, C34)
V-5821	Capacitor, electrolytic 20-20 mfd 400 v. (C35, C36)
V-3236	Capacitor, electrolytic 20 mfd 25 v. (Cathode bypass - C37)
V-4885	Capacitor, electrolytic 4 mfd 450 v. (C38)
V-5985	Capacitor, electrolytic 10 mfd 350 v. (C39)
V-4672	Capacitor, trimmer, AM oscillator (C40)
V-5802	Capacitor, variable AM antenna (C41) FM antenna (C42) AM oscillator (C43) FM oscillator (C44) Trimmer FM antenna (C45) Trimmer FM oscillator (C46) Trimmer AM antenna (C47)
RCP10W4303M	Capacitor, .03 mfd 400 v. (C60)

Part No.	Description
RC10AE225M	Resistor, 2.2 megohms ½ w. (R20)
RC10AE474K	Resistor, 470,000 ohms ½ w. (R21, R22)
RC10AE106M	Resistor, 10 megohms ½ w. (R23)
RC10AE222M	Resistor, 2200 ohms ½ w. (R24)
RC20AE683K	Resistor, 68,000 ohms ½ w. (R25)
RC10AE221M	Resistor, 220 ohms ½ w. (R26)
RC30AE183K	Resistor, 18,000 ohms 1 w. (R27)
RC10AE223K	Resistor, 22,000 ohms ½ w. (R28)
RC30AE271K	Resistor, 270 ohms 1 w. (R29)
V-4169-1	Shield Base, miniature tube (6J6)
V-4169-2	Shield, miniature tube (6J6)
V-5795-1	Socket, dial light
V-4292S-2	Socket, miniature molded (6J6)
V-5670	Socket, miniature wafer (4)
V-5673	Socket, miniature wafer (unshielded) (6AV6)
V-3275S	Socket, molded octal tube (5Y3G)
V-4195	Socket, molded octal tube (6V6)
V-5405	Socket, molded power (phono A-C)
**V-5981	Speaker, 8" P.M. (H-190)
**V-5571	Speaker, 10" P.M. (H-191 and H-191A)
V-3248S	Spring, dial drive
V-3258S	Spring, knob
V-4491-5	Strip, dial
V-6017-2	Support and Grille Cloth Assembly, L.H. Door (H-191 and H-191A)
V-6017-1	Support and Grille Cloth Assembly, R.H. Door (H-191 and H-191A)
V-5878-1	Support and Grille Cloth Assembly, speaker (H-191 and H-191A)
V-5806	Switch, selector
V-4627	Transformer, 1st I-F (C48, C49, C50, C51, C52, L10, L11, L12, L13)
V-4628	Transformer, 2nd I-F (C53, C54, C55, LI4, L15, L16, L17)
V-4629	Transformer, 3rd I-F (C56, C57, L18, L19, L20, L21)
V-5796	Transformer, discriminator (C58, C59, L22, L23, L24, L25)
V-5798	Transformer, audio output
V-5797	Transformer, power
V-3668S	Washer, felt, for knobs

WESTINGHOUSE ELECTRIC CORP. MODELS H-203, H-212



H-203

H-212

SPECIFICATIONS

FREQUENCY RANGES:

Amplitude Modulation .... 540 to 1600 kc.
Frequency Modulation ..... 88 to 108 mc.

INTERMEDIATE FREQUENCIES:

Amplitude Modulation ..... 455 kc.
Frequency Modulation ..... 10.7 mc.

TUBE COMPLEMENT:

1 12AT7 ..... R-F Amp. and Mixer (FM)
1 6BE6 H-F Osc. (AM/FM) and converter(AM)
1 6BA6 ..... I-F Amp.
1 6BA6 ..... I-F Driver (FM)
1 6AL5 ..... Ratio Det. (FM)
1 6AV6 ..... Det. & AVC (AM) and A-F Amp.
1 6V6GT ..... Output Amp.
1 5Y3GT ..... Rectifier

PILOT LAMPS:

2 Westinghouse No. 47 ... 6.3 v., 0.15 a.

POWER OUTPUT:

Undistorted ..... 3.5 watts
Maximum ..... 6 watts

LOUDSPEAKER:

H-203 ..... 10" P.M.
H-212 ..... 8" P.M.

OPERATING VOLTAGE:

..... 105 to 120 volts, 60 cycles A-C

POWER CONSUMPTION:

H-203 ..... 110 watts
H-212 ..... 85 watts

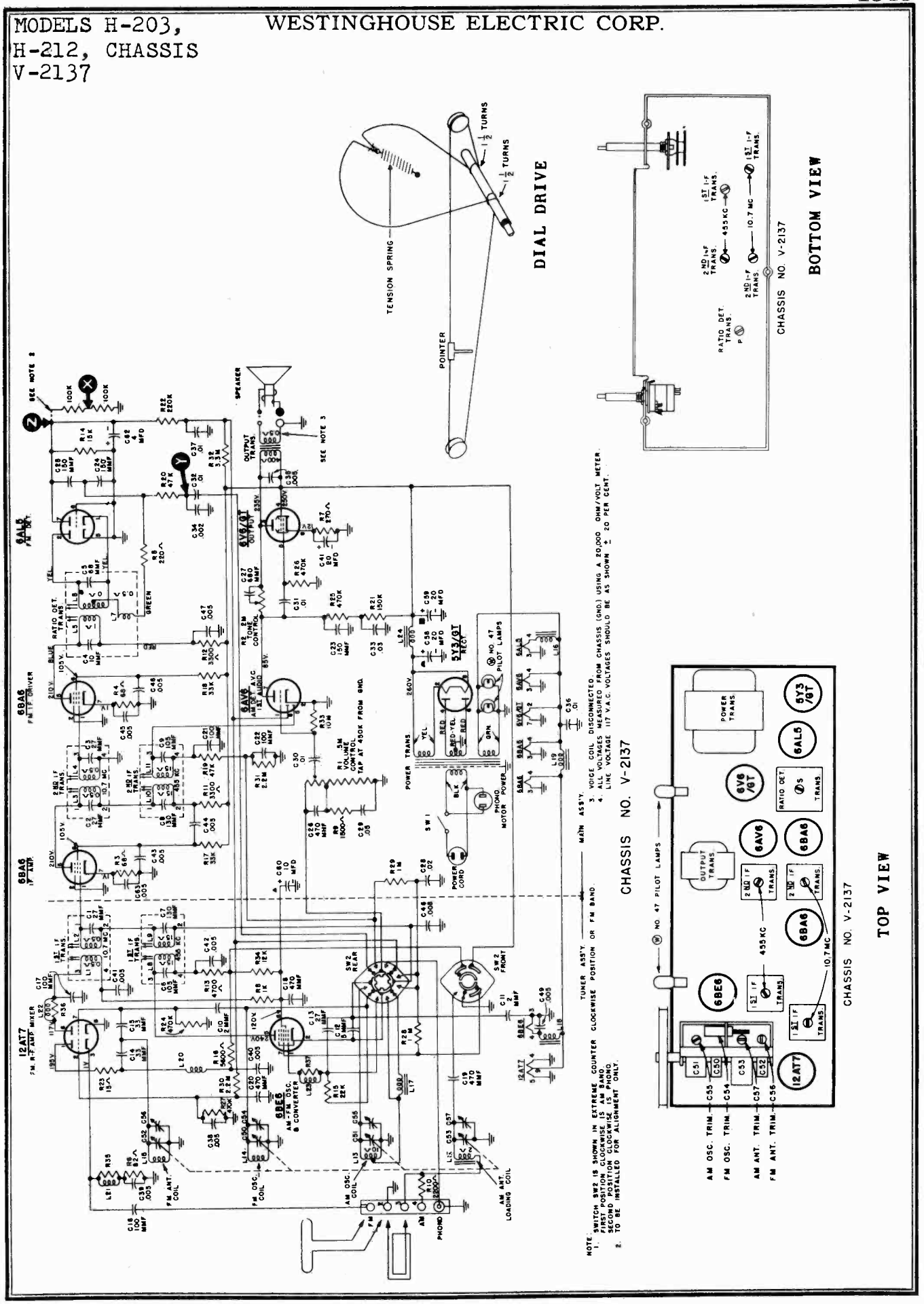
SERVICE NOTES

For information on the V-4944-2 record changer used with Model H-203, refer to the V-4944 Automatic Record Changer Service Notes. However, when ordering replacement parts, specify the items listed below rather than the corresponding parts as listed in the V-4944 Service Notes. The following parts are for the V-4944-2 changer only.

Loc.	Part No.	Description
9	V-7962	Pickup Cable with Connector (28")
13	V-7689	Cartridge, crystal (P-30)
15	V-7963	Nut, needle retaining (for P-30 cartridge)
(Last item on parts list)	V-7964	Needle, phonograph (for P-30 cartridge)

MODELS H-203, H-212, CHASSIS V-2137

WESTINGHOUSE ELECTRIC CORP.



WESTINGHOUSE ELECTRIC CORP. MODELS H-203, H-212, CHASSIS V-2137

ALIGNMENT

BROADCAST BAND

Connect an output meter across the speaker voice coil.

While making the following adjustments, keep the volume control set for maximum output, the tone control set for maximum treble, and the signal generator output attenuated to avoid A.V.C. action.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial Setting	Adjust
1	Set the band switch to AM.			
2	Stator of tuning capacitor (C51) through a 0.1 mfd capacitor	455 kc.	maximum capacity	455 kc. pri. and sec. of 1st and 2nd I-F trans. for max. output
	NOTE: If the I-F transformers are badly mis-aligned, it may be impossible to obtain sufficient output using the above system. In this event, it will be necessary to align each transformer separately. Start with the last I-F transformer and work forward, connecting the signal generator to the control grid of the tube preceding the transformer under alignment.			
3	Radiated signal (no actual connection)	1600 kc.	1600 kc.	AM osc. trimmer (C55) for max. output
4	Radiated signal (no actual connection)	1400 kc.	tune to signal	AM ant. trimmer (C57) for max. output (rock-in adjustment)

FM BAND

Do not align the FM circuits until all AM adjustments have been completed.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial Setting	Adjust
1	Set the band switch to FM.			
2	Connect two 100,000 ohm resistors (the resistances must be equal within 5 percent) between pin #7 of the 6AL5 tube and ground as shown on the schematic diagram.			
3	Connect a V.T.V.M. between points "X" and "Y" (see schematic diagram).			
4	Stator of FM osc. section (C50) on tuning capacitor through a .01 mfd mica capacitor	10.7 mc.	maximum capacity	Sec. of ratio det. trans. for *zero* (use medium strength signal)
5	Connect the V.T.V.M. between point "Z" and ground.			
6	Same as step 4	10.7 mc.	maximum capacity	Pri. of ratio det. trans. and pri. and sec. of 10.7 mc. 1st and 2nd I-F trans. for max.
	NOTE: The pri. of the ratio det. trans. peaks in two places. Use the peak with the slug farthest out.			
7	Reconnect the V.T.V.M. between points "X" and "Y", and increase the signal strength 2 times.			
8	Same as step 4	10.7 mc.	maximum capacity	Recheck sec. of ratio det. trans. for *zero* voltage
9	Reconnect the V.T.V.M. between point "Z" and ground.			
10	Same as step 4	10.7 mc.	maximum capacity	Pri. of ratio det. trans. for maximum voltage
11	Remove the two 100,000 ohm resistors that were inserted in step 2.			
12	FM ant. terminal through a 300 ohm non-inductive resistor	105 mc.	105 mc.	FM osc. trimmer (C54) for maximum output
13	Same as step 12	105 mc.	105 mc.	FM ant. trimmer (C56) for maximum output

MODELS H-203, H-212, CHASSIS V-2137 WESTINGHOUSE ELECTRIC CORP.

PARTS LIST FOR MODELS H-203 AND H-212

When ordering parts, specify model number of set in addition to part number and description of part.

Part No.	Description
V-5982-2	Antenna Assembly, AM loop
V-5986-3	Antenna Assembly, FM dipole(H-203)
V-5986-4	Antenna Assembly, FM dipole(H-212)
V-6120	Background, dial
V-5860-3	Cable Assembly, speaker
R2CC30CK020D	Capacitor, 2 mmf (C10)
R2CC30UK020D	Capacitor, 2 mmf (C11)
R2CC30CK050D	Capacitor, 5 mmf (C12)
R3CC30CK270K	Capacitor, 27 mmf (C13)
R3CC26CK330M	Capacitor, 33 mmf (C14, C15)
R3CC30SL101M	Capacitor, 100 mmf (C16)
R3CC30SL101J	Capacitor, 100 mmf (C17)
R5CC21ZY471M	Capacitor, 470 mmf (C18, C19, C20)
RCM20A101M	Capacitor, 100 mmf (C21, C22)
RCM20A151M	Capacitor, 150 mmf (C23)
RCM20A151J	Capacitor, 150 mmf (C24, C25)
RCM20A471M	Capacitor, 470 mmf (C26)
RCM20A681M	Capacitor, 680 mmf (C27)
RCP10W2203A	Capacitor, .02 mfd 200 v. (C28)
RCP10W2503A	Capacitor, .05 mfd 200 v. (C29)
RCP10W4103A	Capacitor, .01 mfd 400 v. (C30, C31, C32)
RCP10W4303A	Capacitor, .03 mfd 400 v. (C33)
RCP10W6202A	Capacitor, .002 mfd 600 v. (C34)
RCP10M6502A	Capacitor, .005 mfd 600 v. (C35)
V-5040-13	Capacitor, molded paper .01 mfd 200 v. (C36, C37)
V-5596	Capacitor, Hi-Kaps .005 mfd (C38, C39, C40 C41, C42, C43, C44, C45, C46, C47, C48, C49)
V-6137	Capacitor, variable (C50, C51, C52, C53, C54, C55, C56, C57)
V-6121	Capacitor, electrolytic 20 mfd 400 v. (C58) 20 mfd 400 v. (C59) 10 mfd 350 v. (C60) 20 mfd 25 v. (C61)
V-4885	Capacitor, electrolytic 4 mfd 450 v. (C62)
V-4898-1	Catch, bullet (H-203 mahogany)
V-4898-2	Catch, bullet (H-203 blond)
V-5637	Clip, tubular
V-6164	Coil, AM oscillator (L13)
V-6157	Coil, antenna loading (L12)
V-6139	Coil, FM antenna (L15)
V-6138	Coil, FM oscillator (L14)
V-6122	Control, volume - 0.5 megohm (R1), tone - 2.0 megohms (R2) and switch (SW1)
V-6123	Dial
V-6155	Fastener
V-5998-2	Grille Cloth, speaker (H-203 mahogany)
V-6148-1	Grille Cloth, speaker (H-203 blond)
V-6246-1	Grille Cloth Assembly (H-212)
V-5066-5	Hinge, L.H. (H-203 mahogany)
V-5066-3	Hinge, L.H. (H-203 blond)
V-5066-6	Hinge, R.H. (H-203 mahogany)
V-5066-4	Hinge, R.H. (H-203 blond)
V-6146-2	Knob, band (H-212 and H-203 mahogany
V-6146-4	Knob, band (blond)
V-6147-2	Knob, rear (tuning)
V-6146-1	Knob, OFF-ON-TONE (H-212 and H-203 mahogany)
V-6146-3	Knob, OFF-ON-TONE (blond)
V-6147-1	Knob, rear (volume)
No. 47	Lamp, pilot light
V-6160	Molding
V-4696	Nameplate, Westinghouse FM
V-6154-1	Panel, control
V-6125	Pointer
V-6150-1	Pull, door (H-203 mahogany)
V-6150-2	Pull, door (H-203 blond)
V-3166S	Pulley, 7/16 dia.
V-4886-1	Reactor, R-F 14 microhenries (L16)
V-4886-2	Reactor, R-F 1.1 microhenries (L17, L18, L19)
V-4886-4	Reactor, R-F (L20)
V-4886-10	Reactor, R-F (L21, R35)
V-4886-6	Reactor, R-F (L22, R36)
V-4886-7	Reactor, R-F (L23, R37)
V-6161	Reactor, filter choke (L24)
RC10AE680K	Resistor, 68 ohms ½ w. (R3, R4)
RC10AE221M	Resistor, 220 ohms ½ w. (R5)
RC10AE820K	Resistor, 82 ohms ½ w. (R6)
RC30AE271K	Resistor, 270 ohms 1 w. (R7)
RC10AE102K	Resistor, 1000 ohms ½ w. (R8)
RC10AE152M	Resistor, 1500 ohms ½ w. (R9)
RC10AE222K	Resistor, 2200 ohms, ½ w. (R10)
RC30AE332K	Resistor, 3300 ohms 1 w. (R11, R12)
RC10AE472K	Resistor, 4700 ohms ½ w. (R13)
RC10AE153K	Resistor, 15,000 ohms ½ w. (R14)
RC10AE223K	Resistor, 22,000 ohms ½ w. (R15)
RC30AE562K	Resistor, 5600 ohms 1 w. (R16)
RC30AE333K	Resistor, 33,000 ohms 1 w. (R17, R18)
RC10AE473M	Resistor, 47,000 ohms ½ w. (R19, R20)
RC10AE154M	Resistor, 150,000 ohms ½ w. (R21)
RC10AE224M	Resistor, 220,000 ohms ½ w. (R22)
RC10AE150M	Resistor, 15 ohms ½ w. (R23)
RC10AE474M	Resistor, 470,000 ohms ½ w. (R24, R25, R26, R27)
RC10AE105M	Resistor, 1.0 megohm ½ w. (R28, R29)
RC10AE225M	Resistor, 2.2 megohms ½ w. (R30, R31)
RC10AE335M	Resistor, 3.3 megohms ½ w. (R32)
RC10AE106M	Resistor, 10.0 megohms ½ w. (R33)
RC41AE123K	Resistor, 12,000 ohms 2 w. (R34)
V-6151-1	Rosette (H-203 mahogany)
V-6151-2	Rosette (H-203 blond)
V-6126-1	Shockmount
V-6127	Sleeve, dial drive
V-3353-3	Slide Mechanism, L.H. (H-203)
V-3353-4	Slide Mechanism, R.H. (H-203)
V-6165-1	Socket, dial light, 5" leads
V-6165-2	Socket, dial light, 7" leads
V-5670	Socket, miniature wafer
V-5673	Socket, miniature wafer (unshielded)
V-4195	Socket, molded octal tube
V-5405	Socket, molded power
V-3246S	Socket, octal tube
V-5571	Speaker, 10" P.M. (H-203)
V-6251	Speaker, 8" P.M. (H-212)
V-3248S	Spring, dial drive
V-4900-1	Strike, bullet catch (H-203 mahogany)
V-4900-2	Strike, bullet catch (H-203 blonde)
V-6140	Switch, selector Front wafer - SW2 Rear wafer - SW2
V-6136	Terminal Board, PHONO-ANT-GND
V-6130	Transformer, AM 1st and 2nd I-F (455 kc.) (L8, L9, C6, C7, and L10, L11, C8, C9)
V-5798	Transformer, audio output
V-6142	Transformer, FM 1st I-F (10.7 mc.) (L1, L2, C1)
V-6129	Transformer, FM 2nd I-F (10.7 mc.) (L3, L4, C2, C3)
V-6131	Transformer, power
V-6128	Transformer, ratio detector (L5, L6, L7, C4, C5)

MODELS H-210, H-211, WESTINGHOUSE ELECTRIC CORP.
CHASSIS V-2144,
V-2144-1

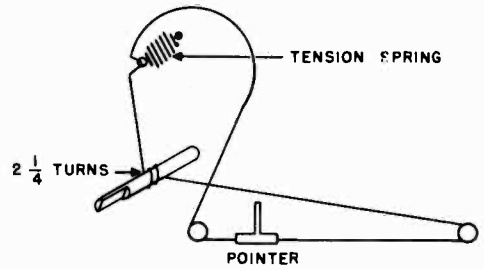
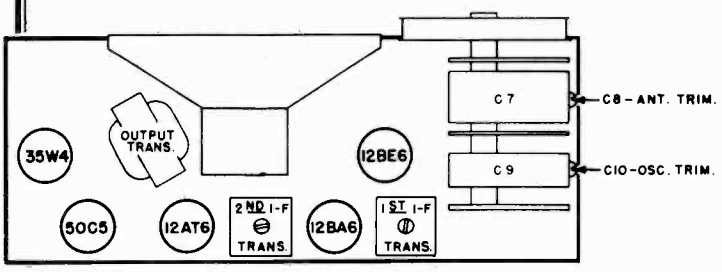
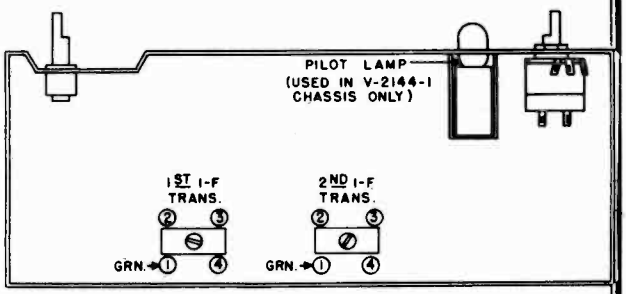


FIG. 1 — DIAL DRIVE



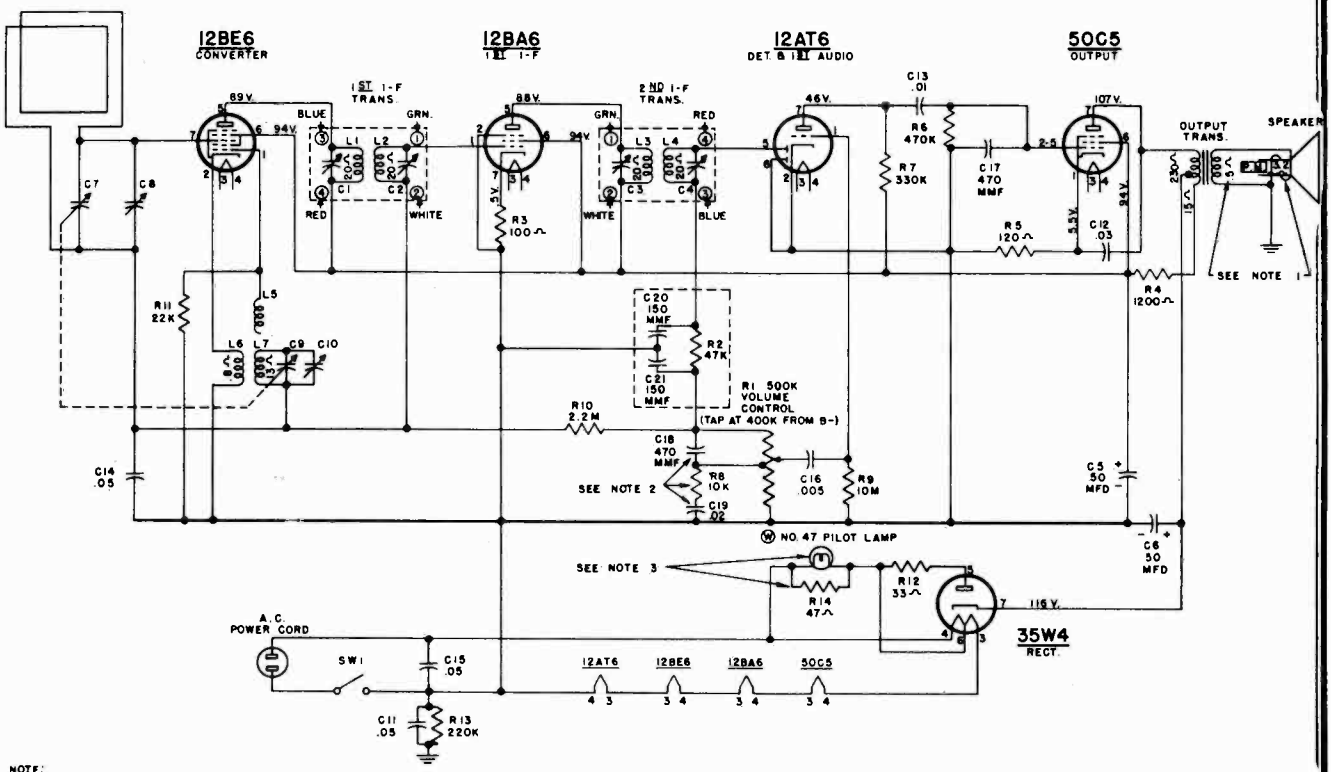
CHASSIS V-2144 and V-2144-1

FIG. 2 — TOP VIEW



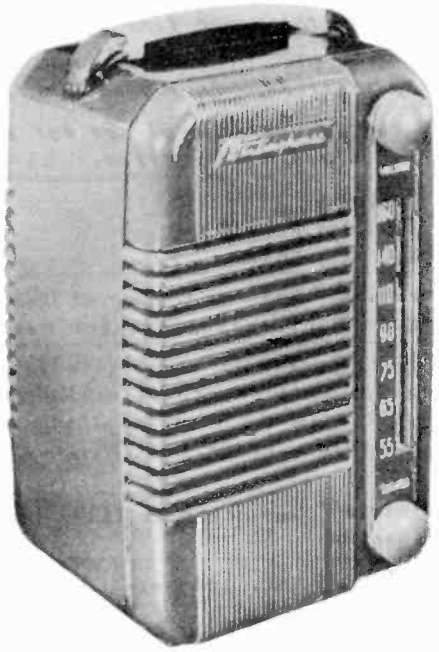
CHASSIS V-2144 and V-2144-1

FIG. 3 — BOTTOM VIEW

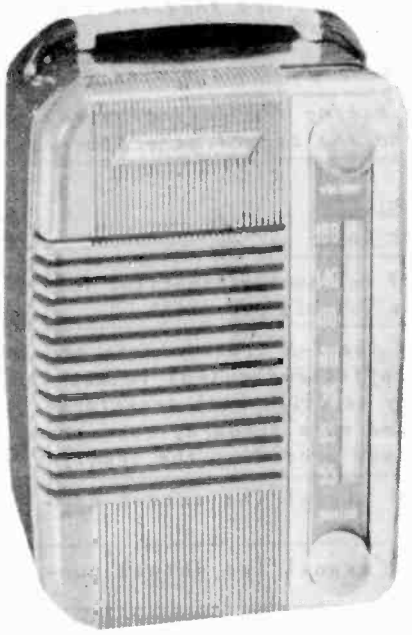


NOTE:
1. VOICE COIL DISCONNECTED FOR RESISTANCE MEASUREMENT.
2. C18, C19 AND R8 ARE NOT USED IN V-2144 CHASSIS (H-210).
3. THE PILOT LAMP IS USED IN THE V-2144-1 CHASSIS (H-211) ONLY. R14 IS USED IN THE V-2144 CHASSIS (H-210) IN PLACE OF THE PILOT LAMP.
4. ALL VOLTAGES MEASURED FROM COMMON NEGATIVE LINE USING A 20,000 OHMS PER VOLT METER. LINE VOLTAGE 117 V.A.C. VOLTAGES SHOULD BE AS SHOWN ± 20 PER CENT.

WESTINGHOUSE ELECTRIC CORP. MODELS H-210, H-211, CHASSIS V-2144, V-2144-1



H-210



H-211

SPECIFICATIONS

FREQUENCY RANGE: ..... 540 to 1600 kc.

INTERMEDIATE FREQUENCY: ..... 455 kc.

TUBE COMPLEMENT:

1	12BE6	Converter
1	12BA6	I-F Amp.
1	12AT6	Det. and 1st A-F Amp.
1	50C5	Output Amp.
1	35W4	Rectifier

PILOT LAMP (H-211 only): ..... Westinghouse No. 47

POWER OUTPUT:

Undistorted	1 watt
Maximum	1.5 watts

LOUDSPEAKER: ..... 4" P.M.

OPERATING VOLTAGE: ..... 105 to 125 volts 50 - 60 cycles A-C or D-C

POWER CONSUMPTION: ..... 35 watts

WESTINGHOUSE ELECTRIC CORP. MODELS H-210, H-211, CHASSIS V-2144, V-2144-1

ALIGNMENT

It is recommended that the chassis be isolated from the power line by means of an isolation transformer.

Make certain that the dial pointer is correctly positioned on the dial cord.

While making the following adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial Setting	Adjust
1.	Stator of R-F tuning capacitor (C7) through a 0.1 mfd capacitor	455 kc.	maximum capacity	Pri. and sec. of 1st and 2nd I-F transformers for max. output
	NOTE: If the I-F transformers are badly mis-aligned, it may be impossible to obtain sufficient output to use the above system. In this event, it will be necessary to align each transformer separately. Start with the last I-F transformer and work forward, connecting the signal generator to the control grid of the tube preceding the transformer under alignment.			
2.	Radiated signal (no actual connection)	1615 kc.	minimum capacity	Osc. trimmer (C10) for max. output
3.	Radiated signal (no actual connection	1400 kc.	1400 kc.	Ant. trimmer (C8) for max. output

PARTS LIST FOR MODELS H-210 AND H-211

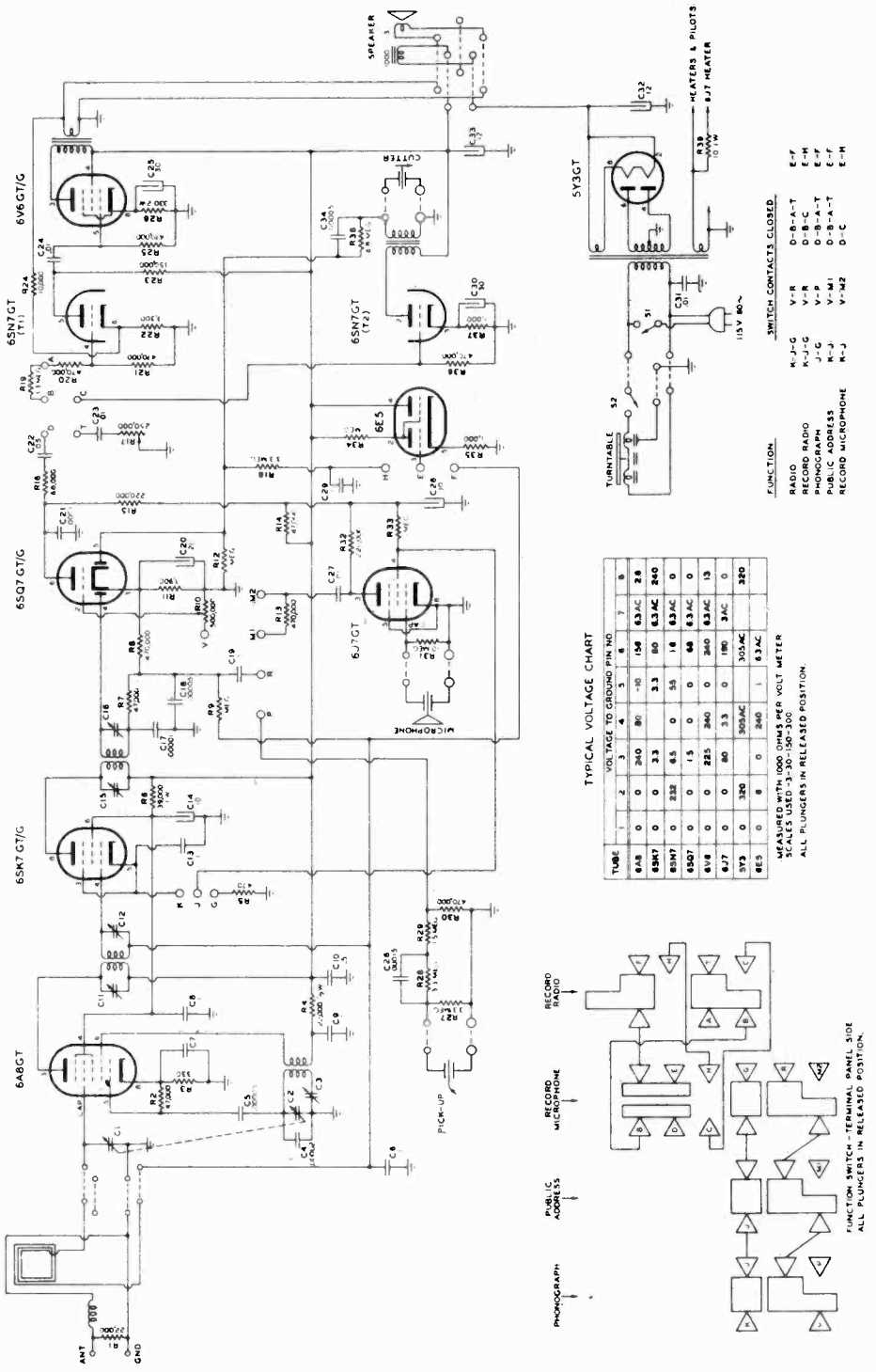
When ordering parts, specify model number of set in addition to part number and description of part.

Part No.	Description
V-6188	Background Rivet Assembly, dial .....
V-1168-1	Cabinet (H-210 Maroon) .....
V-1168-2	Cabinet (H-211 Grey) .....
V-6230	Capacitor, electrolytic ..... 50 mfd 150 v. (C5) 50 mfd 150 v. (C6)
V-6231	Capacitor, variable 2-gang .. Tuner, antenna (C7) Trimmer, antenna (C8) Tuner, oscillator (C9) Trimmer, oscillator (C10)
V-5618-1	Capacitor, .05 resonant (C11)
RCP10W4303A	Capacitor, .03 mfd 400 v. (C12)
RCP10W4103A	Capacitor, .01 mfd 400 v. (C13)
RCP10W4503A	Capacitor, .05 mfd 400 v. (C14, C15) .....
RCP10W4502A	Capacitor, .005 mfd 400 v. (C16)
RCM20A471M	Capacitor, 470 mmf (C17, C18)
RCP10W4203A	Capacitor, .02 mfd 400 v. (C19)
V-5426	Clip, I-F mounting .....
V-5684	Clip, tubular (Back cover clamp) .....
V-6182	Clip, spring (Back cover catch)
V-5851	Coil, oscillator (L5, L6, L7)
V-6198-1	Control, volume, 500 K (R1, SW1) (H-210) .....
V-6198-2	Control, volume, 500 K (R1, SW1) (H-211) .....
V-6242-1	Cover Plate, trim (H-211) ....
V-6232-1	Filter, diode (C20, C21, R2) .

Part No.	Description
V-6184-1	Knob (H-210) .....
V-6184-2	Knob (H-211) .....
#47	Lamp, pilot (H-211) .....
V-6186	Loop, antenna .....
V-6190	Pointer .....
RC10AE101J	Resistor, 100 ohms ¼ w. (R3) .
RC30AE122M	Resistor, 1200 ohms 1 w. (R4)
RC20AE121J	Resistor, 120 ohms ½ w. (R5) .
RC10AE474M	Resistor, 470,000 ohms ¼ w. (R6)
RC10AE334M	Resistor, 330,000 ohms ¼ w. (R7)
RC10AE103M	Resistor, 10,000 ohms ¼ w. (R8) (H-211) .....
RC10AE106M	Resistor, 10 megohms ¼ w. (R9)
RC10AE225M	Resistor, 2.2 megohms ¼ w. (R10)
RC10AE223M	Resistor, 22,000 ohms ¼ w. (R11)
RC20AE330M	Resistor, 33 ohms ½ w. (R12) .
RC10AE224M	Resistor, 220,000 ohms ¼ w. (R13) .....
RC30AE470M	Resistor, 47 ohms 1 w. (R14) (H-210) .....
V-5673	Socket, miniature wafer, unshielded (50C5, 35W4) .....
V-5852-1	Socket, miniature wafer (12AT6, 12BA6) .....
V-5852-3	Socket, miniature wafer (12BE6)
V-6193	Speaker, 4" P.M. .....
V-4057	Spring, dial drive .....
V-6199-2	Transformer, 1st and 2nd I-F (C1, C2, L1, L2, and C3, C4, L3, L4) .....
V-6233-1	Transformer, output .....

