Most - Often - Needed

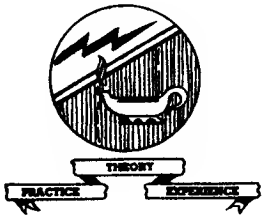
1948

RADIO DIAGRAMS

and Servicing Information

Compiled by

M. N. BEITMAN



SUPREME PUBLICATIONS
CHICAGO

MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

INDEX

Always use this complete Index to find description of the radio you are servicing.

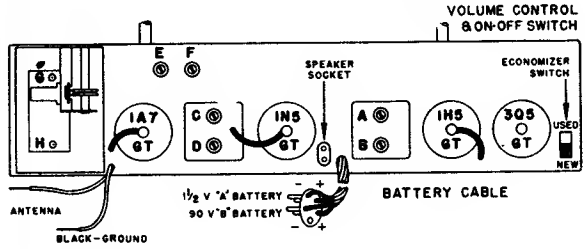
Continued on page 4

MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

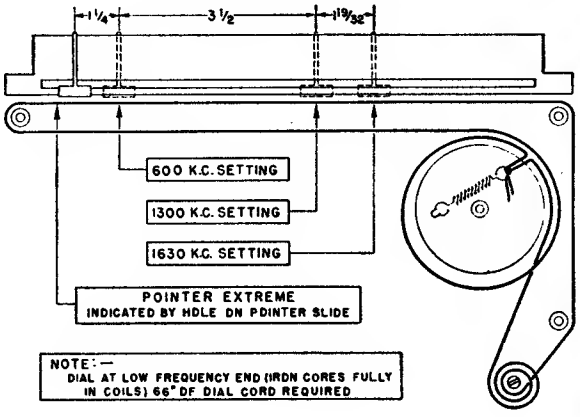
Admiral

CHASSIS **4B1**
MODELS **7T06, 7T12**

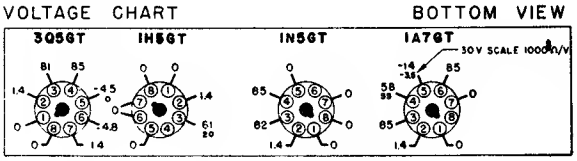
TUBE AND TRIMMER LOCATION



STRINGING DIAGRAM



VOLTAGE CHART — BOTTOM VIEW



VOLTAGE DATA

All readings made between tube socket terminals and chassis. Voltages indicated have been obtained using a Vacuum Tube Voltmeter. A second voltage reading is shown made with a 1000 ohm-per-volt meter, when use of this instrument would result in appreciably lower readings. Measured with a fresh battery, volume control full on, dial at the high frequency end, no signal.

Occasionally audio oscillation may occur in the 4B1 chassis with the volume control in an intermediate position. Should you encounter this trouble, reverse the leads of the primary of the output transformer or ground the speaker frame to the chassis. The speaker leads and grid lead of the 1H5 should be kept as far as possible from the 3Q5 output tube.

RESISTORS

Symbol	Description	Part No.
R1	15,000 ohm ½ Watt	60B B-153
R2	470,000 ohm ¼ Watt	60B 2-474
R3	220,000 ohm ½ Watt	60B B-224
R4	33,000 ohm ½ Watt	60B B-333
R5, RB	4,700,000 ohm ¼ Watt	60B 2-475
R6	2,200,000 ohm ¼ Watt	60B 2-225
R7	1 meg. Vol. Control	75B 1-1
R9, R10	1,000,000 ohm ¼ Watt	60B 2-105
R11	390 ohm ¼ Watt	60B 2-391
R12	.75 ohm ½ Watt (wire)	61A 2-1
R13	2200 ohm ¼ Watt	60B 2-222

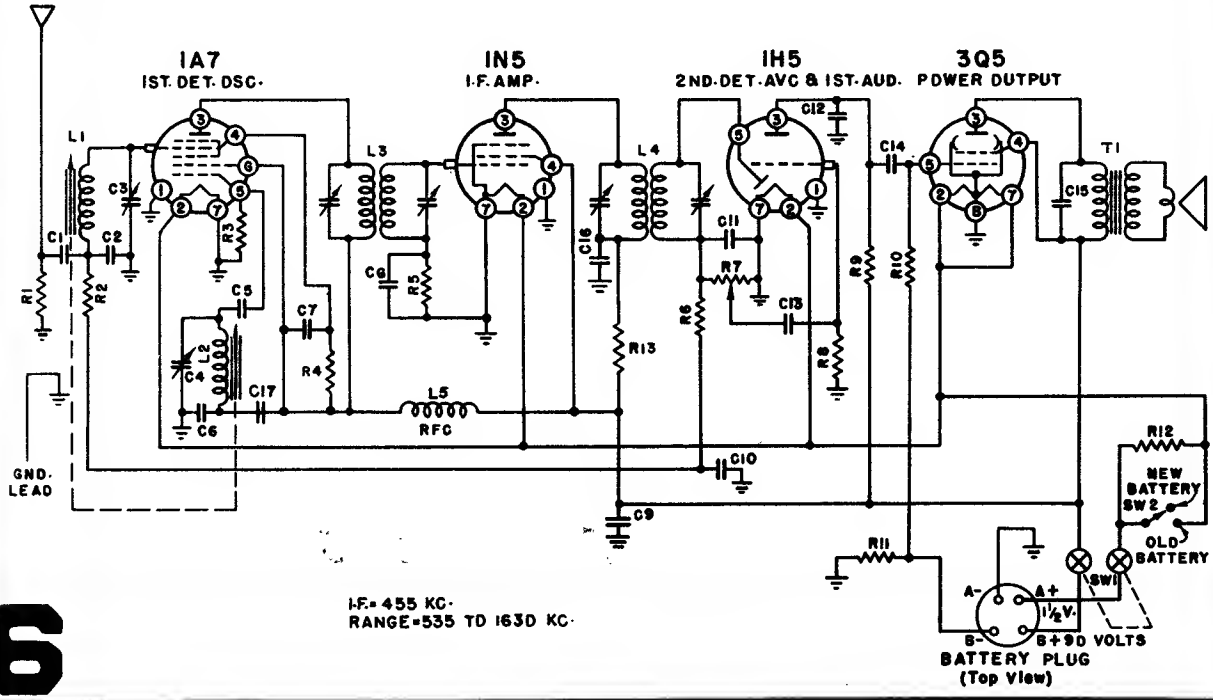
TRANSFORMERS and COILS

Symbol	Description	Part No.
L1	Antenna Coil	AC105-1
L2	Oscillator Coil	A1020
L3	1st I.F. Transformer	72B 5
L4	2nd I.F. Transformer	72B 6
L5	Choke Coil (RF)	AB103-1
T1	Output Transformer	9BA 5

CONDENSERS

	Description	Part No.
C1	.01 mfd. 400 Volts	64B 1-25
C2	.0008 mfd., Mica	65B 5-31
C3	Trimmer, Antenna }	66A 9-1
C4	Trimmer, Oscillator }	
C5	.0001 mfd., Mica	65B 7-17
C6	.0008 mfd., Mica	65B 5-31
C7	.01 mfd., 400 Volts	64B 1-25
C8	.002 mfd., 600 Volts	64B 1-14
C9	4. mfd., 150 Volts (Elect)	67A 4-2
C10	.05 mfd., 200 Volts	64B 1-32
C11	.00025 mfd., Mica	65B 7-22
C12	.00025 mfd., Mica	65B 7-22
C13	.01 mfd., 400 Volts	64B 1-25
C14	.01 mfd., 400 Volts	64B 1-25
C15	.005 mfd., 600 Volts	64B 1-12
C16	.01 mfd., 400 Volts	64B 1-25
C17	.01 mfd., 400 Volts	64B 1-25

(C17 omitted in early models)



I.F. = 455 KC.
RANGE = 535 TO 1630 KC.

MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

CHASSIS **5H1**

MODELS **7P32, 7P33, 7P34**

Admiral

ALIGNMENT PROCEDURE

1. Disconnect Loop Antenna leads from clips on set and remove chassis from cabinet.
2. Make alignment using a battery whenever possible.
3. Connect a fresh battery to the set.

IMPORTANT: Check dial drum position on shaft. Tuner arm should just complete downward travel when gang is fully meshed. At this point, tuner arm should be on short flat part of cam. Check pointer. It should be at last dial scale mark just below 550 K.C. when gang is fully meshed. If not, move pointer on dial cord.

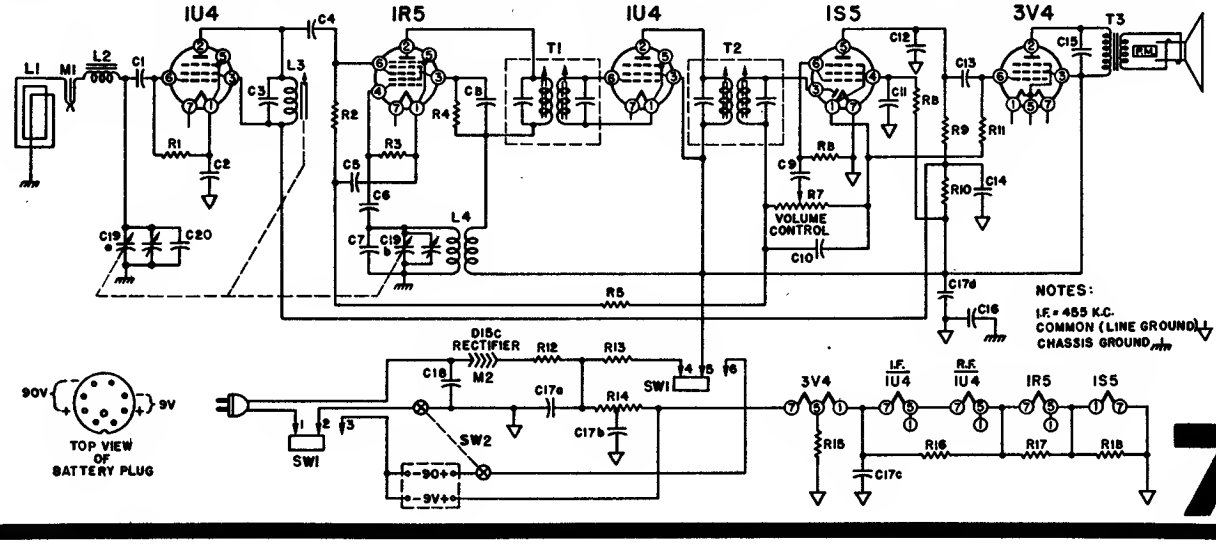
Step	Dummy Antenna Used in Series with Signal Generator	Connect High Side Signal Generator to	Signal Generator Frequency	Receiver Gang Setting	Trimmer Designation and Description	Type of Adjustment
(1)	.00025 Mfd. when using A.C. .1 Mfd. when using Battery	Grid of 1R5 (Pin 6)	455 K.C.	Any point where it does not affect Signal	2nd I.F. 1st I.F.	Maximum Deflection Then repeat
(2)	.00025 Mfd. when using A.C. .1 Mfd. when using Battery	Stator lug of rear variable condenser section	1620 K.C.	Tuning Gang Wide Open	Oscillator Trimmer	Maximum Deflection
(3)	.00025 Mfd. when using A.C. .1 Mfd. when using Battery	Stator lug of rear variable condenser section	1400 K.C.	Tune in Generator Signal	R.F. Slug	Maximum Deflection
(4)	Replace Set in Cabinet					
(5)	.00025 Mfd.	Antenna and Ground Leads	1400 K.C.	Tune in Generator Signal	Antenna Trimmer	Maximum Deflection

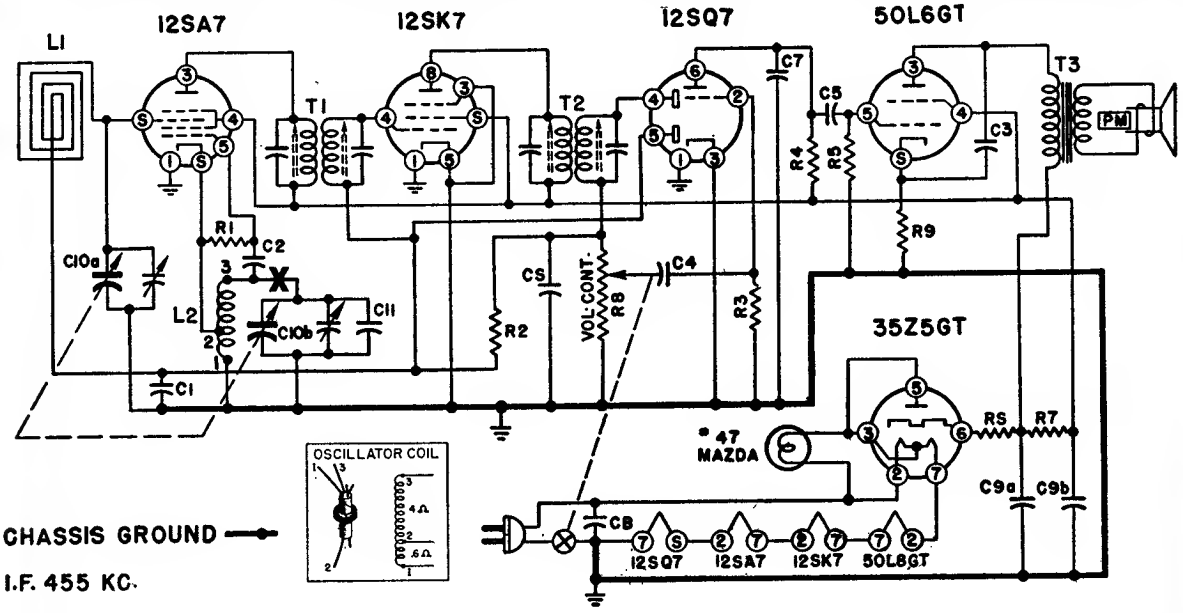
RESISTORS

Symbol	Description	Part No.
R1	2.2 Megohms, 1/4 Watt	60B 3-225
R2	1 Megohm, 1/4 Watt	60B 3-105
R3	100,000 Ohms, 1/4 Watt	60B 3-104
R4	18,000 Ohms, 1/3 Watt	60B 2-183
R5	3.3 Megohms, 1/4 Watt	60B 2-335
R6	10 Megohms, 1/4 Watt	60B 3-106
R7	1 Megohm Volume Control and Switch SW2 (DPST)	75B 1-1B
R8	4.7 Megohms, 1/4 Watt	60B 2-475
R9	470,000 Ohms, 1/4 Watt	60B 3-474
R10	10,000 Ohms, 1/4 Watt	60B 3-103
R11	2.2 Megohms, 1/4 Watt	60B 3-225
R12	47 Ohms, 1 Watt	60B 14-470
R13	2700 Ohms, 1 Watt	60B 14-272
R14	2600 Ohms, 5 Watt	61A 6-1
R15	1500 Ohms, 1/4 Watt	60B 2-152
R16	B20 Ohms, 1/4 Watt	60B 2-B21
R17	220 Ohms, 1/4 Watt	60B 2-221
R18	150 Ohms, 1/4 Watt	60B 2-151

CONDENSERS

C1	250 Mmfd., Mica	65B 7-22
C2	.25 Mfd., 200 Volts, Paper	64B 1-2B
C3	420 Mmfd., Mica	65B 1-13
C4	250 Mmfd., Mica	65B 7-22
C5	.01 Mfd., 400 Volts, Paper	64B 1-25
C6	100 Mmfd., Mica	65B 7-17
C7	15 Mmfd., Ceramic	65B 6-1B
C8	.01 Mfd., 400 Volts, Paper	64B 1-25
C9	.01 Mfd., 400 Volts, Paper	64B 1-25
C10	250 Mmfd., Mica	65B 7-22
C11	.01 Mfd., 400 Volts, Paper	64B 1-25
C12	100 Mmfd., Mica	65B 7-17
C13	.01 Mfd., 400 Volts, Paper	64B 1-25
C14	4 Mfd., 150 Volts, Electrolytic	67A 4-2
C15	.002 Mfd., 600 Volts, Paper	64B 1-14
C16	.1B Mfd., 200 Volts, Paper	64A 2-2
C17a	50 Mfd., 150 Volts, Elect.	67C 7-5
C17b	20 Mfd., 150 Volts, Elect.	
C17c	200 Mfd., 25 Volts, Elect.	
C17d	20 Mfd., 150 Volts, Elect.	
C18	.05 Mfd., 400 Volts, Paper	64B 1-22
C19a	0 to 420 Mmfd., Gang	68B 6
C19b	0 to 162 Mmfd., Gang	
C20	10 Mmfd., Ceramic	65B 6-24





UL5K1

1. **.05 mfd. condenser added at point "X" in oscillator circuit.**
2. **B minus is isolated from chassis by 150,000 ohm resistor and .18 mfd. condenser in parallel.**
3. **Gang condenser grounded to chassis and not connected to B minus as in above circuit.**

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CHASSIS **5K1**

MODELS **7T10, 7T14, 7T15**

RESISTORS

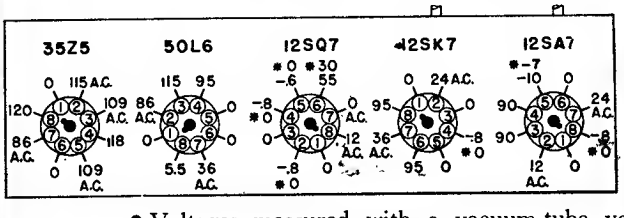
Symbol	Description	Part No.
R1	22,000 Ohms, ½ Watt	60B B-223
R2	1 Megohm, ½ Watt	60B B-105
R3	4.7 Megohms, ½ Watt	60B B-475
R4	470,000 Ohms, ½ Watt	60B B-474
R5	470,000 Ohms, ½ Watt	60B B-474
R6	33 Ohms, 1 Watt	60B 2B-3
R7	1000 Ohms, 1 Watt	60B 2B-2
R8	1 Megohm Volume Control and Switch	75B 1-16
R9	150 Ohms, ½ Watt	60B B-151

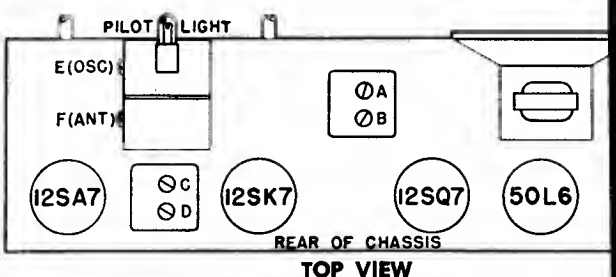
CONDENSERS

C1	.1 mfd., 200 Volts, Paper	64B 1-30
C2	50 mmfd., ±20%, Ceromic	65B 6-4
C3	.02 mfd., 400 Volts, Paper	64B 1-24
C4	.01 mfd., 400 Volts, Paper	64B 1-25
C5	.01 mfd., 400 Volts, Paper	64B 1-25
C6	250 mmfd., ±20%, Ceromic	65B 6-5
C7	500 mmfd., ±20%, Ceromic	65B 6-6
C8	.05 mfd., 400 Volts, Paper	64B 1-22
C9a	50 mmfd., 150 Volts } Elec.	67A 10
C9b	30 mmfd., 150 Volts } Elec.	67A 10
C10a	Gong, 0 to 420 mmfd. }	A1460
C10b	Gong, 0 to 162 mmfd. } (Spot welded to drum)	A1460
C11	20 mmfd., ±20%, Ceromic	65B 6-26

Connect Signal Generator to—	Dummy Antenna Between Radio and Generator	Set Generator Frequency to—	Set Receiver Dial Frequency to—	Adjust Following Trimmers	Type of Adjustment
Tuning Condenser Antenna Stator	250 mmfd. Condenser	455 K.C.	High frequency end of Dial	A-B—2nd I. F. C-D—1st I. F. (See note below)	Adjust to maximum Output
Tuning Condenser Antenna Stator	250 mmfd. Condenser	1630 K.C.	High frequency end of Dial	E—Osc.	Adjust to maximum Output
Loop radiator (or place lead from generator close to loop of set to obtain adequate signal).	No actual connection between set and generator.	1400 K.C.	Tune in generator signal	F—Ant.	Adjust to maximum Output

Note: In some sets, the B and D adjustments must be made from the underside of the chassis.





• Voltages measured with a vacuum-tube voltmeter. A second voltage reading (marked with an asterisk *) indicates readings made with a 1000 ohm-per-volt meter.

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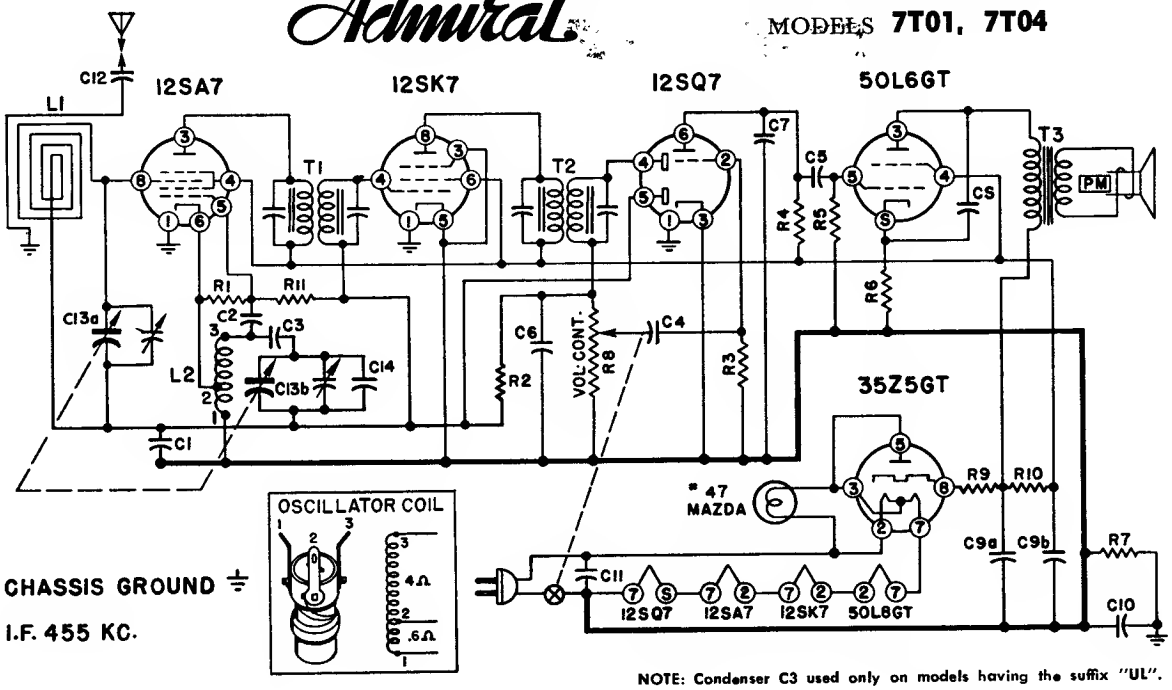
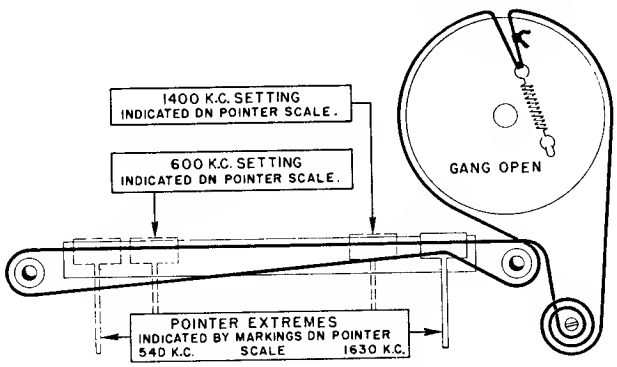
CHASSIS **5 N 1**
MODELS **7T01, 7T04**

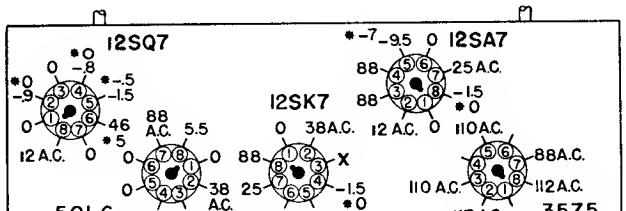


NOTE: Condenser C3 used only on models having the suffix "UL".

DIAL CORD STRINGING & POINTER SETTING



VOLTAGE CHART



- All readings made between tube socket terminals and pin 3 of 12SK7 (marked "X" on Voltage Chart.
- Voltages measured on a 117 Volt A.C. line.
- Dial turned to low frequency end, no signal.
- Voltages measured with a vacuum-tube voltmeter. A second voltage reading (marked with an asterisk *) indicates readings made with a 1000 ohm-per-volt meter when use of this instrument would result in appreciably lower readings.

RESISTORS

Symbol	Description	Part No.
R1	22,000 Ohms, ½ Watt	60B B-223
R2	1 Megohm, ½ Watt	60B B-105
R3	4.7 Megohms, ½ Watt	60B B-475
R4	470,000 Ohms, ½ Watt	60B B-474
R5	470,000 Ohms, ½ Watt	60B B-474
R6	150 Ohms, ½ Watt	60B B-151
R7	150,000 Ohms, ½ Watt	60B B-154
R8	1 Megohm Volume Control & Switch	75B 1-6
R9	33 Ohms, 1 Watt	60B 2B-3
R10	1,000 Ohms, 1 Watt	60B 2B-2
R11	10 Megohms, ¼ Watt	60B 2-106

CONDENSERS

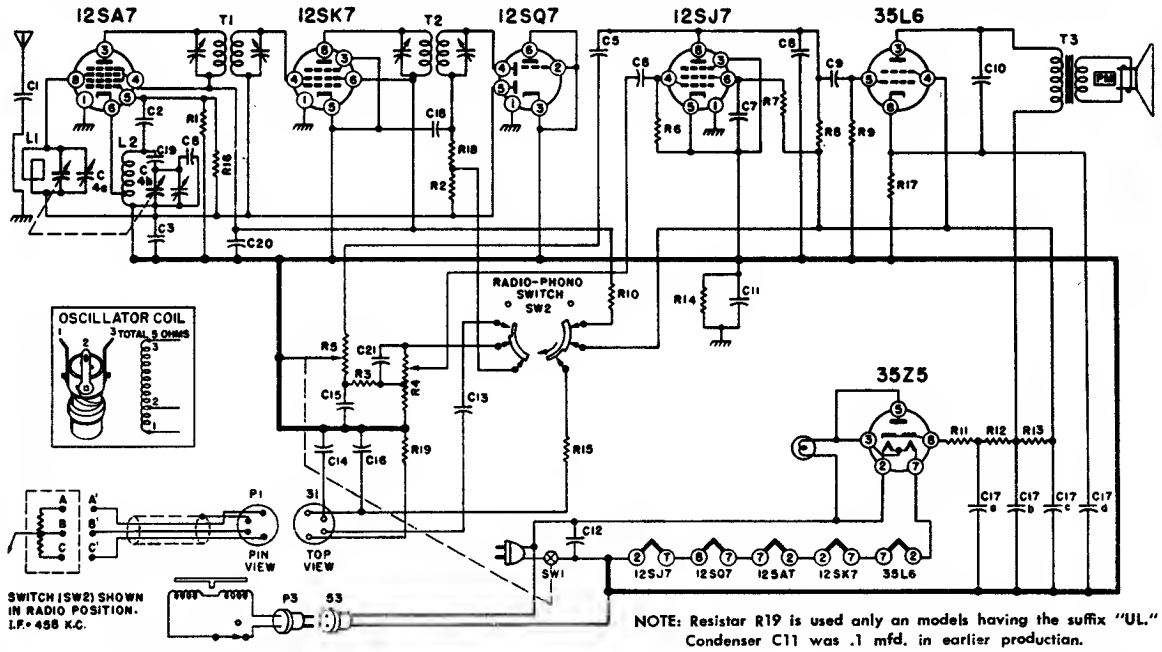
C1	.1 mfd., 200 Volts, Paper	64B 1-30
C2	50 mmfd., Ceramic	65B 6-4
C3	.02 mfd., 400 Volts, Paper	64B 1-24
C4	.01 mfd., 400 Volts, Paper	64B 1-25
C5	.01 mfd., 400 Volts, Paper	64B 1-25
C6	250 mmfd., Ceramic	65B 6-5
C7	500 mmfd., Ceramic	65B 6-6
C8	.02 mfd., 400 Volts, Paper	64B 1-24
C9a	50 mmfd., 150 Volts Elec.	67A 3
C9b	30 mmfd., 150 Volts Elec.	67A 3
C10	.1 mfd., 400 Volts, Paper	64B 1-20
C11	.05 mfd., 400 Volts, Paper	64B 1-22
C12	.005 mfd., 600 Volts, Paper	64B 1-12
C13a	Gang, 0 to 420 mmfd.	A1364
C13b	Gang, 0 to 162 mmfd. (Spot welded to drum)	A1364
C14	15 mmfd., Ceramic	65B 6-18

COILS, TRANSFORMERS, ETC.

L1	Antenna, Loop (Includes C12)	69B 4
L2	Coil, Oscillator	69A 14
T1	Transformer, 1st I.F.	72B 31
T2	Transformer, 2nd I.F.	72B 32
T3	Transformer, Output	98A 4
	Speaker (5" PM) and Output Transformer (Can also use 7BB 1B-1)	7BB 1B-2

MISCELLANEOUS

Description	Part No.
Bötton, Snap (for Dial Background)	13A 1-3-47
Cabinet, Black Plastic (7T01E)	34D 1-3 N
Cabinet, Ivory Plastic (7T01C)	34D 1-1 N
Cabinet, Mahogany Plastic (7T01M)	34D 1-2 N



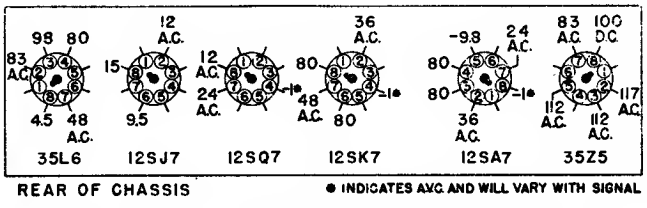
NOTE: Resistar R19 is used anly an models having the suffix "UL." Condenser C11 was .1 mfd. in earlier productian.

RESISTORS

Symbol	Description	Part No.
R1	22,000 Ohms, ½ Watt	60B 8-223
R2	1 Megahm, ½ Watt	60B 8-105
R3	27,000 Ohms, ½ Watt	60B 8-273
R4	1 Megohm Volume Cantral (Tapped at 500,000 ohms)	75B 2-6
R5	2 Megahm Tane Cantral and Switch SW1	75B 1-12
R6	4.7 Megahms, ½ Watt	60B 8-475
R7	1.8 Megohms, ½ Watt	60B 8-185
R8	100,000 Ohms, ½ Watt	60B 8-104
R9	470,000 Ohms, ½ Watt	60B 8-474
R10	100 Ohms, ½ Watt	60B 8-101
R11	33 Ohms, 1 Watt	60B 2B-3
R12	220 Ohms, 1 Watt	60B 2B-7
R13	1,000 Ohms, 1 Watt	60B 2B-2
R14	150,000 Ohms, ½ Watt	60B 8-154
R15	22,000 Ohms, ½ Watt	60B 8-223
R16	10 Megahms, ½ Watt	60B 8-106
R17	150 Ohms, 1 Watt	60B 14-151
R18	100,000 Ohms, ½ Watt	60B 8-104
R19	33,000 Ohms, ½ Watt	60B 8-333

CONDENSERS

C1	.005 mfd., 600 Volts, Paper	64B 1-12
C2	50 mmfd. ±20%, Ceramic	65B 6-4
C3	.1 mfd., 200 Volts, Paper	64B 1-30
C4a, C4b	Gang, 0 to 420 mmfd. / Gang, 0 to 162 mmfd.	68B 5
C5	.002 mfd., 600 Volts, Paper	64B 1-14
C6	.01 mfd., 400 Volts, Paper	64B 1-25
C7	.05 mfd., 400 Volts, Paper	64B 1-22
C8	15 mmfd. ±20%, Ceramic	65B 6-18
C9	.01 mfd., 400 Volts, Paper	64B 1-25
C10	.03 mfd., 400 Volts, Paper	64B 1-23
C11	.18 mfd., 200 Volts, Paper	64A 2-2
C12	.05 mfd., 400 Volts, Paper	64B 1-22
C13	.001 mfd., 600 Volts, Paper	64B 1-15
C14	.05 mfd., 400 Volts, Paper	64B 1-25
C15	.01 mfd., 400 Volts, Paper	64B 1-24
C16	.1 mfd., 200 Volts, Paper	64B 1-30
C17a	30 mfd., 150 Volts	Elect. 67A 14-1
C17b	30 mfd., 150 Volts	
C17c	20 mfd., 150 Volts	
C17d	20 mfd., 25 Volts	
C18	250 mmfd. ±20%, Ceramic	65B 6-5
C19	.02 mfd., 200 Volts, Paper	64B 1-24
C20	.05 mfd., 400 Volts, Paper	64B 1-22
C21	500 mmfd. ±20%, Ceramic	65B 6-6



REAR OF CHASSIS

● INDICATES AVC AND WILL VARY WITH SIGNAL

- Measured on a 117 Volt A.C. line.
- Volume control full on.
- Dial tuned to low frequency end, no signal.
- Voltage obtained on Vacuum Tube Voltmeter.

Connect Signal Generator to—	Dummy Antenna Between Radio and Generator	Set Generator Frequency to—	Set Receiver Dial Frequency to—	Adjust Following Trimmers	Type of Adjustment
Tuning Condenser Antenna Stator	250 mmfd. Condenser	455 K.C.	High frequency end of Dial	A-B—2nd I. F. C-D—1st I. F.	Adjust to maximum Output
Tuning Condenser Antenna Stator	250 mmfd. Condenser	1630 K.C.	High frequency end of Dial	E—Osc.	Adjust to maximum Output
Loop radiator (or place lead from generator close to loop of set to obtain adequate signal)	No actual connection between set and generator.	1400 K.C.	Tune in generator signal	F—Ant. (See Note)	Adjust to maximum Output

Note: Antenna Trimmer "F" must be aligned after chassis and loop are mounted in cabinet. This adjustment can be made thru the small round hole located in the rear of the cabinet.

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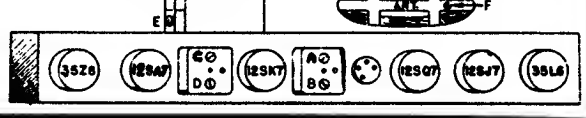
CHASSIS **6L1**

MODELS **7RT41, 7RT42, 7RT43**



MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

Admiral

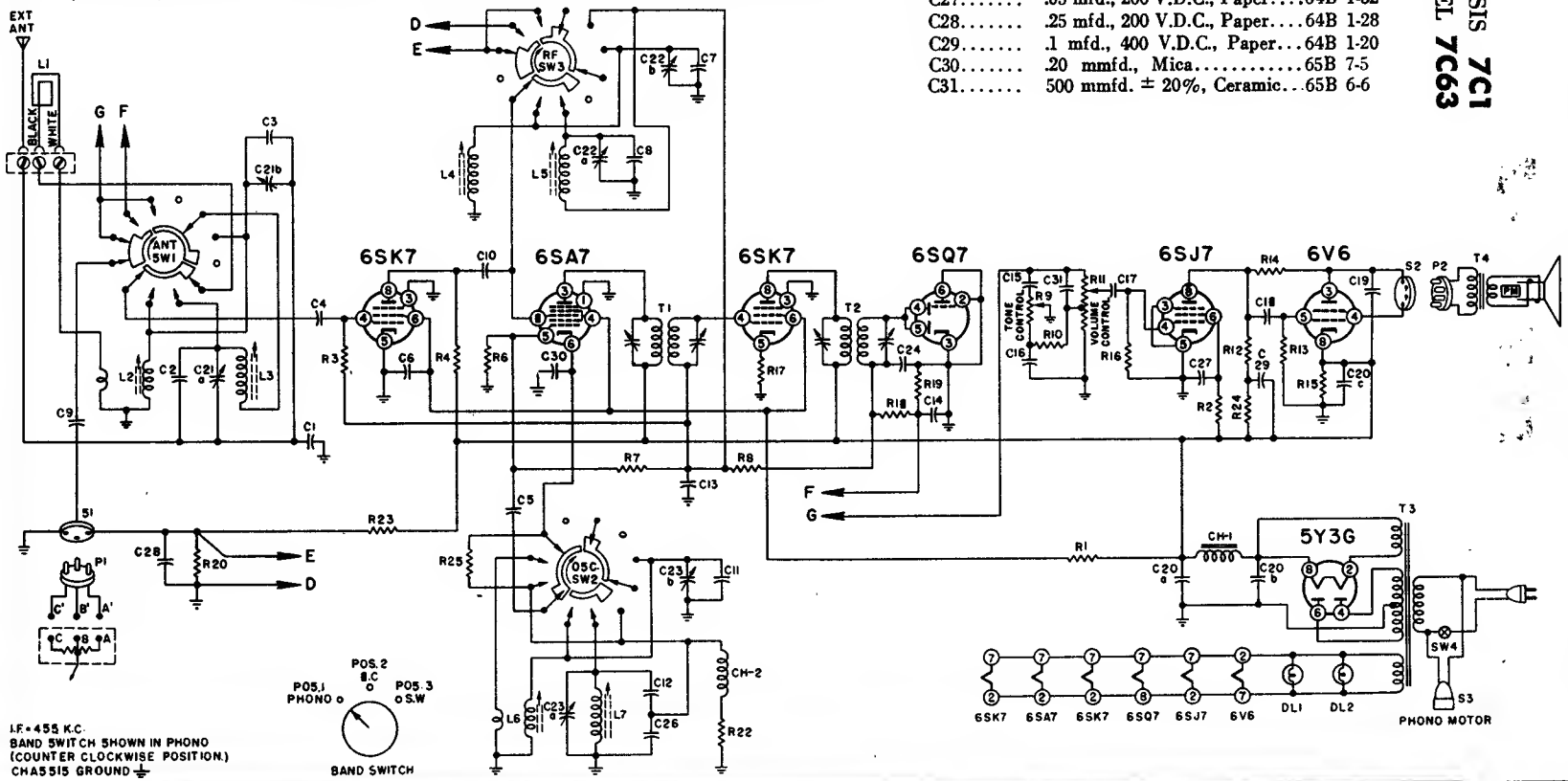
CHASSIS 7C1
MODEL 7C63

RESISTORS

SYMBOL	DESCRIPTION	PART NO.
R1	12,000 Ohms, 5 Watt	61A 1-1
R2	2.2 Megohms, Carbon, ½ Watt	60B 8-225
R3	470,000 Ohms, ½ Watt	60B 8-474
R4	10,000 Ohms, 2 Watt	60B 20-103
R6	22,000 Ohms, ½ Watt	60B 8-223
R7	10 Megohms, ½ Watt	60B 8-106
R8	1 Megohm, ½ Watt	60B 8-105
R9	2 Megohms Tone Control	75B 1-8
R10	27,000 Ohms, ½ Watt	60B 8-273
R11	1 Megohm Volume Control and Switch SW4 Tapped at 500,000 Ohms	75B 2-2
R12	470,000 Ohms, ½ Watt	60B 8-474
R13	470,000 Ohms, ½ Watt	60B 8-474
R14	3.3 Megohms, ½ Watt	60B 8-335
R15	390 Ohms, 1 Watt	60B 14-391
R16	10 Megohms, ½ Watt	60B 8-106
R17	100 Ohms, ½ Watt	60B 8-101
R18	220,000 Ohms, ½ Watt	60B 8-224
R19	100,000 Ohms, ½ Watt	60B 8-104
R20	100,000 Ohms, ½ Watt	60B 8-104
R22	100 Ohms, ½ Watt	60B 8-101
R23	100,000 Ohms, 1 Watt	60B 14-104
R24	47,000 Ohms, ½ Watt	60B 8-473
R25	470 Ohms, ½ Watt	60B 8-471

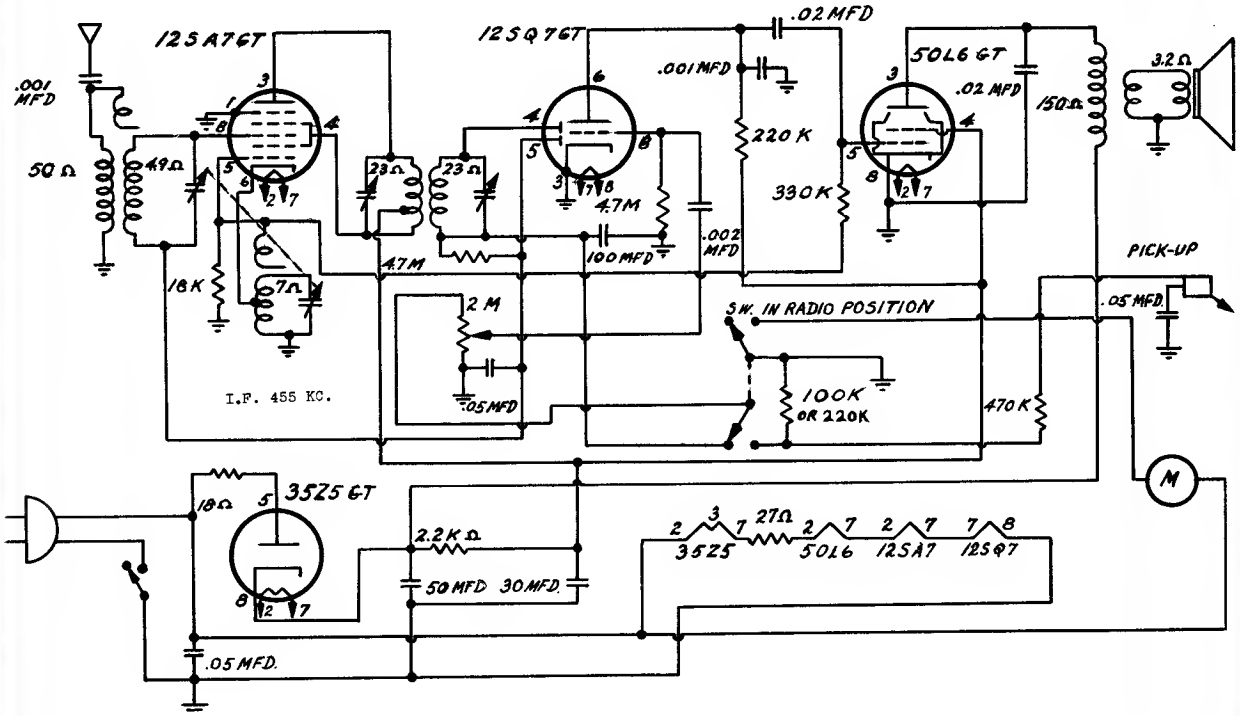
CONDENSERS

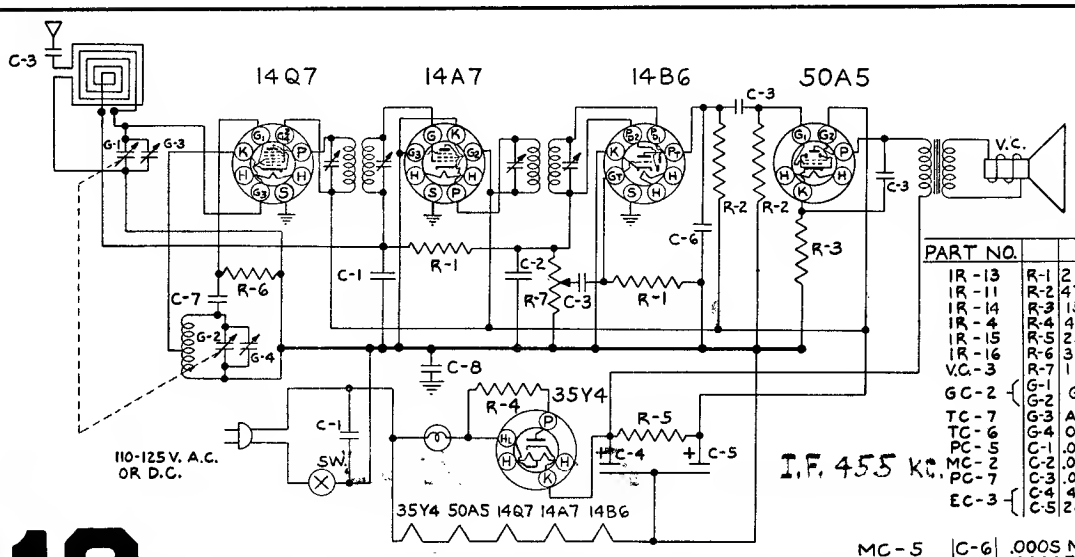
C1	1000 mmfd., Mica	65B 7-33
C2	35 mmfd., Silver Mica 3%	65B 1-31
C3	25 mmfd., Silver Mica 3%	65B 1-28
C4	100 mmfd., Mica	65B 7-17
C5	50 mmfd., Ceramic	65B 6-4
C6	.05 mfd., 400 V.D.C., Paper	64B 1-22
C7	65 mmfd., Silver Mica 3%	65B 1-27
C8	420 mmfd., Silver Mica	65B 1-13
C9	1000 mmfd., Mica	65B 7-33
C10	200 mmfd., Mica 2%	65B 7-5
C11	65 mmfd., Silver Mica 3%	65B 1-27
C12	200 mmfd., Silver Mica, 2%	65B 1-14
C13	.1 mfd., 400 V.D.C., Paper	64B 1-20
C14	250 mmfd., Mica	65B 7-22
C15	1000 mmfd., Mica	65B 7-33
C16	.02 mfd., 400 V.D.C., Paper	64B 1-24
C17	.01 mfd., 400 V.D.C., Paper	64B 1-25
C18	.005 mfd., 600 V.D.C., Paper	64B 1-12
C19	.01 mfd., 600 V.D.C., Paper	64B 1-10
C20a	30 mfd., 350 V.D.C., Elec.	67C 6-25
C20b	30 mfd., 350 V.D.C., Elec.	67C 6-25
C20c	20 mfd., 25 V.D.C., Elec.	67C 6-25
C21a	3-40 mmfd., Dual Trimmer	66A 1-5
C21b	3-40 mmfd., Dual Trimmer	66A 1-5
C22a	3-40 mmfd., Trimmer	66B 8-1
C22b	3-40 mmfd., Trimmer	66B 8-1
C23a	3-40 mmfd., Trimmer	66B 8-1
C23b	3-40 mmfd., Trimmer	66B 8-1
C24	100 mmfd., Mica	65B 7-17
C26	1,200 mmfd., Mica	65B 5-34
C27	.05 mfd., 200 V.D.C., Paper	64B 1-32
C28	.25 mfd., 200 V.D.C., Paper	64B 1-28
C29	.1 mfd., 400 V.D.C., Paper	64B 1-20
C30	.20 mmfd., Mica	65B 7-5
C31	500 mmfd. ± 20%, Ceramic	65B 6-6



I.F. = 455 K.C.
BAND SWITCH SHOWN IN PHONO (COUNTER CLOCKWISE POSITION.)
CHASSIS GROUND ⏚

AIRKING RADIO Model 470-1





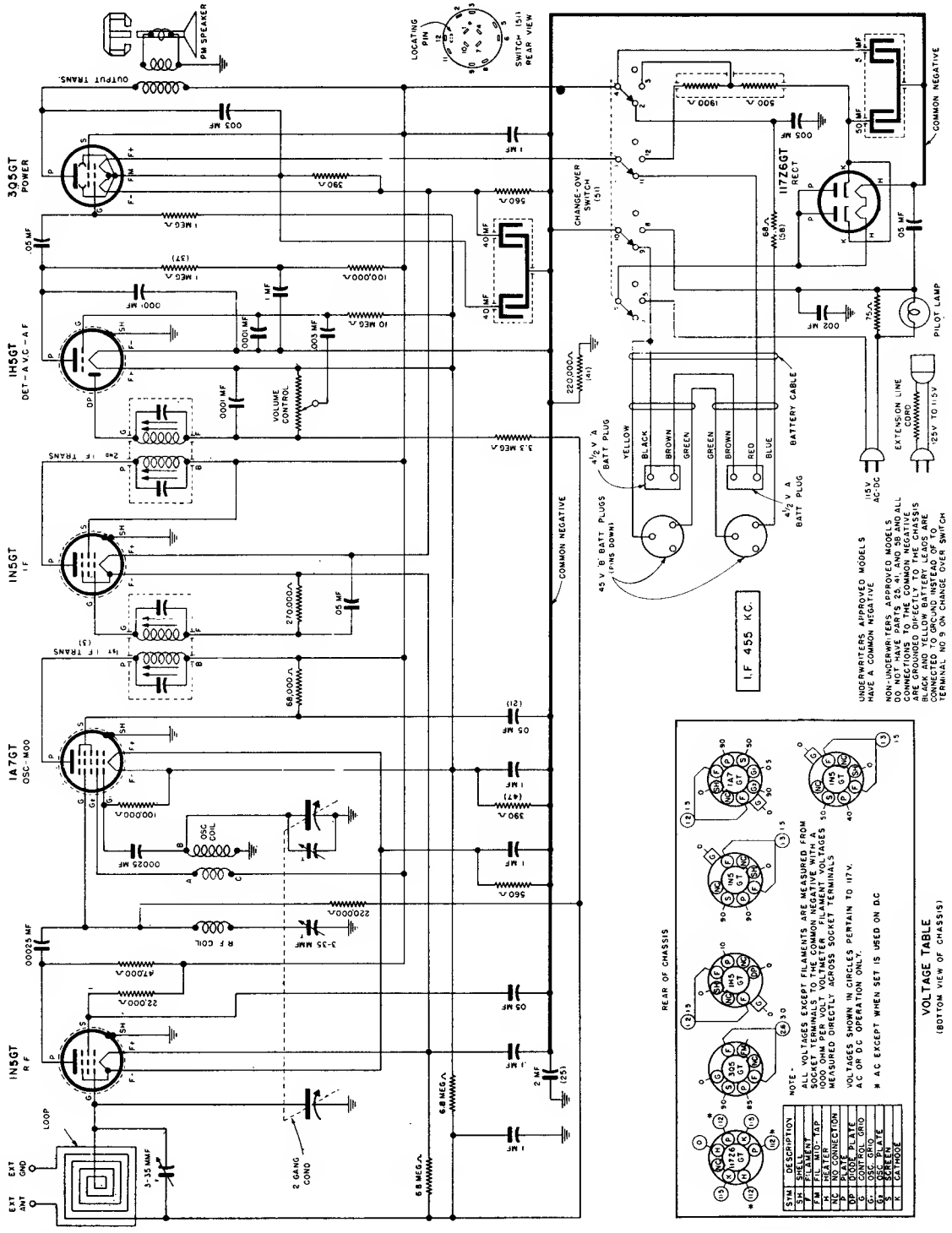
I.F. 455 KC.

PART NO.		DESCRIPTION
IR-13	R-1	2 MEG. RESISTOR ½W 20%
IR-11	R-2	470M " " "
IR-14	R-3	150 " " "
IR-4	R-4	47 " " "
IR-15	R-5	2200 " " "
IR-16	R-6	33,000 " " "
V.C.-3	R-7	1 MEG. VOLUME CONTROL
GC-2	G-1, G-2	GANG COND.
TC-7	G-3	ANT. TRIMMER COND.
TC-6	G-4	OSC. TRIMMER COND.
PC-5	C-1	.05 MFD. COND. 400 V.
MC-2	C-2	.0001 MFD. MICA 20%
PC-7	C-3	.01 MFD. COND. 400 V.
EC-3	C-4	40 MFD. 150 V.
	C-5	20 MFD. ELECTROLYTIC
MC-5	C-6	.0005 MFD. COND. 20%
MC-4	C-7	.000056 MFD. MICA 20%
PC-9	C-8	.1 MFD COND. 400 V.

Allied Radio Corp.
Models 5B175, 5B176, 5C175, 5C176

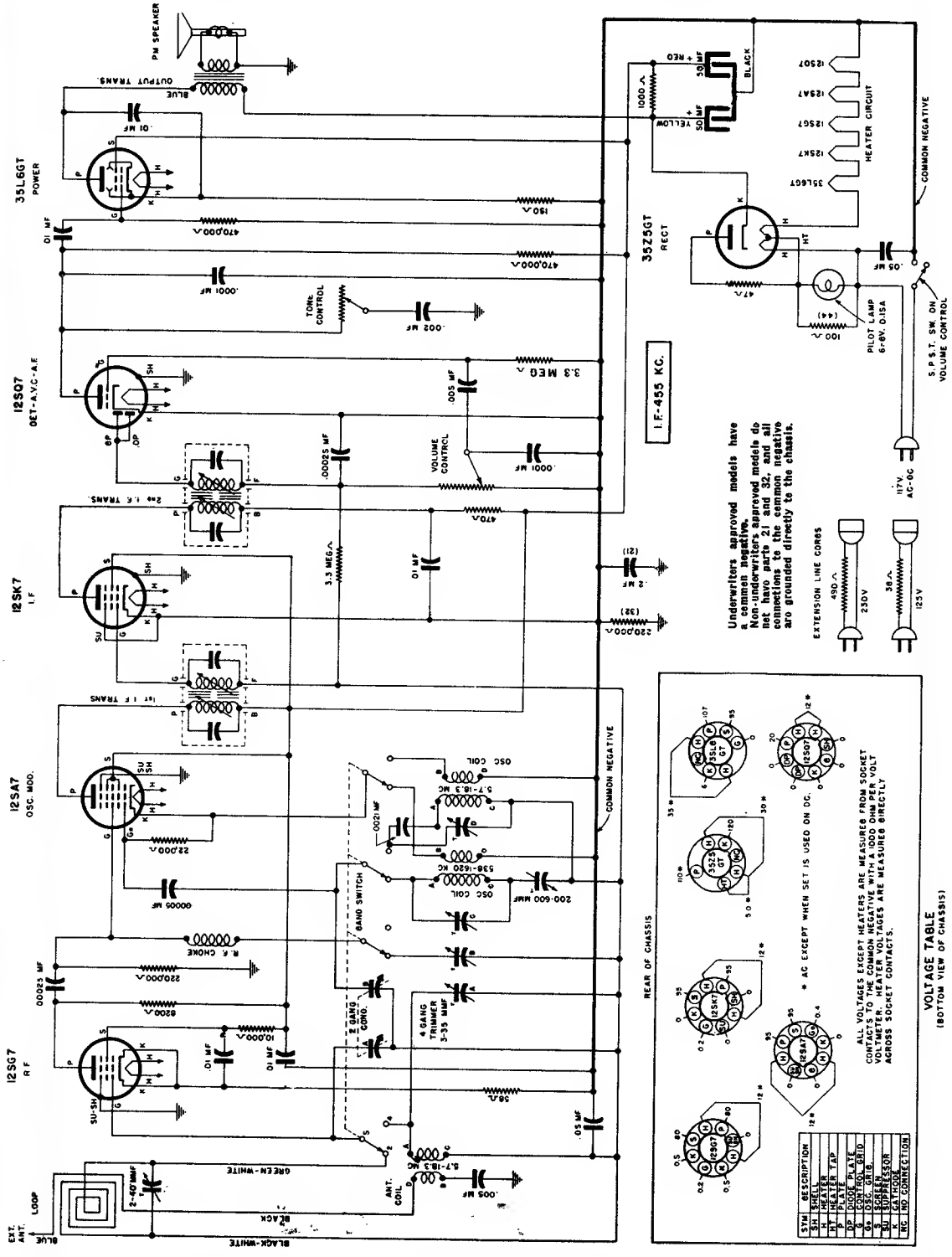
Knight RADIO

6A-127
6B-127
6C-127



Knight RADIO

6A-122
6B-122
6C-122

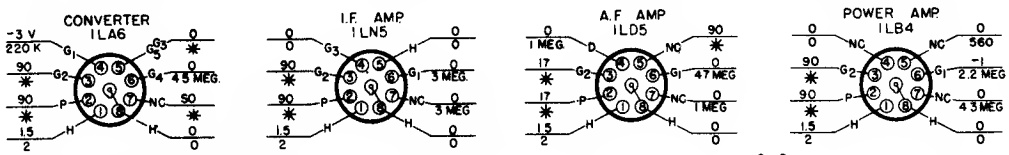


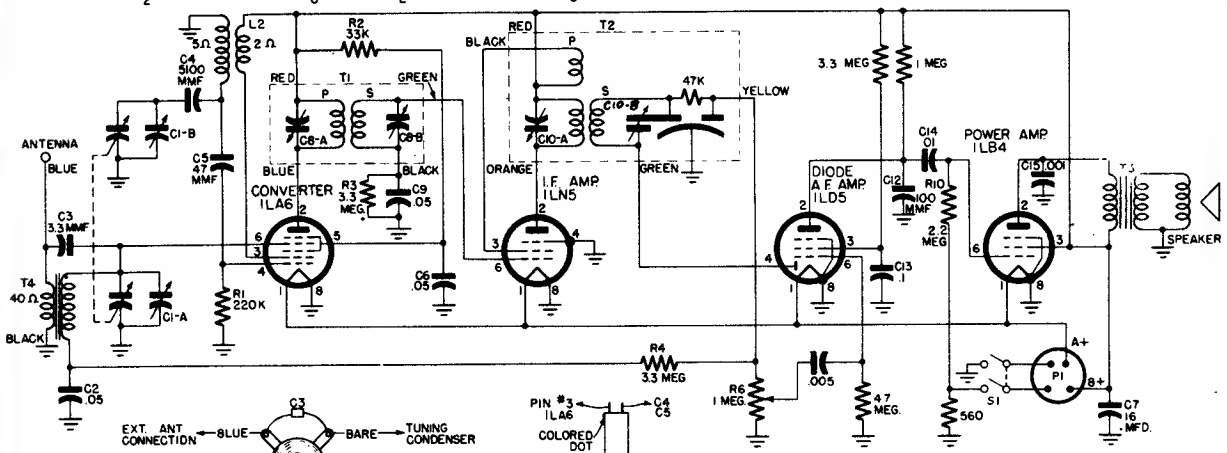
Bendix

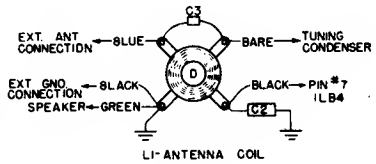
MODEL 416A RECEIVER

CONDITIONS OF MEASUREMENTS

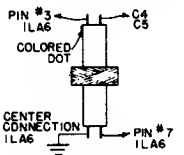
ZERO SIGNAL INPUT VOL. CONT. MIN. SOCKET VOLTAGE / RESISTANCE TO COMMON GROUND ⏚ D.C. AT 20,000 Ω/V.







L1-ANTENNA COIL



L2-OSCILLATOR COIL

NOTES-

ALL CAPACITANCE IN WHOLE NUMBERS IN MMF
THOSE IN DECIMINAL NUMBERS IN MF

ALL RESISTANCE IN OHMS UNLESS OTHERWISE NOTED

✱ IS RESISTANCE MEASURED ACROSS FILTER CONDENSER C7.

K=1000 Ω

⏚ CHASSIS GROUND

RANGE-540 TO 1620 KCS

TRANSFORMER RESISTANCE IN OHMS

	ANT	OSC	1ST I.F.				2ND I.F.			OUTPUT		
SYMBOL	L1	L2	T1				T2			T3		
CODE	238	125	125	198	305	420	238	306	420	125	350	394
PRIMARY	40	1.5	16	16	22	24	25	20	20	1000	1000	2000
SECONDARY	1.5	5	16	16	22	24	25	20	20			

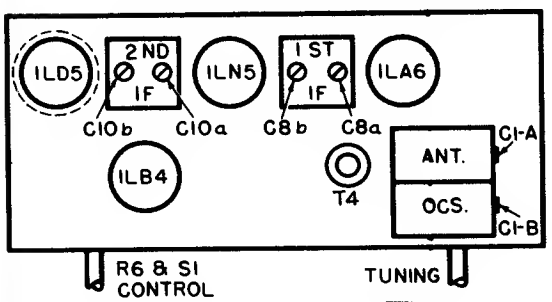
RESISTANCE LESS THAN 1 OHM NOT SHOWN

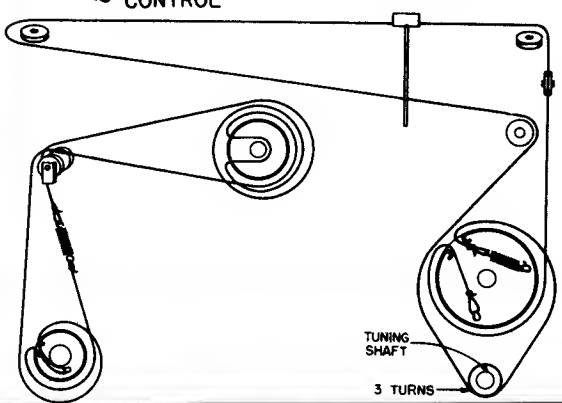
ALIGNMENT PROCEDURE

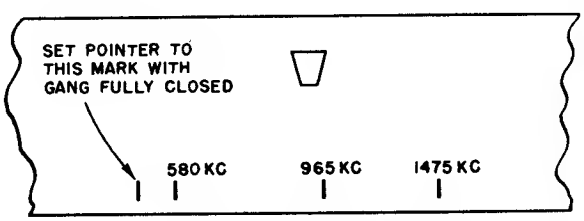
Before making any adjustments check battery voltage: the "B" supply should not be below 85 volts and the "A" supply below 1.3 volts. Connect output meter across voice coil and RF signal generator, 30% amplitude modulated, to antenna lead through a .05 mfd. capacitor for IF alignment and through 200 mfd. for oscillator and RF alignment. All adjustments made for maximum output meter reading with volume control full on. Keep output of signal generator as low as possible at all times. Rotate tuning gang to fully closed position and set dial pointer to reference mark on dial back plate before proceeding with alignment as outlined in chart below.

Input Freq.	Dial Pointer Position	Adjust
455KC	Max. to right	C10B, C10A
1475KC	1475KC	C1B, C1A
965KC	965KC	*Check Calib.
580KC	580KC	*Check Calib.

If calibration is off more than 10KC the rotor plates of the gang may be bent to correct calibration.







DIAL REFERANCE POINTS

Bendix Radio

SPECIFICATIONS: Model 697A

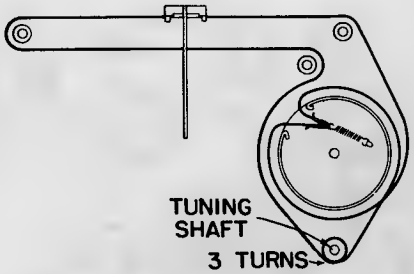
6 Tube AC-OC and Selenium Rectifier

POWER
Voltage (Chassis only).....105-125V AC or OC
Consumption (Including Changer).....72 Watts, 60 Cycle AC
TUNING RANGE.....540 - 1620 K.C.
INTERMEDIATE FREQUENCY.....455 K.C.
TUBES

12BE6	Converter
12BA6	IF Amp.
12AT6	Demodulator & 1st Audio
12BA6	Inverter
35B5 (2)	Push Pull Beam Power Output

POWER OUTPUT (Max.).....3.5 Watts
PICKUP.....High Impedance Crystal
LOUDSPEAKER --- PM
Cone Diameter.....8 Inches
V.C. Impedance - 400 Cycles.....3.2 Ohms

MODEL 697A



DIAL STRINGING DIAGRAM

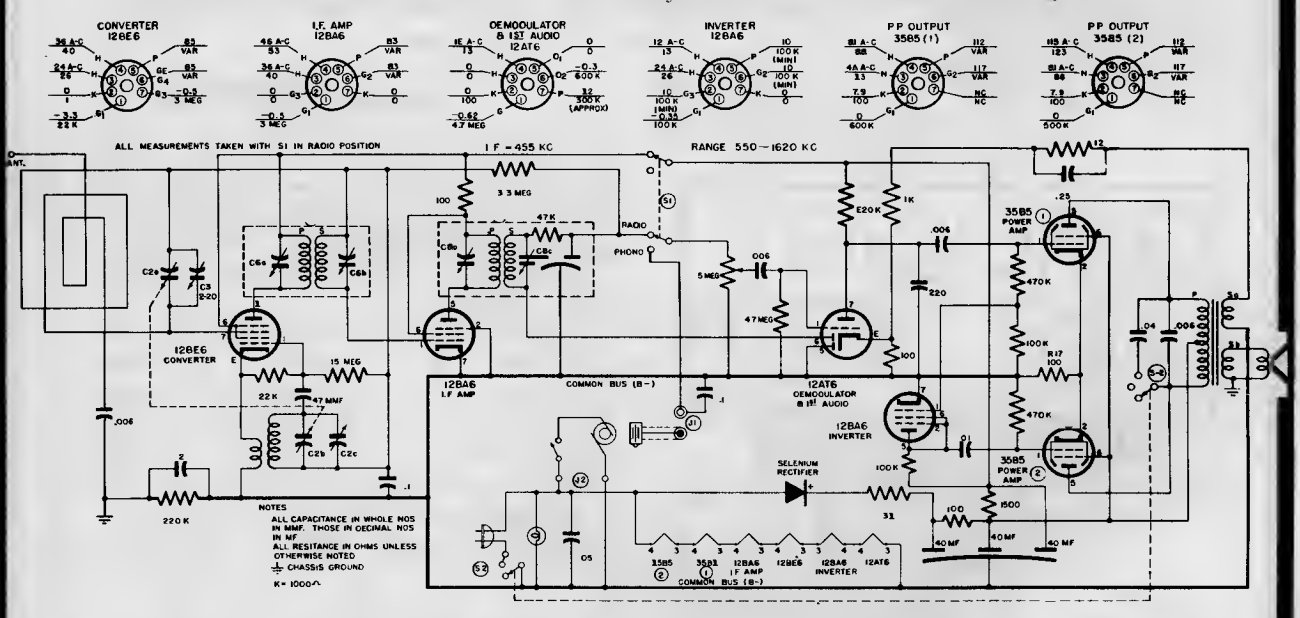
Alignment Procedure:

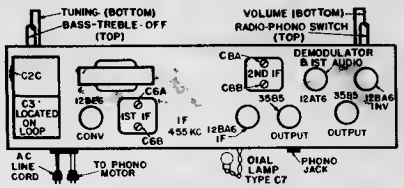
PRELIMINARY:
Close gang completely and set pointer directly over reference mark on back plate, Fig. 1. Connect output meter across voice coil on low scale. Rotate volume control full on, maximum clockwise. Rotate radio-phono switch to radio - full C.C.W.

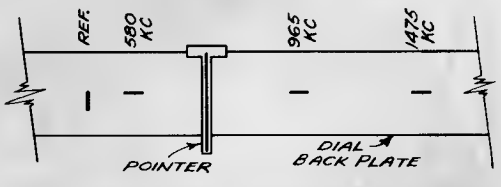
PRECAUTION:
An isolating transformer should be used between the power supply and the receiver if the test equipment is AC operated.

GENERAL FREQ.	POINTER POSITION	APPLY THROUGH	TO	ADJUST FOR MAX. OUTPUT
455 KC	Max. to right	.01 Mfd	Input Grid 12BE6	C6A, C6B, C8A, C8B
1475 KC	Center of 1475 Ref. Mark	50 Mmfd or less	External Ant. Conn.	C2C, C3
965 KC	Approx. 965 Ref. Mark	"	"	* Check Calibration
580 KC	Approx. 580 Ref. Mark	"	"	"

* If calibration is not within limits inscribed on back plate, oscillator and antenna gang rotor sections must be bent.

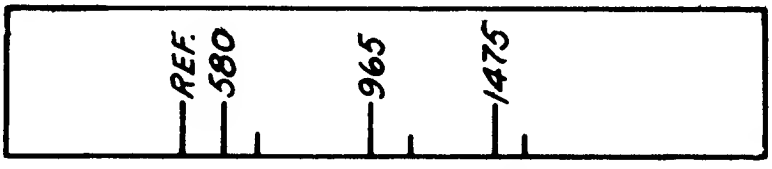






– DIAL BACK PLATE REFERENCE MARKS

Bendix Radio



Dial Back Plate

Model R526M

5 Tube AC-DC Chassis

Power
- Voltage.....105-125 V. A.C. or D.C.
- Frequency.....50-60 Cycles per Second

Power Consumption.....30 Watts
I.F. Frequency.....455 K.C.
Tuning Range.....540-1620 K.C.
Max. Power Output.....1.5 Watts
Loud Speaker.....P.M.
- Cone Diameter.....4 Inches
- Voice Coil Impedance..400Cycles,3.2 Ohms

Alignment Procedure

Set volume control atmaximum. Use low range on output meter and keep signal generator input as low as practical. Make adjustments as shown in table for maximum output - with output meter connected across voice coil.

Precautions

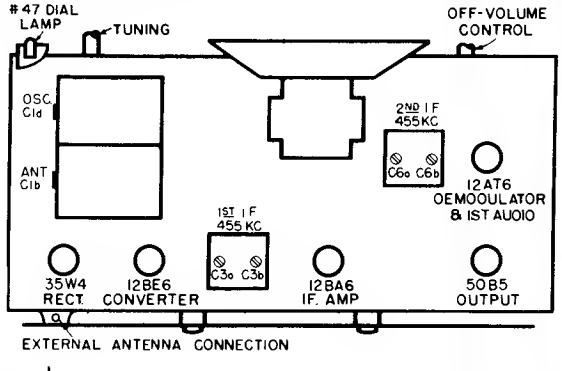
An isolating transformer should be used between the power supply and the receiver for protection of test equipment.

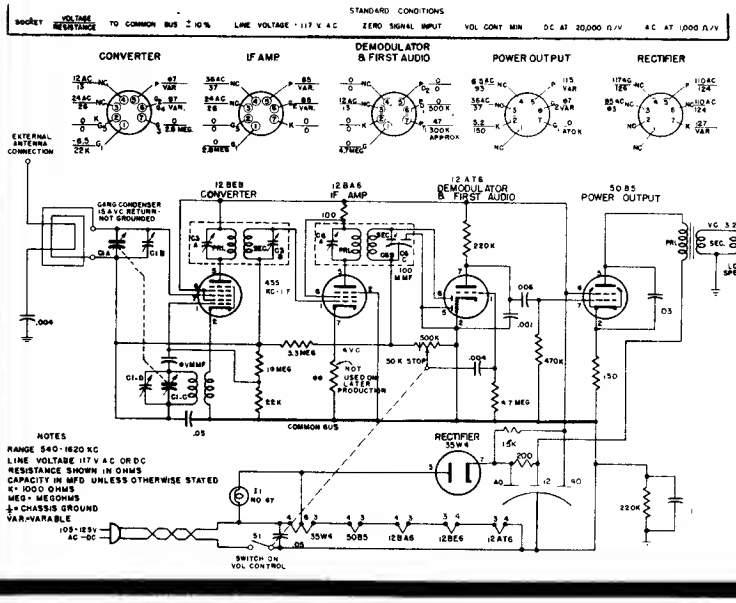
ALIGNMENT CHART

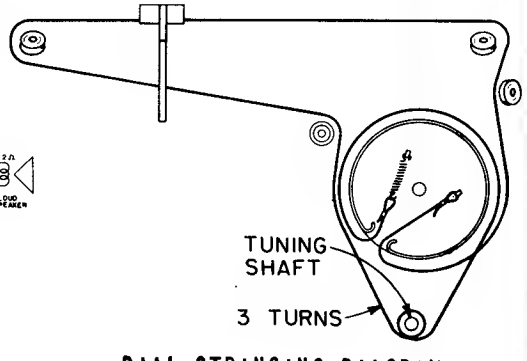
Before alignment begins, set middle of pointer over "Reference" line - with Gang Condenser completely closed - See Figure 1.

CIRCUITS ALIGNED	DIAL POINTER	INPUT FREQUENCY	APPLY THROUGH	TO	ADJUST
I.F.	Max. to Right	455 K.C.	.01 Mfd	Input Grid 12BE6	C3a, C3b, C6a, C6b.
Broadcast	1475 Ref. Mark	1475 K.C.	50 Mmf	External Antenna Terminal	C1d C1b
Broadcast	965 Ref. Mark	965 K.C.	50 Mmf	"	Check Calibration*
Broadcast	580 Ref. Mark	580 K.C.	50 Mmf	"	Check Calibration*

* If calibration does not check within one pointer's width of the frequency mark, both oscillator and antenna sections of the gang condenser must be "knifed" properly.

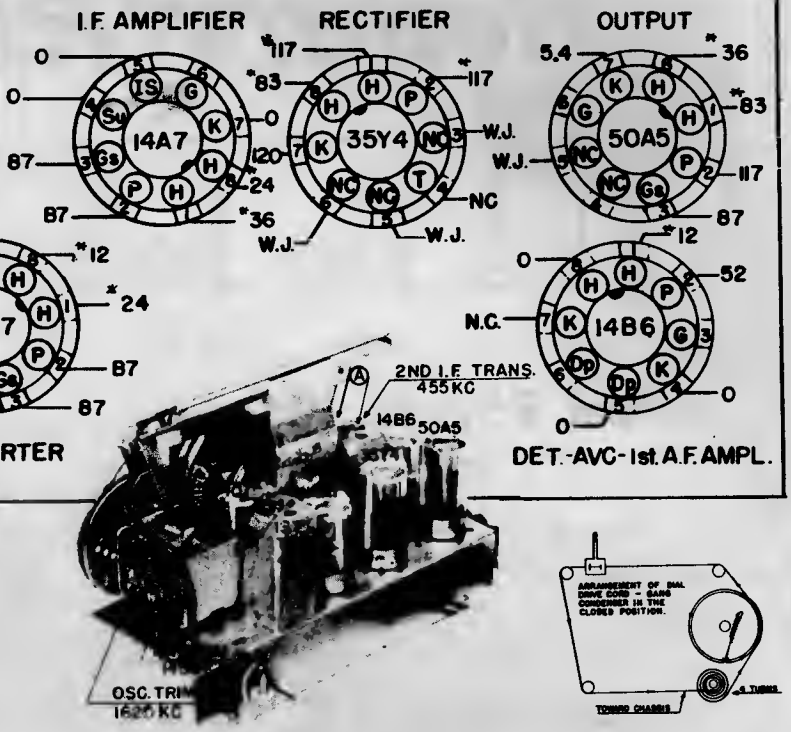






DIAL STRINGING DIAGRAM

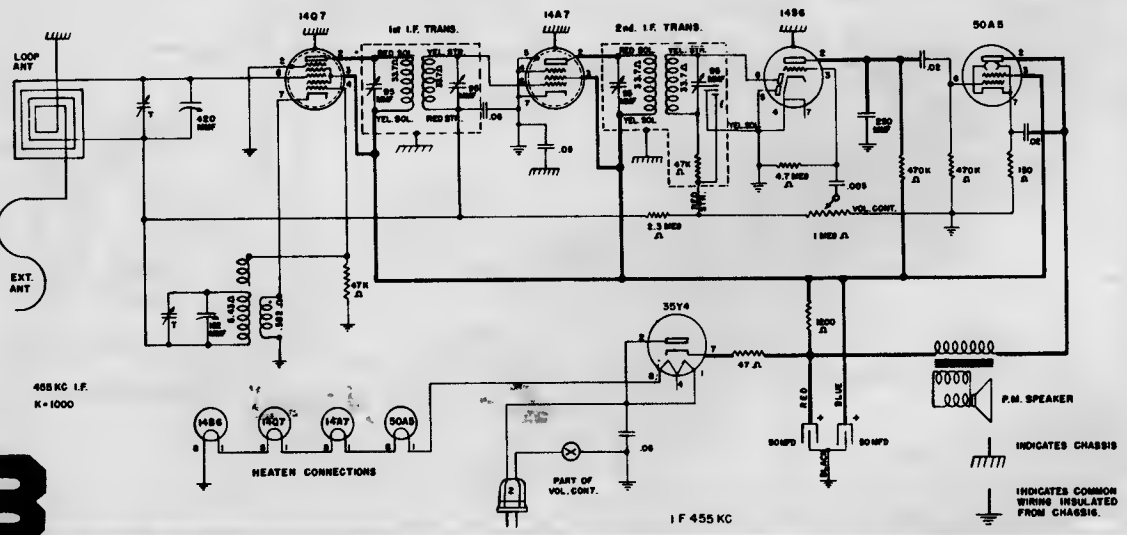
NOTES:
1. BOTTOM VIEW OF TUBE SOCKETS.
2. VOLTAGE MEASURED WITH AN ELECTRONIC VOLTMETER FROM SOCKET LUG TO B- (PIN 5 ON 14Q7).
3. LINE VOLTAGE 117 V. 60 CYCLE.
4. N.C. = NO CONNECTION.
5. W.J. = WIRING JUNCTION.
6. * = A.C. VOLTAGE.
7. SOCKET VOLTAGE TOLERANCE 10 %.



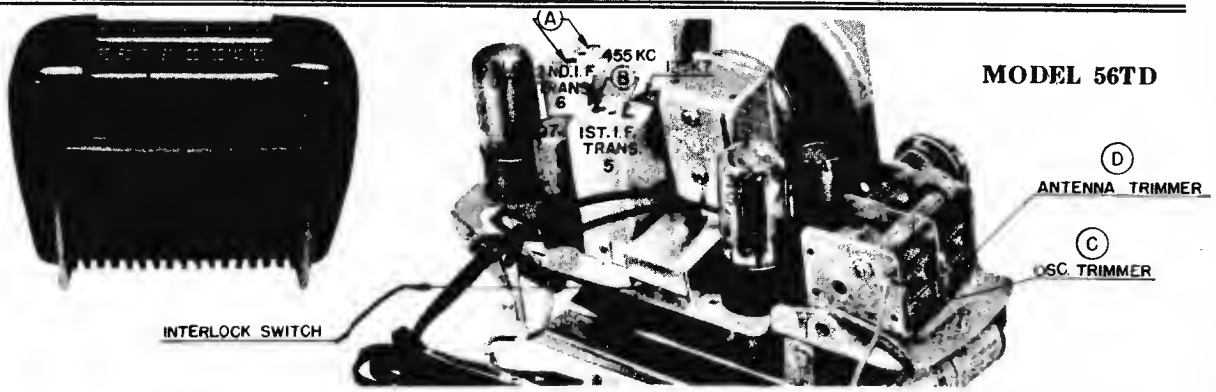
CROSLEY

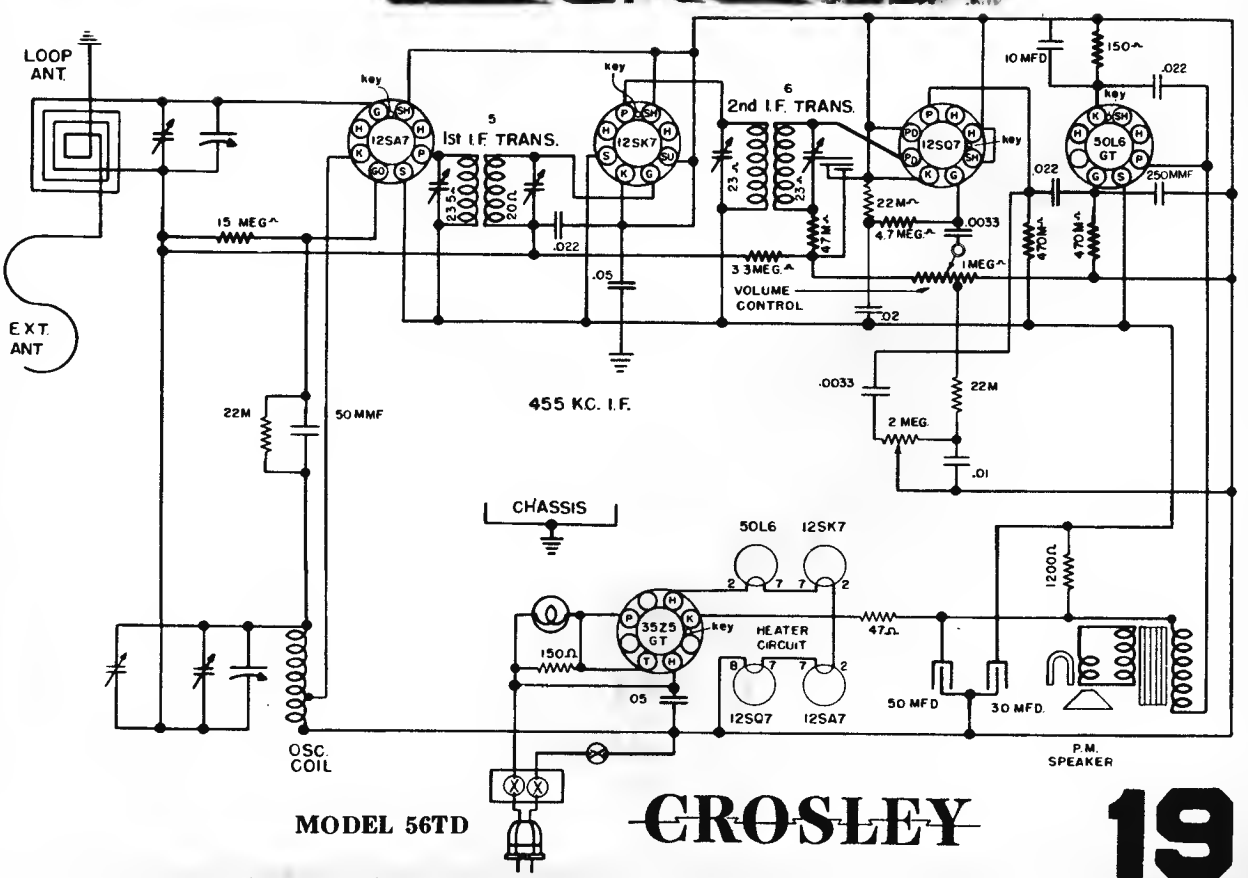
MODELS 58TC, 58TW

Alignment Sequence	Signal Generator Output			Position of Dial Pointer	Adjust for Maximum Output
	Frequency in kc.	In Series with	To		
1	455	200 mmf.	Ant.	1620	A & B
2	1620	200 mmf.	Ant.	1620	C
3	1400	200 mmf.	Ant.	1400	D



Alignment Sequence	Signal Generator Output			Position of Tuning Dial KC	Adjust for Maximum Outout
	Frequency in KC	In Series with	To		
1	455	200 mmf.	Ant.	1620	A & B
2	1620	200 mmf.	Ant.	1620	C
3	1400	200 mmf.	Ant.	1400	D





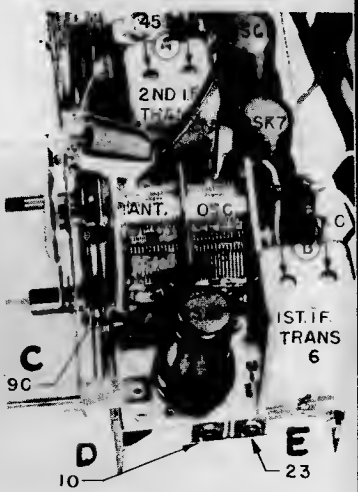
MODEL 56TD

CROSLEY

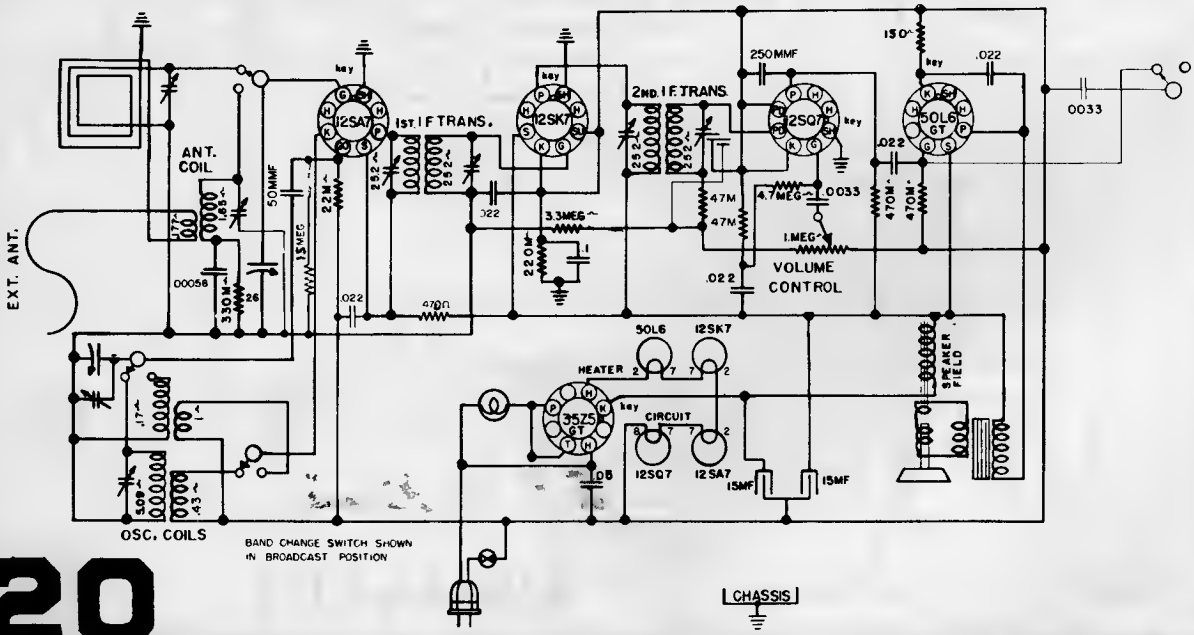
CROSLEY — ALIGNMENT PROCEDURE —MODEL 56TN

1. Turn the tuning condenser to the completely closed position against the stop and set the dial pointer to the reference line at the end of the dial scale.
2. Connect the output meter across the speaker voice coil.
3. The r.f. signal input from the signal generator should be connected to the external antenna lead. Connect the signal generator ground through a 0.1 mfd. condenser to —B (pin 3 on 12SK7 tube socket).
4. Turn the volume control on full and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain signal generator output as low as possible to prevent AVC action in the receiver.

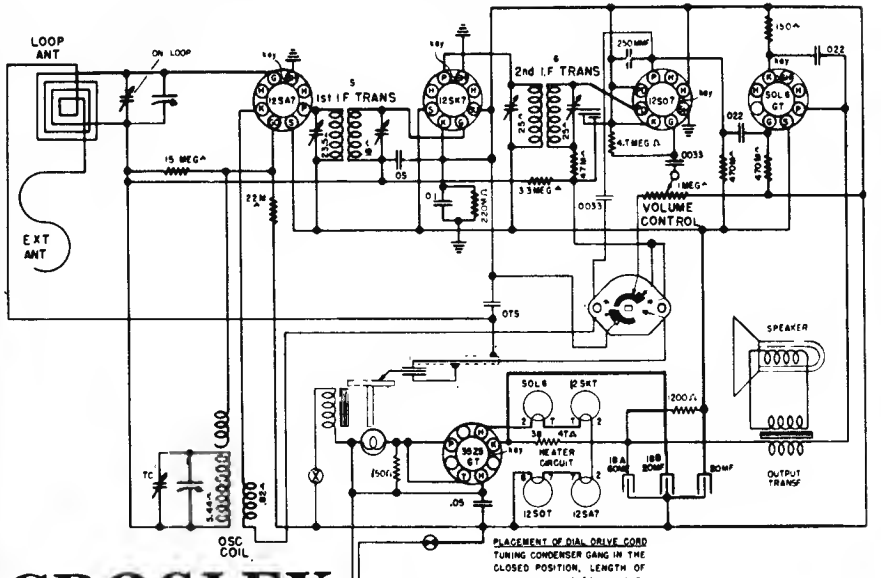
Alignment Sequence	Signal Generator Output			Position of		Adjust for Maximum Output
	Frequency in kc.	In Series with	To	Band Switch	Tuning Dial	
1	455	200 mmf.	Ant.	Left	1,620	A & B
2	15,300	400 ohms	Ant.	Right	15,300	C
3	15,000	400 ohms	Ant.	Right	15,000	D
4	1,400	200 mmf.	Ant.	Left	1,400	E & F



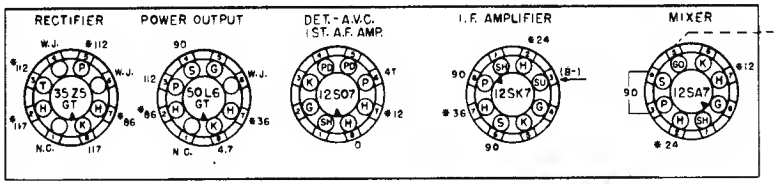
NOTE: When aligning the short-wave oscillator trimmer (C), be sure that the circuit is aligned at the correct frequency and not at the image frequency which is 910 kilocycles lower as indicated by the receiver dial. To check: Tune in the generator frequency, then increase the generator output and tune in the image frequency. The image frequency should be weaker than the fundamental and audible 910 kilocycles lower on the receiver dial. If the image cannot be tuned in, the oscillator trimmer is adjusted to the wrong peak; i.e., the oscillator trimmer may be adjusted to the image or one of the harmonics instead of the fundamental frequency. The correct peak is the second one heard as the trimmer adjustment screw is opened from the completely closed position.



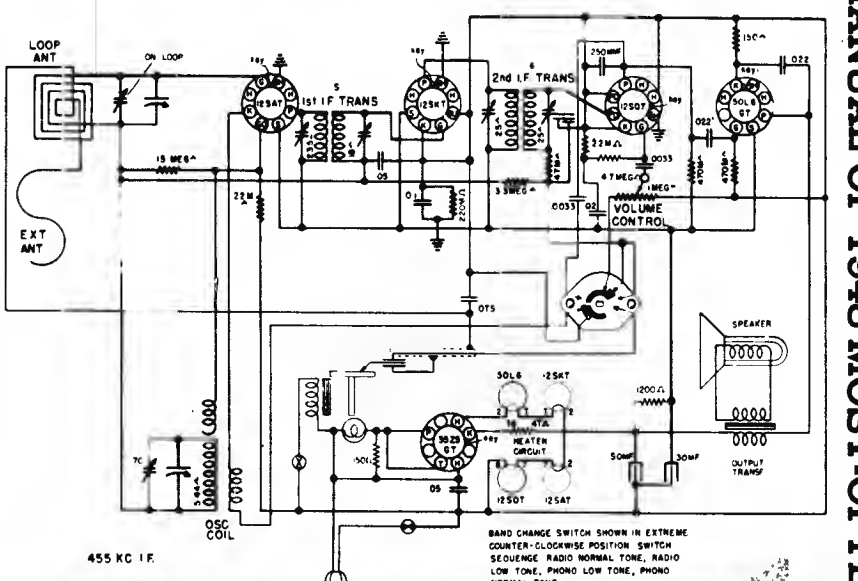
MODELS 56TZ, 57TQ, 1st PRODUCTION

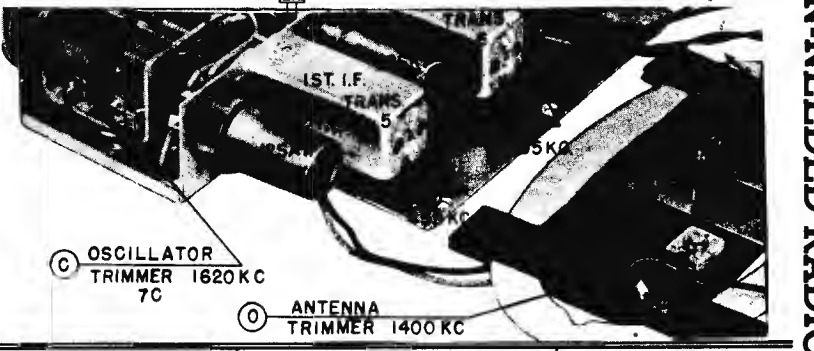


OSCILLATOR GRID VOLTAGE		
BAND	FREQUENCY	VOLTS
AMERICAN	540 KC	-5.5



MODELS 56TZ, 56TQ, 2nd PRODUCTION





CROSLEY

MODELS: 56TZ, 57TQ

NOTES.
1. THESE ARE BOTTOM VIEWS OF TUBE SOCKETS
2. MEASURE VOLTAGES FROM SOCKET LUGS TO B-(PIN 3 ON THE 12SK7)
3. THESE VOLTAGES WERE MEASURED USING AN ELECTRONIC VOLTMETER.
4. W.J. – WIRING JUNCTION.
5. N.C. – NO CONNECTION.
6. * – 60 CYCLE A.C. VOLTAGES.
7. SOCKET VOLTAGE TOLERANCE, 10%
8. LINE VOLTAGE 117 V. 60~ A.C

Alignment Sequence	Signal Generator Output: Frequency in kc.	Signal Generator Output: In Series with	Signal Generator Output: To	Position of: Selector Switch	Position of: Tuning Dial	Adjust for Maximum Output
1	455	200 mmf.	Ant.	R	1620	A & B
2	1620	200 mmf.	Ant.	R	1620	C
3	1400	200 mmf.	Ant.	R	1400	D

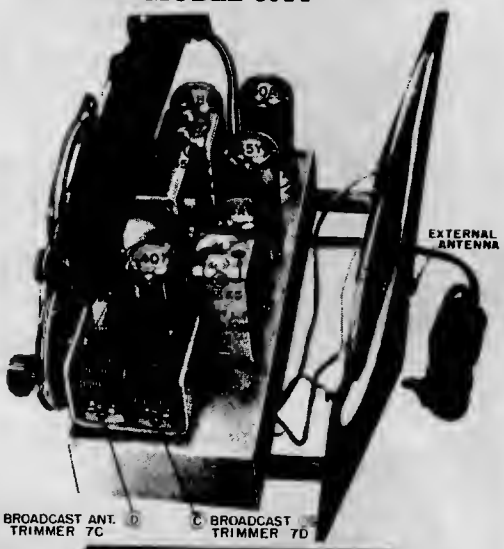
CROSLEY

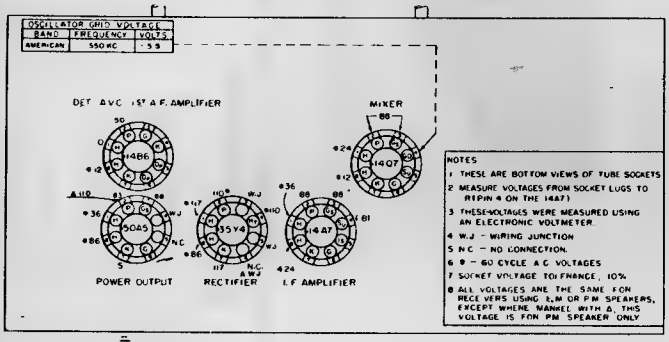
MODEL 56TY

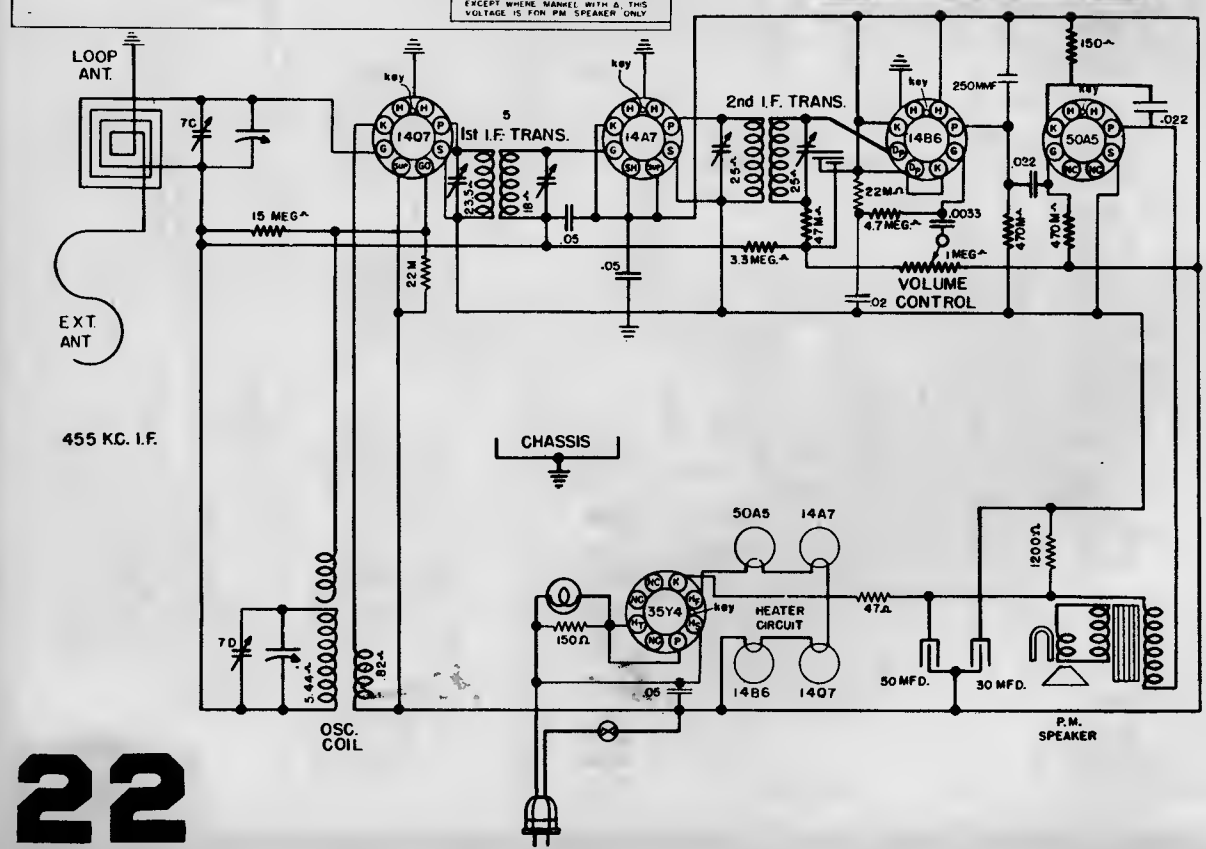
ALIGNMENT PROCEDURE

1. Turn the tuning condenser to the completely closed position against the stop and set the dial pointer to the reference line at the end of the dial scale.
2. Connect the output meter across the speaker voice coil.
3. The r.f. signal input from the signal generator should be connected to the external antenna lead. Connect the signal generator ground through a 0.1 mfd. condenser to —B (pin 4 on 14A7 tube socket).
4. Turn the volume control on full and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain signal generator output as low as possible to prevent AVC action in the receiver.

Alignment sequence	Signal Gen. Output			Position of Tuning Dial	Adjust for max. output
	Frequency in KC	In Series with	To		
1	455	200 mmf.	Ant.	1620	A & B
2	1620	200 mmf.	Ant.	1620	C
3	1400	200 mmf.	Ant.	1400	D

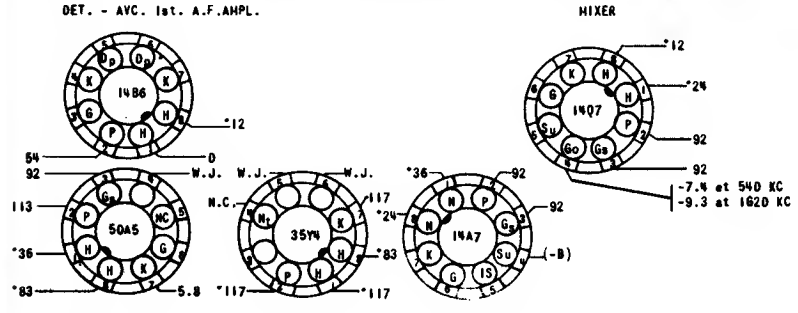






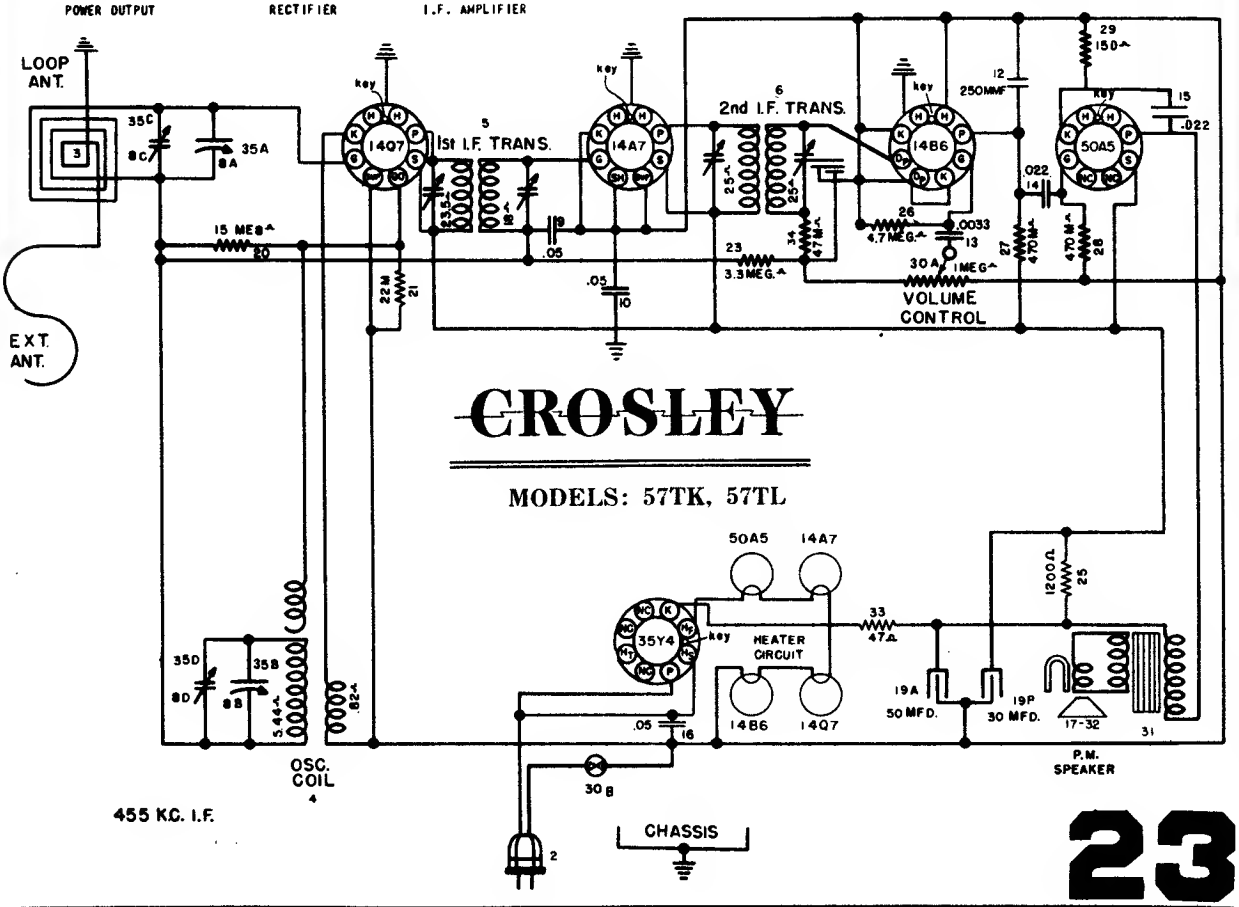
Item No.	Part No.	Description
2	C-132300-1	Cable and Plug Assy., Power
3	AC-135209	Loop and Back Assy., Antenna
4	AW-135195	Coil Assy., Oscillator
5	AW-137665	Transformer, 1st I. F.
6	AW-137667	Transformer, 2nd I. F.
8 A	B-135056	Condenser, Variable ⎫ Two
8 B		Condenser, Variable ⎭ Section
8 C	Part of Item #8A	Condenser, Trimmer
8 D	Part of Item #8B	Condenser, Trimmer
9	39001-17	Condenser, .05 mfd., 600 v., paper
10	39001-17	Condenser, .05 mfd., 600 v., paper
12	39001-73	Condenser, 250 mmf., 600 v., paper
13	39001-73	Condenser, .003 mfd., 600 v., paper
14	39001-80	Condenser, .02 mfd., 600 v., paper
15	39001-80	Condenser, .02 mfd., 600 v., paper
17	B-136768	Speaker
18	39001-17	Condenser, .05 mfd., 600 v., paper
19 A	B-136770	Cond'ser, 50 mfd., 150 v. ⎫ Two Sect.
19 B		Cond'ser, 30 mfd., 150 v. ⎭ Elec. Filter
20	39373-109	Resistor, 15 megohm, ½ w.

Item No.	Part No.	Description
21	39373-60	Resistor, 22,000 ohm, ½ w.
23	39373-100	Resistor, 3.3 megohm, ½ w.
25	39373-144	Resistor, 1200 ohm, 1 w.
26	39373-102	Resistor, 4.7 megohm, ½ w.
27	39373-87	Resistor, 470,000 ohm, ½ w.
28	39373-87	Resistor, 470,000 ohm, ½ w.
29	39373-16	Resistor, 150 ohm, ½ w.
30 A	C-135127	Control, Volume (1 megohm) ⎫ Assy.
30 B		Switch, Power ⎭
*	39368-14	Control, Volume
*	39369-1	Switch, Power
31	B-137723	Transformer, Ouput
33	W-137367	Resistor, 47 ohm, 1 w.
34	Part of Item #6	Resistor, 47,000 ohm, ½ w.
	W-135164	Bumper, Rubber
	R-135162	Cabinet, (57TK)
	AW-135246	Cabinet, (57TL)
	W-131154-1	Cotter, External
	B-135713	Dial Glass
	W-134055	Grommet, Var. Cond. Mtg



MODELS: 57TK, 57TL

NOTES:
1. These are bottom views of tube sockets.
2. Measure voltages from socket lugs to -B (pin 4 on the 14A7).
3. These voltages were measured using an electronic voltmeter. Line voltage 117.
4. W.J. = Wiring junction
5. N.C. = No connection
6. * = 60 cycle A.C. voltages.
7. Socket voltage tolerance 10%.

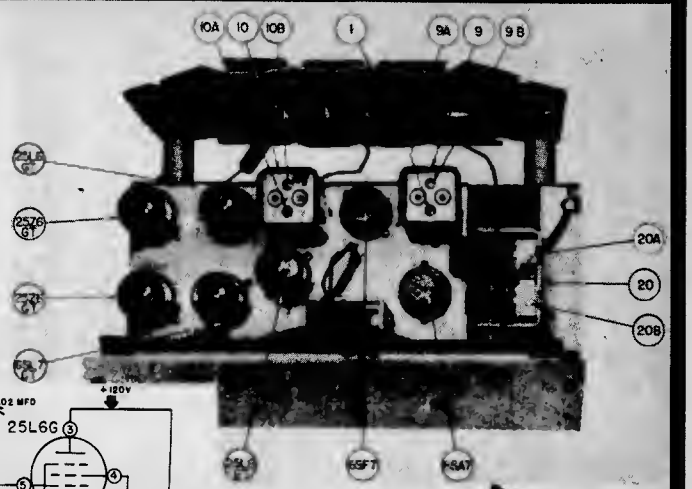


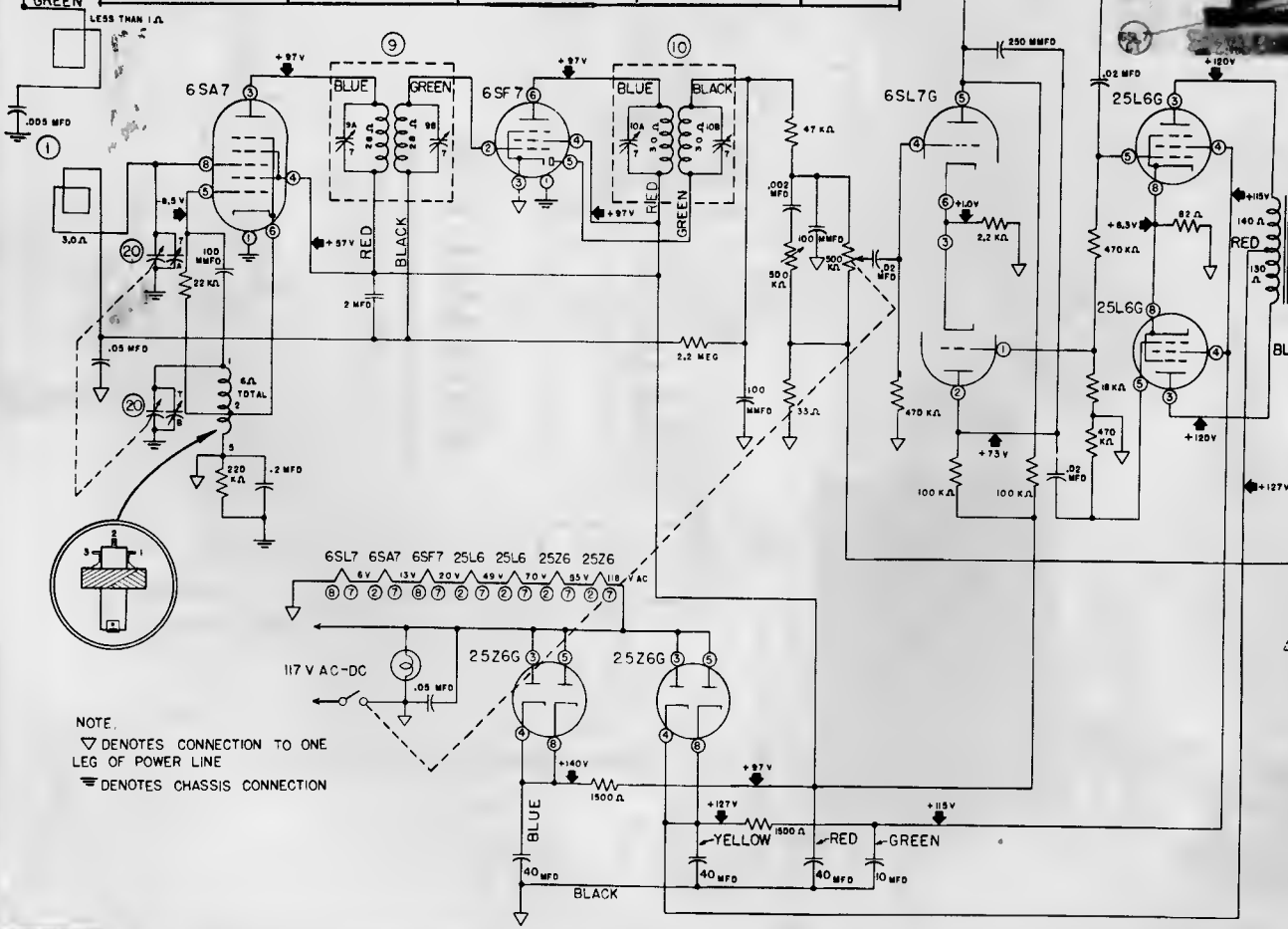
CROSLEY

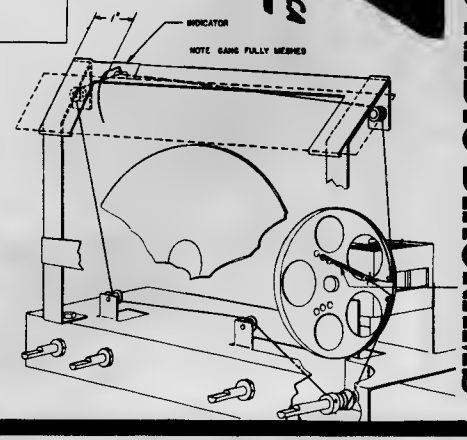
MODELS: 57TK, 57TL

24

SET SIGNAL GENERATOR AT	SET GANG	LOOP DISTANCE	ADJUST TRIMMER	TUNE FOR
455 KC	Meshed	Close	9a 9b 10a 10b	Max.
1720 KC	Fully Open	Close	20a	Max.
1400 KC	1400 KC	Close	20b	Max.







ECA
ELECTRONIC CONST. OF AMERICA
RADIO
108

OFTEN-NEEDED RADIO DIAGRAMS

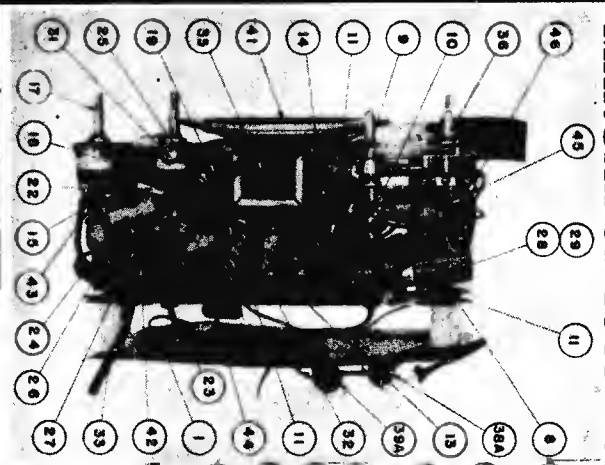
MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

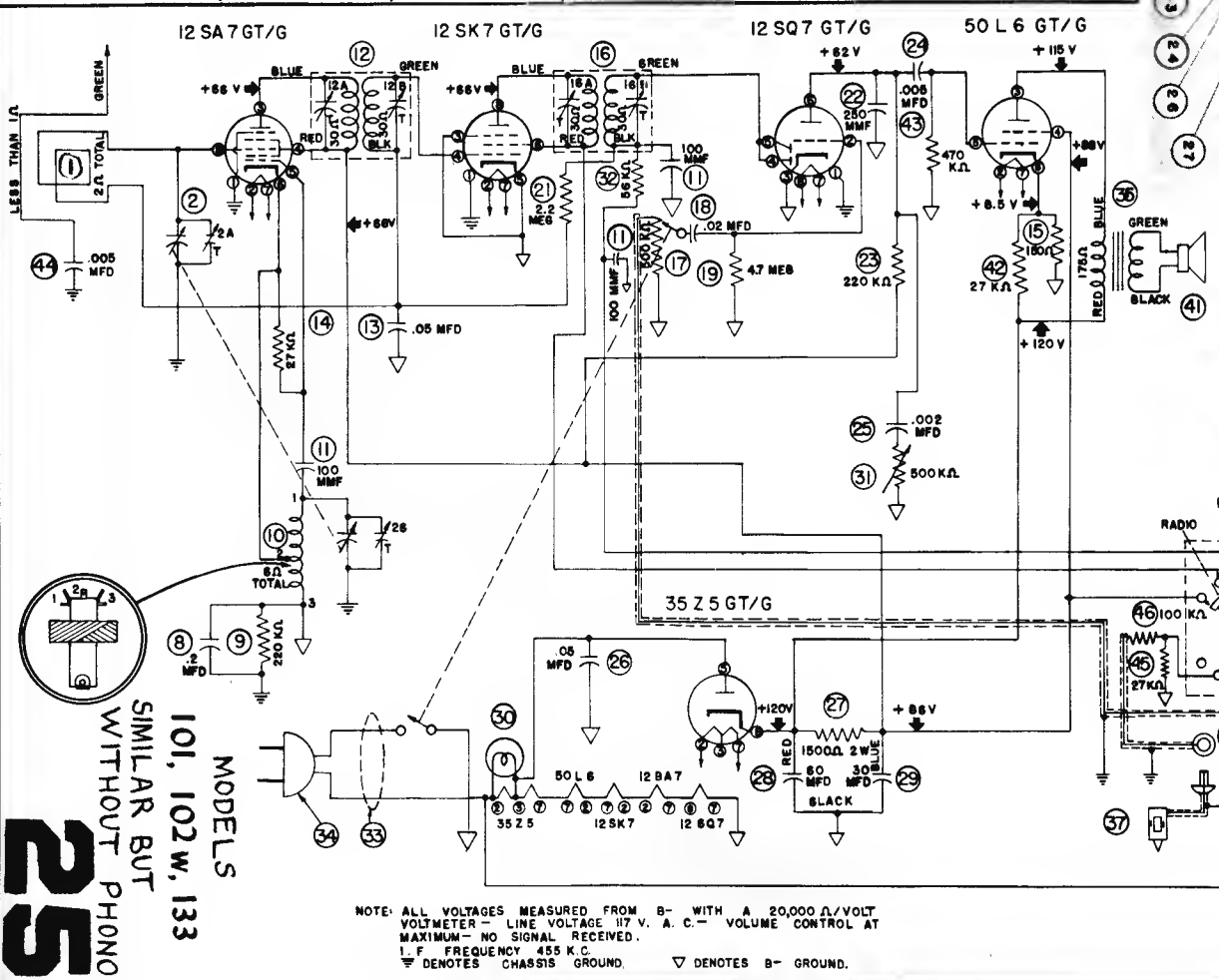
RCA RADIO

ELECTRONIC COMP. OF AMERICA

104 & 106

SET SIGNAL GENERATOR AT	SET GANG	LOOP DISTANCE	ADJUST TRIMMER	TUNE FOR	OPERATION
455 KC	Meshed	Close	12a 12b 16a 16b	Max.	Align-- I.F.
1720 KC	Fully Open	Close	2b	Max.	Align Oscillator
1400 KC	1400 KC	Close	2a	Max.	Align - R.F.





NOTE: ALL VOLTAGES MEASURED FROM B- WITH A 20,000 Ω/VOLT VOLTMETER — LINE VOLTAGE 117 V. A. C.— VOLUME CONTROL AT MAXIMUM— NO SIGNAL RECEIVED.
I. F. FREQUENCY 455 K.C.
⏚ DENOTES CHASSIS GROUND. ▽ DENOTES B- GROUND.

MODELS
101, 102 w, 133
SIMILAR BUT
WITHOUT PHONO

25

Emerson Radio

MODEL: 540A

CHASSIS MODEL: 120042A

IF=455KC

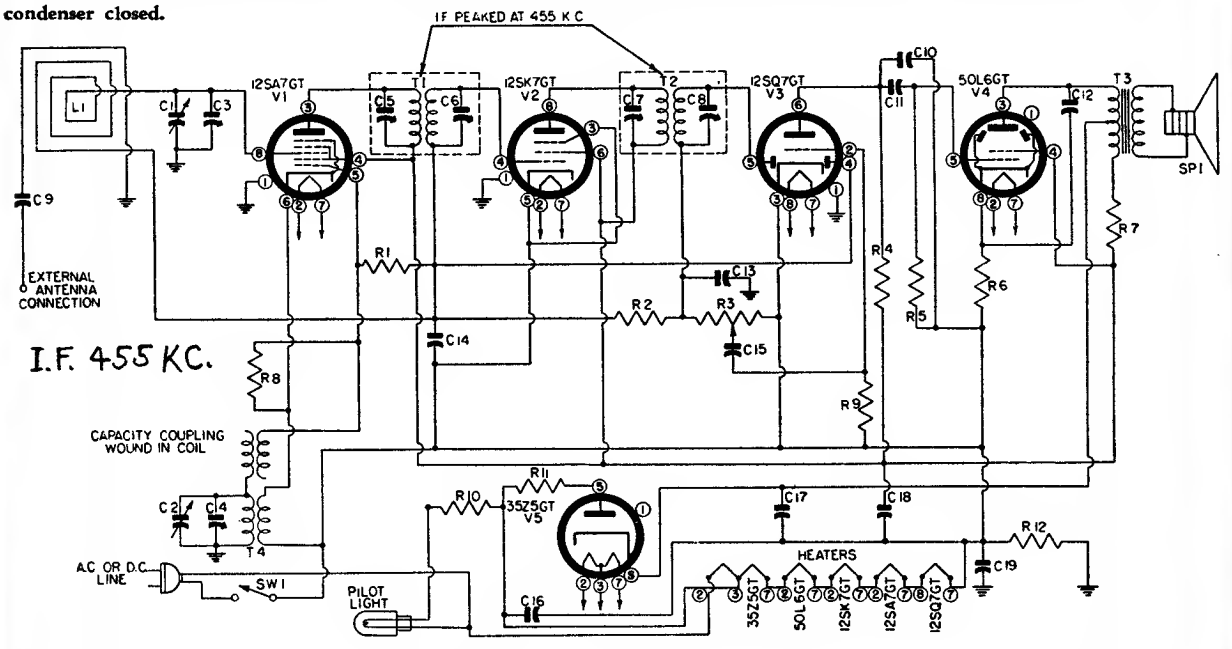
Emerson Radio

MODELS: 511, 517, 541

CHASSIS MODEL: 120010

TUBE	PIN NUMBER							
	1	2	3	4	5	6	7	8
12SA7			89	89	*—10			*—1.6
12SK7				*—1.6		89		89
12SQ7		*—0.7		*—1.6	*—0.5	37.5		
50L6			110	89				6.2
35Z5				116		116		117

The following voltage readings are d-c measurements taken from B— (line switch) to the indicated tube-socket pin. A 1000 ohms-per-volt meter should be used for all readings except those indicated by an asterisk (*), which should be taken with a d-c vacuum-tube voltmeter. Line voltage for these readings was 117 volts, 60 cycles, a.c. Measurements made with 117 volts d.c. will be lower than those given below. Take readings with the volume control set at minimum and the variable condenser closed.



Schematic Symbol	†Part No.	DESCRIPTION
C1, C2	900160	Two-gang variable condenser
*C3, C4		Trimmers, part of variable condenser
*C5, C6, C7, C8		Trimmers, part of i-f transformers
C9, C15	920010	0.002 mfd., 600 V. paper condenser
C10	920240	500 mmfd., 600 V. paper condenser
C11, C12	920020	0.02 mfd., 400 V. paper condenser
C13	910000	220 mmfd., 600 V. mica condenser
C14	920040	0.1 mfd., 200 V. paper condenser
C16	920030	0.05 mfd., 400 V. paper condenser
C17, C18	925000	Dual electrolytic condenser, 150 V.; C20—30 mfd., C21—50 mfd.
C19	920050	0.2 mfd., 200 V. paper condenser
L1	700000	Loop antenna assembly, or
L1	700200	Loop antenna assembly
R1, R9	397000	15 meg., ¼ watt carbon resistor

Schematic Symbol	†Part No.	DESCRIPTION
R2	321330	3.3 meg., ¼ watt carbon resistor
R3	390000	Volume control with line switch
R4, R5	321130	470,000 ohms, ¼ watt carbon resistor
R6	340290	150 ohms, ½ watt carbon resistor
R7	370490	1000 ohms, 1 watt carbon resistor
R8	310810	22,000 ohms, ¼ watt carbon resistor
R10	340010	6.8 ohms, ¼ watt carbon resistor
R11	397040	15 ohms, 1 watt wire-wound resistor
R12	321050	220,000 ohms, ¼ watt carbon resistor
SP1	180000	P.M. Speaker
*SW1		Line switch, part of volume control
T1	720000	First i-f transformer
T2	720100	Second i-f transformer
T3	734000	Output transformer
T4	716010	Oscillator coil
	583010	Line cord

EMERSON RADIO

MODELS: 512, 515, 516, 550

CHASSIS MODELS: 120006, 120056 **530**

The 455 kc wave-trap is located below the chassis deck.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

I-f and Wave-Trap Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 or 14Q7 tube through a 0.1 mfd. condenser and adjust the four i-f trimmers for maximum response.

