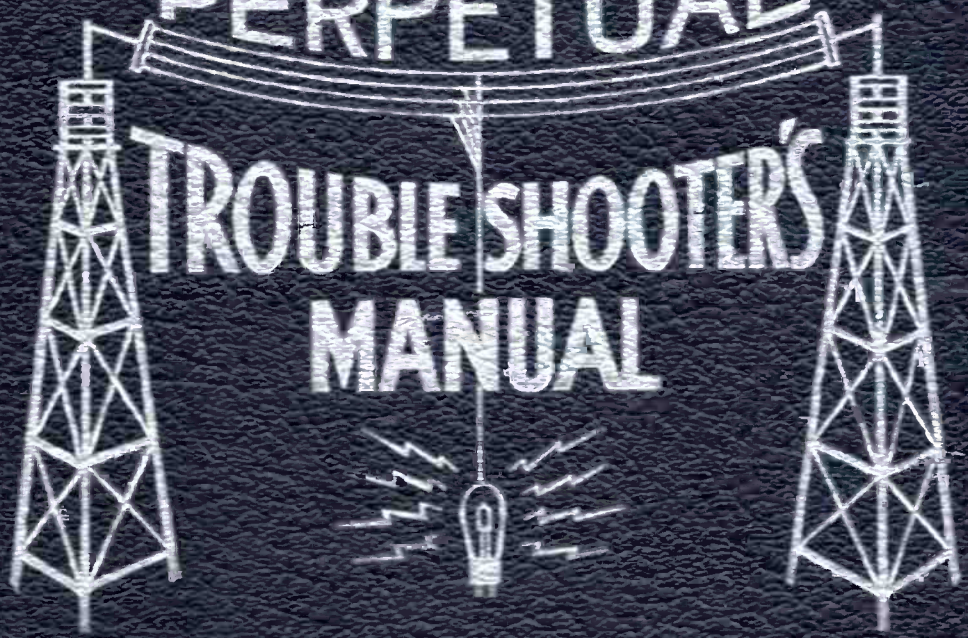
VOLUME VI

PERPETUAL TROUBLE SHOOTER'S MANUAL



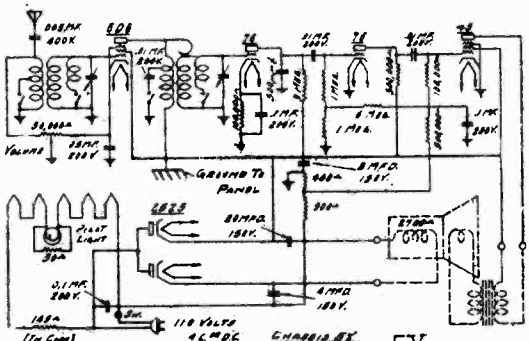
JOHN F. RIDER

MODEL 5Y
MODEL 48
MODEL Warwick

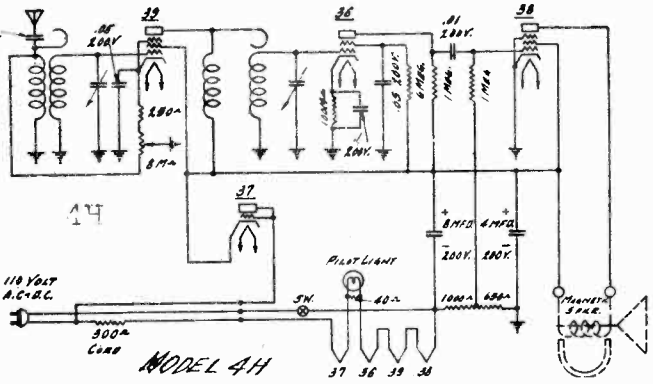
DETROLA RADIO CORP.

MODEL 4C
MODEL 4H

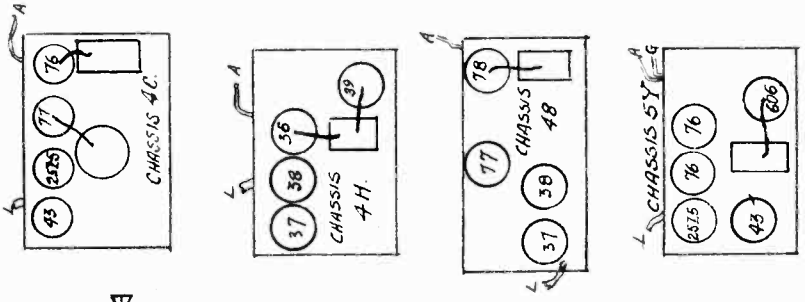
Schematics, Socket

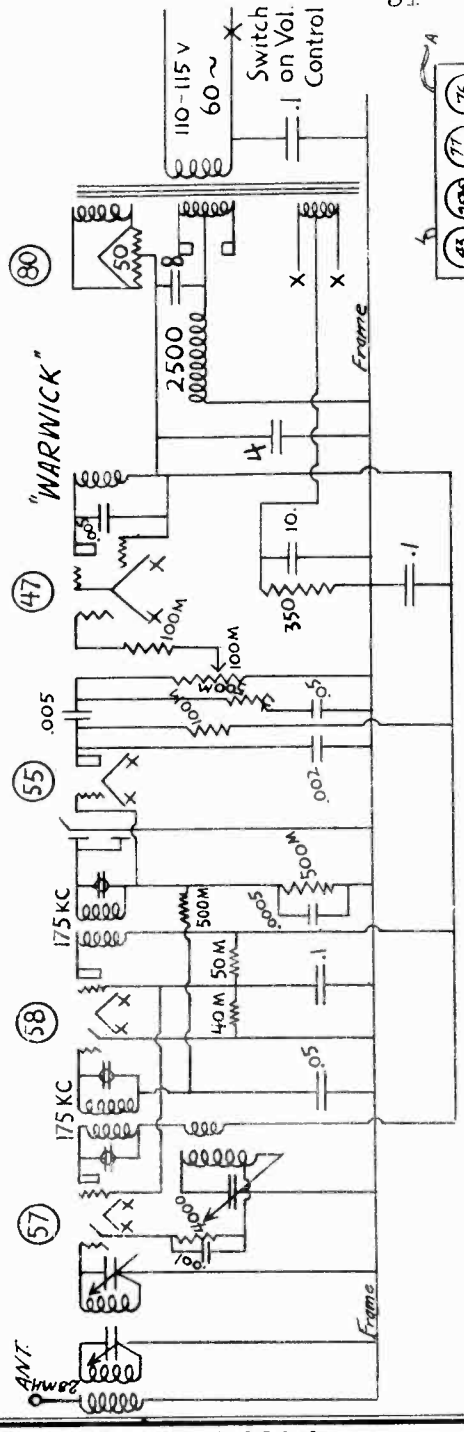


5Y

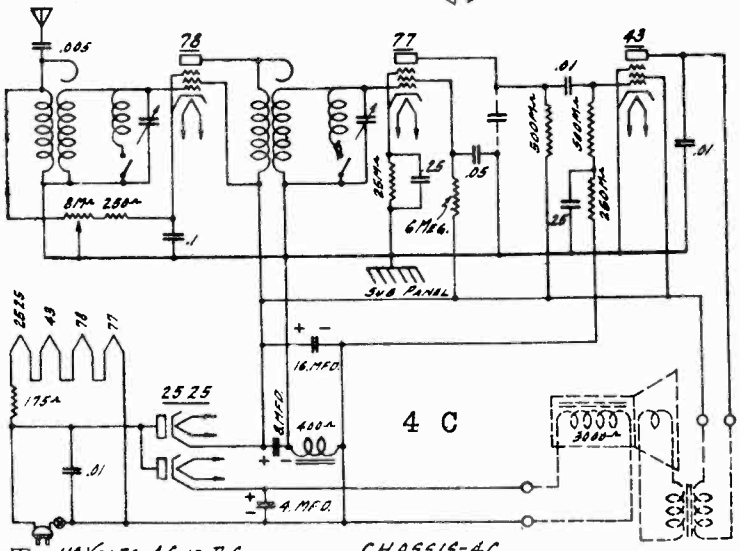


MODEL 4H



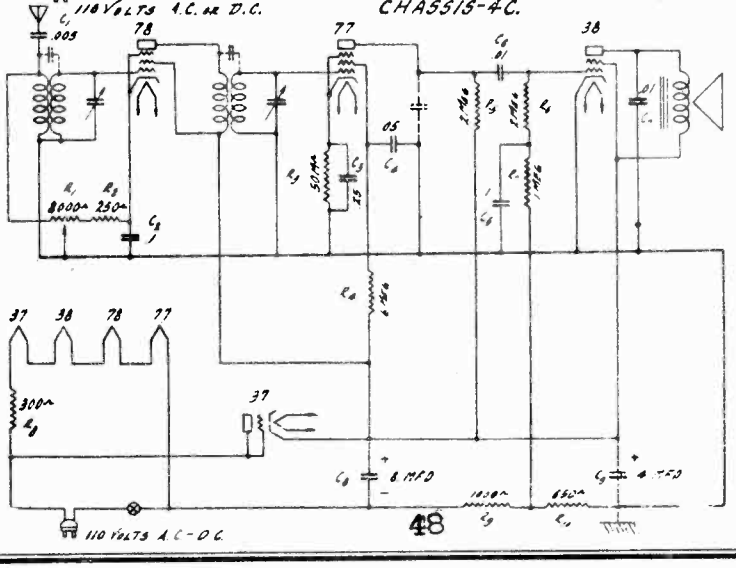


"WARWICK"



4 C

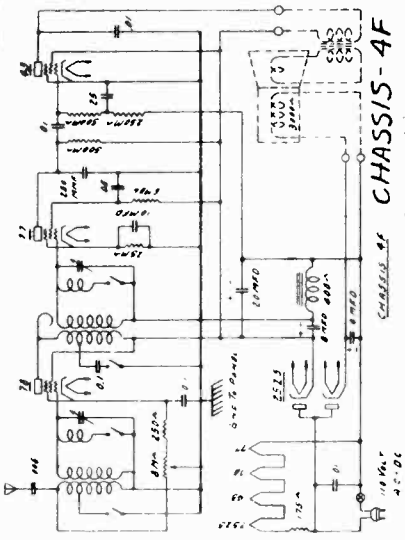
CHASSIS-4C.

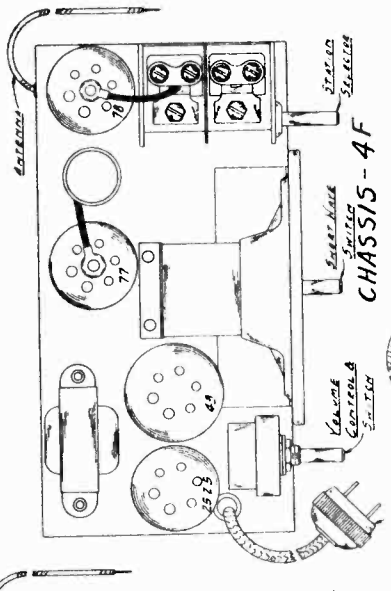


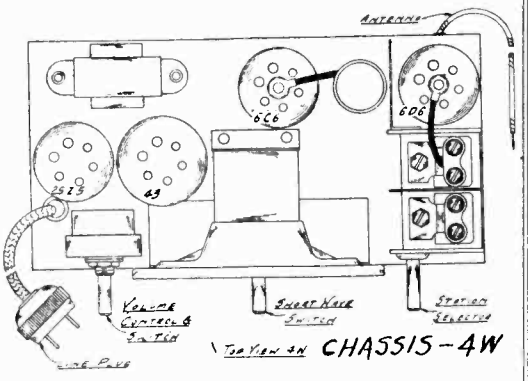
48

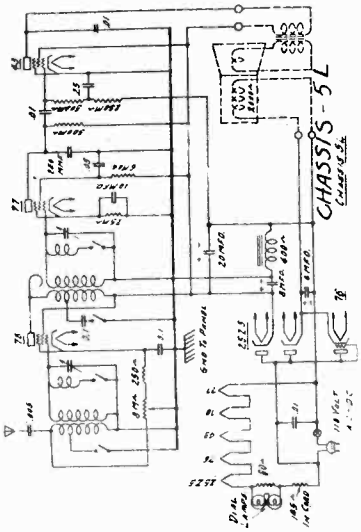
MODEL 4F
MODEL 4J
MODEL 4W
MODEL 4Y
MODEL 5L
Schematic, Socket

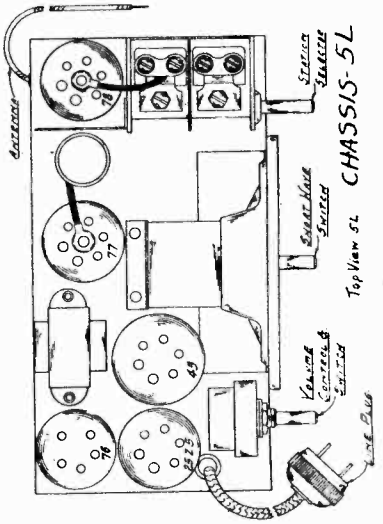
DETROLA RADIO CORP.

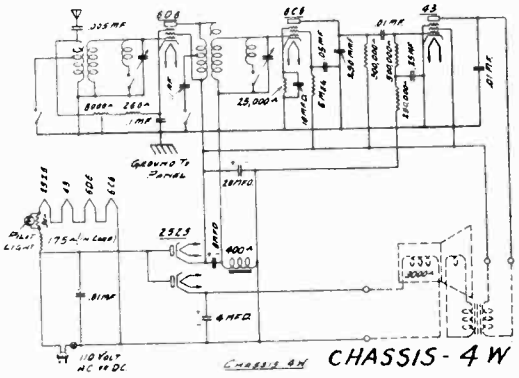


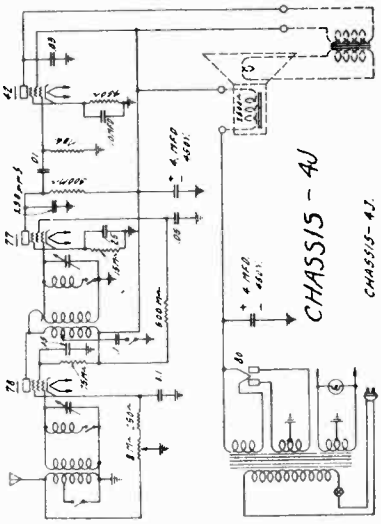


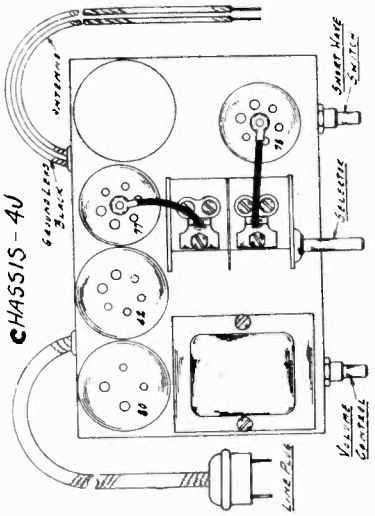


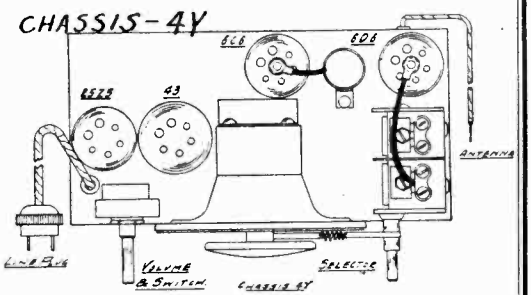


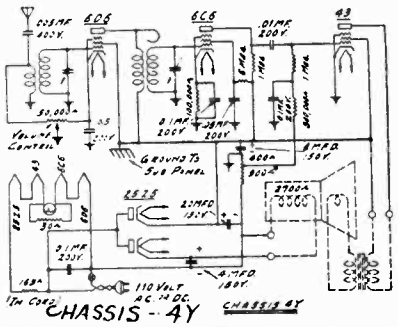






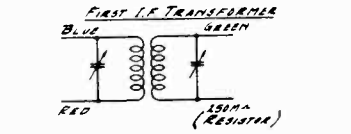


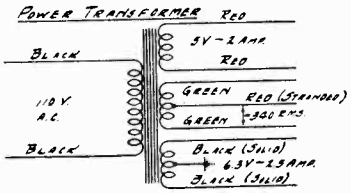


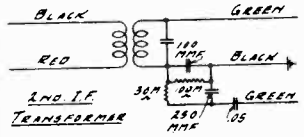


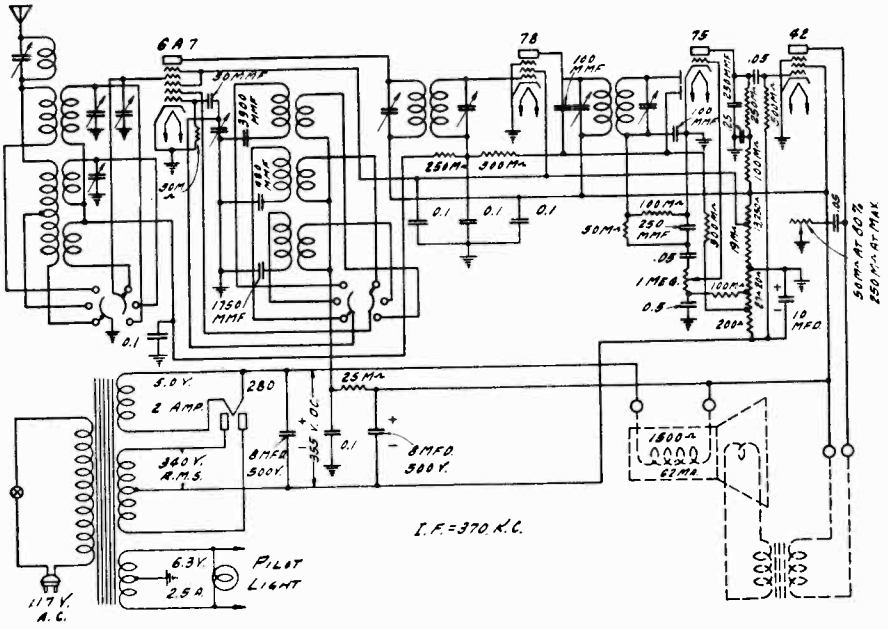
DETROLA RADIO CORP.

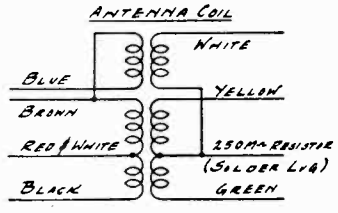
MODEL 5B
Schematic, Voltage
Socket, Data

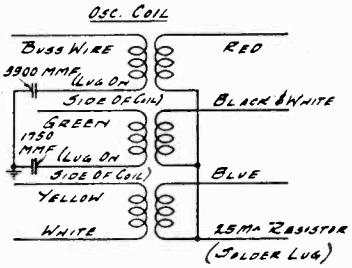




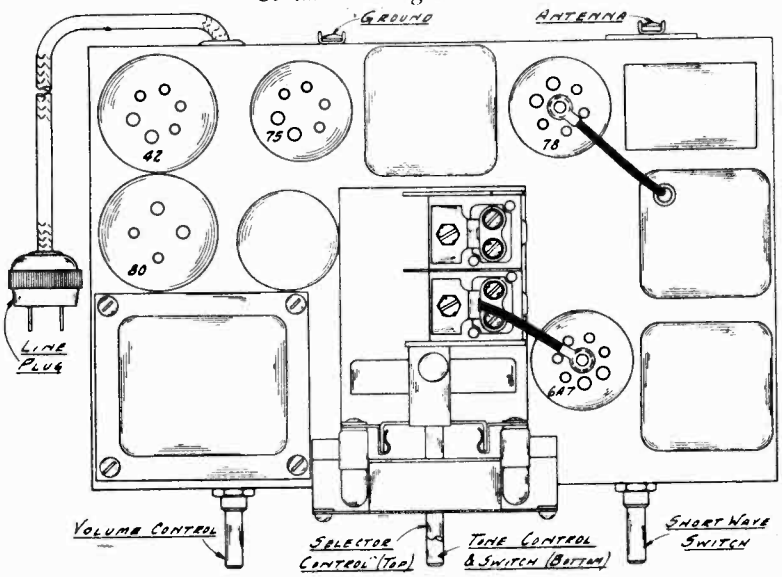








Schematic Diagram



TUBE SOCKET VOLTAGES

Tube No.	Control Grid to Cathode	Screen to Cathode	Plate to Cathode	Plate M. A.	Tube Socket Voltages Heater or Filament Voltage
6A7 1st Det.	* 3	100	250	4	6.3
OSC.	* 4	...	90	4	...
78—I. F.	* 3	100	250	7	6.3
75—2nd Det. A. V. C.	** 1.5	...	75	.8	6.3
42—Audio	***16	250	235	34	6.3
80—Rect.	....	...	...	29 per plate	5.0

All voltage readings taken with 1000 ohm per volt voltmeter using test leads.
*10 volt scale, voltage from ground to terminal on candohm with 500M on resistor.
**10 volt scale, voltage readings from ground to terminal on candohm with single black wire.
***250 volt scale, voltage readings from ground to terminal on candohm connected to filter condenser.

MODEL 5B
Alignment
Parts List

SERVICE NOTES

for

Detrola 5-B All Wave Receiver

The Detrola 5-B is a five-tube, three-band, all-wave, superheterodyne receiver designed for the reception of frequencies from 540 to 16000 KC. The broadcast band covers frequencies from 540 to 1700 KC; the Police band covers frequencies from 1.6 to 5.5 MC and the Foreign band covers frequencies from 5.4 to 16 MC.

The 5-B employs the following tubes, used in their respective circuits: 1 type 6A7 first detector and oscillator; 1 type 78 intermediate amplifier; 1 type 75 delayed AVC, second detector and first audio; 1 type 42 final audio stage; 1 type 80 double wave rectifier.

RF and IF ALIGNMENT

The RF and IF circuits of the 5-B are properly aligned and tested and should need no further adjustment. Should it become necessary, however, to check the adjustment the following equipment will be necessary: 1 calibrated oscillator calibrated for all the frequencies used in this receiver, both IF and RF, and a sensitive output meter.

In order to prevent the AVC from operating and giving a false reading on the output meter the following procedure should be followed: The oscillator should be loosely coupled to the receiver so that only a small deflection will show on the output meter with the volume control of the receiver on the maximum position. This applies to both IF and RF adjustments.

IF ALIGNMENT—To align the intermediate transformer, adjust the test oscillator to 370 KC and couple to the control grid of the first detector and adjust the trimmer condensers on the intermediate transformers for the maximum reading on the output meter.

RF ALIGNMENT—To align the RF circuit: (1) Set pointer on tuning chart to 1400 KC with band switch in broadcast position. (2) Adjust oscillator to 1400 KC and connect to antennae terminal on chassis. (3) Adjust trimmer on tuning condenser for maximum reading. (4) Reset dial pointer and test oscillator to 600 KC and adjust 600 KC padding condenser for maximum reading moving tuning condenser back and forth slowly while making adjustment. (5) Reset dial pointer and oscillator to 1400 KC and readjust trimmer on tuning condenser for maximum reading.

SHORTWAVE ALIGNMENT— (1) Set dial pointer on 3.5 MC and band switch on center position. (2) Adjust oscillator to approximately 3.5 MC or for maximum reading on output meter. (3) Adjust 3.5 MC padding condenser for further increase on the output meter. (4) Set band switch on right hand position. (5) Set dial pointer to 15 MC. (6) Readjust test oscillator to approximately 15 MC or for maximum reading on output meter and adjust 15 MC padding condenser for further increase on output meter.

ADJUSTMENT OF WAVE TRAP

To adjust wave trap to prevent the reception of commercial code signals from stations operating on or about 370 KC, connect test oscillator to antennae terminal on chassis and set to 370 KC and adjust wave trap padding condenser for minimum signal on output meter.

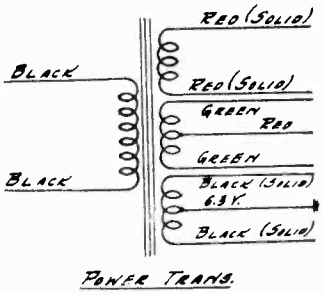
The high and low frequency padding condensers are mounted on the right hand end of the chassis in the following order from front to back: 3.5 MC, 15 MC, 600 KC, and wave trap.

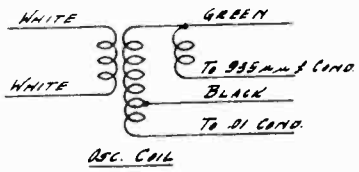
RELACEMENT PARTS MODEL 5-B

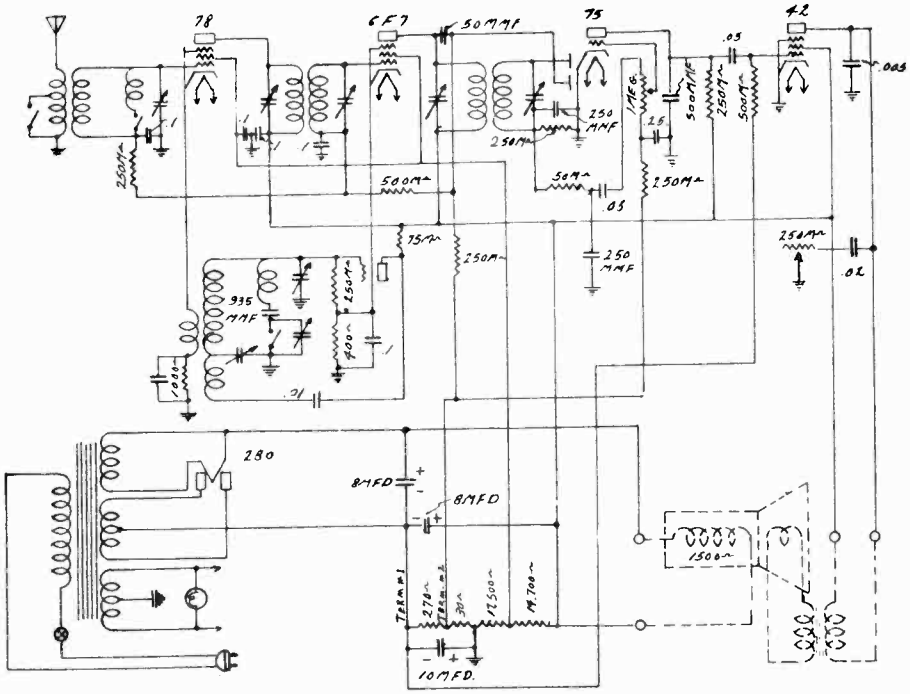
Part No.	DESCRIPTION	List Price	Part No.	DESCRIPTION	List Price
563	.05 mf—400 volt tubular condenser	$0.15	1392	By-pass condenser block	1.30
572	.1 mf—200 volt tubular condenser	.15	1393	2 gang variable condenser	2.49
575	.1 mf—400 volt tubular condenser	.15	1396	Antenna coil can—natural finish	.20
578	Electrolytic condenser, 10 mfd, 30 volts	.65	1397	Oscillator coil can—natural finish	.20
589	50 mmf mica condenser, type "W"	.15	1398	Electrolytic condenser, 8-8 mfd, 450 volts	2.10
590	250 mmf mica condenser, type "W"	.15	1399	Power transformer	3.20
602	250,000 ohm carbon resistor, 1/5 watt	.15	1400	Candohm resistor	.60
603	100,000 ohm carbon resistor, 1/5 watt	.15	1401	All-wave switch	2.20
615	500,000 ohm carbon resistor, 1/5 watt	.15	1402	Single stage padder	.40
631	50,000 ohm carbon resistor, 1/5 watt	.15	1404	7 prong socket No. 6A7	.10
934	Attachment cord—6 feet	.30	1410	Dial chart	.40
936	4 prong socket No. 80	.10	1412	1750 mmf mica condenser, type "W"	.30
937	6 prong socket No. 42	.10	1413	3900 mmf mica condenser, type "W"	.40
939	6 prong socket No. 78	.10	1414	25,000 ohm carbon resistor, 1 watt	.15
1028	6 prong socket No. 75	.10	1415	6" speaker	6.30
1083	Tone control with A. C. switch, 250,000 ohms	1.00	1423	Knobs	.10
1084	Volume control, 1 megohm	.70	1427	Cabinet	5.40
1096	Tube shield (aluminum), natural finish	.15	1441	Oscillator coil	1.00
1097	Tube shield cap (aluminum)	.15	1442	Antenna coil	1.00
1098	Tube shield base (aluminum)	.10	1443	Wave trap	.90
1107	550 mmf mica condenser, type "W"	.20	1444	1st IF transformer	1.60
1199	Pointer	.10	1445	2nd IF transformer	2.40
1274	Escutcheon plate	.40			

DETROLA RADIO CORP.

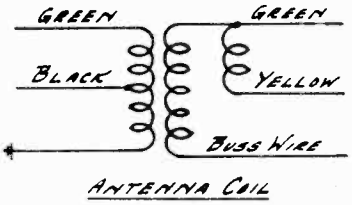
MODEL 5D
Schematic, Voltage
Socket, Data

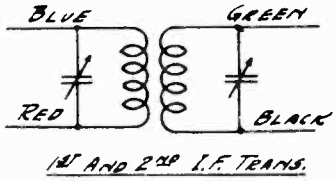


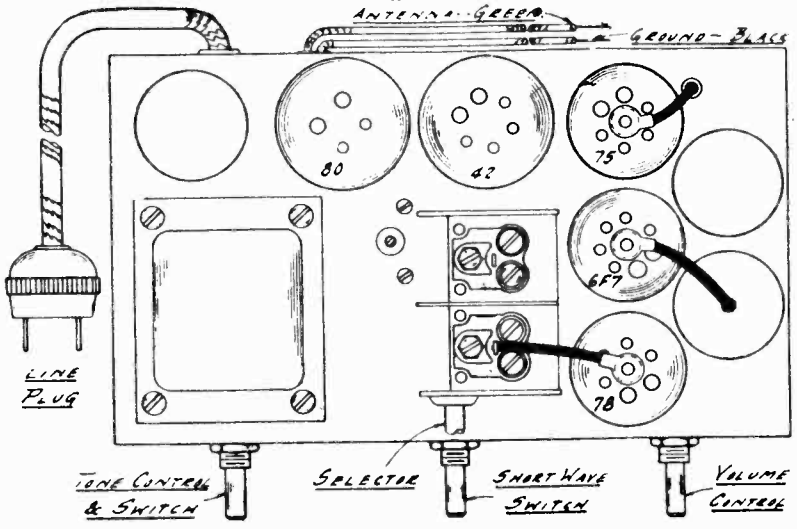




Schematic Diagram







Top View of Chassis

TUBE SOCKET VOLTAGES

Tube No.	Cathode to Heater Voltage	Cathode to Screen Voltage	Cathode to Plate Voltage	Cathode to Control Grid Voltage	Plate M.A.	Heater Voltage
78—1st Det.	4.5	100	230	* 6.5	4.25	6.3
6F7 Pentode I. F.	3	100	235	* 4.5	6.0	6.3
6F7 Triode OSC.			80	4.75	2.0	
75—2nd Det.	...	...	220	* 1.75	.4	6.3
42—2nd Audio	...	235	220	**16.5	28.	6.3
80—Rect.	...	...	...	.....	27 per plate	5.0

*Voltage from cathode to terminal No. 2 on the voltage divider.
**Voltage from cathode to terminal No. 1 on the voltage divider.
All voltage readings taken with high resistance Volt Meter (1000 ohms per volt) using test leads, all tubes in sockets, antenna grounded to chassis, no signal.

MODEL 5D
Alignment
Parts List

SERVICE NOTES

for

Detrola 5-D Dual-Band Receiver

The Detrola 5-D is a five tube superheterodyne, dual-wave receiver covering broadcast frequencies of 550 to 1500 kilocycles and short-wave frequencies of 1.5 to 4.75 megacycles.

It employs the following tubes: Type 78, first detector; type 6F7, intermediate stage and oscillator (the pentode section being used for the intermediate stage, and the triode for the oscillator); type 75, delayed AVC, second detector, and first audio (one diode being used for the AVC and the other for the detector, triode being used for the first audio stage); type 42, final amplifier; type 80, rectifier.

R. F. and I. F. ALIGNMENT

The R. F. and I. F. circuits are properly aligned at the factory with a crystal control oscillator and should require little or no attention. Should it become necessary, however, to check the alignment, an output meter and a calibrated oscillator will be necessary. The automatic volume control in the receiver will defeat the purpose of the output meter unless the following precautions are taken:

I. F. ALIGNMENT—To align the intermediate frequency transformers (1) adjust test oscillator to 455 kilocycles and couple to the control grid of first detector (reduce coupling so that only small deflection is obtained on output meter with volume control in the maximum position). (2) Adjust I. F. trimmers for maximum reading on output meter.

R. F. ALIGNMENT—To align the R. F. circuits (1) set the pointer on the tuning chart to 1400 kilocycles and adjust test oscillator to the 1400 kilocycles. (2) Connect oscillator to antenna connection of chassis, reducing coupling as outlined in I. F. adjustments and adjust trimmer on front of chassis for maximum reading. The above procedure should be repeated at 600 kilocycles adjusting ONLY THE LOW FREQUENCY TRIMMER ON TOP OF CHASSSIS.

The short-wave band may be aligned by setting the test oscillator on 1400 kilocycles and using the 2800 kilocycles harmonic and setting the pointer on the tuning chart to approximately 2.8 megacycles and adjusting trimmers on tuning condenser for maximum reading.

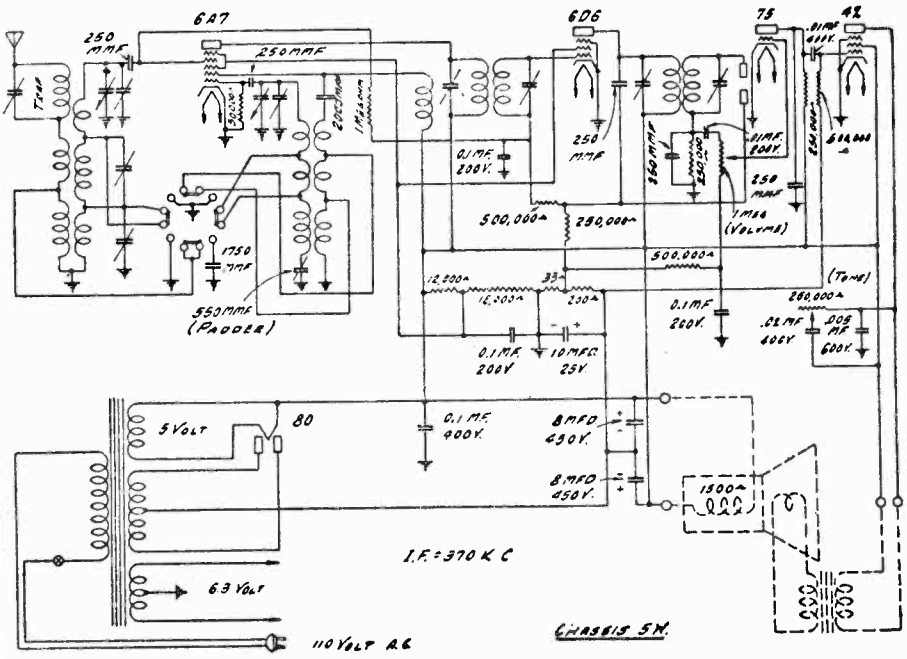
For a more detailed explanation concerning the operation of the delayed automatic volume control used in this receiver and for further service suggestions, refer to the service notes of the Detrola 7-A.

REPLACEMENT PARTS MODEL 5-D

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
532	Knobs	$0.10	937	6 prong socket No. 42	.10
563	.05 mfd 400 volt condenser	.15	939	6 prong socket No. 78	.10
568	.01 mfd 400 volt condenser	.15	993	Oscillator coil shield	.10
572	.1 mfd 200 volt condenser	.15	997	Tube shield base	.15
575	.1 mfd 400 volt condenser	.20	1013	Power transformer	2.90
576	.02 mfd 400 volt condenser	.15	1014	8-8 mfd 450 volt filter condenser	2.05
579	.25 mfd 200 volt condenser	.20	1015	Short wave switch	.80
580	.05 mfd 200 volt condenser	.15	1016	.00002 padder condenser	.30
581	.005 mfd 600 volt condenser	.15	1017	.0005 padder condenser	.40
589	50 mmf mica condenser	.15	1018	1st IF transformer	1.60
590	.00025 mica condenser	.15	1019	2nd IF transformer	1.50
595	10 mfd 35 volt condenser	.65	1022	Cabinet	4.60
602	250,000 ohm resistor, 1/5 watt	.15	1027	4 prong socket No. 6F7	.10
612	75,000 ohm resistor, 1/2 watt	.15	1028	6 prong socket No. 75	.10
615	500,000 ohm resistor	.15	1034	Speaker	6.90
631	50,000 ohm resistor	.15	1038	Pyralin diffuser—blue	.10
791	Tube shield	.10	1042	Escutcheon plate	.30
912	Station selector dial	.25	1052	Candohm resistor, 1000 ohms	.20
919	Volume control	.70	1054	935 mmf mica condenser	.20
921	Tone control with A.C. switch	.90	1079	Candohm resistor, 350 ohms	.20
922	Candohm resistor, 32,500 ohms	.65	1124	Antenna coil	.50
926	Tuning condenser	2.20	1126	Oscillator coil	.50
934	Power cord	.30	1128	Pyralin diffuser—red	.10
936	4 prong socket No. 80	.10	1168	Pilot light socket	.15

DETROLA RADIO CORP.

MODEL 5W
Schematic
Voltage
Parts List



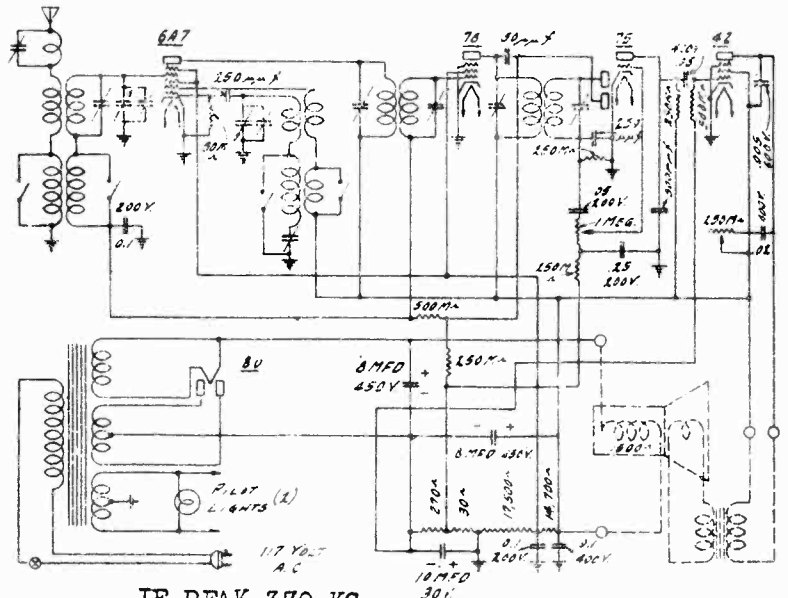
TUBE SOCKET VOLTAGES

Tube Number	Control Grid to Cathode	Screen to Cathode	Plate to Cathode	M. A. Plate	Tube Socket Voltages Heater or Filament Voltage
6A7 1st Det.	*2	80	210	3.	6.3
6A7 OSC.			200	4.	6.3
6D6—I. F.	2	80	210	7.	6.3
75—2nd Det.	2		100	.5	6.3
42—2nd Audio	**15	210	190	32.	6.3
80—Rect.					
				25 Per Plate	

*Terminal No. 5 on candohm to ground.
**Terminal No. 6 on candohm to ground.

For Alignment, see Index

Stock No.	DESCRIPTION
565	.01 mf. 200 volt tubular condenser
568	.01 mf. 400 volt tubular condenser
572	.1 mf. 200 volt tubular condenser
575	.1 mf. 400 volt tubular condenser
581	.005 mfd. 600 volt tubular condenser
576	.02 mf. 400 volt tubular condenser
590	250 mmf. Mica condenser plus-minus 10%
602	250,000 ohm carbon resistors, 1/5 watt
615	500,000 ohm carbon resistors, 1/5 watt
624	1 megohm carbon resistors, 1/5 watt
631	50,000 ohm carbon resistors, 1/5 watt
791	Goat tube shields with ring
936	4-prong tube socket, marked No. 80
937	6-prong tube socket, marked No. 42
1013	Power transformer
1034	6" dynamic speaker
1199	Pointer
1203	Tension spring
1277	Dial cable
1402	Single padder condenser
1404	7-prong tube socket, marked 6A7
1412	1750 mmf. Mica Condenser
1527	Escutcheon ring
1572	Volume control
1573	Tone control and AC switch
1597	Glass crystal
1611	Midget trimmer condenser, bakelite base.
1626B	2-gang variable condenser
1715	Candohm resistor
1716	3-way, 12 point switch
1720	6-prong socket, marked 6D6
1721	7-prong tube socket, marked 75
1724	2000 mmf. Mica condenser
1733	Cabinet
1762	Dial
1646	1st I. F. Transformer
1647	2nd I. F. Transformer
1763	B. C. Antenna coil
1764	Short wave antenna coil
1765	Oscillator coil



IF PEAK 370 KC.

Tube Number		Control Grid to Cathode	Screen to Cathode	Plate to Cathode	M. A. Plate	Tube Socket Voltages Heater or Filament Voltage
6A7	1st Det.	*1.75	92	225	4	6.3
	OSC.	0	0	225	4	6.3
78—I. F.		*1.75	92	225	7	6.3
75—2nd Det.		*1.75	0	**110	.8	6.3
42—2nd Audio		***17	225	212	34	6.3
80—Rect.						

For Alignment, see Index

***Voltage from No. 1 terminal on voltage divider to ground using 250 volt scale.

**Voltage from plate to ground using 250 volt scale.

*Voltage from ground to second terminal on voltage divider using 10 volt scale.

The above voltage readings were taken with 1,000 ohm per volt Volt Meter.

The Detrola 5-X is a 5 tube superheterodyne designed for receivers on frequencies from 540 to 1500 KC and from 5300 to 17,000 KC,

Stock No.	DESCRIPTION
563	.05 mf. 400 volt tubular condenser
572	.1 mf. 200 volt tubular condenser
575	.1 mf. 400 volt tubular condenser
576	.02 mf. 400 volt tubular condenser
578	10 mfd. 30 volt tubular electrolytic condenser
579	.25 mf. 200 volt tubular condenser
580	.05 mf. 200 volt tubular condenser
581	.005 mf. 500 volt tubular condenser
588	500 mmf. mica condenser, type "W"
589	50 mmf. mica condenser, type "W"
590	250 mmf. mica condenser, type "W"
602	250,000 ohm carbon resistor, 1/5 watt
615	500,000 ohm carbon resistor, 1/5 watt
631	50,000 ohm carbon resistor, 1/5 watt
922	Candohm resistor (per dwg.)
934	Attachment cord
1013	Power transformer
1017	Padder condenser, 500 mmf.
1028	6-prong tube socket
1034	6" dynamic speaker
1168	Pilot light socket assembly
1199	Pointer
1404	7-prong tube socket, marked 6A7
1526	Bakelite knob
1527	Escutcheon plate
1571	Dual wave switch
1572	Volume control
1573	Tone control and A.C. switch
1611	Midget trimmer condenser
1624	Elect. condenser 8-8 mfd. 450 volt
1625	Wave trap shield can
1626	2-gang variable condenser
1629	Dial chart
1627	Cabinet
1646	1st I. F. transformer assembly
1647	2nd I. F. transformer assembly
1648	Oscillator coil assembly
1649	Short wave antenna coil
1540	Broadcast antenna coil assembly
1650	Wave trap
1640	8" dynamic speaker

Service Notes

MODELS 5X & 6X

I. F. ALIGNMENT

To align the intermediate transformer the test oscillator should be adjusted to 370 KC and coupled to the control grid of the first detector and adjust the trimmer condensers on the first and second intermediate transformers for maximum reading on the output meter.

R. F. ALIGNMENT

The R.F. circuits: (1) Set pointer on tuning chart to 1400 KC with band switch in the broadcasting position. (2) Adjust test oscillator to 1400 KC and connect to antennae terminal on chassis. (3) Adjust trimmer on tuning condenser for maximum reading. (4) Reset dial pointer on test oscillator to 600 KC. (5) Reset test oscillator to 600 KC. (6) Adjust 600 KC padding condenser for maximum reading moving tuning condenser back and forth slowly while making adjustment. (7) Reset dial pointer and test oscillator to 1400 KC and readjust trimmer on tuning condenser for maximum reading on output meter. (The 600 KC padding condenser is the right hand condenser mounted on the rear of the chassis.)

SHORT WAVE ALIGNMENT

(1) Set dial pointer on 10 MC and band switch on short wave postion. (2) Adjust test oscillator to approximately 10 MC or for maximum reading on output meter. (3) Adjust 10 MC padding condenser mounting on top of chassis near turning condenser for a further increase reading on output meter. (The wave trap trimmer condenser is the left hand condenser on the rear of the chassis.)

WAVE TRAP ADJUSTMENT

(1) To adjust wave trap to prevent reception of commercial code signals from stations operating on or about 370 KC, connect test oscillator to antennae terminal on chassis. (2) Adjust test oscillator to 370 KC. (3) Adjust wave trap condenser mounted on right hand end of the chassis for *minimum* signal on output meter.

POWER SUPPLY:

The 6-X is designed to operate on 110 volts A. C. or D. C. current.

The Model 5-D-X may be supplied for operation on different sources of power supply; namely, 110 volts, 25 cycles; 110 volts, 60 cycles; and 200 volts, 60 cycles.

MODELS 5W & 6W

I. F. ALIGNMENT:

To align the intermediate transformer, the test oscillator should be adjusted to 370 K. C. and coupled to the control grid of the first detector and adjust the trimmer condensers on the first and second intermediate transformers for maximum reading on the output meter.

R. F. ALIGNMENT:

To adjust the R. F. circuits: (1) Set pointer on tuning chart to 1400 K. C. with band switch in the broadcasting position. (2) Adjust test oscillator to 1400 K. C. and connect to antenna lead on chassis. (3) Adjust trimmer on the oscillator section of the tuning condenser for maximum reading. (4) Reset dial pointer on receiver and test oscillator to 600 K. C. (5) Adjust 600 K. C. padding condenser for maximum reading moving tuning condenser back and forth slowly while making adjustment (the 600 K. C. padding condenser is mounted on the base at the left of the tuning condenser). (6) Reset oscillator and tuning pointer on the receiver to 1400 K. C. and readjust trimmer on oscillator section of tuning condenser for maximum reading. (7) Reset dial pointer on receiver and test oscillator to 15 megacycles. (8) Set band change switch in the right hand position. (9) Adjust trimmer on first section of tuning condenser for maximum reading. (10) Reset dial pointer on receiver and test oscillator to 3.6 megacycles. (11) Set band change switch in left hand position. (12) Adjust 3.6 megacycle trimmer condenser for maximum reading (the 3.6 megacycle trimmer is mounted under the chassis and directly in front of the band change switch. (13) Reset dial pointer on receiver and test oscillator to 1400 K. C. (14) Set band change switch in broadcasting position and adjust 1400 K. C. trimmer for maximum reading (the 1400 K. C. trimmer is mounted under the chassis directly over the antenna coil).

WAVE TRAP ADJUSTMENT:

This receiver is designed with a wave trap to prevent interference from commercial code stations operating on or about 370 K. C. To adjust the wave trap, set test oscillator on 370 K. C. and connect to antenna lead on chassis and adjust wave trap trimmer condenser for minimum signal on the output meter (the wave trap is mounted on the rear left end of the chassis).

POWER SUPPLY:

The 5-W is designed for operation on different sources of power supply: namely, 110 volts, 25 cycles; 110 volts, 60 cycles, and 220 volts, 60 cycles.

MODEL 6A
Schematic, Voltage
Alignment

DETROLA RADIO CORP.

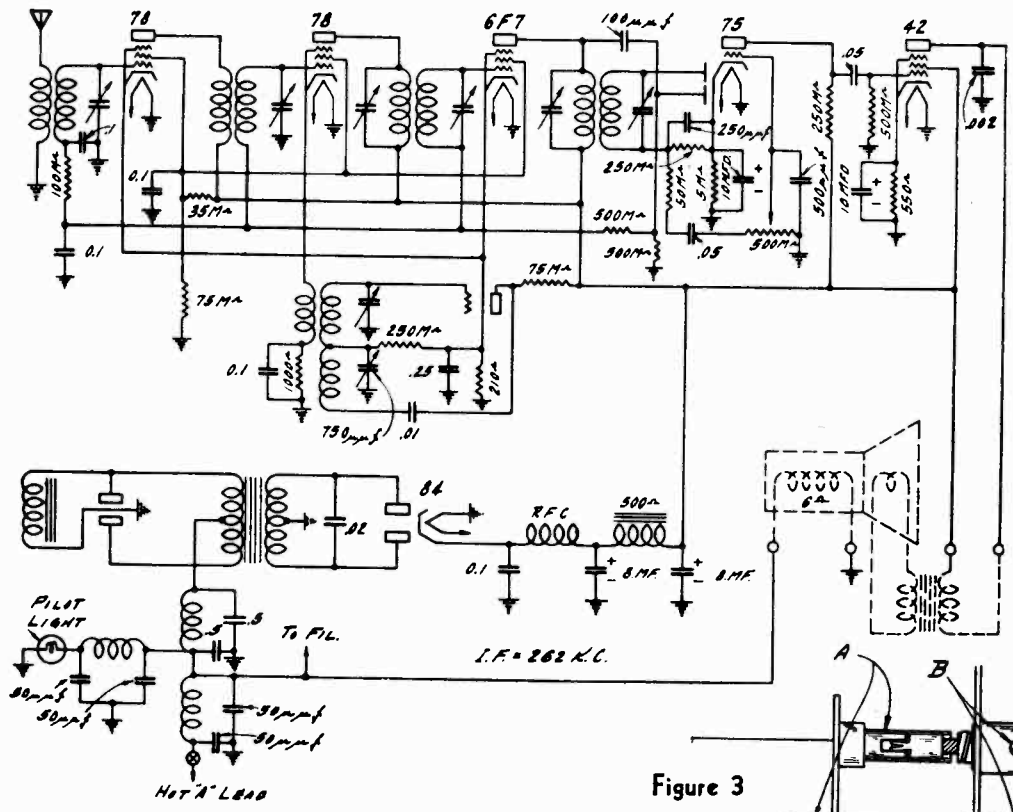


Figure 3

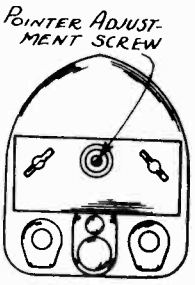
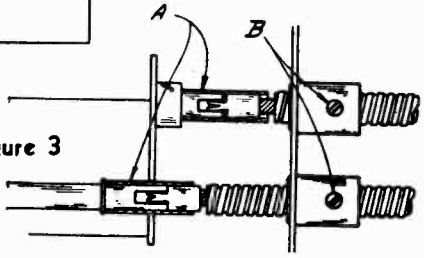


Figure 4



Service Data

Type and Number of Tubes Used:
2 Type 78 1 Type 75
1 Type 6S7 1 Type 42
1 Type 84
Total Battery Current ..... 6.5 Amps.
Undistorted Output ..... 3 Watts
Speaker Field Current ..... 1 Amp.
Rectifier Output Voltage 250
Total Plate Current ..... 50 M.A.

Plate Supply Unit

This receiver uses a vibrator type inverter and tube rectifier to provide a source of direct current voltage as plate and grid supply for all the tubes. This unit is very accurately adjusted at the factory, and service adjustment should not be attempted.

Low Volume

Low volume may be caused by weak or defective tubes (replace with set of tubes known to be in good condition), or antenna grounded or shielded due to wire netting not cut loose from the metal construction of the top.

Low Voltage

Low voltage may be caused by 84 rectifier, shorted filter or bypass condenser, defective power transformer or vibrator unit.

Excessive Hum

Excessive hum may be caused by defective 84 tube, or defective vibrator unit. In cases where the vibrator unit proves to be defective no adjustment should be attempted, the unit should be replaced with a new or replacement unit.

Continuity Test

By referring to the schematic diagrams in figures 5 and 6 a complete continuity test for open and short circuits can be made for all parts of the receiver. A suitable continuity test can be made by using 0 to 50 volt voltmeter and a 45 volt B battery. More accurate readings can be obtained by using a calibrated ohm meter.

R. F. and I. F. Adjustments

The trimmers on the tuning condenser and the intermediate transformers are very accurately adjusted with a crystal control oscillator before the receiver leaves the factory and should need little or no attention; however, to check the adjustments the following procedure should be followed.

I. F. Adjustments

In order to make the I. F. adjustments it is necessary to remove the top and bottom cover of the receiver case and proceed as follows, adjust test oscillator at 262 kilocycles, place the receiver in operation and connect the oscillator output to the grid of the first detector tube and connect the output meter across the voice coil of the loud speaker. Then connect the antenna lead to the ground of the chassis and adjust the tuning condenser so that no signal except the I. F. oscillator is heard at maximum volume. With the volume control at maximum, reduce the external oscillator output coupling until a small deflection is obtained at the output meter. Unless this is done the action of the A. V. C. will make it impossible to obtain a correct adjustment. Adjust trimmers for maximum reading on output meter.

R. F. Adjustments

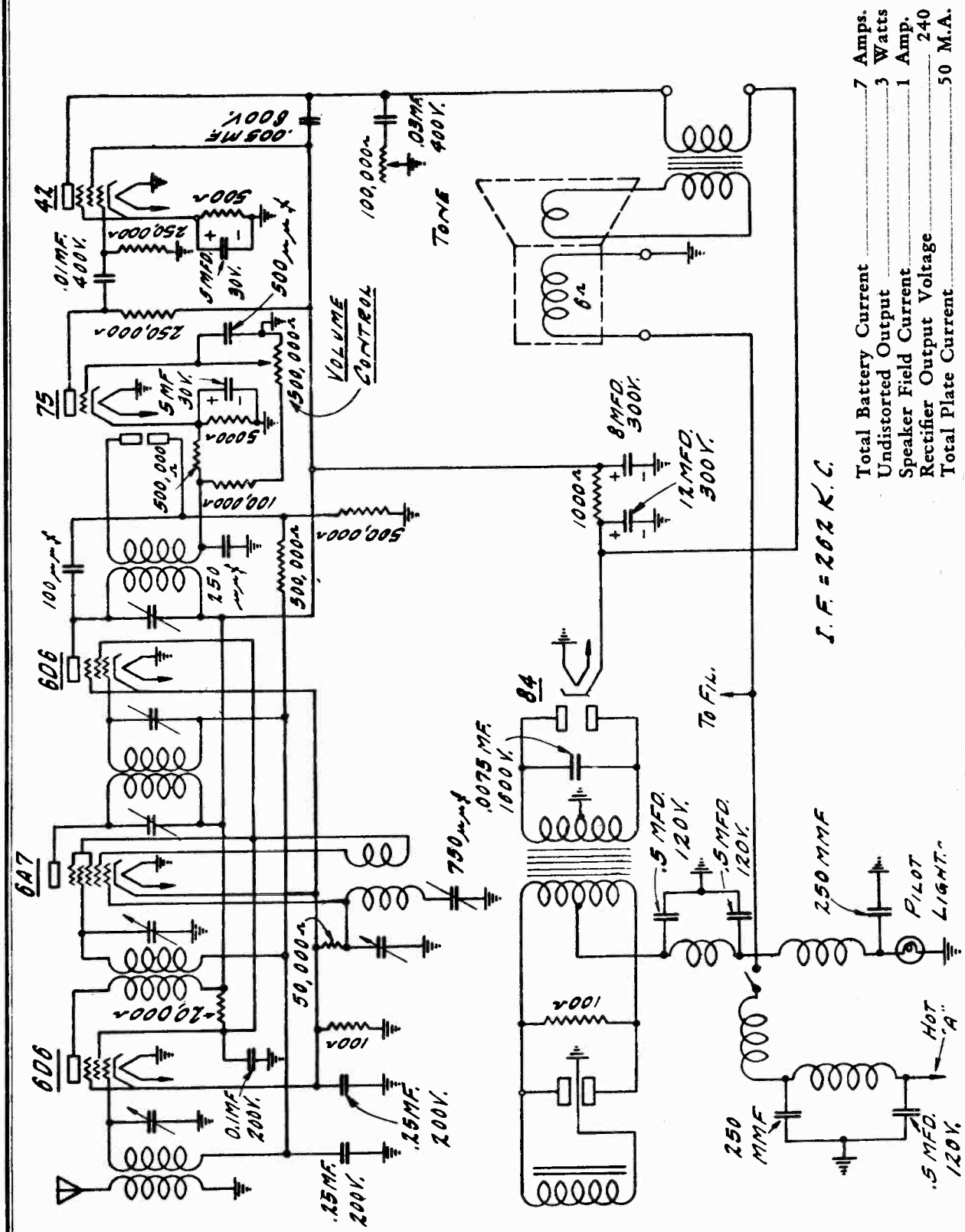
The trimmers on the tuning condenser should be adjusted at 1400 kilocycles, and the padder condenser adjusted at 600 kilocycles respectively. Proceed as follows, adjust the test oscillator at 1400 kilocycles and couple to the antenna off the receiver. Set tuning condenser at minimum capacity and adjust pointer to 1550 kilocycles, reset tuning control to 1400 kilocycles. Place oscillator and receiver in operation and adjust oscillator output so that a weak signal is obtained on the output meter, adjust trimmers for maximum reading. To adjust 600 kilocycle position readjust oscillator and tuning control to 600 kilocycles and adjust the 750 M. M. F. padder condenser (mounted on the chassis near the loud speaker) for maximum reading.

TUBE SOCKET VOLTAGES
6.3 Volt Battery

Tube No.	Cathode to Ground	Cathode to Screen Volts	Cathode to Plate Volts	Plate Current M.A.
78 R. F.	*3.5	100	250	6.0
78 First Detector	*5.	100	250	4.0
6F7 Pentode I. F.	*3.5	100	250	6.0
6F7 Triode OSC.		00	100	2.5
75 Second Detector A. V. C. First Audio	*1.7	00	**150	.3
42 Second Audio	*17.5	250	245	27.0
84 Rectifier				25 M.A. Per Plate

All the above voltage readings were taken by a high resistance volt meter (1000 ohms per volt) using test leads, all tubes in sockets no signal. (**250 volt scale) (*250 volt scale).

MODEL S 6M, 6R
Schematic



Schematic Diagram for Model 6-M.

Model 6R is the same as Model 6M, but it has no tone control and uses a 5-inch speaker.

Drilling Template

Packed in each receiver package is a drilling template, which contains the exact location of the mounting hole. This template is furnished as an aid in locating mounting hole for the chassis, doing away with the necessity of one man holding the chassis while another locates the hole. However, in using this template we wish to utter a word of caution: Do not overlook any rods, wires or units mounted on the dash, which might not interfere with the location of the template, but which would prohibit the mounting of the set. In this way, unnecessary drilling of holes will be avoided.

Antenna Lead-in Connection

An antenna lead-in shield is furnished in the receiver package. The antenna lead wire should be run through this shield, and the shield extended up to where the lead-in leaves the corner post in order to shield the entire length of the lead-in wire, the other end of the lead-in wire should be soldered to a small ferrule which makes connection with a spring socket on the inside of the chassis. At the other end of the shield there is a small piece of braid which should be securely grounded to the dash of the car. (See Fig. No. 2.)

Caution: Clean surface thoroughly where shield braid is fastened to the dash, in order to insure a good ground.

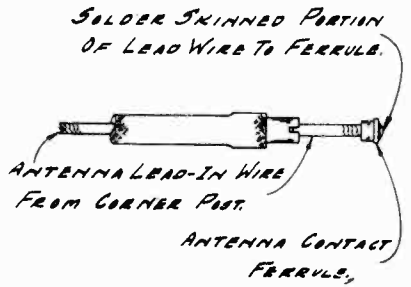


Figure 2

III. The Control Unit

The control unit is a combined Station Selector Dial (marked in kilocycles), tuning cable, volume control and switch cable, all assembled in one unit.

The control unit is designed to be fastened to the "flange" of the instrument panel by means of two thumb screws.

In locating the position for the control unit, it is advisable to leave this operation until the receiver has been located and mounted. Then the best position for the control unit can be determined which will not only allow easy accessibility for the driver, but will also allow for the least possible bend in the "Control Cables" which will ensure as smooth as possible operation of those controls, with a minimum possibility of the cables binding due to an extremely sharp bend.

Connecting Drive Cables and Casing to Control Unit

We would suggest that the "Drive Cables" be connected to the "Control Unit" before it is permanently fastened to the instrument panel. The cable connections to the receiver should be made on the bench, before the set is installed and it should not be necessary to remove these cables in making the installation.

The cable which enters the receiver at the top is the volume control and is connected to the volume control shaft by a slot milled in the end of the shaft and held in place by metal sleeve (A). See Fig. 3. The lower shaft is the tuning control and is connected in the same manner as the volume control.

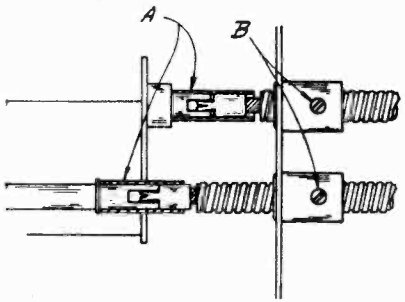


Figure 3

Adjusting the Dial Pointer

To adjust the dial pointer for the correct kilocycle reading, tune the receiver to a station of known frequency and adjust pointer with a screw driver by turning the adjusting screw on the back of the control head. (See Fig. No. 4.)

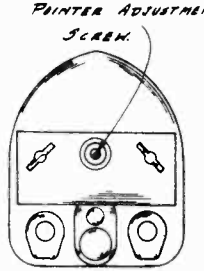


Figure 4

Tube No.		Cathode to Ground	Cathode to Screen Volts	Cathode to Plate Volts	Plate Current M. A.
6D6	R. F.	*1.2	70	230	1.2
6A7	First Detector	*1.2	70	230	1.
	OSC.	***1.8		70	2.2
6D6	I. F.	*1.2	70	230	1.2
75	Second Detector AVC. First Audio	*1.2		**70	.3
42	Second Audio	15	230	235	28
84	Rectifier.				25 M.A. Per Plate

All the above voltage readings taken with a 1,000 ohm per volt voltmeter using test leads all tubes in socket no signal.
*6 volts scale.
**250 volt scale.
***Voltage across 50,000 ohm oscillator grid leak (6 volt scale).

R. F. and I. F. Adjustments

The trimmers on the tuning condenser and the intermediate transformers are very accurately adjusted with a crystal control oscillator before the receiver leaves the factory and should need little or no attention; however, to check the adjustments the following procedure should be followed.

I. F. Adjustments

In order to make the I. F. adjustments it is necessary to remove the top and bottom cover of the receiver case and proceed as follows, adjust test oscillator at 262 kilocycles, place the receiver in operation and connect the oscillator output to the grid of the first detector tube and connect the output meter across the voice coil of the loud speaker. Then connect the antenna lead to the ground of the chassis and adjust the tuning condenser so that no signal except the I. F. oscillator is heard at maximum volume. With the volume control at maximum, reduce the external oscillator output coupling until a small deflection is obtained at the output meter. Unless this is done the action of the A. V. C. will make it impossible to obtain a correct adjustment. Adjust trimmers for maximum reading on output meter.

R. F. Adjustments

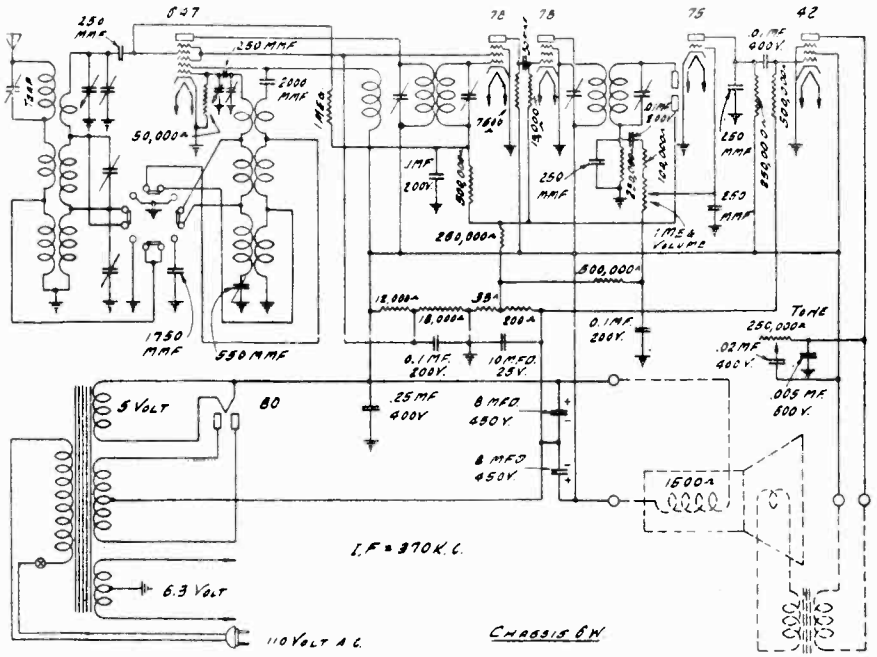
The trimmers on the tuning condenser should be adjusted at 1400 kilocycles, and the padder condenser adjusted at 600 kilocycles respectively. Proceed as follows, adjust the test oscillator at 1400 kilocycles and couple to the antenna of the receiver. Set tuning condenser at minimum capacity and adjust pointer to 1550 kilocycles, reset tuning control to 1400 kilocycles. Place oscillator and receiver in operation and adjust oscillator output so that a weak signal is obtained on the output meter, adjust trimmers for maximum reading. To adjust 600 kilocycle position readjust oscillator and tuning control to 600 kilocycles and adjust the 750 M. M. F. padder condenser (mounted on the chassis near the loud speaker) for maximum reading.