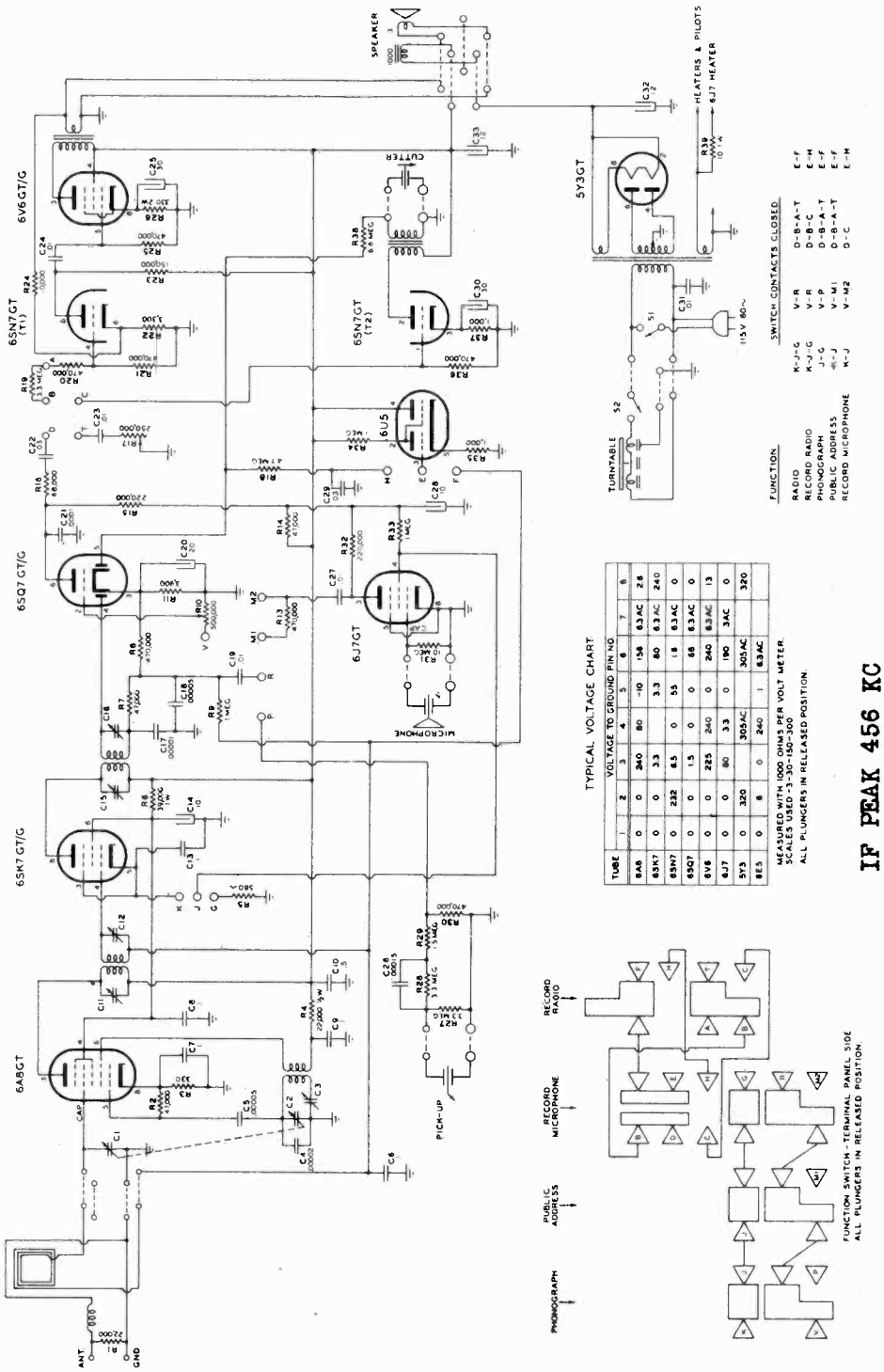
WILCOX GAY CORP.

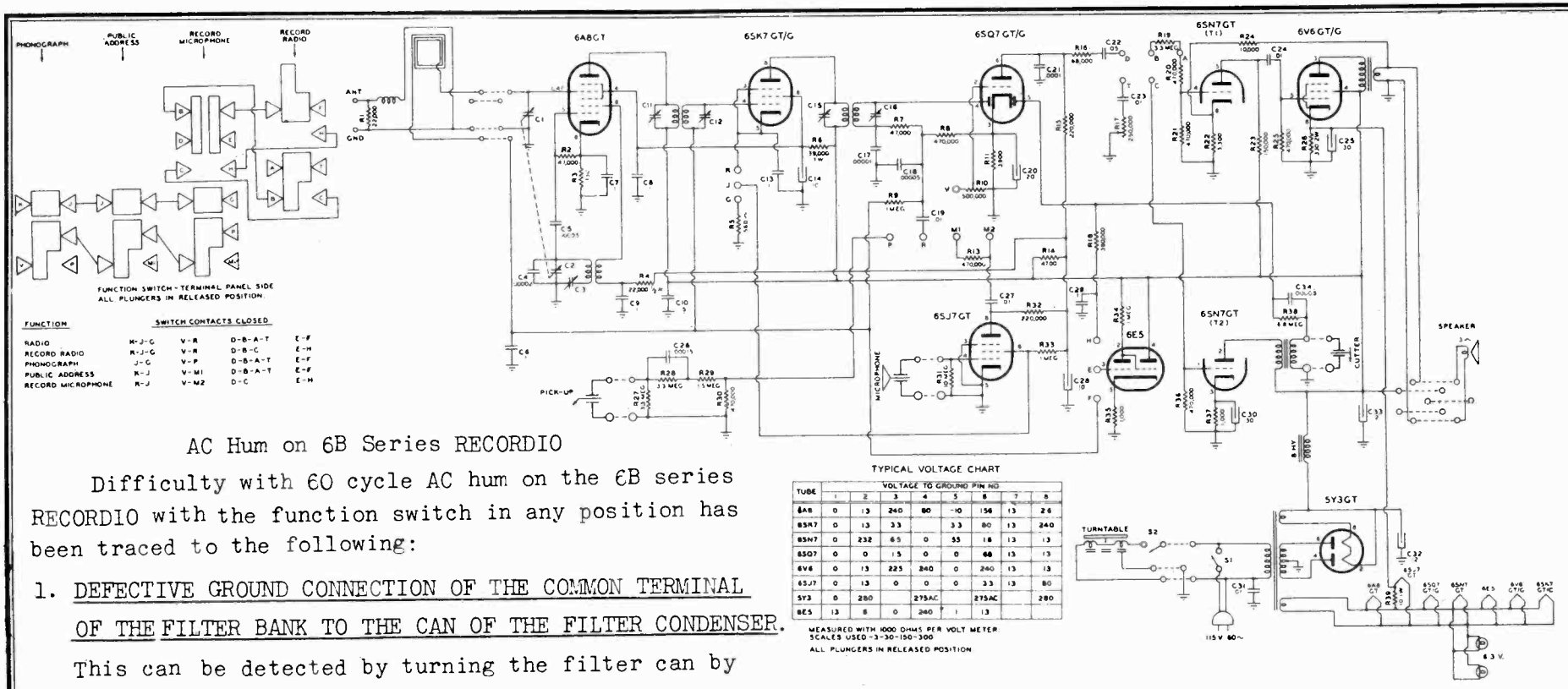
MODELS 6B10,6B20,6B30, 6B32 Early. Serial Nos. 700,000 to 701,751



MODELS 6B10,6B20,6B30, 6B32,Late,Serial Nos. 701,752 to 703,631

WILCOX GAY CORP.





TYPICAL VOLTAGE CHART

TUBE	VOLTAGE TO GROUND PIN NO.							
	1	2	3	4	5	6	7	8
6A8	0	13	240	80	-10	156	13	26
6SK7	0	13	33		33	80	13	240
6SN7	0	232	65	0	55	18	13	13
6SQ7	0	0	15	0	0	66	13	13
6V6	0	13	225	240	0	240	13	13
6SJ7	0	13	0	0	0	33	13	80
5Y3	0	280		275AC		275AC		280
6E5	13	8	0	240	1	13		

MEASURED WITH 1000 OHMS PER VOLT METER
SCALES USED -3-30-150-300
ALL PLUNGERS IN RELEASED POSITION

AC Hum on 6B Series RECORDIO

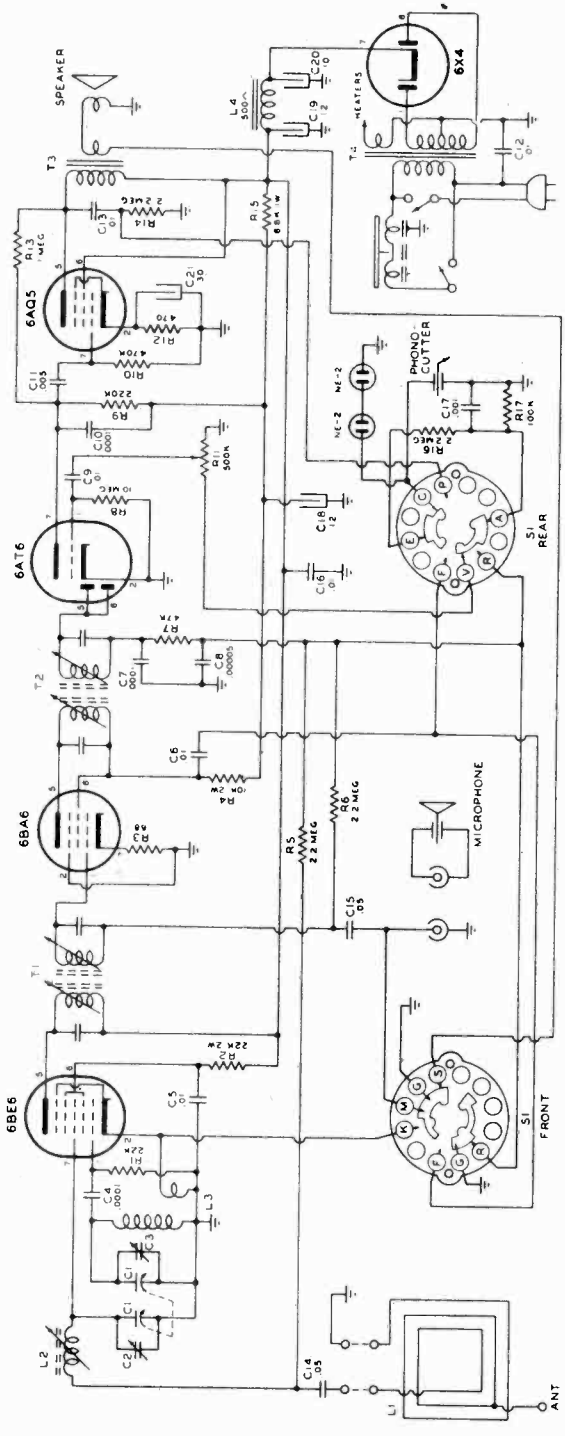
Difficulty with 60 cycle AC hum on the 6B series RECORDIO with the function switch in any position has been traced to the following:

1. DEFECTIVE GROUND CONNECTION OF THE COMMON TERMINAL OF THE FILTER BANK TO THE CAN OF THE FILTER CONDENSER. This can be detected by turning the filter can by hand -- if the hum stops at a certain point then the connection is defective. Peening the can base at the connection point will sometimes help, if not, replace with a new filter condenser.

2. GROUNDED DIAL LIGHT OR HEATER CIRCUIT ON THE CHASSIS USING THE 6SJ7 MICROPHONE AMPLIFIER TUBE. This can be detected by checking the resistance between one side of the heater circuit to ground (chassis) with an ohmmeter. This value should be approximately 340 ohms. If a direct short is shown the short should be cleared. Check dial light sockets by removing them from the supporting brackets.

MODEL 8J10

WILCOX-GAY CORP.



TYPICAL VOLTAGE CHART

TUBE	VOLTAGE FROM PIN NO BELOW TO GND						
	1	2	3	4	5	6	7
6BE6	-6.7V		GND	6.3V*	250V	95V	
6BA6			GND	6.3V*	78V	78V	7
6AT6	- 3		GND	6.3V*	- 3V	- 3	70V
6AQ5		45	GND	6.3V*	235V	250V	
6X4	290V*		GND	6.3V*		290V*	270V

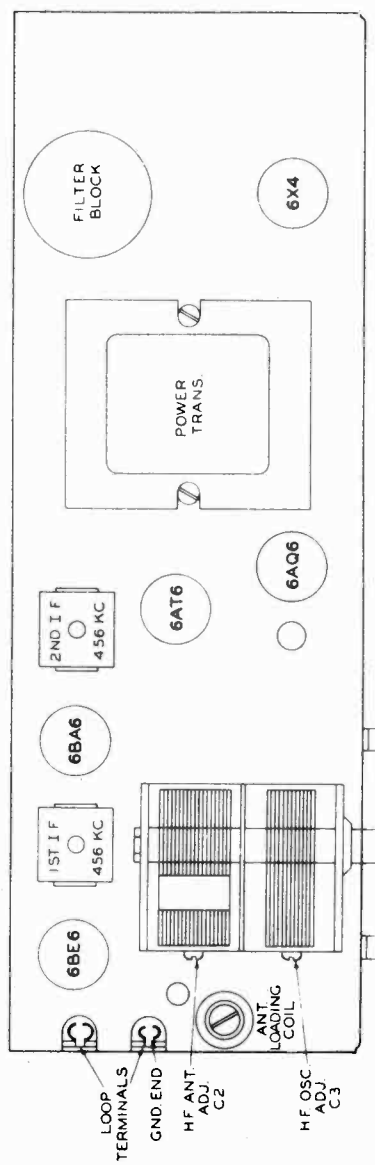
MEASURED WITH 20000Ω PER VOLT METER
SCALES USED 10-50-250-1000 *AC VOLTAGE

FUNCTION — SWITCH CONTACTS CLOSED

FUNCTION	SWITCH CONTACTS CLOSED	
PHONOGRAPH	R-G	M-G-S E-C A-V
RADIO	G-F	M-G-S	
RECORD RADIO	G-F	M-G-S C-P R-V
RECORD MICROPHONE	R-G-K		C-P V-F

SWITCH IN PHONO POSITION - (COUNTERCLOCK-WISE) - VIEWED FROM SHAFT END

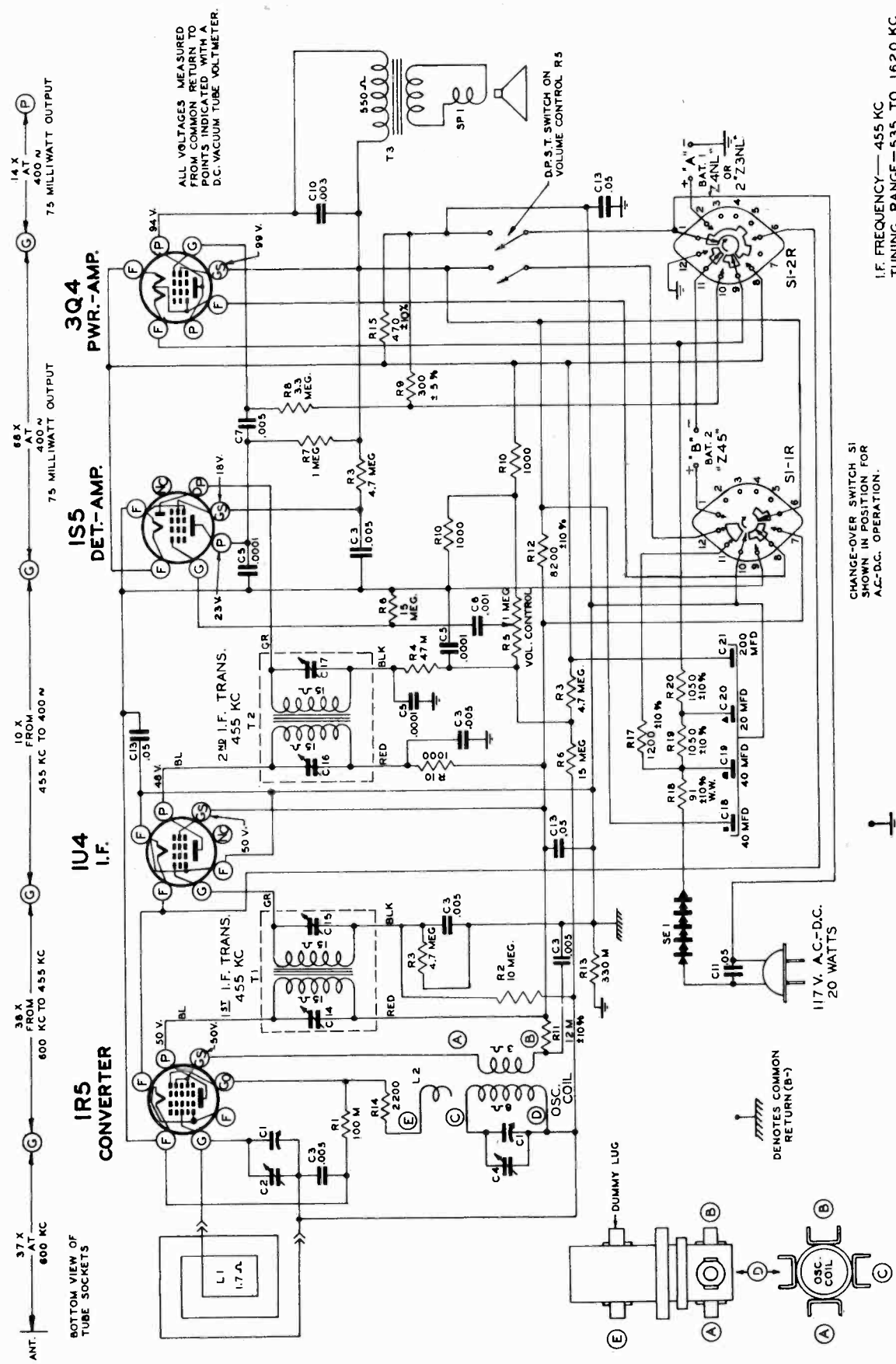
NOTE -
ALL CAPACITIES MFD. ALL RESISTORS ½ WATT
UNLESS OTHERWISE SPECIFIED



TUBE SOCKET LAYOUT

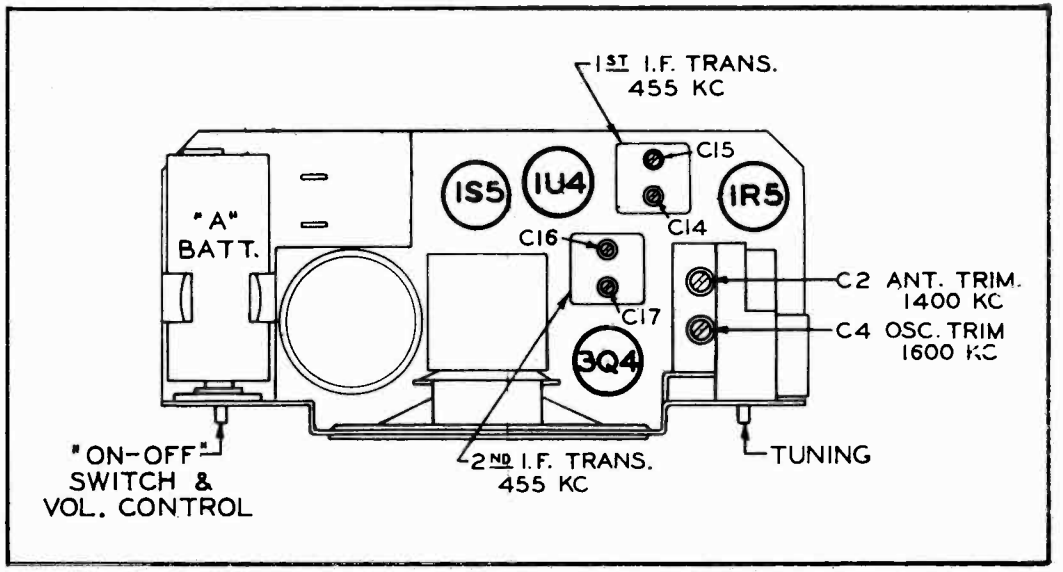
ZENITH RADIO CORP.

MODEL 4G800
Chassis 4E41



PARTS LIST

REFERENCE NO.	DIAGRAM NO.	DESCRIPTION
		CABINET ASSEMBLY
S-13788		Handle Strip Assembly
S-13793		Bottom Cover Assembly
S-13847		Wavemagnet & Cover Assembly
12-1379		Handle Support Bracket (R.H.)
12-1380		Handle Support Bracket (L.H.)
43-149		Handle End Piece
46-683		Front Cover Latch
46-684		Tuning Control Knob
46-685		Volume Control Knob
57-1314		Cabinet Front Plate
57-1315		Chassis Bottom Plate
59-200		Dial Pointer
80-567		Latch Spring
83-1416		Decorative Strip
83-1417		Handle Strip - Rubber
93-870		Fibre Shoulder Washer
110-127		Grille Cloth
199-79		Flexible Handle Sleeve
		CONDENSERS
22-1457	C1	2 Gang Variable
22-1706	C3	.005 MFD . . . 450 V
22-1669	C5	.0001 MFD . . . 500 V
22-1676 OR 22-1343	C6	.001 MFD . . . 500 V .001 MFD . . . 300 V
22-1175	C7	.005 MFD . . . 600 V
22-326	C10	.003 MFD . . . 400 V
22-1660	C11	.05 MFD . . . 400 V
22-1655	C13	.05 MFD . . . 200 V
ON T1	C14	1st I. F. Trans. Pri. Trim
ON T1	C15	1st I. F. Trans. Sec. Trim
ON T2	C16	2nd I. F. Trans. Pri. Trim
ON T2	C17	2nd I. F. Trans. Sec. Trim
22-1443	C18	40 MFD. Electro. . . . 150 V
	C19	40 MFD. Electro. . . . 150 V
	C20	20 MFD. Electro. . . . 150 V
	C21	200 MFD. Electro . . . 10 V
		RESISTORS
63-1870	R1	100 M Ohm . . . 1/2 W
63-1954	R2	10 Megohm . . . 1/2 W
63-1940	R3	4.7 Megohm . . . 1/2 W
63-1856	R4	47 M Ohm . . . 1/2 W
63-1553	R5	1 Meg. Vol. Control
63-1961	R6	15 Megohm . . . 1/2 W
63-1912	R7	1 Megohm . . . 1/2 W
63-1933	R8	3.3 Megohm . . . 1/2 W
63-1762	R9	300 Ohm . . . 1/2 W
63-1786	R10	1000 Ohm . . . 1/2 W
63-1831	R11	12 M Ohm . . . 1/2 W
63-1824	R12	8200 Ohm . . . 1/2 W
63-1891	R13	330 M Ohm . . . 1/2 W
63-1800	R14	2200 Ohm . . . 1/2 W
63-1771	R15	470 Ohm . . . 1/2 W
63-1789	R17	1200 Ohm . . . 1/2 W
63-1564	R18	91 Ohm . . . 2 W
63-1647	R19	1050 Ohm . . . 2-1/2 W
	R20	1050 Ohm . . . 2-1/2 W
		COILS AND CHOKES
S-13786	L1	Wagemagnet Assembly
S-13774	L2	Oscillator Coil Assembly
95-1015	T1	1st I. F. Transformer
95-1016	T2	2nd I. F. Transformer
		MISCELLANEOUS
85-400	S1	Change over Switch
49-587	SP1	3½" P. M. Speaker
95-1014	T3	Speaker Transformer
212-2 OR 212-4	SE1	Selenium Rectifier
	SE1	Selenium Rectifier



TUBE AND TRIMMER LOCATION

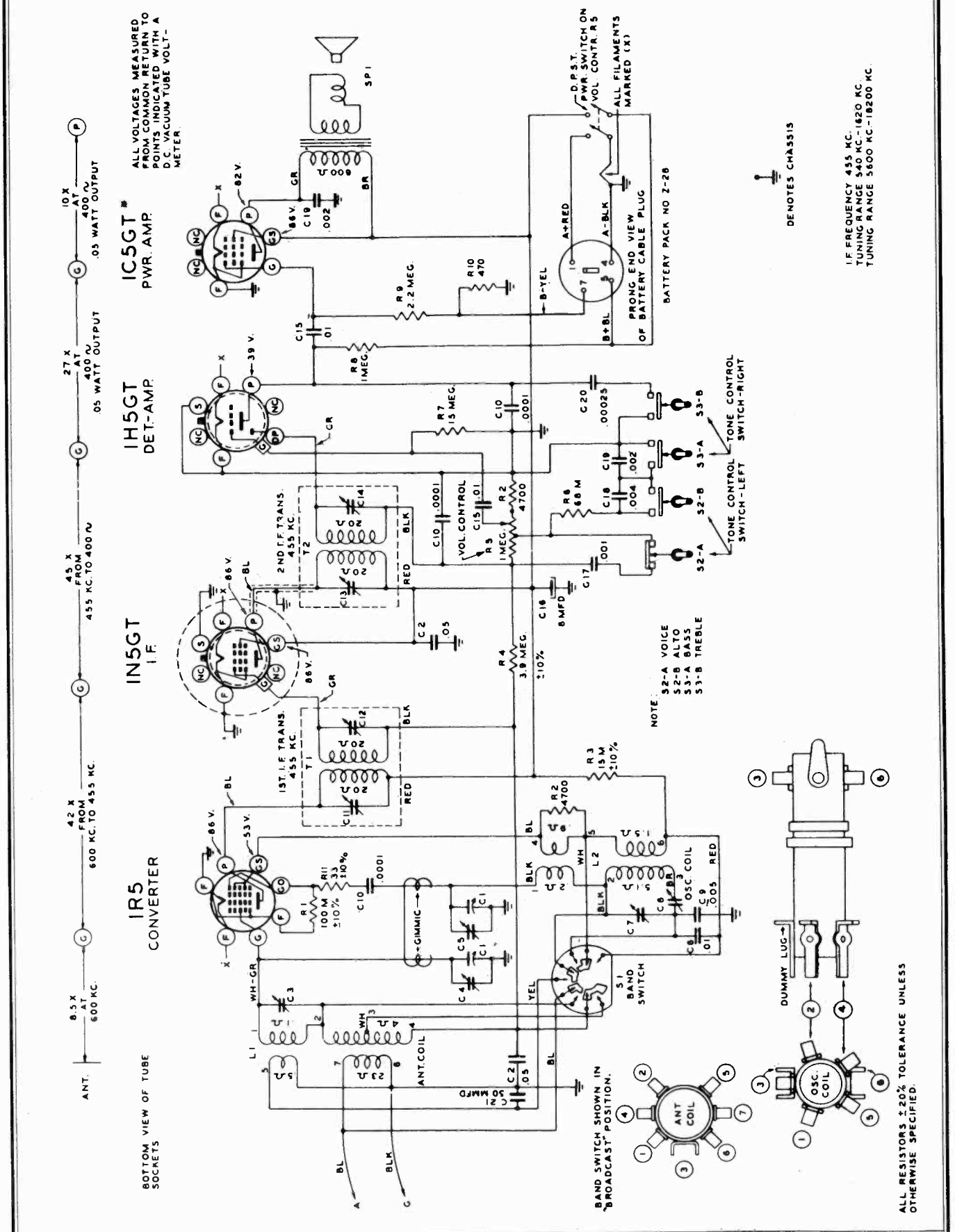
Final alignment of the 4E41 chassis should be made with the chassis installed in the cabinet. Tune in a weak station in the vicinity of 1400 KC and adjust the antenna trimmer for maximum.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid. . . .	.1 MFD	455 Kc.	600 Kc.	C14, C15, C16, C17	Align I.F.
2	One Turn Loosely		1600 Kc.	1600 Kc.	C4	Set Oscillator to Scale --
3	Coupled to Wavemagnet. .		1400 Kc.	1400 Kc.	C2	Adjust for Maximum.

ZENITH RADIO CORP.

MODELS 4K040, 4K040G, Chassis 4C54



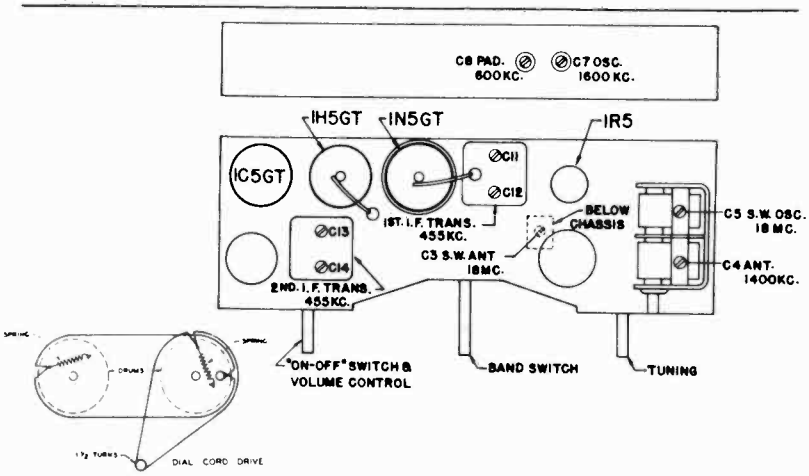
MODELS 4K040, 4K040G

ZENITH RADIO CORP.

TO THE SERVICE MAN:

The alignment of this receiver is conventional. An output meter, connected across the voice coil of the speaker, is very helpful in making correct adjustments.

The Guardian Reminder Circuit consist of a 4700 ohm resistor (R2) in series with the low side of the volume control. With this circuit, it is impossible to turn the volume completely off and leave the power on. In some cases where the minimum volume is too high even at the lowest setting of the volume control, R2 may be changed to a lower value or shorted out completely.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSC. TO	DUMMY ANT.	INPUT SIG. FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	BC	600 Kc.	C-11, C-12, C-13, C-14	Align I.F.
2	Ant.-Gnd.	400 ohms	18 Mc.	SW	18 Mc.	C-5	Set Osc. to Scale
3	Ant.-Gnd.	400 ohms	400 ohms	SW	Rock Gang 18 Mc.	C-3	Align Antenna
4	Ant.-Gnd.	200 Mmf.	1600 Kc.	BC	1600 Kc.	C-7	Set Osc. to Scale
5	Ant.-Gnd.	200 Mmf.	1400 Kc.	BC	1400 Kc.	C-4	Align Antenna
6	Ant.-Gnd.	200 Mmf.	600 Kc.	BC	Rock Gang 600 Kc.	C-8	Adjust Padder

DIAL ASSEMBLY

26-342	Dial Scale
46-443	Radiogran Knob (Voice)
46-444	" " (Treble)
46-445	" " (Alto)
46-446	" " (Bass)
59-122	Off & ON Indicator
59-160	Dial Pointer
76-335	Tuning Control Shaft
80-183	Indicator Spring
80-209	Dial Cord Tension Spring
80-471	Tuning Shaft Spring
93-690	Felt Washer (S-11362)
192-90	Dial Crystal
196-64	Dial Crystal Gasket
S9588	Indicator Cam Assem.
S9610	Dial Cord & Eyelet (Pointer)
S9733	Dial Cord & Eyelet (Gang Cond.)
S9751	Pulley & Rivet Assem. (Gang Cond.)
S11362	Pulley & Bushing Assem. (Pointer)
S11558	Vol. & Tuning Knob Assem. (2 used) (46-520)
S12305	Band Switch Knob Assem. (46-598)

COILS & CHOKES

95-838	1st I.F. Transformer (T1)
95-839	2nd I.F. Transformer (T2)
S9829	Osc. Coil Assem. (L2)
S9832	Ant. Coil Assem. (L1)

CONDENSERS

22-162	.0001 Mfd. (C10) 600 V.
22-182	.00025 Mfd. (C20) 600 V.
22-196	.01 Mfd. (C15) 600 V.
22-448	.004 Mfd. (C18) 600 V.
22-492	.002 Mfd. (C19) 600 V.
22-684	Dry Electrolytic 8 Mfd. (C16) 150 V.
22-826	.01 Mfd. (C6) 200 V.
22-829	.05 Mfd. (C2) 200 V.
22-887	.001 Mfd. (C17) 600 V.
22-1022	.005 Mfd. (C9) 600 V.
22-1208	Two Section Gang (C1)
22-1239	Two Section Trimmer (C7 & C8)
22-1240	Single Section Ceramic Trimmer (C3)
22-1532	50 Mmfd. (C21) 500 V.

RESISTORS

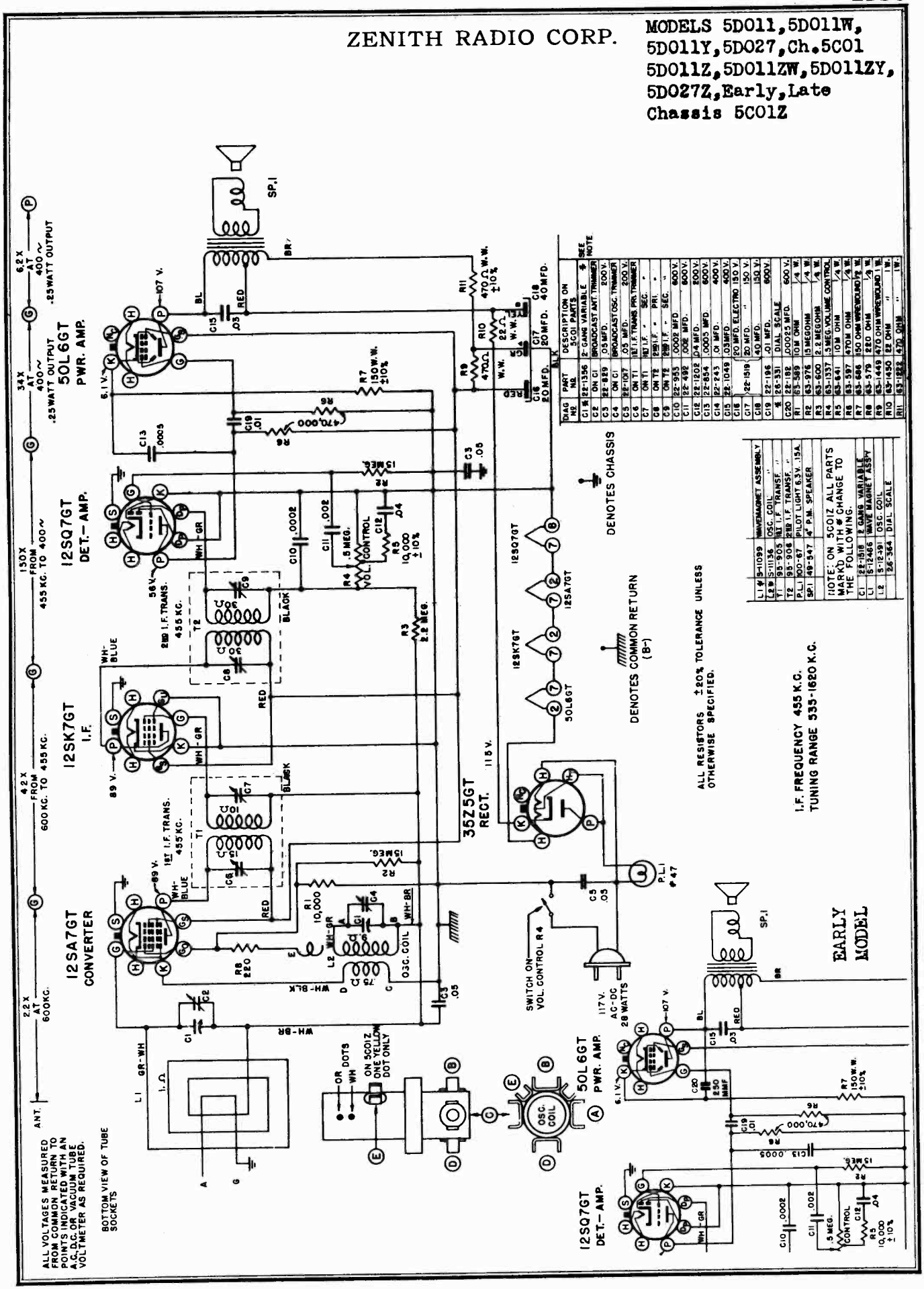
63-260	100M Ohm (R1) 1/4 Watt
63-271	1 Megohm (R8) 1/4 "
63-311	15M Ohm (R3) 1/4 "
63-581	470 Ohm (R10) 1/4 "
63-587	4700 Ohm (R2) 1/4 "
63-594	68M Ohm (R6) 1/4 "
63-600	2.2 Megohm (R9) 1/4 "
63-620	33 Ohm (R11) 1/4 "
63-669	3.9 Megohm (R4) 1/4 "
63-976	15 Megohm (R7) 1/4 "
63-1236	Volume Control & Switch (R5)

MISCELLANEOUS

49-522	6½" P.M. Speaker
	206-522 Output Transformer
	206-522 Cone & Voice Coil
52-190	Speaker Cable
54-34	#6-32 x 1/4 x 3/32 Hex Nut
57-11A	Antenna Marker
57-11G	Ground Marker
57-900	Dial Mtg. Plate
57-1159	Radiorgan Escutcheon Plate (2 used)
58-74	Battery Cable Plug
70-124	#2 x 3/8 Phillips Hd. Wood Screw - Brass Plated (57-1159)
78-436	Miniature Tube Socket
78-611	Octal Base Tube Socket (3 used)
85-279	Band Selector Switch
85-284	Radiorgan Switch L.H. (Voice & Alto)
85-288	Radiorgan Switch R.H. (Treble & Bass)
93-125	#6 Internal Shakeproof Lockwasher
93-258	Brown Felt Washer (Knobs)
94-295	Steel Bushing (Radiorgan) (4 used)
112-56	#6-1/4 Hex Hd. Self Tapping Screw
114-67	#6-32 x 7/16 Hex Acorn Hd. M.S. Steel N.P. (Radiorgan) (4 used)
114-162	#8 x 7/8 Hex Acorn Hd. Self Tapping Screw. (Chassis Mtg.)
125-17	Rubber Grommets (85-284 & 288)
125-39	Rubber Grommets
126-379	Tube Shield
159-14	Plug Buttons (Dial Scale)
188-32	Reteiner Ring (76-335)
188-34	Rétainer Ring (S-11362)
188-48	Control Knob Decorative Ring
202-384	Instruction Book

ZENITH RADIO CORP.