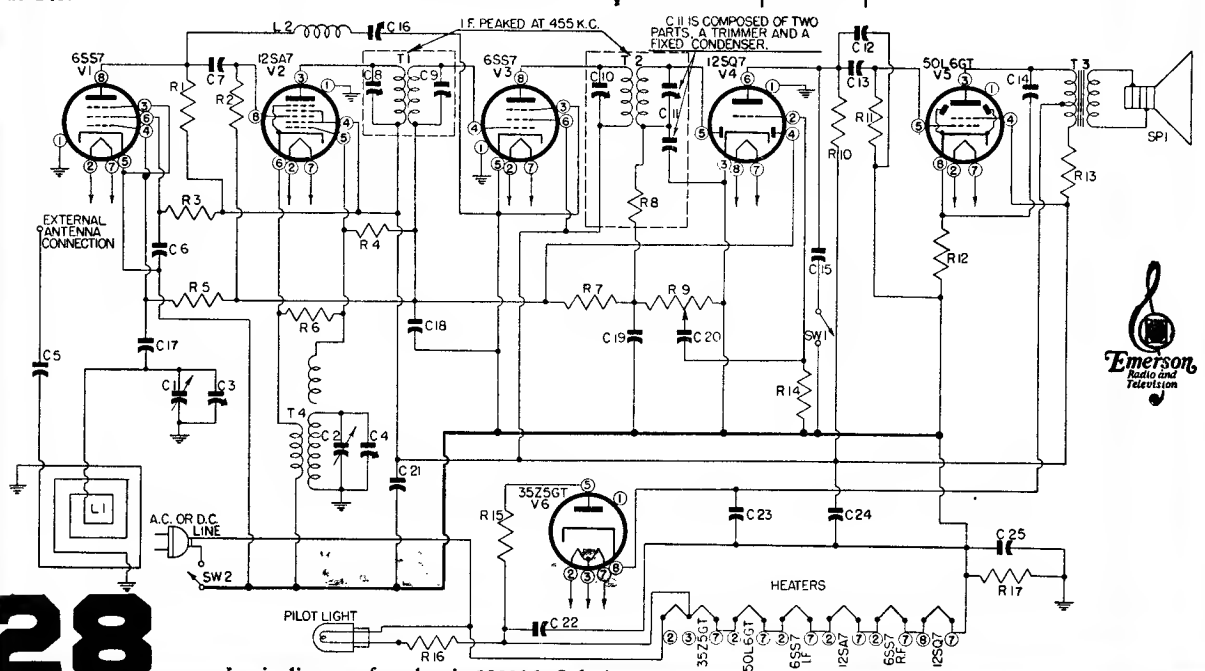
Feed 455 kc to the external antenna lead and adjust the wave-trap for minimum response.

R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

Schematic Symbol	†Part No.	DESCRIPTION
C5, C15, C20	920010	0.002 mfd., 600 volt condenser
C6, C18	920060	0.05 mfd., 200 volt condenser
C7, C19	910010	0.00011 mfd., mica condenser
C12, C17	910000	0.00022 mfd., mica condenser
C13, C14	920020	0.02 mfd., 400 volt condenser
C21, C22	920030	0.05 mfd., 400 volt condenser
C23, C24	925110	30-50 mfd., 150 volt dual electrolytic condenser (chassis 120006), or
C23, C24	925011	50-50 mfd., 150 volt dual electrolytic condenser (chassis 120056)
C25	920050	0.2 mfd., 200 volt condenser
L1	700010	Loop antenna
L2	708060	455 kc wave trap
R1	310730	10,000 ohms, ¼ watt resistor
R2, R6	310810	22,000 ohms, ¼ watt resistor
R3	310870	39,000 ohms, ¼ watt resistor
R4, R14	397000	15 meg, ¼ watt resistor
R5, R10, R11	321130	470,000 ohms, ¼ watt resistor
R7	321330	3.3 meg., ¼ watt resistor
*R8		47,000 ohms resistor, part of i-f transformer
R9	390180	0.5 meg. volume control
R12	340290	150 ohms, ½ watt resistor
R13	370490	1,000 ohms, 1 watt resistor
R15	340050	15 ohms, ½ watt resistor
R16	340010	10 ohms, ½ watt resistor
R17	321050	220,000 ohms, ½ watt resistor



circuit diagram for chassis 120006. Substitute proper pin connections for loctal tubes on chassis 120056.

Emerson Radio

FREQUENCY RANGE:

540-1620 kc. (555-185 meters)
8.8-12.2 mc. (16.3-24.5 meters)

MODELS: 514, 534

CHASSIS MODEL: 120007

The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B+—red

An oscillator with frequencies of 455, 600, 1600 and 12,000 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SG7 tube through a 0.1 mfd. condenser and adjust the four i-f trimmers for maximum response.

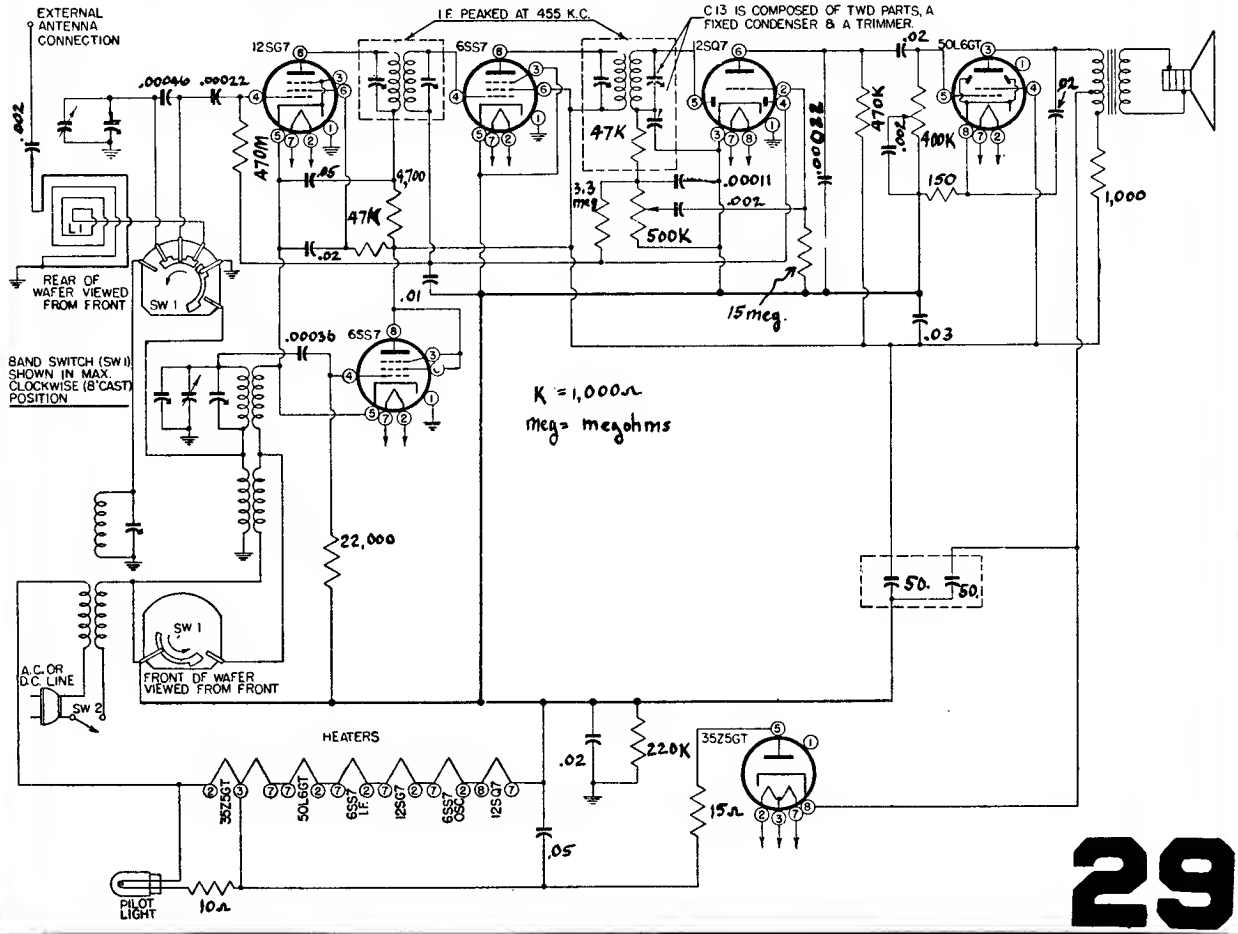
Note: The grid of the 12SG7 tube is the No. 4 pin.

R-f Alignment

Rotate the wave-band switch counter-clockwise to the short-wave position. Set the dial pointer at 12 megacycles and using a 400 ohm carbon resistor as a dummy antenna feed 12 megacycles from the generator to the external antenna lead emerging from the rear of the chassis. Adjust first the short-wave oscillator trimmer and then the short-wave antenna trimmer for maximum response.

Rotate the wave-band switch clockwise to the broadcast position. Set the dial pointer at 160 and feed 1600 kc from the signal generator into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from the loop antenna and advance the signal generator until a deflection is obtained on the output meter. Adjust first the oscillator trimmer (rear section of the variable condenser) and then the antenna trimmer (front section of the variable condenser) for maximum response.

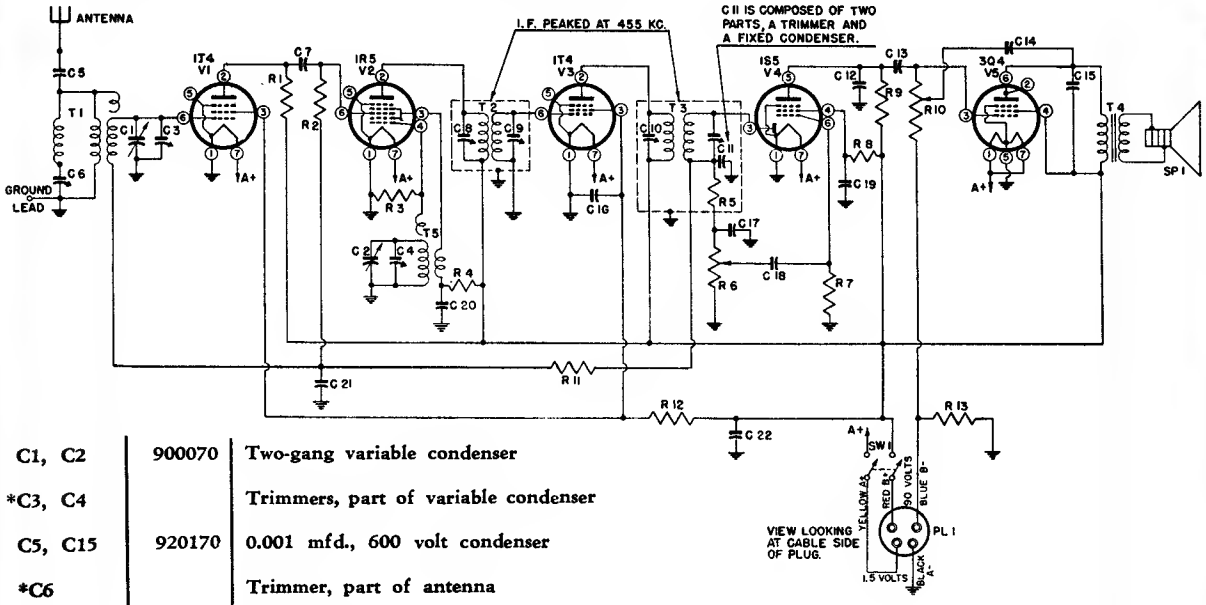
If the loop has been replaced it may be necessary to adjust the loop inductance as follows: Align at 1600. Set the pointer at 60 and feed 600 kc into the radiating loop. A portion of the outside turn of the loop may then be swung to either side of the center to give maximum response. Realign at 1600.



Emerson Radio

MODELS: 531, 532, 533

CHASSIS MODEL: 120040



C1, C2	900070	Two-gang variable condenser	R2	321130	470,000 ohms, ¼ watt resistor
*C3, C4		Trimmers, part of variable condenser	R3	320970	100,000 ohms, ¼ watt resistor
C5, C15	920170	0.001 mfd., 600 volt condenser	*R5		47,000 ohms, ¼ watt resistor, part of second i-f transformer
*C6		Trimmer, part of antenna transformer	R6	390180	0.5 meg. volume control
C7, C12	910000	0.00022 mfd. mica condenser	R7	321450	10 meg., ¼ watt resistor
*C8, C9, C10		Trimmers, part of i-f transformer	R8, R11	321330	3.3 meg., ¼ watt resistor
*C11		Trimmer and fixed condenser, part of second i-f transformer	R9	321210	1 meg., ¼ watt resistor
C13, C16, C19, C20	920100	0.02 mfd., 200 volt condenser	R10	390280	0.4 meg. tone control
C14	910250	0.00005 mfd. mica condenser	R12	310770	15,000 ohms, ¼ watt resistor
C17	910010	0.00011 mfd. mica condenser	R13	310410	470 ohms, ¼ watt resistor
C18	920515	0.002 mfd., 400 volt condenser	SP1	180008	P.M. speaker
C21	920040	0.1 mfd., 200 volt condenser	SW1	510401	Battery switch, or
C22	925003	16 mfd., 150 volt electrolytic condenser	SW1	510001	Battery switch
PL1	585311	Battery plug and cable assembly, or	T1	710001	Antenna transformer and trap
PL1	585312	Battery plug and cable assembly			
R1, R4	310730	10,000 ohms, ¼ watt resistor			

The following voltage readings are d-c measurements from tube socket pin to chassis. A 1000 ohms-per-volt meter should be used for all readings except those indicated by an asterisk (*), which should be taken with a d-c vacuum-tube voltmeter. All voltages are positive unless otherwise indicated.

	PIN NUMBER						
TUBE	1	2	3	4	5	6	7
1T4(V1)		55	52	82		*—.3	1.5
1R5		82	57	*—11.0		*—.4	1.5
1T4(V3)		82	52			*—.4	1.5
1S5		—6.2	*—.45	*18	10	*—.3	1.5
3Q4		80.0	*—6.2	82	1.5	80	

TUBE	PIN NUMBER 1	2	3	4	5	6	7	8
12SA7			89	89	*-10			*-1.6
12SK7				*-1.6		89		89
12SQ7		*-0.7		*-1.6	-0.5	37.5		
50L6GT			110	89				6.2
35Z5GT				116		116		117

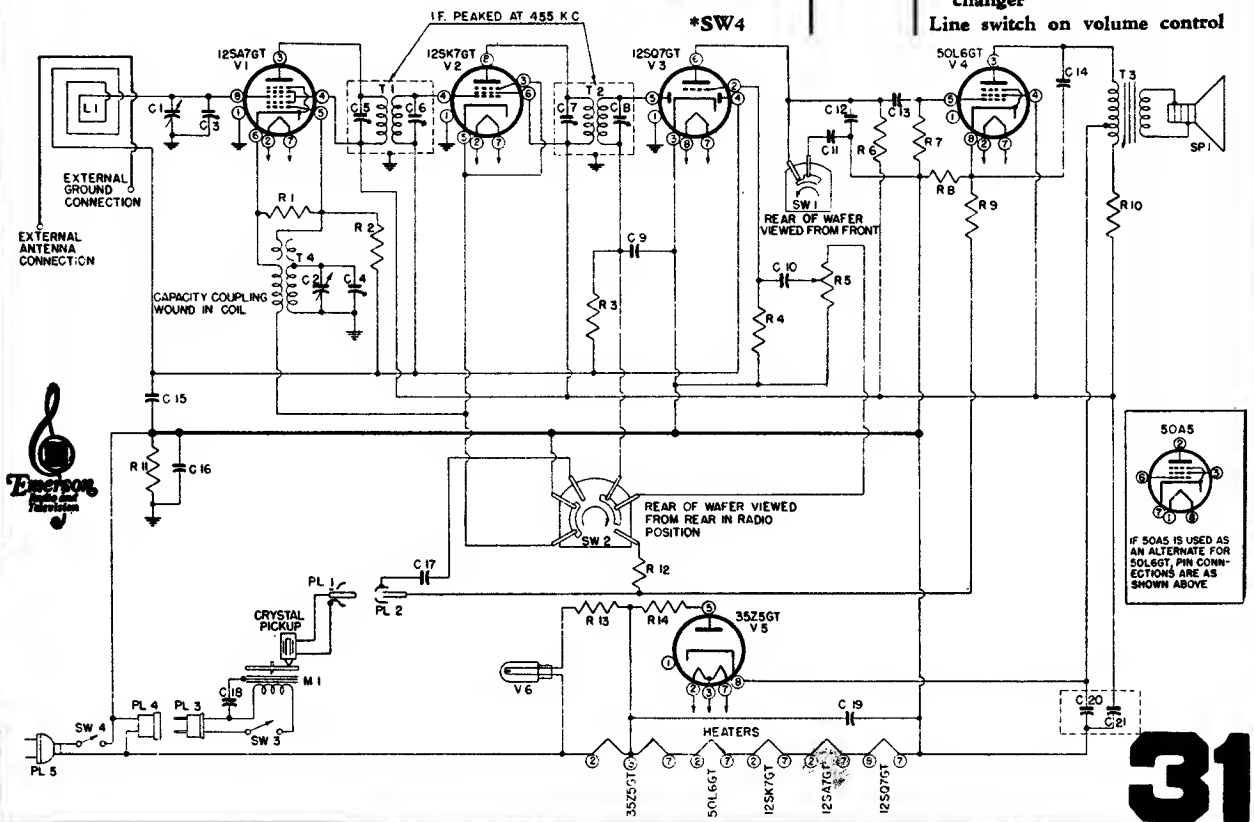
The following voltage readings are d-c measurements taken from B— (line switch) to the indicated tube-socket pin. A 1000 ohms-per-volt meter should be used for all readings except those indicated by an asterisk (*), which should be taken with a d-c vacuum-tube voltmeter. Line voltage for these readings was 117 volts, 60 cycles, a.c. Take readings with the volume control set at minimum and the variable condenser closed.

EMERSON RADIO
MODELS: 525, 552

CHASSIS MODEL: 120037

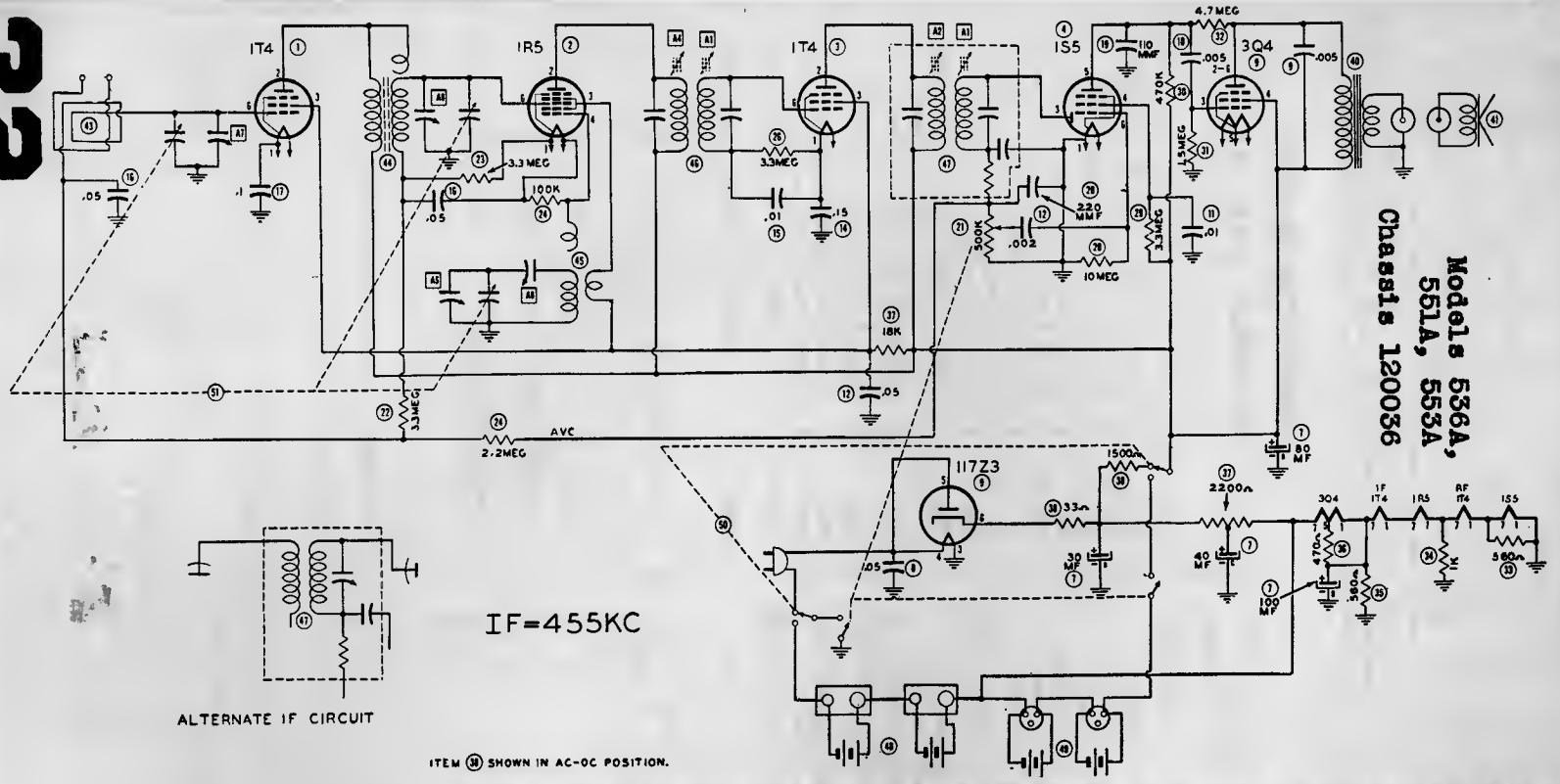
C1, C2	900290	Two-gang variable condenser
*C3, C4		Trimmers, part of variable condenser
*C5, C6, C7, C8		Trimmers, part of i-f transformers
C9	910000	0.00022 mfd. mica condenser
C10	920010	0.002 mfd., 600 volt condenser
C11	920515	0.002 mfd., 400 volt condenser
C12	920240	0.0005 mfd., 600 volt condenser
C13, C14	920020	0.02 mfd., 400 volt condenser
C15	920040	0.1 mfd., 200 volt condenser
C16	920050	0.2 mfd., 200 volt condenser (used only when T1 and T2 are 720000 and 720100 respectively)
C17, C19	920030	0.05 mfd., 400 volt condenser
C18	922090	0.05 mfd., 400 volt condenser (used up to serial No. 8,550,551), or
C18	922101	0.05 mfd., 400 volt condenser (used after serial No. 8,550,551)
C20, C21	925267	30-50 mfd., 150 volt dual electrolytic

R1	310810	22,000 ohms, ¼ watt resistor
R2, R4	397000	15 meg., ½ watt resistor
R3	321330	3.3 meg., ¼ watt resistor
R5	390010	0.5 meg. volume control
R6, R7	321130	470,000 ohms, ¼ watt resistor
R8	340290	150 ohms, ½ watt resistor
R9	321290	2.2 meg., ¼ watt resistor
R10	370490	1,000 ohms, 1 watt resistor
R11	321050	220,000 ohms, ¼ watt resistor
R12	321210	1 meg., ¼ watt resistor
R13	340010	10 ohms, ½ watt resistor
R14	340050	15 ohms, ½ watt resistor
SP1	180000	P.M. speaker
SW1	510130	Tone control switch
SW2	510390	Phono-radio switch
*SW3		Motor switch, part of record changer
*SW4		Line switch on volume control



Emerson Radio

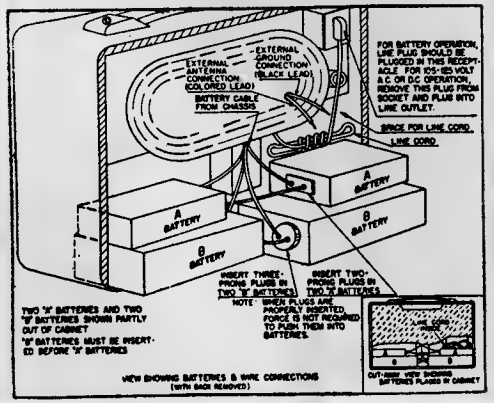
Models 536A, 551A, 553A
Chassis 120036

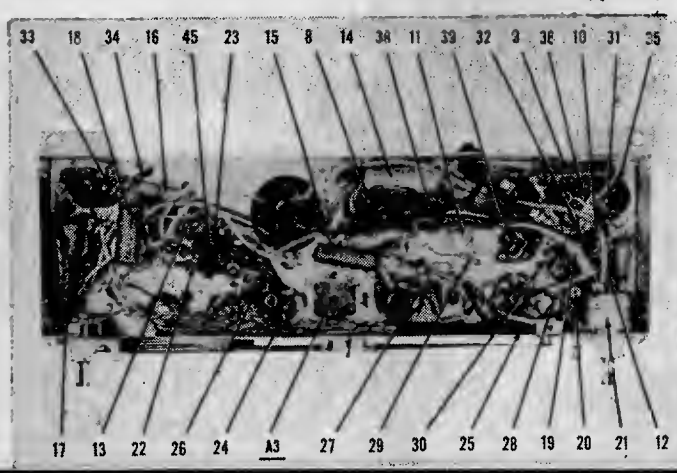


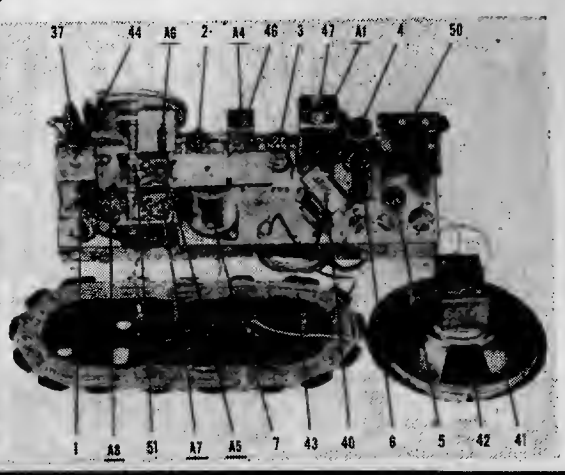
ALTERNATE IF CIRCUIT

IF=455KC

ITEM (38) SHOWN IN AC-OC POSITION.







Emerson Radio

Models 543, 544
Chassis 120046, 120052

Chassis 120046 below, 120052 next page.

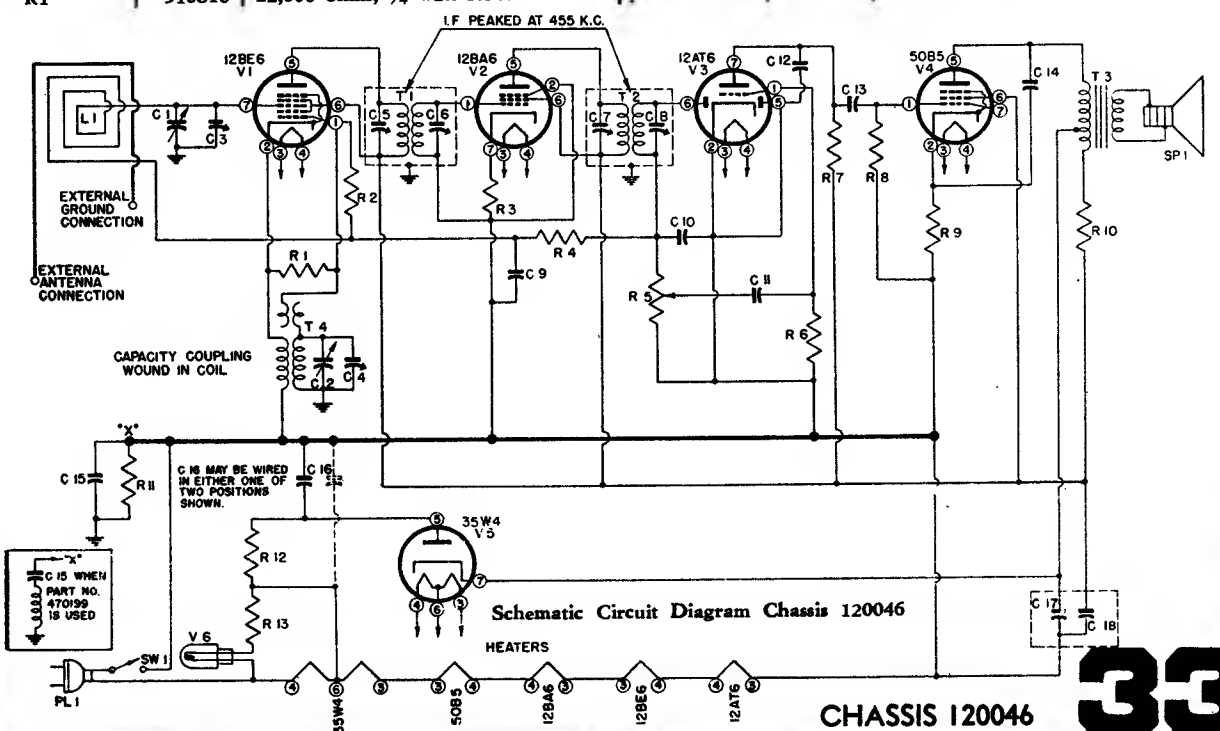
I-f Alignment

1. Rotate the variable condenser to the minimum capacity position.
2. Feed 455 kc to the converter grid (stator of the r-f section of the variable condenser) through a 0.1 mfd. condenser and adjust the four i-f trimmers for maximum response.

R-f Alignment

1. Connect the oscillator to a coil composed of three to four turns of wire wound in a circle approximately 12" in diameter. This coil should be held parallel to and in line with the loop antenna of the receiver at a distance of 15 to 20 inches.
2. Radiate a signal at 1425 kc, set the dial indicator to 1425 kc, and adjust the trimmers on the variable condenser for maximum response.
3. Radiate a 600 kc signal and tune in the signal on the receiver. Adjust the loose outside turn of the loop antenna for maximum response. This loose turn may be moved to either side of the center. Fasten it in the position which gives maximum response.
4. Repeat steps 2 and 3 until no further improvement is evident.

C1, C2	900013	Two-gang variable condenser	R2, R6	397000	15 meg., ½ watt resistor
*C3, C4		Trimmers, part of variable condenser	R3	340310	180 ohms, ½ watt desisteor
*C5, C6, C7, C8		Trimmers, part of i-f transformers	R4	321290	2.2 meg., ¼ watt resistor
			R5	390015	0.5 meg. volume control
C9	920040	0.1 mfd., 200 volt condenser	R7, R8	321130	470,000 ohms, ¼ watt resistor
C10	910000	0.00022 mfd. mica condenser	R9	340290	150 ohms, ½ watt resistor
C11	920010	0.002 mfd., 600 volt condenser	R10	370490	1,000 ohms, 1 watt resistor
C12	920240	0.0005 mfd., 600 volt condenser	R11	321050	220,000 ohms, ¼ watt resistor
C13, C14	920020	0.02 mfd., 400 volt condenser	R12	340050	15 ohms, ½ watt resistor
C15	920050	0.2 mfd., 200 volt condenser (used when T1 and T2 are 720000, and 720100 respectively), or	R13	340010	10 ohms, ½ watt resistor
			SP1	180000	P.M. speaker
			*SW1		Line switch on volume control
C15	470199	0.2 mfd., 200 volt assembly (used when T1 and T2 are 720525 and 720529 respectively)	T1	720000	First i-f transformer, or
			T1	720525	First i-f transformer, midget
C16	920030	0.05 mfd., 400 volt condenser	T2	720100	Second i-f transformer, or
C17, C18	925009	50-50 mfd., 150 volt dual electrolytic condenser	T2	720529	Second i-f transformer, midget
			T3	734000	Output transformer
L1	700000	Loop antenna	T4	716010	Oscillator coil
*PL1		Power plug, part of line cord		583010	Pilot light
R1	310810	22,000 ohms, ¼ watt resistor		807000	Line cord
				507090	Pilot light socket



Schematic Circuit Diagram Chassis 120046

CHASSIS 120046

MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

Emerson Radio, Models 543, 544, Chassis 120052

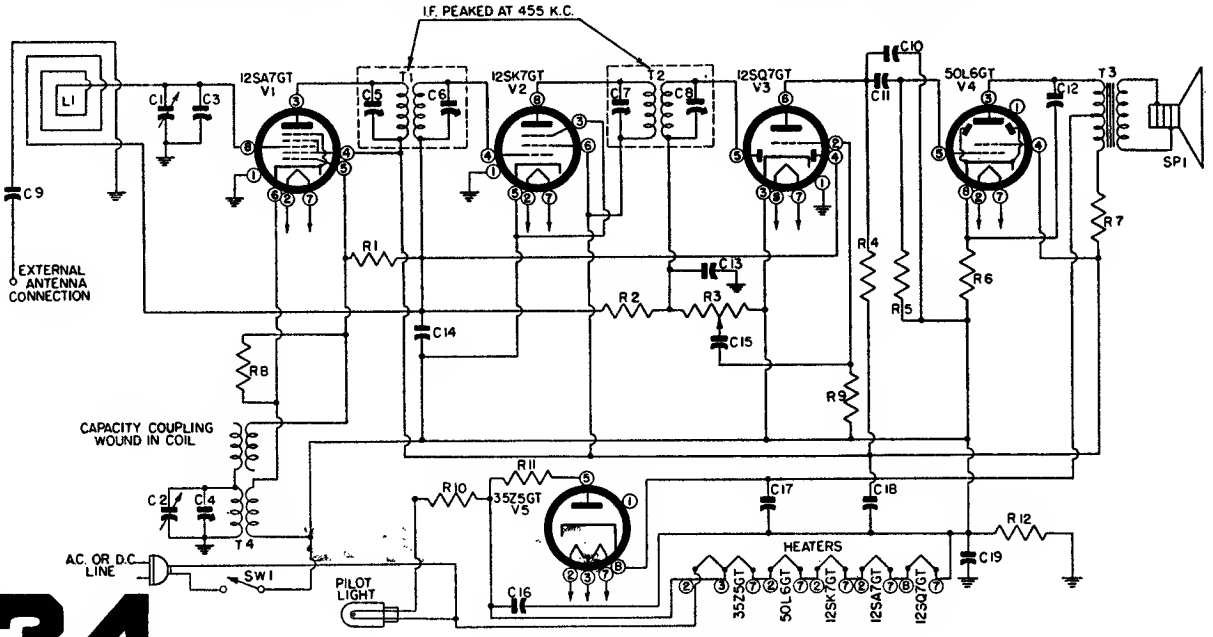
See also preceding page for 120046

The following voltage readings are d-c measurements taken from B— (line switch) to the indicated tube-socket pin. A 1000 ohms-per-volt meter should be used for all readings except those indicated by an asterisk (*), which should be taken with a d-c vacuum-tube voltmeter. Line voltage for these readings was 117 volts, 60 cycles, a.c. Measurements made with 117 volts d.c. will be lower than those given below. Take readings with the volume control set at minimum and the variable condenser closed.

	PIN NUMBER							
TUBE	1	2	3	4	5	6	7	8
12SA7			89	89	*—10			*—1.6
12SK7				*—1.6		89		89
12SQ7		*—0.7		*—1.6	—0.5	37.5		
50L6			110	89				6.2
35Z5				116		116		117
12BE6	*—80				92	92	*—1.3	
12BA6					92	92	1.7	
12AT6	*—0.6					*—0.45	*44	
50B5		5.65			110	92		
35W4	115						115	

Schematic Symbol	†Part No.	DESCRIPTION
C1, C2	900160	Two-gang variable condenser
*C3, C4		Trimmer, part of variable condenser
*C5, C6, C7, C8		Trimmers, part of i-f transformers
C9, C15	920010	0.002 mfd., 600 volt condenser
C10	920240	0.0005 mfd., 600 volt condenser
C11, C12	920020	0.02 mfd., 400 volt condenser
C13	910000	0.00022 mfd. mica condenser
C14	920040	0.1 mfd., 200 volt condenser
C16	920030	0.05 mfd., 400 volt condenser
C17, C18	925000	30-50 mfd., 150 volt dual electrolytic condenser
C19	920050	0.02 mfd., 200 volt condenser
L1	700000	Loop antenna, or
L1	700200	Loop antenna
R1, R9	397000	15 meg., ¼ watt resistor
R2	321330	3.3 meg., ¼ watt resistor

Schematic Symbol	†Part No.	DESCRIPTION
R3	390015	0.5 meg. volume control
R4, R5	321130	470,000 ohms, ¼ watt resistor
R6	340290	150 ohms, ½ watt resistor
R7	370490	1000 ohms, 1 watt resistor
R8	310810	22,000 ohms, ¼ watt resistor
R10	340010	10 ohms, ½ watt resistor
R11	397040	15 ohms, 1 watt wire-wound resistor
R12	321050	220,000 ohms, ¼ watt resistor
SP1	180000	P.M. speaker
*SW1		Line switch on volume control
T1	720000	First i-f transformer
T2	720100	Second i-f transformer
T3	734000	Output transformer
T4	716010	Oscillator coil
	583010	Line cord
	807000	Pilot light
	507090	Pilot light socket

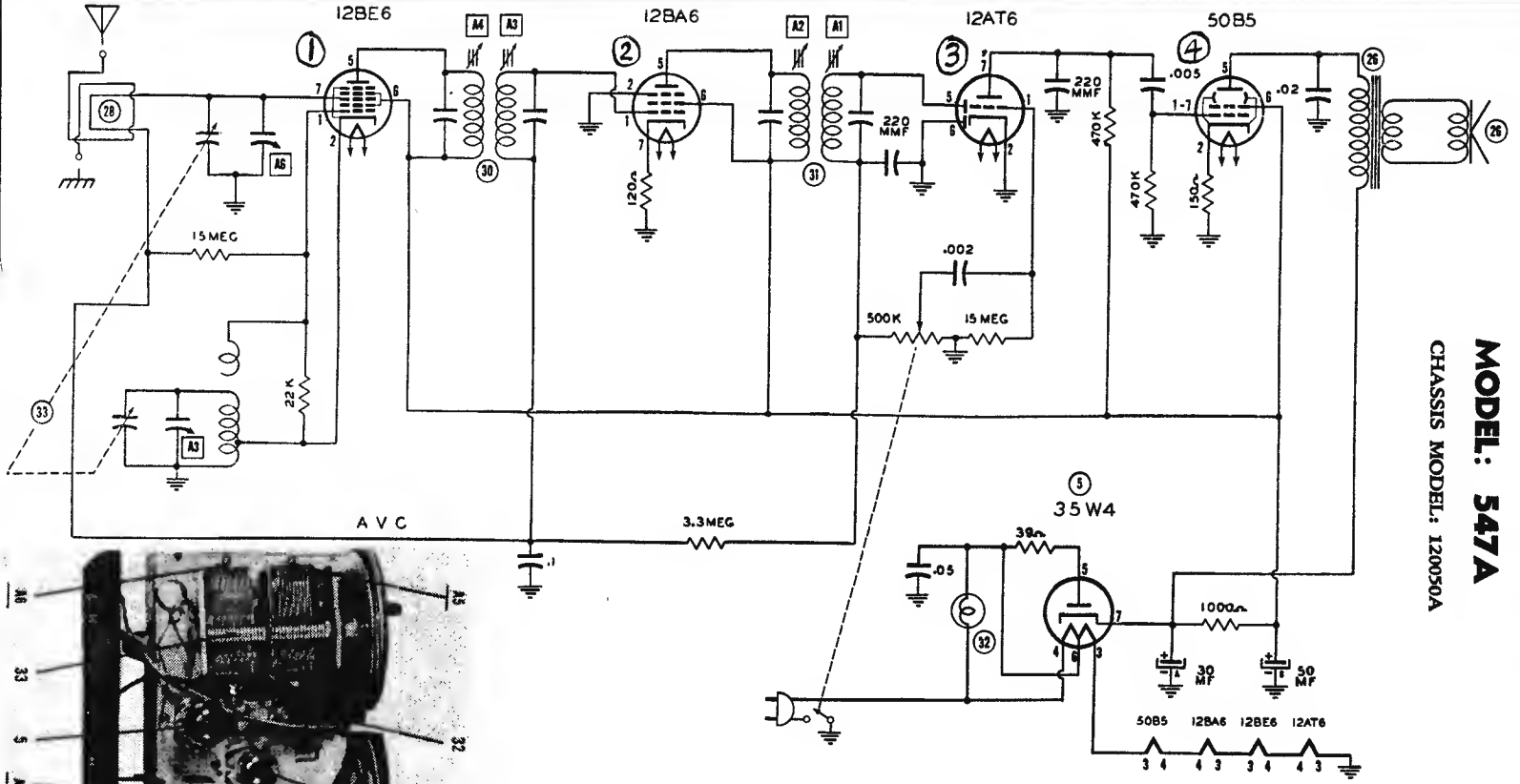


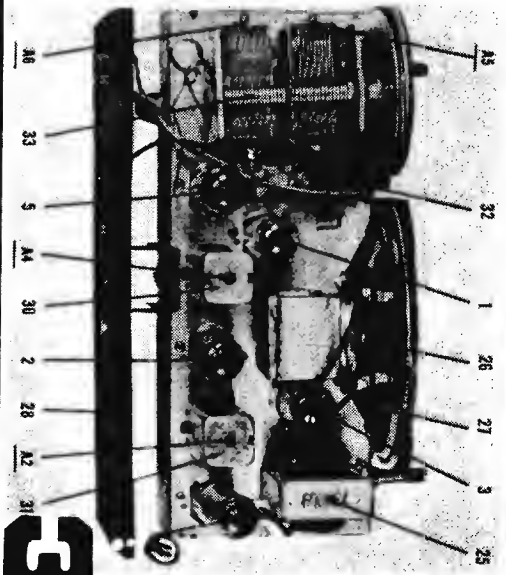
Schematic Circuit Diagram Chassis 120052

Emerson Radio

MODEL: 547A

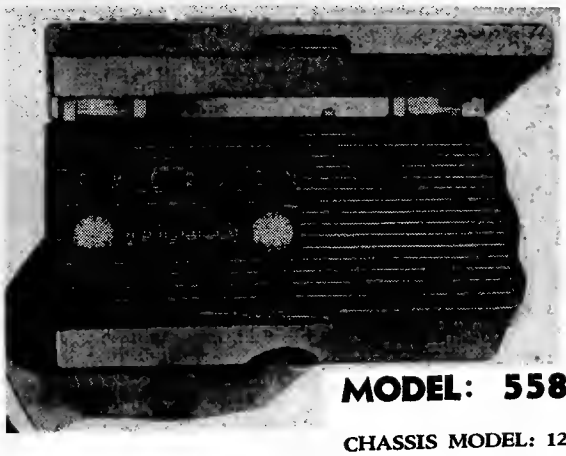
CHASSIS MODEL: 120050A





To set pointer, turn variable condenser fully closed and set pointer at mark near left end of dial backplate. Use isolation transformer if available. If not, connect a 0.1 mfd. condenser in series with low side of signal generator and chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	METER OUTPUT	ADJUST	REMARKS
1	0.1 mfd.	High side to stator of rear section of tuning condenser. Low side to chassis.	455 kc	Variable condenser fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to 0.001 mfd. to reduce hum modulation.
2	200 mmfd.	High side to external antenna lead. Low side to external grounnd lead.	1620 kc	Variable condenser fully open.	Across voice coil.	A5	Adjust for maximum output.
3	200 mmfd.	High side to external antenna lead.	1400 kc	Tune for maximum output.	Across voice coil.	A6	Adjust for maximum output.



MODEL: 558

CHASSIS MODEL: 120058

Schematic Symbol	†Part No.	DESCRIPTION
C1, C2	900022	Two-gang variable condenser
*C3, C4		Trimmers, part of variable condenser
*C5, C6		Trimmers, part of first i-f transformer
*C7, C8		Trimmers, part of second i-f transformer
C9, C14	928013	100 mmfd., ceramic condenser
C10, C13	920495	0.001 mfd., 200 volt condenser
C11	920496	0.005 mfd., 200 volt condenser
C12	928104	212 mmfd., ceramic condenser
C15	920494	0.05 mfd., 200 volt condenser
C16	920120	0.02 mfd., 100 volt condenser
C17	925063	16 mfd., 100 volt electrolytic condenser
C18	920485	0.01 mfd., 100 volt condenser
L1	700008	Loop antenna
R1	350970	100,000 ohms, ½ watt resistor
R2	340470	820 ohms, ½ watt resistor
R3	390025	1 meg., volume control
R4	351450	10 meg., ½ watt resistor
R5, R9	351330	3.3 meg., ½ watt resistor
R6	351130	470,000 ohms, ½ watt resistor
R7	351250	1.5 meg., ½ watt resistor
R8	340730	10,000 ohms, ½ watt resistor
SP1	180029	Speaker, 3-inch P.M.
T1	720028	First i-f transformer, or
T1	720034	First i-f transformer
T2	720028	Second i-f transformer, or
T2	720035	Second i-f transformer
T3	734011	Output transformer
T4	716011	Oscillator coil

The first i-f transformer is located next to the 1R5 tube. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is located between the 1T4 and 1S5 tubes. The single trimming core screw extends from the end of the can. Trimmers are accessible through holes in the top of the can.

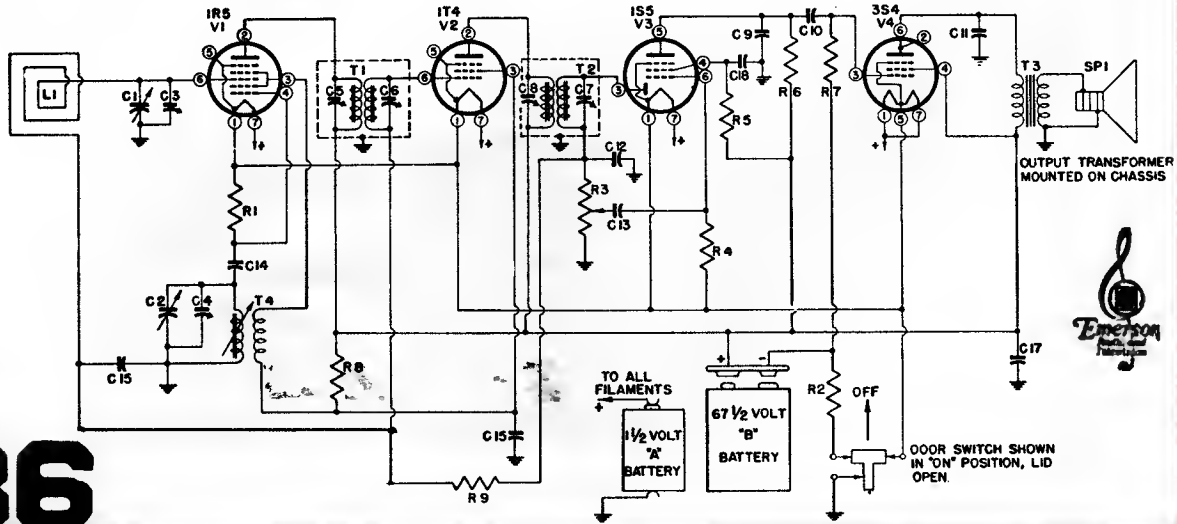
The oscillator coil is located behind the on-off switch. The trimmer for the oscillator is located on the smaller variable condenser section. The 600 kc oscillator core adjustment is the brass screw protruding from the end of the oscillator coil.

I-f Alignment

1. Rotate the variable condenser to the minimum capacity position.
2. Feed 455 kc to the grid (pin 6) of the 1R5 tube through a 0.01 mfd. condenser.
3. Adjust the four i-f trimmer screws for maximum response. (Clip the test signal lead to the stetor of the larger capacity section of the variable condenser.)

R-f Alignment

1. Connect the test oscillator to a coil composed of three or four turns of wire wound in a circle approximately 12 inches in diameter. This coil should be placed parallel to and in line with the receiver loop at a distance of approximately 15 to 20 inches.
2. Radiate a signal at 1620 kc, rotate the variable condenser to minimum capacity, and adjust the oscillator trimmer, on the smaller section of the variable condenser, for maximum response.
3. Radiate a signal at 1420 kc, tune in the 1420 kc signal, and adjust the antenna trimmer, on the larger section of the variable condenser, for maximum response.
4. Radiate a signal at 600 kc, set the dial indicator to 60, and adjust the oscillator coil core trimmer while rocking the variable condenser for maximum response.
5. Return to 1620 kc and check alignment. If readjustment is necessary, repeat Steps 2 to 4 until no further improvement is noted.



Emerson Radio

MODEL: 548 549

CHASSIS MODEL: 120051

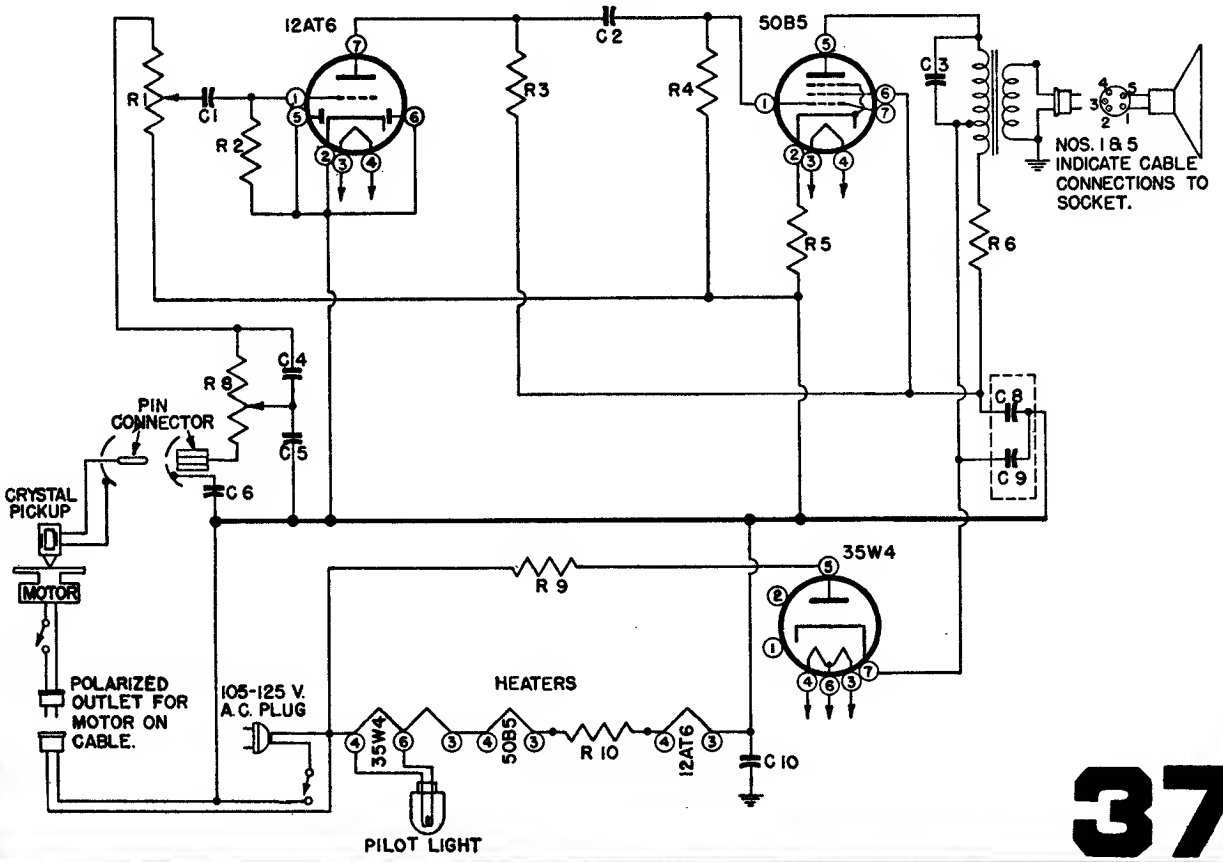
To replace tubes, remove the two knobs and unscrew the four red screws holding the chassis support to the cabinet at the bottom. Lift the board and chassis out and set it aside.

Normally, the record changer should not require additional lubrication. A drop of machine oil on the turntable shaft bearings, motor bearings, and frictional surfaces once a year will do no harm. Do not lubricate the trip mechanism or allow oil to come in contact with the idler wheel.

C1	920170	0.001 mfd., 600 volt condenser
C2	920020	0.02 mfd., 400 volt condenser
C3, C6	920030	0.05 mfd., 400 volt condenser
C4	910010	0.00011 mfd. mica condenser, or
C4	910220	0.0001 mfd. mica condenser
C5	910000	0.00022 mfd. mica condenser, or
C5	910230	0.0002 mfd. mica condenser
C8, C9	925009	50-50 mfd., 150 volt dual electrolytic condenser
C10	920420	0.15 mfd., 200 volt condenser
R1	390016	0.5 meg. volume control
R2	397000	15 meg., ½ watt resistor
R3, R4	351130	470,000 ohms, ½ watt resistor
R5	370290	150 ohms, 1 watt resistor
R6	340430	560 ohms, ½ watt resistor
R8	390370	2 meg. tone control
R9	340050	15 ohms, ½ watt resistor
R10	394160	133 ohms, 5 watt resistor

The following voltage readings are d-c measurements taken from B— (line switch) to the indicated tube-socket pin. A 1000 ohms-per-volt meter should be used for all readings except those indicated by an asterisk (*), which should be taken with a d-c vacuum-tube voltmeter. Line voltage for these readings was 117 volts, 60 cycles, a-c.

	PIN NUMBER						
TUBE	1	2	3	4	5	6	7
12AT6	*—0.7						45
50B5		7.8			118	123	
35W4	128						128



EMERSON RADIO

MODELS: 1002, 1003

CHASSIS MODEL: 129003

The second i-f transformer (T2) is mounted on top of the chassis to the right of the speaker. The trimmers (C7, C8) are accessible through holes in the top of the can.

The trimmer for the antenna (C3) and the trimmer for the oscillator coil (C4) are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

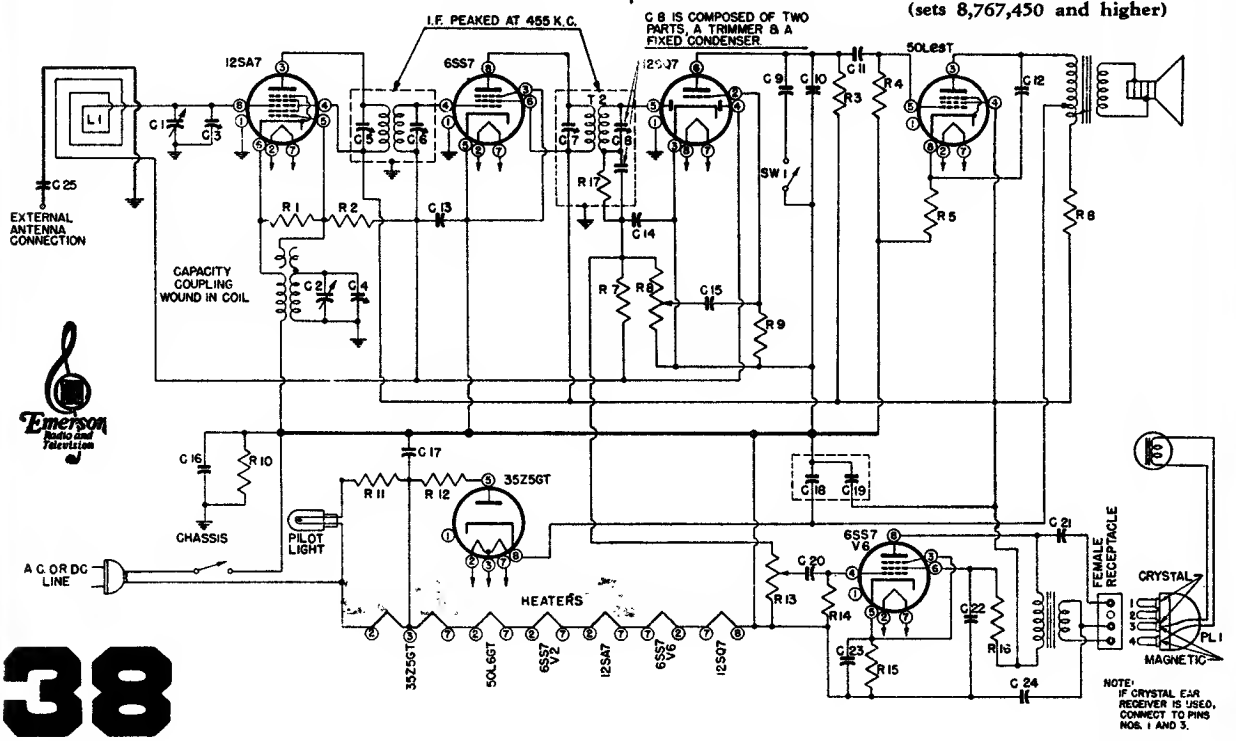
I-f Alignment

1. Rotate the variable condenser to the minimum capacity position.
2. Feed 455 kc to the converter grid (stator of the r-f section of the variable condenser) and adjust the four i-f trimmers (C5, C6, C7, C8) for maximum response.

R-f Alignment

1. Connect the oscillator to a coil composed of three or four turns of wire wound in a circle approximately 12" in diameter. This coil should be held parallel to and in line with the loop antenna of the receiver at a distance of 15 to 20 inches.
2. Radiate a signal at 1425 kc, set the dial indicator to 1425 kc, and adjust the trimmers on the variable condenser (C3, C4) for maximum response.
3. Radiate a 600 kc signal and tune in the signal on the receiver. Adjust the loose outside turn of the loop antenna for maximum response. This loose turn may be moved to either side of the center. Fasten it in the position which gives maximum response.
4. Repeat steps 2 and 3 until no further improvement is evident.

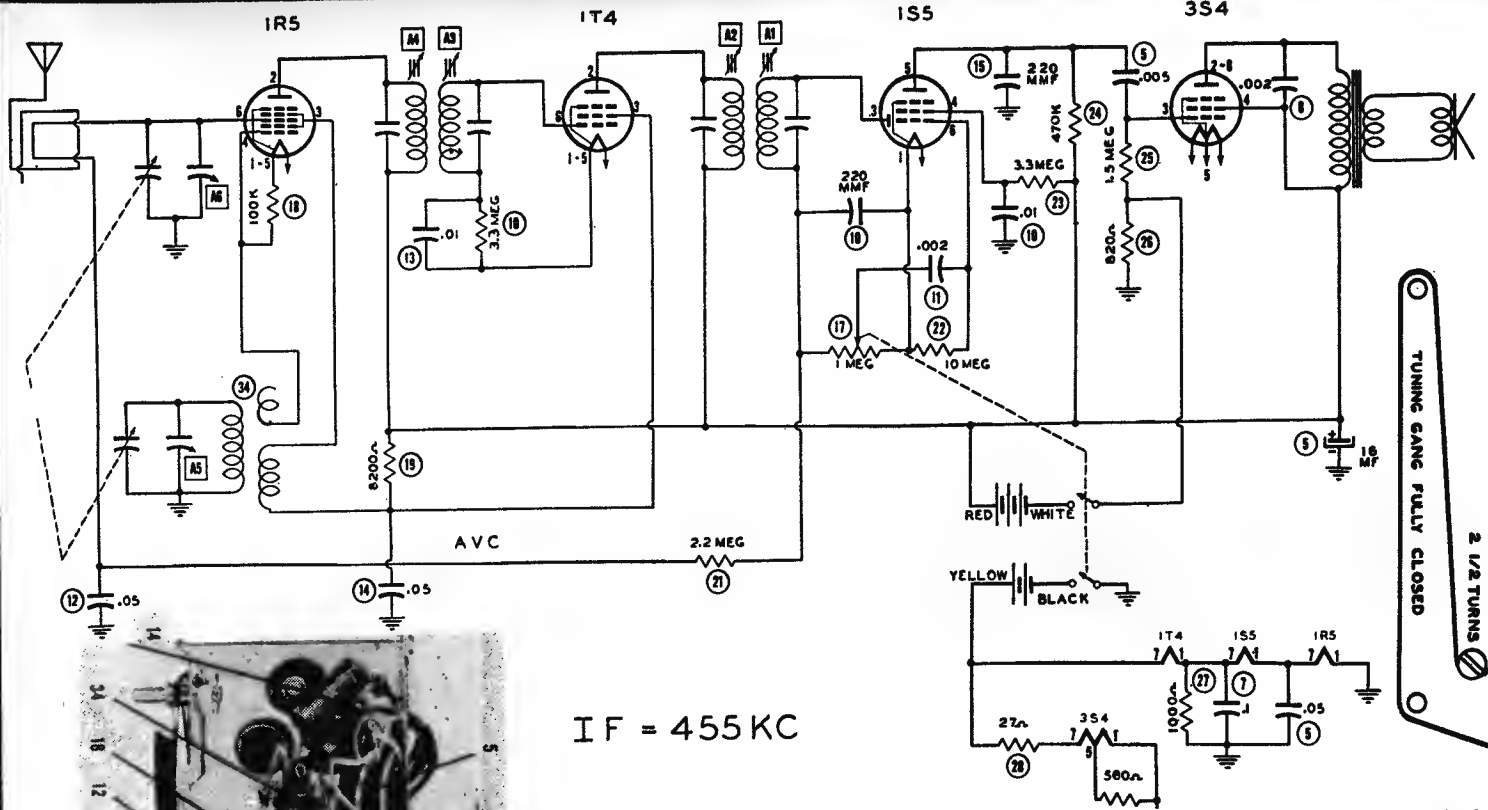
Schematic Symbol	†Part No.	DESCRIPTION
C1, C2	900070	Two-gang variable condenser
*C3, C4		Trimmers, part of variable condenser
*C5, C6, C7, C8		Trimmers, part of i-f transformers
C9, C15, C20, C25	920010	0.002 mfd., 600 volt condenser
C10	920240	0.0005 mfd., 600 volt condenser
C11, C12, C21	920020	0.02 mfd., 400 volt condenser
C13	920040	0.1 mfd., 200 volt condenser
C14	910010	0.00011 mfd. mica condenser
C16	920050	0.2 mfd., 200 volt condenser
C17, C24	920030	0.05 mfd., 400 volt condenser
C18, C19	925011	50-50 mfd., 150 volt dual electrolytic condenser
C22	920060	0.05 mfd., 200 volt condenser
C23	925180	10 mfd., 25 volt electrolytic condenser
L1	700000	Loop antenna
R1	340810	22,000 ohms, ½ watt resistor
R2, R9	397000	15 meg., ½ watt resistor
R3, R4	351130	470,000 ohms, ½ watt resistor
R5	340290	150 ohms, ½ watt resistor
R6	370490	1000 ohms, 1 watt resistor
R7, R14	351330	3.3 meg., ½ watt resistor
R8	390190	0.5 meg. volume control
R10	351050	220,000 ohms, ½ watt resistor
R11	340010	10 ohms, ½ watt resistor
R12	340050	15 ohms, ½ watt resistor
R13	390180	0.5 meg. volume control (sets below 8,767,450), or
R13	390014	2 meg. volume control (sets 8,767,450 and higher)
R15	340410	470 ohms, ½ watt resistor
R16	351050	220,000 ohms, ½ watt resistor (sets below 8,767,450), or
R16	340970	100,000 ohms, ½ watt resistor (sets 8,767,450 and higher)

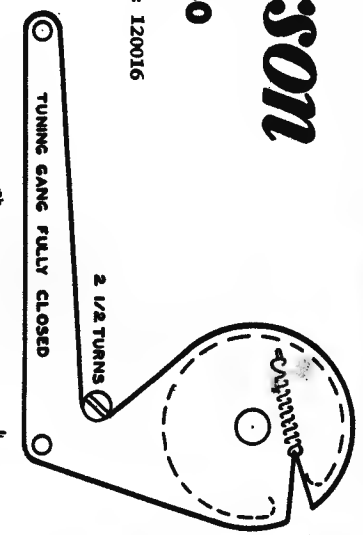


Emerson

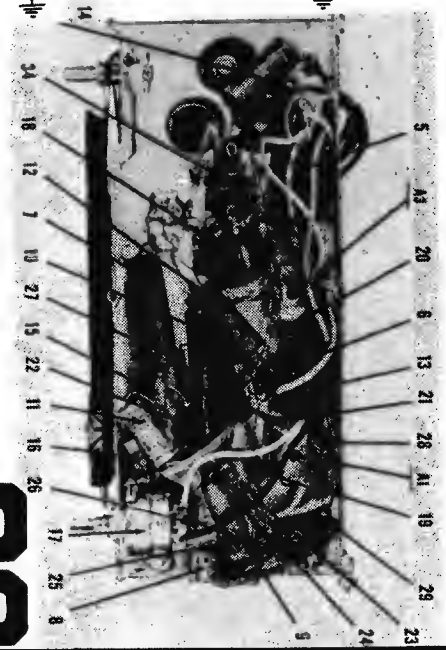
MODEL: 560

CHASSIS MODEL: 120016



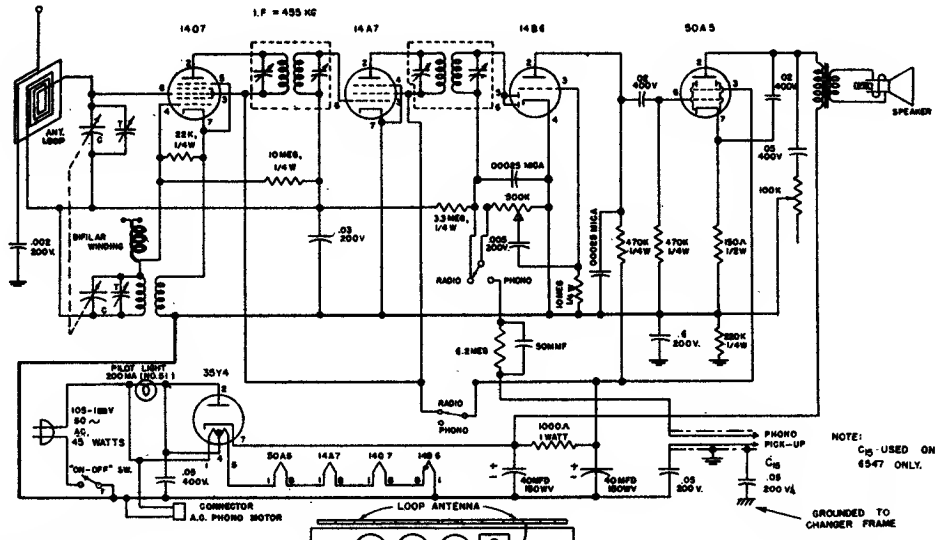


IF = 455 KC



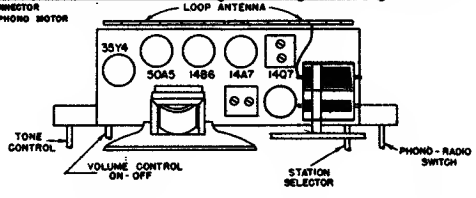
To set pointer, turn variable condenser fully closed and set pointer at mark near left end of dial backplate. Connect a 100,000 ohm resistor across the loop leads during Steps 1 and 2. Volume control should be at maximum position; output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	0.1 mfd.	High side to rear stator of variable condenser. Low side to chassis.	455 kc	Variable condenser fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2	0.1 mfd.	High side to rear stator of variable condenser. Low side to chassis.	1620 kc	Variable condenser fully open.	Across voice coil.	A5	Adjust for maximum output.
3		Loop	1400 kc	Tune for maximum output.	Across voice coil.	A6	Disconnect 100,000 ohm resistor from loop leads. Connect loop leads to loop. Hold chassis in same relative position



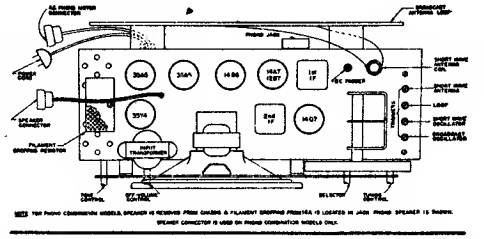
TUBE COMPLEMENT

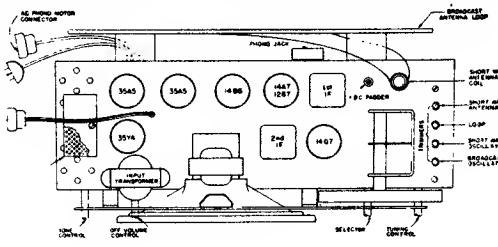
TUBE	LOCTAL	OCTAL	MINIATURE
V_1	14Q7		12BE6
V_2	14A7		12BA6
V_3	14B6		12AT6
V_4	50A5	50L6	50B5
V_5	35Y4		35W4



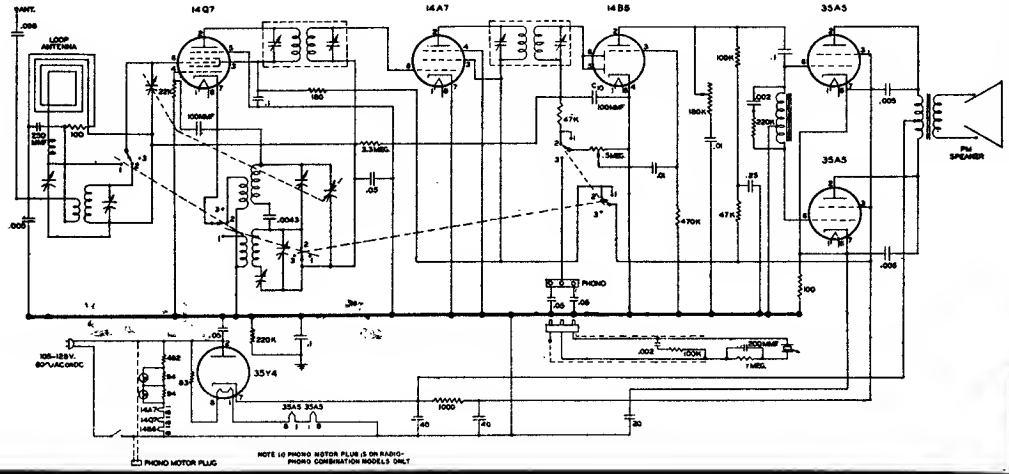
Espey Mfg. Co.

Models 20516A, and 6547.





Steps	Connect output of Generator to	Tune Osc. to	Band Switch on	Tune Radio Dial to	Adjust the following Max. Peak Output
1	Tuning condenser stator (ant.) in series with .01 mfd	455 Kc	Best	Quiet point on high frequency end of dial	1st and 2nd IF transformers
2	Antenna term. of Ant. loop in series with 100 mmf.	1660 Kc	Best	Full clockwise (out of mesh)	B.C. Osc. Trimmer
3	Same	1500 Kc	Best	Signal (1500 Kc)	B.C. loop trimmer
4	Same	600 Kc	Best	600 Kc	Osc. padder (rock in)
5	Same	1660 Kc	Best	Full clockwise (out of mesh)	B.C. Osc. Trimmer
6	Ant. term. in series with 100 mmf and 400 ohm resistor	18.6 Mc	S.W.	Full clockwise (out of mesh)	S.W. Osc. Trimmer
7	Same	18.0 Mc	S.W.	Signal (18.0 Mc)	S.W. Ant. Trimmer

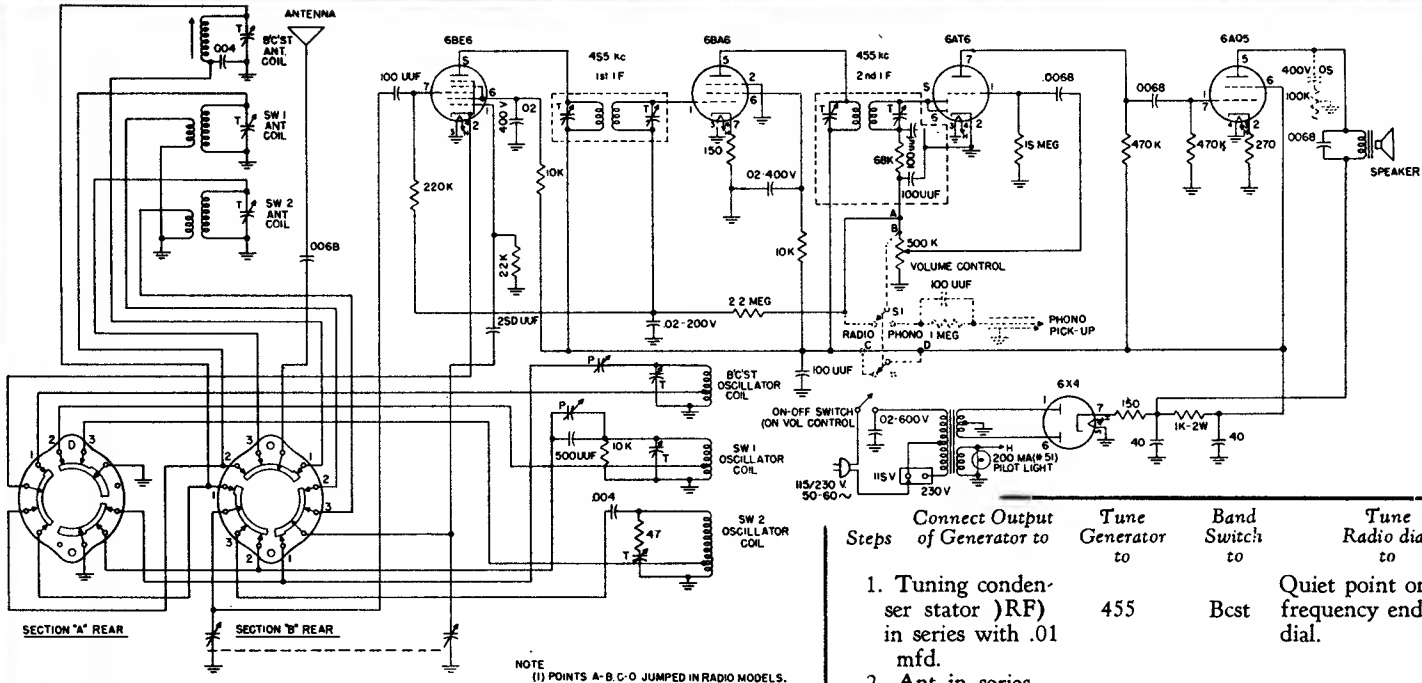


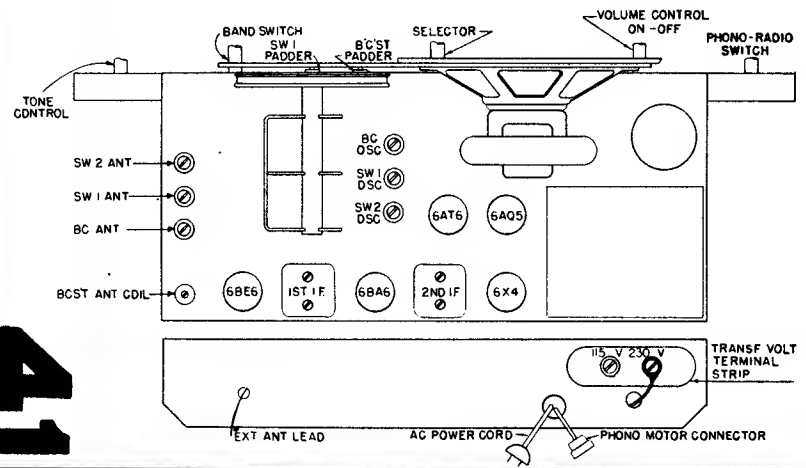
Espey Mfg. Co.

Models 20626-A, and 97-A.

Espey Mfg. Co.

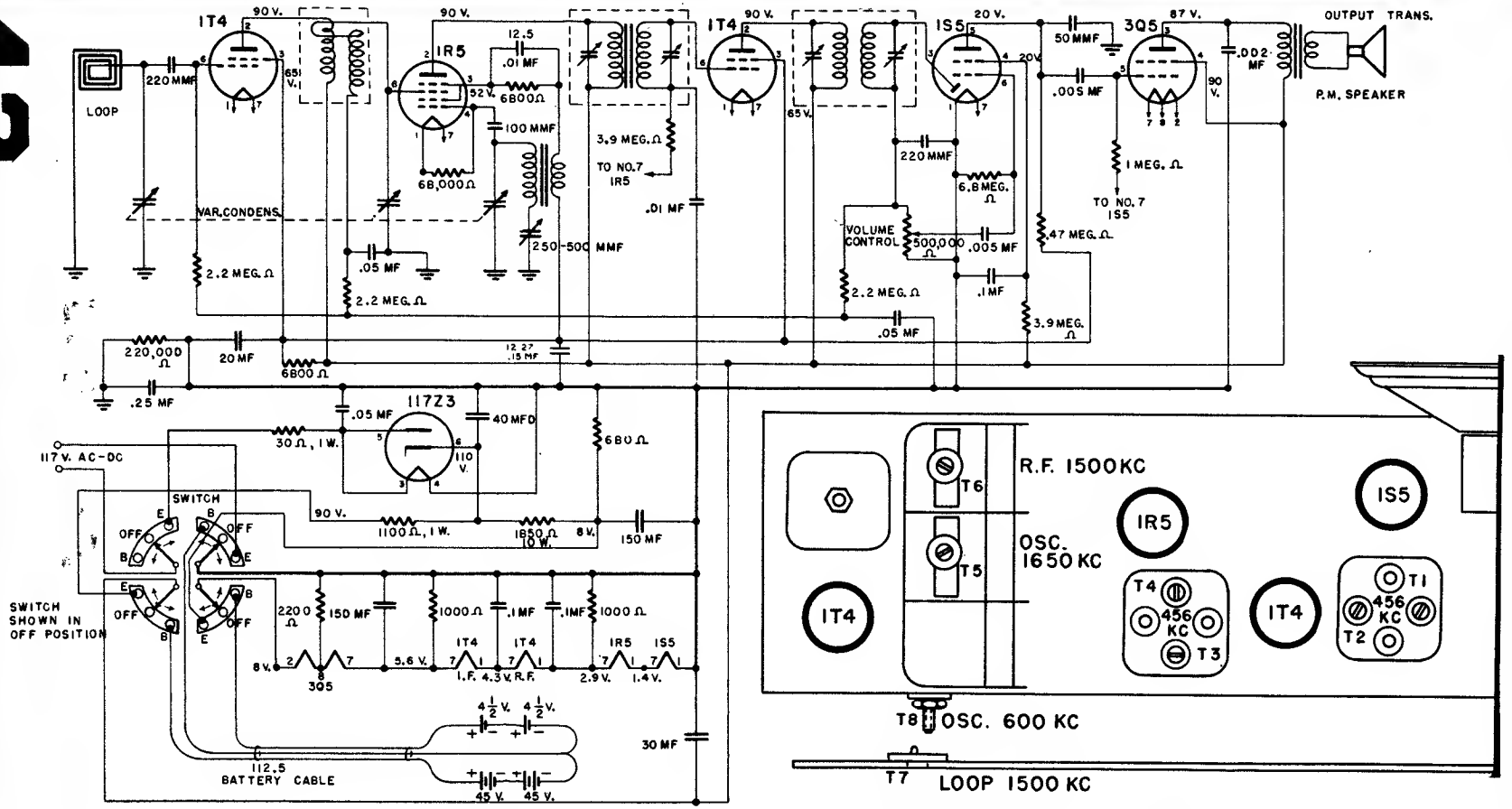
MODEL 10536 A



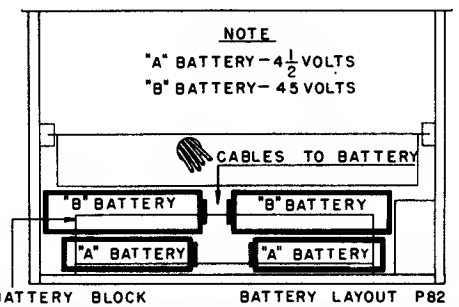


Steps	Connect Output of Generator to	Tune Generator to	Band Switch to	Tune Radio dial to	Adjust the following for maximum peak output
1.	Tuning condenser stator)RF) in series with .01 mfd.	455	Bcst	Quiet point on high frequency end of dial.	1st and 2nd IF transformers
2.	Ant in series with 200 mmf.	1500 kc	Bcst	*1500 kc on dial.	BC Osc. trimmer
3.	Same as above	1500	Bcst	Sig. (1500 kc).	BC Ant. trimmer
4.	Same as above	600 kc	Bcst	600 kc on dial.	BC Osc. padder Ant. coil core
5.	Same as above	1500	Bcst	1500 on dial	BC Ant. trimmer BC Osc. trimmer
6.	Ant. in series with 400 ohm	6 Mc	SW1	6 Mc on dial	SW1 Osc. trimmer
7.	Same as above	6 Mc	SW1	6 Mc	SW1 Ant. trimmer
8.	Same as above	2.5 Mc	SW1	2.5	Rock in SW1 Osc. padder SW1 Ant. trimmer
9.	Same as above	6 Mc	SW1	6 Mc	SW1 Osc. trimmer SW2 Osc. trimmer
10.	Same as above	21 Mc	SW2	21 Mc	SW2 Ant. trimmer
11.	Same as above	21 Mc	SW2	Sig. (21 Mc)	SW2 Ant. trimmer

* Before aligning R.F. and Osc. set dial pointer on dial point marker with condenser fully meshed.



TUNING RANGE 538-1650 KC



BATTERY BLOCK BATTERY LAYOUT P82

NOTE:
K = 1000 OHMS. MEG. = 1,000,000 OHMS

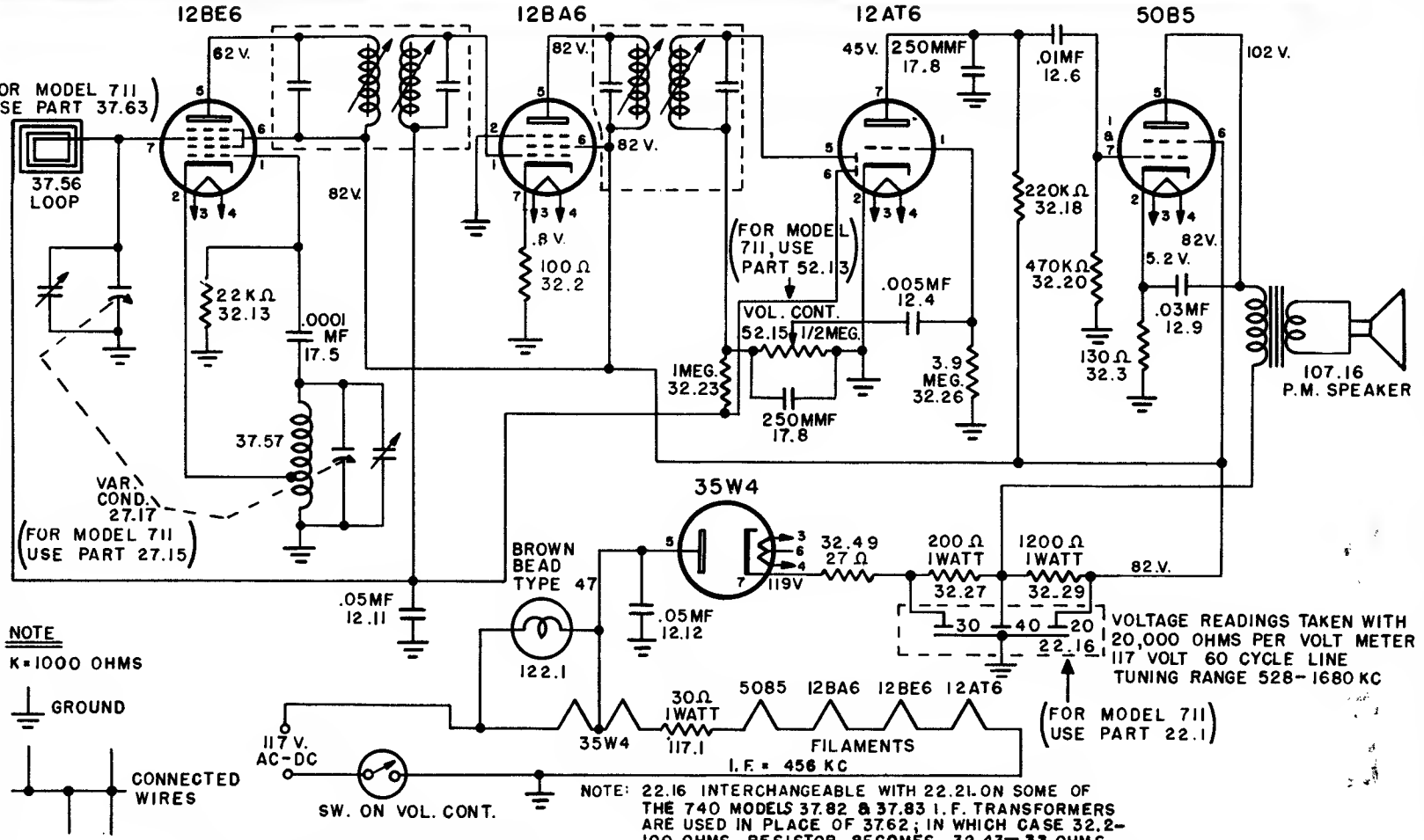
GROUND

CONNECTED WIRES

ALL VOLTAGES MEASURED TO COMMON
VOLTAGE READINGS TAKEN WITH
20,000 OHMS PER VOLT METER
117 VOLT 60 CYCLE LINE
TUNING RANGE 538-1650 Kc

Fada Radio & Electric

Models P-82, and P-100

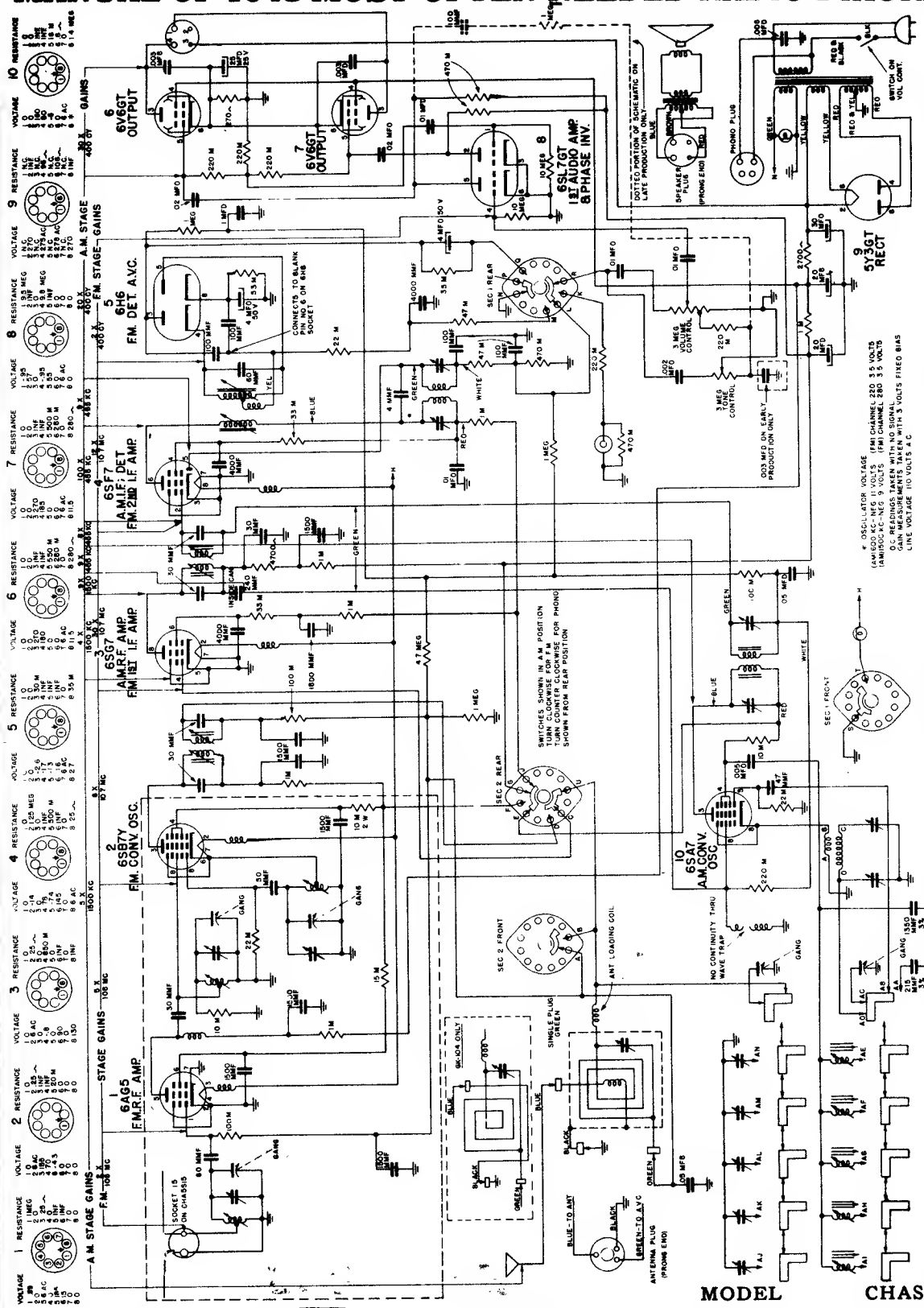


NOTE: 22.16 INTERCHANGEABLE WITH 22.21. ON SOME OF THE 740 MODELS 37.82 & 37.83 I.F. TRANSFORMERS ARE USED IN PLACE OF 37.62; IN WHICH CASE 32.2-100 OHMS RESISTOR BECOMES 32.43-33 OHMS.

Power consumption: 30 Watts
Frequency Range: 530-1680 KC
I.F. Circuits: 456 KC

12.4	Tubular Condenser, .005 mf, 600 V
12.6	Tubular Condenser, .01 mf, 400 V
12.9	Tubular Condenser, .03 mf, 400 V
12.11	Tubular Condenser, .05 mf, 200 V
12.12	Tubular Condenser, .05 mf, 400 V
17.5	Mica Condenser, 100 mmf, ±10%
17.8	Mica Condenser, 250 mmf, ±20%
22.16	3 Section Electrolytic Condenser, 30-40-20 mf, 150 W.V.

MODEL 711 & 740
SCHEMATIC
FADA RADIO & ELECTRIC CO. INC.
BELLEVILLE, NEW JERSEY U.S.A.



AM Intermediate Frequency 455 KC.
FM Intermediate Frequency 10.7 MC.

MODEL	CHASSIS
GK-100	C-170
GK-102	C-194
GK-103	C-216
GK-104	C-201

MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

FARNSWORTH TELEVISION & RADIO CORPORATION

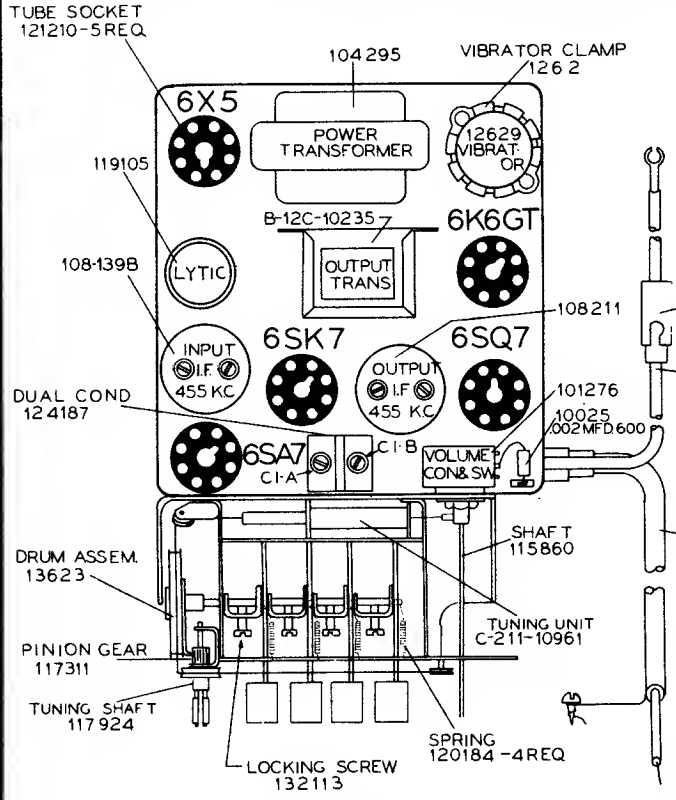
MODEL EF-451

CHASSIS -C-196

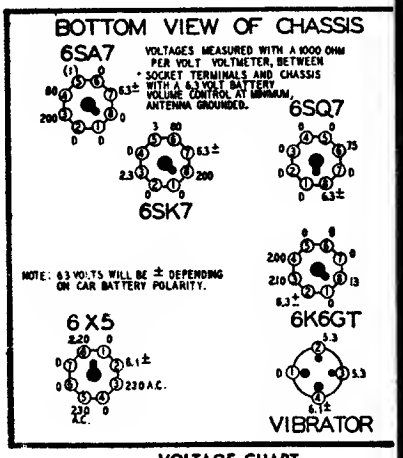
I.F. FREQUENCY 455 K.C.

GAIN MEASUREMENTS TAKEN WITH 3 VOLTS FIXED BIAS.

VOLTAGE AND RESISTANCE MEASUREMENTS TAKEN FROM CHASSIS TO PIN INDICATED.



Gamble-Skogmo, Inc.
Coronado Model 43-5005



VOLTAGE CHART

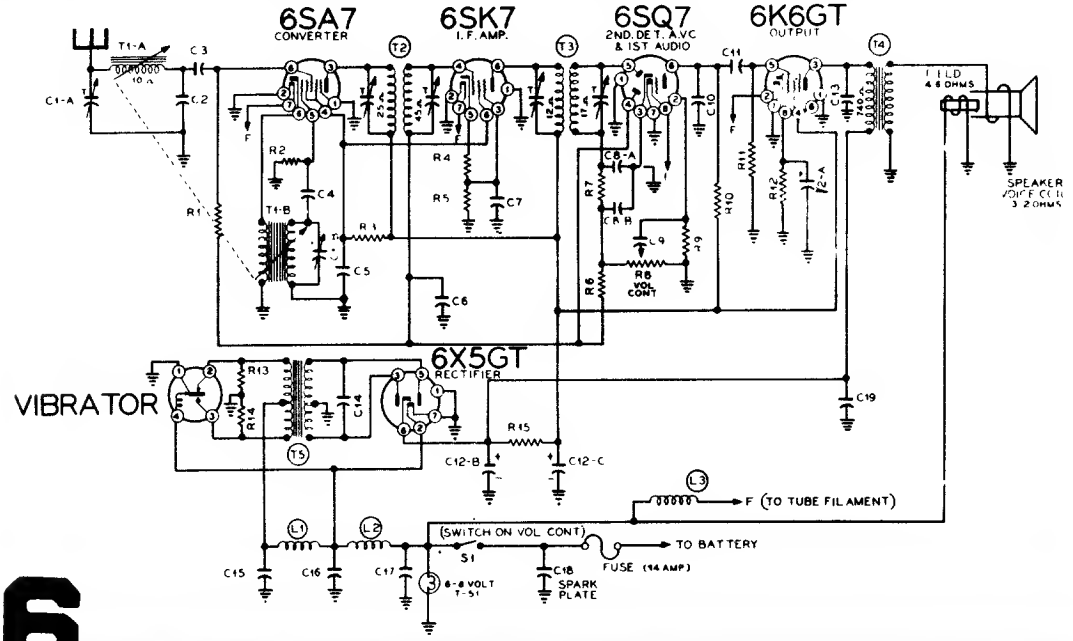
CORONADO MODEL 43-5005

RESISTORS

C-9B1-35	R9	4.7 Megohm, ½ Watt—20%	1
C-9B1-27	R10	220K Ohm, ½ Watt—20%	1
C-9B1-29	R11	470K Ohm, ½ Watt—20%	1
C-9B1-60	R12	680 Ohm, ½ Watt—10%	1
C-9B1-34	R6	3.3 Megohm, ½ Watt—20%	1
C-9B1-23	R7	47K Ohm, ½ Watt—20%	1
C-9B1-31	R1	1 Megohm, ½ Watt—20%	1
C-9B1-22	R2	33K Ohm, ½ Watt—20%	1
C-9B2-76	R3	15K Ohm, 1 Watt—10%	1
C-9B2-64	R15	1500 Ohm, 1 Watt—10%	1
C-9B1-50	R13, R14	100 Ohm, ½ Watt—10%	2
C-9B1-52	R4	150 Ohm, ½ Watt—10%	1
C-9B1-56	R5	230 Ohm, ½ Watt—10%	1

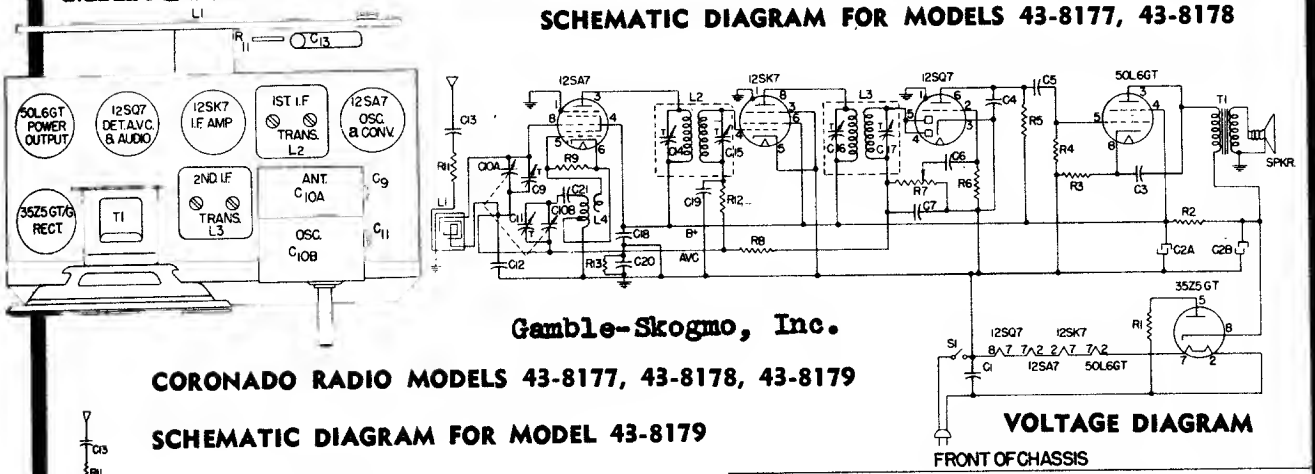
CONDENSERS

100-26	C9	.02 x 400 Volt Tubular	1
100-87	C12	.01 x 600 Volt Tubular	1
100-13	C6	.05 x 400 Volt Tubular	1
100-20	C7	.1 x 200 Volt Tubular	1
100-9	C5	.05 x 200 Volt Tubular	1
100-125	C14	.0035 x 1600 Volt Tubular	1
100-25	C11	.002 x 600 Volt Tubular	1
100-31	C15, C16, C17	.5 x 120 Volt Oval Type	3
100-81		.5 Mfd. Generator Cond.	1
100-82		.5 Mfd. Ammeter Cond.	1
119-105	C12 A-B-C	Electrolytic Filter Condenser—20 Mfd. x 25 Volt; 15 Mfd. x 350 Volt; 15 Mfd. x 250 Volt	1
124-187	C1-A-B	Ant. and Osc. Dual Trimmer	1
129-161	C8A-B	.0001 Dual Mica—10%	1
129-2	C2, C10	.0005 Mica Type—20%	2
129-188	C2	.00008 Mica Type—3%	1
129-21	C4	.0002 Mica Type—20%	1
129-12	C19	.00025 Mica Type—20%	1
11749B	C18	Spark Plate	1



ON SOME SETS R-5 AND C-7 IS ELIMINATED AND THE CATHRODE OF THE 6SK7 IS GROUNDED

SCHEMATIC DIAGRAM FOR MODELS 43-8177, 43-8178



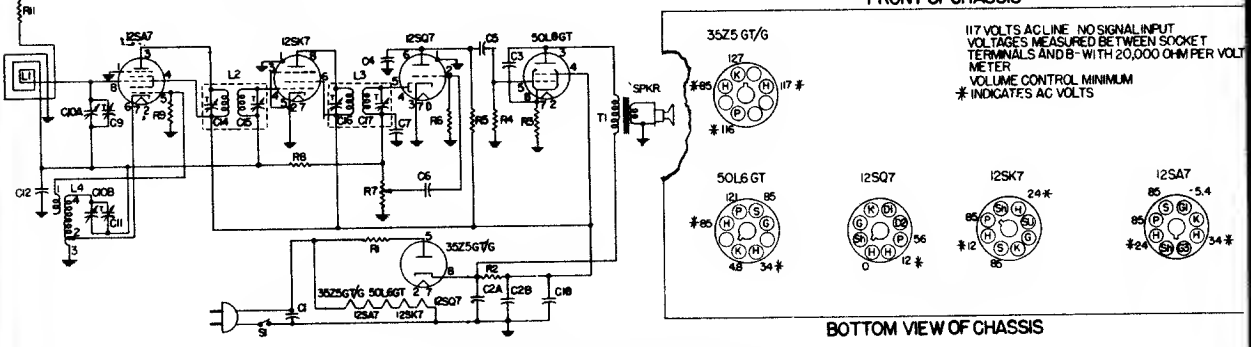
Gamble-Skogmo, Inc.

CORONADO RADIO MODELS 43-8177, 43-8178, 43-8179

VOLTAGE DIAGRAM

117 VOLTS AC LINE, NO SIGNAL INPUT
VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND B- WITH 20,000 OHM PER VOLT METER
VOLUME CONTROL MINIMUM
* INDICATES AC VOLTS

SCHEMATIC DIAGRAM FOR MODEL 43-8179



PARTS DESCRIPTION LIST

MODELS 43-8177, 43-8178, 43-8179

CATALOG NO.	SYMBOL	TITLE	VALUE	RATING	TOLERANCE
UCC-045	C1	Paper Capacitor	.05 mf	600WVDC	+40 - 15%
SCE-003	C2A	Electrolytic Capacitor	40 mf	150WVDC	+100 - 10%
SCE-003	C2B	Electrolytic Capacitor	40 mf	150WVDC	+100 - 10%
UCC-041	C3	Paper Capacitor	.02 mf	600WVDC	±20%
UCU-1040	C4	Mica Capacitor	330 mmf	500WVDC	±10%
UCC-040	C5	Paper Capacitor	.01 mf	400WVDC	±20%
UCC-039	C6	Paper Capacitor	.006 mf	600WVDC	+40 - 15%
UCU-1040	C7	Mica Capacitor	330 mmf	500WVDC	±10%
*	C9	Antenna Trimmer			
*	C10A	Variable Condenser ant. section			
*	C10B	Variable Condenser osc. section			
*	C11	Oscillator Trimmer			
UCC-045	C12	Paper Capacitor	.05 mf	400WVDC	±20%
UCC-039	C13	Paper Capacitor	.005 mf	600WVDC	±20%
UCC-045	C18	Paper Capacitor	.05 mf	400WVDC	±20%
URE-007	R1	Carbon Resistor	22 ohm	½ W	±20%
URF-053	R2	Carbon Resistor	1500 ohm	2 W	±20%
URD-029	R3	Carbon Resistor	150 ohm	½ W	±20%
URD-113	R4	Carbon Resistor	470,000 ohm	½ W	±20%
URD-105	R5	Carbon Resistor	220,000 ohm	½ W	±20%
URD-145	R6	Carbon Resistor	10 megohm	½ W	±20%
SRC-004	R7	Volume Control	500,000 ohm		
URD-129	R8	Carbon Resistor	2.2 megohm	½ W	±20%
URD-081	R9	Carbon Resistor	22,000 ohm	½ W	±20%
URD-041	R11	Carbon Resistor	470 ohm	½ W	±20%
*	L1	Antenna Loop			
*	L2	1st IF Transformer } 455 K.C.			
*	L3	2nd IF Transformer }			
SLC-001	L4	Oscillator Coil			
*	T1	Output Transformer			
SRC-004	S1	Power Switch with R7			
*	SPKR	4" PM Speaker			
SJS-002		Socket-Octal base tube			
SMS-003		Speed Nuts—for fastening metal grille in cabinet			

ADDITIONAL PARTS FOR MODEL 43-8179

UCC-039	C19	Paper Capacitor	.005 mf	600WVDC
UCC-048	C20	Paper Capacitor	.1 mf	400WVDC
UCC-040	C21	Paper Capacitor	.01 mf	400WVDC
URD-113	R12	Carbon Resistor	470,000 ohm	½ W
URD-113	R13	Carbon Resistor	470,000 ohm	½ W

Gamble-Skogmo, Inc. CORONADO RADIO MODEL 43-8190

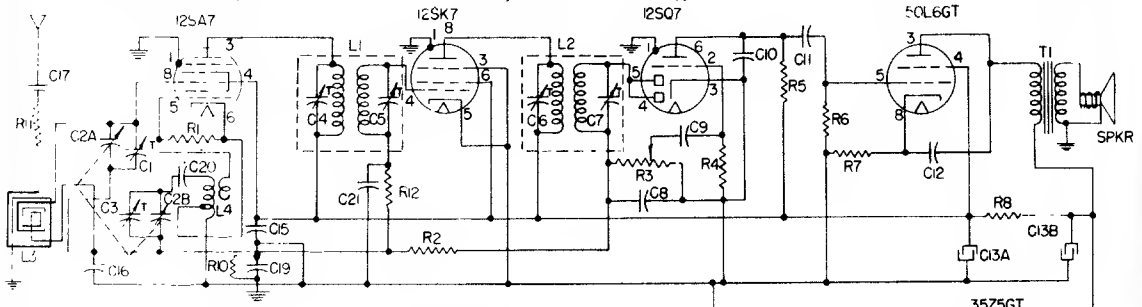
ALIGNMENT PROCEDURE

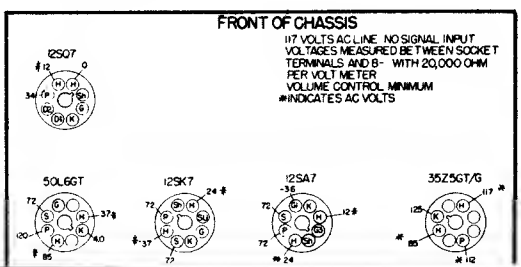
Allow unit to heat for a few minutes before starting alignment.
Volume control set to maximum.
Output meter across speaker.
Align for maximum output.
Keep input as low as readable meter reading of output will permit.

Note: If signal generator is AC operated, use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended as AC through the capacitor will introduce hum and/or create the possibility of a burned out signal generator attenuator.

FREQUENCY	SIGNAL GENERATOR COUPLING CAPACITOR	SIGNAL GENERATOR CONNECTION TO RADIO	GROUND CONNECTION	TUNING CONDENSER SETTING	ADJUST TRIMMERS FOR MAXIMUM OUTPUT (in order shown)
455 KC	0.1 mf	Converter grid	B-	Wide open	2nd IF transformer trimmer 1st IF transformer trimmer
1720 KC	200 mmf	Receiver antenna post	Chassis	Wide open	Oscillator trimmer C3
1500 KC	200 mmf	Receiver antenna post	Chassis	Tune for maximum output	Antenna trimmer C1

SYMBOL	TITLE	VALUE	RATING	TOLERANCE	PART NO
C1	Antenna trimmer				*
C2A	Variable Condenser ant. section				SCT-013
C2B	Variable Condenser osc. section				SCT-013
C3	Oscilaltor trimmer				*
C8	Mica capacitor	220 mmf	500WVDC	±20%	UCU-036
C9	Paper capacitor	.005mf	600WVDC	+40-15%	UCC-044
C10	Mica capacitor	220 mmf	500WVDC	±20%	UCU-036
C11	Paper capacitor	.01mf	600WVDC	±20%	UCC-040
C12	Paper capacitor	.02mf	600WVDC	±20%	UCC-041
C13A	Electrolytic capacitor	30mf	150WVDC		SCE-026
C13B	Electrolytic capactor	30mf	150WVDC		SCE-026
C14	Paper capacitor	.05mf	600WVDC	±20%	UCC-045
C15	Paper capacitor	.05mf	600WVDC	±20%	UCC-045
C16	Paper capacitor	.05mf	600WVDC	±20%	UCC-045
C17	Paper capacitor	.01 mf	600WVDC	±20%	UCC-040
C19	Paper capacitor	.1mf	600WVDC	+20-10%	UCC-048
C20	Paper capacitor	.02mf	600WVDC	±20%	UCC-041
C21	Paper capacitor	.005mf	600WVDC	+40-15%	UCC-044
R1	Carbon resistor	22,000 ohm	½ W	±20%	URD-081
R2	Carbon resistor	2.2 megohm	½ W	±20%	URD-129
R3	Volume control	0.5 megohm			SRC-070
R4	Carbon resistor	4.7 megohm	½W	±20%	URD-137
R5	Carbon resistor	470,000 ohm	½W	±20%	URD-113
R6	Carbon resistor	470,000 ohm	½W	±20%	URD-113
R7	Carbon resistor	150 ohm	½W	±20%	URD-029
R8	Carbon resistor	2700 ohm	2 W	±20%	URE-059
R9	Carbon resistor	18 ohm	½W	±10%	URD-007
R10	Carbon resistor	470,000 ohm	½W	±10%	URD-113
R11	Carbon resistor	470 ohm	½W	±20%	URD-041
R12	Carbon resistor	470,000 ohm	½W	±20%	URD-113





MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

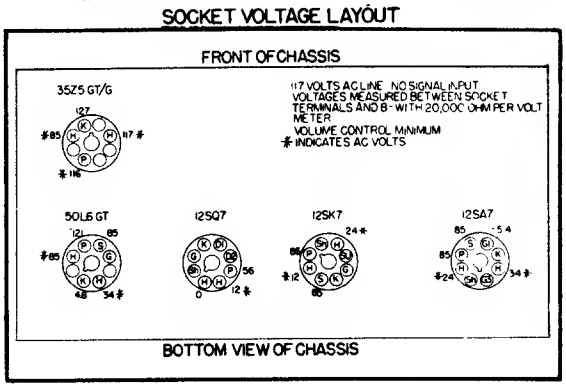
Gamble-Skogmo, Inc. **CORONADO RADIO MODEL 43-8201**

FREQUENCY	SIGNAL GENERATOR COUPLING CAPACITOR	SIGNAL GENERATOR CONNECTION TO RADIO	GROUND CONNECTION	TUNING CONDENSER SETTING	ADJUST TRIMMERS FOR MAXIMUM OUTPUT (in order shown)
455 KC	0.1 mf	Converter grid	Chassis	Wide open	2nd IF transformer trimmer 1st IF transformer trimmer
1720 KC	200 mmf	Receiver antenna post	Chassis	Wide open	Oscillator trimmer C11
1500 KC	200 mmf	Receiver antenna post	Chassis	Tune for maximum output	Antenna trimmer C9

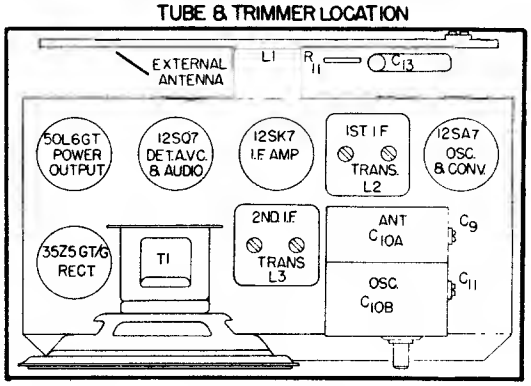
PARTS DESCRIPTION LIST

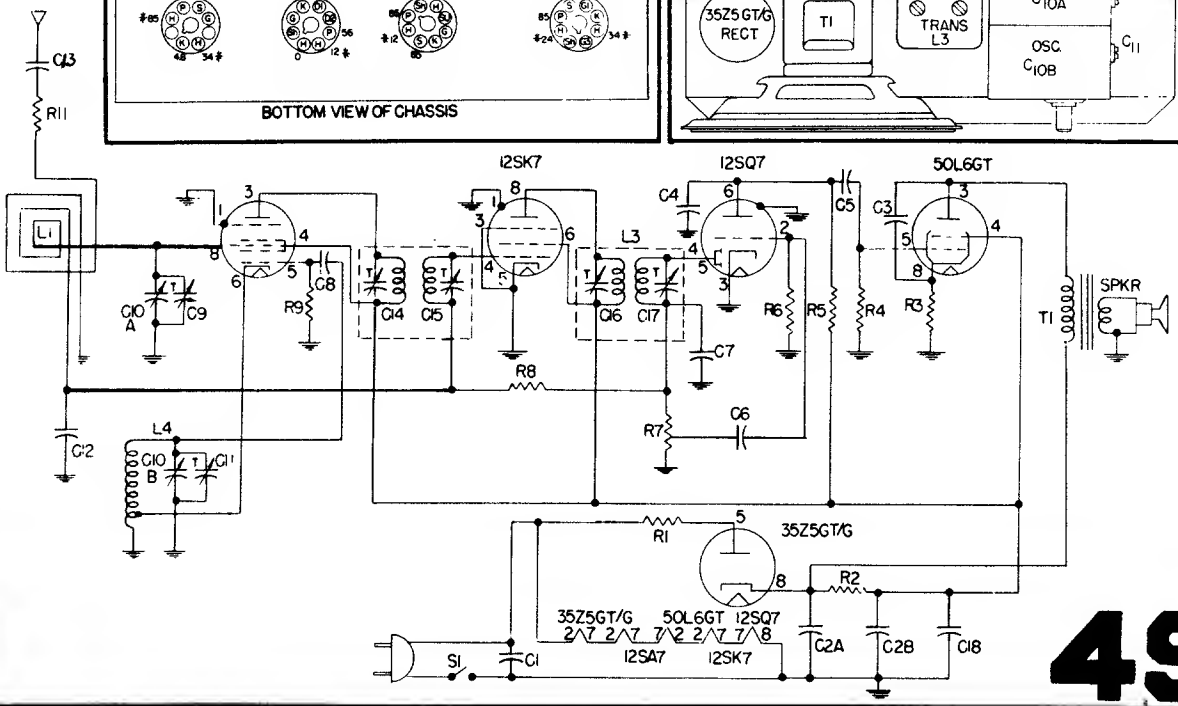
SYMBOL	TITLE	VALUE	RATING	TOLERANCE	PART NO
C1	Paper capacitor	.05mf	600WDVC	+40-10%	UCC-045
C2A	Electrolytic capacitor	40mf	150WVDC	+100-10%	SCE-003
C2B	Electrolytic capacitor	40mf	150WVDC	+100-10%	SCE-003
C3	Paper capacitor	.02mf	600WDVC	+40-10%	UCC-041
C4	Mica capacitor	330mmf	500WVDC	±20%	UCU-1040
C5	Paper capacitor	.01mf	600WDVC	+40-10%	UCC-040
C6	Paper capacitor	.005mf	600WDVC	+40-10%	UCC-039
C7	Mica capacitor	330mmf	500WVDC	±20%	UCU-1040
C8	Mica capacitor	47mmf	500WVDC	±20%	UCU-1020
C12	Paper capacitor	.05mf	600WDVC	+40-10%	UCC-045
C18	Paper capacitor	.05mf	600WDVC	+40-10%	UCC-045
C19	Paper capacitor	.005mf	600WDVC	+40-10%	UCC-039
R1	Carbon resistor	18 ohm	1w	±20%	URE-007
R2	Carbon resistor	150 ohm	2w	±20%	URF-053
R3	Carbon resistor	150 ohm	½w	±20%	URD-029
R4	Carbon resistor	470,000 ohm	½w	±20%	URD-113
R5	Carbon resistor	220,000 ohm	½w	±20%	URD-105
R6	Carbon resistor	10 megohm	½w	±20%	URD-145
R7	Volume control	.5 megohm			SRC-004
R8	Carbon resistor	2.2 megohm	½w	±20%	URD-129
R9	Carbon resistor	22,000 ohm	½w	±20%	URD-081

SOCKET VOLTAGE LAYOUT



TUBE & TRIMMER LOCATION





Gamble-Skogmo, Inc. Coronado Models 43-8353 & 43-8354

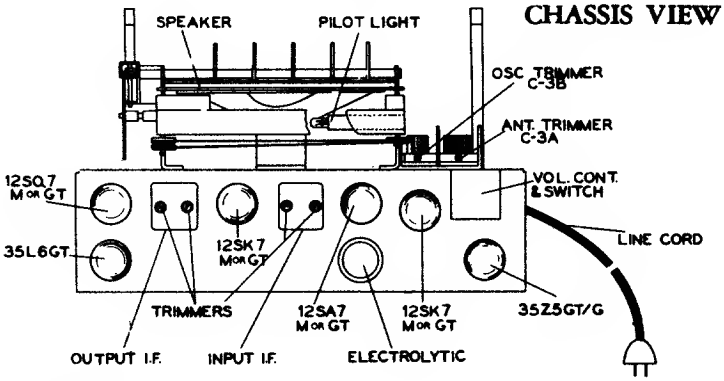
ALIGNMENT PROCEDURE

(Refer to Chassis View)

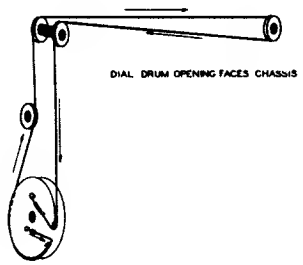
- Output meter across 3.2-ohm output load.
- Volume control at maximum.
- Connect ground post of signal generator to B— of radio.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

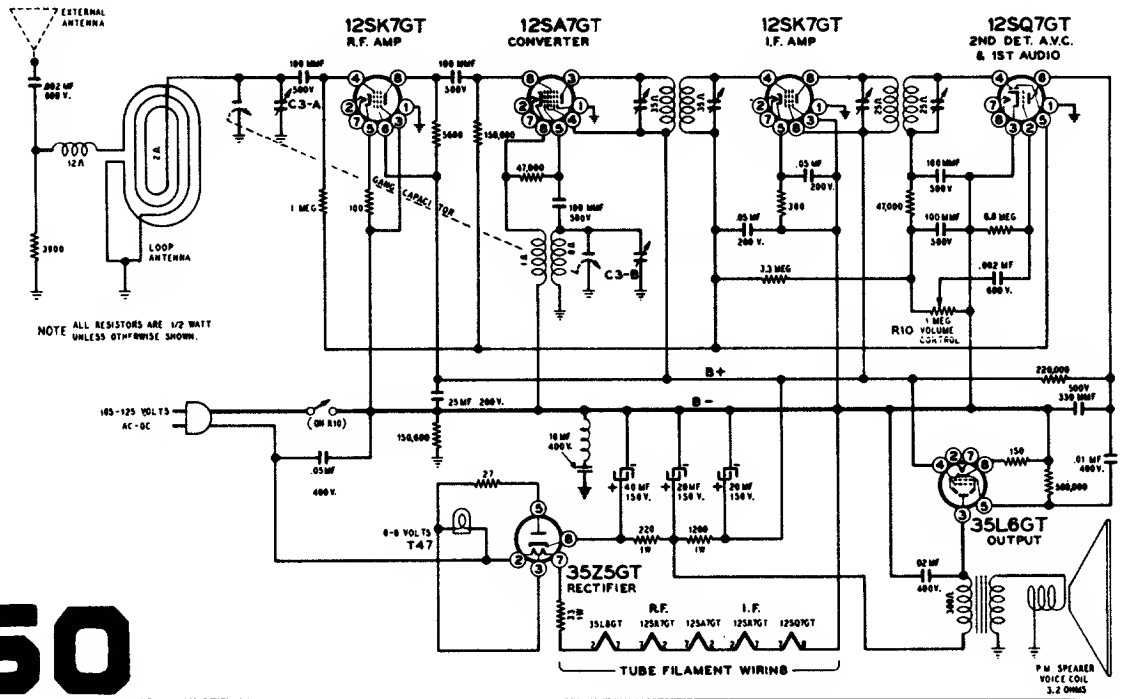
SIGNAL GENERATOR			*TUNER SETTING*	*ADJUST FOR MAXIMUM OUTPUT (in order shown)*
Frequency	*Dummy Antenna*	*Connection to Radio*		
455 kc	0.1 mf	Stator of antenna section of gang	Rotor full open (plates out of mesh)	Trimmers on output and input I.F. cans
1650 kc	0.1 mf	Stator of antenna section of gang	Rotor full open (plates out of mesh)	Oscillator trimmer C3B
1400 kc	200 mmf	External antenna clip	1400 kc	Antenna trimmer C3A

CHASSIS VIEW



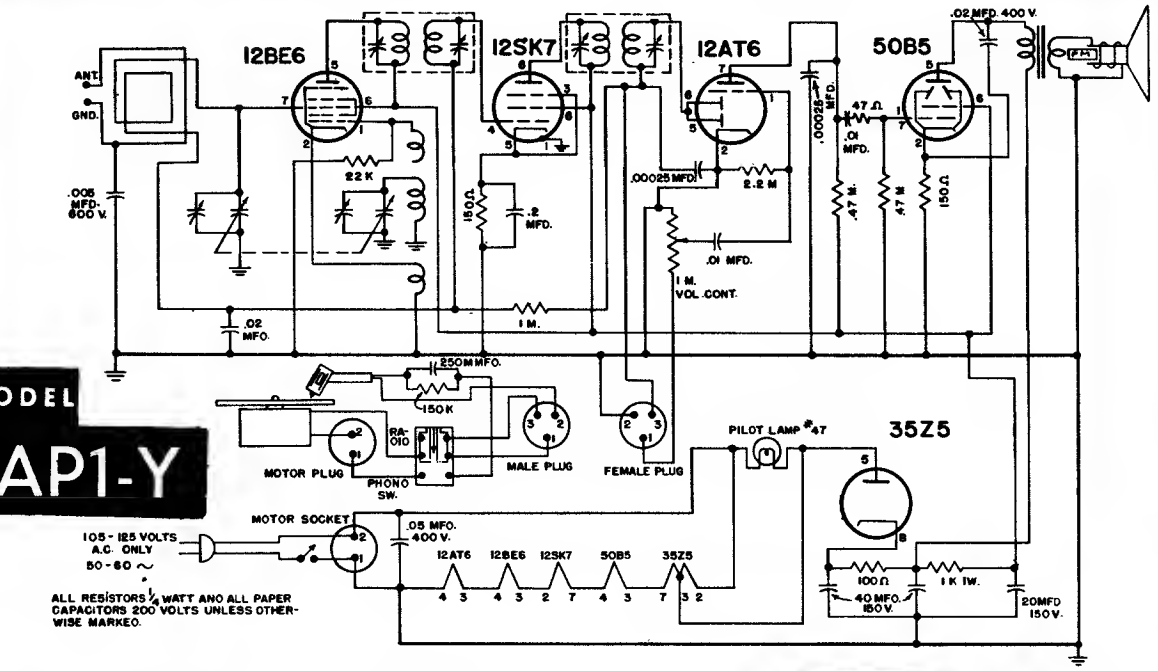
DRIVE CORD REPLACEMENT

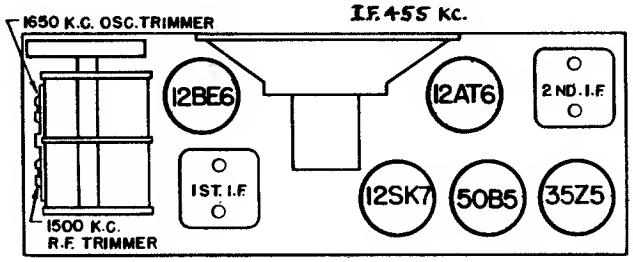


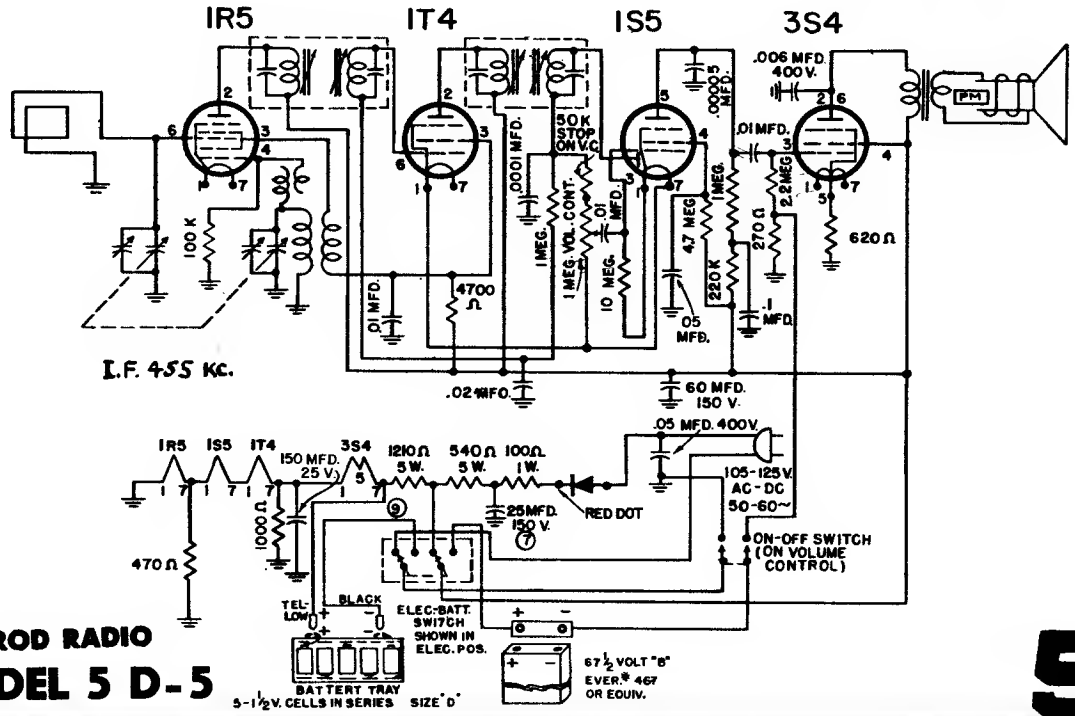


NOTE ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SHOWN.