Stock No.	DESCRIPTION	List Price
557	Carriage bolt and nut	$0.20
564	Distributor suppressor	.50
565	.01 mfd. 200-volt tubular condenser	.15
568	.01 mfd. 400-volt tubular condenser	.20
569	.5 mfd. 200-volt interference condenser	.30
572	.1 mfd. 200-volt tubular condenser	.15
575	.1 mfd. 400-volt tubular condenser	.20
579	.25 mfd. 200-volt tubular condenser	.20
581	.005 mfd. 600-volt tubular condenser	.20
588	500 mmf. Mica condenser, type W	.20
589	50 mmf. Mica condenser, type W	.15
602	250,000 ohm carbon resistor, 1/5 watt	.15
603	100,000 ohm carbon resistor, 1/5 watt	.15
613	20,000 ohm carbon resistor, 1 watt	.15
614	5,000 ohm carbon resistor, 1/5 watt	.15
615	500,000 ohm carbon resistor, 1/5 watt	.15
631	50,000 ohm carbon resistor, 1/5 watt	.15
791	Goat tube shields with ring	.10
937	6-prong tube socket, marked No. 42	.10
1028	6-prong tube socket, marked No. 75	.10
1052A	Candohm resistor, 1,000 ohm	.20
1225	Antenna and detector aluminum shield can	.20
1235	Power transformer	2.80
1238	Vibrator unit	4.20
1241	"A" battery lead assembly	.60
1249	5-prong tube socket, marked No. 84	.10
1272	Low power factor condenser, .5 mfd., 120-volt	.40
1285	100 mmf. mica condenser	.15

Stock No.	DESCRIPTION	List Price
1286	250 mmf. mica condenser	.15
1292	Shaft coupling tubing	.10
1296	Shielded antenna loom	.60
1299	Antenna connector socket	.20
1404	7-prong tube socket, marked No. 6A7	.10
1720	6-prong tube socket, marked No. 6D6	.10
1727	Goat tube shield bases	.10
1869	.015 mfd. 300-volt tubular condenser	.20
1870	750 mmf. variable padder condenser	.30
1871	100 ohm carbon resistor, 1/5 watt	.15
1872	500 ohm carbon resistor, 1/2 watt	.15
1875	Oscillator shield can	.20
1880	3-gang variable condenser	3.60
1881	Volume control and switch	1.00
1882	Electrolytic condenser	1.95
1883	6" dynamic Jensen speaker	5.85
1887	.0075 mfd. 1,600-volt buffer condenser	.65
1888	Toggle switch S. P. S. T. (tone control)	.20
1233A	First I. F. transformer	1.60
1904	Second I. F. transformer	1.60
1910	Remote control unit	4.00
1914	Pilot light lead	.60
1915	1 mfd. 120-volt low-power factor condenser	.30
1949	Volume control shaft	1.50
1950	Tuning control shaft	1.50
1951	Antenna coil	.75
1952	Detector coil	.75
1953	Oscillator coil	.80

DETROLA RADIO CORP.

MODEL 6W
Schematic
Voltage
Parts List



TUBE SOCKET VOLTAGE

Tube Number		Control Grid to Cathode	Screen to Cathode	Plate to Cathode	M. A. Plate	Heater Voltage
6A7	1st Det.	*2	85	210	3.	6.3
	OSC.			210	4.	
78—1st I. F.		*2	85	150	7.	6.3
78—2nd I. F.		*2	85	210	4.	6.3
75—2nd Det.		*2		110	.5	6.3
42—2nd Audio		**15	210	190	32.	6.3
80—Rect.					25 Per Plate	5.

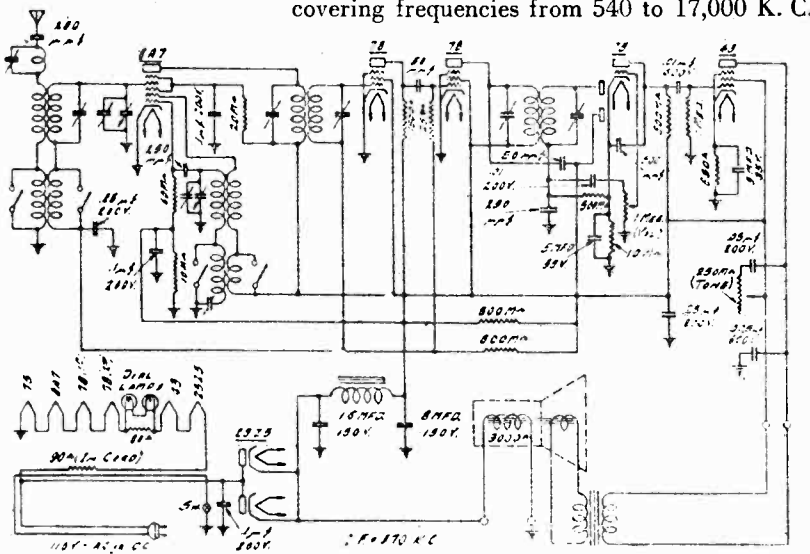
*Terminal No. 5 on candohm to ground.

**Terminal No. 6 on candohm to ground.

For Alignment, see Index

Stock No.	DESCRIPTION
565	.01 mf. 200 volt condenser
568	.01 mf. 400 volt condenser
572	.1 mf. 200 volt condenser
575	.1 mf. 400 volt condenser
578	10 mfd. 30 volt electrolytic condenser
576	.02 mf. 400 volt condenser
581	.005 mf. 600 volt condenser
589	50 mmf. Mica condenser
590	250 mmf. Mica condenser
602	250,000 ohm carbon resistor, 1/5 watt
603	100,000 ohm carbon resistor, 1/5 watt
609	15,000 ohm carbon resistor, 1/5 watt
610	7,500 ohm carbon resistor, 1/5 watt
615	500,000 ohm carbon resistor, 1/5 watt
624	1 megohm carbon resistor, 1/5 watt
631	50,000 ohm carbon resistor, 1/5 watt
936	4-prong tube socket, marked 80
937	6-prong tube socket, marked 42
939	6-prong tube socket, marked 78
1013A	Power transformer
1028	6-prong tube socket, marked 75
1034	6" dynamic speaker
1277	Dial cable
1402	Single padder condenser
1404	7-prong tube socket, marked 6A7
1412	1750 mmf. Mica condenser
1572	Volume control
1573	Tone control and AC switch
1597	Glass crystal
1624A	8-8 mfd. 450 volt electrolytic condenser
1714	Dial chart
1715	Candohm resistor
1716A	3-way, 12 point switch
1727	Goat shield bases
1724	2000 mmf. Mica condenser
1733	Cabinet
1741	Wave band escutcheon plate
1742	Wave band pointer knob
1745	Dual midget trimmer
1768	1st I. F. transformer
1769	2nd I. F. transformer
1770	Wave trap
1765	Oscillator coil
1764	Short wave antenna coil
1763	B. C. antenna coil

The Model 6-X is a 6-tube superheterodyne receiver designed for receptions on standard broadcast, police and amateur and European short wave broadcast, covering frequencies from 540 to 17,000 K. C.



For Alignment, see Index

TUBE SOCKET VOLTAGES

Tube Number	Control Grid to Cathode	Screen to Cathode	Plate to Cathode	M. A. Plate	Tube Socket Voltages Heater or Filament Voltage
6A7 1st Det.	0	50	95	1.5	6.3
6A7 OSC.	2		95	3.	
78—1st I. F.	0	95	50	2.5	6.3
78—2nd I. F.	0	95	95	5.	6.3
75—2nd Det.	1.		30	.25	6.3
43—2nd Audio		95	75	20	25.
25z5—Rect.					25.

Stock No.	DESCRIPTION
532	Bakelite knobs, K. K.
565	.01 mf. 200 volt tubular condenser
568	.01 mf. 200 volt tubular condenser
572	.1 mf. 200 volt tubular condenser
579	.25 mf. 200 volt tubular condenser
580	.05 mf. 200 volt tubular condenser
588	500 mmf. Mica condenser
589	50 mmf. Mica condenser
590	250 mmf. Mica condenser
600	10,000 ohm carbon resistor, 1/5 watt
610	7,500 ohm carbon resistor, 1/5 watt
615	500,000 ohm carbon resistor, 1/5 watt
617	20,000 ohm carbon resistor, 1/5 watt
621	25,000 ohm carbon resistor, 1/5 watt
624	1 megohm carbon resistor, 1/5 watt
636	40,000 ohm carbon resistor, 1/5 watt
1666	Candohm resistor, 60 ohms
1667	Filter choke
1675	Volume control with hex. nut
1676	Tone and A. C. switch with hex. nut
1677	Dual wave switch and hex. nut
1678	Elec. cond., 16-8-5-5 mfd.
1679	A. C. - D. C. cord, 90 ohms
1680	Double stage trimmer
1683	450 ohm carbon resistor, ½ watt
1687	6-prong tube socket, marked 43
1688	6-prong tube socket, marked 25z5
1690	2-gang variable condenser
1693	5" dynamic Rol-a-speaker
1646	1st I. F. transformer assembly
1647	2nd I. F. transformer assembly
1649	Short wave antenna coil
1540	Broadcast antenna coil
1707	Oscillator coil
1711	Wave trap

DETROLA RADIO CORP.

MODEL 7A
Schematic
Voltage

Tube No.	Heater to Cathode Voltage	Control Grid to Cathode Voltage	Screen to Cathode Voltage	Plate to Cathode Voltage	Plate MA	Heater or Fil. Voltage
1—R. F.	0	4.5*	100	250	6.0	6.3
2—1st Det.	0	4.5*	100	250	6.0	6.3
3—I. F.	0	4.5*	100	250	6.0	6.3
4—2nd Det. AVC	0	2.0**	0	125	75	6.3
5—Osc.	0	2.6	0	95	5.5	6.3
6—Audio	0	20.0	250	225	31.0	6.3
7—Rect.	0				32 per plate	5.0

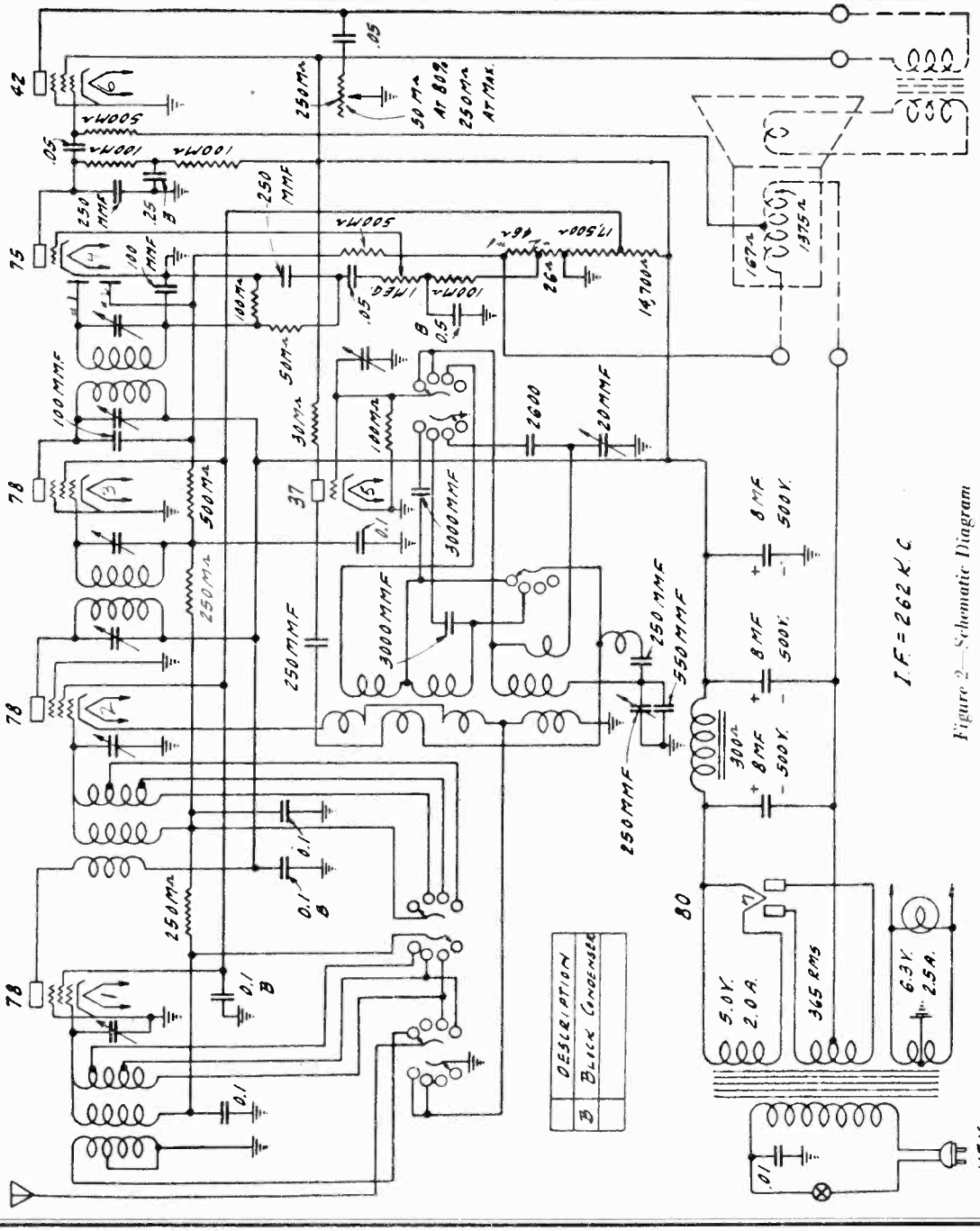


Figure 2—Schematic Diagram

Voltage reading taken with 1000 ohm per volt meter using test prods. All tubes in sockets, Ant. ground to chassis, no signal.
*Voltage from ground to terminal No. 1 ON THE VOLTAGE DIVIDER.
**Voltage from ground to terminal No. 2 ON THE VOLTAGE DIVIDER.

SERVICE NOTES
for

Detrola 7-A All-Wave Receiver

The Detrola- 7A is a seven tube all-wave super-heterodyne receiver, covering broadcast frequencies 550-1520 kilocycles and short-wave frequencies 1.5-4 megacycles, 3.6-10 megacycles, 8-10 megacycles.

Other outstanding features of this receiver are:—78 triple grid super-control tubes in the R. F. first detector and I. F. stages; 37 oscillator; 75 double diode triode, operating as a delayed AVC, second detector and first audio; and the 42 super-power amplifier, delivering 3 watts of undistorted output to the speaker. The location and functioning of each tube is shown in Fig. 1. (Photo on back.)

The 78 tube operating in the R. F. and first detector and I. F. will handle large signal voltages and reduce cross modulation and modulation distortion to a minimum. The 37 tube, operating as an independent oscillator generating the correct oscillator voltage on all bands, greatly adds to the over-all sensitivity of the receiver. Due to the fact that a separate oscillator is used in the receiver, rather than an electron coupled oscillator, the receiver will be found to be extremely free from back ground noises on high frequency bands. This gives the listener the impression that the receiver is not as sensitive as sets using other types of oscillators with the accompanying hiss. The real test for the receiver is to try it on a good antenna in a residential district away from the shielding effect of steel buildings.

The 75 tube operating as a diode detector delayed AVC and first audio has several outstanding advantages. Diode No. 1 operating as a second detector rectifies the signal input voltage of the I. F. amplifier into pulsating DC voltage. This results in a more close approximation of the actual signal broadcast by the transmitting station than may be obtained by other types of detectors which cause considerable distortion in handling high signal voltages. Diode No. 2 operates as a delayed automatic volume control. This type of volume control has an advantage over a quick acting volume control inasmuch as it does not start to operate until the signal voltages have reached approximately 50 microvolts. This makes the receiver very sensitive to weak signals. This is especially desirable on short-wave reception as it allows a good audio output on weak signals, and at the same time reduces fading to a minimum.

AUTOMATIC VOLUME CONTROL

A word about the operation of the automatic volume control at this time may be in order. Diode No. 2 is coupled to the plate of No. 3 tube through a 100 mmf. R. F. bypass condenser impressing the R. F. carrier voltage on the diode at which point a rectifying action takes place and produces a DC voltage drop across the 500,000 ohm resistor in series with the diode and the cathode of the 75 tube, the circuit being completed through 72 ohms of the 32, 372 ohm voltage divider and the ground of the chassis. The voltage drop across the 72 ohms of the voltage divider, which is in series with the negative of the high voltage supply, furnishes a fixed bias of 4.5 volts for the control grids of tubes No. 1, 2 and 3. Refer to Fig. 2, it will be noted that the grid return of tubes No. 1, 2 and 3 return through isolating resistors to the end of the 500,000 ohm resistor that connects the No. 2 diode. When a strong signal is impressed upon the diode, the voltage across the 500,000 ohm resistor increases, thus increasing the control grid bias on the grids of No. 1, 2 and 3 tubes and lowering the sensitivity of the receiver. A weak signal will cause a lower voltage drop across the 500,000 ohm resistor, will decrease the control grid voltage, and will increase the sensitivity of the receiver, thus reducing fading of weak signals and blasting of powerful local stations.

WAVE BAND CHANGE SWITCH

The wave band change switch has four positions. The band on which the switch is set will be indicated by the illuminated chart on the airplane dial.

SERVICE SUGGESTIONS

(1) NOISY RECEPTION. Noisy reception may be checked by disconnecting the antenna from the receiver. If the noise completely stops or dimishes in volume it is an indication that it is being picked up by the antenna, and is not a fault of the receiver. However, if this does not effect the noise it is an indication that it may be in the receiver and is usually caused by defective tubes and can be found by tapping lightly on the tubes or other parts of the receiver which may be defective.

(2) LOW VOLUME. This trouble may be caused by weak or defective tubes (replace with set of tubes known to be in good condition), antenna disconnected from the receiver or highly shielded location.

(3) LOW VOLTAGE. Low voltage may be caused by defective 80 rectifier, shorted filter or bypass condenser, defective power transformer or low line voltage.

(4) DISTORTED REPRODUCTION. Failure of the automatic volume control to operate may be caused by defective 75 tube, shorted or open 500,000 ohm resistor in No. 2 diode circuit, open 250,000 ohm R. F. and I. F. isolating resistor, shorted .1 mfd condensers in grid return of I. F. and R. F. stages. This may be checked by tuning the receiver to a powerful local station and measuring the voltage from No. 2 diode to No. 1 terminal on the voltage divider with high resistance voltmeter. The voltage should be approximately 2 volts and should return to zero when the receiver is tuned off the station. This is not a true voltage reading but will serve to indicate whether or not the automatic volume control is operating.

(5) OSCILLATION. Oscillation may be caused in the R. F. or I. F. stages by open bypass or filter condenser; improper shielding, caused by tube shields not making proper contact with their bases; grid wires out of their proper position. Open bypass condensers may be checked by using a test condenser equipped with test leads and connected to terminals of condenser under test.

(6) HUM. Excessive hum may be caused by defective 80 tube. (Replace with tube known to be in good condition). Open filter condenser (any one of the filter condensers being open would cause an excessive hum), or by defective speaker field coil. The speaker field coil is part of the filter system and shorted turns or grounded coil may cause hum. Shorted or grounded filter reactor may also cause excessive hum.

(7) R. F. and I. F. ALIGNMENT. The trimmer on the tuning condensers and the intermediate stages are very accurately adjusted before the receiver leaves the factory and should need little or no attention. To check adjustments the following procedure should be followed:

The action of the automatic volume control will defeat the purpose of an output meter. To overcome this, it will become necessary to reduce the coupling between the oscillator and the receiver so that only a small reading is obtained on the output meter with the volume control set for maximum volume. This will allow the output meter to work correctly. Adjust the test oscillator to 262 kilocycles and couple to the control grid of No. 2 tube and adjust trimmers on I. F. stage for maximum reading on the output meter.

R. F. ALIGNMENT. Couple oscillator to the antenna (reduce coupling as outlined in I. F. adjustment). Set pointer on tuning chart to 1400 kilocycles with wave band control switch in broadcast position. Adjust test oscillator to 1400 kilocycles. Adjust trimmers on No. 1 and 2 section of tuning condenser for maximum reading. The trimmer of No. 3 section of the tuning condenser should be set for minimum capacity, and the high frequency trimmer on back of chassis (left viewing chassis from back) should be adjusted for maximum read-

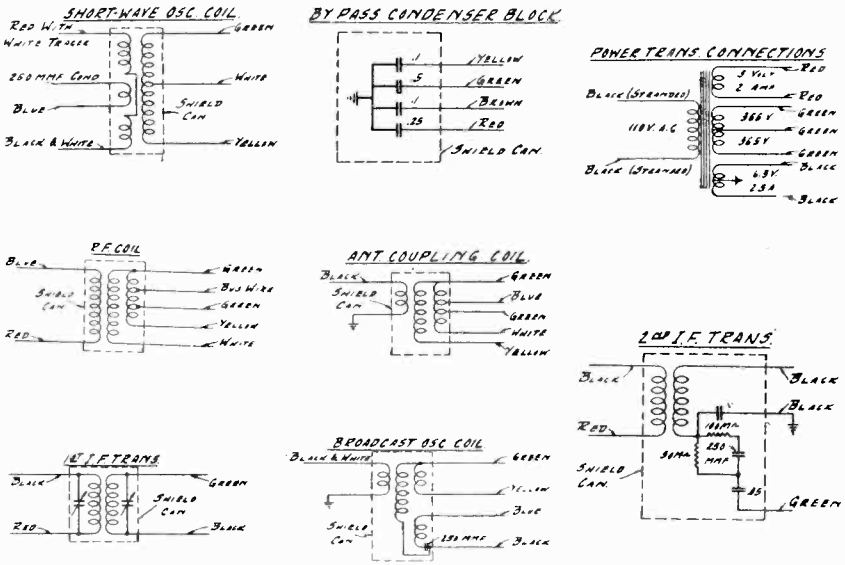


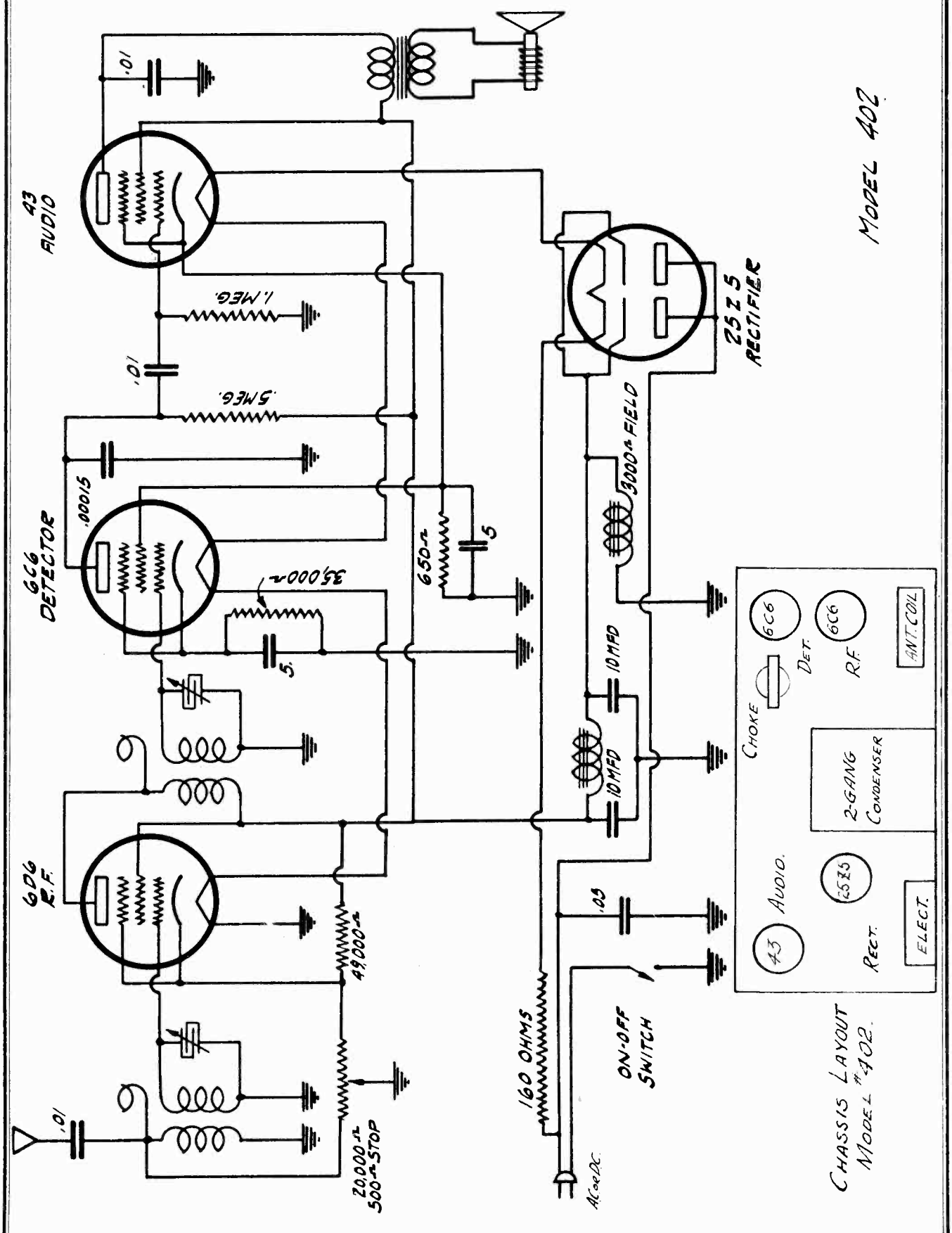
Figure 3

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
1084	Volume control	$0.70	937	6 prong socket No. 42	.10
1083	Tone control and A.C. switch	1.00	1023	6 prong socket No. 75	.10
1063	Short wave switch	2.95	936	4 prong socket No. 80	.10
1062	Tuning condenser for sets with full vision dial	3.20	1098	Tube shield base	.05
1273	Tuning condenser for sets with airplane dial	3.40	1097	Tube shield cap	.10
1059	Filter choke	1.15	1096	Tube shield	.15
934	A. C. cord	.30	1066	8" speaker	9.35
1092	Pilot light socket	.15	1061	Power transformer	3.40
580	.05—200 volt condenser	.10	1014	8-8, 450V filter condenser	2.10
563	.05—400 volt condenser	.15	1085	8—450 filter condenser	1.25
572	.1—200 volt condenser	.15	1175	1st IF transformer	1.55
1088	100 mmf condenser	.15	1176	2nd IF transformer	1.80
590	250 mmf condenser	.15	1060	Bypass condenser block	1.20
1107	550 mmf condenser	.20	1082	Double padder condenser	.40
1105	2600 mmf condenser	.35	568	.01—400 volt condenser	.15
1106	3000 mmf condenser	.40	1104	Dial—Complete full vision	1.20
631	50,000 ohm resistor—½ watt	.15	1179	Antenna coil	.50
603	100,000 ohm resistor—½ watt	.15	1181	Detector coil	.50
602	250,000 ohm resistor—½ watt	.15	1182	Broadcast oscillator coil	.50
615	500,000 ohm resistor—½ watt	.15	1184	Short wave oscillator coil	.50
1087	30,000 ohm resistor—1 watt	.15	1274	Escutcheon plate—Airplane dial	.40
1101	Cabinet for full vision dial	7.00	1275	Pyralin escutcheon window	.20
531	Knobs	.05	1203	Drive cable spring	.10
1136	Escutcheon plate for full vision dial	.40	1209	Dial chart	.10
1282	Cabinet—airplane dial	7.20	1199	Dial pointer	.05
939	6 prong socket No. 78	.10	1277	Dial drive cable	.05
1086	5 prong socket No. 37	.10			

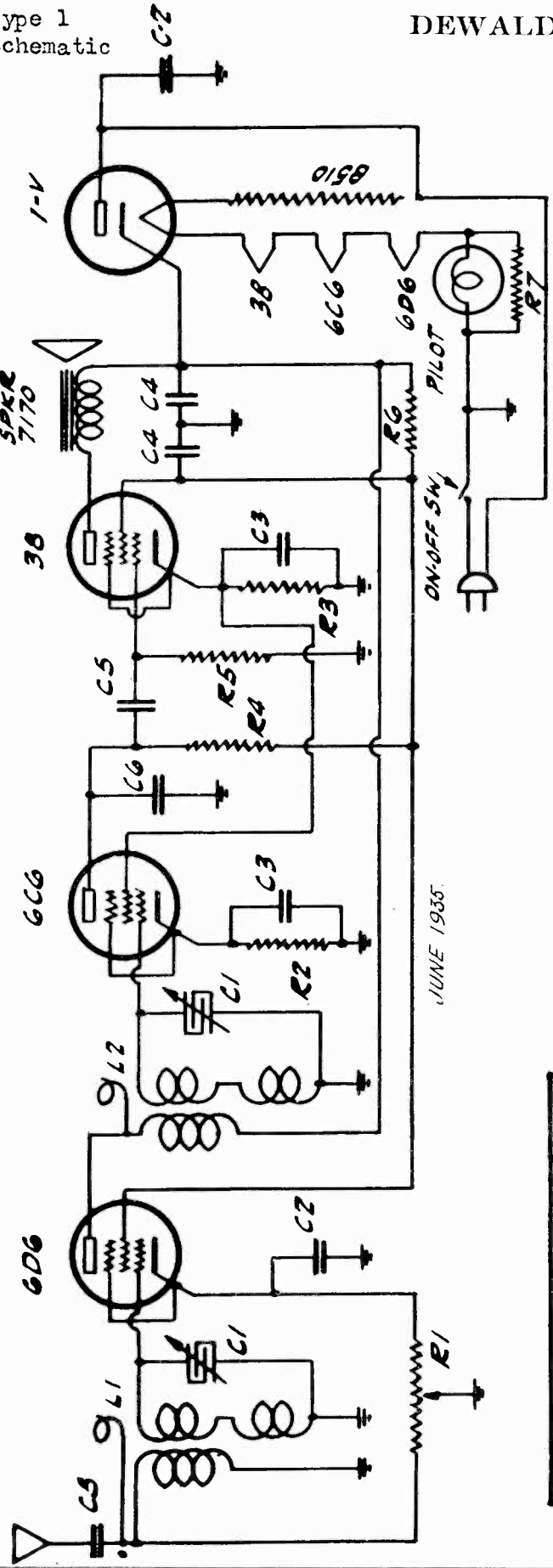
DEWALD RADIO

MODEL 402
Schematic
Socket



MODEL 403-4
Type 1
Schematic

DEWALD RADIO



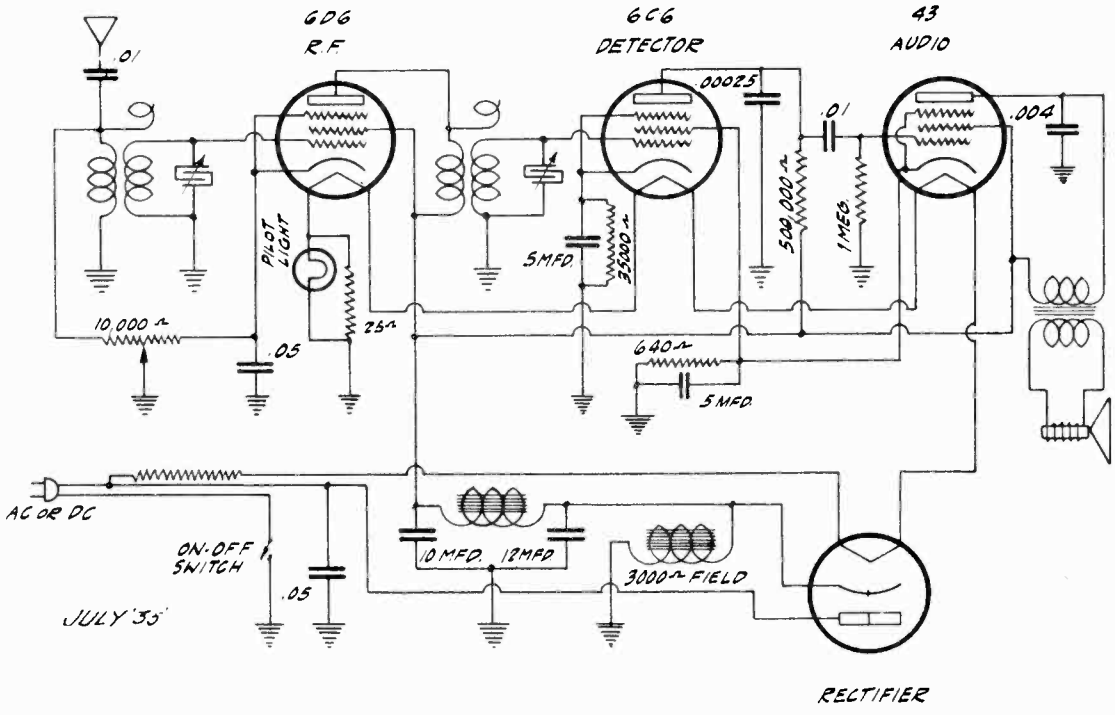
Socket Voltages			
6D6	CATHODE TO GROUND	2.5 VOLTS	A
	PLATE TO CATHODE	120-135 V.	B
	SCREEN TO CATHODE	90-115 V.	B
6C6	CATHODE TO GROUND	.5 VOLTS	A
	PLATE TO CATHODE	20-30 V.	B
38	CATHODE TO GROUND	10-15 V.	B
	PLATE TO CATHODE	115-125 V.	B
	SCREEN TO CATHODE	95-115 V.	B
1-V	CATHODE TO GROUND	120-140 V.	B

ALL READINGS TAKEN WITH VOLUME CONTROL IN MAXIMUM POSITION, USING 1000 OHM-PER-VOLT METER. FILAMENTS AT RATED VOLTAGES. A= 0-10 V. RANGE. B = 0-250 V. RANGE.

L1 - ANTENNA COIL	1331
L2 - R.F. COIL	1332
C1 - VARIABLE COND.	2204
C2 - .05 COND.	2046
C3 - .1 MFD. COND.	2285
C4 - 8 MFD. COND.	2283
C5 - .01 MFD. COND.	2056
C6 - .00025 MFD. COND.	2047
R1 - VOL. CONT. 25M. OHMS	8499
R2 - 35,000 OHM. RES.	3261
R3 - 1,700 OHM. RES.	3335
R4 - 500,000 OHMS RES.	3161
R5 - 1 MEGOHM. RES.	3190
R6 - 10,000 OHM. RES.	3336
R7 - 25 OHM SHUNT	3313
PILOT LIGHT 6-8 VOLTS	8407
LINE CORD	8510
SPEAKER	7170

MODEL 403-4
Schematic
Notes, Parts

DEWALD RADIO



MODEL 403-4

The Model 403 is a 4 Tube Receiver operating on A.C. or D. C., 110-120 Volts, 25-60 Cycles.

OPERATION Turn set on by turning ON-OFF switch. Allow 30 seconds for tubes to heat, turn volume control knob to middle position and then secure desired station by turning the station selector knob. When tuning in a station, set tuning control carefully to maximum station volume, then adjust with volume control knob to desired volume.

When operated on Direct Current if no reception is heard approximately one minute after set is turned on, reverse plug in Outlet. No ground wire is required with this set.

TUBES 1-6D6, 1-6C6, 1-43, and 1-12Z3

ANTENNA Unwind Antenna and place along baseboard or in any convenient location, the Antenna may also be grounded. For Additional signal strength an outside Antenna may be used.

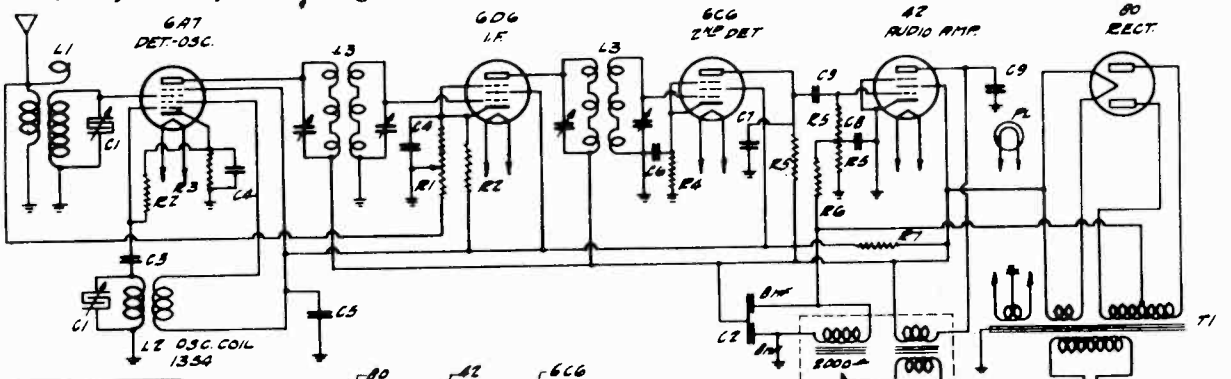
IMPORTANT DO NOT TOUCH GROUND WIRE TO CHASSIS

NUMBERS & LIST PRICES OF REPLACEMENT PARTS

1331	Antenna Coil ----------.55	2047	.00025 Mica Cond ----- .35
1332	Detector Coil ----------.55	7174	Speaker----------4.25
2283	Electrolytic Cond.---- -1.00	8524	Line Cord Resistor---- .80
2284	Variable Condenser------2.15	8499	Vol Control ----------1.00
2056	.01 Cub Cond.---------- .35	5093	Antenna ---------- .20
2046	.05 " " ---------- .35	8512	Knobs ---------- .20
1344	B Choke ---------- .75		

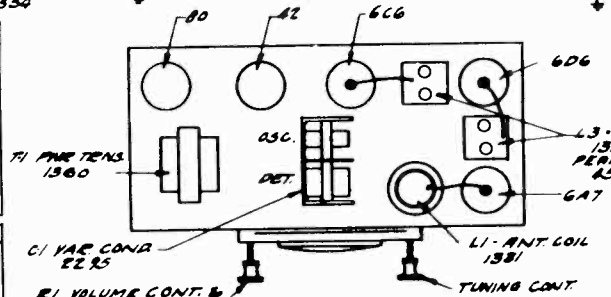
MODEL 505-F
Schematic, Socket, Alignment
MODEL 510
Schematic, Socket, Parts, Alignment

DEWALD RADIO



CONDENSERS		
SYM	MFD	NO
C1	VAR. C.	2295
C2	FILTER	2292
C3	.0001	2123
C4	.05	2046
C5	.1	2188
C6	.25	2033
C7	.000Z5	2047
C8	.1	2022
C9	.01	2056

RESISTORS		
SYM	OHMS	NO.
R1	VOL.CONT.	8553
R2	50,000	3292
R3	300	3346
R4	35,000	3180
R5	.5 MEG.	3161
R6	2. MEG.	3184
R7	18,000	3347



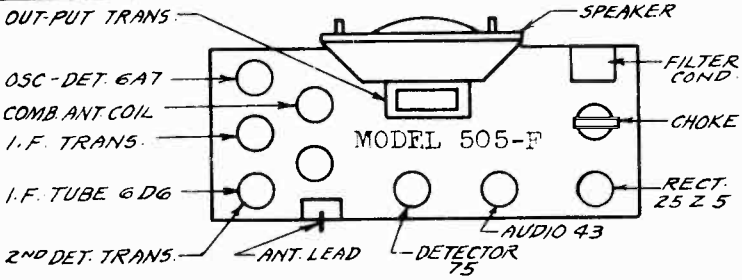
CHASSIS LAYOUT **MODEL 510**

F 47 M 8-35

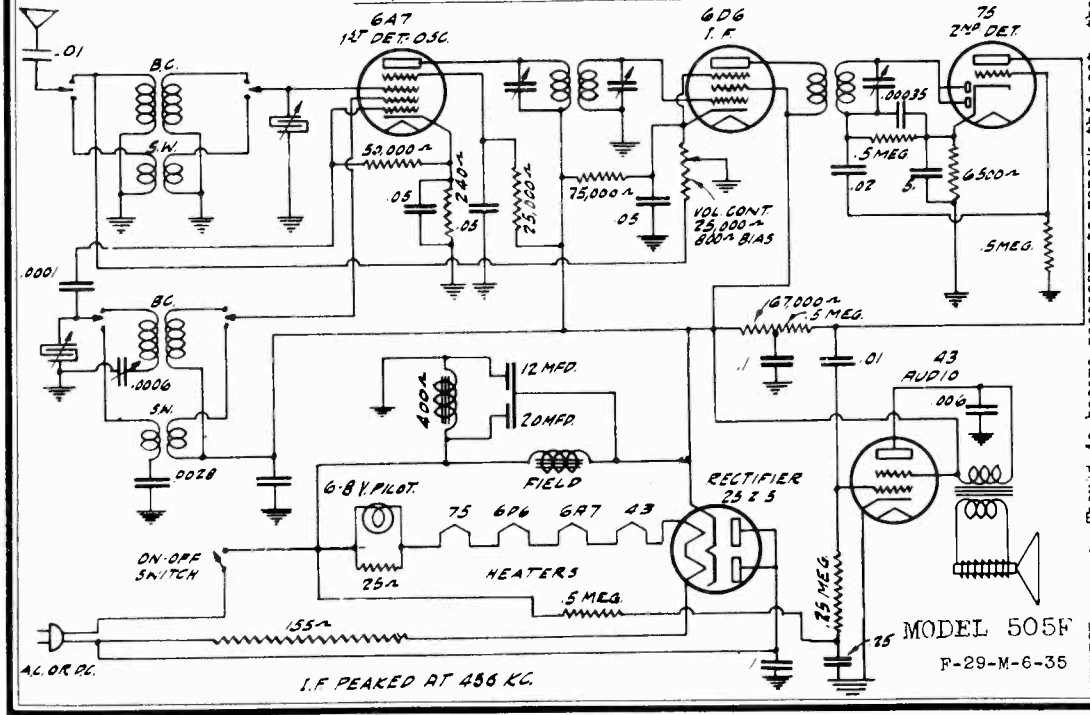
LIST PRICES OF REPLACEMENT PARTS

MODEL 510

1360	Power Transformer	$2.85
1355	I. F. Transformer	1.40
1331	Ant. Coil	.55
1354	Osc. Coil	.55
2295	Variable Condenser	2.10
2292	Combination Electrolytic	1.60
2123	.0001 Mfd. Condenser	.40
2047	.000Z5 " "	.35
2022	.1 Mfd. 200 v. Cond.	.35
2188	.1 Mfd. 400 V Cond.	.35
2056	.01 " " " "	.35
2046	.05 " 200 V "	.35
2033	.25 " 200 V "	.40
7180	Speaker	4.25
8553	Comb. Vol. Control	1.05
8496	Line Cord	.35
8512	Knobs	.20



PLAN VIEW OF CHASSIS

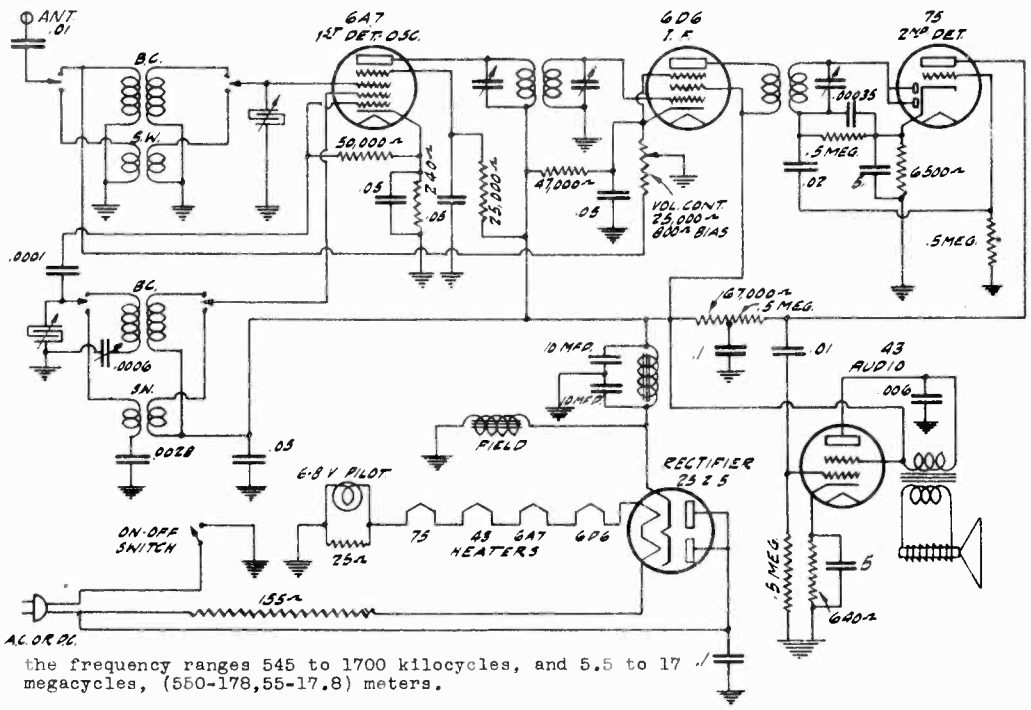


SERVICE NOTES : Should it become necessary to repeak this set, the following procedure should be followed. Set Service Oscillator to 456 K.C. and connect "hot" lead to grid of 6A7 tube. Ground stator of rear (osc.) section of Variable Condenser. Turn volume control for maximum output and repeak intermediate frequency trimmers for maximum gain.

MODEL 510 Remove short from Variable Condenser. Remove Service Oscillator lead from grid of 6A7 and connect same to red lead on rear of set. Adjust service Oscillator and receiver to 1500 K.C. and repeak trimmers on variable condensers for maximum gain. All other frequencies are automatically calibrated when receiver is peaked at 1500 K. C. due to the construction of the cut section of Variable Condenser.

MODEL 505-R
Schematic, Socket
Alignment, Parts

DEWALD RADIO



the frequency ranges 545 to 1700 kilocycles, and 5.5 to 17 megacycles, (550-178,55-17.8) meters.

5094 — I.F. PEAKED AT 456 KC. — Model 505-R

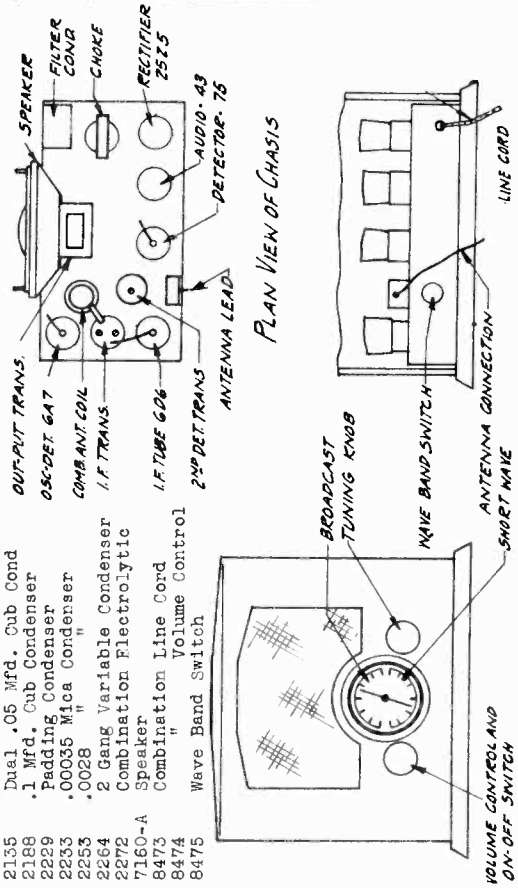
VOLTAGE

This receiver is designed to operate on 110-120 Volts 40-60 cycles, alternating current or 110-120 Volts direct current. When operated on D.C. it is necessary that the line plug be inserted to obtain the correct polarity. If no reception is heard approximately one minute after set has been turned on, reverse line cord plug in outlet.INT. FREQ. ALIGNMENT. Intermediate frequency peaked at 456 KC. Connect test oscillator to grid of 6A7 and chassis. (Ground stator of front section of variable condenser during this operation.)

R.F. ALIGNMENT

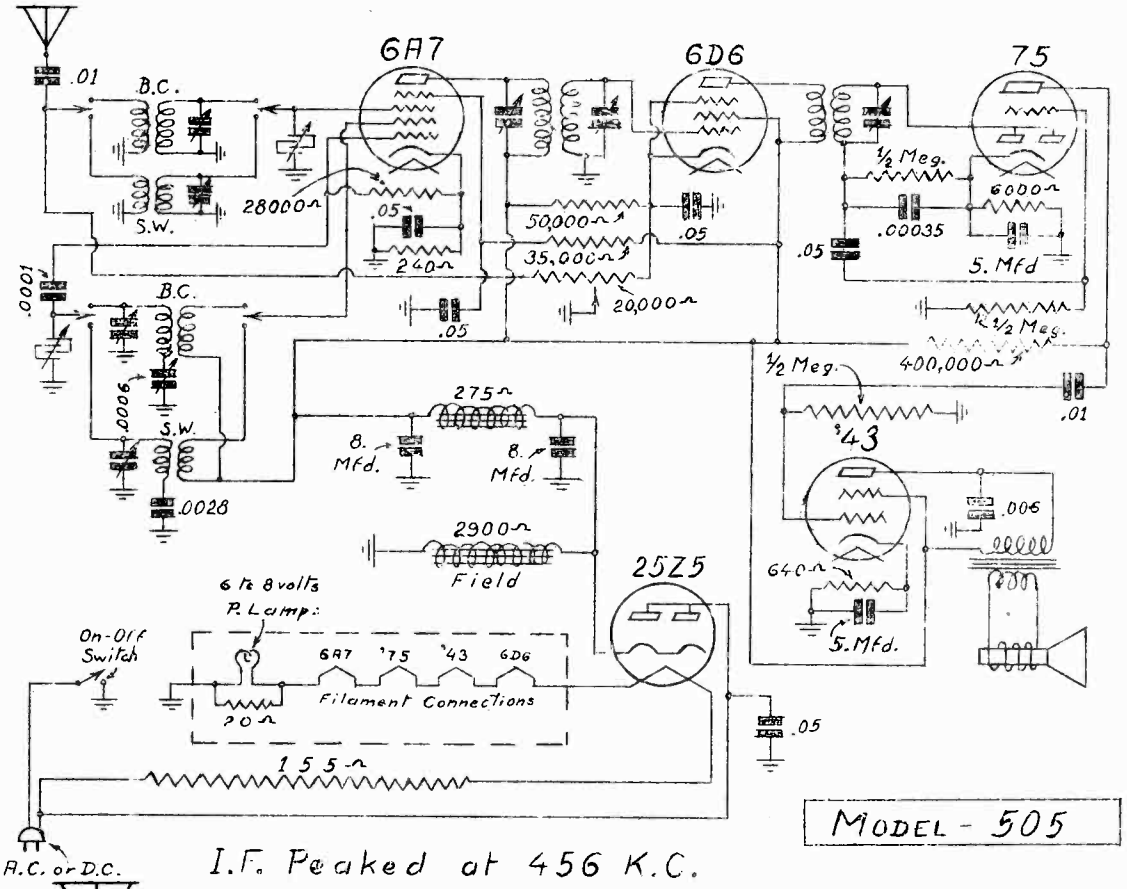
Connect test oscillator to antenna and chassis and set dial to 1500 KC. and peak variable condensers. For low frequency adjustment set dial at 600 KC. and repeak padding condenser on front of chassis, rocking variable condenser at thesame time. Short wave Calibration is automatically taken care of by repeaking at 1500 KC. The short wave coils are matched carefully for this setting. A fixed Calibrated padder automatically peaks the short waves for the low frequency setting.

1304	"B" Choke
1305	Combination Antenna Coil
1306	" Oscillator Coil
1319	Dual I.F. Transformer
1320	Second Detector Coil
2007	.006 Mfd. Cub Condenser
2012	.02 Mfd. Cub Condenser
2046	.05 " "
2056	.01 " "
2123	.0001 Mfd. Mica"
2135	Dual .05 Mfd. Cub Cond
2188	.1 Mfd. Cub Condenser
2229	Padding Condenser
2233	.00035 Mica Condenser
2253	.0028 " "
2264	2 Gang Variable Condenser
2272	Combination Electrolytic
7160-A	Speaker
8473	Combination Line Cord
8474	" Volume Control
8475	Wave Band Switch

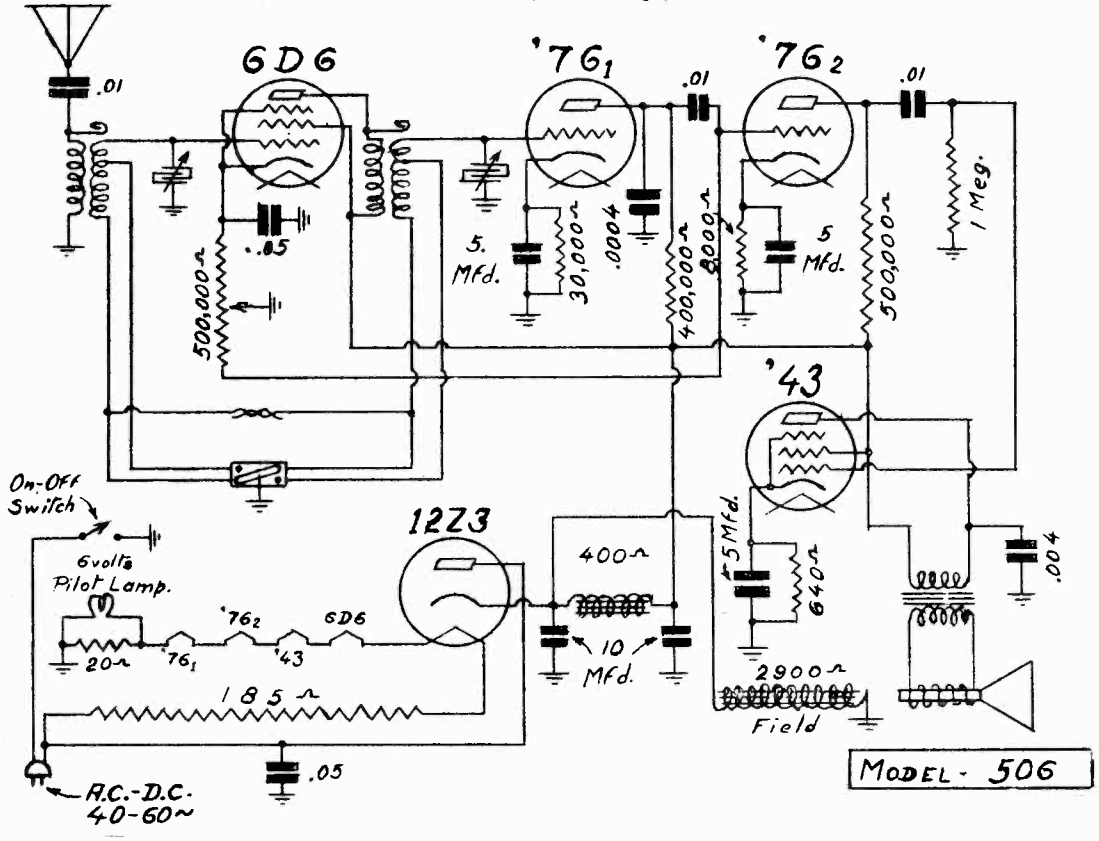


MODEL 505
MODEL 506
Schematics

DEWALD RADIO



I.F. Peaked at 456 K.C.



MODEL 506-R INSTRUCTION SHEET

The Model 506-R receiver is a universal receiver operating on A.C. or D. C. 110-125 volts 40-60 cycles.

With an additional 220 volt ballast plug, set will operate on A.C. or D.C. 210-240 volts, 40-60 cycles.

OPERATION ON 110 A.C. OR D.C. SUPPLY — Insert line cord plug into receptacle. On direct current if no reception is heard one minute after switch has been turned on, reverse line plug in receptacle.

TUBES — 1-43, 1-6D6, 1-25Z5, and 1-186 R-4,- 1-6C6.

ANTENNA — The antenna may be placed along the baseboard, or may be grounded. For additional power, an outside antenna may be used.
NOTE: The antenna must be unwound or the receiver will not operate satisfactorily. No ground wire is necessary for the operation of the set.

IMPORTANT — DO NOT TOUCH GROUND WIRE TO CHASSIS.

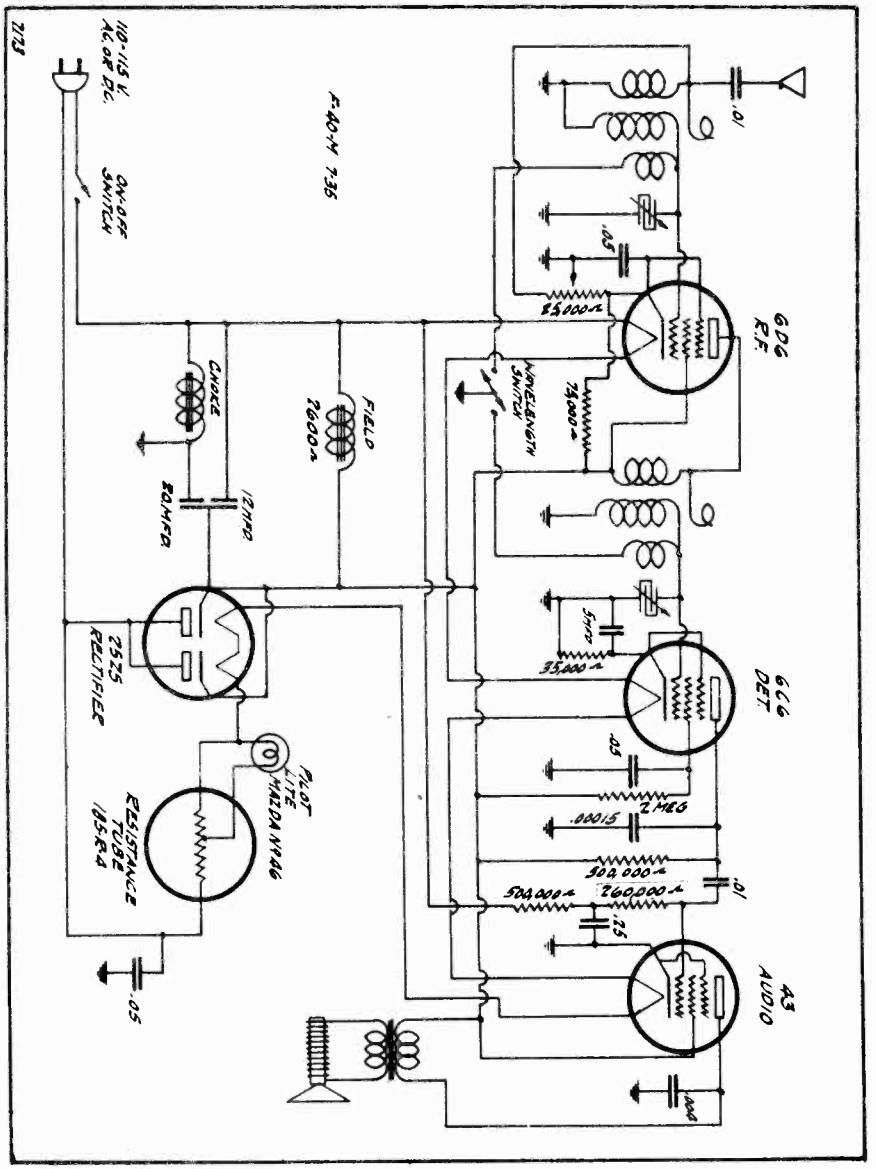
BROADCAST: — Turn wave band switch located in rear of cabinet to broadcast position, locate desired station by turning tuning control.

SHORT-WAVE: — Turn wave band switch to the short wave position and turn tuning control as in Broadcast position. Use Band Two for Dial settings.

WARRANTY — This receiver is guaranteed to be free from defective materials and workmanship for a period of ninety days from date of purchase. We agree to remedy any such defects or to furnish new parts in exchange for any part of any unit of our manufacture which under normal installation or use in service discloses any defects within the stipulated guarantee period. This unit must be delivered by the owner to us or to our representative from whom purchase was made, intact, for our examination. All replacements for defective material will be made providing examination discloses in our judgment that it is thus defective. All transportation charges must be prepaid on merchandise returned to our factory for any cause whatsoever.