MODELS 5D011, 5D011W, 5D011Y, 5D027, Ch. 5C01 5D011Z, 5D011ZW, 5D011ZY, 5D027Z, Early, Late Chassis 5C01Z



DIAG NO.	PART NO.	DESCRIPTION ON 5C01 PARTS	SEE NOTE
C1	22-1356	2-GANG VARIABLE	*
C2	ON C1	BROADCAST ANT. TRIMMER	
C3	22-1839	.05 MFD. 200 V.	
C4	ON C1	BROADCAST OSC. TRIMMER	
C5	22-1067	.05 MFD. 200 V.	
C6	ON T1	1ST I.F. TRANS PRI. TRIMMER	
C7	ON T1	1ST I.F. " SEC. "	
C8	ON T2	2ND I.F. " PRI "	
C9	ON T2	2ND I.F. " SEC. "	
C10	22-933	.0002 MFD. 600 V.	
C11	22-492	.002 MFD. 600 V.	
C12	22-1202	.04 MFD. 200 V.	
C13	22-854	.0005 MFD. 600 V.	
C14	22-243	.01 MFD. 400 V.	
C15	22-1049	.03 MFD. 400 V.	
C16		20 MFD. ELECTRO 150 V.	
C17	22-1519	20 MFD. " 150 V.	
C18		40 MFD. " 150 V.	
C19	22-196	.01 MFD. 600 V.	
	26-331	DIAL SCALE	
C20	22-182	.00025 MFD. 600 V.	
R1	63-589	10M OHM ¼ W.	
R2	63-976	15 MEGOHM ¼ W.	
R3	63-600	2.2 MEGOHM ¼ W.	
R4	63-1337	.5 MEG. VOLUME CONTROL	
R5	63-641	10M OHM ¼ W.	
R6	63-597	470M OHM ¼ W.	
R7	63-606	150 OHM WIREWOUND 2 W.	
R8	63-579	220 OHM ½ W.	
R9	63-1449	470 OHM WIREWOUND 1 W.	
R10	63-1450	22 OHM " 1 W.	
R11	63-1222	470 OHM " 1 W.	

L1	5-11099	HANDMAGNET ASSEMBLY
L2	5-11136	OSC. COIL "
T1	95-905	1ST I.F. TRANSF. "
T2	95-904	2ND I.F. TRANSF. "
P.L.	100-67	PILOT LIGHT 6.3 V. .15 A.
SP.1	49-247	4" P.M. SPEAKER

NOTE: ON 5C01Z ALL PARTS MARKED WITH * CHANGE TO THE FOLLOWING.

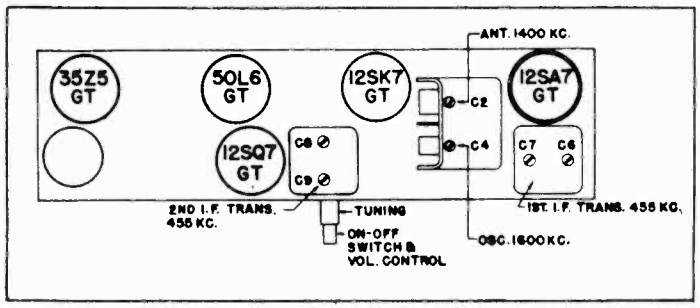
C1	22-1518	2 GANG VARIABLE
L1	5-12466	WAVE MAGNET ASSY
L2	5-12391	OSC. COIL
	26-364	DIAL SCALE

ZENITH RADIO CORP.

MODELS 5D011 Series, 5D011Z Series
MODELS 5R080, 5R086

TO THE SERVICE MAN:

The filter circuits of chassis 5C01 incorporate new features that should be well understood by the service man. An examination of the schematic drawing will show the output transformer tapped slightly off center. This tap is the B+ connection from filter resistor R10 and capacitor C18 off the cathode of the rectifier 35Z5 to the 50L6 plate. The lower connection of the output transformer feeds B+ to the rest of the tubes in the receiver. Current flowing through the upper windings of the output transformer to the 50L6 produces a magnetic field which is 180° out of phase with the magnetic field produced by current flowing in the opposite direction through the output transformer to the rest of the receiver, therefore, most of the AC hum is cancelled. Further reduction of hum is accomplished by filtering through resistor R9 and 11 and capacitors C16 and 17. Capacitor C15 across the primary of the output transformer by passes high frequency back to ground.



TUBE AND TRIMMER LOCATION

This development in filtering systems allows a higher effective plate voltage on the 50L6 for increased power output.

NOTE: The output transformer must be replaced with an exact duplicate Part No. 202-549. Be sure to add the speaker code letter to the transformer Part number.

MODELS 5D011—5D027
CHASSIS No. 5C01
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-6,C-7, C-8,C-9	Align I. F.
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage

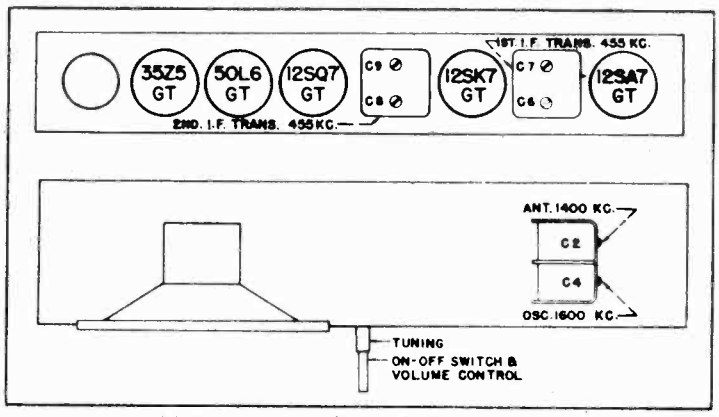
TO THE SERVICE MAN:

The 5C02 and 5C04 chassis are identical electrically. Chassis 5C02 has a Record Reject push button switch on the receiver control panel to reject records.

The socket P1 is used to connect the automatic record changer to the receiver.

The Phono-Radio switch is a two position double acting push-button switch and when in the "in" position connects the changer for playing records.

Chassis 5C04 has the same Phono-Radio switch arrangement. However, the 5C04 does not have socket P1 and the Record Reject switch. The record player is connected to the receiver by a shielded cable and socket arrangement.

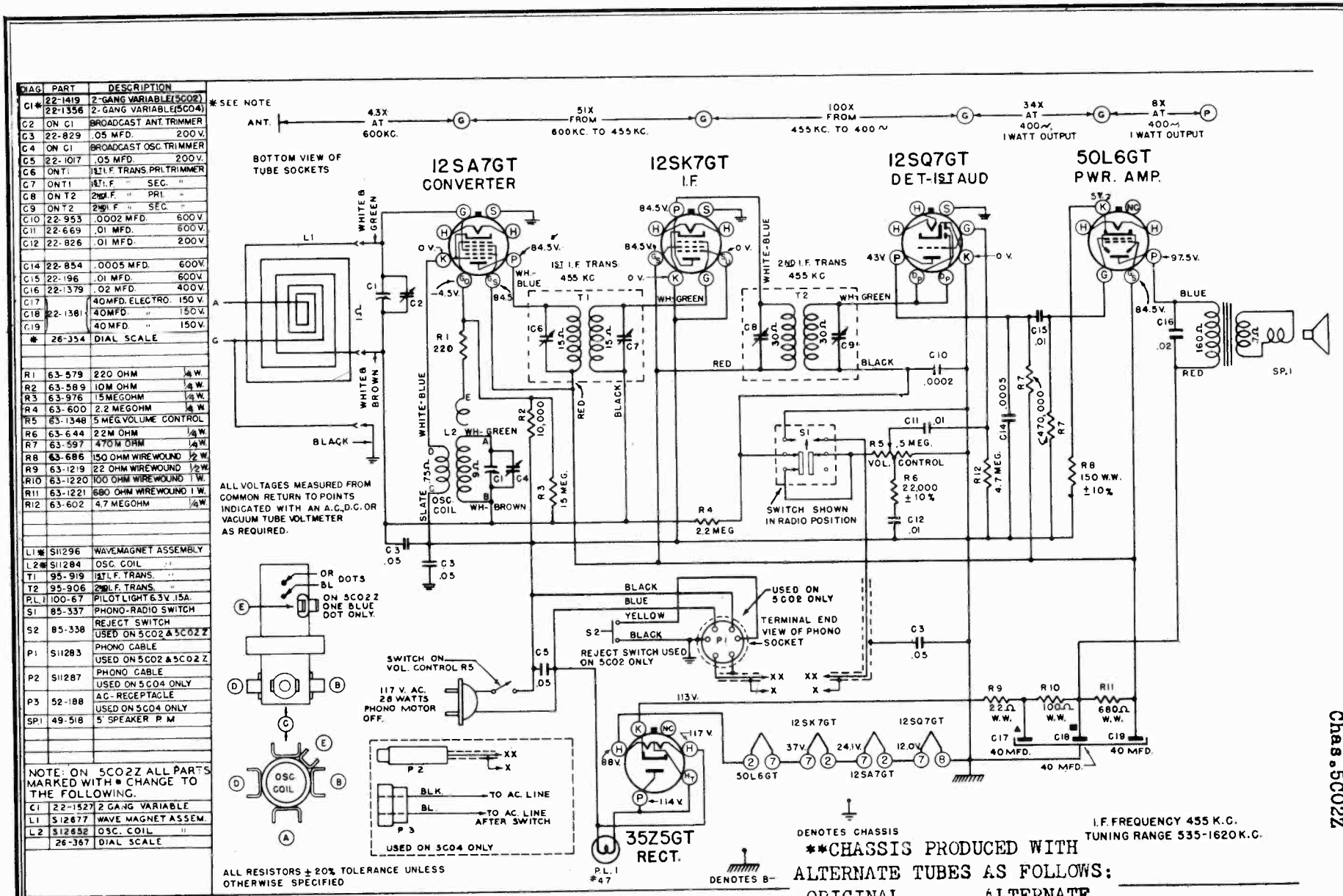


TUBE AND TRIMMER LOCATION

MODELS 5R080—5R086
CHASSIS Nos. 5C02—5C04
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1 1	Converter Grid	.5 Mfd.	455 Kc.	600 KC.	C-6,C-7, C-8,C-9	Align I. F.
2	Single Turn Loop Loosely Coupled to Wave magnet		1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3			1400 Kc.	1400 Kc.	C-2	Align Ant

ZENITH RADIO CORP. MODELS 5R080, Ch. 5C04, 5R086, Ch. 5C02, 5R086Z, Chas. 5C02Z



DIAG.	PART	DESCRIPTION
C1*	22-1419	2-GANG VARIABLE(5C02)
	22-1356	2-GANG VARIABLE(5C04)
C2	ON C1	BROADCAST ANT. TRIMMER
C3	22-829	.05 MFD. 200 V.
C4	ON C1	BROADCAST OSC. TRIMMER
C5	22-1017	.05 MFD. 200 V.
C6	ON T1	1ST I.F. TRANS. PRI. TRIMMER
C7	ON T1	1ST I.F. " SEC. "
C8	ON T2	2ND I.F. " PRI. "
C9	ON T2	2ND I.F. " SEC. "
C10	22-953	.0002 MFD. 600 V.
C11	22-669	.01 MFD. 600 V.
C12	22-826	.01 MFD. 200 V.
C14	22-854	.0005 MFD. 600 V.
C15	22-196	.01 MFD. 600 V.
C16	22-1379	.02 MFD. 400 V.
C17	22-1381	40 MFD. ELECTRO. 150 V.
C18		40 MFD. " 150 V.
C19		40 MFD. " 150 V.
*	26-354	DIAL SCALE
R1	63-579	220 OHM ¼ W.
R2	63-589	10M OHM ¼ W.
R3	63-976	15 MEGOHM ¼ W.
R4	63-600	2.2 MEGOHM ¼ W.
R5	63-1348	5 MEG. VOLUME CONTROL
R6	63-644	22M OHM ¼ W.
R7	63-597	470M OHM ¼ W.
R8	63-686	150 OHM WIREWOUND ½ W.
R9	63-1219	22 OHM WIREWOUND ½ W.
R10	63-1220	100 OHM WIREWOUND 1 W.
R11	63-1221	680 OHM WIREWOUND 1 W.
R12	63-602	4.7 MEGOHM ¼ W.
L1*	S11296	WAVEMAGNET ASSEMBLY
L2*	S11284	OSC. COIL "
T1	95-919	1ST I.F. TRANS. "
T2	95-906	2ND I.F. TRANS. "
P.L.1	100-67	PILOT LIGHT 6.3 V. .15A.
S1	85-337	PHONO-RADIO SWITCH
S2	85-338	REJECT SWITCH
		USED ON 5C02 & 5C02Z
P1	S11283	PHONO CABLE
		USED ON 5C02 & 5C02Z
P2	S11287	PHONO CABLE
		USED ON 5C04 ONLY
P3	52-188	A.C. RECEPTACLE
		USED ON 5C04 ONLY
SP.1	49-518	5" SPEAKER P.M.

NOTE: ON 5C02Z ALL PARTS MARKED WITH * CHANGE TO THE FOLLOWING.

C1	22-1527	2 GANG VARIABLE
L1	S12677	WAVE MAGNET ASSEM.
L2	S12652	OSC. COIL "
	26-367	DIAL SCALE

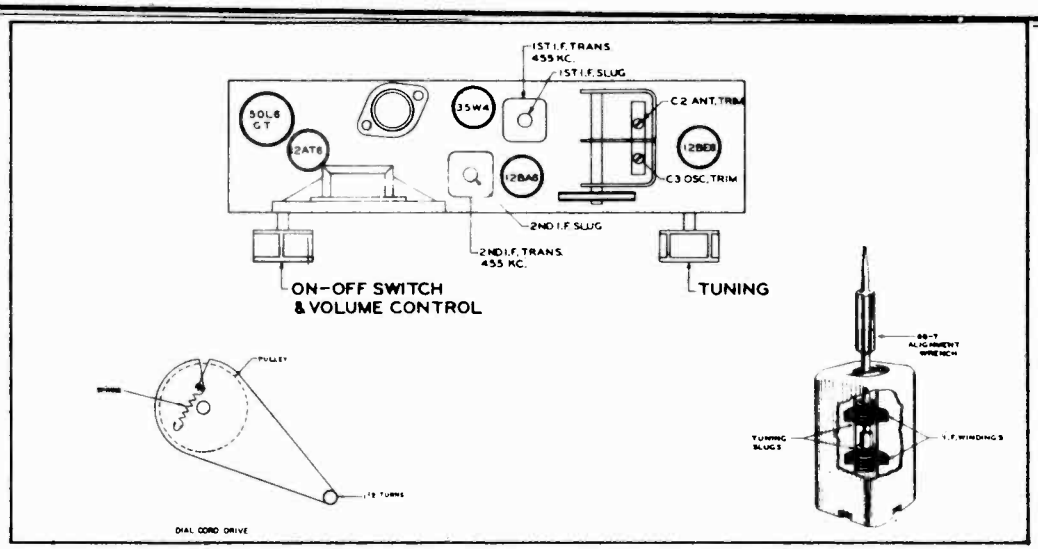
MODELS 5R080—5R086
CHASSIS Nos. 5C02—5C04

**CHASSIS PRODUCED WITH ALTERNATE TUBES AS FOLLOWS:

ORIGINAL	ALTERNATE
12SA7GT	12BE6
12SA7GT	14Q7
35Z5GT	35W4

PARTS LIST

PART NO.			
		DIAL ASSEMBLY	
26-415		Dial Scale	
59-222		Dial Pointer	
76-515		Tuning Shaft	
80-209		Dial Cord Tension Spring	
188-32		Retaining Ring	
188-54		Retaining Ring (Pointer)	
S14843		Dial Cord & Eyelet Assem.	
		COILS & CHOKES	
95-1101	T-1	1st. I. F. Transformer	
95-1102	T-2	2nd. I. F. Transformer	
S14842	L-2	Oscillator Coil Assem.	
		CONDENSERS	
22-162	C-14	100 Mfd. (or 22-1669)	500V.
22-829	C-4	.05 Mfd.	200V.
22-854		.0005 Mfd.	600V.
22-1158	C-4	.05 Mfd.	200V.
22-1379	C-13	.02 Mfd.	400V.
22-1775	C-5	.047 Mfd.	400V.
22-1804	C15, 16	Dry Electrolytic 60 x 20 Mfd.	150V.
22-1807	C-1	Two Section Gang	
105-14	U-1	Dual Ceramic	
		RESISTORS	
63-686	R-7	150 Ohm W.W. Insl.	1/2W
63-1219	R-9	22 Ohm W.W. Insl.	1/2W
63-1574	R-10	1 M Ohm Insl.	1W
63-1575	R-13	39 Ohm W.W. Insl.	2W
63-1660	R-4	Vol. Con. & Sw.	
63-1737	R-12	68 Ohm Insl.	1/2W
63-1782		820 Ohm Insl.	1/2W
63-1814		4700 Ohm Insl.	1/2W
63-1828	R-1	10M Ohm Insl.	1/2W
63-1898	R-6	470M Ohm Insl.	1/2W
63-1926	R-3	2.2 Megohm Insl.	1/2W
63-1940	R-2	4.7 Megohm Insl.	1/2W
		MISCELLANEOUS	
11-79		Line Cord & Plug (6 Ft.)	
14-1010		Model 810Y Plastic Cabinet	
46-745Y		Tuning & Vol. Con. Knob (2 Used)	
49-645	SP-1	4" P.M. Speaker	
		206-645 Output Trans.	
		208-645 Cone & Voice Coil	
54-139		#3/8-32 x 9/16 Palnut	
54-211		Speed Nut	
54-267		#6-32 x 5/16 Palnut	
57-1407		Cabinet Front Plate	
78-275		Socket - Electrolytic	
78-611		Socket - Octal Tube (8 Contact)	
78-806		Socket - Miniature Tube	
78-807		Socket - Miniature Tube (3 Used)	
83-1057		Line Cord Insulating Strip	
94-334		Gang Cond. Mtg. Bushing	
112-697		#6 x 7/16 Straight Side B.H.S.T. Screw	
114-67		#6-32 x 7/16 Hex Acorn Hd. M.S.	
114-217		#8 x 1/4 Hex Hd. Slotted S. T. Screw	
125-17		Rubber Grommet	
139-73		Spk. Baffle	
159-69		Trimount Stud (Cab. Back Mtg.)	
166-44		Rubber Bumper (or 166-41)	
202-665		Instruction Book	
S14879	L-1	Wavemagnet Assem.	
S14951		Front Plate & Spk. Baffle Assem.	



TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

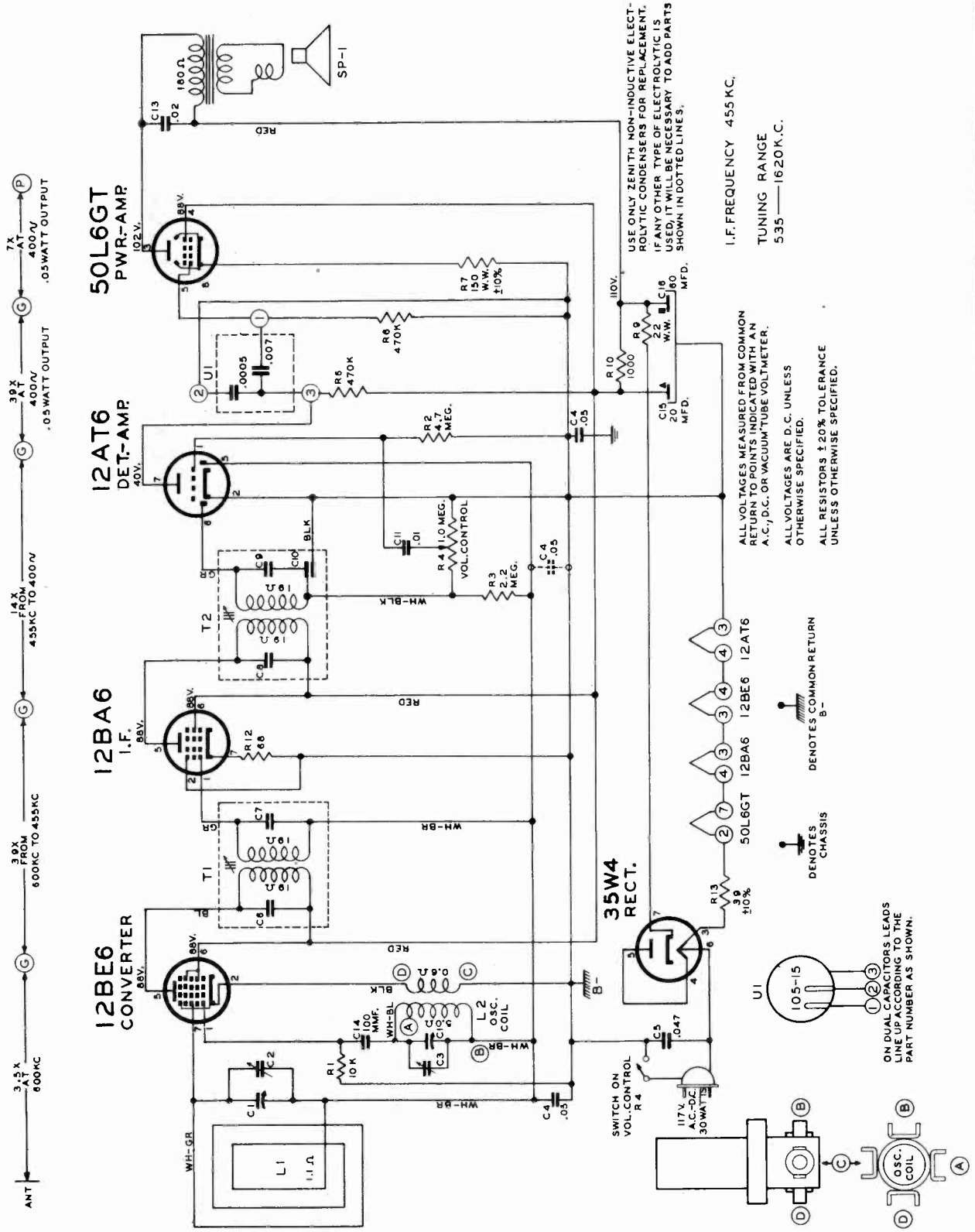
The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage

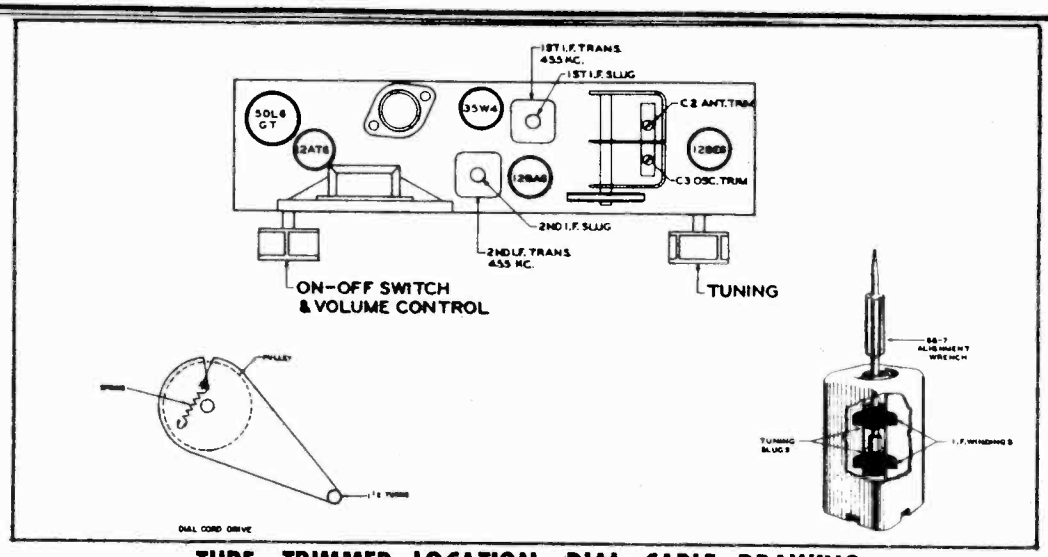
ZENITH RADIO CORP.

MODEL 5D810,
CHASSIS 5E02



PARTS LIST

PART NO.			
		DIAL ASSEMBLY	
26-414		Dial Scale	
59-222		Dial Pointer	
76-515		Tuning Shaft	
78-820		Pilot Light Socket & Wire	
80-209		Dial Cord Tension Spring	
100-67		Dial Light Bulb - 6.3V. - .15 Amp.	
188-32		Retaining Ring	
188-54		Retaining Ring (Pointer)	
S14843		Dial Cord & Eyelet Assem.	
		COILS & CHOKES	
95-1101		1st I.F. Transformer	
95-1102		2nd I.F. Transformer	
S14842		Osc. Coil Assem.	
		CONDENSERS	
22-162	C-14	100 Mmfd. (or 22-1669)	500V.
22-829	C-4	.05 Mfd.	200V.
22-854		.0005 Mfd.	600V.
22-1158	C-11	.05 Mfd.	200V.
22-1379	C-13	.02 Mfd.	400V.
22-1775	C-5	.047 Mfd.	400V.
22-1804	C15, 16	Dry Electrolytic 60 x 20 Mfd.	150V.
22-1807	C-1	Two Section Gang	
105-14	U-1	Dual Ceramic	
		RESISTORS	
63-686	R-9	150 Ohm W.W. Insl.	1/2W
63-1219	R-11	22 Ohm W.W. Insl.	1/2W
63-1574	R-10	10000 Ohm Insl.	1W
63-1660	R-4	Vol. Con. & Sw.	
63-1737	R-2	68 Ohm Insl.	1/2W
63-1782	R-5	820 Ohm Insl.	1/2W
63-1814	R-6	4700 Ohm Insl.	1/2W
63-1828	R-1	10M Ohm Insl.	1/2W
63-1898	R-8	470M Ohm Insl.	1/2W
63-1926	R-3	2.2 Megohm Insl.	1/2W
63-1940	R-7	4.7 Megohm Insl.	1/2W
		MISCELLANEOUS	
11-79		Line Cord & Plug (6 Ft.)	
14-1011		Model 811 Plastic Cabinet	
14-1011W		Model 811W Plastic Cabinet	
14-1011Y		Model 811Y Plastic Cabinet	
43-165		Handle Housing	
46-744		Tuning & Vol. Con. Knob (2 Used) (5D811)	
46-744Y		Tuning & Vol. Con. Knob (2 Used) (5D811W - 811Y)	
49-645	SP-1	4" P.M. Speaker	
		206-645 Output Trans.	
		208-645 Cone & Voice Coil	
54-211		Speed Nut	
57-1408		Cabinet Front Plate	
78-275		Socket - Electrolytic	
78-611		Socket - Octal Tube (8 Contact)	
78-806		Socket - Miniature Tube	
78-807		Socket - Miniature Tube	
83-1057		Line Cord Insulating Strip	
83-1393		Rubber Strip (Handle)	
93-487		1/16 x .144 x 3/8 Steel Washer	
94-334		Gang Cond. Mtg. Bushing	
102-543		Insignia Label	
112-407		#6 x 3/8 R.H.S.T. Screw	
112-697		#6 x 7/16 Straight Side B.H.S.T. Screw	
114-67		#6-32 x 7/16 Hex Acorn Hd. M.S. (3 Used)	
114-217		#8 x 1/4 Hex. Hd. Slotted S. T. Screw (2 Used)	
125-17		Rubber Grommet	
139-74		Spk. Baffle	
159-69		Trimount Stud (Cab. Back Mtg.)	
166-44		Rubber Bumper (or 166-41)	
199-103		Flexible Handle Sleeve (5D811)	
199-103Y		Flexible Handle Sleeve (5D811W-811Y)	
202-665		Instruction Book	
S13210		Strip & Rivet Assem. (Handle Strap)	
S14952		Front Plate & Spk. Baffle Assem.	
S14976	L-1	Wavemagnet Assem. (5D811-811Y)	
S14977	L-1	Wavemagnet Assem. (5D811W)	



TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

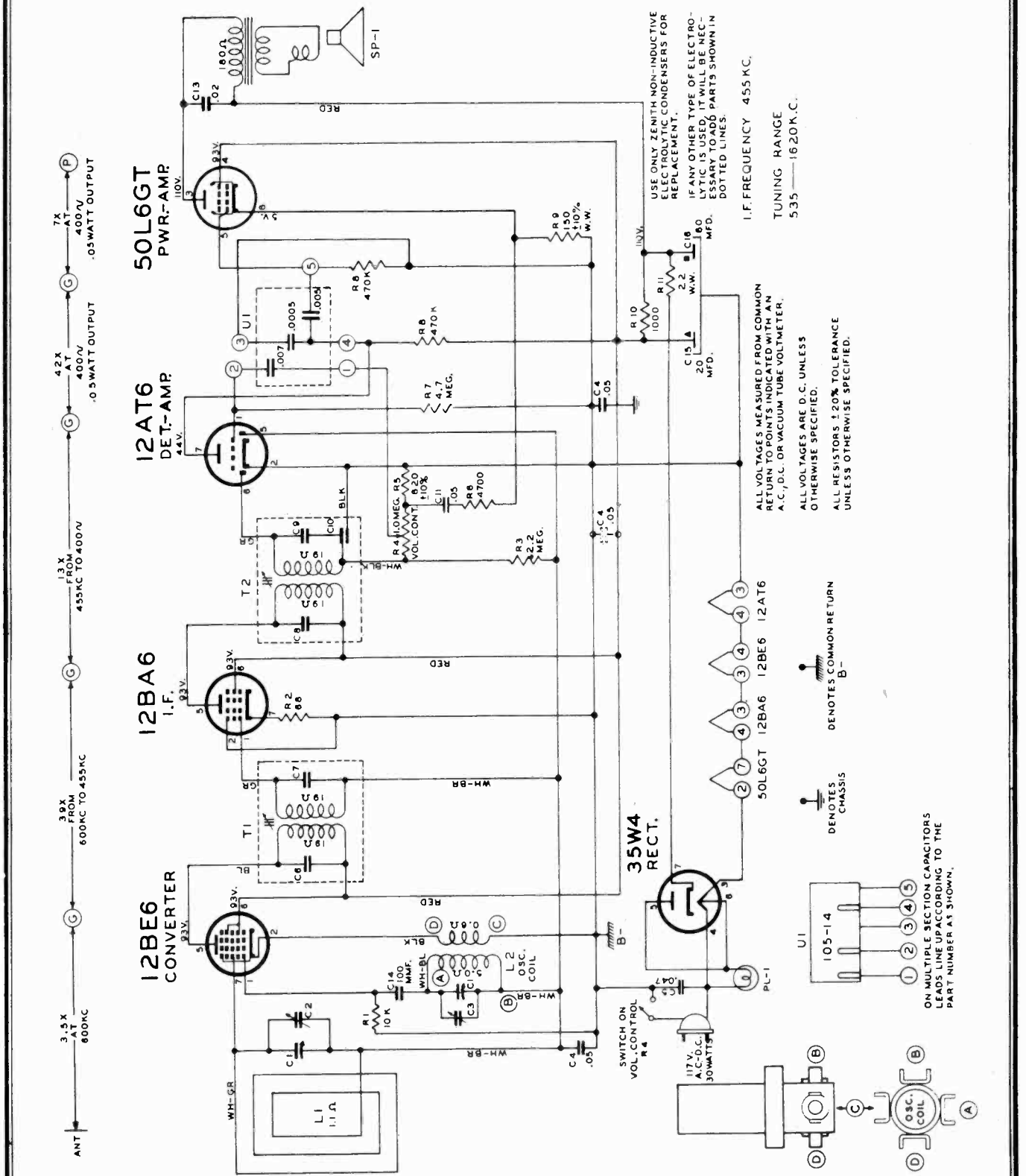
The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

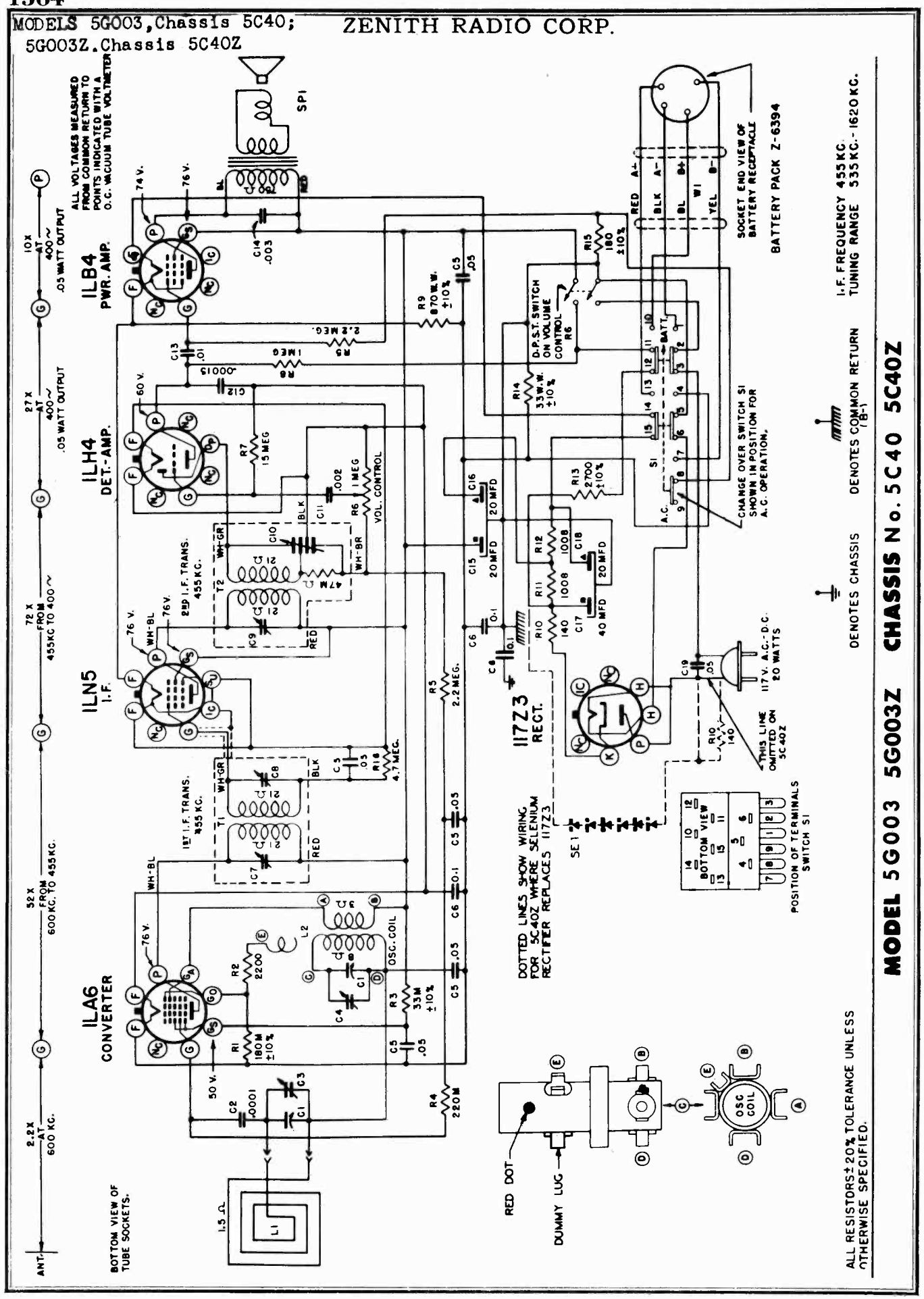
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage

ZENITH RADIO CORP.