MODEL 5AP1-Y



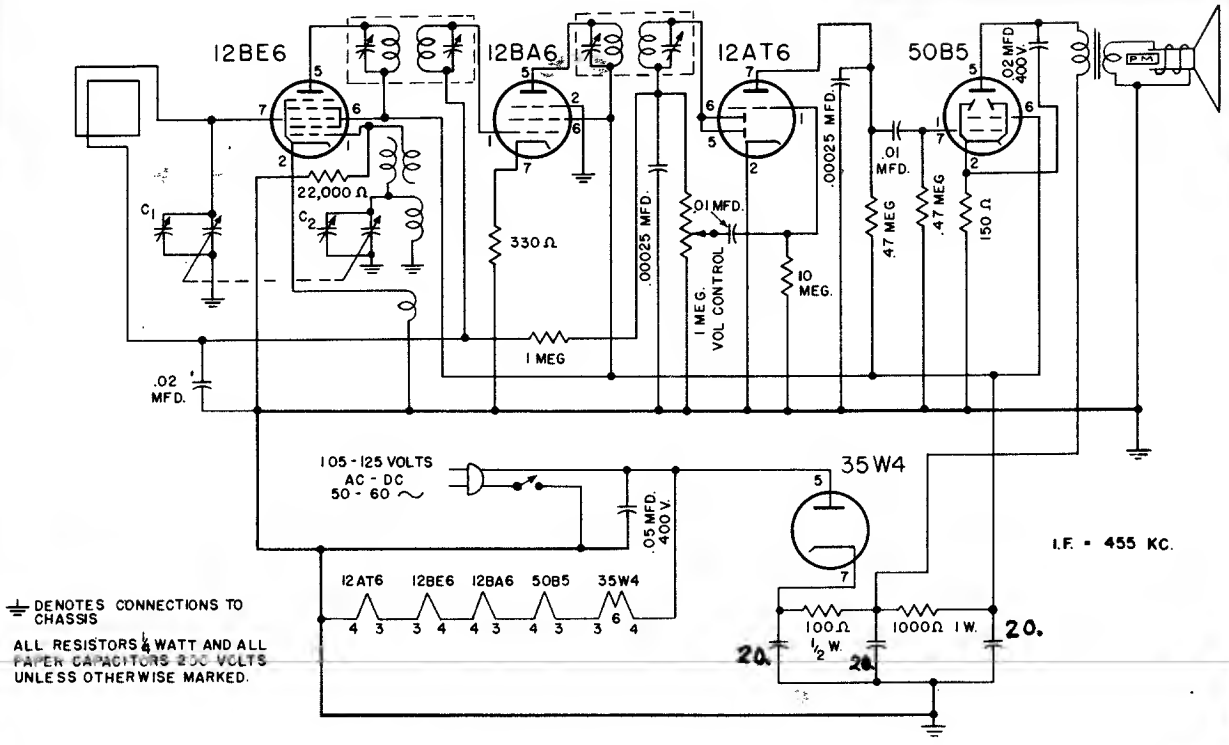


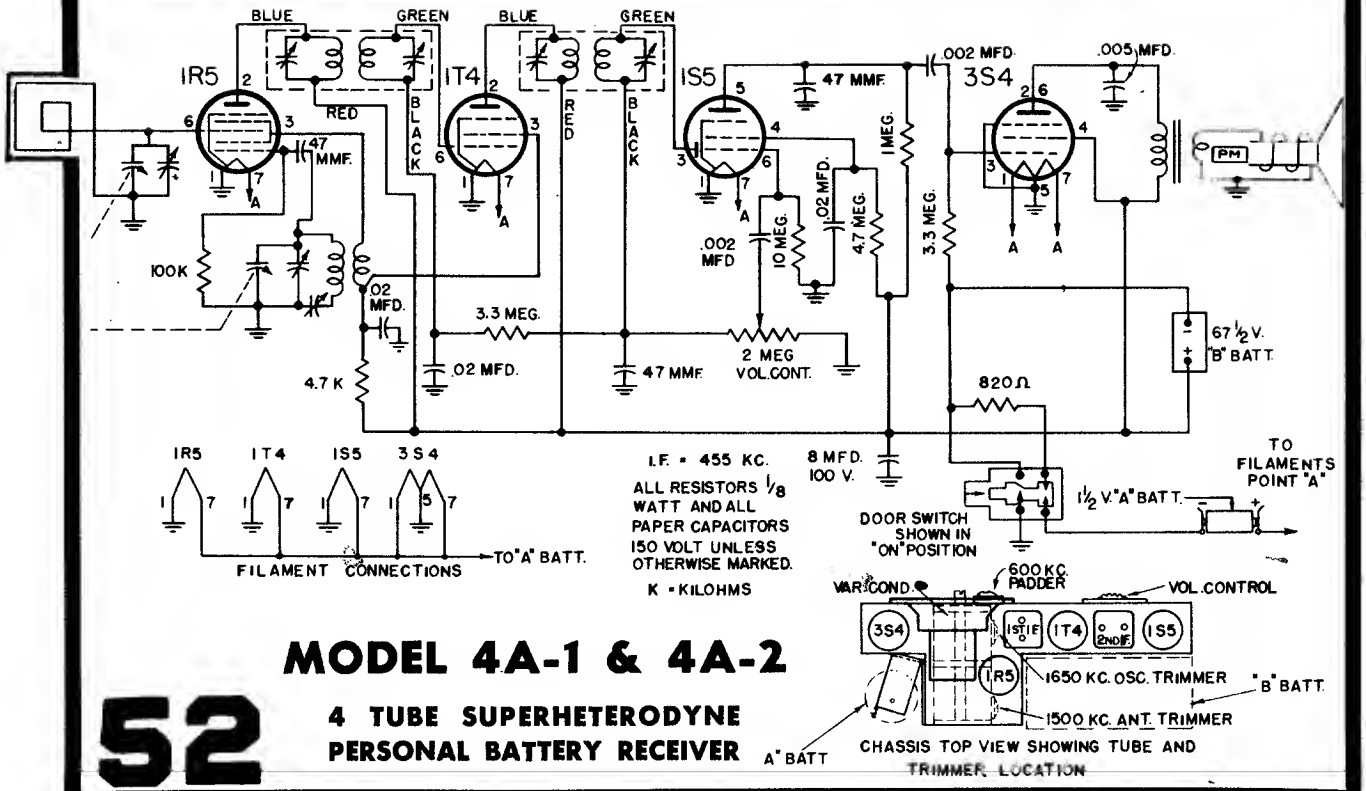


GAROD RADIO MODEL 5 D-5

GAROD RADIO

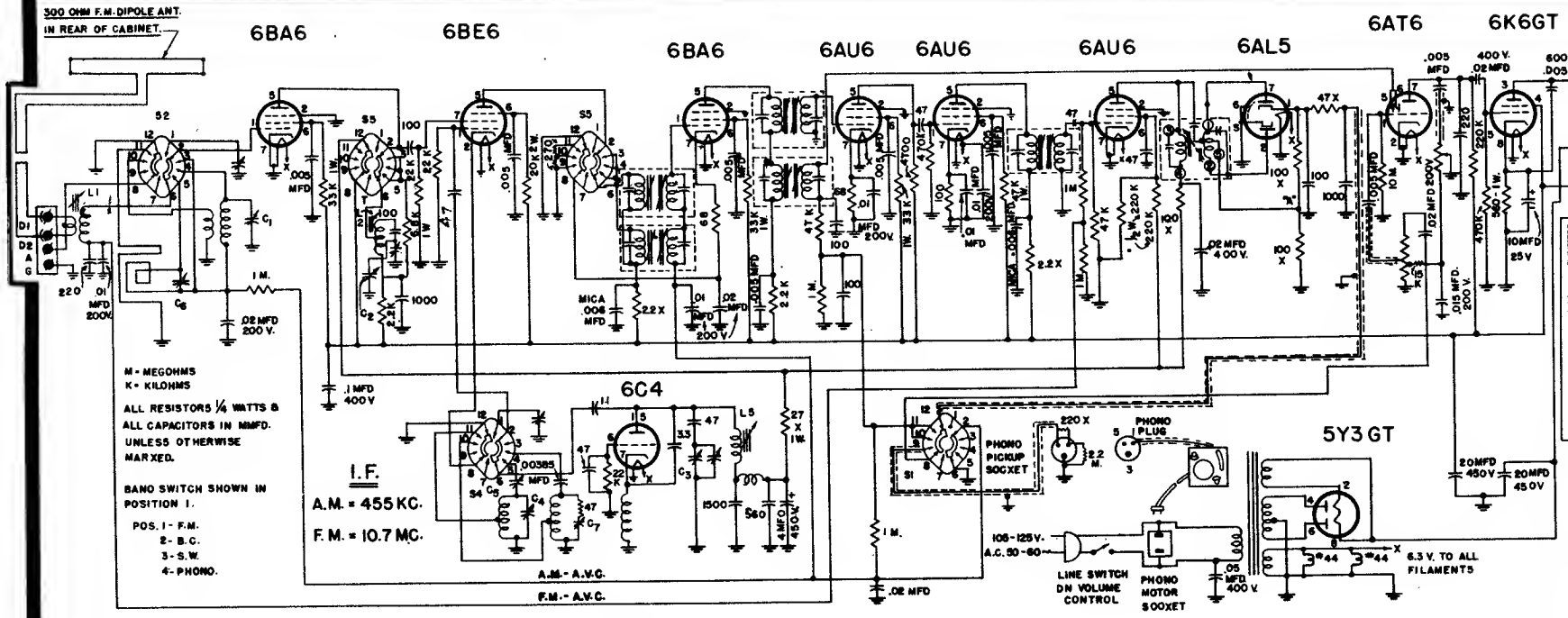
MODEL 5A1

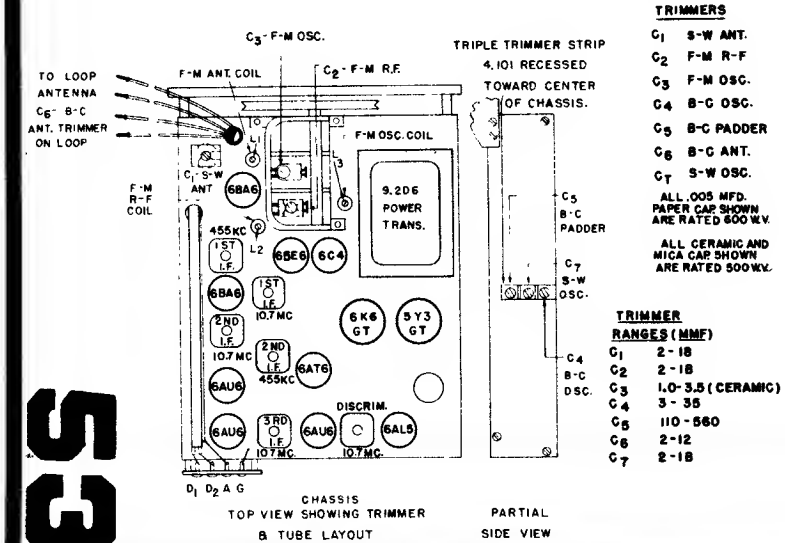




MODEL 4A-1 & 4A-2

4 TUBE SUPERHETERODYNE PERSONAL BATTERY RECEIVER





TRIMMERS

C_1	S-W ANT.
C_2	F-M R-F
C_3	F-M OSC.
C_4	B-C OSC.
C_5	B-C PADDER
C_6	B-C ANT.
C_T	S-W OSC.

ALL .005 MFD. PAPER CAP SHOWN ARE RATED 600 W.V.

ALL CERAMIC AND MICA CAP SHOWN ARE RATED 500 W.V.

TRIMMER RANGES (MMF)

C_1	2-18
C_2	2-18
C_3	1.0-3.5 (CERAMIC)
C_4	3-35
C_5	110-560
C_6	2-12
C_7	2-18

GAROD

MODEL 11 FMP

TUNING RANGE:

Broadcast Band:	540 to 1650 Kilocycles (180 to 555 Meters)
Short Wave Band:	5.3 to 18.5 Megacycles (16 to 56 Meters)
F-M Band:	87.5 to 108.5 Megacycles (2.7 to 3.4 Meters)

NEEDED RADIO DIAGRAMS

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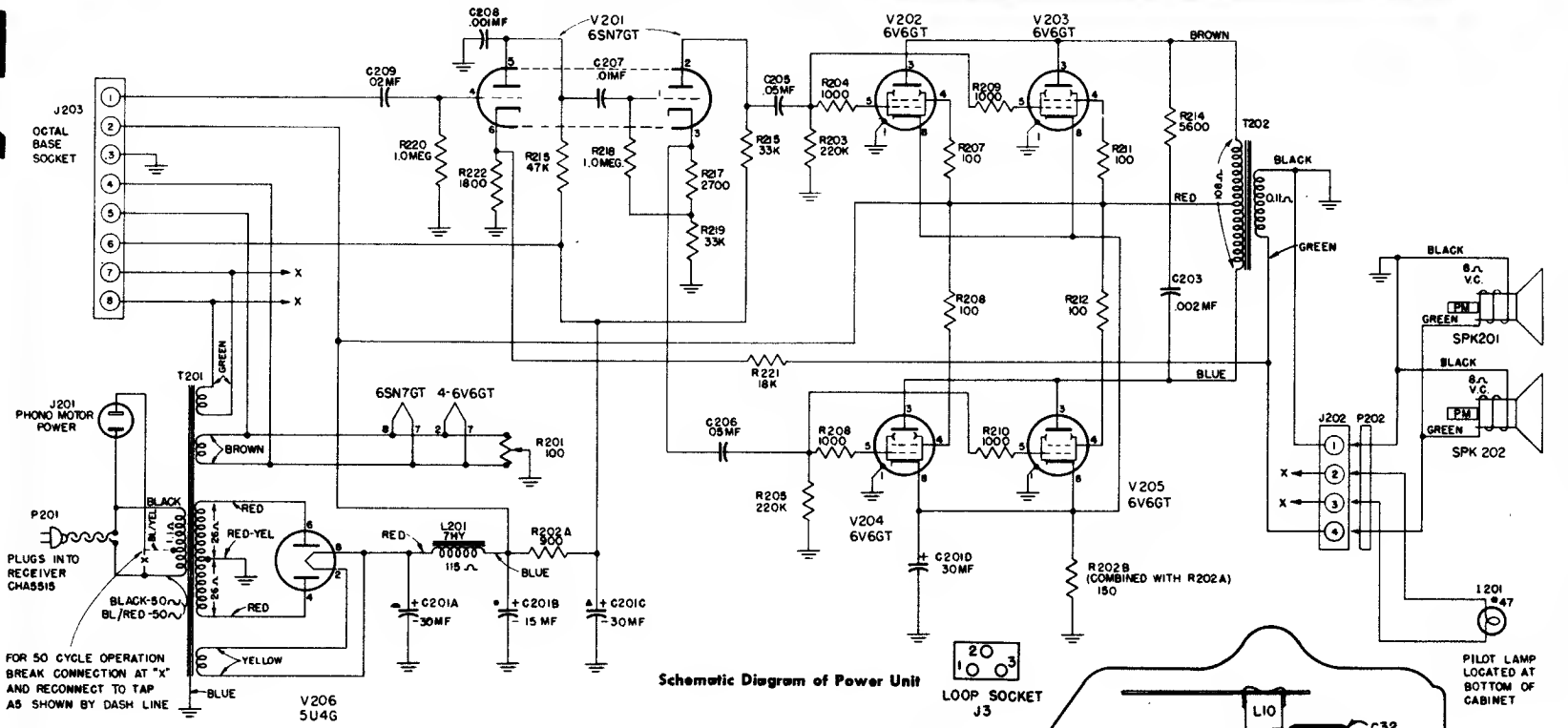
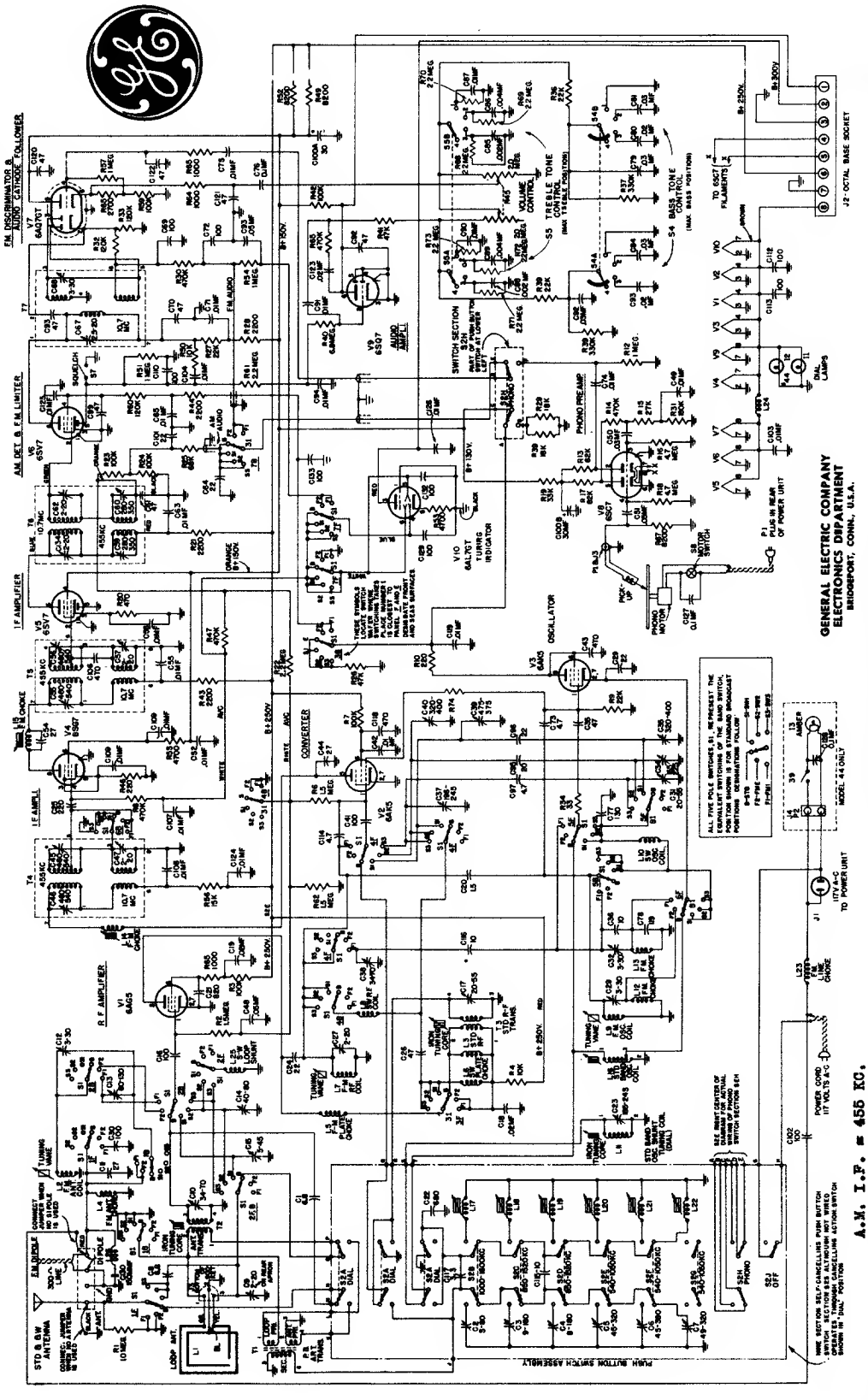
MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS



Musaphonic by GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY

MODELS 41, 42, 43, 44, 45


GENERAL ELECTRIC COMPANY
ELECTRONICS DEPARTMENT
BRIDGEPORT, CONN., U.S.A.
Schematic Diagram, Monophonic Model 41 through 45
A.M. I.F. = 455 KC.
F.M. I.F. = 10.7 MC.

GENERAL ELECTRIC

RADIO

SERVICE DATA

FOR

MODELS YRB 83-1, YRB 79-1, YRB 79-2

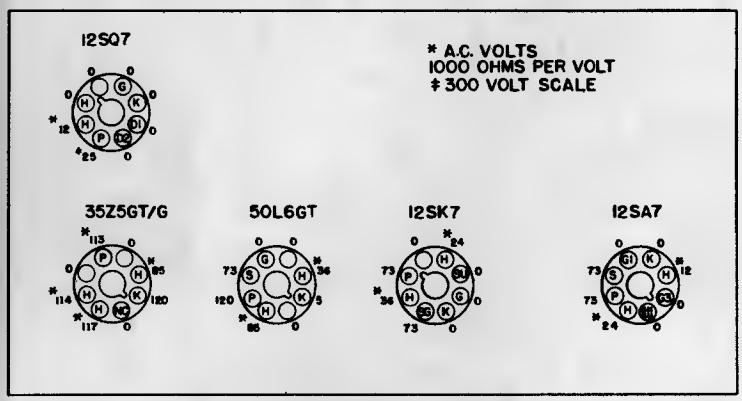
Rating: 105–125 volts d-c
105–125 volts 40–60 cycles a-c
28 watts at 117 volts

Tuning Frequency Range: .....540–1720 KC

Intermediate Frequency: .....455 KC

LOUDSPEAKER "ALNICO V" MAGNET DYNAMIC

Outside Cone Diameter.....5¼ in.
Voice Coil Impedance (400 cycles).....3.2 ohms



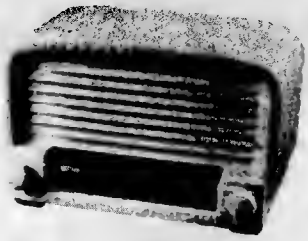
I.F. ALIGNMENT

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

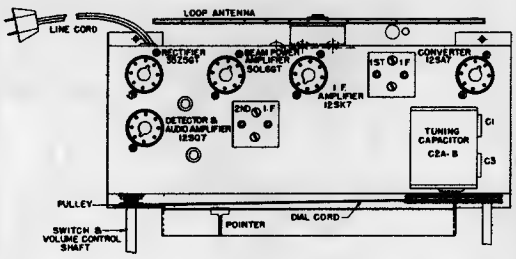
Apply signal to the converter grid through a .05 mfd capacitor and align progressively the trimmers in the 2nd and 1st I.F. transformer cans.

R.F. ALIGNMENT

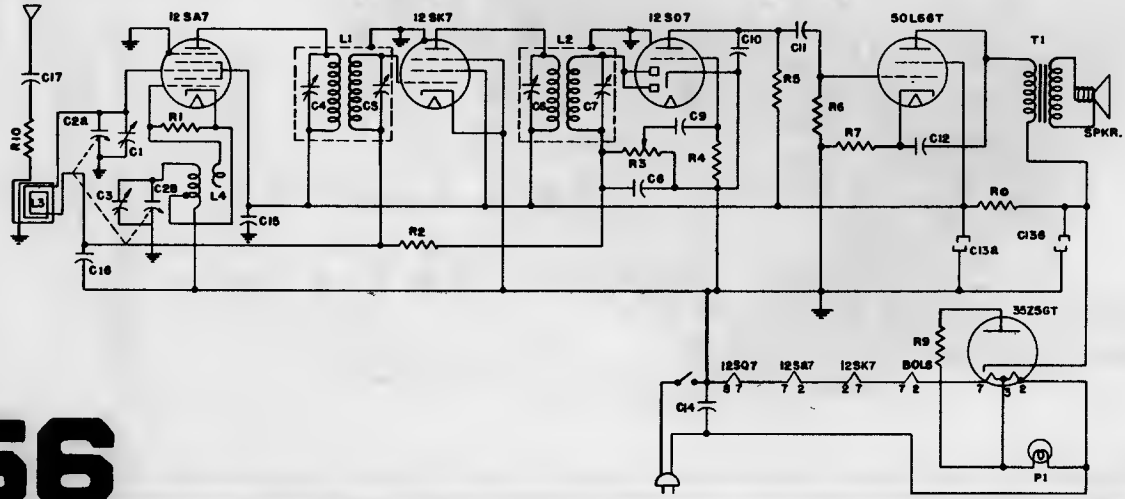
Apply the R.F. alignment signals through a standard I.R.E. dummy antenna to the receiver antenna post. With the gang condenser wide open, align the oscillator trimmer (C17B) to 1720 KC. Change the generator signal to 1500 KC, tune the receiver to the signal and peak antenna trimmer (C17A) for maximum output.

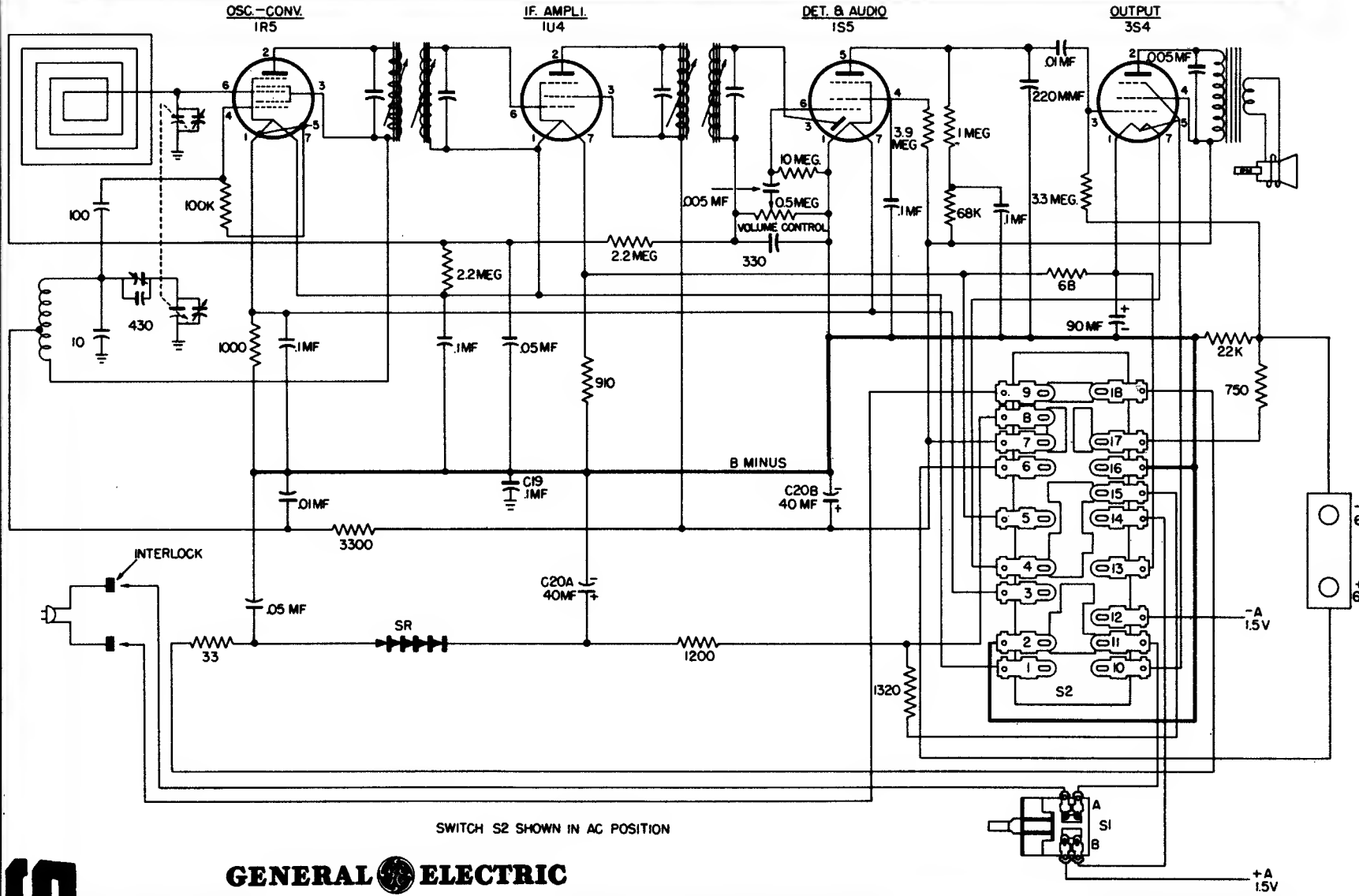


Model YRB 79-2



Symbol	Description	Symbol	Description	Symbol	Description
C1	Antenna trimmer condenser	C14	.05 mfd paper capacitor	R1	22,000 ohm carbon resistor
C2A	Tuning condenser, antenna section	C15	.05 mfd paper capacitor	R2	2.2 megohm carbon resistor
C2B	Tuning condenser, oscillator section	C16	.05 mfd paper capacitor	R3	Volume control, .5 megohm
C3	Oscillator trimmer condenser	C17	.01 mfd paper capacitor	R4	4.7 megohm carbon resistor
C8	220 mmfd mica capacitor	L1	1st I.F. transformer	R5	470,000 ohm carbon resistor
C9	.005 mfd paper capacitor	L2	2nd I.F. transformer	R6	470,000 ohm carbon resistor
C10	220 mmfd mica capacitor	L3	Loop assembly	R7	150 ohm carbon resistor
C11	.01 mfd paper capacitor	L4	Oscillator coil	R8	2700 ohm carbon resistor
C12	.02 mfd paper capacitor	P1	Pilot lamp	R9	18 ohm carbon resistor
C13A	30 mfd electrolytic capacitor	T1	Output transformer	R10	470 ohm carbon resistor
C13B	30 mfd electrolytic capacitor				





GENERAL ELECTRIC

RADIO

MODEL 140

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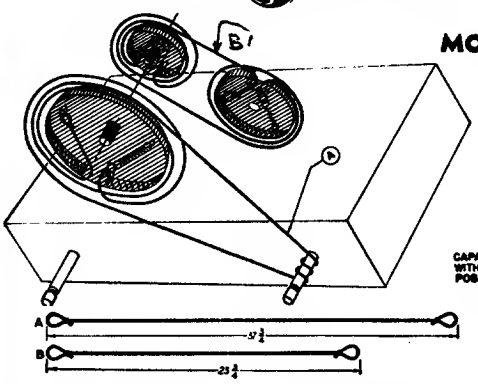
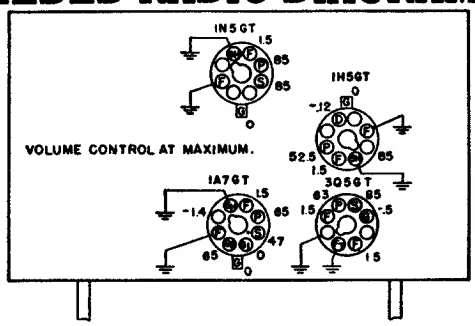
ALIGNMENT FREQUENCIES

R-F	1620, 1500 and 580 kc
I-F	455 kc

GENERAL ELECTRIC

MODEL 180





BOTTOM VIEW OF CHASSIS

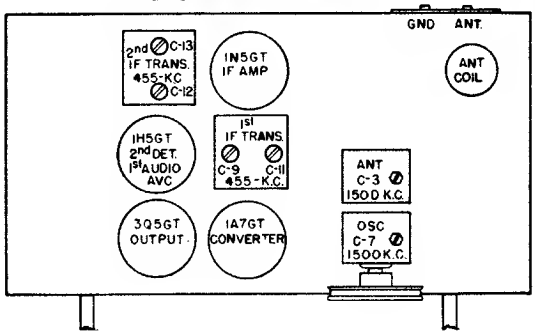
MEASUREMENTS TAKEN ON 20,000 OHMS PER VOLT METER.
MEASURED FROM PIN TO CHASSIS.
1.5 V "A" – 90 V "B" BATTERY PACK. NO SIGNAL INPUT.

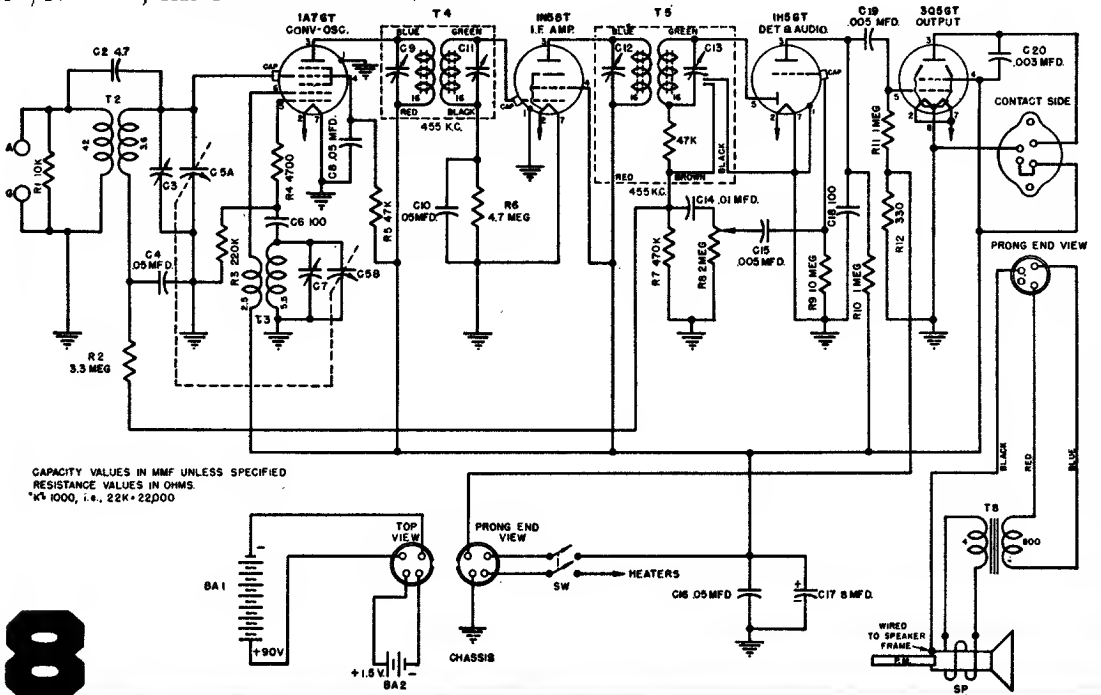
PART NO.	SYMBOL	DESCRIPTION
UCC-011	C4, 8, 10	CAPACITOR—.05 mfd., 200 v., paper
UCC-028	C16	CAPACITOR—.05 mfd., 400 v., paper
UCC-037	C20	CAPACITOR—.003 mfd., 600 v., paper
UCC-039	C15, 19	CAPACITOR—.005 mfd., 600 v., paper
UCC-040	C14	CAPACITOR—.01 mfd., 600 v., paper
UCU-1028	C6, 18	CAPACITOR—100 mmf., mica
UOP-629	SP	SPEAKER—6½ in. permanent magnet
UOX-001		CONE—Replacement speaker cone
URD-037	R12	RESISTOR—330 ohm, ⅓ w., carbon
URD-065	R4	RESISTOR—4700 ohm, ⅓ w., carbon
URD-073	R1	RESISTOR—10,000 ohm, ⅓ w., carbon
URD-089	R5	RESISTOR—47,000 ohm, ⅓ w., carbon
URD-105	R3	RESISTOR—220,000 ohm, ⅓ w., carbon
URD-113	R7	RESISTOR—470,000 ohm, ⅓ w., carbon
URD-121	R10, 11	RESISTOR—1 meg., ⅓ w., carbon
URD-133	R2	RESISTOR—3.3 meg., ⅓ w., carbon
URD-137	R6	RESISTOR—4.7 meg., ⅓ w., carbon
URD-145	R9	RESISTOR—10 meg., ⅓ w., carbon
RCE-5001	C17	CAPACITOR—8 mfd., 150 v., electrolytic
RCT-5001	C5A, 5B	CAPACITOR—Tuning condenser
RCU-5002	C2	CAPACITOR—4.7 mmf., mica
RLA-5001	T2	COIL—Antenna coil
RLC-5001	T3	COIL—Oscillator coil
RRC-5001	R8, S3	VOLUME CONTROL—2 meg. vol. control and switch
RTL-5001	T5	TRANSFORMER—2nd i-f transformer
RTL-5002	T4	TRANSFORMER—1st i-f transformer

ALIGNMENT CHART

Step	Connect Test Oscillator To	Test Oscillator Setting	Pointer Setting On Radio	Adjust For Max. Output
1	1N5GT IF grid in series with .05 mfd.	455 KC	550 KC	1st IF trans. trimmers
2	1A7GT Conv. grid in series with .05 mfd.	455 KC	550 KC	2nd IF trans. trimmers
3	To Ant. Post through 200 mmf. dummy and to Grd. Post.	1500 KC	1500 KC	C7* (osc.) and C3 (R-F)

*Rock gang condenser when making alignment.





ALIGNMENT CHART

Step	Connect Test Oscillator to	Test Oscillator Setting	Pointer Setting on Radio	Adjustment for Maximum Output
1	1N5GT I-F grid in series with .05 mfd	455 kc	550 kc	2nd I-F Trans. (T2) Trimmers
2	1A7GT Conv. grid in series with .05 mfd	455 kc	550 kc	1st I-F Trans. (T1)
3	Repeat Steps 1 and 2			
4	Inductively coupled	1620 kc	Max. freq. cond. open	C1B OSC
5	Inductively coupled	1500 kc	1500 kc	C1A Ant. C1C RF
6	Inductively coupled	600 kc	600 kc	L2 Ant. Loading Coil
7	Inductively coupled	1500 kc	1500 kc	C1A Ant. C1C RF
8	Recheck Steps 5, 6, and 7			

Stage gain by vacuum tube voltmeter or similar measuring devices may be used to check circuit performances and isolate trouble. The gain values listed may have tolerances of 20 per cent. Readings should be taken with low signal input so that the AVC is not effective.

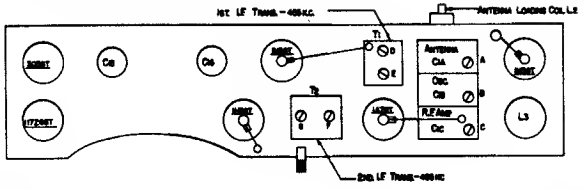
(1) RF STAGE GAINS.

1N5GT r-f grid to 1A7GT grid . . . . . 25 at 1000 kc
1A7GT grid to 1N5GT i-f grid . . . . . 25 at 1000 kc
1A7GT grid to 1N5GT i-f grid . . . . . 30 at 455 kc
1N5GT i-f grid to 1H5GT diode plate . . . . . 65 at 455 kc

(2) AUDIO GAIN.

.06 volt at 400 cycles across volume control (R17) with control set at maximum will give approximately .05 watt output across speaker voice coil.

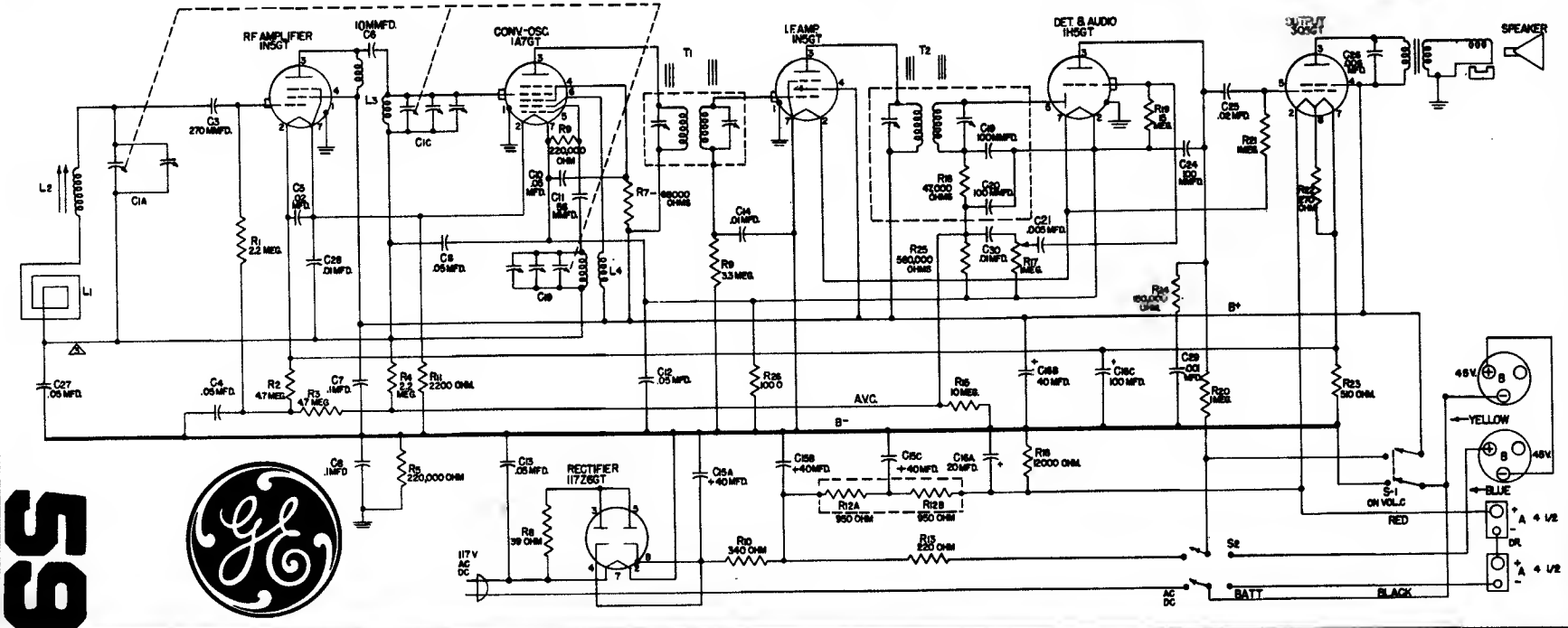
(3) DC voltage developed across oscillator grid resistor (R6) averages 13 volts at 1000 kc.



GENERAL ELECTRIC

RADIO

SERVICE DATA FOR MODEL 254



MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

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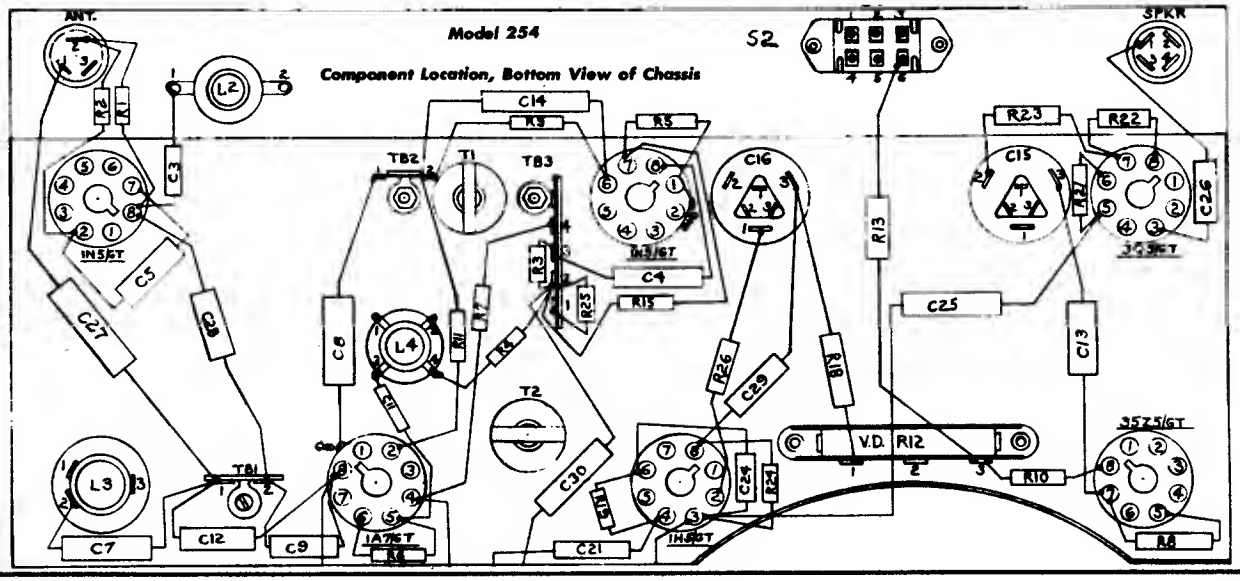
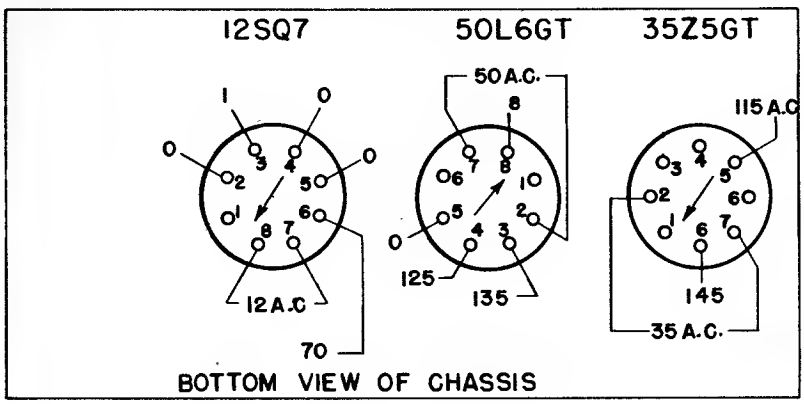


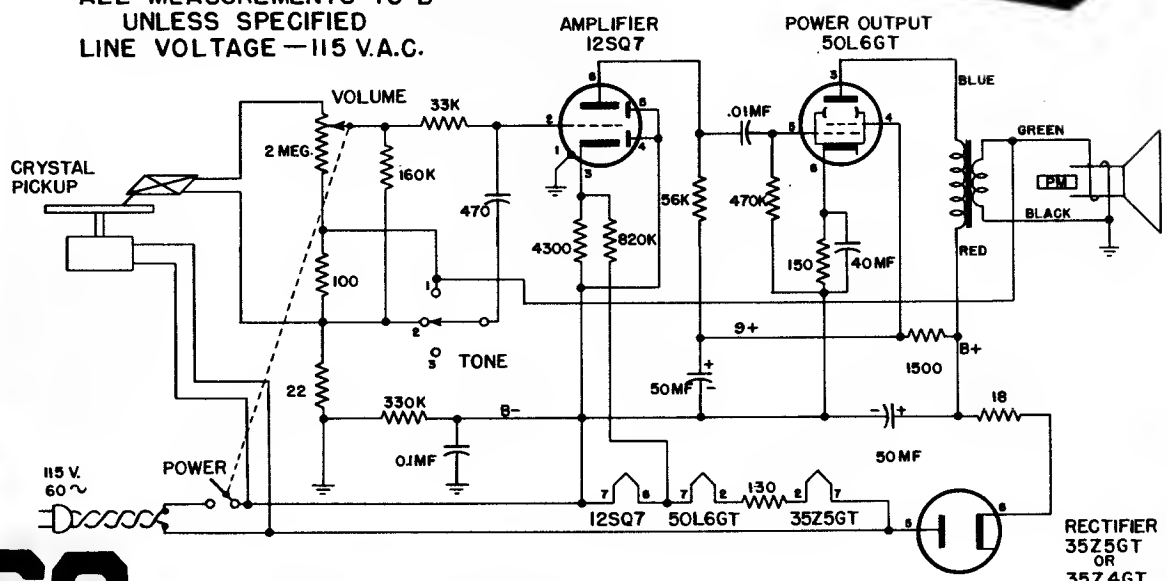


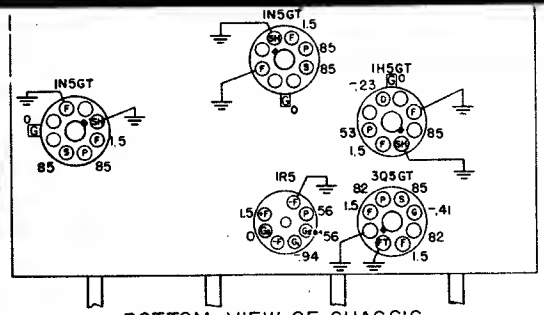
GENERAL ELECTRIC

SERVICE DATA FOR PORTABLE RECORD PLAYER MODEL 15

CONDITIONS OF TEST

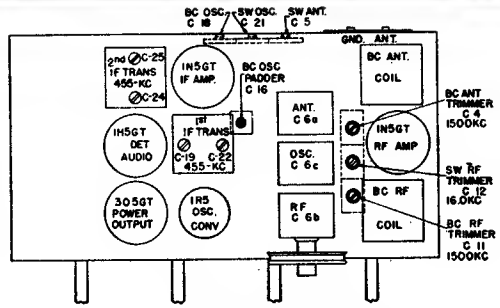
USE 1000 OHMS PER VOLT METER
ALL MEASUREMENTS TO B—
UNLESS SPECIFIED
LINE VOLTAGE—115 V.A.C.



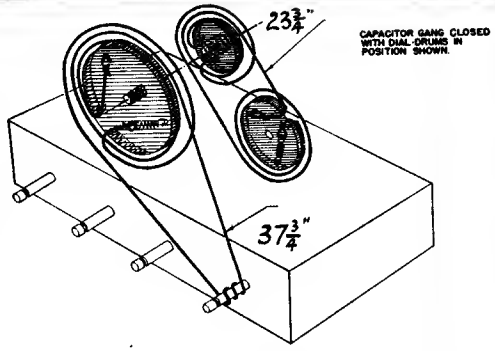


BOTTOM VIEW OF CHASSIS

MEASUREMENTS TAKEN ON 20,000 OHMS PER VOLT METER.
MEASURED FROM PIN TO CHASSIS.

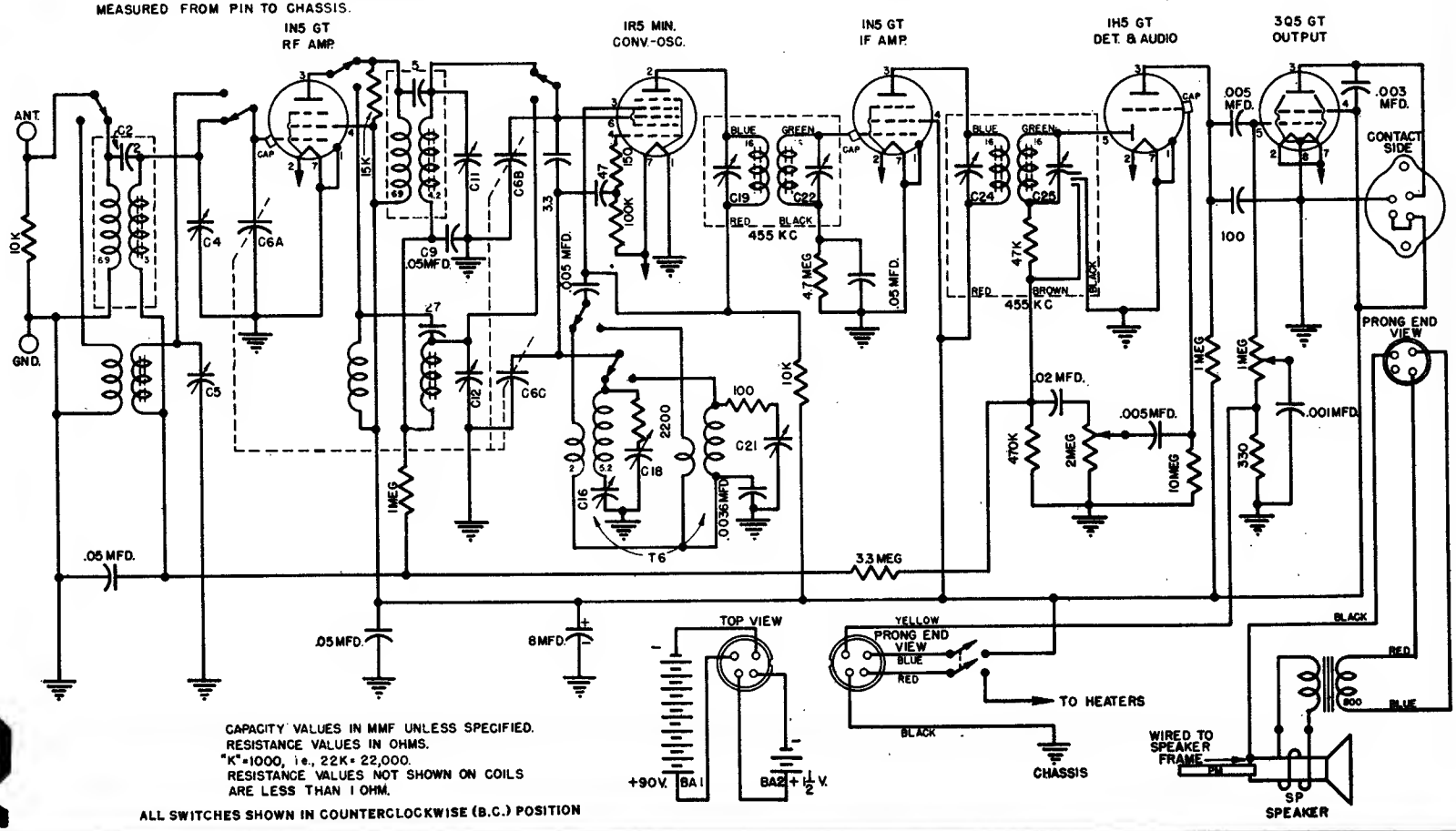


Tubo and Trimmor Location



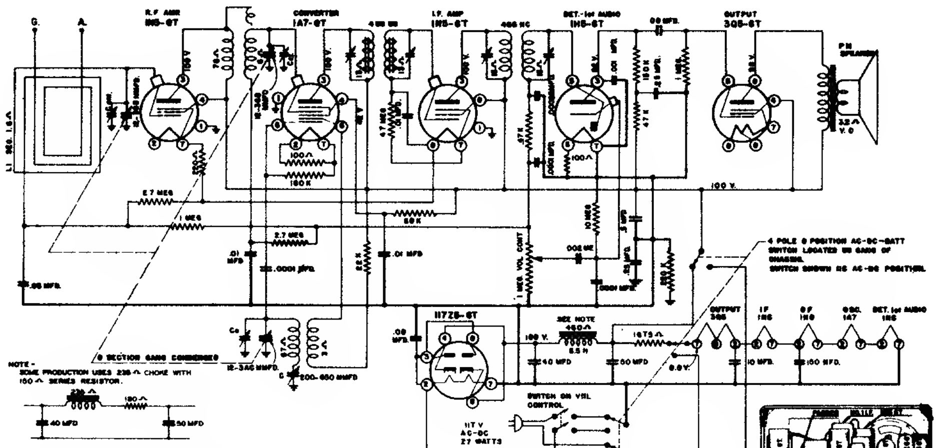
CAPACITOR GANG CLOSED WITH DIAL-DRUMS IN POSITION SHOWN.

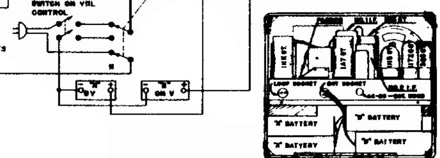
GENERAL ELECTRIC MODEL 280



CAPACITY VALUES IN MMF UNLESS SPECIFIED.
RESISTANCE VALUES IN OHMS.
"K"=1000, i.e., 22K=22,000.
RESISTANCE VALUES NOT SHOWN ON COILS ARE LESS THAN 1 OHM.

ALL SWITCHES SHOWN IN COUNTERCLOCKWISE (B.C.) POSITION





ALIGNMENT PROCEDURE			
PRELIMINARY INFORMATION	CONNECT SIGNAL GENERATOR TO ANTENNA AND GROUND TERMINALS. USE ONLY SUFFICIENT SIGNAL STRENGTH TO CAUSE -[illegible] VOLT ON A.V.C. [illegible] (LARGE TERMINAL OF LOOP PLUG) AC READ ON RCA VOLTOHMYST VACUUM TUBE VOLTMETER OR EQUIVALENT.		
STEPS	TUNE TEST OSC. TO —	TUNE RADIO DIAL TO —	ADJUST TRIMMER FOR MAXIMUM READING
1	4[illegible] KC	CONDENSER GANG FULLY MESHED SET POINTER HORIZONTAL	IF TRANSFORMERS T1 AND T[illegible]
[illegible]	1000 KC	1000 KC	OSC TRIMMER Co R F TRIMMER Crf ANT TRIMMER Cant
[illegible]	[illegible]	[illegible]	PADDER [illegible] WHILE ROCKING GANG
4	REPEAT STEP [illegible]		
5	MOVE POINTER SLIGHTLY IF CALIBRATION CAN BE IMPROVED.		

Gilfillan
ENGINEERED BY RADAR EXPERTS
RADIO

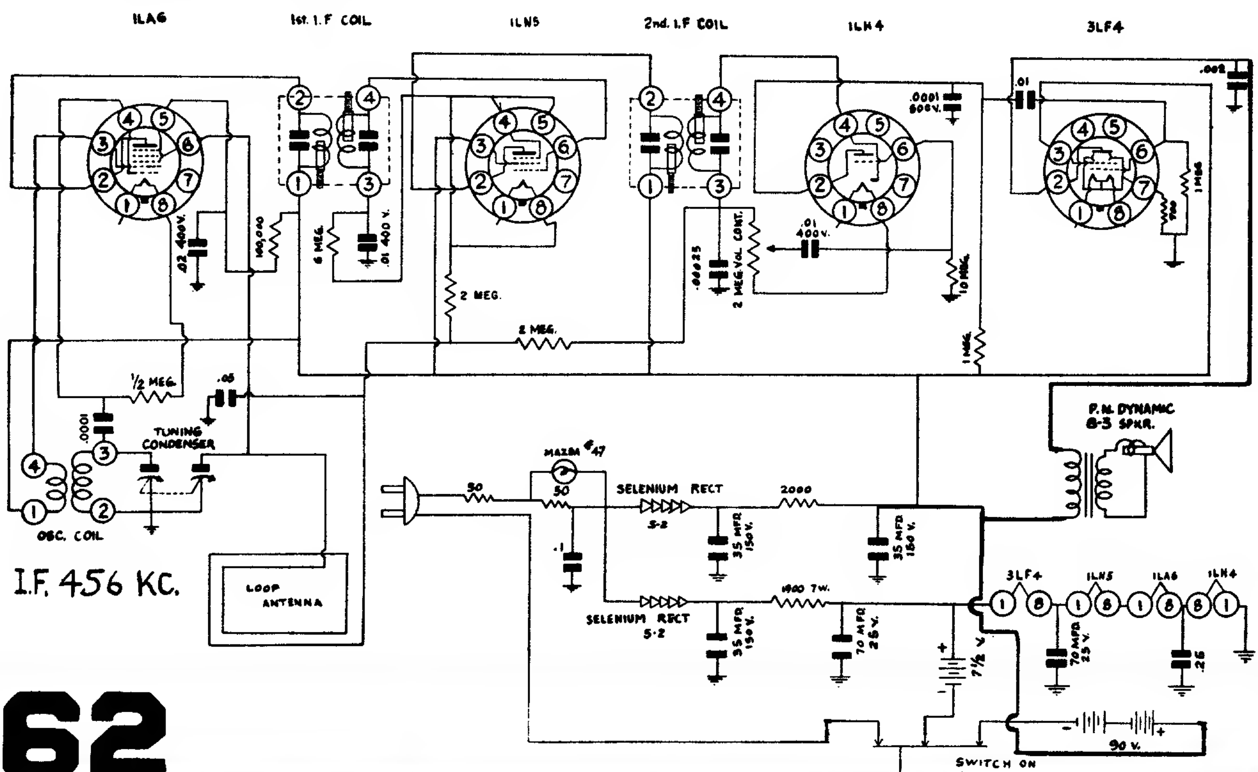
THE OVERLAND-MODEL 66B
SERIES 2

THIS RADIO IS SUPPLIED WITH COMBINATION A-B BATTERY PACK. FOR YOUR CONVENIENCE AN EXTRA BATTERY CABLE MAY BE OBTAINED FROM YOUR DEALER SO THAT YOU MAY MAKE BATTERY REPLACEMENTS BY MEANS OF SEPARATE "A" AND "B" BATTERIES. YOUR GILFILLAN PORTABLE RADIO HAS BEEN ESPECIALLY DESIGNED TO GIVE 200-300 HOURS OF BATTERY LIFE WHEN USED ON BATTERIES AN AVERAGE OF 4 HOURS PER DAY. WHEN OPERATED ON A.C. OR D.C. HOUSE CURRENT YOUR BATTERIES ARE NOT USED.

MFGR	A-B PACKS	"A" BATTERIES	"B" BATTERIES
	NO.	NO.	NO.
GENERAL	[illegible]	[illegible]	V[illegible]A OR F[illegible]A
BURGESS	[illegible]	[illegible]	[illegible]
EVEREADY		740	482
RAY-O-VAC	AB[illegible]4	F[illegible]A	P4[illegible]
PHILCO	P[illegible]41A	P1[illegible]	P[illegible]

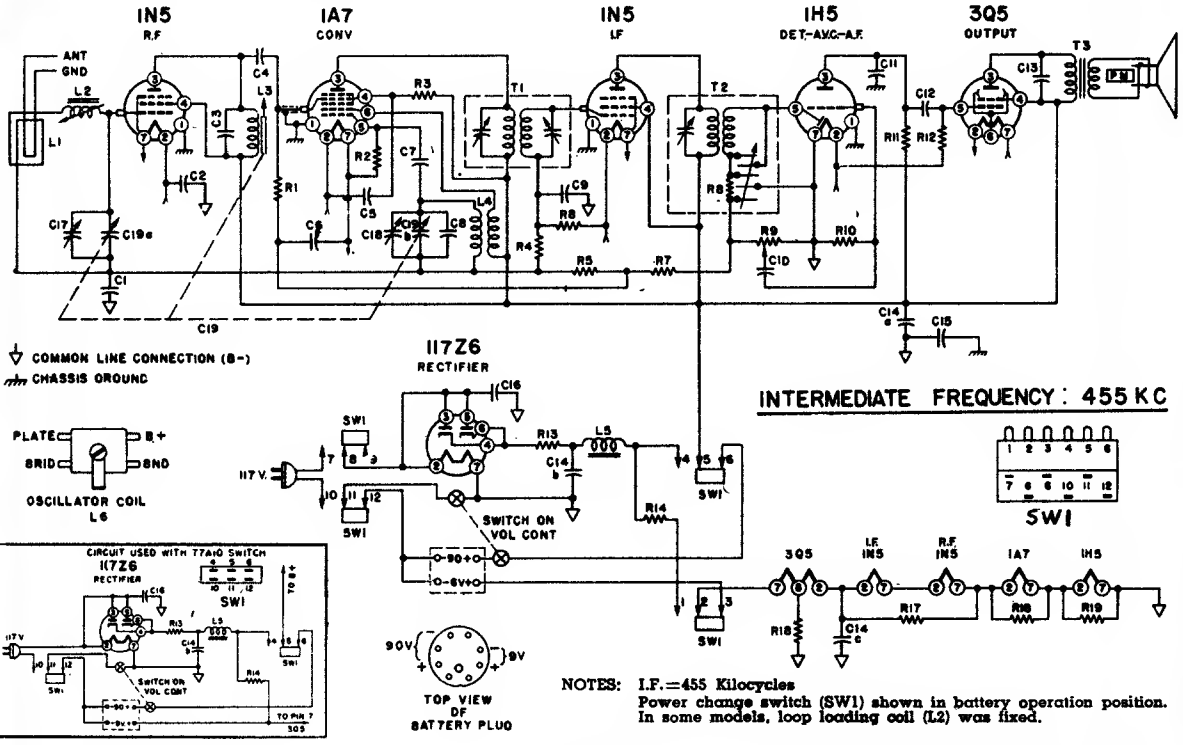
General
TELEVISION and RADIO CORP.

MODEL No. 23 A 6



Mantola

Models R662 R662N



NOTES: I.F.=455 Kilocycles
Power change switch (SW1) shown in battery operation position.
In some models, loop loading coil (L2) was fixed.

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	65B1-9
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. Cond. 67C7-42
C14b	30 Mfd., 150 Volt	
C14c	100 Mfd., 25 Volt	
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 (C18a, C19b)	Condenser, Gang	68B4

RESISTORS

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, ½ Watt, Carbon	60B2-475

RESISTORS

Symbol	Description	Part No.
R6	4.7 Megohms, ½ Watt, Carbon	60B2-475
R7	3.3 Megohms, ½ Watt, Carbon	60B2-335
R8	50,000 Ohms, ½ Watt, Carbon	60B8-503
R9	1 Megohm Volume Control	75B1-100
R10	15 Megohms, ½ Watt, Carbon	60B2-156
R11	1 Megohm, ½ Watt, Carbon	60B2-105
R12	2.2 Megohms, ½ Watt, Carbon	60B2-225
R13	22 Ohms, Wire Wound, ½ Watt	61A2-2
R14	2,450 Ohms, Wire Wound, 5 Watt	61A3-5
R16	1,500 Ohms, ½ Watt, Carbon	80B8-152
R17	560 Ohms, ½ Watt, Carbon	60B8-561
R18	220 Ohms, ½ Watt, Carbon	80B8-221
R19	120 Ohms, ½ Watt, Carbon	60B8-121

COILS & TRANSFORMERS

L2	Coil, Loop Loading, (fixed)	AA114
	Coil, Loop Loading, (variable)	AA115
L3	Iron Slug for plate coil	71B1-3
	Coil, Plate	70A1-30
L4	Oscillator Coil	69A7
L5	Choke Filter	74A5
T1	1st I.F. Transformer	72B9-2

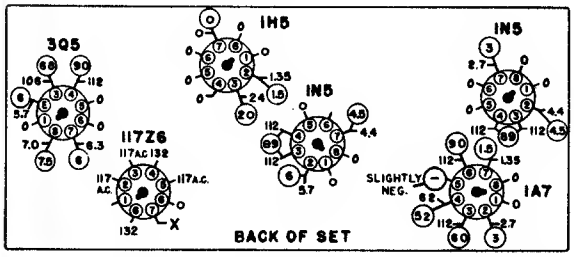
COILS & TRANSFORMERS

Symbol	Description	Part No.
T2	2nd I.F. Transformer	72B10-2
T3	Transformer, Output	e
	eWhen ordering, specify all numbers on the speaker and transformer.	
SW1	Switch, Power Change (R662)	77A6
	Switch, Power Change (R662N)	77A10

MISCELLANEOUS

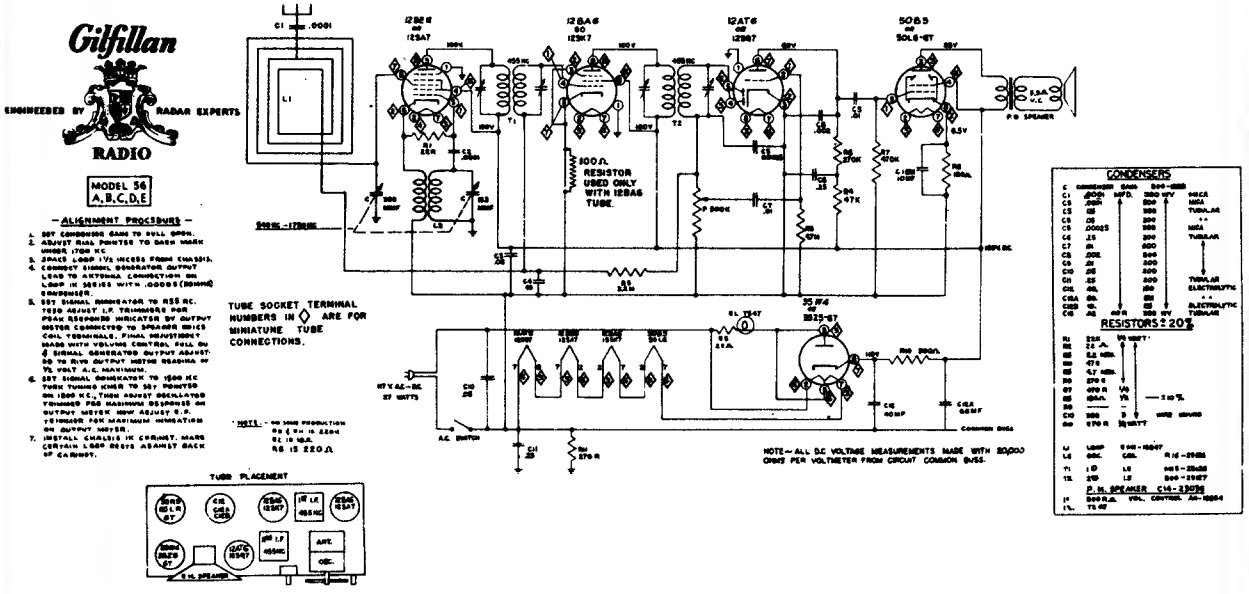
Description	Part No.
Dial Background	21A18-2
Dial Cord, 12"	50A1-3
Dial Cord Tension Spring	19A1-2
Escutcheon and Dial Scale	23C14
Knob, Tuning	33A14-6
Knob, Volume	33A14-5
Plug, Battery (9 prong)	88A3-3
Pointer, Cream Tenite	25A15-1
Speaker & Output Transformer	78B8
Tube Shields	87A8

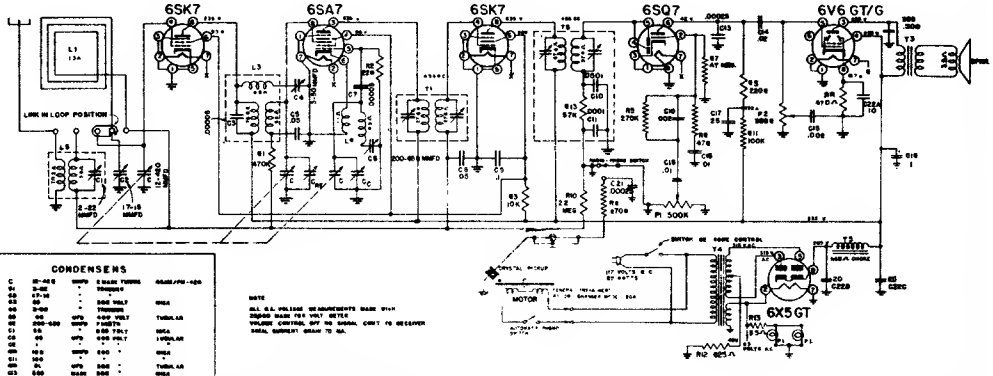
VOLTAGE CHART

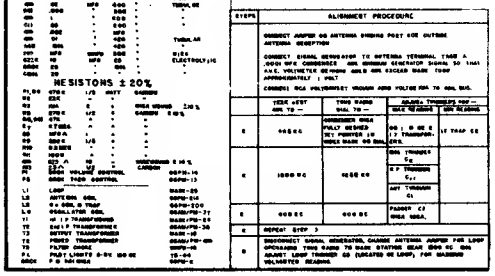


VOLTAGE DATA

1. Voltage readings circled (O) are for Battery Operation.
2. All readings made between Tube Socket Terminals and Terminal No. 7 on the 1I7Z6 (Point "X" on Voltage Chart).
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.

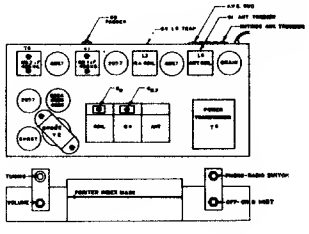

Gilfillan
ENGINEERED BY RADAR EXPERTS
RADIO
MODEL 56
A, B, C, D, E
— ALIGNMENT PROCEDURE —
12SE8 or 12SA7
12SA6 or 12SK7
12AT6 or 12SQ7
50B5 or 50L6-GT
800 Ω. RESISTOR USED ONLY WITH 12SA6 TUBE.
TUBE SOCKET TERMINAL NUMBERS IN ◇ ARE FOR MINIATURE TUBE CONNECTIONS.
35Y4 or 35Z5-GT
P.M. SPEAKER
A.C. SWITCH
NOTE — ALL D.C. VOLTAGE MEASUREMENTS MADE WITH 20,000 OHMS PER VOLT METER FROM CIRCUIT COMMON (M.S.).
TUBE PLACEMENT
CONDENSERS
RESISTORS ± 20%


6SK7
6SA7
6SK7
6SQ7
6V6 GT/G
6X5 GT
LINK IN LOOP POSITION
MOTOR
CONDENSERS
RESISTORS ± 20%

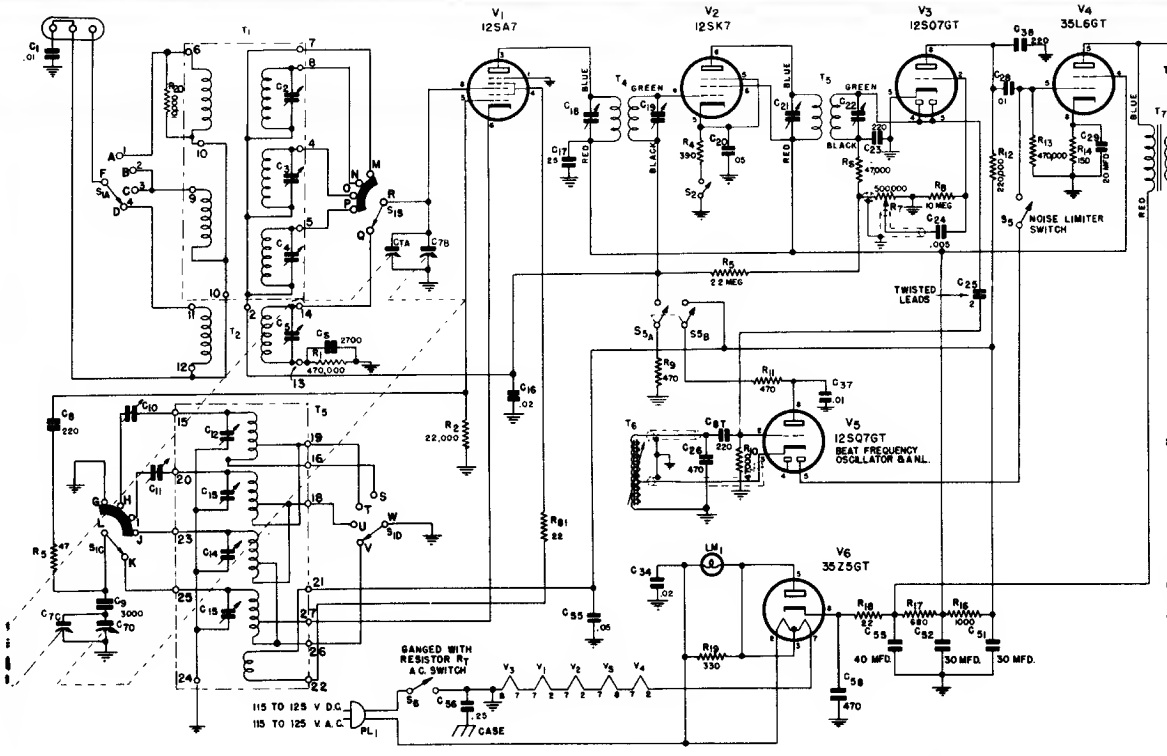

ALIGNMENT PROCEDURE

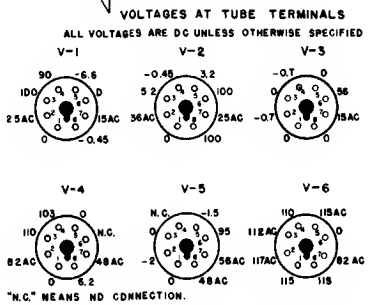

Gilfillan
ENGINEERED BY RADAR EXPERTS
RADIO

MODEL 66PM



the hallicrafters co. MODEL S-38



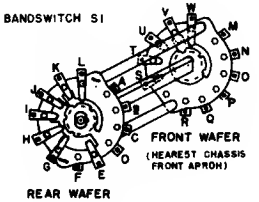


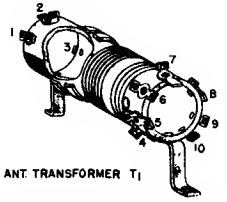
"N.C." MEANS NO CONNECTION.

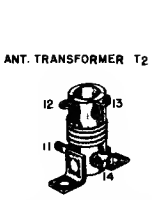
VOLTAGES LISTED WERE TAKEN WITH AN ELECTRONIC VOLT METER; AT 117 V. A-C LINE VOLTAGE; NO SIGNAL BEING RECEIVED. CONTROLS SET AS FOLLOWS:

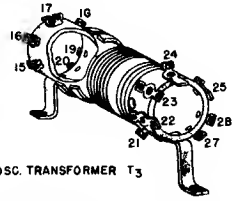
VOLUME	MAX. CLOCKWISE
TUNING	SET AT 550 KC
BANDSPREAD	SET AT 100
A.M./C.W.	SET AT "C.W."
RECEIVE/STANDBY	SET AT "RECEIVE"
NOISE LIMITER	SET AT "OFF"
BAND SELECTOR	SET AT "1"
SPEAKER/PHONES	SET AT "SPEAKER"

NOTE: RESISTANCE VALUES ARE IN OHMS; MICA CAPACITOR VALUES ARE IN MMF.; PAPER CAPACITOR VALUES ARE IN DECIMAL EQUIVALENTS OF MFD; ELECTROLYTIC CAPACITOR VALUES ARE IN MFD.









- - - - DENOTES ELECTRICAL SHIELD.
— — — — DENOTES UNSHIELDED UNIT ASSEMBLY.
DENOTES MECHANICAL GANGING.

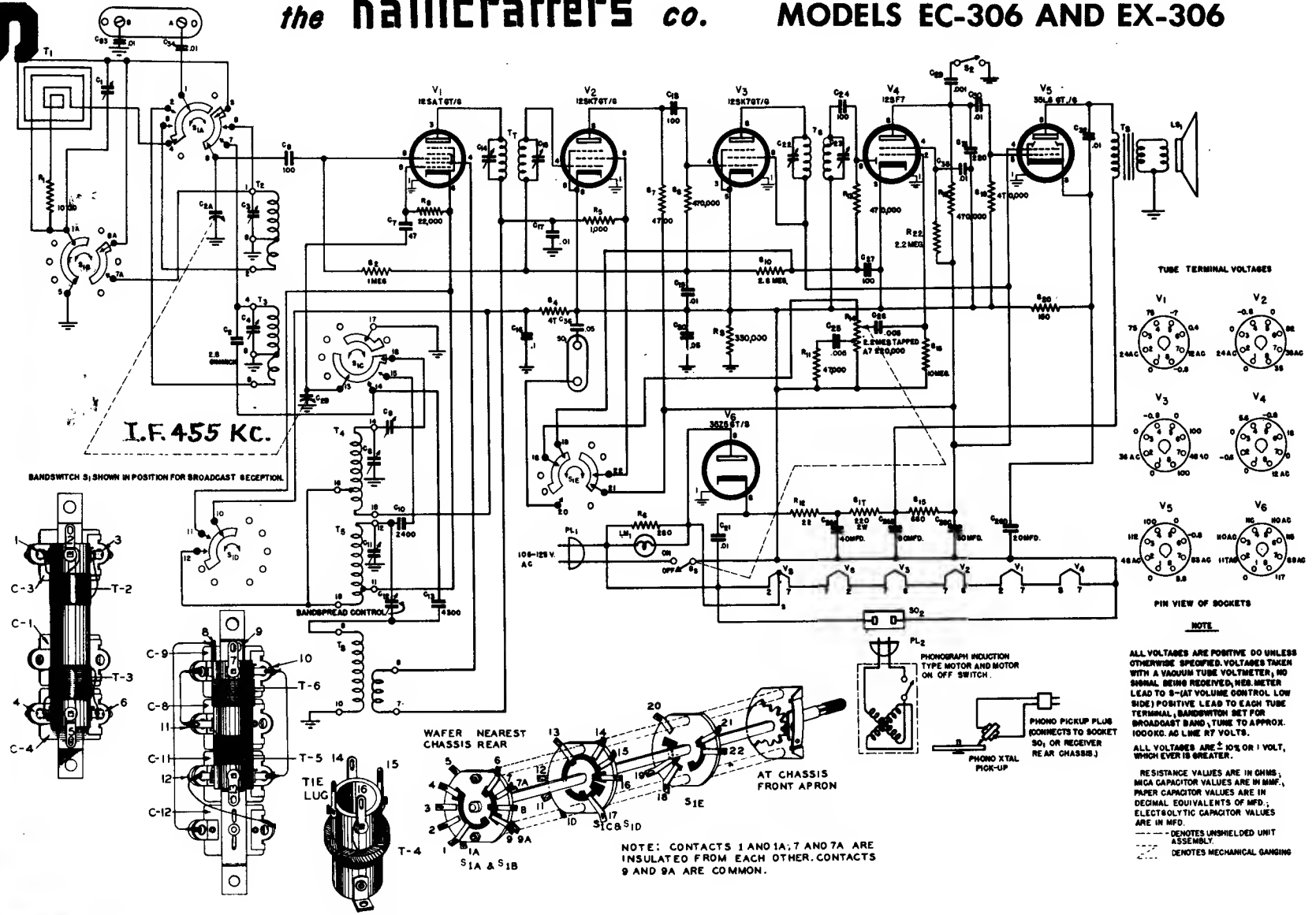
LETTERS AT BANDSWITCH (S_1) AND NUMERALS AT ANTENNA AND OSCILLATOR TRANSFORMERS (T_1, T_2 & T_3) IDENTIFY CORRESPONDING TERMINAL LUGS ON PICTORIAL VIEWS.

NOTE: DIMENSIONS & PROPORTIONS SHOWN IN PICTORIAL VIEWS HAVE BEEN EXAGGERATED FOR CLARITY OF TERMINAL LUG LOCATION.

DETAILED SERVICE INFORMATION

IF FREQUENCY	IF SELECTIVITY	IMAGE RATIO	SENSITIVITY	AUDIO OUTPUT
455 kc	7 kc wide at 6 db down 65 kc wide at 60 db down (for 50 milliwatt output)	2.7:1 at 30 mc 6:1 at 14 mc 10:1 at 5 mc 35:1 at 1500 kc	12 microvolt at 600 kc 12 microvolt at 5 mc 11 microvolt at 14 mc 23 microvolt at 30 mc (for 50 milliwatt output)	675 milliwatt with less than 10% distortion at 400 cycles

the hallicrafters co. MODELS EC-306 AND EX-306

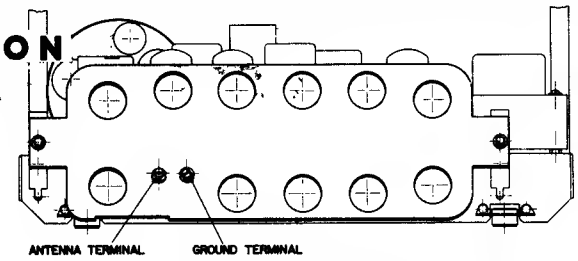


OLYMPIC RADIO & TELEVISION

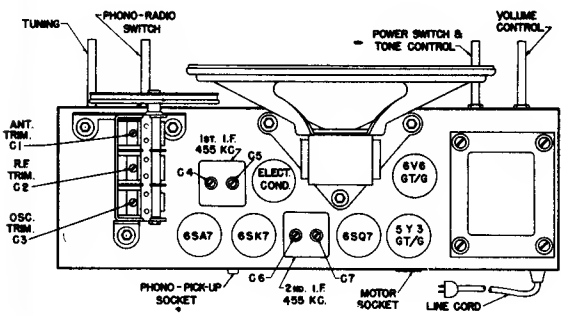
DIVISION OF

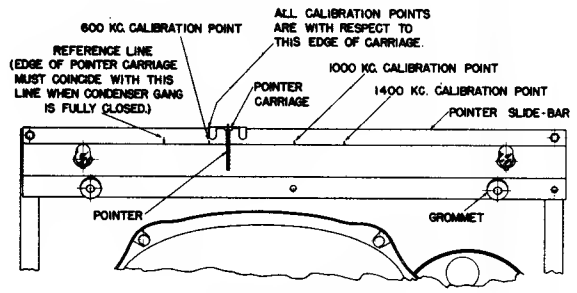
HAMILTON RADIO CORPORATION

Model 6-507



REAR VIEW OF RECEIVER CHASSIS WITH CABINET BACK REMOVED

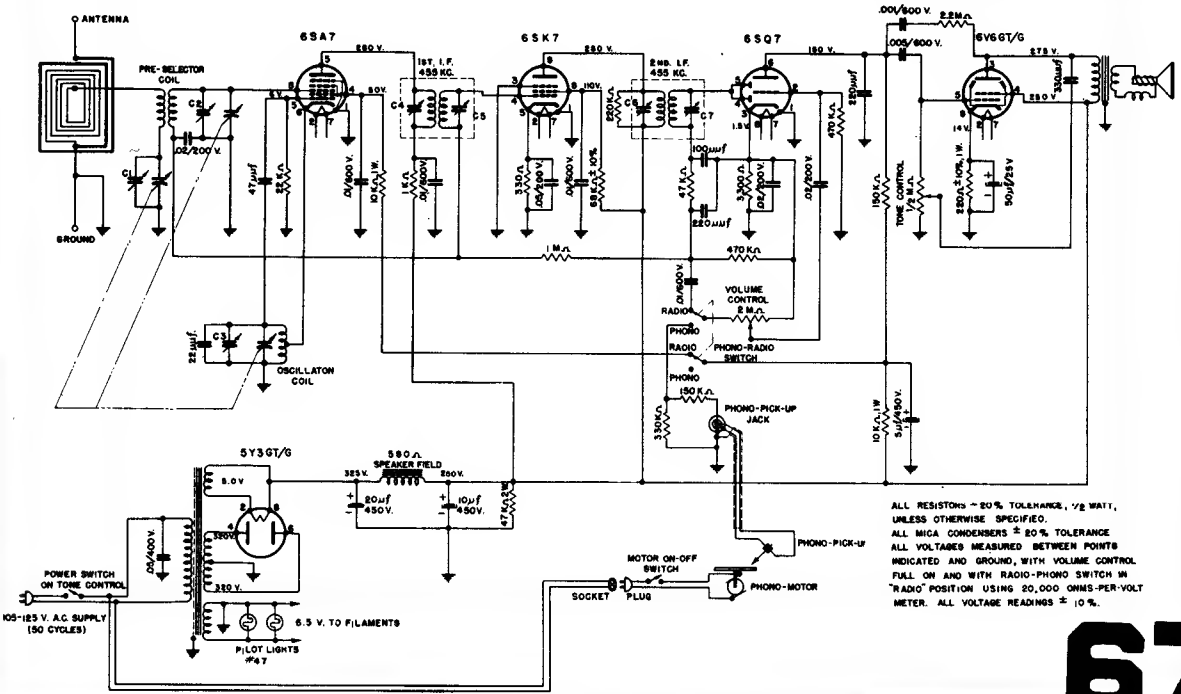




FRONT VIEW OF DIAL BACK-PLATE SHOWING CALIBRATION POINTS

ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR TO-	TURN POINTER TO-	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT. (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	R.F. SECTION OF THE VARIABLE CONDENSER.	455 KC.	EXTREME RIGHTHAND POSITION. (CONDENSER PLATES FULLY OPEN.)	C7, C6, C5, C4 AND REPEAT IN SAME ORDER (1ST. AND 2ND. I.F. TRANSFORMERS.)
2	ANTENNA TERMINAL OF ANTENNA LOOP IN SERIES WITH 50 MMFD. COND.	1400 KC.	1400 KC. CALIBRATION POINT.	C3, C2, C1.
3		600 KC.	RESONANCE	CHECK THAT POINTER EDGE AT RESONANCE COINCIDES WITH 600 KC. CALIBRATION POINT. IF DEVIATION IS TOO LARGE REPEAT STEP 2.

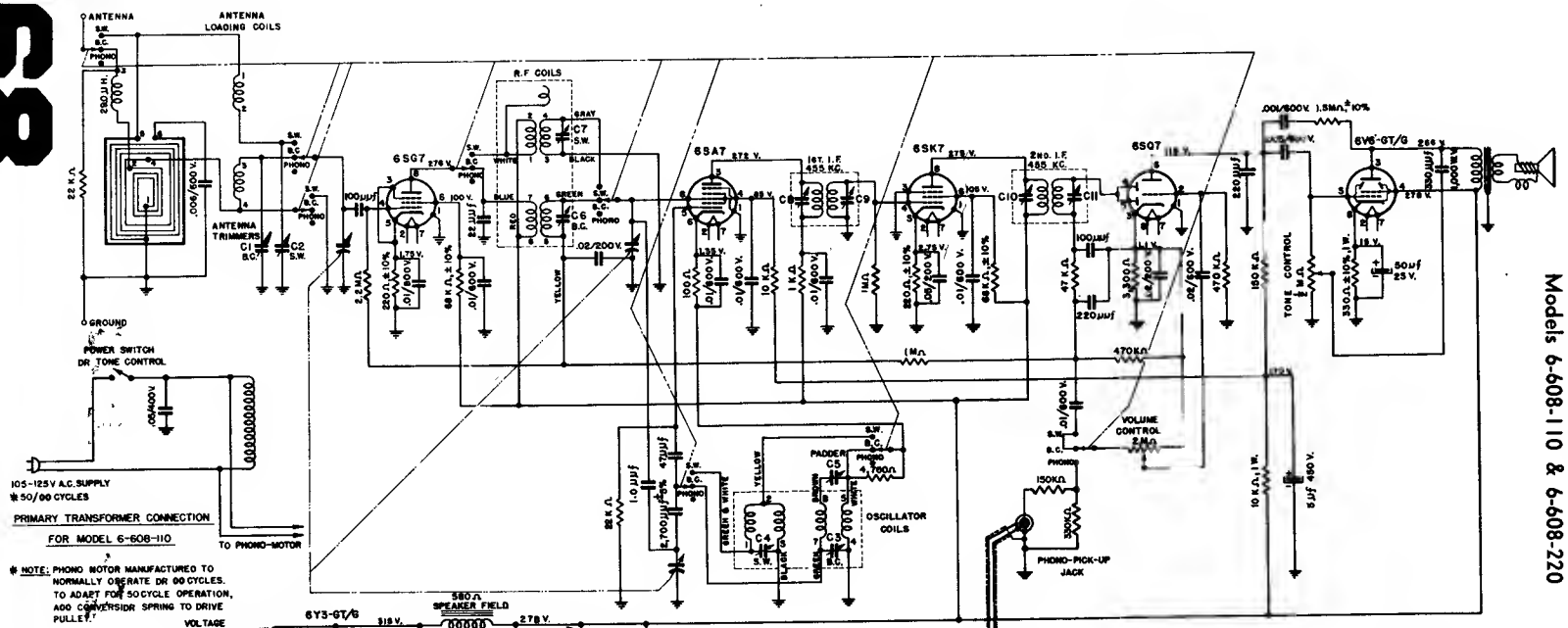


ALL RESISTORS ± 20% TOLERANCE, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
ALL MICA CONDENSERS ± 20% TOLERANCE
ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND GROUND, WITH VOLUME CONTROL FULL ON AND WITH RADIO-PHONO SWITCH IN "RADIO" POSITION USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ± 10%.

MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

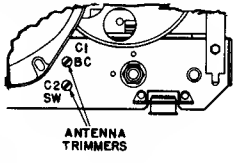
Olympic Radio & Television
Hamilton Radio Corp.

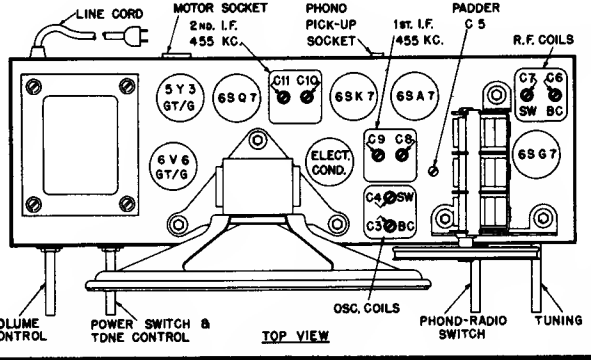
Models 6-608-110 & 6-608-220



NOTES:

1. ALL RESISTORS ± 20% TOLERANCE, ½ WATT, UNLESS OTHERWISE SPECIFIED.
2. ALL MICA CONDENSERS ±20% TOLERANCE, UNLESS OTHERWISE SPECIFIED.
3. BAND SELECTOR SWITCH SHOWN IN BROADCAST POSITION.
4. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND BROUND, WITH VOLUME CONTROL FULL ON AND WITH BAND SWITCH SET IN "B.C." POSITION, USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ±10%, MEASURED WITH AN INPUT VOLTAGE OF 117 V., 60 CYCLES, A.C.
5. TERMINAL NUMBERS ON ANTENNA LOOP CORRESPOND WITH TERMINAL LUGS ON LOOP ON BACK OF CHASSIS.





ALIGNMENT PROCEDURE CHART

STEP	SET BAND SWITCH ON	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR TO-	TURN POINTER TO-	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT. (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE).
1	B.C.	R.F. SECTION OF VARIABLE CONDENSER OR PIN 4 OF THE 6SK7 TUBE IN SERIES WITH A .1 MFD. 400 VOLT CONDENSER.	455 KC.	EXTREME RIGHT HAND POSITION. (CONDENSER PLATES FULLY OPEN).	C11 AND C10 (2ND. I.F. TRANSFORMER)
2	B.C.	R.F. SECTION OF VARIABLE CONDENSER ON PIN 8 OF THE 6SA7 TUBE IN SERIES WITH A .1 MFD. 400 VOLT CONDENSER.	455 KC.	EXTREME RIGHT HAND POSITION. (CONDENSER PLATES FULLY OPEN).	C9 AND C8 (1ST. I.F. TRANSFORMER)
3	B.C.	REPEAT STEPS 1 AND 2			
4	B.C.	USE RADIATED SIGNAL (CONNECT BOTH SIDES OF SIGNAL GENERATOR TO RADIATION LOOP).	1700 KC.	1700 KC. CALIBRATION POINT ON DIFFUSER PLATE.	C3 (OSCILLATOR TRIMMER)
5	B.C.		1400 KC.	RESONANCE, APPROXIMATELY 1400 KC. CALIBRATION POINT ON DIFFUSER PLATE.	C8 AND C1 (R.F. AND ANTENNA TRIMMERS)
6	B.C.		600 KC.	RESONANCE, APPROXIMATELY 600 KC. CALIBRATION POINT ON DIFFUSER PLATE.	C5 (PADDER) ROCK VARIABLE FOR MAXIMUM SIGNAL
7	B.C.	REPEAT STEPS 4, 5 AND 6			
8	S.W.		18 MC.	CALIBRATION POINT ON DIFFUSER PLATE	C4 (OSCILLATOR TRIMMER) SECOND PEAK FROM TIGHT POSITION. C7 (R.F. TRIMMER) C2 (ANTENNA TRIMMER)
9	S.W.		18 MC.	RESONANCE	CHECK THAT POINTER (AT RESONANCE) COINCIDES WITH 18 MC. CALIBRATION POINT IF NOT REPEAT STEP 8.
10	S.W.	REPEAT STEPS 8 AND 9			

NOTE: In order to adjust the short wave oscillator trimmer accurately to the fundamental frequency and not to the image signal, turn the trimmer first to the maximum capacity position (fully tight). From this position loosen the trimmer through one peak indication on the output meter until a second peak is obtained. Adjust for maximum output on this second peak.

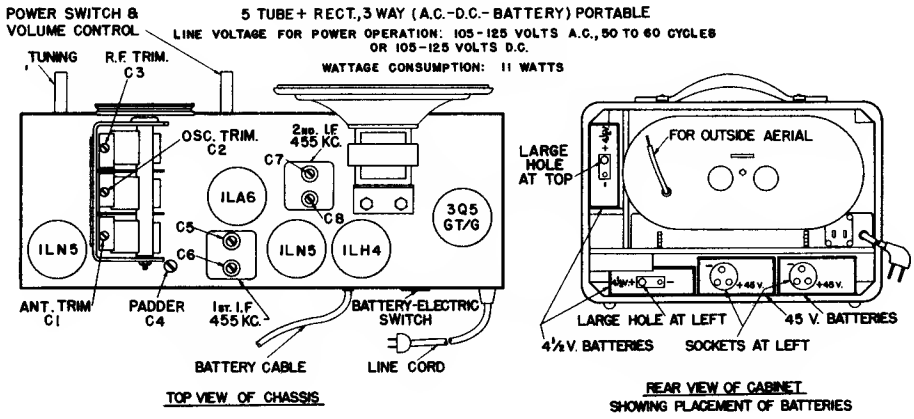
OLYMPIC RADIO

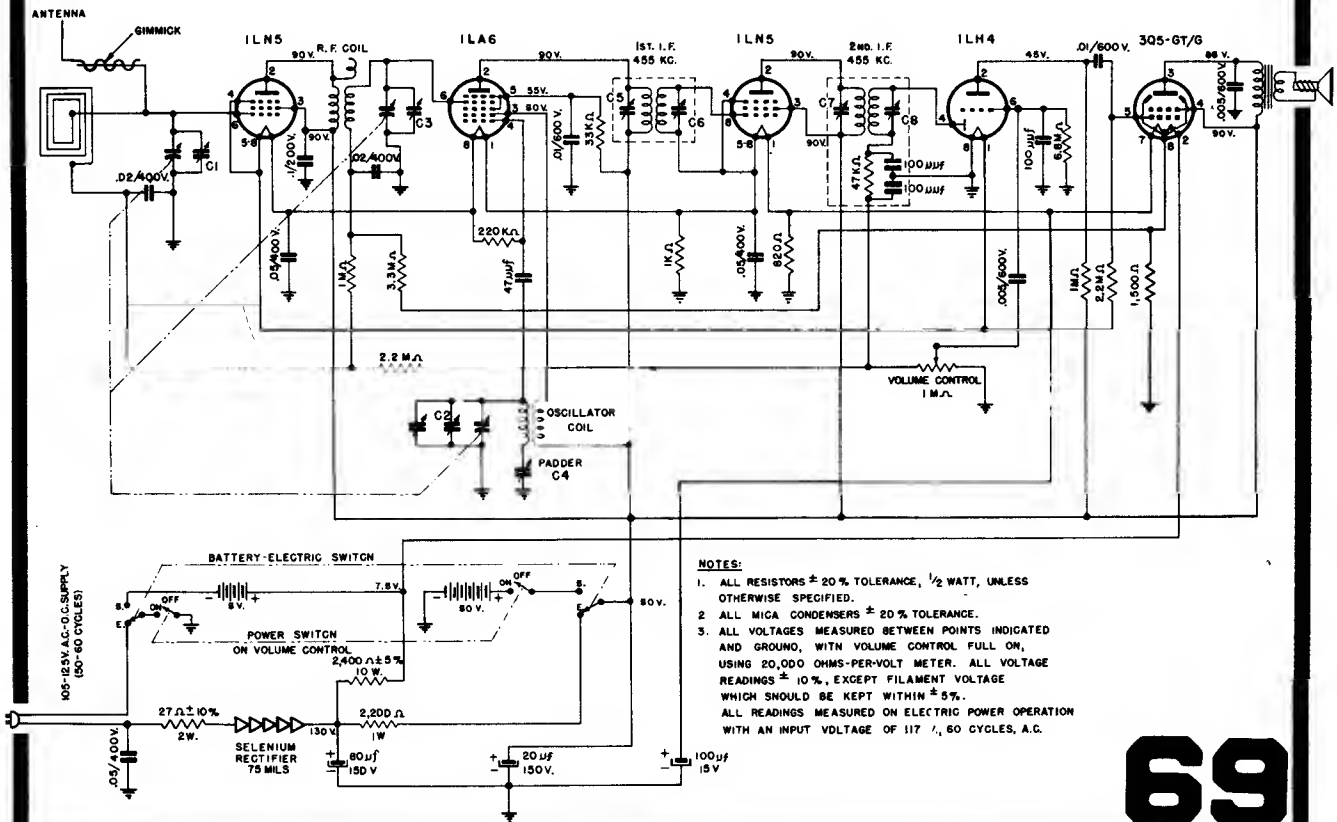
Model 7-526

Hamilton Radio Corp.

ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR TO-	SET POINTER TO-	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT. (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	R.F. SECTION OF VARIABLE CONDENSER IN SERIES WITH .1 MFD. COND.	455 KC.	EXTREME RIGHT HAND POSITION. (CONDENSER PLATES FULLY OPEN.)	C8, C7, C6, C5 AND REPEAT IN SAME ORDER (1ST. AND 2ND. I.F. TRANSFORMERS.)
2	USE RADIATED SIGNAL (CONNECT BOTH SIDES OF SIGNAL GENERATOR TO RADIATION LOOP).	1500 KC.	1500 KC. (150 ON DIAL)	C2, C3, C1 (OSCILLATOR, R.F. AND ANTENNA TRIMMERS)
3		600 KC.	600 KC. (APPROX. 60 ON DIAL)	C4 (PADDER) ROCK DIAL FOR MAXIMUM SIGNAL
4		REPEAT STEPS 2 AND 3		





NOTES:

1. ALL RESISTORS ± 20% TOLERANCE, ½ WATT, UNLESS OTHERWISE SPECIFIED.
2. ALL MICA CONDENSERS ± 20% TOLERANCE.
3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND GROUND, WITH VOLUME CONTROL FULL ON, USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ± 10%, EXCEPT FILAMENT VOLTAGE WHICH SHOULD BE KEPT WITHIN ± 5%. ALL READINGS MEASURED ON ELECTRIC POWER OPERATION WITH AN INPUT VOLTAGE OF 117 V., 60 CYCLES, A.C.

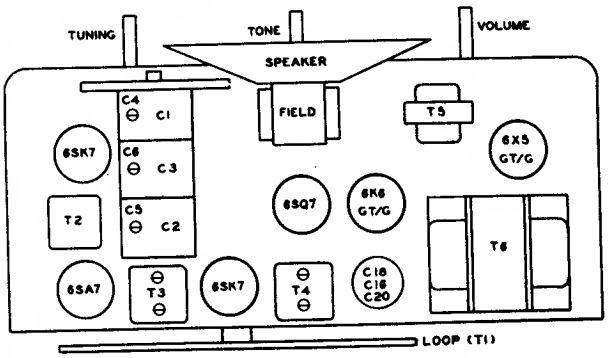
Hoffman RADIO CORP.

MODEL A300
CHASSIS 100
CHASSIS 100S

Hoffman Model A300 with Chassis number 100S is electrically identical with Chassis number 100 except for the following:

1. Five-inch P.M. speaker, part number 9003, has been substituted for 4 x 6 inch oval dynamic speaker, part number 9000.
2. A 1500-ohm resistor, part number 4701, has been connected in the filter circuit in place of the 1500-ohm speaker field.

These changes have been incorporated in the schematic diagram shown below.



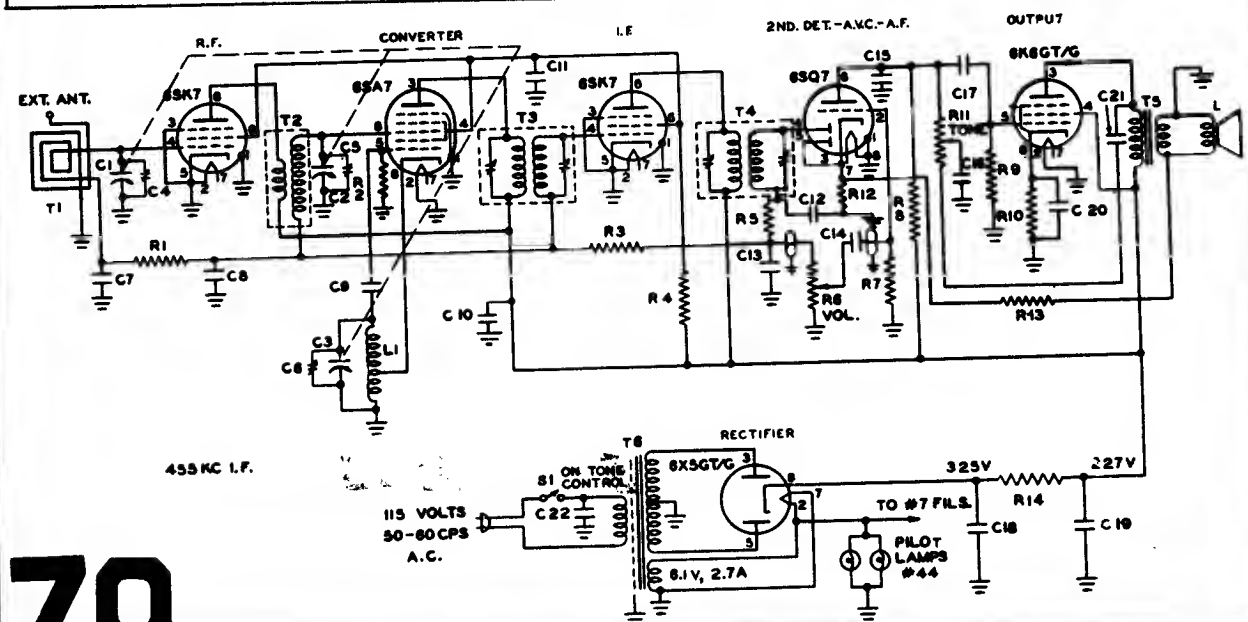
SYMBOL	DESCRIPTION	HOFFMAN NO.
C1-C2-C3	Three-Section Variable (388-388-180 Mmf.)	4400
C4, C5, C6	Trimmers; Part of Variable Condenser	
C7, C8	.05 Mfd, 200 Volt, Tubular Paper	4100
C9, C12, C13, C15	100 Mmf ±20%, Mica	4000
C10, C11	.05 Mfd, 400 Volt, Tubular Paper	4101
C14, C16	.005 Mfd, 600 Volt, Tubular Paper	4102
C17	.01 Mfd, 600 Volt, Tubular Paper	4103
C18-C19-C20	Dry Electrolytic Condenser (20-20-20 Mfd 450-450-25 Volt)	4200
C21	.001 Mfd, 600 Volt, Tubular Paper	4104
C22	.01 Mfd, 600 Volt, Tubular Paper (Metal Can)	4105
L1	Oscillator Coil	5200
LS	5" PM Loudspeaker	9003
R1, R8	.22 Megohm ±20%, ½ Watt	4500
R2	22,000 Ohm ±20%, ½ Watt	4501
R3	2.2 Megohm ±20%, ½ Watt	4502
R4	10,000 Ohm ±10%, 2 Watt	4503
R5	47,000 Ohm ±20%, ½ Watt	4504
R6	.5 Megohm Potentiometer (Volume)	4800
R7	10 Megohm ±20%, ½ Watt	4505
R9	.47 Megohm ±20%, ½ Watt	4506
R10	560 Ohm ±10%, ½ Watt	4507
R11	.25 Megohm Potentiometer With Switch (Tone)	4801
R12	47 Ohm ±20%, ½ Watt	4508
R13	330 Ohm ±20%, ½ Watt	4509
R14	1500 Ohm ±10%, 10 Watt, W.W.	4702
S1	On-Off Switch (On Tone Control)	
T1	Antenna Loop	5201
T2	R.F. Coil (Shielded)	5202
T3	Input I.F. Transformer (455 K.C.)	5203
T4	Output I.F. Transformer (455 K.C.)	5204

PIN NO.	1	2	3	4	5	6	7	8
6SK7 (R.F.)	0	0	0	—.5	0	+85	6.1A.C.	+227
6SA7	0	0	+227	+85	—7	0	6.1A.C.	—.7
6SK7 (I.F.)	0	0	0	—.7	0	+85	6.1A.C.	+227
6SQ7	0	—.5	0	—.25	0	+95	6.1A.C.	0
6K6GT/G	0	0	+217	+227	0	+325 *	6.1A.C.	+15
6X5GT/G	0	6.1A.C.	290A.C.	—	290A.C.	—	0	+325

D.C. voltages measured with 20,000 ohm/volt meter.
A.C. voltages measured with 1,000 ohm/volt meter.
All voltages measured with reference to chassis.
Line voltage 117.5.

* Means tie point.

NOTE: The above readings are obtained with no signal input to the receiver.



Hoffman
RADIO CORP.

MODEL A700 **CHASSIS 110S**

I. F. Alignment

1. Connect output meter across speaker voice coil; set meter on 1-volt scale.
2. Connect output of signal generator to trimmer C3 (blue wire on trimmer located at rear of chassis). The ground side of the signal generator should be connected toB- through a .1 Mfd. condenser. Set signal generator on 455 Kc (modulated).
3. Adjust I.F. trimmers (first T2 and then T1) for maximum reading on output meter.
   NOTE: Keep signal level low, just enough to keep the maximum reading on the output meter at 0.4 volt or less. tuning gang should be set with plates all the way out; volume control full on.
4. Replace bottom cover plate.

R. F. Alignment

1. Leave tuning gang with plates all the way out.
2. Set signal generator on 1650 Kc (modulated) and feed generator output into a loop of wire approximately 6" in diameter. Place the loop about one foot away and parallel to the receiver loop antenna.
3. Tune in signal by adjusting oscillator trimmer C7.
4. Adjust output of signal generator to obtain deflection of .4 volt or less on output meter.
5. Adjust oscillator trimmer for maximum output.
6. Set Signal generator to 1400 Kc and tune in signal with tuning condenser.
7. Adjust loop antenna trimmer C1 and R. F. Coil assembly for maximum output. The R. F. coil adjustment is made by loosening the coil mounting clamp and sliding the coil up or down as required.
8. Set signal generator and tuning gang to 600 Kc and adjust R. F. trimmer C3 for maximum output.
9. Go back to 1400 Kc to check tracking and readjust at 1400 Kc and 600 Kc as required.

SYMBOL	DESCRIPTION	Hoffman No.
C1-C7	Trimmers—Part of Variable Condanser	
C2-C6	Two Section Vaiabla (388-180 Mmf.)	4401
C3	60-260 Mmfd. Mica Trimmer	4306
C4-C9-C11	.0001 Mfd. Mica	4000
C5	47 Mfd. Mica	4009
C8-C26	.01 Mfd. 400 Volt Tubular Papar	4112
C10-C12-C13-C14	.005 Mfd. 600 Volt Tubular Paper	4102
C15-C16	100 Mfd. 25 Volt Dry Electrolytic	4204
C17-C19-C20-C21	.05 Mfd. 200 Volt Tubular Paper	4100
C18-C25	Dry Electrolytic Condansar (30-50 Mfd. 150-150 Volt)	4201
C22-C23	.2 Mfd. 200 Volt Tubular Paper	4108
C24	.05 Mfd. 400 Volt Tubular Paper	4101
L1	Autenna Loop	55208
L2	Antenna Loop Compensator	5250
L3	R.F. Coil Parmaability Tunad	5245
L.S.	5¼" P.M. Speaker	9019
R1-R14	3.3 Megohm, ½ Watt	4535
R2-R7-R9-R16	2.2 Megohm, ½ Watt	4502
R3	680 Ohms, ½ Watt	4514
R4	.47 Megohm, ½ Watt	4506
R5-R15	1 Magohm, ½ Watt	4513
R6-R10	.1 Megohm, ½ Watt	4511
R8	3900 Ohms ± 10%, ½ Watt	4527
R11	1 Megohm Potentiomater with D.P.S.T. Switch (Volume)	4808
R12	10 Megohm, ½ Watt	4505
R13*	820 Ohm ± 10%, ½ Watt	4533
R17	1500 Ohm, ½ Watt	4534
R18-R22	47 Ohm, 2 Watt	4532
R19	1000 Ohm, 1 Watt	4522
R20	1500 Ohm, 6½ Watt ± 5% Wirawound	4701
R21	470 Ohm, 1 Watt ± 10%	4531
S1	AC/DC Battery Switch Plug Oparated	6010
S2	On-Off Switch (on Voluma Control)	
T1	Input I.F. Transformar (455 K.C.)	5242
T2	Output I.F. Transformer (455 K.C.)	5243
T3	Output Audio Transformar	5104
T4	Oscillator Coil	5244
Rect.	Selanium Ractifiar	9517

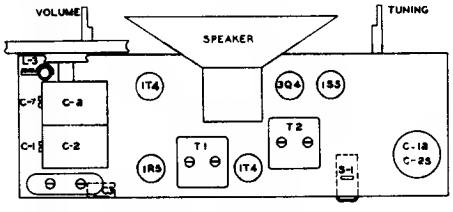
* Semo sets use 1000 ohms ± 20%, ½ Watt, Part No. 4542.

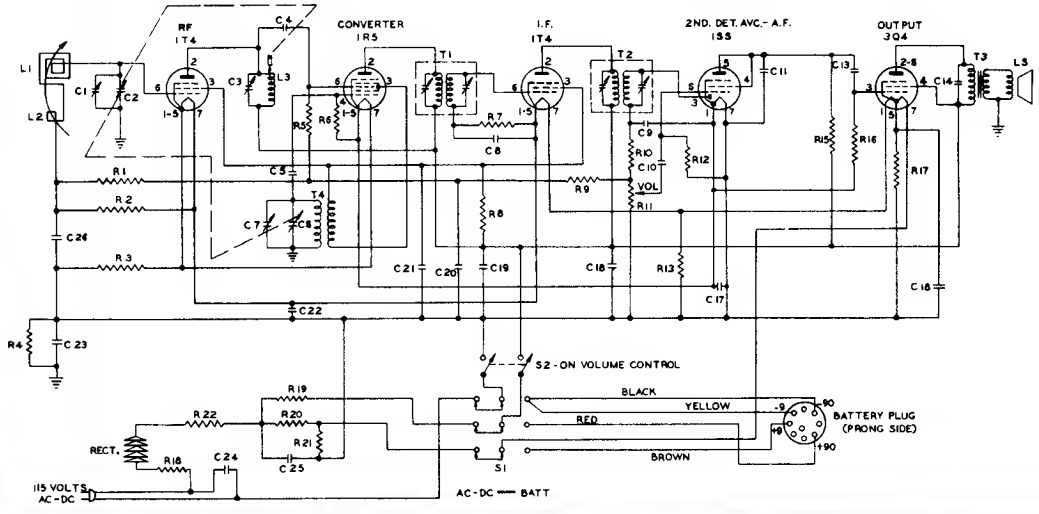
The following table lists the normal operating voltages to be expected at the various socket terminals.

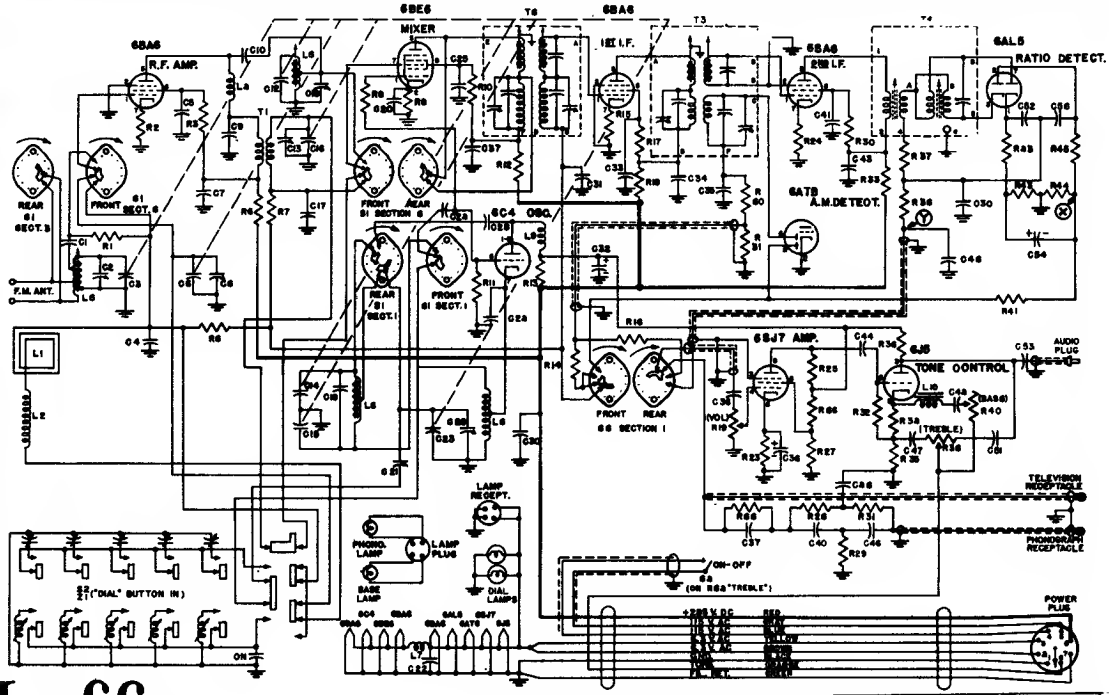
PIN NO.	1	2	3	4	5	6	7	8
1T4 (RF)	2.6	84	65		2.6		3.9	
1R5	1.3	84	64	—5.0*	1.3	3*	2.6	
1T4 (RF)	3.9	84	65	1.2*	3.9	1.5*	5.2	
1S5	1.3	0	.5*	20*	1	—.5*	0	
3Q4	5.2	84	—1.3*	84	6.5	84	7.8	

NOTE: All voltages are measured with reference to B- (black wires on volume control switch) and no signal input to receiver.

* These readings must be taken with a V. T. V. M.







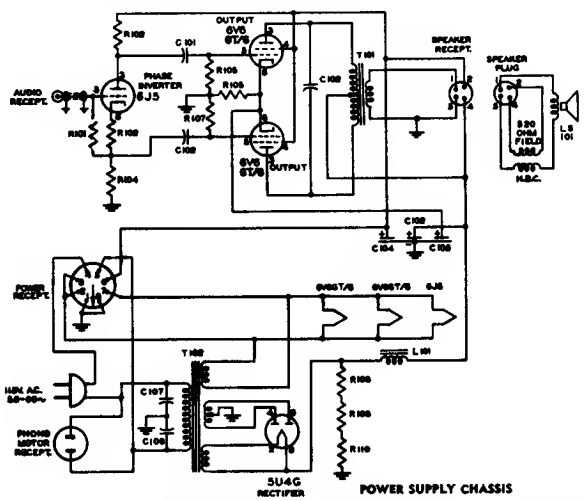
Hoffman
RADIO CORP.