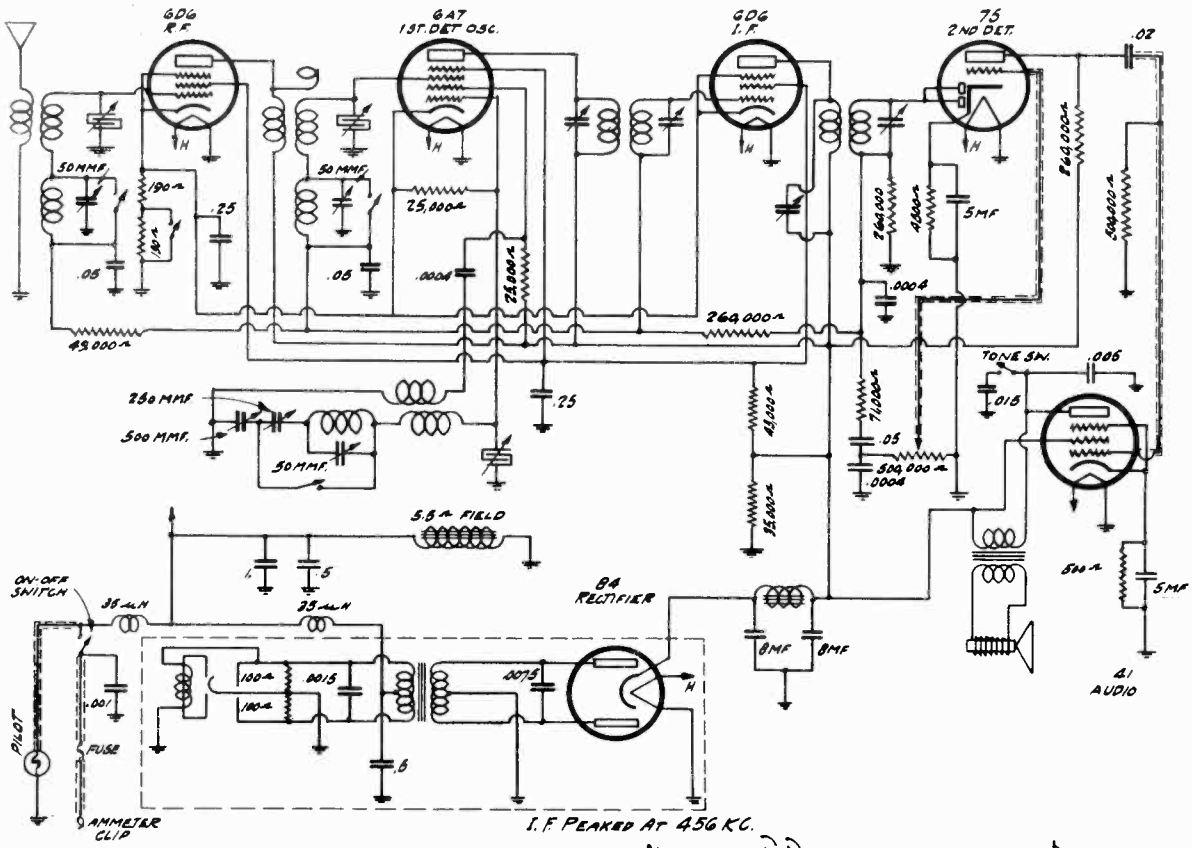
REPLACEMENT PARTS PRICE LIST

PART #		PRICE	PART #		PRICE
1326	Ant. Coil	.65	2033	.25 Mfd. Cond.	.40
1327	Det. Coil	.65	2081	.00025 Mfd. Mica Con.	.40
1328	B Choke	.75	7172	Speaker	4.25
2279	Elect. Cond.	1.50	8496	Line Cord	.80
2280	Variable Cond.	2.15	8487	Volume Control	1.05
2199	.05 Mfd. Cond.	.35	5093	Antenna Cable	.20
2054	.004 " "	.35	8521	Wave Band Switch	.45
2056	.01 " "	.35	8512	Knobs	.20



MODEL 607
Schematic, Socket Trimmers

DEWALD RADIO



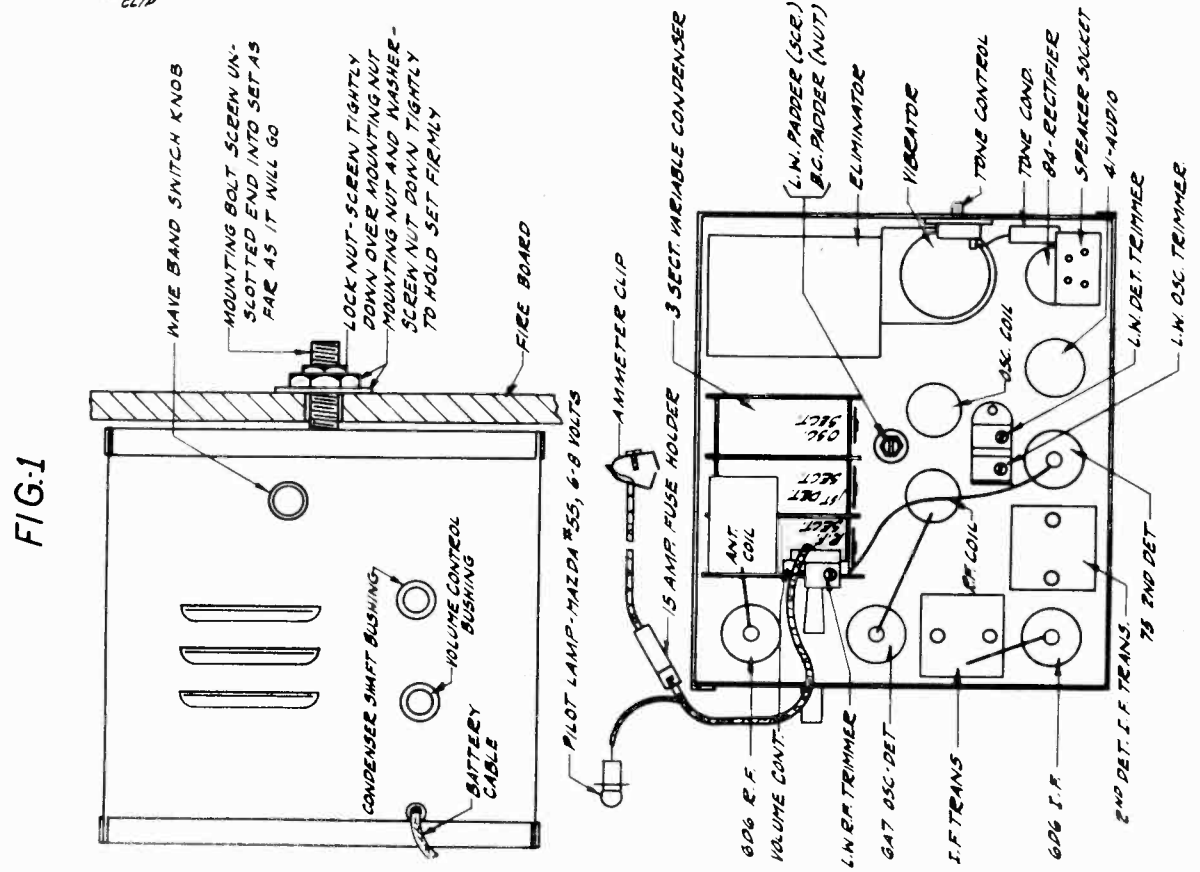
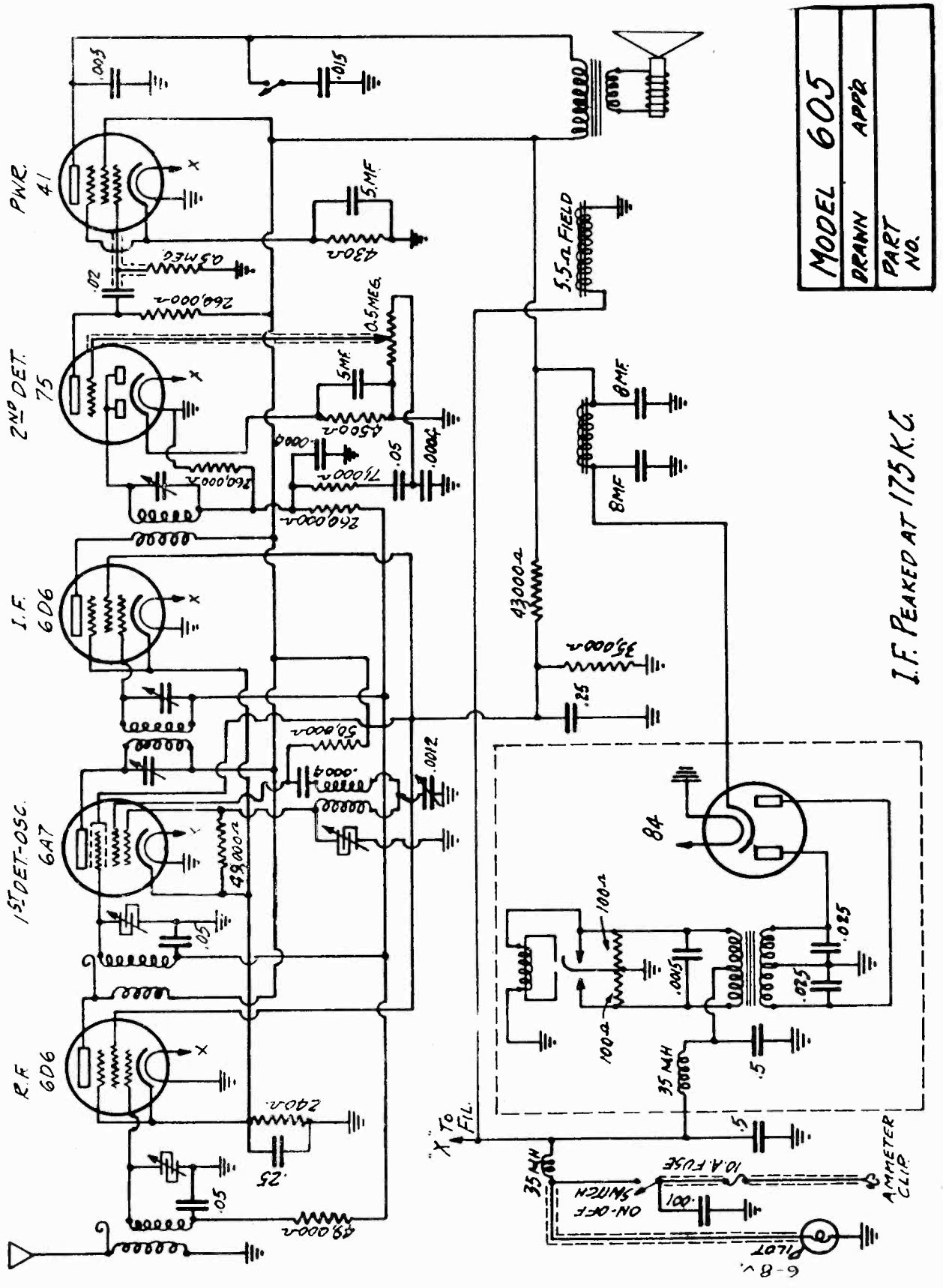
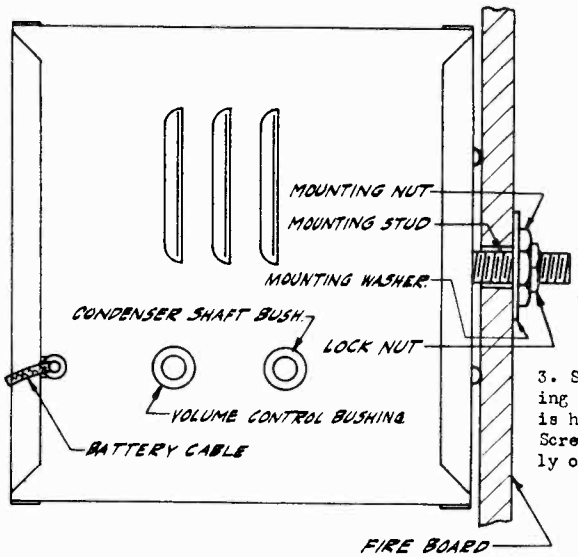


FIG. 1

MODEL 605
Schematic

DEWALD RADIO





MOUNTING DATA

1. Screw unslotted end of mounting bolt tightly (up to the nicks) into large threaded hole in the rear of receiver case.

2. Determine location of set and drill 1-2 inch hole in the fire-board to pass the mounting bolt.

3. Screw on the mounting nut so that the set is held firmly in place. Screw on lock nut firmly over mounting nut.

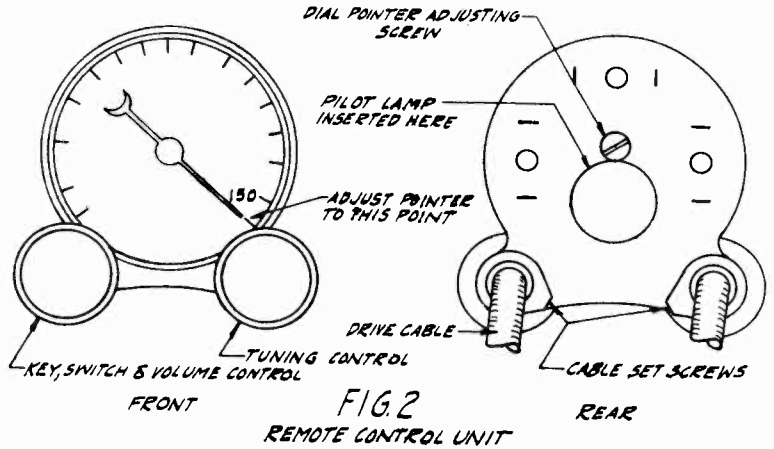
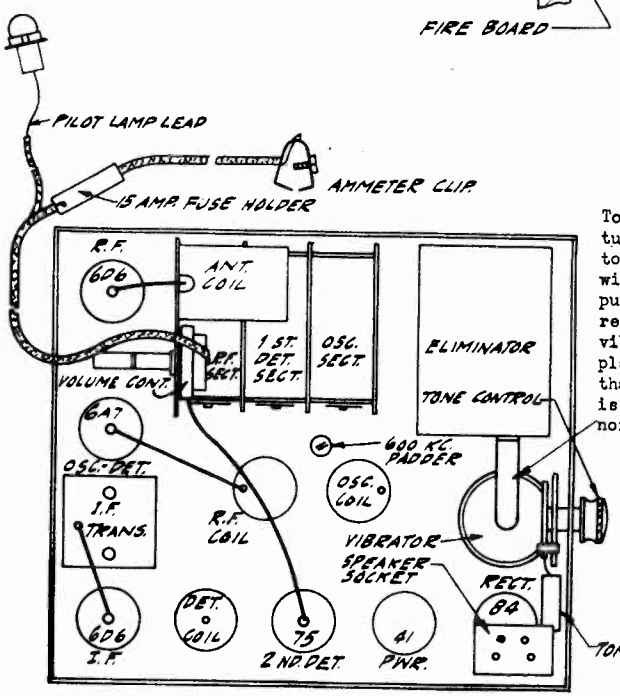


FIG. 2
REMOTE CONTROL UNIT



To replace vibrator, turn tension spring to the left 90°, then with a slight upward pull, vibrator can be removed. After the vibrator has been replaced, make certain that tension spring is returned to its normal position.

FIG. 1

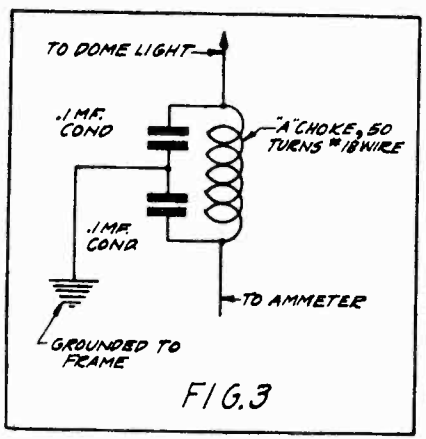


FIG. 3

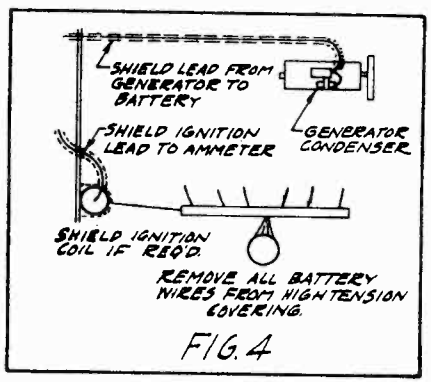


FIG. 4

SERVICE NOTES

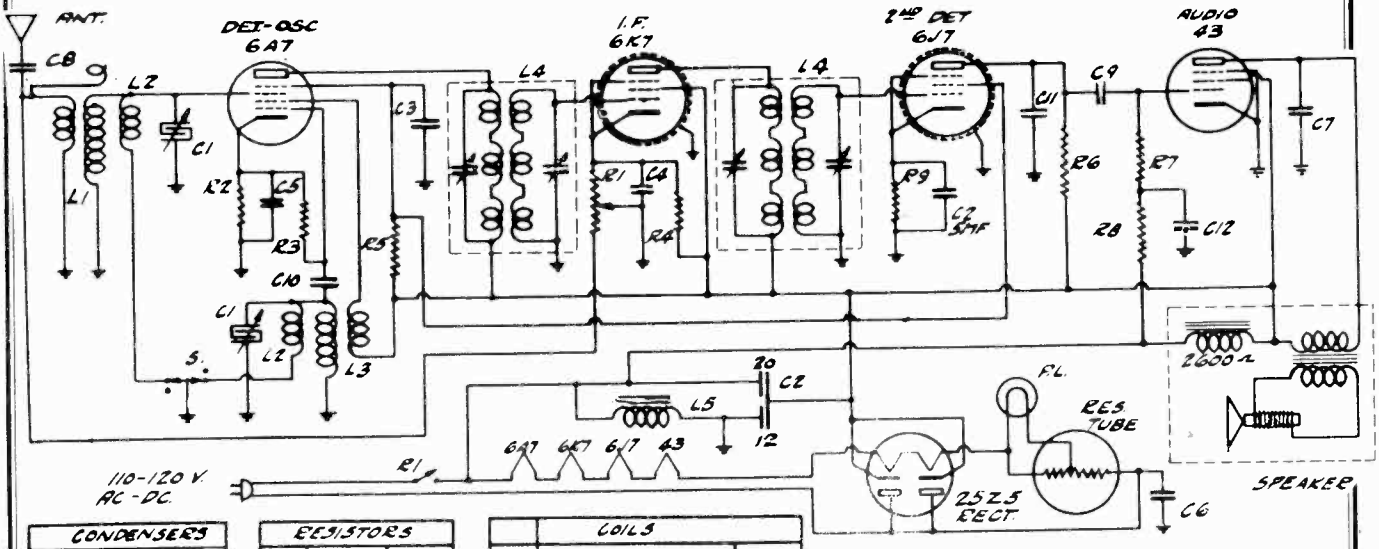
INT. FREQ. ALIGNMENT — Intermediate frequency peaked at 175 K.C. Connect test oscillator to grid of 6A7 and ground. (Ground stator of oscillator condenser during this operation)

R.F. ALIGNMENT — Connect test oscillator to antenna and ground. Set dial to 1500 K.C. and align trimmer condensers on variable condensers for maximum signal. For low frequency adjustment set dial at 600 K.C. and rock padder to match variable condenser setting of R.F. and 1st Detector.

DEWALD RADIO

MODEL 609
Schematic, Data
Parts List

DEWALD RADIO



CONDENSERS		
SYM	MFD	NO
C1	VAR.	2295
C2	20-12-5	2294
C3	.05	2046
C4	.05	2046
C5	.05	2046
C6	.05	2046
C7	.004	2054
C8	.02	2191
C9	.02	2191
C10	.0001	2123
C11	.0001	2123
C12	1	2022

RESISTORS		
SYM	OHMS	NO
R1	VOL CONT.	8474
R2	300	3346
R3	50,000	3292
R4	50,000	3292
R5	35,000	3180
R6	.5 MEG.	3161
R7	.75 MEG.	3145
R8	1 MEG	3190
R9	35,000	3180

COILS		
SYM	NAME	NO
L1	ANT. COIL	1331
L2	SHUNT COIL	1353
L3	OSC. COIL	1354
L4	I.F. TRANSFORMER	1355
L5	CHOKE 400Ω	1328
MISC.		
PL	PILOT LAMP 6.3V	8019
R1	VOL. CONT. & SWITCH	8474
S	WAVE BAND SWITCH	8521
	SPEAKER	7172
	LINE CORD	8496

MODEL 609

The Model 609 receiver is a 6 tube superheterodyne receiver operating on A.C. or D.C. 110-125 volts 40-60 cycles.

With an additional 220 volt ballast plug, set will operate on A.C. or D.C. 210-240 volts, 40-60 cycles.

OPERATION ON 110 A.C. OR D.C. SUPPLY — Insert line cord plug into receptacle. On direct current if no reception is heard one minute after switch has been turned on, reverse line plug in receptacle.

TUBES — 1-6A7, 1-6K7, 1-6J7, 1-43, 1-25Z5 and 1 Resistor Tube.

ANTENNA — The antenna may be placed along the base-board, or may be grounded. For additional power, an outside antenna may be used.

NOTE: The antenna must be unwound or the receiver will not operate satisfactorily. No ground wire is necessary for the operation of the set.

IMPORTANT — DO NOT TOUCH GROUND WIRE TO CHASSIS.

BROADCAST: — Turn wave band switch located in rear of cabinet to "Long" position, locate desired station by turning tuning control.

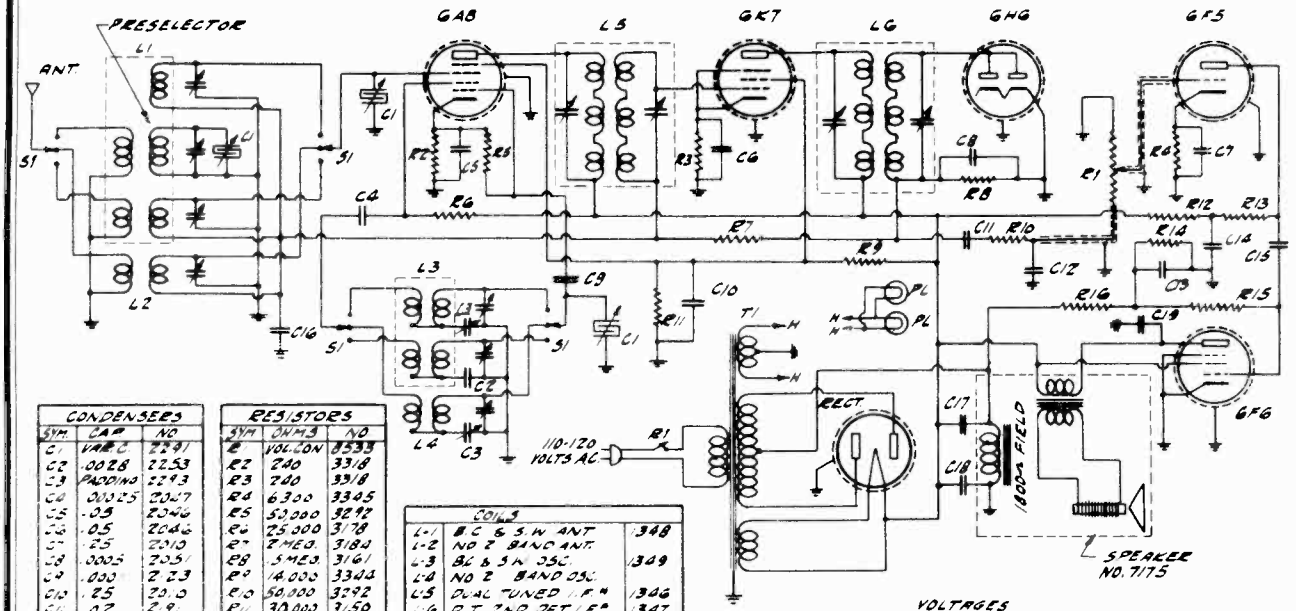
SHORT-WAVE: — Turn wave band switch to the "short" position and turn tuning control as in Broadcast position. Use Band Two for Dial settings.

REPLACEMENT PARTS PRICE LIST

PART #		PRICE	PART #		PRICE
1328	"B" Choke	.75	2022	.1 Mfd. Cub Cond.	.35
1331	Antenna Coil	.55	2295	2 Gang Var. "	2.10
1354	Oscillator Coil	.55	2294	Comb. Elect. "	1.40
1355	Dual I.F. Transformer	1.40	7172	Speaker	4.25
2054	.004 Mfd. cub Cond.	.35	8496	Line Cord	.35
2191	.02 Mfd. Cub Cond.	.35	8474	Switch & Vol. Con.	1.05
2046	.05 " " "	.35	8521	Wave Band Switch	.45
2123	.0001 Mfd. Mica Cond.	.40			

MODELS 610, 610-LW
Schematic, Socket
Alignment, Parts

DEWALD RADIO



CONDENSERS		
SYM.	CAP.	NO.
C1	VAR. C.	2291
C2	.0028	2253
C3	PADDING	2293
C4	.00025	2047
C5	.05	2046
C6	.05	2046
C7	.25	2010
C8	.0005	2051
C9	.000	2123
C10	.25	2010
C11	.02	2.9
C12	.0001	2123
C13	.25	2010
C14		2188
C15	.01	2.9
C16	.05	2046
C17	8 MFD.	2292
C18	8 MFD.	2292
C19	.004	2054

RESISTORS		
SYM.	OHMS	NO.
R	VOL. CON.	8533
R2	240	3318
R3	700	3318
R4	6300	3305
R5	50,000	3292
R6	25,000	3278
R7	2 MEG.	3184
R8	.5 MEG.	3161
R9	14,000	3304
R10	50,000	3292
R11	30,000	3250
R12	100,000	3192
R13	500,000	3216
R14	100,000	3182
R15	250,000	3165
R16	1 MEG.	3221

COILS		
L-1	B.C. & S.W. ANT.	1348
L-2	NO. 2 BAND ANT.	
L-3	B.C. & S.W. OSC.	1349
L-4	NO. 2 BAND OSC.	
L5	DUAL TUNED I.F.'S	1346
L6	D.T. 2ND DET. I.F.'S	1347

MISC.		
PL	PILOT LAMP 6.3V	8019
R	ON-OFF SW. & V.C.	8533
S	WAVE BAND SW.	8534
T1	POWER TRANS.	1345
	SPEAKER	7175

VOLTAGES

6A8	CATHODE - GROUND	2.4 V
	SCREEN - CATHODE	100.0
	PLATE - CATHODE	230.0
	OSC. PLT. - CATHODE	160.0
6K7	CATHODE - GROUND	2.4
	SCREEN - CATHODE	100.0
	PLATE - CATHODE	230.0
6F5	CATHODE - GROUND	1.7
	PLATE - CATHODE	65.0
6F6	PLATE TO GROUND	235.0
	SCREEN - GROUND	280.0
80	FIL. TO GROUND	240.0
	VOLT. AT 1ST FILTER	350.0

I.F. PEAKED AT 456 K.C.

MODEL 610
MODEL 610-LW

7177

SERVICE NOTES

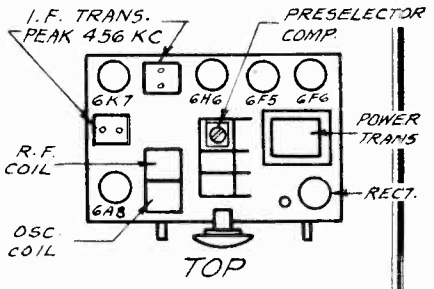
INTERMEDIATE FREQUENCY ALIGNMENT — Intermediate frequency peaked at 456 K.C. Connect test oscillator to grid of 6A8 and Chassis. Ground stator of front section of Variable Condenser during this operation.

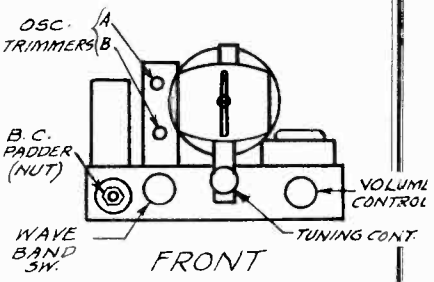
R.F. ALIGNMENT — Connect test oscillator to antenna and ground connections and set dial to 1500 K.C. and peak trimmers "A" for maximum signal. For low frequency adjustment, set dial at 600 K.C. and repeak padding condenser (Nut on front of chassis). Next readjust at 1500 K.C.

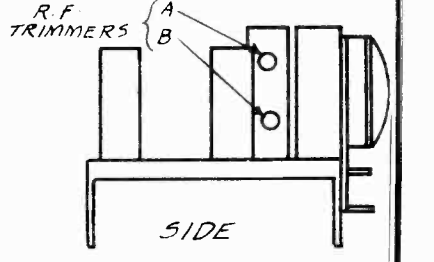
BAND 2 ALIGNMENT — rolice band adjustments for 610 only. Set test oscillator at 4000 K.C. Repeak the two trimmers located underneath chassis for maximum gain. Next set Variable Condenser at 1600 K.C. and repeak padder (screw) on front panel of Chassis. Next readjust trimmers underneath the chassis at 4000 Kilocycles.

Long Wave adjustment for 610 LW only. These adjustments same as police except low frequency setting is 170 K.C. and high frequency setting is 350 K.C.

SHORT WAVE ALIGNMENT — Set Variable Condenser to 15 Megacycles and connect test oscillator to Antenna and ground and repeak trimmers "B" for maximum gain. The low frequency setting is automatically taken care of. The Short wave coils are carefully matched for this setting and a fixed caliprated padder pesks the short waves for the low frequency setting.







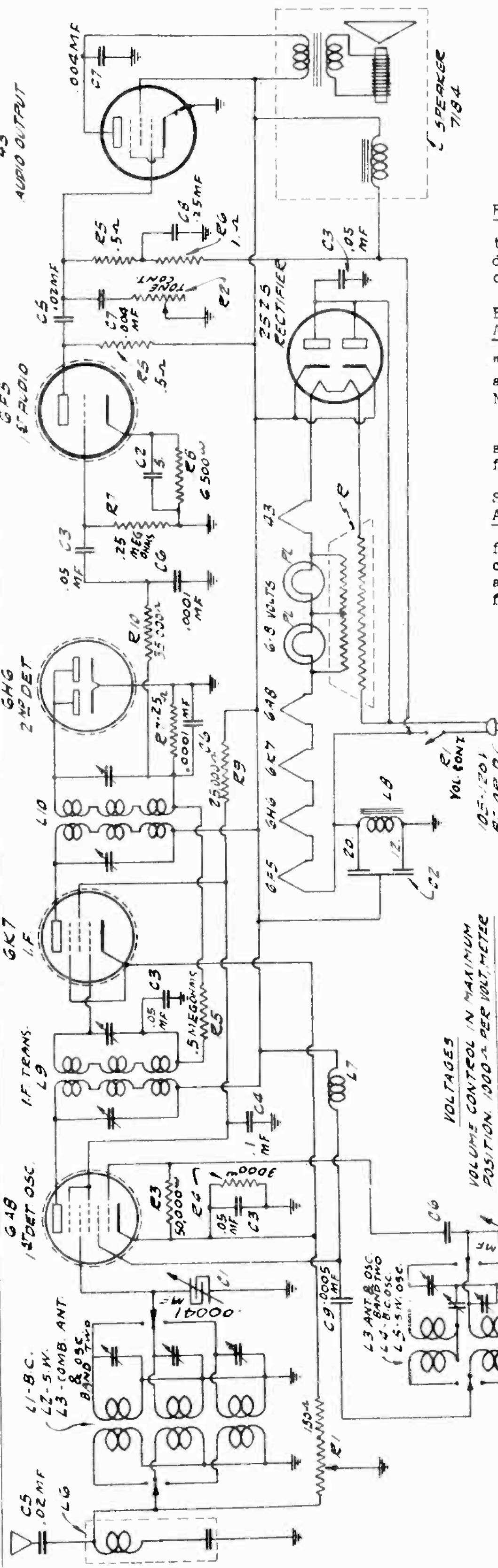
MODEL 610
NUMBERS AND LIST PRICES OF REPLACEMENT PARTS

1345	Power Transformer	$4.00	2293	Padding Condenser	.85
1348	Comb. Antenna Coil	2.15	2051	Mica Condenser .0005	.35
1350	Comb. Police Coil	1.50	2291	3 Gang Variable Cond.	4.05
1349	" Oscillator Coil	1.40	2292	Comb. Electrolytic Cond.	1.60
1346	Dual I.F. Transformer	1.50	2230	Dual Trimmer Cond.	.35
1347	Second Detector Coil	1.50	2010	.25 Mfd. Cub "	.65
2054	.004 Mfd. Cub Condenser	.35	8512	Knobs	.20
2191	.02 Mfd. Cub Condenser	.35	7175	Speaker	5.75
2046	.02 " " "	.35	8496	Line Cord	.35
2188	.1 " " "	.35	8533	Volume Control	1.05
2123	.0001 Mfd. Mica "	.40	8534	Wave Band Switch	.65
2253	.0028 Mica Condenser	.45			
2047	.00025 " "	.35			

F - 44 - M 8-35

MODELS 611, 611-LW
Schematic, Socket
Trimmers, Alignment

DEWALD RADIO



SERVICE NOTES

INTERMEDIATE FREQUENCY ALIGNMENT Intermediate frequency peaked at 456 K.C. Connect test oscillator to grid of 6A8 and Chassis. Short Circuit stator of front section of Variable Condenser during this operation.

RANGE: Model 611 covers the following ranges:- Broadcast - 545 to 1600 Kilocycles; Police - 1600 to 4600 Kilocycles and Short Wave - 5.5 to 16.5 Megacycles.

Model 611 L.W. covers the following ranges:- Long Wave - 150 to 410 Kilocycles; Broadcast - 545 to 1600 Kilocycles and Short Wave 5.5 to 16.5 Megacycles.

RF. ALIGNMENT Connect test oscillator to antenna and chassis, (See Sketch) and set dial to 1500 K.C. and peak trimmers "A" for maximum signal. For low frequency adjustment, set dial at 600 K.C. and repeat padding condenser (Nut on front of chassis). Next readjust at 1500 K.C.

BAND 2 ALIGNMENT Police band adjustments for 611 only. Set test oscillator at 4000 K.C. Repeak the two trimmers "C" (see sketch) for maximum gain. Next set Variable Condenser at 1600 K.C. and repeak padder (screw) on front panel of Chassis. Next readjust trimmers at 4000 Kilocycles.

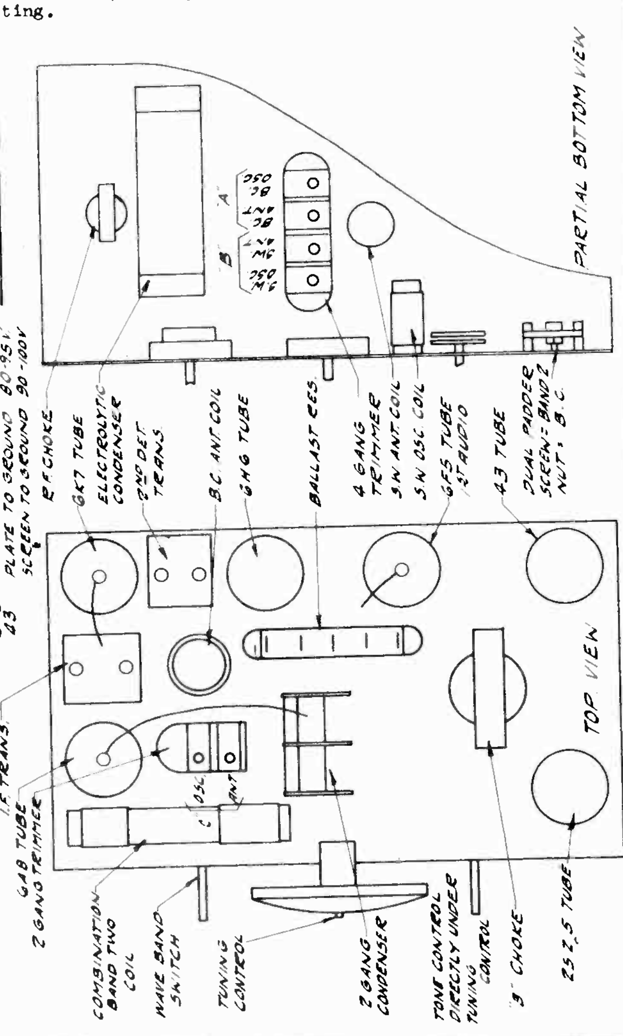
Long Wave adjustment for 611 LW only. These adjustments same as police except low frequency setting is 170 K.C. and high frequency setting is 350 K. C.

SHORT WAVE ALIGNMENT Set Variable Condenser to 15 Megacycles and connect test oscillator to Antenna and ground and repeak trimmers "B" for maximum gain. The low frequency setting is automatically taken care of. The Short Wave coils are carefully matched for this setting and a fixed calibrated padder peaks the short waves for the low frequency setting.

MODEL 611
MODEL 611-LW.

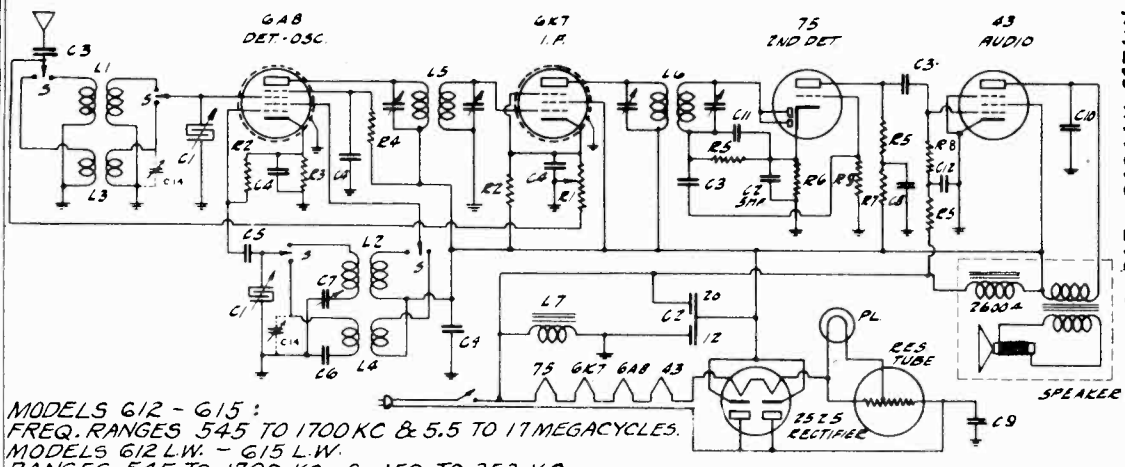
VOLTAGES
VOLUME CONTROL IN MAXIMUM POSITION. 1000 Ω PER VOLT METER

6A8 CATHODE TO GROUND 1-2 V.
SCREEN TO GROUND 35-50V
OSC. PLATE TO GROUND 90-100V
DET PLATE TO GROUND 90-100V
6K7 SCREEN TO GROUND 35-50V
PLATE TO GROUND 90-100V
6F5 CATHODE TO GROUND 1-2V
PLATE TO GROUND 25-30V
43 PLATE TO GROUND 80-95V
SCREEN TO GROUND 90-100V



MODELS 612, 612-LW,
615, 615-LW
Schematic, Socket,
Alignment, Parts

DEWALD RADIO



MODELS 612 - 615:
FREQ. RANGES 545 TO 1700 KC & 5.5 TO 17 MEGACYCLES.
MODELS 612 L.W. - 615 L.W.
RANGES 545 TO 1700 KC & 150 TO 353 KC.

MODELS - 612-615, - 612 LW-615 LW.
ON MODELS - 612 LW. - 615 LW. - TRIMMERS
#2230 ARE USED. PADDER C6. IS
REPLACED BY C13. COIL L3. REPLACED
BY L8. AND COIL L4 BY L9 -

SERVICE NOTES

INT. FREQ. ALIGNMENT. Intermediate frequency peaked at 456 K.C. Connect test oscillator to grid of 6A8 and chassis. (Ground stator of front section of variable condenser during this operation.)

R. F. ALIGNMENT

Connect test oscillator to antenna and chassis and set dial to 1500 K.C and peak variable condensers. For low frequency adjustment set dial at 600 K.C. and repeak padding condenser on front of chassis, rocking variable condenser at the same time. Short Wave Calibration is automatically taken care of by repeaking at 1500 K.C. The short wave coils are matched carefully for this setting. A fixed Calibrated padder automatically peaks the short waves for the low frequency setting.

LONG WAVE ALIGNMENT ON 612 L.W. - 615 L.W.

Turn wave band switch to "Foreign" position, and align the Long Wave trimmers at 375 K.C. Adjust the Long Wave padder (screw section) at 175 K. C.

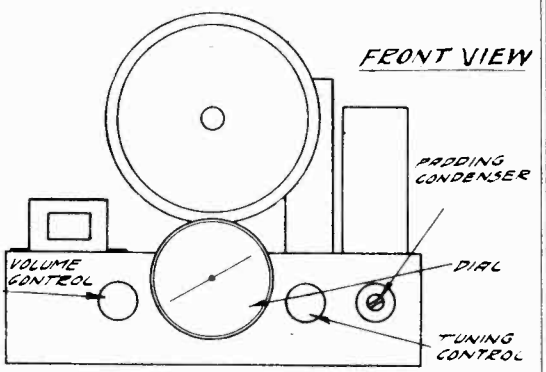
CONDENSERS		
SYM.	MFD.	NO.
C1	VAR C.	2280
C2	20-12.5	2201
C3	.02	2191
C4	.05	2046
C5	.0001	2123
C6	.0028	2253
C7	PADDER	2229
C8	.1-700V	2022
C9	.1-400V	2188
C10	.006	2007
C11	.00035	2233
C12	.25	2053
C13	LW PAD.	2277
C14	L.W. TR	2230

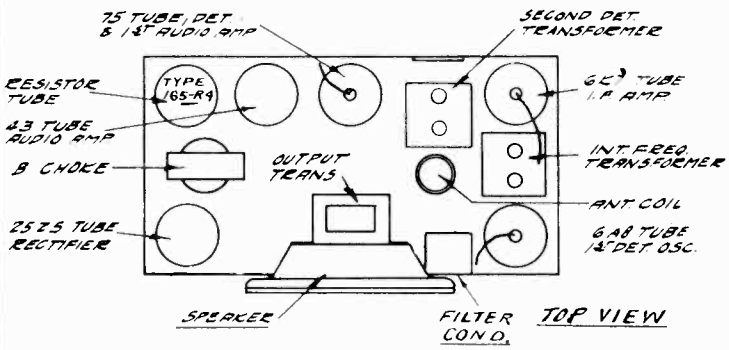
RESISTORS		
SYM	OHMS	NO
R1	VOL CON	8474
R2	50,000	3269
R3	240	3252
R4	25,000	3228
R5	.5 MEG.	3161
R6	6,500	3319
R7	67,000	3321
R8	260,000	3362
R9	100,000	3182

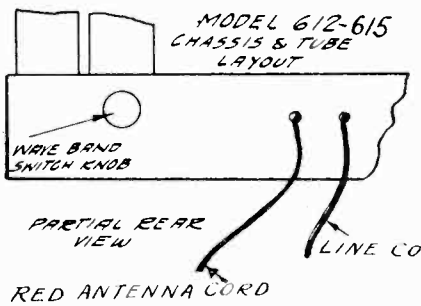
MISC.		
SYM	NAME	NO
L1	B.C. ANT. COIL	1363
L2	B.C. OSC. COIL	1357
L3	S.W. ANT. COIL	1250
L4	S.W. OSC. COIL	1249
L5	DUAL TUNED I.F.	1355
L6	2ND DET. I.F.	1356
L7	B. CHOKE 400Δ	1328
L8	L.W. ANT. COIL	1351
L9	L.W. OSC. COIL	1352
PL	PILOT LITE 6-8 V	8019
R1	VOL. CONT. & SWITH	8474
	SPEAKER	7172
S1	WAVE BAND SW.	8475
	LINE CORD	8496

LIST OF REPLACEMENT PARTS

PART NUMBER		LIST PRICE	PART NUMBER		LIST PRICE
1328	B Choke	.75	2123	.0001 Tubular Cond.	.40
1363	B.C. Ant. Coil	.60	2253	.0028 Mica Condenser	.45
1357	B.C. Oscillator Coil	55	2233	.00035 " "	.35
1250	S.W. Antenna Coil	.55	2033	.25 " "	.40
1249	S.W. Oscillator "	.55	2229	Padding Condenser	.45
1355	I.F. Transformer	1.40	7172	Speaker	4.25
1356	2nd Det. "	1.40	8496	Line Cord	.35
2280	Variable Cond.	2.45	8474	Volume Control	1.05
2301	Comb. Electrolytic	1.40	8475	Wave Band Switch	.65
			8512	Knobs	.20
2007	.006 Tubular Cond.	.35	1351	L.W. Antenna Coil	1.25
2191	.02 " "	.35	1352	L.W. Oscillator "	1.25
2188	.1 " "	.35	2230	L.W. Trimmer Cond.	.40
2046	.05 " "	.35	2277	L.W. Padding Cond.	.90

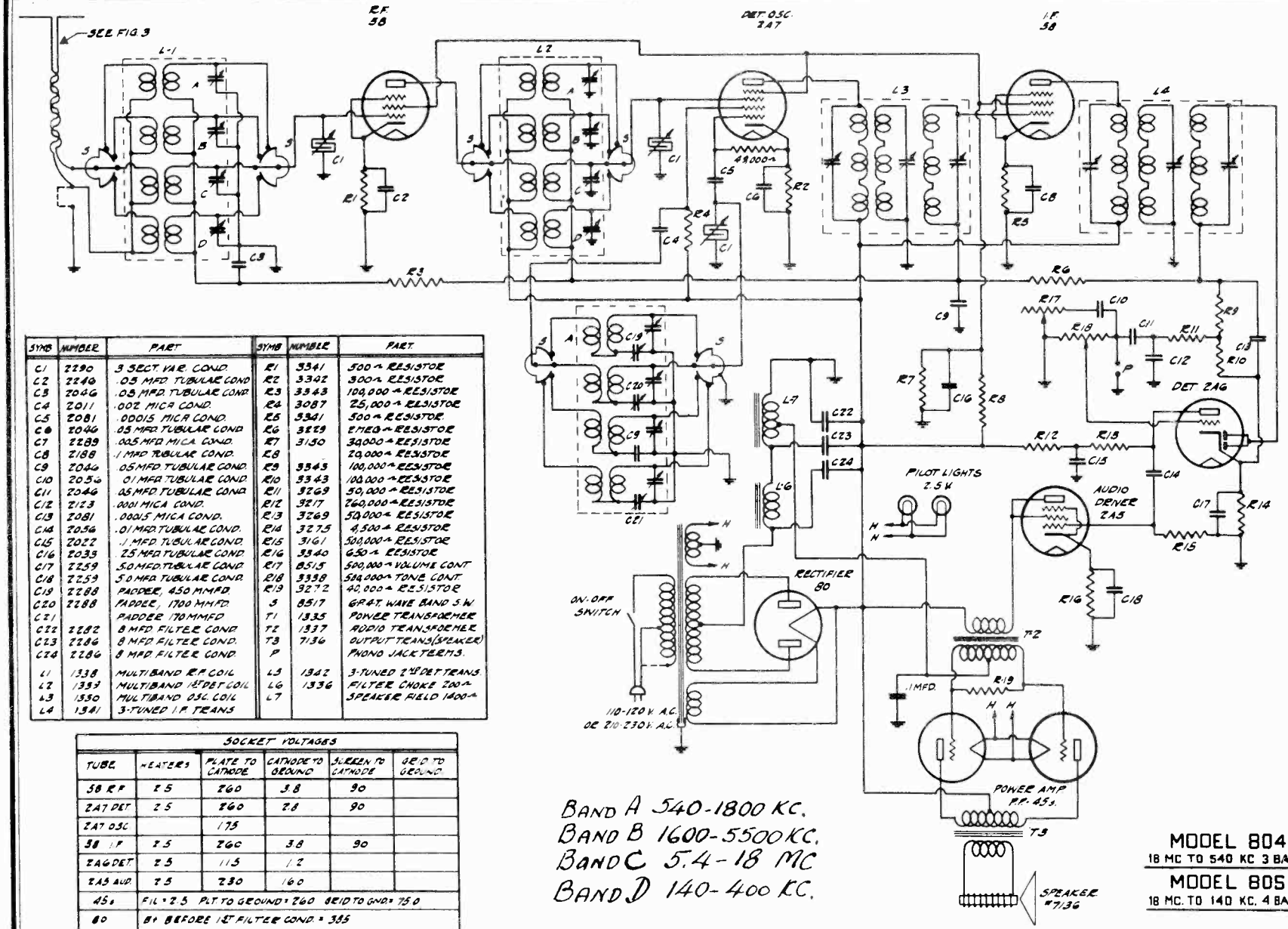






DEWALD RADIO

MODELS 804, 805
Schematic, Voltage



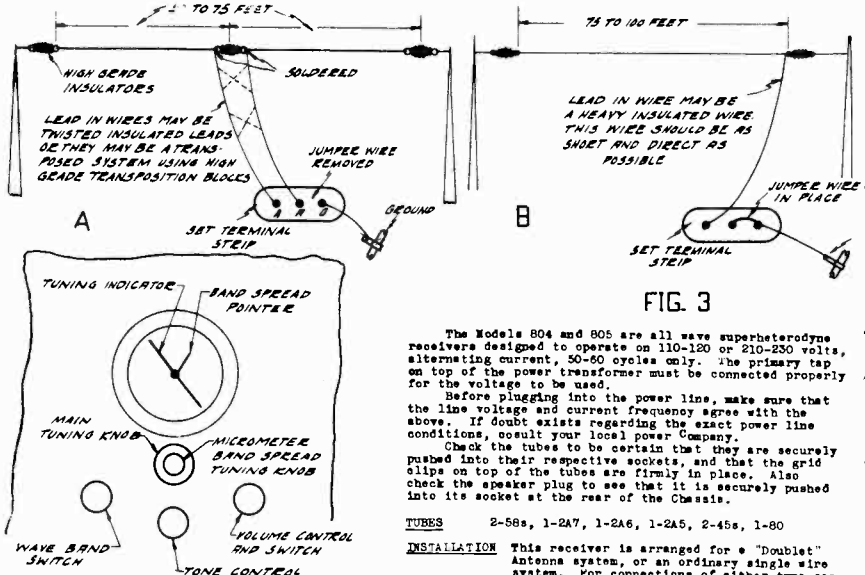
SYMB	NUMBER	PART	SYMB	NUMBER	PART
C1	2290	3 SECT. VAR. COND.	R1	3341	500 Ω RESISTOR
C2	2240	.05 MFD. TUBULAR COND.	R2	3342	300 Ω RESISTOR
C3	2046	.05 MFD. TUBULAR COND.	R3	3343	100,000 Ω RESISTOR
C4	2011	.002 MICA COND.	R4	3087	25,000 Ω RESISTOR
C5	2081	.00015 MICA COND.	R5	3341	500 Ω RESISTOR
C6	2046	.05 MFD. TUBULAR COND.	R6	3229	2 MEG Ω RESISTOR
C7	2289	.005 MFD. MICA COND.	R7	31150	30,000 Ω RESISTOR
C8	2188	.1 MFD. TUBULAR COND.	R8		20,000 Ω RESISTOR
C9	2046	.05 MFD. TUBULAR COND.	R9	3343	100,000 Ω RESISTOR
C10	2056	.01 MFD. TUBULAR COND.	R10	3343	100,000 Ω RESISTOR
C11	2046	.05 MFD. TUBULAR COND.	R11	3269	50,000 Ω RESISTOR
C12	2123	.0001 MICA COND.	R12	3217	260,000 Ω RESISTOR
C13	2081	.00015 MICA COND.	R13	3269	50,000 Ω RESISTOR
C14	2056	.01 MFD. TUBULAR COND.	R14	3275	4,500 Ω RESISTOR
C15	2022	.1 MFD. TUBULAR COND.	R15	3161	500,000 Ω RESISTOR
C16	2039	.25 MFD. TUBULAR COND.	R16	3340	650 Ω RESISTOR
C17	2259	.5 MFD. TUBULAR COND.	R17	8515	500,000 Ω VOLUME CONT.
C18	2259	.5 MFD. TUBULAR COND.	R18	3338	500,000 Ω TONE CONT.
C19	2288	PADDER, 450 MMFD.	R19	3272	40,000 Ω RESISTOR
C20	2288	PADDER, 1700 MMFD.	S	8517	GR'AT. WAVE BAND S.W.
C21		PADDER 170 MMFD.	T1	1335	POWER TRANSFORMER
C22	2282	8 MFD. FILTER COND.	T2	1337	RADIO TRANSFORMER
C23	2286	8 MFD. FILTER COND.	T3	7136	OUTPUT TRANS. (SPEAKER)
C24	2286	8 MFD. FILTER COND.	P		PHONO JACK TERMS.
L1	1338	MULTI BAND R.F. COIL	L5	1342	3-TUNED 2ND DET. TRANS.
L2	1333	MULTI BAND 1ST DET. COIL	L6	1336	FILTER CHOKE 200 Ω
L3	1330	MULTI BAND OSC. COIL	L7		SPEAKER FIELD 1400 Ω
L4	1341	3-TUNED I.F. TRANS.			

SOCKET VOLTAGES					
TUBE	HEATERS	PLATE TO CATHODE	CATHODE TO GROUND	SCREEN TO CATHODE	GRID TO GROUND
58 R.F.	2.5	260	3.8	90	
2A7 DET.	2.5	260	2.8	90	
2A7 OSC.		175			
58 I.F.	2.5	260	3.8	90	
2A6 DET.	2.5	115	1.2		
2A5 AUD.	2.5	230	160		
45's	F.L. = 2.5 P.T. TO GROUND = 260 GRID TO GND. = 75.0				
80	B+ BEFORE 1ST FILTER COND. = 335 B+ AT 2ND FILTER COND. = 320 B+ AT OUT PUT OF FILTER = 260				

BAND A 540-1800 KC.
BAND B 1600-5500 KC.
BAND C 5.4-18 MC
BAND D 140-400 KC.

MODEL 804
18 MC TO 540 KC 3 BANDS

MODEL 805
18 MC. TO 140 KC. 4 BANDS



VIEW OF FRONT PANEL

FIG.4

FIG. 3

The Models 804 and 805 are all wave superheterodyne receivers designed to operate on 110-120 or 210-230 volts, alternating current, 50-60 cycles only. The primary tap on top of the power transformer must be connected properly for the voltage to be used.

Before plugging into the power line, make sure that the line voltage and current frequency agree with the above. If doubt exists regarding the exact power line conditions, consult your local power Company.

Check the tubes to be certain that they are securely pushed into their respective sockets, and that the grid clips on top of the tubes are firmly in place. Also check the speaker plug to see that it is securely pushed into its socket at the rear of the Chassis.

TUBES 2-58s, 1-2A7, 1-2A6, 1-2A5, 2-45s, 1-80

INSTALLATION This receiver is arranged for a "Doublet" Antenna system, or an ordinary single wire system. For connections of either type see Fig. #3a & 3B. A good Antenna is essential for the correct operation of this receiver, especially where distant reception is expected. The flat top portion of the Antenna should be placed as high as possible above the ground and surrounding objects. No. 14 solid or stranded wire may be used for the flat top portion and well insulated semi-flexible wire for the lead-in section. The Antenna should be equipped with good insulators wherever they are required. Material such as pyrex, glass, Bakelite, and high grade porcelain are well suited for radio installations. The lead-in wire should be kept away from all nearby wires and should be run at right angles to power or trolley lines wherever possible. It should be brought into the house at the nearest point convenient to the receiver in order to avoid picking up noise from home electrical devices. The ground wire should be as short as possible and must be a good connection to water or other grounded pipe.

SERVICE NOTES

REALIGNMENT The procedure outlined below should be followed should the receiver require realignment. For location aligning trimmers and padders, see Fig. 2.

I. F. ALIGNMENT To align the Intermediate Frequency stages, first place the Wave Band Switch in Pos. "A" and Short Circuit the Oscillator Section of the Variable Condenser. Set the test Oscillator to 456 K.C. and connect its output through A .00025 MFD fixed Condenser to the grid cap of the 2A7 Tube and chassis ground. Adjust the six I. F. Compensators (Three on each I.F. Transformer) for Max Signal. (Volume Control must be in maximum position during all adjustments. Use the least possibe input to the receiver to prevent broadening of the resonance peaks.)

BAND "A" (BROADCAST) ALIGNMENT After the Intermediate Frequency stages have been completely aligned, connect external test oscillator to the Antenna and Ground binding posts of the set. See Fig. 3-A. Set the band switch to "A" position. Set test Oscillator to 1500 K.C. and adjust the three band A Compensators for maximum gain. Next, set dial at 600 K.C. and adjust Band "A" Paddler for maximum signal, rocking Variable Condenser at the same time. Now repeat repeaking operation at 1500 K. C.

BAND "B" ALIGNMENT Turn Wave Band Switch to "B" Position and set Variable Condenser to 5000 K. C. Adjust test oscillator to this frequency and adjust 3 band "B" Trimmers for maximum gain. Next set dial at 1900 K. C. and adjust band "B" Paddler for maximum signal. Now repeat repeaking operation at 5000 K. C.

BAND "C" (SHORT WAVE) ALIGNMENT Turn Wave Band Switch to "C" position and set Variable Condenser to 16 megacycles. Adjust test oscillator to this frequency and adjust three band "C" Trimmers.

BAND "D" (LONG WAVE) ALIGNMENT Turn wave Band Switch to "D" position and align Trimmers on long wave coils at 575 K.C. Adjust Band "D" Padder at 160 K. C.

BAND SPREAD DIAL This receiver is provided with a dual station selector drive, to permit micrometer tuning which is especially valuable on the short waves where band spreading or its equivalent, high ratio tuning, becomes necessary for easy and rapid registering of foreign programs.

The large knob of the main selector drive is the low ratio control with a normal ratio of 24 to 1 in 3600. The small knob on the same shaft controls the high ratio control with a tuning ratio of 125 to 1 in 3600. Bands "A" and "B" are calibrated in kilocycles and Band "C" in megacycles. The Small Band Spread Indicator may be used to make fine adjustments not obtainable from the larger scale.

PHONOGRAPH PICKUP It is also possible to use this receiver with an electric phono pickup attachment for the reproduction of disc recordings. For this purpose, a Phono Jack is located at the rear of the Chassis. The volume Control will control the strength of signals for phonograph reproduction (any high impedance pickup of high quality may be used with this receiver.)

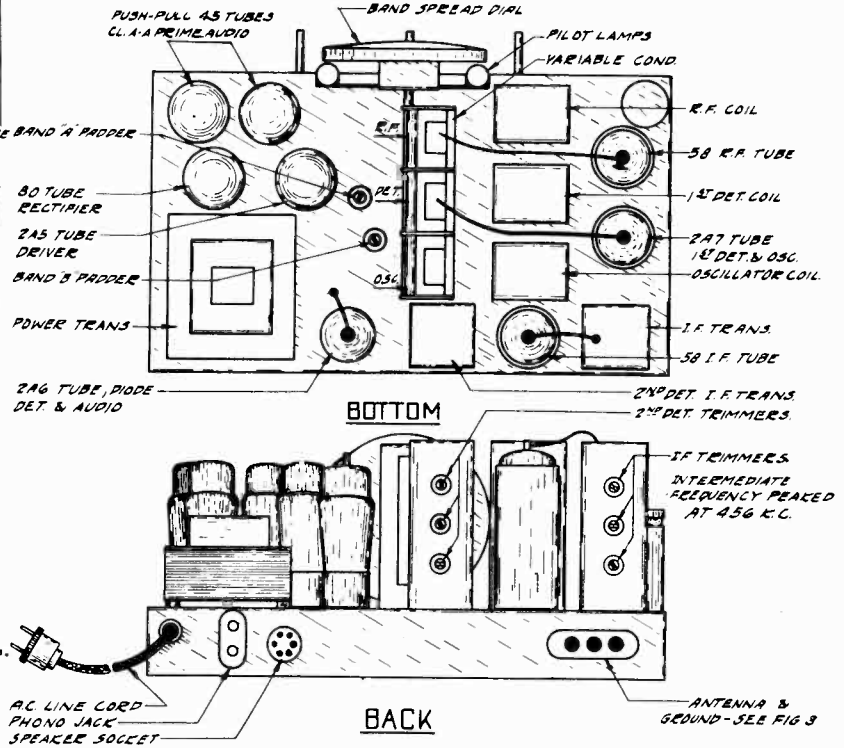
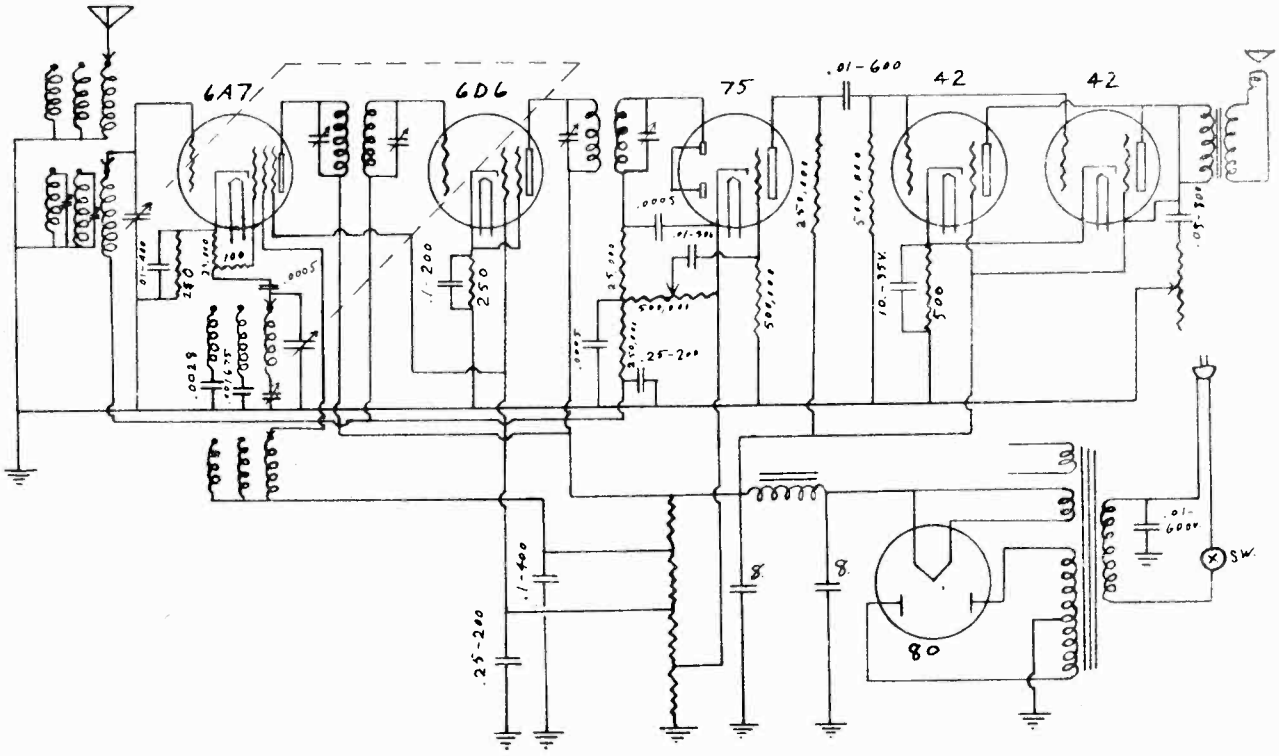
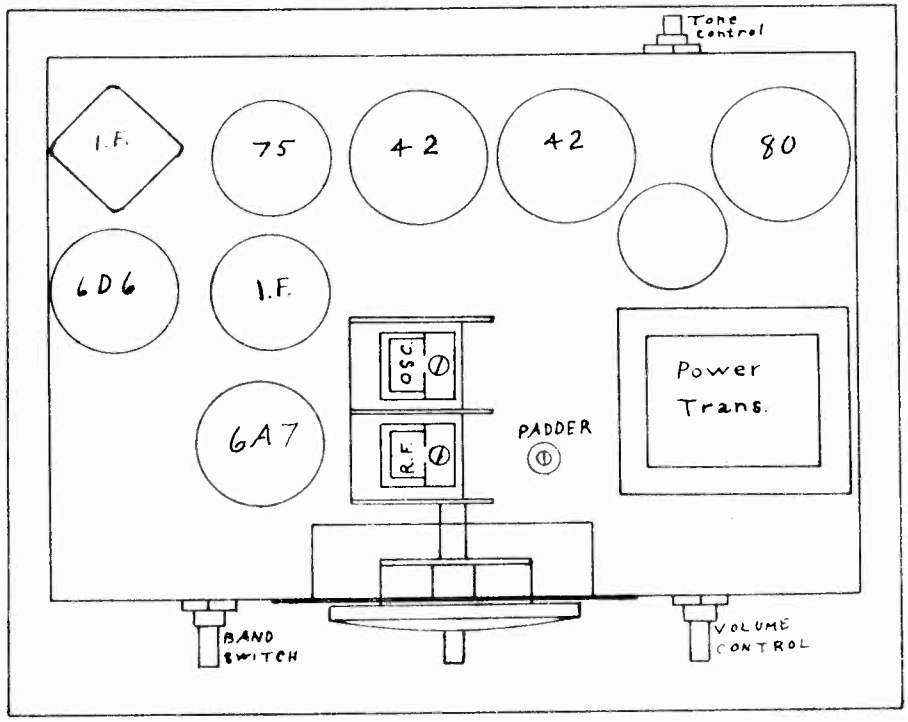


FIG. 2

ECHOPHONE RADIO MFG. CO.

MODELS 139,139C
Schematic, Socket
Trimmers





MODELS 139,139C
Alignment

ECHOPHONE RADIO MFG. CO.

SERVICE MANUAL

MODELS #139 - #139C

This receiver is a six tube superheterodyne, designed to operate on 105 to 120 volts alternating current, 60 cycle and can also be furnished for 25 cycle.

Tube complement:
1 - 6A7 - first detector and oscillator
1 - 6D6 - I F amplifier
1 - 75 - second detector-AVC- 1st audio
2 - 42 - in parallel - power output
1 - 80 - rectifier

This receiver covers the following three wave bands:
540 - 1720 kilocycles
1720- 5000 kilocycles
5.5- 16 megacycles

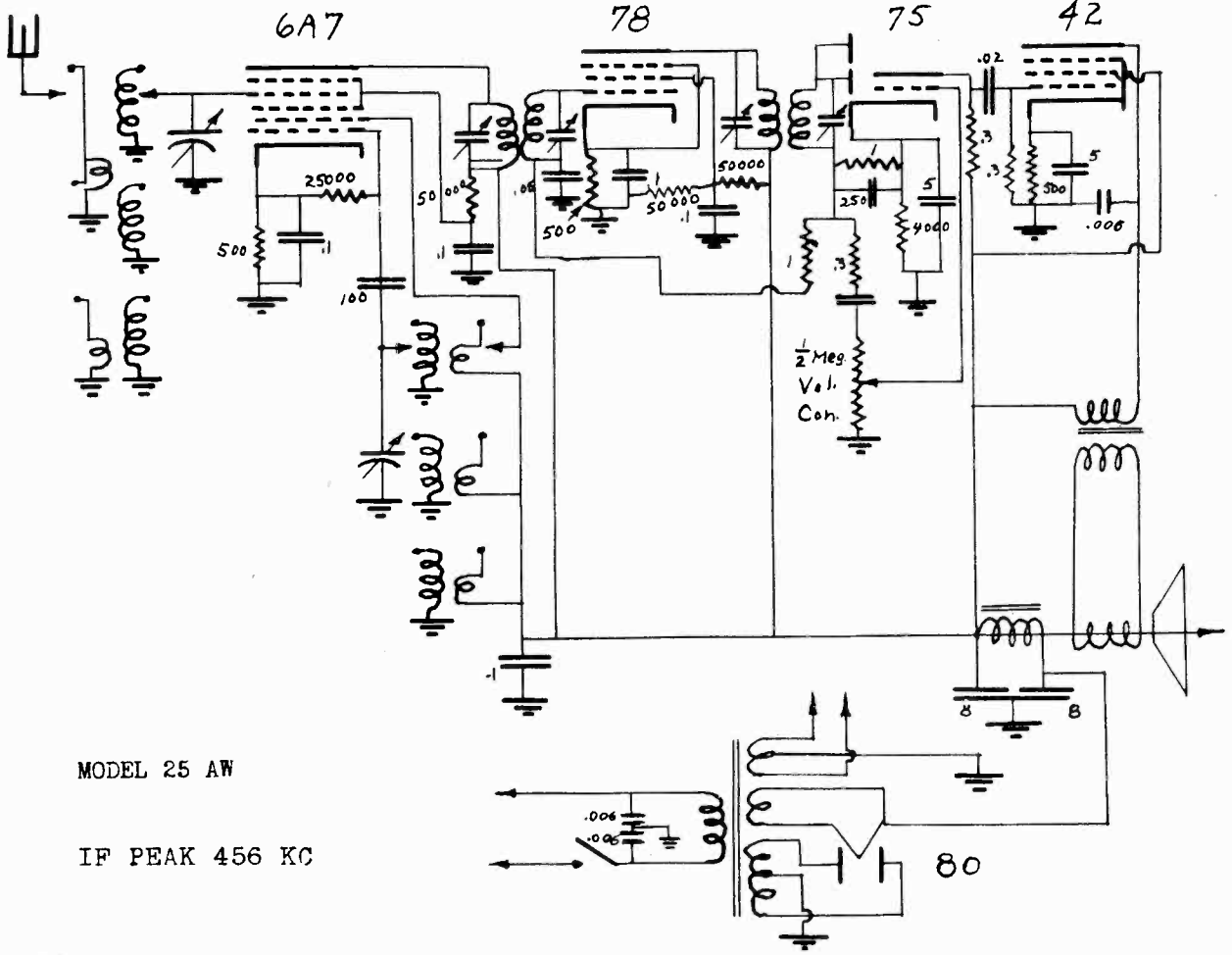
Very satisfactory results should be obtained with an antenna of from 40 to 75 feet long, well insulated and erected well up above ground and at least ten feet away from surrounding objects.

To align receiver, proceed as follows:

1 - Apply 456 KC note to control grid of 6A7 and peak I F transformers for maximum gain.
2 - Apply 4000 KC note to antenna wire; set band switch to second band and align trimmer on oscillator section of variable condenser to track with 4000 KC on dial.
3 - Turn band switch to broadcast band; apply 1500 KC note to antenna wire, adjust trimmer on RF section of variable condenser for maximum gain.
4 - Apply 600 KC note to antenna, adjust padder condenser for maximum gain, swinging condenser back and forth across 600 KC signal.
5 - Check 1400 KC signal for alignment.
6 - Turn band switch to second band; check 4000 KC signal for alignment and adjust trimmer on antenna coil for greatest gain at 4000 KC.
7 - Turn band switch to last band and adjust trimmer on antenna coil for greatest noise on 12 megacycles.