MODEL 5D811, CHASSIS 5E01




MODELS 5G003, Chassis 5C40;
5G003Z, Chassis 5C40Z
ZENITH RADIO CORP.
MODEL 5G003 5G003Z CHASSIS No. 5C40 5C40Z
ILA6 CONVERTER
ILN5 I.F.
ILH4 DET.-AMP.
ILB4 PWR. AMP.
117Z3 RECT.
SP1
S1
SE1
T1 1ST I.F. TRANS. 455 KC.
T2 2ND I.F. TRANS. 455 KC.
OSC. COIL
L1
L2
R1 180M ±10%
R2 2200
R3 33M ±10%
R4 220M
R5 2.2 MEG.
R6 VOL. CONTROL 1 MEG
R7 15 MEG
R8 1 MEG
R9 870 W.W. ±10%
R10 140
R11 1008
R12 1008
R13 2700 ±10%
R14 33 W.W. ±10%
R15 180 ±10%
R16 4.7 MEG.
C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19
20 MFD
40 MFD
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER
D.P.S.T. SWITCH ON VOLUME CONTROL R6
CHANGE OVER SWITCH S1 SHOWN IN POSITION FOR A.C. OPERATION.
DOTTED LINES SHOW WIRING FOR 5C40Z WHERE SELENIUM RECTIFIER REPLACES 117Z3
THIS LINE OMITTED ON 5C40Z
117 V. A.C.-D.C. 20 WATTS
BATTERY PACK Z-6394
SOCKET END VIEW OF BATTERY RECEPTACLE
POSITION OF TERMINALS SWITCH S1
BOTTOM VIEW
BOTTOM VIEW OF TUBE SOCKETS.
DENOTES CHASSIS
DENOTES COMMON RETURN (B-)
I.F. FREQUENCY 455 KC.
TUNING RANGE 535 KC. - 1620 KC.
ALL RESISTORS ± 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
ANT.
2.2X AT 600 KC.
32X FROM 600 KC. TO 455 KC.
72X FROM 455 KC TO 400 ~
27X AT 400 ~ .05 WATT OUTPUT
10X AT 400 ~ .05 WATT OUTPUT
RED DOT
DUMMY LUG
OSC COIL
1.5 Ω

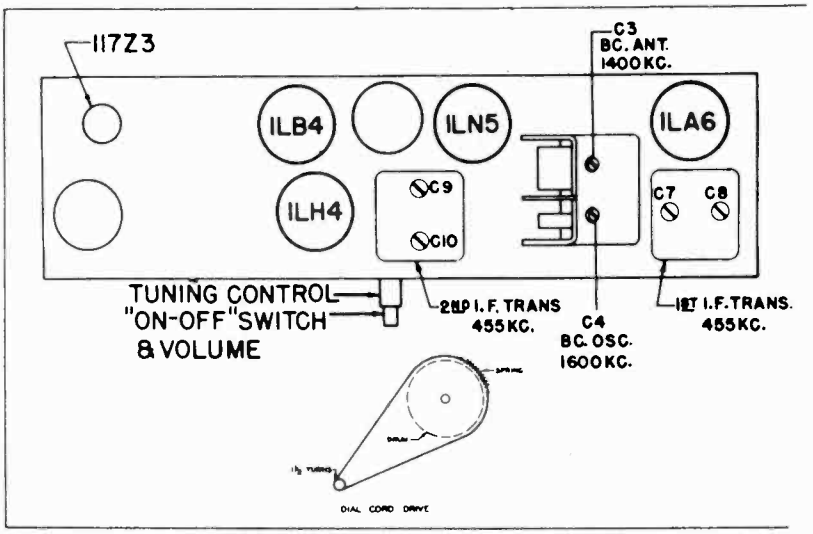
MODELS 5G003, 5G003Z
MODEL 5G003ZZ

ZENITH RADIO CORP.

TO THE SERVICEMAN:

The alignment of chassis 5C40 is conventional and the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic voltohm meter.

Stage by stage gain measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSC. TO	DUMMY ANT.	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	5 Mfd.	455	600	C7, C8, C9 C10	I.F. Alignment
2	Single Turn Loop	--	1600	1600	C4	Set Osc. to scale
3	Coupled Loosely to Wavemagnet	--	1400	1400	C3	Alignment of Antenna

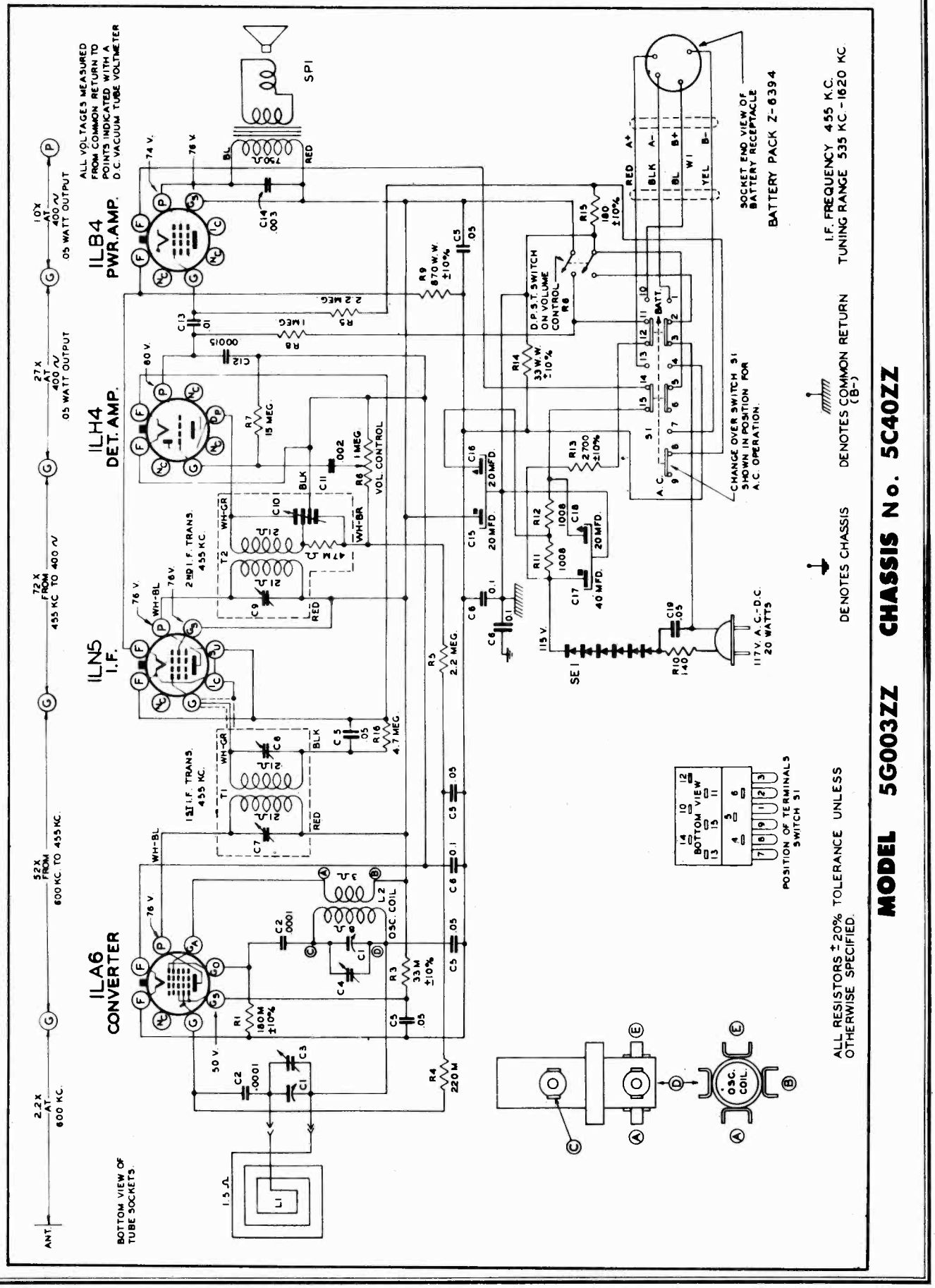
PARTS LIST

PART NO.	REF. NO.	DESCRIPTION
		DIAL ASSEMBLY
26-366		Dial Scale
46-530		Volume Control Knob (Small)
46-587		Tuning Control Knob (Large)
57-1120		Escutcheon Plate
57-1187		Dial Plate
59-164		Dial Pointer
76-488		Tuning Control Shaft
80-365		Tuning Shaft Tension Spring (63-1459)
80-508		Dial Cord Tension Spring
125-17		Rubber Grommets (22-1450)
147-148		Dial Plate Spacer
159-50		Plug Button (26-366-192-99)
188-53		Tuning Shaft Retainer Ring
192-99		Dial Glass
196-88		Dial Glass Gasket
S-11098		Pulley & Bushing Assembly
S-11137		Dial Cord & Eyelet Assembly
		CHOKES AND COILS
95-937	T1	First I.F. Transformer
95-938	T2	Second I.F. Transformer
S-11830	L2	Osc. Coil Assem. 5C40-40Z
S-13765	L2	Osc. Coil Assem. 5C40ZZ
		CONDENSERS
22-162	C2	.0001 Mfd. 500 Volt
22-196	C13	.01 Mfd. 600 Volt
22-326	C14	.003 Mfd. 400 Volt
22-470	C12	.00015 Mfd. 600 Volt
22-492	C11	.002 Mfd. 600 Volt
22-827	C6	.1 Mfd. 200 Volt
22-829	C5	.05 Mfd. 200 Volt
22-1014	C15 & C16	Dry Electrolytic 20 x 20 Mfd. 150 Volt
22-1017	C19	.05 Mfd. 200 Volt
22-1081	C17 & C18	Dry Electrolytic 40 x 20 Mfd. 150 Volt-25 Volt
22-1450	C1	Two Section Gang 5C40-40Z
22-1653	C1	Two Section Gang 5C40ZZ
		RESISTORS
63-271	R8	1 Megohm 1/4 Watt
63-296	R4	220 M Ohm 1/4 Watt
63-439	R13	2700 Ohm 1/4 Watt
63-579	R2	220 Ohm 1/4 Watt
63-600	R5	2.2 Megohm 1/4 Watt
63-602	R16	4.7 Megohm 1/4 Watt
63-627	R15	180 Ohm 1/4 Watt
63-646	R3	33 M Ohm 1/4 Watt
63-654	R1	180 M Ohm 1/4 Watt
63-976	R7	15 Megohm 1/4 Watt

PART NO.	REF. NO.	DESCRIPTION
		RESISTORS - continued
63-1097	R9	870 Ohm W. W. Insl. 1 Watt
63-1099	R14	33 Ohm W. W. Insl. 1/2 Watt
63-1363	R11-R12	Two Section Candohm (63-1132)
63-1366	R10	Zipohm
63-1549	R6	Vol. Control & Switch D P S T
		MISCELLANEOUS
11-70		A. C. Line Cord & Plug (Alt 11-90)
12-1322		Reinforcing Brkt. (2 used Handle)
14-903		Polystyrene Cabinet Front Less Accessories (use S-13209)
45-51		Battery Socket Cap
24-371		Cabinet Rear Cover Less Accessories (Use S-11999)
40-28		Cabinet Hinge
43-111		Handle End Pieces (Die Cast)
49-540		4" P M Speaker (Complete)
		206-540 Output Transformer
		208-540 Cone & Voice Coil Assem.
54-224		Speed Nut (2 used S-11999)
57-1119		Chassis Bottom Plate
64-98		Brass Eyelet (S-11999)
64-99		Brass Eyelet (S-11999)
78-229		Electrolytic Socket
78-275		Electrolytic Socket
78-400		Loktal Base Tube Socket
78-437		Miniature Base Tube Socket
78-446		Loktal Base Tube Socket (3 used)
78-637		Battery Cable Socket
80-436		Tube Retaining Spring (117Z3)
82-20		Battery Retaining Strip
83-1393		Rubber Strip (Handle)
85-367-S1		Power Change Over Switch
86-66		Pin Jack Terminal (Gang)
86-142		Pin Jack Terminal (Gang)
93-743		Bakelite Spacer Washer (S-11999)
110-119		Grille Cloth
112-468		#6 x 5/16 Phillips B H Self Tapping Screw (82-20)
112-533		#6 x 1/4 Phillips R.H. Self Tapping Screw (40-28)
112-604		#6 x 5/16 Phillips Stove Hd. Self Tapping Screw (Chassis Mtg.)
126-482		Spiral Shield
139-61		Baffle Board (or 139-66)
156-27		Cover Catch (2 used)
199-53		Flexible Handle Sleeve
202-429		Instruction Book
212-2		Selenium Rectifier
S-11999	L1	Cabinet Back & Wavemagnet Assem. Complete (24-371) 5C40-5C40Z
S-13767		Cabinet Back & Wavemagnet Assem. ZZ Model
S-13209		Front Cabinet & Hinge Assem. (14-903)
S-13210		Strap & Rivet Assem. (Handles)

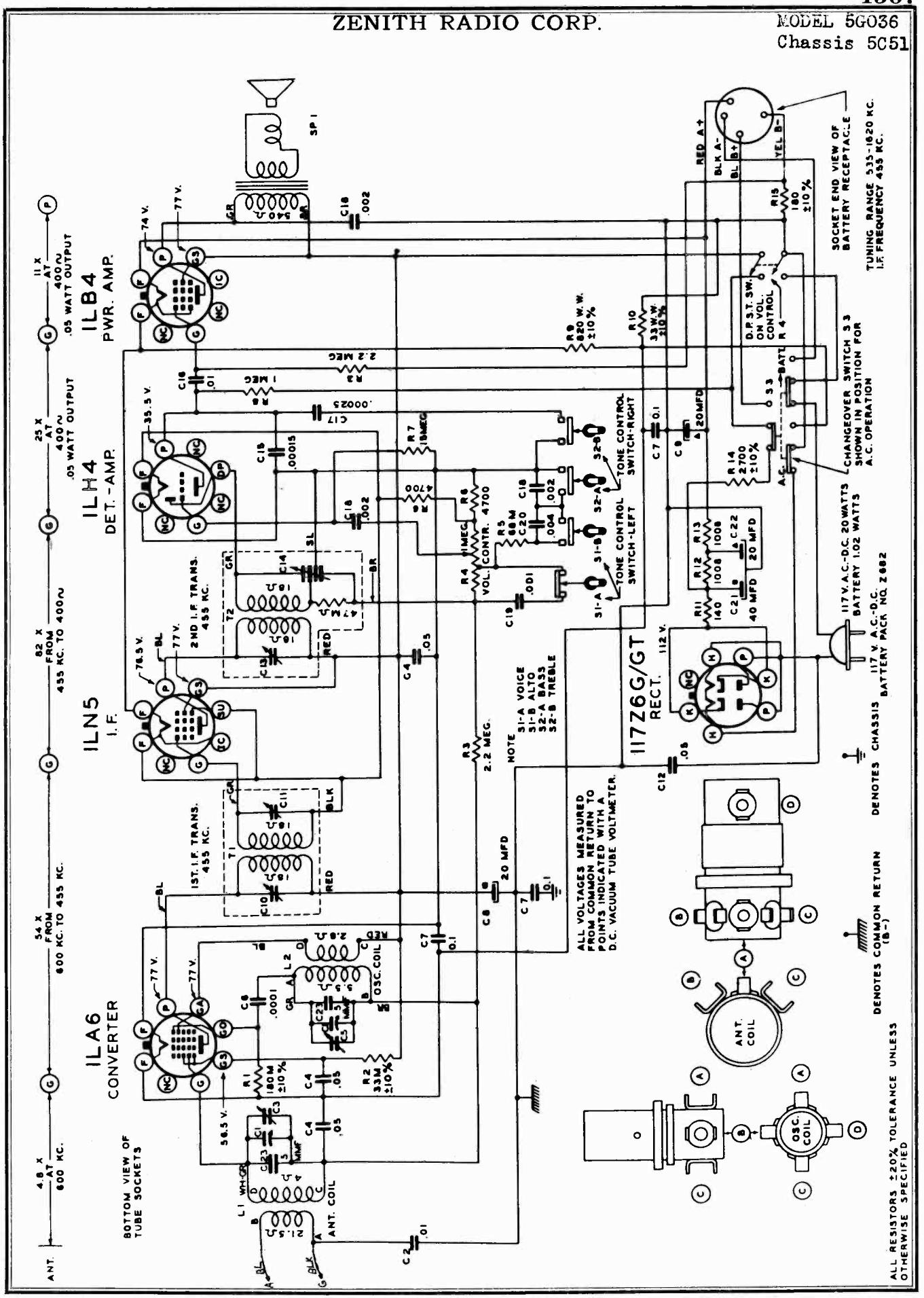
25M 4-29-47

ZENITH RADIO CORP. MODEL 5G003ZZ, Chassis 5C40ZZ



ZENITH RADIO CORP.

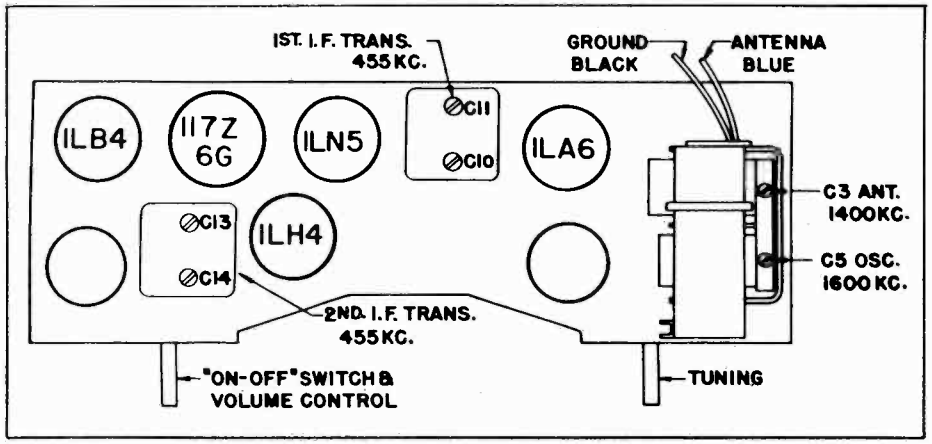
MODEL 5G036
Chassis 5C51



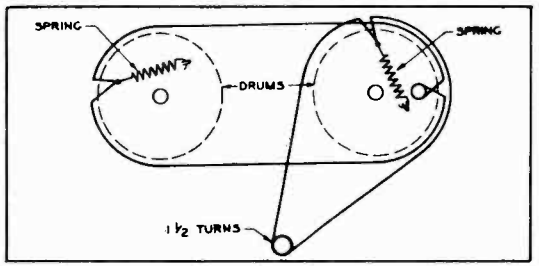
PARTS LIST

PART NO.	REF. NO.	
		RESISTORS
63-271	R6	1 MEGOHM.....1/4 WATT
63-439	R14	2700 OHM.....1/4 WATT
63-587	R6	4700 OHM.....1/4 WATT
63-594	R5	68M OHM.....1/4 WATT
63-600	R3	2.2 MEGOHM.....1/4 WATT
63-627	R15	180 OHM.....1/4 WATT
63-646	R2	33M OHM.....1/4 WATT
63-654	R1	180M OHM.....1/4 WATT
63-976	R7	15 MEGOHM.....1/4 WATT
63-1099	R10	33 OHM W.W. INSUL.1/2 WATT
63-1236	R4	VOLUME CONTROL & SWITCH...
63-1239	R12	CANDOHM (OR 63-1465).....
63-1366	R11	140 OHM W.W. (USED ONLY WHEN USING 63-1465)2 WATT
63-1558	R9	820 OHM W.W. INSUL..1 WATT
		MISCELLANEOUS
11-68		LINE CORD & PLUG.....
15-67		BATTERY CABLE PLUG CAP....
49-523	SP1	8 1/2" P.M. SPEAKER.....
		206-523 OUTPUT TRANSFORMER
		208-523 CONE & VOICE COIL.
52-190		SPEAKER CABLE & PLUG.....
54-34		#6-32 X 1/4" X 3/32" HEX NUT - STEEL N.P.
57-11A		ANTENNA LEAD MARKER.....
57-11G		GROUND LEAD MARKER.....
57-1159		RADIORGAN ESCUTCHEON.....
70-124		#2 X 3/8" PHILLIPS HD.WOOD SCREW-BRASS PLATED (57-1159).....
78-229		ELECTROLYTIC CONDENSER SOCKET.....
78-348		BATTERY CABLE SOCKET.....
78-401		LOKTAL BASE TUBE SOCKET (OR 78-596-729).....
78-456		LOKTAL BASE TUBE SOCKET (7 CONTACT).....
78-611		OCTAL BASE TUBE SOCKET (8 CONTACT).....
85-254	S3	POWER CHANGE OVER SWITCH..
85-284	S1	RADIORGAN SWITCH (VOICE & ALTO) (LEFT).....
85-288	S2	RADIORGAN SWITCH (TREBLE & BASS) (RIGHT).....
93-125		#6 INTERNAL SHAKEPROOF LOCKWASHER.....
93-258		BROWN FELT WASHERS (KNOBS)
94-295		RADIORGAN SWITCH MOUNTING BUSHING (4 USED).....
112-56		#6 X 1/4" HEX HD. SELF TAPPING SCREW.....
114-67		#6-32 X 7/16" HEX ACORN HD. MACH.SCREW-STEEL N.P.
114-162		#8 X 7/8" HEX ACORN WASHER SELF TAPPING SCREW (CHASSIS MTG.).....
125-17		RUBBER GROMMETS.....
202-385		INSTRUCTION BOOK.....

PART NO.	REF. NO.	
		DIAL ASSEMBLY
26-338		DIAL SCALE.....
46-443		RADIORGAN KNOB - VOICE....
46-444		RADIORGAN KNOB - TREBLE...
46-445		RADIORGAN KNOB - ALTO.....
46-446		RADIORGAN KNOB - BASS.....
46-520		VOLUME & TUNING CONTROL KNOB (USE S-11558).....
59-122		ON-OFF INDICATOR.....
59-160		DIAL POINTER.....
76-335		TUNING CONTROL SHAFT.....
80-183		INDICATOR SPRING.....
80-209		DIAL CORD TENSION SPRING..
80-471		TUNING SHAFT SPRING.....
93-690		BROWN FELT WASHER.....
159-50		CINCH PLUG BUTTON #49361 - BLACK OXIDIZE.....
188-32		RETAINING RING (76-335)...
188-34		RETAINING RING (S-11362)..
192-90		DIAL CRYSTAL.....
196-64		DIAL CRYSTAL GASKET.....
S-9588		INDICATOR CAM ASSEMBLY....
S-9610		DIAL CORD & EYELET ASSEMBLY (POINTER).....
S-9733		DIAL CORD & EYELET ASSEMBLY (GANG CONDENSER).....
S-9751		PULLEY & RIVET ASSEMBLY...
S-11362		PULLEY & BUSHING ASSEMBLY (POINTER).....
S-11558		DECORATIVE RING & CONTROL KNOB ASSEMBLY (2 USED)...
S-11660		DIAL PLATE & INDICATOR ASSEMBLY.....
		COILS & CHOKES
95-816	T1	1ST I.F. TRANSFORMER.....
95-817	T2	2ND I.F. TRANSFORMER.....
S-11980	L1	ANTENNA COIL ASSEMBLY.....
S-12505	L2	OSCILLATOR COIL ASSEMBLY..
		CONDENSERS
22-162	C8	.0001 MFD. .....600 V.
22-182	C17	.00025 MFD. .....600 V.
22-196	C16	.01 MFD. .....600 V.
22-303	C23	5 MMFD. .....600 V.
22-448	C20	.004 MFD. .....600 V.
22-470	C15	.00015 MFD. .....600 V.
22-492	C18	.002 MFD. .....600 V.
22-827	C7	.1 MFD. .....200 V.
22-829	C4	.05 MFD. .....200 V.
22-687	C19	.001 MFD. .....600 V.
22-1017	C12	.05 MFD. .....400 V.
22-1026	C21-C22	20 MFD. X 40 MFD. DRY ELECTROLYTIC.....150 V.
22-1027	C8-C9	20 MFD. 25 V. X 20 MFD. 150 V. DRY ELECTROLYTIC..
22-1183	C2	.01 MFD. .....400 V.
22-1216	C1	TRO SECTION VARIABLE.....



TUBE TRIMMER LOCATION



DIAL CABLE DRAWING

The alignment of chassis 5C51 is conventional. None of the adjustment interlock, however, the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic voltohm meter.

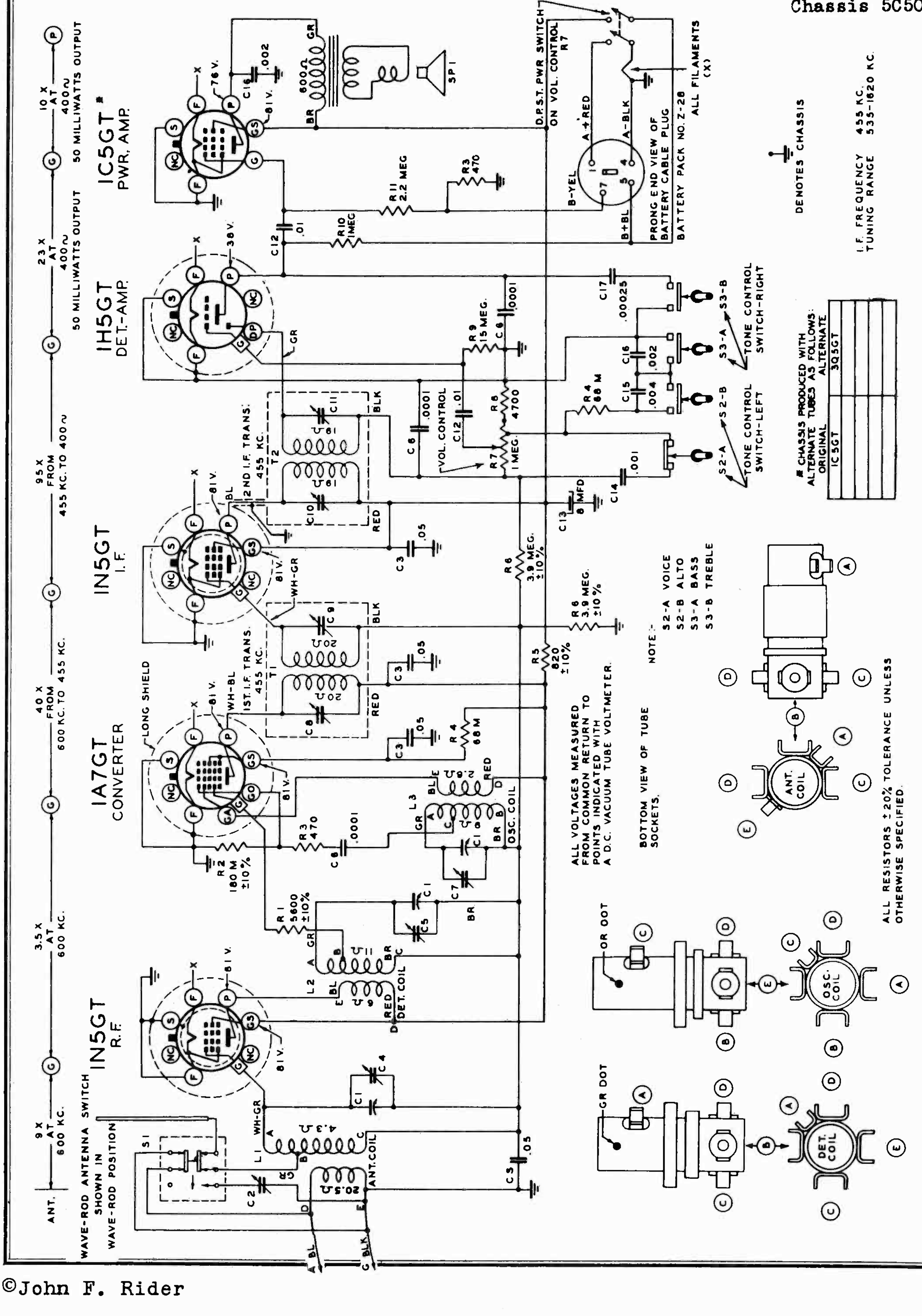
Stage by stage measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C10, C11 C13 and C14	Align I.F.
2	Antenna and Ground	200 Mmfd.	1600 Kc.	1600 Kc.	C5	Set Oscillator to scale
3	Antenna and Ground	200 Mmfd.	1400 Kc.	1400 Kc.	C3	Align Antenna

ZENITH RADIO CORP.

MODEL 5K037
Chassis 5C50



PARTS LIST

DIAL ASSEMBLY

26-344	DIAL SCALE
46-443	RADIORGAN KNOB (VOICE)
46-444	RADIORGAN KNOB (TREBLE)
46-445	RADIORGAN KNOB (ALTO)
46-446	RADIORGAN KNOB (BASS)
59-122	OFF & ON INDICATOR
59-160	DIAL POINTER
76-335	TUNING CONTROL SHAFT
80-183	INDICATOR SPRING
80-209	DIAL CORD TENSION SPRING
80-471	TUNING SHAFT SPRING
93-690	BROWN FELT WASHER (S-11362)
188-32	RETAINER RING (76-335)
188-34	RETAINER RING (S-11362)
192-90	DIAL CRYSTAL
196-64	DIAL CRYSTAL GASKET
S-9588	INDICATOR CAM & BUSHING ASSEMBLY
S-9610	DIAL CORD & EYELET ASSEM (POINTER)
S-9733	DIAL CORD & EYELET ASSEM (GANG)
S-9751	PULLEY & RIVET ASSEM. (GANG)
S-11362	PULLEY & BUSHING ASSEM.
S-11558	VOL. & TUNING KNOB ASSEM (2 USED) (46-520)

CHOKES & COILS

95-814	1ST I.F. TRANSFORMER (T1)
95-839	2ND I.F. TRANSFORMER (T2)
S-9570	DETECTOR COIL ASSEM. (L2)
S-9746	OSCILLATOR COIL ASSEM (L3)
S-11731	ANTENNA COIL ASSEM. (L1)

CONDENSERS

22-162	.0001 MFD. (C6) 600 V.
22-182	.00025 MFD. (C17) 600V.
22-196	.01 MFD. (C12) 600V.
22-448	.004 MFD. (C15) 600V.
22-492	.002 MFD. (C16) 600V.
22-684	DRY ELECTROCLYTIC 8MFD. (C13) 150 V.
22-829	.05 MFD (C3) 200 V.
22-887	.001 MFD. (C14), 600V.
22-1358	THREE SECTION GANG (C1)
22-1421	ANTENNA TRIMMER (C2)

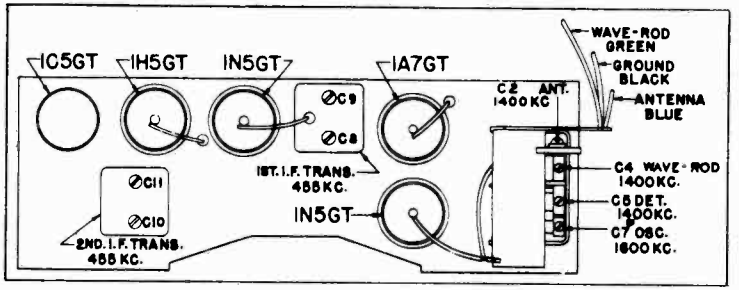
RESISTORS

63-271	1 MEGOHM (R10) ¼ WATT.
63-581	470 OHM (R3) ¼ WATT.
63-587	4700 OHM (R8) ¼ WATT.
63-594	68M OHM (R4) ¼ WATT.
63-600	2.2 MEGOHM (R11) ¼ WATT.
63-634	820 OHM (R5) ¼ WATT.
63-638	5600 OHM (R1) ¼ WATT.
63-669	3.9 MEGOHM (R6) ¼ WATT.
63-976	15 MEGOHM (R9) ¼ WATT.
63-1236	VOLUME CONTROL & SWITCH (R7)

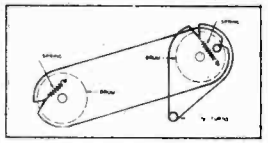
MISCELLANEOUS

12-1082	ANT. ROD MTG. BRKT.
46-572	TELESCOPIC ANT. KNOB
49-522	6½" P.M. SPEAKER
	206-522 OUTPUT TRANS.
	208-522 CONE & VOICE COIL
49-523	6½" P.M. SPEAKER (ALT. FOR 49-522) (SP1)
	206-523 OUTPUT TRANS.
	208-523 CONE & VOICE COIL
52-190	SPEAKER CABLE
57-11A	ANTENNA MARKER
57-11G	GROUND MARKER
57-900	DIAL PLATE
57-1103	ANTENNA KNOB ESCUTCHEON
57-1139	RADIORGAN ESCUTCHEON
58-74	BATTERY CABLE PLUG
70-124	#2 x 3/8 PHILLIPS HD. WOOD SCREW (ESC. MTG)
78-611	OCTAL BASE TUBE SOCKET 5 USED
85-228	WAVE-ROD ANTENNA SW. (CR 85-303) (S1)
85-284	RADIORGAN SWITCH (VOICE & ALTO L.H) (S2)
85-288	RADIORGAN SWITCH (TREBLE & BASS R.H. (S3)
93-125	#6 INTERNAL SHAKEPROOF LOCKWASHER
93-258	BROWN FELT WASHER (KNOBS)
94-295	STEEL BUSHING (RADIORGAN 4 USED)
112-56	#6 ¼ HEX HD. SELF TAPPING SCREW
114-67	#6-32 x 7/16 HEX ACORN HEAD SCREW
114-162	#8 x 7/8 HEX ACORN WASHER HD S.T. SCREW (CHASSIS MTG)
125-17	RUBBER GROMMETS
126-379	TUBE SHIELD (3USED) SHORT
126-382	TUBE SHIELD (1A7GT) LONG.
159-50	PLUG BUTTON (BLK OXIDIZE)
202-386	INSTRUCTION BOOK
S-11251	TELESCOPIC ANTENNA ASSEM. (COMPLETE)
S-11586	RELEASE ASSEM. (TELESCOPIC ASSEMBLY)
S-11729	WAVEROD SWITCH & PLATE ASSEMBLY
Z-28	BATTERY PACK (BP)

15M2-15-47



TUBE TRIMMER LOCATION



DIAL CABLE DRAWING

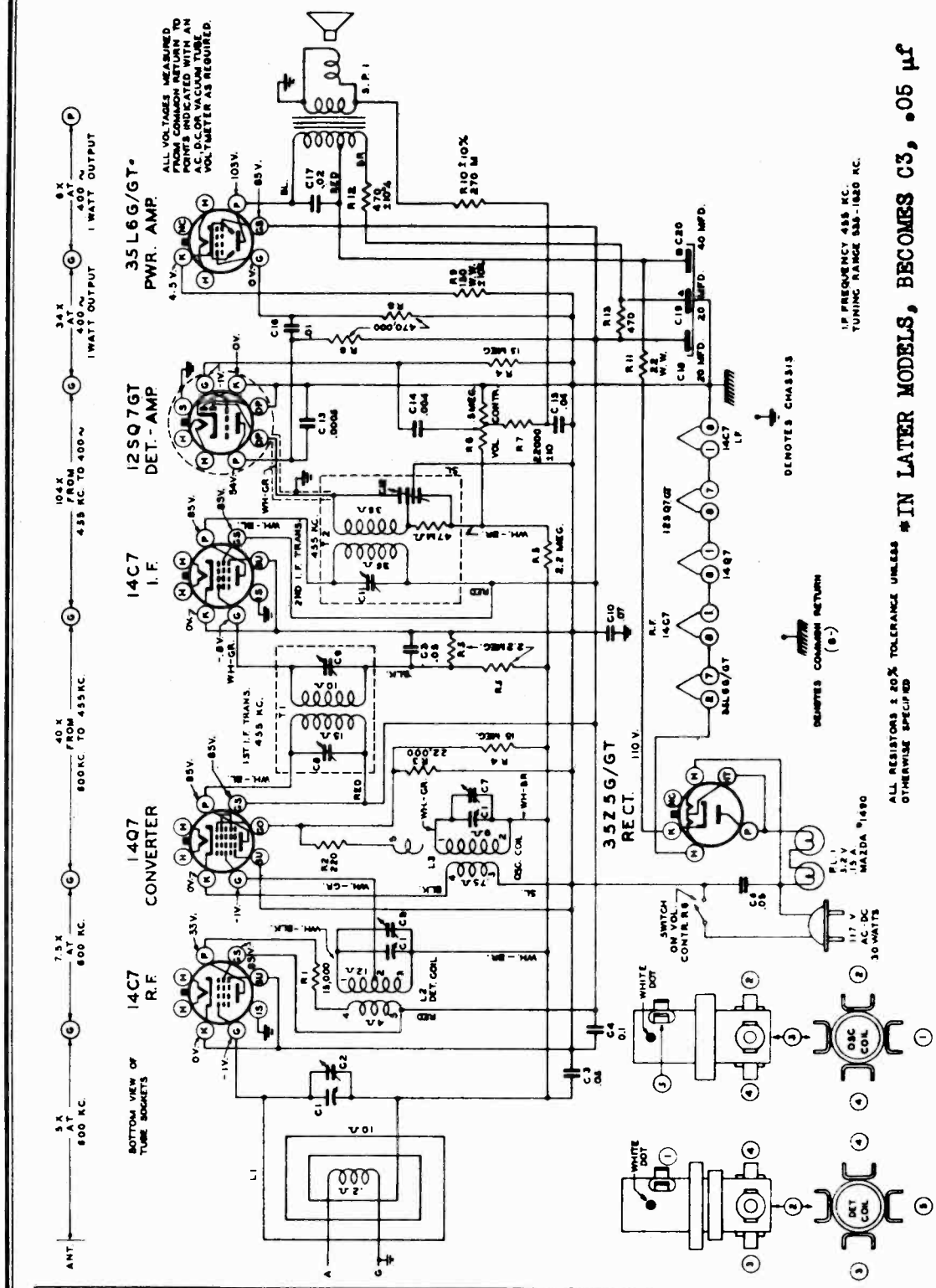
The alignment of chassis 5C50 is conventional. None of the adjustment interlock, however, the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic voltohm meter.

Stage by stage gain measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C8, C9, C10, and C11	Align I.F
2	Ant. and Ground	200Mmfd Antenna Switch in Ant. position	1600 Kc.	1600 Kc.	C7	Set Oscillator to Dial Scale.
3	"	"	1400 Kc.	1400 Kc.	C5	Align Detector
4	"	"	"	"	C2	Align Antenna
5	Two Turns Loosely Coupled To Waverod	Wave Rod Fully extended Switch in Waverod Position	1400 Kc.	1400 Kc.	C4	Align Waverod Antenna

ZENITH RADIO CORP.