MODEL B502 CHASSIS 113

Tuner Schematic Diagram

TUNING RANGES:
- Broadcast Band ..... 535 Kc to 1650 Kc
- FM Band ..... 88 Mc to 108 Mc

INTERMEDIATE FREQUENCIES:
- Broadcast Band ..... 455 Kc
- FM Band ..... 10.7 Mc



POWER SUPPLY CHASSIS

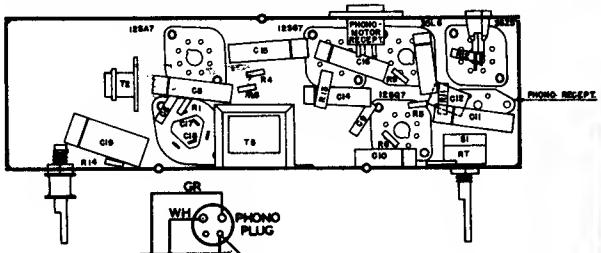
SYMBOL	DESCRIPTION	HOFFMAN NO.
C101, C102	.05 Mfd. 400 Volt Tub. Paper	4101
C103	470 Mmf. ±20% Mica	4003
C104, C105 C106	20/20 Mfd. 450V. 20 Mfd. 25V. Electrolytic	4200
C107, C106	.01 Mfd. 600 Volt, Metal Case	4105
R101	1 Meg. ±20% ½ Watt	4513
R102, R104	47000 Ohm ±10% ½Watt	4559
R103	2200 Ohm ±20% ½Watt	4512
R105, R107	.22 Meg. ±20% ½Watt	4500
R106	220 Ohm ±20% 3 Watt W.W.	4706
R108, R109 R110	10,000 Ohm ±10% 2 Watt	4503
L101	Filter Choke	5116
T101	Audio Output Transformer	5108
T102	Power Transformer	5007
LS101	Speaker—12" Electrodynamic	9044

SYMBOL	DESCRIPTION	HOFFMAN NO.
C1, C9, C10, C28, C35, C37	100 Mmf. ±10% Ceramic	4012
C2, C18	1 - 8 Mmf. Trimmer	4315
C3, C6, C12, C14, C15, C16, C23	3 Sect. Variable with Split Stator	4408
C4, C17, C22, C31	.05 Mfd. 200 Volt Tub. Paper	4100
C5, C25	470 Mmf. ±20% Mica	4003
C7, C30, C34, C44, C51, C53	.01 Mfd. 400 Volt Tub. Paper	4112
C8, C13, C26	1.8 - 30 Mmf. Trimmer	4313
C11	500 Mmf. ±5% Silver Mica	4004
C19	50 Mmf. ±2% Ceramic	4023
C20	220 Mmf. ±20% Ceramic	4028
C21	110-560 Mmf. Trimmer	4301
C24	22 Mmf. ±10% Ceramic	4021
C27	5000 Mmf. (Min.) Ceramic	4029
C29	50 Mmf. ±20% Ceramic	4031
C32	20 Mfd. 450 Volt Electrolytic	4207
C33, C41	.001 Mfd. 600 Volt Tub. Paper	4104
C36	.02 Mfd. 400 Volt Tub. Paper	4106
C38	25 Mfd. 25 Volt Electrolytic	4205
C40, C46, C50, C52, C55	330 Mmf. ±5% Mica	4010
C42	650 Mmf. ±5% Mica	4011
C47	.005 Mfd. 600 Volt Tub. Paper	4102
C48	.002 Mfd. 600 Volt Tub. Paper	4118
C49	.5 Mfd. 200 Volt Tub. Paper	4110
C54	5 Mfd. 50 Volt Electrolytic	4209
C43	2300 Mmf. ±5% Mica	4006
R1	.27 Meg. ±20% ½Watt	4545
R2, R9, R15, R24	56 Ohm ±10% ½Watt	4561
R3, R10, R17, R30	33,000 Ohm ±20% 1 Watt	4556
R5, R7	.1 Meg. ±20% ½Watt	4511
R6, R12, R18, R33	1500 Ohm ±20% ½Watt	4534
R8	22 Ohm ±20% ½Watt	4560
R11, R35, R36	22,000 Ohm ±20% ½Watt	4501
R13	4700 Ohm ±20% 2 Watt	4551
R14	2.2 Meg. ±20% ½Watt	4502
R16, R32	1 Meg. ±20% ½Watt	4513
R19	.5 Meg. Pot. (Volume)	4804
R20, R38	47,000 Ohm ±20% ½Watt	4506
R21	.68 Meg. ±20% ½Watt	4555
R22	4.7 Meg. ±20% ½Watt	4544
R23, R34	2200 Ohm ±20% ½Watt	4512
R25	.22 Meg. ±20% ½Watt	4500
R26	.12 Meg. ±10% ½Watt	4548
R27	15,000 Ohm ±20% ½Watt	4521
R28, R31	47,000 Ohm ±10% ½Watt	4559
R29	22,000 Ohm ±5% ½Watt	4538
R37	120 Ohm ±10% ½Watt	4546
R39	.25 Meg. Pot. With Switch (Treble)	4805
R40	50,000 Ohm Pot. (Bass)	4806
R41	.47 Meg. ±20% ½Watt	4506
R42, R45	390 Ohm ±10% ½Watt	4549
R43, R44	6600 Ohm ±10% ½Watt	4557
L1	Loop Antenna	55210
L2	Antenna Coil—Broadcast	5285
L3	Coil—F.M. Ant.	5253
L4, L9	Coil—R.F.	5254
L5	Coil—F.M. R.F.	5252
L6	Coil—F.M. Osc.	5251
L7	Coil—Fil. R.F.	5266
L8	Coil—B.C. Osc.	5263

Hoffman RADIO CORP.

MODEL B400

CHASSIS 118

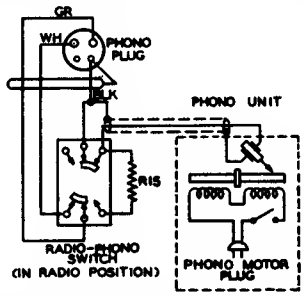


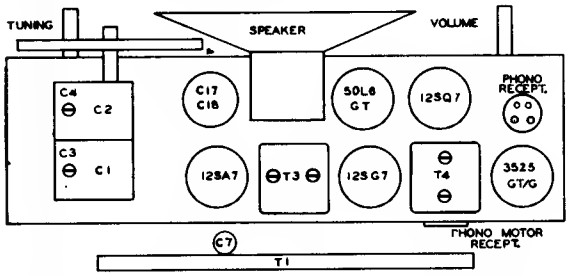
I. F. ALIGNMENT:

1. Connect output meter across speaker voice coil; set meter on 2.5 volt scale.
2. Connect output of signal generator directly to antenna post on loop; connect ground side of generator to chassis of receiver through .1 Mfd. condenser. Set signal generator on 455 Kc (modulated).
3. Adjust I.F. trimmers (first T4 and then T3) for maximum reading on output meter.

R.F. ALIGNMENT:

1. Set tuning condenser with plates completely out.
2. Set signal generator at 1650 Kc (modulated) and feed its output into a loop of wire about 6" in diameter. Place this loop about one foot away from and parallel to the receiver loop antenna.
3. Tune in signal by adjusting oscillator trimmer (C4).
4. Adjust output of signal generator to obtain deflection on lower half of meter scale.
5. Adjust oscillator trimmer (C4) for maximum output.
6. Set signal generator at 1400 Kc and tune in signal with tuning condenser.
7. Adjust antenna trimmer (C3) while rocking gang condenser for maximum reading on output meter. Feed only enough signal from generator to keep maximum reading on lower half of meter scale.



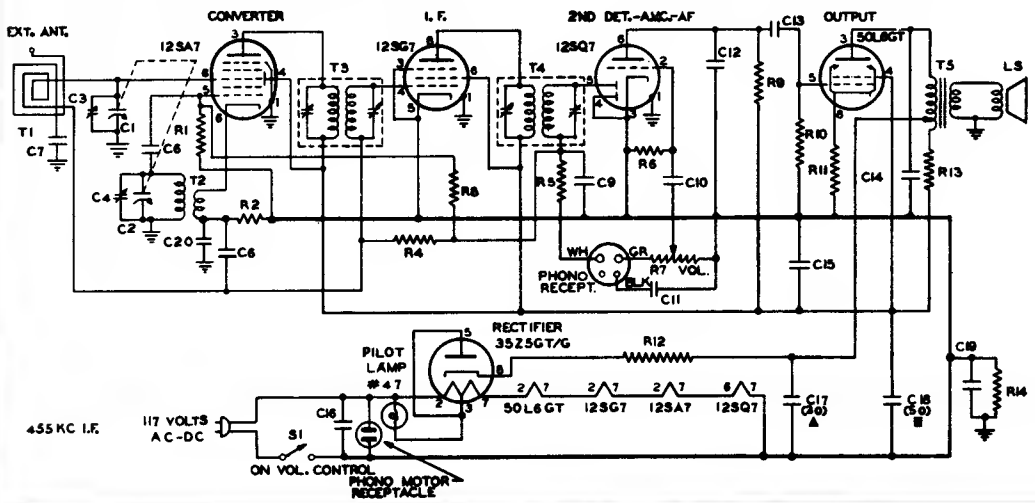


SYMBOL	DESCRIPTION	HOFFMAN No.
C1, C2	Two Section Variable (388-180 Mmf.)	4401
C3, C4	Trimmer: Part of Variable Cond.	
C6	100 Mmf. ±20% Mica	4000
C7, C10, C13	.005 Mfd. 600 Volt Tubular Paper	4102
C8, C11, C15	.05 Mfd. 200 Volt Tubular Paper	4100
C9, C12	270 Mmf. ±20% Mica	4001
C14	.02 Mfd. 400 Volt Tubular Paper	4106
C16	.05 Mfd. 400 Volt Tubular Paper	4101
C17, C18	Dry Electrolytic (50 30 Mfd. 150 V.)	4201
C19	.2 Mfd. 200 Volt Tubular Paper	4108
C20	.001 Mfd. 600 Volt Tubular Paper	4104
R1	22,000 Ohm ±20% ½Watt	4501
R4	2.2 Megohm ±20% ½Watt	4502
R5	47,000 Ohm ±20% ½Watt	4504
R6, R8	10 Megohm ±20% ½Watt	4505
R7	.5 Megohm Pot. with Switch (Vol.)	4002
R9	.22 Megohm ±20% ½Watt	4500
R10, R14, R15	.47 Megohm ±20% ½Watt	4506
R11	150 Ohm ±20% ½Watt	4510
R12	47 Ohm ±20% ½Watt	4508
R13	1500 Ohm ±20% 1 Watt	4552
S2	Phono-Radio-Tone Switch	6021
LS	PM Loudspeaker	9023
S1	On-Off Switch (on Vol. Control)	
T1	Antenna Loop	5255
T2	Oscillator	5208
T3	Input I.F. Transformer (455Kc.)	5205
T4	Output I.F. Transformer (455Kc.)	5206
T5	Audio Output Transformer	5117

PIN NO.	1	2	3	4	5	6	7	8
12SA7	0	24 A.C.	+85	+92	−5.5	0	11.5 A.C.	−.4
12SG7	0	22 A.C.	0	−.4	0	+92	36 A.C.	+86
12SQ7	0	−.8	0	0	−1.0	+60	0	9 A.C.
50L6	0	36 A.C.	+101	+93	+.2	0	87 A.C.	+7.5
35Z5	0	117 A.C.	114 A.C.	+112	114 A.C.	0	87 A.C.	+116

D.C. voltages measured with 20,000 ohm/volt meter.
A.C. voltages measured with 1,000 ohm/volt meter.
All voltages measured with reference to B−.

NOTE: The above readings are obtained with no signal input to the receiver, radio-phono switch in the RADIO position, and volume control full on.

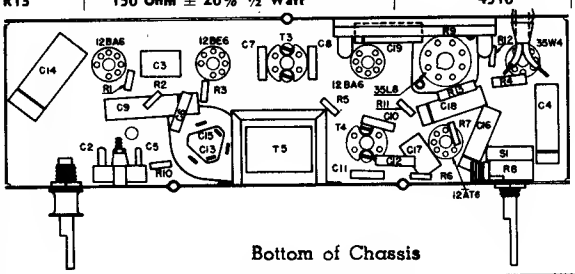


Hoffman RADIO CORP.

MODELS A202 & A309

CHASSIS 119

SYMBOL	DESCRIPTION	HOFFMAN No.
C1	.005 Mfd. 600 Volt Tubular Paper	4102
C2, C5	Dual Padder 280 Mmf. Per Section	4307
C3, C6	100 Mmf. ± 20% Mica	4000
C4	.05 Mfd. 400 Volt Tubular Paper	4101
C7, C8	100 Mmf. ± 10% Ceramic	4012
C9	.05 Mfd. 200 Volt Tubular Paper	4100
C10, C11	100 Mmf. ± 10% Ceramic	4012
C12	270 Mmf. ± 20% Mica	4001
C13, C15	Dry Electrolytic (30-50 Mfd./150 V)	4201
C14	.2 Mfd. 200 Volt Paper Tubular	4108
C16	.005 Mfd. 600 Volt Paper Tubular	4102
C17	270 Mmf. ± 20% Mica	4001
C18	.005 Mfd. 600 Volt Tubular Papar	4102
C19	.02 Mfd. 400 Volt Tubular Paper	4106
LS	5" PM Loudspeaker	9003
R1	2200 Ohm ± 20% ½ Watt	4512
R2, R6	47,000 Ohm ± 20% ½ Watt	4504
R3	22,000 Ohm ± 20% ½ Watt	4501
R4	47 Ohm ± 20% ½ Watt	4508
R5	2.2 Megohm ± 20% ½ Watt	4502
R7	10 Megohm ± 20% ½ Watt	4505
R8	.5 Megohm Pot. with Switch (Volume)	4802
R9	500 Ohm ± 10% 5 Watt	4700
R10, R12	.47 Megohm ± 20% ½ Watt	4506
R11	.22 Megohm ± 20% ½ Watt	4500
R13	150 Ohm ± 20% ½ Watt	4510



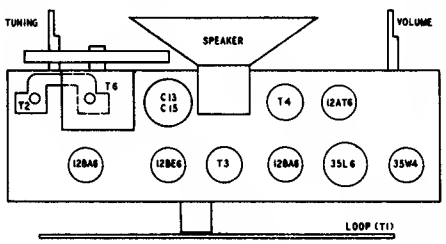
Bottom of Chassis

I.F. ALIGNMENT:

1. Connect output meter across speaker voice coil; set meter on 2.5 volt scale.
2. Connect output of signal generator directly to 12BE6 control grid; connect ground side of generator to chassis of receiver through .25 Mfd. condenser. Set signal generator on 455 Kc (modulated).
3. Adjust I.F. slugs (first T4 and then T3) for maximum reading on output meter.
   Note: Keep signal level low, just enough to keep maximum reading on lower half of meter scale. Tuning condenser plates should be all the way out; volume control should be on full. After adjustment, put a drop of wax on each I.F. tuning slug to hold it in place.

R.F. ALIGNMENT: control ——— with slugs ——— all the way in.

1. Set receiver tuning control with slugs all the way in.
2. Set signal generator on 540 Kc (modulated) and connect generator output to antenna post on receiver. The ground side of the generator should be connected to receiver B- through a .25 Mfd. condenser.
3. Tune in signal by adjusting oscillator trimmer C5.
4. Adjust output of signal generator to obtain deflection on lower half of meter scale.
5. Adjust oscillator trimmer for maximum output.
6. Set signal generator on 1650 Kc and check signal with tuning condenser plates all the way out.
7. Set signal generator on 1470 Kc.
8. Tune in signal on receiver and adjust rf trimmer C2 for maximum reading on output meter. Feed only enough signal from the generator to keep maximum reading on lower half of meter scale.
9. Recheck at 600 Kc, 1000 Kc and 1410 Kc for tracking and readjust as required.

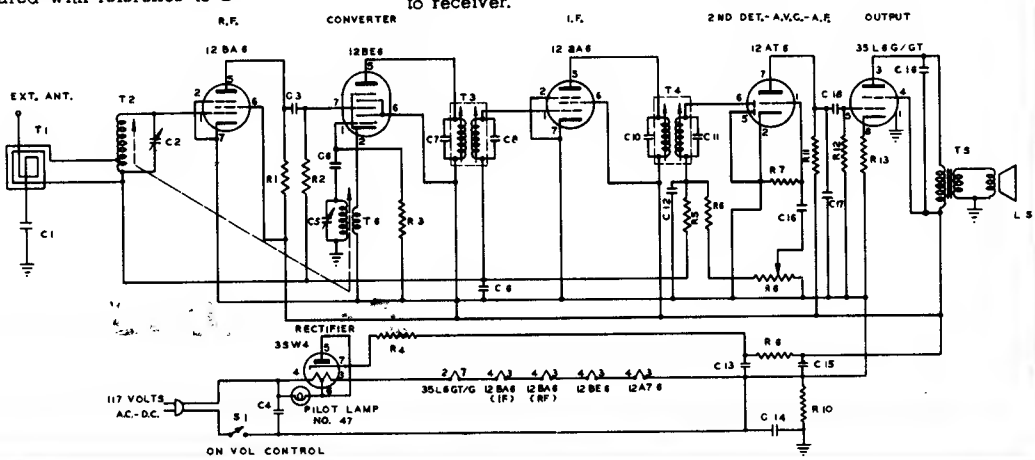


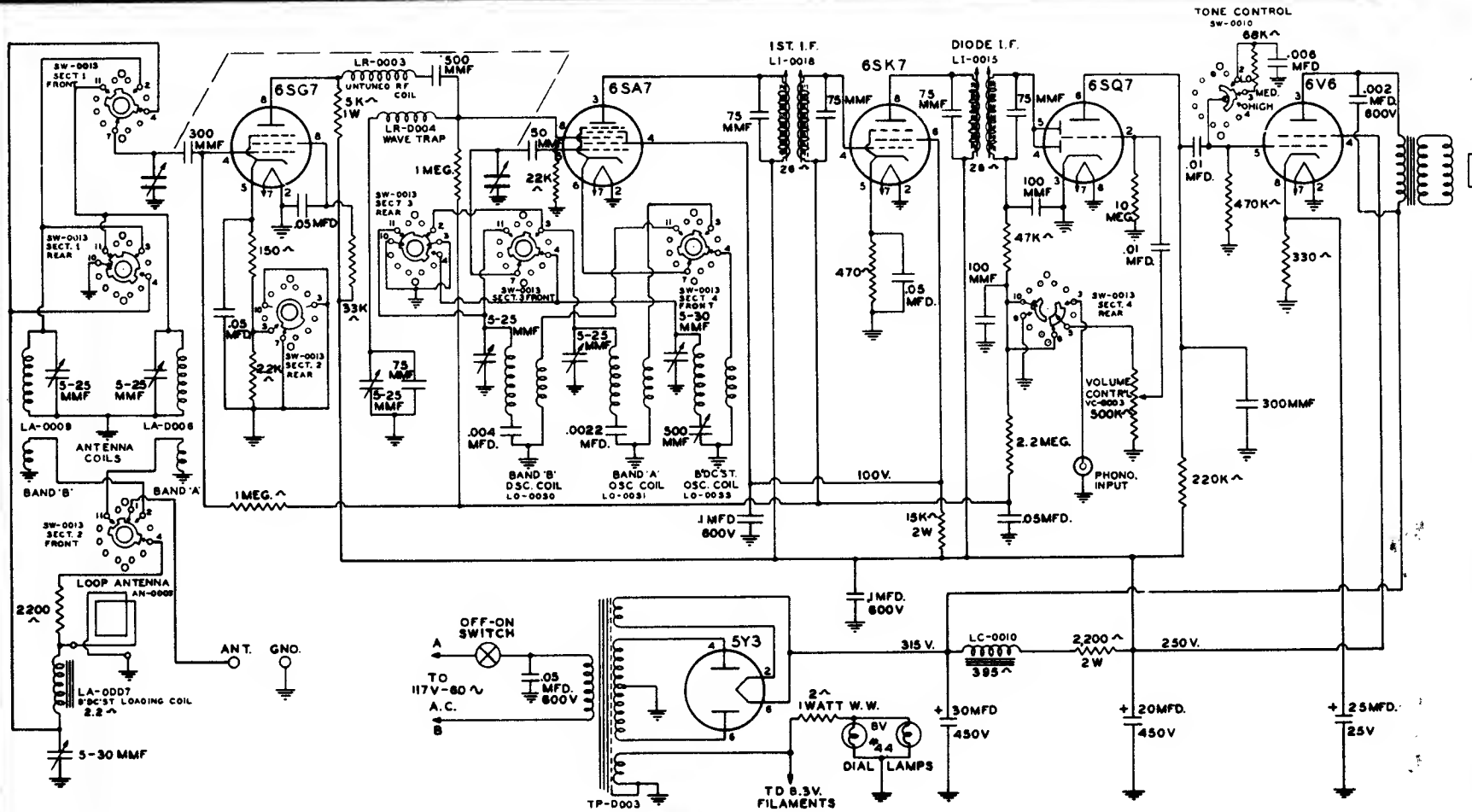
PIN NO.	1	2	3	4	5	6	7	8
12BA6(R.F.)	— .45	0.	25. A.C.	37.5 A.C.	+65.	+80.	0.	
12BE6	4.6*	0.	12.5 A.C.	25. A.C.	+80.	+80.	0.	
12BA6 (I.F.)	— .45	0.	37.5 A.C.	50. A.C.	+80.	+80.	0.	
12AT6	—1.5*	0.	0.	12.5 A.C.	0.	—15.	+37.5	
35L6	0.	85 A.C.	+75 D.C.	+80. D.C.	0.	0.	50. A.C.	+4.6
35W4	115 A.C.	0.	85. A.C.	115. A.C.	110. A.C.	110. A.C.	+110. D.C.	

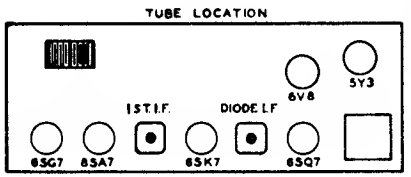
D.C. voltages measured with 1000 ohm/volt meter
A.C. voltages measures with 1000 ohm/volt meter
All voltages measured with reference to B-

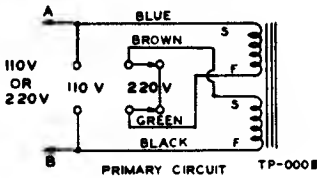
* These readings taken with V. T.V .M.

NOTE: The above readings are obtained with no signal input to receiver.









NOTES—

1. BAND SWITCH, SW-0013, SHOWN IN BROADCAST POSITION.
2. FRONT AND REAR SECTIONS OF SWITCH SHOWN VIEWED FROM KNOB END.
3. TONE CONTROL SWITCH, SW-0010, SHOWN VIEWED FROM KNOB END.
4. BAND SWITCH POSITIONS—
   1. PHONOGRAPH.
   2. RADIO BROADCAST BAND.
   3. RADIO SHORT WAVE BAND 'A' 2 1/2-7 MC.
   4. RADIO SHORT WAVE BAND 'B' 7-22 MC.
5. PRIMARY LEADS 'A' AND 'B' CONNECT TO 'A' AND 'B' ON PRIMARY CIRCUIT FOR UNIVERSAL 110-220 VOLT OPERATION.

HOWARD RADIO COMPANY

Model 906-S

See Page 76 for Alignment

Howard Radio Company. Model 906-S. See page 75 for Schematic.

Voltage reading taken from ground with voltage at line set at 117 volts A.C. These readings were taken with a vacuum tube voltmeter of the VoltOhmyst Junior type.

TUBE	FUNCTION	CATH.	*	SC.	*	PLATE	*	B	*
6SG7	R.F	7.2	5 3	200.	6	210.	8		
6SA7	Convertor			-10. 85.	5 4	225.	3		
6SK7	1st. I.F.	3.	5	90.	6	230.	8		
6SQ7	Det. & 1st. Audio.					110.	6		
6V6	Output.	13.	8	230.	4	280.	3		
5Y3	Rectifier							290.	8
Voltage drop across filter choke 10 volts									

* Socket Terminal Number.

	DUMMY ANTENNA	SIG. GEN. CONNECTION	GEN. FREQ.	BAND POSITION	DIAL SETTING	ORDER OF TRIMMER ADJUSTMENTS	TRIMMER FUNCTION	SEE NOTE
1	.05 Mfd.	Grid of 6SA7	455 KC	BC	Off Station	①②③④	I.F. Peak to Maximum	A
2	.05 Mfd.	Ant.	455 KC	BC	Off Station	⑤	Null	B
3	400 Ohm. Line	"A" Ant. Post	600 KC	BC	600 KC	⑦	Maximum	C
4	400 Ohm. Line	"A" Ant. Post	1400 KC	BC	1400 KC	⑥⑧	BC Osc. and R.F.	D
5	Repeat operations 3 and 4							E
6	400 Ohm. Line	"A" Ant. Post	6 MC	A	6 MC	⑨⑩	Maximum	F
7	400 Ohm. Line	"A" Ant. Post	20 MC	B	20 MC	⑪⑫	Maximum	G
8	Accurately set signal generator at one MC and check through both short wave dials, harmonics to be one MC apart.							

NOTE A. The I.F. adjustments are iron core slug tuning and it should not be necessary to move them very far in either direction from the factory setting, since they are of a very stable nature.

NOTE B. Important. Connect the signal generator to the antenna screw on the outside of the radio chassis and keep the metal of the chassis between the generator lead and the wave trap coil. Use your signal generator to the desired turned up powerful position and adjust the wave trap trimmer to null.

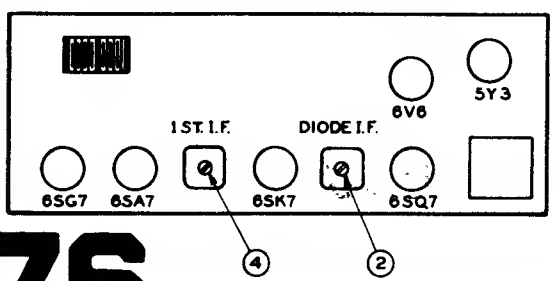
NOTE C. Padding condenser adjustment for calibration at low frequency end of broadcast band.

NOTE D. Set dial at 1400 KC. Adjust oscillator and R.F. trimmer for maximum sensitivity.

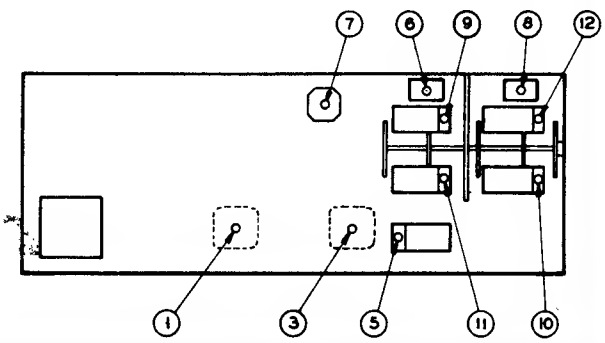
NOTE E. Check broadcast stations across dial for accuracy.

NOTE F. True Signal at 6. Image at 5.

NOTE G. True signal at 20. Image at 19.



TOP VIEW



BOTTOM VIEW

HOWARD RADIO COMPANY

Model 909-M

Continued on page 78.

	DUMMY ANTENNA	SIG. GEN. CONNECTION	GEN. FREQ.	BAND POSITION	DIAL SETTING	ORDER OF TRIMMER ADJUSTMENTS	TRIMMER FUNCTION	SEE NOTE
1	.05 Mfd.	Grid of 6SA7	455 KC	BC	Low end of BC	1,2,3,4	I.F.	A
2	.05 Mfd.	Pin #4 6SK7	1400 KC	BC	1400 KC	5,6	BC Osc. and R.F.	
3	Note B	Note B	1400 KC	BC	1400 KC	7	Loop	B
4	400 Ohm. Line	Antenna on loop	11.9 MC	SW	11.9 MC	8,9,10	SW	C
5	Accurately set signal generator at one MC and check through short wave dial, harmonics to be one MC apart.							

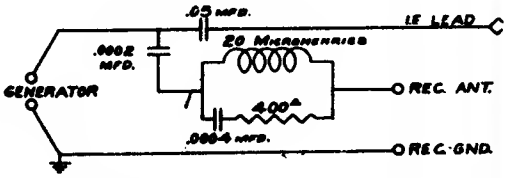
NOTE A. The I.F. adjustments are iron core slug tuning and it should not be necessary to move them very far in either direction from the factory setting, since they are of a very stable nature.

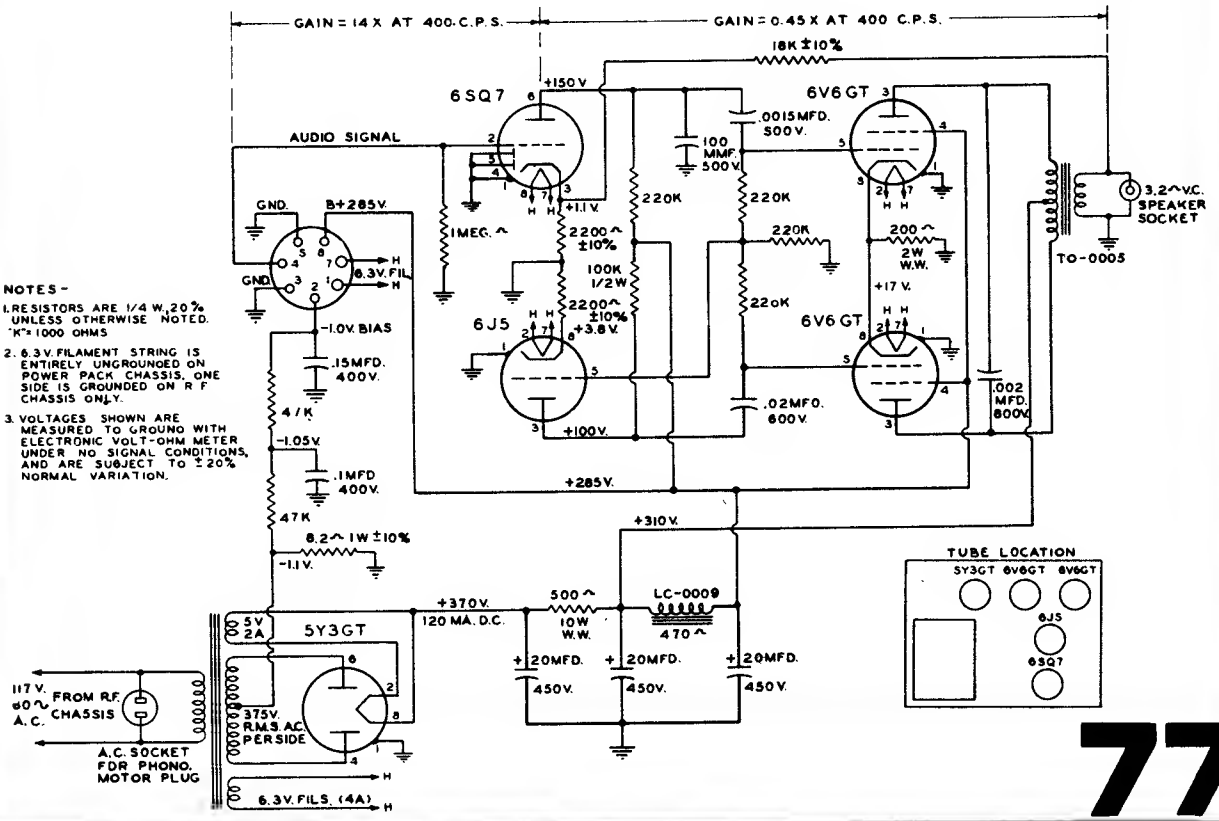
NOTE B. Inductively couple signal generator to loop by wrapping one or two turns of wire around outside wire of loop and fasten one end to the high side of the signal generator.

NOTE C. In adjusting trimmer #8, be sure the image of the I.F. is at approximately 11.MC.

CAUTION: Do not knife gang unless absolutely necessary, and then with extreme care.

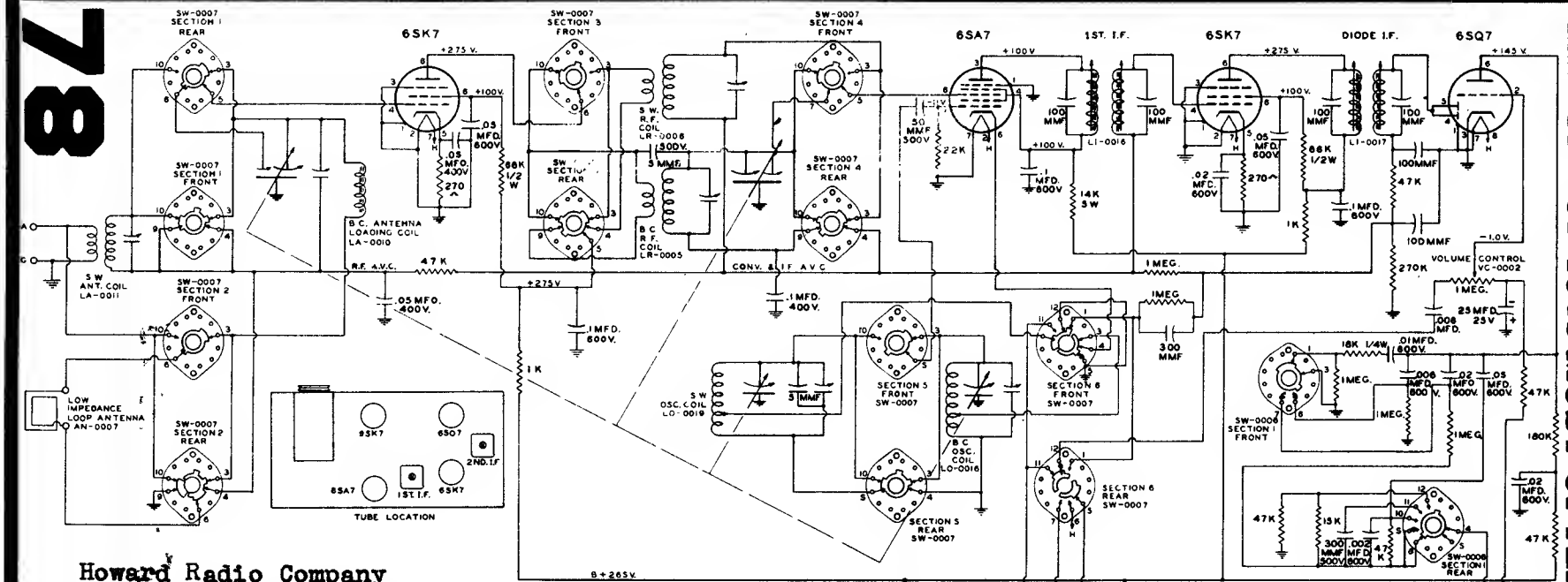
RECOMMENDED DUMMY ANTENNA. Although the values as shown in above table for antenna load may be satisfactory, we urgently recommend the circuit as shown at the right to properly take care of the various frequencies to accomplish the correct alignment.





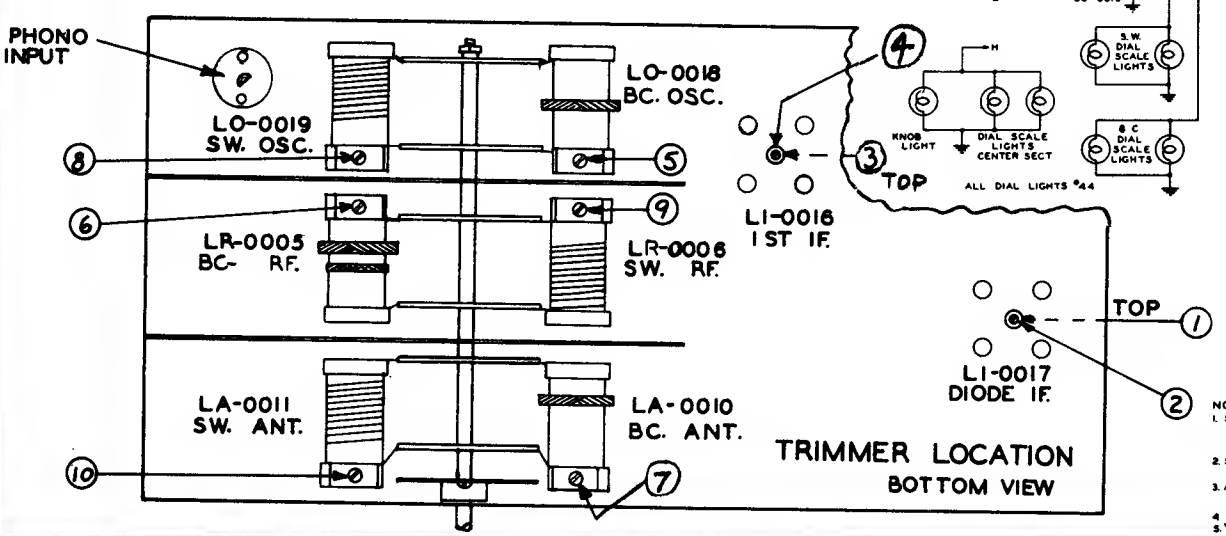
NOTES -

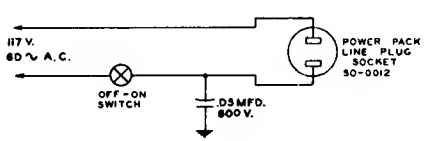
1. RESISTORS ARE 1/4 W, 20% UNLESS OTHERWISE NOTED. "K" = 1000 OHMS
2. 6.3 V. FILAMENT STRING IS ENTIRELY UNGROUNDED ON POWER PACK CHASSIS, ONE SIDE IS GROUNDED ON R F CHASSIS ONLY.
3. VOLTAGES SHOWN ARE MEASURED TO GROUND WITH ELECTRONIC VOLT-OHM METER UNDER NO SIGNAL CONDITIONS, AND ARE SUBJECT TO ±20% NORMAL VARIATION.



Howard Radio Company

Model 909-M, continued from page 77.



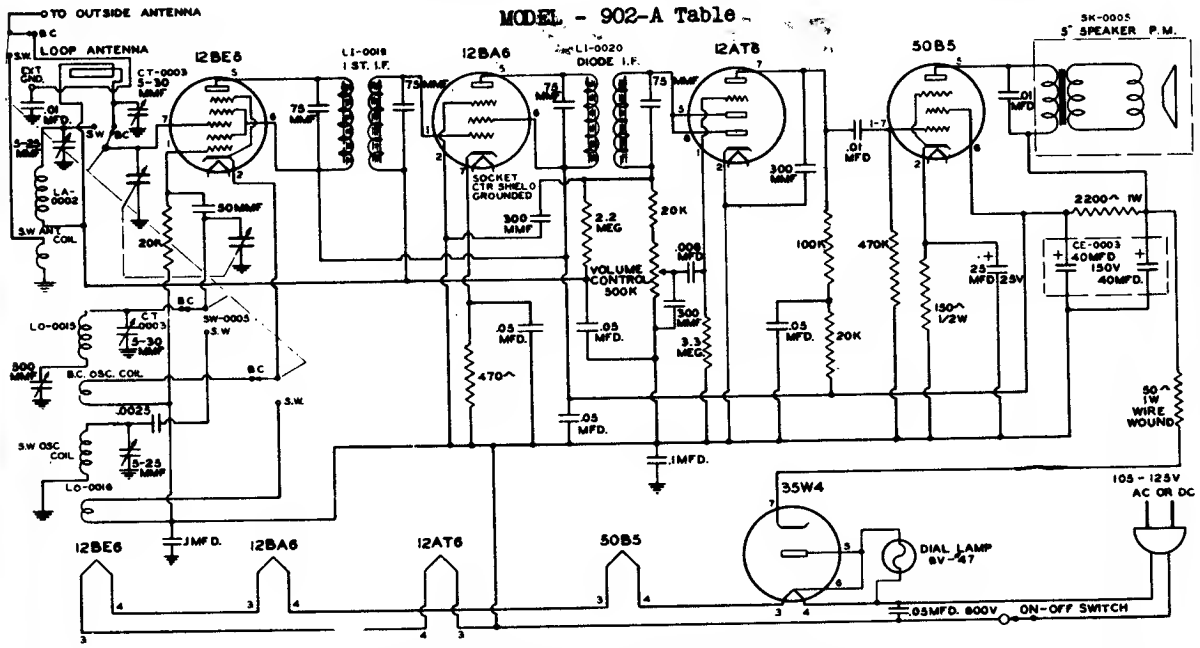


NOTES -

1. SW-0007, SIX SECTION- THREE POSITION BAND SWITCH SHOWN IN POSITION #1.
   NO. 1 POSITION IS PHONO
   2 POSITION IS RADIO BROADCAST.
   3 POSITION IS RADIO SHORT WAVE.
2. SW-0006 ONE SECTION-FIVE POSITION TONE SWITCH SHOWN IN "FULL" POSITION
3. ALL SWITCH SECTIONS SHOWN IN COUNTER-CLOCKWISE POSITION AS VIEWED FROM KNOB END OF SHAFT.
4. RESISTORS ARE ±20% - 1/4W. UNLESS OTHERWISE SPECIFIED.
5. 'K' = 1000 OHMS

HOWARD RADIO COMPANY

MODEL - 902-A Table -

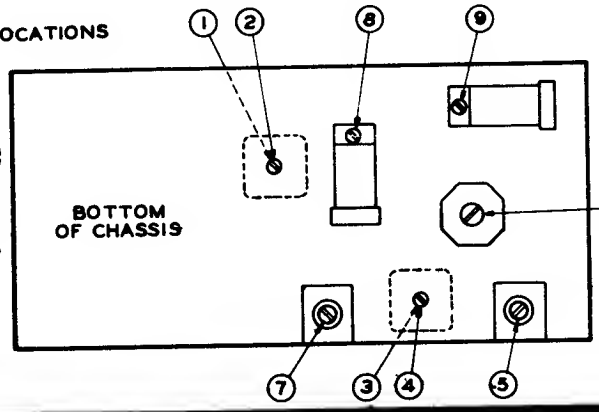


VOLTAGE AND ALIGNMENT CHARTS

TUBE	FUNCTION	CATH.	SCR. GRID	PLATE	TUBE	FUNCTION	CATH.	SCR. GRID	PLATE
12BE6	Mixer	0	79	79	12AT6	Det.	0	--	56
12BA6	I.F. Det.	2	79	79	50B5	Output.	4.6	79	110

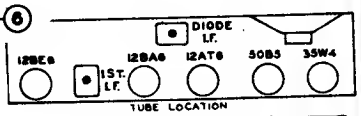
	DUMMY ANTENNA	SIG. GEN. CONNECTION	GEN FREQ.	BAND POSITION	DIAL SETTING	ORDER OF TRIMMER ADJUSTMENTS	TRIMMER FUNCTION
1	.05 MFD.	Grid of 12BE6	445 KC	BC	Off Station	1 2 3 4	I.F. Peak to Max. Output
2	400 Ohm Resistor	Ant.	1400 KC	BC	1400 KC	5 7	BC Osc. and R.F.
3	400 Ohm Resistor	Ant.	600 KC	BC	600 KC	6	BC Osc., Pad.
4	400 Ohm Resistor	Ant.	16 MC	SW	16 MC	9, 8	SW Osc. and R.F.

TRIMMER LOCATIONS



BROADCAST BAND 535 - 1650KC
SHORT WAVE BAND 6 - 19MEGACYCLES
I.F. 455KC

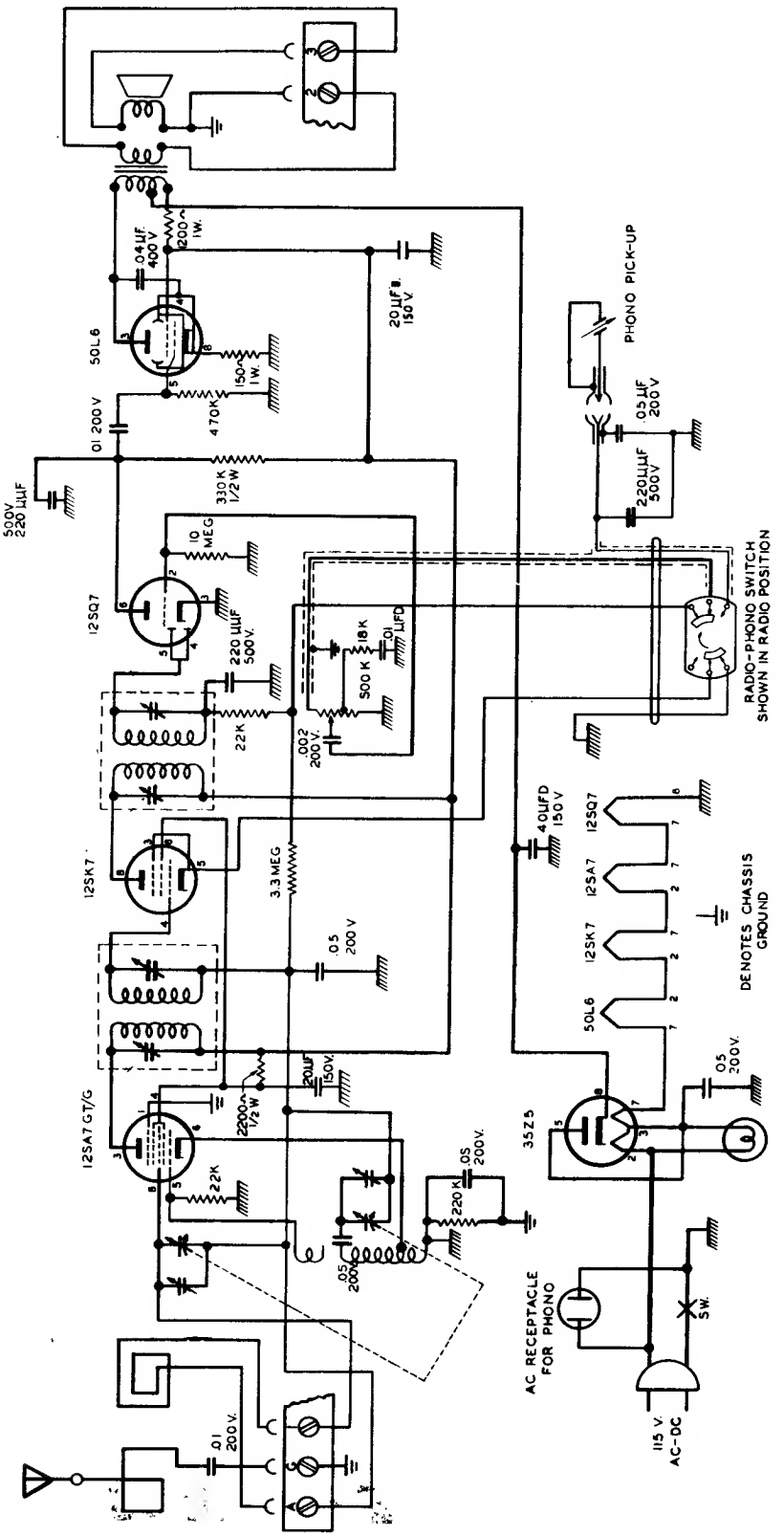
NOTE -
ALL COND. ARE 400V. UNLESS OTHERWISE NOTED.
ALL RESISTORS ARE 1/4 W UNLESS OTHERWISE NOTED.
BAND SWITCH, SW-0005, SHOWN IN BROADCAST POSITION

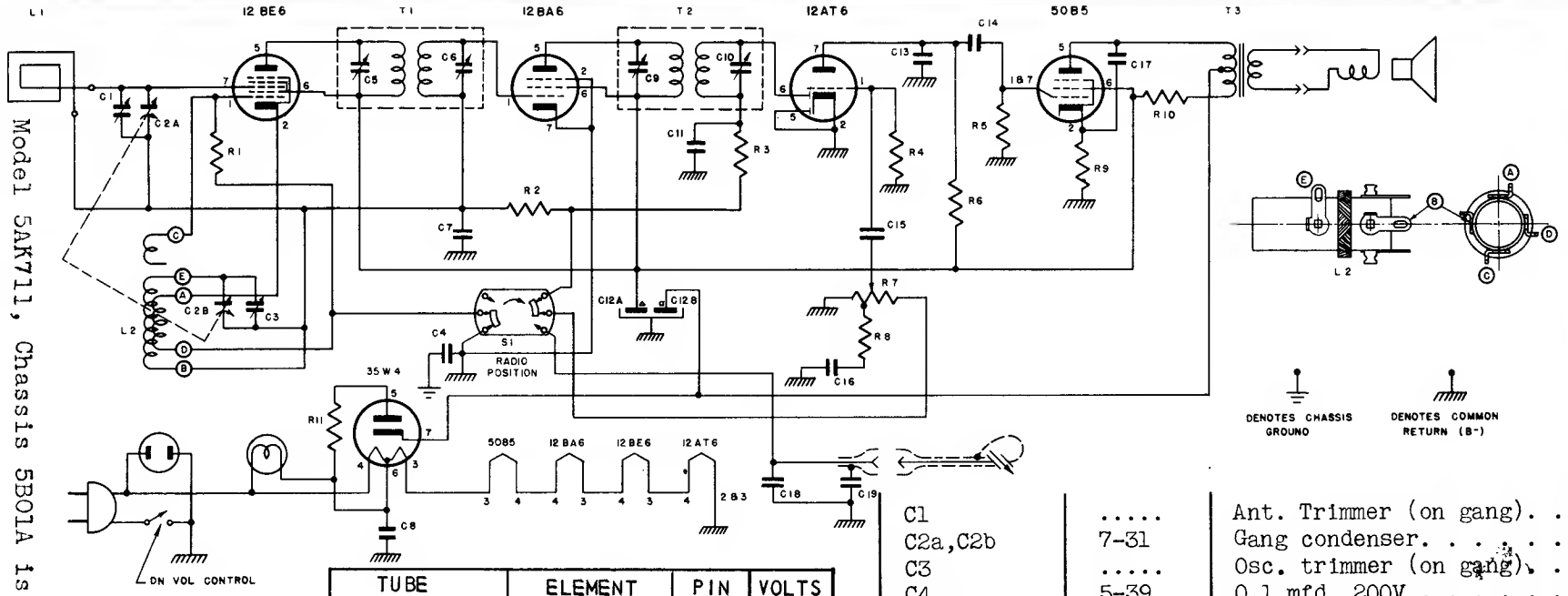


For Model 906-C See Page 63 in Volume 7, 1947 Diagram Manual.

MODELS 5A445, 5A445R
CHASSIS 4506

Majestic





Model 5AK711, Chassis 5B01A is similar, but less phono.

See page 82 for alignment

Majestic

MODELS 5AK731-5AK780
CHASSIS 5B05A

TUBE	ELEMENT	PIN	VOLTS
12BE6 Converter	Plate	5	88
	Screen Grid	6	88
	Grid	7	0.6
12BA6 I.F. Amp.	Plate	5	88
	Screen Grid	6	88
	Grid	1	-0.6
12AT6 2nd Det., AVC	Plate	7	38
	Grid	1	-0.6
50B5 Output	Plate	5	107
	Screen Grid	6	88
	Cathode	2	4.9
	Grid	1 & 7	0
35W4 Rectifier	Plate	5	117AC
	Cathode	7	115

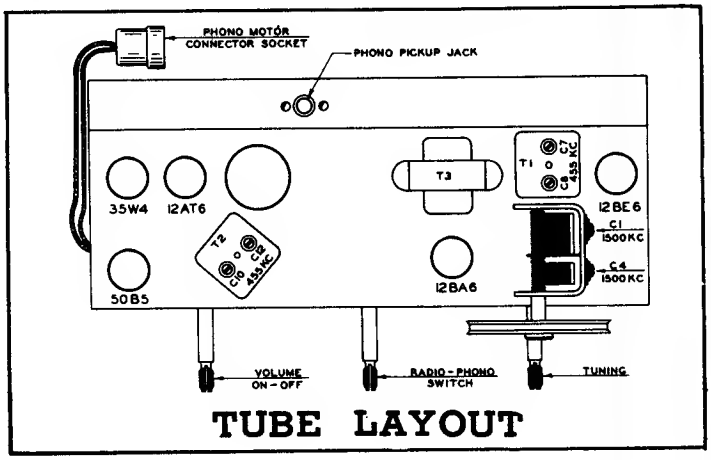
NOTE: All voltages measured with a vacuum tube voltmeter to B--. A full line voltage of 117 V.A.C., volume control at minimum

C1	.....	Ant. Trimmer (on gang). .
C2a,C2b	7-31	Gang condenser. . . . .
C3	.....	Osc. trimmer (on gang). .
C4	5-39	0.1 mfd. 200V . . . . .
C5,C6	.....	On 1st I.F. Transformer .
C7,C8,C19	5-40	.05 mfd. 200V . . . . .
C9,C10	.....	On 2nd I.F. Transformer .
C11,C13,C18	6-151	220 mmf. 500V mica. . . .
C12a,C12b	19-25	20 mfd. 40 mfd. 150V Elec
C14,C16	5-57	.01 mfd. 200V . . . . .
C15	5-52	.002 mfd. 200V. . . . .
C17	5-58	.04 mfd. 400V . . . . .
R1,R3	01-143	22K ohm, 1/4 watt . . . .
R2	01-234	3.3 megohm, 1/4 watt. . .
R4	01-255	10 megohm, 1/4 watt . . .
R5	01-199	470K ohm, 1/4 watt. . . .
R6	02-192	330K ohm, 1/2 watt. . . .
R7	13-28	500K ohm volume control .
R8	01-139	18K ohm, 1/4 watt . . . .
R9	03-52	150 ohm, 1 watt . . . . .
R10	03-90	1200 ohm, 1 watt. . . . .
R11	01-20	27 ohm, 1/4 watt. . . . .
L1	S-1354	Loop Assembly . . . . .
L2	S-1374	Oscillator coil . . . . .

Majestic

Models 5AK731, 5AK780

Chassis 5B05A



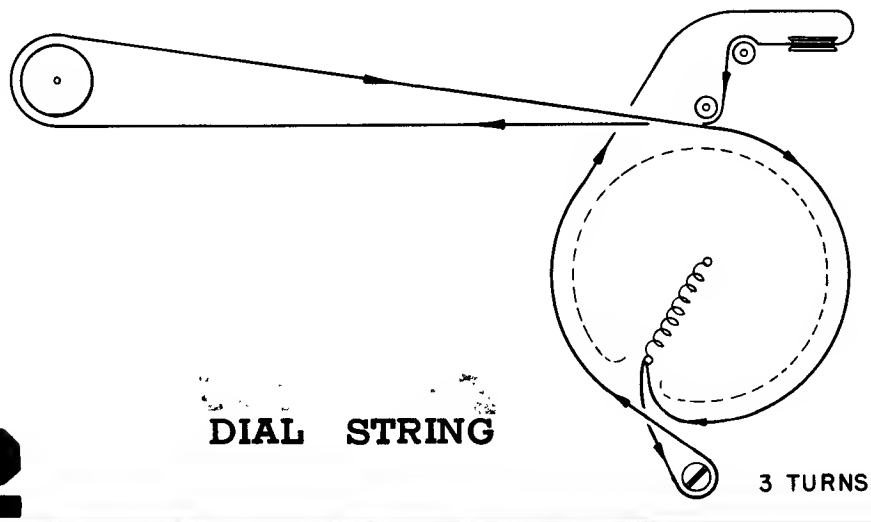
TUBE LAYOUT

ALIGNMENT

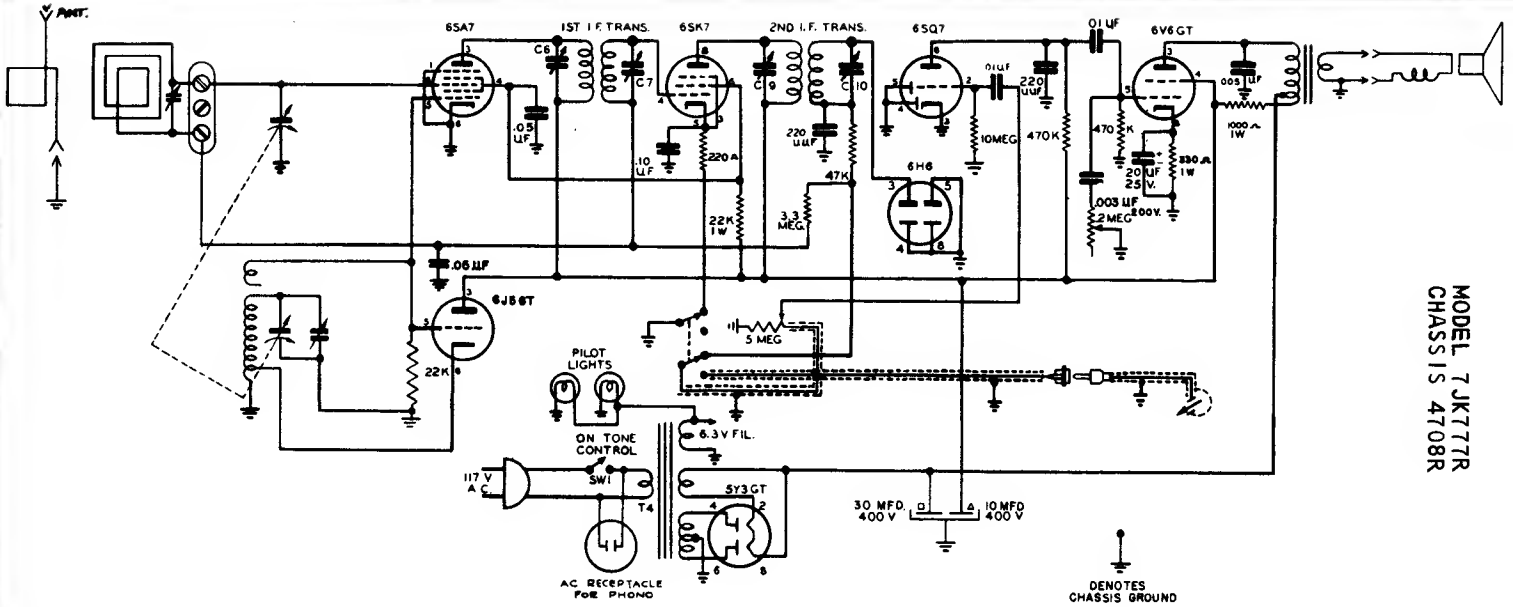
Before aligning, set the dial pointer as follows: Close the tuning gang condenser (plates fully closed). Set the dial pointer so that it is in line with the last mark at the low frequency end of the dial scale.

While aligning this receiver, turn the volume control full on, and keep the signal generator output as low as possible to prevent AVC action and false readings.

OPERATION	CONNECT OSC. TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	SET DIAL TO	ADJ. TRIMMERS	PURPOSE
1	Pin 7 on converter tube 12BE6 socket	.05mfd	455KC Modulated	600KC	C5,C6,C9 and C10	Align I.F. channel for maximum output
2	2 turns loosly cpld. to loop ant.	------	1500KC Modulated	1500KC	C3	Set oscillator to dial scale
3	2 turns loosly cpld. to loop ant.	------	1500KC Modulated	1500KC	C1	Align ant. for maximum output

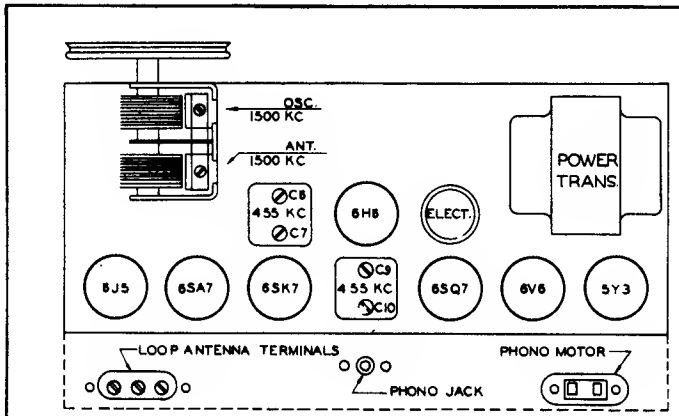


DIAL STRING



MODEL 7JK77R
CHASSIS 4708R

Majestic



TUBE LAYOUT

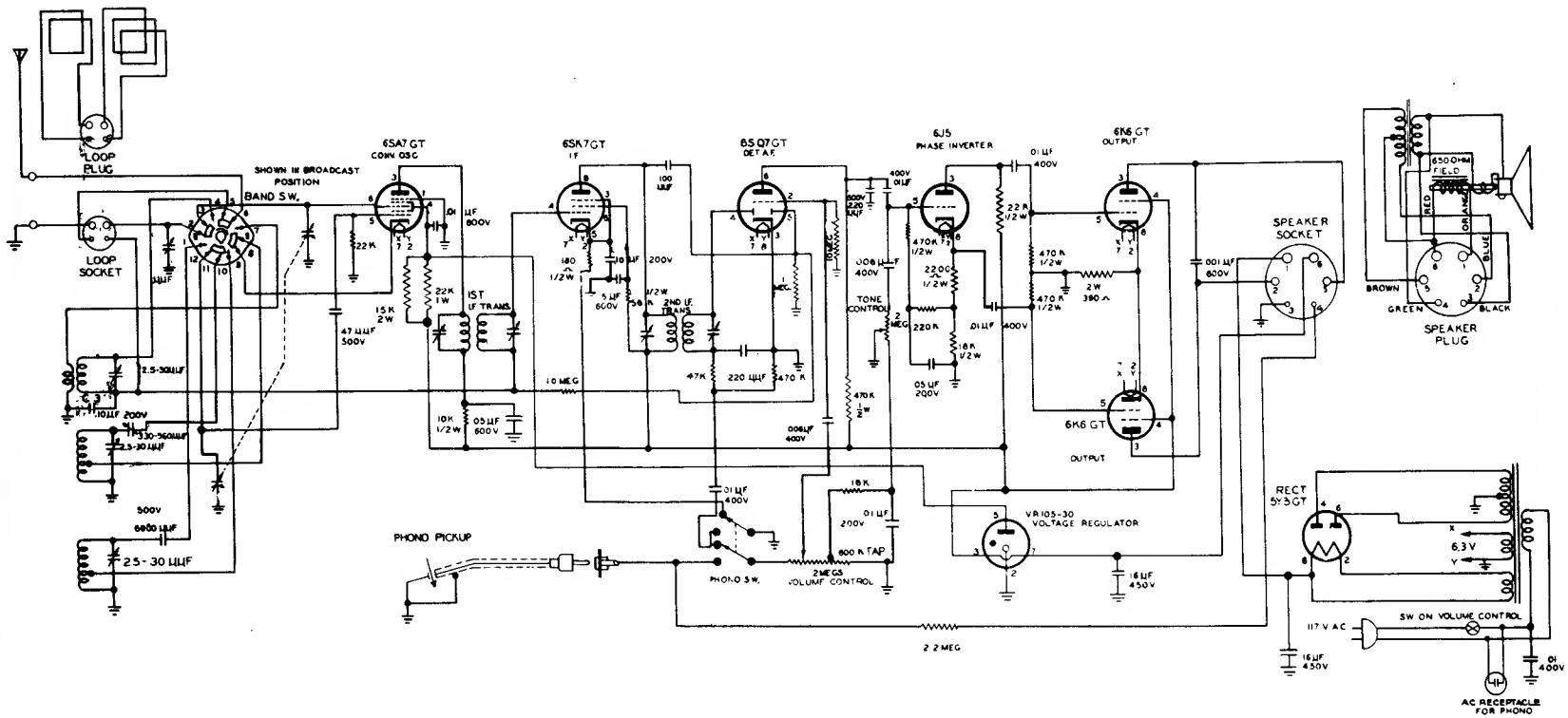
VOLTAGE TABLE

TUBE	PLATE	SCREEN	CATHODE
6SA7 (Conv.)	244	74	---
6J5 (Osc.)	244	---	---
6SK7 (I.F.)	244	74	1.6
6SQ7 (A.F.)	75	---	---
6V6 (Out)	268	243	7.5

NOTE: All voltages measured to ground with 1,000 ohm per volt meter; line 117 VAC values may vary 10 per cent.

Majestic

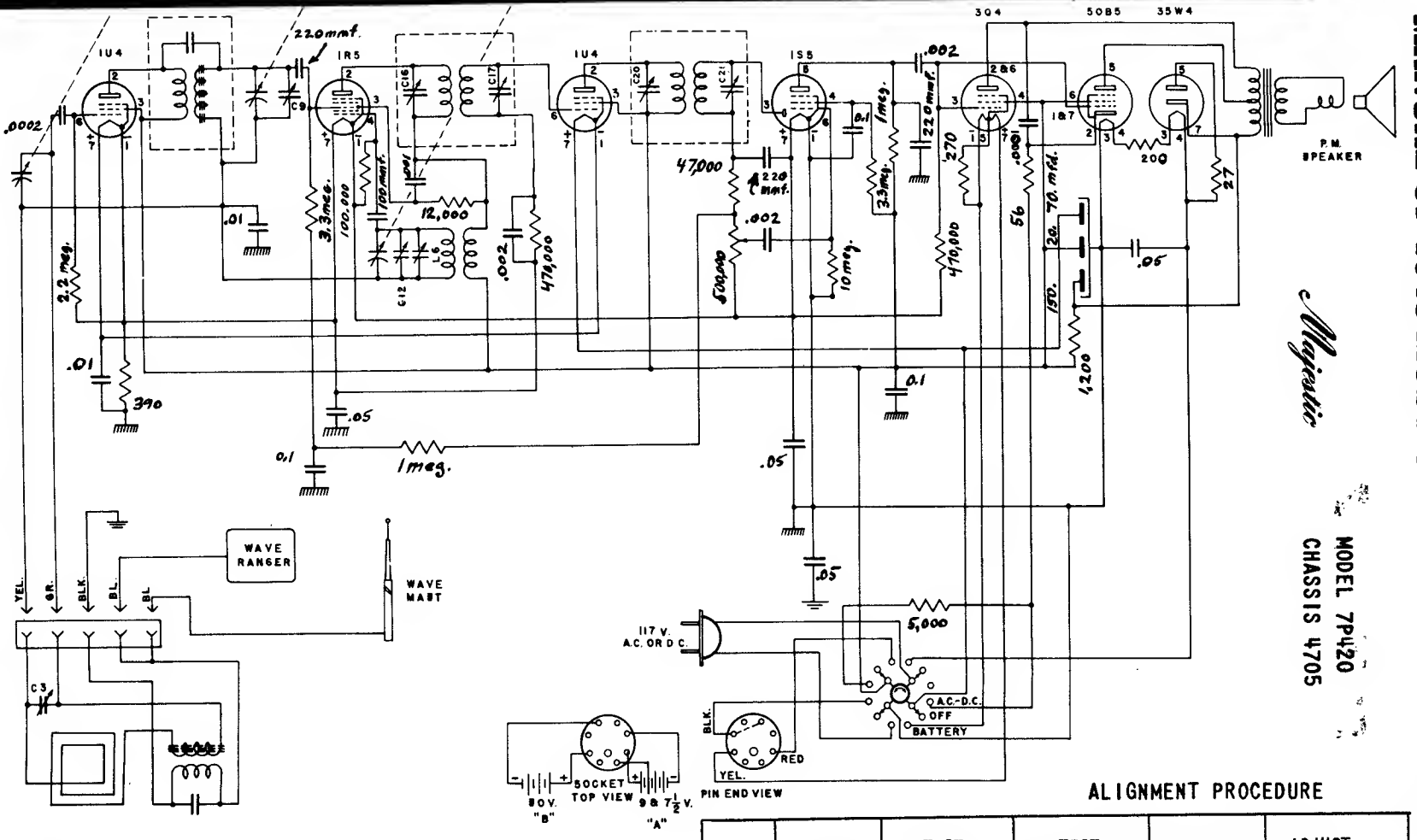
MODEL 8S473
CHASSIS 4810



I.F. 455 KC.

SCHEMATIC DIAGRAM - CHASSIS 4810

(LATE PRODUCTION - SERIAL NUMBERS HIGHER THAN A235000)



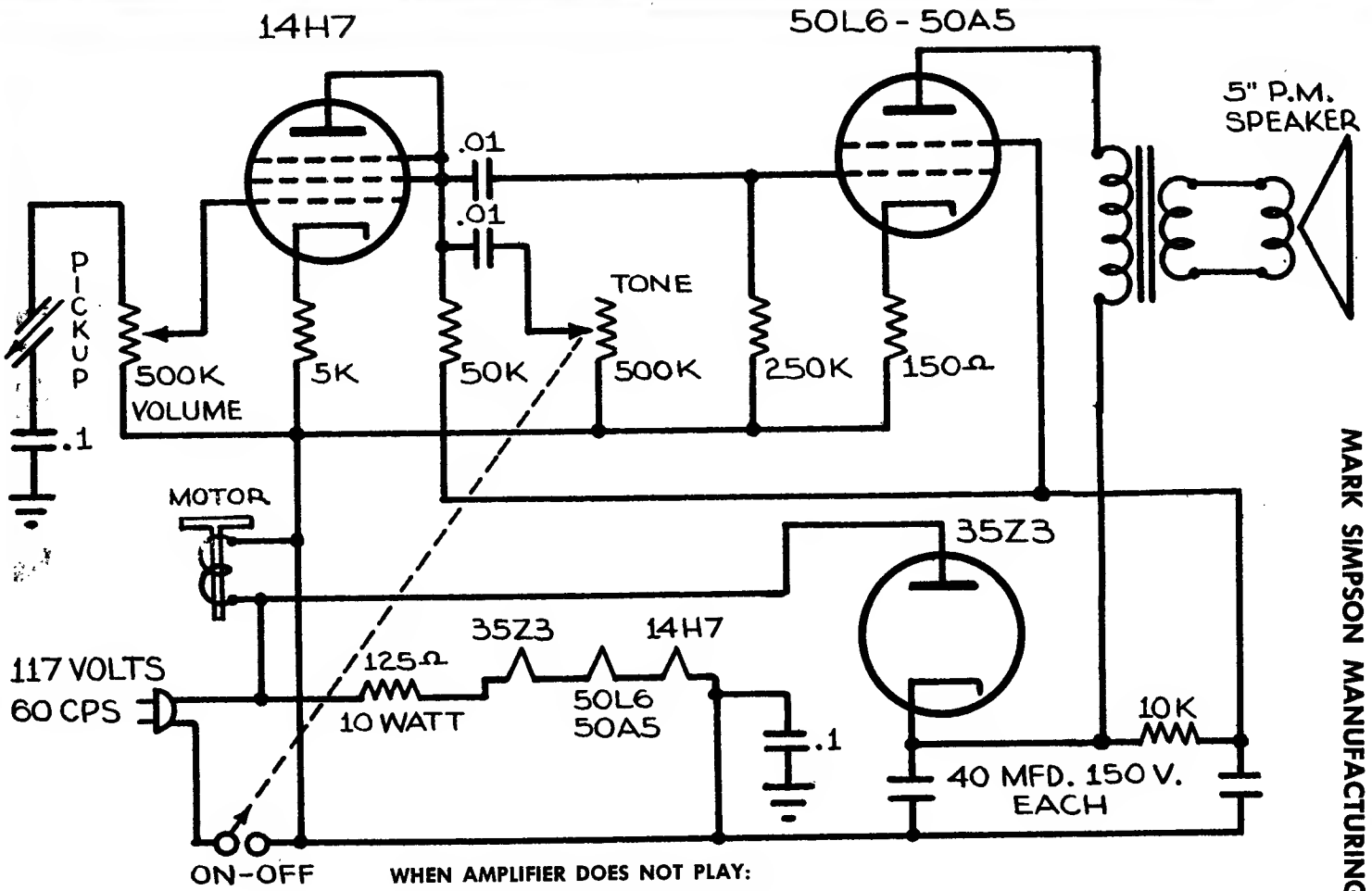
NOTE:-
ALL RESISTORS TO BE 20% ½ WATT, UNLESS OTHERWISE SPECIFIED.

DENOTES COMMON RETURN (B-)

DENOTES CHASSIS

ALIGNMENT PROCEDURE

STEP	DUMMY ANTENNA	TEST OSCILLATOR CONNECTION	TEST OSCILLATOR FREQUENCY	RECEIVER DIAL	ADJUST FOR MAXIMUM
1	.01 MFD.	1R5 GRID	455 KC	ANY QUIET SPOT	C16. C17 C20. C21
2	LOOP		1500 KC	150	C12. C9. C3



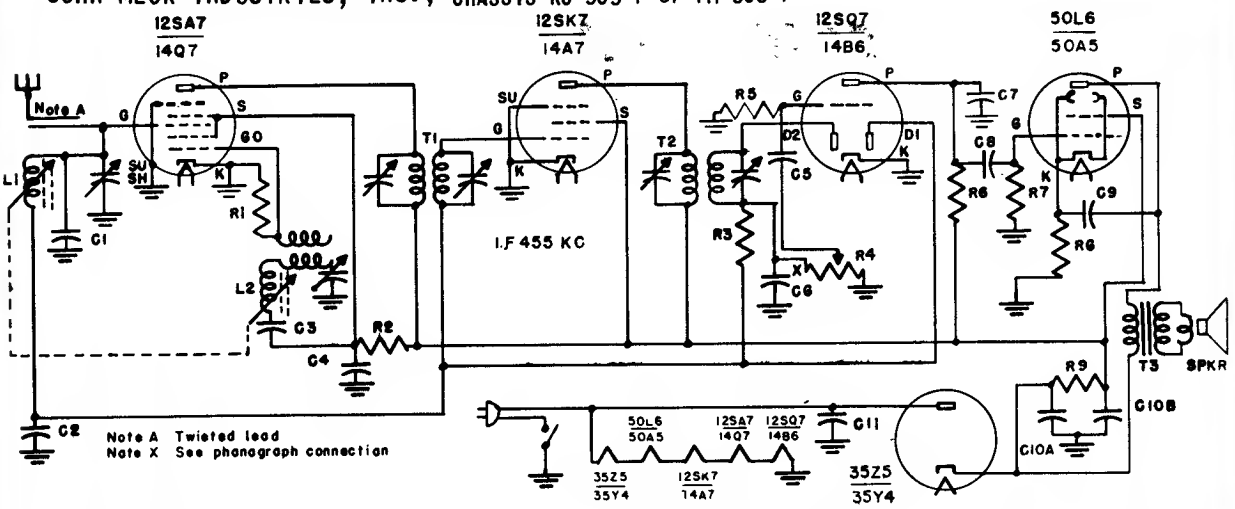
WHEN AMPLIFIER DOES NOT PLAY:

1. SEE THAT ALL TUBES ARE INSERTED IN CORRECT SOCKETS.
2. CHECK ALL CONNECTIONS.
3. CHECK FILTER CONDENSER FOR OPEN OR SHORT.
4. CHECK LINE CORD FOR OPEN CIRCUIT.
5. TEST 125 OHM 10 WATT WIRE WOUND RESISTOR FOR OPEN CIRCUIT.

NOTE: WHEN 35A5 IS USED, 125 OHM 10 WATT RESISTOR IS REPLACED BY 200 OHM 10 WATT RESISTOR.

WHEN ASTATIC RL-267 PICKUP IS USED A .1 MFD. CONDENSER IS CONECTED ACROSS THE 14H7 CATHODE RESISTOR.

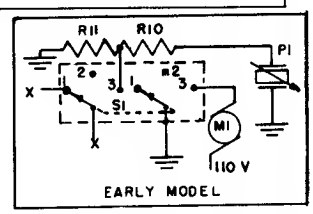
JOHN MECK INDUSTRIES, Inc., CHASSIS RC-5C5-P or PM-5C5-P

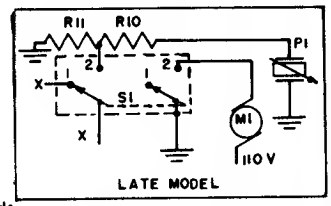


Circuit Symbol	Part Number	Description
C1	CM-15250	Condenser-Mica, 25 mmf., 500 volt
C2,C9,C11	CP-145031	Condenser-Paper, 0.05 mfd., 400 volt
C3,C5,C8	CP-14103	Condenser-Paper, 0.01 mfd., 400 volt
C4	CM-15301	Condenser-Mica, 300 mmf., 500 volt
C6,C7	CM-15251	Condenser-Mica, 250 mmf., 500 volt
C10A,C10B	CL-10001	Condenser-Elect., 20/20 mfd., 150 volt
L1,L2	VP-10000	Tuner-Permeability, assembly
R1	RC-32002	Resistor-Carbon, 20,000 ohms, ½ watt
R2	RC-34001	Resistor-Carbon, 4000 ohms, ½ watt
R3	RC-32004	Resistor-Carbon, 2 megohms, ½ watt
R4	VC-10105	Control-Volume, 1 megohm with switch
R5	RC-31005	Resistor-Carbon, 10 megohms, ½ watt
R6	RC-32502	Resistor-Carbon, 250,000 ohms, ½ watt
R7	RC-35003	Resistor-Carbon, 500,000 ohms, ½ watt
R8	RC-31500	Resistor-Carbon, 150 ohms, ½ watt
R9	RC-31001	Resistor-Carbon, 1000 ohms, ½ watt
SPKR	SR-10000	Speaker-P.M. 4" round less T3
T1	TS-10000	Transformer-1st. I.F.
T2	TS-10001	Transformer-2nd. I.F.
T3	TO-10000	Transformer-Output
PHONOGRAPH MODEL		
M1	PRS-10000	Motor-Phono, with turntable
P1	PA-10000	Pickup-Crystal
R10	RC-31004	Resistor-Carbon, 1 megohm, ½ watt
R11	RC-37503	Resistor-Carbon, 750,000 ohms, ½ watt
S1	VS-10000	Switch-Radio,phono

VOLTAGE TABLE - Use high resistence voltmeter of 1000 ohms per volt

Type tube	1	2	3	4	5	6	7	8
12SA7	0	24AC	78	78	-7 to-12	0	12AC	-.65 to-1.2
12SK7	0	36AC	0	-.8 to-1.2	0	78	24AC	78
12SQ7	0	-.9 to-1.2	0	0	-.8 to-1.2	55	12AC	0
50L6	0	- -	95	78	0	--	36AC	4 to 5
35Z5	-	82	--	78	115 AC	100	115 AC	110
14Q7	24AC	78	78	-7 to-12	0	-.65 to-1.2	0	12AC
14A7	36AC	78	78	0	0	-.8 to-1.2	0	24AC
14B6	0	55	-.9 to-1.2	0	-.8 to-1.2	0	0	12AC
50A5	B2AC	95	78	--	---	0	4 to 5	36AC
35Y4	115AC	115AC	78	--	100	--	110	82AC





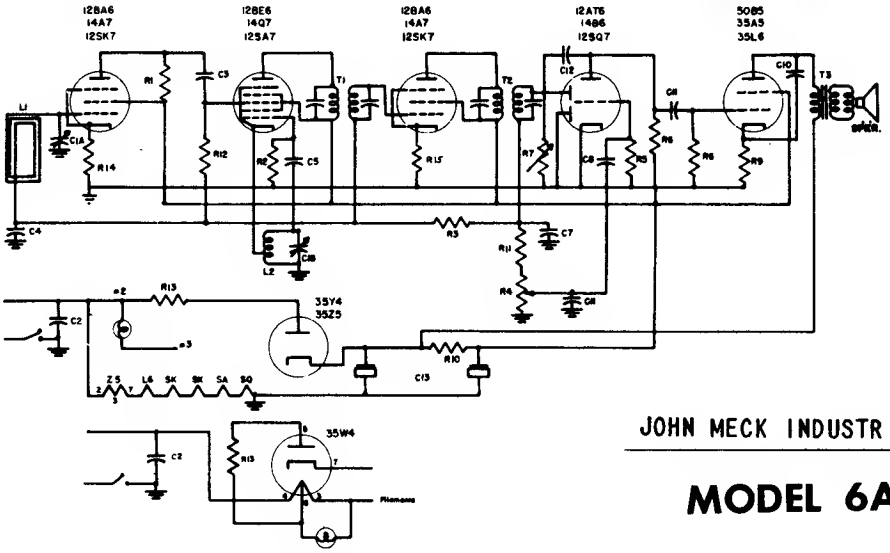
PHONOGRAPH CONNECTION

I.F. ALIGNMENT: The step-by-step routine given below should be carefully followed:

1. The signal generator must be set at 455 kilocycles.
2. Connect the output meter so that the output can be determined.
3. Connect the high side of the signal generator output to the antenna lead of the tuner, the white wire. The low side of the signal generator output lead is connected to the chassis through a 0.01 mfd. condenser.
4. Turn the volume control on full and turn the dial drive shaft so that the slugs of the tuner unit are all the way out against the stop.
5. Adjust the four I.F. trimmers, tuning each carefully to get the maximum deflection of the output meter. Reduce the signal generator output if the output meter goes off scale.
6. Repeat all four adjustments since the adjustment of each I.F. trimmer may effect the others to a certain extent.

OSCILLATOR and R.F. ALIGNMENT:

1. Connect the high side of the signal generator output to the insulation covering of the antenna wire and not the wire itself.
2. Set the signal generator to 1680 kilocycles with the slugs of the tuner all the way out against the stop. Adjust the oscillator trimmer, right hand trimmer screw, for maximum reading on the output meter.
3. Set the signal generator at 1120 kilocycles and turn the dial drive shaft until the 1120 kilocycle note is heard. Adjust the R.F. trimmer, left hand trimmer, for maximum reading on the output meter. Set the dial pointer on 1120 kilocycles on the dial scale. By aligning the R.F. section at 1120 kilocycles the overall alignment will be very good.

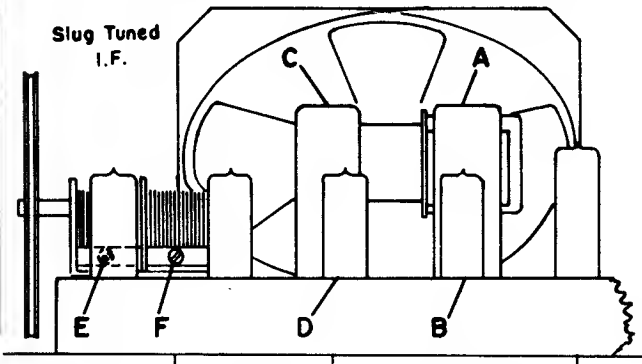


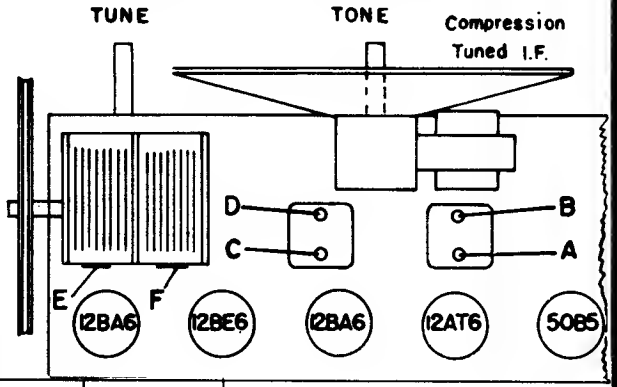
JOHN MECK INDUSTRIES, Inc.

MODEL 6A7

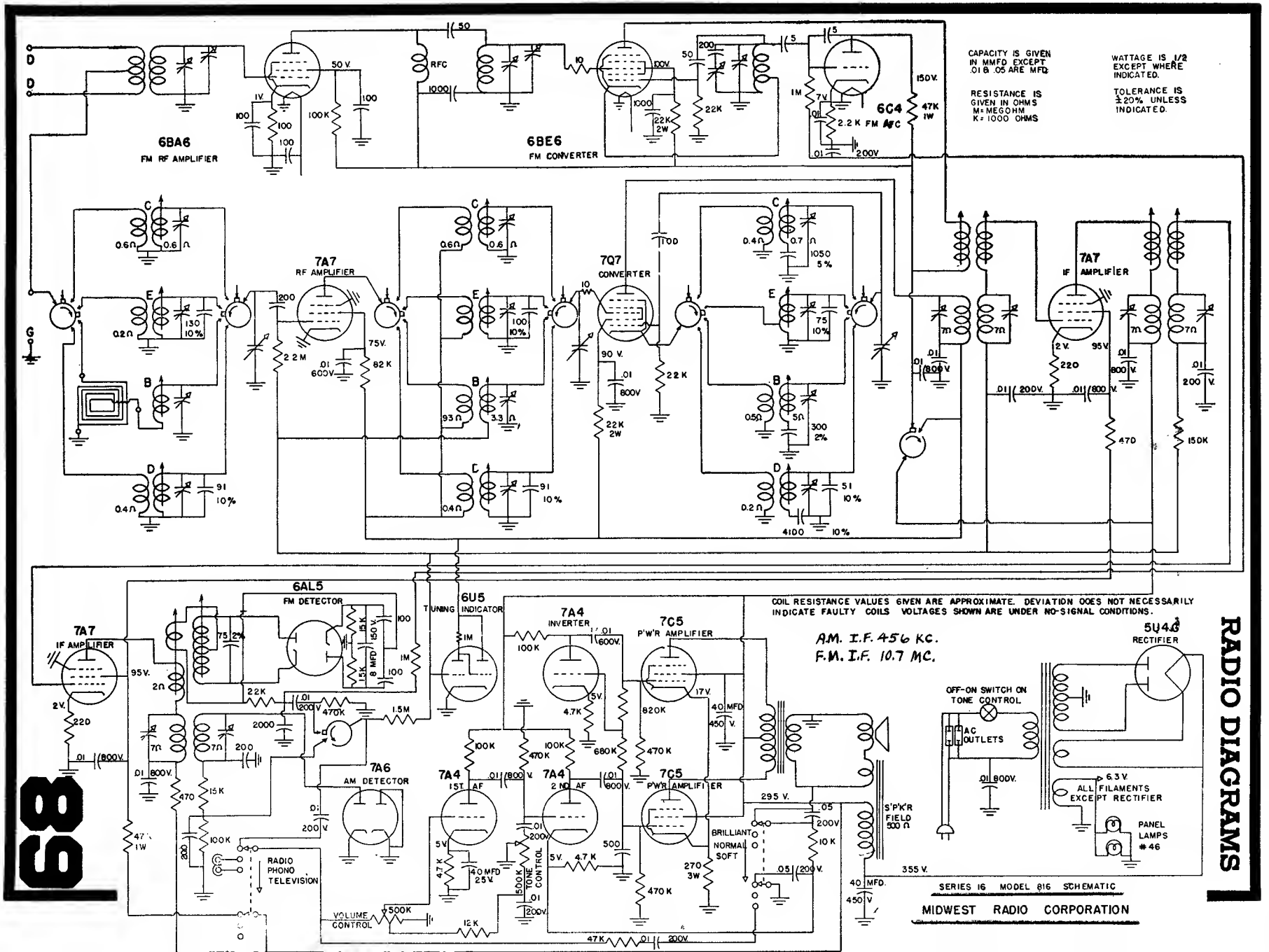
SYMBOL	PART NO.	DESCRIPTION
C1	CV-10009	Condenser, Variable with Pulley.
C2	CP-14503	Condenser, Paper .05 Mfd. 400 volts.
C3	CH-15250	Condenser, Mica 25 mmf. 500 volts.
C4	CP-12503	Condenser, Poper .05 Mfd. 200 volts.
C5	CH-15500	Condenser, Mica 50 mmf. 500 volts.
C6-C7	CH-15251	Condenser, Mica 250 mmf. 500 volts.
C8, C11	CP-14103	Condenser, Paper .01 mfd. 400 volts.
C10	CP-14203	Condenser, Paper .02 mfd. 400 volts.
C12	CP-14302	Condenser, Paper .003 mfd. 400 volts.
C13	CL-10007	Condenser, Electrol. 50/30 mfd. 150
L1	AL-10010	Loop Antenna.
L2	TRC-10000D	Coil, Oscillator
R1	RC-34701	Resistor, Carbon 4700 ohm ½ watt.
R2	RC-32202	Resistor, Corbon 22000 ohm ½ watt.
R3	RC-32204	Resistor, Carbon 2.2 megohm ½ watt.

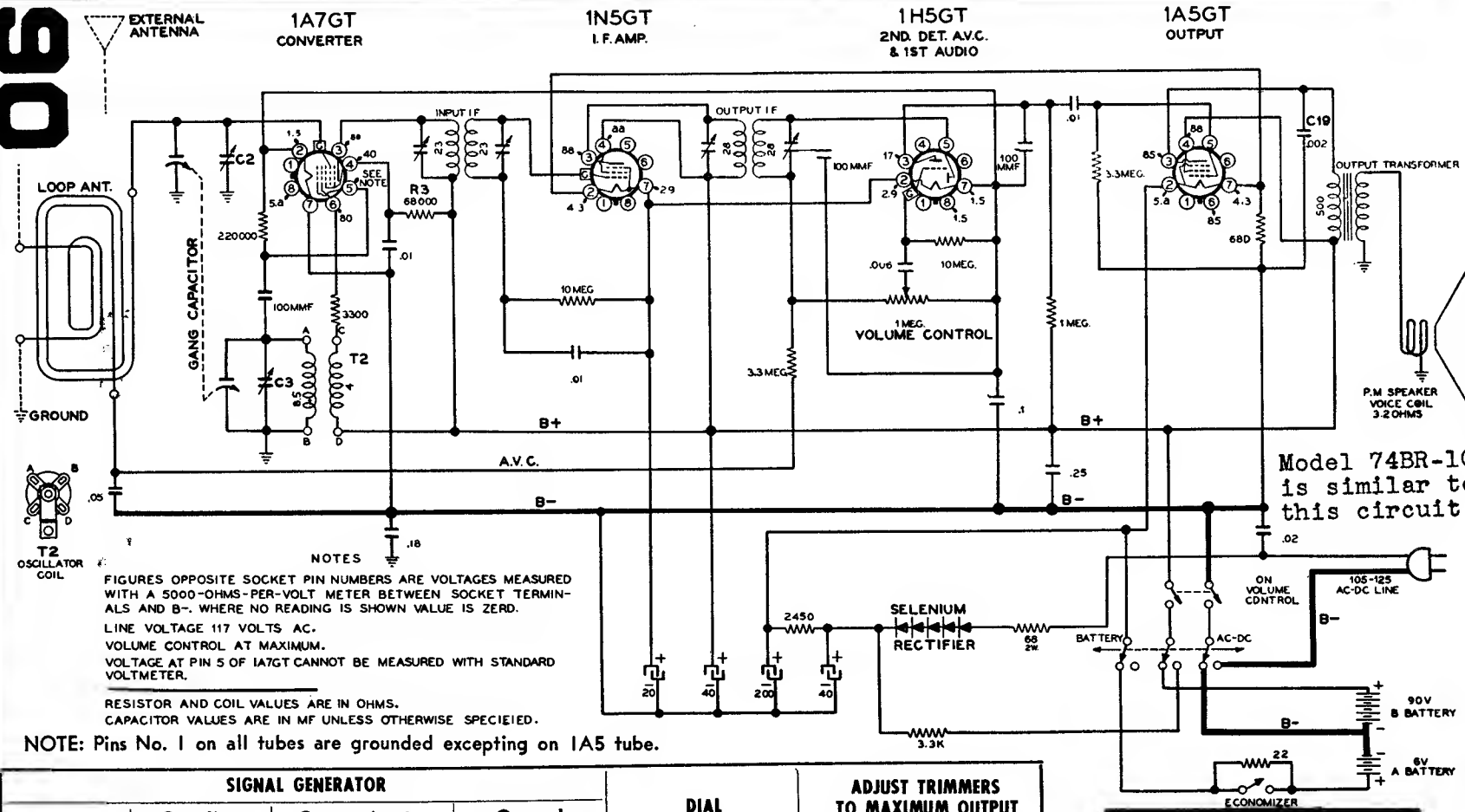
SYMBOL	PART NO.	DESCRIPTION
R4	VC-11105	Control, Volume 1 megohm with switch.
R5	RC-31005	Resistor, Carbon 10 megohm ½ watt.
R6	RC-32203	Resistor, Carbon 220,000 ohm ½ watt.
R7	VC-13105	Control, Tone 1 megohm.
R8, R12	RC-34703	Resistor, Carbon 470,000 ohm ½ watt.
R9, R14	RC-31500	Resistor, Carbon 150 ohm ½ watt.
R10	RC-41001	Resistor, Carbon 1000 ohm 1 watt.
R11	RC-31003	Resistor, Carbon 100,000 ohm ½ watt.
R13	RC-30220	Resistor, Carbon 22 ohm ½ watt.
R15	RC-33300	Resistor, Carbon 330 ohm ½ watt.
SPKR	SO-10002	Speoker, Ovol 4 x 6.
T1	TS-10000	Transformer, I. F. Input.
T2	TS-10001	Transformer, I. F. Output.
T3	TO-10000	Transformer, Output.





Signal Generatar Coupling	Signal Generator Frequency	Gang Condenser Position	Output Meter	Adjust	Remarks
High side of Mixer tube Grid (12BE6)	455 Kc	Stator Turned out to minimum Capacity position	Across Voice Coil	A, B, C, D	Adjust for maximum output. If isolation transformer is not used, reduce dummy ant. to .001 MFD. to reduce hum modulation.
Loop	1720 Kc	Stator Turned out to minimum Capacity position	Across Voice coil	E	Fashion loop from few turns of wire and radiate signal into set. Adjust for maximum output.
Loop	1500 Kc	Tune gang to resonance	Across Voice coil	F	Fashion loop from few turns of wire and radiate signal into set. Adjust for maximum output.


6BA6
FM RF AMPLIFIER
6BE6
FM CONVERTER
6C4
7A7
RF AMPLIFIER
7Q7
CONVERTER
7A7
IF AMPLIFIER
6AL5
FM DETECTOR
6U5
TUNING INDICATOR
7A7
IF AMPLIFIER
7A4
INVERTER
7C5
P'W'R AMPLIFIER
5U4G
RECTIFIER
7A6
AM DETECTOR
7A4
1ST AF
7A4
2ND AF
7C5
P'W'R AMPLIFIER
CAPACITY IS GIVEN IN MMFD EXCEPT .01 & .05 ARE MFD.
RESISTANCE IS GIVEN IN OHMS M=MEGOHM K=1000 OHMS
WATTAGE IS 1/2 EXCEPT WHERE INDICATED.
TOLERANCE IS ±20% UNLESS INDICATED.
COIL RESISTANCE VALUES GIVEN ARE APPROXIMATE. DEVIATION DOES NOT NECESSARILY INDICATE FAULTY COILS VOLTAGES SHOWN ARE UNDER NO-SIGNAL CONDITIONS.
A.M. I.F. 456 KC.
F.M. I.F. 10.7 MC.
OFF-ON SWITCH ON TONE CONTROL
AC OUTLETS
ALL FILAMENTS EXCEPT RECTIFIER
PANEL LAMPS #46
RADIO PHONO TELEVISION
VOLUME CONTROL
TONE CONTROL
BRILLIANT NORMAL SOFT
S'P'K'R FIELD 500 Ω
SERIES 16 MODEL 816 SCHEMATIC
MIDWEST RADIO CORPORATION
RADIO DIAGRAMS
89



Model 74BR-1055A is similar to this circuit.

NOTES

FIGURES OPPOSITE SOCKET PIN NUMBERS ARE VOLTAGES MEASURED WITH A 5000-OHMS-PER-VOLT METER BETWEEN SOCKET TERMINALS AND B-. WHERE NO READING IS SHOWN VALUE IS ZERO.

LINE VOLTAGE 117 VOLTS AC.

VOLUME CONTROL AT MAXIMUM.

VOLTAGE AT PIN 5 OF 1A7GT CANNOT BE MEASURED WITH STANDARD VOLTMETER.

RESISTOR AND COIL VALUES ARE IN OHMS.

CAPACITOR VALUES ARE IN MF UNLESS OTHERWISE SPECIFIED.

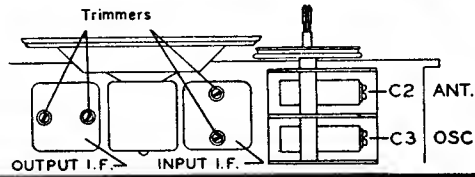
NOTE: Pins No. 1 on all tubes are grounded excepting on 1A5 tube.

SIGNAL GENERATOR				DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT in order shown
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection		
455 kc	.1 mf	1A7GT grid cap*	1A7GT Pin 7	Rotor full open (plates out of mesh)	Input and output trimmers on IF cans
1650 kc	.1 mf	1A7GT grid cap*	1A7GT Pin 7	Rotor full open (plates out of mesh)	Osc. trimmer on gang (see trimmer view)
1400 kc	Chassis installed in cabinet. Lay lead from generator about 1 ft. from loop. Back cover must be snapped shut. Trimmer is reached thru small hole in end of cabinet. Do not move loop leads after alignment.				Set dial to 1400 kc. Ant. trimmer on gang (see trimmer view)

*For these adjustments chassis must be removed from cabinet. Insert a 1 megohm resistor between A.V.C. Buss and 1A7GT grid cap. It is assumed loop is disconnected from chassis.

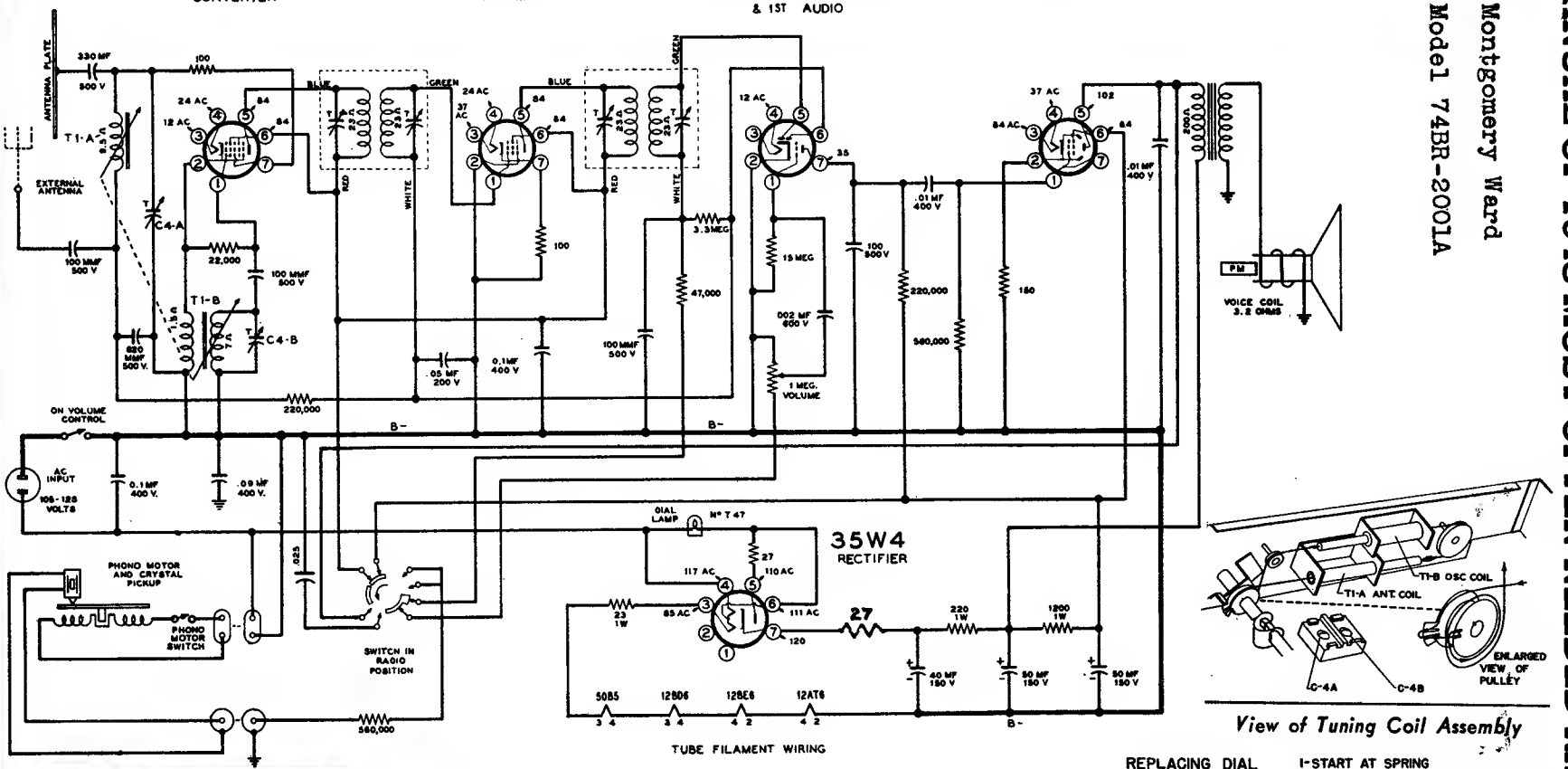
WARDS

MODEL 74BR-1053A



Montgomery Ward

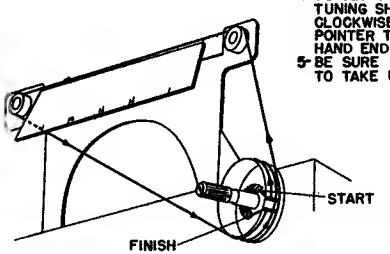
Model 74BR-2001A



View of Tuning Coil Assembly

REPLACING DIAL STRING

1-START AT SPRING
2-WRAP 2 TURNS COUNTER CLOCK-WISE AROUND DRIVE PULLEY
3-GO AROUND IDLER PULLEYS BACK TO DRIVE PULLEY AND FINISH AT SPRING
4-TO SET POINTER ROTATE TUNING SHAFT TO EXTREME CLOCKWISE POSITION, FASTEN POINTER TO STRING AT RIGHT HAND END MARKER
5-BE SURE SPRING IS STRETCHED TO TAKE UP SLACK

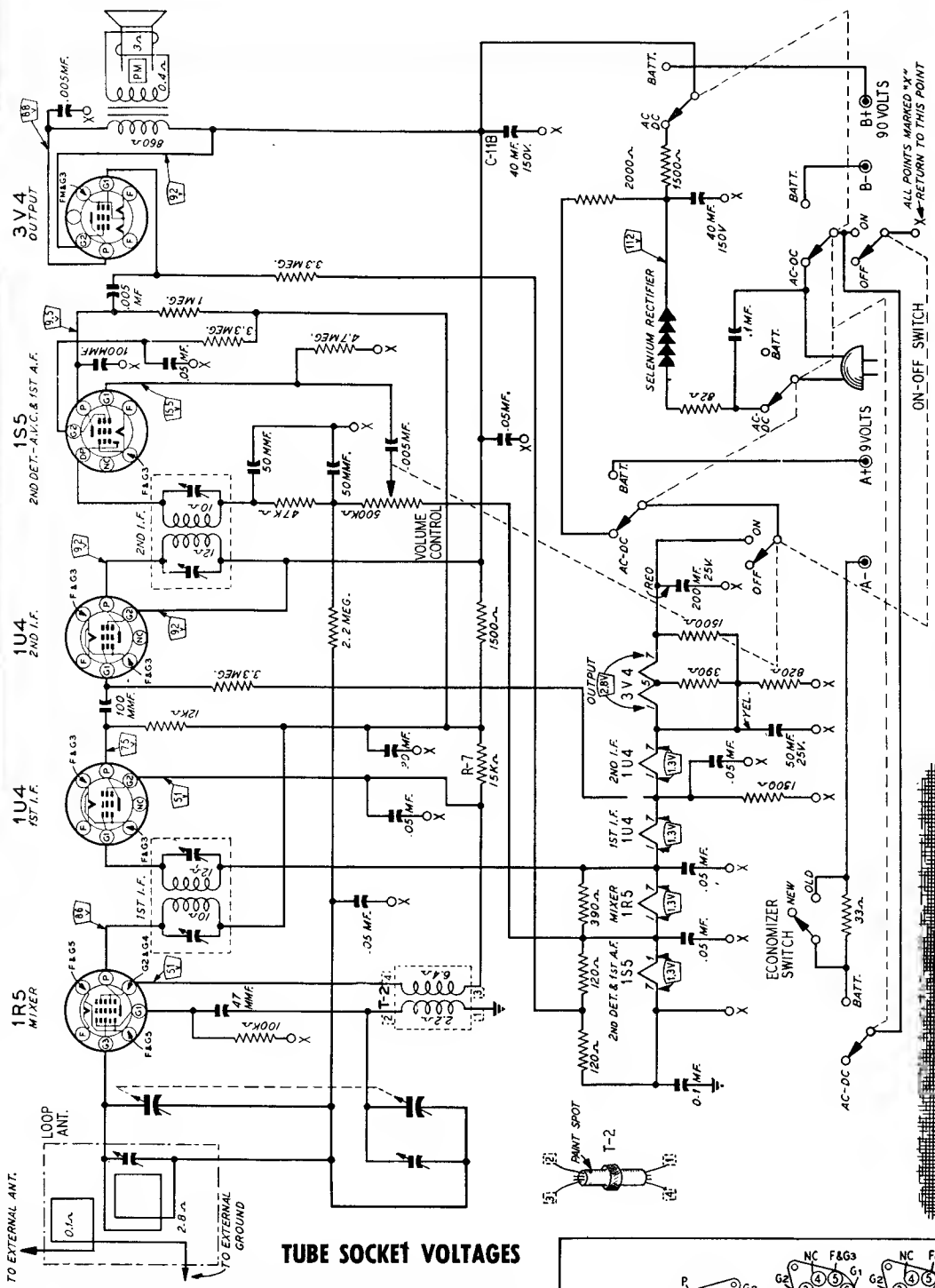


WARDS

MODEL 74BR-2001A

Frequency Range	535 to 1690 kc.
Intermediate Freq.	455 kc.
Selectivity	At 1000 kc. 52 kc at 1000 x signel.
Sensitivity	23 microvolts average for .05 watts output.
Power Output	0.75 watts undistorted, 1.0 watts maximum.
Loud Speaker	4" x 6" oval, P.M., v.c. impedence 3.2 ohms.

NOTES:
VOLTAGES TAKEN WITH A 1000-OHMS-PER-VOLT VOLTMETER. DC SOCKET VOLTAGE READINGS ARE TAKEN SETWEEN PINS DESIGNATED AND B-.
LINE VOLTAGE 117 AC.
VOLTAGES SHOWN ARE DC UNLESS OTHERWISE INDICATED.
ALL RESISTORS ARE ½ WATT UNLESS OTHERWISE INDICATED.



WARDS Airline

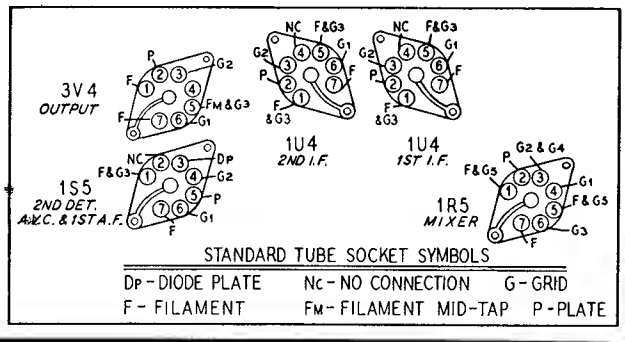
MODEL 74 WG-1054A

TUBE SOCKET VOLTAGES

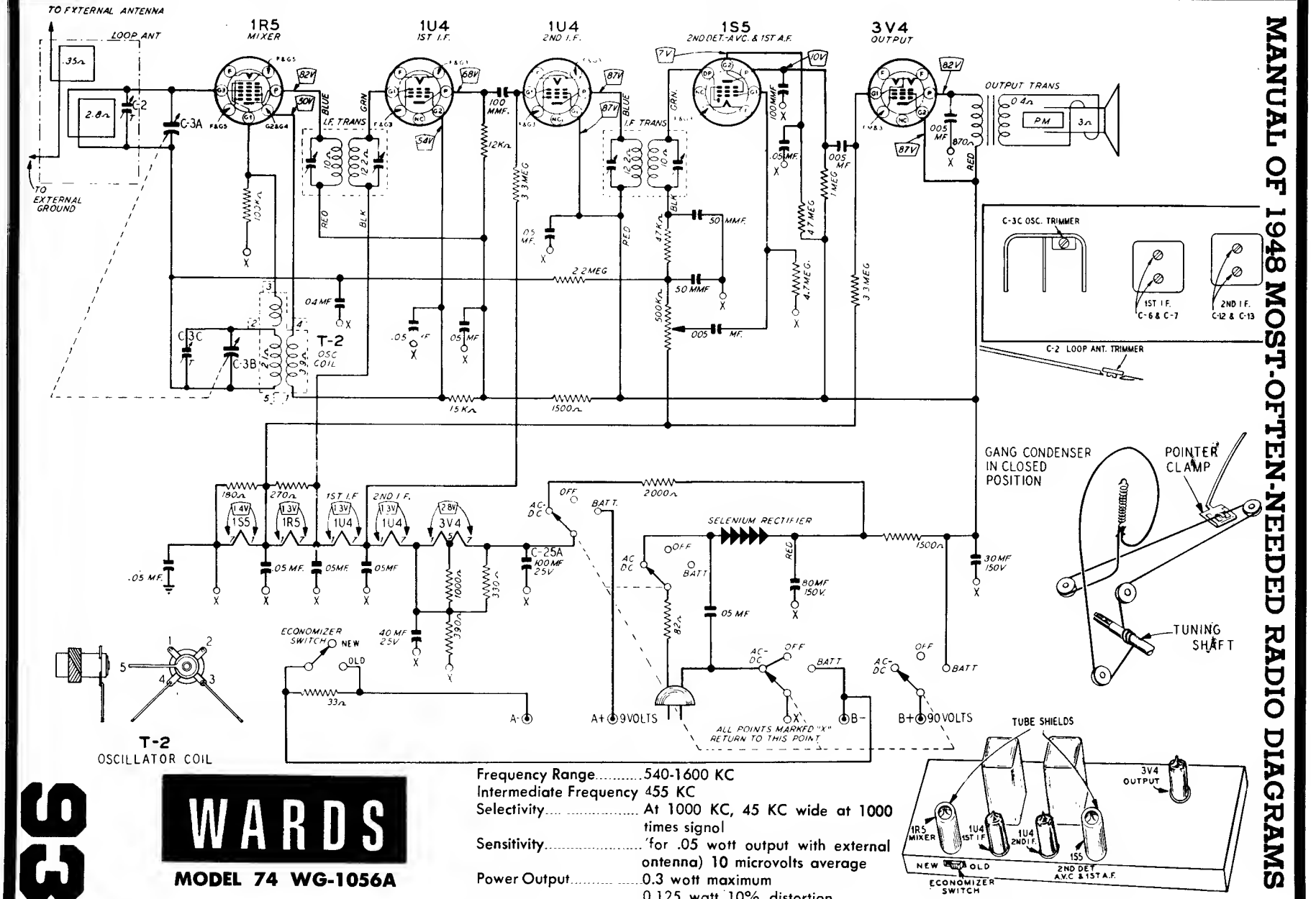
The readings were taken with a 1000 ohm-per-volt meter and all plate and screen voltages read on a 500 volt scale. Conditions of measurement are:

Line voltage.....117 volts AC
Volume control.....maximum
Signol input.....none

A variation of ±10% is usually permissible.



Frequency Range.....540-1600 KC
Intermediate Frequency 455 KC



MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

WARDS

MODEL 74 WG-1056A

Frequency Range	540-1600 KC
Intermediate Frequency	455 KC
Selectivity	At 1000 KC, 45 KC wide at 1000 times signol
Sensitivity	for .05 wott output with external ontenna) 10 microvolts average
Power Output	0.3 wott maximum 0.125 watt 10% distortion

NOTE A:—Index line is on dial light diffuser strip.

SIGNAL GENERATOR			Coupling Capacitor	DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT IN ORDER SHOWN (See Trimmer Illustration)
Frequency Setting	Connection to Receiver	Ground Connection			
455 kc	Control Grid 12SF7—I-F (Prong No. 2)	Point "X" 12SK7—R-F (Prong No. 3)	.1 mf	Turn Rotor to full open	2nd I-F (C10) & (C11)
455 kc	Control Grid 12SA7—1st Det. (Prong No. 8)	Same as above	.1 mf	Turn Rotor to full open	1st I-F (C7) & (C8)
1620 kc	Control Grid 12SA7—1st Det. (Prong No. 8)	Same as above	.1 mf	Turn Rotor to fully open position	Oscillator (C6)
1400 kc	External Antenna Clip on Loop	Chassis	50 mmf	Turn Rotor to 1400 kc Index Line. See Note A	Antenna (C24)

TUBE SOCKET VOLTAGES

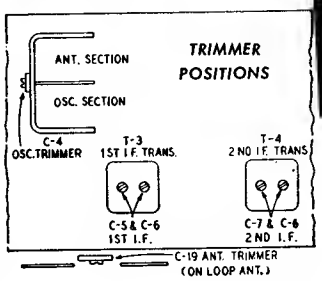
Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages except those for the heater and dial lamp are between the socket terminal and "X" point.

The readings were taken with a 1000 ohm-per-volt meter and all plate and screen voltages read on a 500 volt scale. Conditions of measurement are:

Line voltage.....117 volts AC
Volume control.....maximum
Signal input.....none

A variation of ±10% is usually permissible.

SIGNAL GENERATOR					
Frequency Setting	Coupling Capacitor	Connection To Radio	Ground Connection	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM See Trimmer Illustration
455 kc	.1 mf	Control Grid 12SK7—I-F Prong No. 4	Point "X" 12SK7—I-F Prong No. 3	Turn Rotor to full open	2nd I-F (C7) & (C8)
455 kc	.1 mf	Control Grid 12SA7—1st Det. Prong No. 8	Same as above	Turn Rotor to full open	1st I-F (C5) & (C6)
1620 kc	.1 mf	Control Grid 12SA7—1st Det. Prong No. 8	Same as above	Turn Rotor to full open	Oscillator (C4)
1400 kc	50 mmf	External Antenna Clip on Loop See Note A	Chassis	Tune Rotor to Max. Output Set Indicator to 1400 KC— See Note B	Antenna (C19)



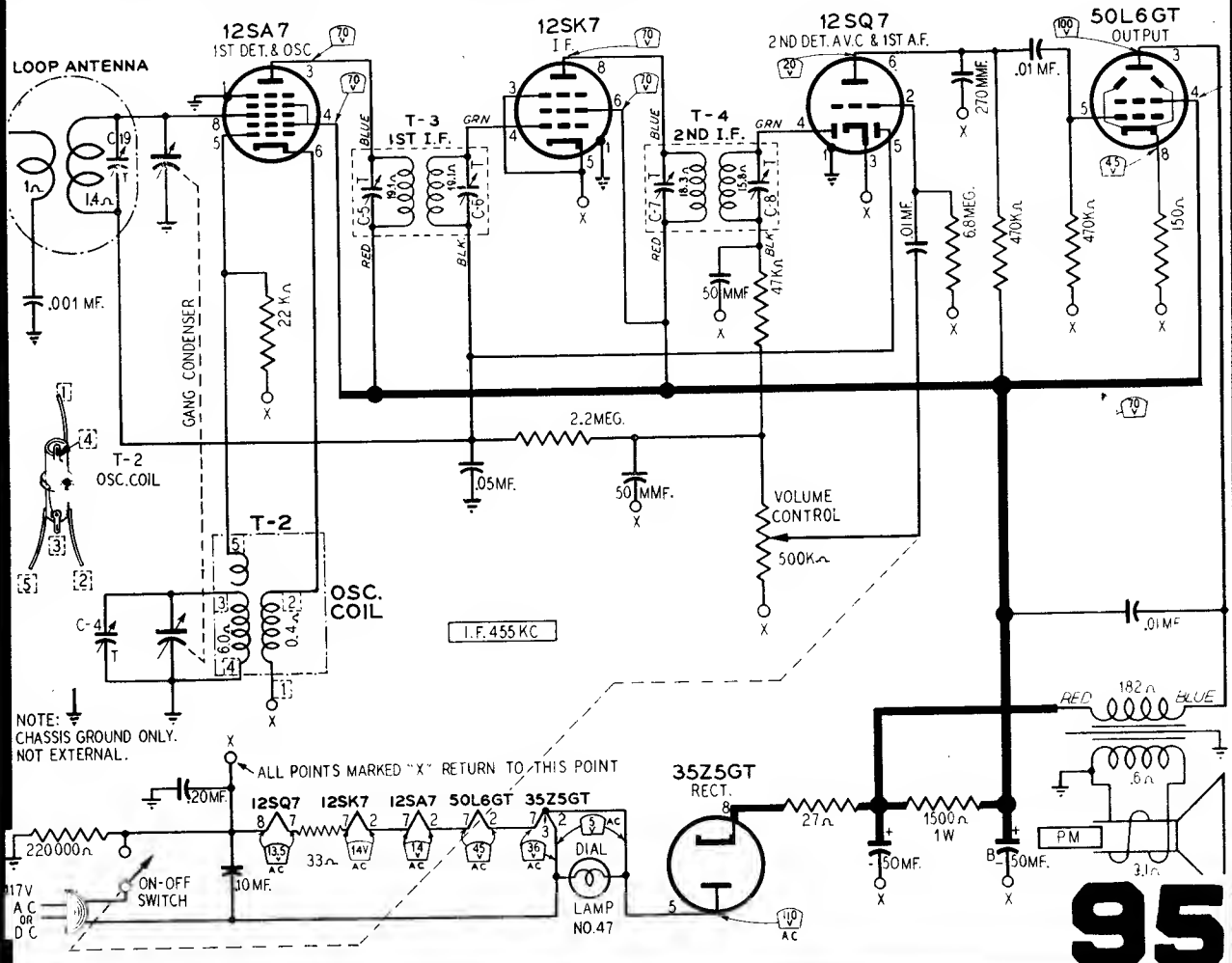
WARDS

74 WG-1802A
74 WG-1803A

NOTE A—Re-assemble chassis in cabinet. Replace back on cabinet.

NOTE B—Tune in a 1400 KC signal. If pointer is not at the 1400 KC mark on the dial scale, pull pointer off shaft. Set pointer at the 1400 KC mark and push back on shaft.

Model 74WG-2004 is similar, but has phono.



MONTGOMERY WARD

TUBE SOCKET VOLTAGES

As.

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground.

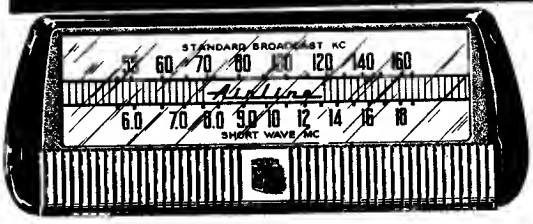
The readings were taken with a 1000 ohm per volt meter and all plate and screen voltages read on a 500 volt scale. Conditions of measurement are:

Line voltage..... 117 volts AC
Volume control..... maximum
Signal input..... none

A variation of ±10% is usually permissible.

Montgomery Ward Model 74WG-2504C
(Model 74WG-2704C is similar)
See page 97 for more details.

WARDS Airline RADIO

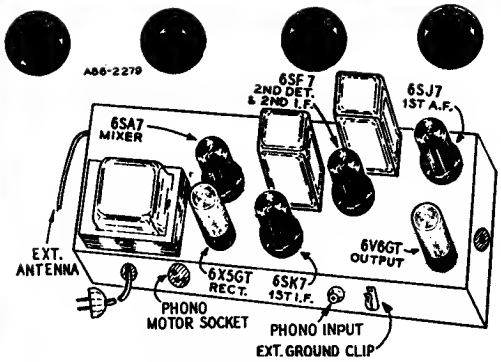


MODEL 74 WG-2504C

(Model 74WG-2704C is similar)
See page 96 for schematic.

Frequency Range.....B range—540-1600 KC
D range—5.75 to 18.3 MC

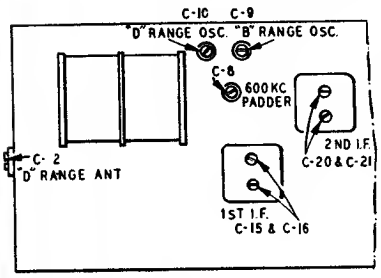
Intermediate Frequency..455 KC



DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully open position. Use a new 10X65 drive cord assembly or a piece of cord 48 inches long and tie one end to the tension spring. Hook the other end of the tension spring to the tab on the drive pulley. Pass the cord through the slot in the drive pulley rim around idler stud A and wind three and one-half turns clockwise around the tuning shaft (turns must progress away from chassis). Then pass cord over idler pulleys B and C. Wrap cord counterclockwise around drive pulley, stretch tension spring and fasten free end of cord to spring.

ALIGNMENT PROCEDURE

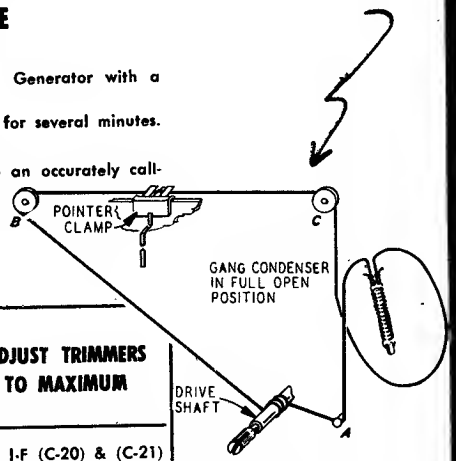


Volume Control—Maximum All Adjustments.

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		Dummy Antenna	Band Switch Setting	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
	Frequency Setting	Connection at Radio				
I-F	455 kc	6SA7, Pin 8	.1 mf	B Range	Turn Rotor to Full Open	2nd I-F (C-20) & (C-21) 1st I-F (C-15) & (C-16)
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. Set Indicator to 1400 KC. See Note A	Antenna Range B (C3)
	600 kc	Antenna Lead	50 mmf	B Range	Tune Rotor to Mox. Output	600 kc (C8) Rock Rotor—See Note B
Repeat above oscillator adjustments 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	Antenno Lead	400 Ohm	D Range	Tune Rotor to Max. Output	Antenna Range D (C2) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cobinet. 1400 kc	Antenna Lead	50 mmf	B Range	Tune Rator to Max. Output	Antenna Range B (C3)

After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial, re-set pointer at the 1400 KC mark on the dial scole.

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

WARDS

MODEL 74 WG-2709A

See page 99 for alignment

ELECTRICAL SPECIFICATIONS

Power Supply..... 105-125 volts AC, 60 cycles, 55 watts normal, 77 watts phono operating

Frequency Range..... B range—540-1600 KC
D range—5.75 to 18.3 MC

Intermediate Frequency. 455 KC

Selectivity..... 43 KC broad at 1000 times signal, 1000 KC

TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground.