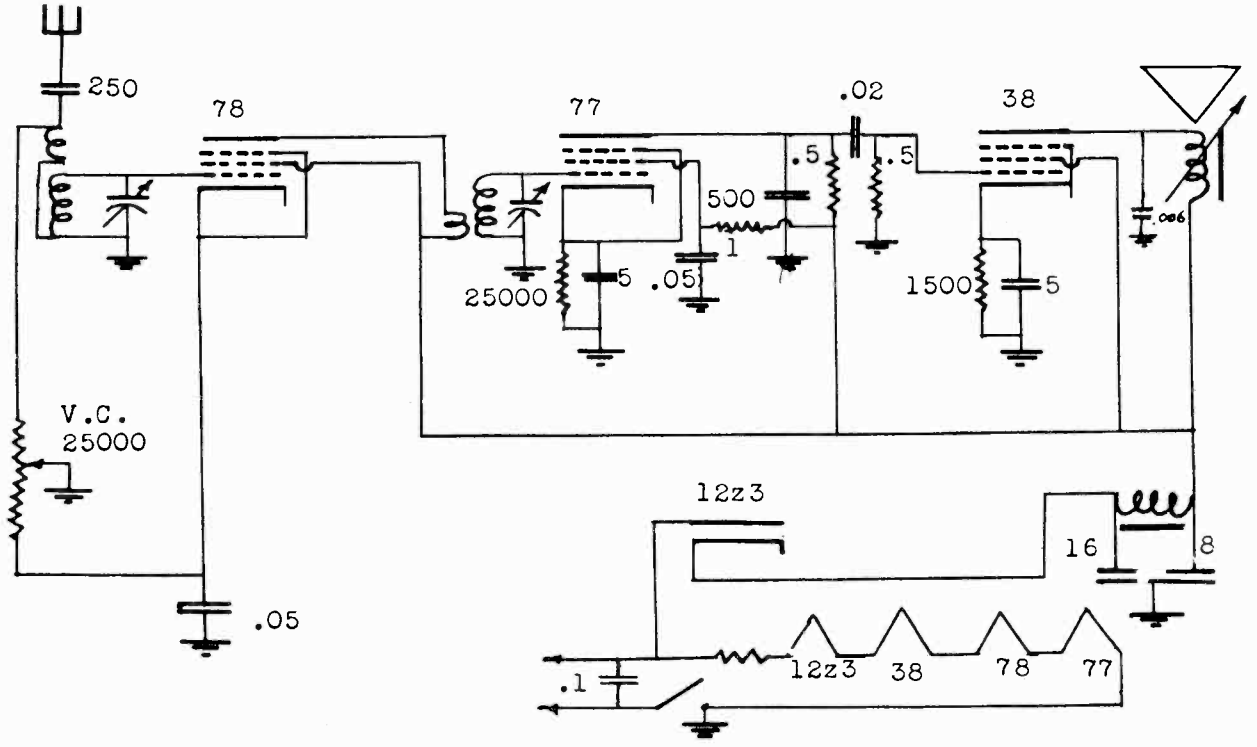
MODEL 4M
MODEL 25-AW
Schematics

ELECTRIC & AUTOMOTIVE PROD. CO.



MODEL 25 AW

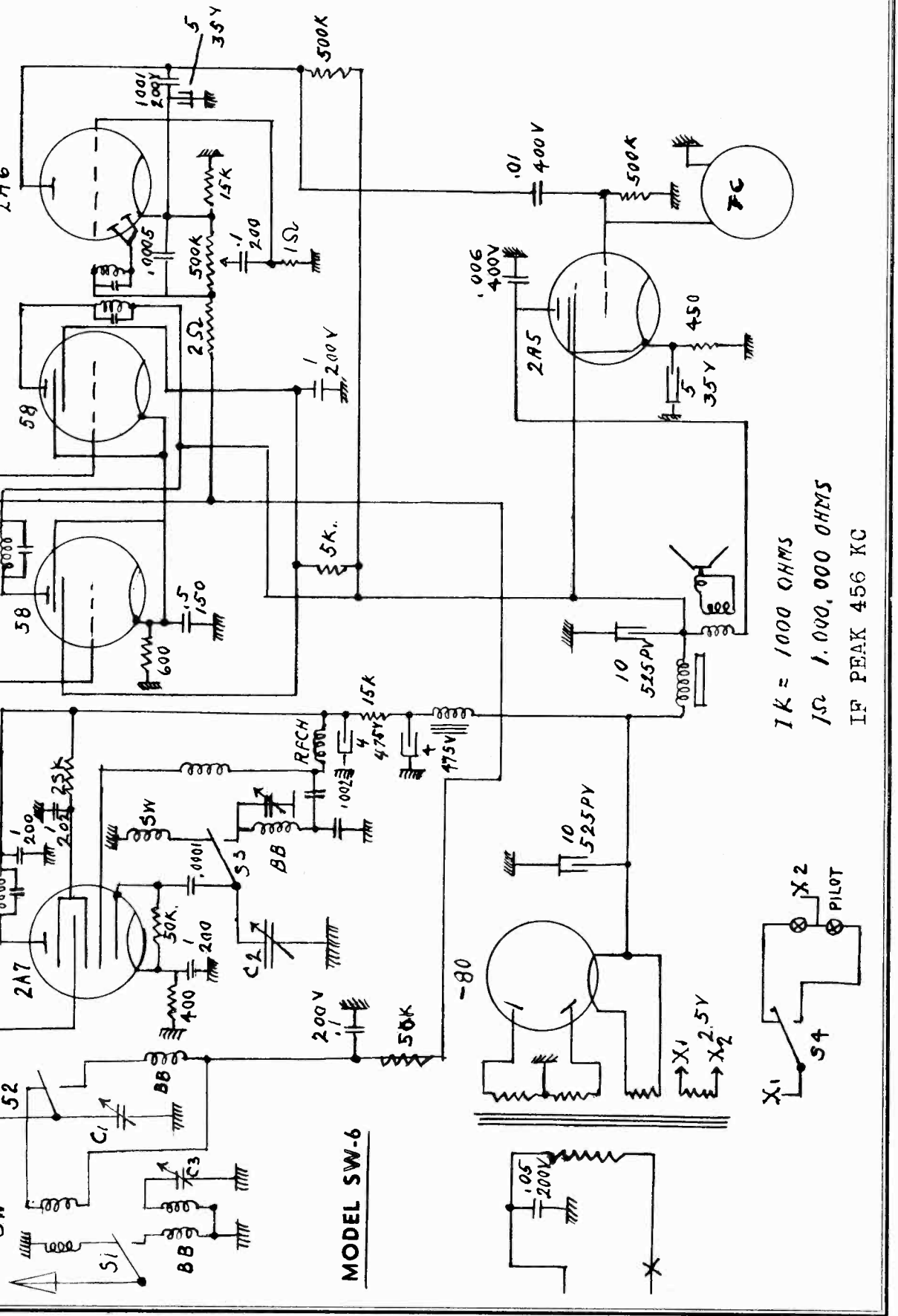
IF PEAK 456 KC



MODEL 4M.

MODEL SW-6
Schematic

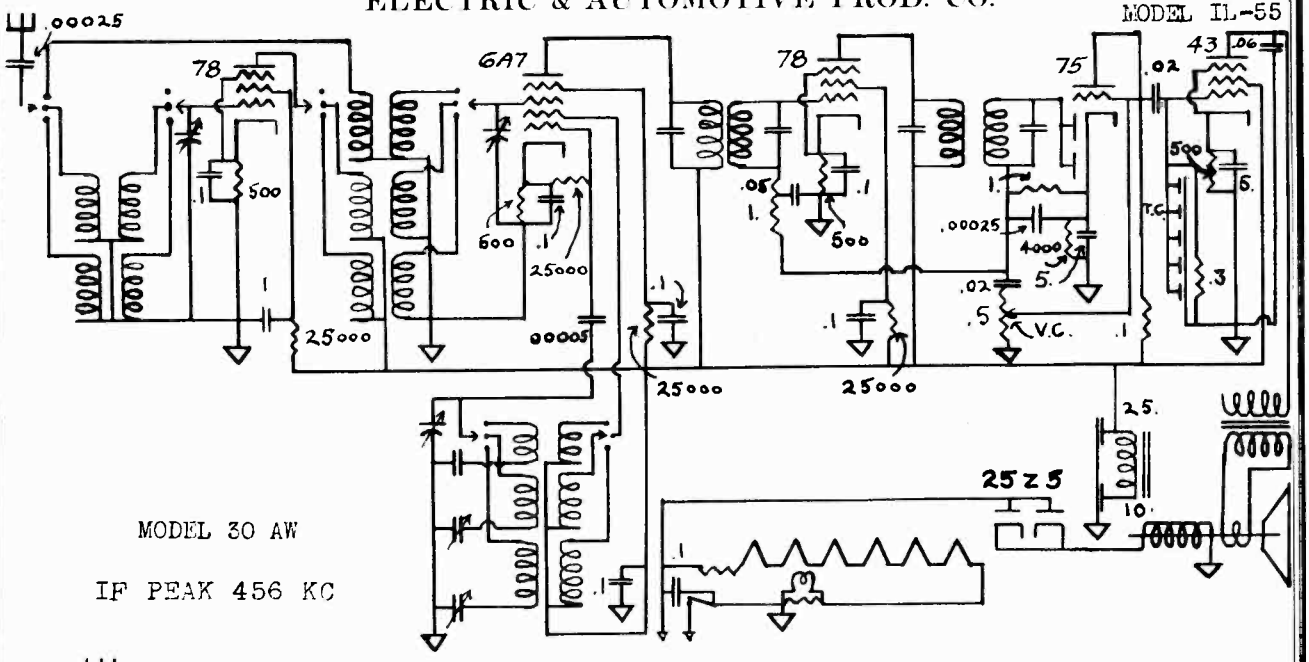
ELECTRIC & AUTOMOTIVE PROD. CO.



Schematics

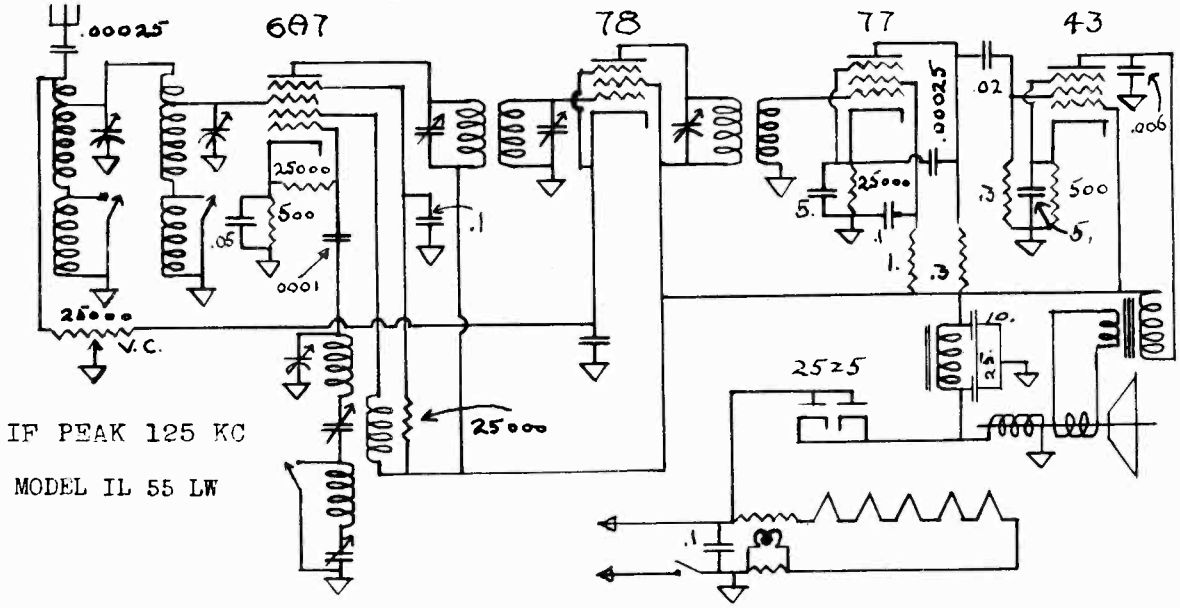
ELECTRIC & AUTOMOTIVE PROD. CO.

MODEL IL-5
MODEL 30-AW
MODEL IL-55



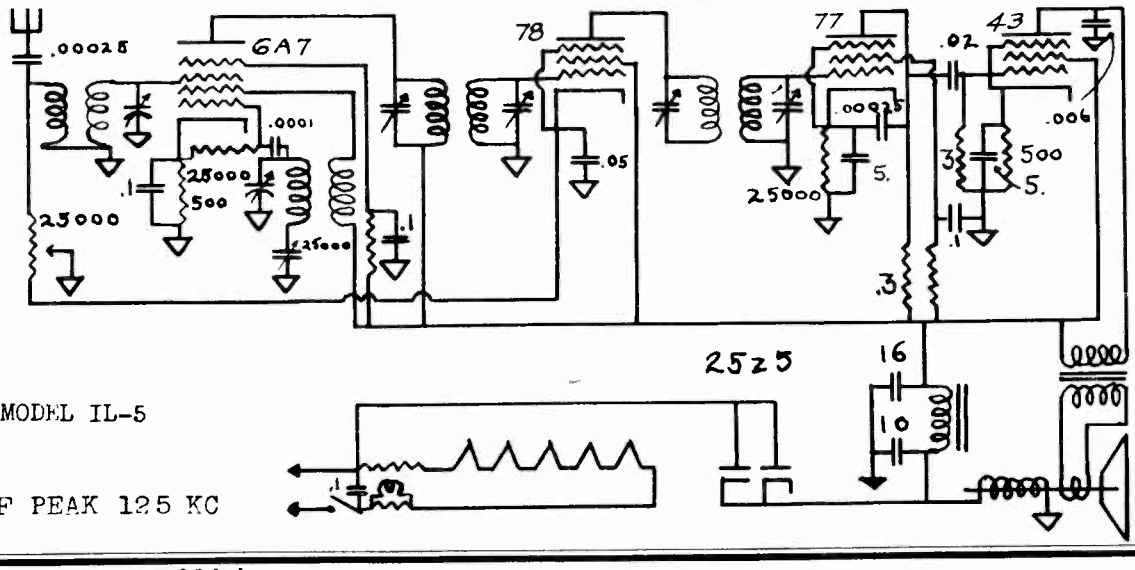
MODEL 30 AW

IF PEAK 456 KC



IF PEAK 125 KC

MODEL IL 55 LW

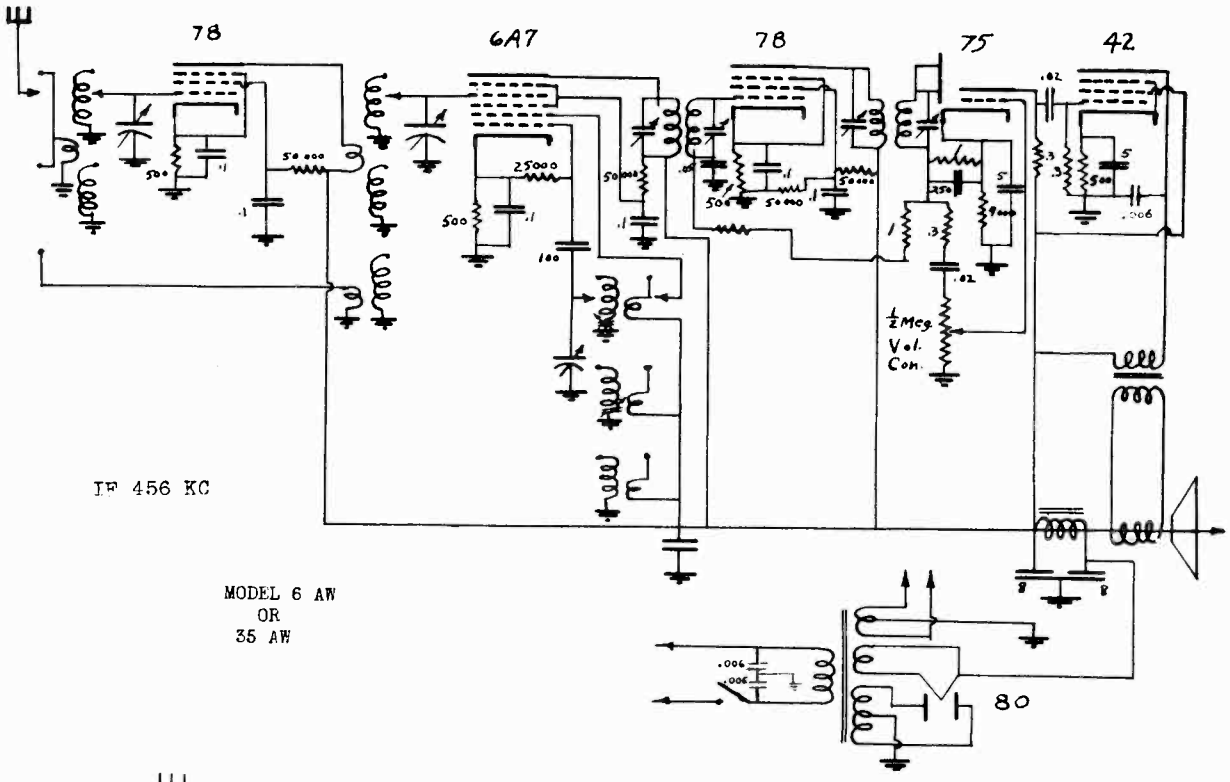


MODEL IL-5

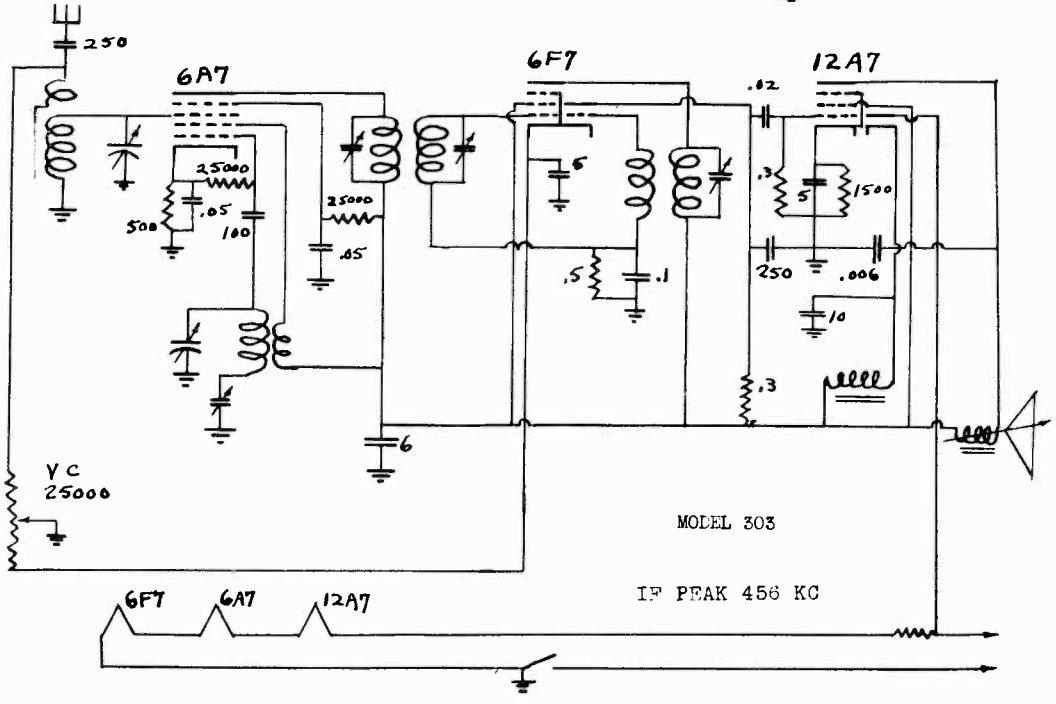
IF PEAK 125 KC

MODEL 6-AW,35-AW
MODEL 303
Schematics

ELECTRIC & AUTOMOTIVE PROD. CO.



MODEL 6 AW
OR
35 AW

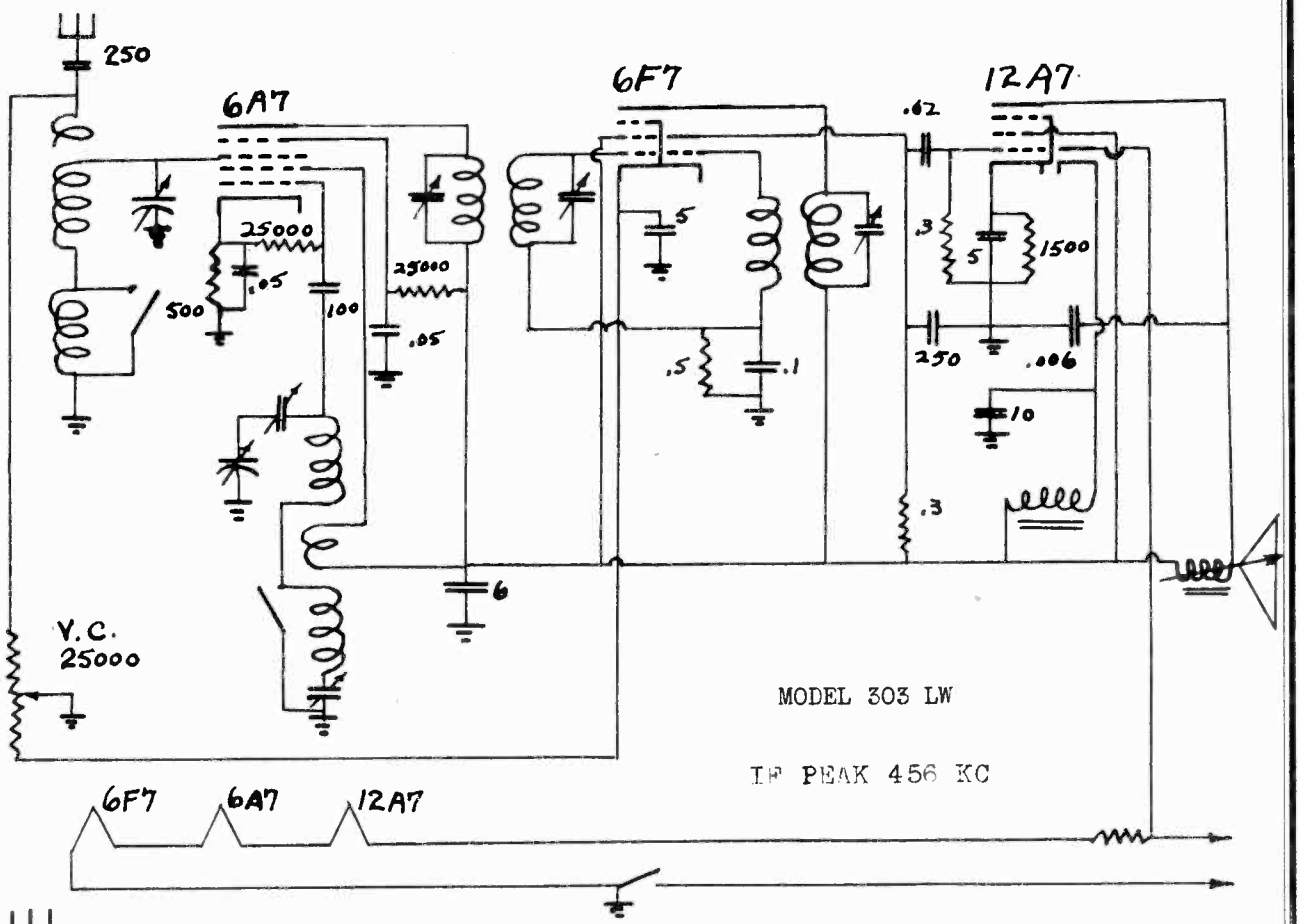


MODEL 303

IF PEAK 456 KC

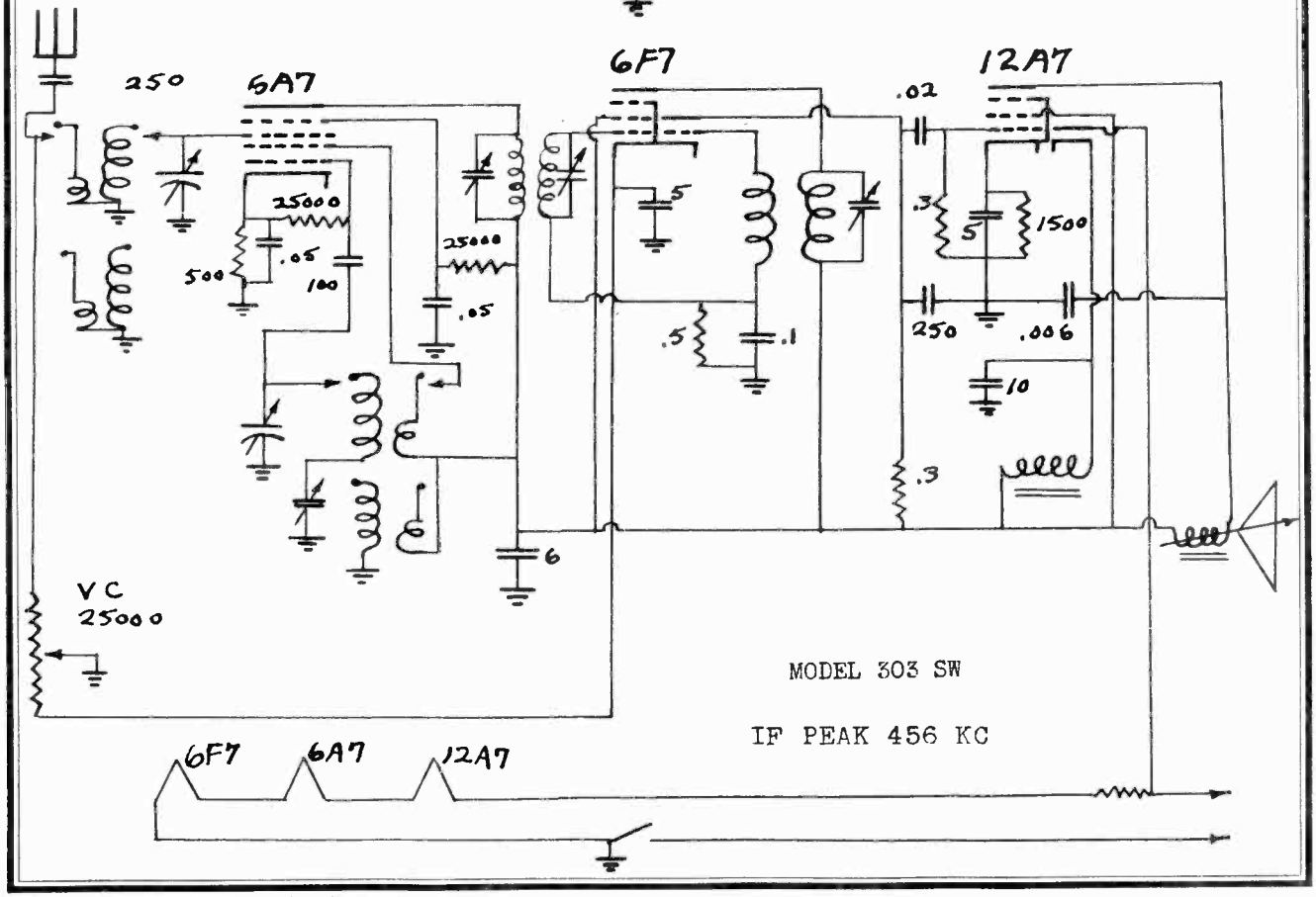
MODEL 303-LW
MODEL 303-SW
Schematics

ELECTRIC & AUTOMOTIVE PROD. CO.



MODEL 303 LW

IF PEAK 456 KC

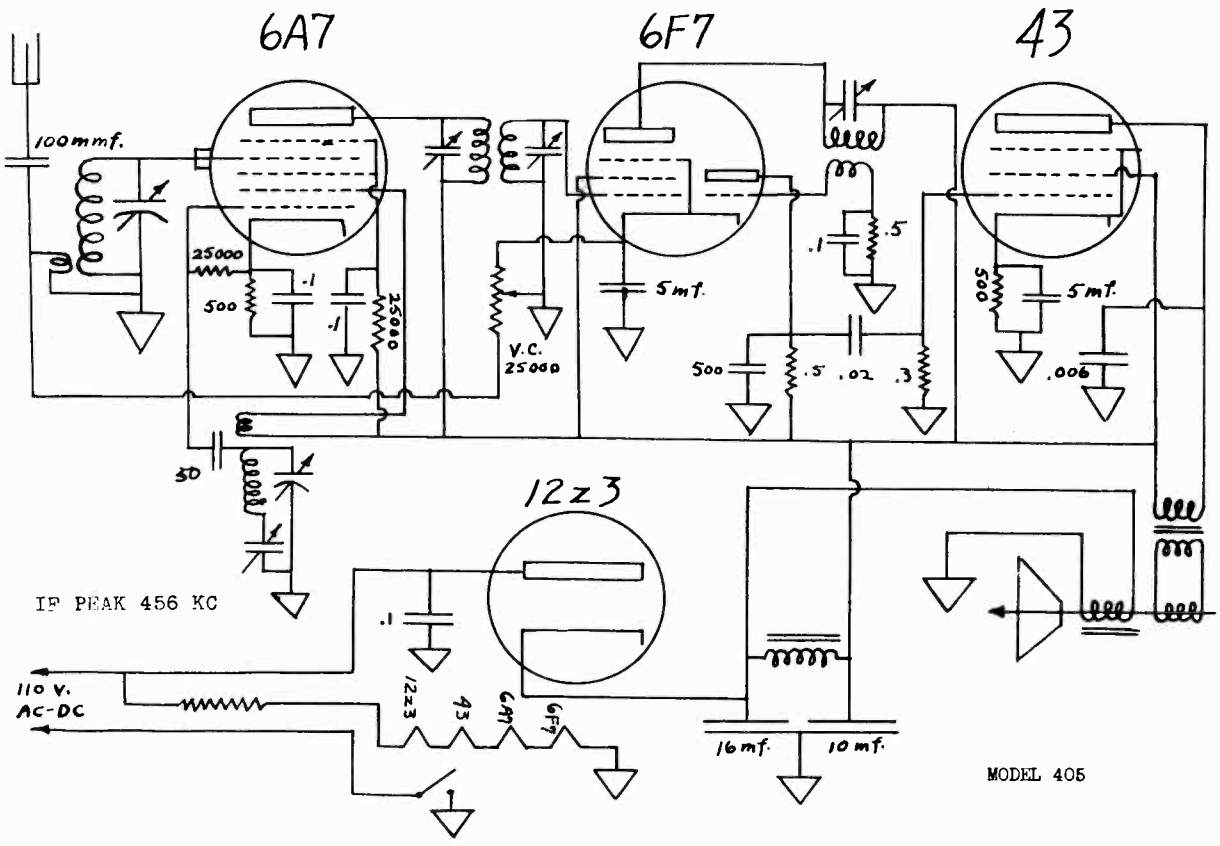


MODEL 303 SW

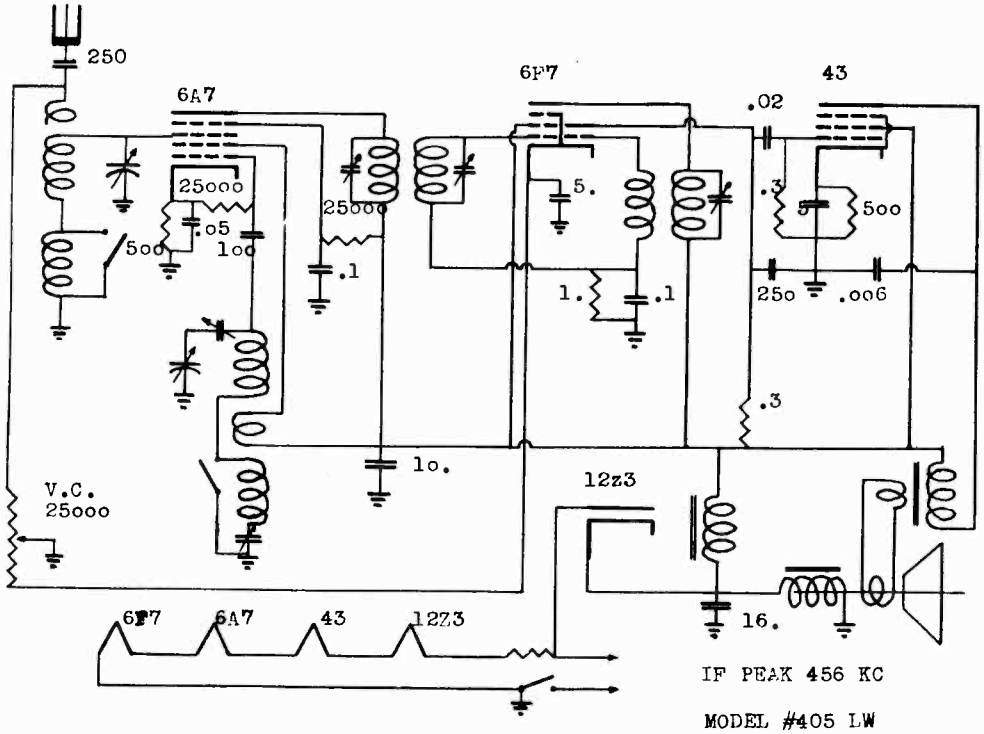
IF PEAK 456 KC

MODEL 405
MODEL 405-LW
Schematics

ELECTRIC & AUTOMOTIVE PROD. CO.



MODEL 405

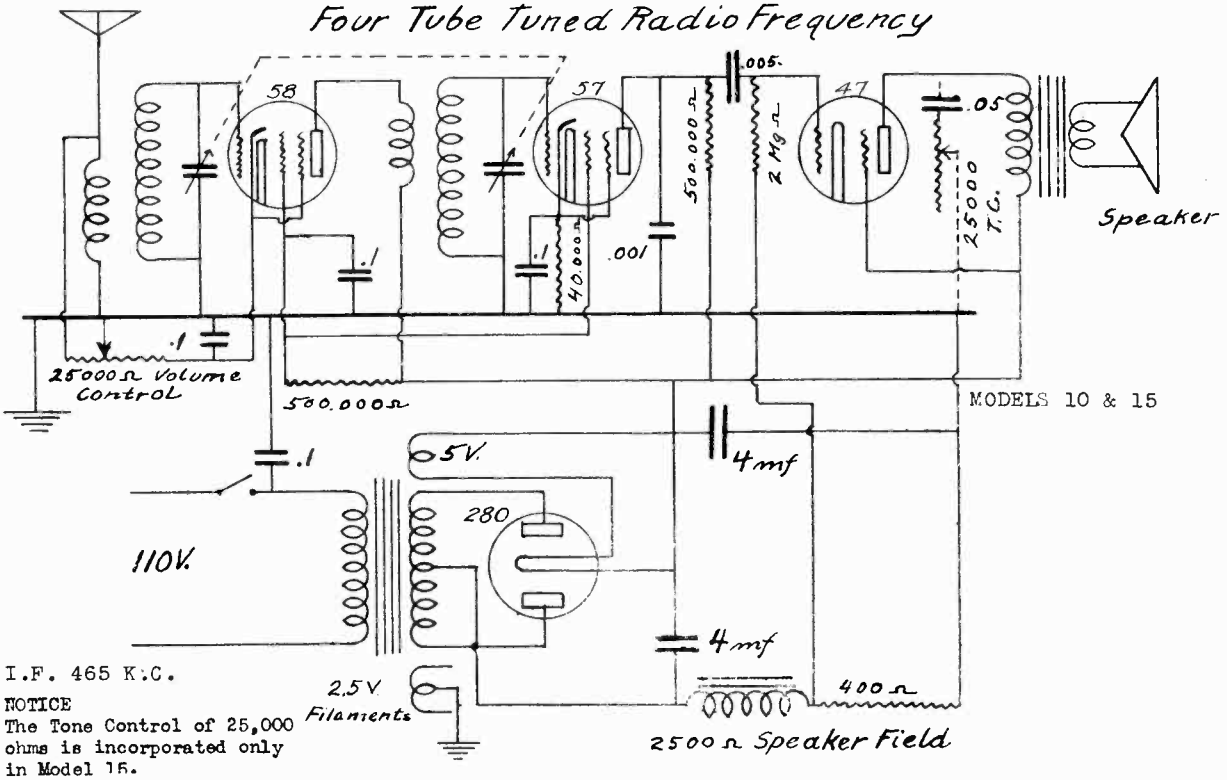


MODEL #405 LW

EL-REY RADIO MFG. CO.

MODELS 10,15
MODEL 20
Schematics

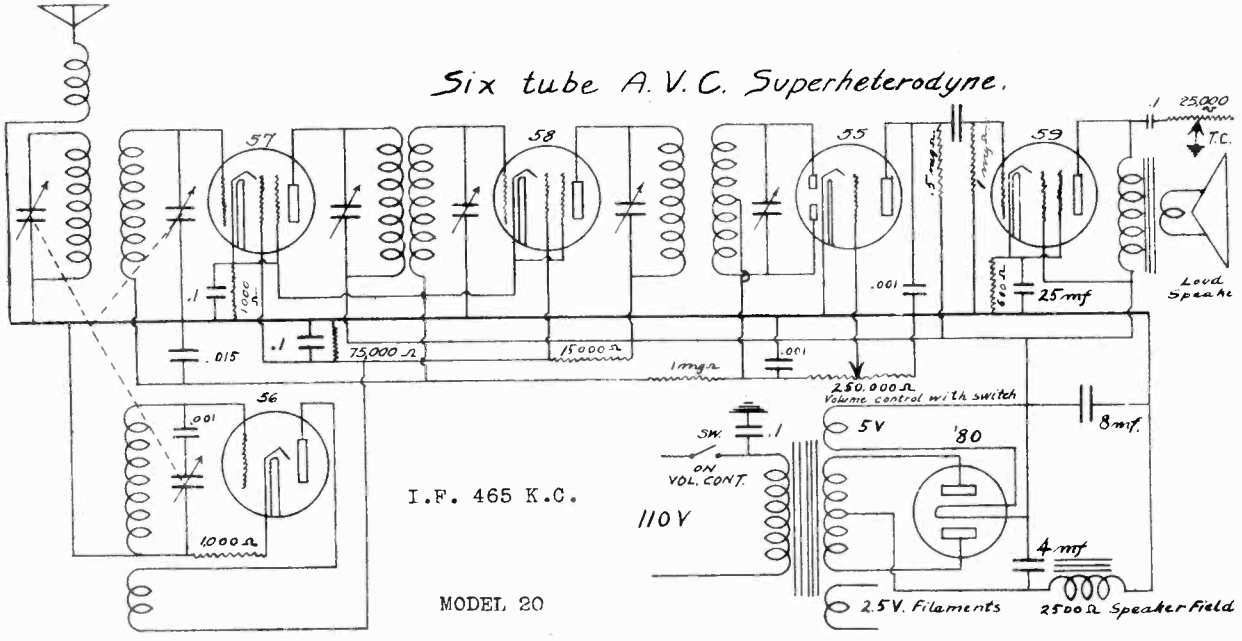
Four Tube Tuned Radio Frequency



I.F. 465 K.C.

NOTICE
The Tone Control of 25,000 ohms is incorporated only in Model 15.

Six tube A.V.C. Superheterodyne.

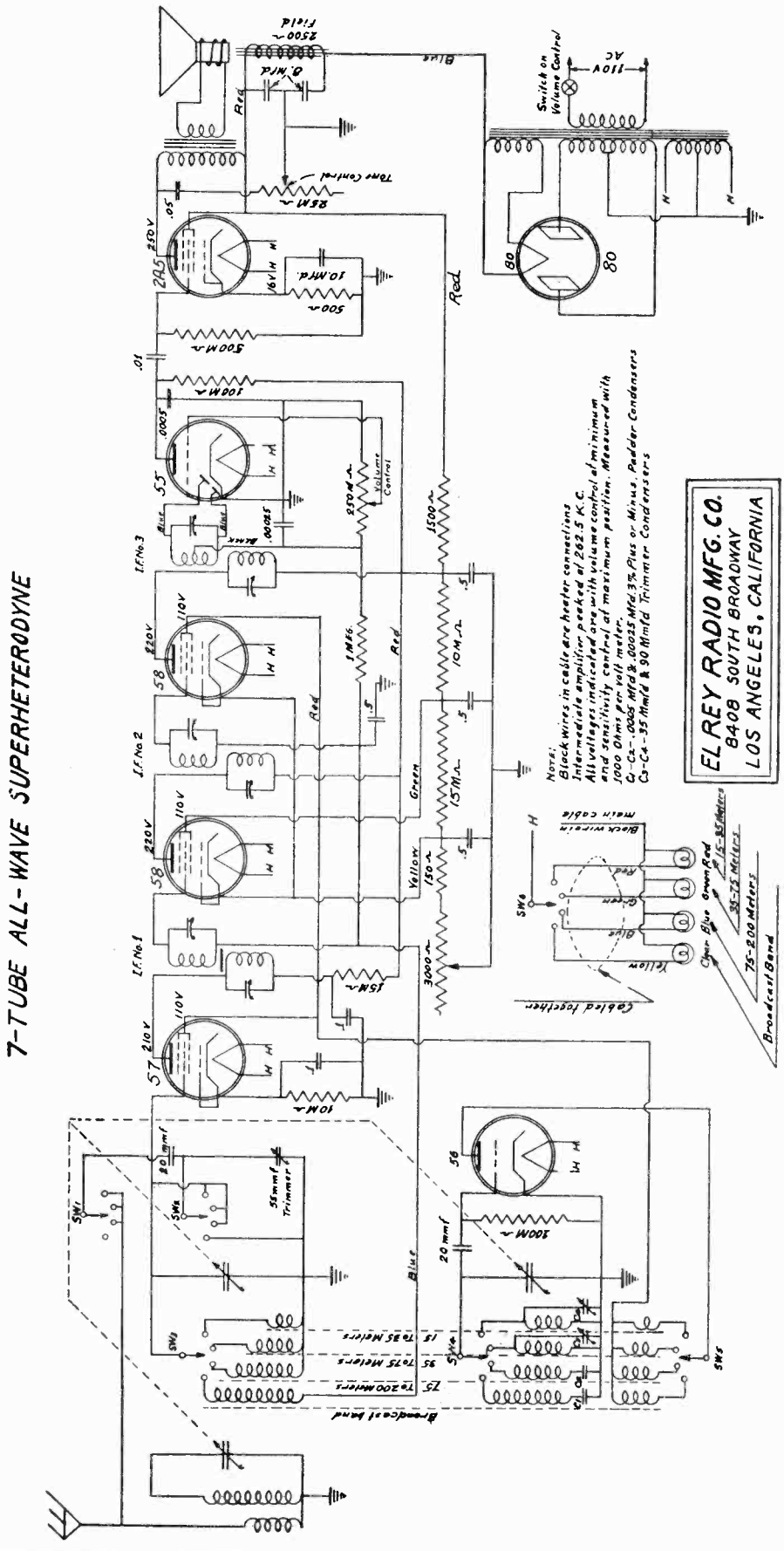


I.F. 465 K.C.

MODEL 20

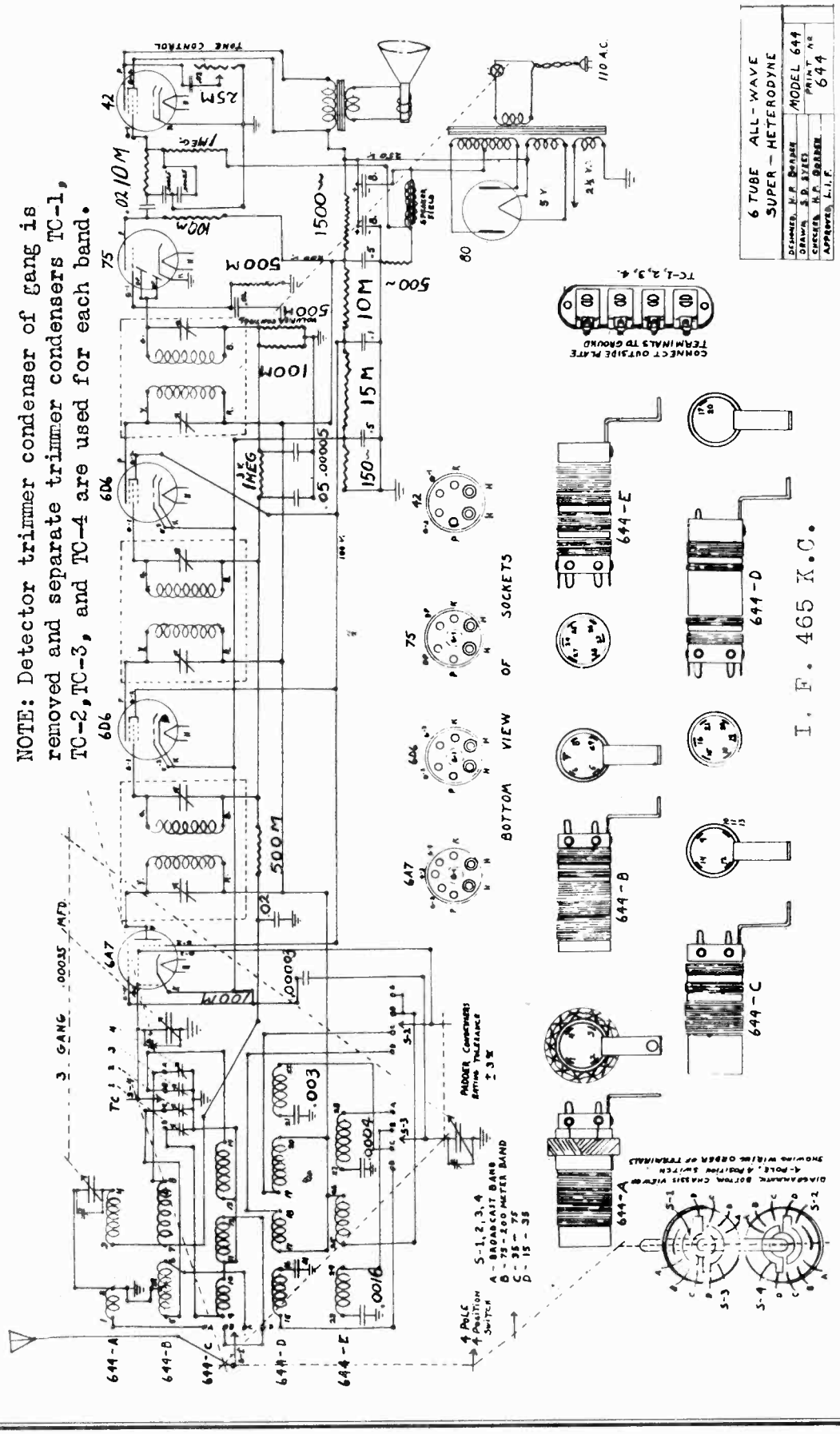
MODEL 7-Tube A-W.
Superhet.
Schematic

EL-REY RADIO MFG. CO.



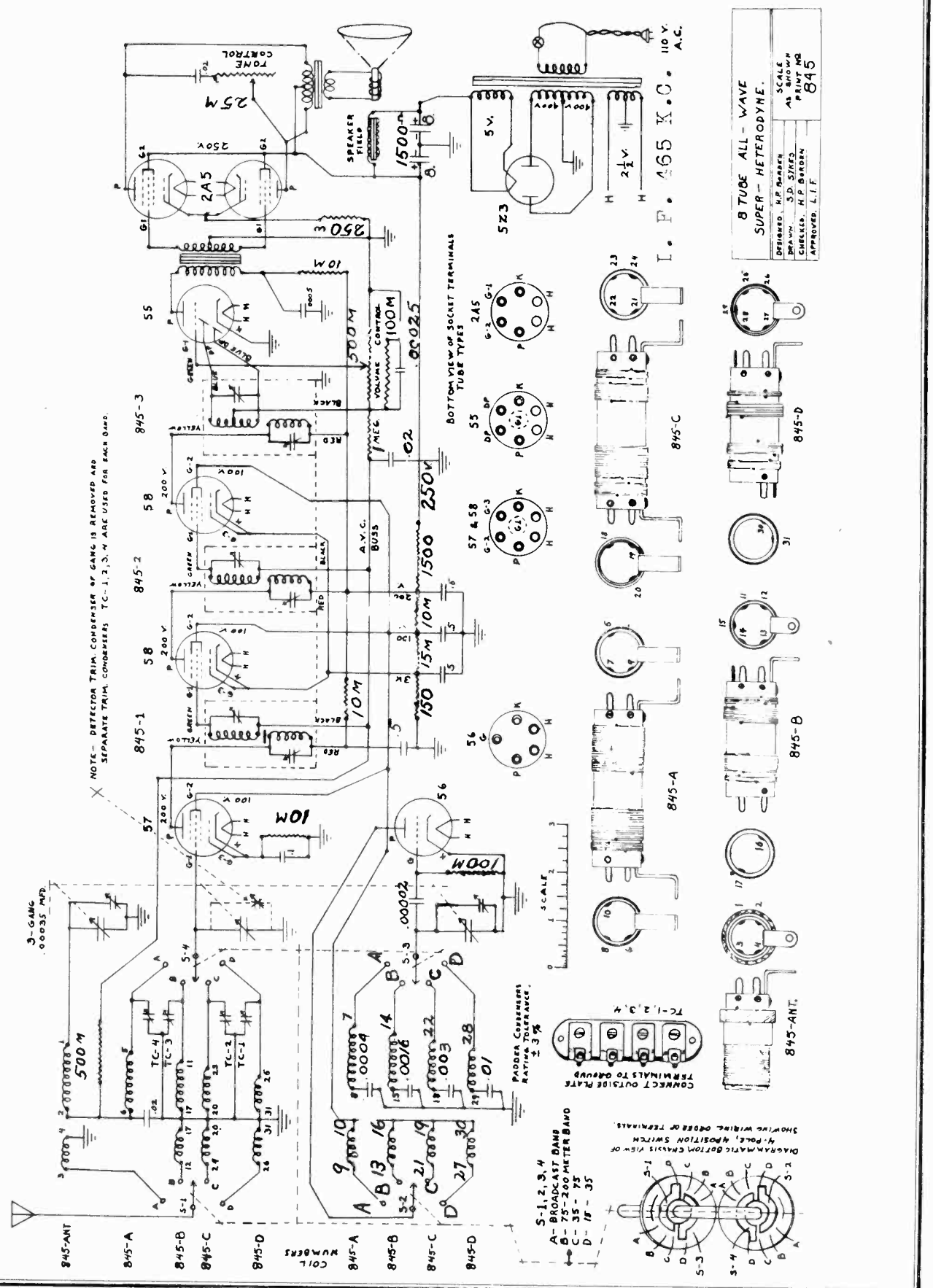
MODEL 644
Schematic

EL-REY RADIO MFG. CO.



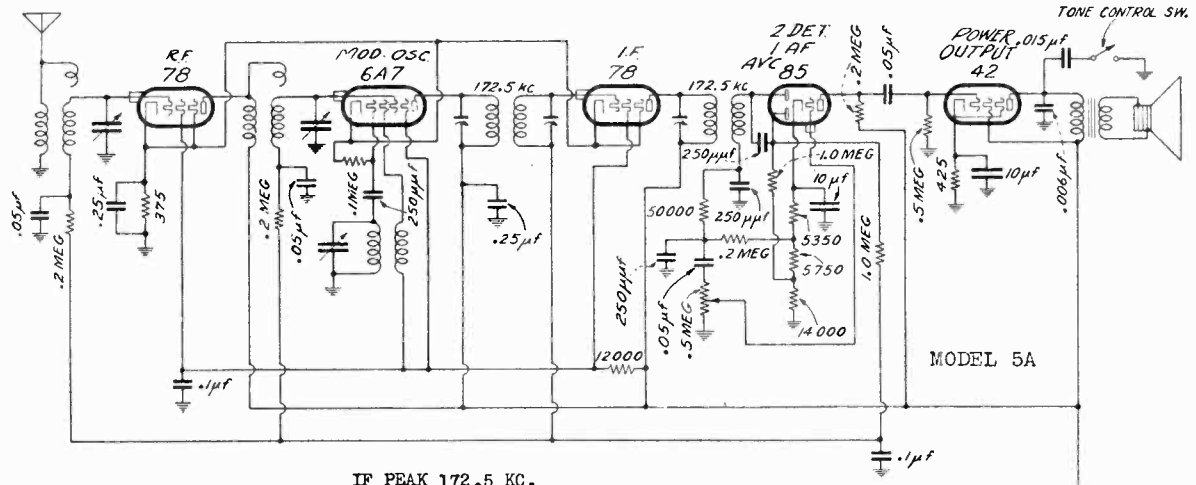
MODEL 845
Schematic

EL-REY RADIO MFG. CO.

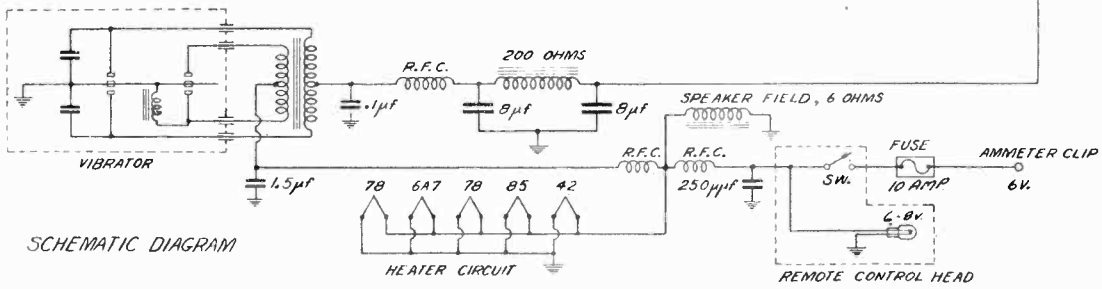


EMERSON RADIO AND PHONOGRAPH CORPORATION

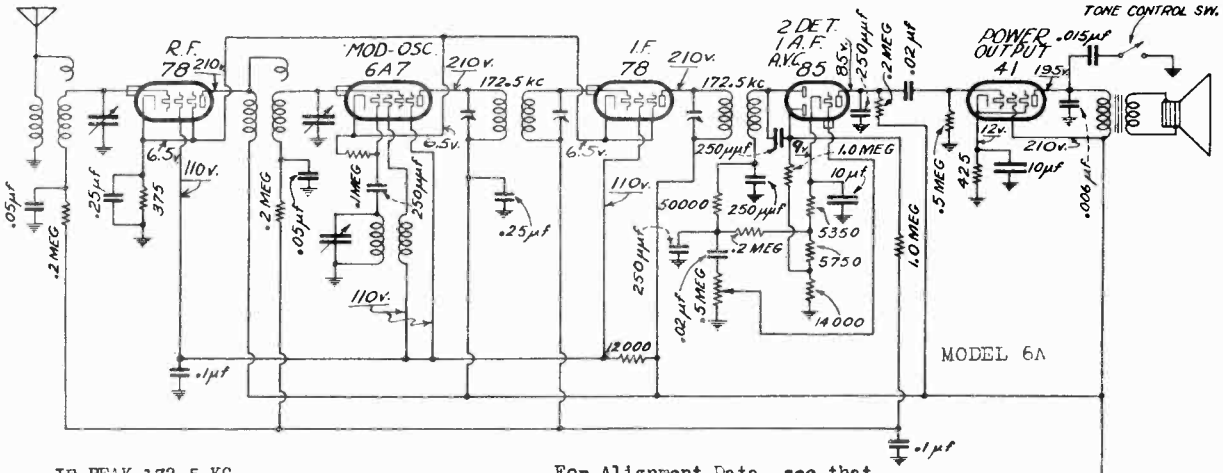
MODEL 5A
Schematic
MODEL 6A
Schematic, Voltage



IF PEAK 172.5 KC.

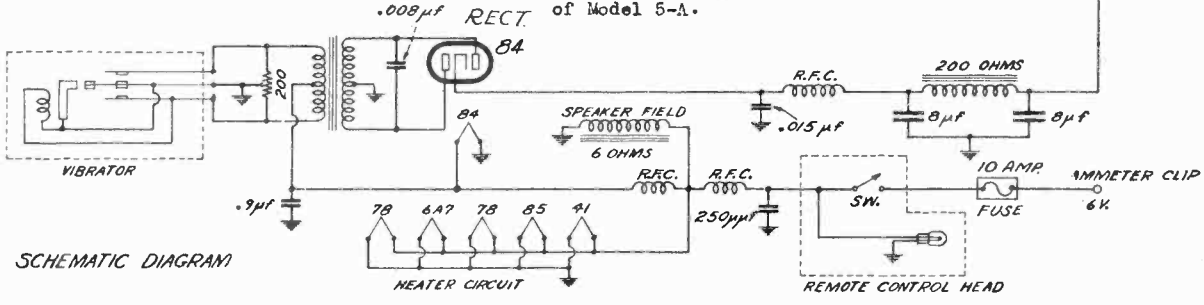


SCHEMATIC DIAGRAM



IF PEAK 172.5 KC.

For Alignment Data, see that of Model 5-A.



SCHEMATIC DIAGRAM

MODEL 5A
Alignment, Voltage
MODEL 6A
Alignment

EMERSON RADIO AND PHONOGRAPH CORPORATION

Remove bottom cover. See that all tubes are pushed down in their sockets, and that the grid clips are in place. Remove clamp holding vibrator in socket by removing screw fastening it to transformer case. Note whether vibrator is polarized correctly (i.e., if receiver is to be installed in car having the negative side of the battery grounded, the red arrow on transformer case should point to (—) on top of the vibrator). The polarity may be changed by removing the vibrator from socket, turning the complete unit until correct polarity sign is indicated by arrow, and then re-inserting into socket. The polarity must be correct, otherwise serious damage might be incurred to both vibrator and receiver. Replace the clamp over the vibrator after this has been checked.

Below is a list of cars and their correct polarization:

Positive Ground

Auburn	Ford	Nash
Austin	Graham	Packard
Cadillac	Hudson	Pierce Arrow
Chrysler	Hupmobile	Plymouth
De Soto	La Fayette	Studebaker
Dodge	La Salle	Terraplane

Negative Ground

Buick	Lincoln	Reo
Chevrolet	Oldsmobile	Stutz
Duesenberg	Pontiac	Willys

Intermediate Transformers

To align the intermediate frequency transformers, use a good modulated oscillator set for 172½ kc. Set the volume control for maximum volume and turn the dial to a point where little or no signal is received; then ground the antenna.

Connect the oscillator output between the grid of the 6A7 tube and ground. Connect an output meter across the primary of the speaker transformer, or across the voice coil. Using the smallest output from the test oscillator that will give a small reading on the meter, adjust the two i.f. transformers for the largest reading obtainable. Use a non-metallic screw driver if possible.

Radio Frequency and Oscillator

To align the r.f. and oscillator sections, couple the oscillator through a standard dummy antenna to the antenna lead and ground of the receiver. Set the test oscillator to some frequency near 1400 kc. Set the dial to the frequency selected. Adjust trimmers on the variable condenser, beginning with the oscillator trimmer. Reduce the output of the test oscillator and repeat. In the absence of an oscillator, the r.f. sections may be aligned on broadcast signals. Tune in a weak station between 1350 and 1450 kc. and align as before. If an output meter is not available, adjust for maximum volume, then reduce the input and repeat.

Voltage Analysis:

NOTE: All "B" and "C" voltages should be measured on a high resistance voltmeter of 1000 ohms per volt or over.

The voltages are measured to ground from the points named. Ground the antenna to its shield when taking readings.

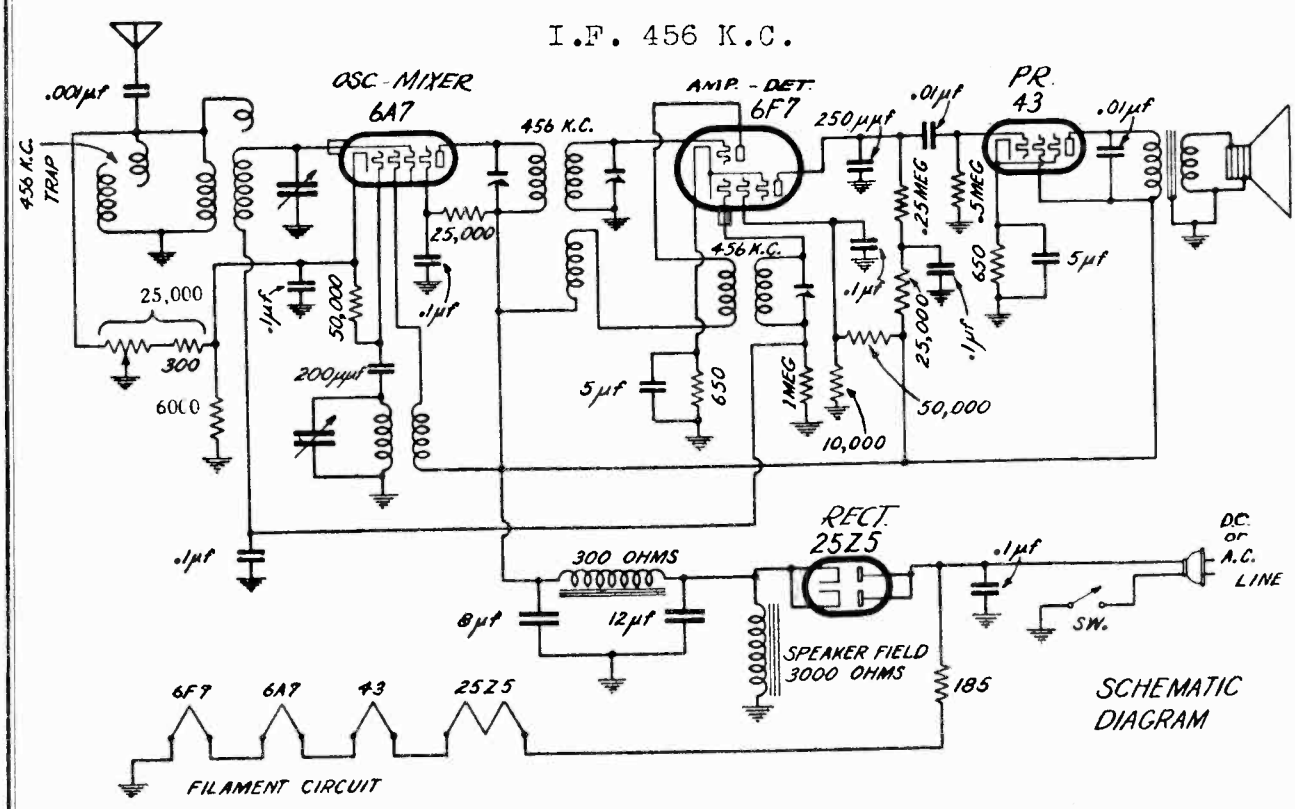
Battery volts—6.3, voltage across heaters—5.5, voltage across speaker field—5.5:

Tube	*Plate*	*Screen*	*Cathode*	*Suppressor*	*Osc. Plate*
78	215	110	10	10	—
6A7	215	110	10	—	110
78	215	110	10	10	—
85	95	—	9.5	—	—
42	205	215	12.5	—	—

MODEL 19
Chassis UV4
Schematic
Voltage, Parts

EMERSON RADIO AND PHONOGRAPH CORPORATION

I.F. 456 K.C.



CAUTION — UNDER NO CIRCUMSTANCE ALLOW A GROUND WIRE TO COME IN CONTACT WITH THE METAL PARTS OF THIS RECEIVER.

Voltage Readings:

Measurements should be made with the volume control on full, using a d-c voltmeter of 1000 ohms-per-volt. Measurements are given from the point indicated to ground, with an input power line voltage of 117.5 volts, 60 cycles.

	Plate	Screen	Cathode	Osc. Plate
6A7 Oscillator-mixer	105	53	1.5	100
6F7 Triode	105	—	2.5	—
6F7 Pentode	50	15	2.5	—
43 Power pentode	95	100	14	—

Voltage across speaker field, 112 volts, d-c.

For operation on power line voltages other than 105 to 130 volts special ballast resistors may be secured.

REPLACEMENT PARTS

KKT-134	Antenna Coil	KKC-142	Two-gang variable condenser
KKT-135	Oscillator Coil	KKC-143	12 and 8 mf dry electrolytic filter condenser
KKT-136	First i-f transformer assembly	KKC-145	Dual 5 mf, 25 volt, dry electrolytic by-pass condenser
KKT-137A	Second i-f transformer assembly	KS-38B	5" dynamic speaker
KKT-138	Iron-core filter choke	KKW-46A	185 ohm, 17 watt, resistor line cord
KKR-134A	Volume control		

MODEL 32
Chassis U5S
Schematic
Voltage, Parts

EMERSON RADIO AND PHONOGRAPH CORPORATION

FIVE-TUBE SUPERHETERODYNE RECEIVER

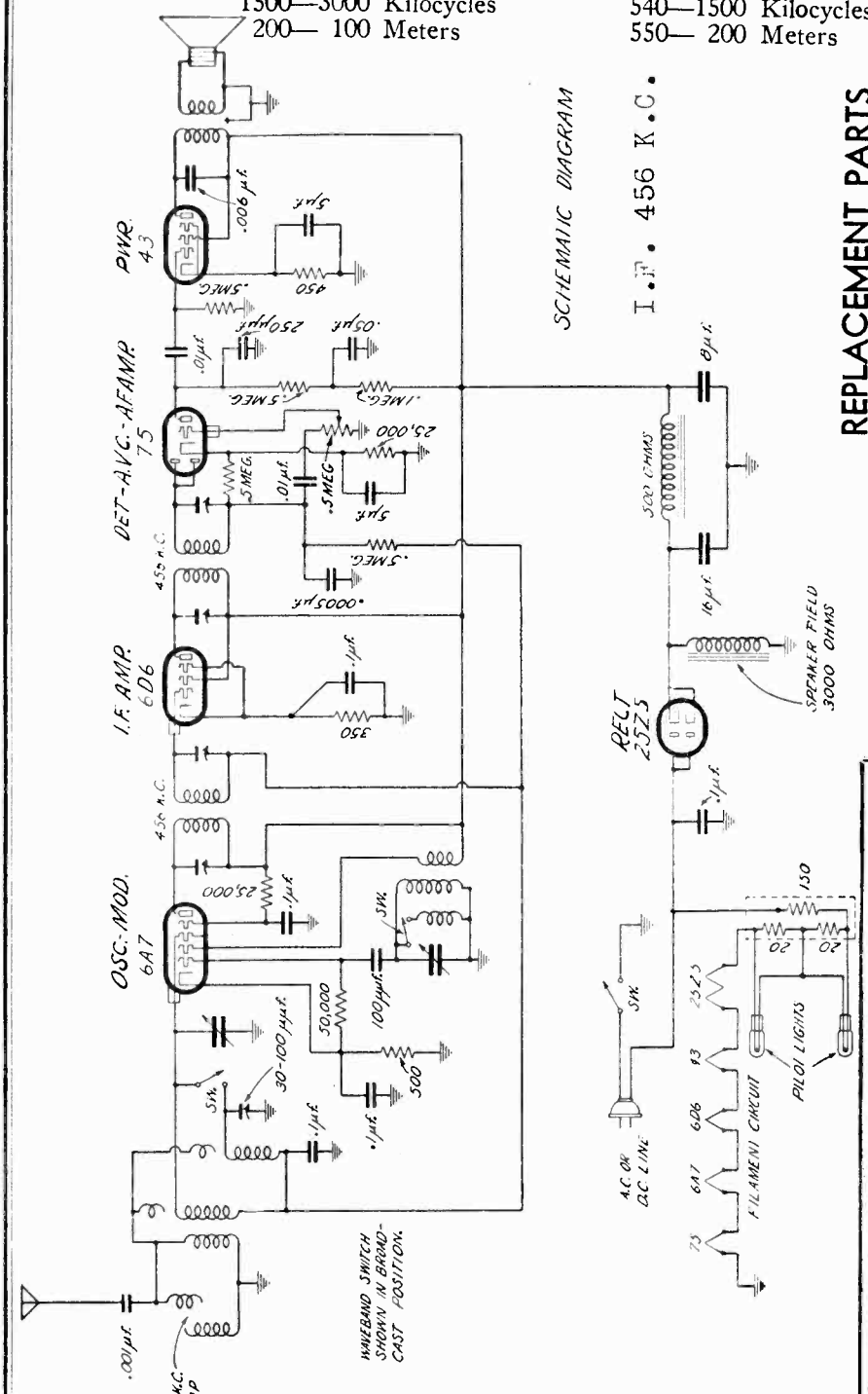
A.C.-D.C....105-130 Volts...25-70 Cycles

Short-Wave Range
1500—3000 Kilocycles
200— 100 Meters

Broadcast Range
540—1500 Kilocycles
550— 200 Meters

SCHEMATIC DIAGRAM

I.F. 456 K.C.