MODELS 6D014,6D029
Chassis 6C01



STOCK NO	PART NO	DESCRIPTION
C1	22-1358	3-GANG VARIABLE
C2	ON C1	BROADCAST ANT TRIM
C3	22-829	.05 MFD. 200 V.
C4	22-827	.1 MFD. 200 V.
C5	ON C1	BROADCAST DET TRIM
C6	22-1017	.05 MFD. 200 V.
C7	ON C1	BROADCAST OSC. TRIM
C8	ON T1	1ST I.F. TRANS. PRI. TRIM
C9	ON T1	1ST I.F. " SEC. "
C10	22-1207	.07 MFD. 200 V.
C11	ON T2	2ND I.F. TRANS. PRI. TRIM
C12	ON T2	2ND I.F. " SEC. "
C13	22-854	.0005 MFD. 600 V.
C14	22-1382	.004 MFD. 600 V.
C15	22-1381	.04 MFD. 600 V.
C16	22-198	.01 MFD. 600 V.
C17	22-1379	.02 MFD. 400 V.
C18	22-1519 OR 22-1531	20 MFD. ELECTRO 150 V. 20 MFD. ELECTRO 150 V.
C19		40 MFD. "
C20		
R1	03-380	15 M. OHM ½ W.
R2	03-379	270 OHM ½ W.
R3	03-381	2.2 M. OHM ½ W.
R4	03-978	1.5 MEGOHM ½ W.
R5	03-800	2.2 MEGOHM ½ W.
R6	03-1335	.5 MEG. VOL. CONTROL
R7	03-844	2.2 M. OHM ½ W.
R8	03-597	470 M. OHM ½ W.
R9	03-1227	180 OHM WIRE W. 2%
R10	03-775	270 M. ½ W.
R11	03-1450	22 OHM W.W. 1 W.
R12	03-1222	470 OHM 1 W.
R13	03-1448	470 OHM 1 W.
L1	5-11124	WAVEMAGNET ASS'Y.
L2	5-9281	DET. COIL -
L3	5-9578	OSC. COIL -
T1	95-811	1ST I.F. TRANS. -
T2	95-858	2ND I.F. -
P.L.1	100-90	PILOT LIGHT ASS'Y. #3A
SP 1	49-349	5" P. M. SPEAKER

***IN LATER MODELS, BECOMES C3, .05 µf**

DISTORTION AND POOR SENSITIVITY: Distortion and poor sensitivity caused by a short between turns on the wavemagnet.
Poor sensitivity and set fails to operate on low frequency end of dial--replace oscillator coil.
UNCONTROLLED OSCILLATION: A 470,000 ohm carbon resistor soldered across the secondary of the first i-f transformer will correct this condition.

MODELS 6D014—6D029
CHASSIS No. 6C01

TO THE SERVICE MAN:

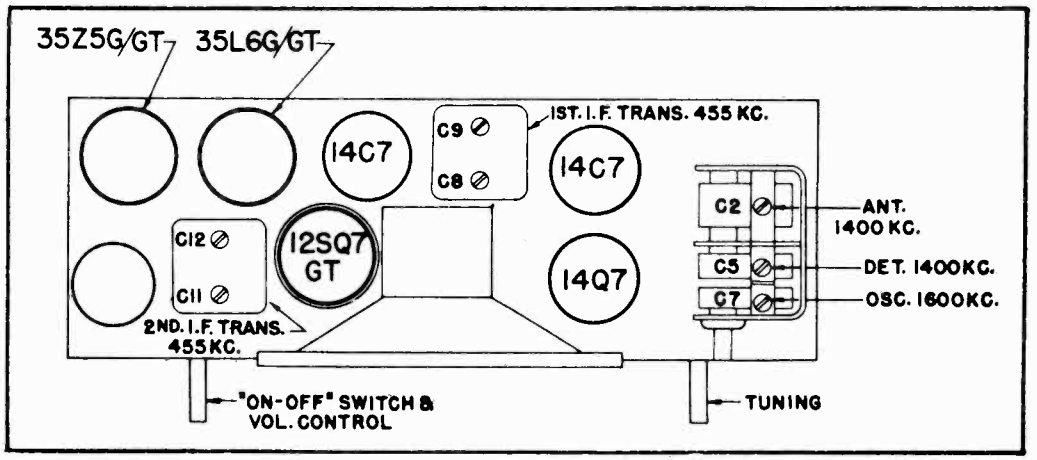
Chassis 6C01 features a high gain tuned R.F. circuit ahead of a conventional superheterodyne circuit, with feedback in the audio circuit, and a new filter circuit to reduce hum to a minimum.

Part of the audio voltage from the voice coil is fed back to the first audio grid(12SQ7) in phase through resistor R10 and R7 to a tap on the volume control R6. Capacitor C15 bypasses highs to ground. One side of the output transformer secondary is grounded. The side grounded determines the phase relationship of the feedback voltage, therefore, when replacing the output transformer be certain the proper end of the secondary is grounded or degeneration will result. The overall result of this arrangement is to boost the bass tones.

The filter circuits of chassis 6C01 incorporate new features that should be well understood by the service man. An examination of the schematic drawing will show the output transformer tapped slightly off center. This tap is the B + connection from filter resistor R11 and capacitor C20 off the cathode of the rectifier 35Z5 to the 35L6 plate. The lower connection of the output transformer feeds B+ to the rest of the tubes in the receiver. Current flowing through the upper windings of the output transformer to the 35L6 produces a magnetic field which is 180° out of phase with the magnetic field produced by current flowing in the opposite direction through the output transformer to the rest of the receiver, therefore, most of the AC hum is cancelled. Further reduction of hum is accomplished by filtering through resistors R12 and R13 and capacitors C18 and C19.

This development in filtering systems allows a higher effective plate voltage on the 35L6 for increased power output.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 206-549 be sure to add the speaker code letter to the transformer Part Number.



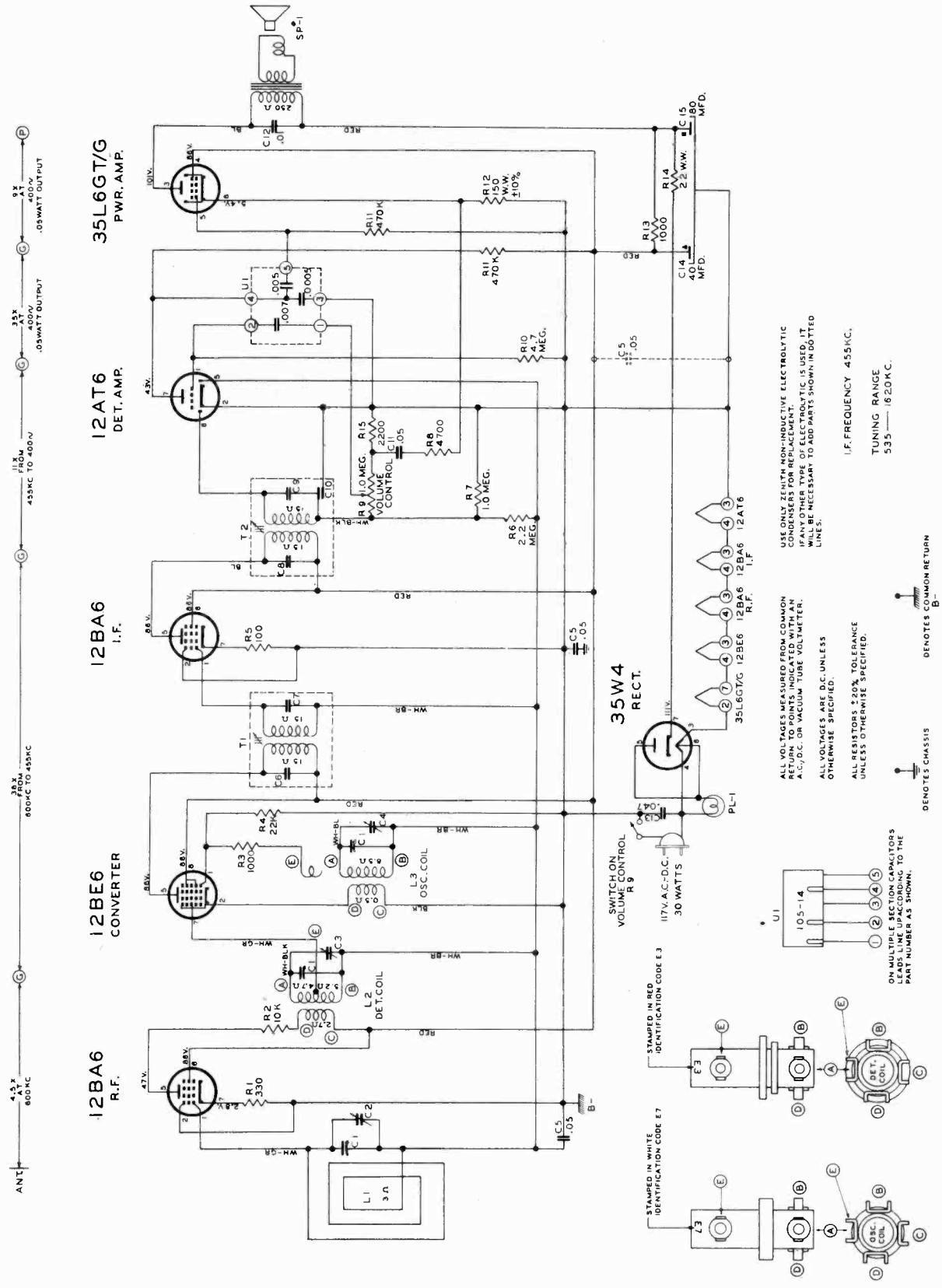
TUBE AND TRIMMER LOCATION

ALIGNMENT PROCEDURE

OPERATOR	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-8,C-9, C-11,C-12	Align I. F.
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-7	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-5	Align detector
4		--	1400 Kc.	1400 Kc.	C-2	Align antenna stage

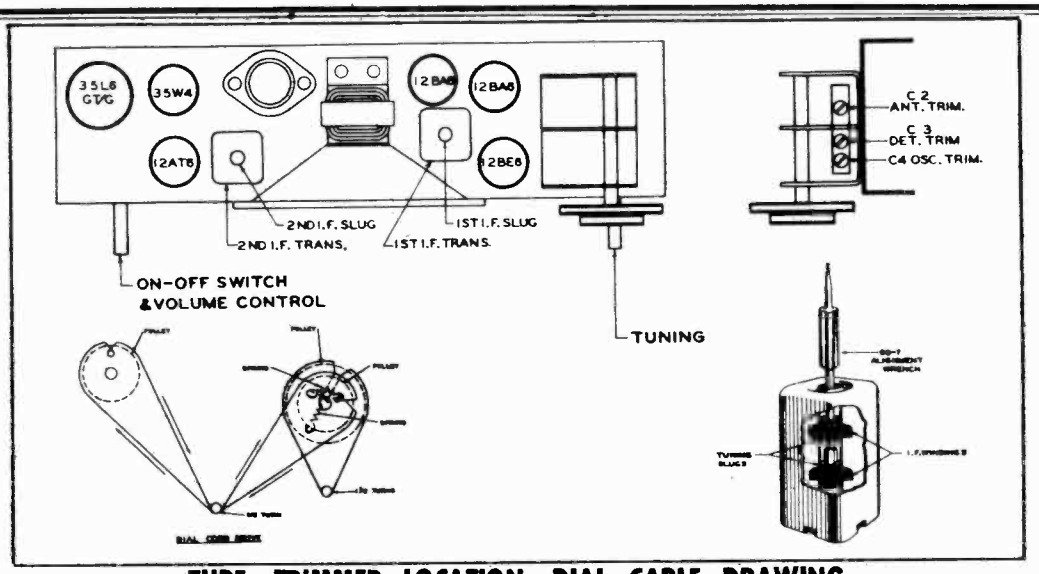
ZENITH RADIO CORP.

MODEL 6D815,
CHASSIS E605



PARTS LIST

PART NO.	REF. NO.	DESCRIPTION
		DIAL ASSEMBLY
26-411		Dial Scale
59-219		Dial Pointer
76-519		Tuning Shaft
78-822		Dial Light Socket and Wire
80-69		Dial Cord Tension Spring
80-209		Dial Cord Tension Spring
97-284		Dial Cord Guide Stud
100-67	PL-1	Dial Light Bulb - 6.3 VC .15 Amp.
188-32		Retaining Ring
188-60		Retaining Ring
S-14834		Dial Cord and Eyelet Assembly (Short)
S-14866		Dial Cord and Eyelet Assembly (Long)
S-14867		Pointer Pulley and Bushing Assembly
S-14868		Pointer Pulley Bracket and Stud Assembly
		COILS AND CHOKES
95-1101	T1	1st I. F. Transformer
95-1102	T2	2nd I. F. Transformer
S-14832	L2	Detector Coil Assembly
S-14833	L3	Oscillator Coil Assembly
		CONDENSERS
22-178	C-11	.05 MFD ..... 200 V
22-829	C-5	.05 MFD ..... 200 V
22-1182	C-12	.01 MFD ..... 400 V
22-1775	C-13	.047 MFD ..... 400 V
22-1805	C-1	Three Section Gang
22-1808	C-14, C-15	Dry Electrolytic 80 x 40 MFD 150 V
105-14	U-1	Multiple Copacitor Unit
		RESISTORS
63-686	R12	150 Ohm W.W. Insulated ..... 1/2 W
63-1219	R14	22 Ohm W.W. Insulated ..... 1/2 W
63-1574	R13	1M Ohm Insulated ..... 1 W
63-1664	R9	Vol. Con. and Switch
63-1744	R5	100 Ohm Insulated ..... 1/2 W
63-1765	R1	330 Ohm Insulated ..... 1/2 W
63-1786	R3	1M Ohm Insulated ..... 1/2 W
63-1814	R8	4700 Ohm Insulated ..... 1/2 W
63-1828	R2	10M Ohm Insulated ..... 1/2 W
63-1842	R4	22M Ohm Insulated ..... 1/2 W
63-1898	R11	470M Ohm Insulated ..... 1/2 W
63-1912	R7	1 Megohm Insulated ..... 1/2 W
63-1926	R6	2.2 Megohm Insulated ..... 1/2 W
63-1940	R10	4.7 Megohm Insulated ..... 1/2 W
63-1800	R15	2200 Ohm Insulated ..... 1/2 W
		MISCELLANEOUS
11-85		Line Cord and Plug
14-1015		Model 815 Plastic Cabinet
14-1015W		Model 815W Plastic Cabinet
14-1015Y		Model 815Y Plastic Cabinet
43-165		Handle Housing
46-744		Tuning and Vol. Con. Knob (2 used)
46-744Y		Tuning and Vol. Con. Knob (2 used) (815W & 815Y)
49-643	SP1	5 1/4" P.M. Speaker
		206-643 Output Trans.
		208-643 Cone and Voice Coil
54-30		8-32 x 5/16 Hex Nut (Spk. Mtg)
54-129		Speed Nut (Used on 26-411 and 57-1409)
57-1409		Cabinet Front Plate
78-275		Socket Electrolytic
78-611		Socket Octal Tube (8 Contact)
78-806		Socket Miniature Tube
78-807		Socket Miniature Tube (4 used)
83-1057		Line Cord Insulating Strip
83-1165		Handle Strap
83-1166		Handle Strap (Slotted)
83-1393		Handle Strip (Rubber)
93-766		Steel Washer
93-906		Block Felt Washer
93-941		Bakelite Washer
94-295		Gang Cond. Mtg. Bushing
112-407		#6 x 3/8 R.H.S.T. Screw (2 Used on 43-165)
112-697		#6 x 7/16 Straight Side B.H.S.T. Screw
114-217		#8 x 1/4 Hex Hd. Slotted S.T. Screw (Spk. Mtg.)
114-291		#8-32 x 7/16 Hex Hd. Slotted M.S. (Spk. Mtg.)
125-17		Rubber Grommet
139-71		Speaker Baffle
139-75		Baffle Board
159-69		Trimmont Stud (Cab Back Mtg.) (4 used)
166-66		Rubber Bumper (or 166-41)
171-10		Pilot Light Lens
199-103		Flexible Handle Sleeve
199-103Y		Flexible Handle Sleeve (6D815W & 815Y)
202-666		Instruction Book
S-14888	L1	Wavemagnet Assembly
S-14978		Wavemagnet Assembly (6D815W only)



TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

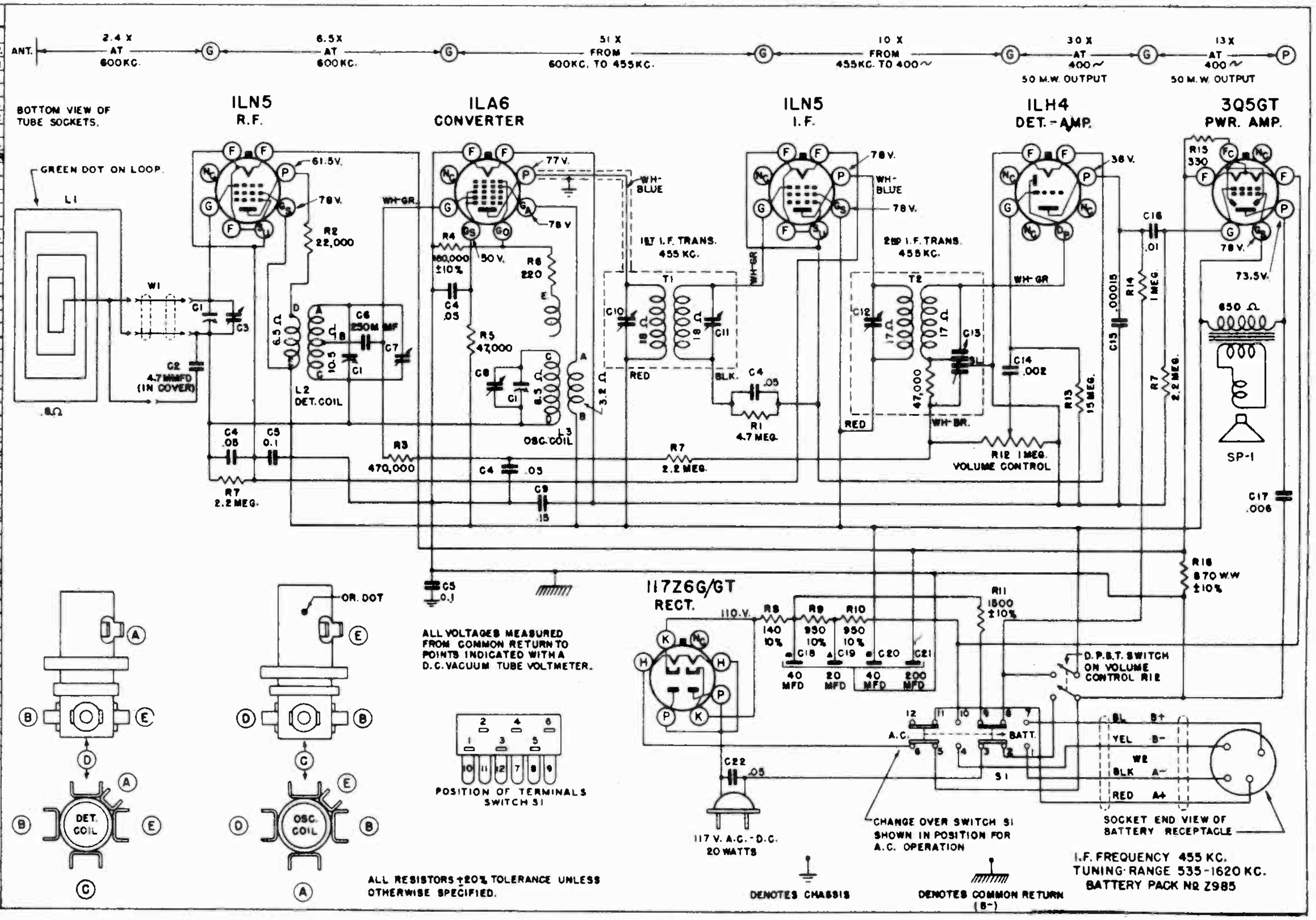
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Convertor Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I.F. Alignment
2	Single Turn Loosely Coupled to Wave Magnet	--	1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-3	Detector Alignment
4		--	1400 Kc.	1400 Kc.	C-2	Antenna Alignment

ZENITH RADIO CORP.

BLOCKING: The a-c plug being inserted in the battery saver switch socket while the on-off switch is on may cause the set to block and become dead. Switching the set off and on will relieve this blocked condition and return the set to normal operation.

123-217

DIAG NO	PART NO	DESCRIPTION	
C1	22-1352	3-GANG VARIABLE	
C2	[illegible] OR [illegible]	4.7 MMFD. (IN COVER)	600 V.
C3	ON C1	BROADCAST ANT. TRIMMER	
C4	22-829	.05 MFD.	200 V.
C5	22-827	.1 MFD.	200 V.
C6	22-182	250 MMFD.	600 V.
C7	ON C1	BROADCAST DET. TRIMMER	
C8	22-1226	BROADCAST OSC. TRIMMER	
C9	22-1025	.15 MFD.	200 V.
C10	ON T1	1ST I.F. TRANS. PRI. TRIMMER	
C11	ON T1	1ST I.F. " SEC. "	
C12	ON T2	2ND I.F. " PRI. "	
C13	ON T2	2ND I.F. " SEC. "	
C14	22-492	.002 MFD.	600 V.
C15	22-470	.00015 MFD.	600 V.
C16	22-196	.01 MFD.	600 V.
C17	22-458	.006 MFD	600 V.
C18	22-1443	40 MFD. ELECTRO	150 V.
C19	22-1443	20 MFD "	150 V.
C20	22-1443	40 MFD "	150 V.
C21	22-1443	200 MFD "	10 V.
C22	22-1017	.05 MFD	200 V.
R1	63-602	4.7 MEG. OHM	1/4 W.
R2	63-644	22 M OHM	1/4 W.
R3	63-719	470M OHM	1/4 W.
R4	63-773	180M OHM	1/4 W.
R5	63-713	47 M OHM	1/4 W.
R6	63-579	220 OHM	1/4 W.
R7	63-600	2.2 MEGOHM	1/4 W.
R8	63-1366	140 OHM	2 W.
R9	63-1362 OR 63-1365	950 OHM	3 W.
R10	63-1362 OR 63-1365	950 OHM	3 W.
R11	63-418	1800 OHM	1/2 W.
R12	63-1231	1 MEG. VOLUME CONTROL	
R13	63-976	15 MEGOHM	1/4 W.
R14	63-271	1 MEGOHM	1/4 W.
R15	63-580	330 OHM	1/4 W.
R16	63-1097	870 OHM WIREWOUND	1 W.
L1	S10857	WAVEMAGNET ASSEM.	
L2	S10884	DETECTOR COIL "	
L3	S10883	OSCILLATOR "	
T1	95-804	1ST I.F. TRANSFORMER	
T2	95-805	2ND I.F. "	
SP1	49-512	5 1/4" P.M. SPEAKER	
S1	85-311	CHANGEOVER SWITCH	
W1	S10862	WAVEMAGNET CABLE	
W2	S11019	BATTERY CABLE	
B.P.1	5-27	BATTERY PACK Z985	

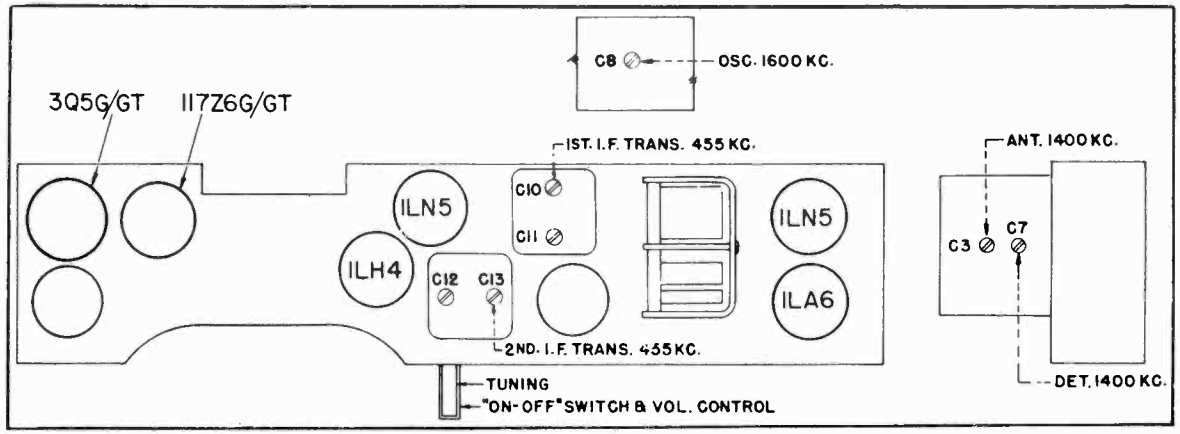


MODEL 6G001
CHASSIS No. 6C40

TO THE SERVICE MAN:

The 6C40 chassis is an AC, DC or battery operated superheterodyne circuit with a stage of RF amplification. The chassis is isolated from the DC circuit, and all measurements must be made from a common negative point. The most convenient place to reach this negative point is the terminal strip to which C5 is connected. The DC resistance from chassis to any circuit must be almost infinite. If any circuit becomes grounded a hum will appear. Microphonic tubes will cause audio howl. Check 1LA6.

The wavemagnet is connected to the chassis through the hinges in the cabinet, snaps and flexible leads. If the RF becomes weak or dead, check resistance of wavemagnet at condenser gang. The DC resistance across the two leads should be approximately 1 ohm. If the circuit is open, remove the two screws that hold the handle and top panel. When the top is removed, the wavemagnet connecting leads will be visible for inspection. Also loosen the snap-on socket and check for shorted or broken leads.



TUBE AND TRIMMER LOCATION

IF Alignment: Remove the chassis from the cabinet and arrange the units so that the wavemagnet can be plugged in. All the connections and adjustments can be made from the top of the chassis. Connect a signal generator, through a .1 mfd. dummy antenna, to the lug on top of the center section of the gang condenser (converter grid) and condenser gang frame. Connect an output meter across the voice coil of the speaker (two lugs provided). Set the signal generator to 455Kc. and adjust C10, C11, C12 and C13 for maximum indication on the output meter. Always keep the signal output from the generator just high enough to get an indication, otherwise excessive loading may result. Remove the signal generator leads from the gang.

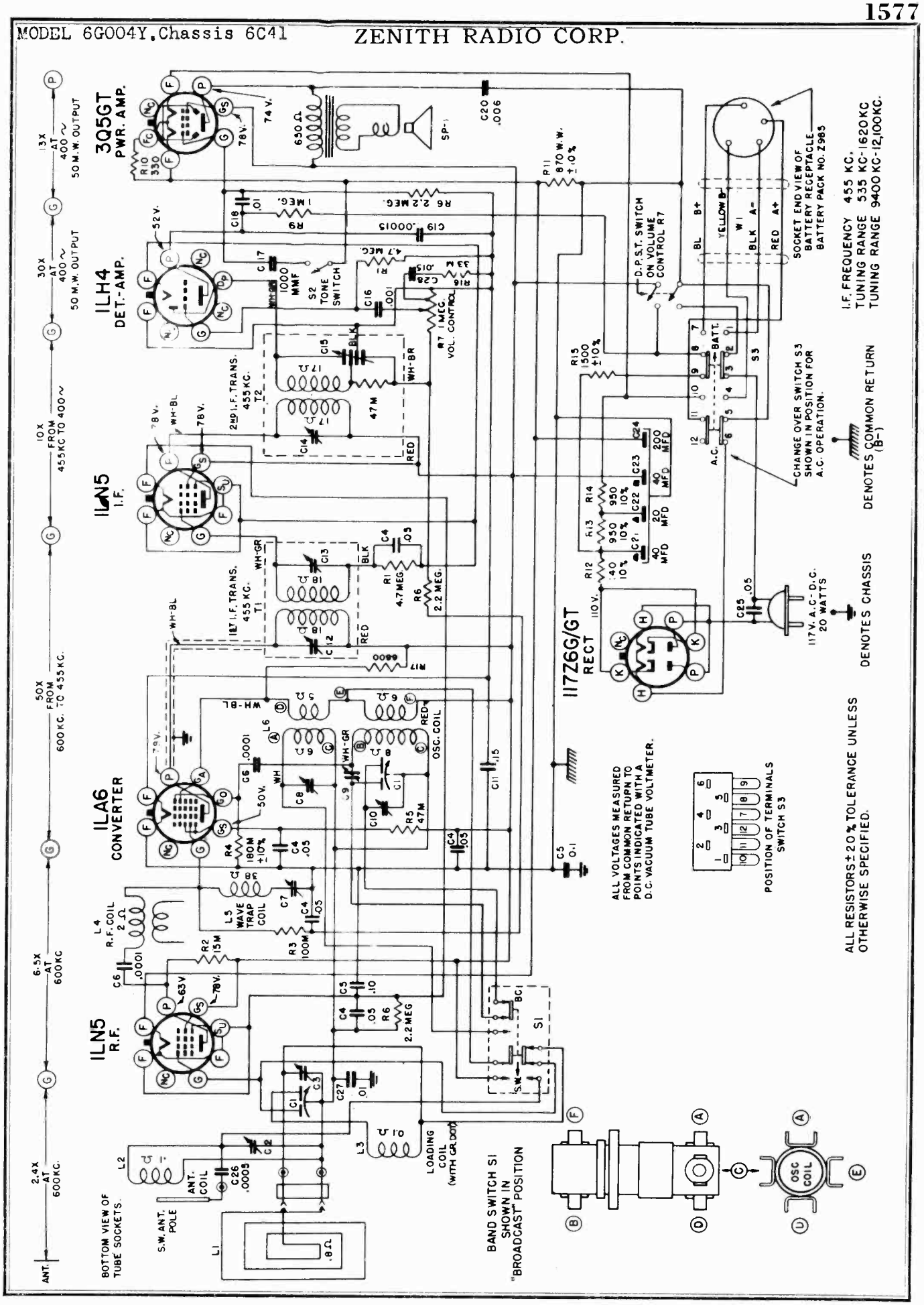
RF Alignment: Connect a two turn loop across the leads of the signal generator, loosely couple this loop to the wavemagnet. Set the signal generator and the dial pointer of the receiver to 1600 Kc. and adjust C8 to resonance. Set the signal generator and dial pointer to 1400 and adjust C7 (detector) and C3 (RF) to resonance. These trimmers are on the side of gang condenser. Check operation and re-install set in cabinet. Tune in a weak station near 1400 Kc. or use background noise and readjust C3 through the hole in the side of the cabinet for maximum sensitivity.

ALIGNMENT PROCEDURE

Operation	Connect Osc. To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Trimmers	Purpose
1	Converter Grid	.1 MFD	455KC	BC	600KC	C-10-11-12 13	IF alignment
2	Two turns loosely coupled to Wave Magnet		1600KC	BC	1600KC	C8	Set oscillator to scale
3	Two turns loosely coupled to Wave Magnet		1400KC	BC	1400KC	C7	Align Det.
4	Two turns loosely coupled to Wave Magnet		1400KC	BC	1400KC	C3	Align Wave magnet

MODEL 6G004Y, Chassis 6C41

ZENITH RADIO CORP.



PARTS LIST

DIAL ASSEMBLY

12-887	TUNING CONTROL SHAFT BRACKET
26-349	DIAL SCALE
46-518	TUNING & VOLUME CONTROL KNOB (2 USED)
46-573	SWITCH CONTROL KNOB (RED) (2 USED)
59-146	DIAL POINTER
59-167	ON-OFF INDICATOR
76-304	TUNING CONTROL SHAFT
80-209	DIAL CORD TENSION SPRING
80-421	INDICATOR SPRING
188-32	RETAINING RING (76-304)
192-112	DIAL CRYSTAL
S-9534	INDICATOR LEVER & BUSHING ASSEMBLY
S-9653	DIAL CORD & EYELET ASSEMBLY
MS-684	PULLEY & BRACKET ASSEMBLY

COILS AND CHOKES

95-804	1ST I. F. TRANSFORMER (T1)
95-805	2ND I.F. TRANSFORMER (T2)
S-8326	WAVE TRAP COIL ASSEMBLY (L5)
S-11591	ANTENNA LOADING COIL ASSEMBLY (L3)
S-11798	OSCILLATOR COIL ASSEMBLY(L6)
S-11800	PEAKING COIL ASSEMBLY (L4)
S-11801	ANTENNA COIL ASSEMBLY (L2)

CONDENSERS

22-147	500 MMFD. (C26) 600 V.
22-162	.0001 MFD. (C6) 500 V.
22-196	.01 MFD. (C18) 600 V.
22-458	.006 MFD. (C20) 600 V.
22-470	.00015 MFD. (C19) 600 V
22-826	.01 MFD. (C27) 200 V.
22-827	.1 MFD. (C5) 200 V.
22-829	.05 MFD. (C4) 200 V.
22-1017	.05 MFD. (C25) 200 V.
22-1025	.15 MFD. (C11) 200 V.
22-1120	.015 MFD. (C28) 400 V.
22-1388	SINGLE SECTION TRIMMER (WAVE-TRAP) (85 MMFD.) (C7)
22-1427	TWO GANG VARIABLE (C1)
22-1428	TWO SECTION TRIMMER (ANT.) 2-20 MMF. (C2 & C3)
22-1429	THREE SECTION TRIMMER (OSC.) (C8,C9 & C10)
22-1431	.001 MFD. (C16) 600 V.
22-1443	DRY ELECTROLYTIC 40-40-20 MFD.-150 V.-200 MFD. 10 V. (C21,C22,C23 & C24)
22-1444	.001 MFD. 200V (C17)

RESISTORS

63-271	1 MEGOHM (R9) 1/4 WATT
63-418	1500 OHM (R15) 1/2 WATT
63-580	330 OHM (R10) 1/4 WATT
63-590	15000 OHM (R2) 1/4 WATT
63-592	33000 OHM (R16) 1/4 WATT
63-600	2.2 MEGOHM (R6) 1/4 WATT
63-602	4.7 MEGOHM (R1) 1/4 WATT
63-708	6800 OHM (INSULATED) (R17) 1/4 WATT
63-713	47000 OHM (INSULATED) (R5) 1/4 WATT
63-715	100000 OHM (INSULATED) (R3) 1/4 WATT
63-773	180000 OHM (INSULATED) (R9) 1/4 WATT
63-1097	870 OHM W.W. (INSULATED) (R11) 1 WATT
63-1362	2 SECTION CANDOHM (OR 63-1365) 3 WATT (R13 & R14)
63-1366	140 OHM ZIPOHM (R12) 2½ WATT
63-1537	VOLUME CONTROL & SWITCH (R7)

MISCELLANEOUS

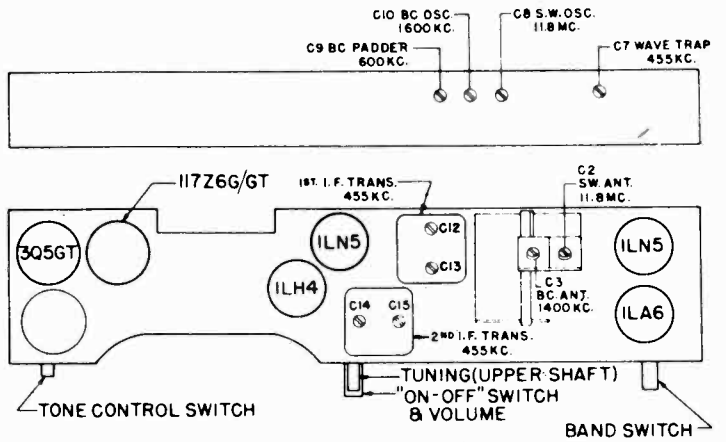
11-70	LINE CORD & PLUG (OR 11-90)
12-1134	TELESCOPIC ANTENNA SUPPORT BRACKET
15-51	PLUG CAP
19-125	ANTENNA MOUNTING CLIP
19-148	ANTENNA MOUNTING CLIP
36-37	CABINET HANDLE & INSERT (36-38)
49-512	5½" P.M. SPEAKER 206-512 OUTPUT TRANSFORMER 208-512 CONE & VOICE COIL
54-211	SPEED NUT (3 USED)
57-1111	FRONT PANEL
57-1121	ESCUTCHEON:
64-98	BRASS EYELET
64-99	BRASS EYELET (ANT. LEAD) (2 USED)
700-111	#5 x 3/8" PHILLIPS B.H. WOOD SCREW (FRONT PANEL MTG.)
78-274	ELECTROLYTIC SOCKET
78-371	LOKTAL BASE TUBE SOCKET
78-401	LOKTAL BASE TUBE SOCKET (OR 78-596 OR 78-729)
78-543	FOUR PRONG FEMALE SOCKET (BATTERY CABLE)
78-611	OCTAL BASE TUBE SOCKET
78-671	OCTAL BASE TUBE SOCKET
83-1401	FELT STRIP (USED ON 46-573)
85-311	POWER CHANGE-OVER SWITCH (244705) (S3)
85-364	BAND SWITCH (S1)
85-368	TONE CONTROL SWITCH (S2)
93-485	COUNTERSUNK WASHER (2 USED) (STATUARY BRONZE) (CHASSIS MTG.)
93-553	BLACK FELT WASHER (2 USED)
110-105	GRILLE CLOTH
112-236	ORNAMENTAL HD. M.SC. (ANT. MTG.) (2 USED)
112-290	CHASSIS MTG. SCREW (2 USED)
112-403	10-24 x 1" WASHER HD. M.S. (HANDLE MTG.) (2 USED)
125-17	RUBBER GROMMET (GANG MTG. & ANT. MTG.)
139-54	BAFFLE BOARD
156-19	FRICTION CATCH (2 USED)
156-20	DOOR LATCH - UPPER HALF
156-21	DOOR LATCH - LOWER HALF
157-7	STRIKE FASTENER (2 USED)
184-7	BALL TIP FOR TELESCOPIC ANTENNA
188-47	HANDLE RING (2 USED)
202-400	INSTRUCTION BOOK
S-11802	ANTENNA TRIMMER BRKT. & PIN JACK ASSEM.
S-11820	TELESCOPIC ANT. ASSEM. (COMPLETE)
S-13719	TONE SWITCH KNOB YOKE & PLATE ASSEM.