The readings were taken with a 1000 ohm per volt meter and all plate and screen voltages read on a 500 volt scale. Conditions of measurement are:

Line voltage.....117 volts AC

Volume control.....maximum

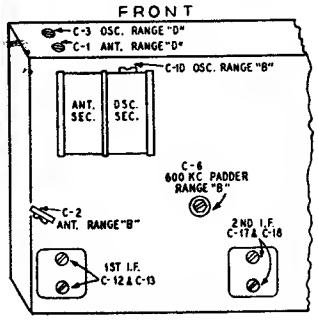
Signal input .....none

NOTE: Gimmick and 4.7 mmf capacitor used together. 7 mmf capacitor used without the gimmick.

WARDS Airline

MODEL 74 WG-2709A

Frequency Range..... B range—540-1600 KC
D range—5.75 to 18.3 MC
Intermediate Frequency. 455 KC
Selectivity..... 43 KC broad at 1000 times signal, 1000 KC



TRIMMER POSITIONS

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.

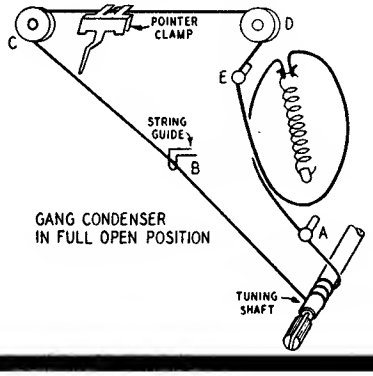
The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter; Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

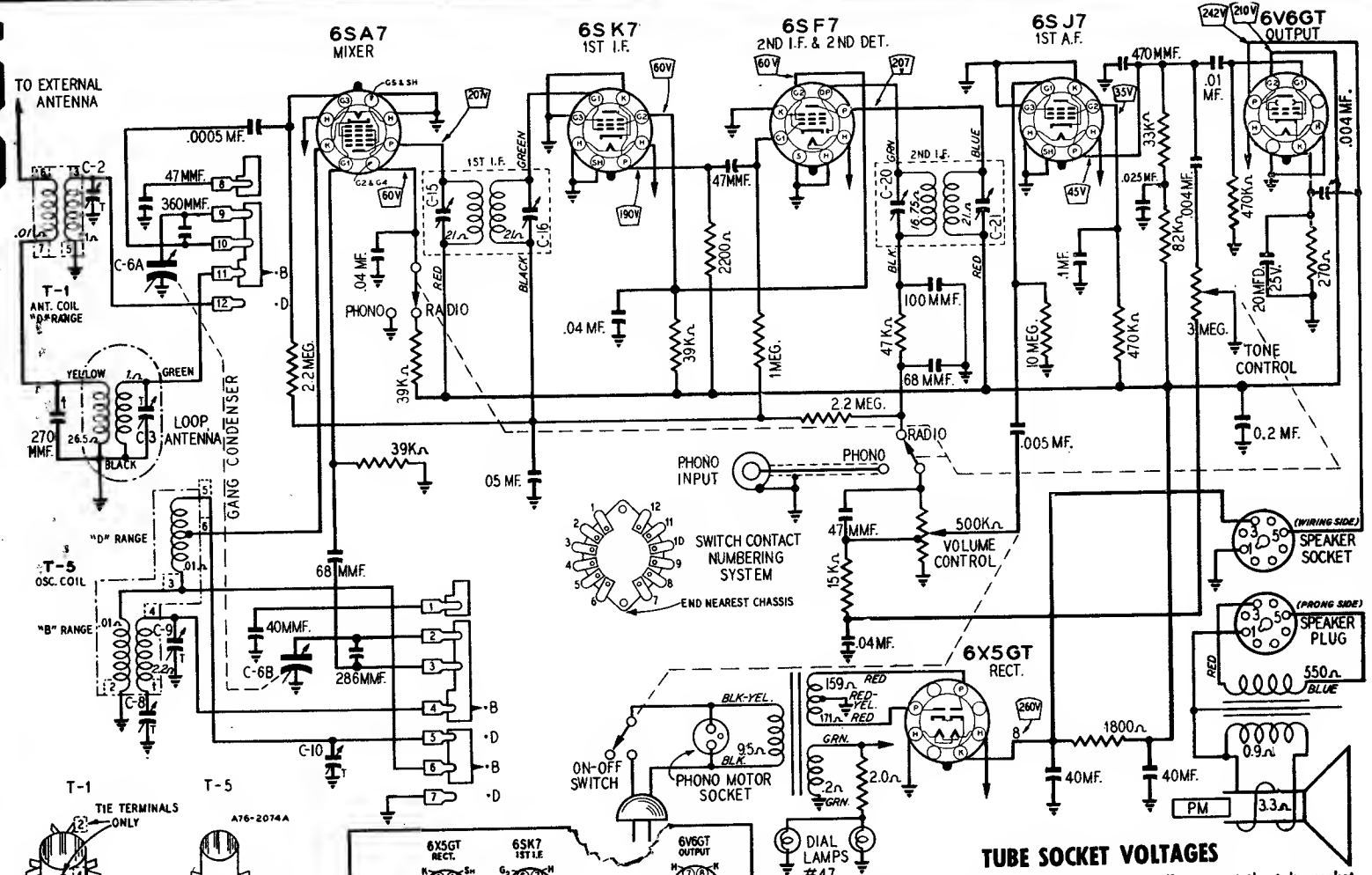
	SIGNAL GENERATOR		Dummy Antenna	Band Switch Setting	Candenser Setting	ADJUST TRIMMERS TO MAXIMUM
	Frequency Setting	Cannectian at Radia				
I-F	455 kc	6SJ7, Pin 4	.1 mf	B Ronge	Turn Rotor to Full Open	2nd I-F (C17) & (C18) 1st I-F (C12) & (C13)
RANGE B	1600 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Full Open	Oscillator Range B (C10)
	1400 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note A	Antenna Range B (C2)
	600 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Mox. Output	600 kc (C6) Rock Rotor—See Note B
Repeat above oscillator adjustments at 1600 and 600 kc until readjusting the oscillator Range B Trimmer (C10) causes no further improvement in output.						
RANGE D	18,300 kc	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C3)
	17,000 kc	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Antenna Range D (C1) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet. 1400 kc	Antenna Lead	100 mmf	B Ronge	Turn Rotor to Max. Output	Antenna Range B (C2)

After each range is completed, repeat the procedure as a final check.
NOTE A—If the pointer is not at 1400 KC on the dial, re-set pointer at the 1400 KC mark on the dial scale.
NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully open position. Use a new 10X64 drive cord or a piece of cord 46" long and tie one end to the tension spring. Hook the other end of the tension spring to the tab on the drive pulley. Pass the cord through the slot in the drive pulley rim and continue one half turn counterclockwise around the drive pulley. Then pass the cord around idler stud A and wind three turns clockwise around the tuning shaft (turns must progress away from chassis). Pass cord through string guide B, over pulleys C and D and around idler stud E. Wrap ¾ turn counterclockwise around drive pulley, stretch the tension spring and tie free end of the cord to spring.





TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagrom ot the tube socket terminol ond chassis ground.

The readings were taken with a 1000 ohm per volt meter ond oll plote and screen voltages read on a 500 volt scale. Conditions of meosurement are:

Line voltage..... 117 volts AC
Volume control..... maximum
Signal input..... none

A variotion of ±10% is usually permissible.

WARDS

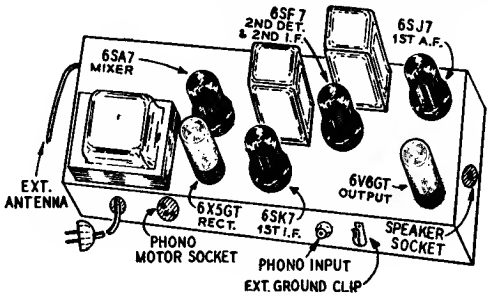
MODEL 74 WG-2010B

Frequency Ronge.....B ronge—540-1600 KC
D ronge—9 to 15.5 MC

Intermediote Frequency..455 KC

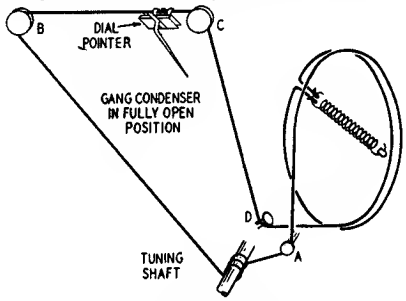
Selectivity.....40 KC brood ot 1000 times signol, 1000 KC

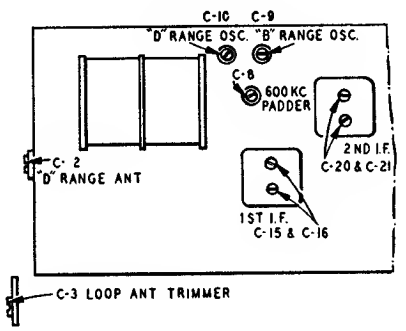
Sensitivity.....(for .5 wott output) with externol antenno
B ronge—9 microvolts overoge
D ronge—20 microvolts overoge



DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully open position. Use o new drive cord 46" long and tie one end to the tension spring. Hook the other end of the tension spring to the tob on the drive pulley. Poss the cord through the slot in the drive pulley rim ond continue one and one-holf turns counterclockwise oround the drive pulley. Then poss the cord around idler stud A ond wind three and one-holf turns clockwise oround the tuning shoft (turns must progress owoy from chossis). Pass cord oround pulleys B ond C ond around idler stud D. Wrop cord counterclockwise oround drive pulley, stretch the tension spring ond tie free end of the cord to spring. Cut off ony excess string.





ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Rodio 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		Dummy Antenna	Band Switch Setting	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
	Frequency Setting	Connection at Radio				
I-F	455 kc	6SA7, Pin 8	.1 mf	B Range	Turn Rotor to Full Open	2nd I-F (C-20) & (C-21) 1st I-F (C-15) & (C-16)
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 Indicator to 1400 KC. See Note A	Antenna Range B (C3)
	600 kc	Antenna Lead	100 mmf	B Range	Tune Rotor to Max. Output	600 kc (C8) Rock Rotor—See Note B
Repeat above oscillator adjustments at 1620 and 600 KC until readjusting the oscillator Range B Trimmer (C9) causes no further improvement in output.						
RANGE D	15.6 mc	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
	14 mc	Antenna Lead	400 Ohm	D Range	Tune Rotor to Max. Output	Antenna 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	Antenna Range B (C3)

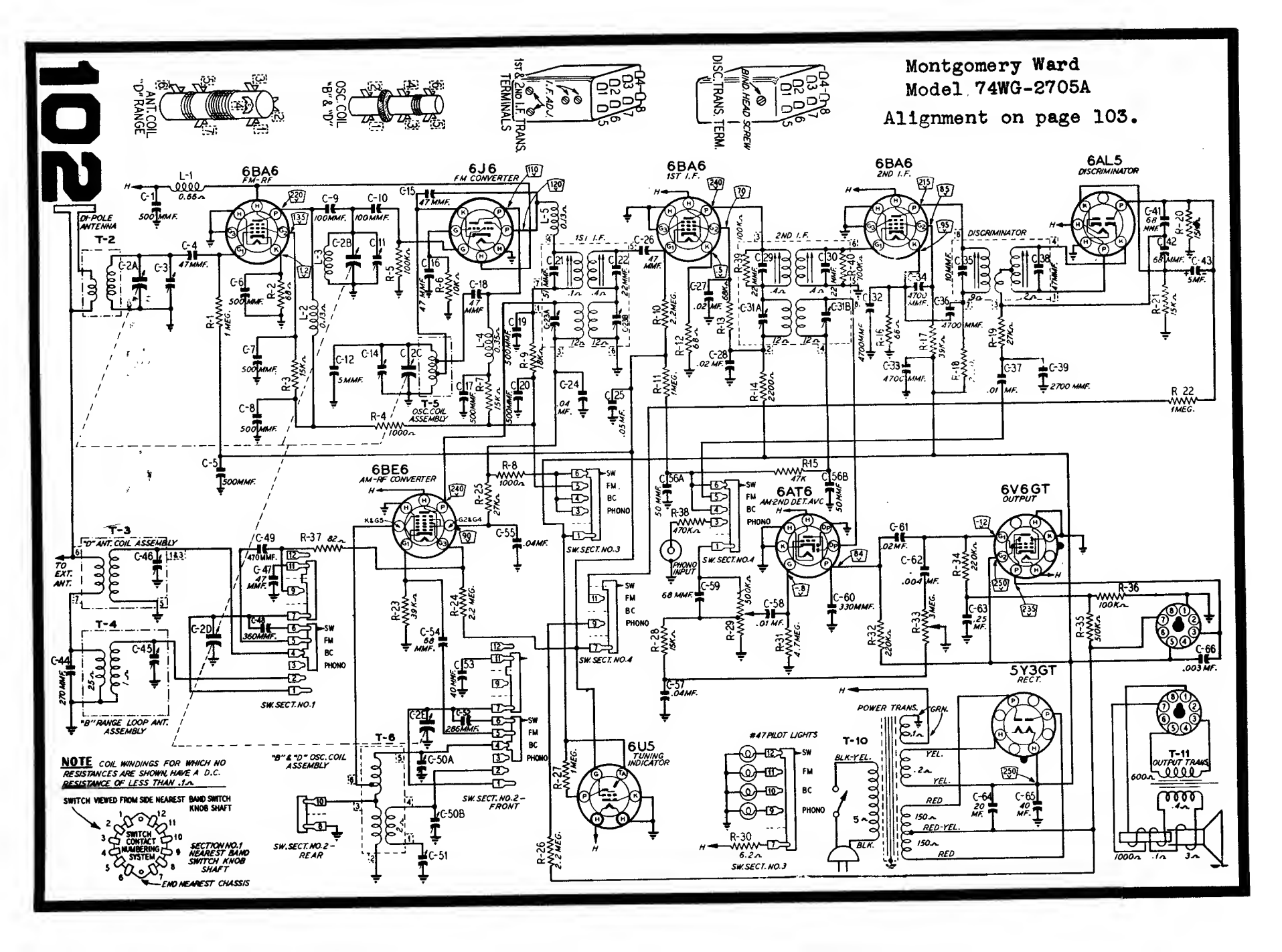
After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial, re-set pointer at the 1400 KC mark on the dial scale.

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

Montgomery Ward
Model 74WG-2705A

Alignment on page 103.



WARDS Airline — MODEL 74WG-2705A

	SIGNAL GENERATOR		DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
	FREQUENCY SETTING	CONNECTION AT RADIO				
I-F	455 kc	6BE6 Pin 7	.1 mf	Broadcast	Rotor Fully Open	2nd I-F C-31B & C-31A 1st I-F C-23B & C-23A
Broadcast	1620 kc	External ant. lead	200 mmf	Broadcast	Rator Fully Open	Oscillator C-50B
	1400 kc	External antenna lead	200 mmf	Broadcast	Turn Rator to Max. Output Set paintor to 1400 kc See Note A	Antenna C-45
	600 kc	External antenna lead	200 mmf	Braadcast	Turn Rotor to Max. Output and Rack See Note B	600 Kc padder C-51
Repeat abave ascillatar adjustments at 1620 and 600 KC until readjusting the oscillator Range B Trimmer C-50B causes na further improvement in output.						
Shart Wave	15.5 MC	External antenna lead	400 ohm	Short Wave	Rotor Fully Open	Oscillatar C-50A
	15 MC	External antenna lead	400 ohm	Short Wave	Turn Rotar ta Max. Output	Antenna C-46
Reassemble chassis in cabinet						
Braadcast	1400 kc	External antenna lead	200 mmf	Broadcast	Turn Rator to Max. Output	Antenna C-45

After each range is completed, repeat the pracedure as a final check.

Note A—If the paintor is not at 1400 KC on the dial, reset paintor at the 1400 KC mark on the dial scale.

Note B—Turn the rotar back and forth and adjust the trimmer until the peak af greatest intensity is obtained.

Discriminator	10.7 MC Note B	6BA6 2nd I-F Pin 1 and Chassis	.01 mf	FM	Rotor ta Full Open	Disc. Pri. (1) Note A
	10.7 MC Note B	Same as above	.01 mf	FM	Same as above	Disc Sec. Note C (2)
	10.7 MC Note B	Same as abave	.01 mf	FM	Same as abave	Disc. Pri. (1) Note A
	10.7 MC Note B	Same as above	.01 mf	FM	Same as above	Disc. Sec. Note C (2)
I-F	10.7 MC	6BA6 1st I-F, Pin 1 and Chassis	.01 mf	FM	Same as abave	2nd I-F Pri. Note A and D (3) 2nd I-F Sec. Note A and E (4)
	10.7 MC	Cannect ta the FM-RF Gang Condenser terminal on underside of chassis	.01 mf	FM	Same as above	1st I-F Pri. (5) 1st I-F Sec. (6) Note A
Recheck I-F Adjustments in order given						
R-F & Osc.	108.4	Disconnect dipole and connect generator to dipole terminals with resistor in series	300 ohms	FM	Rotor ta full open	Oscillator C-14
	104.5	Same as above	300 ahms	FM	Tune Rotar for Max. AVC voltage	R.F. C-11
	104.5	Same as above	300 ahms	FM	Same as abave	Ant. C-3
Recheck R-F and Osc. Adjustments in order given						

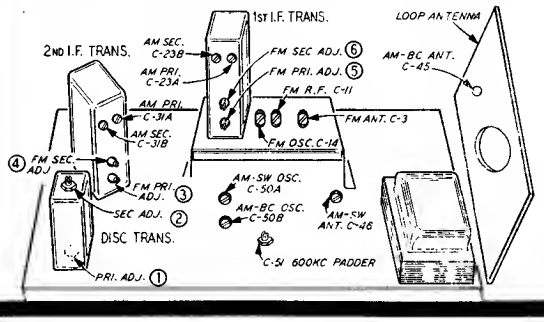
Note A—Test Equipment connections are as given in the table. The zero center scale DC vacuum tube voltmeter is to be connected between chassis graund and the AVC line at the 1 megohm resistor R-22 and the band switch terminal (as shown in the illustratian) far all adjustments except the discriminator secondary adjustment, far which see Note C.

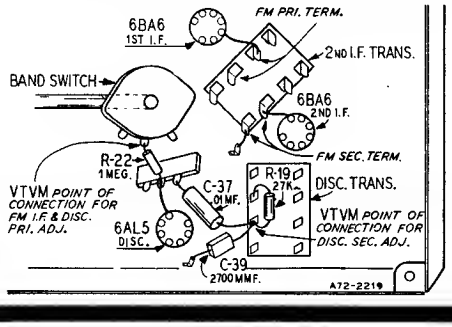
Note B—A signal of .1 volt must be fed into the receiver far this adjustment.

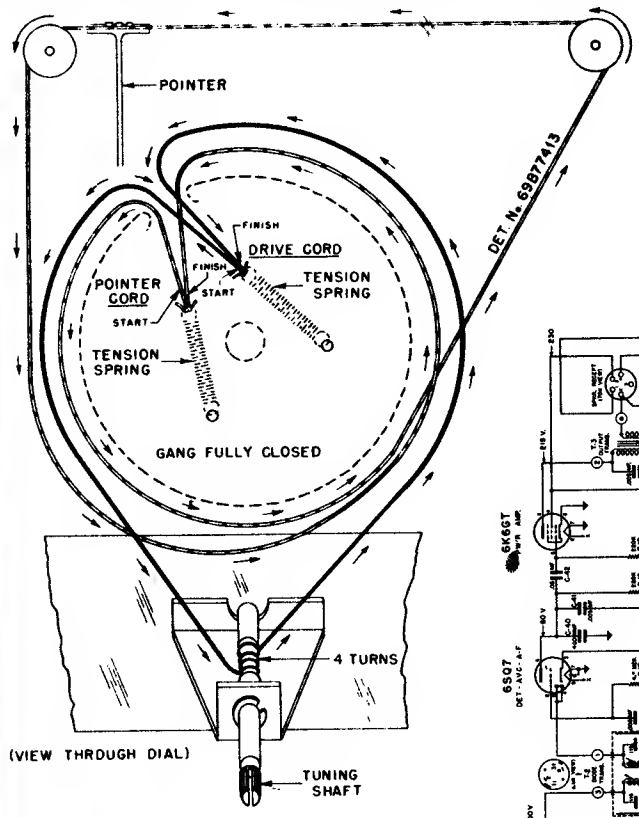
Note C—Disconnect zero center DC vacuum tube voltmeter from AVC and reconnect to junction af R-19, C-37 and C-39 (See illustration). Adjust for zero voltage indication.

Note D—Before adjusting Pri. core connect 5000 ohm load resistor acrass the 2nd I.F. secondary terminals, (See illustration).

Note E—Disconnect 5000 ohm load resistor from secandary terminals and reconnect across the 2nd I.F. primary terminals, (See illustration).







STRING DRIVE DETAIL

WAVEBAND SWITCH (K).

"A" position - 532 to 1620 Kc.

"B" position - 3.0 to 9.1 Mc.

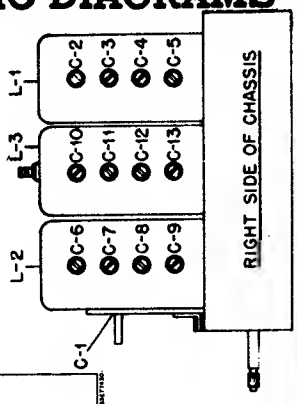
"C" position - 8.8 to 10.6 Mc.

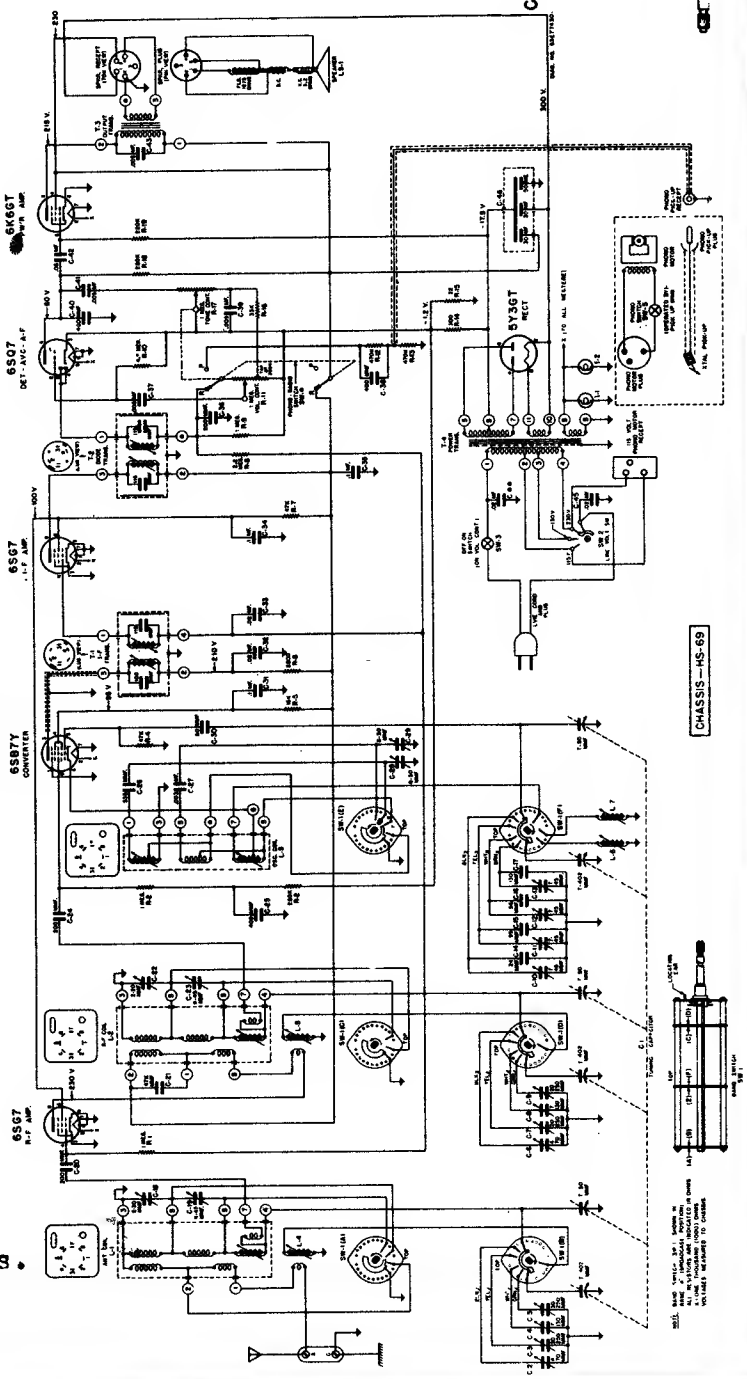
"D" position - 10.5 to 13.9 Mc.

"E" position - 13.8 to 16.6 Mc.

"F" position - 16.5 to 22.5 Mc.

MOTOROLA
Model 67F61BN
Chassis HS-69



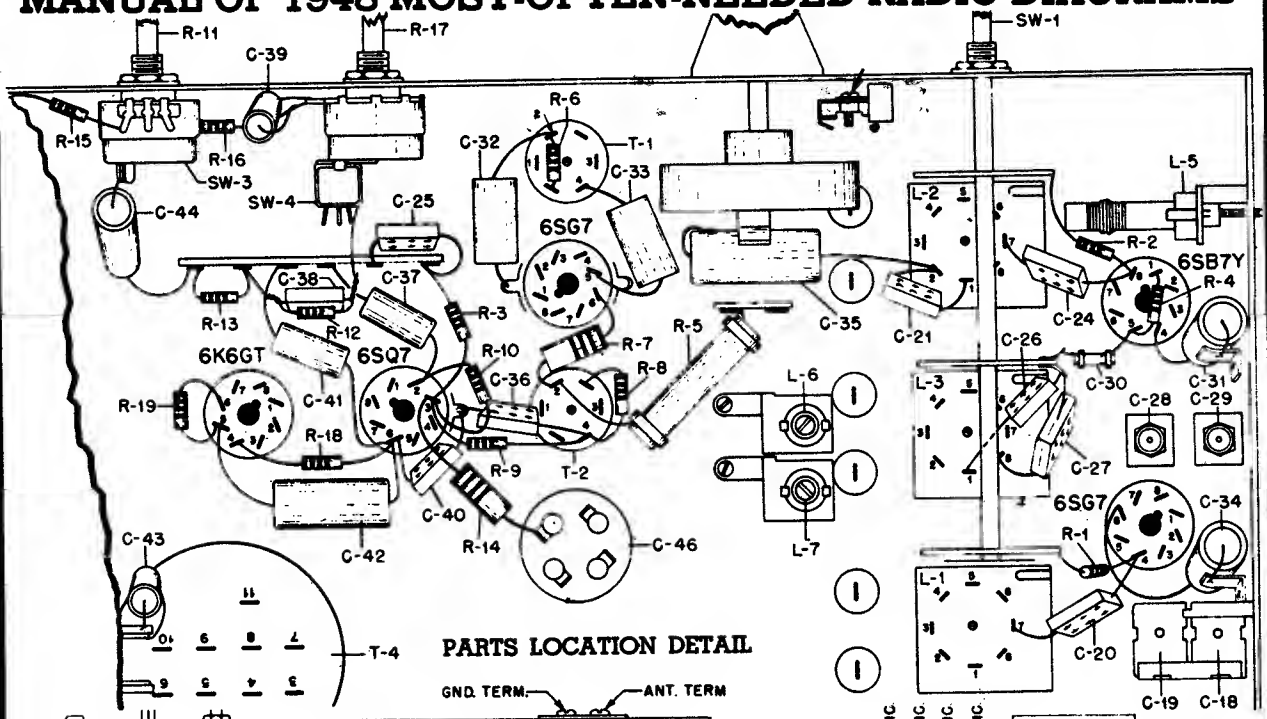


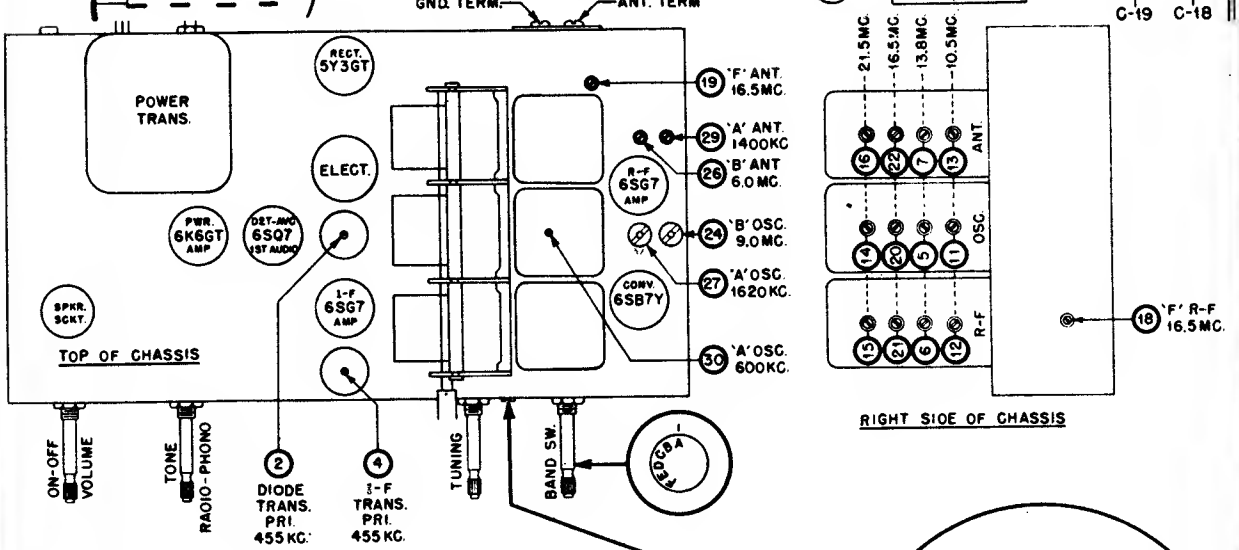
Motorola

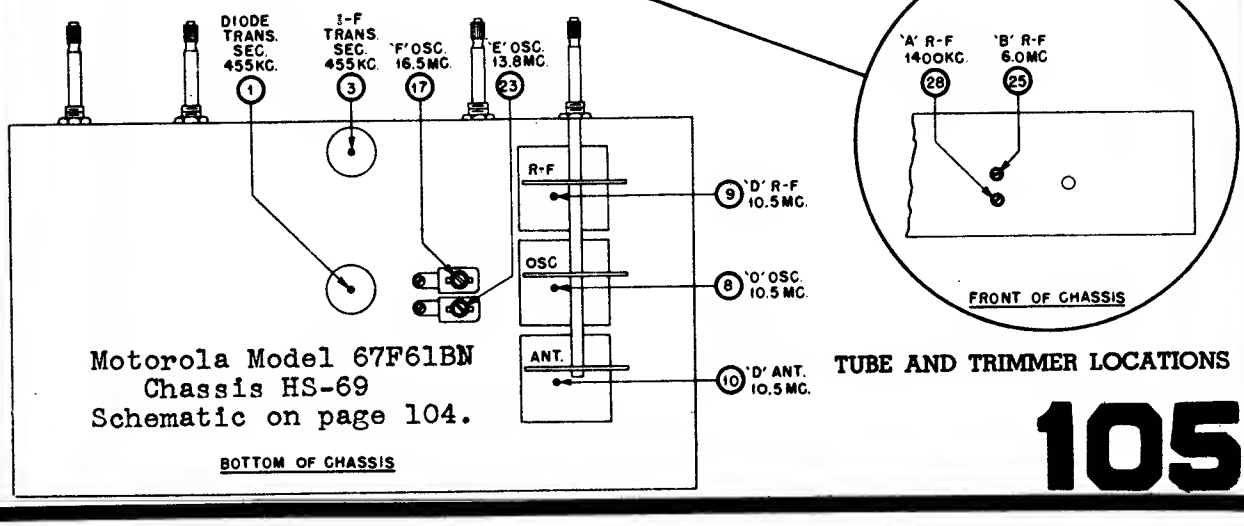
MODEL 67F61BN

CHASSIS HS-69.

See page 105 for more details.



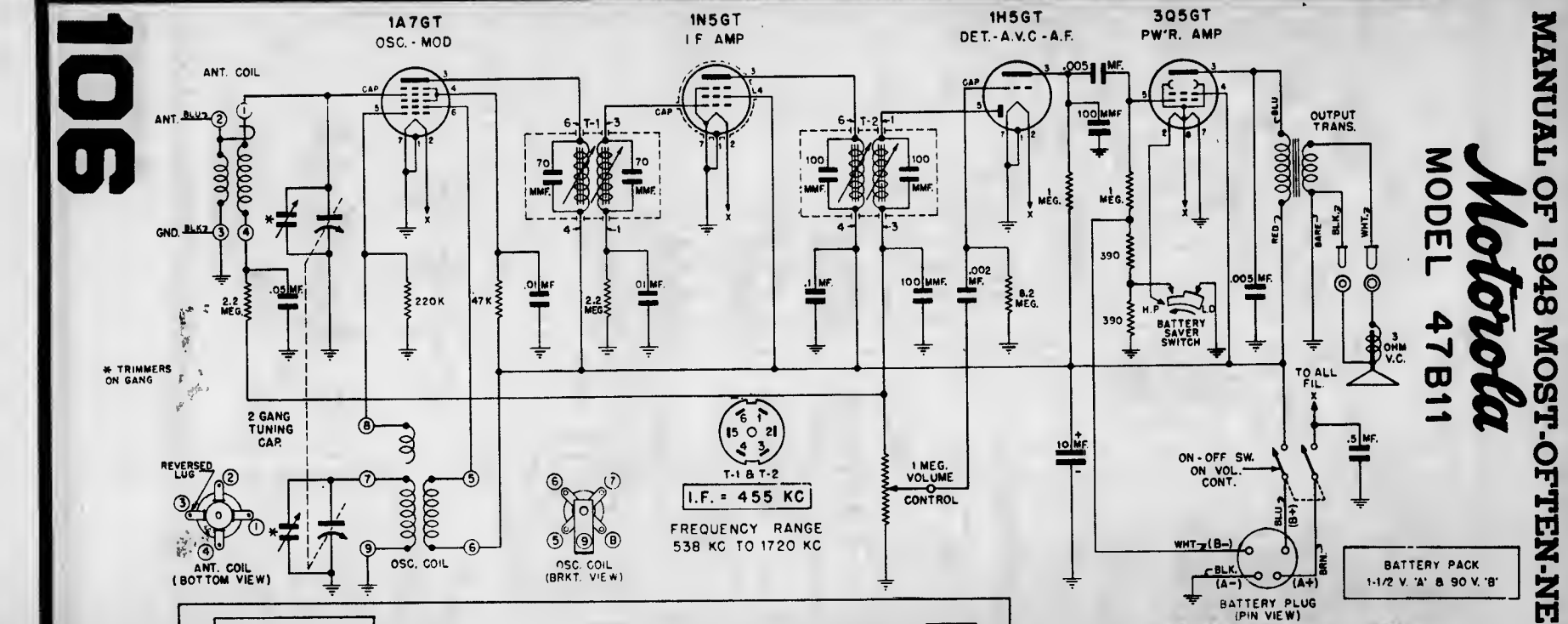


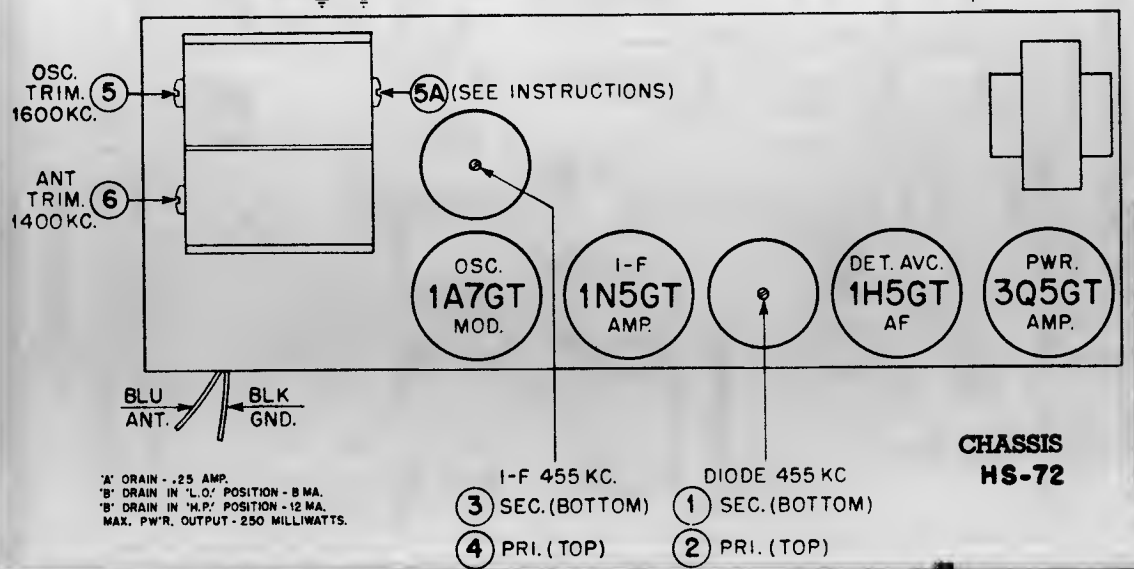


Motorola Model 67F61BN
Chassis HS-69
Schematic on page 104.

TUBE AND TRIMMER LOCATIONS

Motorola
MODEL 47B11





'A' DRAIN - .25 AMP.
'B' DRAIN IN 'L.O.' POSITION - 8 MA.
'B' DRAIN IN 'H.P.' POSITION - 12 MA.
MAX. PW'R. OUTPUT - 250 MILLIWATTS.

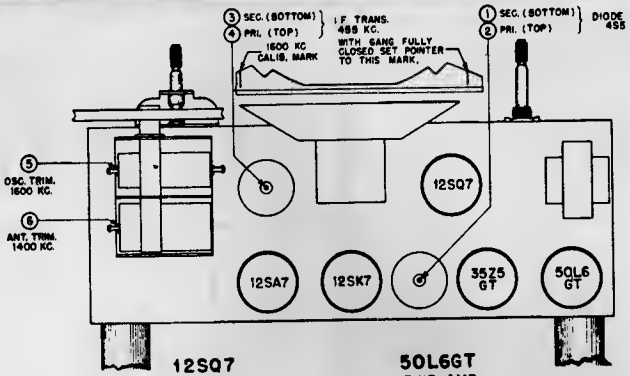
I-F 455 KC.
(3) SEC. (BOTTOM)
(4) PRI. (TOP)

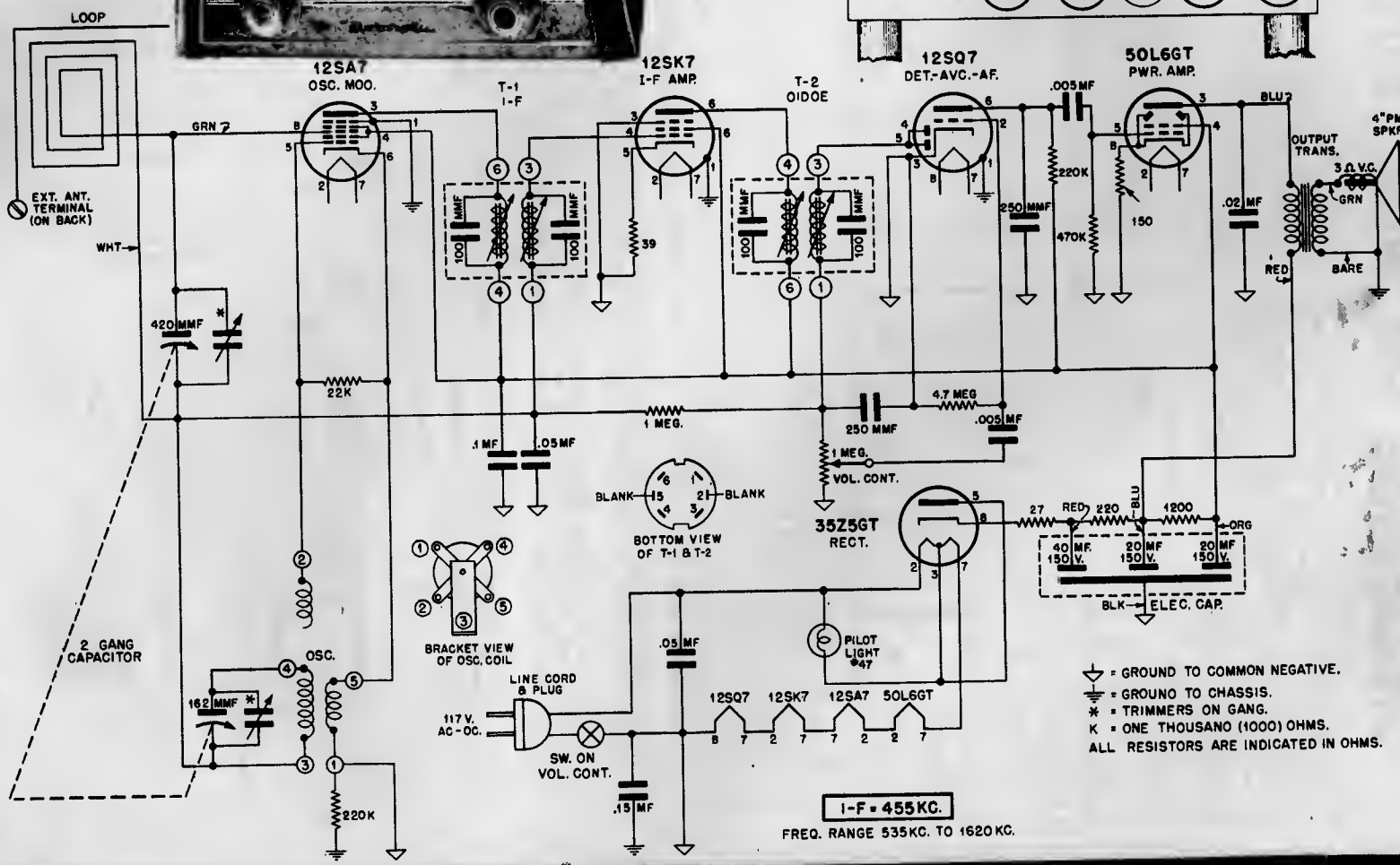
DIODE 455 KC
(1) SEC. (BOTTOM)
(2) PRI. (TOP)

CHASSIS HS-72

MOTOROLA INC.

Models 57X11, 57X12
Chassis HS-60
Alignment page 108





MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

Motorola Models 57X11, 57X12, Chassis HS-60

Motorola CHASSIS HS-60 MODELS 57X11 & 57X12

A low range output meter should be connected across the speaker voice coil. Set receiver volume control to maximum; for greatest accuracy keep output of receiver at approximately .05 watt throughout alignment by reducing generator output (not receiver volume control) as stages are brought into alignment. (.05 watt = .40 volt on output meter). The alignment tool should be of an insulated type.

If receiver is operated from AC line during alignment, it is suggested that an isolating transformer be used between receiver and power line. If no isolation transformer is used and hum is encountered during alignment, connect the ground side of the signal generator to B- instead of the receiver chassis.

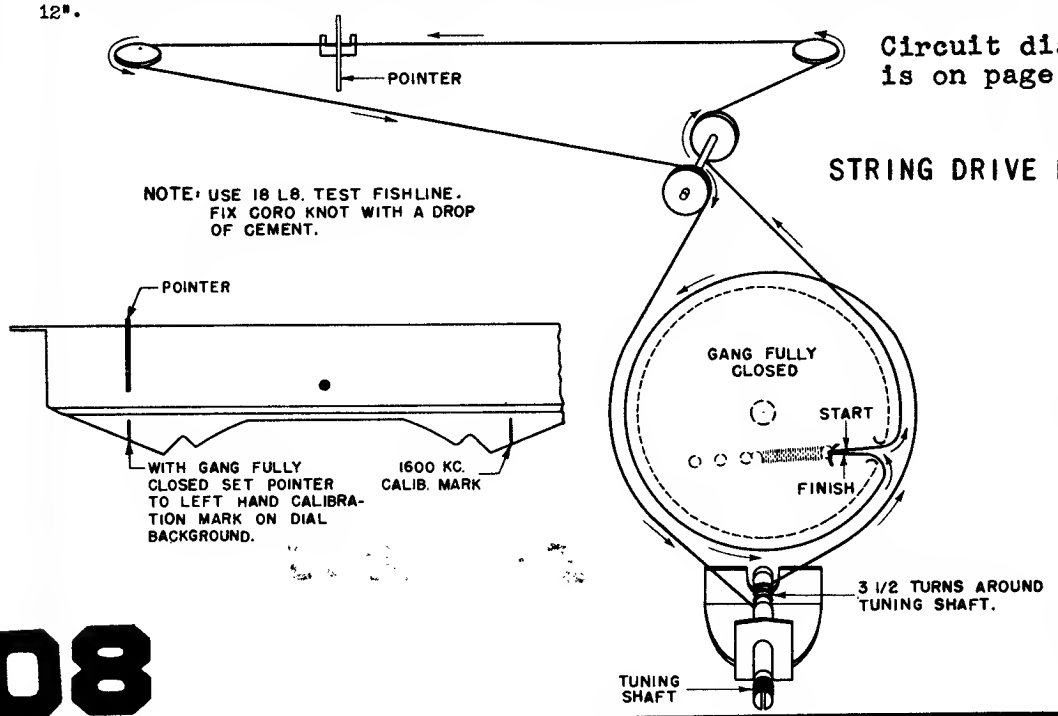
STEP	DIAL SET TO	DUMMY	SIGNAL GENERATOR CONNECTED TO	SIGNAL GENERATOR SET TO	ADJUST TRIMMER OR CORE	REMARKS
IF ALIGNMENT						
1.	Gang fully opened	.1 mf.	Osc-Mod grid *	455 Kc	1,2,3 & 4	Adjust for maximum
RF ALIGNMENT						
2.	1600 Kc **	-	Radiation loop ***	1600 Kc	5	This sets osc. to dial scale
3.	1400 Kc	-	Radiation loop ***	1400 Kc	6	Tune signal for max. with receiver tuning knob, then peak trimmer 6.

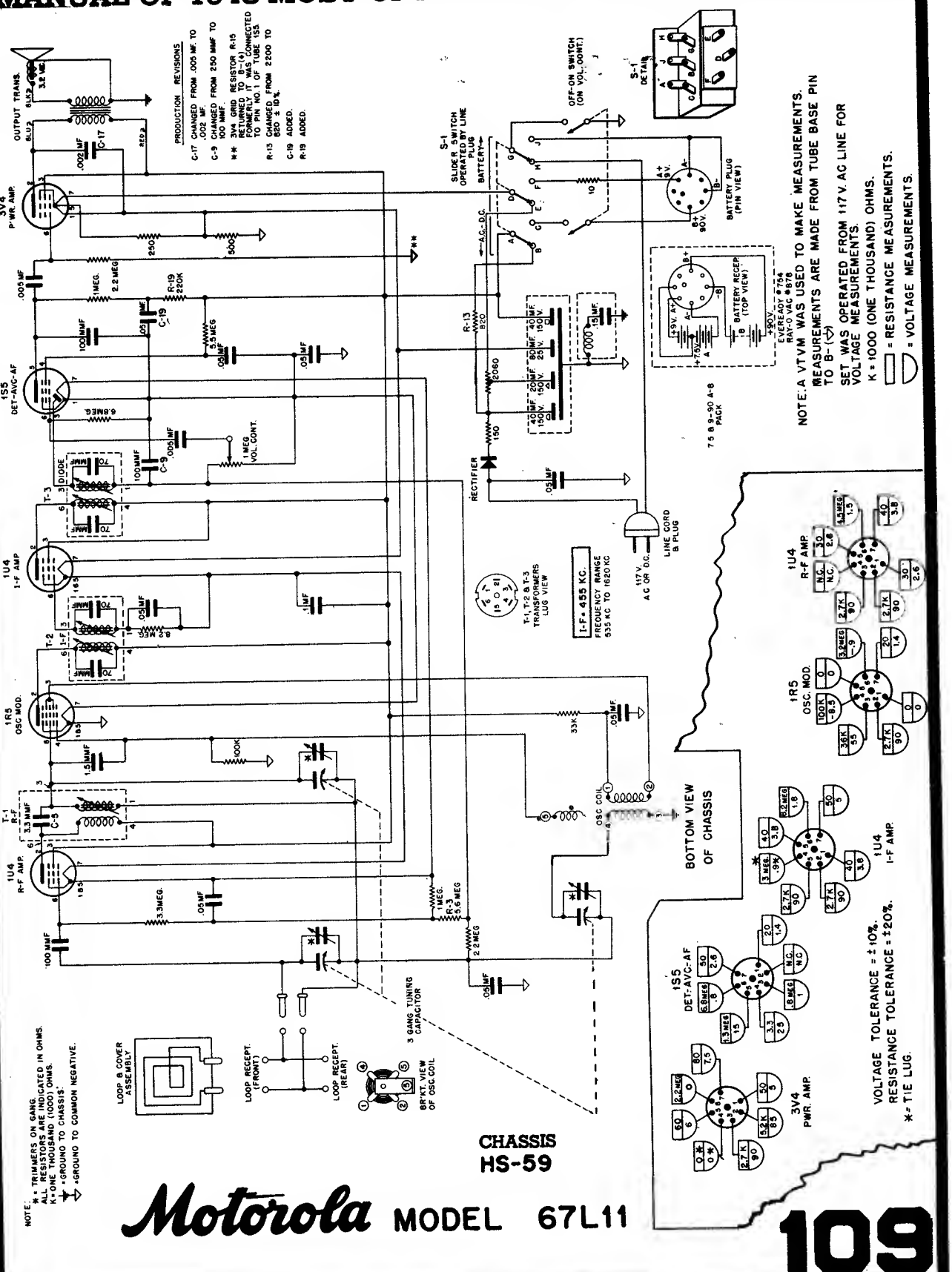
* A convenient point is the stator of the antenna section of the tuning capacitor.

** Close gang fully and set pointer to calibration mark at left hand side of dial background; then set pointer to 1600 Kc by turning tuning knob till pointer lines up with right hand calibration mark.

*** Connect output of signal generator to a 5" diameter, 3 turn loop and bring loop close enough to receiver loop to obtain output of 50 milliwatts (.40V) on output meter. Vary distance between loops to maintain this output during alignment. Minimum distance between loops should never be less than 12".

Circuit diagram is on page 107.




PRODUCTION REVISIONS
C-17 CHANGED FROM .005 MF. TO .002 MF.
C-9 CHANGED FROM 250 MMF TO 100 MMF.
** 3V4 GRID RESISTOR R-15 RETURNED TO B-(+) FORMERLY IT WAS CONNECTED TO PIN NO.1 OF TUBE 1S5
R-13 CHANGED FROM 2200 TO 820 ± 10%.
C-19 ADDED.
R-19 ADDED.
NOTE: A VTVM WAS USED TO MAKE MEASUREMENTS.
MEASUREMENTS ARE MADE FROM TUBE BASE PIN TO B-(⏚)
SET WAS OPERATED FROM 117 V. AC LINE FOR VOLTAGE MEASUREMENTS.
K = 1000 (ONE THOUSAND) OHMS.
= RESISTANCE MEASUREMENTS.
= VOLTAGE MEASUREMENTS.
NOTE:
* = TRIMMERS ON GANG.
ALL RESISTORS ARE INDICATED IN OHMS.
K = ONE THOUSAND (1000) OHMS.
= GROUND TO CHASSIS.
= GROUND TO COMMON NEGATIVE.
VOLTAGE TOLERANCE = ± 10%.
RESISTANCE TOLERANCE = ±20%.
*= TIE LUG.
BOTTOM VIEW OF CHASSIS
CHASSIS HS-59
Motorola MODEL 67L11

MOTOROLA INC.

Model 67L11, Chassis HS-59
Schematic on page 109.

Normally, alignment can be made with trimmers 5, 6 and 7. However, if range of these trimmers is insufficient to obtain peak, adjustment can be made with trimmers 5A, 6A and 7A.

R.F. COIL. The inductance of this coil is set at time of manufacture by adjusting the iron core. No resetting of this core should be made unless it has been tampered with. If so, readjustment can be made by proceeding as follows:

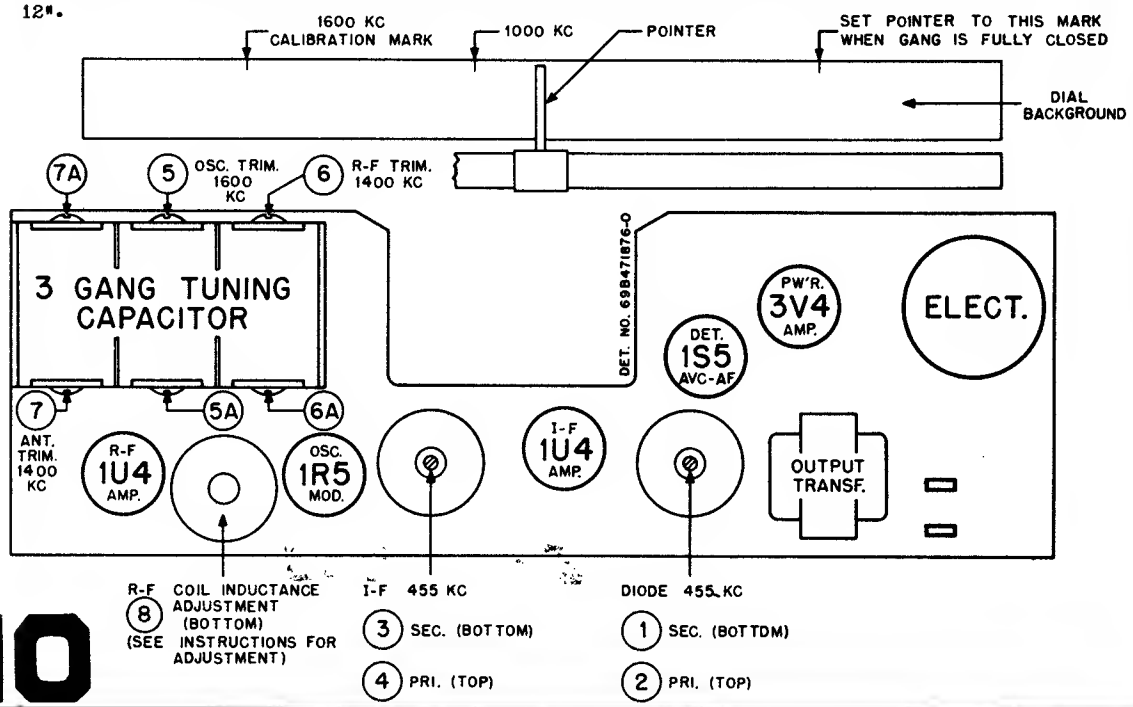
Tune in 600 Kc signal and peak Padder Adj. (8). Next tune in 1400 Kc signal and peak trimmer (6). Repeat both adjustments until maximum response is obtained at both ends; the last adjustment should be trimmer (6).

STEP	DIAL SET TO	DUMMY	SIGNAL GENERATOR CONNECTED TO	SIGNAL GENERATOR SET TO	ADJUST TRIMMER OR CORE	REMARKS
IF ALIGNMENT						
1.	Gang fully opened.	.1 mf	OSC-MOD grid*	455 Kc	1,2,3 & 4	Adjust for maximum output
RF ALIGNMENT						
2.	1600 Kc**	-	Radiation loop***	1600 Kc	5	This sets osc. to dial scale.
3.	1400 Kc	-	Radiation loop***	1400 Kc	6 & 7	Tune signal for max. with receiver tuning knob, then peak trimmers 6 & 7.
4.	1400 Kc	-	Radiation loop***	1400 Kc	7	With chassis assembled into cabinet, repeak antenna trimmer.

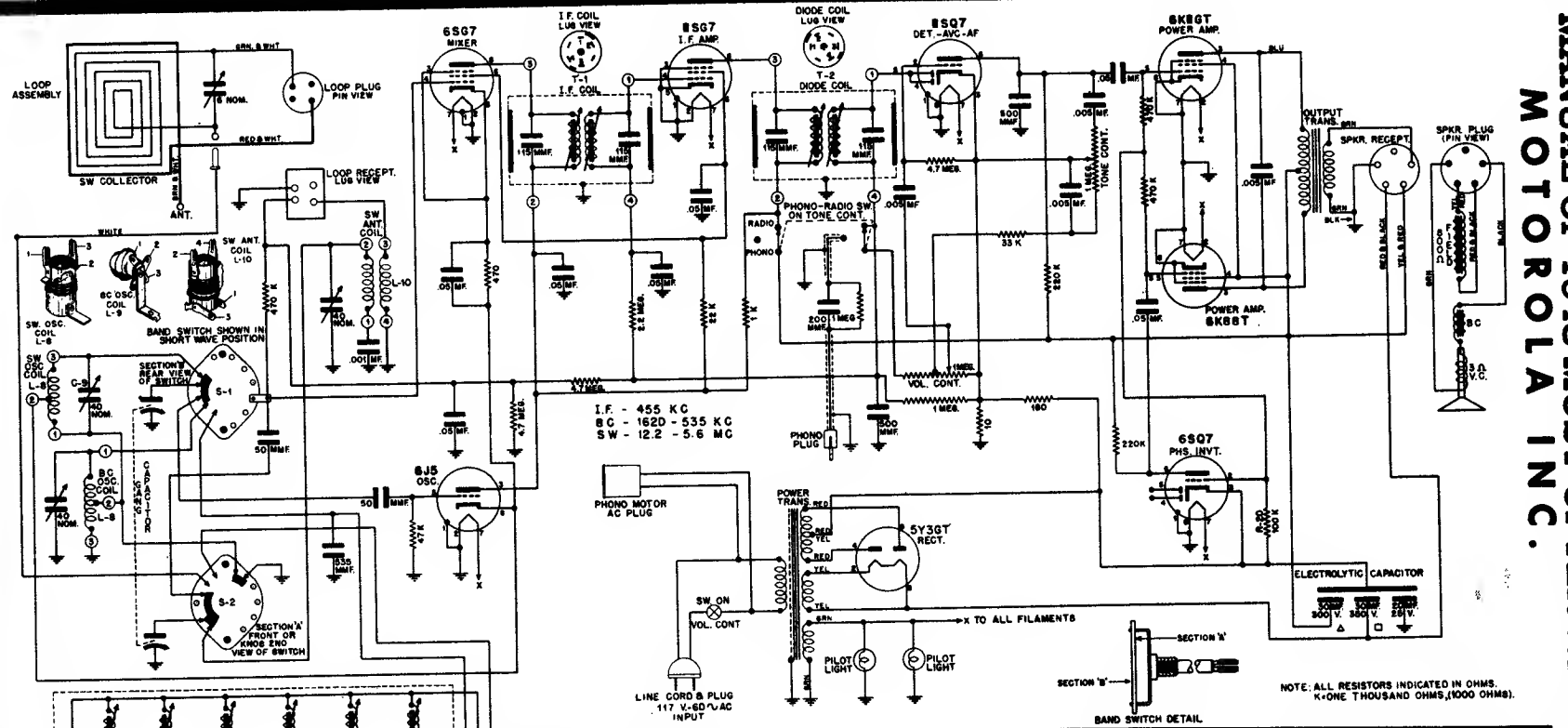
* A convenient point is the stator of the tuning capacitor.

** Close gang fully and set pointer to calibration mark at left hand side of dial background, then set to 1600 Kc by setting pointer at right hand calibration mark.

*** Connect output of signal generator to a 5" diameter, 3 turn loop and bring loop close enough to receiver loop to obtain output of 50 milliwatts (.40V) on output meter. Vary distance between loops to maintain this output during alignment. Minimum distance between loops should never be less than 12".



MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS
MOTOROLA INC.



VOLUME CONTROL ON FULL.

VOLTAGE TOLERANCE ±10%

RESISTANCE TOLERANCE ±20%

BAND SWITCH IN BC POSITION.

PHONO RADIO SWITCH IN RADIO POSITION

* MEASUREMENTS MAY VARY DUE TO ELECTROLYTIC CAPACITOR IN CIRCUIT.

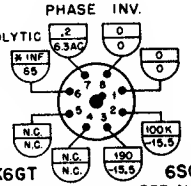
▭ = RESISTANCE MEASUREMENTS.

⌓ = VOLTAGE MEASUREMENTS

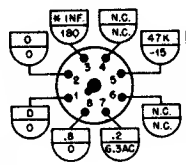
NOTE:- A V.T.V.M. WAS USED TO MAKE MEASUREMENTS. IF A 20,000 OHM PER VOLT METER IS USED ALL GRID & AVC VOLTAGES WILL READ LOWER.

MEASUREMENTS ARE MADE FROM TUBE BASE PIN TERMINALS TO CHASSIS.

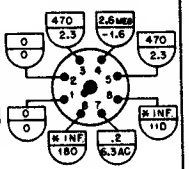
6SQ7 PHASE INV.



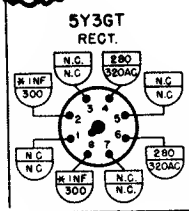
6J5 OSC.



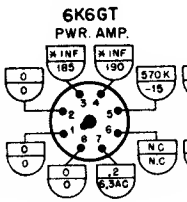
6SG7 MIXER



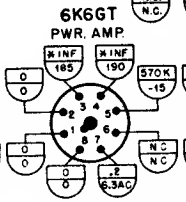
5Y3GT RECT.



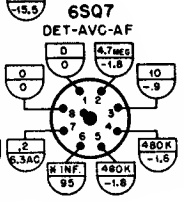
6K6GT PWR. AMP.



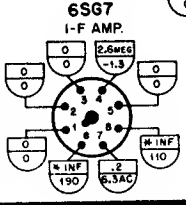
6K6GT PWR. AMP.



6SQ7 DET-AVC-AF



6SG7 I-F AMP.



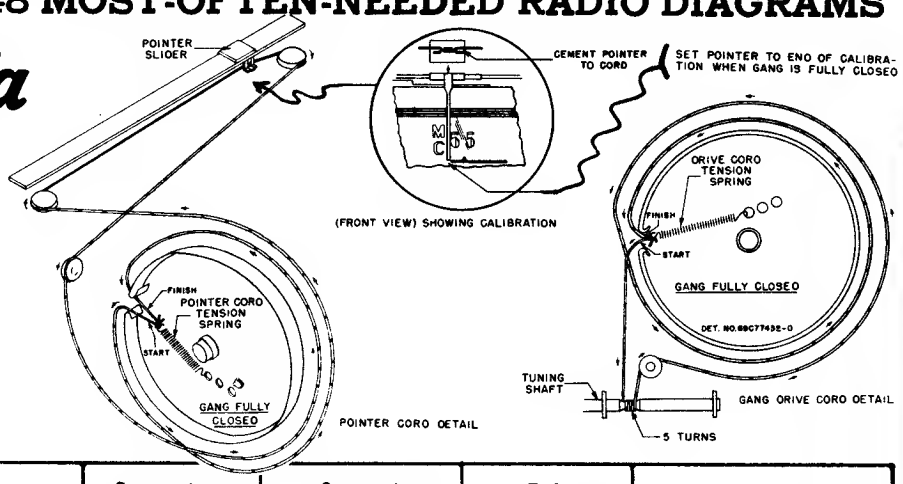
Motorola Model 85F21
Chassis HS-22

(Models 65F21, 85K21, Chassis HS-26, HS-52, are similar).

Motorola

Model 85F21
Chassis HS-22

(Schematic on previous page)

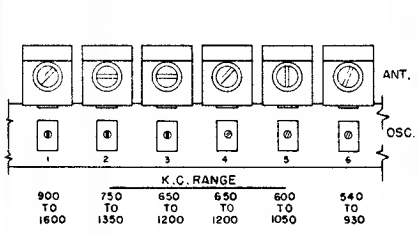


ALIGNMENT

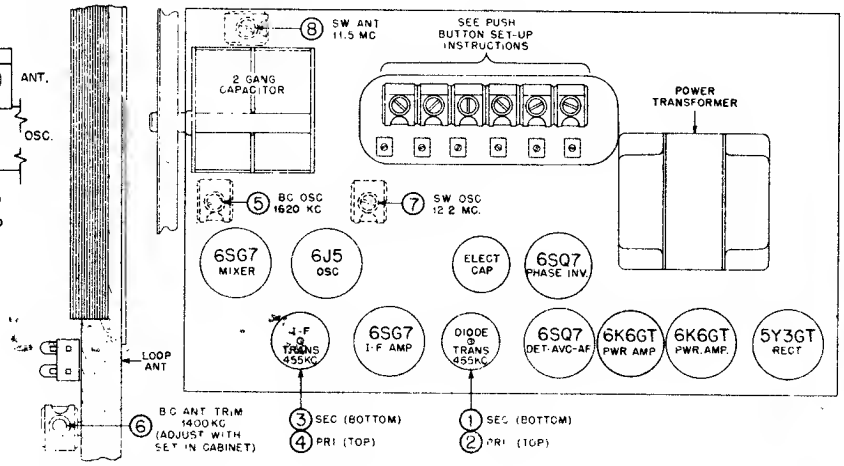
Step	Gang Setting	Band	Dummy	Generator Connected to	Generator Frequency	Trimmer or Core	Remarks
1	Fully opened	B.C	.1mf	Mixer grid & chassis	455 kc	1, 2, 3, &4	Adjust I.F. & Diode trans. for maximum
2	Fully opened	B.C	-	Radiation loop*	1620 kc	5	Set oscillator to dial scale
3	1400 KC	B.C	-	Radiation loop*	1400 kc	6 ‡	Tune signal generator for max. on output meter, then peak trimmer.
4	12.2 MC	SW	50mmf	Short wave antenna terminal	12.2 Mc	7	Set osc. to dial scale.
5	11.5 MC	SW	50mmf	Short wave antenna terminal	11.5 Mc	8	Tune signal generator for max. on output meter, then peak trimmer.

‡ Repeak after chassis and loop are installed in cabinet.

* Connect output of signal generator to a 5" diameter, 3 turn loop. With volume on full, bring loop close enough to receiver until output of 50 milliwatts is obtained. (.38V on output meter). Vary distance between generator and receiver loops to maintain this output during alignment. Minimum distance between loops should never be less than 12".

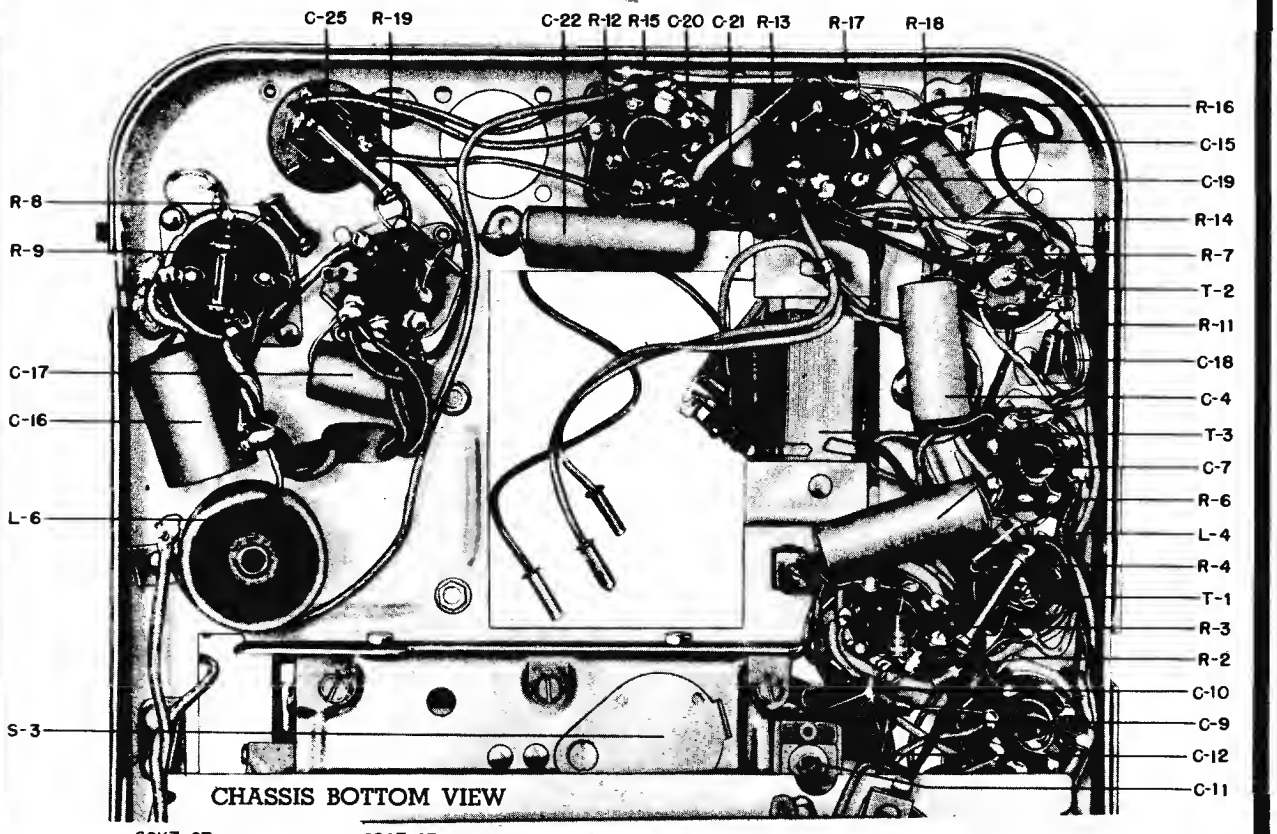


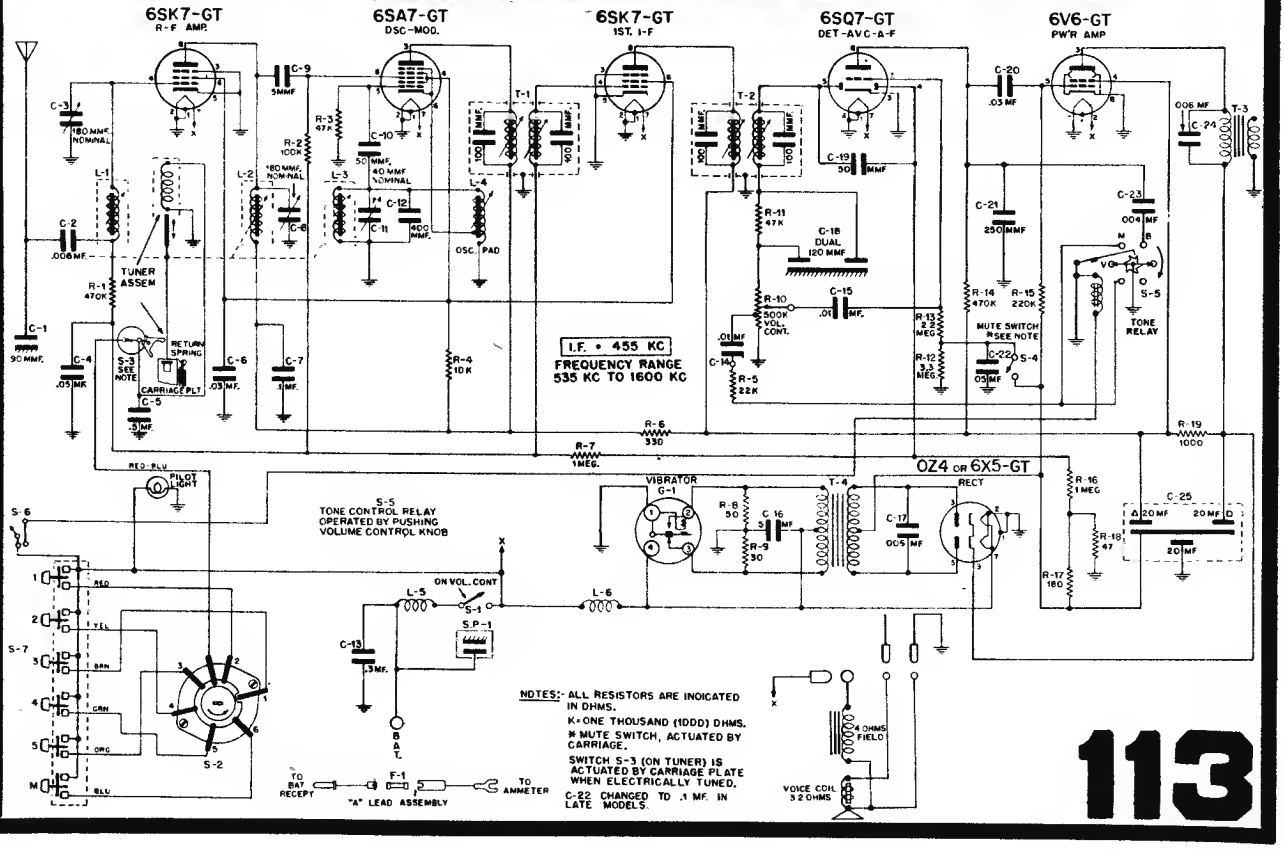
PUSH BUTTON SET-UP



MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

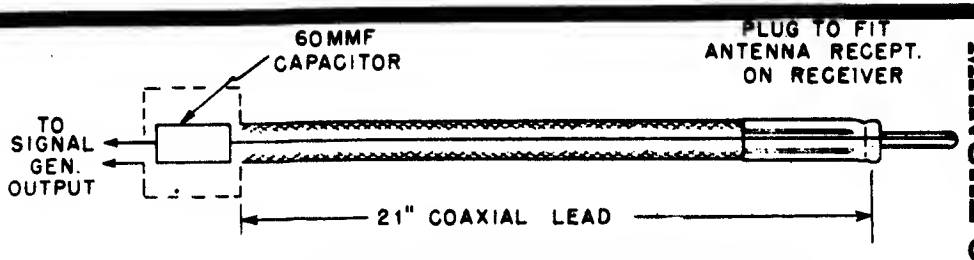
Motorola Model CT6 for Chevrolet (Many other Motorola Auto Sets for other cars are similar in some respects).





Motorola Auto Radio
Model CT6 for Chevrolet

Schematic on page 113.



DUMMY ANTENNA CONSTRUCTION DETAIL

STEP	TUNER POSITION SET TO	DUMMY ANTENNA	SIGNAL GENERATOR LEAD CONNECTED TO	SIG. GEN. SET AT	ADJUST FOR PEAK ON OUTPUT METER
1.	High frequency end (cores out)	.1 mfd. at Sig. Gen.	Osc. Mod grid (#5 pin)	455 Kc	#1 and 2 P & S in T-1 #3 and 4 P & S in T-2
2.	High frequency end, tuning shaft against stop. Cores should be set to project 1-1/8" from cans.*	60 mmf. at Sig. Gen. in series with 21" long coax lead	Antenna Receptacle	1600 Kc	#5 Osc. coil trimmer #6 R.F. coil trimmer #7 Ant. coil trimmer
3.	EXACTLY one full turn in from high frequency end. Use knob set screw as an indicator. Start measuring turn the moment tuner carriage starts moving inward.*	"	"	1425 Kc	#8 Osc. coil core #9 R.F. coil core #10 Ant. coil core
4.	EXACTLY four more full turns in (as indicated by knob setscrew)	"	"	Power turned Off.	#11 Osc. Pad. core for maximum noise

NOTE: If oscillator padder core adjustment is too far off, repeat alignment procedure, steps 2, 3, and 4 It may be necessary to repeat alignment more than once if padder adjustment has been indiscriminately tampered with.

5. Install assembled receiver in car and peak antenna trimmer (#7) to car antenna. Extend antenna to its full height. Tune set to a spot around 1400 kc that is free of stations, and adjust antenna trimmer (#7) for maximum noise.

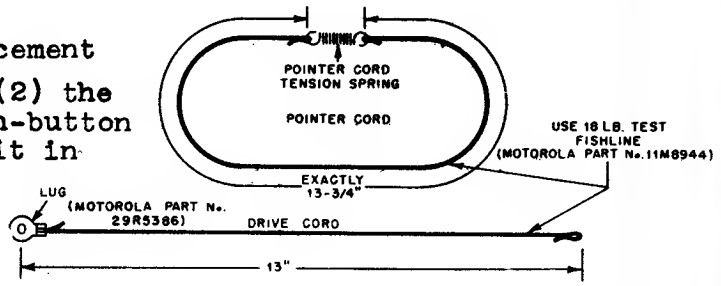
* For greater accuracy in setting tuner to alignment frequencies, use gauge (Motorola Part No. 66A76825)

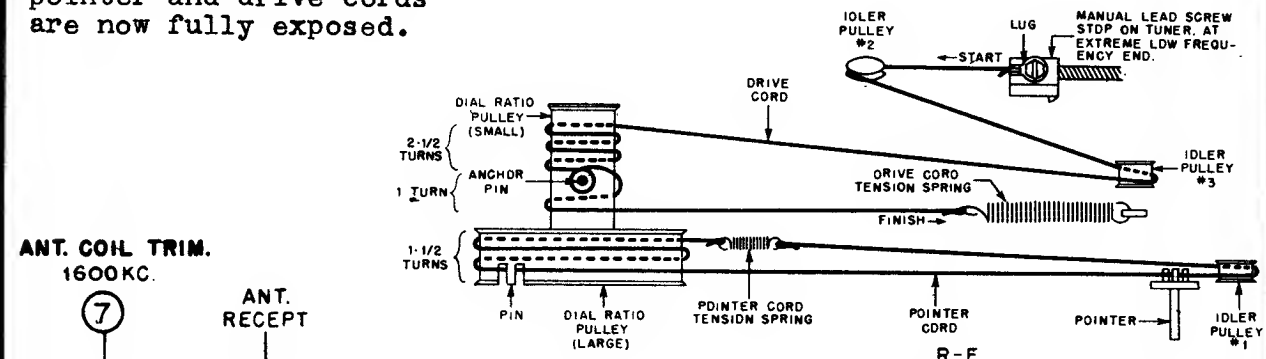
MOTOROLA Model CT6 for Chevrolet (See also pages 113, 114)

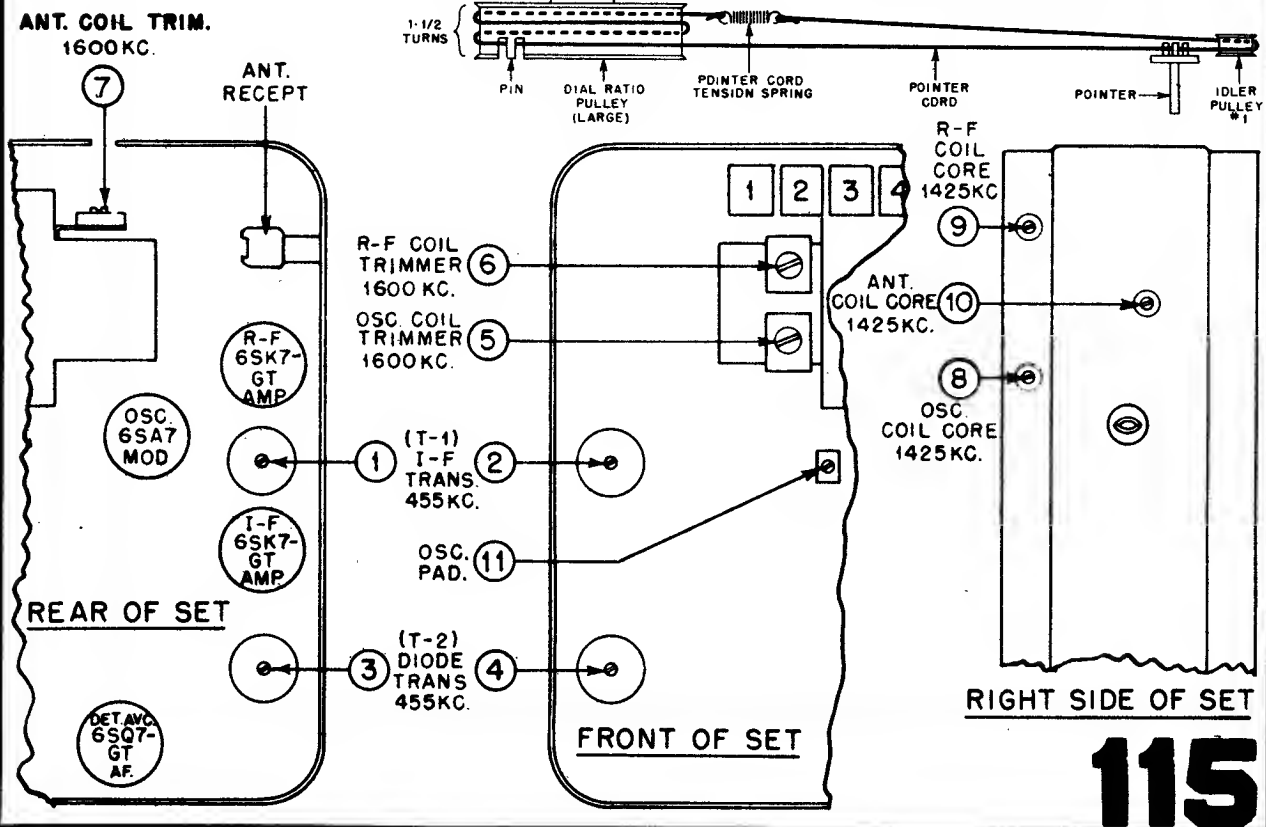
For alignment refer to chart on page 114, and trimmer location diagrams below. Use special tool, Motorola part No. 66A76278, for adjusting tuner cores. A small screwdriver will do for I.F. and R.F. alignment. Use dummy antenna as described on page 114. A low range output meter is required. Adjustment points shown below will be exposed after front and rear covers are removed. Allow receiver to warm up, press "M" button to place automatic tuner in manual tuning position. Volume control at maximum, tone control to voice position (high position).

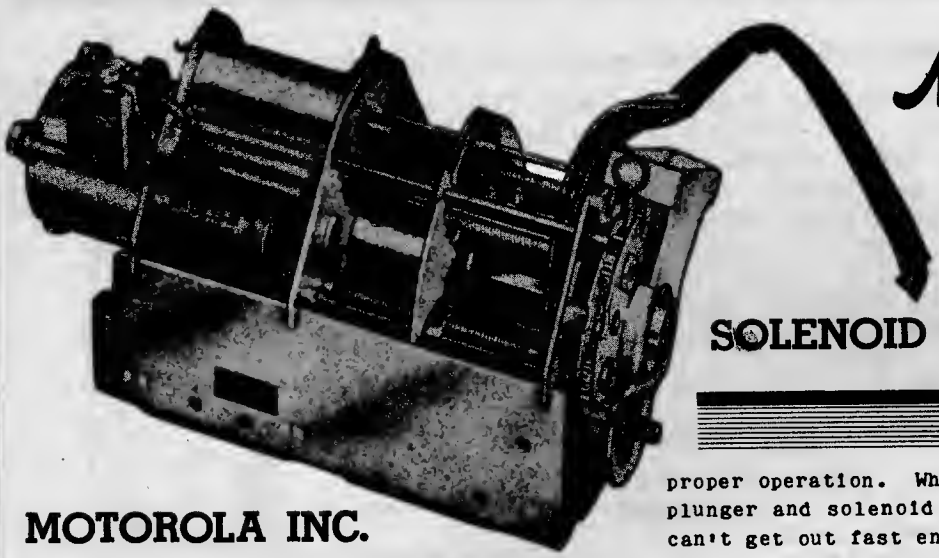
Pointer and Drive Cord Replacement

Remove (1) the front cover, (2) the dial background, and (3) push-button assembly. Four screws hold it in position. Do not unsolder any wire leads, just lay the push-button assembly on top of the set. The pointer and drive cords are now fully exposed.









Motorola

SOLENOID TUNER ST-56

MOTOROLA INC.

Solenoid Tuners ST-56 (ST-56 - CR6, ST-56 - FD6 etc.,) are used in 1946 and 1947 Motorola automatic tuning specific auto receivers.

Fundamentally, all ST-56 tuners are the same except for the manual tuning shaft, dial cord pulleys and pushbutton switch lead lengths. These variations are brought about by mechanical differences between the specific receivers in which this tuner is used. The receiver model number is included in the tuner model number to identify which specific receiver the tuner will fit, i.e., ST-56-CR7, ST-56-BK6 etc.

This is a 3 gang permeability type tuner operated by a solenoid. Five pre-set and one manual tuning positions are provided. The frequency range is 535 to 1600 kc. The pre-set positions can be set to any frequency within this range.

The tuner is designed to operate satisfactorily with 4-1/2 to 7.3 volts input. Before attempting any service work on a tuner that operates too slowly or one that doesn't operate at all, check the battery voltage directly at the receiver spark plate. Normally, this voltage is 6.3 volts. At the moment any pushbutton is pressed, the voltage at the spark plate should not drop to less than 4-1/2 volts. If the voltage is less than 4-1/2, it is an indication of poor wiring between the car battery and receiver or a defective car battery.

This tuner depends on "dash-pot" action between the plunger and the solenoid for proper operation. When the fit between the plunger and solenoid is too tight, the air can't get out fast enough. The result is a slow or sluggish operating tuner. All late production tuners have an adjustable air release in the solenoid end plate. Early production tuners that do not have this adjustable air release and operate sluggishly, due to dash-pot action, should have the solenoid end plate replaced with an end plate having the adjustable air release. Order part number 1X76556.

The tuner solenoid coil must be in a horizontal or near horizontal position or the tuner will not operate properly. If it is operated with the coil in a vertical position, the solenoid and carriage return spring may not be strong enough to operate tuner.

THEORY OF OPERATION

NOTE: Throughout this paragraph, it is suggested that constant reference be made to Figure 1.

When any push-button is pressed, current flows through the solenoid coil, causing the plunger to pull into the soil. Near the end of the plunger travel, through a ratchet mechanism inside the plunger, the selector switch shaft is rotated 60°, moving the selector switch and stop plate to their new position.

An instant later, the solenoid switch is opened breaking solenoid current and the carriage return spring then pulls the plunger out, closing the solenoid switch again. If the selector switch is now resting at the position selected by the push-button (cut away section of selector switch resting in front of contact selected by push-button), the solenoid plunger will continue to be pulled out until the stop plate is resting on the selected lead screw stop. In the event the selector switch

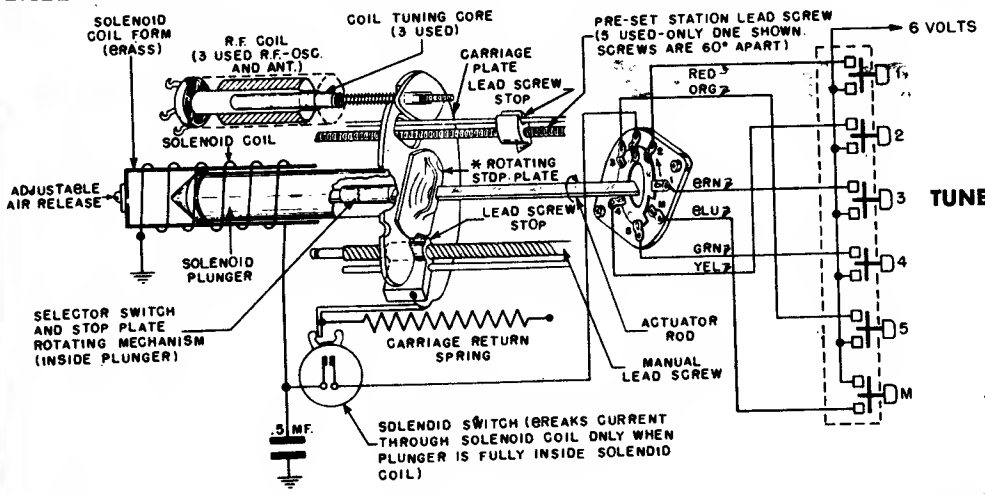


FIGURE 1.

TUNER FUNCTIONAL DETAIL

is not resting in the position selected by the push button when the solenoid plunger is on its return trip, the moment the plunger moves out far enough to actuate the solenoid switch, current will again flow through solenoid causing the plunger to be pulled in again. The plungers inward motion again rotates the stop plate and selector switch through another 60°. This last operation is repeated automatically until the selector swtich comes to rest at the position selected by the push-button, at which time the solenoid circuit is opened and the plunger moves out until the stop plate is resting on the selected lead screw stop. The stops are adjusted to the desired positions during the station setting up procedure, through the set-up gear train assembly.

Refer to Figure 2 for mechanics behind station setting-up mechanism detail.

When the button on which a station is to be set up is first pressed, the tuner operates and the stop plate comes to rest against the selected lead screw stop. The pressure of the stop plate against the lead screw stop moves the lead screw forward until its shoulder rests against the tuner and plate. The square end of the lead screw does not engage in the square hole of the set-up gear until the set-up button is pushed in or the station set-up knob is turned (whichever is applicable). A latch on one end of the detent lever engages the gear lever, holding the set-up gear train in contact with the selected lead screw. Now the selected lead screw stop can be moved on its lead screw by turning the manual tuning shaft. None of the other lead screws turn because the stop plate is not resting against them. After the button is set up, pressing any other button will unlatch the gear lever and disengage the lead screw from the set-up gear. See Figure 2.

Since the coil tuning iron cores are attached to the carriage plate and move in unison with the plunger, the point at which they are brought to a stop (by means of the lead screw stop) determines the frequency to which the coils are tuned.

Dash-pot action between the plunger and the solenoid determines the tuner operating speed. The rate at which air is allowed to enter or escape through the adjustable air release determines the speed of the plunger. See Figure 1.

TO REMOVE TUNER FROM CHASSIS

Should it become necessary to remove the solenoid tuner from the receiver chassis, proceed as follows:

1. Remove the covers from the set, completely exposing the chassis.
2. Mark all leads connecting tuner to receiver.
3. Disconnect all leads connecting tuner to receiver. Do not unsolder leads from the tuner selector switch; unsolder them at the push-switch. The .5 mf paper capacitor need not be removed.
4. The tuner is held to the chassis by self-tapping screws driven into the sides of the tuner. Do not remove any other screws.

The speed at which the tuner operates is governed by dash-pot action of the solenoid plunger within the closed solenoid coil form. The rate at which air is allowed to enter or escape determines the speed of the plunger.

AIR RELEASE ADJUSTMENT

An adjustable air release is provided on all late production tuners. See Fig. 3. To adjust, loosen the screw and move the eccentric washer which covers the air release hole to expose or cover more of the air release hole as required. Early production tuners did not have a solenoid end plate with an adjustable air release. If such a tuner is slow or sluggish because of too much "daah-pot" action, replace the solenoid end plate with the adjustable air release type. Order part number 1X76556.

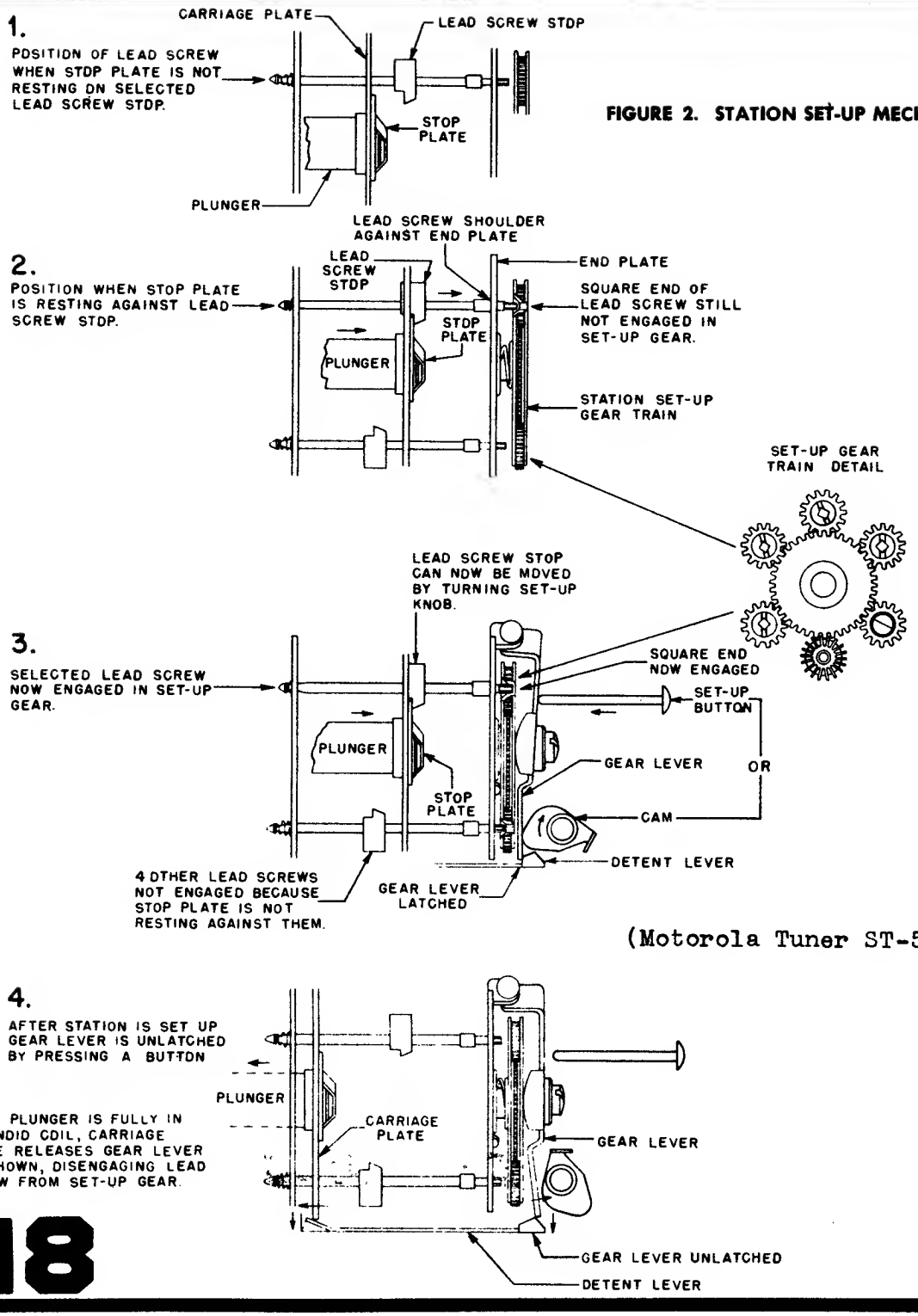


FIGURE 2. STATION SET-UP MECHANISM

(Motorola Tuner ST-56)

END VIEW OF TUNER

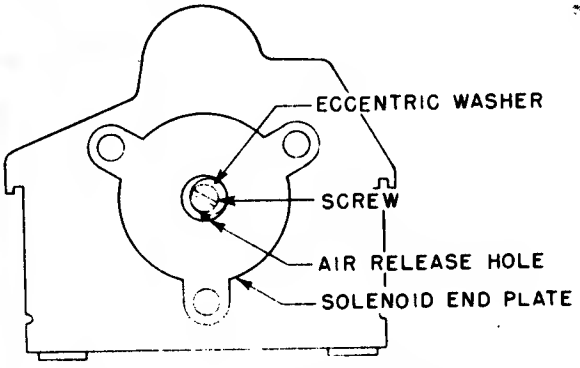


FIGURE 3. AIR RELEASE ADJUSTMENT

1. If tuner operates too slowly, open the air release hole. Open it only far enough to secure reliable operation. Too little "dash-pot" action (air release open too much) may cause the plunger to hammer and sometimes even to make the tuner operate continuously due to the selector switch rotor being turned so rapidly as to overshoot its contacts.

2. If the tuner operates too rapidly increase dash-pot action by closing the air release hole slightly. Close it only enough to eliminate hammering.

PLUNGER RATCHET ADJUSTMENT

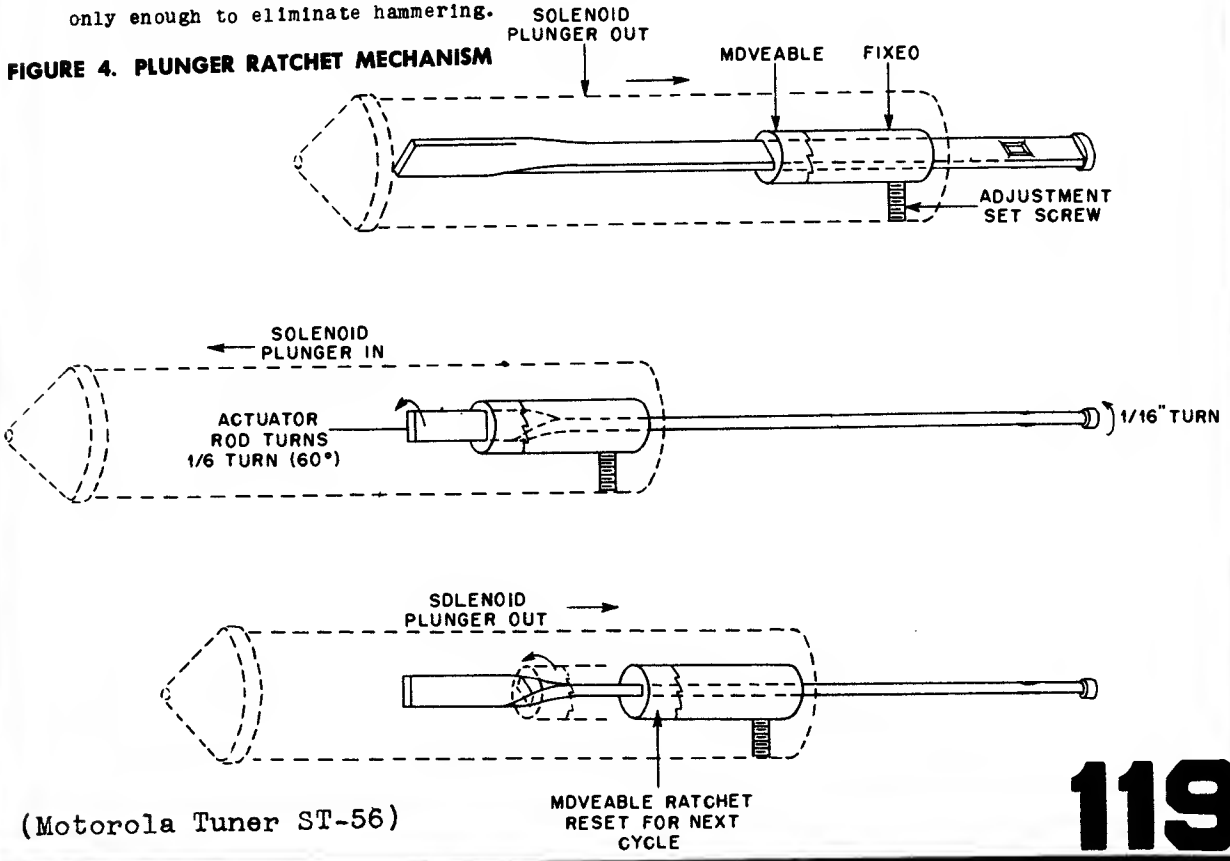
The plunger ratchet mechanism in Figure 4. This mechanism rotates the actuator rod which, in turn, rotates the carriage stop plate and the selector switch 60° for each inward motion of the plunger.

If this adjustment is incorrect, tuner may operate continuously once current is applied.

Correct ratchet adjustment is indicated when 1/64 to 1/32" clearance is observed between selector switch contacts and the selector switch rotor as shown in Figure 5. Slowly work the plunger by hand and observe clearance at each contact position. If the average clearance is not 1/64 to 1/32", correction can be made by loosening ratchet adjustment setscrew and turning actuator rod by hand until correct clearance is observed.

Before ratchet adjustment setscrew is finally tightened, push fixed ratchet 1/32" back into plunger. This increases spring tension against rotating ratchet, thus insuring more positive operation.

FIGURE 4. PLUNGER RATCHET MECHANISM



(Motorola Tuner ST-56)

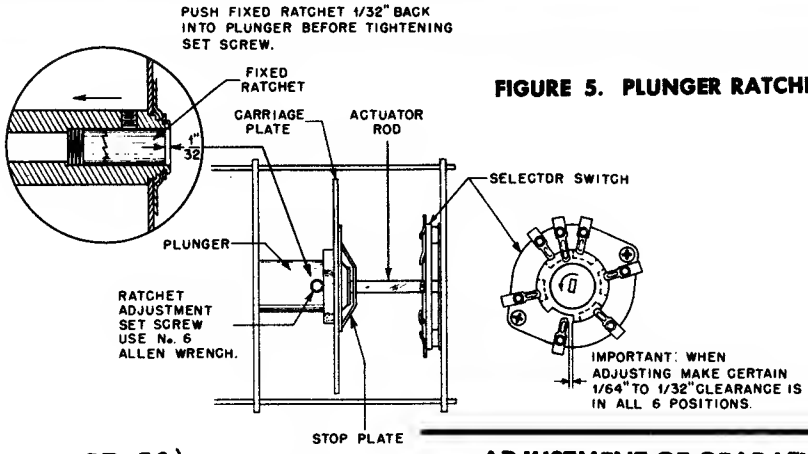


FIGURE 5. PLUNGER RATCHET ADJUSTMENT

(Motorola Tuner ST-56)

SOLENOID SWITCH TRIP ADJUSTMENT

The solenoid switch tripping mechanism should be adjusted as shown in Figure 6.

If the solenoid switch is tripped too early, the ratchet mechanism may fail to operate; if it trips too late, the plunger may hammer violently or should the solenoid switch fail to trip, the plunger would be held within the solenoid.

ADJUSTMENT OF GEAR LEVER LATCH

The gear lever latch holds the station set-up gear train in position while setting up stations. Failure of the latch to engage properly when the set-up button is pushed in or the station set-up knob is turned (whichever is applicable) would result in the inability to set up pre-set stations. Failure of the latch to disengage after station is set up would result in faulty automatic tuning because the lead screws might not seat themselves properly against the tuner end plate. Figure 7 above shows the latch detail and adjustment.

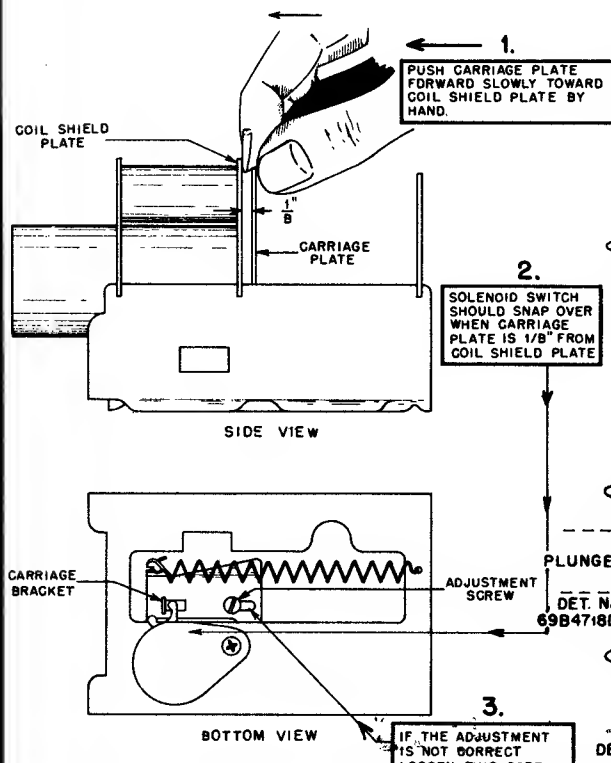


FIGURE 6. SOLENOID SWITCH ADJUSTMENT

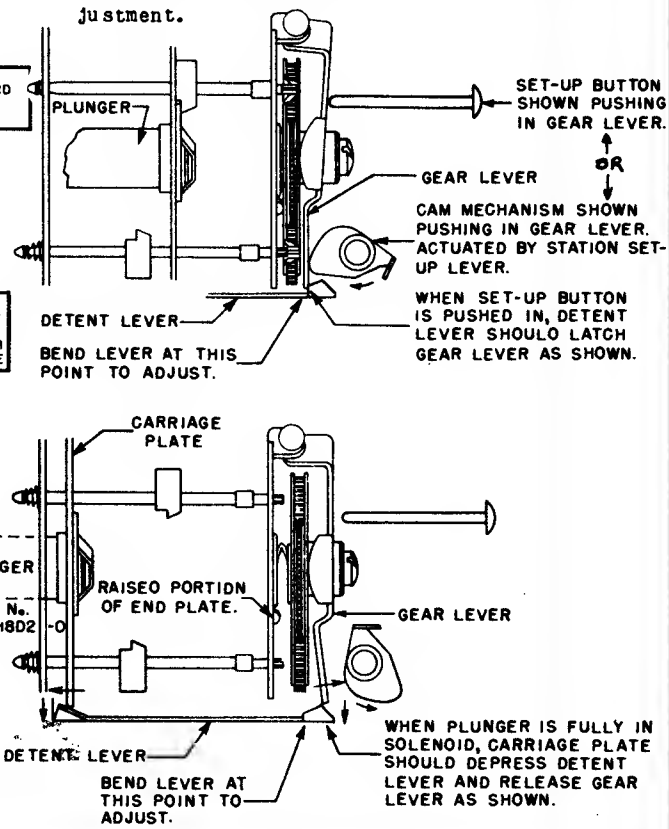


FIGURE 7. GEAR LEVER LATCH ADJUSTMENT

SERVICE NOTES

FAILURE OF SOME LEAD SCREW TO ENGAGE IN SET-UP GEARS

If some of the lead screws fail to engage in the set-up gears during station setting up procedure, check the gear lever to see if it is bent. When the set-up button is pushed in and the gear lever latches on the detent lever, the set-up gear train should be parallel with the tuner end plate and the bottom of the gear train should be resting on the raised portions of the tuner end plate.

LUBRICATION

Should lubrication ever be required, it is recommended that a very fine grease, commercially called Lubriplate, or its equivalent, be used.

Remove all old and sticky lubricant with a solvent such as carbon tetrachloride and then, very sparingly, lubricate only the following points:

1. Carriage guide rods.
2. Actuator rod.
3. Manual lead screw.

Do not lubricate or permit lubricant to get on Selector Switch contacts. The friction drag is required for proper operation of tuner.

LEAD DRESSING

Make sure that the selector switch and solenoid coil leads are dressed so that carriage plate does not rub against them. Leads rubbing against the carriage plate may cause the tuner to stick, especially at the high frequency end.

REPLACEMENT OF SOLENOID COIL OR SOLENOID PLUNGER

Should replacement of the solenoid coil or solenoid plunger be required, it will be necessary to replace the entire tuner. A close fit between solenoid plunger and solenoid coil form is required; a proper match can only be secured at the factory. When service of this kind is required, return the tuner to the factory for exchange.

TO REPLACE ANT. R.F., OR OSC. COILS

IMPORTANT: When ordering replacement coils, order by part number and also specify the color coding (paint dots) on old coil. THE REPLACEMENT COIL SHOULD CARRY THE SAME COLOR CODING AS THE ORIGINAL OR THE TUNER WILL NOT TRACK PROPERLY.

1. If coil is not readily accessible remove the tuner from the chassis as outlined under "TO REMOVE TUNER FROM CHASSIS."
2. Unsolder the two lugs holding the coil to the tuner plate.
3. Carefully remove the old coil. Save the thin paper washer that is found at the base of the coil.
4. Slip the paper washer over the replacement coil and slip coil into shield can.
5. Orient coil so its lugs are in same position as before and resolder to tuner plate.
6. Reassemble tuner and install in receiver.
7. Realign ANT., R.F. and OSC. stages per instructions found in the receiver service manual.

TO REPLACE ANT. R.F. OR OSC COIL TUNING CORES

1. The core which tunes the top coil is readily accessible and presents no replacement problem. To reach the two bottom coil tuning cores, remove the tuner from the chassis base as outlined under "TO REMOVE TUNER FROM CHASSIS."
2. Remove the carriage return spring.
3. Move the carriage plate back as far as it can go. The tuning cores can now be screwed "out" or "in" by grasping the portion that sticks out the back of the coil. When installing a new core, make sure that the insulating washer and adjustment clip are replaced properly. The insulating washer goes on the core side; the core adjustment clip has an ear on it and this ear must fit into a hole in the bakelite insulator on the carriage plate. Refer to Figure 8.
4. Replace the carriage return spring.
5. Install tuner in receiver.
6. Realign ANT., R.F. and OSC. stages following the instructions found in the receiver service manual.

(Motorola Tuner ST-56)

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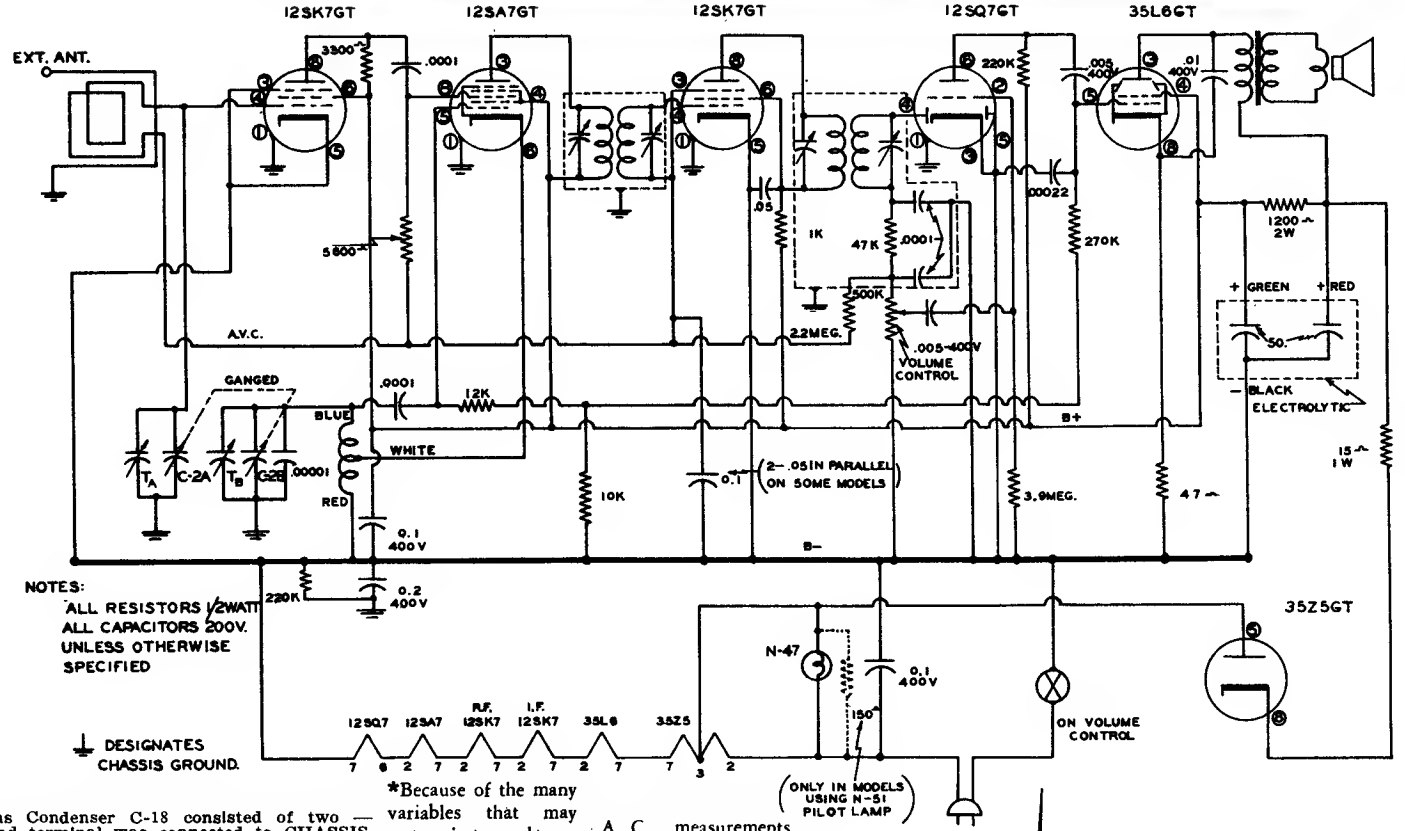
N. U. "PRESENTATION" RADIO

MODEL G-619

NATIONAL UNION RADIO CORPORATION



NOTES:
ALL RESISTORS 1/2WATT
ALL CAPACITORS 200V. UNLESS OTHERWISE SPECIFIED

HUM MODULATION:

On Early Production runs Condenser C-18 consisted of two — .05 mfd. units. One ground terminal was connected to CHASSIS, the other to B—. Disconnect the CHASSIS terminal of the .05 Condenser now connected to Pin No. 1 of the 12SA7GT tube and connect this lead to Pin No. 5 of either of the 12SK7GTs or to any other convenient B— point. This effectively by-passes the A.C. Modulation hum to B— instead of to Chassis.

OSCILLATION:

Remove one side of Resistor R-2 (in grid circuit of 12SA7GT) now connected to A.V.C. bus and reconnect to cathode (#5 pin) of I.F.—12SK7GT.

AVERAGE VOLTAGES*

PIN NO.	R.F. 12SK7GT		CONV. 12SA7GT		I.F. 12SK7GT		DET. 12SQ7GT		PWR. AMP. 35L6GT		RECT. 35Z5GT	
	A.C.	D.C.	A.C.	D.C.	A.C.	D.C.	A.C.	D.C.	A.C.	D.C.	A.C.	D.C.
1	Zero		Zero		Zero		Zero		Zero		Zero	
2	25.0		13.0		37.0			—0.65	51.5		117.0	
3	Zero			72.0		—0.6	Zero			91.0	111.0	
4		—0.6		72.0		—0.6		—0.55		72.0	Zero	
5	Zero			—5.2	Zero		Zero			—0.4	111.0	
6		72.0	Zero			64.0		55.0		—2.1	Zero	
7	37.0		25.0		51.5		Zero		85.5		85.5	
8		43.0		—0.55		64.0	13.0			1.3		96.0

*Because of the many variables that may enter into voltage measurements it is impractical to indicate ABSOLUTE values of voltage. Readings must necessarily be AVERAGE voltages and even these are subject to a ±10% variation.

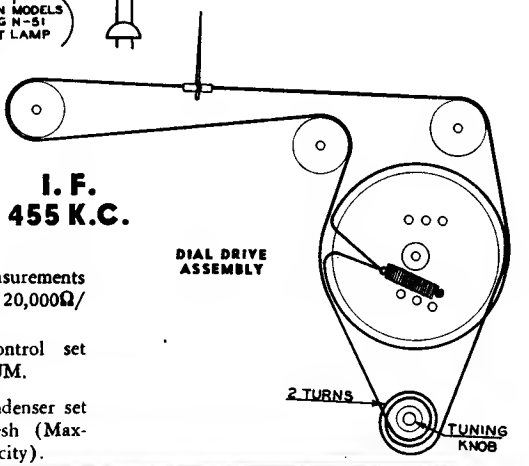
A.C. measurements shown are at 1,000Ω/volt.

Readings are taken from SOCKET PINS TO COMMON NEGATIVE while viewing socket from the BOTTOM.

D.C. measurements shown are at 20,000Ω/volt.

Volume Control set at MINIMUM.

Tuning Condenser set at Full Mesh (Maximum Capacity).



ARVIN Model 140P
Chassis RE-209
Noblitt-Sparks In.

VOLTAGE & RESISTANCE MEASUREMENTS FROM SOCKET TERMINALS TO FLOATING GROUND

WITH SLIDE SWITCH IN ELECTRIC POSITION

TUBE	VOLTAGE 1	2	3	4	5	6	7	8	RESISTANCE 1	2	3	4	5	6	7	8
1R5	2.8	95	48	**	2.8	*1.8	4.2		39	3.5K	25.5K	100K	39	4.3M	50	
1U4	0	95	95	*1.8	0	0	1.4		0	3.5K	3.5K	4.3M	0	10M	22	
1S5	2.8	0	*2	*20	*50	*1	1.4		39	Inf.	1M+	4.75M	333.5K	4.7M	22	
3V4	4.2	95	95	7	5.6	0	7		50	3.5K	3.5K	65	60	2.2M	65	
OY4	0	0	+DC	117AC	117AC	0	120	120	330K	Inf.	Inf.	Inf.	Inf.	Inf.	1889	1889

WITH SLIDE SWITCH IN BATTERY POSITION

1R5	3.0	90	48	**	3.0	*1.8	4.5		39	*	**	100K	39	4.3M	50	
1U4	0	90	90	*1.8	0	0	1.5		0	*	*	4.3M	0	10M	22	
1S5	3.0	0	*2	*20	*50	*1	1.5		39	Inf.	1M+	4.75M	390K	4.7M	22	
3V4	4.5	90	90	0	6.0	0	7.5		50	*	*	680	60	2.2M	72	
OY4	0	0	0	0	0	0	0	0	330K	Inf.	10.3M	330K	330K	Inf.	2.5K	2.5K

All voltage measurements are made with a line voltage of 117V AC or a battery having 90 VB and 7.5 VA; with no signal using a 1000 ohm per volt voltmeter and are +DC unless otherwise indicated.

* Measured with a vacuum tube voltmeter.

** The oscillator voltage measured with a vacuum tube voltmeter from the oscillator grid to floating ground will vary from approx. —6V with the variable condenser closed to —12V with the condenser open. The true oscillator voltage measured from the grid to the negative filament lug should be from —10 to —20V.

* The resistance reading at this point is the leakage across the electrolytic condenser and will vary with different condensers and different ohmeters. With the negative lead of the ohmeter to floating ground. the reading may vary anywhere from 50K to 1M depending on the type meter used.