REPLACEMENT PARTS

Part No.	Description	
GGT-130	Antenna coil	GGC-136A Variable condenser
GGT-131	Oscillator coil	SC-81 Single padding condenser
GGT-132	First i-f transformer	GGC-137 Combination by-pass and filter condenser
GGT-133	Second i-f transformer	KS-42 Wave band selector switch
KT-40	Filter choke	KS-38A 5" Dynamic speaker
GGR-143	Volume control	KL-6 Pilot light
GGR-128	Ballast resistor	

CAUTION—UNDER NO CIRCUMSTANCES SHOULD A GROUND WIRE BE PERMITTED TO COME IN CONTACT WITH THE METAL CHASSIS OF THIS RECEIVER.

Voltage Readings:

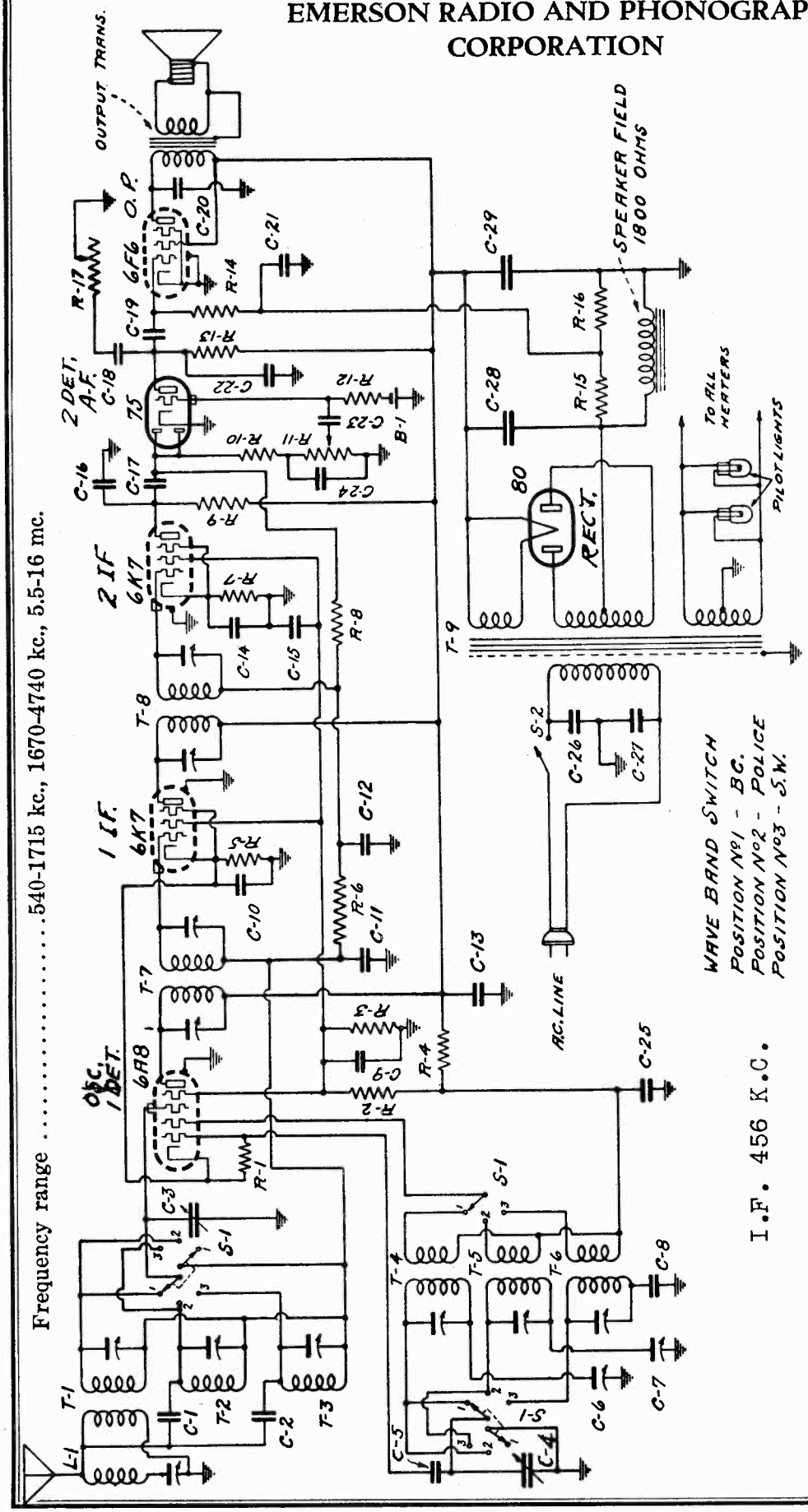
Readings should be taken with volume control on full, using a d-c voltmeter of 1000 ohms-per-volt. Measurements given are for a line voltage of 117.5 volts, 60 cycles and are measured from point indicated to ground with the antenna grounded to the metal chassis.

	Plate	Screen	Cathode	Suppressor	Osc. Plate
6A7 Oscillator-modulator	100	55	3	———	100
6D6 I.f.	100	100	3	3	———
75 A.f.	30	———	1.5	———	———
43 Output	80	100	11	———	———

Voltage across speaker field, 125 volts.

EMERSON RADIO AND PHONOGRAPH CORPORATION

MODELS 34C,101
Chassis C6,D6
Schematic
Voltage



Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to ground, with no signal. Line voltage for these readings was 117.5 v., a.c., 60 cycles.

Tube	*Plate*	*Screen*	*Osc. Plate*	*Cathode*	*Fil*
6A8	250	75	160	5	6.3 a-c
6K7 1st i-f	250	75	—	5	6.3 a-c
6K7 2nd i-f	145	75	—	5	6.3 a-c
75	100	—	—	0	6.3 a-c
6F6	225	250	—	**0**	6.3 a-c

B plus at 80 filament—355 volts.
Voltage across speaker field—105 volts.

ADJUSTMENTS

This receiver was carefully aligned and adjusted at the factory. *No one but a serviceman experienced with short-wave receivers should attempt to realign the receiver.*

An oscillator with frequencies of 456, 600, 1600, 1800, 4500 and 15,000 kc. should be used. In addition, an output meter should be used across the voice coil or output transformer for indicating maximum response.

Alignment Procedure:

1. Set variable condenser to minimum and turn wave-band switch to broadcast (clockwise). Introduce a 456 kc. signal on grid of the 6A8 tube. Adjust both trimmers of each of the two i-f transformers for maximum deflection on the output meter (maximum response). Repeat the process.
2. Remove 456 kc. signal from 6A8 grid and feed it through the antenna. Adjust the 456 kc. interference trap trimmer for *minimum response*. The trap trimmer is at the rear wall beneath the chassis deck.
3. With pointer at 600 feed 600 kc. through the antenna and adjust the broadcast series padder (headless set-screw, closest to front) for maximum response. Move pointer to 1600, feed 1600 kc., and align the broadcast oscillator (on left row, nearest front) and then the antenna (on right row, furthest from front). Return to 600 kc. and readjust padder, rocking the variable condenser for maximum response. Return to 1600 kc. again and check. (See General Instructions below).
4. Set switch at police-band (central position) and pointer at 1800. Feed 1800 kc. and align police-band series padder (headless set-screw, furthest from front). Move pointer to 4500, feed 4500 kc., and align oscillator (middle one at left) and antenna (middle one at right). Return to 1800 kc. and readjust series padder, rocking for maximum response. Return again to 4500 kc. and check.
5. Set switch at short-wave (counter-clockwise) and pointer at 15 megacycles (the thin line on the dial marking the edge of the 19 meter band). Feed 15,000 kc. and align the short-wave oscillator (furthest from front at left), choosing the minimum capacity peak, and then the antenna (nearest front at right) choosing the maximum capacity peak. The receiver is now completely aligned.

General Instructions

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely. Loose screws are a source of noise, frequency drift and microphonism.

In aligning antenna trimmers on the high-frequency signals there is usually a tendency for the oscillator to drift, due to interlocking. To compensate for this always keep re-tuning the variable condenser as you align.

GENERAL NOTES

1. The receiver should never be turned on with either the speaker plug or the 42 tube out of its respective socket, since the rapid rise in rectifier voltage will damage the electrolytic condenser.
2. Bias for the grid of the audio section of the 75 tube is obtained by means of a very small one-volt battery (bias cell). Do not put a voltmeter across this bias cell. Check it by temporarily replacing with a new cell or some other one-volt source and noting results. To remove the bias cell, simply pull up on the spring clip and lift the cell from its cup. The cell assembly is mounted on a bakelite strip on the inside of the right-hand chassis wall. On replacing the cell be sure the clip makes good contact.
3. Pilot lights may be replaced by slipping the push-on sockets off the dial and unscrewing the bulbs. It is not necessary to remove either the dial or chassis from cabinet.
4. When replacing the chassis in the cabinet take precautions to keep any part of the dial and condenser assembly from hitting the cabinet, otherwise microphonism will result.

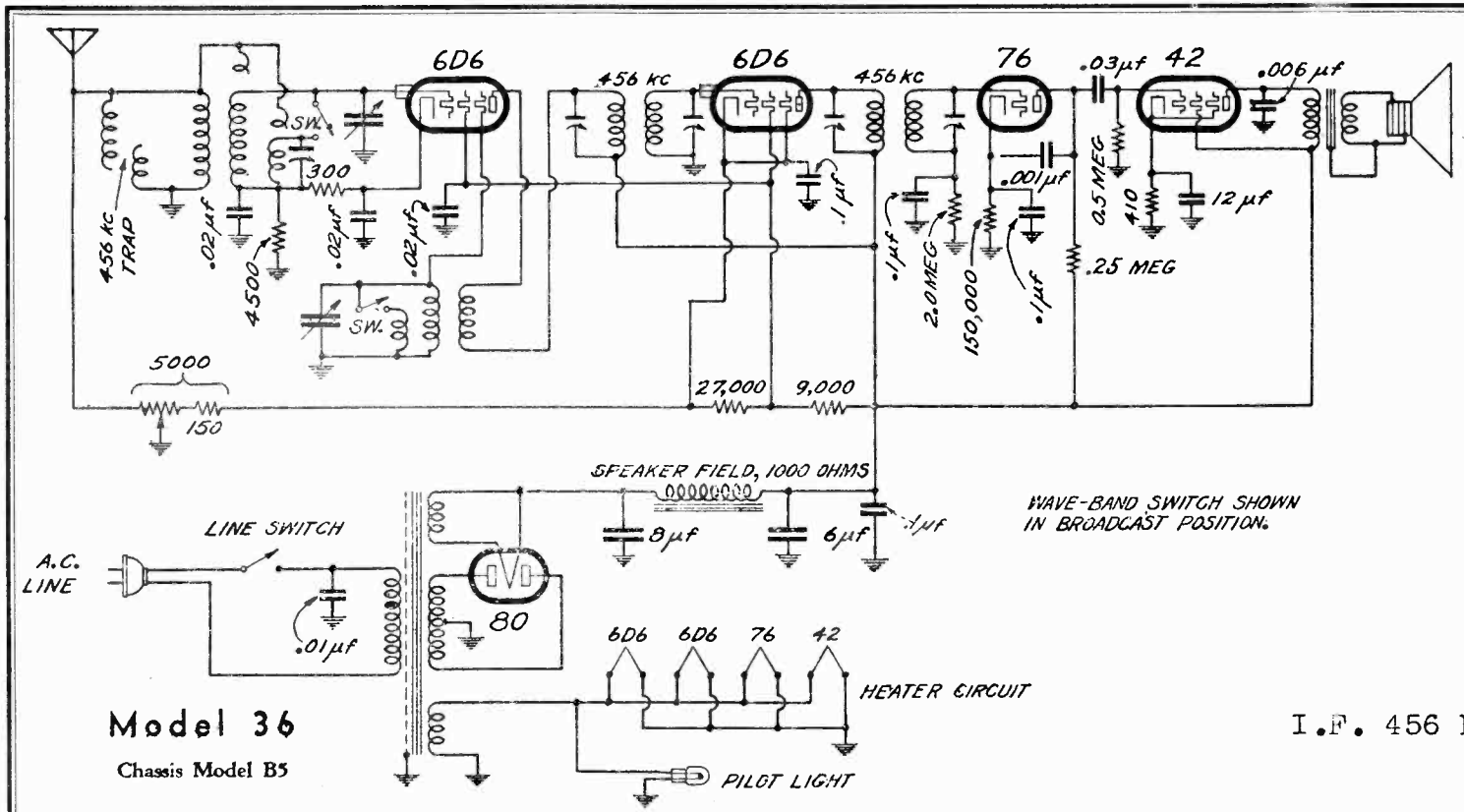
REPLACEMENT PARTS

* ITEM	PART NO.	DESCRIPTION
L1	MMT-149	456 kc tunable wave trap
T1, T2, T3	XXT-186	Three band antenna coil assembly
T4, T5, T6	XXT-187	Three band oscillator coil assembly
T7	XXT-188A	456 kc 1st i-f transformer
T8	XXT-189A	456 kc 2nd i-f transformer
T9	XXT-190	Power transformer
R11	XXR-185A	Volume control—.25 megohm
R17, S2	XXR-186A	Tone control with switch—.25 megohm
R7	KR-51	2,500 ohm—¼ watt carbon resistor
R1, R9	KR-53	50,000 " " " " "
R10, R14	KR-54	100,000 " " " " "
R13	LR-61	200,000 " " " " "
R16	XXR-202	210,000 " " " " "
R6	KR-55	250,000 " " " " "
R12	KR-56	500,000 " " " " "
R8	KR-57	1 meg. " " " " "
R15	XXR-203	1.1 " " " " " "
R5	FFR-126	500 ohm wire-wound resistor—½ watt
R2, R3, R4	XXR-194	30,000 ohm metal clad wire-wound tapped resistor R2=10,400 ohms—1 watt R3=13,000 ohms—1 watt R4= 6,600 ohms—1¼ watt
C3, C4	XXC-187	Two-gang variable condenser
C28, C29	XXC-188	Dual 8 mf dry electrolytic condenser
C6, C7	JJC-144D	Dual padding condenser C6—250 to 600 mmf. C7—800 to 1600 mmf.
C1, C2, C16	IIC-133A	.000025 mf mica condenser
C5	EC-24A	.0001 mf mica condenser
C17	AC-7A	.00025 mf mica condenser
C22, C24	IC-47	.0005 mf mica condenser
C8	XXC-197	.0038 mf mica condenser
C18	XXC-207	.005 mf-400 v. tubular condenser
C20	ZC-115	.006 mf-1000 v. tubular condenser
C23	CCC-127	.01 mf-200 v. tubular condenser
C19	KC-58	.01 mf-400 v. tubular condenser
C11, C12	BC-12	.05 mf-200 v. tubular condenser
C26, C27	XXC-220	Dual .01 mf, 250 volt condenser
C9, C14 C10, C15	AC-6	.1 mf-200 v. tubular condenser
C13, C25	EEC-132	.1 mf-400 v. tubular condenser
C21	BC-13	.25 mf-200 v. tubular condenser
	XXS-127	6" dynamic speaker
	2BS-130	10" dynamic speaker
S1	XXS-117A	Wave-band switch
	KL-6	Pilot light, 6-8 volt, .15 amp
	XXD-25B	Airplane dial
	XXZ-195	Escutcheon with crystal
B1	XXZ-213	Bias cell

When Ordering Replacement Parts Specify Part Number

*Item number locates the article on the Schematic Diagram.

EMERSON RADIO AND PHONOGRAPH CORPORATION



Model 36

Chassis Model B5

I.F. 456 K.C.

115-120 Volts . . , A.C. . . . 60 Cycle

Broadcast Range	Short-Wave Range
540 to 1530 kilocycles	1500 to 3200 kilocycles
(550 to 195 meters)	(200 to 93 meters)

Readings are to be taken with all the tubes in their places, volume control turned on full and antenna wire grounded to chassis.

The d-c voltmeter used should be 1000 ohms per volt, or over. The readings tabulated below were taken at an a-c line voltage of 117.

	Fil.	Ground to Plate	Ground to Screen	Ground to Cathode
6D6 Osc. 1st Det.	6.3 a.c.	220 d.c.	120 d.c.	35.0 d.c.
6D6 I-f Amplifier	6.3 a.c.	220 d.c.	120 d.c.	3.0 d.c.
76 2nd Detector	6.3 a.c.	120 d.c.	———	9.5 d.c.
42 Output	6.3 a.c.	210 d.c.	220 d.c.	13.0 d.c.
80 Rectifier	5.0 a.c.	———	———	———

Voltage across speaker field, 60.

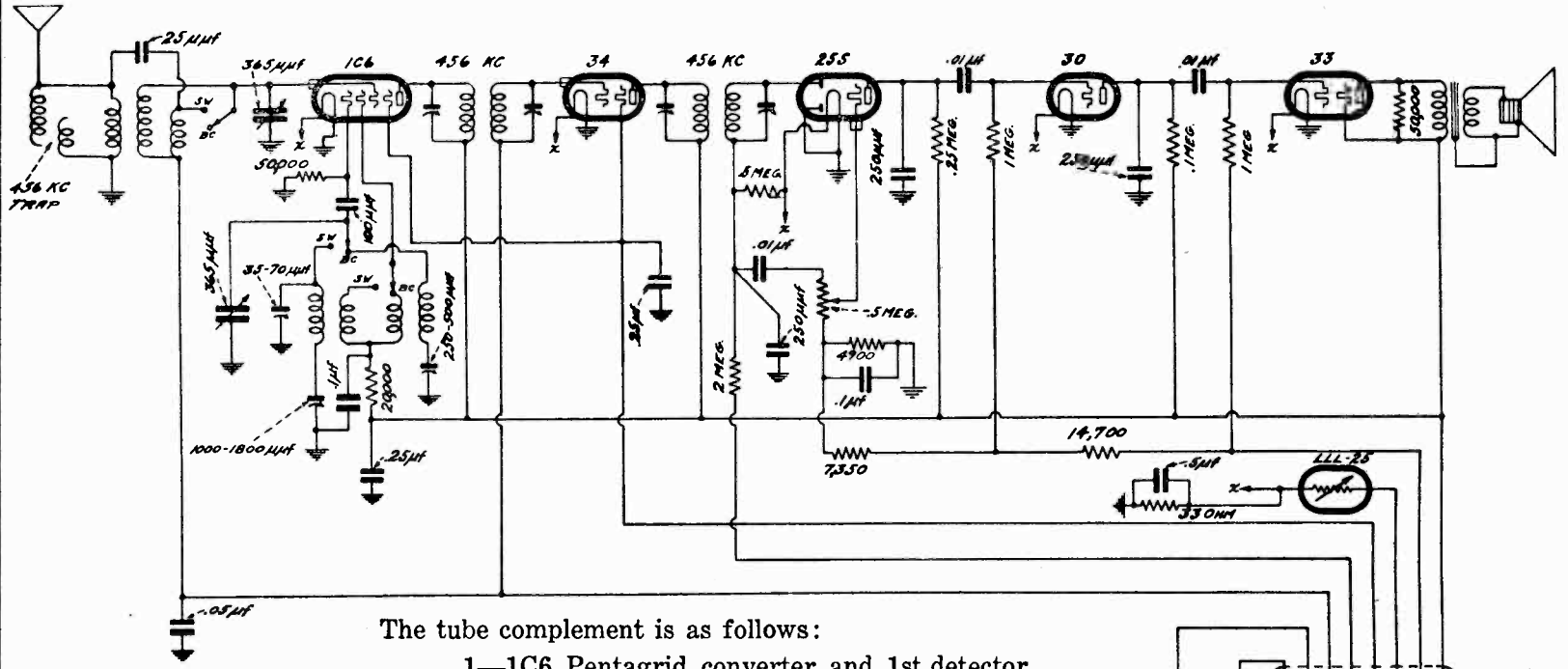
Description:

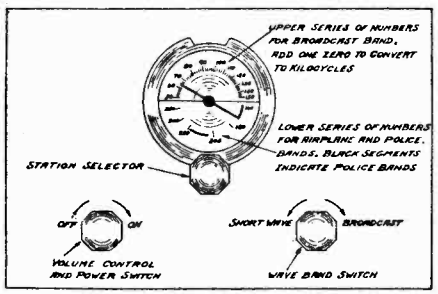
The Model 36 is a five-tube superheterodyne radio receiver bringing in regular broadcast stations, and, in addition, stations on the short-wave band down to 100 meters.

The following tubes are employed:

1 — 6D6 R.F. Pentode (1st Detector-Oscillator)
1 — 6D6 I.F. Amplifier
1 — 76 Triode (2nd Detector)
1 — 42 Output-Pentode
1 — 80 Rectifier

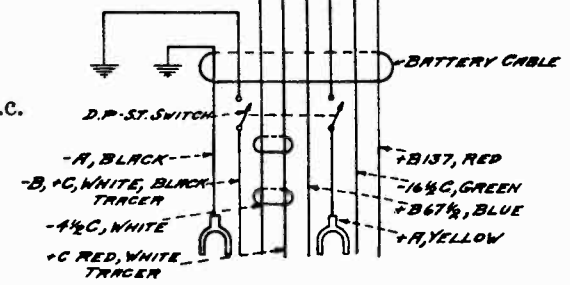
Unless marked otherwise, this receiver is designed to operate on 105-125 volts, 50-60 cycles, alternating current only.





The tube complement is as follows:

1—1C6 Pentagrid converter and 1st detector.
1—34 Pentode i-f amplifier.
1—25S Duplex diode-triode 2nd detector and a.v.c.
1—30 Audio amplifier.
1—33 Pentode output.
1—LLL-25 Ballast tube for 3-volt operation.



CHASSIS MODEL F5

MODEL 103

Broadcast Range	Short-Wave Range
540 to 1700 kilocycles	1620 to 3950 kilocycles
(555 to 176 meters)	(185 to 76 meters)

Readings should be taken with 1000 ohms-per-volt voltmeter with 135 volts of "B" battery and 3 volts of "A" battery. Voltages listed below are from point indicated to ground.

I.F. 456 K.C.

Tube	*Plate*	*Screen*	*Bias*	*Osc. Plate*
33	135	135	—16.5	—
30	90	—	—3.0	—
25S	80	—	—1.5	—
34	135	67.5	0	—
1C6	135	67.5	0	80

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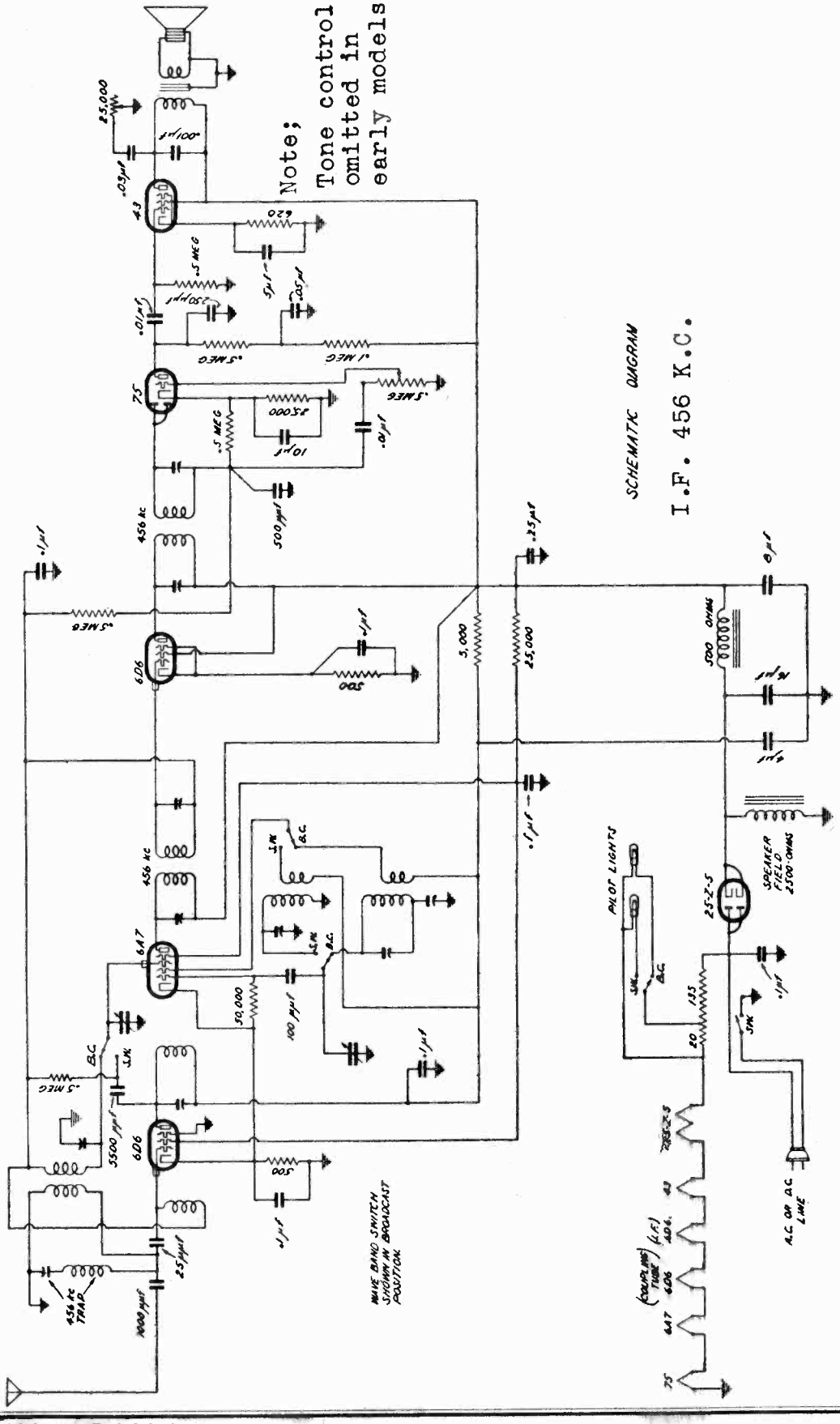
MODELS 38,42,49
Chassis U6
Schematic



MODELS 38,42,49
Chassis U6
Alignment,Voltage

EMERSON RADIO AND PHONOGRAPH CORPORATION

Alignment Procedure:

1. Short circuit the oscillator stator of the variable condenser to ground.
2. Introduce a 456 kc signal on the grid of the 6A7 tube.
3. Adjust both trimmers of each of the two i-f transformers for maximum response on the output meter. Repeat the process.
4. Remove the short circuit from the oscillator stator of the variable condenser.
5. Remove the 456 signal from 6A7 grid and connect to the antenna.
6. Set the range switch to the broadcast band.
7. Set the pointer at the low frequency end of the dial.
8. Adjust the 456 kc interference trap trimmer *for minimum response.* The trap trimmer is across the ½ inch coil form just behind the speaker.
9. Make sure that the pointer on the dial reaches its extreme positions at both ends of the broadcast band when the gang condenser is at the maximum and minimum positions. If it does not, loosen the set screws on the hub of the dial and rotate the gang condenser to maximum capacity. Then rotate the pointer of the dial, by means of the selector knob, to its extreme position at the 550 kc end of the broadcast band. Tighten the set screws securely and proceed to re-align the set.
10. Set the pointer to 1600 kc on the dial.
11. Introduce a 1600 kc signal into the antenna.
12. Adjust the oscillator trimmer (the one farthest from the chassis, on the oscillator coil) and the antenna trimmer (at the bottom of the large antenna coil on top of the chassis) for maximum response. The oscillator coil is on the underside of the chassis.
13. Introduce a 600 kc signal into the antenna. Rock the gang condenser back and forth around the 600 kc dial reading and, at the same time, adjust the series padding condenser for maximum output. Leave the series padder set at the point of maximum sensitivity. The series padder is on the front of the chassis.
14. Repeat steps 12 and 13 until no further readjustment of the trimmer and padder is necessary.
15. Throw the range switch to the short-wave position and introduce a 15 megacycle (mc) signal into the antenna.
16. Set the dial to 15 mc. Adjust the short-wave oscillator trimmer for maximum response. If two peaks are evident, the correct one is at the maximum capacity end. The short-wave oscillator trimmer is the one nearest the chassis on the oscillator coil beneath the chassis.
17. Connect an outside antenna to the set antenna lead and adjust the interstage coil trimmer for maximum noise when the pointer on the dial is set at 14 mc. Two peaks may be noticed. The correct peak is the one nearest the minimum capacity end. The interstage coil is on top of the chassis immediately behind the large antenna coil.
18. Set range switch to broadcast band and set pointer to 600 kc. Feed 456 to antenna and again adjust the interference trap trimmer *for minimum response.*
19. The set is now ready for operation.

Voltage Analysis:

Readings should be taken with a 1000 ohms per volt meter.

Voltages listed below are from the point indicated to ground.

	Plate	*Screen*	*Suppressor*	*Cathode*
6D6 R.f.	80	45.	0	3
6A7 Oscillator-Modulator	100	45	—	3
6D6 I.f.	100	100	4.0	4.0
75 A.f.	35	—	—	1
43 Output	95	100	—	13.5

The pilot light used is Mazda No. 40, 6-8 volts and .15 ampere, brown bead.

Voltage across field—120 volts, d.c. Line voltage—117.5 volts a.c.

MODEL 105
Chassis All
Schematic

EMERSON RADIO AND PHONOGRAPH CORPORATION

MODEL 105
Chassis Model A11

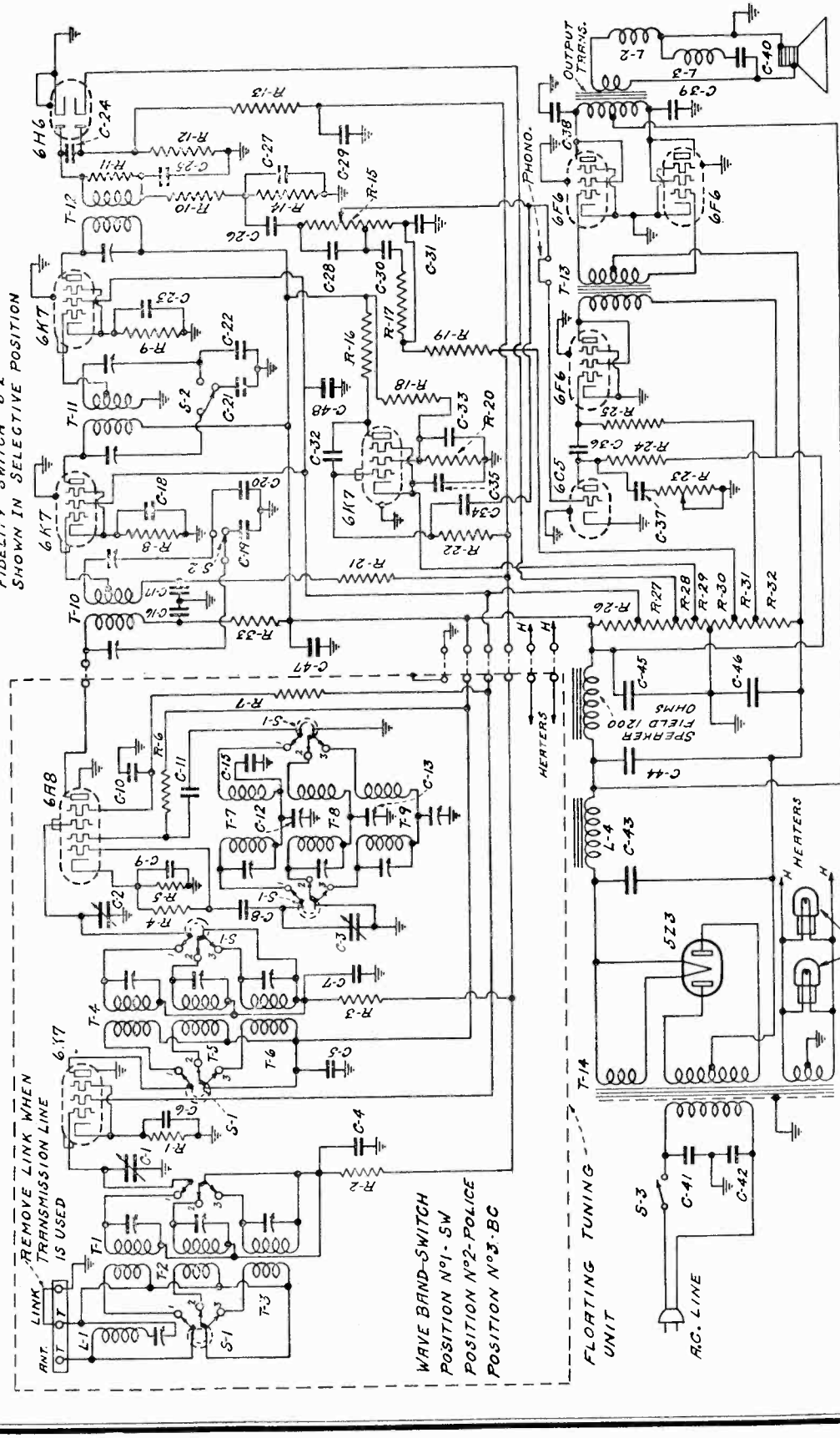
The tube complement is as follows:

1—6K7 (metal)—R-f amplifier
1—6K7 (metal)—1st i-f amplifier
1—6K7 (metal)—2nd i-f amplifier
1—6K7 (metal)—Automatic tone control and interstation noise suppressor
1—6A8 (metal)—Pentagrid oscillator-modulator
1—6H6 (metal)—Diode detector and automatic volume control
1—6C5 (metal)—1st audio amplifier
1—6F6 (metal)—Class "A B" driver
2—6F6's (metal)—Push-pull output
1—5Z3 (glass)—Full-wave rectifier.

Voltage rating ..... 110-120 volts a-c
Current drain ..... 1.15 amps.
Frequency ranges ..... 540 to 1800 kc, 1710 to 5950 kc, 5.5 to 19.0 megacycles

I.F. 456 K.C.

FIDELITY SWITCH S-2 SHOWN IN SELECTIVE POSITION



SCHEMATIC DIAGRAM

EMERSON RADIO AND PHONOGRAPH CORPORATION

GENERAL NOTES

1. A jack is provided at the rear of the chassis for a phonograph attachment. The pickup to be used should be of the high impedance type. A separate potentiometer type volume control is required, the overall resistance to be determined by the type of pickup chosen. The pickup leads should be connected to the two outside terminals of the volume control with the ground lead of the pickup on the right-hand terminal (looking at front with terminals at top) of the control. A lead from this terminal should be plugged into the hole in the phono jack nearest the center of the chassis. A lead from the center terminal of the volume control should be plugged into the other hole in the jack (grid side of jack). Ends of leads to be plugged in jack should be fitted with tips. The volume control in the receiver should be turned to the extreme counter-clockwise (low) position when operating phonograph. Since the phono jack is of the shorting type signals cannot be received by the set when the leads are plugged into the jack. The leads should be removed before attempting to receive broadcast stations.
2. The receiver should never be turned on with the speaker plug or the 6F6 tubes out of their sockets, since the rapid rise in rectifier voltage would damage the electrolytic condenser.
3. Pilot lights may be replaced by slipping the push-on sockets off the dial and unscrewing the bulbs. It is not necessary to remove either the dial or chassis from cabinet.
4. In replacing chassis in cabinet do not tighten mounting screws so much that chassis will not float freely, and do not allow any part of the dial assembly to touch the cabinet. Do not push control knobs on so far that they touch the cabinet front panel. If these precautions are not observed the receiver may become microphonic.
5. The color coding of the power transformer leads is as follows:

Primary—two green leads	6.3 v. sec. (Fil.)—two blue leads
Electrostatic shield—bare stranded wire	6.3 v. sec. center tap—yellow lead
High voltage sec.—two black leads	5 v. sec.—two red leads.
High voltage sec. center tap—yellow lead	

ADJUSTMENTS

The receiver was carefully aligned and checked at the factory by means of an oscillograph, and it is strongly recommended that servicemen use one for realignment.

An oscillator with frequencies of 456, 600, 1600, 1800, 5500, 6000 and 17,000 kc should be used.

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

Checking High-Fidelity Operation

On the oscillograph screen the peak of the selectivity curve (i-f response curve with fidelity-selectivity switch in selective position, clockwise) should appear in a position midway between the two peaks of the high-fidelity curve (i-f response curve with fidelity-selectivity switch in fidelity position, counter-clockwise). In other words the central vertical axis of the selectivity curve should be coincident on the screen with the central vertical axis of the high-fidelity curve.

An approximate check of the high-fidelity operation can be made with the use of the oscillator and output meter. First, the i-f's should be very carefully peaked at 456 kc *with the fidelity-selectivity switch in the selective position.* Turn the switch to the fidelity position, counter-clockwise, and vary the frequency of the oscillator. Two peaks should be observed on the output meter, approximately 7 kc on each side of the selectivity peak.

Alignment Procedure:

IMPORTANT: All adjustments should be made with the fidelity-selectivity switch in the selective position, clockwise.

I-f Alignment

The i-f transformers 2AT-203, 2AT-204 and 2AT-205 are located on extreme left side of chassis. Set wave-band switch at position A (clockwise) and condenser nt minimum. Feed 456 kc to grid of 6A8 tube. Adjust the five i-f trimmers carefully for maximum response. Feed 456 kc through antenna and adjust 456 kc wave-trap for *minimum response.* This wave-trap is located at bottom rear of set, directly under the antenna binding post.

Broadcast Alignment

The three broadcast coils are in separate cans on top of tuner unit. (The tuner unit is the separate chassis section floated on rubber in center of chassis base). All trimmers for these coils are located at bottoms of cans and are available from bottom of chassis. NNT-150 is antenna coil, NNT-151 is detector coil and NNT-152 is oscillator coil. The oscillator coil has two adjusting screws; the one painted red is the series padder and the other is the trimmer. The antenna and detector coils have one trimmer each.

Set switch at A and pointer to 600 on dial. Feed 600 kc to antenna and adjust broadcast oscillator padder (red screw at bottom front of tuner unit, left-hand corner) for maximum response. Set pointer at 1600, feed 1600 kc to antenna and adjust oscillator trimmer beside red padder for maximum response, and then adjust r-f trimmer (through hole at about center of tuner unit), and antenna trimmer (through hole at rear of unit). Reset the pointer to 600, feed 600 kc to antenna and rock the variable condenser while resetting the oscillator padder for maximum response. Return to 1600, and check alignment. If readjustment is necessary, return to 600 and repeat entire procedure.

Police Alignment

The three police-band coils are the smaller ones located on the bottom side of the tuner unit, in row at left of wave-band switch (same side of switch as antenna binding post). The antenna coil is the one furthest from front of chassis, detector coil in center, and oscillator coil nearest front of chassis. The dual padder mounted on bottom, right-hand side of tuner unit has one padder for police-band oscillator coil and one for short-wave oscillator coil. The padder nearest wave-band switch is for the police band. Each of the three trimmers for the police-band coils is located on top of its respective coil.

Set switch at B (central position) and pointer to 1800 (2 divisions below 200 mark). Feed 1800 kc to antenna. Adjust oscillator series padder nearest to switch in right-hand corner for maximum response. Set pointer to 5500 and feed 5500 kc to antenna. First adjust oscillator trimmer (front one on row of smaller coils) for maximum response. If two peaks are obtained, select the *minimum capacity* peak. (See General Instructions below). Then adjust the antenna (rear) and detector (center) trimmers for maximum response. If two peaks are obtained, select the *maximum capacity* peak. Return pointer to 1800, feed 1800 kc to antenna, and rock variable condenser while adjusting police band oscillator padder for maximum response. Return to 5500 and check alignment. If a readjustment is necessary return to 1800 and repeat entire procedure.

Short-Wave Alignment

The three short-wave coils are the larger ones located on bottom side of tuner unit in row at right of wave-band switch. The antenna coil is the one furthest from front of chassis, detector coil in center and oscillator coil nearest front of chassis. On dual padding condenser the padder furthest from wave-band switch is for short-wave oscillator coil. Each of the three trimmers for the short-wave coils is located on top of its respective coil.

Set switch at C (counter-clockwise) and pointer at 6 megacycles. Feed 6000 kc to antenna. Adjust short-wave oscillator padder (furthest from switch on dual unit) for maximum response. Set pointer to 17 megacycles and feed 17000 kc to antenna. First adjust oscillator trimmer (front) for maximum response. If two peaks are obtained, select the *minimum capacity* peak. Then adjust the antenna (rear) and detector (center) trimmers for maximum response. If two peaks are obtained, select the *maximum capacity* peak. Return pointer to 6 mc, feed 6000 kc to antenna and rock variable condenser while adjusting the oscillator padder for maximum response. Return to 17 mc. Feed 17000 kc to antenna and check alignment.

Check the receiver on all three bands for dead spots which indicate incorrect alignment.

General Instructions

The set's oscillator is higher in frequency than the signal on all three bands. Images, therefore, should be observed on the low-frequency side of the signals.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna and r-f trimmers. The last motion in adjusting trimmers should always be a tightening one.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely. Loose screws are a source of noise, frequency drift and microphonism.

In aligning antenna trimmers on the high-frequency signals there is usually a tendency for the oscillator to drift, due to interlocking. To compensate for this always keep re-tuning the variable condenser as you align.

Readings should be taken with a 1000-ohms-per-volt meter. Voltages listed below are from point indicated to ground with no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Control Grid*	*Fil.*
6K7 r-f amp.—on tuner unit	237	87	2.6	—	0	6.3 a.c.
6K7 1st i-f—left front corner	237	87	2.6	—	0	6.3 a.c.
6K7 2nd i-f—second from front at left	237	87	2.6	—	0	6.3 a.c.
6K7 tone control—beside 6C5	4	11	1.0	—	0	6.3 a.c.
6A8 1st det. osc.	237	85	3.0	175	0	6.3 a.c.
6H6 diode det.	—	—	7.8	—	0	6.3 a.c.
6C5 1st audio	95	—	0	—	—2	6.3 a.c.
6F6 driver—furthest left	225	225	0	—	—7	6.3 a.c.
6F6 output	350	350	0	—	—38	6.3 a.c.
6F6 output	350	350	0	—	—38	6.3 a.c.

Voltage at 5Z3 fil.—373
Voltage across speaker field—120
Voltage across choke—12

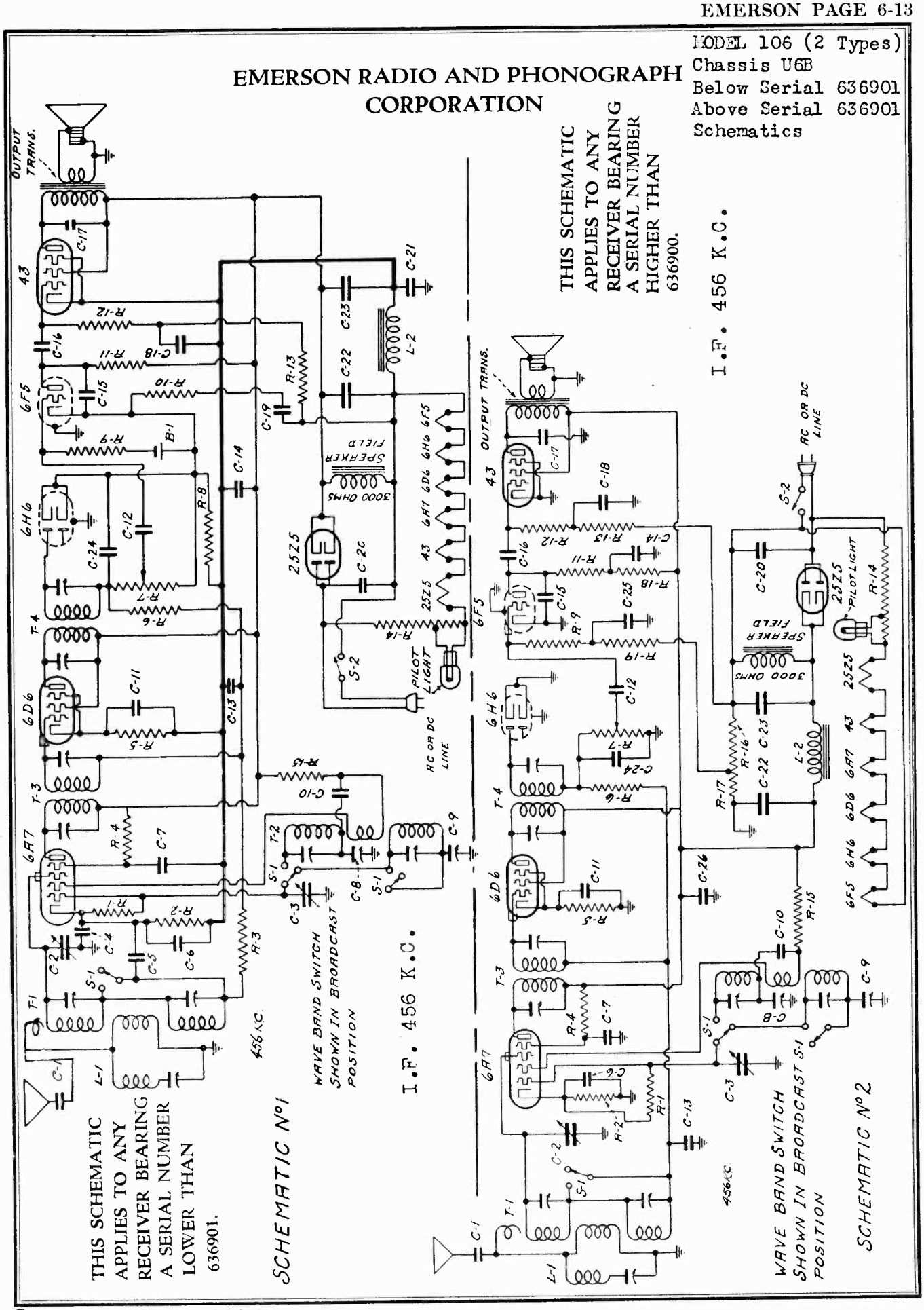
Voltages, to chassis, measured along voltage divider, starting at end near the 5Z3 tube. (The voltage divider is the long wire-wound tapped resistor on the rear chassis wall.)

Tap 1 (near 5Z3), 237 v.
Tap 2, 87 v.
Tap 3, 7.8 v.
Tap 4, 1.0 v.
Tap 5 (grounded), 0 v.
Tap 6, —5.3 v.
Tap 7, —20 v.
Tap 8, —38 v.

Item	Part No.	DESCRIPTION	List Price Effective as of Sept. 1st, 1935 PRICE
L1	MMT-149	456 kc tunable wave trap	$ .35
L2	2AT-208	10 kc filter choke—720 microhenries	.95
L3	2AT-209	10 kc filter choke—320 microhenries	.85
L4	2AT-206	Iron-core filter choke—90 ohms	2.50
T1	NNT-158	Short-wave antenna coil	.55
T2	NNT-155	Intermediate band antenna coil	.50
T3	NNT-150	Broadcast antenna coil	.90
T4	NNT-159	Short-wave detector coil	.60
T5	NNT-156	Intermediate band detector coil	.50
T6	NNT-151	Broadcast detector coil	.90
T7	NNT-160	Short-wave oscillator coil	.55
T8	NNT-157	Intermediate band oscillator coil	.50
T9	NNT-152	Broadcast oscillator coil	.90
T10	2AT-203	456 kc first i-f transformer	1.45
T11	2AT-204	456 kc second i-f transformer	1.45
T12	2AT-205	456 kc third i-f transformer	1.15
T13	2AT-210	Audio transformer	2.75
T14	2AT-211	Power transformer	6.00
R1, R5, R8, R9	CCR-140	350 ohm wire-wound resistor	.16
R2, R3, R18, R19, R21, R24, R25	KR-54	100,000 ohm ¼ watt carbon resistor	.16
R4	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R6	YR-97	15,000 ohm ½ watt carbon resistor	.16
R7, R33	GR-86	2,000 ohm ¼ watt carbon resistor	.16
R10	OR-73	25,000 ohm ¼ watt carbon resistor	.16
R11, R14	LLR-154	75,000 ohm ¼ watt carbon resistor	.16
R12	KR-56	0.5 megohm ¼ watt carbon resistor	.16
R13, R16, R22	KR-57	1 megohm ¼ watt carbon resistor	.16
R15	NNR-156	Volume control—1.2 megohms	.70
R17, R20	LR-64	5,000 ohm ¼ watt carbon resistor	.16
R23, S3	2AR-198	Tone control with line switch—0.5 megohms	.80
R26, R27, R28, R29, R30, R31, R32	2AR-199A	5,469 ohm wire-wound resistor (voltage divider) R26—3100 ohms, 8 watts; R27—1920 ohms, 5 watts; R28—155 ohms, 0.5 watts; R29—23 ohms, 0.1 watts; R30—36 ohms, 1 watt; R31—107 ohms, 2.5 watts; R32—128 ohms, 2.5 watts	1.80
C1, C2, C3	NNC-153	Three gang variable condenser	3.25
C4, C7	NNC-158	0.05 mf, 200 volt tubular condenser with mounting strap	.16
C5, C10	EEC-132	0.1 mf, 400 volt tubular condenser	.16
C6, C9	AC-6	0.1 mf, 200 volt tubular condenser	.16
C8, C25, C27	EC-24A	0.0001 mf mica condenser	.16
C11	AAC-114	0.001 mf mica condenser	.16
C12, C13	NNC-154A	Dual padding condenser C12, C13—800 to 1400 mmf	.75
C15	NNC-181	0.0015 mf mica condenser	.16
C16, C18, C23, C29, C33, C35, C47, C48	2AC-210	Eight-section condenser block C16—0.1 mf, 400 v.; C18—0.1 mf, 200 v.; C23—0.1 mf, 200 v.; C29—0.05 mf, 200 v.; C33—0.1 mf, 200 v.; C35—0.1 mf, 200 v.; C47—0.5 mf, 400 v.; C48—0.25 mf, 400 v.	2.00
C17	CCC-127	0.01 mf, 200 volt tubular condenser	.16
C19, C20, C21, C22	2AC-216	0.004 mf mica condenser	.16
C24, C28, C32	AC-7A	0.00025 mf mica condenser	.16
C26, C36	LC-65	0.02 mf, 400 volt tubular condenser	.16
C30	LC-64	0.05 mf, 400 volt tubular condenser	.16
C31	IC-43	5 mf, 25 volt electrolytic tubular condenser	.60
C34, C37	KC-58	0.01 mf, 400 volt tubular condenser	.16
C38, C39	NNC-214	0.002 mf, 1000 volt tubular condenser	.16
C40	2AC-215	0.7 mf filter condenser in metal container	.80
C41, C42	XXC-220	Dual 0.01 mf, 250 v. tubular condenser in metal container	.30
C43, C44, C45, C46	2AC-209A	10 mf and triple 8 mf electrolytic filter and by-pass condenser block C43—8 mf, 450 v.; C44—8 mf, 450 v.; C45—8 mf, 450 v.; C46—10 mf, 50 v.	3.20
S1	2AS-135	12" dynamic high-fidelity speaker	18.00
S2	NNS-95	Wave-band switch with shields	2.40
	2AS-137	Fidelity-selectivity switch	.70
	KL-6	Pilot light, 6.3 volt, .15 amp. Mazda No .40	.15
	NND-23	Airplane dial	5.25
	NNZ-205	Escutcheon with crystal	.50

EMERSON RADIO AND PHONOGRAPH CORPORATION

MODEL 106 (2 Types)
Chassis U6B
Below Serial 636901
Above Serial 636901
Schematics



GENERAL NOTES

1. To take the chassis out of the cabinet first remove the knobs (knobs are of push-on type), and then the cabinet bottom. Remove the two wood screws and four nuts holding the chassis to the cabinet. With the receiver bottom side up, slide the chassis towards the back and lift out of cabinet.
2. If replacements are made or the wiring disturbed in the r-f section of the circuit the receiver should be carefully realigned.
3. On early production runs bias for the grid of the 6F5 tube is obtained by means of a very small one-volt battery (bias cell). The cell assembly is mounted on a bakelite strip on the inside of the left-hand chassis wall. Do not put a voltmeter across this bias cell. Check it by temporarily replacing with a new cell, or some other one-volt source, and noting results. To remove the bias cell simply pull up on the spring clip and lift the cell from its cup. On replacing cell be sure the clip makes good contact.
4. If adjustment of the sliding scale dial is necessary, loosen the two slotted hexagon-head guides at the top edge of the scale. These guides are held in place by nuts on the inside of the chassis. Adjust the guides by moving them either up or down in the slotted holes in the chassis. Do not bring them so far down that the pinion gear binds on the rack. The scale should move freely and smoothly without appreciable vertical movement.

   After replacing a dial scale care should be taken to align it properly with respect to the variable condenser. To do this rotate the variable condenser to maximum capacity, loosen the set-screw on the hub of the pinion gear and slide the scale so that the extreme right-hand mark (near 55) is in line with the center of the speaker. With scale and condenser in these positions tighten the set-screw.

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1425, 1600 and 3600 kc is required.

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

I-f and Wave-Trap Alignment

The i-f coils are located in cans on the top of the chassis. The second i-f transformer is the one directly behind the speaker. The four trimmers, two for each transformer, are located at the tops of the cans.

Turn the wave-band switch to the broadcast position, clockwise. Rotate the variable condenser to the minimum position and feed 456 kc to grid of 6A7 tube. Adjust the four i-f trimmers for maximum response. Feed 456 kc through the antenna lead and adjust the 456 kc wave-trap trimmer for *minimum response*. This trimmer will be found on the small wave-trap which is mounted on the bracket extending vertically from the right-hand chassis wall.

Location of Coils

The broadcast antenna coil and the short-wave antenna coil are wound on one form, mounted on the vertical bracket at the right-hand side of the chassis. The trimmers for these coils are mounted on the same assembly facing outward, and are available through two holes in the bracket. The lower trimmer is for the short-wave antenna coil and the upper for the broadcast antenna coil.

The broadcast oscillator coil and short-wave oscillator coil are wound on one form mounted below the chassis deck. The trimmers are mounted on the same assembly, facing outward, and are accessible through two holes in the right-hand chassis wall. The front one is for the short-wave oscillator coil and the rear one for the broadcast oscillator coil.

The dual padding condenser for the oscillator coils is mounted on the inside of the front chassis wall. The two adjusting screws are available through two holes in the front wall of the chassis. The upper screw is for the broadcast padder and the lower for the short-wave padder.

Broadcast Alignment

Turn wave-band switch to clockwise position (broadcast), set dial to 600 (use center of speaker as reference point), and feed 600 kc through the antenna. Adjust the broadcast oscillator padder (upper screw on front chassis wall) for maximum response. Set the dial to 1425 and feed 1425 kc through the antenna. Adjust the broadcast oscillator trimmer (rear screw on right-hand side of chassis), for maximum response and then adjust the broadcast antenna trimmer (upper screw on vertical bracket) for maximum response. Reset dial to 600 and rock variable condenser (rotate back and forth through small arc) while realigning the broadcast oscillator padder.

Short-Wave Alignment

Turn wave-band switch to counter-clockwise position (short-wave), set dial to 570 and feed 1600 kc through antenna. Adjust the short-wave oscillator padder (lower screw on front chassis wall) for maximum response. Set dial to 1280 and feed 3600 kc through the antenna. Adjust the short-wave oscillator trimmer (front screw on right-hand chassis wall) for maximum response and then adjust the short-wave antenna trimmer (lower screw on vertical bracket) for maximum response. Reset dial to 570, feed 1600 kc and rock variable condenser while readjusting the short-wave oscillator padder.

TUBE DATA

The tube complement is as follows:

1—6H6 (metal)—Diode detector and a.v.c.
1—6F5 (metal)—Audio amplifier.
1—43 (glass)—Power pentode output.
1—25Z5 (glass)—Dual half-wave rectifier.
1—6A7 (glass)—Pentagrid oscillator-modulator.
1—6D6 (glass)—I-f amplifier.

MODEL 106

Voltage rating	105-130 volts
Current drain	0.43 amps
Frequency ranges	530 to 1630 kc, 1490 to 4300 kc.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to 43 cathode (B minus). Line voltage for these readings was 117.5 volts, 60 cycles, a-c.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A7	105	55	1.7	100	6 a-c
6D6	105	105	2.75	—	6 a-c
6H6	—	—	0	—	6 a-c
6F5	55	—	0	—	6 a-c
43	100	105	0	—	24 a-c

Voltage across choke (B minus to line switch)—20 volts.

Voltage across speaker field (25Z5 cathode to line switch)—125 volts.

PRODUCTION CHANGES

Schematic No. 1 illustrates the circuit used in receivers bearing a serial number lower than 636901. Minor parts changes made in this circuit are as follows:

C10 originally 0.0001 mf mica condenser.
R15 added. C1 added. R4 originally ½ watt carbon resistor.
Speaker changed from part No. 2CS-131B to part No. KS-38B (price $3.50).
C21 removed and B minus grounded to chassis as indicated by dotted lines in schematic.

Schematic No. 2 illustrates the revised circuit used in all receivers bearing a serial number higher than 636900.

To convert the circuit in schematic No. 1 to the circuit in schematic No. 2 the following changes in parts were necessary:

L2, filter choke, changed from part No. ZZT-196 to 2CT-207, 200 ohm choke (price 60c).
R10 removed. R3 removed. R8 removed.
R9 changed from 1 megohm resistor to 0.5 megohm ¼ watt carbon resistor, part No. KR-56 (price 16c).
R13 changed from 0.5 megohm resistor to 50,000 ohm ¼ watt carbon resistor, part No. KR-53 (price 16c).
R18 added. R18 is 100,000 ohm ¼ watt carbon resistor, part No. KR-54 (price 16c).
R19 added. R19 is 0.5 megohm ¼ watt carbon resistor, part No. KR-56 (price 16c).
R16, R17 added, 250 ohm wire-wound metal clad tapped resistor, part No. 2CR-211. R16—230 ohms. R17—20 ohms (price 25c).
C22, C23 changed from multiple 8 and 16 mf electrolytic condenser to dual 12 mf electrolytic condenser, part No. 2CC-222 (price $1.65).
C19 removed. C5, C4 removed.
C25, C26 added, 0.1 mf, 200 volt tubular condensers, part No. AC-6 (price 16c).
B1, bias cell, removed.

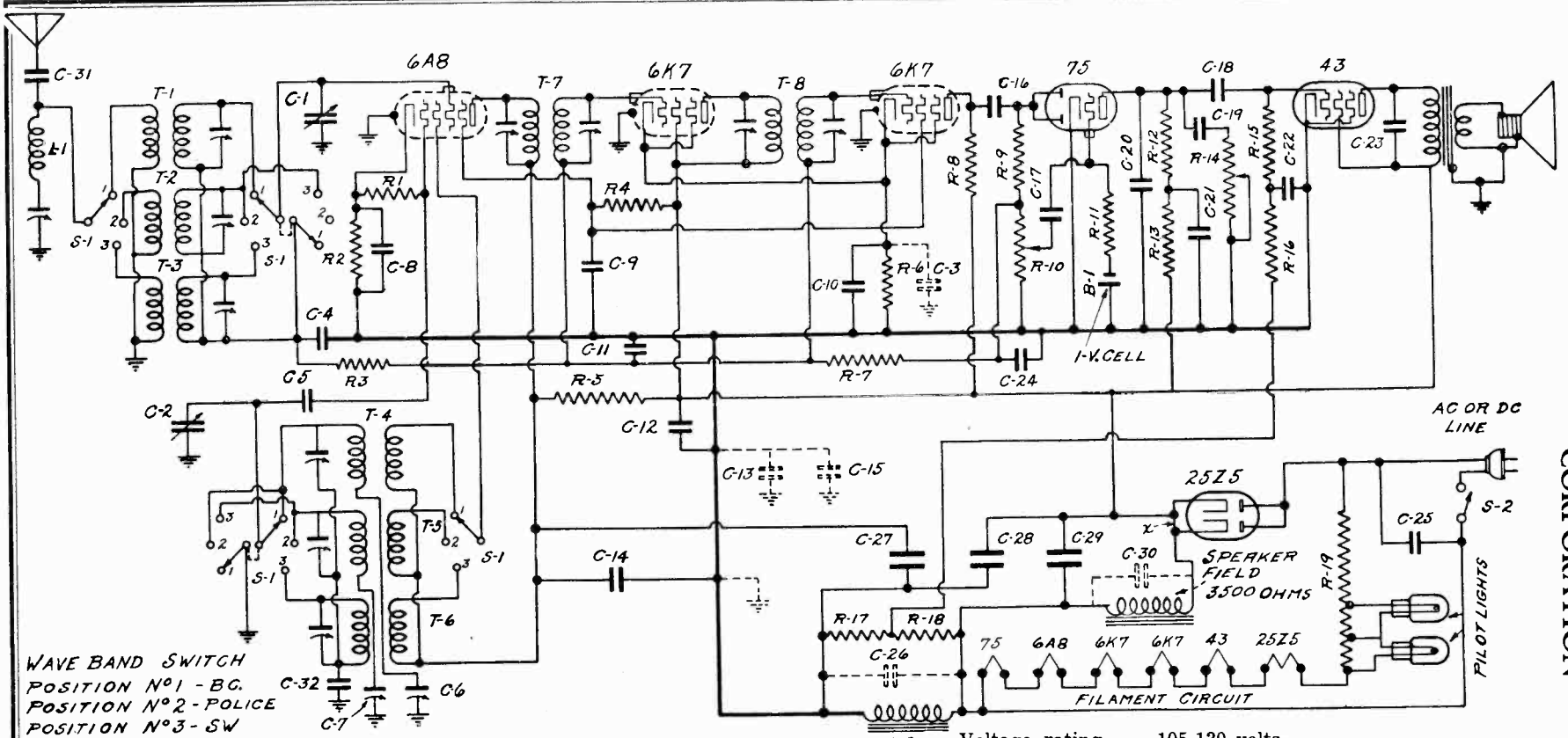
In later production runs of this second series the pilot light was changed to part No. XL-9, Mazda No. 46.

REPLACEMENT PARTS

*Item	Part No.	DESCRIPTION
L1	MMT-149	456 kc adjustable wave trap
L2	ZZT-196	Filter choke—500 ohms
T1	2CT-197	Two-band antenna coil assembly
T2	2CT-198	Two-band oscillator coil assembly
T3	CCT-118C	456 kc first i-f transformer
T4	CCT-119B	456 kc second i-f transformer
R1	KR-53	50,000 ohm, ¼ watt carbon resistor
R2	CCR-140	350 ohm, ½ watt wire-wound resistor
R3	LR-61	200,000 ohm, ¼ watt carbon resistor
R4, R10	ZZR-196	30,000 ohm, ¼ watt carbon resistor
R5	AAR-119	300 ohm, ½ watt wire-wound resistor
R6, R9	KR-57	1 megohm, ¼ watt carbon resistor
R7, S2	2CR-195	Volume control with line switch—0.5 megohm
R8	FFR-126	500 ohm, ½ watt wire-wound resistor
R11	KR-55	250,000 ohm, ¼ watt carbon resistor
R12, R13	KR-56	500,000 ohm, ¼ watt carbon resistor
R14	ZZR-192A	Wire-wound ballast resistor—130 ohms
R15	GR-85	2,000 ohm, ¼ watt carbon resistor
C1	AAC-114	0.001 mf mica condenser
C2, C3	2CC-193	Two-gang variable condenser
C4, C5	BC-12	0.05 mf, 200 v. tubular condenser
C6, C7	2CC-196	Four-section condenser block
C11, C13		(Each section is 0.1 mf, 200 v.)
C8, C9	JJC-144C	Dual adjustable padding condenser C8—800 to 1400 mmf. C9—250 to 550 mmf.
C10	IC-47A	0.0005 mf mica condenser
C12, C16, C19	CCC-127	0.01 mf, 200 v. tubular condenser.
C14, C17, C18, C20	2CC-195	Four-section condenser block C14—0.25 mf, 200 v. C18—0.1 mf, 200 v. C17—0.01 mf, 400 v. C20—0.1 mf, 200 v.
C15, C24	AC-7A	0.00025 mf mica condenser
C21	2CC-208	0.2 mf, 200 v. tubular condenser
C22, C23	2CC-194	8 and 16 mf electrolytic filter condenser block C22—16 mf, 150 v. C23—8 mf, 150 v.
	2CS-131B	5" dynamic speaker
S1	2CS-132	Wave-band switch
	KL-6	Pilot light, 6-8 volt, 0.15 amp.

EMERSON RADIO AND PHONOGRAPH CORPORATION

MODELS 107, 111
Chassis U6A
Schematic
Voltage



MODELS 107 and 111

Chassis Model U6A

Voltage rating . . . 105-130 volts.
Current drain . . . . 0.43 amps.
Frequency ranges 540-1660 kc, 1580-4750 kc, 5.5—16 mc.