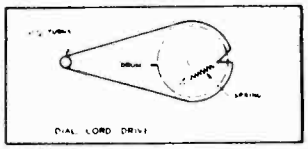
WAVEMAGNET PARTS

19-134	WAVEMAGNET CABLE CLIP
S-10862	WAVEMAGNET CABLE ASSEMBLY
S-10865	WAVEMAGNET SUCTION CUP ASSEM. (OR S-12528) (2 USED)
S-10867	WAVEMAGNET MTG. STRIP ASSEMBLY (SINGLE SNAP)
S-11928	WAVEMAGNET WINDING & PLATE ASSEMBLY (L1)
S-12382	WAVEMAGNET MTG. STRIP ASSEMBLY (THREE SNAP)

3-10-47

PRICES SUBJECT TO CHANGE WITHOUT NOTICE





DIAL CABLE DRAWING

TUBE TRIMMER LOCATION

TO THE SERVICEMAN: THE 6C41 CHASSIS IS A AC,DC OR BATTERY OPERATED SUPERHETERODYNE WITH A STAGE OF RF AMPLIFICATION AND TWO TUNING RANGES, 935 TO 1620KC AND 9.4 TO 12.1 MC. THE CHASSIS IS ISOLATED FROM THE DC CIRCUITS, AND ALL MEASUREMENTS MUST BE MADE FROM A COMMON NEGATIVE POINT. THE MOST CONVENIENT PLACE TO REACH THIS NEGATIVE POINT IS THE TERMINAL STRIP TO WHICH C5 IS CONNECTED. THE DC RESISTANCE FROM CHASSIS TO ANY CIRCUIT MUST BE ALMOST INFINITE. IF ANY CIRCUIT BECOMES GROUNDED A HUM WILL DEVELOP. MICROPHONIC TUBES WILL CAUSE AUDIO HOWL. CHECK 1LA6.

THE WAVEMAGNET IS CONNECTED TO THE CHASSIS THROUGH THE HINGES IN THE CABINET, SNAPS AND FLEXIBLE LEADS. IF THE RF BECOMES WEAK OR DEAD, CHECK THE RESISTANCE OF THE WAVEMAGNET AT TUNING GANG. THE DC RESISTANCE ACROSS THE TWO LEADS SHOULD BE APPROXIMATELY 1 OHM. IF THE CIRCUIT IS OPEN, REMOVE THE TWO SCREWS WHICH HOLD THE HANDLE AND TOP PANEL AND REMOVE THE TOP PANEL. WHEN THE TOP IS REMOVED, THE WAVEMAGNET CONNECTING LEADS WILL BE VISIBLE FOR INSPECTION. ALSO LOOSEN THE SNAP-ON SOCKET AND CHECK FOR SHORTED OR BROKEN LEADS.

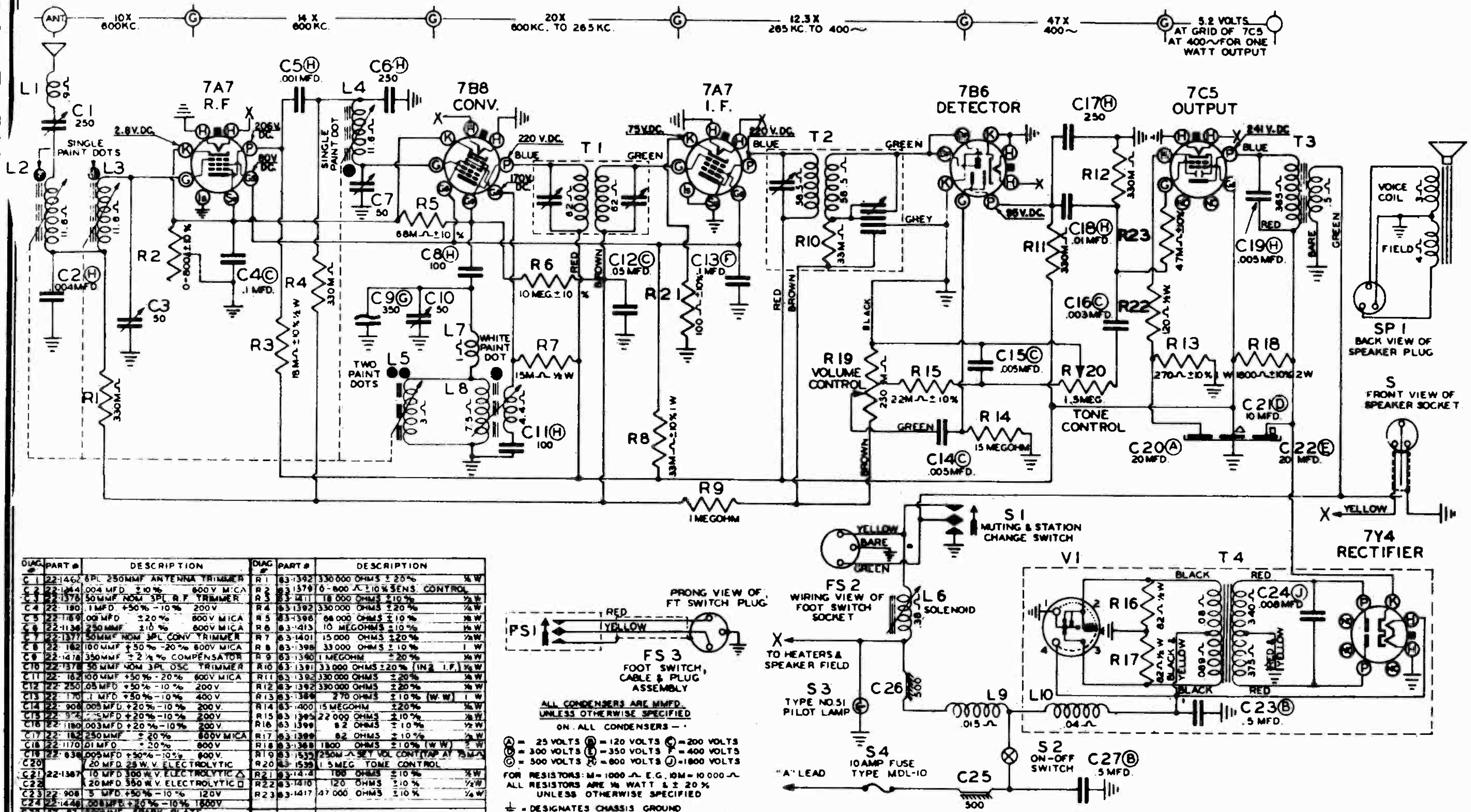
IF ALIGNMENT: REMOVE THE CHASSIS FROM THE CABINET AND ARRANGE THE UNITS SO THAT THE WAVEMAGNET CAN BE PLUGGED IN. THROUGH A .1MFD DUMMY ANTENNA, FEED A 455 KC SIGNAL TO THE CONVERTER GRID. CONNECT AN OUTPUT METER ACROSS THE VOICE COIL OF THE SPEAKER (TWO LUGS PROVIDED) AND ADJUST C12,C13,C14 AND C15 FOR MAXIMUM INDICATION ON THE OUTPUT METER. ALWAYS KEEP THE SIGNAL OUTPUT FROM THE GENERATOR JUST HIGH ENOUGH TO GET INDICATION ON THE METER. TOO MUCH SIGNAL WILL CAUSE LOADING AND INACCURATE ALIGNMENT. THE WAVE-TRAP IS ADJUSTED BY COUPLING THE 455KC SIGNAL TO THE WAVEMAGNET THROUGH A ONE TURN LOOP AND ADJUSTING C7 FOR MINIMUM INDICATION ON THE OUTPUT METER.

RF ALIGNMENT: SET THE BAND SWITCH TO SHORT WAVE AND THROUGH A SINGLE TURN LOOP LOOSELY COUPLE A 11.8 MC SIGNAL TO THE WAVEROD. C8 AND C2 ARE ADJUSTED TO SCALE AND MAXIMUM OUTPUT. SET THE BAND SWITCH TO STANDARD BROADCAST. SIGNAL GENERATOR TO 1600KC AND LOOSELY COUPLE A ONE TURN LOOP TO THE WAVEMAGNET. C10 IS ADJUSTED TO SCALE. SET SIGNAL GENERATOR AND DIAL SCALE TO 1400 KC AND ADJUST C3 FOR MAXIMUM SIGNAL. SET SIGNAL GENERATOR AND DIAL TO 600 AND WHILE ROCKING THE GANG ADJUST C9 TO MAXIMUM. A SLIGHT RE-ADJUSTMENT OF C2 AT 11.8 MC AND C3 AT 1400KC MAY BE NECESSARY AFTER THE CHASSIS IS INSTALLED IN THE CABINET.

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	CONVERTER GRID	5 MFD	455 KC	BC	600 KC	C12 C13, C14 C15	ALIGN I.F.
2	ONE TURN LOOSELY COUPLED TO WAVEMAGNET		455 KC	BC	600 KC	C7	ADJUST WAVETRAP TO TO MINIMUM
3	ONE TURN LOOSELY COUPLED TO WAVEROD	EXTEND WAVEROD FULL LENGTH	11.8 MC	SW	11.8 MC	C8	SET OSCILLATOR TO SCALE
4			11.8 MC	SW	11.8 MC	C2	ALIGN WAVEROD
5	ONE TURN LOOSELY COUPLED TO WAVEMAGNET		1600 KC	BC	1600 KC	C10	SET OSCILLATOR TO SCALE
6			1400 KC	BC	1400 KC	C3	ALIGN WAVEMAGNET
7			600 KC	BC	ROCK GANG AT 600 KC	C9	ADJUST PADDER

ZENITH RADIO CORP.

MODEL 6MH089, DB47 HUDSON



DIAG #	PART #	DESCRIPTION
C 1	22-1462	6PL 250MMF ANTENNA TRIMMER
C 2	22-1244	.004 MFD ±10% 600V MICA
C 3	22-1376	50MMF NOM 3PL R.F. TRIMMER
C 4	22-180	.1 MFD. +50% -10% 200V
C 5	22-1169	.001 MFD ±20% 600V MICA
C 6	22-1136	250MMF ±10% 600V MICA
C 7	22-1377	50MMF NOM 3PL CONV TRIMMER
C 8	22-162	100 MMF +50% -20% 600V MICA
C 9	22-1478	350MMF ±2½% COMPENSATOR
C10	22-1378	50 MMF NOM 3PL OSC TRIMMER
C11	22-162	100 MMF +50% -20% 600V MICA
C12	22-250	.05 MFD +50% -10% 200V
C13	22-170	.1 MFD +50% -10% 400V
C14	22-906	.005 MFD. +20% -10% 200V.
C15	22-976	.005 MFD +20% -10% 200V
C16	22-1180	.003 MFD +20% -10% 200V.
C17	22-162	250 MMF ±20% 600V MICA
C18	22-1170	.01 MFD ±20% 600V
C19	22-638	.005 MFD +50% -10% 600V.
C20	22-1387	20 MFD. 25 W.V. ELECTROLYTIC
C21		10 MFD 300 W.V. ELECTROLYTIC △
C22		20 MFD 350 W.V. ELECTROLYTIC □
C23	22-908	.5 MFD. +50% -10% 120V
C24	22-1446	.008 MFD +20% -10% 1600V
C25	27-87	500MMF SPARK PLATE
C26	27-87	500MMF SPARK PLATE
C27	22-908	.5 MFD +50% -10% 120V
L 1	S-8819	ANTENNA MOTOR NOISE CHOKE
L 2	S-12080	ANT. TUNING COIL (TUNING UNIT; COLOR OF DOT)
L 3		R.F. TUNING COIL
L 4		CONV. TUNING COIL
L 5	S-12053	OSC. TUNING COIL
L 6	S-10829	SOLENOID (PART OF TUNING UNIT)
L 7	S-11229	OSC SERIES COIL
L 8	S-11231	OSC SHUNT COIL
L 9	S-11232	MOTOR NOISE CHOKE
L10	20-213	HASH CHOKE
SP1	49-584	SPEAKER & PLUG
SK1	52-279	SPEAKER CABLE & SOCKET

DIAG #	PART #	DESCRIPTION	
R 1	63-1392	330 000 OHMS ±20%	½ W
R 2	63-1379	0-800 Ω ±10% SENS. CONTROL	
R 3	63-1411	18 000 OHMS ±10%	½ W
R 4	63-1392	330 000 OHMS ±20%	¼ W
R 5	63-1396	68 000 OHMS ±10%	½ W
R 6	63-1413	10 MEGOHMS ±10%	½ W
R 7	63-1401	15 000 OHMS ±20%	½ W
R 8	63-1398	33 000 OHMS ±10%	1 W
R 9	63-1390	1 MEGOHM ±20%	½ W
R10	63-1391	33 000 OHMS ±20% (IN 2 I.F.)	½ W
R11	63-1392	330 000 OHMS ±20%	½ W
R12	63-1392	330 000 OHMS ±20%	½ W
R13	63-1389	270 OHMS ±10% (W.W.)	1 W
R14	63-1400	15 MEGOHM ±20%	½ W
R15	63-1395	22 000 OHMS ±10%	½ W
R16	63-1399	82 OHMS ±10%	½ W
R17	63-1399	82 OHMS ±10%	½ W
R18	63-1368	1800 OHMS ±10% (W.W.)	2 W
R19	63-1535	250M Ω SET VOL CONT (TAP AT 75M Ω)	
R20	63-1539	1.5MEG TONE CONTROL	
R21	63-1414	100 OHMS ±10%	½ W
R22	63-1410	120 OHMS ±10%	½ W
R23	63-1417	47 000 OHMS ±10%	¼ W
T 1	95-918	FIRST I.F. TRANSFORMER	
T 2	95-942	2ND I.F. TRANSFORMER	
T 3	95-915	OUTPUT TRANSFORMER	
T4	95-1013	VIBRATOR POWER TRANSFORMER	
	95-914	VIBRATOR POWER TRANS (ALTERNATE)	
FS1	S-11140	FOOT SWITCH & PLATE ASSEMBLY	
FS2	78-646	FOOT SWITCH CONTROL SOCKET	
FS3	S-13246	FOOT CONTROL SWITCH, CABLE (& PLUG ASSEMBLY	
S 1	S-11272	HAND SELECTOR & MUTING SWITCH	
S 2	85-339	ON-OFF SWITCH	
S 3	100-32	TYPE NO 51 PILOT LAMP	
S 4	136-14	10AMP. FUSE TYPE MDL-10	
V1	190-20	VIBRATOR (NON SYNCHRONOUS)	

ALL CONDENSERS ARE MMFD. UNLESS OTHERWISE SPECIFIED

ON ALL CONDENSERS —

(A) = 25 VOLTS (B) = 120 VOLTS (C) = 200 VOLTS
(D) = 300 VOLTS (E) = 350 VOLTS (F) = 400 VOLTS
(G) = 500 VOLTS (H) = 600 VOLTS (J) = 1600 VOLTS

FOR RESISTORS: M = 1000 Ω E.G. 10M = 10 000 Ω
ALL RESISTORS ARE ½ WATT & ± 20% UNLESS OTHERWISE SPECIFIED

⏚ = DESIGNATES CHASSIS GROUND

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS

TAKEN AT ANT. SOCKET AT R.F. GRID AT 600KC. & TAKEN AT CONV. GRID AT 265KC.

DUMMY ANTENNA

MMFD SERIES & MMFD. SHUNT AT ANT. SOCKET & 0.1 MFD. SERIES TO CONVERTER GRID

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDED

TEST CONDITIONS

VOL. CONTROL SET AT "MAX". TONE CONTROL SET ON "HIGH", WITH NO INCOMING SIGNAL

VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

I. F. 265 KC.
TUNING RANGE 540KC. TO 1600KC.

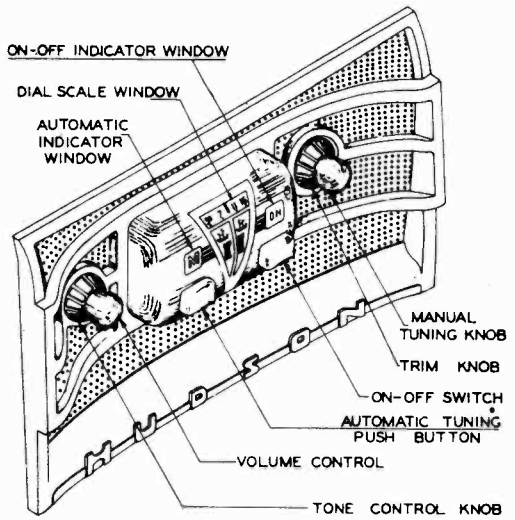
Automatic Tuning

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted proceed as follows:

1. Press the automatic tuning push button (on the left side) until Number 1 appears in the automatic indicator window.
2. Pull the manual tuning knob OUTWARD to engage the automatic mechanism.
3. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception.

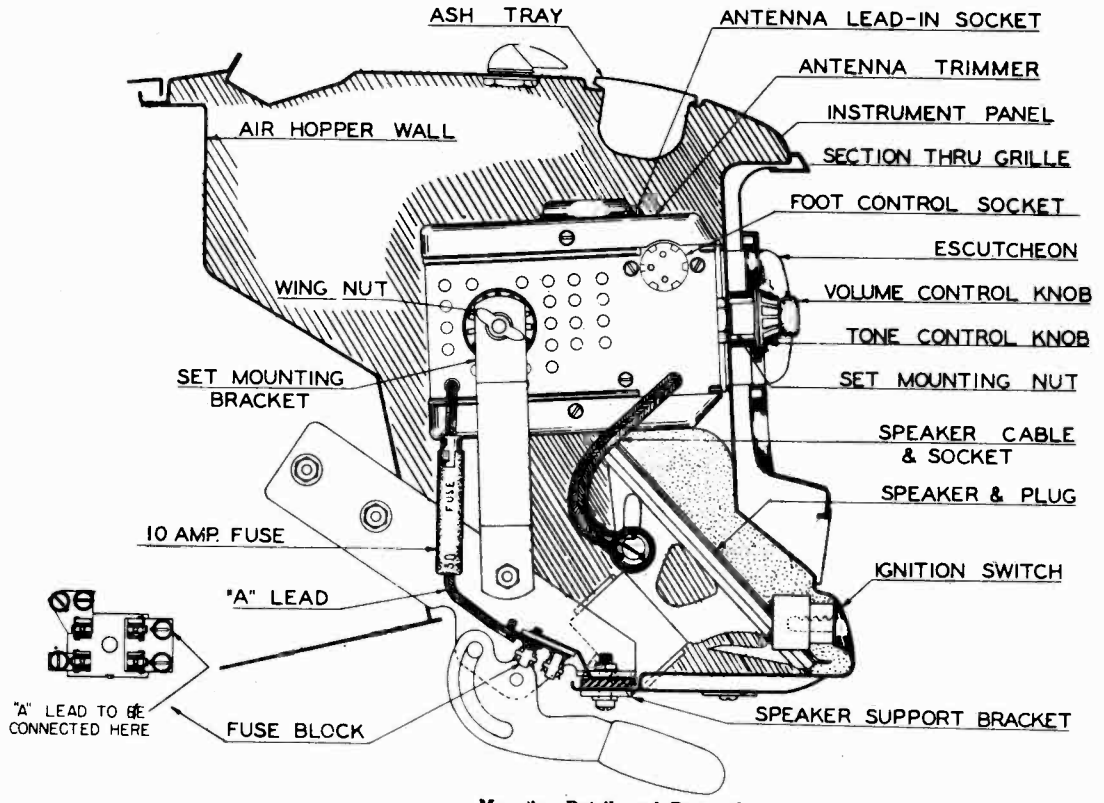
   CAUTION: DO NOT ATTEMPT TO FORCE THE KNOB IN. The knob will automatically return to the "IN" position when the automatic tuning push button or the foot switch is operated.
4. Press the automatic tuning push button, pull manual tuning knob outward, and tune in station desired for No. 2 position. Use the same procedure for positions No. 3, 4 and 5.

When the five automatic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the AUTOMATIC button to return to MANUAL tuning, or to any one of the stations selected on the Automatic.

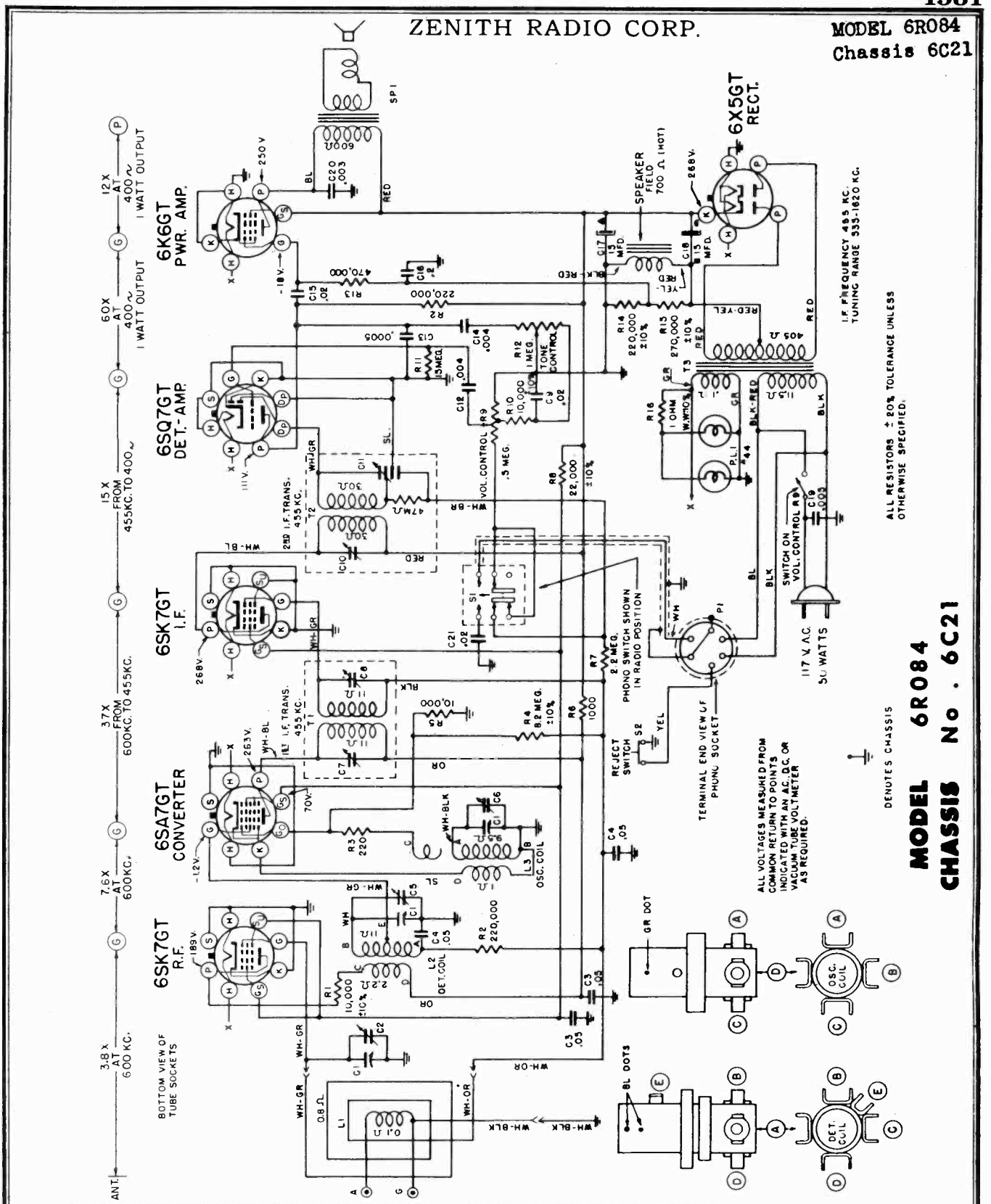


Operating Controls.

INSTALLATION INSTRUCTIONS



Mounting Details and Connections



DIAG NO	PART NO	DESCRIPTION
C1	22-1369	3-GANG VARIABLE
C2	ON C1	BROADCAST ANT. TRIMMER
C3	22-171	.05 MFD. 600 V.
C4	22-829	.05 MFD. 200 V.
C5	ON C1	BROADCAST DET. TRIMMER
C6	ON C1	BROADCAST OSC. TRIMMER
C7	ON T1	1ST I.F. TRANS. PRI. TRIMMER
C8	ON T1	1ST I.F. " " SEC. "
C9	22-327	.02 MFD. 200 V.
C10	ON T2	2ND I.F. TRANS. PRI. TRIMMER
C11	ON T2	2ND I.F. " " SEC. "
C12	22-1362	.004 MFD. 600 V.
C13	22-854	.0005 MFD. 600 V.
C14	22-448	.004 MFD. 600 V.
C15	22-830	.02 MFD. 600 V.
C16	22-138	.2 MFD. 200 V.
C17	22-1372	15 MFD. ELECTRO 350 V.
C18	22-1372	15 MFD. " 450 V.
C19	22-1041	.003 MFD. 400 V.
C20	22-288	.003 MFD. 600 V.
C21	22-1386	.02 MFD. 200 V.
R1	63-156	10 M OHM 1 W.
R2	63-298	220 M OHM 1/4 W.
R3	63-879	220 OHM 1/4 W.
R4	63-873	8.2 MEGOHM 1/4 W.
R5	63-589	10 M OHM 1/4 W.
R6	63-605	1000 OHM 1/2 W.
R7	63-600	2.2 MEGOHM 1/4 W.
R8	63-1058	22 M OHM 2 W.
R9	63-1340	.5 MEG VOLUME CONTROL
R10	63-641	10 M OHM 1/4 W.
R11	63-076	1.5 MEGOHM 1/4 W.
R12	63-341	1 MEG. TONE CONTROL
R13	63-597	470 M OHM 1/4 W.
R14	63-655	220 M OHM 1/4 W.
R15	63-656	270 M OHM 1/4 W.
R16	63-1223	1 OHM WIREWOUND 1/4 W.
L1	8-11308	WAVEMAGNET
L2	8-11163	DET. COIL ASSEMBLY
L3	8-11164	OSC. "
T1	98-909	1ST I.F. TRANSFORMER
T2	98-910	2ND I.F. "
T3	98-911	PWR. TRANS. 117V. 50-60~
P.L.1	100-38	DIAL LIGHT 6.3V. .28A.
S1	98-337	PHONO-RADIO SWITCH
S2	98-348	REJECT SWITCH
SP1	40-816	6" DYNAMIC SPEAKER
P1	8-11167	PHONO CABLE ASSEMBLY

TO THE SERVICE MAN:

A feature of chassis 6C21 is a high gain tuned R.F. stage ahead of the conventional superheterodyne circuit.

When making repairs or adjustments on the chassis be sure to have the Phono-Radio switch in Radio position (button out).

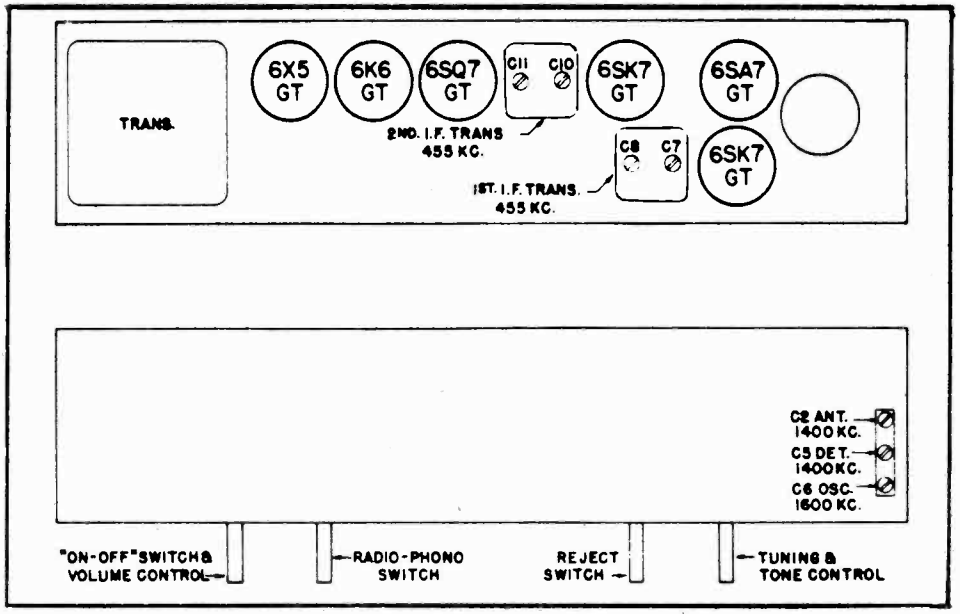
The Tone Control circuit used in chassis 6C21 is unusual. Attenuation or control occurs in both the grid and plate circuit of the triode section of the 6SQ7 tube. To increase the bass response Resistor R10 and Capacitor C9 boost the bass in the grid circuit.

Capacitor C14 and the Variable Tone Control R12 attenuate the highs in the plate circuit.

When the tone control R12 is in the treble position attenuation to highs are greatly reduced in the plate circuit and minimum bass boost takes place in the grid circuit.

When the tone control is in bass position, attenuation to the highs takes place in the plate circuit with maximum bass boost in the grid circuit.

The result of this arrangement allows a smooth tone control over the audio frequency range.



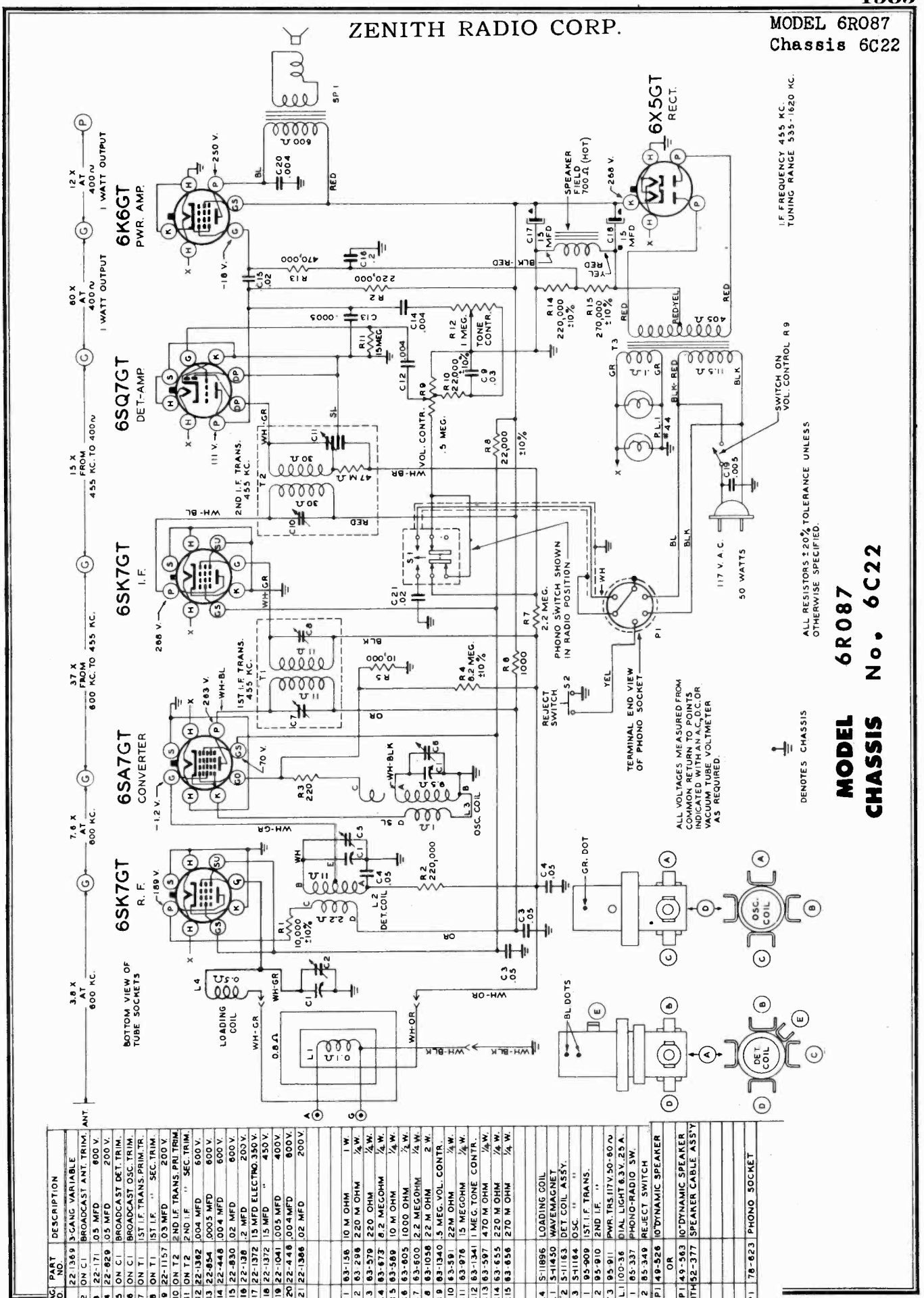
TUBE AND TRIMMER LOCATION

MODELS 6R084—6R087

CHASSIS Nos. 6C21—6C22

ALIGNMENT PROCEDURE

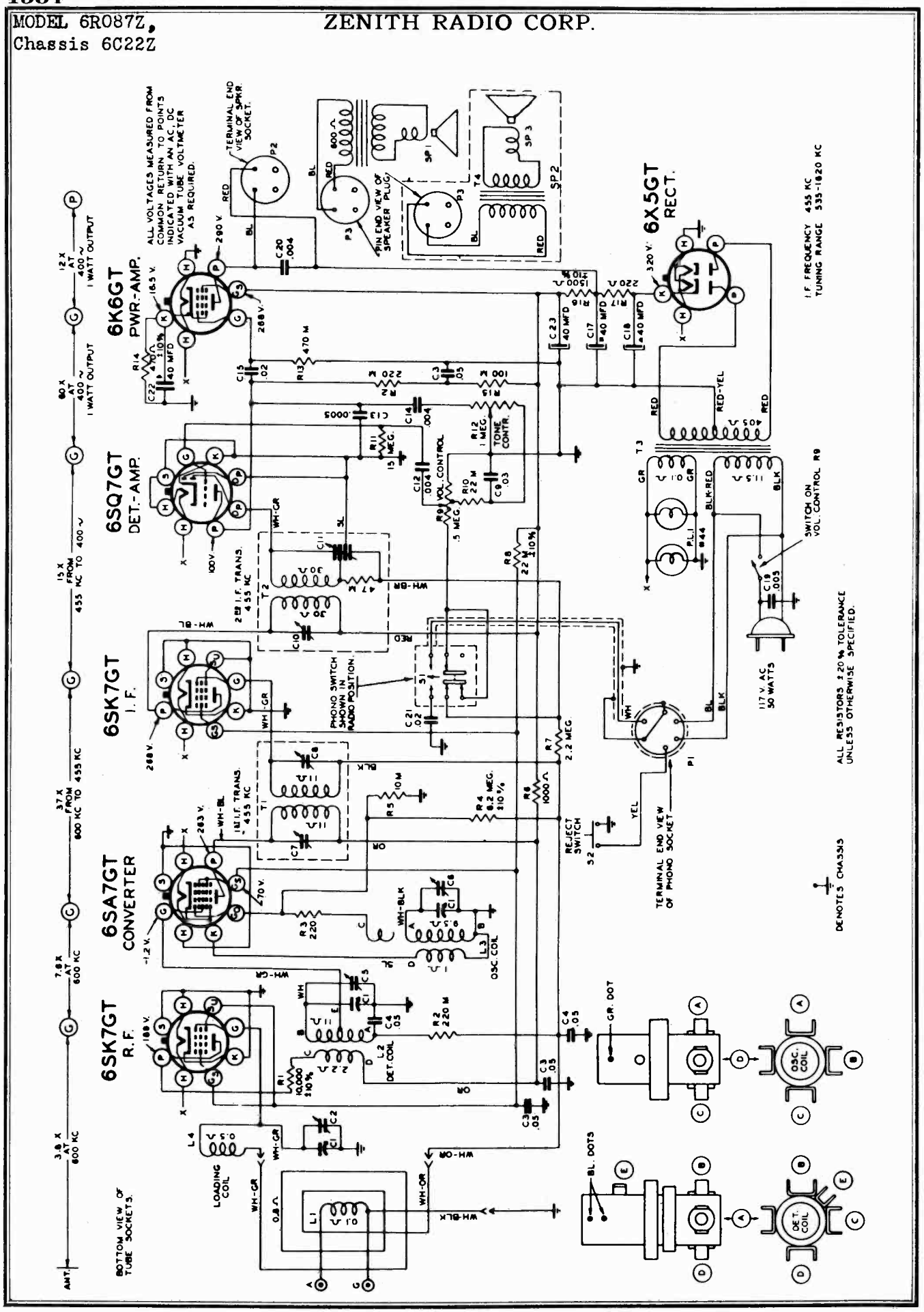
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	5 Mfd.	455 Kc.	600 Kc.	C-7-,C-8, C-10,C-11	Align I F
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc	1600 Kc	C-6	Set Oscillator to Dial Scale
3		--	1400 Kc.	1400 Kc.	C-5	Align det.
4		--	1400 Kc.	1400 Kc.	C-2	Align Ant.