** 22K higher than the electrolytic condensers leakage

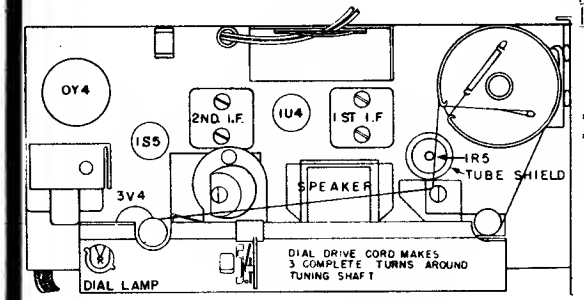
K equals 100 ohms

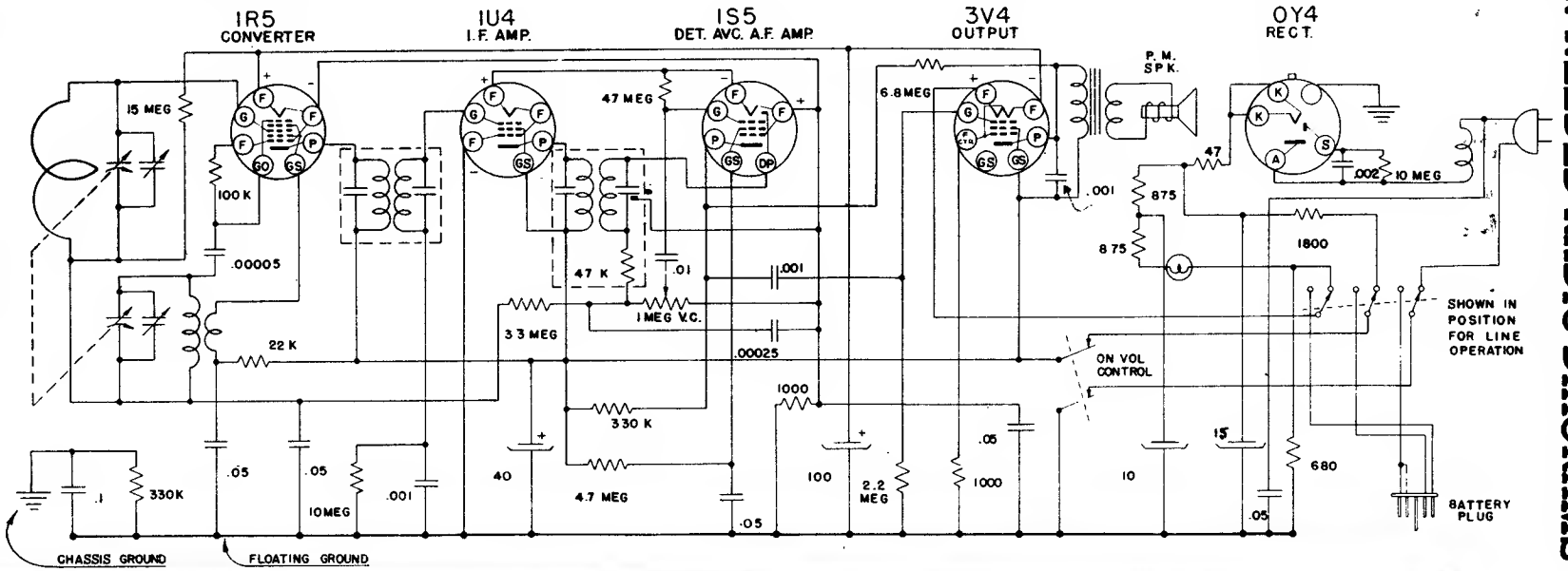
M equals 1 megohm

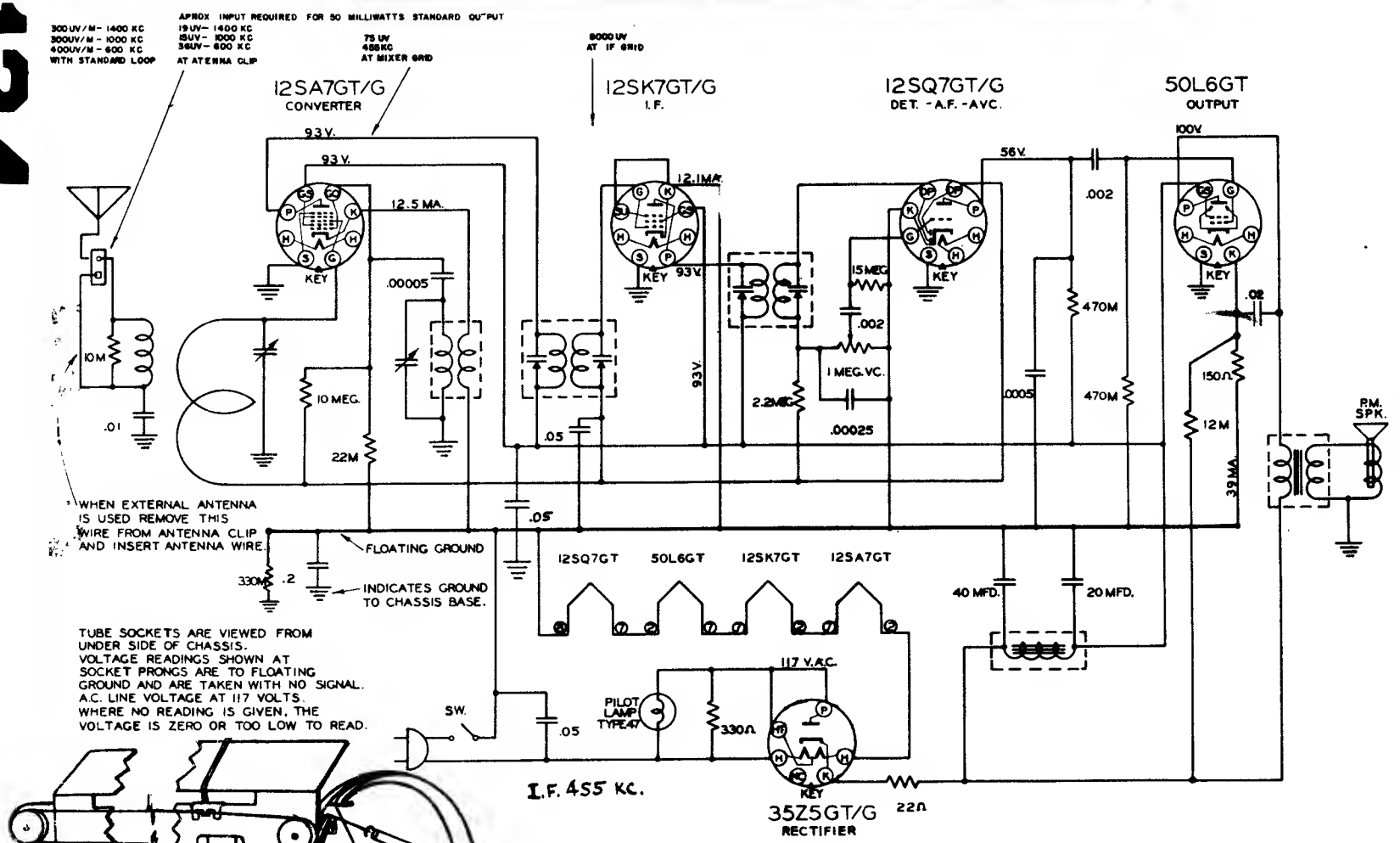
FREQUENCY RANGE

Broadcast ..... 540-1600 kc

IF ..... 455 kc

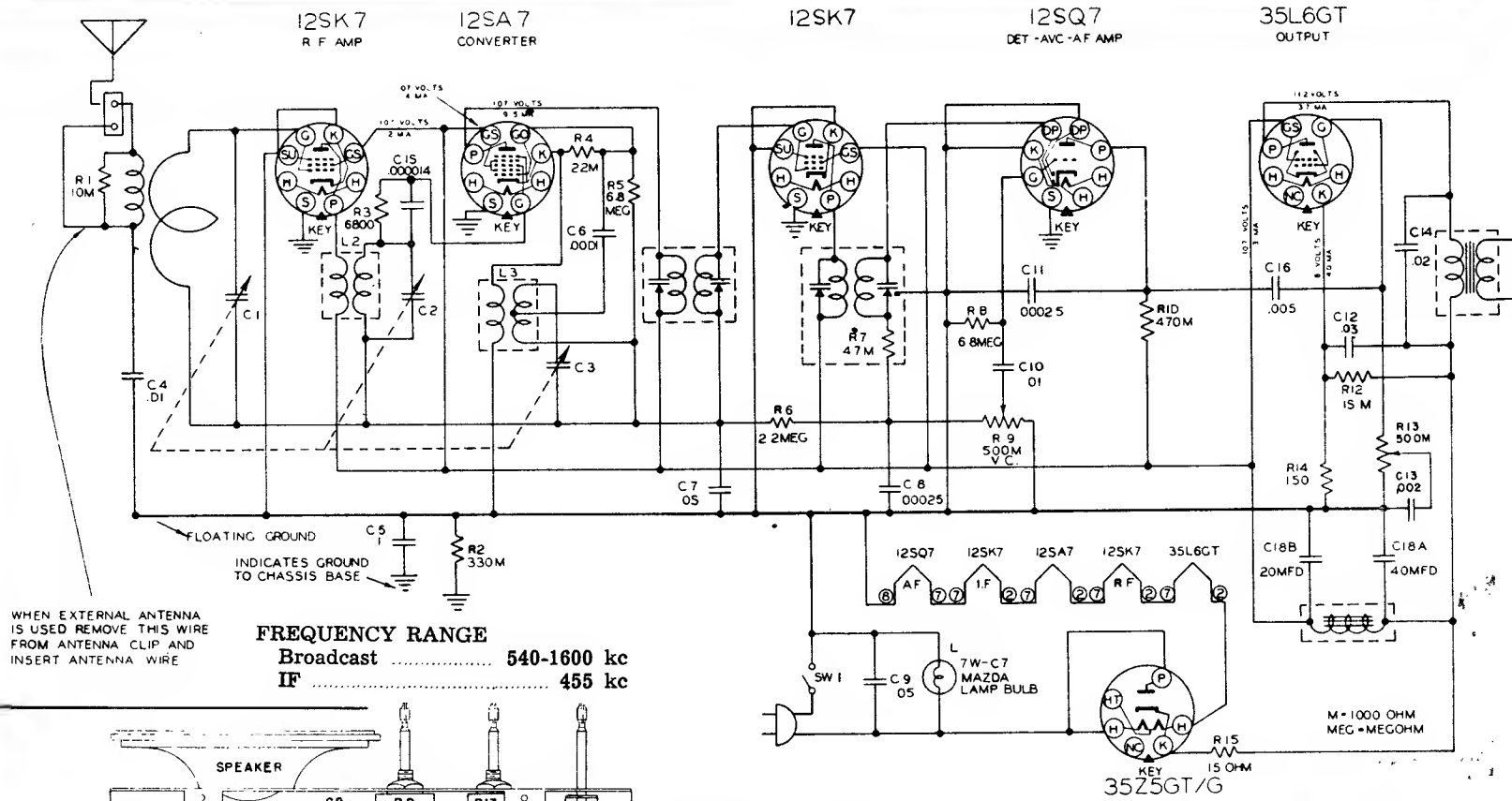






FOR ARVIN RADIOS
MODELS 555; 555A; 552N; & 552AN
CHASSIS RE-202 AND RE-231
5 TUBE AC-DC

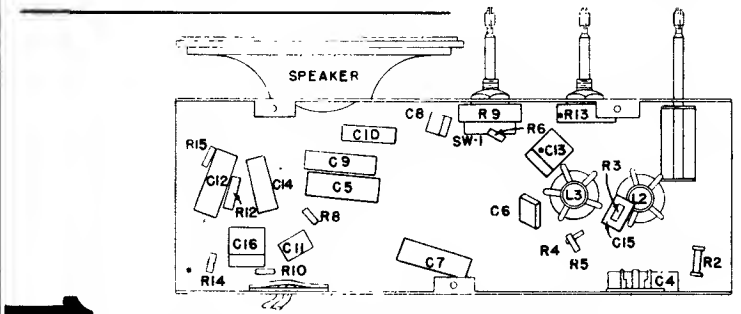
MANUFACTURED BY NOBLITT-SPARKS INDUSTRIES, INC., COLUMBUS, IND.



WHEN EXTERNAL ANTENNA IS USED REMOVE THIS WIRE FROM ANTENNA CLIP AND INSERT ANTENNA WIRE

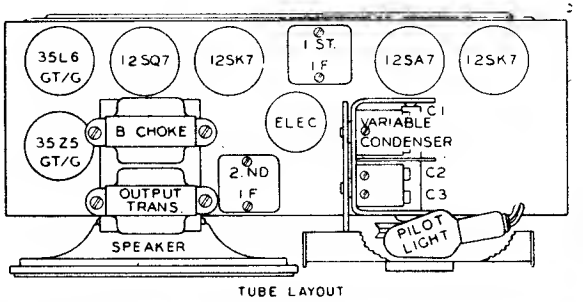
FREQUENCY RANGE

Broadcast	540-1600 kc
IF	455 kc



LOCATION OF PARTS UNDER CHASSIS

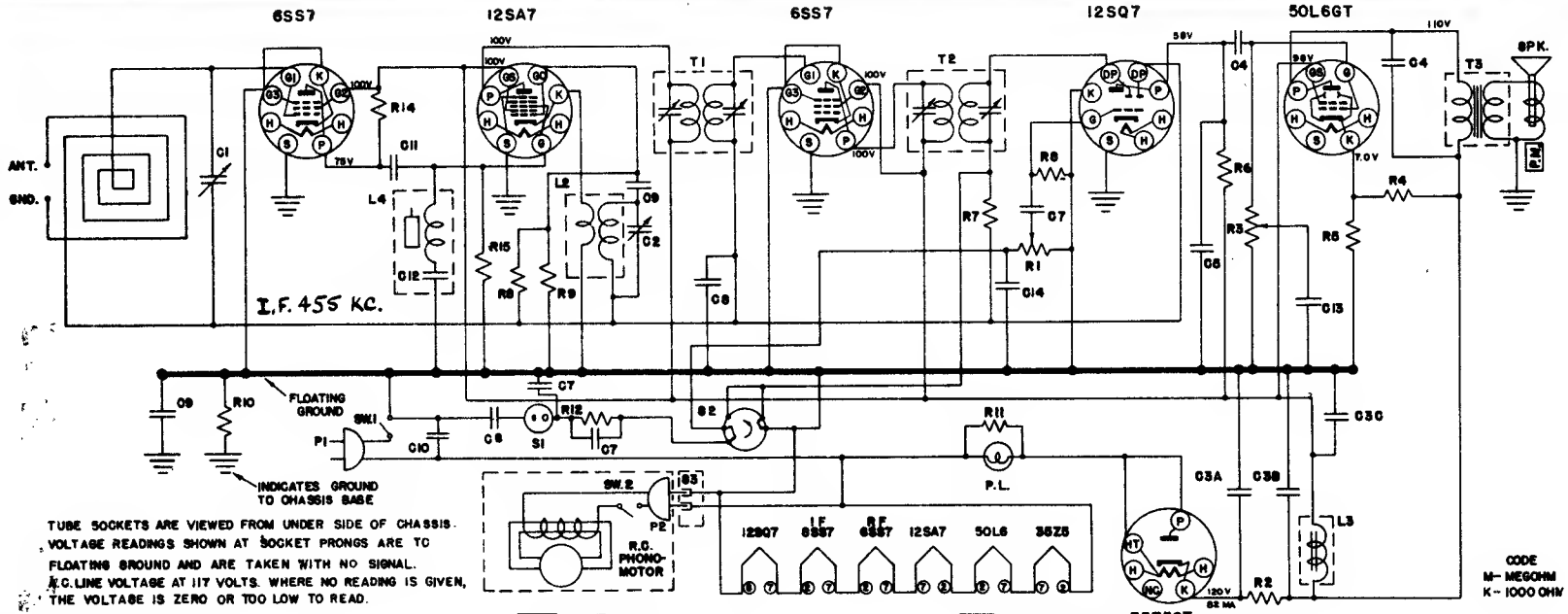
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS VOLTAGE READINGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL.



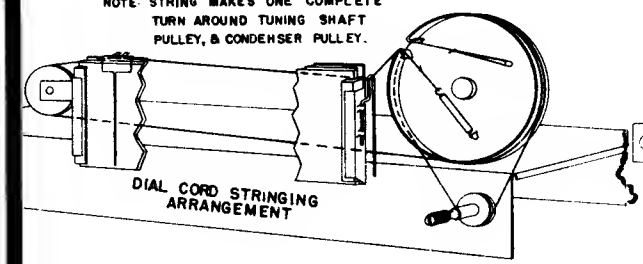
TUBE LAYOUT

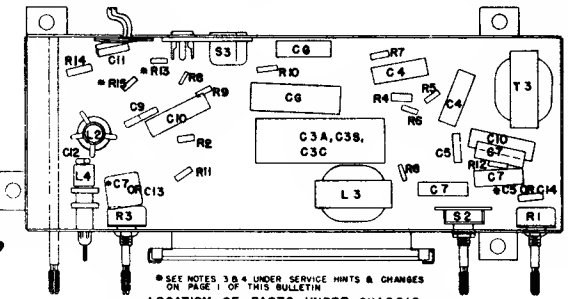
ARVIN RADIO MODEL 6640
CHASSIS RE-206-2, 6 TUBE AC-DC

MANUFACTURED BY NOBLITT - SPARKS INDUSTRIES, INC., COLUMBUS, IND.



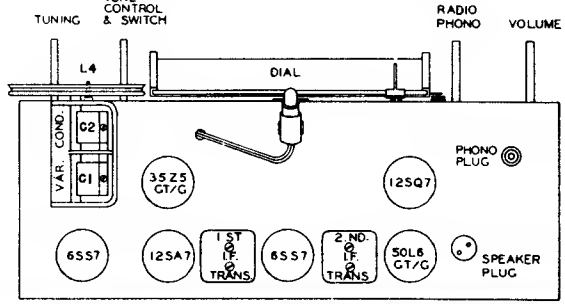
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL. A.C. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.





* SEE NOTES 3 & 4 UNDER SERVICE HINTS & CHANGES ON PAGE 1 OF THIS BULLETIN

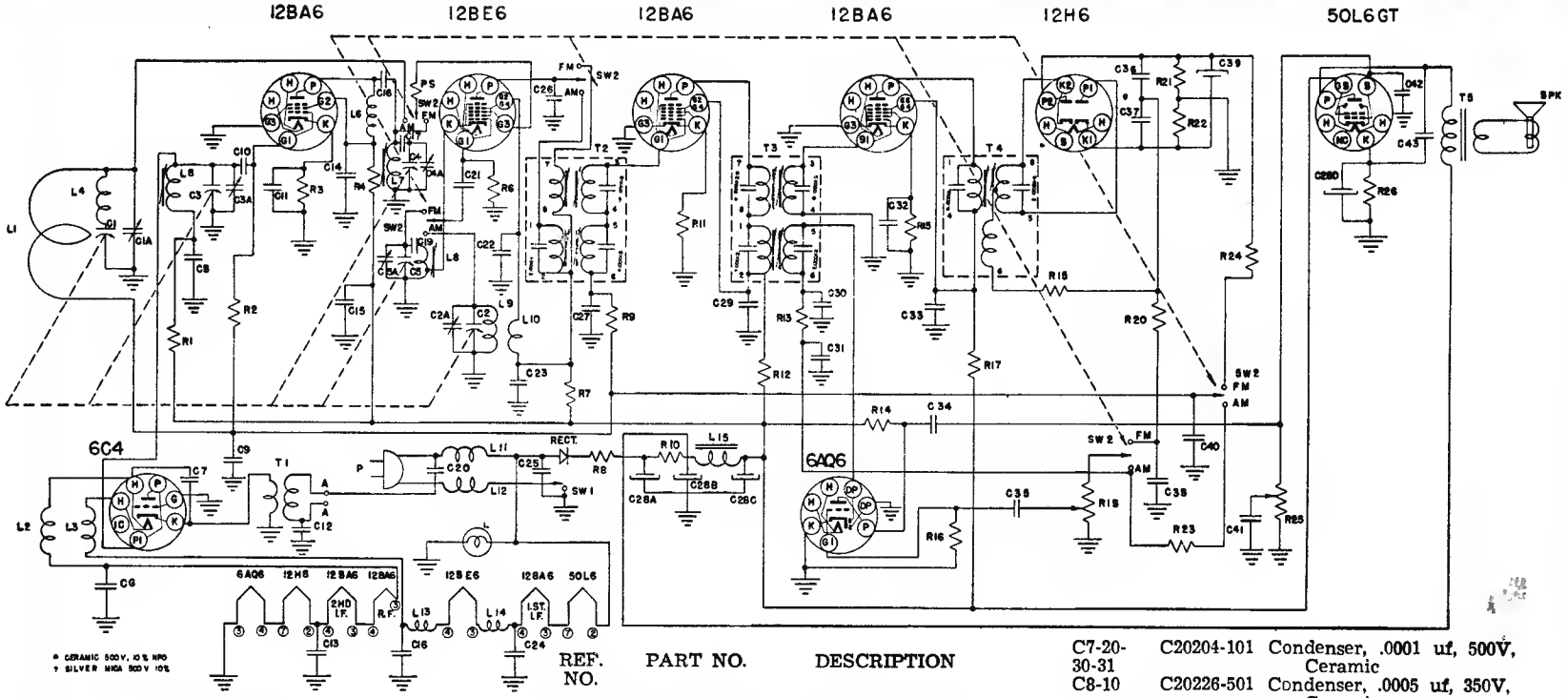
LOCATION OF PARTS UNDER CHASSIS



TUBE LAYOUT OUTLINE

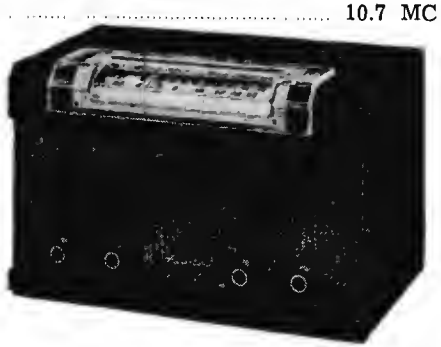
ARVIN Model 665
Chassis RE-229
Noblitt-Sparks

REF. NO.	PART NO.	DESCRIPTION
R1	C19582	Volume Control - 1 meg.
R2	C20060-150	Resistor, 15 ohm
R3	C19946	Tone Control & Switch
R4	C20070-123	Resistor, 12,000 ohm - 1 W.
R5	C20060-151	Resistor, 150 ohm
R6	C20060-474	Resistor, .47 meg.
R7	C20060-225	Resistor, 2.2 meg.
R8	C20060-156	Resistor, 15 meg., ½ W.
R9	C20060-223	Resistor, 22,000 ohm
R10	C20060-334	Resistor, 330,000 ohm
R11	C20060-331	Resistor, 330 ohm
R12	C20060-224	Resistor, .22 meg.
R13	C20060-105	Resistor, 1 megohm
R14	C20060-222	Resistor, 2200 ohm, ½ W.
R15	C20060-104	Resistor, 100,000 ohm, ½ W.
C1,C2	C19584	Var. Condenser, 2 gang
C3C		Elect. Cond., 40 uf, 150 V.
C3B	A19780	Elect. Cond., 20 uf, 150 V.
C3A		Elect. Cond., 10 uf, 150 V.
C4	C20068-103	Condenser, Paper, .01 uf, 400 V.
C5	C20065-501	Condenser, .0005 uf, 500 V.
C6	A19765	Condenser, .2 uf, 400 V.
C7	C20068-202	Condenser, Paper, .002 uf, 400 V.
C8	C20067-503	Condenser, .05 uf, 200 V.
C9	C20065-500	Condenser, Mica, .00005 uf, 500 V
C10	C20068-503	Condenser, .05 uf, 400 V.
C11	C20065-102	Condenser, Mica, .001 uf, 500 V.
C12	A21040	Condenser, .00003 uf, 500 V.
C13	C20068-502	Condenser, .005 uf., 400 V.
C14	C20065-251	Condenser, .00025 uf, 600 V.
L1	AE19943-1	Ant. Loop Assy.
L2	AC19586-1	Osc. Coil
L3	AC21073-1	Choke, Iron Core



FREQUENCY RANGE

Broadcast Band	540-1600 KC
AM-IF	455 KC
FM Band	88-108 MC
FM-IF	10.7 MC

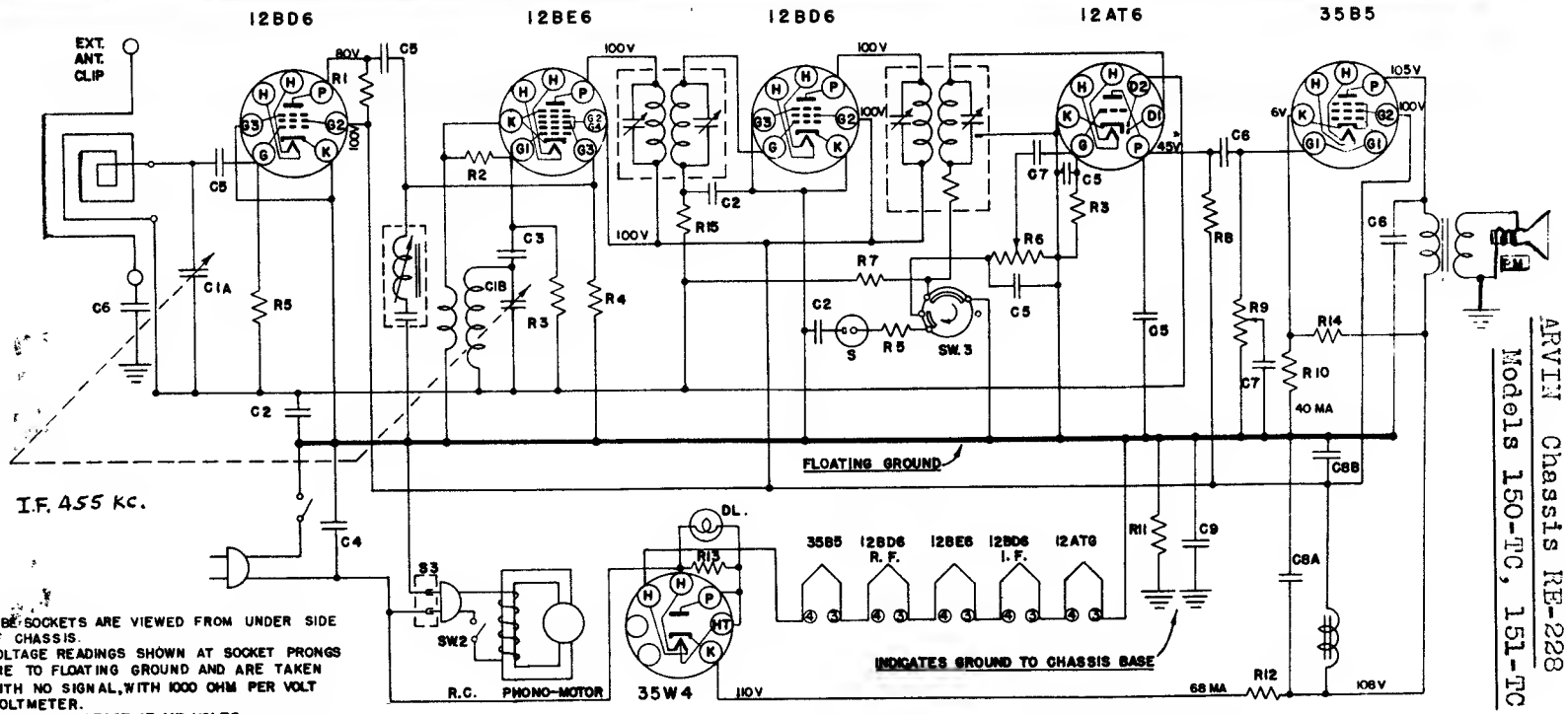


REF. NO.	PART NO.	DESCRIPTION
R1-12-17	C20060-102	Resistor, 1000 ohm, ¼ W
R2-24	C20060-105	Resistor, 1 megohm, ¼ W
R3-11-15	C20060-680	Resistor, 68 ohm, ¼ W
R4-7	C20060-331	Resistor, 330ohm, ¼ W
R5	C20060-100	Resistor, 10 ohm, ¼ W
R6-13-20	C20060-223	Resistor, 22,000 ohm, ¼ W
R8	C20060-220	Resistor, 22 ohm, ¼ W
R9	C20060-104	Resistor, 100,000 ohm, ¼ W
R10	C20103-101	Resistor, 100 ohm, 1 W
R14	C20060-334	Resistor, 300,000 ohm, ¼ W
R16	C20060-685	Resistor, 6.8 megohm, ¼ W
R18	C20060-101	Resistor, 100 ohm, ¼ W
R-19	C21404-1	Volume Control, 1 megohm
R21-22	C20120-682	Resistor, 6800 ohm, ¼ W
R23	C20060-225	Resistor, 2.2 megohm, ¼ W
R25	C21405-1	Tone Control and Switch. 500,000
R26	C20060-221	Resistor, 220 ohm, ¼ W
C3A-4A	A21440	Trimmer Condenser, 1.6-18 uuf. Compression Type
C5A	A21439	Trimmer Condenser, 1-8 uuf, Glass
C6-11-18-24	C20204-500	Condenser, .00005 uf, 500V, Ceramic
C7-20-30-31	C20204-101	Condenser, .0001 uf, 500V, Ceramic
C8-10	C20226-501	Condenser, .0005 uf, 350V, Ceramic
C9-12-13-14-22	C20226-102	Condenser, .001 uf, 350V, Ceramic
C15-23-27-29-32-33	C20226-502	Condenser, .005 uf, 350V, Ceramic
C16	C20204-100	Condenser, .00001 uf, 500V, Ceramic
C17	C20206-201	Condenser, .0002 uf, 500V, Mica
C19	C20205-2	Condenser, .0001 uf, 500V, Ceramic
C21	C20204-270	Condenser, .000027 uf, 500V, Ceramic
C25-34	C20068-503	Condenser, .05 uf, 400 V, P. T.
C26	C20205-3	Condenser, .00002 uf., 500 V, Ceramic
C28,A,B, C,D	A21402	Condenser, Electrolytic, 40-40-80 uf, 150V, 20 uf., 25V
C35	C20068-103	Condenser, .01 uf, 400V, P. T.
C36-37	C20205-5	Condenser, .00005 uf, 500V, Ceramic 10% N750
C38	C20203-202	Condenser, .002 uf, 350V, Ceramic
C39	A21403	Condenser, Electrolytic, 8 uf, 50V
C40	C20067-503	Condenser, .05 uf, 200V, P. T.
C41	C20067-502	Condenser, .005 uf, 200V. P. T.
C42	C20065-251	Condenser, .00025 uf, 500V, Mica
C43	C20069-502	Condenser, .005 uf, 600V, P. T.

ARVIN RADIO – MODEL 182TFM CHASSIS RE – 237

MANUFACTURED BY NOBLITT - SPARKS INDUSTRIES, INC., COLUMBUS, IND.

ARVIN Chassis RE-228
Models 150-TC, 151-TC



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL, WITH 1000 OHM PER VOLT VOLTMETER.
A.C. LINE VOLTAGE AT 117 VOLTS.
* MEASURED WITH VACUUM TUBE VOLTMETER.

REF. NO.	PART NO.	DESCRIPTION
R1	C20060-222	Resistor, 2200 ohm 1/4 W
R2	C20060-223	Resistor, 22,000 ohm 1/4 W
R3	C20060-106	Resistor, 10 megohm 1/4 W
R4	C20060-224	Resistor, .22 megohm 1/4 W
R5	C20060-105	Resistor, 1 megohm 1/4 W
R6	C19927	Volume Control, 1 megohm
R7	C20060-225	Resistor, 2.2 megohm 1/4 W
R8	C20060-474	Resistor, .47 megohm 1/4 W
R9	C19928	Tone Control & Switch, .5 megohm
R10	C20060-151	Resistor, 150 ohm 1/4 W
R11	C20060-334	Resistor, .33 megohm 1/4 W
R12	C20060-220	Resistor, 22 ohm 1/4 W
R13	C20060-331	Resistor, 330 ohm 1/4 W
R14	C20070-123	Resistor, 12,000 ohm 1 W
R15	C20060-104	Resistor, .1 megohm 1/4 W
C1A-C1B	AD21111-1	Variable Condenser & Pulley Assy.
C2	C20067-503	Condenser, .05 ue 200 V, Paper
C3	C20065-500	Condenser, .00005 uf 500 V, Mica
C4	C20068-503	Condenser, .05 uf 400 V, Paper
C5	C20065-251	Condenser, .00025 uf 500 V, Mica
C6	C20068-103	Condenser, .01 uf 400 V, Paper
C7	C20068-502	Condenser, .005 uf 400 V, Paper
C8A-C8B	A21349	Electrolytic Condenser, 50-30 uf., 150V
C9	C20068-104	Condenser, .1 uf 400 V, Paper

SOCKET VOLTAGE AND RESISTANCE MEASUREMENTS

	VOLTAGE							RESISTANCE						
TUBE	1	2	3	4	5	6	7	1	2	3	4	5	6	7
35W4	0	0	85AC	117AC	112AC	112AC	110DC	INF	80	108	105	105	11250	
12BD6 RF	0	0	37.5AC	50AC	80DC	100DC	0	ǂ 4.2m	0	39	50	14K	12K	0
12BE6 **-6.8DC	0	25AC	37.5AC	100DC	100DC	0	22K	.5	25	39	12K	12K	200K	
12BD6 IF	0	0	12.5AC	25AC	100DC	100DC	0	ǂ 3.3m	0	14	25	12K	12K	0
12AT6	0	0	0	12.5AC	0	0	* 45DC	10m	0	0	14	ǂ 3.2m	ǂ 1.05m	482K
35B5	0	6DC	50AC	85AC	105DC	100DC	0	500K	150	50	80	12K	12K	500K

All readings are taken from the socket terminal indicated to floating ground, with AC line voltage at 117V.
Voltage measurements made with 1000 ohm per volt voltmeter except where indicated otherwise;
* Measured with a vacoum tube voltmeter.
** Average measured with a vacoum tube voltmeter. (-7.7V with variable condenser closed, -9.9V with variable condenser open.)
ǂ One meg lower resistance with Phono-Radio Sw in Phono Position.

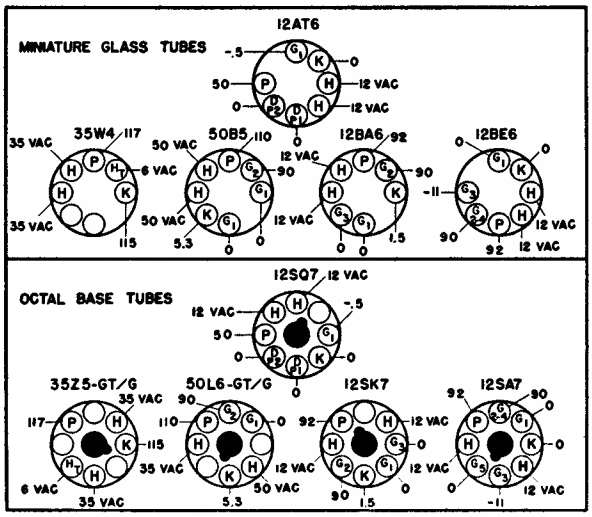
RESISTANCE OF COILS

Oscillator		First IF Transformer		Second IF Transformer		Output Transformer	
Cathode winding	.75 ohms	Primary winding	14 ohms	Primary winding	13 ohms	Primary	110 ohms
Grid winding	6. ohms	Secondary winding	14 ohms	Secondary winding	13 ohms	Secondary	.3 ohms
Wave trap	26 ohms	B Choke	200 ohms	47K Resistor in Series Inside Can			

Packard-Bell

SERVICE DATA . . . MODEL 5DA

All D.C. voltages measured with a vacuum tube voltmeter from socket contacts to ground buss.—A.C. voltages measured with a 1000 ohms per volt A.C. meter from socket contacts to ground buss.*—Volume Control maximum.—No signal.—117 volts A.C. line voltage.—All voltages shown are positive D.C. unless otherwise noted.
*NOTE: Filament voltages should be measured across the filament of the tube.



*R1-1, 220,000 ohm resistor, is used only in sets utilizing metal, octal base tubes.

ALIGNMENT PROCEDURE

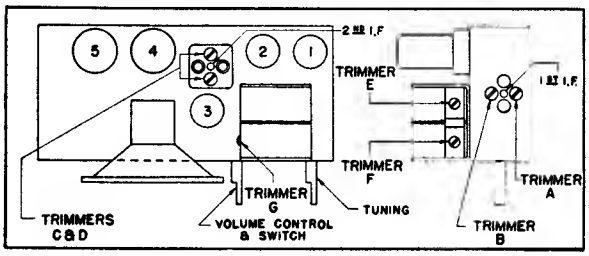
Alignment Procedure consists of the four steps outlined in the Alignment Procedure Chart.

For Step No. 1, I.F. Alignment, connect the leads of a test oscillator to the mixer grid and the ground buss through an .01 Mfd. capacitor (dummy load). Upon completion of this step "Rock" the variable condenser to assure that the I.F.s have been aligned to the correct frequency. Output should remain constant at any setting of the variable condenser.

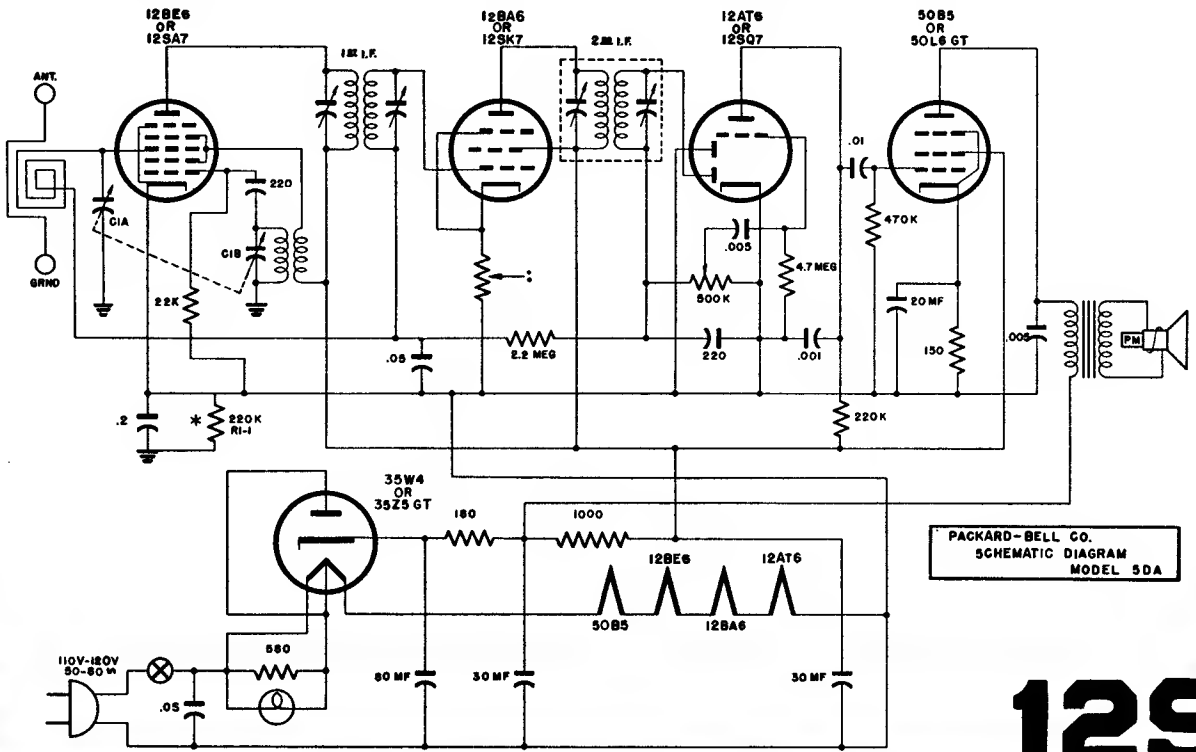
ALIGNMENT CHART

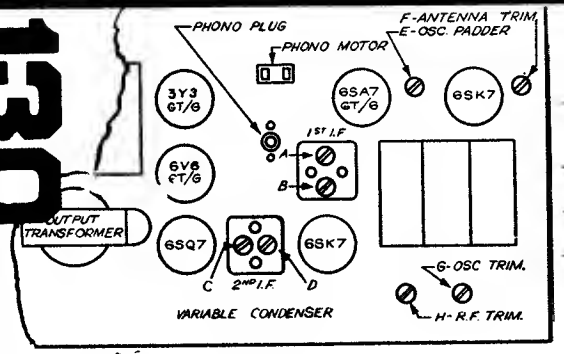
STEP	CONNECT TEST OSC. TO	TEST OSC. SETTING	POINTER SETTING	ADJUST FOR MAX. OUTPUT
1	Mixer Grid & Grd. .01 Mfd. Cap.	455 KC	540 KC	Trimmers A, B, C, & D
2	Standard* Test Loop	1740 KC	1740 KC	Trimmer E to 1740 KC
3	Standard* Test Loop	1500 KC	1500 KC	Trimmer F
4	Standard* Test Loop	600 KC	600 KC	Loop

*NOTE: Hazeltine Standard Test Loop No. 1150 or a reasonable substitute.

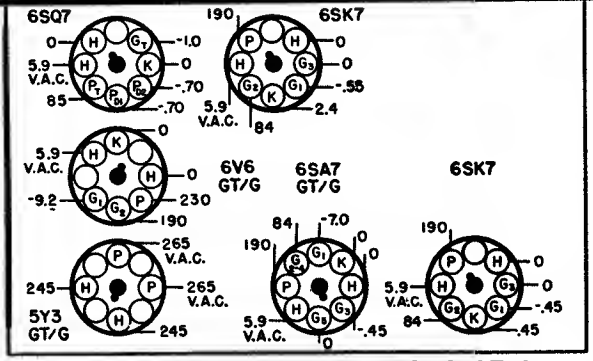


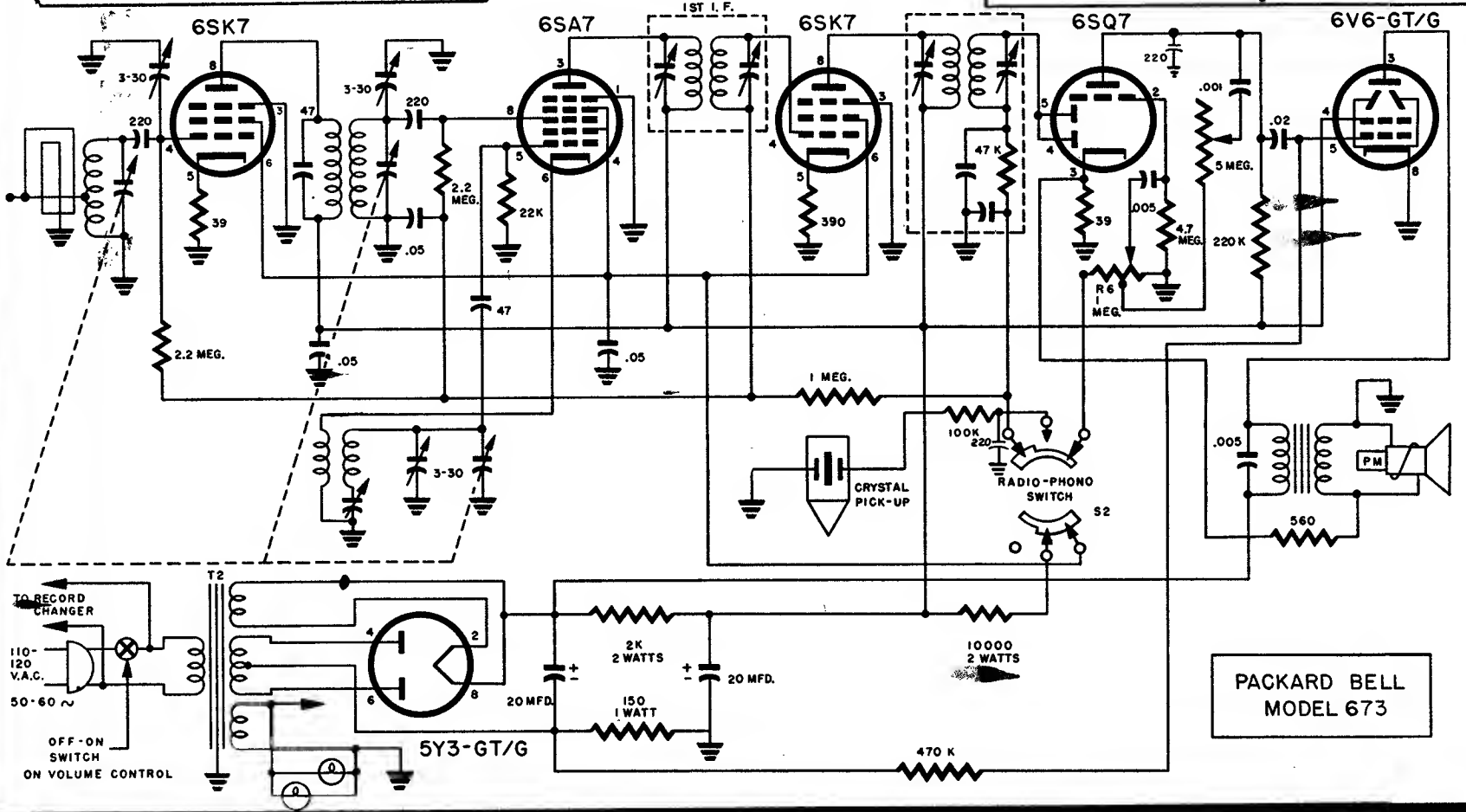
:180 ohm ½ watt resistor used for sets employing miniature glass tubes.





CONNECT TEST OSC. STEP		TEST OSC. SETTING	POINTER SETTING	ADJUST FOR MAX. OUTPUT
1	Mixer Grid & Grd. (.01 Mfd. Cap.)	455KC	540 KC	Trimmers A, B, C & D
2	Standard Test Loop*	1620 KC	1620 KC	Trimmer G to 1620 KC
3	Standard Test Loop*	600 KC	Rock Variable	Padder E
4	Standard Test Loop*	1500 KC	1500 KC	Trimmers F & H
5	Repeat Steps 2, 3, & 4			



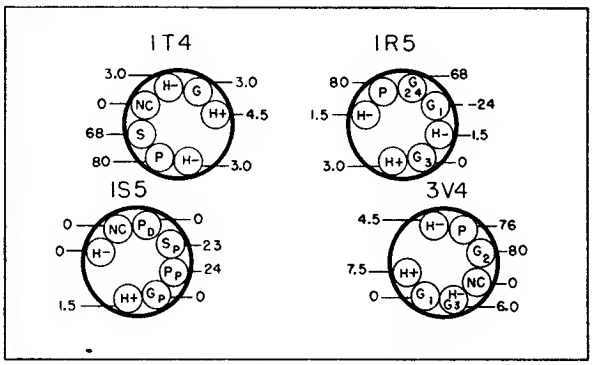


PACKARD BELL
MODEL 673

Packard-Bell

SERVICE BULLETIN — MODEL 471

PORTABLE RECEIVER



TUBE VOLTAGE CHART

NOTE: VOLTAGES TAKEN FROM B— WITH V.T.V.M.—NO SIGNAL

STAGE GAIN MEASUREMENTS

Standard Output . . . 50 mw
Dummy Antenna . . . .01 mfd.
Volume Control . . . Maximum
Converter grid to 1st I.F. grid . . . 51 X at 1000 KC
Converter grid to 1st I.F. grid . . . 65 X at 455 KC
1st I.F. grid to 2nd detector . . . 55 X at 455 KC
Overall audio gain . . . . .014V at 1S5 grid — 100 mw output 400 cycles

D.C. Resistance Measurements

1st I.F. Coil
Primary . . . . . 20 ohms
Secondary . . . . . 20 ohms

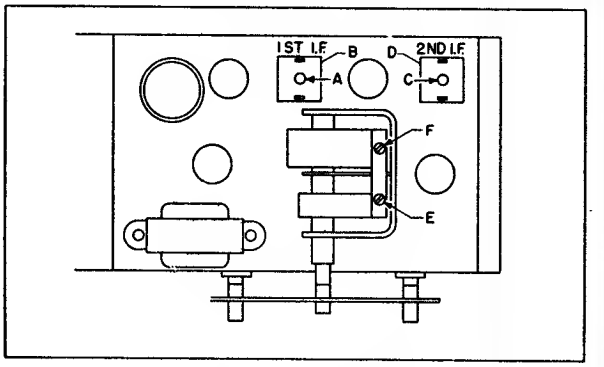
Oscillator Coil
Primary . . . . . 3 ohms
Secondary . . . . . 7 ohms

2nd I.F. Coil
Primary . . . . . 15 ohms
Secondary . . . . . 15 ohms

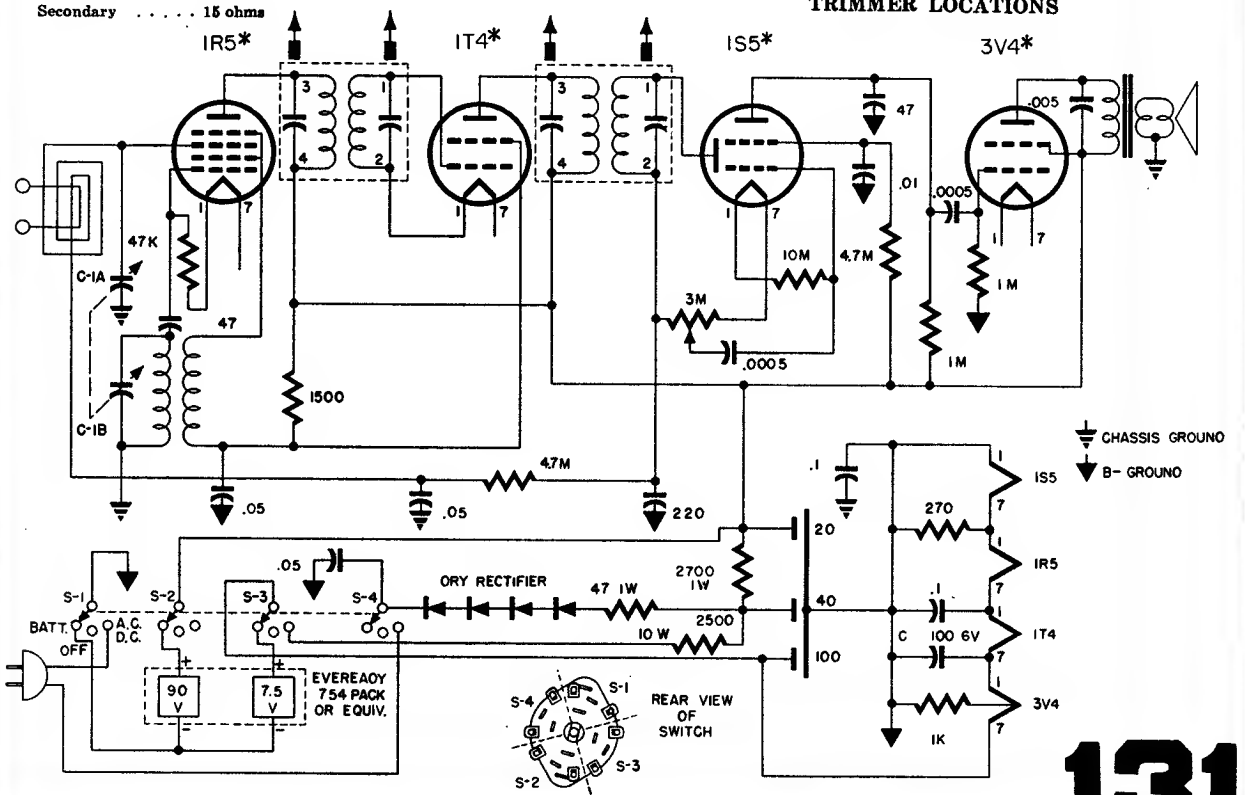
ALIGNMENT CHART

STEP	CONNECT TEST OSC. TO	TEST OSC. SETTING	POINTER SETTING	ADJUST FOR MAX. OUTPUT
1	Conv. Grid .01 Mfd. Dum. Ant.	455 KC	1620 KC	I.F. Trimmers A, B, C, D
2	Conv. Grid .01 Mfd Dum. Ant.	1620 KC	1620 KC	Oscillator Trimmer E
3	*Standard Test Loop	1500 KC	1500 KC	Ant. Trimmer F
4	*Standard Test Loop	600 KC	600 KC	Loop
5	Repeat Step No. 3			

NOTE: Hazeltine Test Loop No. 1150 or equivalent.



TRIMMER LOCATIONS



* SUPPRESSOR GRIDS TIED INTERNALLY AND NOT SHOWN IN SCHEMATIC

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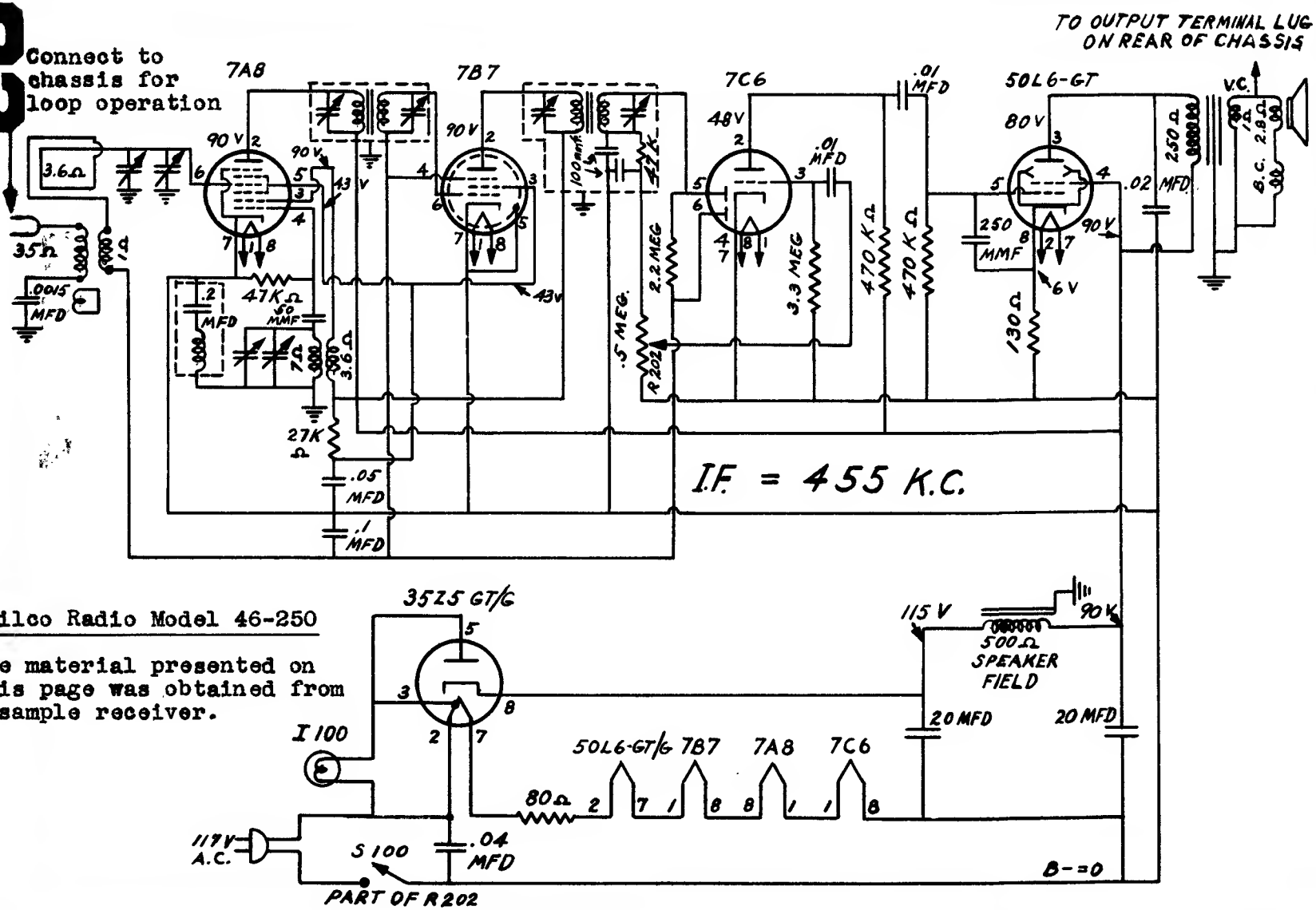
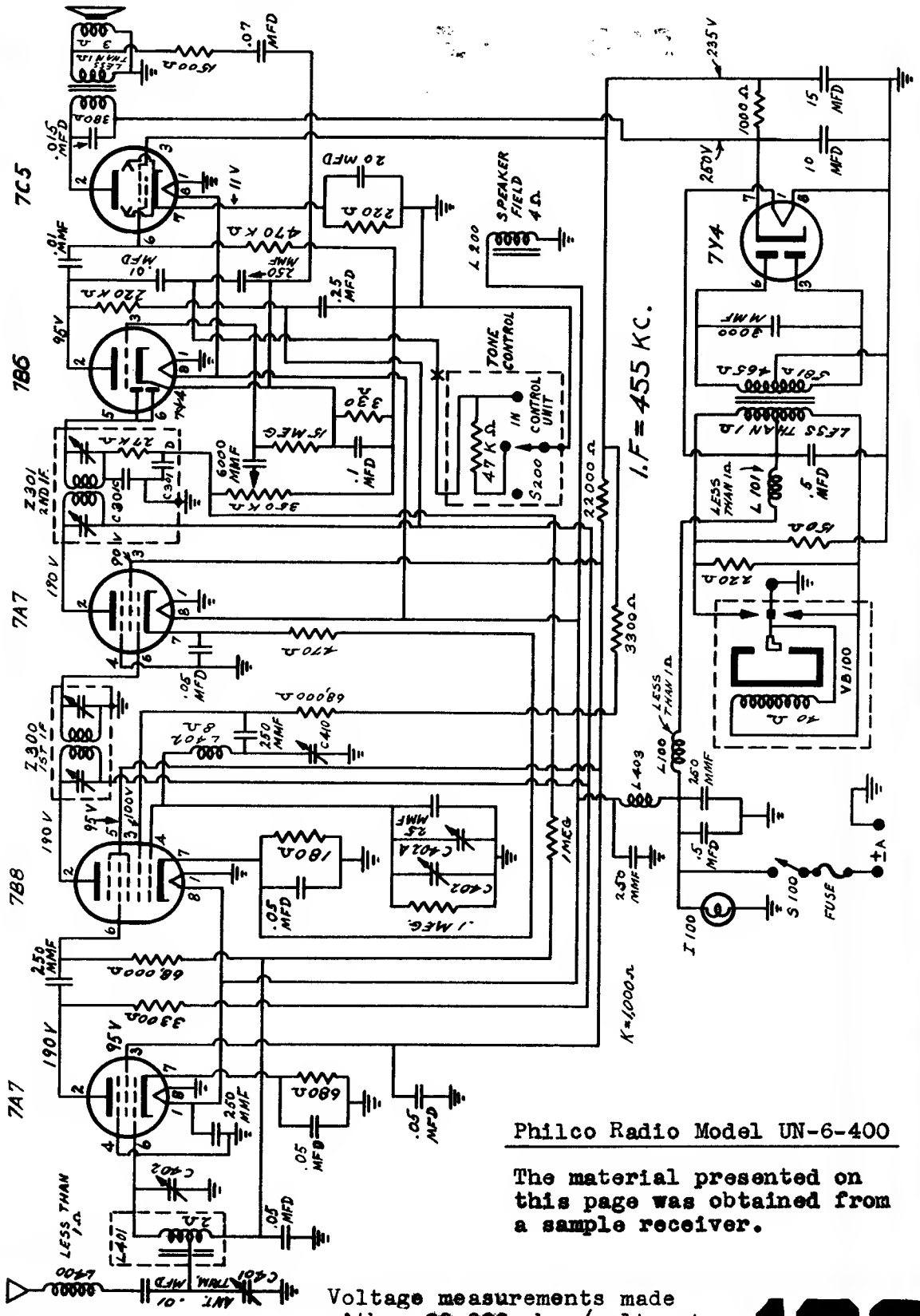
Connect to chassis for loop operation



Philco Radio Model 46-250

The material presented on this page was obtained from a sample receiver.

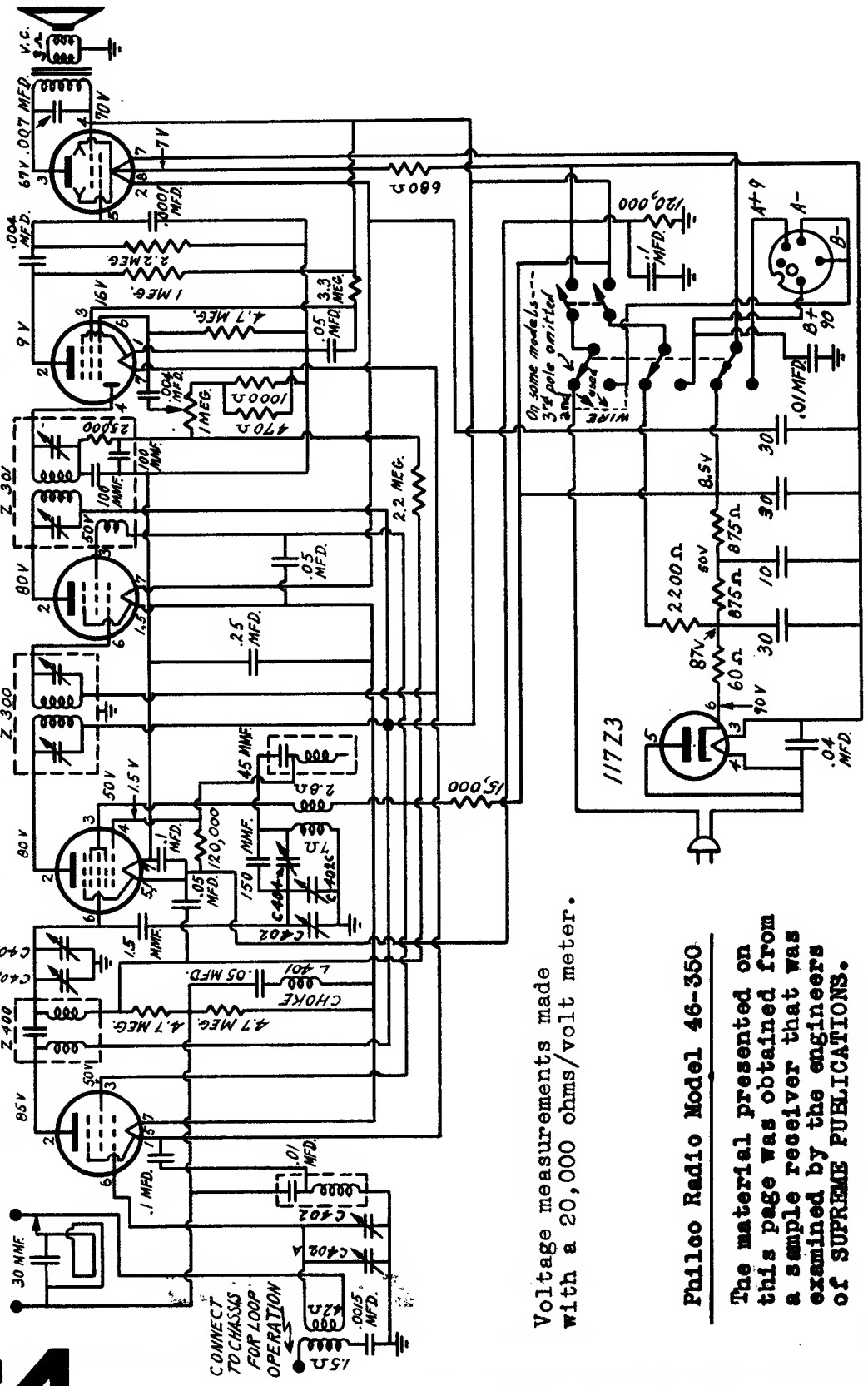
Voltage measurements made with a 20,000 ohms/volt meter.



Philco Radio Model UN-6-400

The material presented on this page was obtained from a sample receiver.

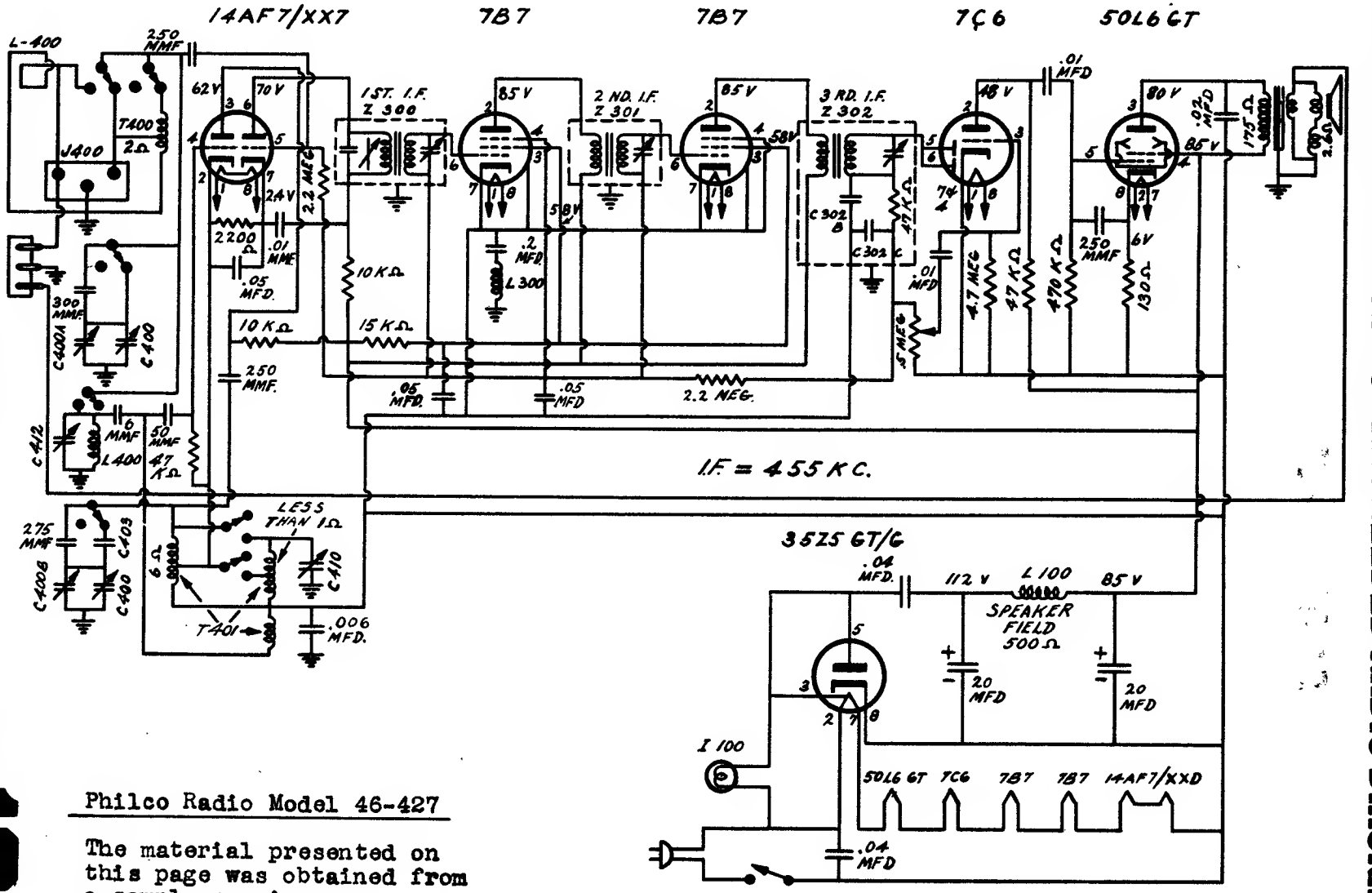
Voltage measurements made with a 20,000 ohms/volt meter.



Voltage measurements made with a 20,000 ohms/volt meter.

Philco Radio Model 46-350

The material presented on this page was obtained from a sample receiver that was examined by the engineers of SUPREME PUBLICATIONS.



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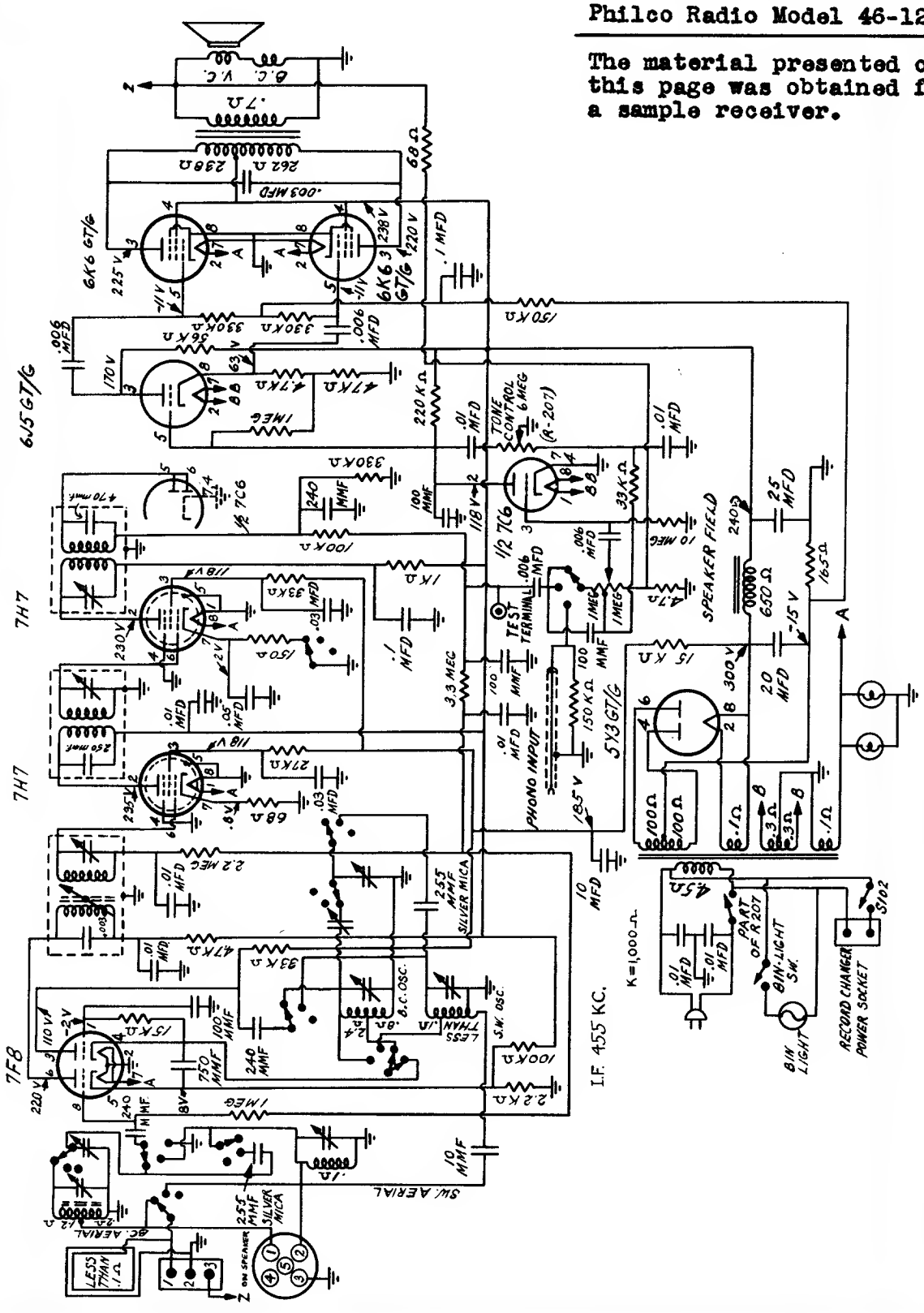
Philco Radio Model 46-427

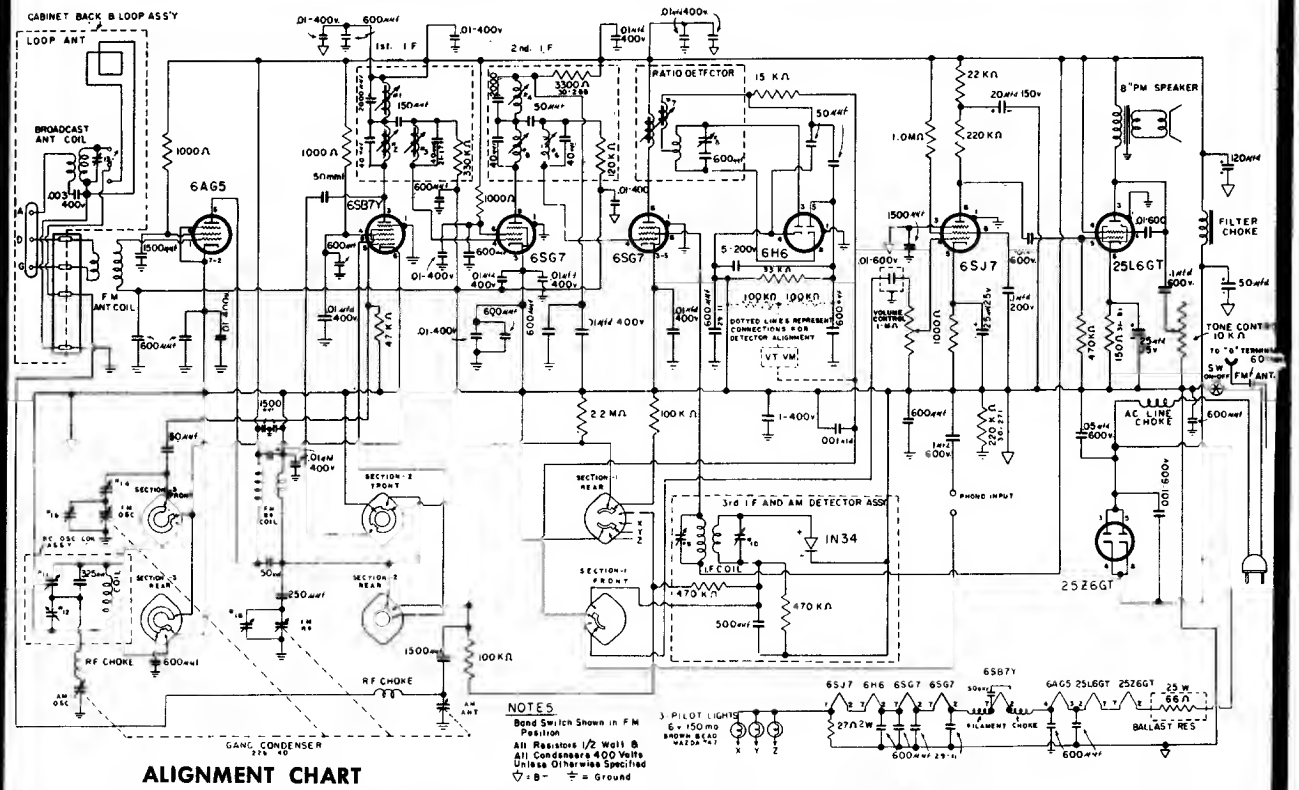
The material presented on this page was obtained from a sample receiver.

Voltage measurements made with a 20,000 ohms/volt meter.

Philco Radio Model 46-1226

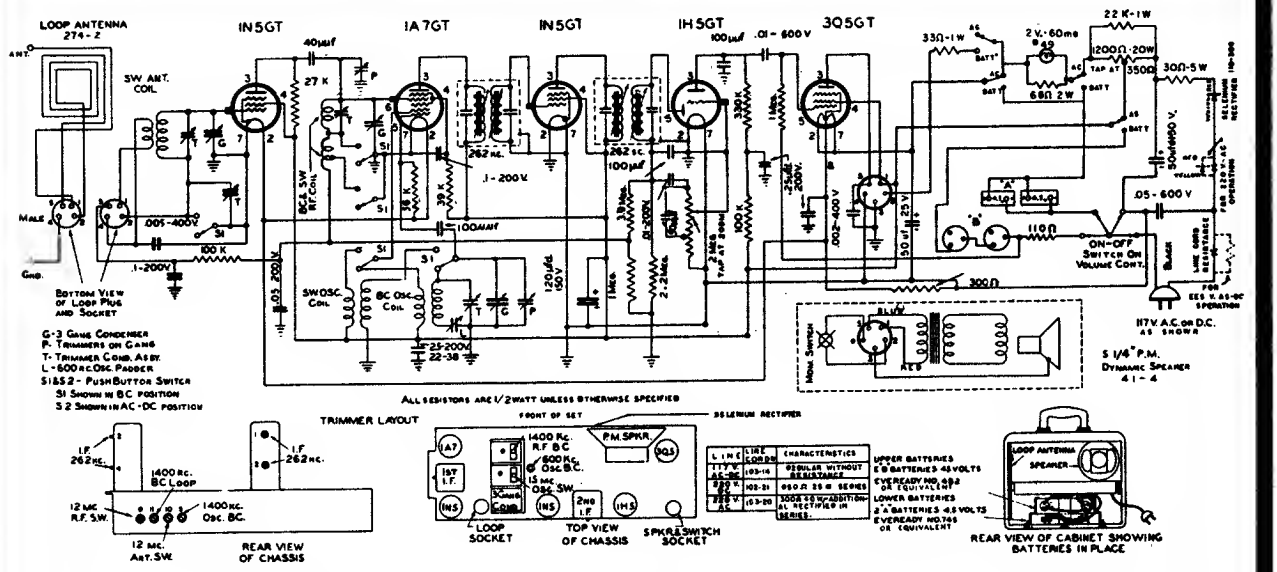
The material presented on this page was obtained from a sample receiver.





ALIGNMENT CHART

CIRCUIT ALIGNED	STEP	RECEIVER BAND SWITCH	RECEIVER DIAL POINTER	SIGNAL GENERATOR FREQ.	SIGNAL GENERATOR CONNECTIONS	METER CONNECTIONS TYPE See List	METER CONNECTIONS	TRIMMER OR SLUG ADJUST	PROCEDURE
AM I.F.	1	BC	55	455 KC	Through .1 MFD cap. to Grid of 6SB7Y	A	Across Voice-Coil of Speaker	1, 4, 9, 10	Adjust for Maximum Output
FM I.F.	2	FM	88	10.7 MC	Through .1 MFD cap. to Grid of 6SB7Y	A	Across Voice-Coil of Speaker	2, 3, 5, 6, 7, 8	Adjust for Maximum Output
Ratio-detector	3	FM	88	10.7 MC	Through .1 MFD cap. to Grid of 6SB7Y	B	*From:* Junction of two 100K resistors connected across 47K load resistor of the ratio detector. *To:* Audio output of ratio detector. (See Circuit Diagram)	8	Adjust meter to zero. (Check proper zero set. Meter should register reverse polarity when trimmer is turned slightly to the right, and then to the left of zero output)
Broadcast R.F.	4	BC	150	1500 KC	Through 200 mmf. cap. to Antenna "A" Post on back.	A	Across Voice-Coil of Speaker	12, 13	Adjust for maximum output
	5	BC	60	600 KC	Through 200 mmf. cap. to Antenna "A" Post on back.	A	Across Voice-Coil of Speaker	11	Adjust for maximum output while rocking variable condenser
	6	REPEAT STEPS 4 5 AND REPLACE BOTTOM COVER OF CHASSIS							
Frequency Modulation R.F.	7	FM	106	106 MC	To "D" and "G" Antenna Terminals	A	Across Voice-Coil of Speaker	15, 16	Adjust for maximum output
	8	FM	90	90 MC	To "D" and "G" Antenna Terminals	A	Across Voice-Coil of Speaker	14	Adjust for maximum output
	9	REPEAT STEPS 7 AND 8							



SERVICE NOTES

The location and seqnence of the screws for adjusting the ANT., R.F., and I.F. circuits, are illustrated on the diagram. The I.F. amplifier may be aligned with the chassis out of the cabinet but with the loop antenna plugged in. For the I.F. alignment the signal generator must be connected to the grid of the 1A7GT tube through a .1 mfd. condenser. The R.F. trimmers should also be peaked for maximum with the chassis out of the cabinet. When aligning the ANT. trimmers, the "A" and "B" batteries must be in place, the loop antenna and receiver correctly mounted in the cabinet. The receiver may be aligned on either batteries or house current. When the receiver is aligned on the broadcast band, connect the signal generator to the ANT. post at the back through a .0002 mfd. condenser, and on the shortwave band use a 400 ohm carbon resistor.

When removing the batteries, first unscrew clamps, and then remove battery plugs. Be sure not to pull on the cables, but on the plugs themselves.

Place the new "A" and "B" batteries in position shown on diagram and replace clamps in position.

The blue and white cable, coming from the chassis, has two 2-prong plugs which are then plugged into the "A" batteries. The red and black cable has two 3-prong plugs, both of which are plugged into the "B" batteries.

Pilot

Model T-570

RADIO CORPORATION

Pilot

RADIO CORPORATION

MODEL T-521

A.C.-D.C. Receiver

ALIGNMENT NOTES

See Alignment chart on next page.

The following notes ore intended for the use of an expert radio technician:

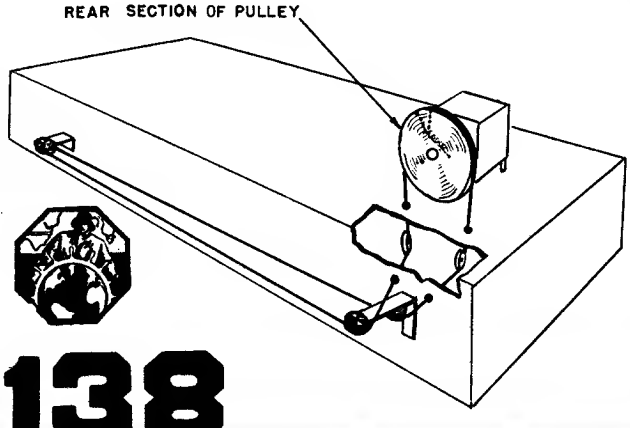
Alignment should be attempted only if the proper meter and signal generator are at your dispasal. Insulated alignment tools are necessary. Outputmeters should include A) a low range AC meter, B) a 0-20 volt DC vacuum tube voltmeter.

The signal generator must cover the frequencies of 455 kc, 600 kc, 1500 kc, 10.7 mc, 90 mc and 106 mc.

During alignment the line voltage feeding the receiver power-supply should be kept at approximately 117 volts.

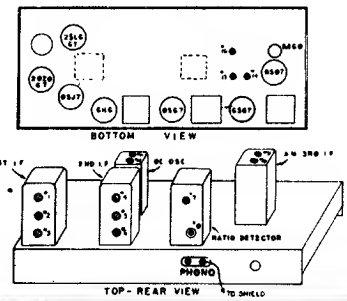
The receiver should be allowed to warm up for at least 30 minutes before making any adjustments.

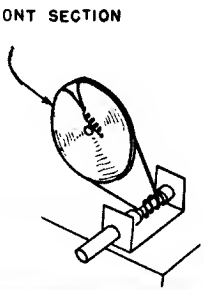
The locations of adjustment screws are indicated clearly on the schematic diagram. Alignment adjustments should be made only in the sequence given in the chart.

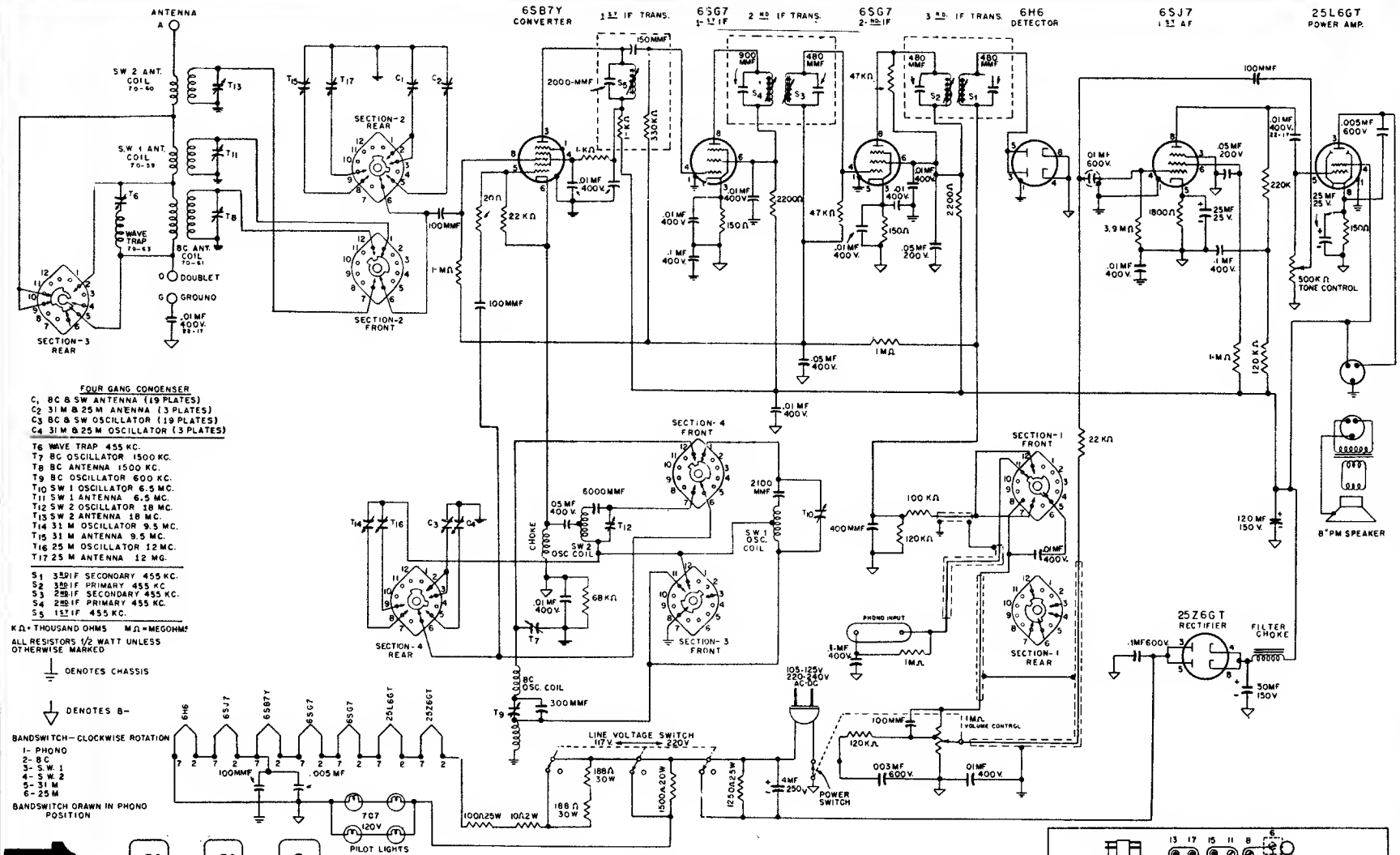


1- 1st I.F. 455 Kc
2- 1st I.F. 10.7 mc, Primary
3- 1st I.F. 10.7 mc, Secondary
4- 2nd I.F. 455 Kc
5- 2nd I.F. 10.7 mc, Primary
6- 2nd I.F. 10.7 mc, Secondary
7- Ratio Detector 10.7 mc, Primary
8- Ratio Detector 10.7 mc, Secondary
9- AM 3rd I.F. 455 Kc, Primary
10- AM 3rd I.F. 455 Kc, Secondary
11- BC Osc. Padder
12- BC Osc. Trimmer
13- Ant BC Trimmer (on rear cover)
14- FM Osc. Padder
15- FM Osc. Trimmer
16- FM R.F. Trimmer

ALIGNMENT ADJUSTMENTS







PILOT RADIO

MODEL T-741

A.C.-D.C. Receiver

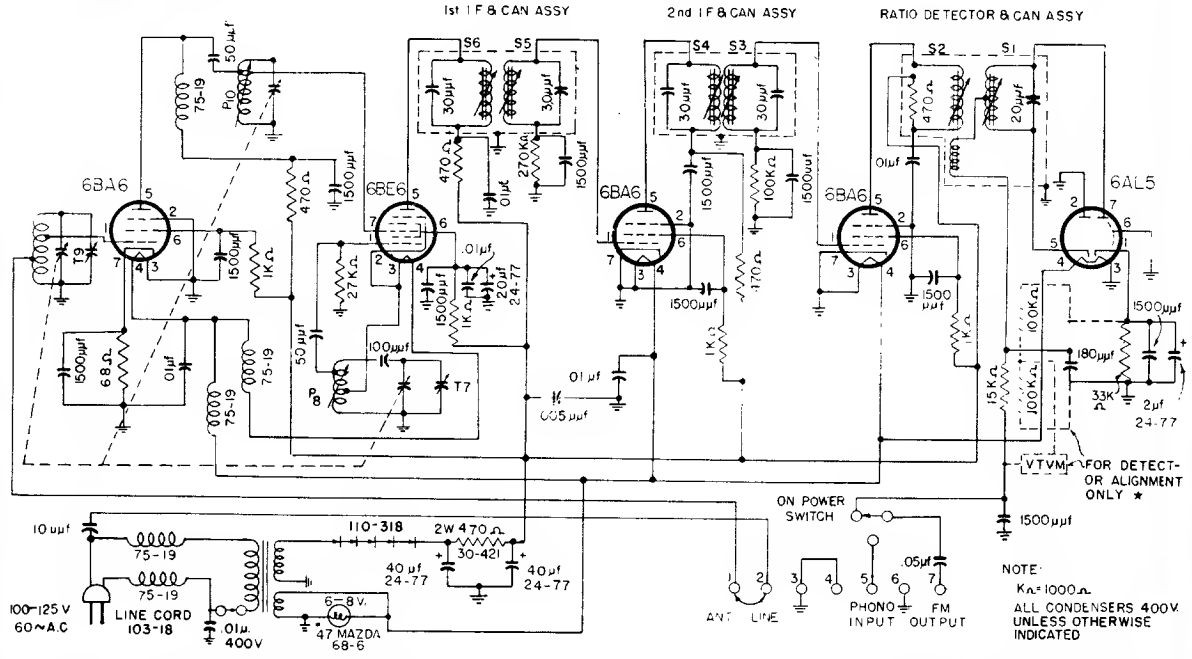
PILOT RADIO - MODEL T-601

ALIGNMENT CHART

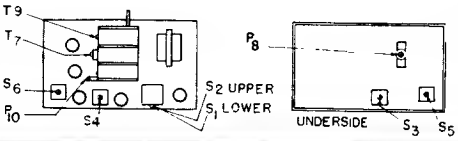
Tuning Range 88-108 Mc.

Insulated alignment tools are necessary. The output meter should be a D.C. vacuum tube voltmeter with a range of at least 20 volts. The signal generator should cover the frequencies of 10.7, 90 and 106 mc. Allow the PILOTUNER to warm up for at least 30 minutes before making any adjustments. The location of the adjustment screws is indicated clearly on the schematic diagram. Follow the sequence in the alignment chart.

CIRCUIT ALIGNED	STEP	RCVR. DIAL POINTER	SIGNAL GEN. FREQ.	SIGNAL GEN. CONNECTIONS	METER CONNECTIONS	TRIMMER OR SLUG ADJUSTMENT	PROCEDURE
IF	1	88 mc	10.7 mc	Through .01 mfd. cap. to grid of 6BE6	Across two 100K resistors —indicated by dotted lines in schematic	S2, S1, S4, S3, S6, S5	Adjust for maximum output
	2	Repeat Step No 1					
Ratio Detector	3	88 mc	10.7 mc	Same as No. 1	From: Junction of two 100K resistors TO: Audio output of ratio detector. Connections indicated by dotted lines in schematic	S1	Adjust meter to zero (Check proper zero set) Meter should register reverse polarity when slug is rotated through zero output.
Oscillator	4	90 mc	90 mc	Through carbon 300 ohm resistor to Ant. Terminal	Same as Step No. 1	P8	Same as Step No. 1
	5	106 mc	106 mc	Same as No. 4	Same as No. 1	T7	Same as No. 1
	6	Repeat Steps No. 4 & 5					
	7	90 mc	90 mc	Same as No. 4	Same as No. 1	P10	Same as No. 1
RF	8	106 mc	106 mc	Same as No. 4	Same as No. 1	T9	Same as No. 1



S1 RATIO DETECTOR SEC 10.7 MC
S2 RATIO DETECTOR PRI 10.7 MC
S3 2ND I F SEC. 10.7 MC
S4 2ND I F PRI 10.7 MC
S5 1ST I F SEC 10.7 MC
S6 1ST I F PRI. 10.7 MC
T7 OSC TRIMMER 106 MC
P8 OSC PADDER 90 MC
T9 ANT TRIMMER 106 MC
P10 R.F. PADDER 90 MC



TO ALIGN RECEIVER USE FREQUENCIES AS INDICATED ON LEFT. ADJUST ALL TRIMMERS FOR MAX D C OUTPUT ACROSS 33KΩ RESISTOR IN 6AL5 CIRCUIT.

★TO ALIGN SECONDARY OF RATIO DETECTOR CONNECT METER AS INDICATED IN SCHEMATIC AND ADJUST S_1 FOR ZERO OUTPUT.

RCA VICTOR

VICTROLA

Model 63E, 63EM

Chassis No. RS-127 Mfr. No. 274

Irregular Turntable Speed:

(1) Oil or grease on rubber tire of turntable drive wheel. Remove turntable and clean drive wheel tire, and inside edge of turntable with naphtha or carbon-tetrachloride.

(2) Insufficient tension in drive wheel tension spring.

(3) Lack of lubrication.

Replacement of Sapphire

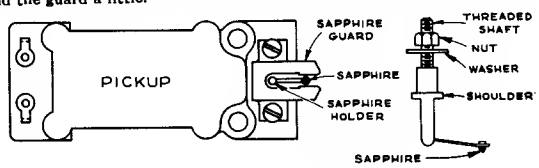
CAUTION: Never bend the sapphire support wire.

The nut on the sapphire holder assembly may be locked by a light cement. Extreme care should be used when loosening the nut so that the twisting motion does not break the crystal.

Remove the two screws holding the sapphire guard in place and remove guard. Remove the small nut and washer on the threaded shaft of the sapphire holder and gently push the shaft through the hole in the armature shaft until the sapphire holder assembly comes free.

Use of a drop or two of acetone will facilitate the removal of the nut and shaft if cement has been used. Do not use force as the crystal may be broken.

Insert threaded shaft of replacement sapphire holder through armature shaft and replace the washer and nut. Make sure that the sapphire is in the correct position. Take hold at the lower end of the shaft with a pair of pliers while tightening the nut, being very careful so as not to strip the threads or break the crystal. Replace the sapphire guard, positioning it by means of the oversize screw slots. Make certain that the sapphire and its supporting wire are centered in the guard. Tighten the guard screws. Before using, check to see that the sapphire projects far enough (approx. .020") beyond the guard so that the guard will not strike the record. If necessary, bend the guard a little.



Lubrication

Motor

The bearings of the motors furnished in these instruments are lubricated at the factory and should require no further lubrication for a period of at least one year. When lubrication is required, apply a few drops of any good grade of S.A.E. #10 oil to the bearing felts.

Turntable Spindle

When lubrication is required, apply one or two drops of Gargoyle 600W to the bearing.

Drive Wheel

Apply one or two drops of any good grade of S.A.E. #10 oil to the bearing felt.

CAUTION: Exercise extreme care to prevent getting any oil on the rubber tire or on the motor shaft. Oil on these parts will cause slippage with resultant irregular turntable speed.

Service Hints

To Remove Turntable:

Remove "C" washer from turntable spindle and lift turntable straight up.

Motor Board Disassembly

a. Remove the "C" washer on turntable spindle.
b. Lift turntable straight up.
c. Disconnect motor plug from power plug.
d. Remove two screws exposed on top of cabinet.

To replace Drive Idler

a. Remove "C" washer at bottom of drive idler wheel shaft.
b. Lift idler drive wheel up from motor mounting board.

To remove turntable spindle disengage the spring clip from the bottom of the turntable spindle and lift up on the spindle.

To remove the motor from the motor mounting board, remove the three nuts from the top of the motor mounting board.

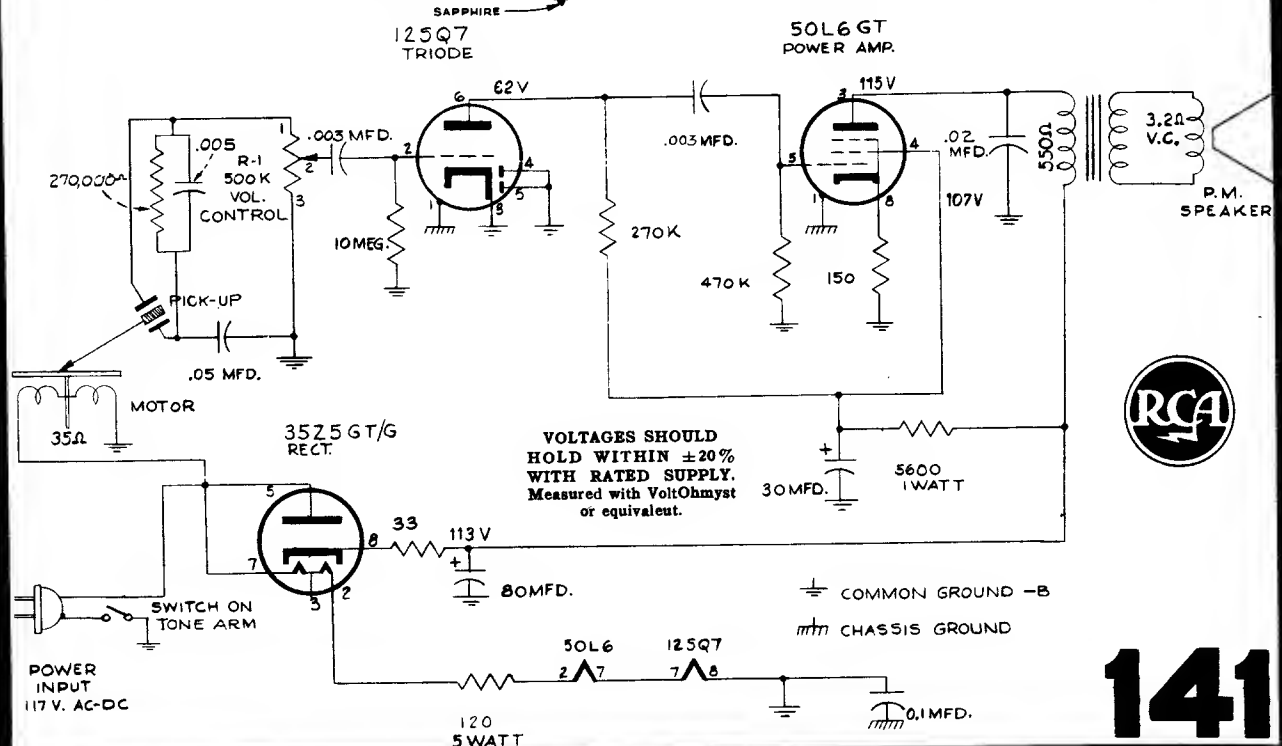
To remove the switch, unscrew the two screws holding the switch assembly to the pickup assembly.

Service Hints

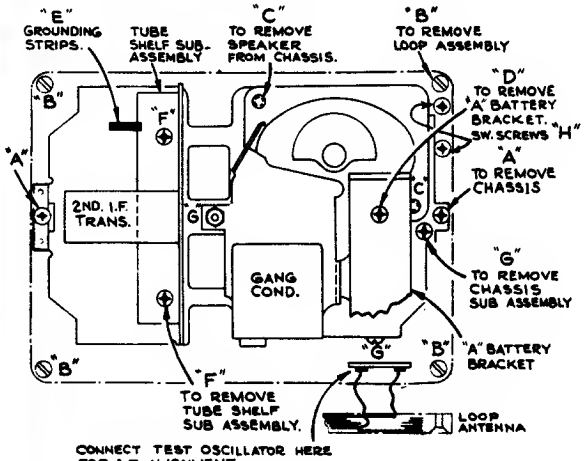
1. Failure to start when pickup is lifted.
   a. Dirty switch contacts.
   b. Weak or broken spring on pickup support arm.
   c. Motor connector plug broken or dirty.

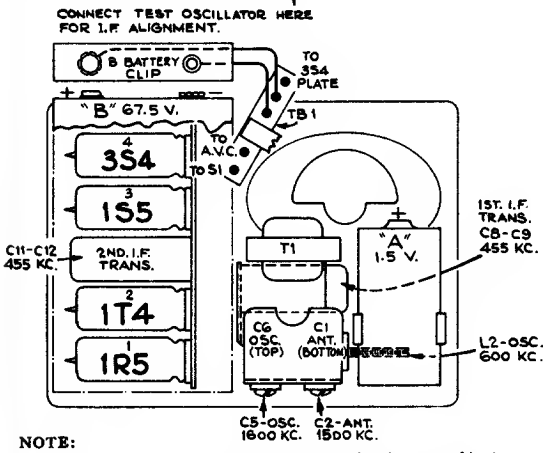
To Remove Pick-up Arm

a. Remove the switch.
b. Remove the spring clips from the rear pivot of the support arm.
c. Disengage the tone arm lift spring from the support arm.
d. Remove the spring clips from the front pivot of the support arm.
e. Remove the "C" washer from the pick-up pivot arm.
f. Pick-up is free to be removed when the two leads from the crystal are removed.



RCA 54B5 Chassis No. RC1047





NOTE:
A rubber band should be placed around each tube for cushioning.
Dirty tube contacts may be mistaken for a defective tube.

Alignment Procedure

Test Oscillator.—Connect test oscillator as indicated in chart keeping the output as low as possible to avoid A V C action.

Output Meter.—Connect a high resistance AC voltmeter in series with a .1 mfd capacitor from top lug of TB1 (plate of 354) to ground. Turn volume control to maximum position.

When using the dummy case for the osc. alignment, the loop assembly must he raised slightly so that osc. trimmer becomes accessible.

Steps	Connect the high side of test osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	lug of C2, (located on rear of gang) through a .01 mfd. capacitor	455 kc	Quiet poiat near 1,600 kc	C11, C12 2nd I-F trans.
2		455 kc	Quiet point uear 1,600 kc	C8, C9 1st I-F trans.
3	**Antenna coupling loop thru 200 mmf. capacitor	1,600 kc	1,600 kc	C5 (osc.)
4		1,500 kc	1,500 kc	C2 (ant.)
5		600 kc	600 kc	L2 (osc.) (Rock gang)
6	Repeat steps 4 and 5 for final adjustments.			

*The 1F transformers can he aligned with chassis out of case.

**Steps 3, 4 and 5 require a coupling loop from the signal generator to feed a signal into the receiver loop located in the back. This loop should he approximately one turn of 6 x 3½ inches coupled to the signal generator through a 200 mmf. capacitor, and loosely coupled to the receiver loop antenna at about 1¾ inches distance, so as not to disturb the receiver loop inductance. Ground test oscillator through .1 mf. capacitor to receiver chassis.

CRITICAL LEAD DRESS

1. Dress blue, green and black leads of second IF transformer as direct as possible. If excess lead exists, dress down side of socket and flat against chassis to transformer opening.

2. Cross the green and the black leads Inside the first IF transformer can, keeping the green lead to the outside. Load coil bracket is to separate the blue and the green leads.

3. Dress audio coupling capacitor C14 and the lead to the volume control up and underneath shelf supporting the output transformer.

4. Wire in the three capacitors pyramided hehind the speaker with enough space hehlnd the battery holder to allow holder to move when battery Is replaced. Dress the ground leads of these capacitors to keep from aborting the off-on switch.

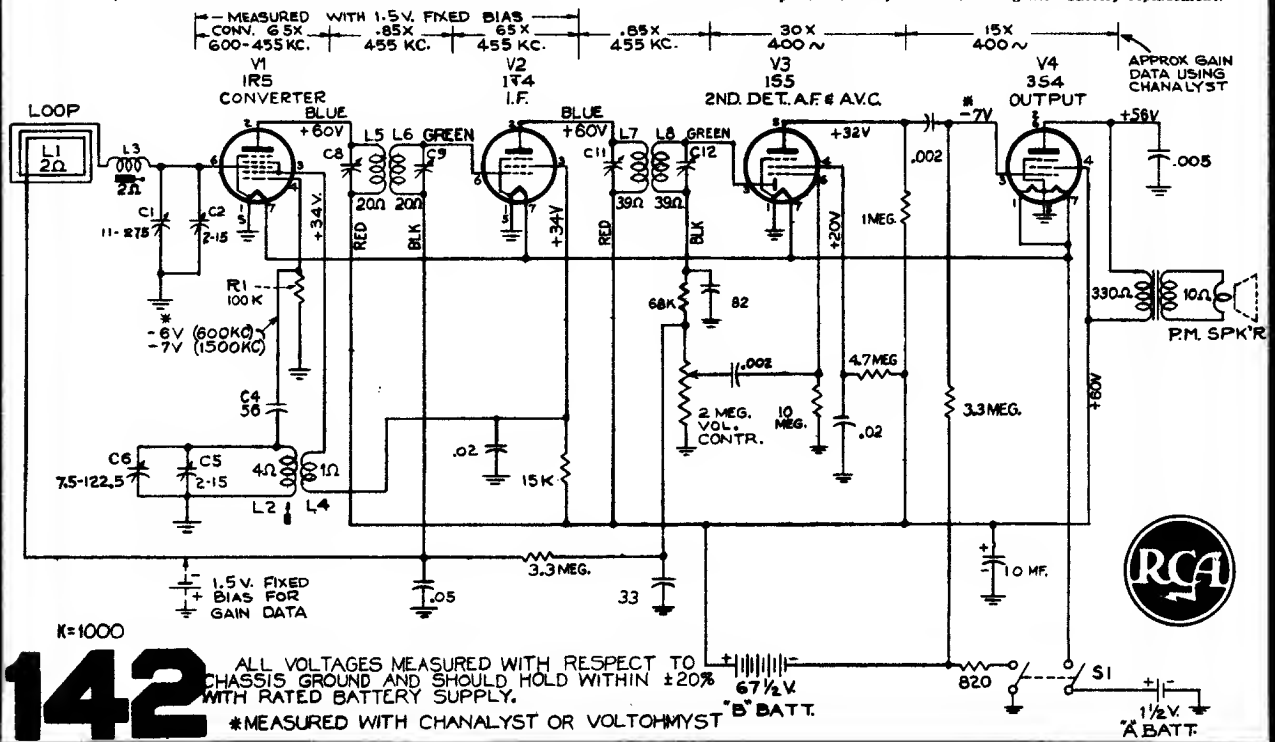
5. Observe the outside foil connections on all paper capacitors, also the polarity of the electrolytic capacitor C17.

6. Keep blue and red leads of output transformer above the mounting shelf.

7. Dress all leads as far as possible from loading coil.

8. Dress leads to gang as far as possible from all metal parts.

9. Dress loop leads to keep from interferlng with battery replacement.



K=1000

ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS GROUND AND SHOULD HOLD WITHIN ±20% WITH RATED BATTERY SUPPLY.
*MEASURED WITH CHANALYST OR VOLTOHMYST

RCA VICTOR

65F and CV-42 Electrifier

Chassis No. (RC-1004E) (RS-1000)

Cathode Ray Alignment is the preferable method. Connections for the oscillograph are shown in the diagram.

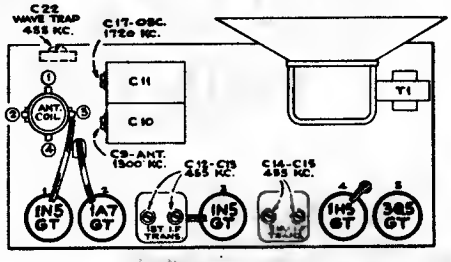
Output Meter Alignment.—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

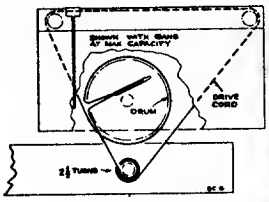
Test Oscillator.—For all alignment operations, connect the low side of the test oscillator to the receiver chassis, and keep the output as low as possible to avoid AVC action.

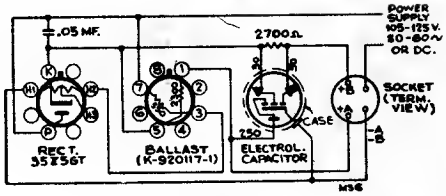
Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be set at the left-hand end dial calibration mark.

Step	Connect high side of the test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I-F grid in series with .01 mfd.	455 kc	Quiet point between 550 and 750 kc	C14, C15 (2nd I-F Trans.)
2	1A7GT grid in series with .01 mfd.			C12, C13 (1st I-F Trans.)
3	Antenna terminal in series with 200 mmfd.	1,720 kc	Tuning condenser rotor plates all out	C17 (osc.)
4		1,300 kc	1,300 kc signal	C9 (ant.)
5		455 kc	Quiet point between 550 and 750 kc	Adjust C22 for minimum output on strong 455 kc signal

Top-View



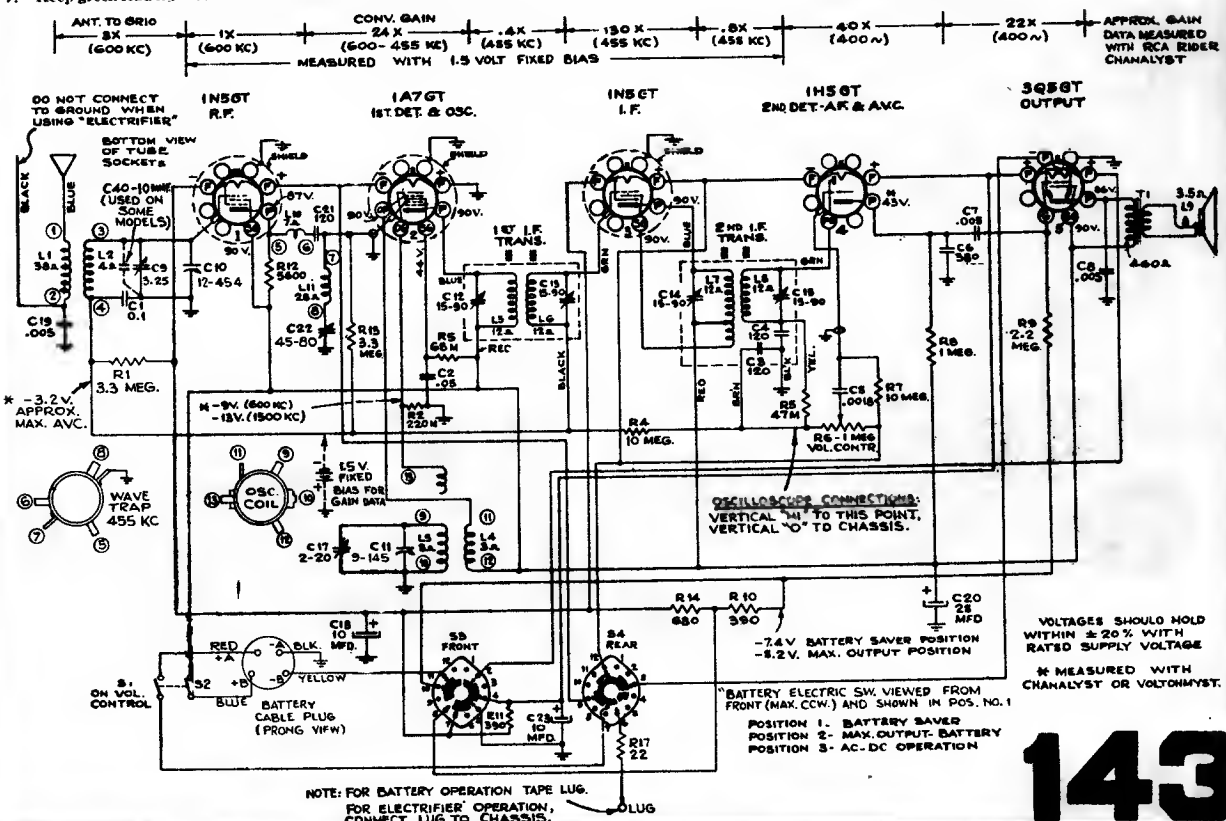




Precautionary Lead Dress.—

1. The lead from the 3Q5 plate to output transformer should be dressed under clip, and away from audio input leads.
2. All filament wires should be dressed close to chassis.
3. Keep AVC lead connecting C1 (0.1 mfd. filter) to antenna coil away from the 1A7GT plate.
4. Keep blue plate leads coming from 1.F. transformers short and close to chassis.
5. Keep yellow leads connected to oscillator coil away from trap coil.
6. Keep grid lead of 1N5GT RF tube away from 1A7GT grid.
7. Keep green lead from second I.F. transformer short and close to ground.

Electrifier Schematic



RCA VICTOR

66X11, 66X12, 66X13

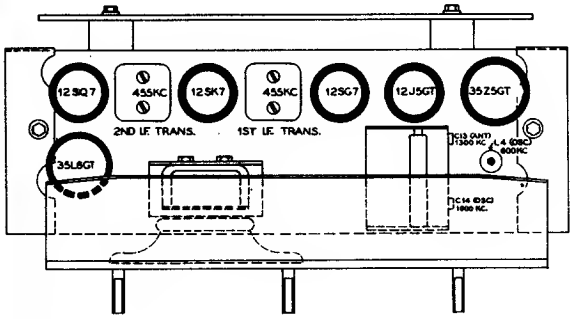
Chassis No. RC-1046A, RC-1046, RC-1046B

66X14, 66X15

RC-1046B

Critical Lead Dress

1. Dress output plate bypass capacitor (C-11 .02 mf) against chassis.
2. Dress 35L6GT plate lead (red) against chassis and away from volume control, leads and terminals.
3. Dress audio coupling capacitor (C-7 .02 mf) away from 35L6GT heater leads.
4. Dress tone control lead against front apron.
5. Dress 2nd i-f yellow and brown leads away from output plate bypass capacitor (C-11, .02 mf.) and away from all heater leads.
6. Dress lead to speaker voice coil away from tuning shaft "C" washer.
7. Dress tone control capacitor (C-10, .002 mf.) away from oscillator coil.
8. Dress all uninsulated leads away from each other and away from chassis to prevent short circuits.
9. Dress blue and green leads of both i-f transformers back in shields leaving exposed lengths as short as possible.



Alignment Procedure

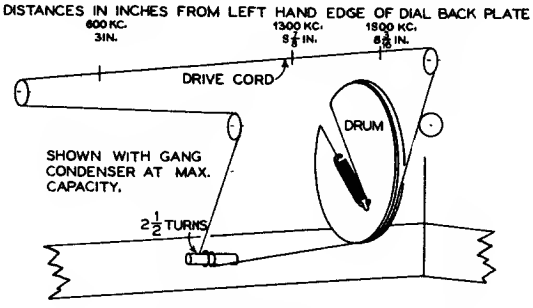
Test Oscillator.—Connect high side of test oscillator as shown in chart. Connect low side through a .01 mf capacitor to common "—B." Keep the output signal as low as possible to avoid AVC action.

Output Meter.—Connect leads between speaker voice coil and chassis. Turn volume control to maximum clockwise, tone control to maximum highs (clockwise).

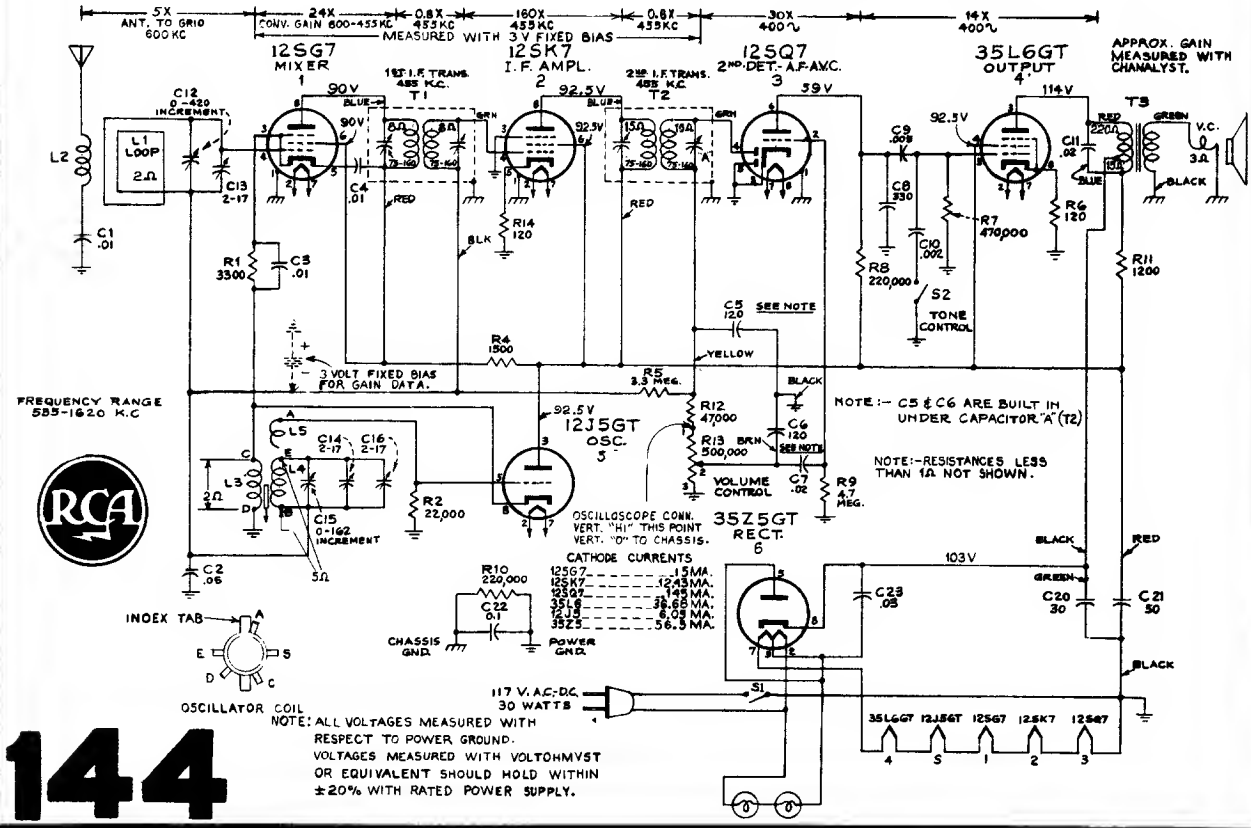
Dial Pointer Adjustment.—Rotate tuning condenser fully counterclockwise (plates closed). Adjust indicator pointer to 2 1/16" from left hand edge of dial back plate.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	Stator of C-12 in series with .01 mfd.	455 kc	Quiet-point 1,600 kc end of dial	Sec. and pri. 2nd I-F trans.
2				Sec. and pri. 1st I-F trans.
3	Ant. lead in series with 200 mmfd.	1,600 kc	1,600 kc	C14 (osc.)*
4		1,300 kc	1,300 kc	C13 ant.
5		600 kc	600 kc	L4 (osc.) Rock in
6	Repeat steps 3, 4 and 5.			

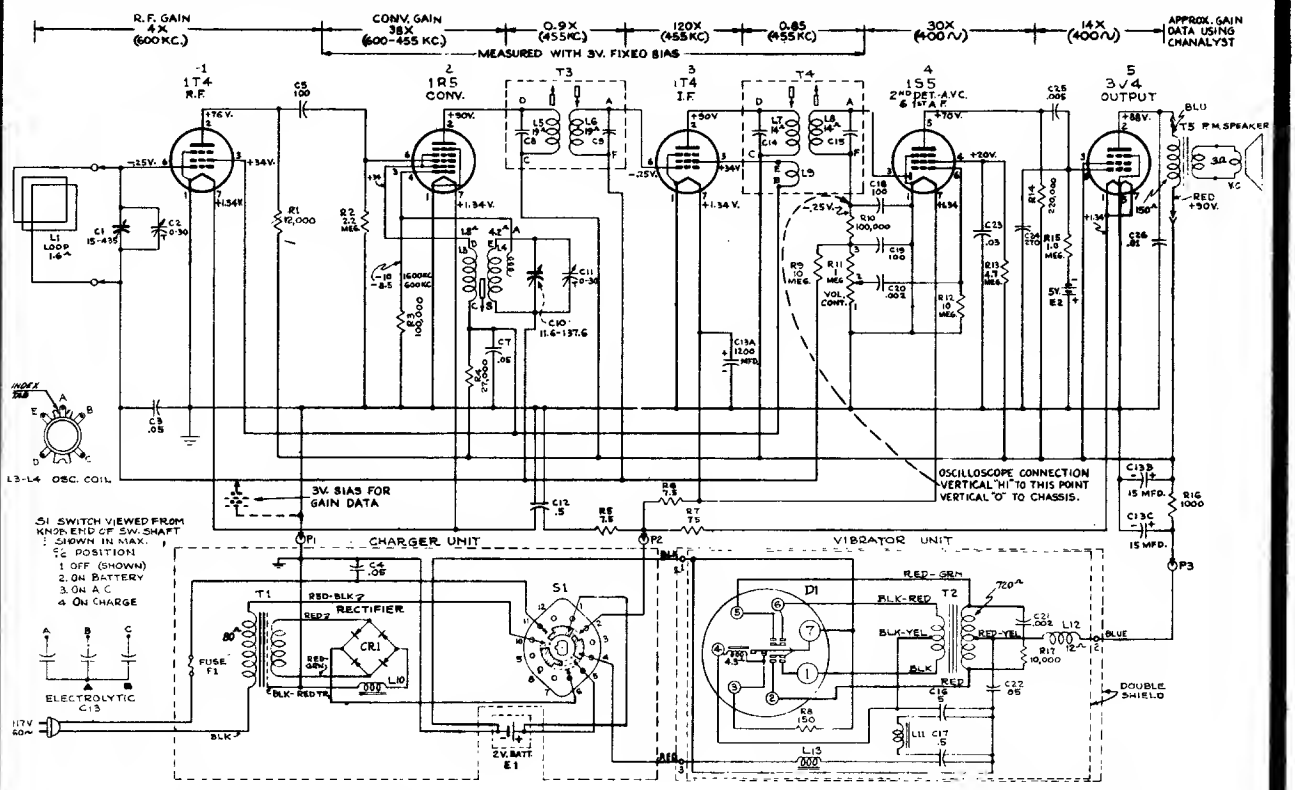
*Left hand osc. trimmer should be pre-set approx. ¼ turn from tight.



Dial-Indicator and Drive Mechanism



NOTE: ALL VOLTAGES MEASURED WITH RESPECT TO POWER GROUND. VOLTAGES MEASURED WITH VOLTOHMYST OR EQUIVALENT SHOULD HOLD WITHIN ±20% WITH RATED POWER SUPPLY.



Cathode Ray Alignment is the preferable method. Connections for the oscilloscope are shown on the schematic diagram.

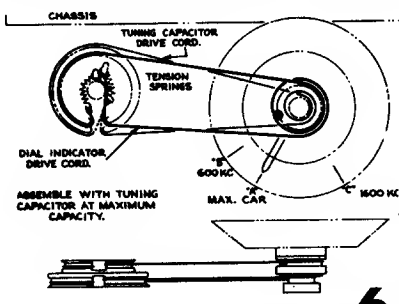
Output Meter Alignment.—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

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

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	High side of loop (Green lead) in series with 0.1 mfd.	455 kc	Gang at max. cap.	L7, L8, 2nd I.F. trans L5, L6, 1st I.F. trans.
2	220 mmf. in series with a single turn loop 4x8 in., approx. 3 in. from receiver loop. (Bottom shield cover in place and chassis in cabinet)	1600 kc	1600 kc "C"	C11 Osc. C2 R.F.
3		600 kc	600 kc "B"	L4 Osc. Rock in
4		1600 kc	1600 kc "C"	C11 Osc.

Note.—In alignment, if possible, it is advisable to utilize an external source of "B" voltage. This will facilitate accessibility of the various trimmers.

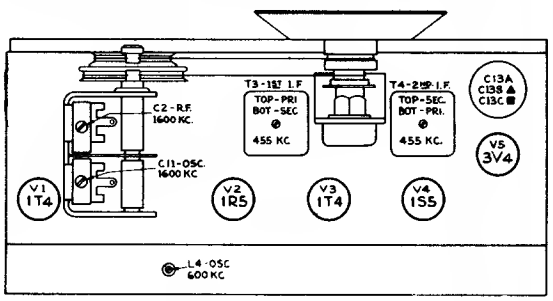
Calibration.—It is not necessary to refer to the dial scale for calibration. Three reference marks on the dial backing are used. With the gang completely meshed, the pointer should be set at "A" as shown in the diagram. For alignment purposes, 600 kc. will then fall at "B", and 1600 kc. will be at "C"



Operation.—This set operates on battery, or 117 Volt, 60 cycle AC (Battery in set, and in good condition). Provision is made so that when the set is operating on "AC" the battery is receiving a slight charge. In the "Charge" position, the rate of charge is much higher. A completely discharged battery will recharge in about 24 hours on "Charge". It is possible to overcharge the battery in the "AC" position, so it is advisable to play the receiver on "Battery" until slightly discharged whenever the battery has become fully charged on "AC"

Battery Charging.—With the cabinet back removed, two balls (1 red and 1 green) may be seen through an opening in the battery compartment cover. Both balls at top—battery full charged—Green ball sinks when battery is 20% discharged. Both balls at bottom—battery 90% discharged. Re-charge by connecting set to 115 volt 60 cycle power supply and set power switch to "CHG". Do not overcharge—check fuse if battery does not charge—do not allow battery to remain in discharged condition.

Water level.—Water Level should be checked frequently and **distilled** water or tap water, if it is used for cooking and drinking, added if required to bring liquid level up to the indicator line visible through the opening in the battery compartment cover. To add water; Remove line cord from power supply, remove cabinet back, remove thumb nuts and battery compartment cover, pull the battery out sufficiently to expose the red fill cap (pull on strap at bottom of battery), do not strain battery leads. Unscrew the red fill cap and add sufficient water to bring liquid level up to the indicator line.



RCA VICTOR

65BR9 PORTABLE

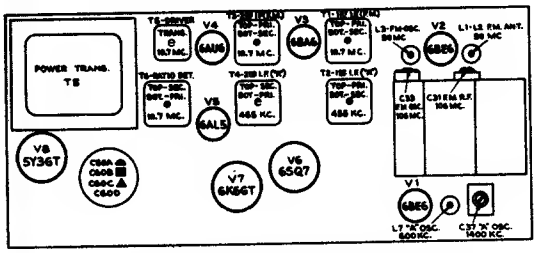
Chassis No. RC-1045

RCA VICTOR

Chassis No. RC-608

MODELS 68R1, 68R2, 68R3, 68R4

Circuit diagram next page.