These service notes apply only to chassis model U6A. Different service notes are available for chassis model U6F also used in the models 107 and 111 cabinets. The chassis model number for this receiver is the group of symbols before the dash in the serial number printed on the license plate.

I.F. 456 K.C.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (cathode of 43 tube). Line voltage for these readings was 117.5 volts, a.c., 60 cycles.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*
6A8	82	50	2	82
6K7 1st i-f	107	107	5	—
6K7 2nd i-f	65	50	5	—
75	50	—	0	—
43	95	107	0	—

Voltage across speaker field (25Z5 cathode to line switch) — 107 volts.

Voltage across choke (43 cathode to line switch) — 22 volts.

The tube complement is as follows:

Fil.	
6	1—6A8 (metal) Pentagrid oscillator-modulator.
6	1—6K7 (metal) 1st i-f amplifier.
6	1—6K7 (metal) 2nd i-f amplifier (adjacent to 75).
6	1—75 (glass) 2nd detector—a-f amplifier—a.v.c.
24	1—43 (glass) Power output pentode.
	1—25Z5 (glass) Half-wave rectifier.

GENERAL NOTES

1. To take the chassis out of the Model 107 cabinet first remove the knobs (knobs are of push-on type), and then the cabinet bottom. Remove the two wood screws and four nuts holding the chassis to the cabinet. With the receiver bottom side up, slide the chassis towards the back and lift out of cabinet.

2. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.

3. Bias for the grid of the audio section of the 75 tube is obtained by means of a very small one-volt battery (bias cell). The cell assembly is mounted on a bakelite strip in the front corner of the chassis near the volume control. Do not put a voltmeter across this bias cell. Check it by temporarily replacing with a new cell, or some other one-volt source, and noting results. To remove the bias cell, simply pull up on the spring clip and lift the cell from its cup.

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1600, 1700, 4500 and 15,000 kc should be used. In addition, an output meter should be used across the voice coil or output transformer for observing maximum response.

I-f Alignment

The i-f transformers ZZT-194 and ZZT-195 are located on the top of the chassis. The four trimmers, two for each i-f transformer, are located at the tops of the cans. Set the wave-band switch to broadcast (extreme clockwise position) and rotate variable condenser to minimum. Feed 456 kc to grid of the 6A8 tube and adjust the four i-f trimmers for maximum response. Then feed 456 kc through the antenna and adjust the wave-trap trimmer for *minimum response*. The trimmer is on the wave-trap, which is located on top of the chassis behind the speaker.

Location of Coils

The antenna coils for the three bands are wound on one form and mounted on top of the chassis to the right of the speaker. The three trimmers for these coils are mounted on a bakelite strip above the tubing. The trimmer nearest the speaker is for the short-wave antenna coil. The center trimmer is for the police antenna coil and the trimmer furthest from speaker is for the broadcast antenna coil.

The oscillator coils for the three bands are wound on one form and mounted underneath the chassis deck on the right-hand wall with the trimmers facing out. The trimmer screws are available through three holes in the chassis wall. The trimmer closest to front is for the broadcast oscillator coil, the central trimmer is for the police oscillator coil and the trimmer furthest from front is for the short-wave oscillator coil.

The adjusting screws for the dual padder are also available at the right-hand chassis wall. The screw closer to the front is for the broadcast band and the other is for the police band. The short-wave band has no adjustable padder.

Broadcast Alignment

Set the wave-band switch to broadcast position (extreme clockwise) and dial pointer to 600. Feed 600 kc through antenna lead and adjust broadcast padder (lower row on right wall, closest to front) for maximum response. Set pointer to 1600, feed 1600 kc and adjust the broadcast oscillator trimmer (top row on right wall, closest to front) for maximum response, and then the broadcast antenna trimmer (on antenna coil, furthest from speaker). Return pointer to 600 and rock the variable condenser (rotate condenser back and forth through small arc) while adjusting the broadcast padder for maximum response. If a readjustment is necessary return to 1600 and realign the antenna and oscillator trimmers.

Police Alignment

Set the wave-band switch to police (central position), pointer to 1700 and feed 1700 kc through antenna lead. Adjust police band padder (furthest from front on right wall, lower row) for maximum response. Set pointer to 4500 and feed 4500 kc. Adjust police band oscillator trimmer (central trimmer on right wall, upper row) for maximum response. If two peaks are heard, select the one of minimum capacity (see General Instructions below), then adjust police band antenna trimmer (central one on top) for maximum response, selecting the peak of maximum capacity. Again feed 1700 kc, with pointer at 1700, rock variable condenser and adjust police band padder for maximum response. Realign at 4500 if necessary.

Short-Wave Alignment

Set wave-band switch to counter-clockwise (short-wave) position and pointer at 15 megacycles. Feed 15,000 kc through antenna. Adjust short-wave oscillator trimmer (furthest from front on right wall, top row) for maximum response. If two peaks are obtained, select the one of minimum capacity.

Check all three bands for dead spots or incorrect image responses.

General Instructions

The set's oscillator is higher in frequency than the signal on all three bands. Images, therefore, should be observed on the low-frequency side of the signals.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna and r-f trimmers. The last motion in adjusting trimmers should always be a tightening one.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely. Loose screws are a source of noise, frequency drift and microphonism.

In aligning antenna trimmers on the high-frequency signals there is usually a tendency for the oscillator to drift, due to interlocking. To compensate for this, always keep re-tuning the variable condenser.

REPLACEMENT PARTS

* Item No.	Part No.	DESCRIPTION	List Price Effective as of Sept. 1st, 1935 Price
L1	MMT-149	456 kc adjustable wave-trap	$ .35
L2	ZZT-196	Filter choke—500 ohms	.60
T1, T2, T3	ZZT-192A	Three-band antenna coil assembly	1.80
T4, T5, T6	ZZT-193	Three-band oscillator coil assembly	1.80
T7	ZZT-194	456 kc first i-f transformer	1.15
T8	ZZT-195	456 kc second i-f transformer	1.15
R1, R8	KR-53	50,000 ohm, ¼ watt carbon resistor	.16
R2	FFR-126	500 ohm, ½ watt wire-wound resistor	.16
R3, R7, R11	KR-57	1 megohm, ¼ watt carbon resistor	.16
R4	ZZR-196	30,000 ohm, ¼ watt carbon resistor	.16
R5, R17	LR-65	10,000 ohm, ¼ watt carbon resistor	.16
R6	ZZR-197	850 ohm, ½ watt wire-wound resistor	.16
R9, R13	KR-54	100,000 ohm, ¼ watt carbon resistor	.16
R10, S2	ZZR-190A	Volume control with line switch—0.5 megohms	.16
R12	LR-61	200,000 ohm, ¼ watt carbon resistor	.75
R14	ZZR-191A	Tone control—0.25 megohms	.16
R15, R16	KR-56	500,000 ohm, ¼ watt carbon resistor	.55
R18	LR-64	5,000 ohm, ¼ watt carbon resistor	.16
R19	ZZR-192A	Wire-wound ballast resistor—130 ohms	.16
C1, C2	ZZC-184	Two-gang variable condenser	.40
			1.80
C3, C4, C21, C22, C25	AC-6	0.1 mf, 200 volt tubular condenser	.16
C5	EC-24A	0.0001 mf mica condenser	.16
C6, C7	JJC-144C	Dual adjustable padding condenser C6—250 to 550 mmf. C7—800 to 1400 mmf.	.60
C8, C9, C10, C11, C12, C13, C14	ZZC-191B	Seven-section condenser block C8—0.1 mf, 200 v. C12—0.1 mf, 200 v. C9—0.1 mf, 200 v. C13—0.1 mf, 200 v. C10—0.2 mf, 200 v. C14—0.1 mf, 200 v. C11—0.05 mf, 200 v.	1.05
C15	ZZC-205	0.02 mf, 200 v. tubular condenser	.16
C16, C20, C24	AC-7A	0.00025 mf mica condenser	.16
C17, C18	CCC-127	0.01 mf, 200 v. tubular condenser	.16
C19	ZZC-213	0.006 mf, 200 v. tubular condenser	.16
C23, C31	AAC-114	0.001 mf mica condenser	.16
C26	BC-13	0.25 mf, 200 v. tubular condenser	.16
C27, C28, C29	ZZC-192A	4, 8 and 16 mf electrolytic filter condenser block C27—4 mf, 150 v. C29—16 mf, 150 v. C28—8 mf, 150 v.	2.25
C30	YC-98A	Tubular 4 mf, 150 v. electrolytic condenser	.70
C32	ZZC-206	0.005 mf mica condenser	.16
	ZZS-128A	5" dynamic speaker	3.75
S1	ZZS-129A	Wave-band switch	1.05
	KL-6	Pilot light, 6-8 volt, .15 amp.	.15
	ZZD-26A	Airplane dial	.85
B1	XXZ-213	Bias cell, one volt	.15
	ZZZ-209	Escutcheon with crystal	.20

When ordering replacement parts specify part number.

Production Changes

In early production runs C3 was a 0.03 mf, 200 v. condenser. Later it was changed to a 0.1 mf, 200 v. condenser and subsequently removed entirely from the circuit.

In later production runs, the following changes were made:

C30 added and circuit broken at X; 25Z5 cathodes separated (see schematic). C26 removed.
B minus grounded to chassis. C15 and C13 removed. C22 placed in the condenser block.
R11 changed from 1 megohm carbon resistor to 0.5 megohm, ¼ watt carbon resistor, our part KR-56.
R16 changed from 0.5 megohm carbon resistor to 0.25 megohm, ¼ watt carbon resistor, our part KR-55.

* Item number locates the article on the schematic diagram.

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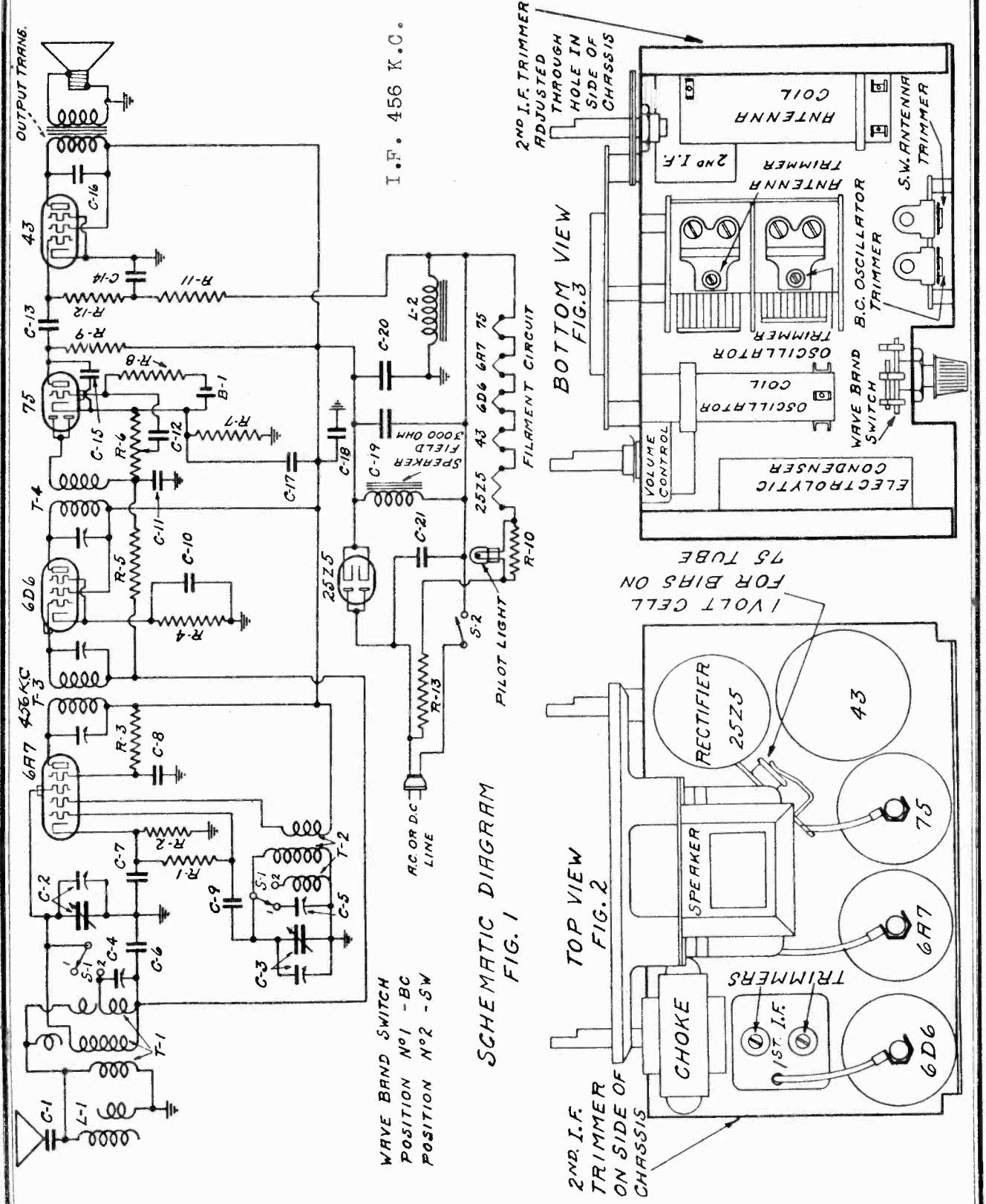
MODELS 108,110
Chassis U5A
Schematic
Socket, Trimmers



MODELS 108 and 110

Chassis Model U5A

Voltage rating	105-130 volts
Current drain	0.4 amp.
Frequency ranges	530-1550 kc, 1500-3800 kc.

GENERAL NOTES

1. Bias for the grid of the audio section of the 75 tube is obtained by means of a very small one-volt battery (bias cell). The cell assembly is mounted on a bakelite strip on top of the chassis. Do not put a voltmeter across this bias cell. If the set distorts, check the cell by temporarily replacing with a new cell, or some other one-volt source, and noting results. To remove the bias cell, simply pull up on the spring clip and lift the cell from its cup. On replacing it be sure the clip makes good contact.
2. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully realigned.
3. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
4. The filament dropping resistor, (R13—see schematic), is a resistance wire in the special line cord. The cord will, therefore, become warm under normal operating conditions. To insure good heat radiation stretch out the line cord to its full length. Do not attempt to shorten it by cutting.
5. In operating the receiver on d-c it may be necessary to reverse the line plug for correct polarity.
6. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red.

ADJUSTMENTS

The diagrams, Fig. 2 and Fig. 3, on the second page illustrate the location of the trimmers on the chassis. Note that the first i-f transformer, part No. 2DT-201, has two trimmers, located at the top of the can. The second i-f transformer is mounted on the inside of the right-hand chassis wall and has one trimmer, accessible through a hole in the chassis.

Two trimmers are mounted on the metal strap at the rear of the chassis. The trimmer nearest the wave-band switch is for the broadcast oscillator coil. The trimmer furthest away from the wave-band switch is for the short-wave antenna coil. The antenna stage trimmer will be found on the front section of the variable condenser and the oscillator stage trimmer on the rear section.

Alignment Procedure:

An oscillator with frequencies of 456, 1425, 2500 and 3600 kc should be used.

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

1. Turn the wave-band switch clockwise, to the broadcast position, and rotate the variable condenser to minimum.
2. Feed a 456 kc signal to the grid of the 6A7 tube.
3. Adjust the three i-f trimmers for maximum response.
4. Turn the wave-band switch counter-clockwise, to the short-wave position.
5. Set the dial pointer to 3600 and feed 3600 kc through the antenna lead.
6. Adjust the variable condenser oscillator trimmer (rear) for maximum response.
7. Turn wave-band switch to broadcast position and set the dial pointer to 1425.
8. Feed 1425 kc through the antenna and adjust the broadcast oscillator trimmer (on rear dual-trimmer strip, nearest band switch) for maximum response. Then adjust the antenna (front) section of variable condenser for maximum response.
9. Turn the wave-band switch counter-clockwise to the short-wave position. Set the dial pointer to 2500 and feed 2500 kc through the antenna.
10. Adjust the short-wave antenna trimmer (on rear strip, furthest from band switch) for maximum response.

TUBE DATA

The tube layout is illustrated in a diagram on the next page, Fig. 2. The complement of tubes and their functions are as indicated in the following table:

1—6A7—Pentagrid oscillator-modulator.
1—6D6—I-f amplifier.
1—75—Diode detector, audio amplifier, automatic volume control.
1—43—Pentode power output.
1—25Z5—Dual half-wave rectifier.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A7	105	55	1.6	105	6
6D6	105	105	3.0	—	6
75	45	—	0	—	6
43	100	105	0	—	24

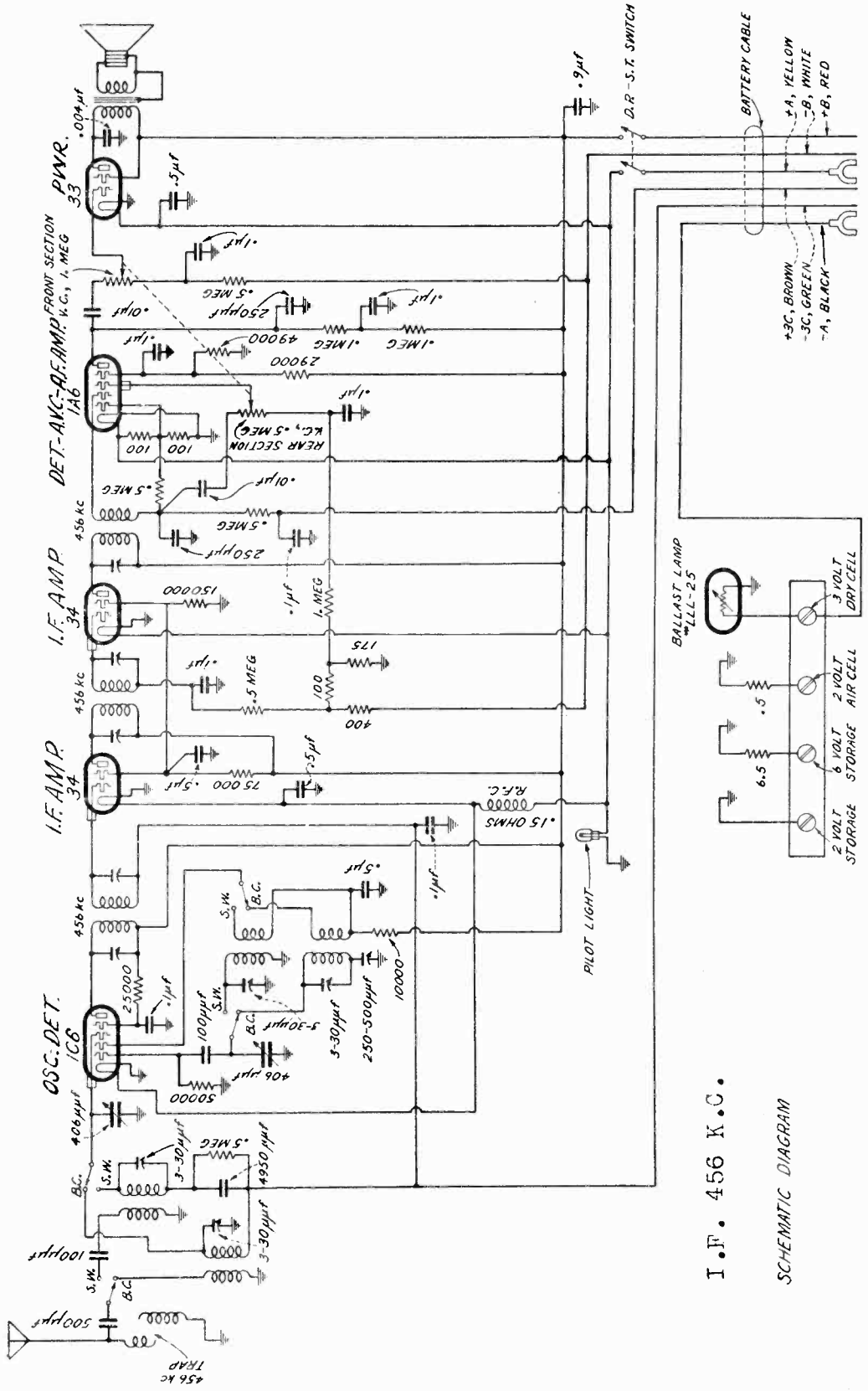
Voltage across speaker field (25Z5 cathode to line switch)—125 volts.
Voltage across choke (chassis to line switch)—20 volts.

REPLACEMENT PARTS

*Item	Part No.	DESCRIPTION
L2	ZZT-196	Filter choke—500 ohms
T1, L1	2DT-199	Two-band antenna coil with 456 kc wave trap
T2	2DT-200	Two-band oscillator coil
T3	2DT-201	456 first i-f transformer
T4	2DT-202A	456 kc second i-f transformer
R1	KR-53	50,000 ohm ¼ watt carbon resistor
R2	CCR-140	350 ohm ½ watt wire-wound resistor
R3	ZZR-196	30,000 ohm ¼ watt carbon resistor
R4	AAR-119	300 ohm ½ watt wire-wound resistor
R5, R8	KR-57	1 megohm ¼ watt carbon resistor
R6, S2	2DR-169	Volume control with line switch—0.5 megohm
R7	PR-79	1,000 ohm ¼ watt carbon resistor
R9, R11, R12	KR-56	0.5 megohm ¼ watt carbon resistor
R10	2DR-200	25 ohm wire-wound metal clad resistor
R13	2DW-62	145 ohm, 15 watt resistor wire in line cord
C1, C11	IC-47A	0.0005 mf mica condenser
C2, C3	2DC-202	Two gang variable condenser
C4, C5	2DC-212	Dual trimmer on bakelite strip 3 to 30 mmf—each trimmer
C6, C14, C21	AC-6	0.1 mf, 200 volt tubular condenser
C7, C8, C10	BC-12	0.05 mf, 200 volt tubular condenser
C9	EC-24A	0.0001 mf mica condenser
C12, C13	CCC-127	0.01 mf, 200 volt tubular condenser
C15	AC-7A	0.00025 mf mica condenser
C16	HC-34	0.006 mf, 600 volt tubular condenser
C17	EC-19	0.5 mf, 200 volt tubular condenser
C18	BC-13	0.25 mf, 200 volt tubular condenser
C19, C20	2DC-203	Multiple 8 and 16 mf electrolytic filter condenser C19—16 mf, 150 volts. C20—8 mf, 150 volts.
B1	XXZ-213	Bias cell, one volt
S1	2DS-102A	Wave-band switch
	KS-38B	5" dynamic speaker
	KL-6	Pilot light, 6-8 volt, .15 amp.
	2DW-62	Line cord with built-in resistor wire (R-13)
		Dial Assembly consists of:
	2DD-21A	Dial scale and bracket
	2DD-21B	Pyralin drive disc
	2DD-21C	Vernier friction drive
	2DD-21D	Dial crystal
	2DD-21E	Dial pointer

MODEL 280
Chassis F6D
Schematic

EMERSON RADIO AND PHONOGRAPH CORPORATION



DESCRIPTION

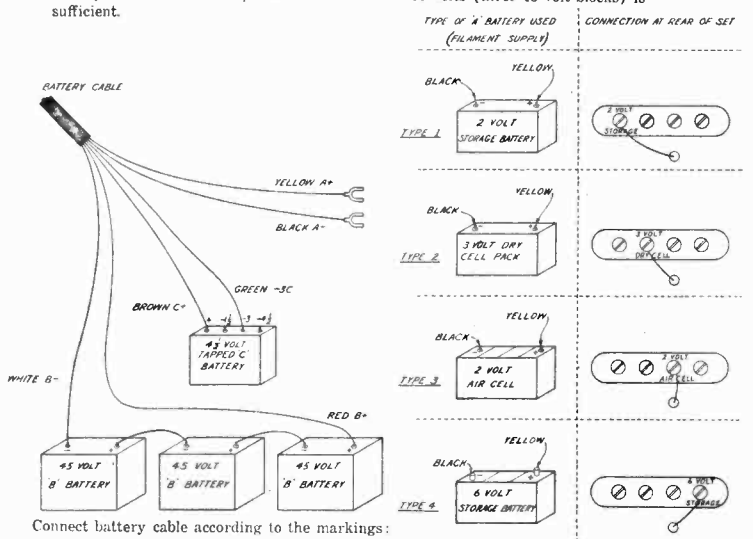
The following batteries are required:

For filament supply, one of the following: 2 volt storage battery, 2½ volt aircell, 3 volt dry cell pack or 6 volt storage battery.

High voltage: either 135 or 180 volts of B batteries.

Bias: either 3 or 4½ volts of C Battery (3 volts if 135 volt B is used, 4½ volts if 180 volt B is used).

Use of 180 volts (four 45 volt blocks) of B Battery is justified only when an unusually loud volume is required. For home use 135 volts (three 45 volt blocks) is sufficient.



Connect battery cable according to the markings:

yellow	A+	to	positive (+) side of filament supply. (A battery)
black	A—	to	negative (—) side of filament supply
white	B—	to	— side of B battery
brown	C+	to	+ side of 4½ volt tapped C battery
red	B+180 B+135	to	+ 180 or + 135 B
green	C—4½ C—3	to	— 4½ if 180 volt B is used, — 3 if 135 volt B is used.

Voltage Analysis:

Reading should be taken with 1000 ohms-per-volt voltmeter with 135 volts of B battery and 3 volts of C battery. Voltages are from points listed to ground.

Tube	*Plate*	*S. G.*	*Bias*	*Osc. plate*
1C6	118	60-70	—3 to +3C	85
34	118	45-50	—3 to +3C	
34	118	45-50	—6	
1A6	70	32-38	—3.8	
33	116	118	—15	

Measure bias voltage along resistor series circuit below chassis. Pilot light is 2 volt .06 amp. No other should be used. Set should not be operated without it.

The ballast (voltage regulator) tube is used *only* when a 3 volt dry cell pack is employed for filament supply. With a new dry cell unit the filament voltage on the tubes should not exceed 2.2 volts as measured with an *accurate* 1000 ohms-per-volt voltmeter. When the dry cell voltage has dropped to 2.2 volts, the filament voltage should not be less than 1.8 volts. A dry cell pack showing less than 2.2 volts with load should be discarded.

ADJUSTMENTS

This instrument was carefully aligned and adjusted at the factory. No one but a service man experienced with short-wave receivers should attempt to re-align the receiver. If it becomes necessary, the following procedure may be accurately followed:

An oscillator with frequencies of 456, 550, 1600 and 15000 kc (15 mc) should be used. In addition, an output meter should be used across the voice coil for the precise results necessary.

Alignment Procedure:

1. Set the range switch to the broadcast band.
2. Short circuit oscillator stator of the variable condenser to ground. (Front section.)
3. Introduce the 456 kc signal on the grid of 1C6 tube.
4. Adjust the single-tuned i-f transformer for maximum response on the output meter.
5. Adjust both trimmers on first two i-f transformers for maximum response.
6. Remove 456 kc signal from 1C6 grid.
7. Remove the short circuit from the stator of the oscillator section of the gang condenser.
8. Make sure that the dial reaches its extreme position at both ends of the broadcast band when the gang condenser is at maximum and minimum. If the dial does not do this, loosen the set screws on the hub and rotate the gang condenser to maximum capacity. Then rotate the dial (by means of the selector knob) to its extreme position at the 550 kc end of the broadcast band. Tighten the set-screws securely and proceed to re-align the set.
9. Set the dial to 1600 kc.
10. Introduce a 1600 kc signal into the antenna.
11. Adjust broadcast oscillator trimmer (on universal-wound oscillator coil under chassis) for maximum response.
12. Adjust trimmer on top of b.c. detector coil (long coil on top of chassis) for maximum response.
13. Introduce a 550 kc signal into the antenna. Rock the gang condenser back and forth around the 550 kc dial reading and at the same time adjust the series padding condenser for maximum output. Leave the series padder set to the point of maximum sensitivity. The series padder is on the front of the chassis.
14. Return to 1600 kc and repeat 11 and 12.
15. Now throw the range switch to short-wave position and introduce a 15 megacycles (mc) signal into the antenna.
16. Set the dial to 15 mc.
17. Adjust oscillator trimmer for maximum output. The short-wave oscillator trimmer is on the heavy-wire coil beneath the chassis.
18. Connect an outside antenna to the set and adjust the s. w. detector coil trimmer for maximum noise at 15 mc. The s. w. detector coil is the heavy-wire coil on top of the chassis. Before starting the adjustment turn the trimmer out so as to have minimum capacity, and then gradually increase it. A peak will be noticed and then as the capacity is increased the noise diminishes and disappears. When the capacity is increased further, the noise may increase again. The correct peak is the one at the minimum capacity end.

SERVICE PARTS

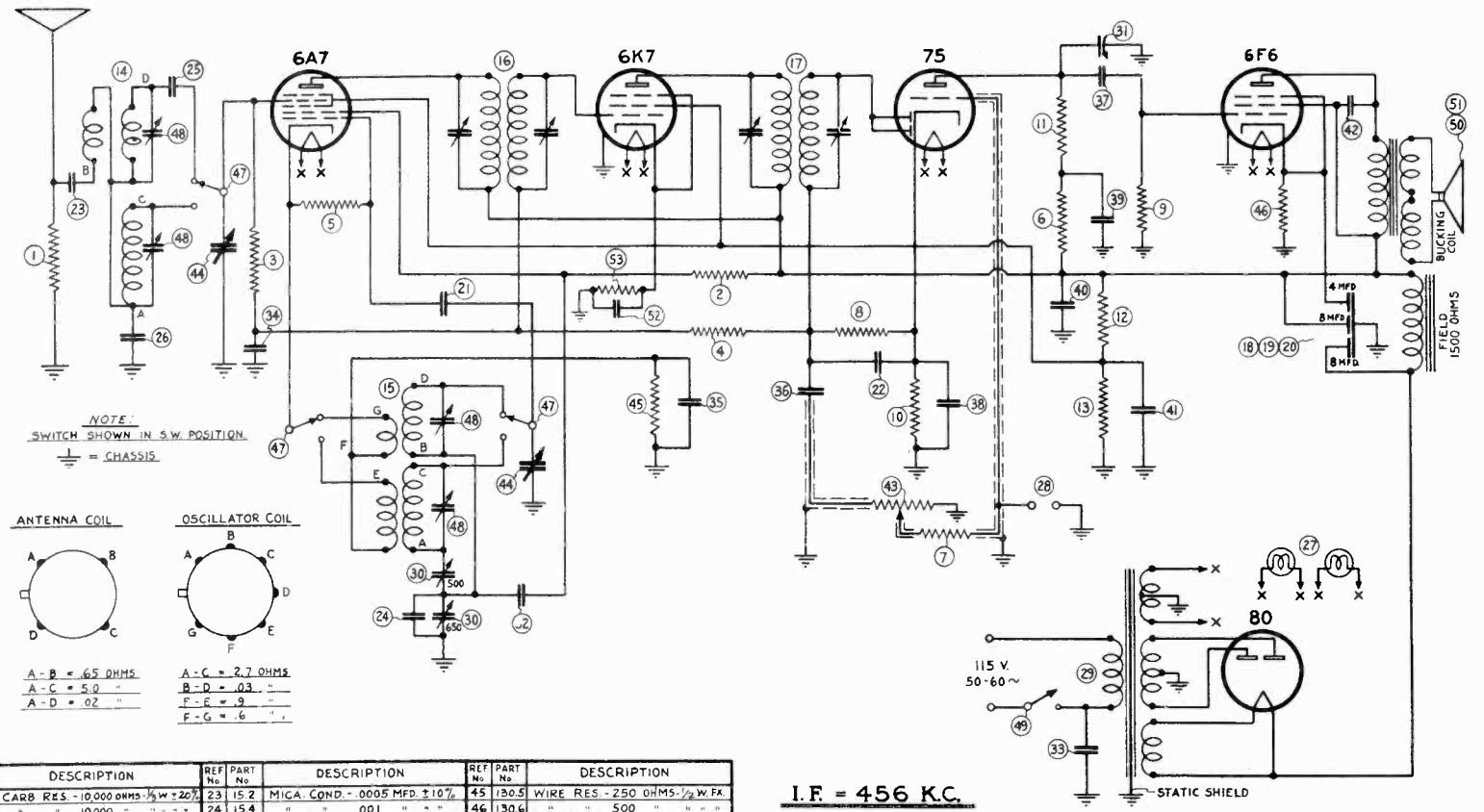
Part No.	*Description*		
LLT-139	Broadcast antenna coil	LLC-148A	Multiple condenser bank
LLT-140	Short-wave antenna coil	BBC-131	.9 mf tubular condenser
LLT-141	Broadcast oscillator coil	LLC-149	.00495 mf (4950 mmf) mica condenser
LLT-142	Short-wave oscillator coil	LLS-85	33 socket
LLT-143A	Filament r-f choke coil	LLS-86	34 socket
LLT-144	Dual tuned first i-f transformer	LLS-87	1A6 socket
DDT-121	Dual tuned second i-f transformer	LLS-88	1C6 socket
LLT-145	Single tuned third i-f transformer	LLS-89	LLL-25 socket (for ballast)
LLR-144	Volume control	LLS-90	Wave-band switch
LLR-145	.5 ohm aircell resistor	LLS-91	6" permanent magnet speaker
LLR-146	6.5 ohm 3 watt resistor (for 6 volt operation)	LLL-24	6 volt .06 amp. pilot light
EC-19	.5 mf 200 volt tubular condenser	LLW-49	Battery cable
LLC-147	Variable condenser	LLZ-142	Battery terminal strip
BBC-121	Adjustable padding condenser	LLD-19A	Vernier dial and scale

EMERSON RADIO AND PHONOGRAPH CORPORATION

FADA RADIO & ELECTRIC CORP.

MODEL 150 (2 Types)
Schematic

NOTE: In some receivers 6D6 is used instead of 6K7 and a 42 is used in place of the 6F6.



ANTENNA COIL

A - B = .65 OHMS
A - C = 5.0 "
A - D = .02 "

OSCILLATOR COIL

A - C = 2.7 OHMS
B - D = .03 "
F - E = .9 "
F - G = .6 "

REF No.	PART No	DESCRIPTION	REF No.	PART No	DESCRIPTION	REF No.	PART No	DESCRIPTION
1	30.31	CARB RES. - 10,000 OHMS - ½ W ± 20%	23	15.2	MICA COND. - .0005 MFD. ± 10%	45	130.5	WIRE RES. - 250 OHMS - ½ W. FX
2	30.31	" " 10,000 " " " "	24	15.4	" " .001 " " "	46	130.6	" " 500 " " "
3	30.22	" " 1 MEG " " " "	25	15.5	" " .002 " ± 3%	47	45.1	BAND SWITCH
4	30.22	" " 1 " " " "	26	15.6	" " .0025 " "	48		MIN. ADJ. ON COILS
5	30.3	" " 50,000 " " " 10%	27	120.3	PILOT LIGHTS - 6-8 V. .15 A.	49		ON-OFF SW. ON VOL. CONT (43)
6	30.26	" " 50,000 " " " 20%	28	125.1	PHONO. JACK	50	105.4	SPEAKER - (150 T)
7	30.26	" " 50,000 " " " "	29	40.4	POWER TRANSFORMER	51	105.20	" (150 C)
8	30.23	" " 500,000 " " " "	30	25.1	PADDING COND. - 650-500 MMF.	52	10.5	TUBULAR COND. - .05 MFD - 200 V.
9	30.23	" " 500,000 " " " "	31	55.1	TONE CONTROL	53	130.2	WIRE RES. - 350 OHMS - ½ W. FX
10	30.12	" " 4,000 " " " 10%	32	10.7	TUBULAR COND. - .05 MFD - 400 V.			
11	30.20	" " 250000 " " " 20%	33	10.7	" " .05 " " "			
12	30.13	" " 20,000 " 1 " 10%	34	10.5	" " .05 " 200 "			
13	30.14	" " 50,000 " ½ " " "	35	10.5	" " .05 " " "			
14	2026	ANTENNA COIL	36	10.4	" " .01 " " "			
15	3116	OSCILLATOR "	37	10.10	" " .01 " 400 "			
16	3879	1ST I.F. "	38	10.1	" " .35 " 200 "			
17	3880	2ND I.F. "	39	10.9	" " .1 " 400 "			
18	20.8	ELECTRO. COND. BLOCK - 8 MFD 450 W	40	10.9	" " .1 " " "			
19	20.8	" " " 8 " 450 "	41	10.9	" " .1 " " "			
20	20.8	" " " 4 " 25 "	42	10.3	" " .006 " " "			
21	15.3	MICA COND. - .0001 MFD. ± 10%	43	50.1	VOLUME CONTROL - ½ MEG			
22	15.1	" " .00025 " " "	44	25.20A	VARIABLE COND.			

I.F. = 456 K.C.

1ST I.F. TRANS.	2ND I.F. TRANS.
PRI. - 14.5 OHMS	PRI. - 14.5 OHMS
SEC. - 14.5 "	SEC. - 14.5 "

FADA RADIO & ELECTRIC CO. LONG ISLAND CITY, N.Y.	
MODEL 150	
DRAWN BY CP	DATE 7-10-35
CHECKED BY JB	APP RFG

NOTE: In sets using 6D6, the cathode of 6D6 joins resistor 45 and units 52 and 53 are not used. In these receivers 35 is .OI MFD. and 36 is .25 MFD.

MODEL 150
Alignment, Trimmers
Socket, Voltage

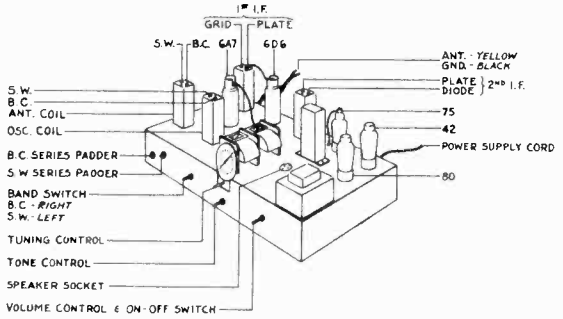
FADA RADIO & ELECTRIC CORP.

COMPENSATING INSTRUCTIONS FOR

MODEL 150 SERIES

In order to adjust accurately the various aligning condensers of the receiver in accordance with the following instructions, it is essential to use a shielded signal generator capable of giving a modulated carrier which can be attenuated at 456 KC, 600 KC, 1500 KC, 6 MC and 15 MC.

This receiver is equipped with an automatic volume control which necessitates setting the manual volume control of the receiver to its maximum position to insure accuracy in alignment. To control the signal output of the receiver it will be necessary to use the attenuator control of the signal generator.



ADJUSTMENT OF THE I.F. CONDENSERS

The four (4) intermediate frequency (I.F.) condensers are located as shown in the sketch.

1st - Disconnect the outside antenna system from the receiver.

2nd - Disconnect the control grid lead from the 6A7 tube.

3rd - Connect the high potential lead of the signal generator to the control grid of the 6A7 tube, and the low potential side to the receiver "ground" lead.

4th - Place an output meter (copper oxide type) across the speaker voice coil so that variations in signal output can be noted.

5th - Place the signal generator in operation and adjust the carrier frequency to 456 KC. Regulate the attenuator control of the signal generator so that the output signal is low enough to insure accuracy in adjusting the I.F. condensers.

6th - With the aid of a bakelite type screw driver, adjust the four (4) I.F. condensers to resonance as indicated by the greatest swing of the needle on the output meter. Repeat these adjustments as there is a slight interlocking effect.

ADJUSTMENT OF S.W. SHUNT COMPENSATORS

The compensators are located as indicated on the sketch.

1st - Remove the signal generator connection from the control grid of the 6A7 tube and replace the control grid lead.

2nd - Connect the antenna wire of the receiver chassis through a 400 ohm carbon resistor to the high potential side of the signal generator. The ground wire should remain connected to the signal generator.

3rd - Adjust the carrier frequency output of the signal generator to 15 MC.

4th - Turn the wave band selector switch to the left - short wave position. Set the calibrated dial of the receiver to read 15 MC.

5th - Adjust the S.W. oscillator shunt compensator for maximum signal output. If two peaks are noted on this adjustment, the proper one is that with the compensator farthest "in." To determine that this compensator has not been adjusted to the image frequency, turn the receiver dial to approximately 15.9 MC. If no signal can be heard at this setting, even with a greater signal generator output, the S.W. oscillator shunt compensator has been improperly adjusted and it will be necessary to return the dial to 15 MC and adjust to the proper peak. After re-adjusting check to see that the image frequency comes in at 15.9 MC on the receiver dial. It is well to bear in mind throughout these adjustments that with the same signal input to the receiver, the image response point should be weaker than the original (fundamental) signal frequency.

6th - Having determined the correct peak, and maximum setting, for the S.W. oscillator shunt compensator, adjust the S.W. detector shunt compensator for maximum signal output.

ADJUSTMENT OF S.W. OSCILLATOR SERIES PADDER

1st - Adjust the carrier frequency output of the signal generator to 6 MC.

2nd - Turn the calibrated dial of the receiver to pick up this 6 MC signal.

3rd - With the aid of a bakelite type screw driver, adjust the S.W. oscillator series padder (see sketch) until a maximum output signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum output signal.

4th - Having determined the maximum peak of the S.W. oscillator series padder, re-adjust the carrier frequency of the signal generator to 15 MC. Turn the calibrated dial to 15 MC and re-adjust S.W. oscillator shunt compensator, and then S.W. detector shunt compensator for maximum signal output; checking for image point as outlined in the foregoing instructions.

ADJUSTMENT OF BC SHUNT COMPENSATORS

The compensators are located as indicated in the sketch.

1st - Remove the 400 ohm resistor from the high potential side of the signal generator and insert a 250 mmfd. mica condenser in its place.

2nd - Turn the wave band selector switch to the right - broadcast position.

3rd - Adjust the carrier frequency to 1500 KC.

4th - Set the calibrated dial of the receiver to read 1500 KC.

5th - Adjust the BC oscillator shunt compensator for maximum signal output.

6th - Adjust the BC detector shunt compensator for maximum signal output.

ADJUSTMENT OF BC OSCILLATOR SERIES PADDER

1st - Adjust the carrier frequency output of the signal generator to 600 KC.

2nd - Turn the calibrated dial of the receiver to pick up this 600 KC signal.

3rd - With the aid of a bakelite type screw driver, adjust the BC oscillator series padder (see sketch) until a maximum signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

4th - Having determined the maximum peak of the BC oscillator series padder, re-adjust the carrier frequency of the signal generator to 1500 KC. Turn the calibrated dial to 1500 KC and re-adjust the BC oscillator shunt and the BC detector shunt compensators for maximum signal output as outlined in the foregoing instructions.

CONTINUITY AND VOLTAGE READINGS ON

MODEL 150 SERIES

Line Voltage 118 - Input Current .45 amp.
No Signal Input - Wave Band Switch - Right.

TYPE OF TUBE	POSITION OF TUBE	PLATE VOLTS	PLATE MA CURRENT	CATHODE VOLTS	SCREEN GRID VOLTS
6A 7	1st Det.-Osc.	182	1.9	4.0	80
6D6	Int. Freq.	182	5.5	4.0	80
75	2nd Det.	---	---	---	---
	1st Aud.	82*	0.3	1.5	---
42	2nd Aud.	166	20.0	13.0	173
80	Rectifier	---	42.0 TOTAL	---	---

6A7 Osc. Anode voltage -- 132 and Current -- 4.8 ma.

* These readings were taken with a 1,000 ohm per volt meter and are not indicative of effective voltages.

VOLTAGE ACROSS ELECTROLYTIC CONDENSER

1st section	2nd section
338	186

Voltage across speaker field..... 152 volts
" " 20,000 ohm 1 watt resistor..... 102 "
" " 50,000 " 1/2 " " ..... 84 "

D.C. RESISTANCE VALUES

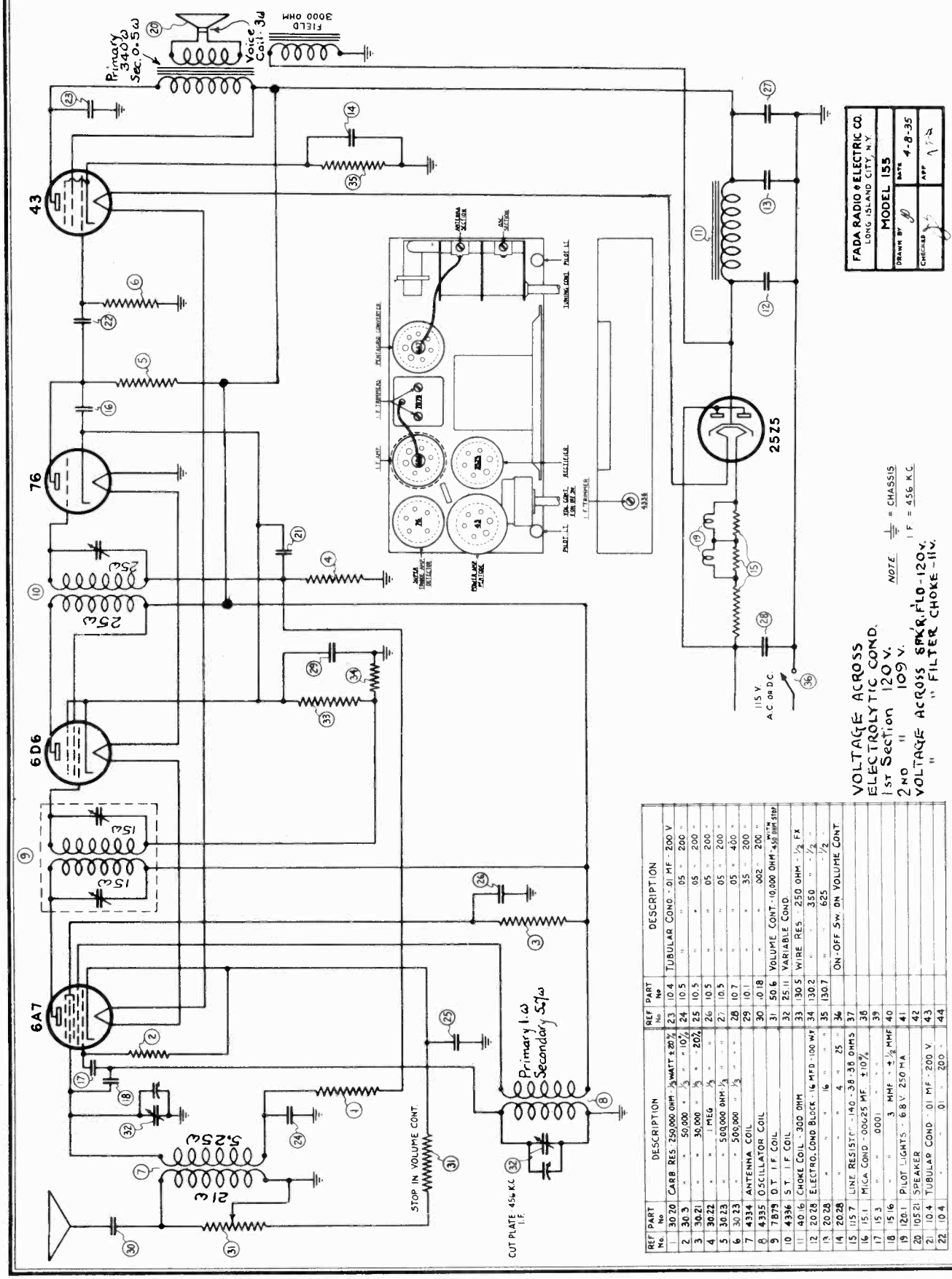
	PRIMARY	SECONDARY
Speaker input transformer	550. ohms	.335 ohms
" field coil	1,520. "	
" voice coil	2.9 "	
" bucking coil	.345 "	

FORM S-2147
July 1, 1935

SERVICE DIVISION

FADA RADIO & ELECTRIC CORP.

MODEL 155
Schematic, Socket
Trimmers



REF No.	PART No	DESCRIPTION	REF No	PART No	DESCRIPTION
1	30.20	CARB RES 250,000 OHM - ½ WATT ±20%	23	10.4	TUBULAR COND - .01 MF - 200 V
2	30.3	" " 50,000 " " ½ " " - 10%	24	10.5	" " .05 " " 200 "
3	30.21	" " 30,000 " " ½ " " - 20%	25	10.5	" " .05 " " 200 "
4	30.22	" " 1 MEG " " ½ " "	26	10.5	" " .05 " " 200 "
5	30.23	" " 500,000 OHM ½ " "	27	10.5	" " .05 " " 200 "
6	30.23	" " 500,000 " " ½ " "	28	10.7	" " .05 " 400 "
7	4334	ANTENNA COIL	29	10.1	" " .35 " 200 "
8	4335	OSCILLATOR COIL	30	.018	" " .002 " 200 "
9	7879	D.T. I.F. COIL	31	50.6	VOLUME CONT - 10,000 OHM - WITH stop
10	4336	S.T. I.F. COIL	32	25.11	VARIABLE COND
11	40.16	CHOKE COIL - 300 OHM	33	30.5	WIRE RES - 250 OHM - ½ " FX
12	2028	ELECTRO. COND BLOCK - 16 MFD - 100 WV	34	130.2	" " 350 " - ½ " "
13	2028	" " " 16 " " "	35	130.7	" " 625 " - ½ " "
14	2028	" " " 4 " 25 "	36		ON-OFF SW. ON VOLUME CONT
15	115.7	LINE RESISTOR - 140 - 38 - 38 OHMS	37		
16	15.1	MICA COND - .00025 MF ±10%	38		
17	15.3	" " .0001 " "	39		
18	15.16	" " .3 MMF - ±½ MMF	40		
19	120.1	PILOT LIGHTS - 6.8 V 250 MA	41		
20	10521	SPEAKER	42		
21	10.4	TUBULAR COND - .01 MF - 200 V	43		
22	10.4	" " .01 " 200 "	44		

COMPENSATING INSTRUCTIONS FOR

MODEL 155

In order to adjust accurately the various trimmer condensers of the receiver in accordance with the following instructions, it is essential to use a shielded signal generator capable of giving a modulated carrier which can be attenuated at 456 KC and 1500 KC.

This receiver is equipped with an automatic overload control which necessitates setting the manual volume control of the receiver to the maximum position, to assure accuracy in alignment. To control the signal output of the receiver it will be necessary to use the attenuator control of the signal generator.

NOTE: Do not remove knobs, screws or chassis from the cabinet before removing the line cord plug from the power line socket. If the above precaution is not followed a severe electric shock, or damage to the receiver, may result.

ADJUSTMENT OF I.F. CONDENSERS

The three (3) intermediate frequency (I.F.) condensers are located as shown in the sketch.

1st - Turn the rotor plates of the ganged variable condenser to a position where no broadcast station carrier is heard. If this is not possible, the oscillator stator section (see sketch) of the ganged variable condenser may be short circuited to chassis.

2nd - Disconnect the control grid lead from the 6A7 oscillator-modulator tube.

3rd - Connect the high potential lead of the signal generator to the control grid of the 6A7 oscillator-modulator tube, and the low potential lead to the receiver chassis.

4th - Place an output meter (copper oxide type) across the speaker voice coil terminals so that variations in signal output can be noted.

5th - Place the signal generator in operation and adjust the carrier frequency to 456 KC. Regulate the attenuator control of the signal generator so that the output signal is low enough to insure accuracy in adjusting the I.F. condensers.

6th - With the aid of a bakelite type screw driver, adjust the three (3) I.F. condensers to resonance as indicated by the greatest swing of the needle on the output meter.

ADJUSTMENT OF THE GANGED VARIABLE CONDENSER

The compensators are located at the top of their respective tuning condenser section and can be adjusted with the aid of a screw driver.

1st - Remove signal generator connection from control grid of 6A7 oscillator-modulator tube and replace control grid lead.

2nd - Connect the antenna wire of the receiver to the high potential lead of the signal generator through a 250 mmfd. condenser.

3rd - Adjust the carrier frequency of the signal generator to 1500 KC.

4th - Set the dial of the receiver to read 1500 KC.

5th - Starting with the compensator nearest the front of the receiver, adjust each compensator (as indicated on sketch) for maximum signal output. Do not disturb the setting of the gang condenser during these operations.

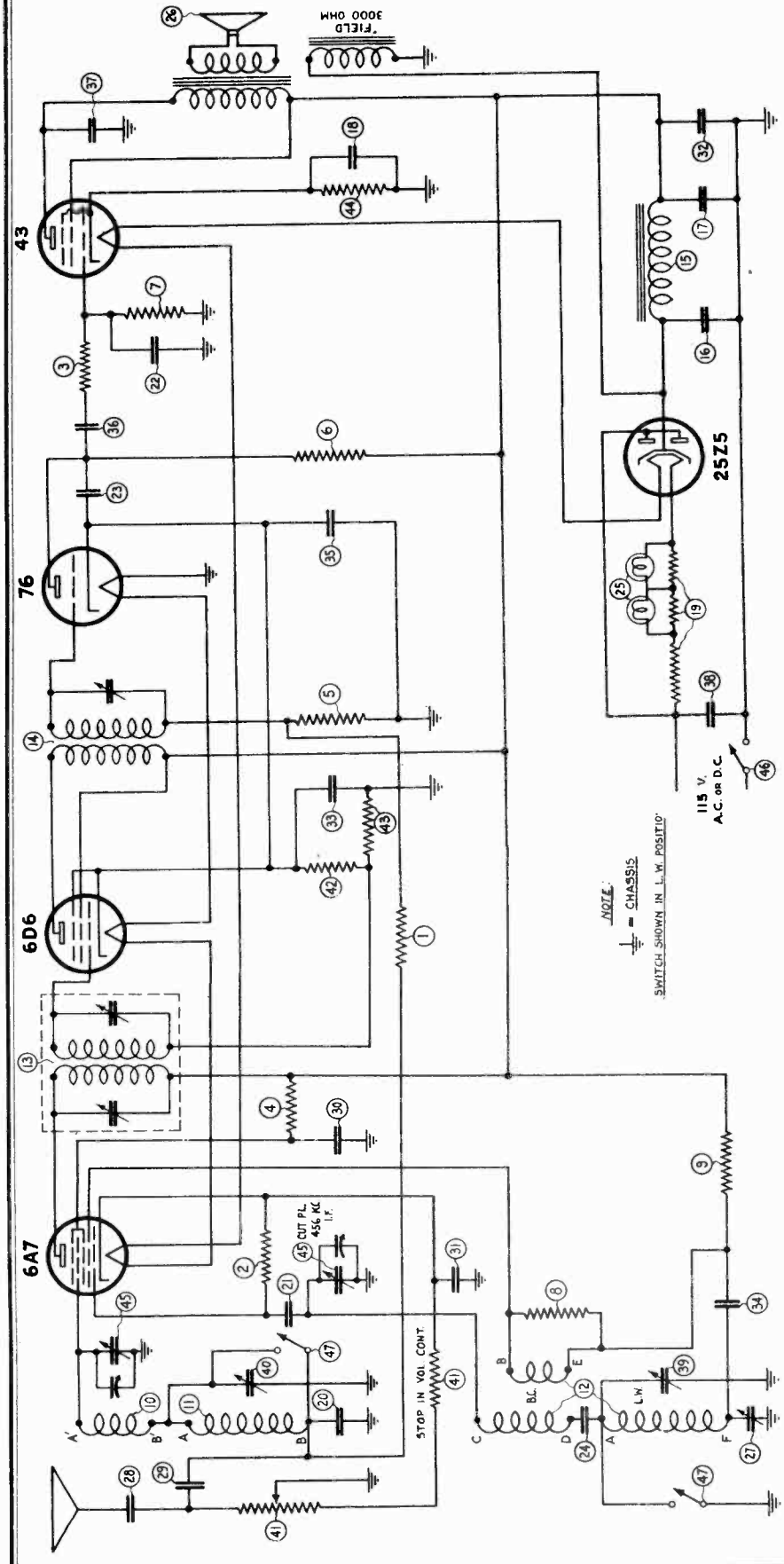
TYPE OF TUBES	POSITION OF TUBES	PLATE VOLTS	PLATE MA CURRENT	CONTROL GRID VOLTS	SCREEN GRID VOLTS
6A7	1st Det. Osc.	107	1.0	2.0**	48
6D6	Int. Freq.	102	8.0	2.6	102
76	2nd Det.	34*	0.1	6.5**	
43	Pwr. Pentode	89	18.0	14.0**	95
25Z5	Rectifier		76. TOTAL		

* These readings were taken with a 1,000 ohm per volt meter and are not indicative of effective voltages.

** Correct readings cannot be obtained at control grid, due to series resistors. To be measured across each respective bias resistor.

FADA RADIO & ELECTRIC CORP.

MODEL 156
Schematic



REF No.	PART No.	DESCRIPTION	REF No.	PART No.	DESCRIPTION	REF No.	PART No.	DESCRIPTION
1	30.20	CARB. RES. - 250,000 OHM ½W. ±20%	23	15.2	MICA COND. - .0005 MFD. ± 10%	45	25.11	VARIABLE COND.
2	30.3	" " 50,000 " " " ±10%	24	15.17	" " .0015 " " 3%	46		ON-OFF SW. ON VOLUME CONT.
3	30.3	" " 50,000 " " " "	25	20.1	PILOT LIGHTS 6-8 V. .25 A.	47	45.8	BAND SWITCH
4	30.21	" " 30,000 " " " ±20%	26	105.21	SPEAKER - 3000 OHM			
5	30.22	" " 1 MEG " " " "	27	25.41	PADDING COND. - 400 MMF.			
6	30.23	" " 500,000 " " " "	28	10.18	TUBULAR COND. - .002 MMF. 200 V.			
7	30.23	" " 500,000 " " " ±10%	29	10.18	" " .002 " " "			
8	30.1	" " 5,000 " " " "	30	10.5	" " .05 " " "			
9	30.1	" " 5,000 " " " "	31	10.5	" " .05 " " "			
10	45.74	BROADCAST ANTENNA COIL	32	10.5	" " .05 " " "			
11	45.76	LONG WAVE "	33	10.1	" " .35 " " "			
12	45.75	B.C. & L.W. OSCILLATOR "	34	10.4	" " .01 " " "			
13	78.79	D.T. I.F. COIL	35	10.4	" " .01 " " "			
14	43.36	S.T. I.F. "	36	10.4	" " .01 " " "			
15	40.16	CHOKE COIL - 300 OHM	37	10.4	" " .01 " " "			
16	20.28	ELECTRO. COND. BLOCK - 16 MFD. 100 W.V.	38	10.7	" " .05 " " 400 "			
17	20.28	" " " 16 " " "	39	25.38	TRIMMER - 10-60 MMF.			
18	20.28	" " " 4 " 25 "	40	25.14	" 3-30 "			
19	115.7	LINE RESISTOR - 140-38-38 OHM	41	50.6	VOLUME CONT. - 10,000 OHM WITH 250 OHM SHUNT			
20	15.5	MICA COND. - .002 MFD. ± 3%	42	130.5	WIRE RES. - 250 OHM - ½ FX.			
21	15.3	" " .0001 " " 10%	43	130.2	" " 350 " " "			
22	15.3	" " .0001 " " " "	44	130.1	" " 625 " " "			

B.C. ANT. COIL — A'-B' = 4.9 OHMS

B.C. & L.W. OSC. COIL — A-F = 13.4 OHMS; B-E = 1.8 "; C-D = 6.7 "

L.W. ANT. COIL — A-B = 18.5 OHMS

I.F. = 456 K.C.

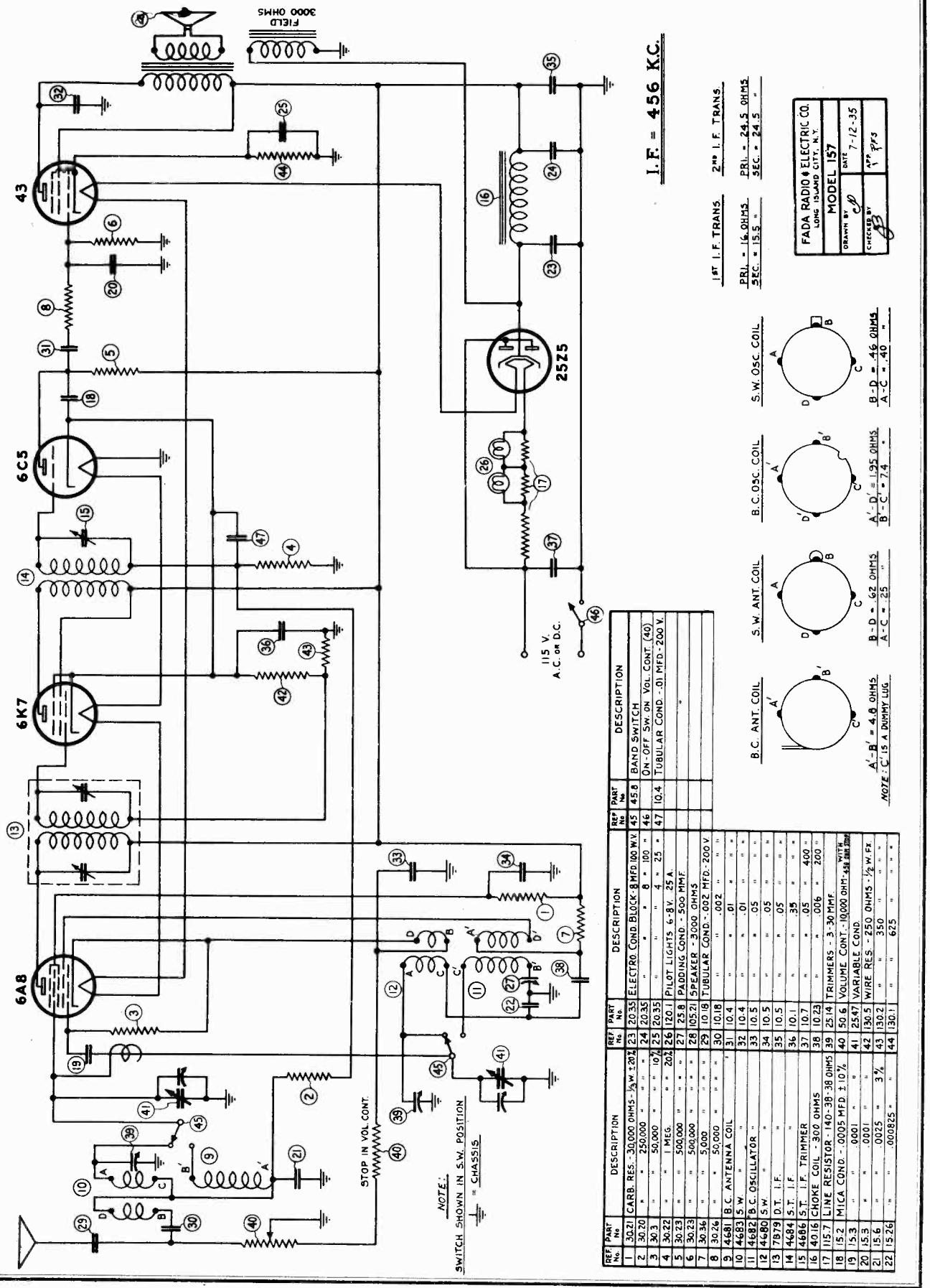
1ST I.F. TRANS. — PRI. = 16 OHMS; SEC. = 15.5 "

2ND I.F. TRANS. — PRI. = 24.5 OHMS; SEC. = 24.5 "

FADA RADIO & ELECTRIC CO. LONG ISLAND CITY, N.Y.		
MODEL 156		
DRAWN BY GD	DATE 6-29-35	
CHECKED BY [illegible]	APP. [illegible]	

MODEL 157
Schematic

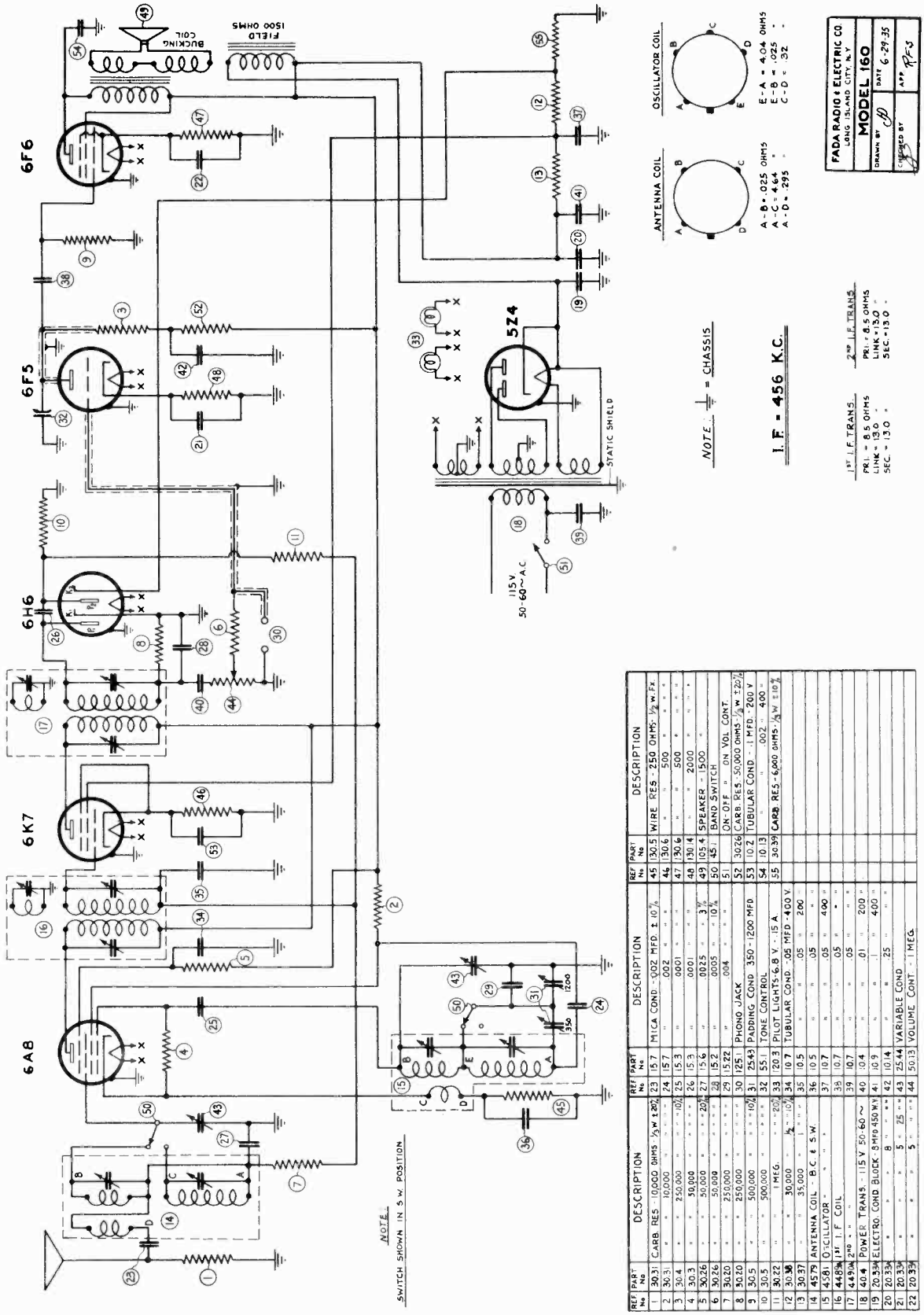
FADA RADIO & ELECTRIC CORP.