DIAG. NO.	PART NO.	DESCRIPTION
C1	22-1369	3-GANG VARIABLE
C2	ON C1	BROADCAST ANT. TRIM.
C3	22-171	.05 MFD 800 V.
C4	22-829	.05 MFD 200 V.
C5	ON C1	BROADCAST DET. TRIM.
C6	ON C1	BROADCAST OSC. TRIM.
C7	ON T1	1ST I.F. TRANS. PRIM. TR.
C8	ON T1	1ST I.F. " SEC. TRIM.
C9	22-1157	.03 MFD 200 V.
C10	ON T2	2ND I.F. TRANS. PRI TRIM.
C11	ON T2	2ND I.F. " SEC. TRIM.
C12	22-1362	.004 MFD 600 V.
C13	22-854	.0005 MFD 600 V.
C14	22-448	.004 MFD 600 V.
C15	22-830	.02 MFD 600 V.
C16	22-138	.2 MFD 200 V.
C17	22-1372	15 MFD ELECTRO. 350 V.
C18	22-1372	15 MFD " 450 V.
C19	22-1041	.005 MFD 400 V.
C20	22-448	.004 MFD 600 V.
C21	22-1366	.02 MFD 200 V.
R1	63-156	10 M OHM 1 W.
R2	63-298	220 M OHM ¼ W.
R3	63-579	220 OHM ¼ W.
R4	63-673	8.2 MEGOHM ¼ W.
R5	63-589	10 M OHM ¼ W.
R6	63-605	1000 OHM ½ W.
R7	63-600	2.2 MEGOHM ¼ W.
R8	63-1058	22 M OHM 2 W.
R9	63-1340	.5 MEG. VOL. CONTR.
R10	63-591	22M OHM ¼ W.
R11	63-976	15 MEGOHM ¼ W.
R12	63-1341	1 MEG. TONE CONTR.
R13	63-597	470 M OHM ¼ W.
R14	63-655	220 M OHM ¼ W.
R15	63-656	270 M OHM ¼ W.
L4	S-11896	LOADING COIL
L1	S-11450	WAVEMAGNET
L2	S-11163	DET. COIL ASSY.
L3	S-11164	OSC. " "
T1	95-909	1ST I.F. TRANS.
T2	95-910	2ND I.F. "
T3	95-911	PWR. TRS. 117 V. 50-60 ~
PL1	100-36	DIAL LIGHT 6.3 V. .25 A.
S1	85-337	PHONO-RADIO SW.
S2	85-349	REJECT SWITCH
SP1	49-526	10" DYNAMIC SPEAKER
OR		
SP1	49-563	10" DYNAMIC SPEAKER
WITH	52-377	SPEAKER CABLE ASS'Y
P1	78-623	PHONO SOCKET

MODEL 6R087Z,
Chassis 6C22Z

ZENITH RADIO CORP.



A feature of chassis 6C22Zand 6C22ZZis a high gain tuned R.F. stage ahead of the conventional superheterodyne circuit.

When making repairs or adjustments on the chassis be sure to have the Phono-Radio switch in Radio position (button out).

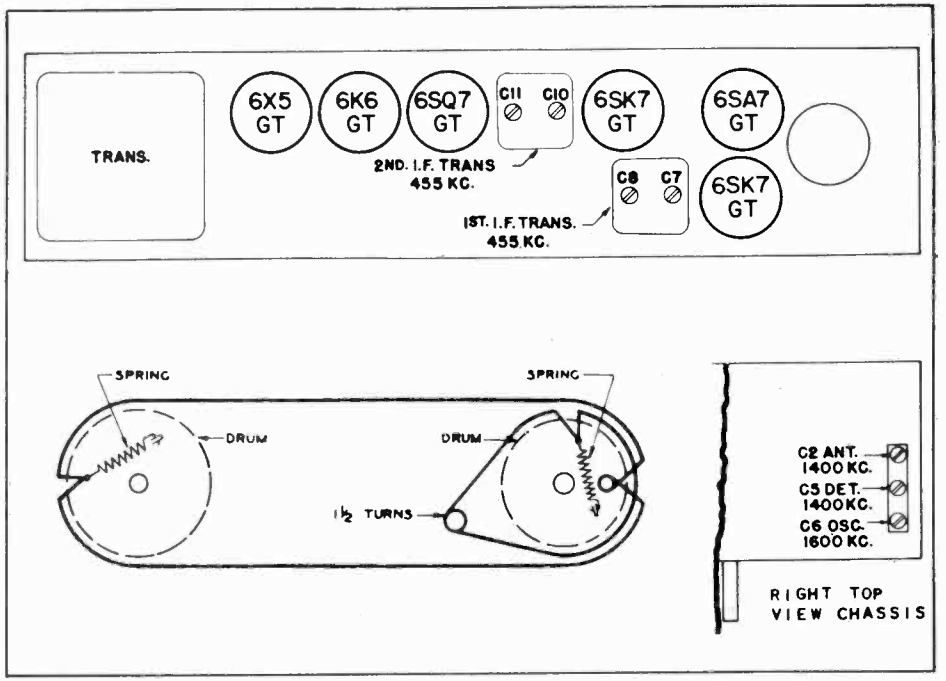
The Tone Control circuit used in this chassis is unusual. Attenuation or control occurs in both the grid and plate circuit of the triode section of the 6SQ7 tube. To increase the bass response Resistor R10 and Capacitor C9 boost the bass in the grid circuit.

Capacitor C14 and the Variable Tone Control R12 attenuate the highs in the plate circuit.

When the tone control R12 is in the treble position attemuation to highs are greatly reduced in the plate circuit and minimum bass boost takes place in the grid circuit.

When the tone control is in bass position, attenuation to the highs takes place in the plate circuit with maximum bass boost in the grid circuit.

The result of this arrangement allows a smooth tone control over the audio frequency range.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-7, C-8, C-10, C-11	Align I. F.
2	One turn loop coupled loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-6	Set Oscillator to Dial Scale
3		--	1400 Kc.	1400 Kc	C-5	Align Det.
4		--	1400 Kc.	1400 Kc.	C-2	Align Ant.

MODEL 6R087Z
MODEL 6R087ZZ

ZENITH RADIO CORP.

PARTS LIST

DIAL ASSEMBLY

26-334	Dial Scale.
46-522	Control Knob (Dummy).
46-538	Tuning Knob
46-548	Radio-Phono Reject Knob
57-1071	Escutcheon Plate.
59-161	Dial Pointer.
76-413	Tuning Control Shaft.
78-504	Dial Light Socket & Wire.
80-365	Tuning Shaft Tension Spring
80-402	Dial Cord Tension Spring.
100-36	Dial Light Bulb 6.3 Volts
159-50	Plug Button (Dial Scale Mtg.)
188-30	Retaining Ring (Tuning Shaft)
188-32	Retaining Ring (Dial Pulley).
188-34	Retainer Ring
188-54	Knob Clamping Ring.
192-94	Dial Crystal.
S11161	Dial Pulley Cord & Eyelet Assem
S11162	Pointer Pulley Cord & Eyelet Assem.
S11168	Condenser Pulley & Bushing Assem.
S11292	Dial Pulley & Bushing Assem
S11558	Tone & Volume Control Knob & Ring Assem.

CHOKES & COILS

95-909	1st I.F. Transformer.
95-910	2nd I.F. Transformer.
S11163	Detector Coil Assem
S11164	Oscillator Coil Assem
S13478	Antenna Loading Coil Assem. 6C22ZZ.
S11896	Antenna Loading Coil Assem. 6C22Z

CONDENSERS

22-138	.2 Mfd. (C16)	.200 V.
22-171	.05 Mfd. (C3)	.600 V.
22-448	.004 Mfd. (C14 & C20)	.600 V.
22-530	12 Mmfd . 6C22ZZ	.600 V.
22-1444	.001. . . 6C22ZZ	.200 V.
22-829	.05 Mfd. (C4)	.200 V.
22-830	.02 Mfd. (C15)	.600 V.
22-854	.0005 Mfd. (C13)	.600 V.
22-1041	.005 Mfd. (C19)	.400 V.
22-1157	.03 Mfd. (C9)	.200 V.
22-1362	.004 Mfd. (C12)	.600 V.
22-1369	3 Section Gang Cond. (C9)	
22-1372	Dry Electrolytic 15 Mfd.-450V.X 15 Mfd.-350V.X (C17 & C18) 6C22ZZ	
22-1382	Dry Electrolytic 40 x 40 Mfd. 450v. x 40 Mfd.-25 v. 6C22Z (C17, 18, 22).	
22-1386	.02 Mfd. (C21)	.600 V.
22-1611	Dry Electrolytic 40 Mfd. 450v (C23-6C22Z)	

RESISTORS

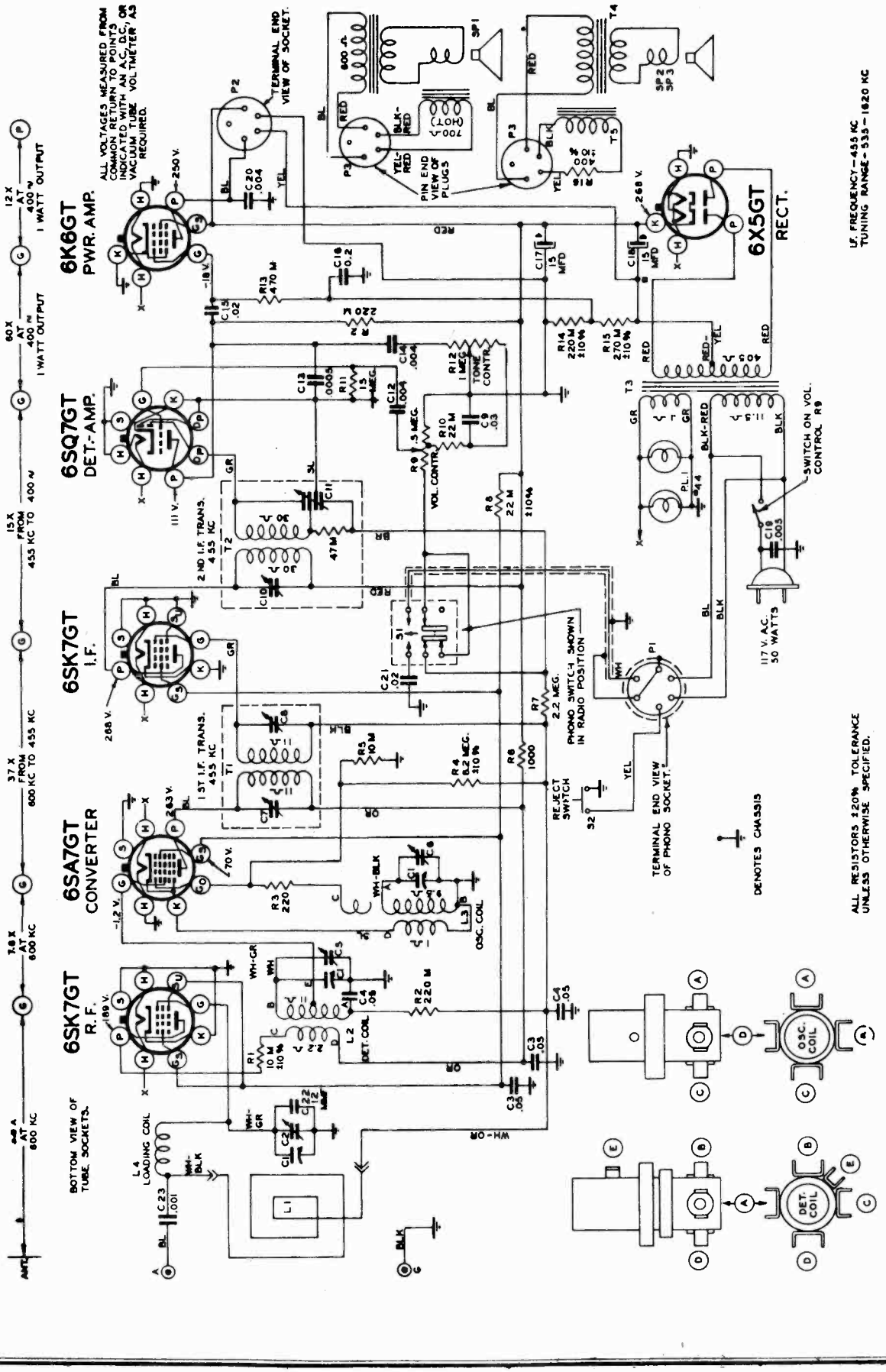
63-156	10M Phm (R1)	.1 Watt
63-296	220M Ohm (R2)	.1/4 Watt
63-579	220 Ohm (R3)	.1/4 Watt
63-589	10M Ohm (R5)	.1/4 Watt
63-591	22M Ohm (R10)	.1/4 Watt
63-595	100M ohm (R15-6C22Z)	1/4 watt
63-597	470M Ohm (R13)	.1/4 Watt
63-600	2.2 Megohm (R7)	.1/4 Watt
63-605	1M Ohm (R6)	.1/2 Watt
63-655	220M Ohm (R14-6C22ZZ)	.1/4 Watt
63-656	270M Ohm (R15-6C22ZZ)	.1/4 Watt
63-673	8.2 Megohm (R4)	.1/4 Watt
63-976	15 Megohm (R11)	.1/4 Watt
63-1170	1500 ohm w.w. (R16-6C22Z)	.2 watt
63-1222	470 ohm w.w. (R14-6C22Z)	.1 watt
63-1227	220 ohm w.w. (R17-6C22Z)	.1 watt
63-1340	Volume Control & Switch (R9)	
63-1341	Tone Control (1 Megohm) (R12)	
63-1545	400 ohm 10w (R16-6C22)	

MISCELLANOUS

2-121	Cabinet Back.
11-85	Line Cord & Plug.
11-87	Line Cord & Plug (Z Models)
12-1138	Wavemagnet Mtg. Brkt.
15-23	Plug Cap & Insulator (used on S11456).
15-62	Plug Cap & Insulator (used on S11456).
19-123	Phono Unit Mtg. Clip.
27-81	Mounting Flange (Shaft Bearing Disc)
36-31	Record Changer Pull-out Handle.
45-526	10" Dynamic Speaker
	206-526 Output Transformer.
	207-526 Field Coil (not replaceable)
	208-526 Cone & voice coil
49-563	10" Dynamic Speaker (alt. for 49-526)
	206-563 Output Transformer.
	207-563 Field Coil (not replaceable)
	208-563 Cone & voice coil
49-581	10" P.M. speaker (also see s-132571). 6C22Z
	output transformer (see 95-1011)
	208-581 cone & voice coil
49-585	10" P.M. speaker 6C22Z
	296-585 output transformer.
	208-585 cone & voice coil
52-377	Speaker cable (49-563).
58-88	Wavemagnet Plug (3 prong)
58-132	Six prong plug (used on S11456)
58-152	Speaker plug. 6C22ZZ.
58-156	speaker plug (49-585) 6C22Z
70-83	#6 x 1/2 washer hd. wood screw (Cabinet Back)
72-55	#6 x 3/8 Flat Phillips Hd. Wood Screw
72-59	#2 x 2-1/2 Phillips flat hd. wood. Screw (esc. mtg.).
78-128	Speaker plug socket
78-349	Wavemagnet plug socket.
78-373	Octal Base Tube sokcet (5 contact).
78-374	Octal Base Tube socket (6 contact).
78-376	Octal Base Tube socket (8 contact).
78-555	Six Prong Socket (used on S11456)
78-611	Octal Base Tube Socket (Z Model). (8 contact).
78-623	Phono Socket (6 prong).
78-732	Speaker Plug Socket (Z Model)
89-463	Phono Mtg. Spring
83-1218	Insulating Strip (gang cond.)
83-1240	Black vinylite Trim Strip (record Changer)
85-337	Phono-Radio Switch.
85-349	Record Reject switch.
94-295	Bushing-Switch Mtg. (Z Model)
94-334	Bushing-Switch Mtg.
95-911	Power Transformer, 117v. 50-60.
95-1007	Output Transformer. 6C22ZZ
95-1011	spkr. output transformer (49-581) 6C22Z
95-1019	Filter Choke. 6C22ZZ
112-420	Phono Mtg. Screw.
112-489	Handle Mtg. Screw (36-31)
114-58	6-32 x 3/8 Hex Accrn Hd. M.S. Screw
114-128	Chassis Mtg. Self Tapping Screw
114-193	#8 x 3/16 Hex Accrn Hd. S.T. Screw.
114-202	#8-32 x 1-1/8 slotted Hex. Washer Hd S.T. Screw (used on 12-1138)
125-17	Switch Mtg. Grommets.
125-45	Condenser Mtg. Grommets
196-80	Dust Gasket
202-381	Phono Instruction Sheet
202-388	Instruction Book.
237-1	Cable Clamp
S13479	Loop Antenna. 6C22ZZ
S13391	12" PM Speaker Assembly 6C22ZZ
S13406	10" PM Speaker Assembly 6C22ZZ
S11450	Wavemagnet Assem. (30A). 6C22Z
S11456	Inter Connecting Cable Assem.
S11468	Record Changer Assem.
S11920	Record Changer Mtg. Frame Assem.
S12864	Drive Wheel & Pin Assem. (Rec. Chang.)
S13257	10" P.M. Spkr. & Transformer Assem. (Alt. for 49-585) (Z Model) 6C22Z

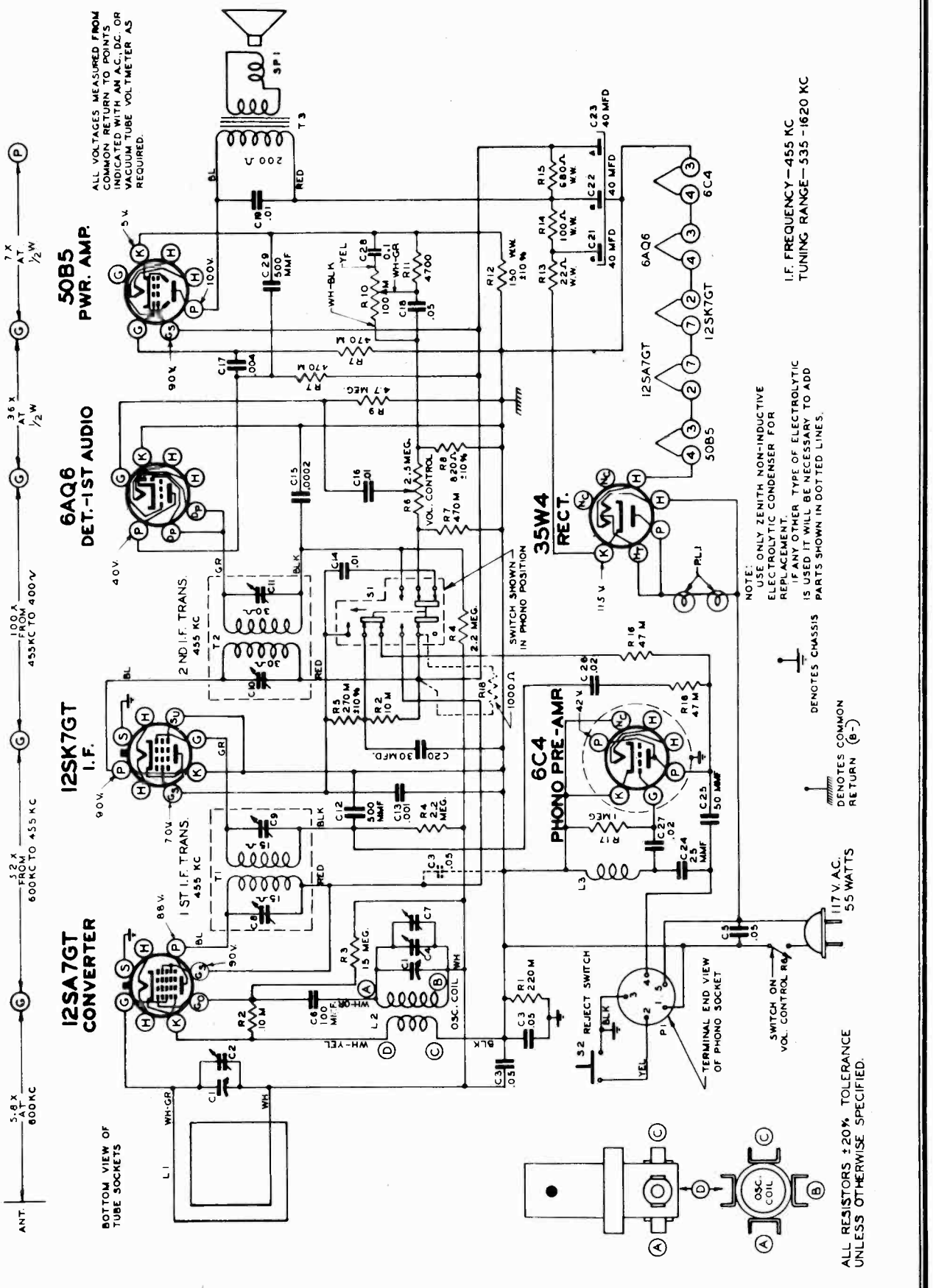
ZENITH RADIO CORP.

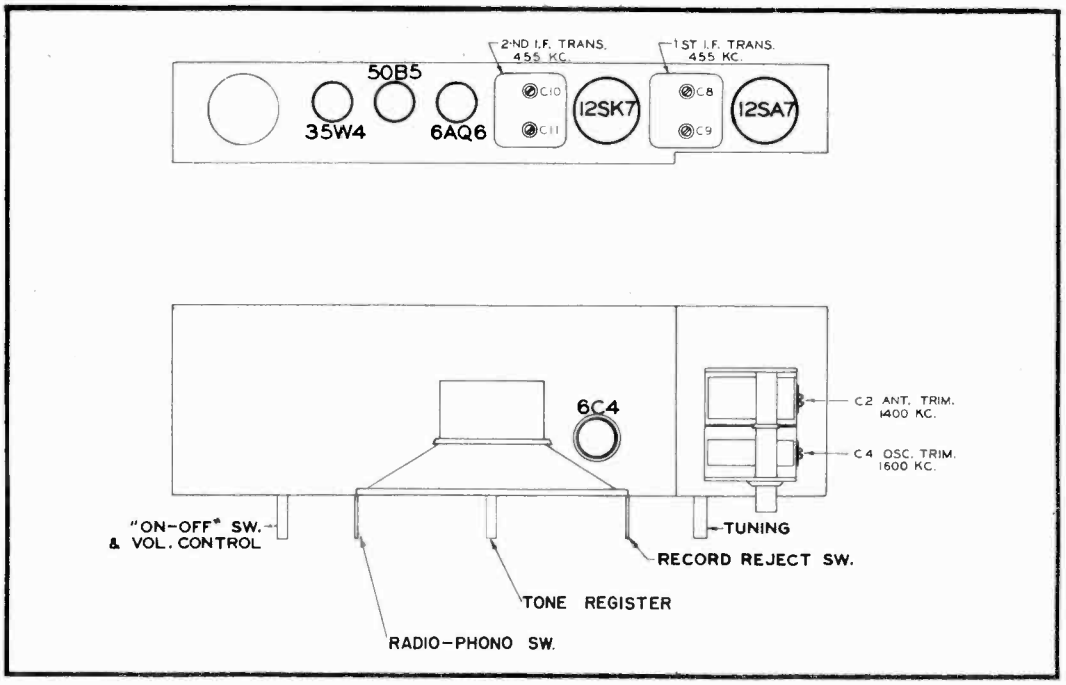
MODEL 6R087ZZ,
Chassis 6C22ZZ



MODEL 6R880,
CHASSIS 6E03

ZENITH RADIO CORP.





TUBE AND TRIMMER LOCATION

The alignment of chassis 6E03 is conventional, however the adjustments interlock to some degree, therefore, the procedure must be followed exactly. Since this chassis is of the AC/DC type, care must be exercised when making measurements. Chassis 6E03 has a phono-radio push button switch of the double acting type. When in the "In" position this connects the radio for playing records. Socket P1 is used to connect the changer to the receiver chassis.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 MFD	455 Kc.	600 Kc.	C8, C9, C10, C11	Align I.F.
2	Single Turn Loop Loosely Coupled to Wavemagnet	-------	1600 Kc.	1600 Kc.	C4	Set Oscillator to Dial Scale.
3		-------	1400 Kc.	1400 Kc.	C2	Align Antenna.

PARTS LIST

MISCELLANEOUS

2-135		Cabinet Back
2-136		Cabinet Back (6R880GO only)
11-104		Line Cord Plug - 7 ft.
12-1468		Tone Control Mounting Bracket
12-1486		Shield Support Bracket
19-123		Record Changer Mounting Clip (4 used)
46-687		Tuning & Volume Control Knob
46-688		Tone Control Knob
46-689		Phono Switch Knob
49-602	SP-1	P. M. Speaker (5 1/4")
		208-602 Cone & Voice Coil
54-30		#8-32 X 5/16" Hex Nut Steel N.P. (2 used)
54-139		#3/8 - 32 X 9/16" Palnut Type 9N -Steel Cad. (2 used)
54-143		Speed Nut
54-228		Speed Nut (Used on 26-387)
54-267		#6-32 X 5/16" Hex Palnut - Inverted Type (4 used)
57-1105		Wavemagnet Lead Spacer Strip
57-1398		Dial Escutcheon
57-1402		Chassis Cover Plate
70-117		#6 X 5/16" Phillips Rd. Hd. Wood Screw-Steel - Statuary Bronze (7 used)
70-128		#5 X 3/8" Washer Hd. Wood Screw-Steel-Statuary Bronze (6 used) (Cabinet Back Mtg.)
72-74		#4 X 3/8" Phillips Flat Hd Wood Screw-Steel Brass Plate (Escutcheon Mtg.)
78-274		Socket - Electrolytic Capacitor
78-436		Socket - Miniature Tube
78-792	P-1	Socket - Phono (5 contact)
78-793		Socket - Octal Tube (2 used)
78-794		Socket Miniature Tube (7 contact)
78-795		Socket - Miniature Tube (7 contact) (2 used)
80-407		Record Changer Mounting Spring (4 used)
84-70		Tone Arm Support
85-421	S-1	Phono - Radio Switch (or 85-438)
85-422	S-2	Reject Switch
93-125		#6 Int. Shakeproof Lockwasher (4 used)
93-126		#8 Int. Shakeproof Lockwasher (2 used)
93-721		Felt Washer (2 used)
94-295		Capacitor Mounting Bushing (5 used)
95-1025	T-3	Output Transformer
110-129		Grille Cloth
112-544		Record Changer Mounting Screw (4 used)
112-721		#6 X 7/16" Straight Binding Hd. Wood Screw Steel Statuary Bronze (8 used)
114-58		#6-32 X 3/8" Hex Acorn Hd. M.S. Steel N.P. (2 used)
114-67		#6-32 x 7/16" Hex Acorn Hd. M. S. Steel N.P. (3 used)
114-128		#10 X 1 1/16" Hex Washer Hd. Self Tapping Screw
114-217		#8 X 1/4" Hex Hd. Slotted Self Tapping Screw-Cad (9 used)
114-291		#8-32 X 7/16" Hex Hd. Slotted M. Screw - Steel N.P.
125-17		Rubber Grommet (5 used)
125-66		Rubber Grommet (2 used)
139-71		Speaker Baffle
166-44		Rubber Bumper (or 166-41)
202-662		Instruction Book (Phono & Chassis)
S-14958	L-1	Wavemagnet Assembly - Type 26 FR
S-14007		Non-Intermixer Record Changer
S-14657		Hinge Assembly

DIAL ASSEMBLY

12-1383		Dial Light Bracket (2 used)
26-387		Dial Scale
76-492		Tuning Control Shaft
78-769		Dual Dial Light Socket & Wire
80-69		Dial Cord Tension Spring
80-209		Dial Cord Tension Spring
97-284		Dial Cord Guide Stud
100-90	PL-1	Dial Light Bulb (2 used)
188-32		Retaining Ring
188-34		Retaining Ring
S-13827		Dial Cord Assembly (Short)
S-13828		Dial Cord Assembly (Long)
S-13830		Tuning Pulley & Bushing Assembly
S-14667		Dial Pointer & Pulley Assembly (59-214)

COIL & CHOKES

95-906	T-2	2nd I. F. Transformer
95-919	T-1	1st I. F. Transformer
S-12603	L-3	Phono Oscillator Coil Assembly (FM-Phono)
S-13799	L-2	Oscillator Coil Assembly

CONDENSERS

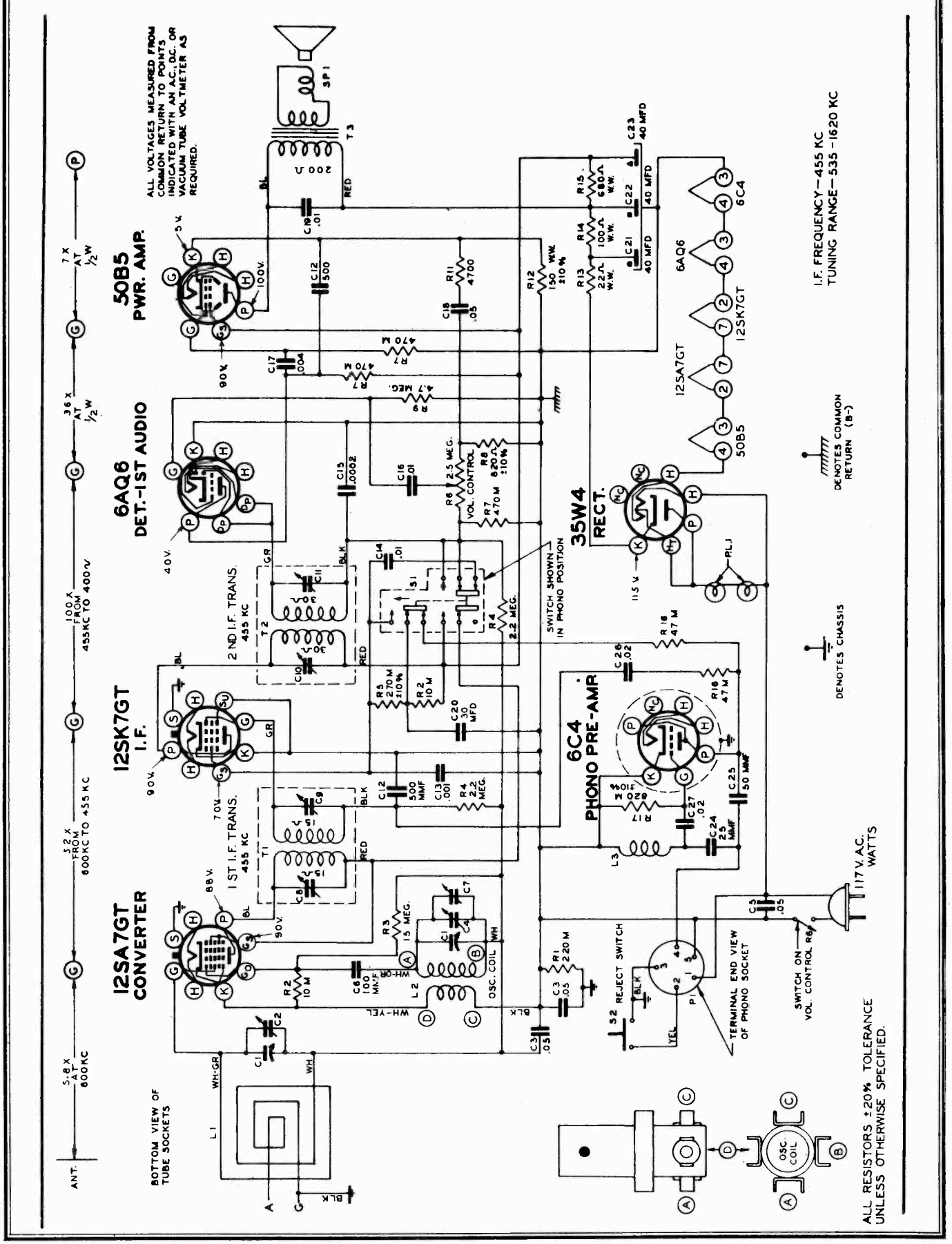
22-162	C-6	.0001 MFD (or 22-1669)	500 V.
22-178	C-18	.05 MFD	200 V.
22-188	C-26	.02 MFD	400 V.
22-196	C-16	.01 MFD	600 V.
22-243	C-14	.01 MFD	400 V.
22-327	C-27	.02 MFD	200 V.
22-448	C-17	.004 MFD	600 V.
22-716	C-29	.0005 MFD	500 V.
22-827	C-28	.1 MFD	200 V.
22-829	C-3	.05 MFD	200 V.
22-854	C-12	.0005 MFD	600 V.
22-953	C-15	.0002 MFD (or 22-1668)	500 V.
22-1017	C-5	.05 MFD	400 V.
22-1182	C-19	.01 MFD	400 V.
22-1444	C-13	.001 MFD	200 V.
22-1532	C-25	50 MMFD (or 22-1674)	500 V.
22-1657	C-1	Two Gang Variable	
22-1707	C20,21,22,23	Dry Electrolytic 40-40-40-30 MFD	150 V.
22-1758	C-24	25 MMFD Ceramic	500 V.

RESISTORS

63-686	R-12	150 ohm W. W.		$\frac{1}{2}$ W.
63-1219	R-13	22 ohm W. W.		$\frac{1}{2}$ W.
63-1220	R-14	100 ohm W. W.		1 W.
63-1221	R-15	680 ohm W. W.		1 W.
63-1555	R-6	Volume Control & Switch		
63-1653	R-10	Tone Control		
63-1782	R-8	820 ohm	(Insulated)	$\frac{1}{2}$ W.
63-1814	R-11	4700 ohm	(Insulated)	$\frac{1}{2}$ W.
63-1828	R-2	10 M ohm	(Insulated)	$\frac{1}{2}$ W.
63-1856	R-16	47 M ohm	(Insulated)	$\frac{1}{2}$ W.
63-1884	R-1	220 M ohm	(Insulated)	$\frac{1}{2}$ W.
63-1887	R-5	270 M ohm	(Insulated)	$\frac{1}{2}$ W.
63-1898	R-7	470 M ohm	(Insulated)	$\frac{1}{2}$ W.
63-1911	R-17	1 Megohm	(Insulated)	$\frac{1}{2}$ W.
63-1926	R-4	2.2 Megohm	(Insulated)	$\frac{1}{2}$ W.
63-1940	R-9	4.7 Megohm	(Insulated)	$\frac{1}{2}$ W.
63-1961	R-3	15 Megohm	(Insulated)	$\frac{1}{2}$ W.

ZENITH RADIO CORP.