Tube and Trimmer Locations (Top View)

FM Ratio Detector Alignment

Range Switch in FM Position

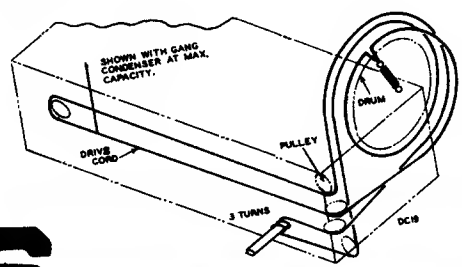
Steps	Connect the high side of the test osc. to—	Tune test-osc. to—	Turn volume control to—	Adjust
1	Connect a 680 ohm resistor between pins 5 & 7 of the ratio detector tube 6AL5. Connect the d-c probe of a VoltOhmyst to the negative lead of the 5 mfd. electrolytic condenser, C18. The common lead of the meter to ground.			
2	Driver grid, pin 1, of the 6AU6 in series with .01 mfd.	10.7 mc. 30% mod. 400 cycles (AM) Approx. .25 Volt output	Maximum Volume	*Driver transformer, T5 for maximum d-c across C18.
3	Remove the meter leads and disconnect the 680 ohm resistor from the 6AL5. Connect two 68,000 ohms (±1%) resistors in series, across the 22,000 ohm ratio detector load resister, R17. Connect the common lead of the VoltOhmyst to the center point of the 68,000 ohm resistors, and the d-c probe to terminal "A" of the ratio detector transformer, T6. Set the meter to the 0-30 VDC scale.			
4	Same as in Step 2.	Same as in Step 2. Approx. .25 Volt output.	Maximum volume.	†T6 bottom core for zero d-c balance. T6 top core for min. audio output.‡
5	Reconnect VoltOhmyst as in Step 1, omitting 680 ohm resistor.			
6	Repeat Step 2.			
7	Remove ALL connections.			

*Approximately 14.5 volts.

†Near the correct core position the zero point is approached rapidly and continued adjustment causes the indicated polarity to reverse. A slow approach to the zero point is an indication of severe detuning, and the bottom core should be turned in the opposite direction.

‡The zero d-c balance and the minimum a-f output should occur at the same point. If such is not the case, the two cores should be adjusted until both occur with no further adjustment of either core. It may be advantageous to adjust both cores simultaneously, watching the VoltOhmyst, and the output meter, hooked across the voice coil, for the point at which both zero d-c and minimum a-f output occur.

Note:—Two or more points may be found which will satisfy the condition required in Step 4. T6 top core should be correctly adjusted when approximately ⅛ inch of threads extend above the can, therefore, it is desirable to start adjustment with the top core in its furthest "in" position and turn out, while adjusting the bottom core, until the first point of minimum a-f and zero d-c is reached.



Dial-Indicator and Drive Mechanism

FM I.F. R.F. Alignment*

Range Switch in FM Position

Steps	Connect the high side of the test-osc. to—	Connect the ground side of the test-osc. to—	Tune test-osc. to—	Radio dial turned to—	Adjust
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 5 mfd. electrolytic condenser, C18, and the common lead of the meter to chassis ground.				
2	To one terminal of the FM antenna in series with .01 mfd.	To the other terminal of the FM antenna.	10.7 mc. 30% mod. at 400 cycles. (AM)	Maximum capacity. (Fully meshed)	†T3, bottom core for maximum d-c across C 18. Load the plate winding of T3 with a 680 ohm resistor.‡
3	Same as 2.				T3, top core for maximum d-c across C 18. Load the grid winding of T3 with the 680 ohm resistor used in Step 2.
4	Same as 2.				T1, bottom core for maximum d-c across C 18. Load the plate winding of T1 with the 680 ohm resistor.
5	Same as 2.				T1, top core for maximum d-c across C 18. Load the grid winding of T1 with the 680 ohm resistor.
6	To one terminal of the FM antenna in series with a 120 ohm resistor.	To the other terminal of the antenna in series with a 120 ohm resistor.	106 mc.	106 mc.§	Condensers C33 and C31 for maximum d-c output across C18.
7	Same	Same	90 mc.	90 mc.	Coils L2 and L3 for maximum d-c output across C18.
8	Repeat steps 6 & 7 until further adjustment no longer improves calibration.				

*Correct alignment of the 455 kc. I.F. requires that the 10.7 mc. FM I.F. be aligned previously.

†This method is known as alternate loading which involves the use of a 680 ohm resistor to load the plate winding while the grid winding of the *same* transformer is peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked.

‡When the windings are loaded it may be necessary to increase the 10.7 mc input since the gain will decrease resulting in a small or no reading across C18. This reading should be maintained at 2-4 volts, by adjusting the input, as each transformer is aligned.

§Completely mesh the gang and see that the pointer goes to mechanical maximum calibration point at low end of band. (Reference mark on dial back plate).

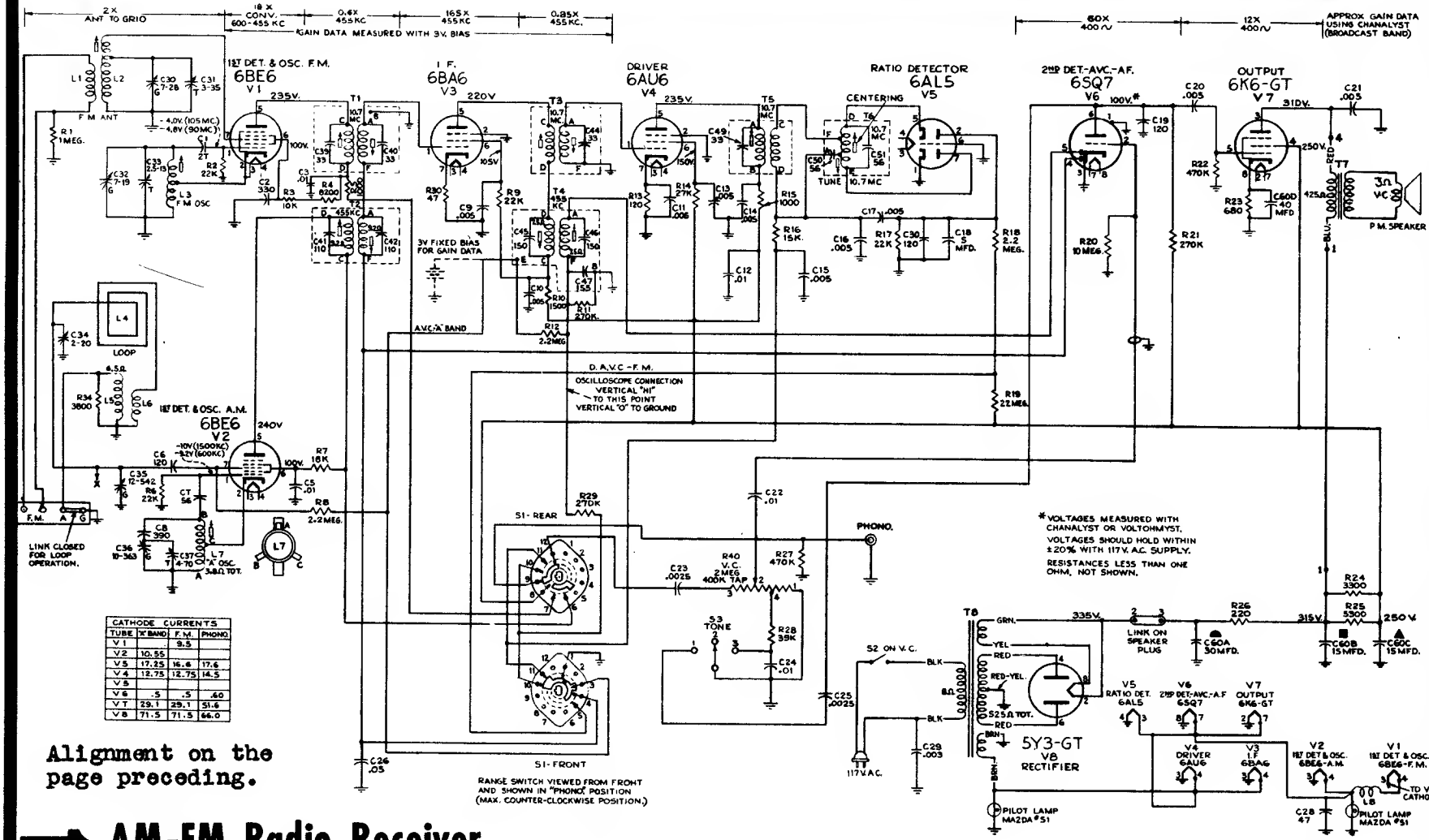
"A" Band Alignment*

Range Switch in BC Position

Steps	Connect the high side of the test osc. to—	Tune test osc. to—	Turn the radio dinl to—	Adjust for max. peak output.
1	AM converter grid, pin 1, 6BE6 in series with .01 mfd.	455 kc.	"A" Band Quiet poiat at high freq. end.	†T4—Top core T4—Bottom core
2				T2—Bottom core T2—Top core
3	Antenna lead in series with 200 mmf.	1400 kc.	"A" Band 1400 kc calibration pt.	C37—Osc. C34—Ant. (Loop)
4		600 kc.	"A" Band 600 kc calibration pt.	L7—Osc. Rock in.
5	Repeat steps 3 and 4 until aligned			
6	When chassis is installed, readjust C34 on the loop for max. output at 1400 kc.			

*Correct alignment of the 455 kc. I.F. requires that the 10.7 mc. FM I.F. be aligned previously.

†Align T4 and T2 by means of alternate loading. Use a 47,000 ohm resistor instead of a 680 ohm resistor. Alternate loading is explained in "FM I.F.-R.F. Alignment."



CATHODE CURRENTS			
TUBE	"A" BAND	F.M.	PHONO.
V 1		9.5	
V 2	10.55		
V 5	17.25	16.6	17.6
V 4	12.75	12.75	14.5
V 5			
V 6	.5	.5	.60
V 7	29.1	29.1	51.6
V 8	71.5	71.5	66.0

Alignment on the page preceding.

AM-FM Radio Receiver

Schematic Diagram

Critical Lead Dress

1. Dress capacitor C-1 near chassis base.
2. Dress lead from pin No. 5, No. 1 6BE6 to terminal C, of transformer T1, as near the bottom of the FM shelf as possible.
3. Dress capacitor C-23 next to chassis.
4. The lead from capacitor C-23 to the high side of the volume control must be dressed next to chassis along front apron.
5. Dress resistor R-20 near chassis base.
6. Dress all a-c leads away from volume control.
7. Solder FM antenna coil primary leads to terminal board with as short a lead length as practical.
8. Make all FM leads as short as possible. Dress of all other leads should be similar to original wiring.
9. The lead from pin No. 2, 6BA6, to ground must be dressed as close to the base and as near to the back apron as possible. This lead provides degeneration for the IF stage and neither its length, nor the point at which it is grounded to the chassis should be changed.

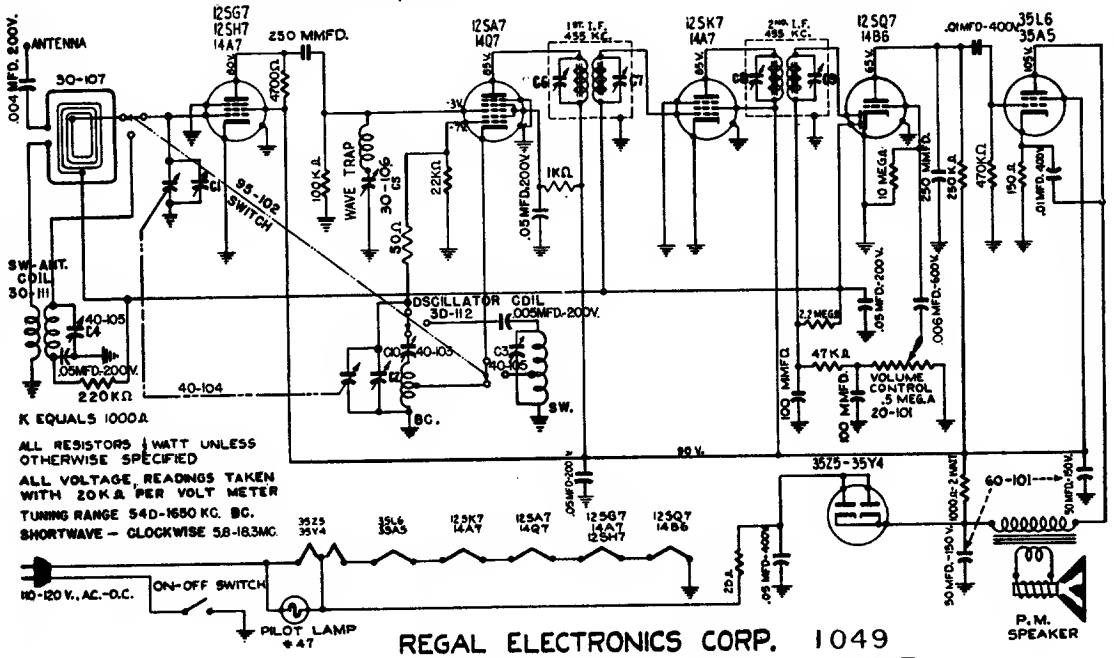
R C A VICTOR

Models 68R1, 68R2, 68R3, & 68R4

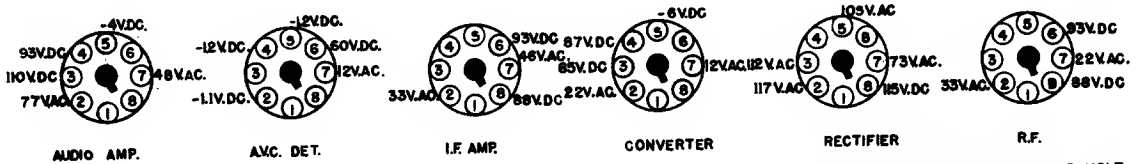
Chassis No. RC-608

REGAL ELECTRONICS CORPORATION
NEW YORK, N. Y.

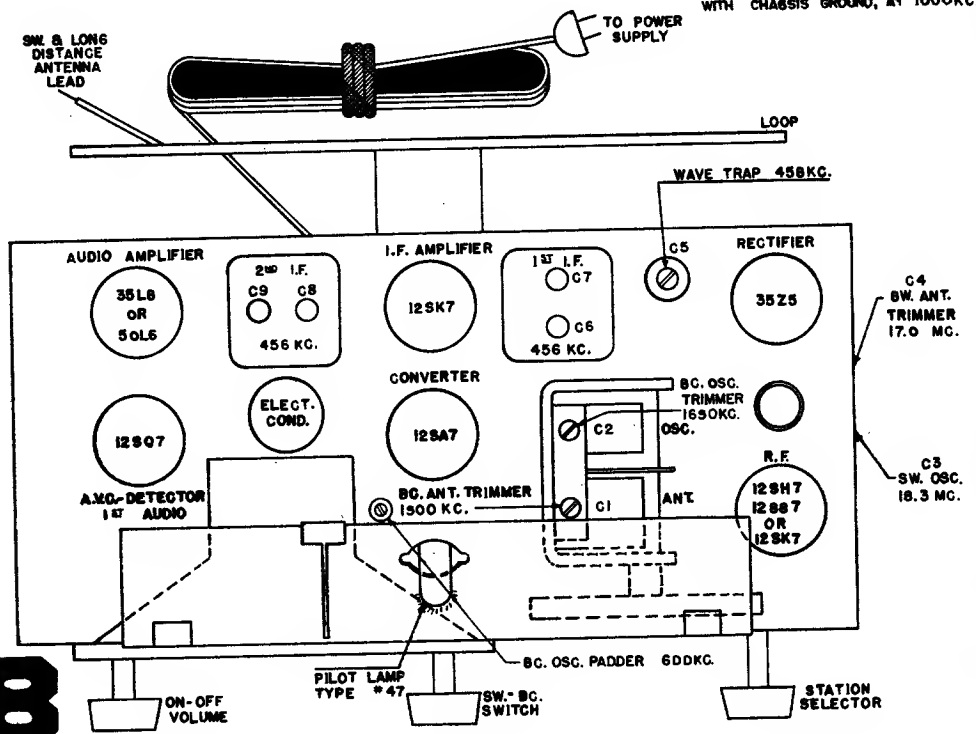
MODEL 1049

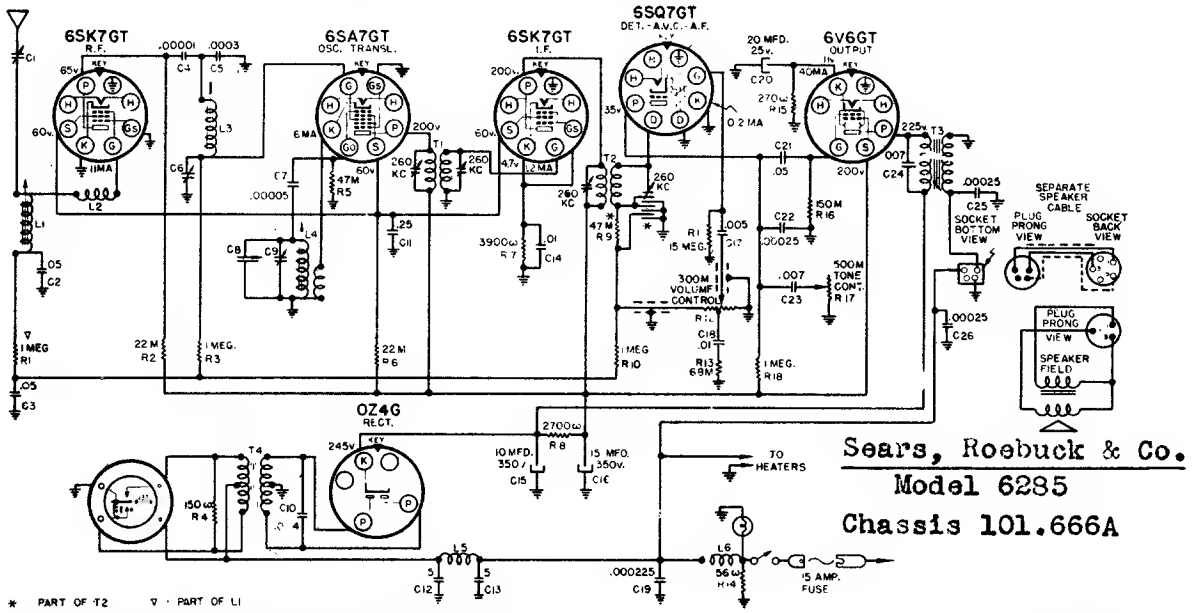


REGAL ELECTRONICS CORP. 1049



VOLTAGES TAKEN WITH 20KΩ PER VOLT METER WITH CHASSIS GROUND, AT 1000KC.

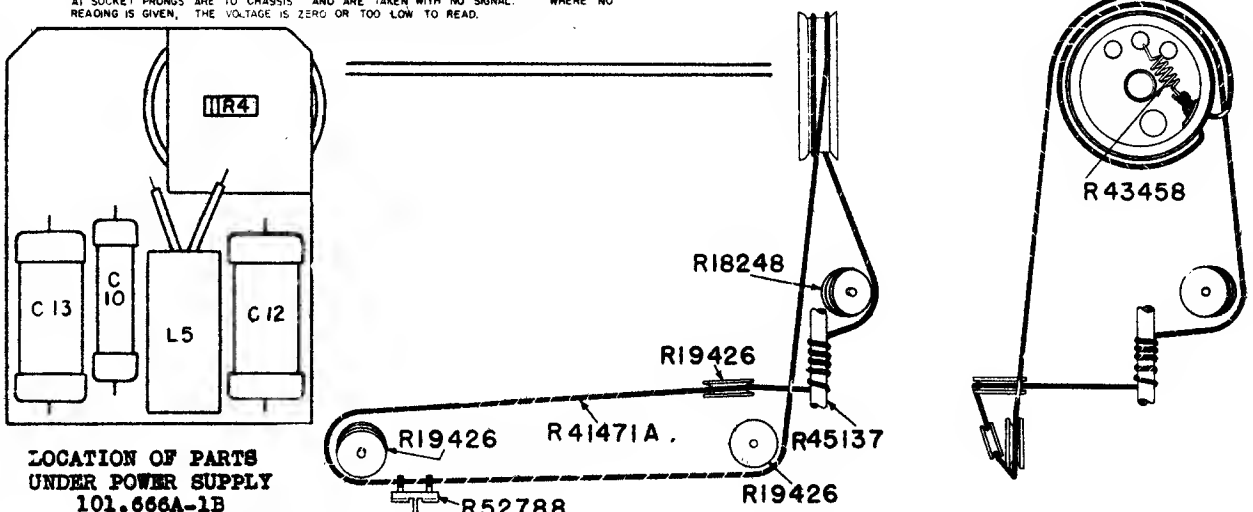




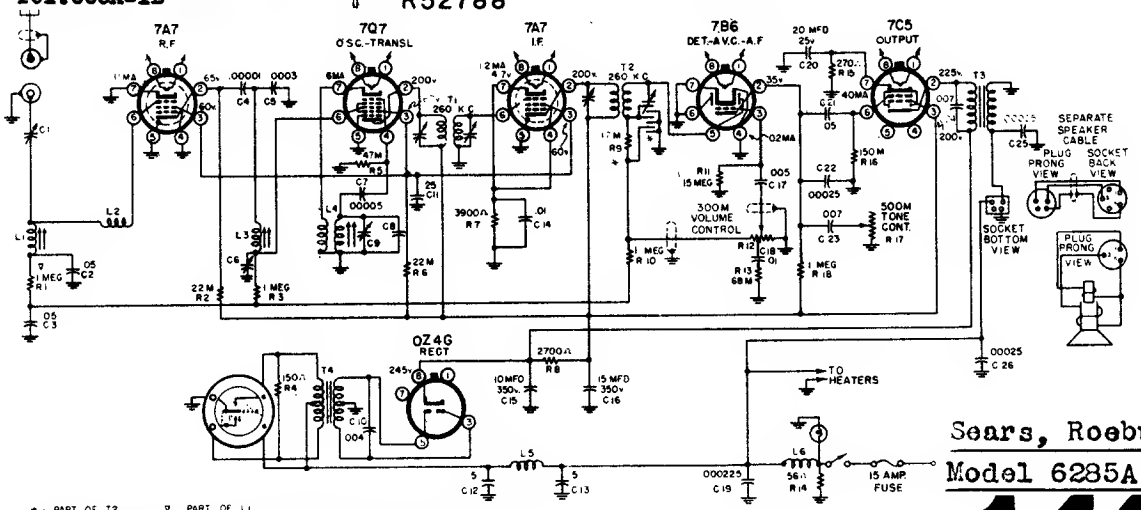
Sears, Roebuck & Co.
Model 6285
Chassis 101.666A

* PART OF T2 ▽ PART OF L1

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



LOCATION OF PARTS UNDER POWER SUPPLY 101.666A-1B



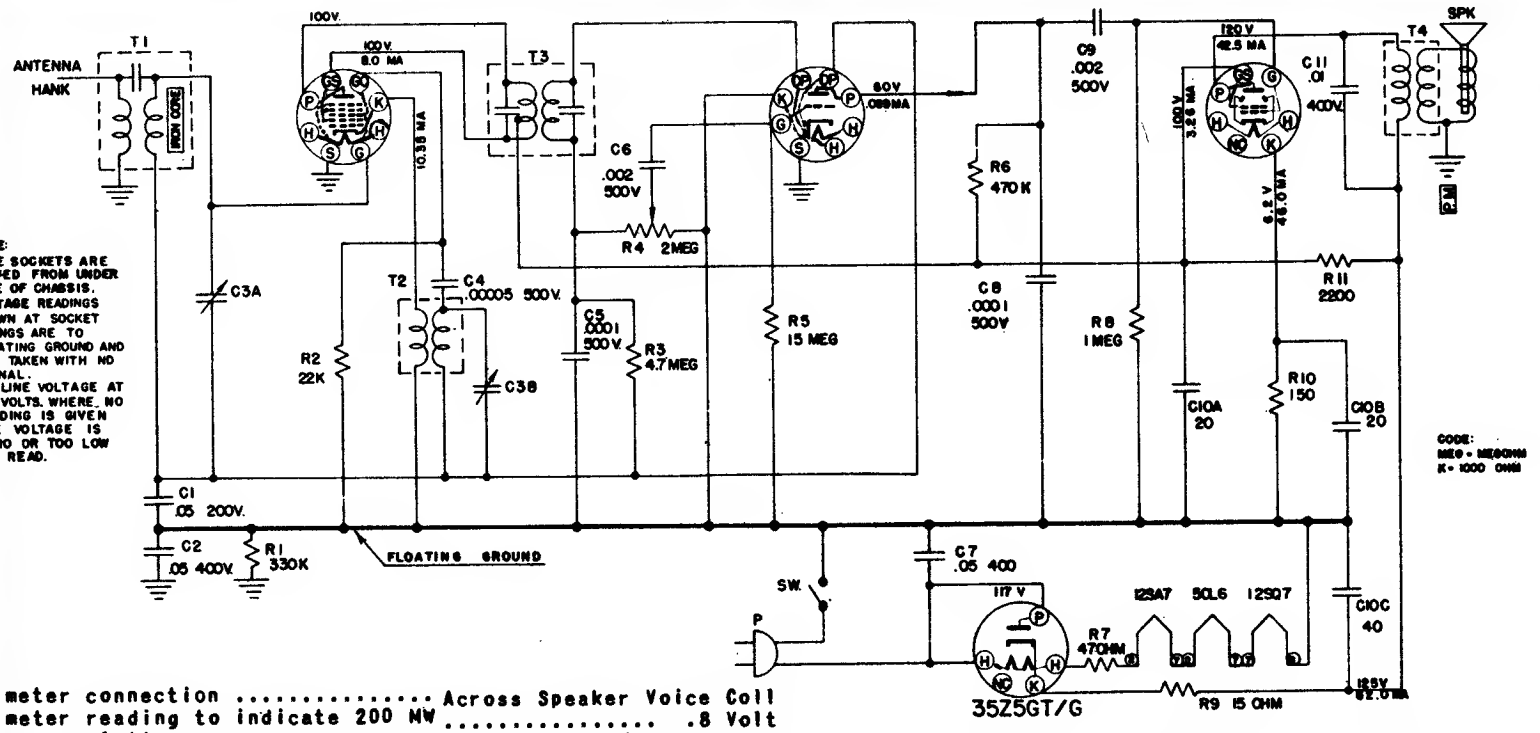
Sears, Roebuck
Model 6285A

* PART OF T2 ▽ PART OF L1

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

"A" BATTERY - 6 VOLTS CURRENT DRAIN - 6.5 AMPERES

DIAGRAM 101.666-1B



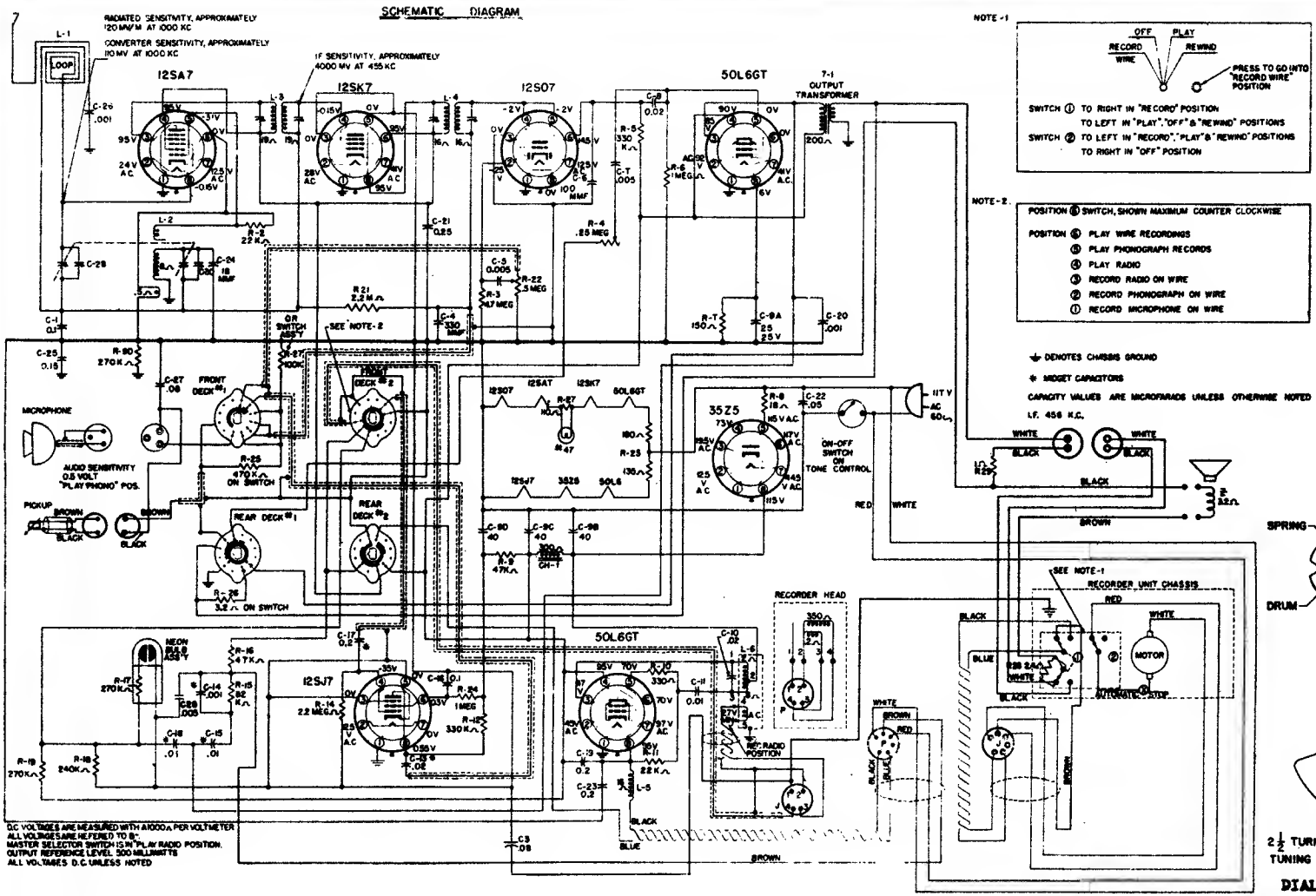
Output meter connection ..... Across Speaker Voice Coil
Output meter reading to indicate 200 MW ..... .8 Volt
Generator modulation ..... 30% 400 Cycles
Position of volume control ..... Fully Clockwise
Position of dial pointer with variable condenser fully closed ..... Down

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATDR CONNECTION NIGH SIDE	GENERATOR CONNECTION GRD. LEAD	ADJUST TRIMMERS IN ORDER SHOWN	TRIMMER FUNCTION
Open	455 KC	.05 Mfd.	Mixer Grid	Floating Gnd	T3	IF
Open	1620 KC	50 Mmf.	*Ant. Lug	Float. Gnd.	C3B	Oscillator
1400 KC	1400 KC	50 Mmf.	*Ant. Lug	Float. Gnd.	C3A	Antenna
600 KC	600 KC	50 Mmf.	*Ant.. Lug	Float. Gnd.	**Check Point	Antenna

* Antenna hank lug on antenna coil with hank removed.
** Check sensitivity at 600 KC. If low, adjust antenna section plates of variable for maximum output at 600 KC.
The alignment procedure should be repeeted in the original order for greatest accuracy
Always keep the output from the signal generator at its lowest possible value to make the A. V. C. action of the receiver ineffective.

SCHEMATIC LOCATION	PART NO.	DESCRIPTION
R1		Resistor, 330,000 Ohms, 1/4 Watt
R2		Resistor, 22,000 Ohms, 1/4 Watt
R3		Resistor, 4.7 Megohm, 1/4 Watt
R4	X21385	Control - Vol and switch, 2 meg.
R5		Resistor, 15 Megohm, 1/2 Watt
R6		Resistor, 470,000 Ohms, 1/4 Watt
R7	X10177	Resistor, 47 Ohms, 1 Watt
R8		Resistor, 1 Megohm, 1/4 Watt
R9		Resistor, 15 Ohms, 1/4 Watt
R10		Resistor, 150 Ohms, 1/4 Watt
R11		Resistor, 2200 Ohms, 1 Watt
C7		Condenser, .05 Mfd., 200 V
C8, C7		Condenser, .05 Mfd., 400 V
C8A, C3B	X21388	Condenser, Variable, 2 Gang
C6		Condenser, .00005 Mfd., 500 V., Mica
C5, C8		Condenser, .0001 Mfd., 500 V., Mica
C4, C9		Condenser, .002 Mfd., 400 V
C10A, C10B, & C10C	X21655	Condenser, Electrolytic, 40-20 Mfd., 150 Volt, 20 Mfd., 25 Volt
C11		Condenser, .01 Mfd, 400 V
T1	X21320	Coil, Antenna
T2	X21328	Coil, Oscillator
T3	X21329	Transformer, I. F.
Spk	X21470	Speaker, 4" P.M. with Output Transformer
	X21334	Speaker, 4" P.M.
	X21323	Transformer, Output
P	X20138	Line Cord with Plug
	X21128	Cabinet, Ivory
	X18028	Grille, Metal Cabinet Front
	X21175	Sticker, Dial Scale
	X21306	Grille Cloth, Rear Cabinet
	X21314	Felt Feet
	X21101	Knob, Tuning, Ivory
	X21178	Pointer, Dial
	X21177	Knob, Volume, Ivory
	X18138	Wire, Antenna Hank

Sears, Roebuck & Co.
Catalog Models 7086 & 7103
Chassis 110.466, 110.466-1

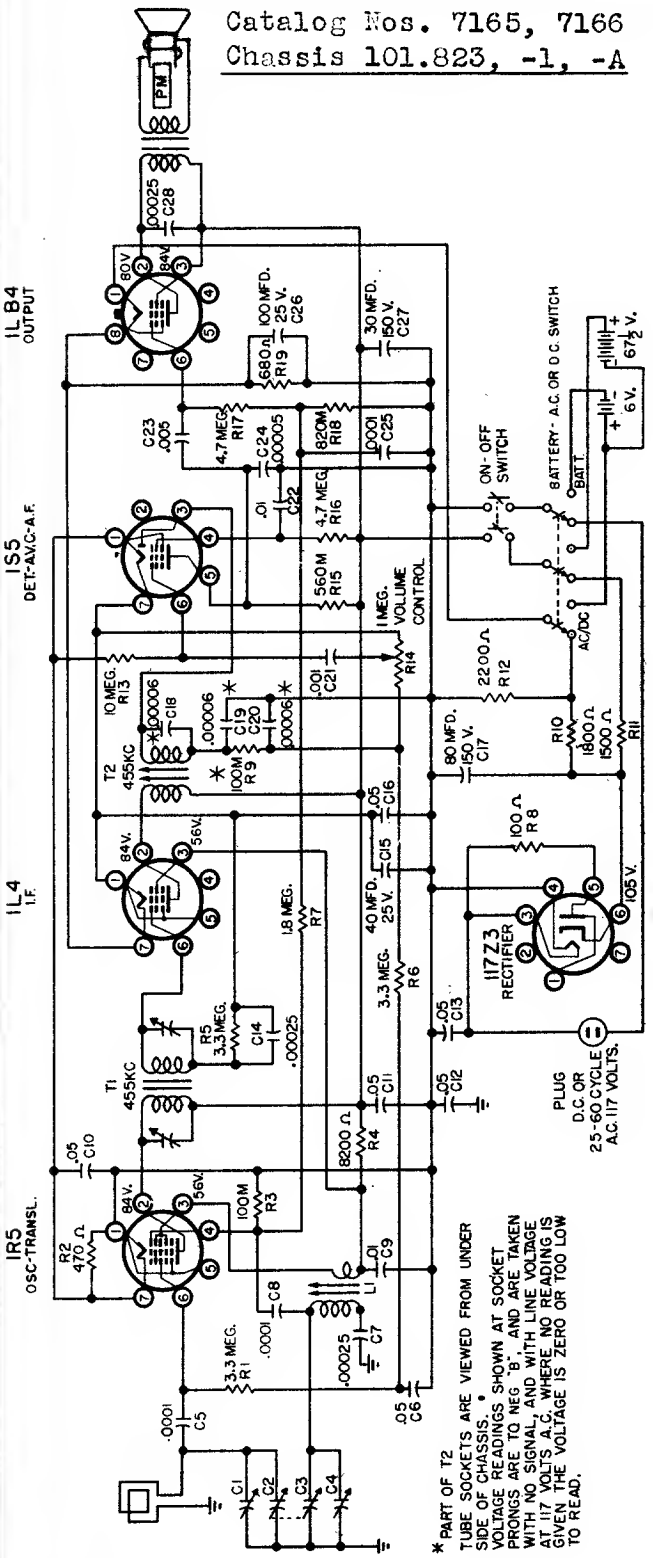


POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	ADJUSTMENTS (In order shown)	FUNCTION
Any	455	.2 mfd.	Grid. 12BA7GT	L3, L4	I.F.
1500 Kc	1500 Kc	***	*** See Below	C30, C29	Osc. R. F.
600 Kc	600 Kc	***	*** See Note Below	(Check-Point)	(Check Point)

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

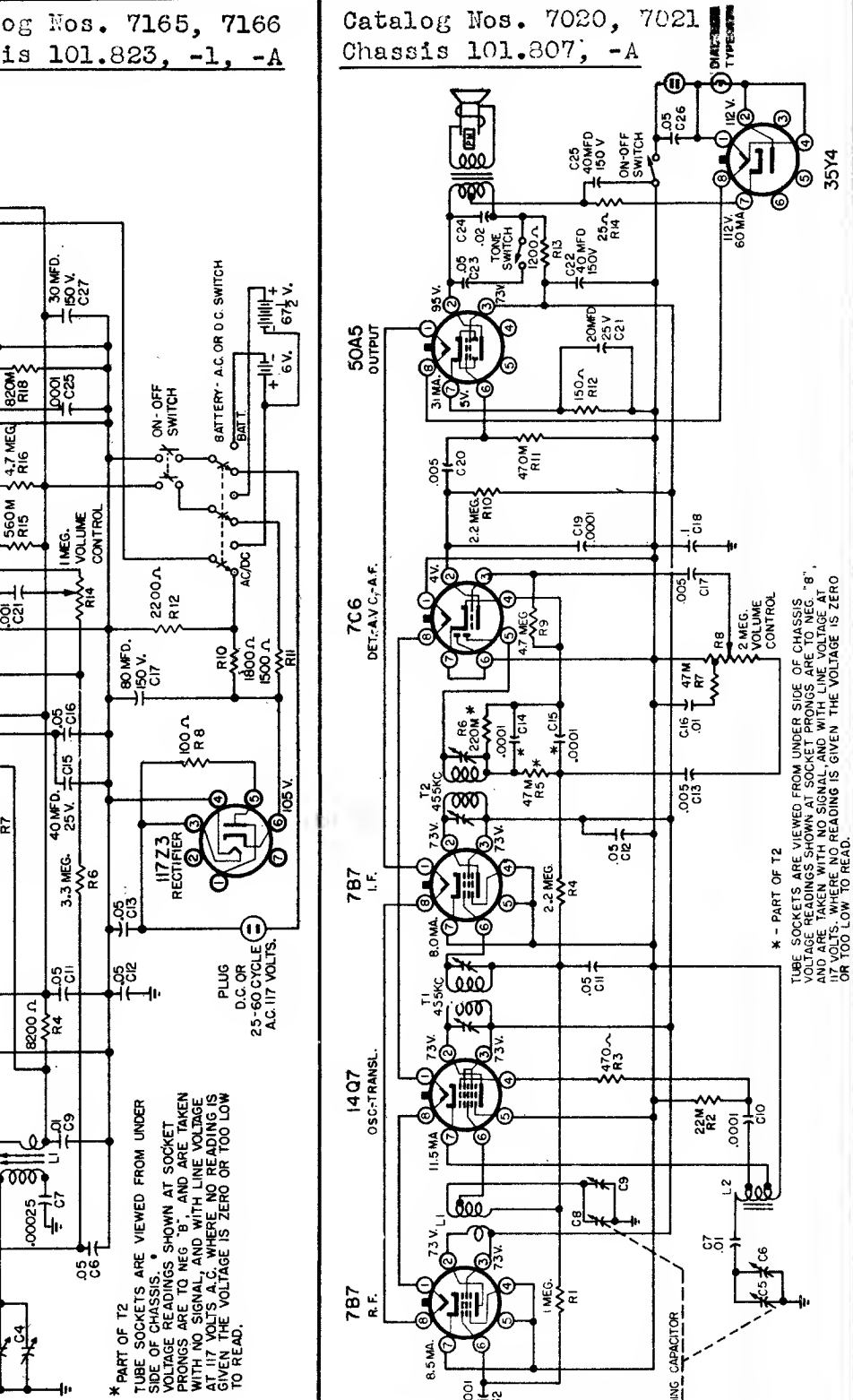
Sears, Roebuck & Co.

Catalog Nos. 7165, 7166
Chassis 101.823, -1, -A

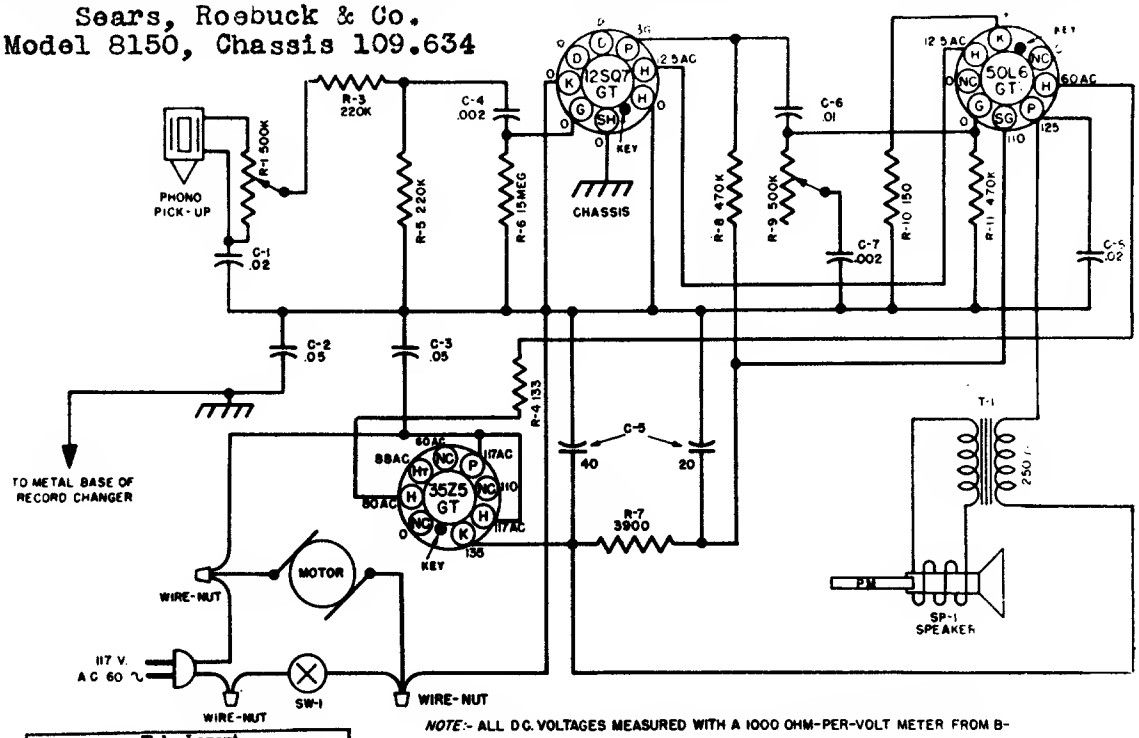


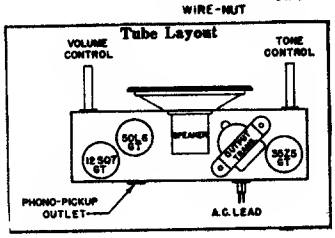
Sears, Roebuck & Co.

Catalog Nos. 7020, 7021
Chassis 101.807, -A



Sears, Roebuck & Co.
Model 8150, Chassis 109.634





NOTE:- ALL D.C. VOLTAGES MEASURED WITH A 1000 OHM-PER-VOLT METER FROM B- TO SOCKET CONTACT INDICATED. ALL VOLTAGES ARE POSITIVE D.C. UNLESS OTHERWISE MARKED.

VOLUME CONTROL FULL ON. ZERO SIGNAL INPUT.

TONE CONTROL IN CLOCKWISE POSITION.

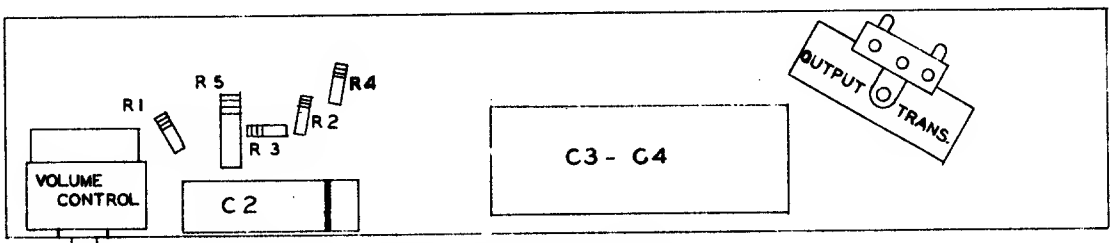
LINE VOLTAGE 117 VOLTS A.C.

RESISTANCE VALUES ARE IN OHMS UNLESS OTHERWISE NOTED "K" EQUALS 1000 OHMS, "MEG" EQUALS 1,000,000 OHMS.

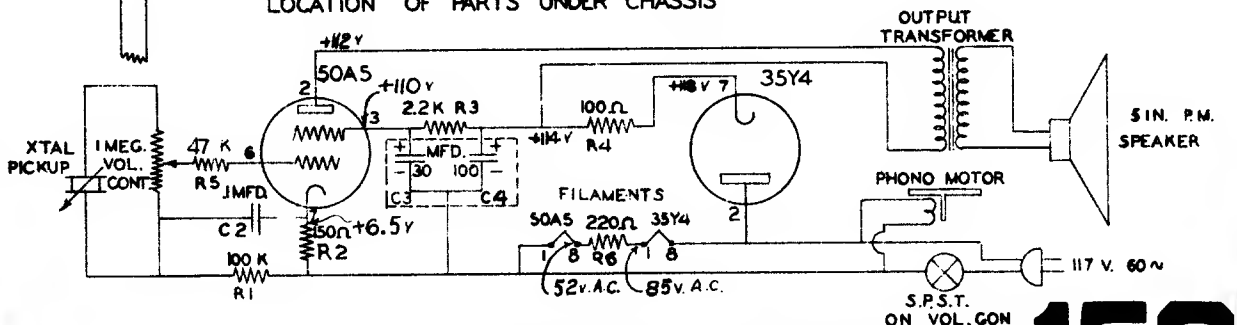
CAPACITY VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED.

ALL TUBE SOCKETS ARE SHOWN FROM PIN END VIEW.

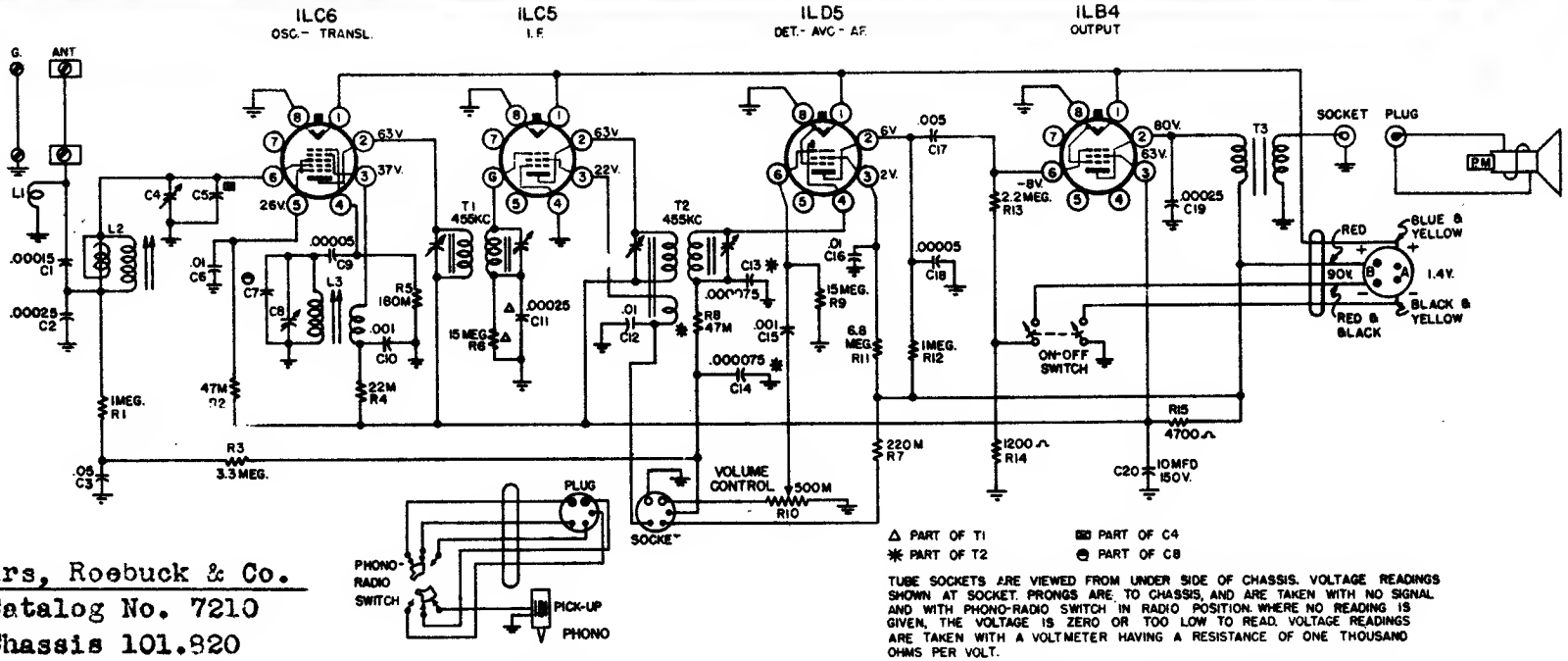
Sears, Roebuck & Co. Catalog No. 8144, Chassis 431.199



LOCATION OF PARTS UNDER CHASSIS

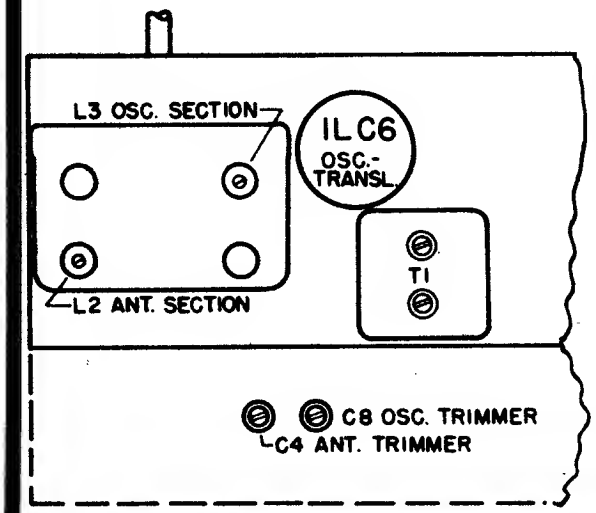


AMPLIFIER SCHEMATIC DIAGRAM 431.199



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL AND WITH PHONO-RADIO SWITCH IN RADIO POSITION WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. VOLTAGE READINGS ARE TAKEN WITH A VOLTMETER HAVING A RESISTANCE OF ONE THOUSAND OHMS PER VOLT.

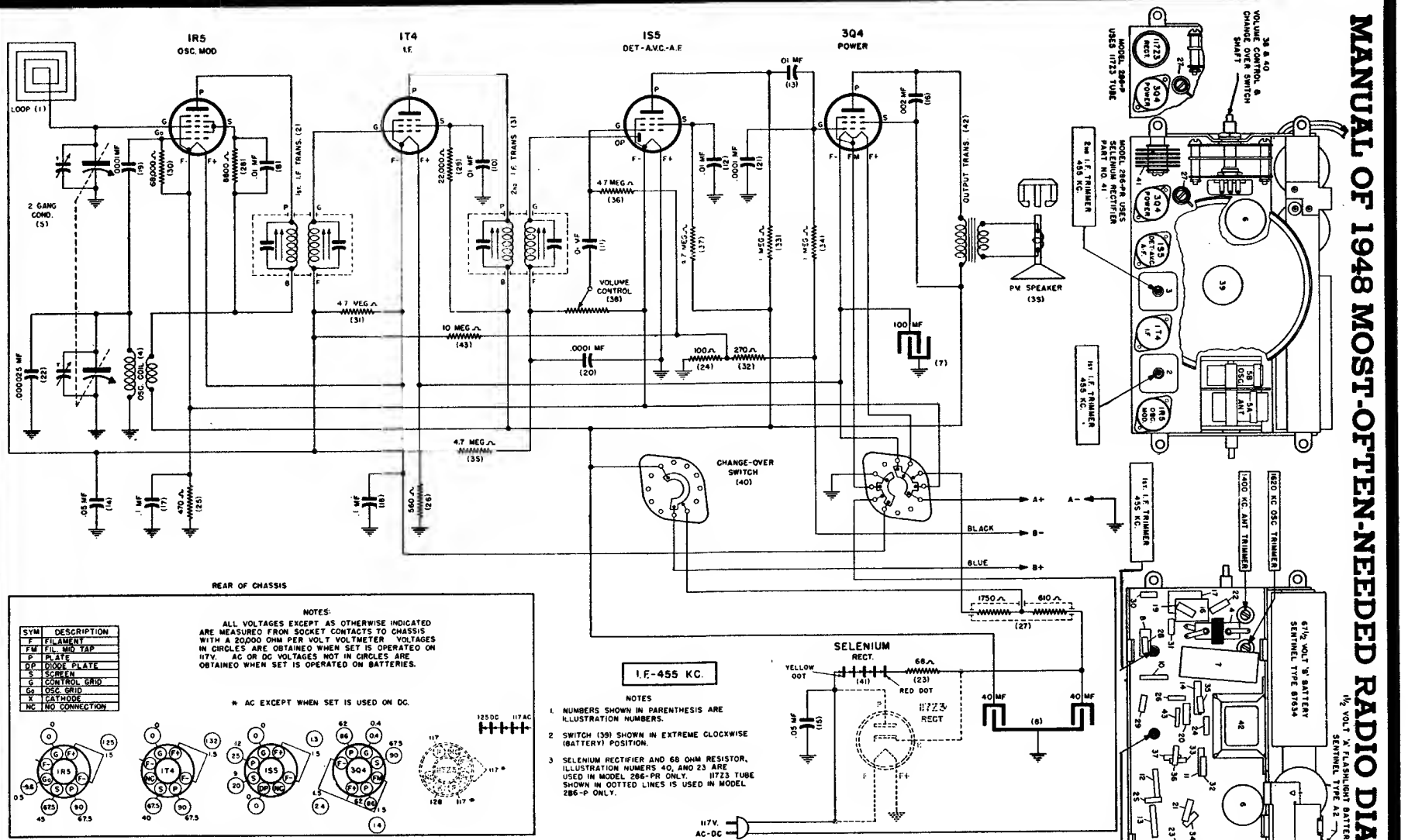
Sears, Roebuck & Co.
Catalog No. 7210
Chassis 101.820



Output Meter Connection.....Across loud-speaker voice coil
Output Meter Reading to Indicate 50 Milliwatts (Standard Output)..... 0.4 volt
Generator Ground Lead Connection.....Receiver chassis
Dummy Antenna Value to be in Series with Generator Output.....See chart below
Connection of Generator Output Lead.....See chart below
Generator Modulation.....30%, 400 cycles
Position of Volume Control..... Fully on
Position of Pointer with Tuner Fully Closed....Line to the left of 540 Kc calibration mark

POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	ADJUSTMENTS (IN ORDER SHOWN)	FUNCTION
Closed	455 Kc.	.1 mfd.	1LC6 Transl. Grid	T2,T1	I.F.
1725	1725 Kc.	.000075 mfd.	Ant. Terminal	C8	Oscillator
1725	1725 Kc.	.000075 mfd.	Ant. Terminal	C4	Antenna
1500	1500 Kc.	.000075 mfd.	Ant. Terminal	L3	Oscillator
1500	1500 Kc.	.000075 mfd.	Ant. Terminal	L2	Antenna
1725	1725 Kc.	.000075 mfd.	Ant. Terminal	C8,C4	Osc. & Ant. Recheck

MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS



REAR OF CHASSIS

SYM	DESCRIPTION
F	FILAMENT
FM	FIL. MID TAP
P	PLATE
DP	DIODE PLATE
S	SCREEN
G	CONTROL GRID
Go	OSC. GRID
X	CATHODE
NC	NO CONNECTION

NOTES:

ALL VOLTAGES EXCEPT AS OTHERWISE INDICATED ARE MEASURED FROM SOCKET CONTACTS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. VOLTAGES IN CIRCLES ARE OBTAINED WHEN SET IS OPERATED ON 117V. AC OR DC. VOLTAGES NOT IN CIRCLES ARE OBTAINED WHEN SET IS OPERATED ON BATTERIES.

* AC EXCEPT WHEN SET IS USED ON DC.

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

NOTES

1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. SWITCH (39) SHOWN IN EXTREME CLOCKWISE (BATTERY) POSITION.
3. SELENIUM RECTIFIER AND 68 OHM RESISTOR, ILLUSTRATION NUMBERS 40, AND 23 ARE USED IN MODEL 286-PR ONLY. 1172 3 TUBE SHOWN IN DOTTED LINES IS USED IN MODEL 286-P ONLY.

155

Sentinel Radio

MODEL 286P and 286PR

AC-DC BATTERY SUPERHETERODYNE RADIO

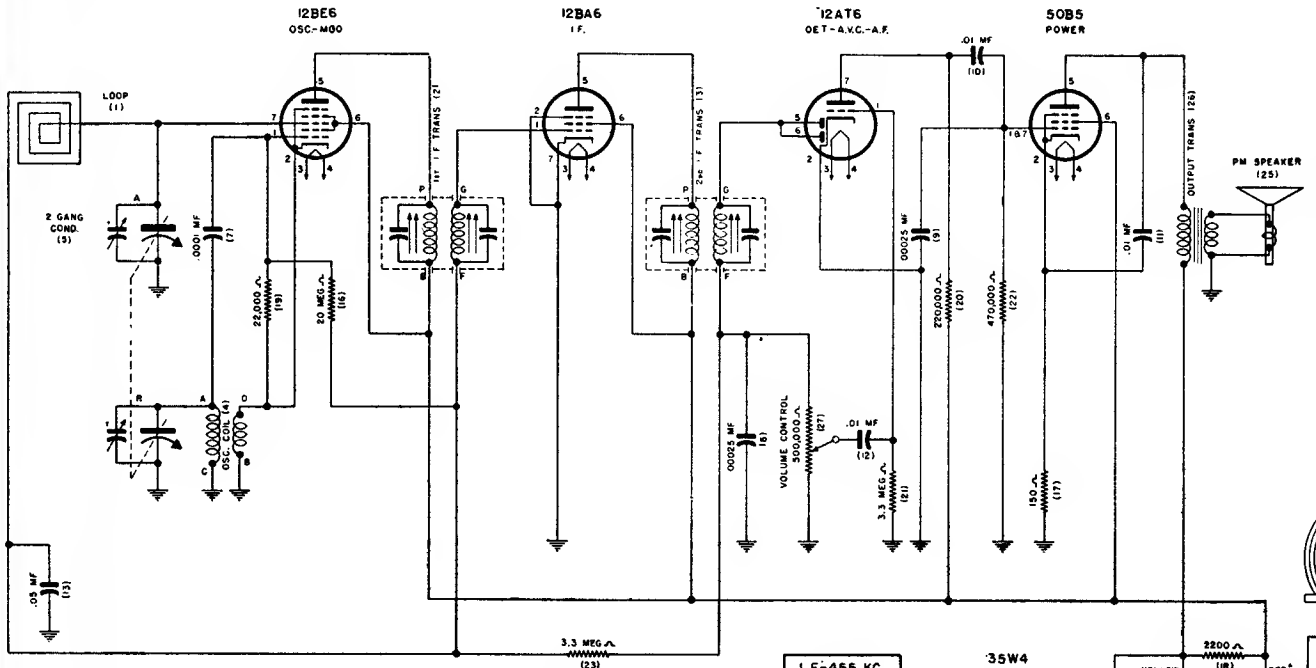
156

Sentinel Radio

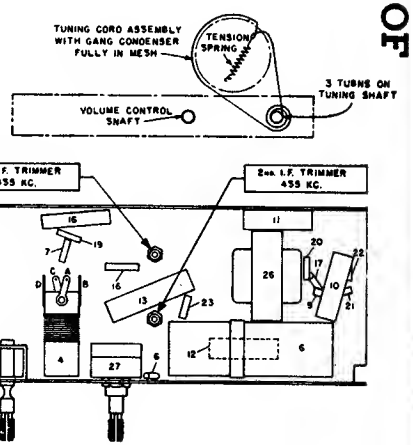
MODELS 309-W, 309-I, 309-N, 309-R

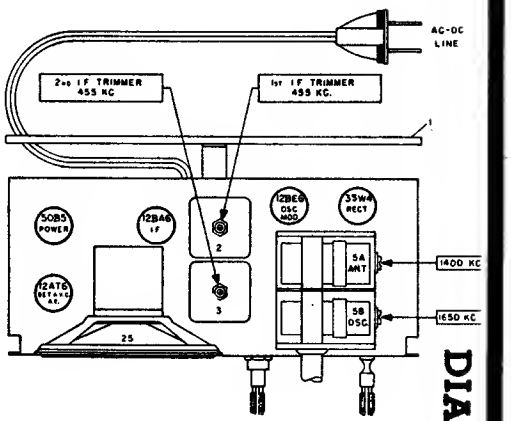
AC-DC SUPERHETERODYNE RECEIVER

MANUAL OF DIAGRAMS

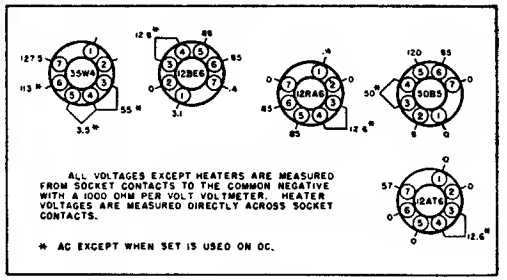


NOTE
NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.





REAR OF CHASSIS

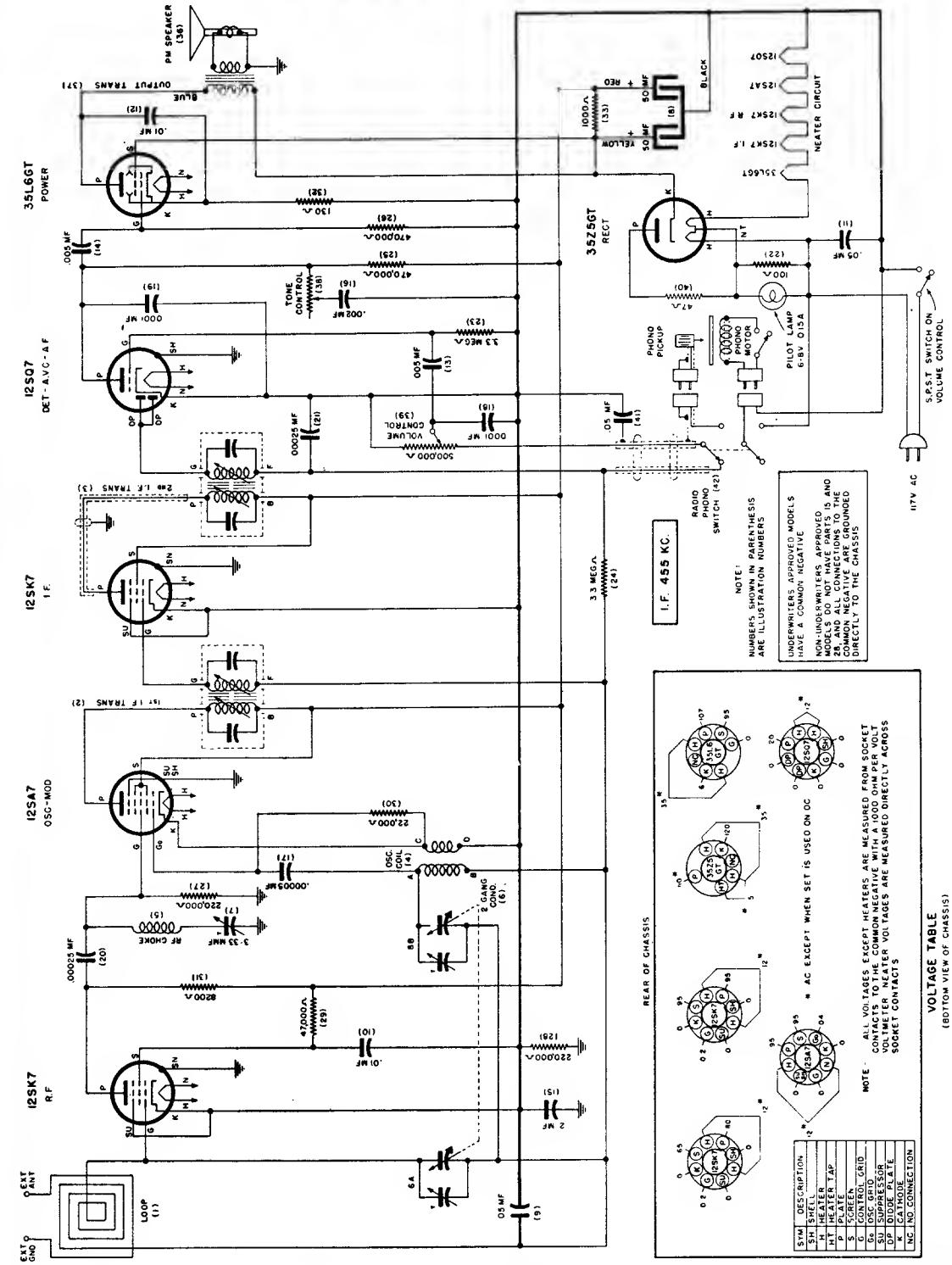


ALL VOLTAGES EXCEPT HEATERS ARE MEASURED FROM SOCKET CONTACTS TO THE COMMON NEGATIVE WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES ARE MEASURED DIRECTLY ACROSS SOCKET CONTACTS.

* AC EXCEPT WHEN SET IS USED ON DC.

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

Sentinel Radio MODELS 293-CT and 1U-293-CT

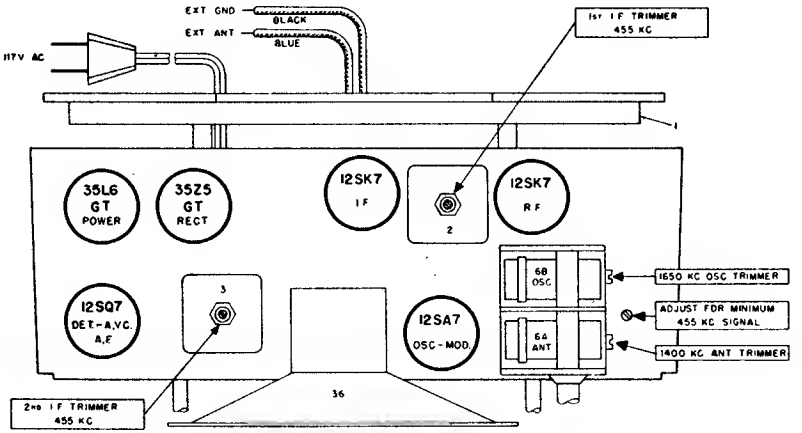


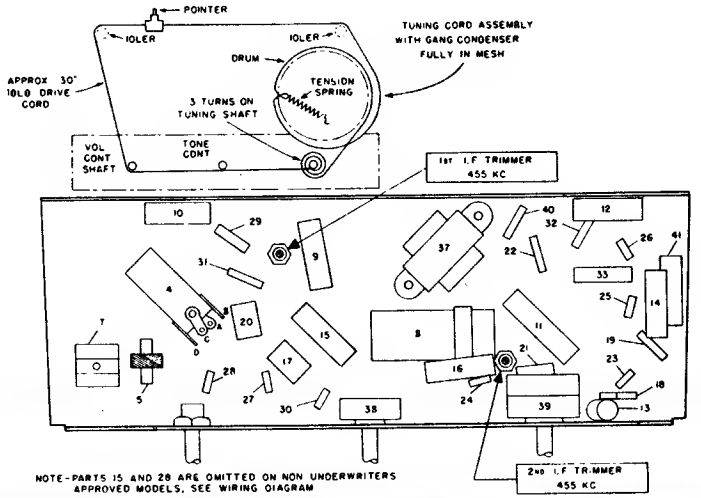
ALIGNMENT PROCEDURE

For Alignment procedure read tabulations from left to right, and make the adjustment marked (1) first, (2) next, (3) third.
IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET. BE SURE THAT IT DOES NOT MOVE WHILE ALIGNING.

When adjusting 1650 kilocycle oscillator trimmer, 455 K.C. R.F. trimmer and 1400 kilocycle antenna trimmer, connect test oscillator to loop external antenna and ground connections with a .0002 Mfd. condenser in series with antenna lead.

Steps	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to	
	Any point where no interfering signal is received	Exactly 455 K. C.	0.2 Mfd. Condenser	High side to grid of 12SA7 tube, Low side to chassis (if Model 293CT) or Common Negative (if Model 1U-293CT).	Adjust each of the 2nd I.F. transformer trimmer adjustment screws for maximum output, then adjust each of the 1st I.F. transformer trimmer adjustment screws for maximum output.
1	Rotate gang condenser to maximum capacity	Exactly 455 K. C.	.0002 Mfd. Condenser	To loop external antenna and ground connections	Adjust R. F. coil trimmer for minimum 455 K. C. signal.
2	Rotate gang condenser to minimum capacity	Exactly 1650 K. C.	.0002 Mfd. Condenser	To loop external antenna and ground connections	Adjust 1650 K. C. oscillator trimmer for maximum output.
3	Approximately 1400 K. C.	Approx. 1400 K. C.	.0002 Mfd. Condenser	To loop external antenna and ground connections	Adjust 1400 K. C. antenna trimmer for maximum output.





McMurdo Silver Company
INCORPORATED

MODEL 906 AM/FM SIGNAL GENERATOR

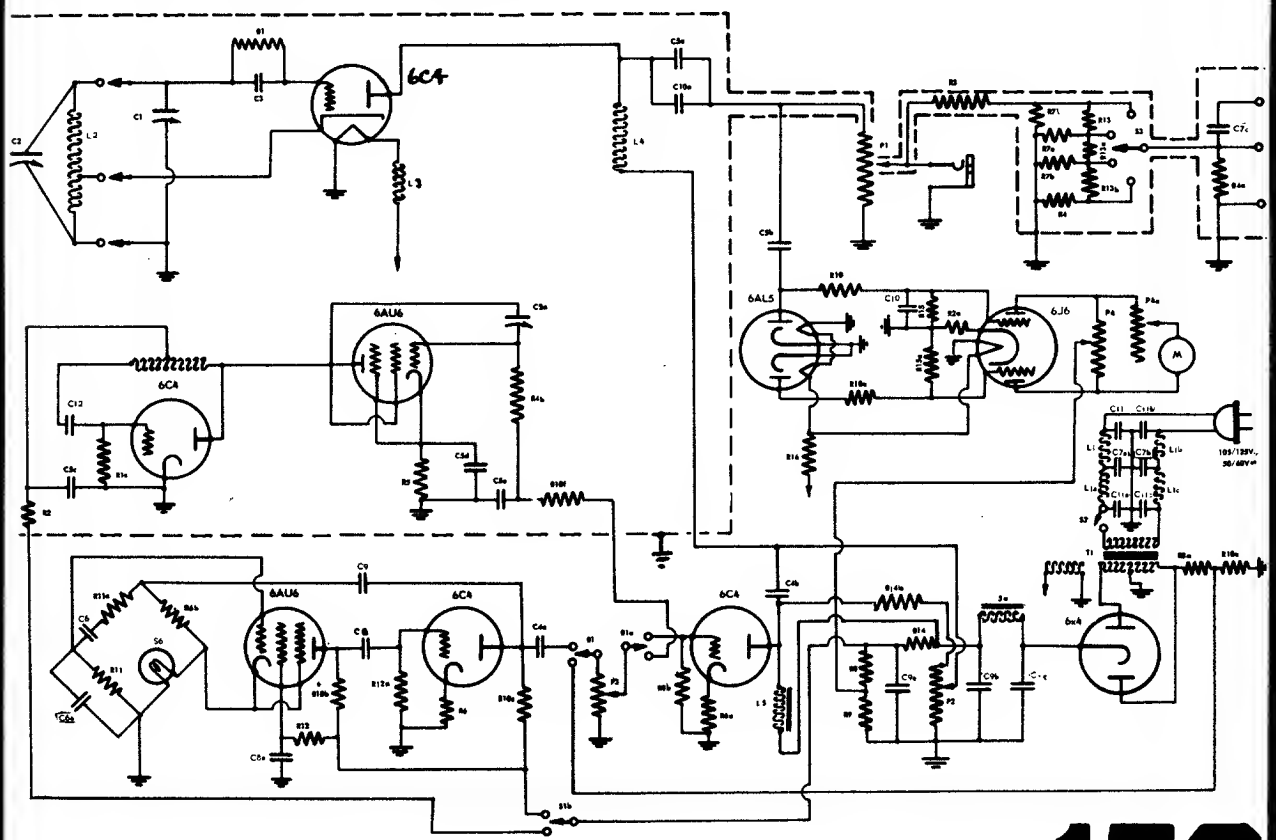
C1 - 10/210 mmfd. air capacitor
C2, C2a - 3/30 mmfd. air capacitors
C3 - 50 mmfd. tubular ceramic ±20%
C4a, C4b - .1 mfd., 400 volt, ±20%
C5a thru C5e - 500 mmfd. ceramic ±20%
C6, C6a - 500 mmfd. ceramic ±2%
C7a thru C7c - .02 mfd., 400 volt, ±20%
C8, C8a - .05 mfd., 400 volt ±20%
C9 thru C9c - 8 mfd., 350 v. elect. ±20%
C10, C10a - .005 mfd. mica, ±20%
C11 thru C11c - .05 mfd., 200 v. ±20%
C12 - 20 mmfd. tubular ceramic ±20%

R1, R1c - 20 KΩ 1/2 watt, ±20%
R2, R2a - 5 KΩ 1/2 watt, ±20%
R3 - 130Ω 1/2 watt, ±5%
R4 thru R4b - 30Ω 1/2 watt, ±5%
R5 - 510Ω 1/2 watt, ±20%
R6 thru R6b - 1.5 KΩ 1/2 watt, ±20%
R7 thru R7b - 33Ω 1/2 watt, ±5%
R8 - 220 KΩ 1 watt, ±20%
R8a - 220 KΩ 1/2 watt, ±20%
R9 - 43 KΩ 1/2 watt, ±20%
R10 thru R10f - 100 KΩ 1/2 watt, ±20%
R11, R11a - 800 KΩ 1/2 watt, ±1%
R12, R12a - 270 KΩ 1/2 watt, ±20%
R13 thru R13b - 270Ω 1/2 watt, ±5%
R14, R14a - 2 KΩ 2 watt, ±20%
R15, R15a - 500 KΩ 1/2 watt, ±20%
R16 - 3Ω 2 watt, ±20%

S 6 - Mazda S6 lamp

P1 - 125 molded potentiometer
P2-S2 - 30 KΩ molded potentiometer
P3 - 30 KΩ molded potentiometer
P4, P4a - 3 KΩ w.w. potentiometer

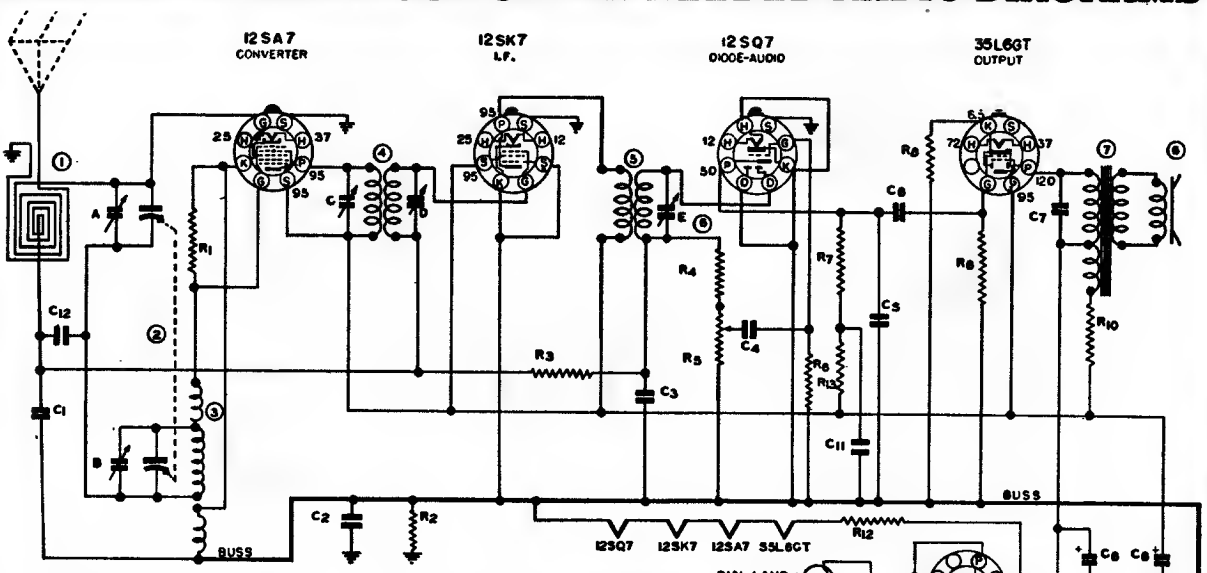
L5, L5a - 8H., 40 MA. reactor



DIAG. NO.	PART NO.	DESCRIPTION
R1	N-4025	22,000 OHM .5W 20%
R2	N-4023	62 OHM 2W 10%
R3	N-1262	1 MEGOHM .5W 20%
R4	N-4007	.5 MEGOHM VOL.CON.
R5	N-4028	6.6 MEGOHM .5W 20%
R6	N-4026	220,000 OHM .5W 20%
R7	N-4027	470 000 OHM .5W 20%
R8	N-4067	180 OHM .5W 10%
R9	N-5056	1000 OHM 1.W 10%
R10	N-4022	33 OHM .5W 20%
R11	N-4029	220 000 OHM .5W 20%
R12	N-4063	47 000 OHM .5W 20%
R13	N-1262	1 MEGOHM .5W 20%
C1	N-1345	.05 MFD 200V
C2	N-1345	.05 MFD 200V
C3	N-1346	.05 MFD 400V
C4	N-1374	100 MMFD MICA
C5	N-4894	.005 MFD 600V
C6	N-4890	500 MMFD 600V
C7	N-1344	.01 MFD 400V
C8	N-1378	.02 MFD 400V
C9	N-5051	40 MFD 150V ELECT.
C10		40 MFD 150V
C11	N-4957	.09 MFD 200V

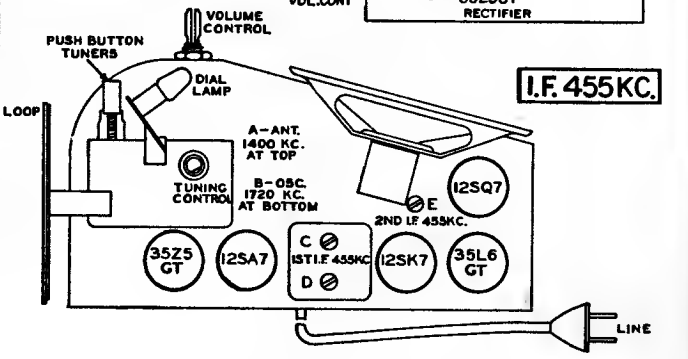
DIAG. NO.	PART NO.	DESCRIPTION
1	N-6100	ANT. COIL LOOP
2	N-4810	OSCILLATOR COIL
3	N-4813	1ST I.F. TRANSFORMER
4	N-4846	2ND I.F. TRANSF.
5	N-6102	4" SPEAKER
6	N-4975	OUTPUT TRANSF.
7	N-6083	2 GANG CONDENSER
8	N-4046	TRIMMER
9	N-5014 (N-4967)	PHONO PICKUP
10	N-3846 (N-3860)	6" TURNTABLE & MOTOR
S1	N-2877	RADIO-PHONO SWITCH
S2	N-2094	MOTOR SW.

SONORA RADIO Models WGF-241, -242, WGFU-241, -242



DIA NO.	PART NO.	DESCRIPTION	DIA NO.	PART NO.	DESCRIPTION
R1	N-4025	22,000 OHM .5W 20%	C6	N-1344	.01 MFD 400V 20%
R2	N-4028	220,000 OHM .5W 20%	C7	N-1378	.02 MFD 400V 20%
R3	N-1262	1 MEGOHM .5W 20%	C8	N-5051	40 MFD 150V ELECTRO-
R4	N-4063	47,000 OHM .5W 20%	C9		40 MFD 150V LYTIC
R5	N-2087	.5MEG VOLUME CONTROL	C10	N-1376	.05 MFD 400V 20%
R6	N-4028	68 MEGOHM .5W 20%	C11	N-1351	.1 MFD 200V 20%
R7	N-4028	220,000 OHM .5W 20%	C12	N-1345	.05 MFD 200V 20%
R8	N-4067	180 OHM .5W 10%			
R9	N-4027	470,000 OHM .5W 20%	1	N-8185	LOOP COIL
R10	N-5355	1,000 OHM 1.W 10%	2	N-8192	2 GANG CONDENSER
R11	N-4022	33 OHM .5W 20%	3	N-4845	OSC. COIL
R12	N-4023	82 OHM 2. W 10%	4	N-4813	1ST I.F. TRANSFORMER
R13	N-4823	56,000 OHM .5W 10%	5	N-4848	2ND I.F TRANSFORMER
			6	N-4985	TRIMMER
C1	N-1345	.05 MFD 200V 20%	7	N-8191	OUTPUT TRANSFORMER
C2	N-1345	.05 MFD 200V 20%	8	N-8187	5" SPEAKER
C3	N-6015	100 MMFD 500V 20%			
C4	N-4884	.005 MFD 600V -15+40%			
C5	N-6135	250 MMFD 500V 20%			

ALL VOLTAGES SHOWN ARE MEASURED FROM TERMINAL TO BUSS. LINE VOLTAGE 117 A.C.



GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1720 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

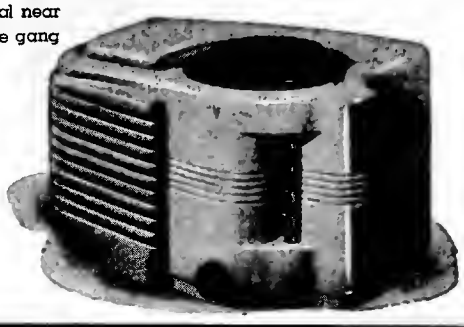
I.F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all three I.F. trimmers to peak or maximum reading on the output meter.

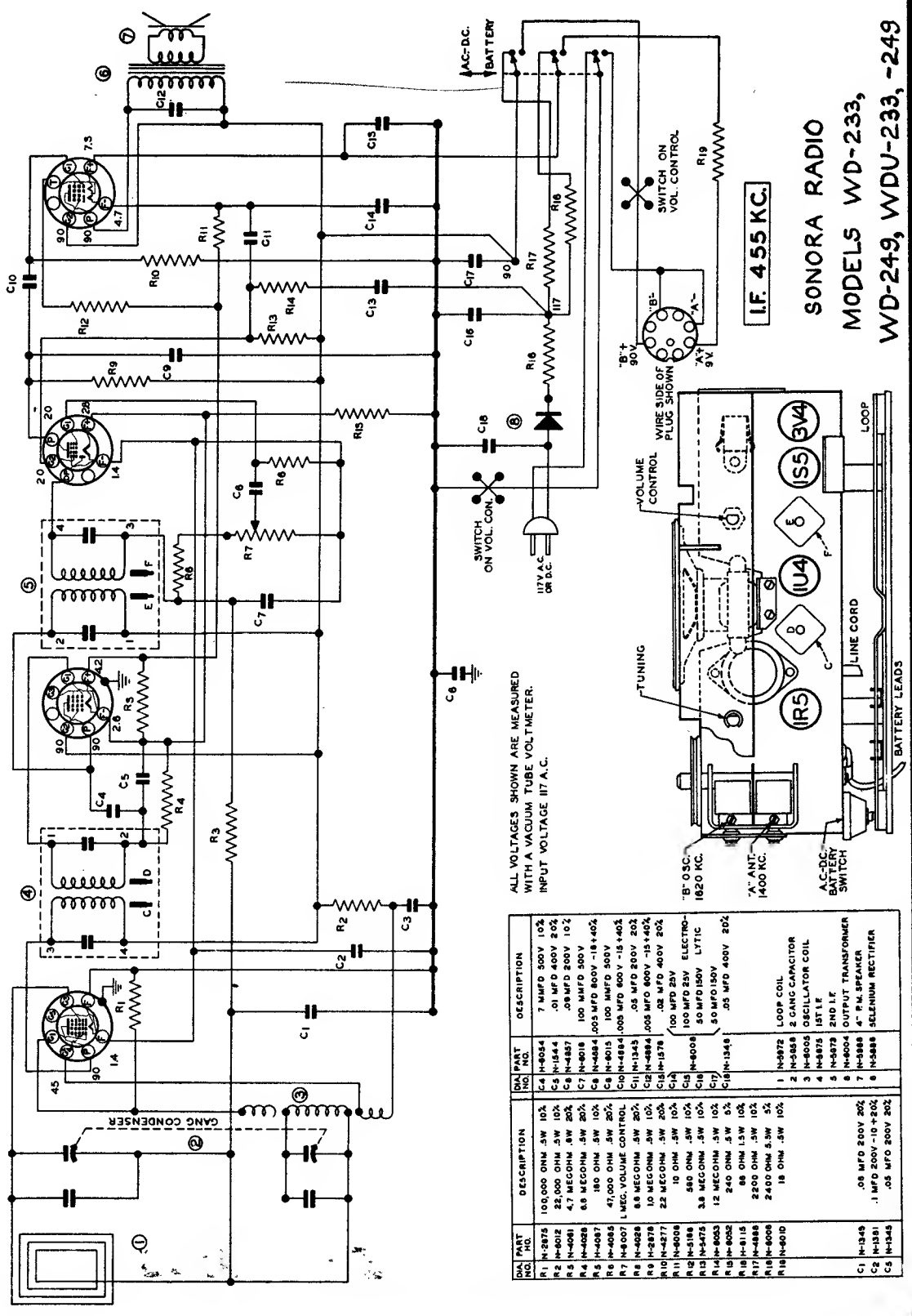
BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

SONORA RADIO

Models WA-243, -244
WAU-243, -244

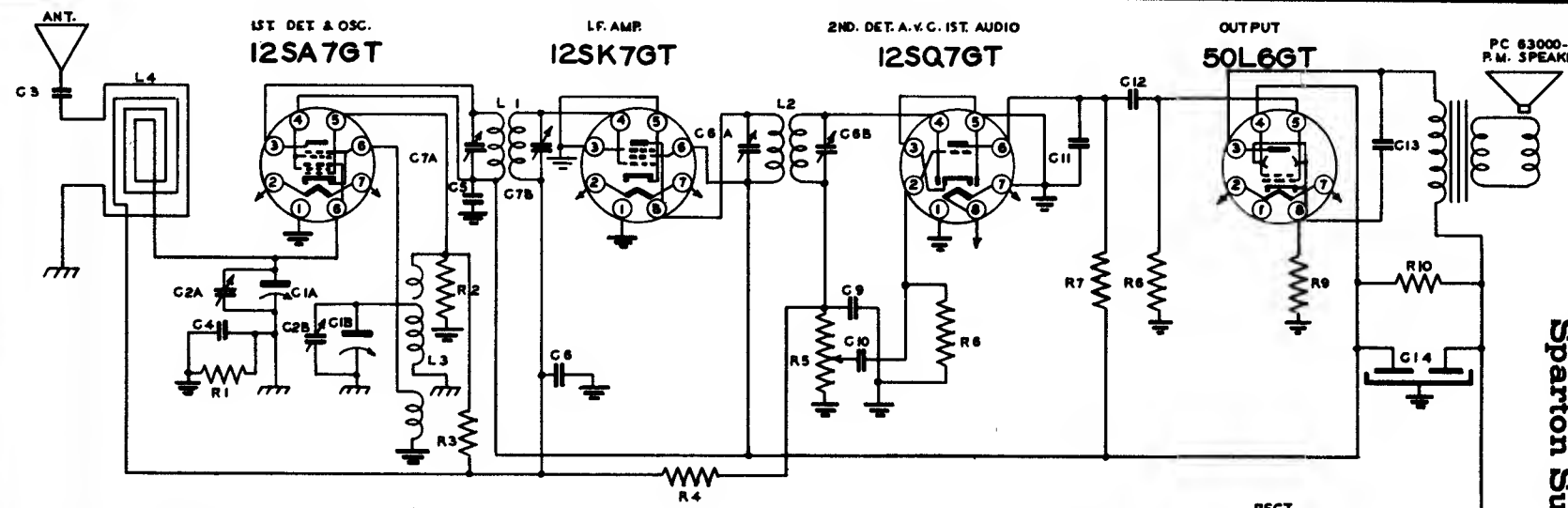
Sonora
Clear as a Bell

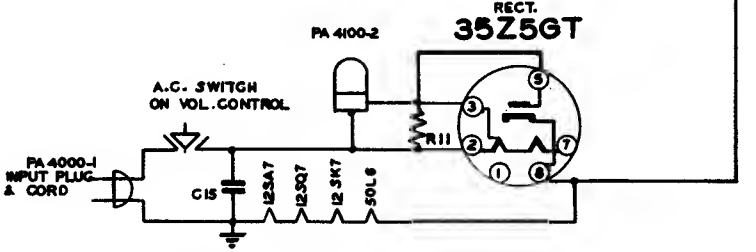




DIA. NO.	PART NO.	DESCRIPTION
R1	N-2675	100,000 OHM .5W 10%
R2	N-6012	22,000 OHM .5W 10%
R3	N-4061	4.7 MEGOHM .1W 20%
R4	N-4028	6.8 MEGOHM .5W 20%
R5	N-4087	180 OHM .5W 10%
R6	N-4085	47,000 OHM .5W 20%
R7	N-6007	1 MEG. VOLUME CONTROL
R8	N-4028	6.8 MEGOHM .5W 20%
R9	N-2678	10 MEGOHM .5W 10%
R10	N-4277	22 MEGOHM .5W 20%
R11	N-6008	10 OHM .5W 10%
R12	N-5188	560 OHM .5W 10%
R13	N-4475	3.8 MEGOHM .5W 10%
R14	N-6053	12 MEGOHM .5W 10%
R15	N-6052	240 OHM .5W 5%
R16	N-8115	88 OHM 1.5W 10%
R17	N-4988	2200 OHM .5W 10%
R18	N-6006	2400 OHM 5.5W 5%
R19	N-6010	18 OHM .5W 10%
C1	N-1349	.05 MFD 200V 20%
C2	N-1351	.1 MFD 200V -10+20%
C3	N-1345	.05 MFD 200V 20%

DIA. NO.	PART NO.	DESCRIPTION
C4	N-8054	7 MMFD 500V 10%
C5	N-1344	.01 MFD 400V 20%
C6	N-4857	.09 MFD 200V 10%
C7	N-8018	100 MMFD 500V
C8	N-4884	.005 MFD 600V -18+40%
C9	N-8015	100 MMFD 500V
C10	N-4884	.005 MFD 600V -15+40%
C11	N-1343	.05 MFD 200V 20%
C12	N-4894	.005 MFD 600V -15+40%
C13	N-1578	.02 MFD 400V 20%
C14	N-6008	100 MFD 25V ELECTRO-LYTIC
C15		100 MFD 25V
C16		30 MFD 150V
C17		30 MFD 150V
C18	N-1348	.05 MFD 400V 20%
1	N-3972	LOOP COIL
2	N-3858	2 GANG CAPACITOR
3	N-8005	OSCILLATOR COIL
4	N-3875	1ST I.F.
5	N-3878	2ND I.F.
6	N-6004	OUTPUT TRANSFORMER
7	N-3988	4" P.M. SPEAKER
8	N-3888	SELENIUM RECTIFIER





CHASSIS GROUND

COMMON GROUND

C1A & B	VARIABLE CONDENSER		PB 40406
C2A & B	TRIMMERS ON VARIABLE		
C3	.001 MFD.	400 V.	PC 40GL-102
C4	.15 MFD.	400 V.	PC 40GL-154
C5	.05 MFD.	200 V.	PC 40GK-503
C6	.05 MFD.	200 V.	PC 40GK-503
C7A & B	NO. 1 I.F. TRIMMERS		AB 43500-44
C8A & B	NO. 2 I.F. TRIMMERS		AB 43500-55

C9	270 MMF.	MICA	MC 60G-271
C10	.01 MFD.	400 V.	PC 40GL-103
C11	510 MMF.	MICA	MC 60G-511
C12	.002 MFD.	400 V.	PC 40GL-202
C13	.01 MFD.	400 V.	PC 40GL-103
C14	ELECT. CONDENSER		PA 4301-1
	RED 30 MFD.	YELLOW 40 MFD.	
C15	.05 MFD.	400 V.	PC 40GL-503

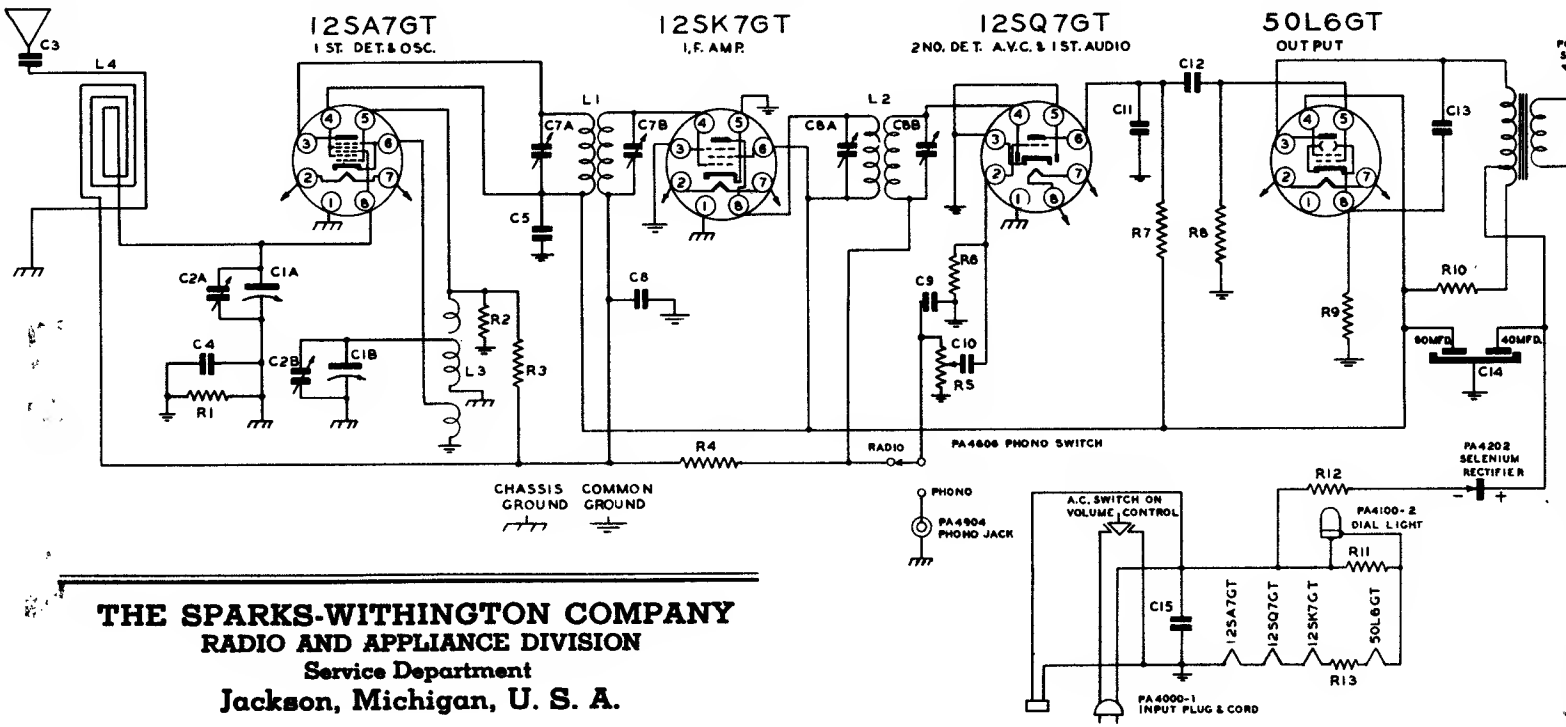
L1	NO. 1 I.F. COIL ASSEMBLY		AA 6800-12
L2	NO. 2 I.F. COIL	"	AA 6800-2
L3	B.C. OSCILLATOR COIL ASSEMBLY		AA 6797-1
L4	LOOP ASSEMBLY		AB 43025-1

R1	150,000 Ω	.5W	BR12N-154
R2	22,000 Ω	.5W	BR12S-223
R3	15 MEGOHM	.5W	BR12S-156
R4	2.2 "	.5W.	BR12N-225
R5	.5 MEG. VOL. CONT. & SW.		PA 4400-3
R6	5.6 MEGOHM	.5W	BR12S-565
R7	220,000 Ω	.5W	BR12N-224
R8	470,000 Ω	.5W	BR12N-474
R9	150 Ω	.5W	BR12S-151
R10	1200 Ω	1W.	CR12S-122
R11	82 Ω	.5W	BR12S-820

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer with left hand stop line and with condenser closed.						
2	I.F.	*	* *	456 KC	Open	C8A & B	Peak accurately
						C7A & B	Peak accurately
3	B.C.	* * *	Dummy Loop	1500 KC	1500 KC	C2B Osc. Trim.	Peak accurately
						C2A R.F. Trim.	Peak accurately
4	(Repeat operation 2 and 3).						
5	(Check calibration at 600 KC, 1000 KC, and 1500 KC).						
6	(Check operations 1 to 5 inclusive).						

* Pin No. 6 on 12SA7GT
** Standard Dummy
*** Driver Loop.

SPARTON SUPERHETERODYNE MODEL 5-07PA
INTERMEDIATE FREQUENCY 456 KC.



THE SPARKS-WITHINGTON COMPANY
RADIO AND APPLIANCE DIVISION
Service Department
Jackson, Michigan, U. S. A.

C1A&B	VARIABLE CONDENSER	PB40406
C2A&B	TRIMMERS ON VARIABLE	
C3	.001 MFD. 400V.	PC40GL-102
C4	.1 MFD. 400 V.	PC40GL-104
C5	.05 MFD. 200 V.	PC40GK-503
C6	.05 MFD. 200 V.	PC40GK-503
C7A&B	NO.1 I.F. TRIMMERS	AB43500-44
C8A&B	NO.2 I.F. TRIMMERS	AB43500-55
C9	270 MMF. MICA	MC60G-271
C10	.01 MFD. 400 V.	PC40GL-103
C11	510 MMF. MICA	MC60G-511
C12	.002 MFD. 400 V.	PC40GL-202
C13	.01 MFD. 400 V.	PC40GL-103
C14	ELECTROLYTIC	PA4306
C15	.05 MFD. 400 V.	PC40GL-503

R1	150,000 OHM	.5W.	BR12N-154
R2	22,000	.5W.	BR12S-223
R3	1.5 MEGOHM	.5W.	BR12S-156
R4	2.2 MEGOHM	.5W.	BR12N-225
R5	.5 MEG. VOL. CONT. &	5W.	PA4400-8
R6	5.6 MEGOHM	.5W.	BR12S-565
R7	220,000 OHM	.5W.	BR12N-224
R8	470,000 OHM	.5W.	BR12N-474
R9	150 OHM	.5W.	BR12S-151
R10	1200 OHM	1.W.	CR12S-122
R11	47 OHM	.5W.	BR12S-470
R12	27 OHM	1W.	CR12S-270
R13	165 OHM	5.W.	PA4200-6

L1	NO.1 I.F. COIL ASSEM.	AA6800-1
L2	NO.2 I.F. COIL ASSEM.	AA6800-2
L3	B.C. OSC. COIL ASSEM.	AA6797-1
L4	LOOP ASSEM.	AB43506-1

RECEIVER OPERATED ON: A.C.
Line Voltage: 117 Volts

Position of Volume Control: Full with set tunned to quiet channel.

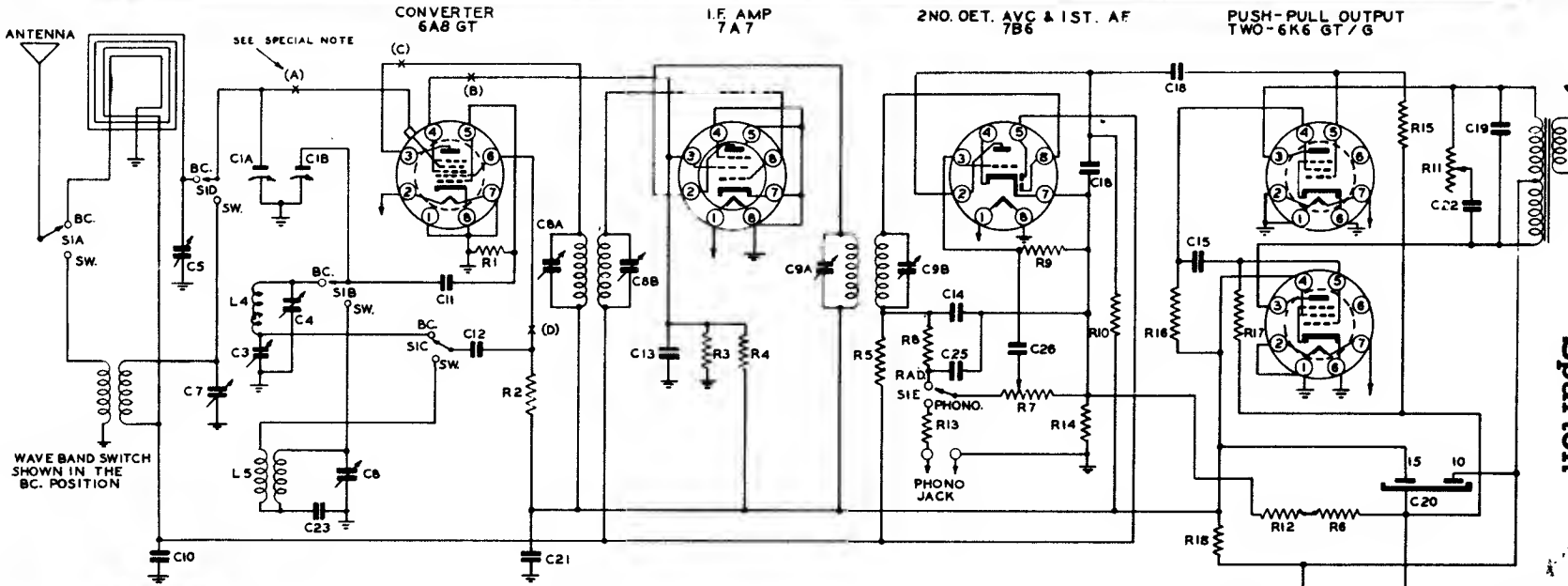
TUBE	FUNCTION	Voltage of socket prongs to B-. See prong Nos. on schematic.							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
12SA7GT	Osc. & Det.	0	0	97.0	97.5	**	0	12.4*	0
12SK7GT	I. F. Amp.	0	24.6*	0	-.5	0	97.5	37.2*	97.0
12SQ7GT	2nd Det. A.V.C., 1st Audio	0	0.5	0	**	0	5.5	24.6*	12.4*
50L6GT	Output	0	112*	131	97	0	117*	66.0*	6.2

NOTE: Voltage readings are for schematic diagram. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.
* Designates A.C. Volts
** Cannot be measured with 20,000 ohms per volt voltmeter.

MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS

Model 6-26 & 6-26-PA

Sparton



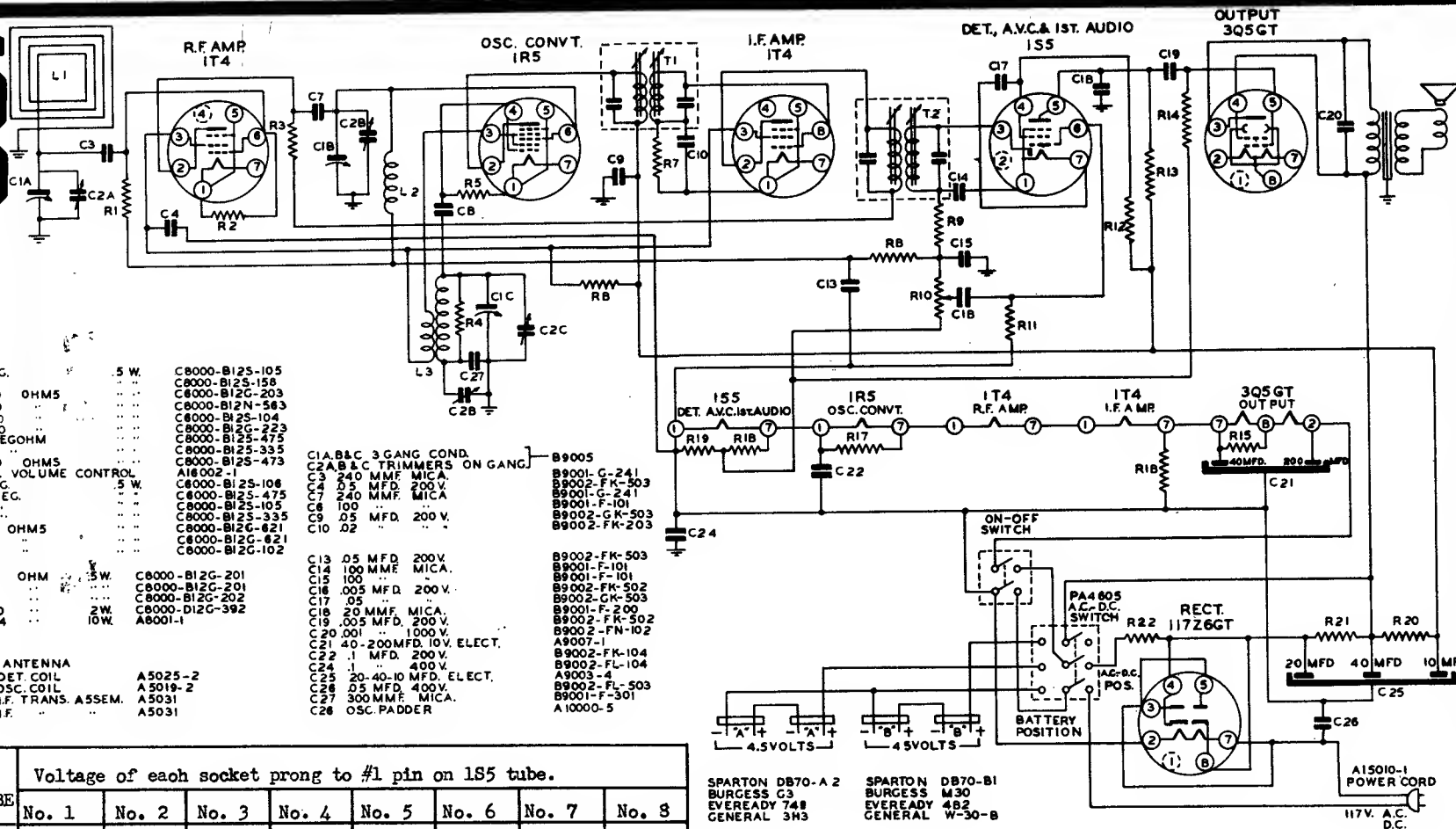
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING CONDENSER SETTING	TRIMMERS	REMARKS
1	Set dial pointer even with L.H. stop line with condenser gang fully closed.							
2	I.F.	G.C. 6A8GT	.02 MFD.	456 KC.	BC	OPEN	C9 A & B	Peak Accurately
							C8 A & B	
3	BC	Driver Loop	*	1500 KC.	BC	1500 KC.	C4 Osc.Trim.	
							C5 Ant.Trim.	
				600 KC.	BC	600 KC.	C3 Osc.Pad.	
4	(Repeat Operation #3)							
5	Check Calibration at 600 KC., 1000 KC., and 1500 KC.							
6	S.W.	"A" on Antenna Strip	* *	18 MC.	S.W.	18 MC.	C6 Osc.Trim.	
							C7 Ant.Trim.	* * *
							C23 Osc.Pad.	See Operation #7
7	Osc. padder C25 is percision set at the factory and should not be readjusted in the field.							
8	(Repeat Operation #6)							
9	Check calibration at 6 MC., 11 MC., and 18 MC.							
10	Check Operations 1 to 6 inclusive.							

* Driver Loop.
** Standard Dummy.
*** Rock dial while making this adjustment.

C10 .05 MFD. 600V.
C11 51 MMFD. MOLDED MICA
C12 240 MMFD. MOLDED MICA
C13 .1 MFD. 400V.
C14 240 MMFD. MOLDED MICA
C15 .05 MFD. 400V.
C16 100 MMFD. MOLDED

C16 .05 MFD. 400V.
C19 .05 MFD. 1000V.
C20 15-10 MFD. ELECTROLYTIC 600V.
C21 .1 MFD. 600V.
C22 .02 MFD. 600V.
C23 2575 MMFD. PADDER

C25 100 MMFD. MOLDED
R1 51000 OHMS .5W
R2 51000 OHMS .5W
R3 47000 OHMS .5W
R4 22000 OHMS .2 W
R5 3.3 MEGOHMS .5W
R6 27000 OHMS .5W
R7 .5 MEGOHMS VOLUME CONTROL
R8 100 OHMS .5W
R9 10 MEGOHMS .5W
R10 270000 OHMS .5W
R11 .5 MEGOHM TONE CONTROL
R12 3.3 MEGOHMS .5W
R13 470,000 OHMS .5W
R14 15 OHMS .5W
R15 470,000 OHMS .5W
R16 2600 OHMS .5W
R17 470,000 OHMS .5W
R18 2700 OHMS 5 W.W.



R1	1 MEG.	.5 W.	C8000-B12S-105
R2	15 "	" "	C8000-B12S-156
R3	20,000 OHMS	" "	C8000-B12G-203
R4	56,000 "	" "	C8000-B12N-563
R5	100,000 "	" "	C8000-B12S-104
R8	22,000 "	" "	C8000-B12G-223
R7	4.7 MEGOHM	" "	C8000-B12S-475
R8	3.3 "	" "	C8000-B12S-335
R9	47,000 OHMS	" "	C8000-B12S-473
R10	1 MEG. VOLUME CONTROL		A16002-1
R11	10 MEG.	.5 W.	C8000-B12S-106
R12	4.7 MEG.	" "	C8000-B12S-475
R13	1 "	" "	C8000-B12S-105
R14	3.3 "	" "	C8000-B12S-335
R15	620 OHMS	" "	C8000-B12G-621
R18	620 "	" "	C8000-B12G-621
R17	1000 "	" "	C8000-B12G-102
R18	200 OHM	.5 W.	C8000-B12G-201
R19	200 "	" "	C8000-B12G-201
R20	2,000 "	" "	C8000-B12G-202
R21	3,900 "	2 W.	C8000-D12G-392
R22	2,634 "	10 W.	A8001-1

C1A,B&C	3 GANG COND.		B9005
C2A,B & C	TRIMMERS ON GANG		B9001-G-241
C3	240 MMF	MICA.	B9002-FK-503
C4	.05	MFD. 200 V.	B9001-G-241
C7	240 MMF	MICA	B9001-F-101
C8	100 "	"	B9002-GK-503
C9	.05	MFD. 200 V.	B9002-FK-203
C10	.02 "	" "	
C13	.05	MFD. 200 V.	B9002-FK-503
C14	100	MMF. MICA.	B9001-F-101
C15	100 "	"	B9001-F-101
C16	.005	MFD. 200 V.	B9002-FK-502
C17	.05 "	"	B9002-GK-503
C18	20	MMF. MICA.	B9001-F-200
C19	.005	MFD. 200 V.	B9002-FK-502
C20	.001 "	1000 V.	B9002-FN-102
C21	40-200	MFD. 10 V. ELECT.	A9007-1
C22	.1	MFD. 200 V.	B9002-FK-104
C24	.1 "	400 V.	B9002-FL-104
C25	20-40-10	MFD. ELECT.	A9003-4
C26	.05	MFD. 400 V.	B9002-FL-503
C27	300	MMF. MICA.	B9001-F-301
C28	OSC. PADDER		A10000-5

L1	LOOP ANTENNA	
L2	B.C. DET. COIL	A5025-2
L3	B.C. OSC. COIL	A5019-2
T1	NO. 1 I.F. TRANS. ASSEM.	A5031
T2	NO. 2 I.F. " "	A5031

TUBE	Voltage of each socket prong to #1 pin on 1S5 tube.							
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
1T4	2.6f	80	39	0	-	0	3.9f	-
1R5	1.24f	80	39	.38	1.24	0	2.3f	-
1T4	4f	80	39	-	4	0	5.2f	-
1S5	B-**	80	0	13	14.25	0	1.25f	-
3Q5GT	-	8f	85	90	0	.6	5.3f	6.5f
117Z6	-	0	117*	135	117*	-	117*	135

Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.

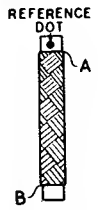
f Filament Voltage

* A.C. Voltage

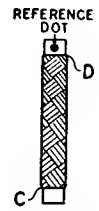
** All voltages measured from this point to socket prongs.

SPARTON SUPERHETERODYNE MODEL 6-06
INTERMEDIATE FREQUENCY 456 KC.

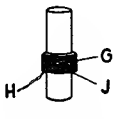
SERVICE DATA FOR STEWART-WARNER MODEL [A41T1 9032-A]



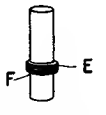
ANTENNA COIL 505192



OSCILLATOR COIL 505192

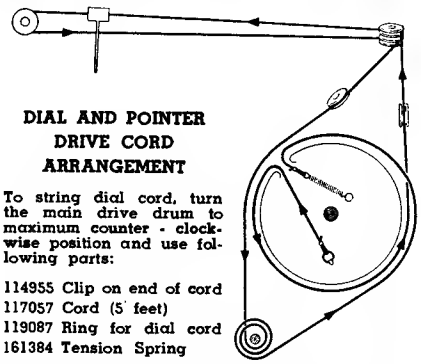


OSCILLATOR (SHUNT) COIL 505186



OSCILLATOR (SERIES) COIL 505167

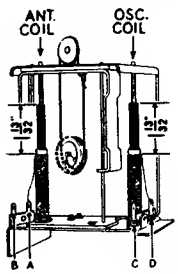
Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.



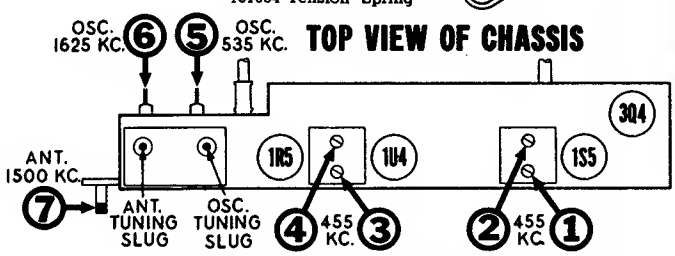
DIAL AND POINTER DRIVE CORD ARRANGEMENT

To string dial cord, turn the main drive drum to maximum counter - clockwise position and use following parts:

114955 Clip on end of cord
117057 Cord (5' feet)
119087 Ring for dial cord
161384 Tension Spring



SLUG TUNER ASSEMBLY
(Drive Parts)
117057 Cord (12")
114955 Clip on cord
504012 Spring



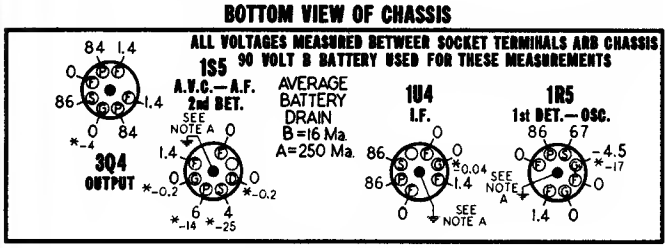
TRIMMER LOCATIONS

SOCKET VOLTAGES

Measured with voltmeter having sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

VOLUME ON FULL WITH NO SIGNAL **DIAL TUNED TO 540 KC.**

BOTTOM VIEW OF CHASSIS



REAR OF CHASSIS

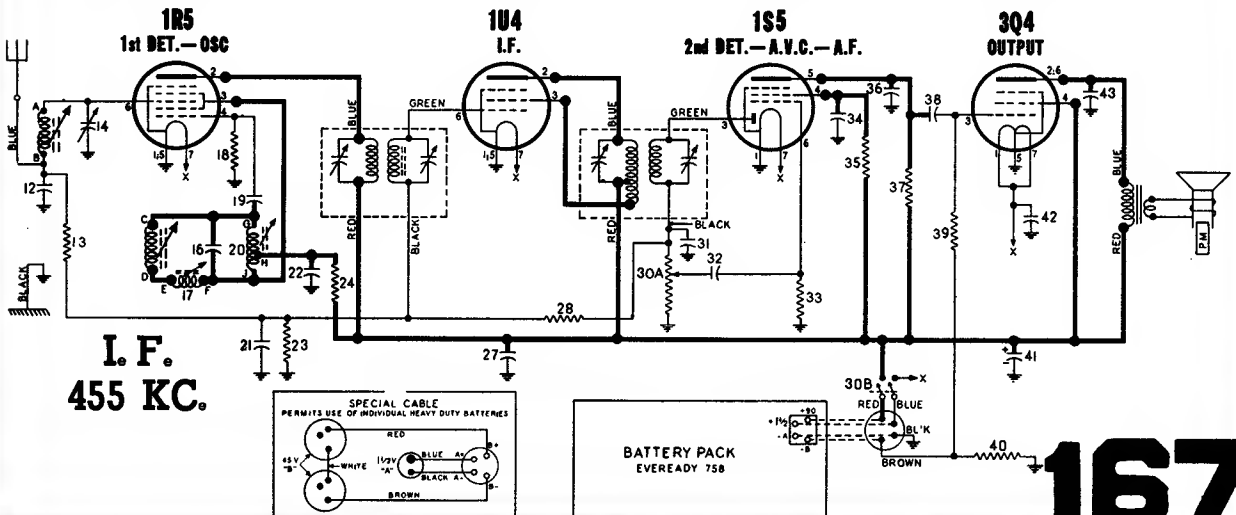
NOTE A: Grounding of center stud on tube socket is necessary to reduce capacity coupling between other pins. Oscillation may result if this ground is omitted.

CONDENSERS

12	502790	Condenser—mica 200 Mmfd. 500 volt
14	505179	Condenser—trimmer 30 to 270 Mmfd.
16	505183	Condenser—ceramic 47 Mmfd. ± 2% 500 volt
19	502929	Condenser—mica 47 Mmfd. 500 volt
21, 22	502153	Condenser—.05 Mfd. 200 volt
27	502155	Condenser—.1 Mfd. 200 volt
31	502931	Condenser—mica 100 Mmfd. 500 volt
32	502156	Condenser—.004 Mfd. 400 volt
34	502153	Condenser—.05 Mfd. 200 volt
36	502271	Condenser—mica 260 Mmfd. 500 volt
38	504726	Condenser—.01 Mfd. 200 volt
41	505174	Condenser—electrolytic 10 Mfd. 150 volt
42	502263	Condenser—.5 Mfd. 150 volt
43	502453	Condenser—.002 Mfd. 400 volt

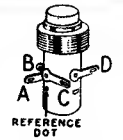
RESISTORS

13	502269	Resistor—carbon 1 Meg. ¼ watt
19	502132	Resistor—carbon 100,000 Ohms ¼ watt
23	502133	Resistor—carbon 220,000 Ohms ¼ watt
24	502459	Resistor—carbon 6,800 Ohms ¼ watt
28	502268	Resistor—carbon 1 Meg. ¼ watt
30-A, B	505197	Volume control 1 Meg. (with switch)
33	502136	Resistor—carbon 10 Meg. ¼ watt
35	502269	Resistor—carbon 3.3 Meg. ¼ watt
37	502268	Resistor—carbon 1 Meg. ¼ watt
39	502268	Resistor—carbon 1 Meg. ¼ watt
40	505184	Resistor—carbon 270 Ohms ¼ watt

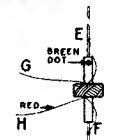


I.F. 455 KC.