REF No.	PART No.	DESCRIPTION
1	30.21	CARB. RES. - 30,000 OHMS - ½W ± 20%
2	30.20	" " 250,000 " " " "
3	30.3	" " 50,000 " " " 10%
4	30.22	" " 1 MEG. " " " 20%
5	30.23	" " 500,000 " " " "
6	30.23	" " 500,000 " " " "
7	30.36	" " 5,000 " " " "
8	30.24	" " 50,000 " " " "
9	4681	B.C. ANTENNA COIL
10	4683	S.W. "
11	4682	B.C. OSCILLATOR "
12	4680	S.W. "
13	7879	O.T. I.F. "
14	4684	S.T. I.F. "
15	4686	S.T. I.F. TRIMMER
16	4016	CHOKE COIL - 300 OHMS
17	115.7	LINE RESISTOR - 140-38-38 OHMS
18	15.2	MICA COND. - .0005 MFD ± 10%
19	15.3	" " .0001 " "
20	15.3	" " .0001 " "
21	15.6	" " .0025 " 3%
22	15.26	" " .000825 " "
23	20.35	ELECTRO. COND. BLOCK - 8 MFD. 100 W.V.
24	20.35	" " " 8 " 100 "
25	20.35	" " " 4 " 25 "
26	120.1	PILOT LIGHTS 6-8 V. .25 A.
27	25.8	PADDING COND. - 500 MMF
28	105.21	SPEAKER - 3000 OHMS
29	10.18	TUBULAR COND. - .002 MFD. - 200 V.
30	10.18	" " " .002 " " "
31	10.4	" " " .01 " " "
32	10.4	" " " .01 " " "
33	10.5	" " " .05 " " "
34	10.5	" " " .05 " " "
35	10.5	" " " .05 " " "
36	10.1	" " " .35 " " "
37	10.7	" " " .05 " 400 "
38	10.23	" " " .006 " 200 "
39	25.14	TRIMMERS - 3-30 MMF
40	50.6	VOLUME CONT. - 10,000 OHMS - 4½ WATT TYPE
41	25.47	VARIABLE COND.
42	130.5	WIRE RES. - 250 OHMS - ½ W. FX
43	130.2	" " 350 " " "
44	130.1	" " 625 " " "
45	45.8	BAND SWITCH
46	45	ON - OFF SW. ON VOL. CONT. (40)
47	10.4	TUBULAR COND. - .01 MFD - 200 V.

MODEL 160 Series
Schematic

FADA RADIO & ELECTRIC CORP.



FADA RADIO & ELECTRIC CO
LONG ISLAND CITY, N.Y.
MODEL 160
DRAWN BY: CD DATE: 6-29-35
CHECKED BY: APP'D BY: RFS

REF No	PART No	DESCRIPTION
1	30.31	CARB. RES - 10,000 OHMS ½ W ± 20%
2	30.31	" " 10,000 " " " " " "
3	30.4	" " 250,000 " " " 10% " "
4	30.3	" " 50,000 " " " " " "
5	30.26	" " 50,000 " " " 20% " "
6	30.26	" " 50,000 " " " " " "
7	30.20	" " 250,000 " " " 10% " "
8	30.20	" " 250,000 " " " " " "
9	30.5	" " 500,000 " " " 10% " "
10	30.5	" " 500,000 " " " " " "
11	30.22	" " 1 MEG. " " " 20% " "
12	30.30	" " 30,000 " " " 10% " "
13	30.37	" " 35,000 " " " " " "
14	45.79	ANTENNA COIL - B.C. & S.W.
15	45.81	OSCILLATOR " " "
16	44.85	1ST I.F. COIL
17	44.90	2ND " "
18	40.4	POWER TRANS. - 115 V. 50-60~
19	20.34	ELECTRO. COND. BLOCK - 8 MFD 450 W.V.
20	20.33	" " " 8 " " " " "
21	20.33	" " " 5 " 25 " " "
22	20.33	" " " 5 " " " " "

REF No	PART No	DESCRIPTION
23	15.7	MICA COND. - .002 MFD ± 10%
24	15.7	" " .002 " " " "
25	15.3	" " .0001 " " " "
26	15.3	" " .0001 " " " "
27	15.6	" " .0025 " " " 3%
28	15.2	" " .0005 " " " 10%
29	15.22	" " .004 " " " "
30	125.1	PHONO JACK
31	25.43	PADDING COND. 350 - 1200 MFD
32	55.1	TONE CONTROL
33	20.3	PILOT LIGHTS - 6.8 V. .15 A.
34	10.7	TUBULAR COND. - .05 MFD - 400 V.
35	10.5	" " " .05 " " 200 "
36	10.5	" " " .05 " " " "
37	10.7	" " " .05 " " 400 "
38	10.7	" " " .05 " " " "
39	10.7	" " " .05 " " " "
40	10.4	" " " .01 " " 200 "
41	10.9	" " " .1 " " 400 "
42	10.14	" " " .25 " " " "
43	25.44	VARIABLE COND.
44	50.13	VOLUME CONT. - 1 MEG.

REF No	PART No	DESCRIPTION
45	30.5	WIRE RES - 250 OHMS ½ W. Fx
46	30.6	" " 500 " " " "
47	30.6	" " 500 " " " "
48	30.4	" " 2000 " " " "
49	105.4	SPEAKER - 1500 "
50	45.1	BAND SWITCH
51		ON - OFF " ON VOL. CONT.
52	30.26	CARB. RES. - 50,000 OHMS ½ W ± 20%
53	10.2	TUBULAR COND. - 1 MFD - 200 V.
54	10.13	" " .002 " 400 "
55	30.39	CARB. RES. - 6,000 OHMS ½ W ± 10%

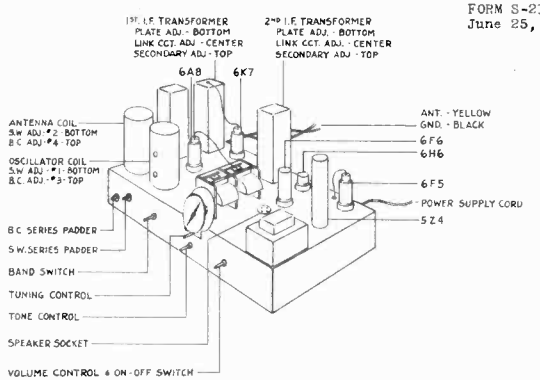
COMPENSATING INSTRUCTIONS FOR

MODEL 160 SERIES

In order to adjust accurately the various trimmer condensers of the receiver in accordance with the following instructions, it is essential to use a shielded signal generator capable of giving a modulated carrier which can be attenuated at 456 KC, 600 KC, 1500 KC, 6 MC and 15 MC.

This receiver is equipped with an automatic volume control which necessitates setting the manual volume control of the receiver to its maximum position to insure accuracy in alignment. To control the signal output of the receiver it will be necessary to use the attenuator control of the signal generator.

FORM S-2138
June 25, 1935



ADJUSTMENT OF THE I.F. CONDENSERS

The six (6) intermediate frequency (I.F.) condensers are located as shown in the sketch.

1st - Disconnect the outside antenna system from the receiver.
2nd - Disconnect the control grid lead from the 6A8 tube.

3rd - Connect the high potential lead of the signal generator to the control grid of the 6A8 tube, and the low potential side to the receiver "ground" lead.

4th - Place an output meter (copper oxide type) across the speaker voice coil so that variations in signal output can be noted.

5th - Place the signal generator in operation and adjust the carrier frequency to 456 KC. Regulate the attenuator control of the signal generator so that the output signal is low enough to insure accuracy in adjusting the I.F. condensers.

6th - With the aid of a bakelite type screw driver, adjust the six (6) I.F. condensers to resonance; adjusting first the I.F. condenser across the secondary winding of the 2nd I.F. transformer and then each in turn, ending with the adjustment of the condenser across the primary winding of the 1st I.F. transformer.

ADJUSTMENT OF S.W. SHUNT COMPENSATORS

The compensators are located as indicated on the sketch.

1st Remove the signal generator connection from the control grid of the 6A8 tube and replace the control grid lead.

2nd Connect the antenna wire of the receiver chassis through a 400 ohm carbon resistor to the high potential side of the signal generator. The ground wire should remain connected to the signal generator.

3rd Adjust the carrier frequency output of the signal generator to 15 MC.

4th Turn the wave band selector switch to the left - short wave position. Set the calibrated dial of the receiver to read 15 MC.

5th Adjust the S.W. oscillator shunt compensator (#1 on sketch) for maximum signal output. If two peaks are noted on this adjustment, the proper one is that with the compensator farthest "in". To determine that this compensator has not been adjusted to the image frequency, turn the receiver dial to approximately 15.9 MC. If no signal can be heard at this setting even with a greater signal generator output, the S.W. shunt compensator (#1) has been improperly adjusted and it will be necessary to re-adjust to the proper peak. After re-adjusting check to see that the image frequency comes in at 15.9 MC. It is well to bear in mind throughout these adjustments that with the same signal input to the receiver, the image response point should be weaker than the original signal frequency output reading.

6th Having determined the correct peak, and maximum setting, for the S.W. oscillator shunt compensator (#1) adjust the S.W. detector shunt compensator (#2) for maximum output.

ADJUSTMENT OF S.W. OSCILLATOR SERIES TRIMMER

1st Adjust the carrier frequency output of the signal generator to 6 MC.

2nd Turn the calibrated dial of the receiver to pick up this 6 MC signal.

3rd With the aid of a bakelite type screw driver, adjust the S.W. oscillator series trimmer (see sketch) until a maximum output signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

4th Having determined the maximum peak of the S.W. oscillator series trimmer, re-adjust the carrier frequency of the signal generator to 15 MC. Turn the calibrated dial to 15 MC, and re-adjust S.W. oscillator shunt compensator (#1), and then, S.W. detector shunt compensator (#2) for maximum signal output; checking for image point as outlined in the foregoing instructions.

ADJUSTMENT OF BC. SHUNT COMPENSATORS

The compensators are located as indicated in the sketch.

1st - Remove the 400 ohm resistor from the high potential side of the signal generator and insert a 250 mmfd. mica condenser in its place.

2nd - Turn the wave band selector switch to the right - broadcast position.

3rd - Adjust the carrier frequency to 1500 KC.
4th - Set the calibrated dial of the receiver to read 1500 KC.

5th - Adjust the BC. oscillator shunt compensator (#3) for maximum signal output.

6th - Adjust the BC. detector shunt compensator (#4) for maximum signal output.

ADJUSTMENT OF BC. OSCILLATOR SERIES TRIMMER

1st - Adjust the carrier frequency output of the signal generator to 600 KC.

2nd - Turn the calibrated dial of the receiver to pick up this 600 KC signal.

3rd - With the aid of a bakelite type screw driver, adjust the BC. oscillator series trimmer (see sketch) until a maximum signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

4th - Having determined the maximum peak of the BC. oscillator series trimmer, re-adjust the carrier frequency of the signal generator to 1500 KC. Turn the calibrated dial to 1500 KC and re-adjust BC. oscillator shunt compensator (#3) and BC. detector shunt compensator (#4) for maximum signal output as outlined in the foregoing instructions.

CONTINUITY AND VOLTAGE READINGS ON

MODEL 160 SERIES

Line Voltage 118 - Input Current .52 Amp.
No Signal Input - Wave Band Switch - Right.

TYPE OF TUBE	POSITION OF TUBE	PLATE VOLTS	PLATE MA CURRENT	CATHODE VOLTS	SCREEN GRID VOLTS
6A8	1st Det.-Osc.	250	2.9	4	92
6K7	Int. freq.	249	6.4	5	96
6H6	2nd Det.	---	---	--	--
	A.V.C.	---	---	18	--
6F5	1st Aud.	103*	.3	1	--
6F6	2nd Aud.	222	29.0	18	236
5Z4	Rectifier	---	55.9 TOTAL	--	---

6A8 Osc. Anode Voltage -- 202 and current -- 4.1 ma.
* These readings were taken with a 1,000 ohm per volt meter and are not indicative of effective voltages.

VOLTAGE ACROSS ELECTROLYTIC CONDENSER (#20.33A)

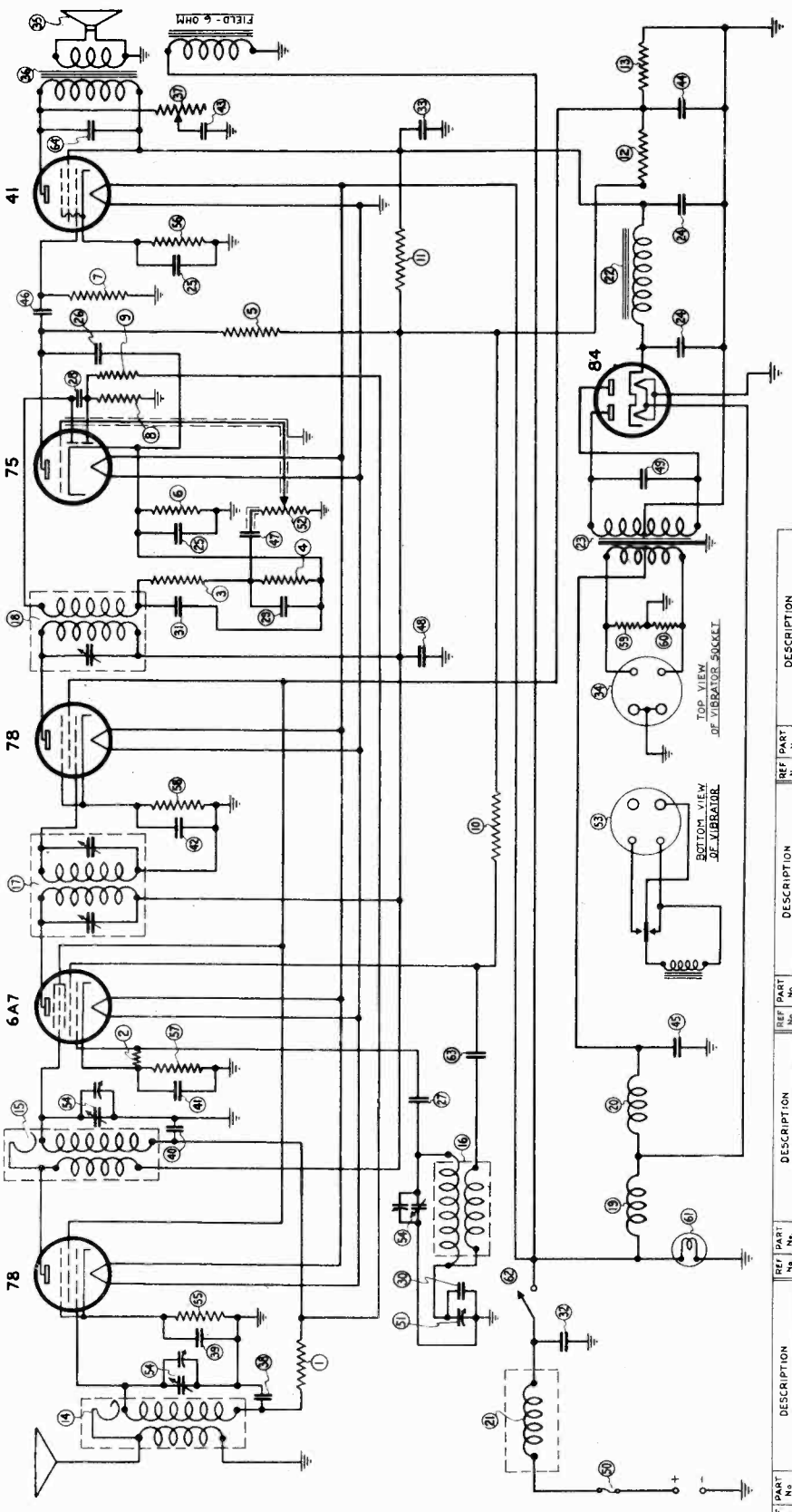
	1st section 350	2nd section 254
Voltage across speaker field		96 volts
" " 35,000 ohm resistor (#30.37)		150 "
" " 30,000 " " (#30.38)		87 "
" " 6,000 " " (#30.39)		18 "

D.C. RESISTANCE VALUES

	PRIMARY	SECONDARY
Speaker input transformer	550 ohms	.335 ohms
" field coil	1,520 "	
" voice coil	2.9 "	
" bucking coil	.345 "	

FADA RADIO & ELECTRIC CORP.

MODEL 166, Motoset
Schematic



I.F. = 175 K.C.

REF No.	PART No.	DESCRIPTION
1	30.20	CARB. RES.- 250,000 OHM - ½ WATT ± 20%
2	30.3	" " 50,000 " " ½ " ± 10%
3	30.3	" " 50,000 " " ½ " "
4	30.24	" " 100,000 " " ½ " ± 20%
5	30.24	" " 100,000 " " ½ " "
6	30.1	" " 5,000 " " ½ " ± 10%
7	30.23	" " 500,000 " " ½ " ± 20%
8	30.23	" " 500,000 " " ½ " "
9	30.23	" " 500,000 " " ½ " "
10	30.11	" " 25,000 " " ½ " ± 10%
11	30.25	" " 5,000 " " 2 " ± 20%
12	30.13	" " 20,000 " " 1 " ± 10%
13	30.26	" " 50,000 " " ½ " ± 20%
14	4303	ANTENNA COIL
15	4304	R.F. COIL
16	4422	OSCILLATOR COIL
17	717	D.T. I.F. COIL
18	4423	S.T. I.F. COIL
19	4414	R.F. CHOKE
20	4414	R.F. CHOKE
21	4424	SHIELDED CHOKE (SPARK FILTER CHOKE)
22	40.1	AUDIO CHOKE COIL - 300 OHM
23	40.15	POWER TRANSFORMER
24	20.29	ELECTRO COND. - DUAL - 8 MFD. 350 W.V.
25	20.30	" " " 4 " 25 W.V.
26	15.7	MICA COND. .002 MFD. ± 10%
27	15.3	" " .0001 " "
28	15.3	" " .0001 " "
29	15.3	" " .0001 " "
30	15.11	" " .0004 " "
31	15.2	" " .0005 " "
32	15.10	" " .00065 " "
33	15.4	" " .001 " "
34	65.20	VIBRATOR SOCKET
35	103.22	LOUD SPEAKER
36	4022	OUTPUT TRANSFORMER
37	554	TONE CONT. RES. - 100,000 OHM
38	10.5	TUBULAR COND. - .05 MFD. - 200 V
39	10.5	" " " .05 " " 200 "
40	10.5	" " " .05 " " 200 "
41	10.5	" " " .05 " " 200 "
42	10.5	" " " .05 " " 200 "
43	10.7	" " " .05 " " 400 "
44	10.7	" " " .05 " " 400 "
45	10.21	TUBULAR COND. - .5 MFD 120 V
46	10.10	TUBULAR COND. .01 " 400 "
47	10.4	" " " .01 " 200 "
48	10.16	" " " .25 " 400 "
49	10.20	" " " .01 " 1000 "
50	90.13	FUSE - 10 AMP
51	2534	PADDING COND. - .000650 MFD.
52	50.8	VOLUME CONTROL - 1 MEG.
53	90.17	VIBRATOR
54	25.33	VARIABLE COND. - .000367 MFD.
55	130.12	WIRE RES. - 750 OHM ½ FX
56	130.11	" " " 625 " ½ "
57	130.8	" " " 1000 " ½ "
58	130.8	" " " 1000 " ½ "
59	130.13	" " " 100 " 1 WATT
60	130.13	" " " 100 " 1 "
61	90.31	PILOT LIGHT - MAZDA # 51
62		ON-OFF SW. ON VOL CONT. (52)
63	15.4	MICA COND. .001 MFD. ± 10%
64	10.3	TUBULAR " .004 MFD. - 400 V
65		
66		

FADA RADIO & ELECTRIC CO.
LONG ISLAND CITY, N.Y.
MODEL 166 - MOTOSET
DRAWN BY JF DATE 4-13-35
CHECKED BY [illegible] APP. [illegible]

MODEL 166, Motoset
Alignment, Socket
Trimmers, Data

FADA RADIO & ELECTRIC CORP.

SERVICE DIVISION

COMPENSATING INSTRUCTIONS FOR MOTOSET - MODEL 166

In order to adjust accurately the various trimmer condensers of the MOTOSET in accordance with the following instructions, it is essential to use a shielded signal generator capable of giving a modulated carrier which can be attenuated at 175 KC, 600 KC and 1500 KC.

The MOTOSET is equipped with an automatic volume control which necessitates setting the manual volume control of the MOTOSET to its maximum position to insure accuracy in alignment. To control the signal output of the MOTOSET it will be necessary to use the attenuator control of the signal generator.

The following adjustments can be made without removing the MOTOSET chassis from its housing; it is only necessary to remove the front housing cover. The speaker cable should remain connected to the MOTOSET chassis.

ADJUSTMENT OF I.F. CONDENSERS

The three (3) intermediate frequency (I.F.) condensers are located as shown in the sketch.

1st - Turn the rotor plates of the ganged variable condenser to a position where no broadcast station carrier is heard. If this is not possible, the oscillator stator section (see sketch) of the ganged variable condenser may be short circuited to chassis.

2nd - Disconnect the control grid lead from the 6A7 tube.

3rd - Connect the high potential lead of the signal generator to the control grid of the 6A7 pentagrid converter tube, and the low potential lead to the shielding on the antenna cable.

4th - Place an output meter (copper oxide type) across the speaker voice coil terminals so that variations in signal output can be noted.

5th - Place the signal generator in operation and adjust the carrier frequency to 175 KC. Regulate the attenuator control of the signal generator so that the output signal is low enough to insure accuracy in adjusting the I.F. condensers.

6th - With the aid of a bakelite type screw driver, adjust the three (3) I.F. condensers to resonance as indicated by the greatest swing of the needle on the output meter. Repeat these adjustments as there is a slight interlocking effect.

ADJUSTMENT OF THE GANGED VARIABLE CONDENSER

Turn the ganged variable condenser until the rotor plates are fully meshed. Pull out the pilot light socket from the rear of the remote control head and insert a small screw driver. Turn the adjusting screw so that the dial pointer reads on the last division below 550 KC. This procedure aligns the remote control calibration scale to the ganged variable condenser. To hold this alignment it will be necessary to prevent any shifting of the remote control head or its cables in relation to the MOTOSET.

The compensators are located at the top of their respective tuning condenser section and can be adjusted with the aid of a screw driver.

1st - Remove the signal generator connection from the control grid of the 6A7 pentagrid converter tube and replace control grid lead.

2nd - Connect the antenna cable of the MOTOSET to the high potential lead of the signal generator through a 250 mmfd. condenser.

3rd - Adjust the carrier frequency of the signal generator to 1500 KC.

4th - With the aid of the remote control unit, turn the ganged variable condenser to pick up this 1500 KC signal.

5th - Starting with the oscillator compensator, adjust each compensator for maximum signal output. Do not disturb the setting of the ganged variable condenser during these operations.

ADJUSTMENT OF OSCILLATOR SERIES CONDENSER

The oscillator series condenser can be adjusted through the hole in the chassis as indicated in the sketch.

1st - Adjust the carrier frequency output of the signal generator to 600 KC.

2nd - Turn the remote control unit until the 600 KC signal is tuned in.

CONTINUITY AND VOLTAGE READINGS ON MODEL 166 MOTOSET

(No signal input)
Battery supply voltage 6.0 volts
Battery current drain 5.6 amperes

TYPE OF TUBE	POSITION OF TUBE	PLATE VOLTAGE	PLATE CURRENT	CONTROL GRID VOLTAGE	SCREEN GRID VOLTAGE
78	R.F. Amp.	162	3.0	2.7**	68
6A7	1st Detector	160	.7	5.5**	66
	Oscillator	90*	2.7	---	---
78	I.F. Amp.	162	2.9	2.2	68
75	2nd Det.& 1st A.F.	107*	.3	1.1**	---
41	Power Pentode	226	19.0	15.0**	236
84	Rectifier		37.0 TOTAL		

* These readings were taken with a 1,000 ohm per volt meter and are not indicative of effective voltages.

** Correct readings cannot be obtained at control grid due to series resistors. To be measured across each respective bias resistor.

VOLTAGE ACROSS ELECTROLYTIC FILTER CONDENSER (20.29)
1st section 250 volts
2nd section 236 volts

D.C. RESISTANCE VALUES

PART NO.	DESCRIPTION	PRIMARY	SECONDARY
4303	Antenna coil	30.0 ohms	4.9 ohms
4304	R.F. coil	70.0 "	4.8 "
4422	Oscillator coil	1.7 "	7.5 "
717	1st I.F. transformer	80.0 "	80.0 "
4423	2nd I.F. transformer	80.0 "	80.0 "
40.15	Power transformer	.213 "	540.0 "
40.22	Audio output transformer	485.0 "	.2 "
4414	R.F. choke	.024 "	
4424	Spark filter choke	.022 "	
40.1	Filter choke	300.0 "	
105.22	Speaker field coil	6.0 "	
105.22	Speaker voice coil	5.0	

3rd - With the aid of a bakelite type screw driver, adjust the oscillator series compensator until a maximum output signal is indicated on the output meter. To insure perfect adjustment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

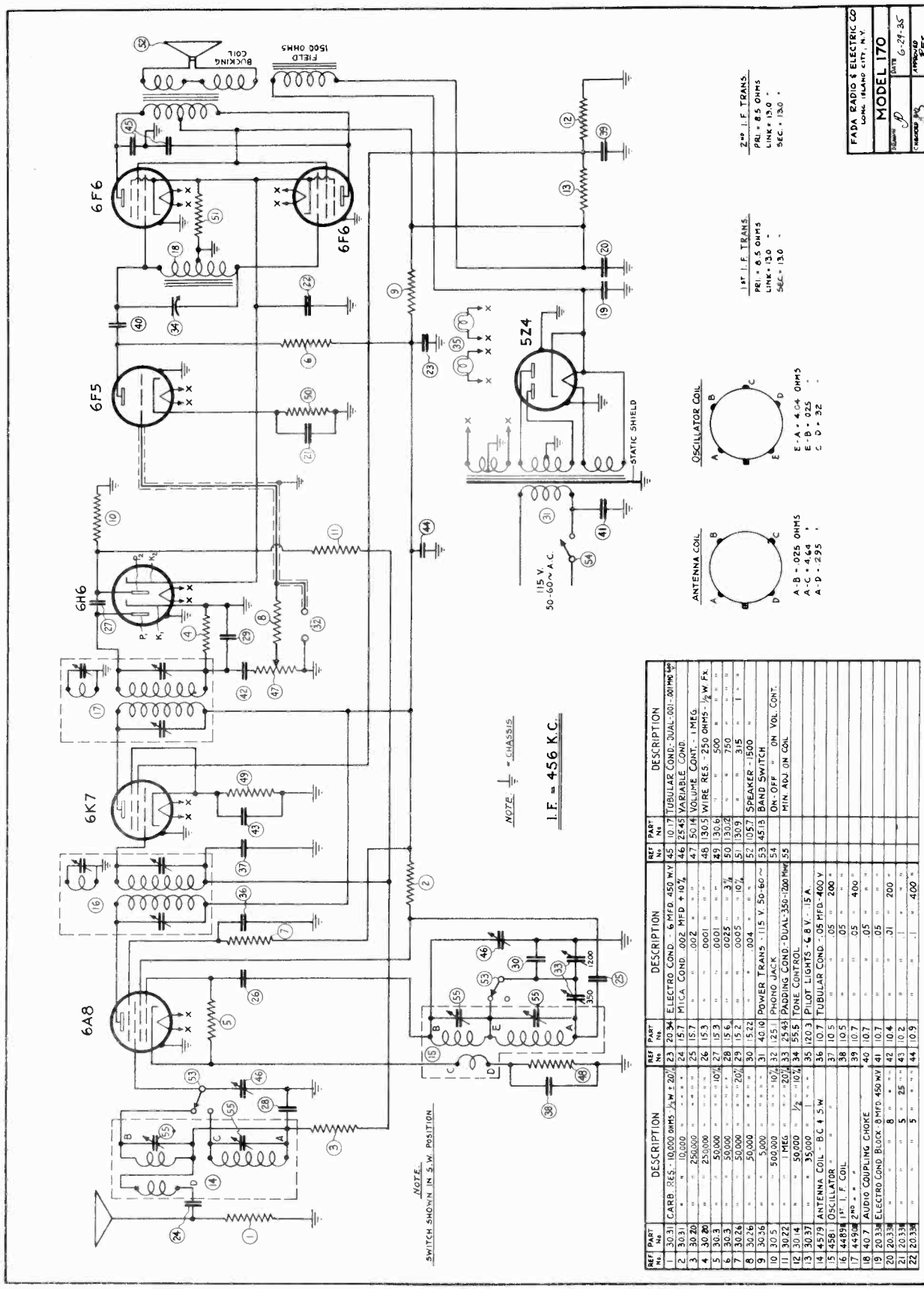
4th - Having determined the maximum peak of the oscillator series compensator, readjust the carrier frequency of the signal generator to 1500 KC. Turn the ganged variable condenser to 1500 KC, and readjust all variable condenser compensators as outlined in the foregoing instructions.

CHASSIS LAYOUT

FORM S-2136
MAY 21, 1935
MM/is

MODEL 170
Schematic

FADA RADIO & ELECTRIC CORP.



REF No.	PART No.	DESCRIPTION
1	30.31	CARB. RES. - 10,000 OHMS ½ W ± 20%
2	30.31	" " 10,000 " " " "
3	30.20	" " 250,000 " " " "
4	30.20	" " 250,000 " " " "
5	30.3	" " 50,000 " " " 10%
6	30.3	" " 50,000 " " " "
7	30.26	" " 50,000 " " " 20%
8	30.26	" " 50,000 " " " "
9	30.36	" " 5,000 " " " "
10	30.5	" " 500,000 " " " 10%
11	30.22	" " 1 MEG " " " 20%
12	30.4	" " 50,000 " " ½ " 10%
13	30.37	" " 35,000 " " 1 " "
14	4579	ANTENNA COIL - B.C. & S.W.
15	4581	OSCILLATOR " " "
16	4489	1ST I.F. COIL
17	4490	2ND " "
18	40.7	AUDIO COUPLING CHOKE
19	20.336	ELECTRO COND. BLOCK - 8 MFD. 450 W.V.
20	20.336	" " " 8 " " "
21	20.336	" " " 5 " 25 "
22	20.336	" " " 5 " " "

REF No.	PART No.	DESCRIPTION
23	20.34	ELECTRO COND. - 6 MFD. 450 W.V.
24	15.7	MICA COND. .002 MFD. ± 10%
25	15.7	" " .002 " " " "
26	15.3	" " .0001 " " " "
27	15.3	" " .0001 " " " "
28	15.6	" " .0025 " " 3%
29	15.2	" " .0005 " " 10%
30	15.22	" " .004 " " " "
31	40.10	POWER TRANS. - 115 V. 50-60 ~
32	25.1	PHONO JACK
33	25.43	PADDING COND. - DUAL - 350-1200 MMF
34	55.5	TONE CONTROL
35	120.3	PILOT LIGHTS - 6.8 V. - .15 A.
36	10.7	TUBULAR COND. - .05 MFD. 400 V.
37	10.5	" " .05 " 200 "
38	10.5	" " .05 " " "
39	10.7	" " .05 " 400 "
40	10.7	" " .05 " " "
41	10.7	" " .05 " " "
42	10.4	" " .01 " 200 "
43	10.2	" " .1 " " "
44	10.9	" " .1 " 400 "

REF No.	PART No.	DESCRIPTION
45	10.17	TUBULAR COND. - DUAL - .001 - .001 MFD.
46	25.45	VARIABLE COND.
47	50.14	VOLUME CONT. - 1 MEG.
48	130.5	WIRE RES. - 250 OHMS - ½ W. FX.
49	130.6	" " 500 " " " "
50	130.12	" " 750 " " " "
51	130.9	" " 315 " " " "
52	105.7	SPEAKER - 1500 "
53	45.13	BAND SWITCH
54		ON-OFF " ON VOL. CONT.
55		MIN. ADJ. ON COIL

S-2149

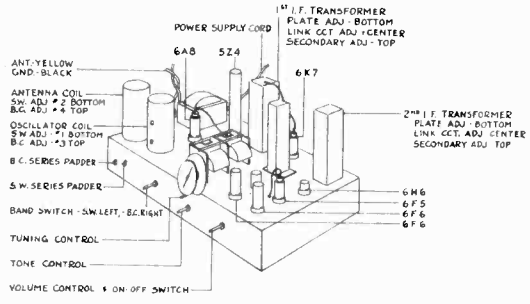
MODEL 170
Socket, Trimmers
Alignment, Voltage

FADA RADIO & ELECTRIC CORP.

COMPENSATING INSTRUCTIONS FOR MODEL 170 SERIES

In order to adjust accurately the various trimmer condensers of the receiver in accordance with the following instructions, it is essential to use a shielded signal generator capable of giving a modulated carrier which can be attenuated at 456 KC, 600 KC, 1500 KC, 6 MC and 15 MC.

This receiver is equipped with an automatic volume control which necessitates setting the manual volume control of the receiver to its maximum position to insure accuracy in alignment. To control the signal output of the receiver it will be necessary to use the attenuator control of the signal generator.



ADJUSTMENT OF I.F. CONDENSERS

The six (6) intermediate frequency (I.F.) condensers are located as shown in the sketch.

1st - Disconnect the outside antenna system from the receiver.

2nd - Disconnect the control grid lead from the 6A8 tube.

3rd - Connect the high potential lead of the signal generator to the control grid of the 6A8 tube, and the low potential side to the receiver "ground" lead.

4th - Place an output meter (copper oxide type) across the speaker voice coil so that variations in signal output can be noted.

5th - Place the signal generator in operation and adjust the carrier frequency to 456 KC. Regulate the attenuator control of the signal generator so that the output signal is low enough to insure accuracy in adjusting the I.F. condensers.

6th - With the aid of a bakelite type screw driver, adjust the six (6) I.F. condensers to resonance; adjusting first the I.F. condenser across the secondary winding of the 2nd I.F. transformer and then each in turn, ending with the adjustment of the condenser across the primary winding of the 1st I.F. transformer.

ADJUSTMENT OF S.W. SHUNT COMPENSATORS

The compensators are located as indicated on the sketch.

1st - Remove the signal generator connection from the control grid of the 6A8 tube and replace the control grid lead.

2nd - Connect the antenna wire of the receiver chassis through a 400 ohm carbon resistor to the high potential side of the signal generator. The ground wire should remain connected to the signal generator.

3rd - Adjust the carrier frequency output of the signal generator to 15 MC.

4th - Turn the wave band selector switch to the left - short wave position. Set the calibrated dial of the receiver to read 15 MC.

5th - Adjust the S.W. oscillator shunt compensator (#1 on sketch) for maximum signal output. If two peaks are noted on this adjustment, the proper one is that with the compensator farthest "in". To determine that this compensator has not been adjusted to the image frequency, turn the receiver dial to approximately 15.9 MC. If no signal can be heard at this setting even with a greater signal generator output, the S.W. shunt compensator (#1) has been improperly adjusted and it will be necessary to re-adjust to the proper peak. After re-adjusting check to see that the image frequency comes in at 15.9 MC. It is well to bear in mind throughout these adjustments that with the same signal input to the receiver, the image response point should be weaker than the original signal frequency output reading.

6th - Having determined the correct peak, and maximum setting, for the S.W. oscillator shunt compensator (#1) adjust the S.W. detector shunt compensator (#2) for maximum output.

ADJUSTMENT OF S.W. OSCILLATOR SERIES TRIMMER

1st - Adjust the carrier frequency output of the signal generator to 6 MC.

2nd - Turn the calibrated dial of the receiver to pick up this 6 MC signal.

3rd - With the aid of a bakelite type screw driver, adjust the S.W. oscillator series trimmer (see sketch) until a maximum output signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

4th - Having determined the maximum peak of the S.W. oscillator series trimmer, re-adjust the carrier frequency of the signal generator to 15 MC. Turn the calibrated dial to 15 MC, and re-adjust S.W. oscillator shunt compensator (#1), and then, S.W. detector shunt compensator (#2) for maximum signal output; checking for image point as outlined in the foregoing instructions.

ADJUSTMENT OF BC. SHUNT COMPENSATORS

The compensators are located as indicated in the sketch.

1st - Remove the 400 ohm resistor from the high potential side of the signal generator and insert a 250 mmfd. mica condenser in its place.

2nd - Turn the wave band selector switch to the right - broadcast position.

3rd - Adjust the carrier frequency to 1500 KC.

4th - Set the calibrated dial of the receiver to read 1500 KC.

5th - Adjust the BC. oscillator shunt compensator (#3) for maximum signal output.

6th - Adjust the BC. detector shunt compensator (#4) for maximum signal output.

ADJUSTMENT OF BC. OSCILLATOR SERIES TRIMMER

1st - Adjust the carrier frequency output of the signal generator to 600 KC.

2nd - Turn the calibrated dial of the receiver to pick up this 600 KC signal.

3rd - With the aid of a bakelite type screw driver, adjust the BC. oscillator series trimmer (see sketch) until a maximum signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

4th - Having determined the maximum peak of the BC. oscillator series trimmer, re-adjust the carrier frequency of the signal generator to 1500 KC. Turn the calibrated dial to 1500 KC and re-adjust BC. oscillator shunt compensator (#3) and BC. detector shunt compensator (#4) for maximum signal output as outlined in the foregoing instructions.

CONTINUITY AND VOLTAGE READINGS ON MODEL 170 SERIES

Line Voltage 118 - Input Current .69 Amp.
No Signal Input - Wave Band Switch - Right

TYPE OF TUBE	POSITION OF TUBE	PLATE VOLTS	PLATE MA. CURRENT	CATHODE VOLTS	SCREEN GRID VOLTS
6A8	1st Det.-Osc	252	3.0	2	80
6K7	Int. Freq.	249	6.9	5	109
6H6	2nd Det.	---	---	--	---
	A.V.C.	---	---	19	---
6F5	1st Aud.	156*	1.3	1	---
6F6	P.P. 2nd Aud.	232	24.0	19	235
5Z4	Rectifier	---	77.0 TOTAL	--	---

6A8 Osc. Anode Voltage -- 182 and current 2.9 Ma.

* These readings were taken with a 1,000 ohm per volt meter and are not indicative of effective voltages.

VOLTAGE ACROSS ELECTROLYTIC CONDENSER (#20.33B)

1st section	2nd section
385	254

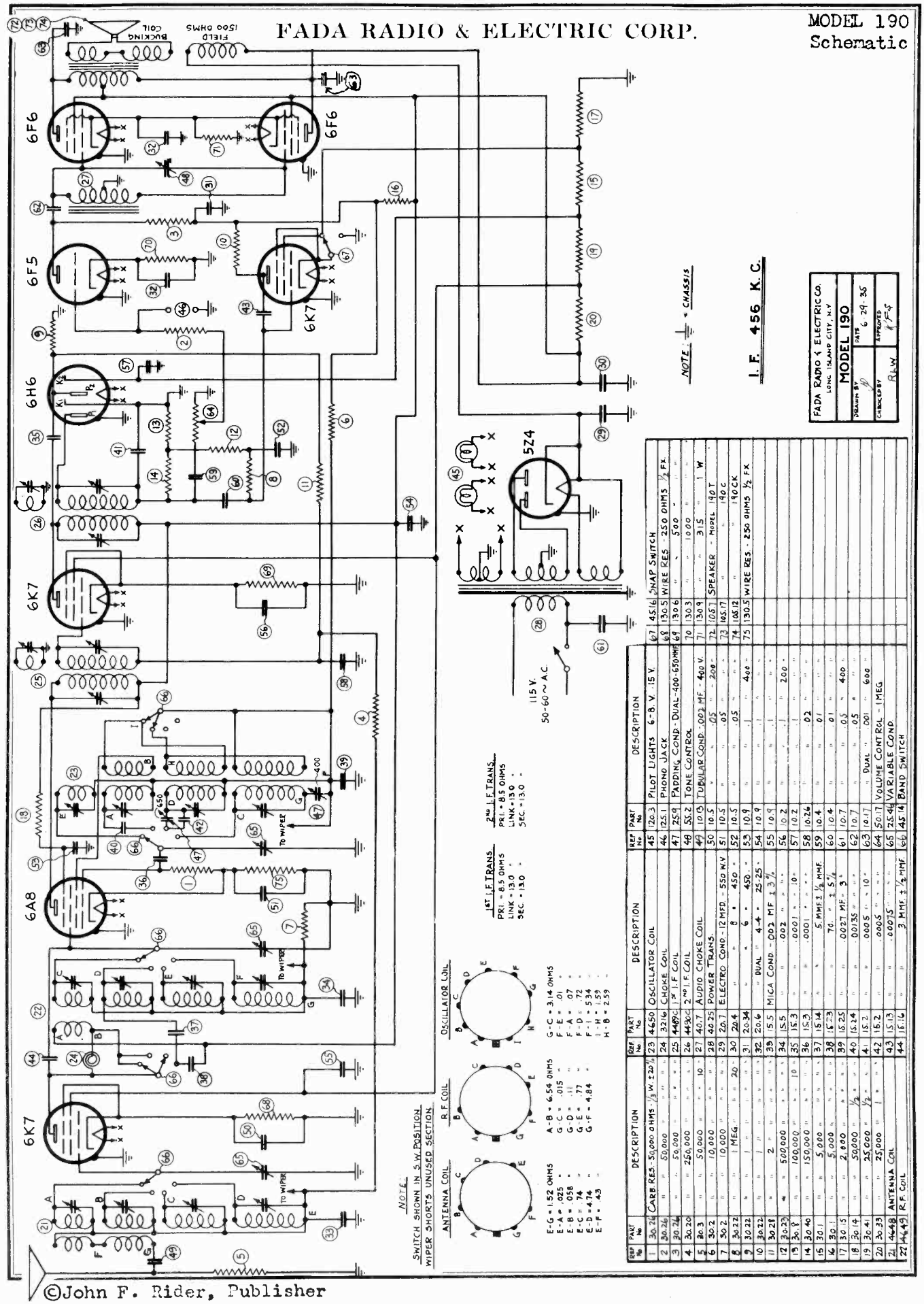
Voltage across speaker field	131 volts
" " 35,000 ohm resistor (#30.37)	140 "
" " 50,000 " " (#30.14)	114 "
" " 5,000 " " (#30.36)	33 "

D. C. RESISTANCE VALUES

	PRIMARY	SECONDARY
Speaker input transformer	392 ohms	.09 ohms
" field coil	1,540 "	
" voice coil	1.9 "	
" bucking coil	.26 "	
Audio Coupling Choke	2,440 "	

FORM S-2143
June 26, 1935

SERVICE DIVISION



REP No	PART No	DESCRIPTION
1	30.24	CARB RES - 50,000 OHMS - 1/3 W ± 20%
2	30.26	" 50,000 " " " " "
3	30.24	" 50,000 " " " " "
4	30.20	" 250,000 " " " " "
5	30.3	" 50,000 " " " 10 "
6	30.2	" 10,000 " " " " "
7	30.2	" 10,000 " " " " "
8	30.22	" 1 MEG " " " 20 "
9	30.22	" 1 " " " " "
10	30.22	" 1 " " " " "
11	30.21	" 2 " " " " "
12	30.23	" 500,000 " " " " "
13	30.8	" 100,000 " " " 10 "
14	30.40	" 150,000 " " " " "
15	30.1	" 5,000 " " " " "
16	30.1	" 5,000 " " " " "
17	30.15	" 2,000 " " " " "
18	30.14	" 50,000 " " " 1/2 "
19	30.41	" 25,000 " " " 1/2 "
20	30.33	" 25,000 " " " 1 "
21	44.48	ANTENNA COIL
22	44.49	R.F. COIL
23	44.50	OSCILLATOR COIL
24	32.16	CHOKE COIL
25	44.95	1ST I.F. COIL
26	44.96	2ND I.F. COIL
27	40.7	AUDIO CHOKE COIL
28	40.25	POWER TRANS
29	20.7	ELECTRO COND - 12 MFD - 550 W.V
30	20.4	" " 8 " 450 "
31	20.34	" " " 6 " 450 "
32	20.6	" DUAL " 4-4 " 25-25 "
33	15.5	MICA COND - .002 MF ± 3%
34	15.5	" " .002 " " "
35	15.3	" " .0001 " " 10 "
36	15.3	" " .0001 " " "
37	15.14	" " 5 MMF ± 1/2 MMF.
38	15.23	" " 70 " ± 5%
39	15.25	" " .0027 MF. ± 3 "
40	15.24	" " .00135 " " "
41	15.2	" " .0005 " " 10 "
42	16.2	" " .0005 " " "
43	15.13	" " .00075 " " "
44	16.14	" " 3 MMF ± 1/2 MMF
45	120.3	PILOT LIGHTS 6-8. V. .15 V.
46	125.1	PHONO JACK
47	259	PADDING COND - DUAL - 400-650 MMF
48	58.2	TONE CONTROL
49	10.15	TUBULAR COND - .002 MF - 400 V.
50	10.5	" " " .05 " " 200 "
51	10.5	" " " .05 " " "
52	10.5	" " " .05 " " "
53	10.9	" " " .1 " " 400 "
54	10.9	" " " .1 " " "
55	10.9	" " " .1 " " "
56	10.2	" " " .1 " " 200 "
57	10.2	" " " .1 " " "
58	10.24	" " " .02 " " "
59	10.4	" " " .01 " " "
60	10.4	" " " .01 " " "
61	10.7	" " " .05 " 400 "
62	10.7	" " " .05 " " "
63	10.17	" DUAL " .001 " " 600 "
64	50.17	VOLUME CONTROL - 1 MEG
65	25.44	VARIABLE COND
66	45.14	BAND SWITCH
67	45.16	SNAP SWITCH
68	130.5	WIRE RES - 250 OHMS 1/2 FX
69	130.6	" " 500 " "
70	130.3	" " 1000 " "
71	130.9	" " 315 " 1 W
72	105.1	SPEAKER - MODEL 190 T
73	105.17	" " 190 C
74	105.12	" " 190 CK
75	130.5	WIRE RES - 250 OHMS 1/2 FX

MODEL 190
Socket, Trimmers
Alignment

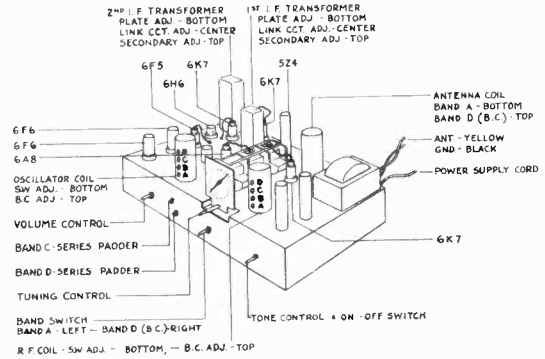
FADA RADIO & ELECTRIC CORP.

COMPENSATING INSTRUCTIONS FOR

MODEL 190 SERIES

In order to adjust accurately the various trimmer condensers of the receiver in accordance with the following instructions, it is essential to use a shielded signal generator capable of giving a modulated carrier which can be attenuated at 456 KC, 600 KC, 1500 KC, 3750 KC, 4 MC, 10 MC and 20 MC.

This receiver is equipped with an automatic volume control which necessitates setting the manual volume control of the receiver to its maximum position to insure accuracy in alignment. To control the signal output of the receiver it will be necessary to use the attenuator control of the signal generator.



ADJUSTMENT OF I.F. CONDENSERS

The six (6) intermediate frequency (I.F.) condensers are located as shown in the sketch.

1st - Disconnect the outside antenna system from the receiver.

2nd - Disconnect the control grid lead from the 6A8 tube.

3rd - Connect the high potential lead of the signal generator to the control grid of the 6A8 tube, and the low potential side to the receiver "ground" lead.

4th - Place an output meter (copper oxide type) across the speaker voice coil terminals so that variations in signal output can be noted.

5th - Place the signal generator in operation and adjust the carrier output to 456 KC. Regulate the attenuator of the signal generator so that the output signal is low enough to insure accuracy in adjusting the I.F. condensers.

6th - With the aid of a bakelite type screw driver, adjust the six (6) I.F. condensers to resonance. From a fidelity standpoint the best procedure for aligning the I.F. system is to adjust the I.F. condenser connected across the secondary winding feeding into the diode (2nd detector), then the link circuit condenser and finally the primary circuit condenser. The same procedure is to be followed in adjusting the 1st I.F. transformer. Do not adjust the I.F. condensers at random but follow the above procedure of alignment carefully.

ADJUSTMENT OF S.W. BAND "A" SHUNT COMPENSATORS

The compensators are located as indicated in the sketch.

1st - Remove the signal generator connection from the control grid of the 6A8 tube and replace the control grid lead.

2nd - Connect the antenna wire of the receiver chassis through a 400 ohm carbon resistor to the high potential side of the signal generator.

3rd - Adjust the carrier output of the signal generator to 20 MC.

4th - Turn the wave band selector switch to band "A" - left. Set the calibrated dial of the receiver to read 20 MC.

5th - Adjust the S.W. band "A" oscillator shunt compensator for maximum signal output. If two peaks are noted on this adjustment, the proper one is that with the compensator farthest "in". To determine that this compensator has not been adjusted to the image frequency, turn the receiver dial to approximately 20.9 MC. If no signal can be heard at this setting, even with a greater signal generator output, the S.W. band "A" oscillator shunt compensator has been improperly adjusted and it will be necessary to re-adjust to the proper peak. After re-adjusting, check to see that the image frequency comes in at 20.9 MC. It is well to bear in mind throughout these adjustments that with the same signal input to the receiver, the image point should be weaker than the original reading.

6th - Having determined the correct peak, and maximum setting for the S.W. band "A" oscillator shunt compensator, adjust the S.W. band "A" R.F. stage shunt compensator and the S.W. band "A" detector shunt compensator for maximum signal output. Turn the receiver dial to the image point (20.9 MC) to determine that both compensators have been adjusted to the correct peak (See paragraph 5 for determining image).

7th - Adjust the carrier frequency output of the signal generator to 10 MC.

8th - Turn the calibrated dial of the receiver to pick up this 10 MC signal and check for sensitivity at this point. There is no variable oscillator series condenser at this frequency to adjust as the receiver employs a fixed oscillator series padder

ADJUSTMENT OF S.W. BAND "B" SHUNT COMPENSATORS

The compensators are located as indicated in the sketch.

1st - Maintaining the same signal generator output (10 MC) turn the wave band selector switch to band "B".

2nd - Turn the calibrated dial of the receiver to 10 MC on wave band "B".

3rd - Adjust the S.W. band "B" oscillator shunt compensator for maximum signal output. If two peaks are noted on this adjustment, the proper one is that with the compensator farthest "out." Check for image point on the calibrated dial at approximately 9 MC (See paragraph 5 under the heading "ADJUSTMENT OF S.W. BAND "A" SHUNT COMPENSATORS" for determining image).

4th - Having determined the correct peak and maximum setting, for the S.W. band "B" oscillator shunt compensator, adjust the S.W. band "B" R.F. stage shunt compensator and the S.W. band "B" detector shunt compensator for maximum signal output. Turn the receiver dial to the image point (9 MC) to determine that both compensators have been adjusted to the correct peak (See paragraph 5 under the heading "ADJUSTMENT OF S.W. BAND "A" SHUNT COMPENSATOR").

5th - Adjust the carrier frequency output of the signal generator to 4 MC.

6th - Turn the calibrated dial of the receiver to pick up this 4 MC signal and check for sensitivity at this point. There is no variable oscillator series condenser to adjust at this frequency as the receiver employs a fixed oscillator series padder.

ADJUSTMENT OF S.W. BAND "C" SHUNT COMPENSATORS

The compensators are located as indicated in the sketch.

1st - Adjust the carrier frequency output of the signal generator to 3.75 MC.

2nd - Turn the calibrated dial of the receiver to 3.75 MC on wave band "C".

3rd - Adjust the S.W. band "C" oscillator shunt compensator for maximum signal output. If two peaks are noted on this adjustment, the proper one is that with the compensator farthest "out". Check for image point on the calibrated dial at approximately 2.8 MC (See paragraph 5 under the heading "ADJUSTMENT OF S.W. BAND "A" SHUNT COMPENSATORS" for determining image).

4th - Having determined the correct peak, and the maximum setting, for the S.W. band "C" oscillator shunt compensator adjust the S.W. band "C" R.F. stage shunt compensator and the S.W. band "C" detector shunt compensator for maximum signal output. Turn the receiver dial to the image point (2.8 MC) to determine that both compensators have been adjusted to the correct peak (See paragraph 5 under the heading "ADJUSTMENT OF S.W. BAND "A" SHUNT COMPENSATORS" for determining image).

ADJUSTMENT OF S.W. BAND "C" OSCILLATOR SERIES TRIMMER

1st - Adjust the carrier frequency output of the signal generator to 1.5 MC.

2nd - Turn the calibrated dial of the receiver to pick up this 1.5 MC signal.

3rd - Adjust the S.W. band "C" oscillator series trimmer (see sketch) until a maximum output signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

4th - Having determined the maximum peak of the S.W. band "C" oscillator series trimmer, re-adjust the carrier frequency of the signal generator to 3.75 MC. Turn the calibrated dial of the receiver to 3.75 MC and re-adjust S.W. band "C" oscillator shunt compensator, and then, S.W. band "C" R.F. stage shunt compensator and S.W. band "C" detector shunt compensator for maximum signal output; checking for image point as outlined in the foregoing instructions.

ADJUSTMENT OF BC BAND "D" SHUNT COMPENSATORS

The compensators are located as indicated in the sketch.

1st - Remove the 400 ohm carbon resistor from the high potential side of the signal generator and insert a 250 mmfd. mica condenser in its place.

2nd - Turn the wave band selector switch to band "D" - broadcast position.

3rd - Adjust the carrier frequency of the signal generator to 1500 KC.

4th - Set the calibrated dial of the receiver to 1500 KC.

5th - Adjust the BC band "D" oscillator shunt compensator and then, the BC band "D" R.F. stage shunt compensator and BC detector shunt compensator for maximum signal output.

FADA RADIO & ELECTRIC CORP.

ADJUSTMENT OF BC BAND "D" OSCILLATOR SERIES TRIMMER

1st - Adjust the carrier frequency output of the signal generator to 600 KC.

2nd - Turn the calibrated dial of the receiver to pick up this 600 KC signal.

3rd - Adjust the BC band "D" oscillator series trimmer (see sketch) until a maximum signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

4th - Having determined the maximum peak of the oscillator series trimmer, re-adjust the carrier of the signal generator to 1500 KC. Turn the calibrated dial to 1500 KC and then, re-adjust the BC band "D" shunt compensators as outlined in the foregoing instructions.

CONTINUITY AND VOLTAGE READINGS ON MODEL 190 SERIES

Line Voltage 118 - Input Current .74 Amp.
No Signal Input - Wave Band Switch - Right
A.T.C. Toggle Control Switch "ON"

TYPE OF TUBE	POSITION OF TUBE	PLATE VOLTS	PLATE MA CURRENT	CATHODE VOLTS	SCREEN GRID VOLTS
6K7	R.F.	229	7.8	3	89
6A8	1st Det.-Osc.	229	3.1	3	78
6K7	Int. Freq.	228	5.8	4	88
6K7	A.T.C.	30*	.15	--	6
6H6	2nd Det.	---	---	--	--
	A.V.C.	---	---	17	--
6F5	1st Aud.	154*	.9	1	--
6F6	P.P. 2nd Aud.	212	22.0	15	217
5Z4	Rectifier	---	80.0 TOTAL	--	--

6A8 Osc. Anode Voltage -- 166 and current -- 3.7 ma.

* These readings were taken with a 1,000 ohm per volt meter and are not indicative of effective voltages.

VOLTAGE ACROSS ELECTROLYTIC CONDENSERS
1st (#20.7) 372 2nd (#20.4) 232

Voltage across speaker field.....		140 volts
" " 25,000 ohm 1 watt resistor	(#30.33).....	133 "
" " 25,000 " 1/2 " "	(#30.41).....	72 "
" " 5,000 " 1/3 " "	(#30.1).....	14 "
" " 2,000 " 1/3 " "	(#30.15).....	6 "
" " 5,000 " 1/3 " "	(#30.1) **	22 "

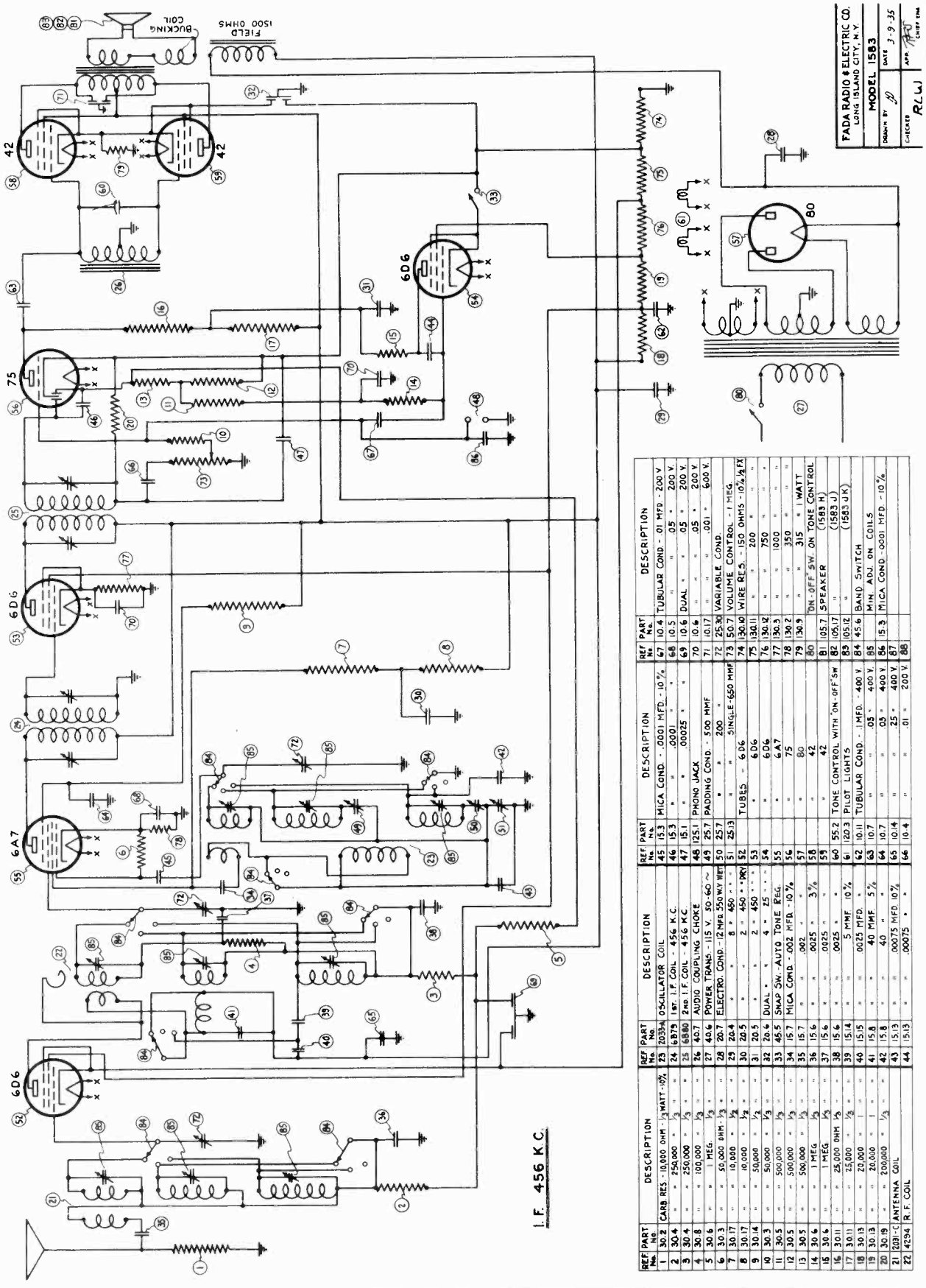
** Resistor in series with Osc. & 1st A.F. "B" Supply

D.C. RESISTANCE VALUES

	PRIMARY	SECONDARY
Speaker input transformer	392 ohms	.09 ohms
" field coil	1,540 "	
" voice coil	1.9 "	
" bucking coil	.26 "	
Audio Coupling Choke (#40.7)	2,440 "	
R.F. plate circuit choke (#3216)	42.5	

MODEL 1583
Schematic

FADA RADIO & ELECTRIC CORP.



REF No.	PART No.	DESCRIPTION
1	30.2	CARB. RES. - 10,000 OHM - ½ WATT - 10%
2	30.4	" " 250,000 " ½ " " "
3	30.4	" " 250,000 " ½ " " "
4	30.8	" " 100,000 " ½ " " "
5	30.6	" " 1 MEG. ½ " " "
6	30.3	" " 50,000 OHM - ½ " " "
7	30.17	" " 10,000 " ½ " " "
8	30.17	" " 10,000 " ½ " " "
9	30.14	" " 50,000 " ½ " " "
10	30.3	" " 50,000 " ½ " " "
11	30.5	" " 500,000 " ½ " " "
12	30.5	" " 500,000 " ½ " " "
13	30.5	" " 500,000 " ½ " " "
14	30.6	" " 1 MEG. ½ " " "
15	30.6	" " 1 MEG. ½ " " "
16	30.11	" " 25,000 OHM ½ " " "
17	30.11	" " 25,000 " ½ " " "
18	30.13	" " 20,000 " 1 " " "
19	30.13	" " 20,000 " 1 " " "
20	30.19	" " 200,000 " ½ " " "
21	2031-C	ANTENNA COIL
22	4294	R.F. COIL

REF No.	PART No.	DESCRIPTION
23	2033-A	OSCILLATOR COIL
24	6879	1st. I.F. COIL - 456 K.C.
25	6880	2nd I.F. COIL - 456 K.C.
26	40.7	AUDIO COUPLING CHOKE
27	40.6	POWER TRANS. - 115 V. 50-60 ~
28	20.7	ELECTRO. COND. - 12 MFD. 350 W.V. WET
29	20.4	" " 8 " 450 " " "
30	20.5	" " 2 " 450 " " DRY
31	20.5	" " 2 " 450 " " "
32	20.6	DUAL " " 4 " 25 " " "
33	45.5	SNAP SW. - AUTO TONE REG.
34	15.7	MICA COND. - .002 MFD. - 10%
35	15.7	" " .002 " 5%
36	15.6	" " .0025 " 3%
37	15.6	" " .0025 " "
38	15.6	" " .0025 " "
39	15.14	" " 5 MMF 10%
40	15.15	" " 0025 MFD. "
41	15.8	" " 40 MMF. 5%
42	15.8	" " 40 " "
43	15.13	" " .00075 MFD 10%
44	15.13	" " .00075 " "

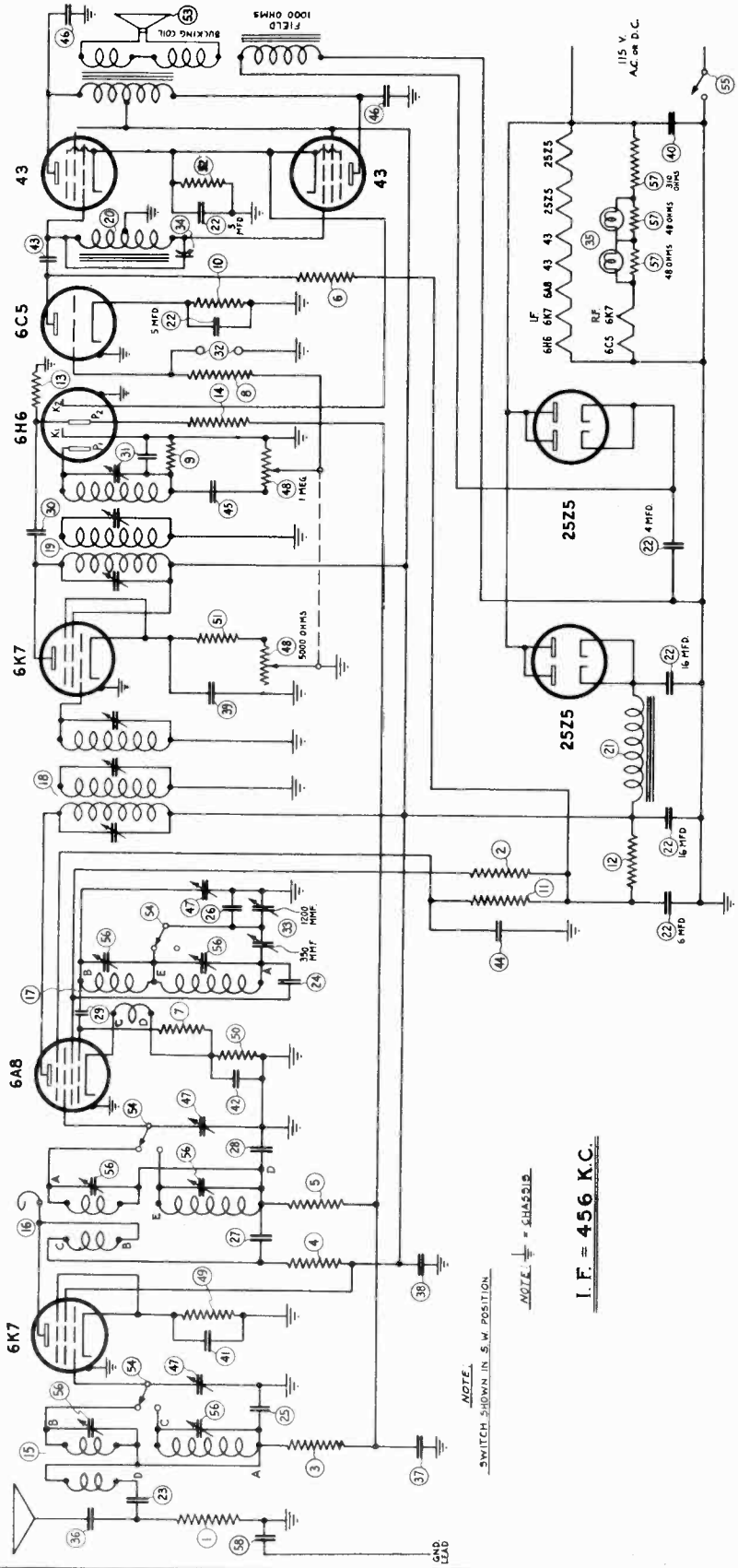
REF No.	PART No.	DESCRIPTION
45	15.3	MICA COND. - .0001 MFD. - 10%
46	15.3	" " .0001 " "
47	15.1	" " .00025 " "
48	125.1	PHONO JACK
49	25.7	PADDING COND. - 500 MMF
50	25.7	" " 200 "
51	25.13	" " SINGLE - 660 MMF
52		TUBES - 6D6
53		" 6D6
54		" 6D6
55		" 6A7
56		" 75
57		" 80
58		" 42
59		" 42
60	55.2	TONE CONTROL WITH ON-OFF SW
61	120.3	PILOT LIGHTS
62	10.11	TUBULAR COND. - 1 MFD. - 400 V
63	10.7	" " .05 " 400 V
64	10.7	" " .05 " 400 V
65	10.14	" " .25 " 400 V
66	10.4	" " .01 " 200 V

REF No.	PART No.	DESCRIPTION
67	10.4	TUBULAR COND. - .01 MFD. - 200 V
68	10.5	" " .05 " 200 V.
69	10.6	DUAL " " .05 " 200 V.
70	10.6	" " " .05 " 200 V
71	10.17	" " " .001 " 600 V.
72	25.30	VARIABLE COND.
73	50.7	VOLUME CONTROL - 1 MEG.
74	130.10	WIRE RES. - 150 OHMS - 10% 4 FX
75	130.11	" " 200 " " "
76	130.12	" " 750 " " "
77	130.3	" " 1000 " " "
78	130.2	" " 350 " " "
79	130.9	" " 315 " 1 WATT
80		ON-OFF SW. ON TONE CONTROL
81	105.7	SPEAKER (1583 H)
82	105.17	" (1583 J)
83	105.12	" (1583 J K)
84	45.6	BAND SWITCH
85		MIN. ADJ. ON COILS
86	15.3	MICA COND. - 0001 MFD. - 10%
87		
88		

FADA RADIO & ELECTRIC CO.
LONG ISLAND CITY, N.Y.
MODEL 1583
DRAWN BY — DATE 3-9-35
CHECKED RCLW — APP. — CHIEF ENG.