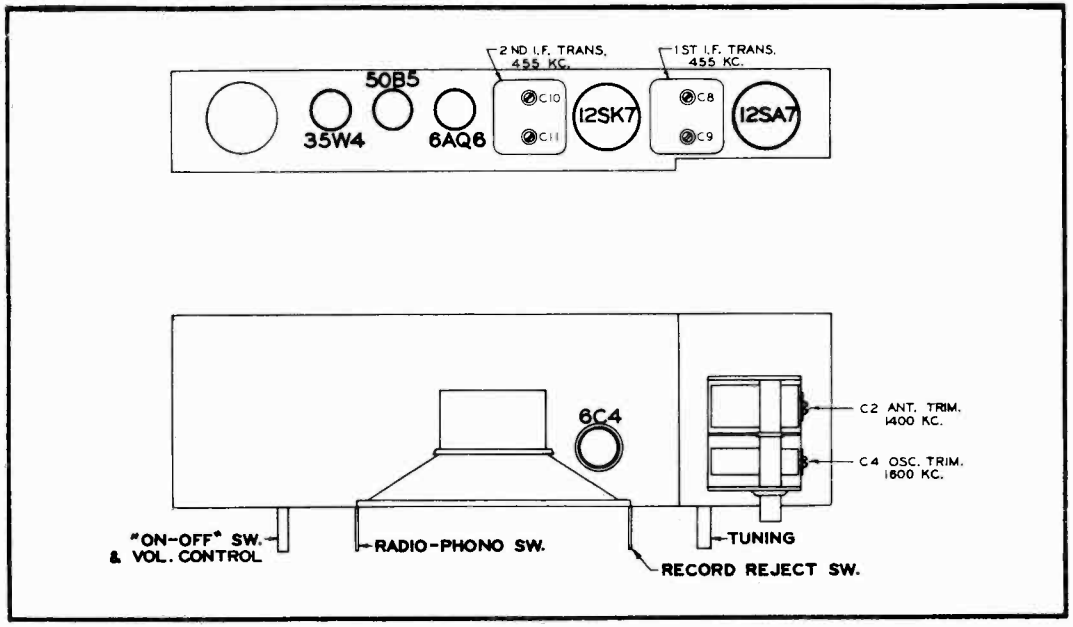
MODEL 6R886
Chassis 6E02



PARTS LIST

REFERENCE NUMBER	DIAGRAM NUMBER	DESCRIPTION
		CONDENSERS
22-1657	C1	2-Gang Variable . . . . .
ON C1	C2	Bc. Ant. Trim . . . . .
22-829	C3	.05 Mfd . . . . . .200 V.
ON C1	C4	Bc. Osc. Trimmer. . . . .
22-1017	C5	.05 Mfd . . . . . .400 V.
22-162	C6	100 Mmfd. . . . . .500 V.
ON C1	C7	Bc. Osc. Trim . . . . .
ON T1	C8	1st. I.F. Trans. Pri. Trim. . . . .
ON T1	C9	1st. IlF. Trans. Sec. Trim. . . . .
ON T2	C10	2nd. I.F. Trans. Pri. Trim. . . . .
ON T2	C11	2nd. I.F. Trans. Sec. Trim. . . . .
22-716	C12	.0005 Mfd . . . . . .500 V.
22-1444	C13	.001 Mfd. . . . . .200 V.
22-243	C14	.01 Mfd . . . . . .400 V.
22-963	C15	.0002 Mfd . . . . . .600 V.
22-196	C16	.01 Mfd . . . . . .600 V.
22-448	C17	.004 Mfd. . . . . .600 V.
22-178	C18	.05 Mfd . . . . . .200 V.
22-1182	C19	.01 Mfd . . . . . .400 V.
	C20	30 Mfd. Electro . . . . . .150 V.
	C21	40 Mfd. Electro . . . . . .150 V.
22-1707	C22	40 Mfd. Electro . . . . . .150 V.
	C23	40 Mfd. Electro . . . . . .150 V.
22-127	C24	25 Mmfd . . . . . .500 V.
22-1532	C25	50 Mmfd . . . . . .500 V.
22-188	C26	.02 Mfd . . . . . .400 V.
22-327	C27	.02 Mfd . . . . . .200 V.
		RESISTORS
63-1884	R1	220 M Ohm . . . . . .1/2 W.
63-1828	R2	10 M Ohm. . . . . .1/2 W.
63-1961	R3	15 Megohm . . . . . .1/2 W.
63-1926	R4	2.2 Megohm. . . . . .1/2 W.
63-1887	R5	270 M Ohm . . . . . .1/2 W.
63-1555	R6	2.5 Meg. Vol. Control . . . . .
63-1898	R7	470 M Ohm . . . . . .1/2 W.
63-1782	R8	820 Ohm . . . . . .1/2 W.
63-1940	R9	4.7 Megohm. . . . . .1/2 W.
63-1814	R11	4700 Ohm. . . . . .1/2 W.
63-686	R12	150 Ohm W. W. . . . . .1/2 W.
63-1219	R13	22 Ohm W. W . . . . . .1/2 W.
63-1220	R14	100 Ohm W. W. . . . . 1 W.
63-1221	R15	680 Ohm W. W. . . . . 1 W.
63-1856	R16	47 M Ohm. . . . . .1/2 W.
63-1908	R17	820 M Ohm . . . . . .1/2 W.
		COILS
S13817	L1	Wavemagnet Assem. . . . .
S13799	L2	Osc. Coil Assem . . . . .
S12603	L3	Osc. Coil Assem . . . . .
95-919	T1	1st. I.F. Trans . . . . .
95-906	T2	2nd. I.F. Trans . . . . .
95-1025	T3	Output Trans. . . . .
		MISCELLANEOUS
100-90	P.L.1	Pilot Light 3.2 V . . . . .
78-592	P1	5 Prong Phono Socket. . . . .
86-421	S1	Phono-Radio Switch. . . . .
85-422	S2	Reject Switch . . . . .
49-602	SP1	5-1/4" P.M. Speaker . . . . .
S13815		Hinge Assembly. . . . .
S13829		Dial Pointer and Pulley Assembly. . . . .
S14196		Escutcheon and Grille Cloth Assembly. . . . .
2-122		Cabinet Back. . . . .
13-1382		Hinge Support Bracket . . . . .
14-1086		Table Cabinet . . . . .
26-387		Dial Scale. . . . .
27-99		Felt Disc . . . . .
46-667		Tuning Control Knob . . . . .
46-669		Phono Switch Knob . . . . .
57-1105		Wavemagnet Lead Spacer Strip. . . . .
57-1320		Chassis Cover Plate . . . . .
80-407		Record Changer Mounting Spring. . . . .
80-569		Dial Scale Retaining Spring . . . . .
110-129		Grille Cloth. . . . .
112-544		Record Changer Mounting Screw . . . . .
139-71		Speaker Baffle. . . . .
166-13		Rubber Bumper . . . . .

11-1-47



TUBE AND TRIMMER LOCATION

Chassis 6E02 has a Record Reject push button switch on the receiver control panel to reject records.

The socket P1 is used to connect the automatic record changer to the receiver. The record player is connected to the receiver by a shielded cable and socket arrangement.

The Phono-Radio switch is a two position double acting push-button switch and when in the "in" position connects the changer for playing records.

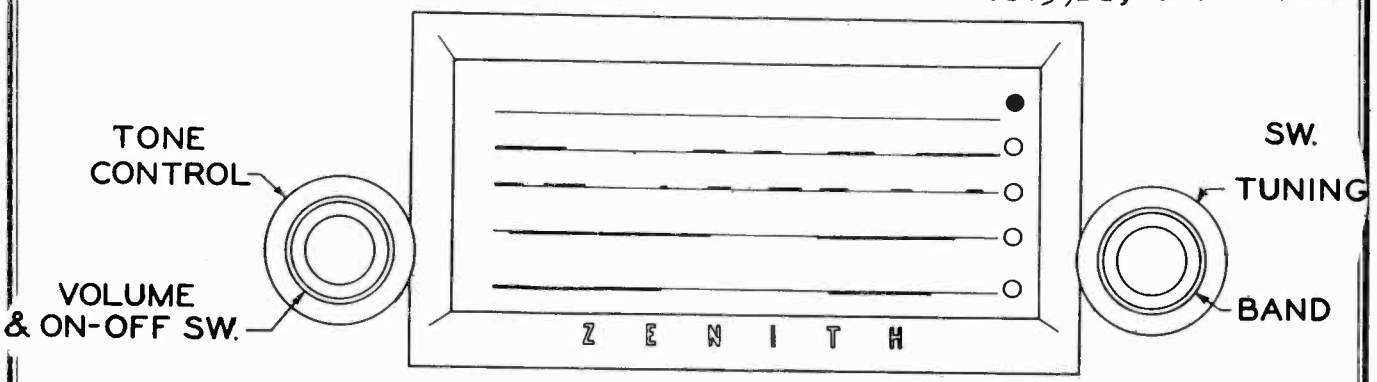
ALIGNMENT PROCEDURE

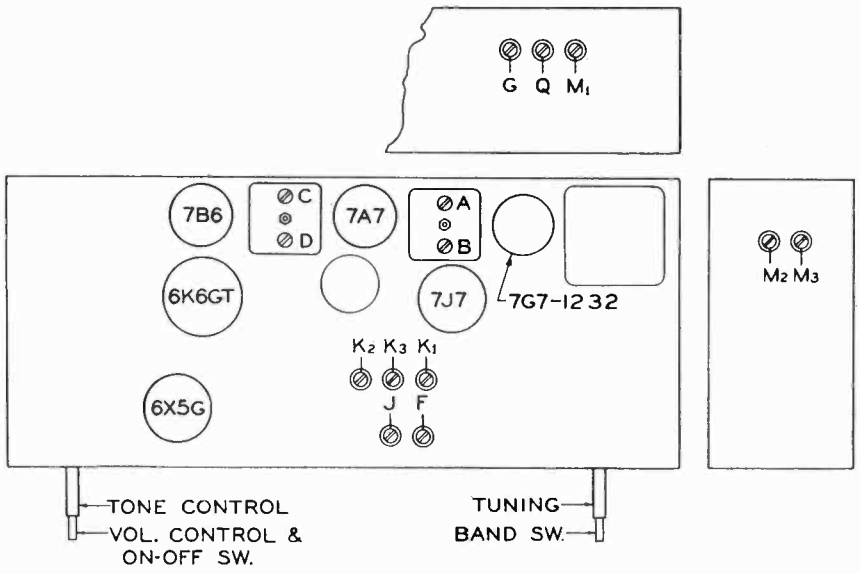
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 MFD	455 Kc.	1600 Kc.	C8, C9, C10, C11	Align I.F.
2	Single Turn Loop Loosely Coupled to Wavemagnet	------	1600 Kc.	1600 Kc.	C4	Set Oscillator to Dial Scale.
3		------	1400 Kc.	1400 Kc.	C2	Align Antenna.

MODELS 6S624CT, 6S643CT, Ch. 6B16CT

ZENITH RADIO CORP.

MODELS 6S643AT, 6S659AT, Ch. 6B16AT; 6S624BT, 6S643BT, 6S659BT, Ch. 6B16BT





Operation	Connect test osc. to	Dummy Ant.	Input signal frequency	Band	Set Dial	Adjust Trim	Purpose
1	1st det. Gnd.	.1 mfd.	455 kc.	BC	600 kc.	ABCD	Align IF
2	Ant. Gnd.	200 mmf.	1400 kc.	BC	1400 kc.	F	Set osc. to scale
3	Ant. Gnd.	200 mmf.	1400 kc.	BC	1400 kc.	G	Align Ant.
4	Ant. Gnd.	200 mmf.	600 kc.	BC	Rock at 600 kc.	J	Set Padder
5	Ant. Gnd.	400 ohm	6.5 mc.	SW2	6.5 mc.	Q	Align SW2
6	Ant. Gnd.	400 ohm	18.0 mc.	SW1	18.0 mc.	K1	Set osc. to scale
7	Ant. Gnd.	400 ohm	18.0 mc.	SW1	18.0 mc.	M1	Align Ant.
8	Ant. Gnd.	400 ohm	17.8 mc.	19-16m	17.8 mc.	K3	Set osc. to scale
9	Ant. Gnd.	400 ohm	17.8 mc.	19-16m	17.8 mc.	M3	Align Ant.
10	Ant. Gnd.	400 ohm	11.8 mc.	25-31m	11.8 mc.	K2	Set osc. to scale
11	Ant. Gnd.	400 ohm	11.8 mc.	25-31m	11.8 mc.	M2	Align Ant.

POWER

Under no circumstances should this receiver be connected to direct current (D.C.).

6B16AT — This chassis is designed to operate on 25 cycles alternating current (A.C.) and may be adjusted for use on 110–125–190–220 or 240 volts by means of the switch on top of the transformer.

6B16BT — This chassis is designed to operate on 50 to 100 cycle alternating current (A.C.) and may be adjusted for use on either 115 or 225 volts by means of the switch on the power transformer.

6B16CT — This chassis is designed to operate on 50 to 60 cycle alternating current (A.C.) and may be adjusted for use on either 95, 115 or 150 volts by means of the switch on the power transformer.

The total power consumption is 50 watts.

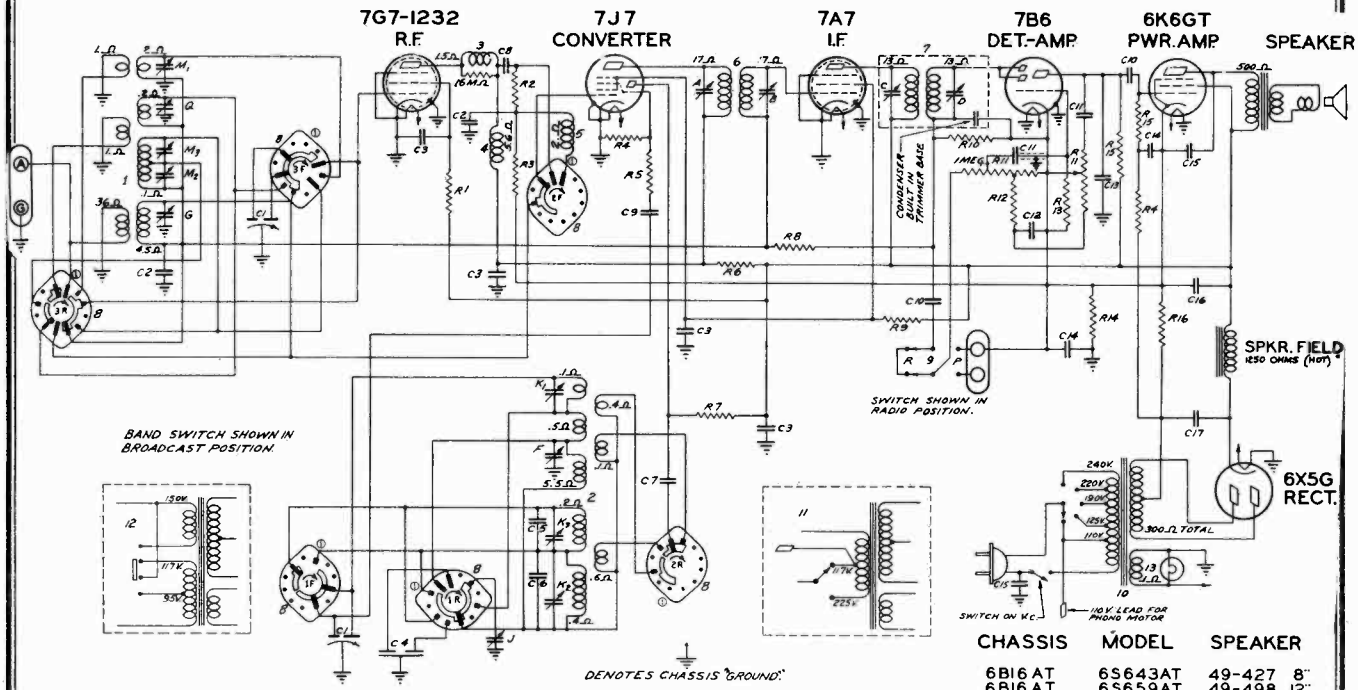
TUBES

The following tubes are used — (see Fig. 2):

7G7/1232 – 7J7 – 7A7 – 7B6 – 6K6GT – 6X5G

ZENITH RADIO CORP.

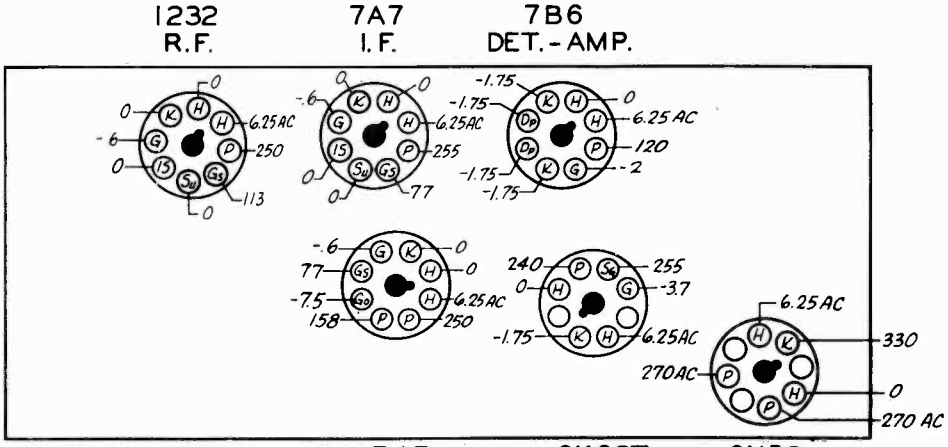
MODELS 6S643AT, 6S659AT, Ch. 6B16AT; 6S624BT, 6S643BT, 6S659BT, Ch. 6B16BT; 6S624CT, 6S643CT, Ch. 6B16CT



CHASSIS	MODEL	SPEAKER
6B16AT	6S643AT	49-427 8"
6B16AT	6S659AT	49-498 12"
6B16BT	6S624BT	49-419 6½"
6B16BT	6S643BT	49-427 8"
6B16BT	6S659BT	49-498 12"
6B16CT	6S624CT	49-419 6½"
6B16CT	6S643CT	49-427 8"

I.F. FREQUENCY 455 KC.
6 TUBE SUPERHETERODYNE
95-240 V. A.C. 5-BAND
CHASSIS Nº 6B16 AT-BT-CT

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION	DIAG LTR	DESCRIPTION
C1	22-1092	TWO GANG VARIABLE		R1	63-595	100 M OHM	½ W	2	59347	OSCILLATOR COIL ASSEMBLY	C	2ND I.F. TRANS. PRI.
C2	22-818	.05 MFD.	400 V.	R2	63-706	3300 OHM	½ W	3	58905	CHOKE & RES.	D	2ND I.F. " SEC.
C3	22-819	.05 MFD.	600 V.	R3	63-585	2200 OHM	½ W	4	58907	PLATE CHOKE "	F	BROADCAST OSC. (NOTE 1)
C4	22-708	DUAL PADDER		R4	63-593	47 M OHM	½ W	5	58908	GRID CHOKE "	G	BROADCAST ANT. (NOTE 2)
C5	22-1142	45 MMFD. COMP.		R5	63-621	39 OHM	½ W	6	95-757	1ST I.F. TRANSFORMER	J	BROADCAST MIXER (NOTE 1)
C6	22-116	40 MMFD. COMP.		R6	63-605	1000 OHM	½ W	7	95-758	2ND I.F. "	K_1	SHORTWAVE 1 OSC. (NOTE 3)
C7	22-716	.0003 MFD.	600 V.	R7	63-958	22 M OHM	1 W	8	85-245	BAND SELECTOR SWITCH	K_2	31-25 M. OSC. (NOTE 3)
C8	22-162	.0001 MFD.	600 V.	R8	63-271	1 MEGOHM	½ W	9	85-214	PHONO-RADIO SWITCH	K_3	19-16 M. OSC. (NOTE 3)
C9	22-1289	50 MMFD.	600 V.	R9	63-1157	47 M OHM	½ W	10	95-857	(PWR. TRANS. 105-125-210-240 V. 25~) 6B16AT	M_1	SHORTWAVE 1 ANT. (NOTE 2)
C10	22-815	.02 MFD.	600 V.	R10	63-597	470 M OHM	½ W			(PWR. TRANS. 105-125-210-240 V. 50-60~) 6B16BT	M_2	31-25 M. ANT. (NOTE 4)
C11	22-805	.006 MFD.	600 V.	R11	63-1136	VOLUME & TONE CONTROL		11	95-858	(PWR. TRANS. 115-225 V. 50-60~) 6B16BT	M_3	19-16 M. ANT. (NOTE 4)
C12	22-1120	.015 MFD.	400 V.	R12	63-712	33 M OHM	½ W			115-225 V. 50-60~	Q	SHORTWAVE 1 ANT. (NOTE 2)
C13	22-1117	.0005 MFD.	600 V.	R13	63-604	10 MEGOHM	½ W	12	95-859	(PWR. TRANS. 95-115-130 V. 50-60~) 6B16CT	NOTE	(1) TRIMMERS F, J ARE MOUNTED ON STRIP #22-1088
C14	22-821	.1 MFD.	400 V.	R14	63-975	82 OHM WIREWOUND	½ W	13	100-36	DIAL LIGHT 6.3 V. .25 A.		(2) TRIMMERS G, M & EQ ARE MOUNTED ON STRIP #22-1090
C15	22-806	.004 MFD.	1000 V.	R15	63-296	220 M OHM	½ W					(3) TRIMMERS K_1, K_2 & K_3 ARE MOUNTED ON STRIP #22-1091
C16	22-719	16 MFD. ELECTROLYTIC	350 V.	R16	63-1056	280 OHM WIREWOUND	2 W					(4) TRIMMERS M_2 & M_3 ARE MOUNTED ON STRIP #22-1089
C17	22-1097	20 MFD. "	450 V.					A		1ST I.F. TRANS. PRI.		
				1	58909	ANTENNA COIL ASSEMBLY		B		1ST I.F. " SEC.		



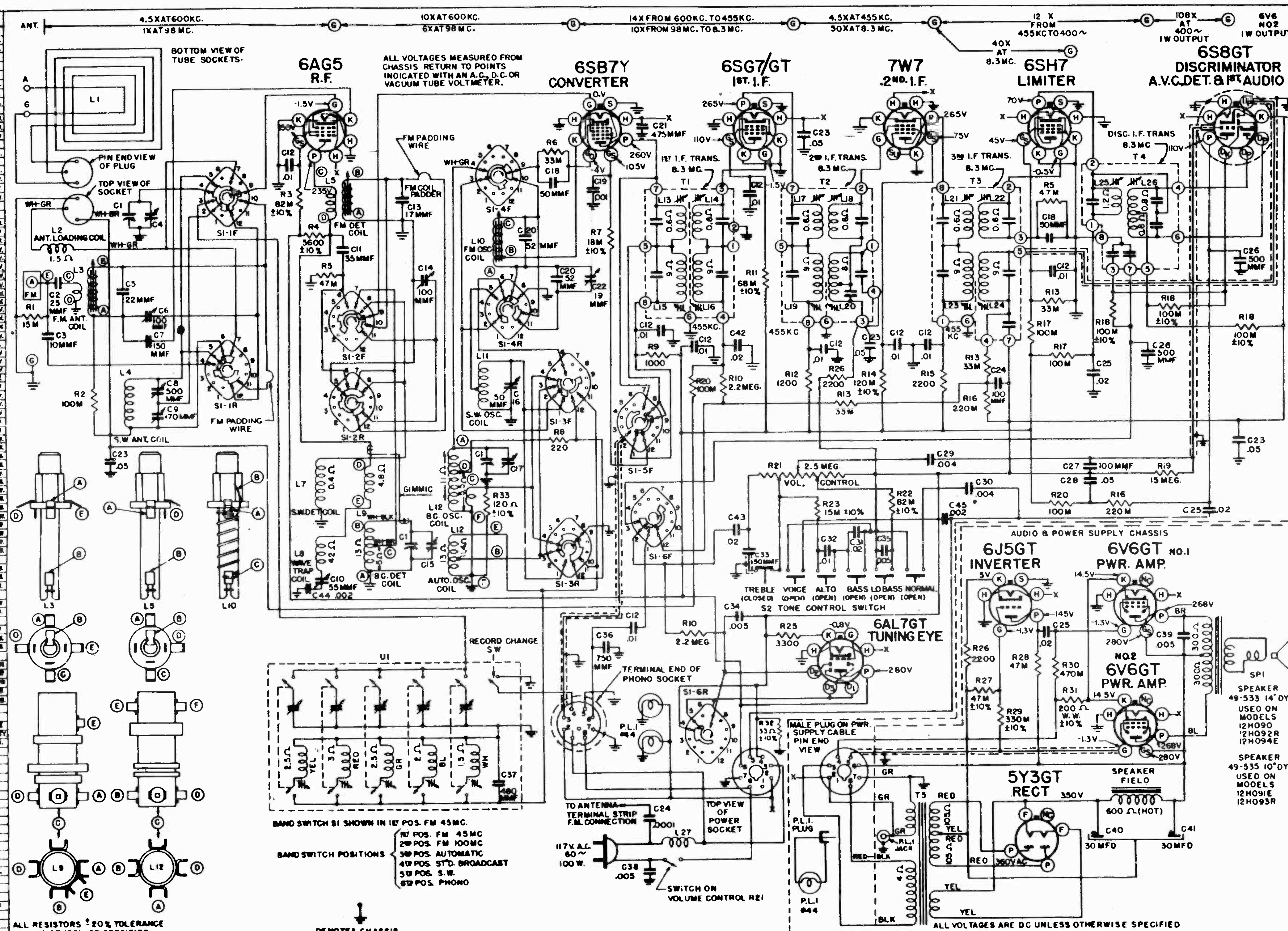
SOCKET VOLTAGES — BOTTOM VIEW

MODELS 12H090,12H091,12H092,12H093, 12H094, Chassis 11C21 Late

ZENITH RADIO CORP.

DIAG. No.	PART No.	DESCRIPTION
C1	22-1363	3-GANG VARIABLE
C2	22-1507	25 MMFD. CER. 500 V.
C3	22-1504	10 MMFD. CER. 500 V.
C4	ON C1	BROADCAST ANT. TRIM.
C5	22-1506	22 MMFD CER. 500 V.
C6	22-1493	FM ANTENNA TRIM.
C7	22-1503	150 MMFD. 500 V.
C8	22-1497	S.W. ANT. TRIM.
C9		S.W. ANT. TRIM.
C10		WAVE TRAP TRIMMER
C11	22-1508	35 MMFD CER. 500 V.
C12	22-196	.01 MFD. 600 V.
C13	22-1505	17 MMFD CER. 500 V.
C14	22-1494	FM DET. TRIMMER
C15	ON C1	BROADCAST DET. TRIM.
C16	22-1502	S.W. OSC. TRIMMER
C17	ON C1	BROADCAST OSC. TRIM.
C18	22-1367	50 MMFD. CER. 500 V.
C19	22-1169	.001 MFD. MICA 600 V.
C20	22-1509	52 MMFD CER. 500 V.
C21	27-87	475 MMFD. MICA DISC.
C22	22-1514	F.M. OSC. TRIMMER
C23	22-879	.05 MFD. 200 V.
C24	22-162	100 MMFD. MICA 600 V.
C25	22-830	.02 MFD. 600 V.
C26	22-1138	500 MMFD MICA 600 V.
C27	22-365	100 MMFD MICA 600 V.
C28	22-171	.05 MFD 600 V.
C29	22-1362	.004 MFD. 600 V.
C30	22-448	.004 MFD ±10% 600 V.
C31	22-1127	.02 MFD. 400 V.
C32	22-1126	.01 MFD. 400 V.
C33	22-289	50 MMFD MICA 600 V.
C34	22-319	.005 MFD 200 V.
C35	22-1135	.005 MFD 600 V.
C36	22-242	750 MMFD MICA 500 V.
C37	22-848	480 MMFD SILVER MICA
C38	22-1041	.005 MFD 400 V.
C39	22-1257	.005 MFD 1000 V.
C40	22-1406	30 MFD. ELECTRO 450 V.
C41		30 MFD. " 450 V.
C42	22-1306	.02 MFD. 200 V.
C43	22-189	.02 MFD. 400 V.
C44	22-912	.002 MFD. 600 V.
C45	22-492	.002 MFD 600 V.
R1	63-607	15 M OHM 1/2 W.
R2	63-715	100 M OHM 1/2 W.
R3	63-885	82 M OHM 1/2 W.
R4	63-1448	5600 OHM 1/2 W.
R5	63-593	47 M OHM 1/4 W.
R6	63-712	33 M OHM 1/4 W.
R7	63-510	18 M OHM 2 W.
R8	63-579	220 OHM 1/4 W.
R9	63-603	1000 OHM 1/2 W.
R10	63-600	2.2 MEGOHM 1/4 W.
R11	63-900	68 M OHM 1/2 W.
R12	63-1446	1200 OHM 1/2 W.
R13	63-592	33 M OHM 1/4 W.
R14	63-1447	120 M OHM 1/2 W.
R15	63-803	2200 OHM 1/2 W.
R16	63-298	220 M OHM 1/4 W.
R17	63-380	100 M OHM 1 W.
R18	63-260	100 M OHM 1/4 W.
R19	63-976	15 MEGOHM 1/4 W.
R20	63-596	100 M OHM 1/4 W.
R21	63-1399	2.5 MEG-VOL. CONTROL
R22	63-[illegible]	82 M OHM 1/4 W.
R23	63-908	15 M OHM 1/4 W.
R25	63-586	3300 OHM 1/4 W.
R26	63-566	2200 OHM 1/4 W.
R27	63-748	47 M OHM 1/4 W.
R28	63-1187	47 M OHM 1 W.
R29	63-637	330 M OHM 1/4 W.
R30	63-597	470 M OHM 1/4 W.
R31	63-1199	200 OHM WIREWOUND 5 W.
R32	63-820	33 OHM 1/4 W.
R33	63-826	120 OHM 1/4 W.
L1	S12101	WAVEMAGNET TYPE 30E
L2	S12029	ANT. LOADING COIL ASSY.
L3	S12301	F.M. ANT. COIL ASSEM.
L4	S12262	S.W. ANT. " "
L5	S12302	F.M. SEC. " "
L7	S12291	S.W. DET. COIL ASSEM.
L8	S12281	WAVE TRAP " "
L9	S12293	B.C. DET. " "
L10	S12303	F.M. OSC. " "
L11	S12298	S.W. OSC. " "
L12	S11344	BC & AUTO OSC. " "
L13	ON T1	1st I.F. TRANS. PRI. FM
L14	ON T1	1st I.F. " SEC. FM
L15	ON T1	1st I.F. " PRI.
L16	ON T1	1st I.F. " SEC.
L17	ON T2	2nd I.F. TRANS. PRI. FM
L18	ON T2	2nd I.F. " SEC. F.M.
L19	ON T2	2nd I.F. " PRI.
L20	ON T2	2nd I.F. " SEC.
L21	ON T3	3rd I.F. TRANS. PRI. FM
L22	ON T3	3rd I.F. " SEC. FM
L23	ON T3	3rd I.F. " PRI.
L24	ON T3	3rd I.F. " SEC.
L25	ON T4	DISC. I.F. TRANS. PRI.
L26	ON T4	DISC. I.F. SEC.
L27	S12256	A.C. LINE CHOKE COIL ASSY.
PL	100-39	PILOT LIGHT 6.3V. .15A.
S1	S-12366	BAND SWITCH ASSEM.
S2	S-1248	TONE " "
SP1	49-533	14" DYNAMIC SPEAKER

T1	S12249	1st I.F. TRANS.
T2	S12250	2nd I.F. TRANS.
T3	S12251	3rd I.F. TRANS.
T4	S12252	DISC. I.F. TRANS.
T5	95-921	POWER TRANSFORMER
U1	S12534	AUTOMATIC TUNING UNIT
SP1	49-536	10" DYNAMIC SPK. FFR



MODELS 12H090 – 12H091 – 12H092 – 12H093 – 12H094

CHASSIS No. 11C21

ZENITH RADIO CORP.

MODELS 12H090,12H091, 12H092,12H093,12H094

Late

TO THE SERVICE MAN:

The 11C21 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

AM Alignment:. The alignment of this chassis on the short wave and standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool (fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments. The second 8.3 Mc IF stage is overcoupled. Overcoupling gives a wide band pass with good sensitivity. When an overcoupled stage is aligned with an unmodulated signal, the stage must be loaded. A 300 ohm carbon resistor soldered across the secondary of the second IF transformer provides a satisfactory load for this circuit. The resistor leads must be kept short to reduce the distributed capacity of the circuit.

When aligning a loaded stage, it will be found that considerable signal from the generator will be required, and that it will tune broadly. THE LOAD RESISTOR MUST BE REMOVED AFTER ALIGNMENT.

If the signal generator used does not have sufficient output to overcome the temporary loss caused by the load resistor, the load resistance may be increased or the signal fed into the preceding stage.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 9) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.

HUM COMPLAINT: Check for excessive length of the a-c line cord inside the main chassis between the point of entrance and the solder lugs. This slack may be in close proximity of the tone control leads.

DIFFERENCES IN 11C21-11C21Z CHASSIS: Sets using chassis 11C21Z are equipped with FM speakers. FM speakers cannot be used on 11C21 chassis. When ordering speaker replacements specify 11C21 or 11C21Z chassis.

IMPROVING FM RECEPTION: In FM Consoles a cabinet FM antenna may be added in addition to the line antenna. This antenna is made up of two 28-inch lengths of wire. One wire is connected to the FM antenna post, the other to chassis. The two wires are then tacked in the cabinet in opposite directions, and should not come in contact with ground.

HOWL ON FM: FM howl may be caused by the speaker vibrating the oscillator slug. A fiber spacer between the oscillator, and detector slug shafts in the FM tuner will eliminate vibration. A thin rubber band tied to the center of the oscillator slug shaft and upper frame will also eliminate the howl.

INCREASING BASS RESPONSE ON PHONO: To increase the bass response on records, the value of R5 in the phono-preamplifier may be increased. Do not increase the value to over 10,000 ohms or audio howl may be heard.

STRIPPED IF THREAD INSERTS: Damaged IF slug thread inserts may be replaced by unscrewing the slug, and pushing out the old insert. Two types of inserts are used, 83-1063 short, and 83-1069 long.

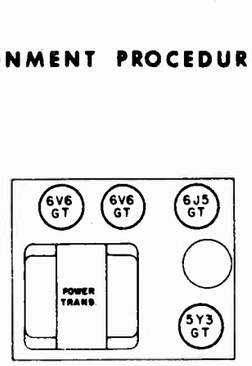
WAVE TRAP TRIMMER SHORTS OUT: A .002 mfd 600 volt condenser has been added in series with the grounded side of the wave trap.

MODELS 12H090,12H091, 12H092,12H093,12H094

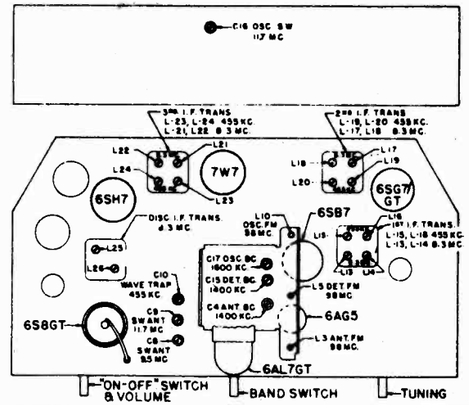
Late

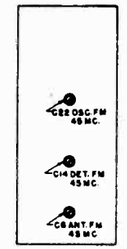
ZENITH RADIO CORP.

ALIGNMENT PROCEDURE



AUDIO & POWER SUPPLY





Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L15,16,19,20,23 and 24	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	455 Kc. Modulated	Aut.	Press any button on Auto.	C10	Adjust wavetrap to minimum
3	2 Turns loosely coupled to wavemag.		1600 Kc. Modulated	BC	1600 Kc.	C17	Set oscillator to dial scale
4	2 turns loosely coupled to wavemag.		1400 Kc. Modulated	BC	1400 Kc.	C15 & C4	Align det. and ant. stages
5	Antenna Post (Remove line ant.)	400 ohms	11.7 Mc. Modulated	SW	11.7 Mc.	C16	Set oscillator to dial scale
6	Antenna Post (Remove line ant.)	400 ohms	11.7 Mc. Modulated	SW	11.7 Mc.	C9	Align ant. stage
7	Antenna Post (Remove line ant.)	400 ohms	9.7 Mc. Modulated	SW	9.7 Mc.	C8	Align ant. stage Repeat Oper. 6 for maximum output
8 (a)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L25 coil slug primary disc.	Align primary of discriminator for maximum reading
9 (b)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L26 coil slug sec. of discr.	Adjust secondary of discr. for zero reading
10 (c)	Pin 6 (grid) on 7W7 2nd IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L21 & L22 prim. & sec. of 3rd IF transformer	Align 3rd IF transformer for maximum reading
11 (c) (d)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L17 & L18 prim. & sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading
12 (c) (d)	Pin 8(grid)on 6SB7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM 45		L13 & L14 prim. & sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
13 (c)	Antenna Post (remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L10 Osc. coil Slug	Set oscillator to dial scale
14 (c)	Antenna Post (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 and L3 Det. and RF coil slugs	Align det. and Ant. stage to maximum reading
15 (c)	Antenna Post (remove line ant.)	270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C22.	Set oscillator to dial scale
16 (c)	Antenna Post (remove line ant.)	270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C14 and C6	Align detector and ant. stages for maximum reading

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead must be shielded.

An ordinary AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)
(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4 to chassis).
(d) 300 ohm ½ watt carbon resistor soldered across the secondary L18 (pin 2 and 3 of 2nd IF trans.). The leads to the resistor must be as short as possible and the resistor removed before operation 13 is started.