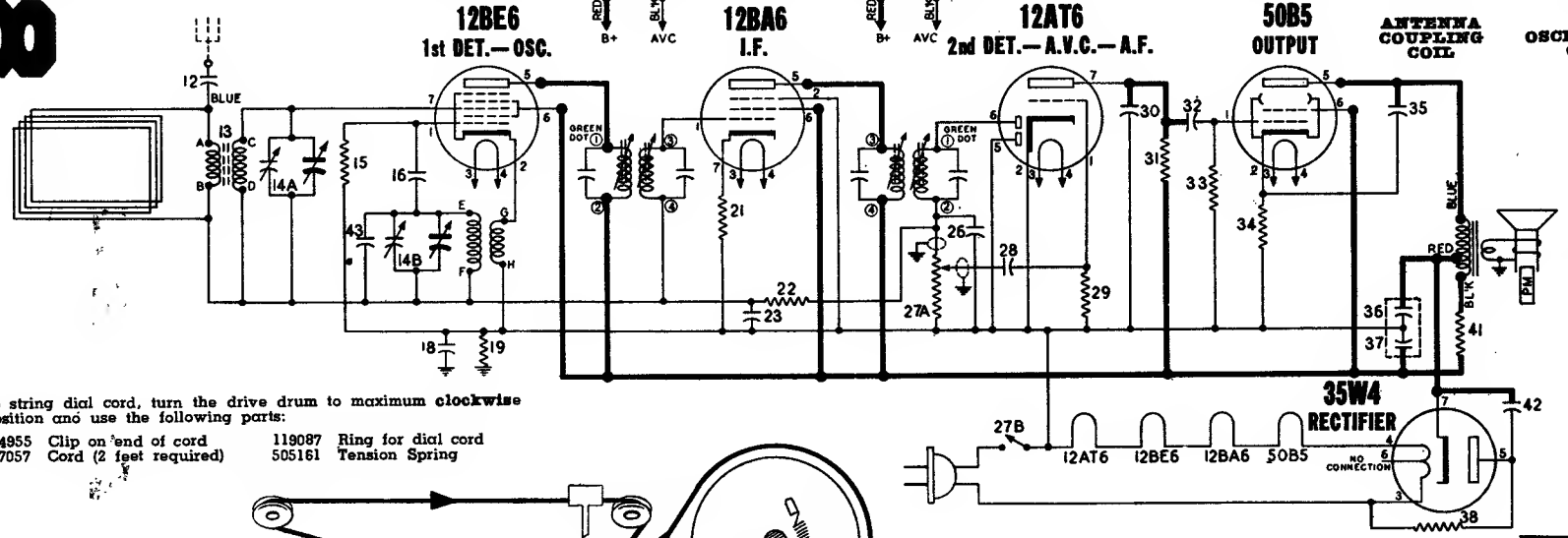
Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.



ANTENNA COUPLING COIL

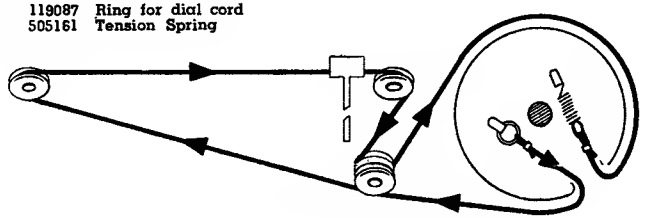


OSCILLATOR COIL



To string dial cord, turn the drive drum to maximum **clockwise** position and use the following parts:

114955	Clip on end of cord	119087	Ring for dial cord
117057	Cord (2 feet required)	505161	Tension Spring



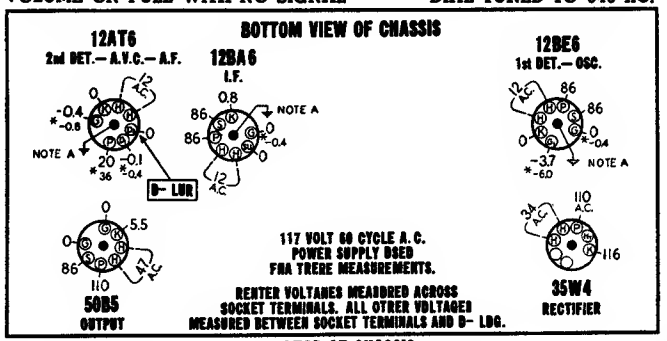
DIAL AND POINTER DRIVE CORD ARRANGEMENT

[A51T4 9020-D]

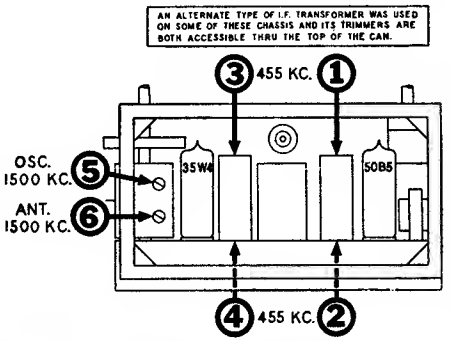
SOCKET VOLTAGES

Measured with voltmeter having sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

VOLUME ON FULL WITH NO SIGNAL — DIAL TUNED TO 540 KC.



REAR OF CHASSIS



REAR VIEW OF CHASSIS

CONDENSERS

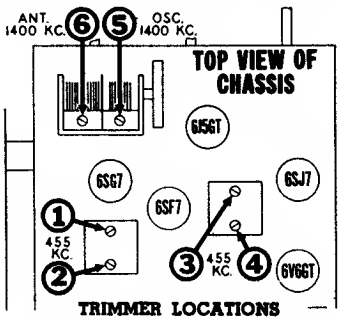
12	502156	Condenser—.004 Mfd. 400 volt
14	504390	Condenser—variable gang (with drum)
16	504434	Condenser—ceramic 50 Mmfd. 500 volt
18	504446	Condenser—.1 Mfd. 400 volt
23	504444	Condenser—.05 Mfd. 400 volt
26	502271	Condenser—mica 260 Mmfd. 500 volt
28	504445	Condenser—.004 Mfd. 150 velt
30	502271	Condenser—mica 260 Mmfd. 500 volt
32	504450	Condenser—.01 Mfd. 150 volt
35	504448	Condenser—.01 Mfd. 400 volt
36	504431	Condenser—electrolytic 20 Mfd. 150 volt
37	504431	Condenser—electrolytic 20 Mfd. 150 volt
42	504444	Condenser—.05 Mfd. 400 volt
43	502285	Condenser—10 Mmfd. 500 volt

RESISTORS

15	504440	Resistor—carbon 22,000 ohms 1/3 watt
19	504435	Resistor—carbon 220,000 ohms 1/3 watt
21	504436	Resistor—carbon 82 ohms 1/2 watt
22	504441	Resistor—carbon 2.2 Meg. 1/3 watt
27A, B	504391	Volume control—with switch: 1 Meg.
28	504439	Resistor—carbon 3.3 Meg. 1/3 watt
31	504438	Resistor—carbon 470,000 ohms 1/3 watt
33	504436	Resistor—carbon 470,000 ohms 1/3 watt
34	504437	Resistor—carbon 150 ohms 1/2 watt
38	502574	Resistor—carbon 33 ohms 1/2 watt
41	504442	Resistor—carbon 1500 ohms 1 watt

NOTE A: Grounding of center stud on tube socket is necessary to reduce capacity coupling between other pins. Oscillation may result if this ground is omitted.

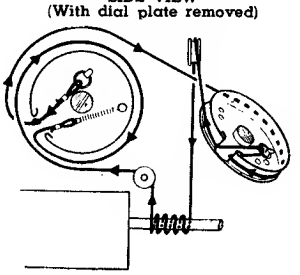
STEWART-WARNER MODELS [A61CR1 9034-C] ; [A61CR2 9034-D] ; [A61CR3 9034-E] & [A61CR4 9034-F].



TRIMMER LOCATIONS

DIAL AND POINTER DRIVE CORD ARRANGEMENT

SIDE VIEW
(With dial plate removed)



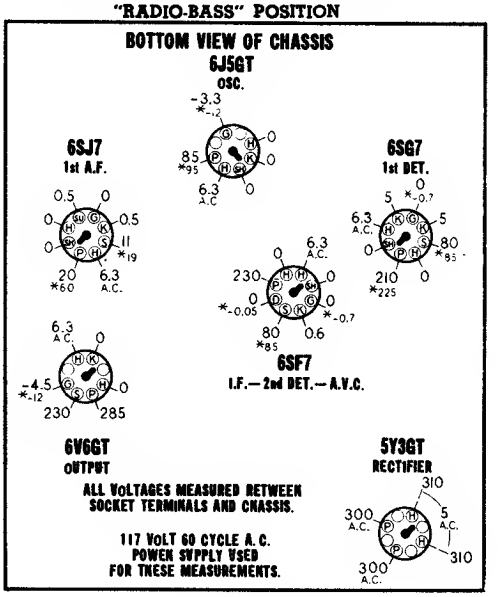
To string dial cord first slip pointer off its shaft. Then remove dial scale by taking out the six clips around its edges. Dial plate may now be taken off by removing the two screws which are visible and accessible at front of chassis. Now set gang condenser to fully open position and use the following parts:

114955 Clip on end of cord
117057 Cord (3 feet)
119087 Ring for dial cord
505161 Tension spring

SOCKET VOLTAGES

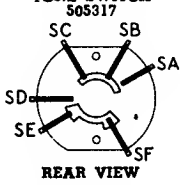
Measured with voltmeter having sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

DIAL TUNED TO 540 KC.
VOLUME ON FULL WITH NO SIGNAL
RADIO-PHONO & TONE SWITCH IN "RADIO-BASS" POSITION

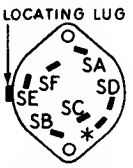


REAR OF CHASSIS

ALTERNATE TYPES OF RADIO-PHONO & TONE SWITCH 505317



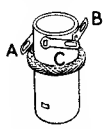
REAR VIEW



REAR VIEW

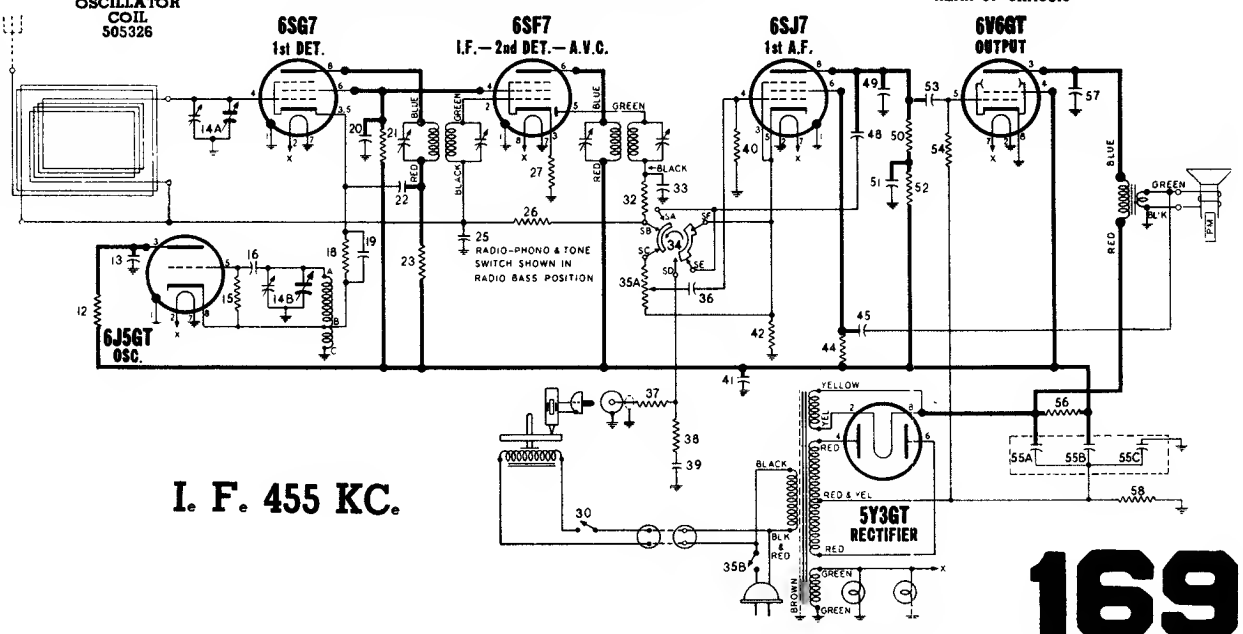
*Not used; may serve as wiring junction point.

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram



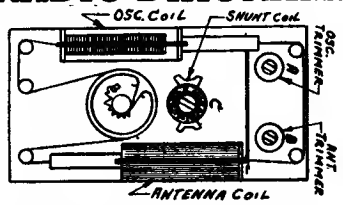
OSCILLATOR COIL 505326

DIAGRAM NO.	PART NO.	DESCRIPTION
		CONDENSERS
13	502151	Condenser—.01 Mfd. 400 volt
14-A, B	505315	Condenser—variable gang (with drum)
16	502931	Condenser—mica 100 Mmfd. 500 volt
19	502153	Condenser—.05 Mfd. 200 volt
20	502157	Condenser—.05 Mfd. 400 volt
22	502152	Condenser—.02 Mfd. 400 volt
25	502153	Condenser—.05 Mfd. 200 volt
33	502931	Condenser—mica 100 Mmfd. 500 volt
36	502156	Condenser—.004 Mfd. 400 volt
39	502152	Condenser—.02 Mfd. 400 volt
41	502157	Condenser—.05 Mfd. 400 volt
45	502405	Condenser—.25 Mfd. 400 volt
48	502150	Condenser—.004 Mfd. 600 volt
49	502271	Condenser—mica 260 Mmfd. 500 volt
51	502410	Condenser—.1 Mfd. 400 volt
53	502152	Condenser—.02 Mfd. 400 volt
55-A, B, C	502207	Condenser—electrolytic A—20 Mfd. 400 volt B—10 Mfd. 400 volt C—20 Mfd. 25 volt
57	502156	Condenser—.004 Mfd. 400 volt
		RESISTORS
12	502466	Resistor—carbon 33,000 Ohms 1 watt
15	502131	Resistor—carbon 47,000 Ohms ¼ watt
18	502128	Resistor—carbon 2,200 Ohms ¼ watt
21	502288	Resistor—carbon 47,000 Ohms 1 watt
23	502459	Resistor—carbon 6,800 Ohms ¼ watt
26	502269	Resistor—carbon 3.3 Meg. ¼ watt
27	502264	Resistor—carbon 47 Ohms ¼ watt
32	502131	Resistor—carbon 47,000 Ohms ¼ watt
35-A, B	505318	Volume Control 1 Meg. (with switch)
37	502132	Resistor—carbon 100,000 Ohms ¼ watt
38	502408	Resistor—carbon 68,000 Ohms ¼ watt
40	502468	Resistor—carbon 4.7 Meg. ¼ watt
42	502406	Resistor—carbon 1,500 Ohms ¼ watt
44	502135	Resistor—carbon 2.2 Meg. ¼ watt
50	502133	Resistor—carbon 220,000 Ohms ¼ watt.
52	502133	Resistor—carbon 220,000 Ohms ¼ watt.
54	502134	Resistor—carbon 470,000 Ohms ¼ watt.
56	504771	Resistor—carbon 3,300 Ohms 2 watt
58	502293	Resistor—wire wound 200 ohms 2 watt.



I. F. 455 KC.

TEMPLETONE RADIO MFG. CORP.



Models E-510 to E-519, also G-513 and G-515 are almost identical and correspond with few exceptions to the diagram below. In some sets, 14 volt tubes were used as indicated.

Controls: Only two controls are required for operation. The left-hand control puts set into operation, increases the volume with clockwise rotation, and includes the power switch. The right-hand control tunes the dial to the desired station.

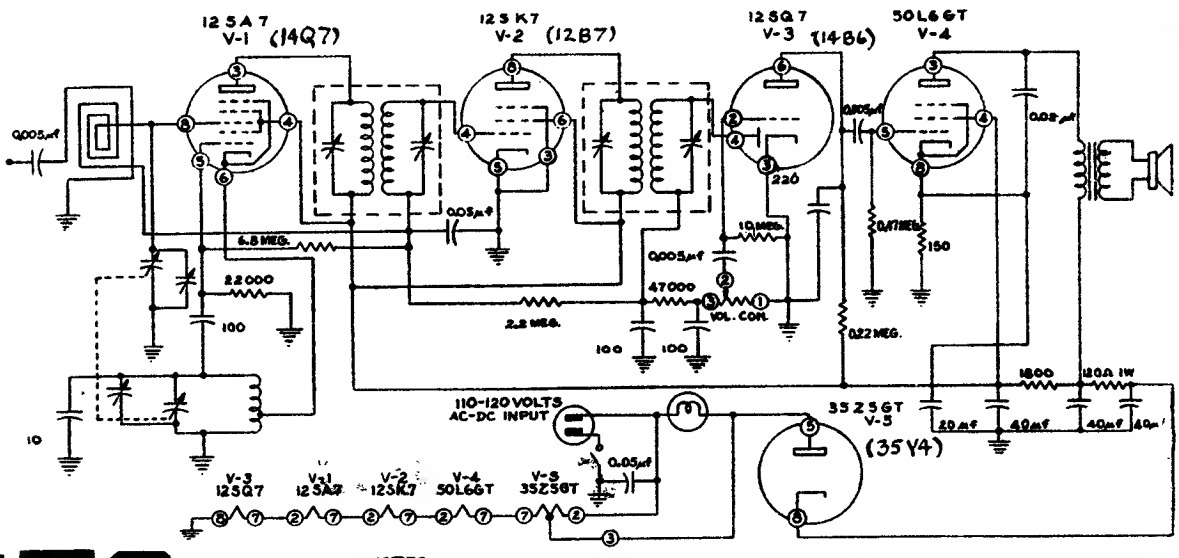
Antenna: For normal reception, no outside aerial is required, as more than adequate pickup is obtained by the self-contained loop antenna.

At installations remote from the stations desired to be heard, improved results may be obtained by rotating the receiver for maximum response, as the loop antenna has a marked directional effect on weak signals. Reception can also be improved, and the directional effect reduced, by attaching a length of insulated wire approximately 15 to 25 feet long, to the antenna connection provided at the back of the cabinet.

Alignment: No attempt should be made to realign this receiver until it has been determined that a poor tube, or some local condition is not responsible for faulty reception. An output meter may be clipped directly across the voice coil lugs.

The Signal Generator may be connected through a 0.01 mf capacitor (used as dummy antenna) to the lug on RF section (B) of tuning capacitor. Connect ground clip of generator directly to chassis. Align the I. F. trimmers to 455 kc, using least possible input from Signal Generator to avoid developing A.V.C. voltage which would make the tuning adjustments very broad.

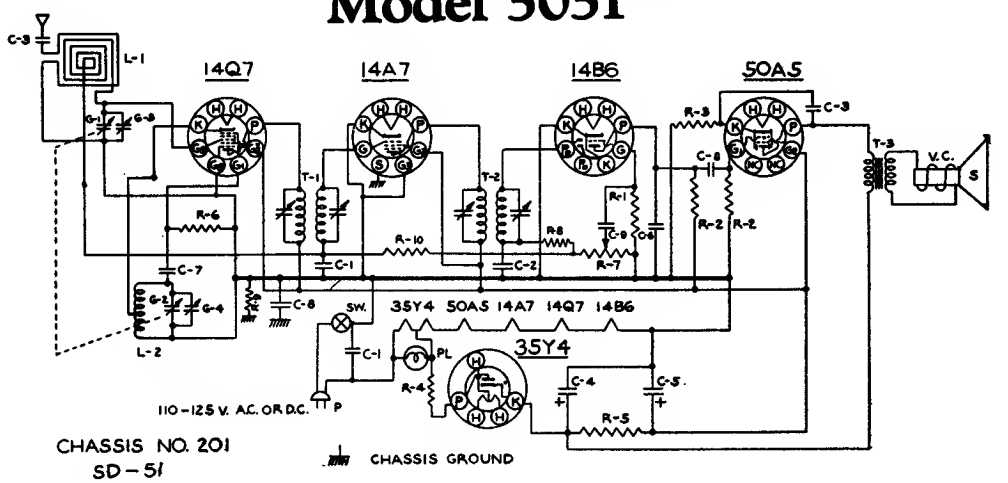
To align RF trimmers, remove the 0.01 mf capacitor and connect the Signal Generator leads or two or three turns of heavy wire, forming a self-supporting loop of about 7 or 8 inches diameter, placed about a foot away from the receiver's loop antenna. Again, use the least possible input from the Signal Generator. With the tuning capacitor plates completely out of mesh, and pointer at extreme left end of travel, adjust the oscillator trimmer (A) (on front section of tuning capacitor) to 1700 kc. Readjust both Signal Generator and tuning capacitor to 1550 kc and adjust the RF trimmer (B) (on rear section) for maximum response. With tuning capacitor plates fully meshed, the receiver should tune to 535 kc; however, no adjustment is required at this point. For checking purposes, four fine marks are engraved on the dial plate. These represent, in order, the pointer settings for 1550, 1000, 600 kc, and the pointer position with capacitor plates fully meshed.



NOTES:
1. RESISTORS ARE IN OHMS, CAPACITORS ARE IN mmf, INDUCTORS ARE IN μH UNLESS OTHERWISE MARKED.
2. VOLUME CONTROL R-4 IS 0.5 MEGOHMS, WITH SWITCH S-1 MOUNTED ON REAR.
3. IN A FEW EARLY MODELS C-12D WAS A SEPARATE 25 mf CAPACITOR. C-12A WAS 80 mf, C-12C WAS 20 mf AND R-11 WAS NOT USED.

TRAV-LER RADIO CORP.

Model 5051



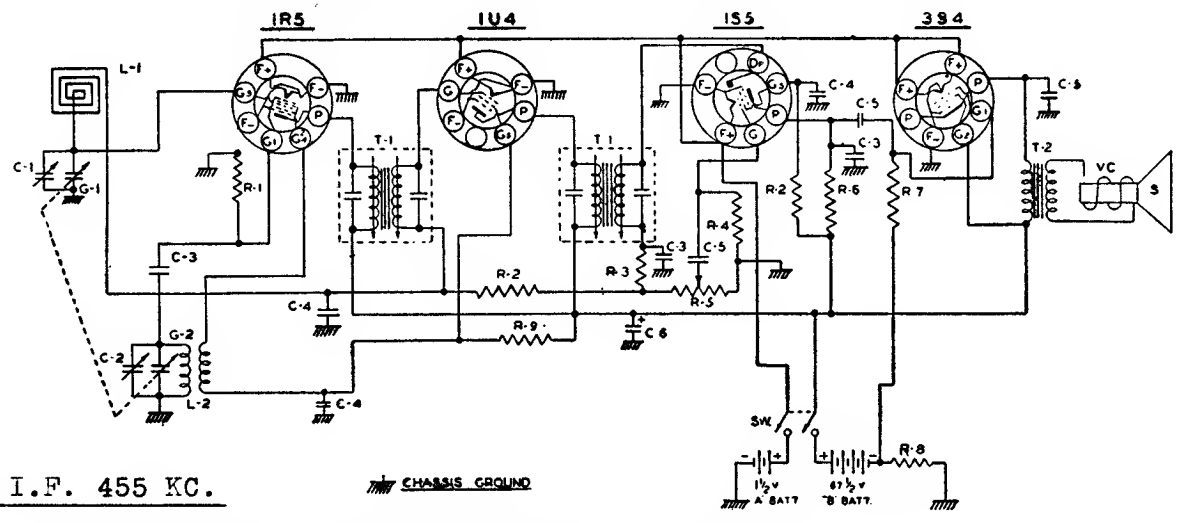
CHASSIS NO. 201
SD-51

I.F. 455 KC.

PART NO.		DESCRIPTION	PART NO.		DESCRIPTION	PART NO.		DESCRIPTION
IR-13	R-1	2.2 MEG RESISTOR 1-2 W 20%		G-4	OSC. TRIMMER COND.	LO-11	L-2	OSC. COIL
IR-11	R-2	470M Ω RESISTOR 1-2 W 20%	PC-5	C-1	.05 MFD. COND. 400 V.	L1-1	T-1	INPUT I.F. TRANSFORMER
IR-14	R-3	150 Ω RESISTOR 1-2 W 20%	MC-2	C-2	.0001 MFD. MICA COND. 20%	L1-2	T-2	OUTPUT I.F. TRANSFORMER
IR-4	R-4	47 Ω RESISTOR 1-2 W 20%	PC-7	C-3	.01 MFD. COND. 400 V.		T-3	OUTPUT SPK. TRANSFORMER
IR-15	R-5	2200 Ω RESISTOR 1-2 W 20%	EC-12	C-4	40 MFD. 150 V. ELECTROLYTIC CONDENSER	SPK.-4	V.C.	VOICE COIL
IR-16	R-6	33 M Ω RESISTOR 1-2 W 20%		C-5	20 MFD.		S	RM. SPEAKER
VC-3	R-7	1 MEG. VOLUME CONTROL	MC-8	C-6	.0005 MFD. COND. 20%	PB-1	PL	#47 PILOT BULB
GC-4	G-1	GANG CONDENSER	MC-4	C-7	.000056 MFD. MICA 20%		SW.	A.C. SW. ON VOL. CONTROL
	G-2		PC-9	C-8	.1 MFD. COND. 400 V.	CO-1	P	LINE CORD
TC-7	G-3	ANT. TRIMMER COND.	LL-6	L-1	LOOP ANTENNA	TU-6	——	14Q7 14A7 14B6 50A5 35Y4
IR-10	R-8	47M Ω 1/2W 20%	IR-20	R-9	220M Ω 1/2W 20%	IR-23	R-10	3.3 MEG. 1/2 W. 20%
						PC-8	C-9	.005 MFD. 600 V

TRAV-LER RADIO CORP.

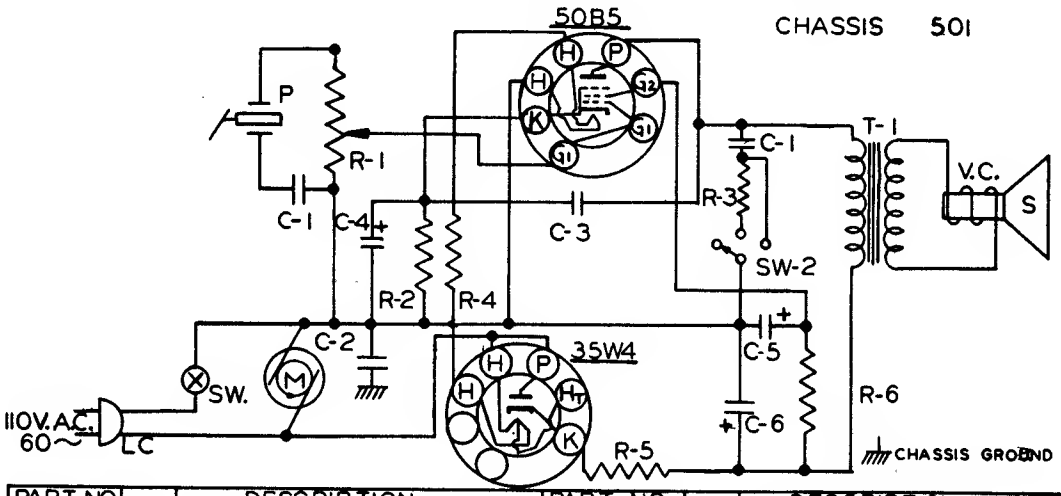
MODEL No. 5019



I.F. 455 KC.

PART NO		DESCRIPTION	PART NO		DESCRIPTION
IR-20	R-1	220M Ω RESISTOR 1/2W 20%	GC-4	G-1	GANG CONDENSER
IR-23	R-2	3.3 MEG. RESISTOR 1/2W 20%		G-2	
IR-31	R-3	82M Ω RESISTOR 1/2W 10%	LL-8	L-1	LOOP ANTENNA
IR-3	R-4	10MEG RESISTOR 1/2W 20%	LO-12	L-2	OSC COIL
VC-8	R-5	1MEG. VOLUME CONTROL	L1-5	T-1	I F TRANSFORMER
IR-12	R-6	1MEG. RESISTOR 1/2W 20%		SW	DPST. SWITCH ON VOLUME CONTROL
IR-13	R-7	2.2MEG RESISTOR 1/2W 20%		T-2	SPEAKER TRANSFORMER
IR-5	R-8	220 Ω RESISTOR 1/2W 10%	SPK-8	VC.	VOICE COIL
IR-37	R-9	10M Ω RESISTOR 1/2W 20%		S	PM SPEAKER
TC-7	C-1	ANT. TRIMMER	TU-29		1R5-1U4-1S5-3S4
	C-2	OSC TRIMMER ON GANG			
MC-2	C-3	100 MMFD MICA CONDENSER			
PC-7	C-4	.01 MFD 400 V.			
PC-6	C-5	.005 MFD 600 V.			
EC-7	C-6	20MFD 80 WV.			

Trav-ler Radio Corp. Electric Phonograph Model 7004

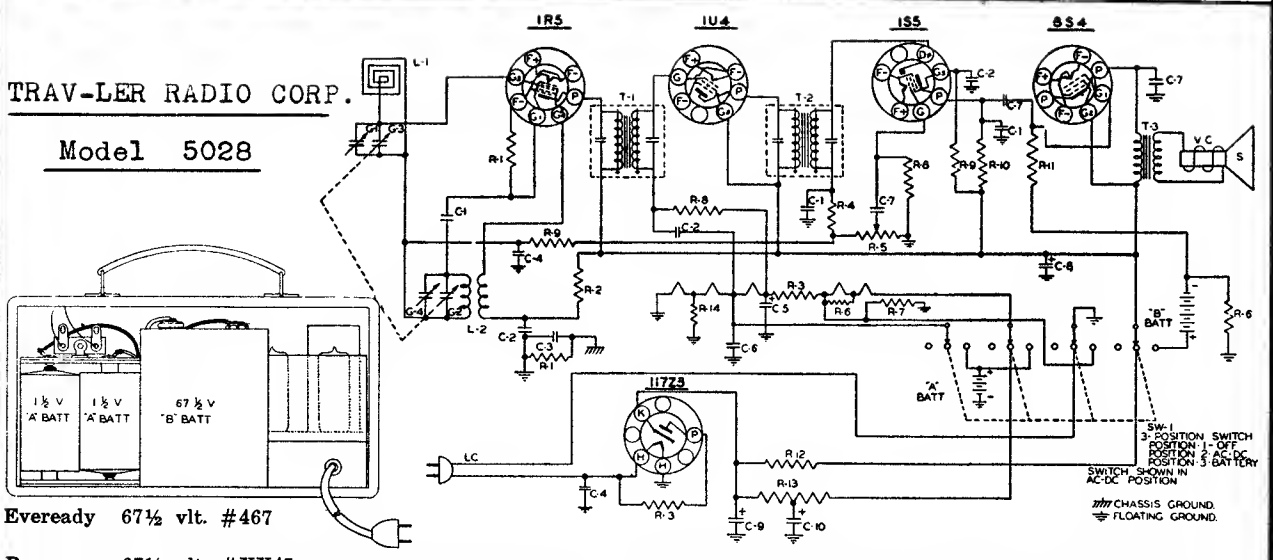


PART NO.		DESCRIPTION	PART NO.		DESCRIPTION
VC-6	R-1	1/2MEG. VOLUME CONTROL.	M-1	M	MOTOR 110V. 60~ 9" TURNTABLE
1R-14	R-2	150Ω RESISTOR. 1/2W. 20%	CO-2	LC	POWER CORD.
1R-7	R-3	2200Ω RESISTOR. 1/2W. 5%		SW	A.C. SW. ON VOLUME CONTR
WR-1	R-4	210Ω RESISTOR. 5W. 5% WIRE WOUND.	SW-2	SW2	TONE SWITCH
1R-17	R-5	39Ω RESISTOR 1/2W. 20%		T-1	OUTPUT TRANSFORMER
1R-18	R-6	4700Ω RESISTOR. 1/2W. 20%	SPK-2	VC	VOICE COIL
PC-5	C-1	.05 MFD. CONDENSER. 400V.		S	P.M. SPEAKER
PC-8	C-2	.1 MFD. CONDENSER. 400 V.	TU-22	—	50B5 — 35W4
PC-7	C-3	.01 MFD. CONDENSER. 400 V.	PU-2	P	CRYSTAL CARTRIDGE L-72
EC-5	C-4	10MFD. 25 V.			
	C-5	12MFD. 150 V. ELECTROLYTIC			
	C-6	8DMFD. 150V			

Trav-ler Radio Corp. Phonograph Models 7014 and 7015 are similar to Model 7000 described on page 154 of Volume 6, 1946 Diagram Manual.

TRAV-LER RADIO CORP.

Model 5028



Eveready 67½ vlt. #467

Burgess 67½ vlt. #XX45

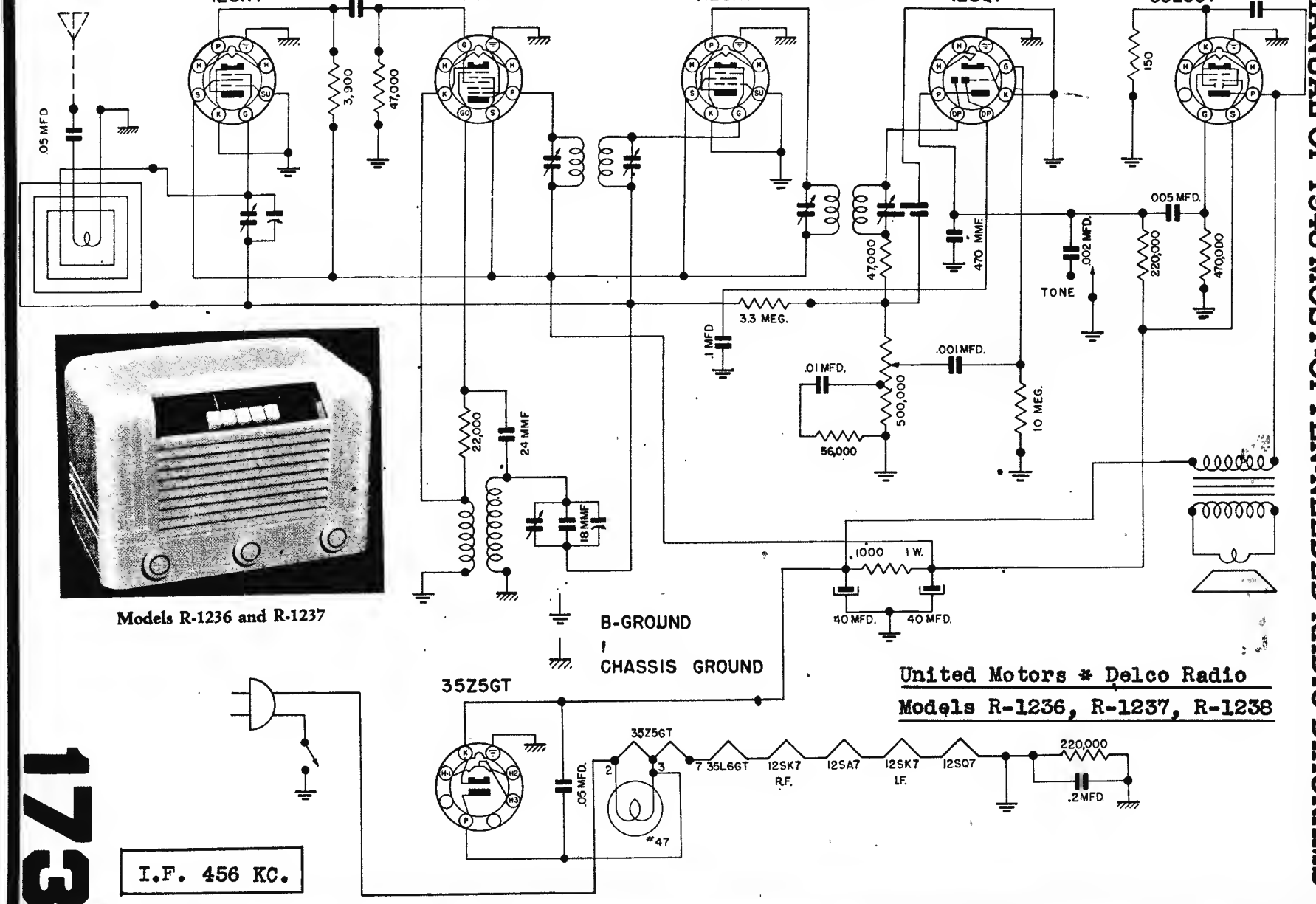
General 67½ vlt. #W45A

Ray-O-Vac 67½ vlt. #4367

PART NO		DESCRIPTION	PART NO		DESCRIPTION	PART NO		DESCRIPTION
1R-20	R-1	220M RESISTOR 1/2W 20%	PC-3	C-6	.1 MFD. CONDENSER 200 WV	LI-5	T-1	INPUT IF TRANSFORMER
1R-17	R-2	150 RESISTOR 1/2W 20%	PC-6	C-7	005MFD CONDENSER 600 WV	LI-3	T-2	OUTPUT IF TRANSFORMER
1R-21	R-3	33 RESISTOR 1/2W 20%	EC-14	C-8	40 MFD		T-3	SPEAKER OUTPUT TRANSFORMER
VC-11	R-5	1MEG. VOLUME CONTROL		C-9	40 MFD 150 WV ELECTROLYTIC	SPK-8	VC	VOICE COIL
1R-33	R-6	270 RESISTOR 1/2W 10%		C-10	20 MFD		S	3½ P.M. SPEAKER
1R-39	R-7	620 RESISTOR 1/2W 5%				TU-31	—	11Z3-1R5-1U4-1S5-3S4
1R-3	R-8	10MEG RESISTOR 1/2W 20%		G-1	ANT TRIMMER			
1R-23	R-9	3.3MEG RESISTOR 1/2W 20%	OC-15	G-2	GANG CONDENSER		2X BATT	2 "D" SIZE 1½ VOLT FLASHLITE CELLS
1R-12	R-10	1MEG RESISTOR 1/2W 20%		G-3			3S BATT	1-67½ VOLT BATTERY
1R-13	R-11	2.2MEG RESISTOR 1/2W 20%		G-4	OSC TRIMMER			
R-10	R-12	3900 RESISTOR 1W 10%						
WR-7	R-13	1050-1050 CANDOHM RESISTOR 5W 5%						
IR-1	R-14	470 RESISTOR 1/2 20%	LL-14	L-1	LOOP ANTENNA			
			LO-8	L-2	OSC COIL			
MC-2	C-1	400MMFD MICA CONDENSER						
PC-7	C-2	.01MFD CONDENSER 400WV	CO-1	LC	LINE CORD			
PC-8	C-3	1MFD CONDENSER 400WV						
PC-5	C-4	.05MFD CONDENSER 400WV	SW-8	SW-1	4 POLE-3 POSITION SWITCH			
EC-6	C-5	10MFD 10WV ELECTROLYTIC						

I.F. 455 KC.

Models R-1236 and R-1237



United Motors * Delco Radio

Models R-1236, R-1237, R-1238

I.F. 456 KC.

UNITED MOTORS SERVICE

DIVISION OF GENERAL MOTORS CORPORATION

Buick Models 980744 and 980745

For diagram see page 175.

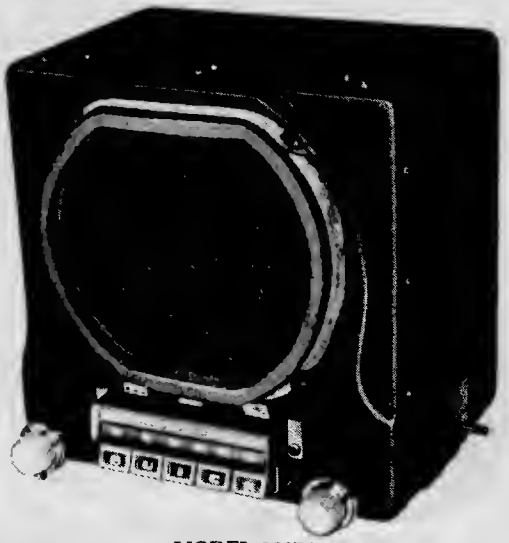
PUSH BUTTON SET-UP

Release holding spring in bottom of button, pull button off. Loosen re-set screw and push in until it bottoms. Tune in desired station while holding in re-set screw. Release and tighten screw. Replace button.

ALIGNMENT PROCEDURE

Volume Control Maximum.

Signal Generator output minimum for satisfactory output indication.



MODEL 980744

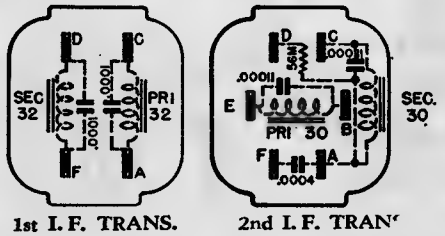
Series Condenser or Dummy Antenna	Connect To	Tune Receiver To	Signal Generator Frequency	Adjust Screws In Order
0.1 Mfd.	6SA7 Pin #8	No Broadcast Sig.	262 KC	A B C D
*.000060 Mfd.	Antenna Connector	Extreme Hi. Freq. End of Dial	1615 KC	E F G
***.000060 Mfd.	Antenna Connector	Signal Generator	1430 KC	**J K

*Before making this adjustment turn core screws J, K, H by means of a bakelite screwdriver, so that the rear end of the cores are $1\frac{3}{8}$" from the rear of the coil form. The purpose of this adjustment is to set the cores at the correct starting point with respect to the windings.

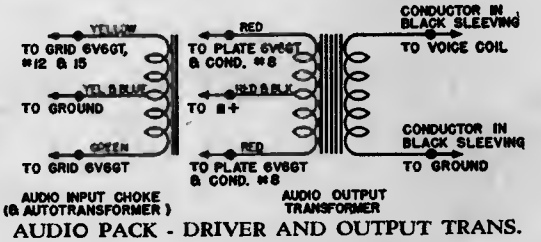
**Cores J and K are adjusted by means of a bakelite screwdriver through the rear end of the coils. There must not be any metal in part of screwdriver inserted in the coil.

***Should it be necessary to calibrate the pointer after this adjustment, tune signal generator to 1300 KC and the receiver to the signal. Loosen dial cord pulley set screws and adjust pointer to 1300 KC. Tighten set screws.

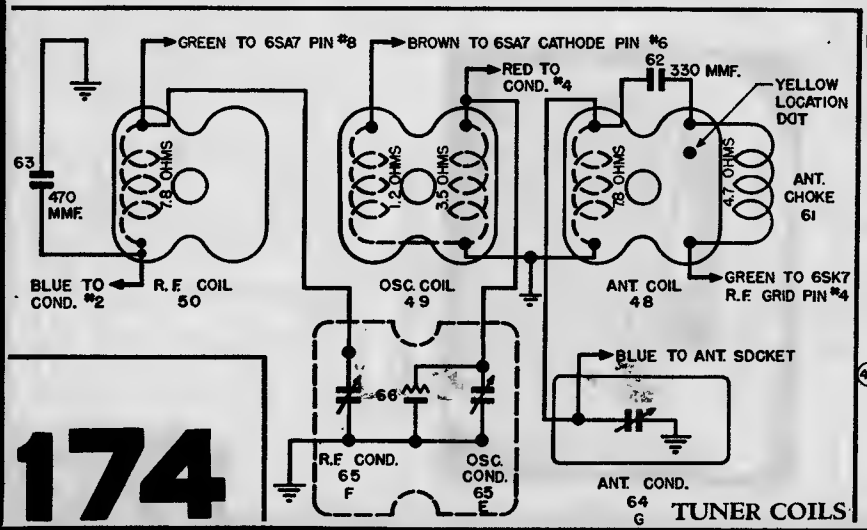
Adjust trimmer G to match car antenna (at approx. 1400 KC) when radio is installed.



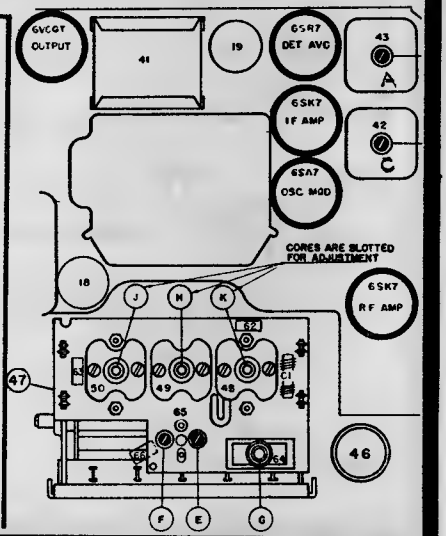
1st I. F. TRANS. 2nd I. F. TRANS



AUDIO PACK - DRIVER AND OUTPUT TRANS.



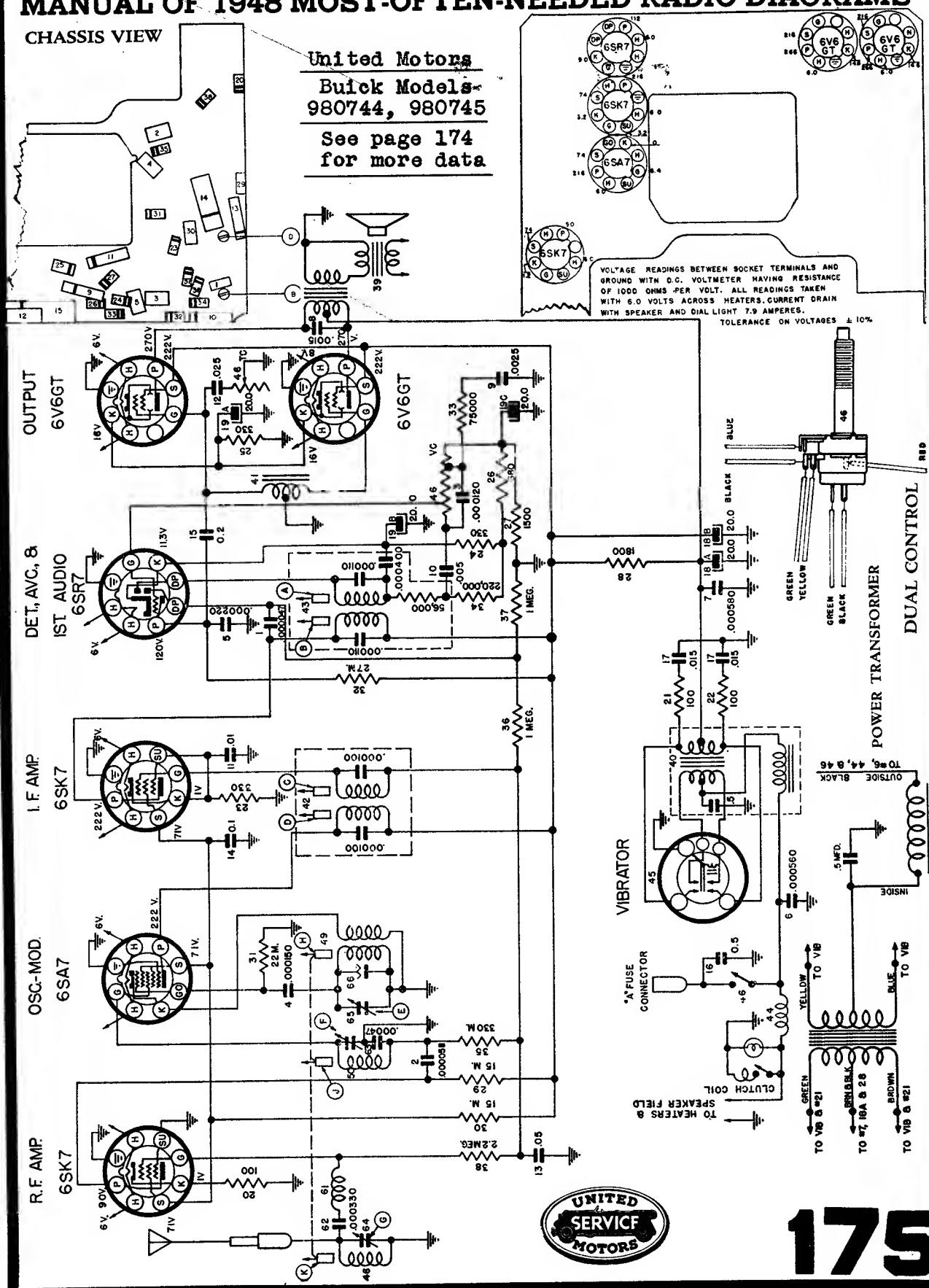
TUNER COILS



CHASSIS VIEW

United Motors
Buick Models
980744, 980745

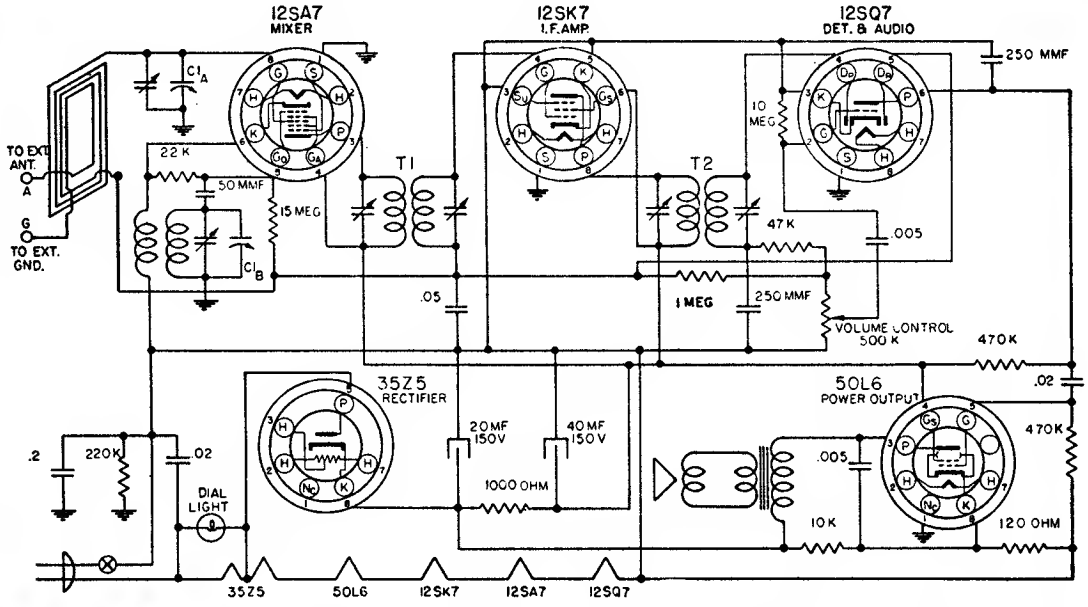
See page 174
for more data



UNITED SERVICE MOTORS

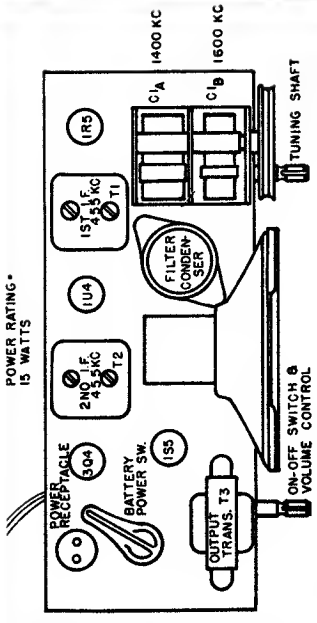
WARWICK MANUFACTURING CORPORATION

Model C110



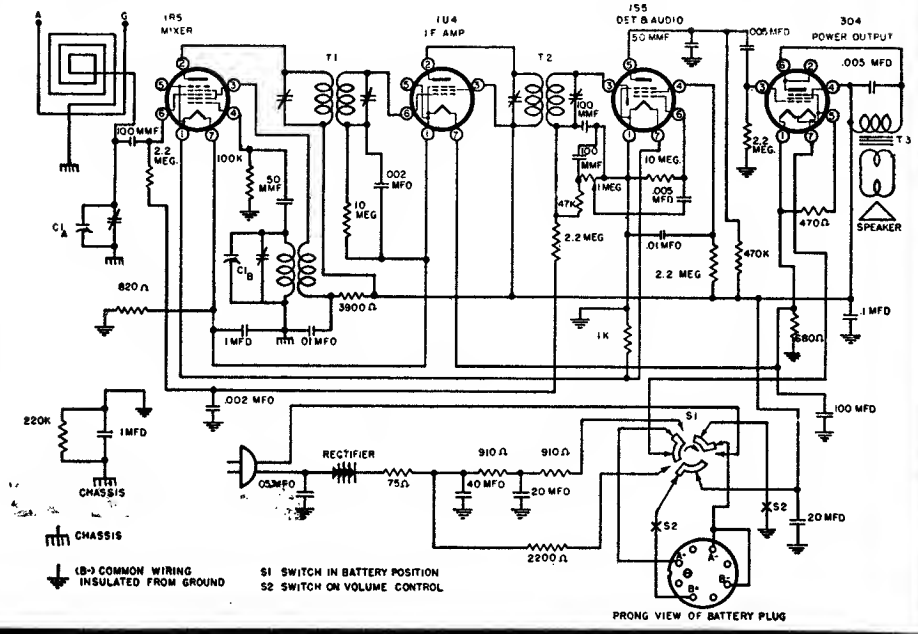
Position of Variable	Generator Frequency	Dummy Ant. Mfd.	Generator Connections	Trimmer Adjustment	Trimmer Function
Fully open	455 KC	.1	* 12SA7 Grid (Stator of C1A)	T1	Input I.F.
Fully open	455 KC	.1	* 12SA7 Grid (Stator of C1A)	T2	Output I.F.
Fully open	1725 KC	.00025	** Ant. terminal on loop	C1B	Oscillator
Tune in signal from generator	1500 KC	.00025	** Ant. terminal on loop	C1A	Antenna

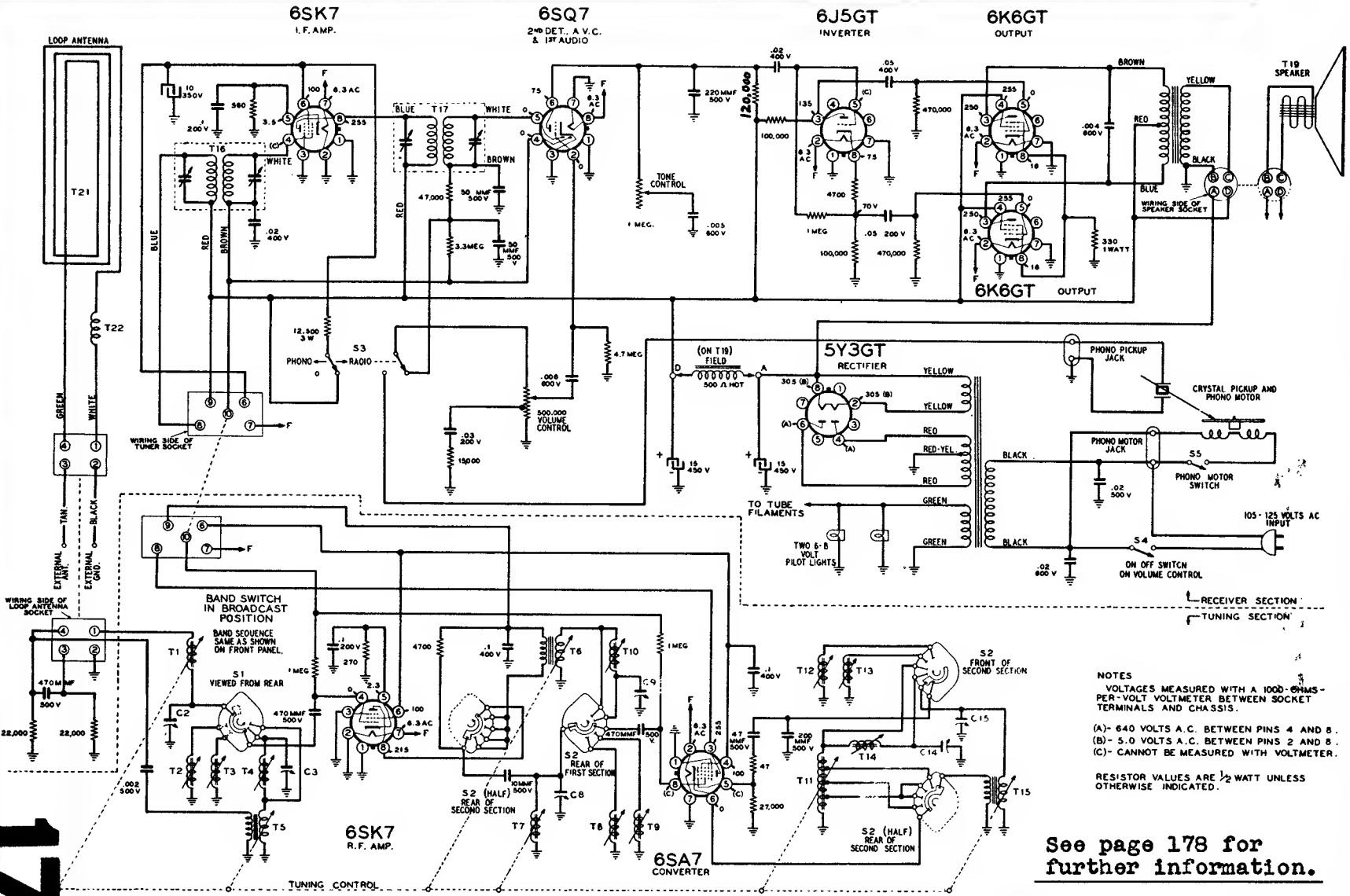
* Connect ground lead of signal generator to chassis.
** Connect ground lead of signal generator to terminal marked "G" on the back of the loop.



WARWICK MANUFACTURING CORPORATION

Model 11011





NOTES

VOLTAGES MEASURED WITH A 1000-OHMS-PER-VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.

(A)- 640 VOLTS A.C. BETWEEN PINS 4 AND 8.
(B)- 5.0 VOLTS A.C. BETWEEN PINS 2 AND 8.
(C)- CANNOT BE MEASURED WITH VOLTMETER.

RESISTOR VALUES ARE ½ WATT UNLESS OTHERWISE INDICATED.

See page 178 for further information.

WESTERN AUTO SUPPLY COMPANY

MODELS D1747 & D1748

NOTE: Before removing chassis, take off escutcheon and pull pointer from pointer carriage.

WESTERN AUTO SUPPLY COMPANY

MODELS D1747 & D1748

ALIGNMENT PROCEDURE

Continued from page 177

MECHANICAL ADJUSTMENT—The core tuning bar (see illustration of iron cores) and dial pointer must be adjusted mechanically before any electrical alignment is attempted. Rotate the manual tuning control until the core bar is farthest from the coils. For proper adjustment the bar should be approximately 1/32 of an inch from the two rod guide angles.

With the core bar in this position, adjust the dial pointer to coincide with 1600 kc on the dial scale.

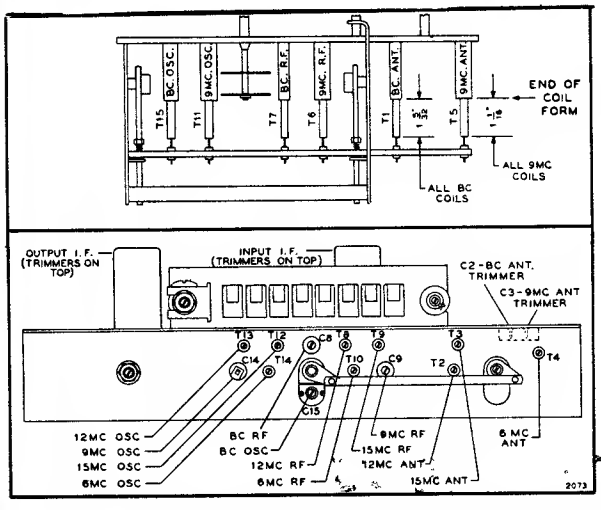
Rotate the cores of each of the three broadcast coils (see illustration) until the end of the coil is 1-5/32" from the end of the coil form. Rotate the three 9-mc cores until this dimension is 1-1/16" for these coils. After these adjustments have been made, the unit can be aligned electrically.

ELECTRICAL ADJUSTMENT—To align the set make the following preliminary adjustments: Set the tone control for treble tone; set the volume control at maximum; connect the ground post of the signal generator to the radio chassis; connect the output meter across a 3.2-ohm output load; and allow the receiver and signal generator to warm up for several minutes.

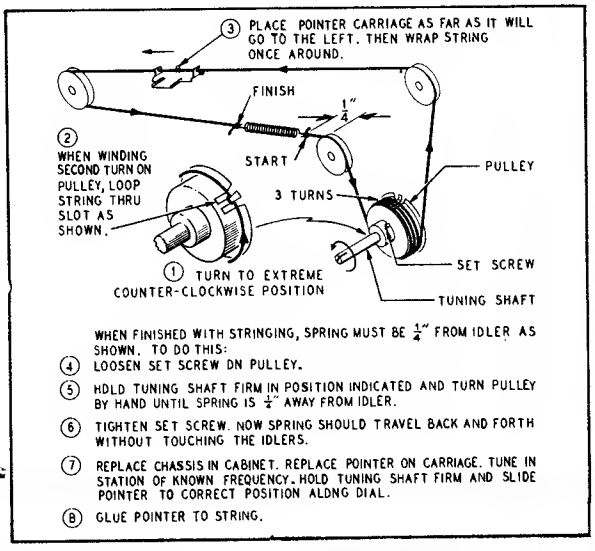
Align the set according to the sequence given in the chart. The indicated dummy antenna is to be connected in series between the signal generator output lead and the receiver. Adjust the set for maximum output; reduce the input as needed to keep the output near 1.3 volts.

Locations of all trimmers and coils are shown elsewhere in this manual. After adjustment, seal the coil cores with collodion or a similar substance (do not use cement).

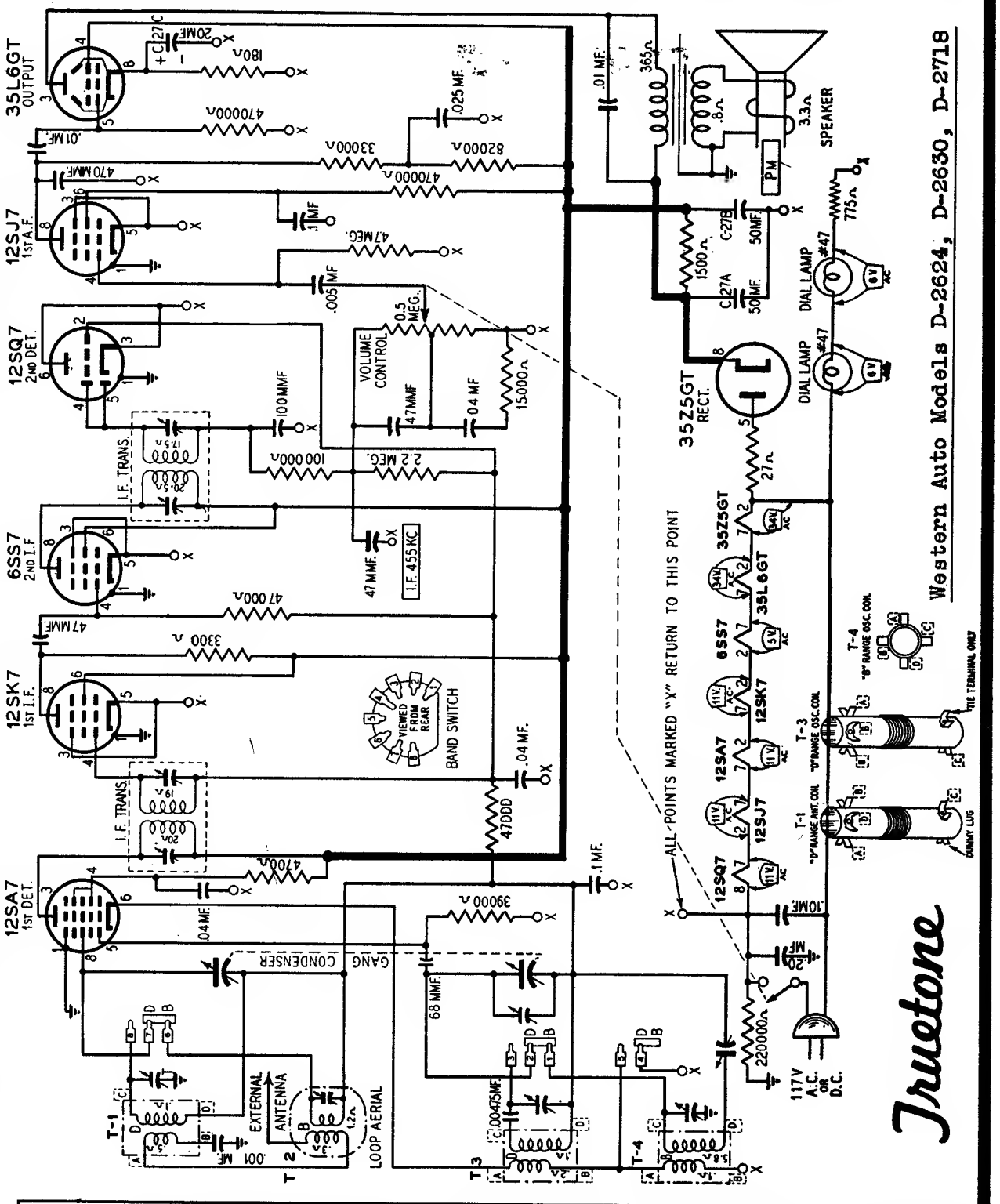
BAND SWITCH SETTING	*SIGNAL GENERATOR*			*DIAL POINTER SETTING*	*ADJUST TO MAXIMUM OUTPUT (in order shown)*
	Frequency	*Coupling Capacitor*	*Connection to Radio*		
Broadcast (for I. F.)	455 kc	.1 mf	Grid (pin 8) of converter (6SA7)	1600 kc	Trimmers on output and input I. F. cans
Broadcast	1600 kc	200 mmf	Antenna lead	1600 kc	BC Osc. trimmer C15 BC R. F. trimmer C8 BC Ant. trimmer C2
	1400 kc	200 mmf	Antenna lead	1400 kc	Rotate cores of BC R. F. coil T7 and BC Ant. coil T1
31 Meter	9.6 mc	400 ohms	Antenna lead	9.6 mc	9 mc Osc. trimmer C14 9 mc R. F. trimmer C9 9 mc Ant. trimmer C3
49 Meter	6.1 mc	400 ohms	Antenna lead	6.1 mc	6 mc Osc. coil T14 6 mc R. F. coil T10 6 mc Ant. coil T4
25 Meter	11.8 mc	400 ohms	Antenna lead	11.8 mc	12 mc Osc. coil T13 12 mc. R. F. coil T8 12 mc. Ant. coil T2
19 Meter	15.2 mc	400 ohms	Antenna lead	15.2 mc	15 mc. Osc. coil T12 15 mc R. F. coil T9 15 mc Ant. coil T3

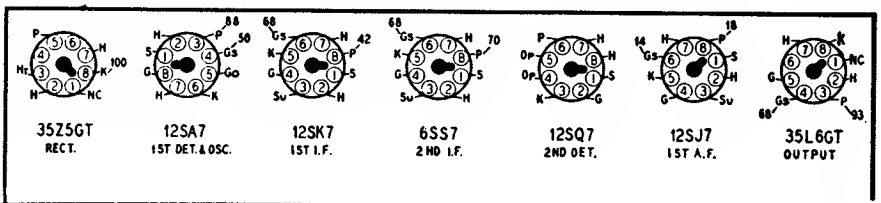


Coils and Trimmers



Replacement of Drive Cord





LINE VOLTAGE.....117 VOLTS A. C.
NO SIGNAL INPUT
READINGS TAKEN WITH 1000 OHM-PER-VOLT METER.

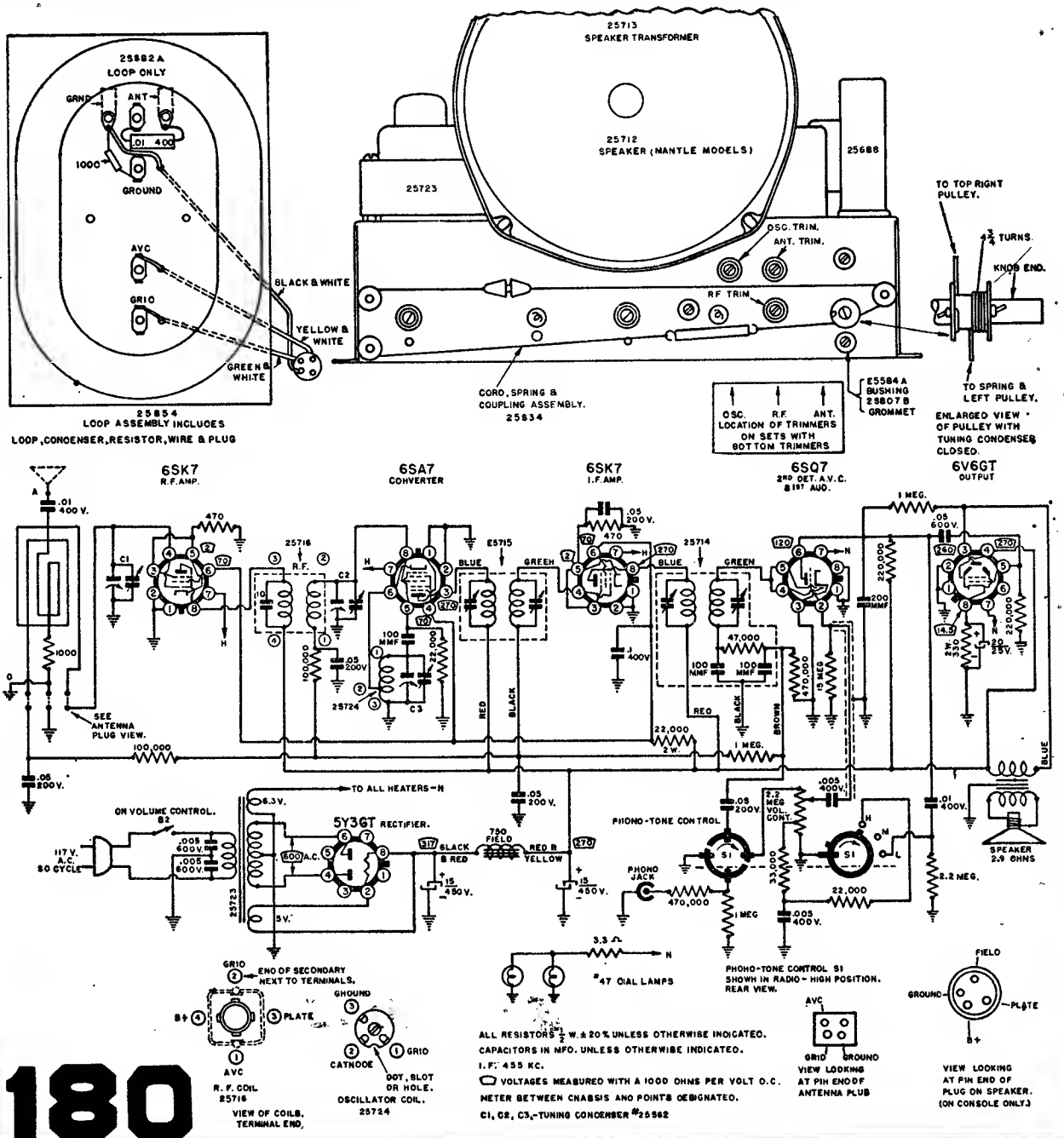
ALL VOLTAGES EXCEPT HEATERS AND DIAL LAMP, ARE BETWEEN SOCKET TERMINALS AND "X" POINT. SEE SCHEMATIC FOR HEATERS

TRUETONE

MODEL D-2634

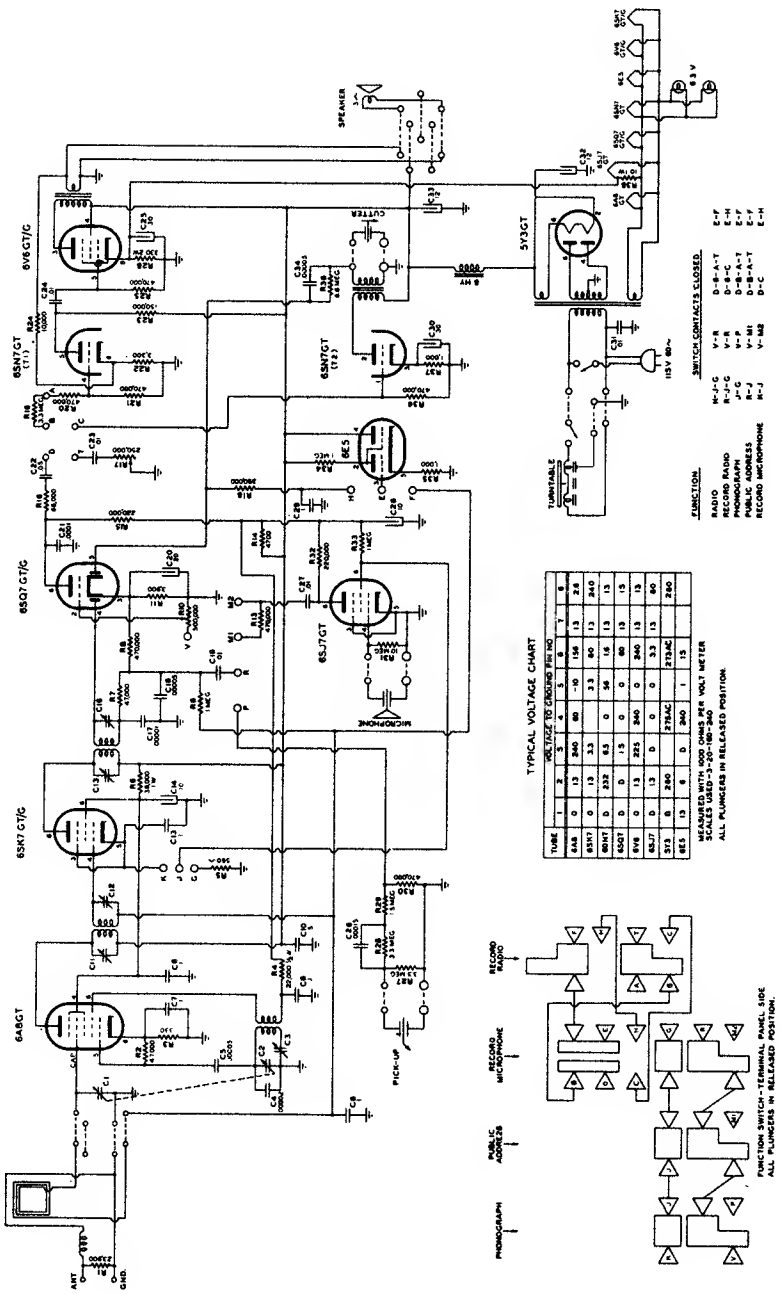
ALIGNMENT—Sets are properly aligned at the factory with precision equipment and the adjustments should not be disturbed unless a coil, tuning condenser or IF transformer has to be replaced or the set has been subject to damage or tampering. Alignment should only be done with the oid of an accurate signal generator and output indicating instrument.

TO PROPERLY ALIGN—Remove chassis from cabinet, and align I. F. Transformers in the conventional manner with a Signal Generator adjusted to 455 KC, connected to the grid of the 6SA7 through a .1 Mfd. condenser, with the tuning condenser set at minimum capacity. To align tuning condenser, carefully place loop in normal relation to chassis, connect Signal Generator to antenna clip through a .0001 Mfd. condenser. Adjust oscillator trimmer condenser (located on left top) to 1620 KC with tuning condenser at minimum capacity (complete out of mesh). The antenna ond R. F. sections are trimmed at 1400 KC. Antenna trimmer is top right; R. F. trimmer is below at right. Dial pointer may be adjusted to scale by slipping pointer coupling on dial cord.

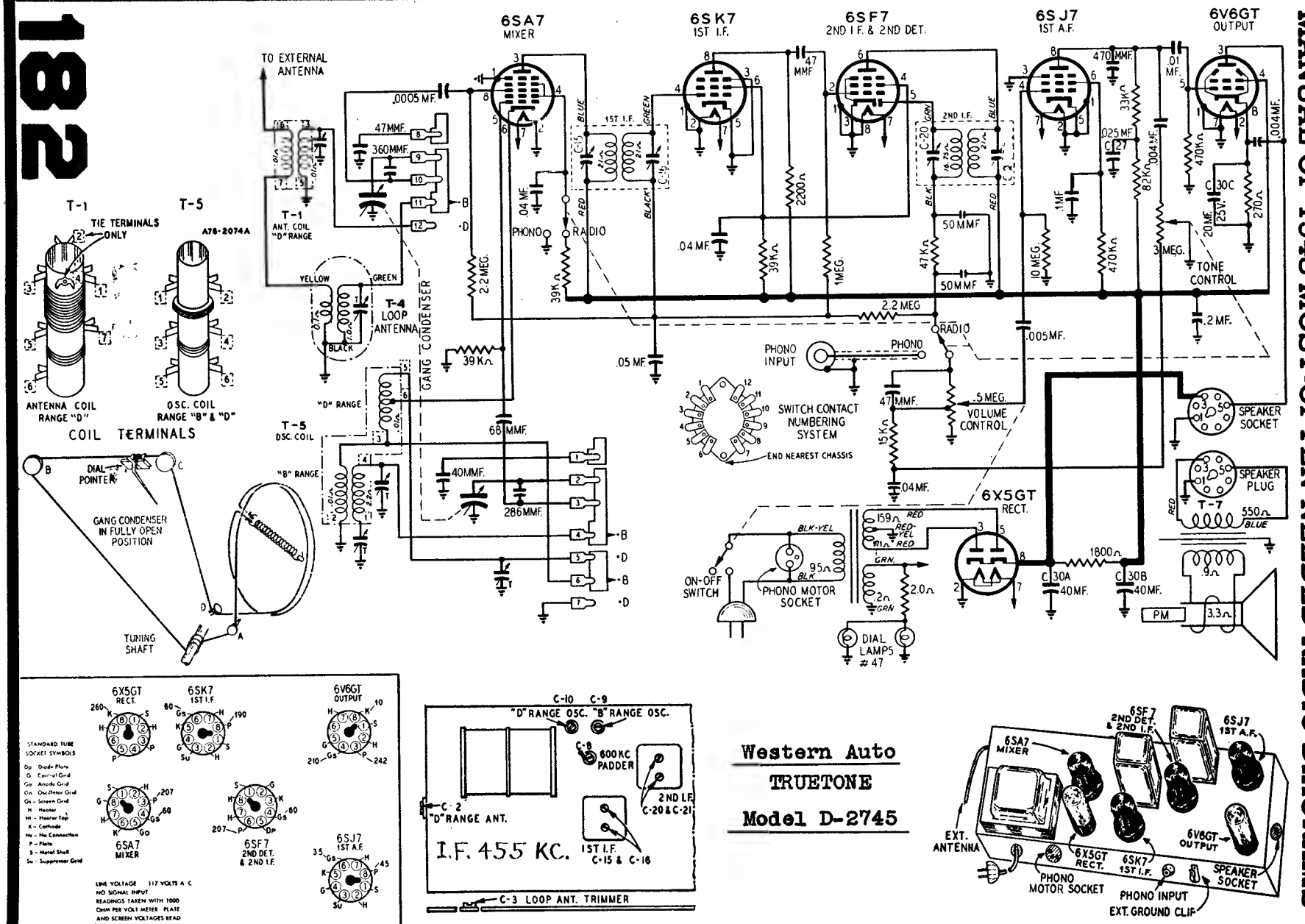


WILCOX-GAY CORPORATION — CHARLOTTE, MICHIGAN

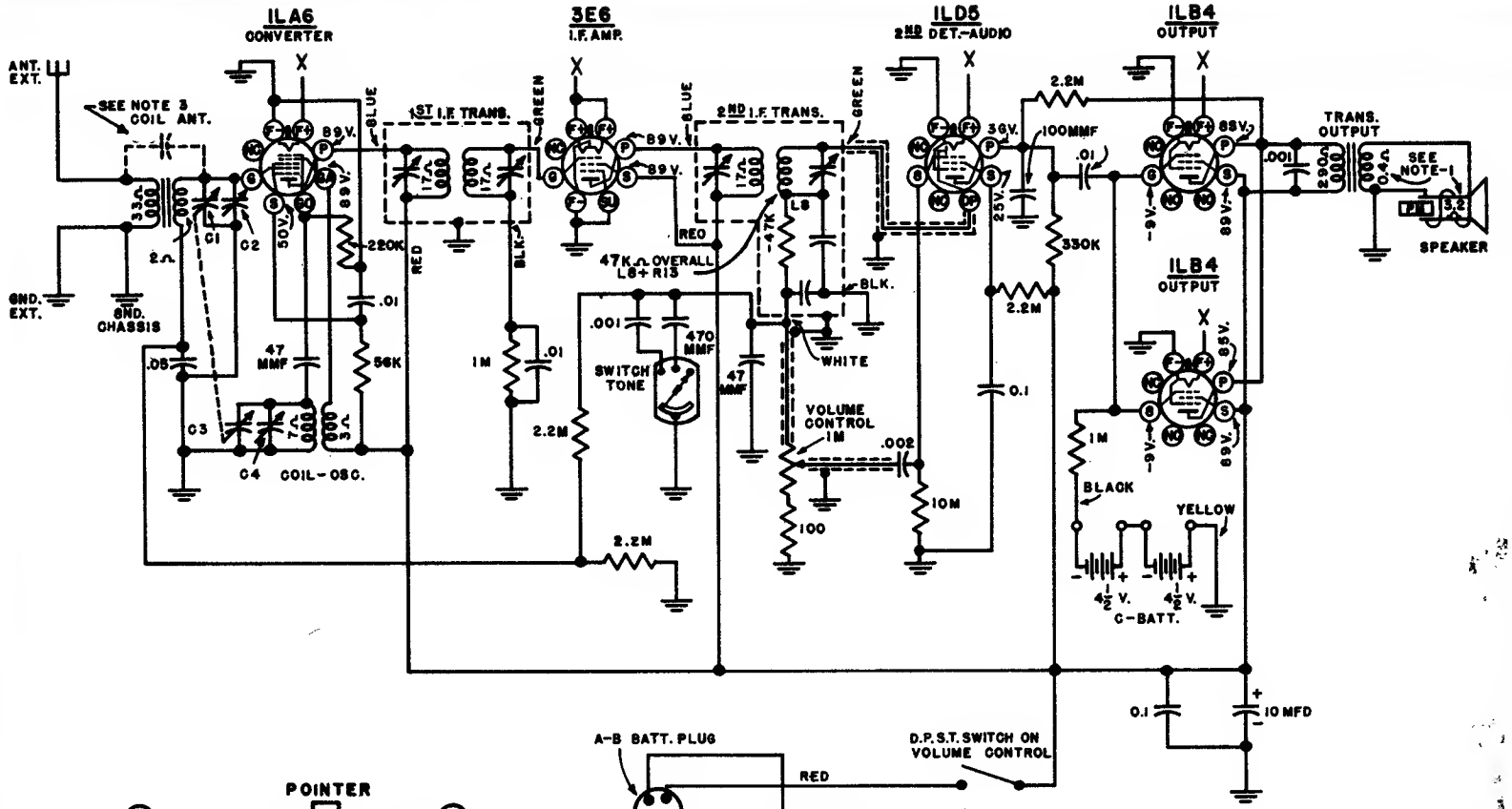
Models 6B45B - 6B45M - 6B45W

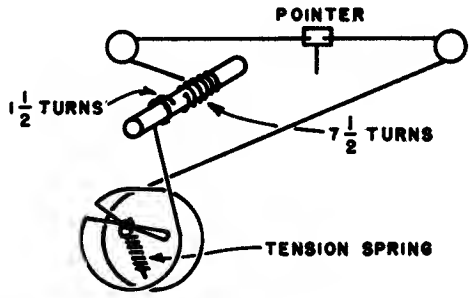


MANUAL OF 1948 MOST-OFTEN-NEEDED RADIO DIAGRAMS



Western Auto
TRUETONE
Model D-2745





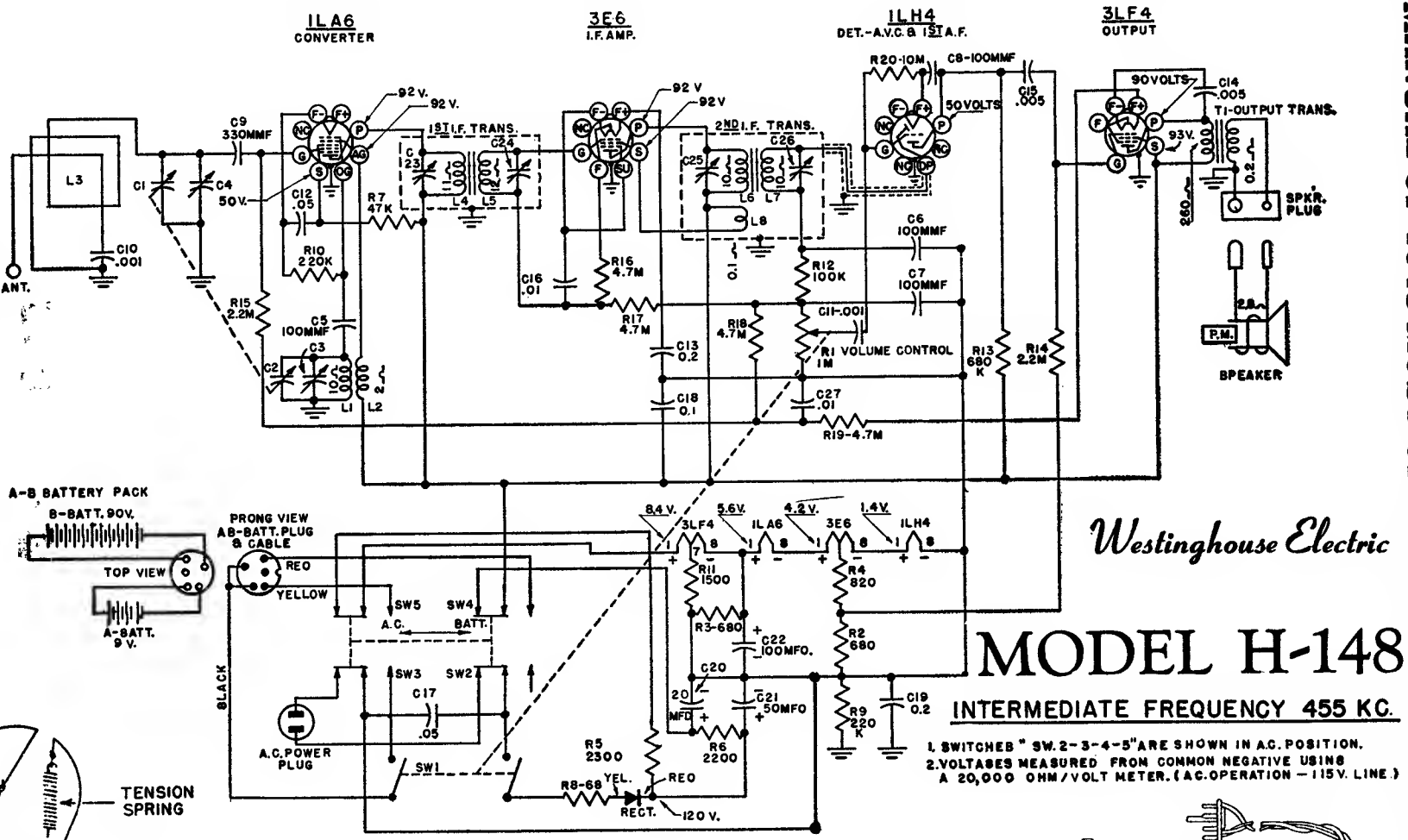
DIAL DRIVE MECHANISM

NOTE—
1. VOICE COIL DISCONNECTED.
2. ALL VOLTAGES MEASURED FROM CHASSIS (GND.) USING 20,000 OHMS/VOLT METER. READINGS SHOULD APPROXIMATE THE VALUES SHOWN WITHIN 20 PERCENT.
3. NOT USED ON ALL CHASSIS.

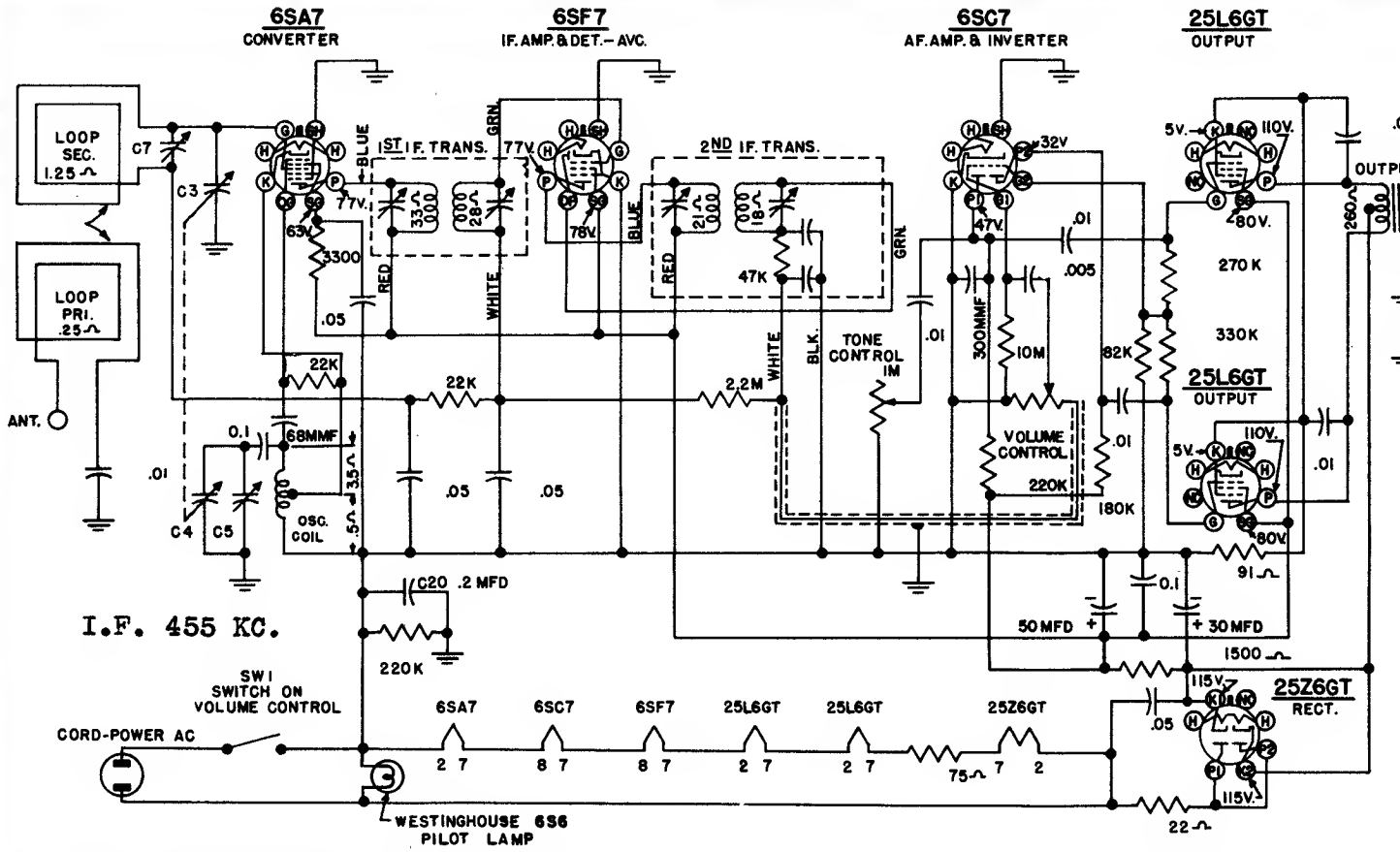
INTERMEDIATE FREQUENCY: 455KC

Westinghouse
RADIO • TELEVISION

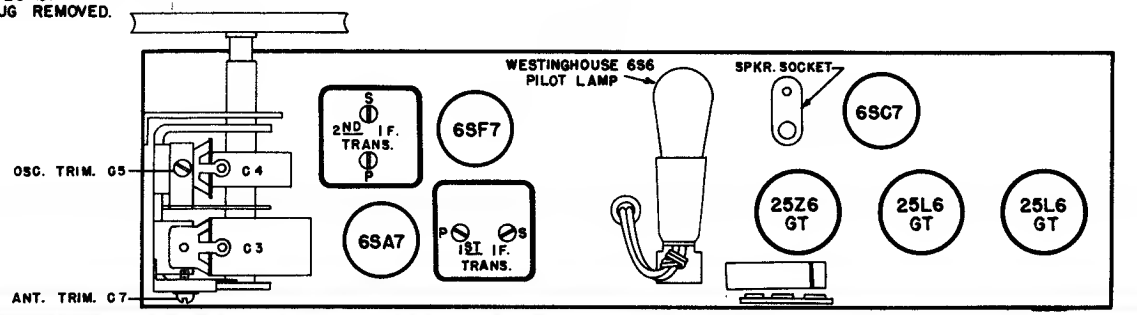
MODEL H-133


1LA6
CONVERTER
3E6
I.F. AMP.
1LH4
DET.-A.V.C. & 1ST A.F.
3LF4
OUTPUT
ANT.
L3
C1
C4
50V.
C9
330MMF
C10
.001
C12
.05
R7
47K
R10
220K
R15
2.2M
C5
100MMF
C3
C2
L1
L2
92 V.
92 V.
1ST I.F. TRANS.
C24
L4
L5
92 V
92 V
2ND I.F. TRANS.
C26
C25
L6
L7
L8
R16
4.7M
R17
4.7M
R18
4.7M
C16
.01
C13
0.2
C18
0.1
C6
100MMF
C7
100MMF
C11-.001
R1 VOLUME CONTROL
1M
R12
100K
R13
680
K
R14
2.2M
C27
.01
R19-4.7M
R20-10M
C8-100MMF
C15
.005
50VOLTS
90VOLTS
C14
.005
T1-OUTPUT TRANS.
93V.
250
0.2
SPKR.
PLUG
2.8
P.M.
SPEAKER
A-B BATTERY PACK
B-BATT. 90V.
TOP VIEW
A-BATT.
9 V.
PRONG VIEW
AB-BATT. PLUG
& CABLE
RED
YELLOW
BLACK
SW5
A.C.
SW4
BATT.
SW3
SW2
C17
.05
A.C. POWER
PLUG
SW1
8.4 V.
5.6V.
4.2V.
1.4V.
3LF4
1LA6
3E6
1LH4
R11
1500
R3-680
C22
100MFD.
C20
20
MFD
C21
.50MFD
R5
2300
R6
2200
R8-68
YEL.
RED
RECT.
120 V.
R4
820
R2
680
R9
220
K
C19
0.2
Westinghouse Electric
MODEL H-148
INTERMEDIATE FREQUENCY 455 KC.
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.)
TENSION
SPRING
2 1/2 TURNS
DIAL DRIVE
MECHANISM
OSCILLATOR
TRIMMER C3
ANTENNA
TRIMMER C4
1ST I-F
TRANS.
2ND I-F
TRANS.
3E6
1LA6
1LH4
3LF4
SPEAKER SOCKET
AC-DC
POWER CABLE
BATTERY AC-DC
BATTERY CABLE
BATTERY CABLE
BOTTOM VIEW OF CHASSIS

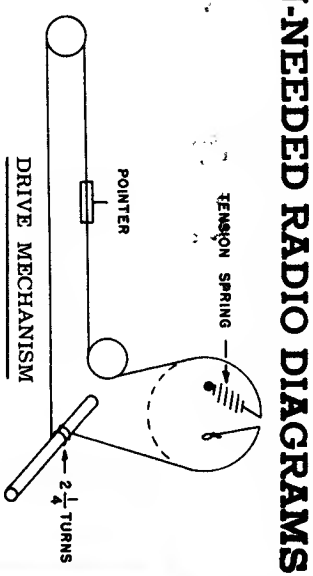
Westinghouse Electric
Model H-157



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.

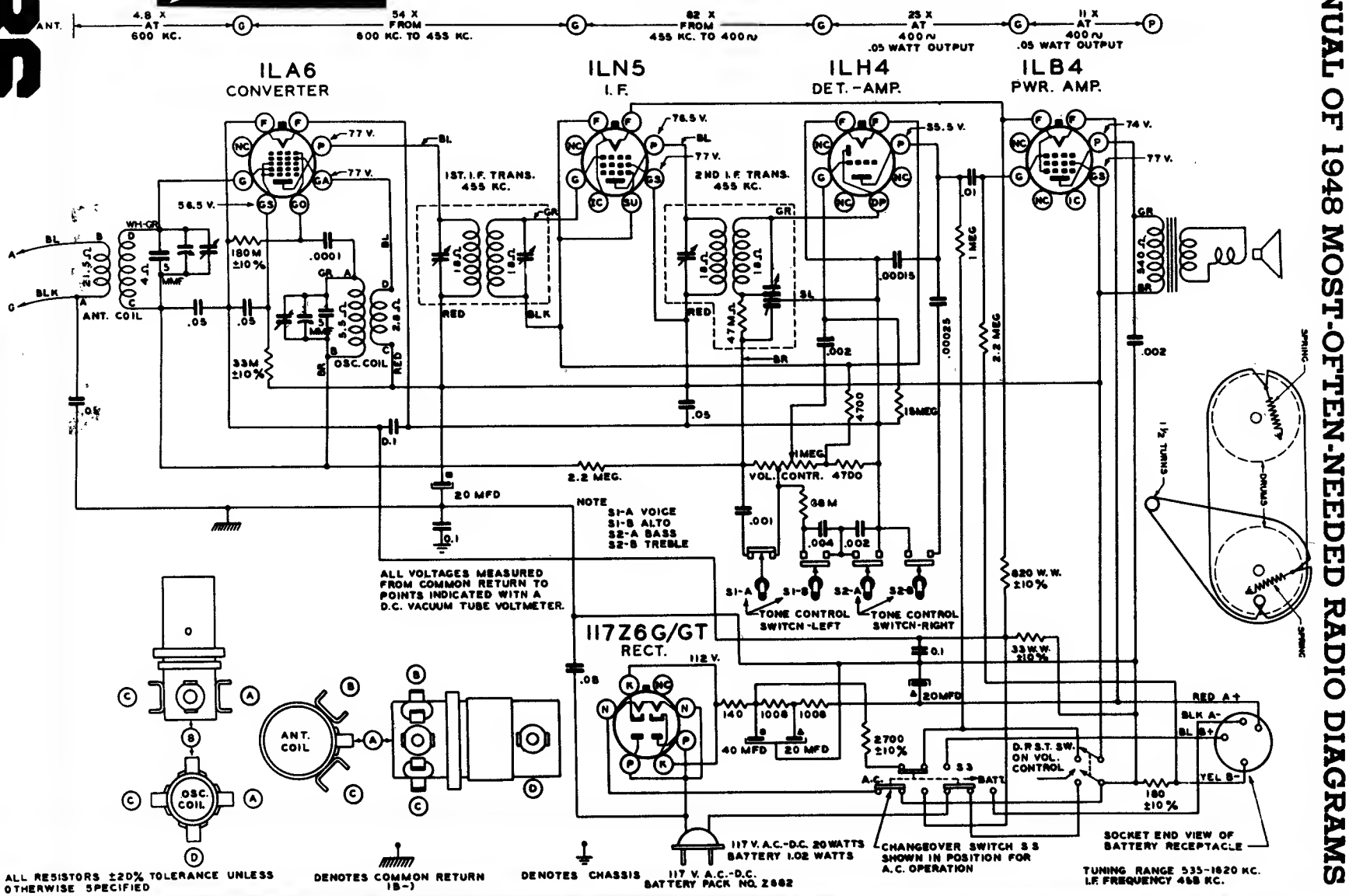


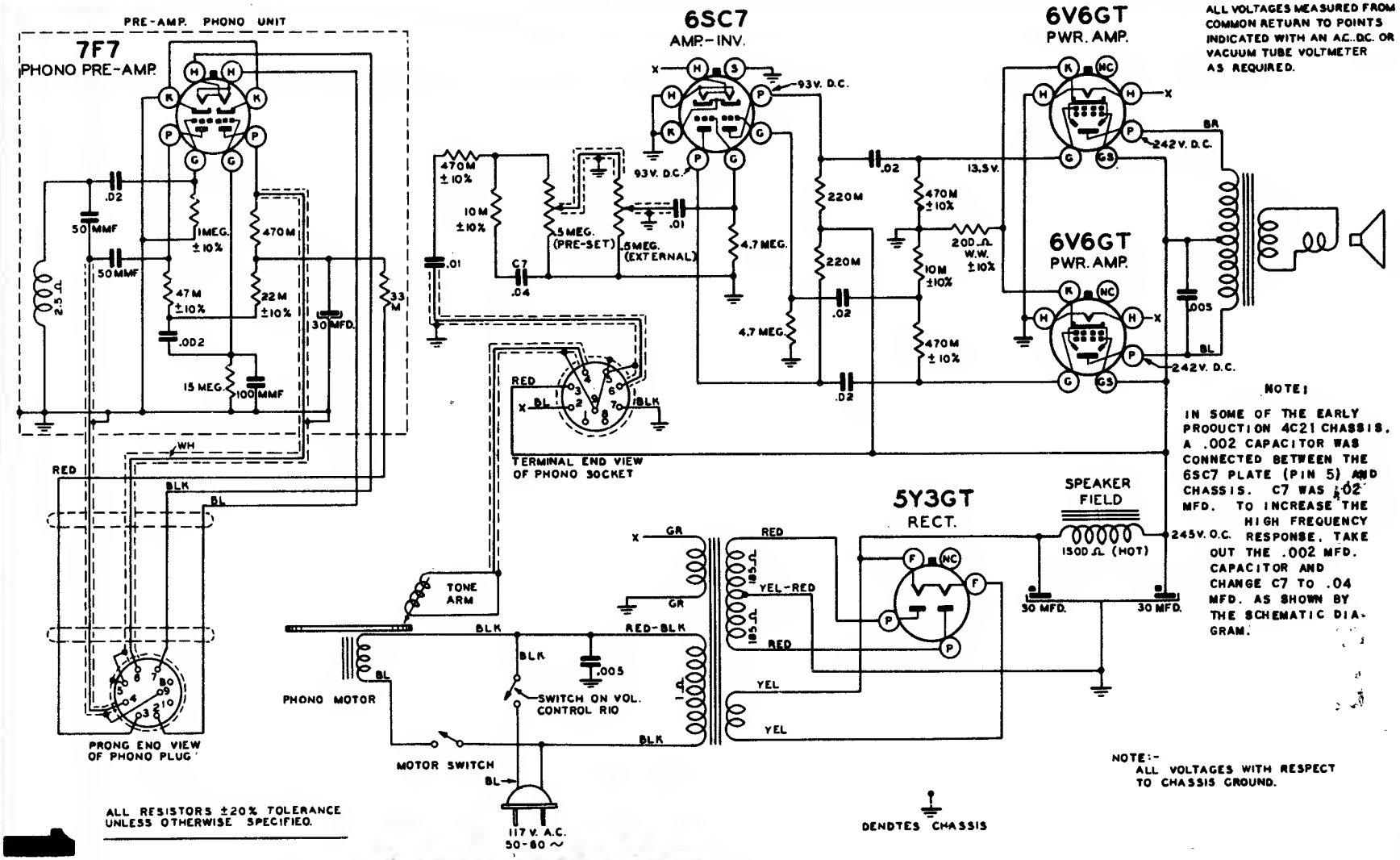
DRIVE MECHANISM



ZENITH

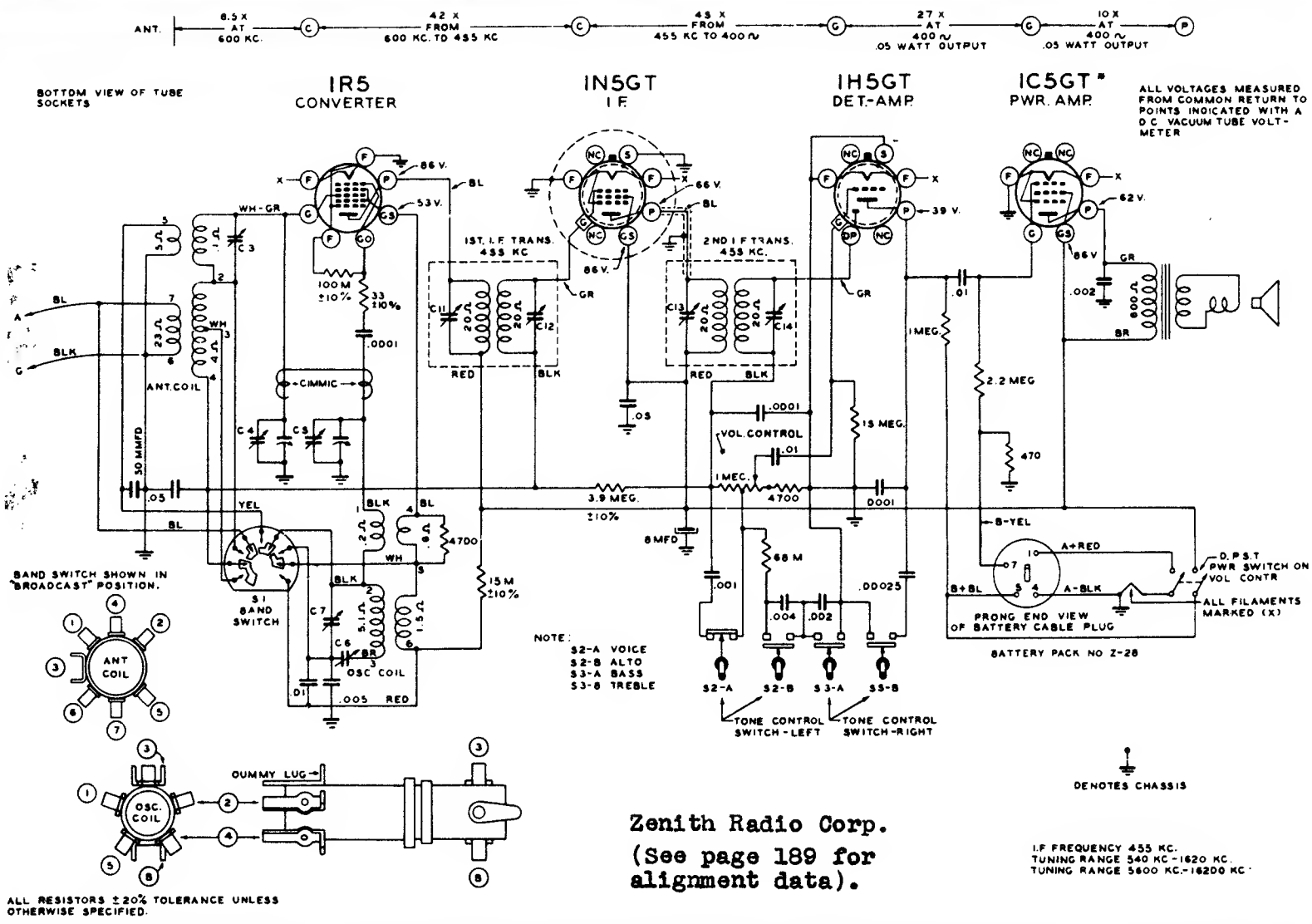
MODEL 5G036 CHASSIS No. 5C51





ZENITH

MODEL S 12600
CHASSIS No. 4C21



Zenith Radio Corp.

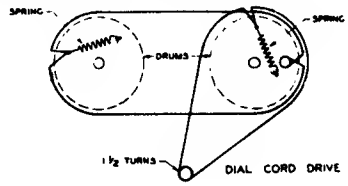
(See page 189 for alignment data).

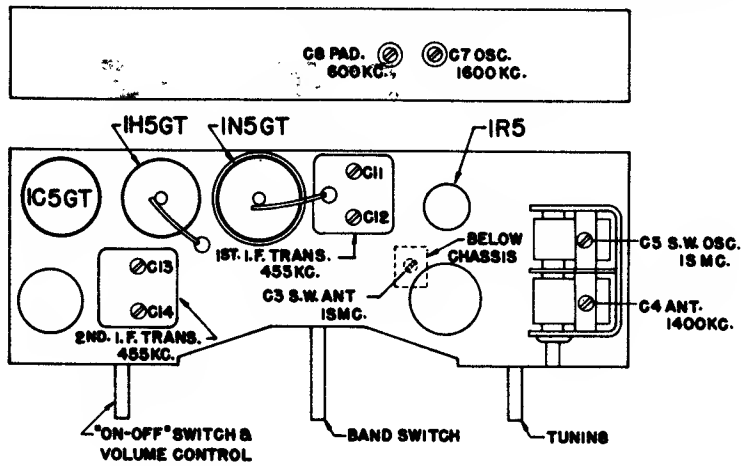
I.F. FREQUENCY 455 KC.
TUNING RANGE 540 KC - 1620 KC.
TUNING RANGE 5600 KC. - 16200 KC.

MODELS 4K040-4K040G **CHASSIS** No. 4C54

Zenith Radio Corp.
Schematic on page 188

MODELS 4K040-4K040G
CHASSIS No. 4C54

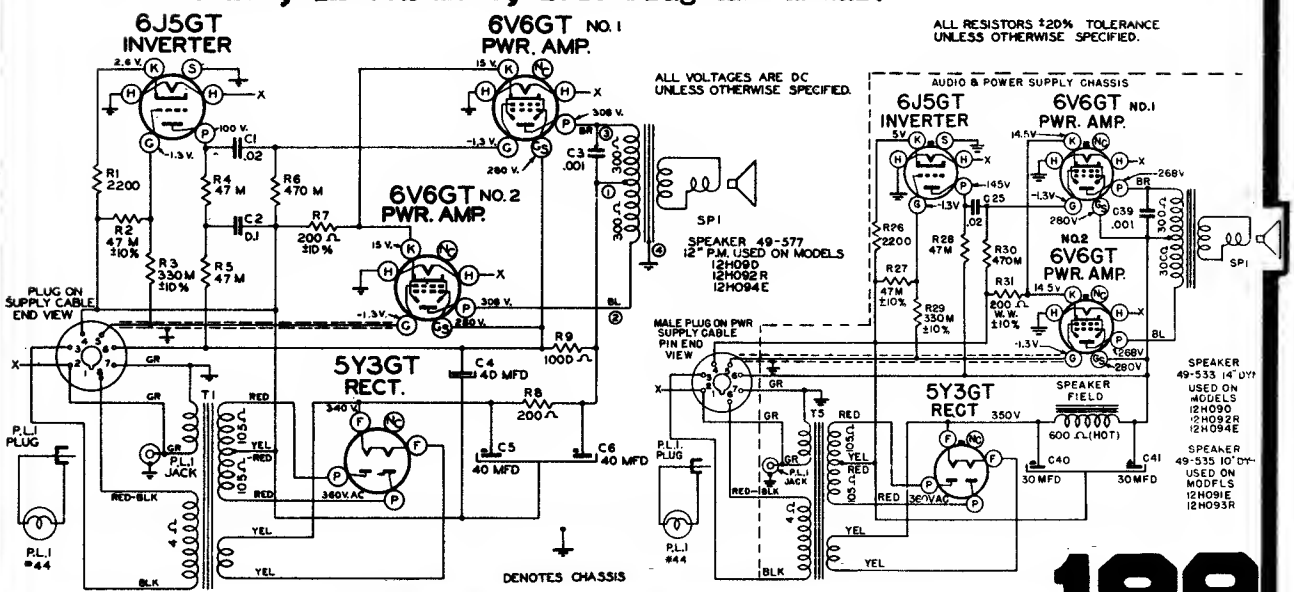




ALIGNMENT PROCEDURE

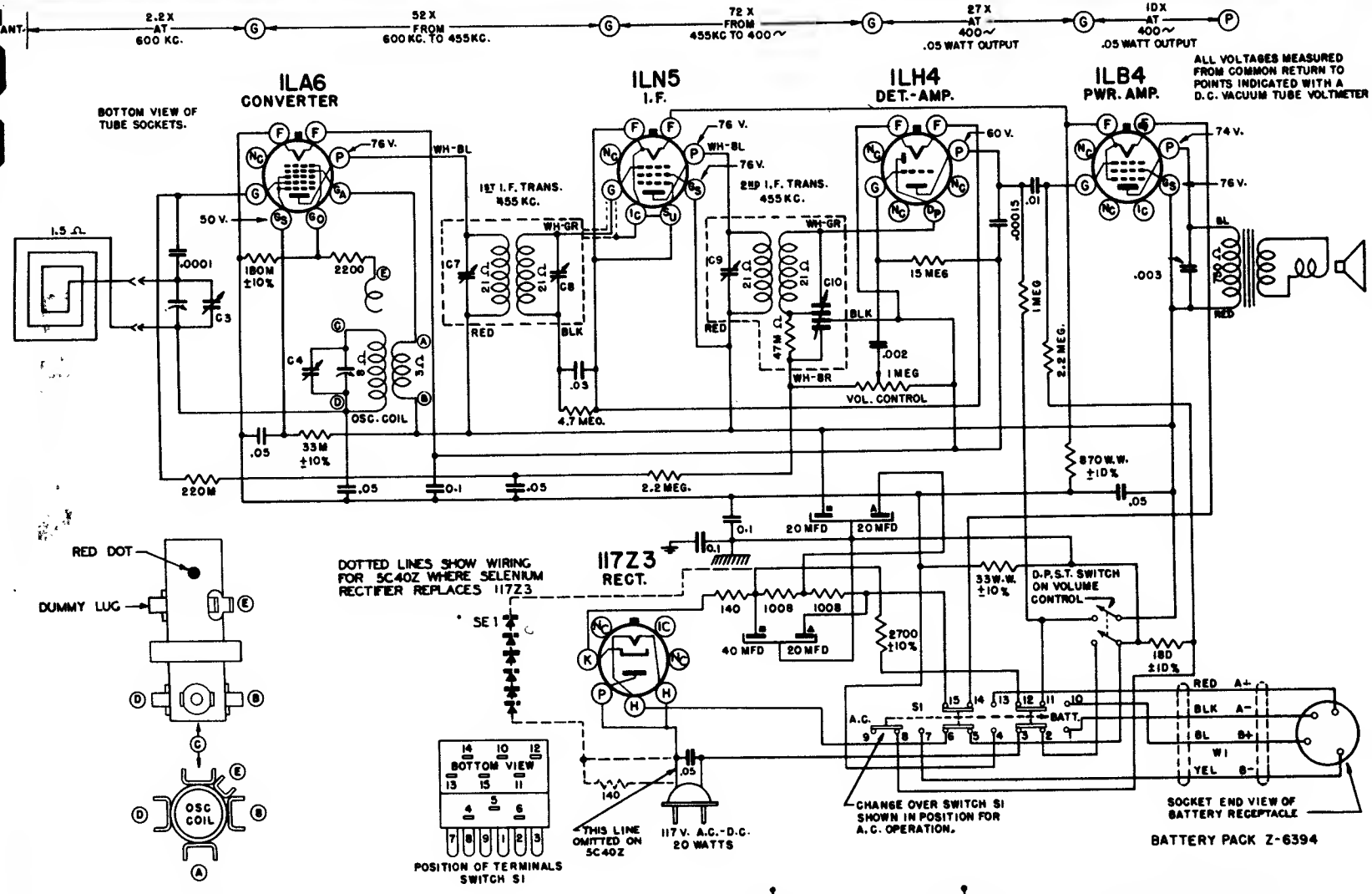
OPERATION	CONNECT OSC. TO	DUMMY ANT.	INPUT SIG. FREQUENCY	BAND	SET DIAL AT	TRIMMERS
1	Converter Grid	.5 Mfd.	455 Kc.	BC	600 Kc.	C-11, C-12, C-13, C-14
2	Ant.-Gnd.	400 ohms	18 Mc.	SW	18 Mc.	C-5
3	Ant.-Gnd.	400 ohms	400 ohms	SW	Rock Gang 18 Mc.	C-3
4	Ant.-Gnd.	200 Mmf.	1600 Kc.	BC	1600 Kc.	C-7
5	Ant.-Gnd.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

Zenith Radio Corp. Changes between Chassis 11C21 and Chassis 11C21Z shown in circuit diagrams below. For complete receiver diagram and alignment see pages 190 to 192, in Volume 6, 1946 Diagram Manual.



11C21Z POWER SUPPLY FOR P.M. SPEAKER

11C21 USING DYNAMIC SPEAKER



ALL RESISTORS ± 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.

DENOTES CHASSIS

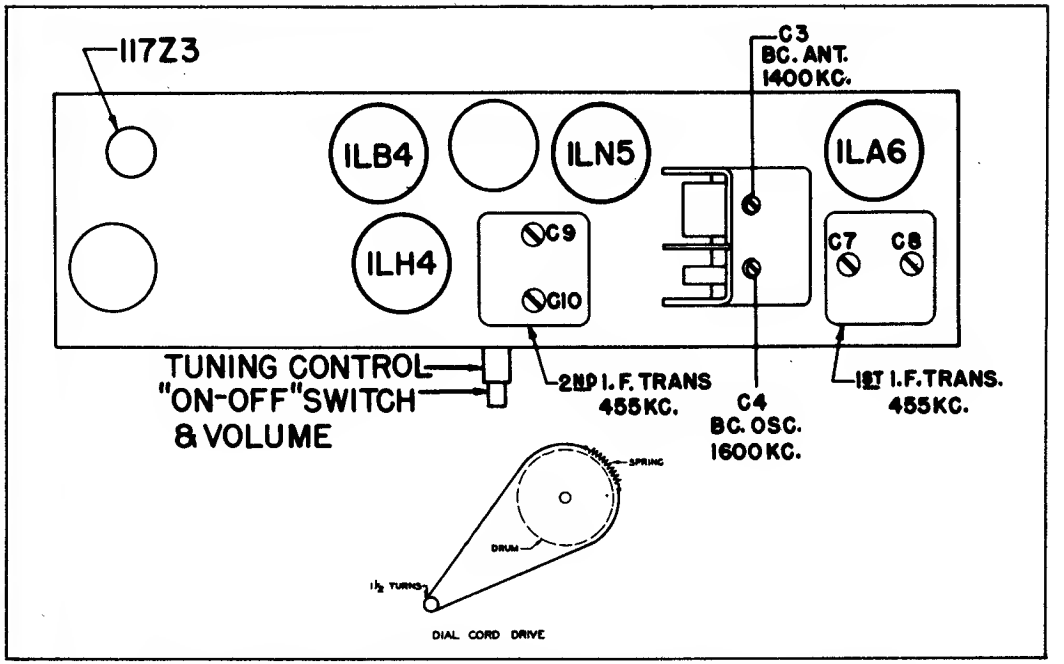
DENOTES COMMON RETURN

I.F. FREQUENCY 455 KC.
TUNING RANGE 535 KC. - 1620 KC.

(8-1)

ZENITH RADIO CORP.

MODEL 5G003 5G003Z **CHASSIS** No. 5C40 5C40Z



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

Zenith Radio Corp.

Diagram on page 190

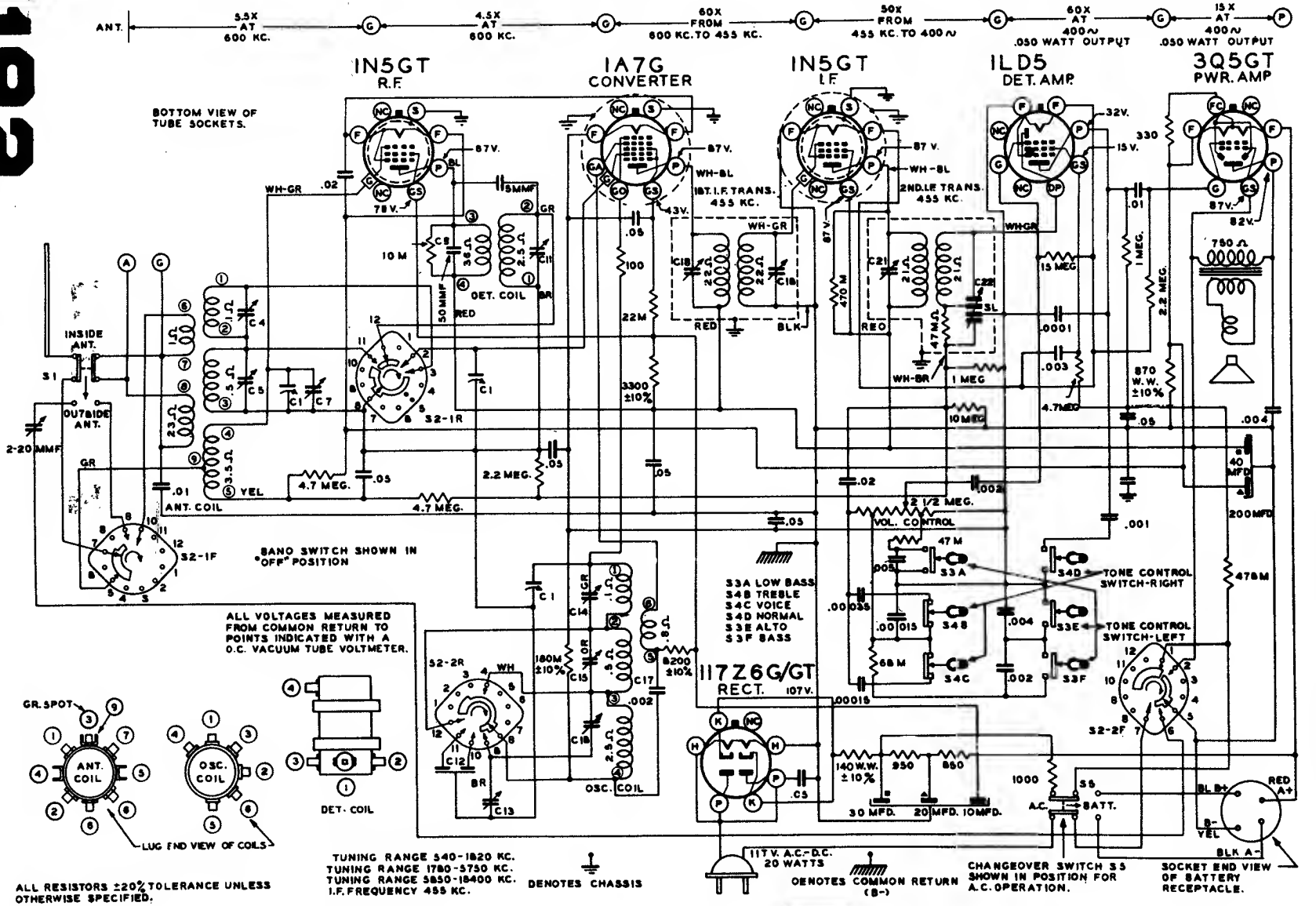
MODEL 5G003
CHASSIS No. 5C40

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 electonic 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.

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 and C10	I.F. Alignment
2	Single Turn Loop	--	1600	1600	C4	Set Osc. to scale
3	Coupled Loosely to	--	1400	1400	C3	Alignment of Antenna
	Wavemagnet					



ZENITH RADIO CORP.

MODELS 6G038

CHASSIS No. 6C50