MODEL 192
Schematic

FADA RADIO & ELECTRIC CORP.



REF No.	PART No.	DESCRIPTION
1	30.2	CARB. RES. - 10,000 OHM - ½ W ±10%
2	30.2	" " 10,000 " " " "
3	30.20	" " 250,000 " " " ±20%
4	30.30	" " 1,400 " " " ±10%
5	30.32	" " 25,000 " " " ±20%
6	30.11	" " 25,000 " " " ±10%
7	30.3	" " 50,000 " " " "
8	30.26	" " 50,000 " " " ±20%
9	30.5	" " 500,000 " " " ±10%
10	30.15	" " 2,000 " " " "
11	30.10	" " 30,000 " " " "
12	30.12	" " 4,000 " " " "
13	30.22	" " 1 MEG " " " ±20%
14	30.28	" " 2 " " " "
15	4579	ANTENNA COIL
16	4580	R.F. COIL
17	4581	OSCILLATOR COIL
18	4489C	1ST I.F. COIL
19	4490C	2ND I.F. COIL
20	407	AUDIO COUPLING CHOKE
21	40.3	CHOKE COIL - 200 OHMS
22	20.32	ELECTRO. COND. 8 MFD 450 V.

REF No.	PART No.	DESCRIPTION
23	15.7	MICA COND. - .002 MFD - 10%
24	15.7	" " .002 " " "
25	15.6	" " .0025 " " 3%
26	15.21	" " .003 " " 5%
27	15.2	" " .0005 " " 10%
28	15.20	" " .00275 " " 3%
29	15.3	" " .0001 " " 10%
30	15.3	" " .0001 " " "
31	15.1	" " .00025 " " "
32	125.1	PHONO JACK
33	2543	PADDING COND. 350-1200 MMF
34	55.2	TONE CONTROL WITH ON-OFF SW.
35	120.3	PILOT LIGHTS 6-8 V. .15 A.
36	10.18	TUBULAR COND. - .002 MFD - 200 V.
37	10.26	" " .02 " " "
38	10.2	" " .1 " " "
39	10.2	" " .1 " " "
40	10.2	" " .1 " " "
41	10.5	" " .05 " " "
42	10.5	" " .05 " " "
43	10.5	" " .05 " " "
44	10.5	" " .05 " " "

REF No.	PART No.	DESCRIPTION
45	10.4	TUBULAR COND. - .01 MFD - 200 V.
46	10.17	" " DUAL - .001 - 600 V.
47	25.44	VARIABLE COND.
48	50.12	VOL. CONTROL-DUAL - 5000 OHM-1 MEG
49	130.5	WIRE RES. - 250 OHMS 10% 1/4"
50	130.5	" " 250 " " " "
51	130.6	" " 500 " " " "
52	130.9	" " 3.5 " " " "
53	105.9	SPEAKER - 1000 OHMS
54	45.5	BAND SWITCH
55		ON-OFF SW. ON TONE CONT. (34)
56		MIN. ADJ. ON COILS
57	115.10	LINE RESISTOR - 48-48-310 OHMS
58	10.23	TUBULAR COND. - .006 - 200 V.

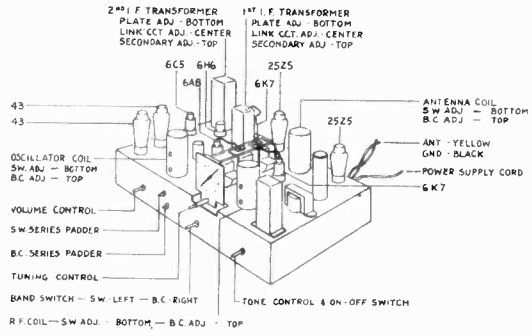
MODEL 192
Socket, Trimmers
Alignment, Voltage

FADA RADIO & ELECTRIC CORP.

COMPENSATING INSTRUCTIONS FOR MODEL 192 SERIES

In order to adjust accurately the various trimmer condensers of the receiver in accordance with the following instructions, it is essential to use a shielded signal generator capable of giving a modulated carrier which can be attenuated at 456 KC, 600 KC, 1500 KC, 6 MC and 15 MC.

This receiver is equipped with an automatic volume control which necessitates setting the manual volume control of the receiver to its maximum position to insure accuracy in alignment. To control the signal output of the receiver it will be necessary to use the attenuator control of the signal generator.



ADJUSTMENT OF THE I.F. CONDENSERS

The six (6) intermediate frequency (I.F.) condensers are located as shown in the sketch.

1st - Disconnect the outside antenna system from the receiver.
2nd - Disconnect the control grid lead from the 6A8 tube.

3rd - Connect the high potential lead of the signal generator to the control grid of the 6A8 tube, and the low potential side to the receiver "ground" lead.

4th - Place an output meter (copper oxide type) across the speaker voice coil terminals so that variations in signal output can be noted.

5th - Place the signal generator in operation and adjust the carrier output to 456 KC. Regulate the attenuator control of the signal generator so that the output signal is low enough to insure accuracy in adjusting the I.F. condensers.

6th - With the aid of a bakelite type screw driver, adjust the six (6) I.F. condensers to resonance. From a fidelity standpoint the best procedure for aligning the I.F. system is to adjust the I.F. condenser connected across the secondary winding feeding into the diode (2nd detector), then the link circuit condenser and finally the primary circuit. The same procedure is to be followed in adjusting the 1st I.F. transformer. Do not adjust the I.F. condensers at random but follow the above procedure of alignment carefully.

ADJUSTMENT OF S.W. SHUNT COMPENSATORS

The compensators are located as indicated in the sketch.

1st - Remove the signal generator connection from the control grid of the 6A8 tube and replace the control grid lead.

2nd - Connect the antenna wire of the receiver chassis through a 400 ohm carbon resistor to the high potential side of the signal generator. The ground wire should remain connected to the signal generator.

3rd - Adjust the carrier frequency output of the signal generator to 15 MC.

4th - Turn the wave band selector switch to the left - short wave position - set the calibrated dial of the receiver to read 15 MC.

5th - Adjust the S.W. oscillator shunt compensator for maximum signal output. If two peaks are noted on this adjustment, the proper one is that with the compensator farthest "in". To determine that this compensator has not been adjusted to the image frequency, turn the receiver dial to approximately 15.9 MC. If no signal can be heard at this setting even with a greater signal generator output, the S.W. oscillator shunt compensator has been improperly adjusted and it will be necessary to re-adjust to the proper peak. After re-adjusting, check to see that the image frequency comes in at 15.9 MC. It is well to bear in mind throughout these adjustments that with the same signal input to the receiver, the image response point should be weaker than the original reading.

6th - Having determined the correct peak, and maximum setting, for the S.W. oscillator shunt compensator, adjust the S.W. RF stage shunt compensator and the S.W. detector shunt compensator for maximum signal output. Turn the receiver dial to the image point (15.9 MC) to determine that both compensators have been adjusted to the correct peak (See Paragraph 5).

ADJUSTMENT OF S.W. OSCILLATOR SERIES TRIMMER

1st - Adjust the carrier frequency output of the signal generator to 6 MC.

2nd - Turn the calibrated dial of the receiver to pick up this 6 MC signal.

3rd - With the aid of a bakelite type screw driver, adjust the S.W. oscillator series trimmer (see sketch) until a maximum output signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

4th - Having determined the maximum peak of the S.W. oscillator series trimmer, re-adjust the carrier frequency of the signal generator to 15 MC. Turn the calibrated dial to 15 MC, and re-adjust S.W. oscillator shunt compensator, and then, S.W. RF stage shunt compensator and S.W. detector shunt compensator for maximum signal output; checking for image point as outlined in the foregoing instructions.

ADJUSTMENT OF BC SHUNT COMPENSATORS

The compensators are located as indicated in the sketch.

1st - Remove the 400 ohm resistor from the high potential side of the signal generator and insert a 250 mmfd. mica condenser in its place.

2nd - Turn the wave band selector switch to the right - broadcast position.

3rd - Adjust the carrier frequency to 1500 KC.

4th - Set the calibrated dial of the receiver to read 1500 KC.

5th - Adjust the BC oscillator shunt compensator for maximum signal output.

6th - Adjust the BC RF stage shunt compensator and the BC detector shunt compensator for maximum signal output.

ADJUSTMENT OF BC OSCILLATOR SERIES TRIMMER

1st - Adjust the carrier frequency output of the signal generator to 600 KC.

2nd - Turn the calibrated dial of the receiver to pick up this 600 KC signal.

3rd - With the aid of a bakelite type screw driver, adjust the BC oscillator series trimmer (see sketch) until a maximum signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

4th - Having determined the maximum peak of the BC oscillator series trimmer, re-adjust the carrier frequency of the signal generator to 1500 KC. Turn the calibrated dial to 1500 KC and re-adjust BC oscillator shunt compensator, and then, BC RF stage shunt compensator and BC detector shunt compensator for maximum signal output, as outlined in the foregoing instructions.

CONTINUITY AND VOLTAGE READINGS ON MODEL 192 SERIES

Line Voltage 118 - Input Current .81 Amp.
No Signal Input - Wave Band Switch - Right.

TYPE OF TUBE	POSITION OF TUBE	PLATE VOLTS	PLATE MA CURRENT	CATHODE VOLTS	SCREEN GRID VOLTS
6K7	R.F.	99	8.8	3	111
6A8	1st Det.Osc.	113	1.0	1	49
6K7	I.F.	107	3.3	7	107
6H6	2nd Det.	---	---	-	---
	AVC	---	---	16	---
6C5	1st Aud.	62*	1.2	2	---
43	P.P. 2nd Aud.	91	20.0	16	98
25Z5	"B" Rectifier	---	67.0 TOTAL	--	---
25Z5	Spk.Rectifier	---	77.0 TOTAL	--	---

6A8 Osc. Anode Voltage -- 78 and current -- 1.4 ma.

* These readings were taken with a 1,000 ohm per volt meter and are not indicative of effective voltages.

VOLTAGE ACROSS ELECTROLYTIC CONDENSER (#20.32)

	1st section	2nd section
	130	114

Voltage across speaker field	85	volts
" " filter choke (#40.3)	16	"
" " 4,000 ohm resistor (#30.12)	17	"
" " 30,000 ohm resistor (#30.10)	47	"

D.C. RESISTANCE VALUES

	PRIMARY	SECONDARY
Speaker input transformer	710 ohms	.34 ohms
" field coil	1,000 "	
" voice coil	2.05 "	
" bucking coil	.35 "	
Audio coupling choke (#40.7)	2,420 "	

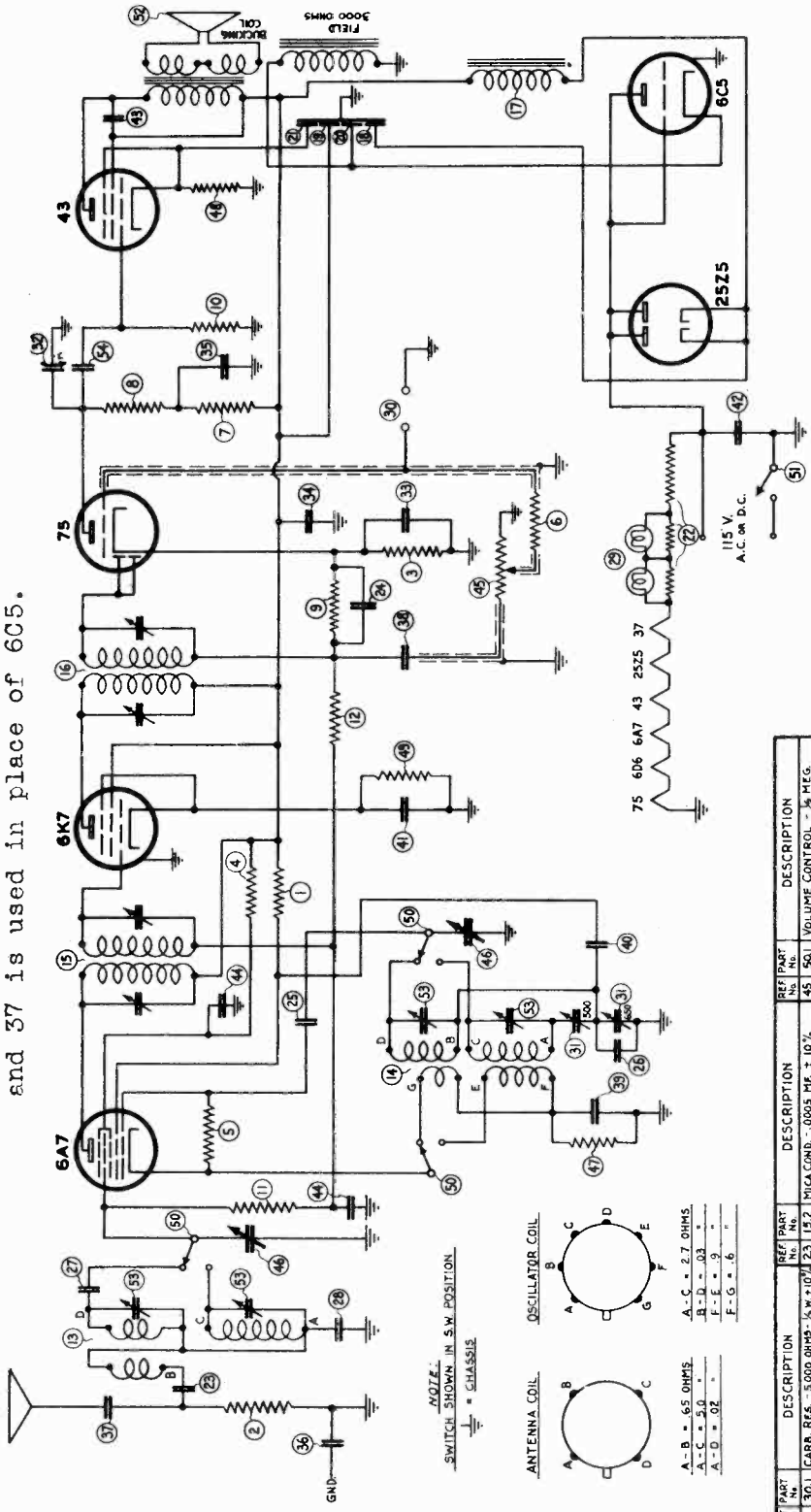
FORM S-2140
JUNE 26, 1935

SERVICE DIVISION

FADA RADIO & ELECTRIC CORP.

MODEL 1462
Two Types
Schematic

NOTE:
In some receivers 6D6 is used instead of 6K7 and 37 is used in place of 6C5.



REF No.	PART No.	DESCRIPTION
1	30.1	CARB. RES. - 5,000 OHMS - ½ W ± 10%
2	30.31	" " 10,000 " " " 20%
3	30.31	" " 10,000 " " " "
4	30.7	" " 15,000 " " " 10%
5	30.3	" " 50,000 " " " "
6	30.26	" " 50,000 " " " 20%
7	30.26	" " 50,000 " " " "
8	30.20	" " 250,000 " " " "
9	30.23	" " 500,000 " " " "
10	30.23	" " 500,000 " " " "
11	30.22	" " 1 MEG " " " "
12	30.22	" " " " " " "
13	2026	ANTENNA COIL
14	3116	OSCILLATOR "
15	3B79	1ST I.F. "
16	3B80	2ND I.F. "
17	40.1	CHOKE " 390 OHMS
18	20.1	ELECTRO. COND. BLOCK - 16 MF. 100 WV
19	20.1	" " " 16 " 100 "
20	20.1	" " " 4 " 100 "
21	20.1	" " " 4 - 25 "
22	115.1	LINE RESISTOR - 120-30-30 OHMS
23	19.2	MICA COND. - .0005 MF. ± 10%
24	15.2	" " " .0005 " "
25	15.3	" " " .001 " "
26	15.19	" " " .0015 " "
27	15.5	" " " .002 " 3%
28	15.6	" " " .0025 " "
29	120.1	PILOT LIGHTS 6-8 V. .25 A.
30	125.1	PHONO JACK
31	25.1	PADDING COND. - 650-500 MMF
32	55.1	TONE CONTROL
33	10.12	TUBULAR COND. - 1.0 MF. - 200 V.
34	10.2	" " " .1 " " "
35	10.2	" " " .1 " " "
36	10.3	" " " .006 " 400 "
37	10.4	" " " .01 " 200 "
38	10.4	" " " .01 " " "
39	10.5	" " " .05 " " "
40	10.5	" " " .05 " " "
41	10.5	" " " .05 " " "
42	10.5	" " " .05 " " "
43	10.10	" " " .01 " 400 "
44	10.6	" " " DUAL .05 - 200 "
45	90.1	VOLUME CONTROL - ½ MEG.
46	25.2	VARIABLE COND.
47	130.2	WIRE RES. - 350 OHMS ½ W. FX.
48	130.1	" " 625 " " "
49	130.3	" " 1000 " " "
50	45.1	BAND SWITCH
51		ON-OFF SW. ON VOL. CONT. (45)
52	105.1	SPEAKER - 3,000 OHMS
53		MIN. ADJ. ON COILS
54	10.4	TUBULAR COND. - .01 MF. - 200 V.

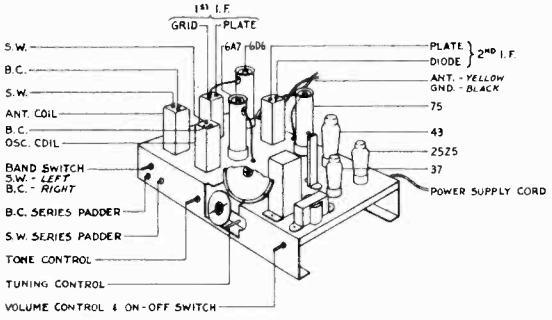
MODEL 1462
Two Types
Socket, Trimmers
Alignment, Voltage

FADA RADIO & ELECTRIC CORP.

COMPENSATING INSTRUCTIONS FOR MODEL 1462 SERIES

In order to adjust accurately the various trimmer condensers of the receiver in accordance with the following instructions, it is essential to use a shielded signal generator capable of giving a modulated carrier which can be attenuated at 456 KC, 600 KC, 1500 KC, 6 MC and 15 MC.

This receiver is equipped with an automatic volume control which necessitates setting the manual volume control of the receiver to its maximum position to insure accuracy in alignment. To control the signal output of the receiver it will be necessary to use the attenuator control of the signal generator.



ADJUSTMENT OF THE I.F. CONDENSERS

The four (4) intermediate frequency (I.F.) condensers are located as shown in the sketch.

1st - Disconnect the outside antenna system from the receiver.

2nd - Disconnect the control grid lead from the 6A7 tube.

3rd - Connect the high potential lead of the signal generator to the control grid of the 6A7 tube, and the low potential side to the receiver "ground" lead.

4th - Place an output meter (copper oxide type) across the speaker voice coil so that variations in signal output can be noted.

5th - Place the signal generator in operation and adjust the carrier frequency to 456 KC. Regulate the attenuator control of the signal generator so that the output signal is low enough to insure accuracy in adjusting the I.F. condensers.

6th - With the aid of a bakelite type screw driver, adjust the four (4) I.F. condensers to resonance as indicated by the greatest swing of the needle on the output meter. Repeat these adjustments as there is a slight interlocking effect.

ADJUSTMENT OF S.W. SHUNT COMPENSATORS

The compensators are located as indicated on the sketch.

1st - Remove the signal generator connection from the control grid of the 6A7 tube and replace the control grid lead.

2nd - Connect the antenna wire of the receiver chassis through a 400 ohm carbon resistor to the high potential side of the signal generator. The ground wire should remain connected to the signal generator.

3rd - Adjust the carrier frequency output of the signal generator to 15 MC.

4th - Turn the wave band selector switch to the left - short wave position. Set the calibrated dial of the receiver to read 15 MC.

5th - Adjust the S.W. oscillator shunt compensator for maximum signal output. If two peaks are noted on this adjustment, the proper one is that with the compensator farthest "in." To determine that this compensator has not been adjusted to the image frequency, turn the receiver dial to approximately 15.9 MC. If no signal can be heard at this setting, even with a greater signal generator output, the S.W. oscillator shunt compensator has been improperly adjusted and it will be necessary to return the dial to 15 MC and adjust to the proper peak. After re-adjusting check to see that the image frequency comes in at 15.9 MC on the receiver dial. It is well to bear in mind throughout these adjustments that with the same signal input to the receiver, the image response point should be weaker than the original (fundamental) signal frequency.

6th - Having determined the correct peak, and maximum setting, for the S.W. oscillator shunt compensator, adjust the S.W. detector shunt compensator for maximum signal output.

ADJUSTMENT OF S.W. OSCILLATOR SERIES PADDER

1st - Adjust the carrier frequency output of the signal generator to 6 MC.

2nd - Turn the calibrated dial of the receiver to pick up this 6 MC signal.

3rd - With the aid of a bakelite type screw driver, adjust the S.W. oscillator series padder (see sketch) until a maximum output signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum output signal.

4th - Having determined the maximum peak of the S.W. oscillator series padder, re-adjust the carrier frequency of the signal generator to 15 MC. Turn the calibrated dial to 15 MC and re-adjust S.W. oscillator shunt compensator, and then S.W. detector shunt compensator for maximum signal output; checking for image point as outlined in the foregoing instructions.

ADJUSTMENT OF BC SHUNT COMPENSATORS

The compensators are located as indicated in the sketch.

1st - Remove the 400 ohm resistor from the high potential side of the signal generator and insert a 250 mmfd. mica condenser in its place.

2nd - Turn the wave band selector switch to the right - broadcast position.

3rd - Adjust the carrier frequency to 1500 KC.

4th - Set the calibrated dial of the receiver to read 1500 KC.

5th - Adjust the BC oscillator shunt compensator for maximum signal output.

6th - Adjust the BC detector shunt compensator for maximum signal output.

ADJUSTMENT OF BC OSCILLATOR SERIES PADDER

1st - Adjust the carrier frequency output of the signal generator to 600 KC.

2nd - Turn the calibrated dial of the receiver to pick up this 600 KC signal.

3rd - With the aid of a bakelite type screw driver, adjust the BC oscillator series padder (see sketch) until a maximum signal is indicated on the output meter. To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

4th - Having determined the maximum peak of the BC oscillator series padder, re-adjust the carrier frequency of the signal generator to 1500 KC. Turn the calibrated dial to 1500 KC and re-adjust the BC oscillator shunt and the BC detector shunt compensators for maximum signal output as outlined in the foregoing instructions.

CONTINUITY AND VOLTAGE READINGS ON MODEL 1462 SERIES

Line Voltage 117 - Input Current .45 amp.
No Signal Input - Wave Band Switch - Right

TYPE OF TUBE	POSITION OF TUBE	PLATE VOLTS	PLATE MA CURRENT	CATHODE VOLTS	SCREEN GRID VOLTS
6A7	1st Det.-Osc.	121	2.4	3	70
6D6	Int. Freq.	117	5.3	7	117
75	1st Aud.	58*	.1	1	---
	2nd Det.	---	---	--	---
43	2nd Aud.	99	22.0	17	107
37	Spk. Rectifier	---	26.0	--	---
25Z5	"B" Rectifier	---	42.0 TOTAL	--	---

6A7 Osc. Anode Voltage -- 100 and Current -- 3.3 ma.

* These readings were taken with a 1,000 ohm per volt meter and are not indicative of effective voltages.

VOLTAGE ACROSS ELECTROLYTIC CONDENSER

1st section	2nd section
139	124

Voltage across speaker field..... 80 volts
" " filter choke..... 15 "

D.C. RESISTANCE VALUES

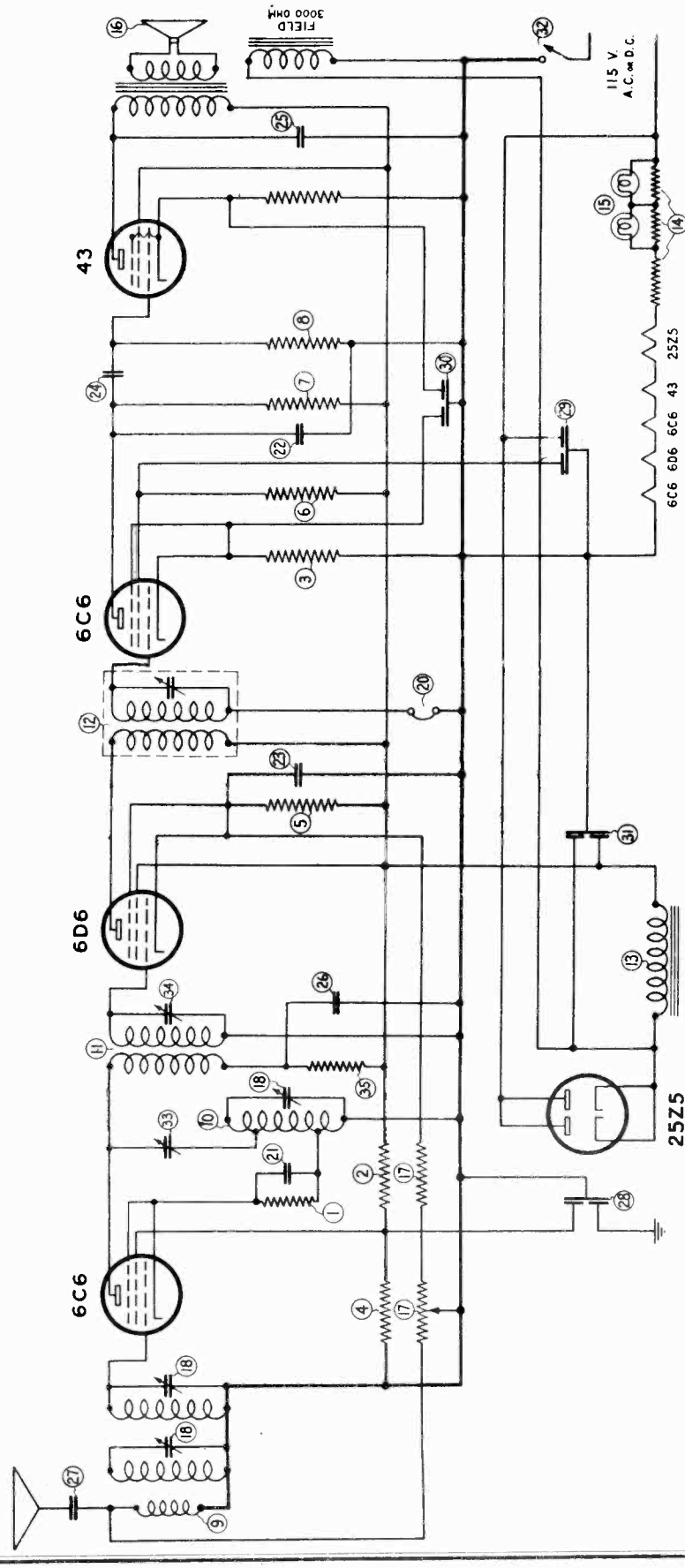
	PRIMARY	SECONDARY
Speaker input transformer	330. ohms	.42 ohms
" field coil	3,000. "	
" voice coil	3. "	
" bucking coil	.38 "	

FORM S-2146
July 1, 1935

SERVICE DIVISION

FADA RADIO & ELECTRIC CORP.

MODEL 1556
Schematic

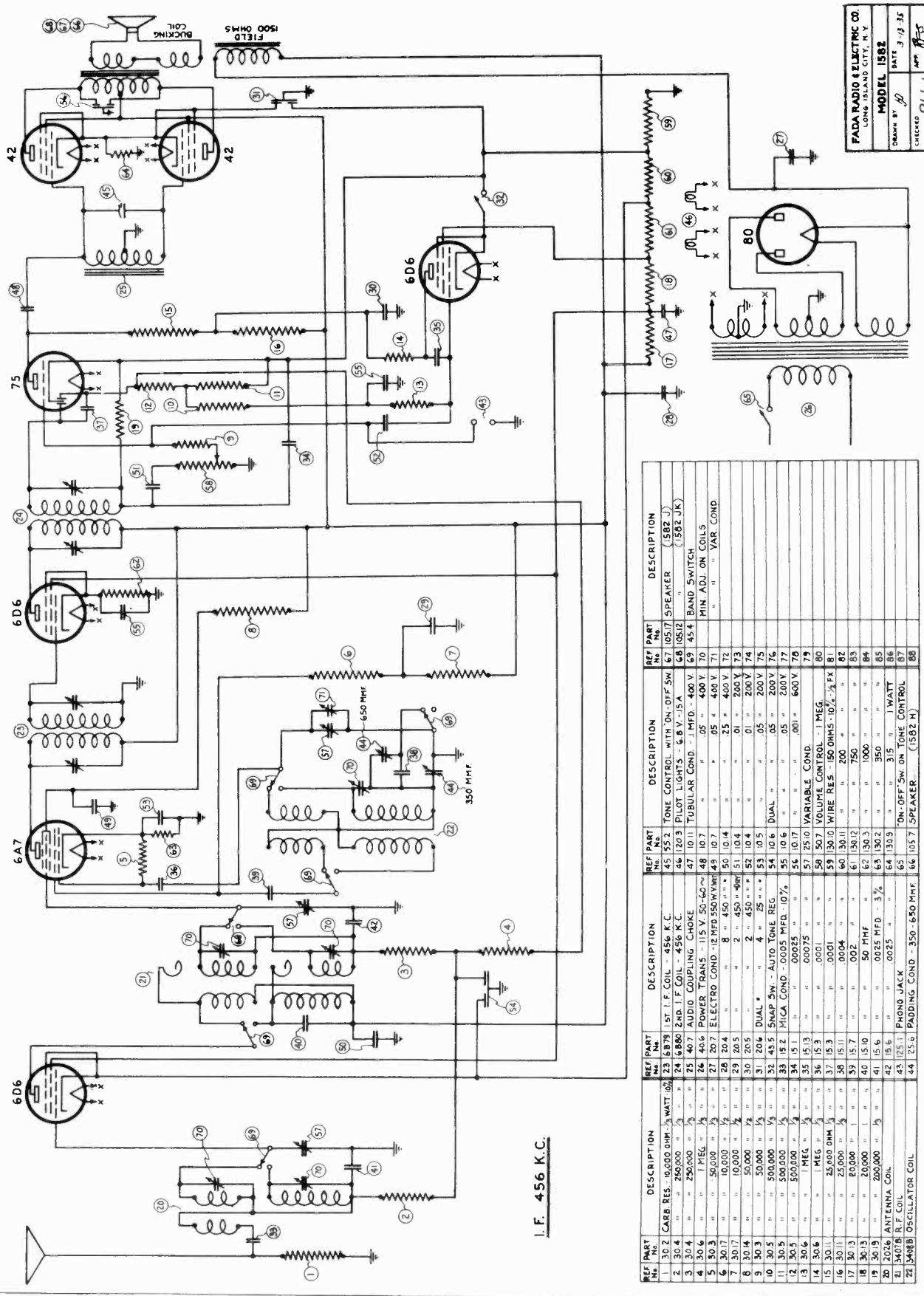


FADA RADIO & ELECTRIC CO. LONG ISLAND CITY, N.Y.		
MODEL 1556		
DRAWN BY CP	DATE 5-24-35	
CHECKED BY RLW	APPROVED BY [illegible]	

REF No.	PART No.	DESCRIPTION	REF No	PART No.	DESCRIPTION
1	30.12	CARB. RES - 4,000 OHM - 1/3 W. ± 10%	23	10.5	TUBULAR COND. - .05 MF. - 200 V.
2	30.10	" " 30,000 " 1/3 W. ± 10%	24	10.4	" " .01 " - "
3	30.11	" " 25,000 " 1/3 W. ± 10%	25	10.4	" " .01 " - "
4	30.8	" " .1 MEG. 1/3 W. ± 10%	26	10.1	" " .35 " - "
5	30.8	" " .1 " 1/3 W. ± 10%	27	10.25	" " .001 " - "
6	30.6	" " .1 " 1/3 W. ± 20%	28	10.6	" " DUAL .05 " - "
7	30.5	" " .5 " 1/3 W. ± 20%	29	10.6	" " .05 " - "
8	30.5	" " .5 " 1/3 W. ± 20%	30	20.17	ELECTRO COND. 2-4 MF
9	X204-E	ANTENNA COIL (PRESELECTOR)	31	20.22	" " 8-16 "
10	X192-F	OSCILLATOR COIL	32		ON-OFF SW. ON VOL. CONT.
11	X205	D.T. I.F. COIL	33	25.40	PADDING CONDENSER
12	X194-A	S.T. I.F. COIL	34	25.40	"
13	40.1	CHOKE COIL - 300 OHMS	35	30.35	CARB. RES - 1000 OHM - 1/3 W. ± 20%
14	115.6	LINE RESISTOR - 140-38 OHMS	36		
15	120.1	PILOT LIGHT - 6.8 V. .25 A.	37		
16	105.21	SPEAKER - 3,000 OHMS	38		
17	50.11	VOL. CONT. - 35,000 OHMS WITH 2700 OHM SHUNT	39		
18	25.16	VARIABLE COND.	40		
19	130.1	WIRE RES. - 625 OHM - 1/2 F.X.	41		
20	125.1	PHONO JACK	42		
21	15.7	MICA COND. - .002 MF.	43		
22	15.2	" " .0005 "	44		

MODEL 1582
Schematic

FADA RADIO & ELECTRIC CORP.



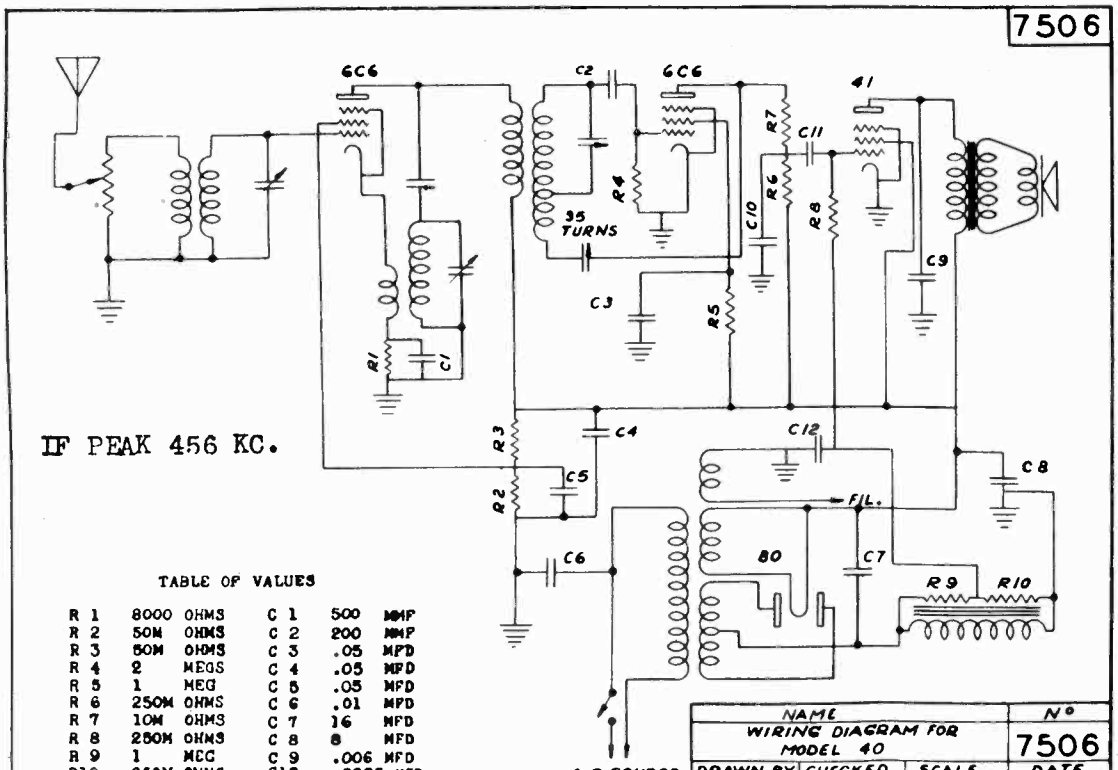
REF No.	PART No.	DESCRIPTION
1	30.2	CARB. RES. - 10,000 OHM - ½ WATT 10%
2	30.4	" " 250,000 " " ½ " " "
3	30.4	" " 250,000 " " ½ " " "
4	30.6	" " 1 MEG " " ½ " " "
5	30.3	" " 50,000 " " ½ " " "
6	30.17	" " 10,000 " " ½ " " "
7	30.17	" " 10,000 " " ½ " " "
8	30.14	" " 50,000 " " ½ " " "
9	30.3	" " 50,000 " " ½ " " "
10	30.5	" " 500,000 " " ½ " " "
11	30.5	" " 500,000 " " ½ " " "
12	30.5	" " 500,000 " " ½ " " "
13	30.6	" " 1 MEG " " ½ " " "
14	30.6	" " 1 MEG " " ½ " " "
15	30.11	" " 25,000 OHM ½ " " "
16	30.11	" " 25,000 " " ½ " " "
17	30.13	" " 20,000 " " 1 " " "
18	30.13	" " 20,000 " " 1 " " "
19	30.19	" " 200,000 " " ½ " " "
20	2026	ANTENNA COIL
21	3407A	R.F. COIL
22	3408B	OSCILLATOR COIL
23	6879	1ST I.F. COIL - 456 K.C.
24	6880	2ND I.F. COIL - 456 K.C.
25	40.7	AUDIO COUPLING CHOKE
26	40.6	POWER TRANS - 115 V. 50-60 ~
27	20.7	ELECTRO COND - 12 MFD 550 WVMT
28	20.4	" " " 8 " 450 " "
29	20.5	" " " 2 " 450 " 40WT
30	20.5	" " " 2 " 450 " " "
31	20.6	DUAL " " 4 " 25 " " "
32	45.5	SNAP SW. - AUTO TONE REG.
33	15.2	MICA COND - .0005 MFD - 10%
34	15.1	" " .00025 " "
35	15.13	" " .00075 " "
36	15.3	" " .0001 " "
37	15.3	" " .0001 " "
38	15.11	" " .0004 " "
39	15.7	" " .002 " "
40	15.10	" " 50 MMF " "
41	15.6	" " .0025 MFD - 3%
42	15.6	" " .0025 " "
43	25.1	PHONO JACK
44	25.6	PADDING COND - 350 - 650 MMF.

REF No.	PART No.	DESCRIPTION
45	55.2	TONE CONTROL WITH "ON-OFF" SW
46	120.3	PILOT LIGHTS - 6.8 V. - 1.5 A
47	10.11	TUBULAR COND. - .1 MFD. - 400 V
48	10.7	" " .05 " 400 V
49	10.7	" " .05 " 400 V
50	10.4	" " .25 " 400 V
51	10.4	" " .01 " 200 V
52	10.4	" " .01 " 200 V
53	10.5	" " .05 " 200 V
54	10.6	DUAL " " .05 " 200 V
55	10.6	" " .05 " 200 V
56	10.17	" " .001 " 600 V
57	25.10	VARIABLE COND.
58	52.7	VOLUME CONTROL - 1 MEG.
59	130.10	WIRE RES - 150 OHMS - 10% - ¼ FX
60	130.11	" " 200 " " " "
61	130.12	" " 750 " " " "
62	130.3	" " 1000 " " " "
63	130.2	" " 350 " " " "
64	130.9	" " 3.15 " 1 WATT
65	130.9	ON-OFF SW. ON TONE CONTROL
66	105.7	SPEAKER (1582 H)
67	105.17	SPEAKER (1582 J)
68	105.12	" (1582 JK)
69	45.4	BAND SWITCH
70		MIN. ADJ. ON COILS
71		" " " VAR. COND
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		

MODEL 40
MODEL 41
Schematics

FAIRBANKS-MORSE HOME APP., INC.

7506

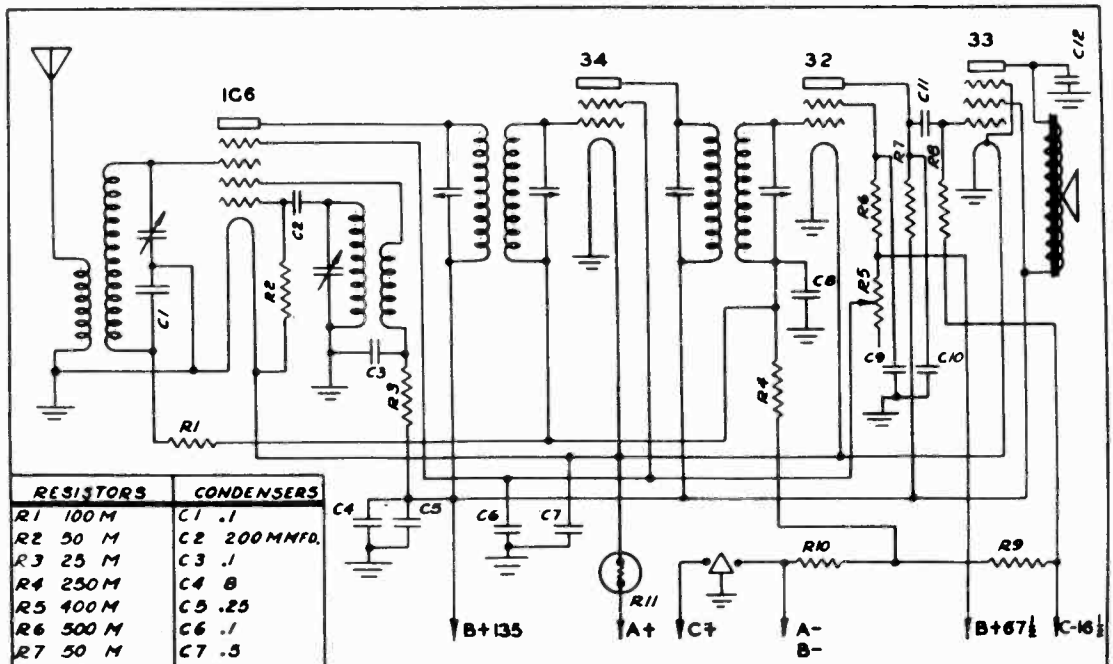


IF PEAK 456 KC.

TABLE OF VALUES

R 1	8000	OHMS	C 1	500	MMF
R 2	50M	OHMS	C 2	200	MMF
R 3	50M	OHMS	C 3	.05	MFD
R 4	2	MEGS	C 4	.05	MFD
R 5	1	MEG	C 5	.05	MFD
R 6	250M	OHMS	C 6	.01	MFD
R 7	10M	OHMS	C 7	16	MFD
R 8	250M	OHMS	C 8	8	MFD
R 9	1	MEG	C 9	.006	MFD
R10	250M	OHMS	C10	.0005	MFD
			C11	.01	MFD
			C12	.1	MFD

NAME			N°
WIRING DIAGRAM FOR MODEL 40			7506
DRAWN BY	CHECKED	SCALE	DATE
		X = 1"	6-12-36
FAIRBANKS MORSE HOME APPLIANCES, INC.			



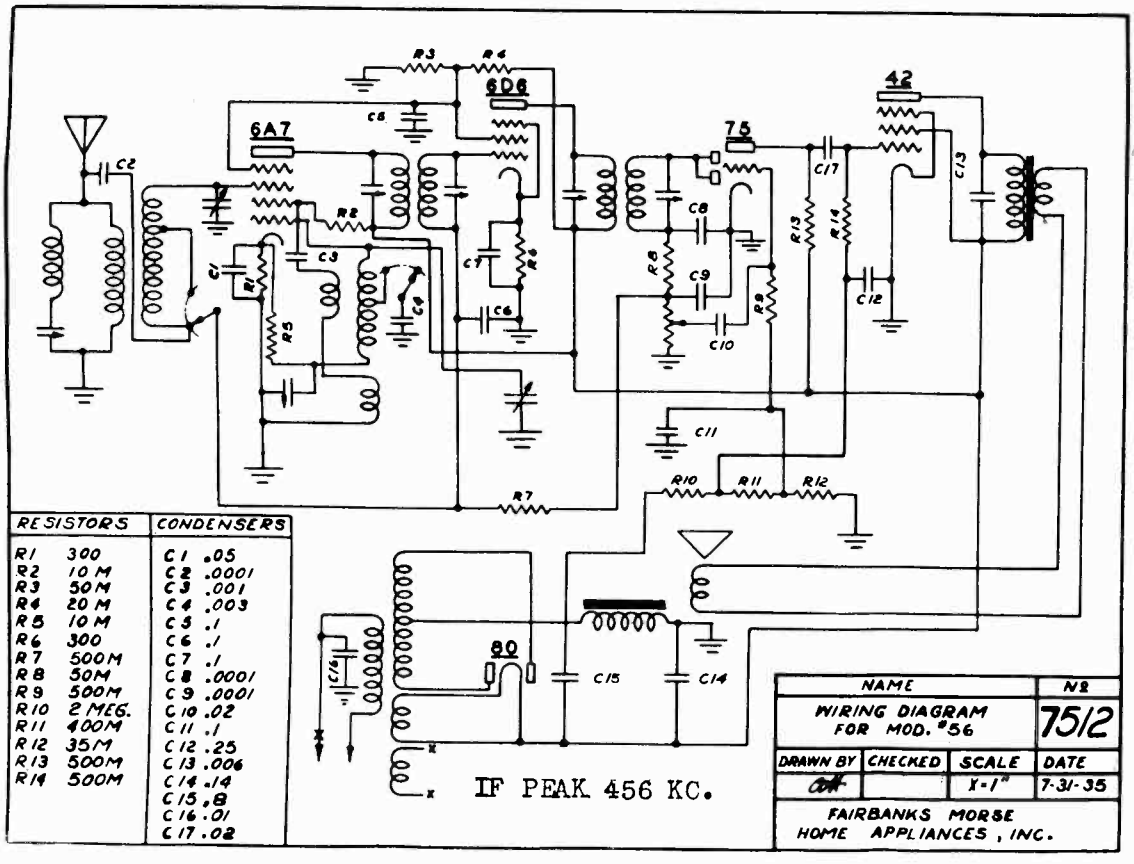
RESISTORS	CONDENSERS
R1 100 M	C1 .1
R2 50 M	C2 200 MMFD.
R3 25 M	C3 .1
R4 250 M	C4 8
R5 400 M	C5 .25
R6 500 M	C6 .1
R7 50 M	C7 .5
R8 500 M	C8 .1
R9 5 M	C9 .05
R10 1000	C10 200 MMFD.
R11 .6	C11 .02
	C12 .02

IF PEAK 456 KC.

NAME			N°
WIRING DIAGRAM FOR MODEL # 41			7521
DRAWN BY	CHECKED	SCALE	DATE
			9-11-35
FAIRBANKS MORSE HOME APPLIANCES, INC.			

MODEL C-6
MODEL 56
Schematics

FAIRBANKS-MORSE HOME APP., INC.



RESISTORS		CONDENSERS	
R1	300	C1	.05
R2	10 M	C2	.0001
R3	50 M	C3	.001
R4	20 M	C4	.003
R5	10 M	C5	.1
R6	300	C6	.1
R7	500M	C7	.1
R8	50M	C8	.0001
R9	500M	C9	.0001
R10	2 MEG.	C10	.02
R11	400M	C11	.1
R12	35M	C12	.25
R13	500M	C13	.006
R14	500M	C14	.14
		C15	.8
		C16	.01
		C17	.02

NAME			NO
WIRING DIAGRAM FOR MOD. "56			75/2
DRAWN BY	CHECKED	SCALE	DATE
		X-1"	7-31-35
FAIRBANKS MORSE HOME APPLIANCES, INC.			

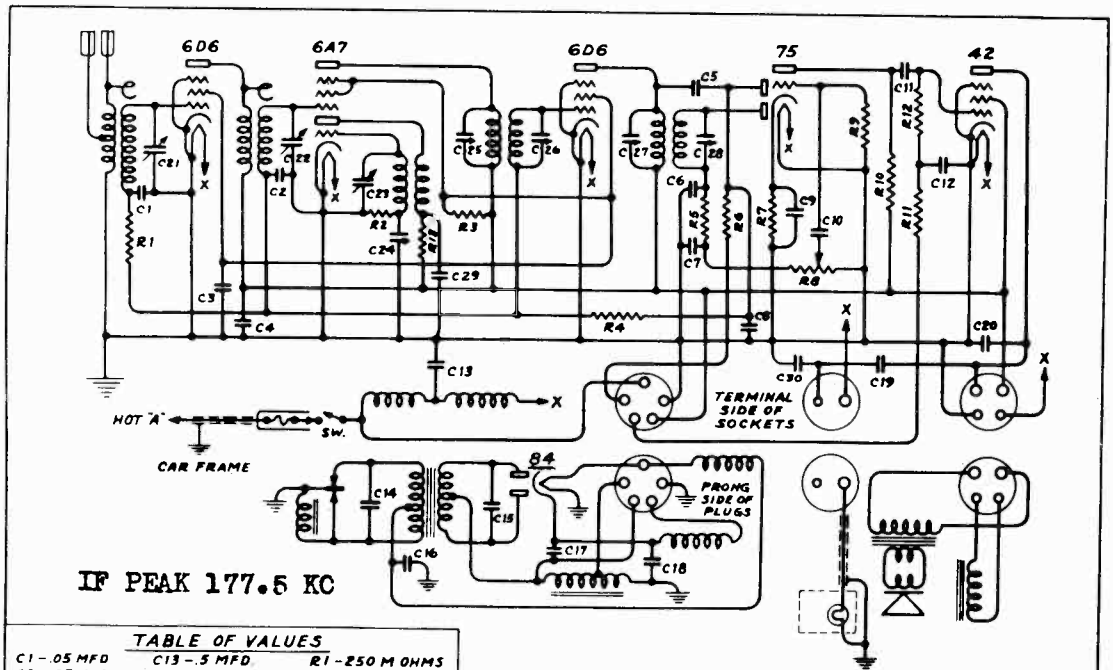


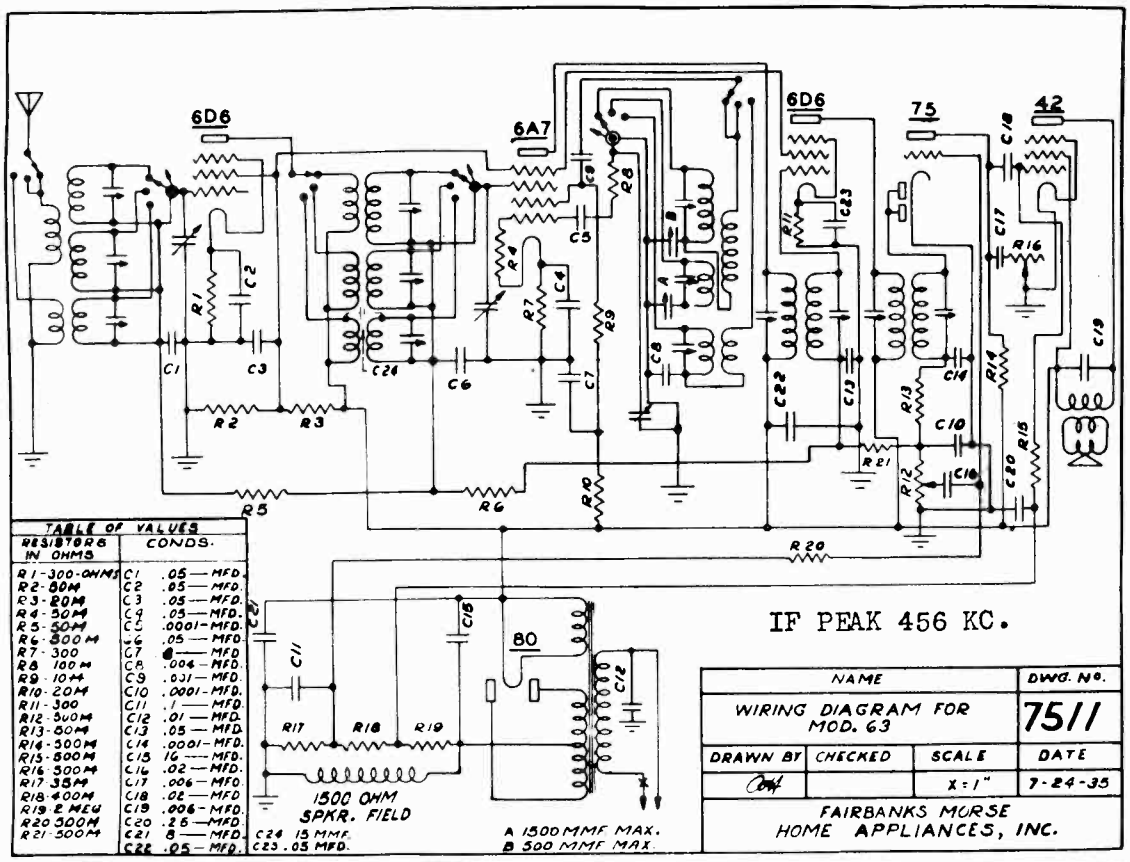
TABLE OF VALUES		
C1 - .05 MFD	C13 - .5 MFD.	R1 - 250 M OHMS
C2 - .05 MFD	C14 - .25 MFD.	R2 - 50 M OHMS
C3 - .1 MFD.	C15 - .02 MFD.	R3 - 20 M OHMS
C4 - .25 MFD.	C16 - .25 MFD.	R4 - 250 M OHMS
C5 - 50 MMFD.	C17 - 8 MFD.	R5 - 25 M OHMS
C6 - 200 MMFD.	C18 - 8 MFD.	R6 - 250 M OHMS
C7 - 200 MMFD.	C19 - .02 MFD.	R7 - 6000 OHMS
C8 - 500 MMFD.	C20 - .006 MFD.	R8 - 250 M OHM V.C.
C9 - 25 MFD	C29 - .01 MFD.	R9 - 500 M OHMS
C10 - 01 MFD	C30 - 500 MMFD.	R10 - 100 M OHMS
C11 - .01 MFD		R11 - 250 M OHMS
C12 - .1 MFD.	R13 - 40 M OHMS	R12 - 250 M OHMS

MOD. C-6
AUTO RADIO RECEIVER

FAIRBANKS-MORSE
HOME APPLIANCES, INC.
CHICAGO, U.S.A.
SD-32335

MODEL 63
MODEL 64
Schematics

FAIRBANKS-MORSE HOME APP., INC.



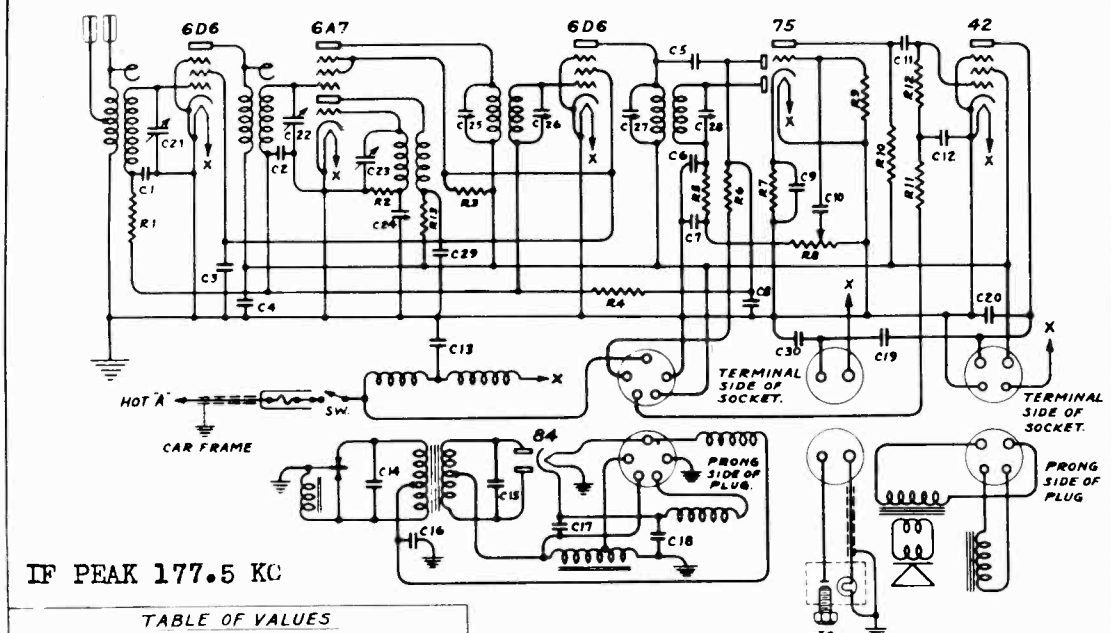
IF PEAK 456 KC.

TABLE OF VALUES

RESISTORS IN OHMS	CONDS.
R1-300-OHMS	C1 .05 MFD.
R2-80M	C2 .05 MFD.
R3-80M	C3 .05 MFD.
R4-50M	C4 .05 MFD.
R5-50M	C5 .0001 MFD.
R6-300 M	C6 .05 MFD.
R7-300	C7 MFD
R8 100 M	C8 .004 MFD.
R9-10M	C9 .031 MFD.
R10-20M	C10 .0001 MFD.
R11-300	C11 .1 MFD.
R12-500M	C12 .01 MFD.
R13-80M	C13 .05 MFD.
R14-300M	C14 .0001 MFD.
R15-800M	C15 .1G MFD.
R16 300M	C16 .02 MFD.
R17 38M	C17 .006 MFD.
R18-400M	C18 .02 MFD.
R19 2 MEG	C19 .006 MFD.
R20 300M	C20 .25 MFD.
R21-500M	C21 8 MFD.
	C22 .05 MFD.
	C24 15 MMF.
	C23 .05 MFD.

NAME			DWG. NO.
WIRING DIAGRAM FOR MOD. 63			7511
DRAWN BY	CHECKED	SCALE	DATE
		X=1"	7-24-35

FAIRBANKS MORSE
HOME APPLIANCES, INC.



IF PEAK 177.5 KC

TABLE OF VALUES

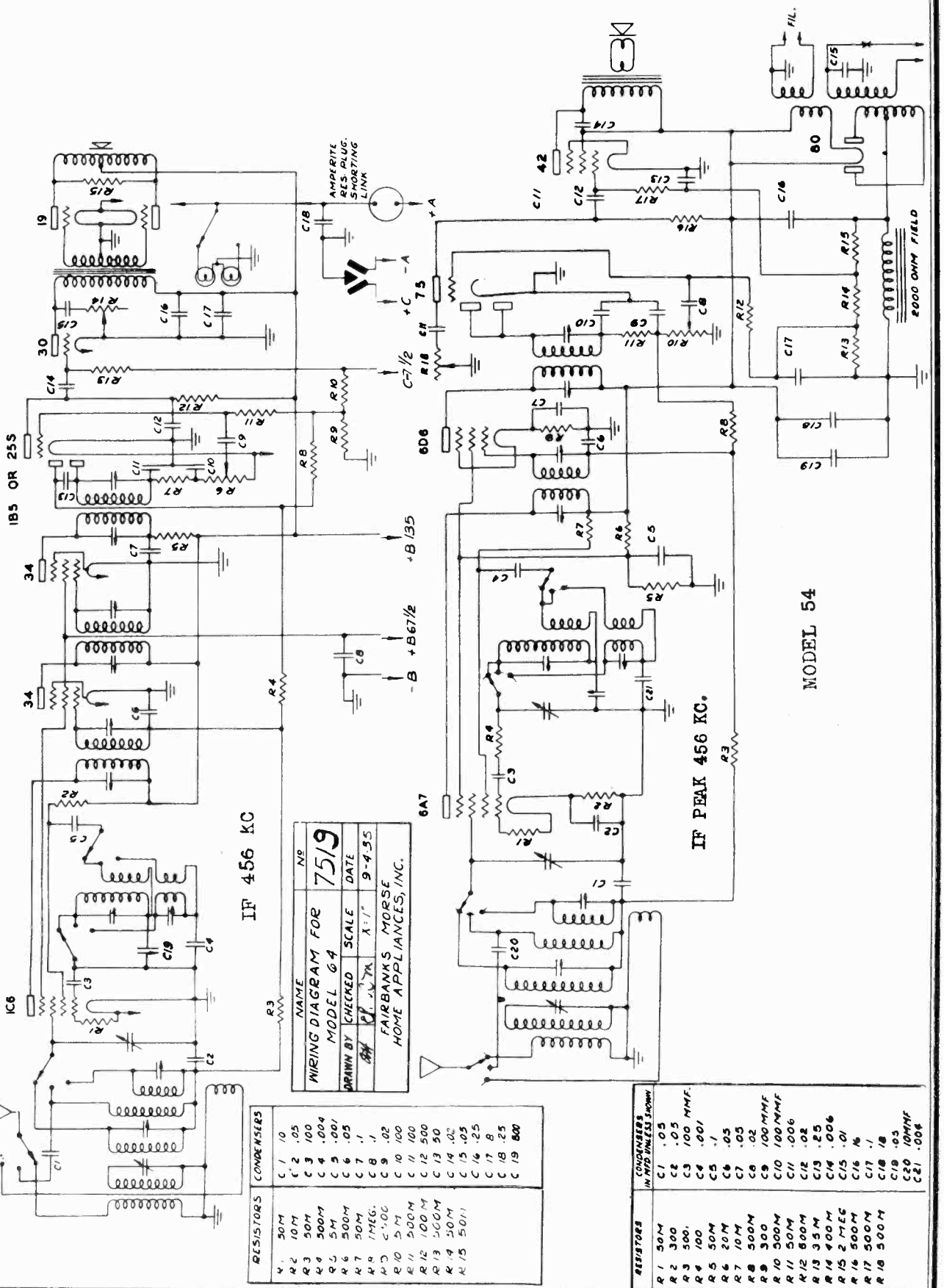
C1 05 MFD	C13 - .5 MFD.	R3 - 20 M OHMS
C2 05 MFD	C14 - .25 MFD.	R4 - 250 M OHMS
C3 1 MFD	C15 - .02 MFD	R5 25 M OHMS
C4 25 MFD.	C16 25 MFD	R6 250 M OHMS
C5 50 MMFD.	C17 8 MFD	R7 6000 OHMS
C6 200 MMFD.	C18 8 MFD	R8 - 250 M OHM V.C.
C7 200 MMFD.	C19 - .02 MFD.	R9 - 500 M OHMS
C8 500 MMFD	C20 - .006 MFD.	R10 100 M OHMS
C9 25 MFD.	C29 - .01 MFD.	R11 - 250 M OHMS
C10 01 MFD	C30 - 500 MMFD	R12 - 250 M OHMS
C11 01 MFD.	R1 - 250 M OHMS	R13 - 40 M OHMS
C12 - .1 MFD.	R2 - 50 M OHMS	

MOD 64
AUTO RADIO RECEIVER

FAIRBANKS-MORSE
HOME APPLIANCES, INC.
CHICAGO, U.S.A.
SD-21235

MODEL 54
MODEL 64
Schematics

FAIRBANKS-MORSE HOME APP., INC.

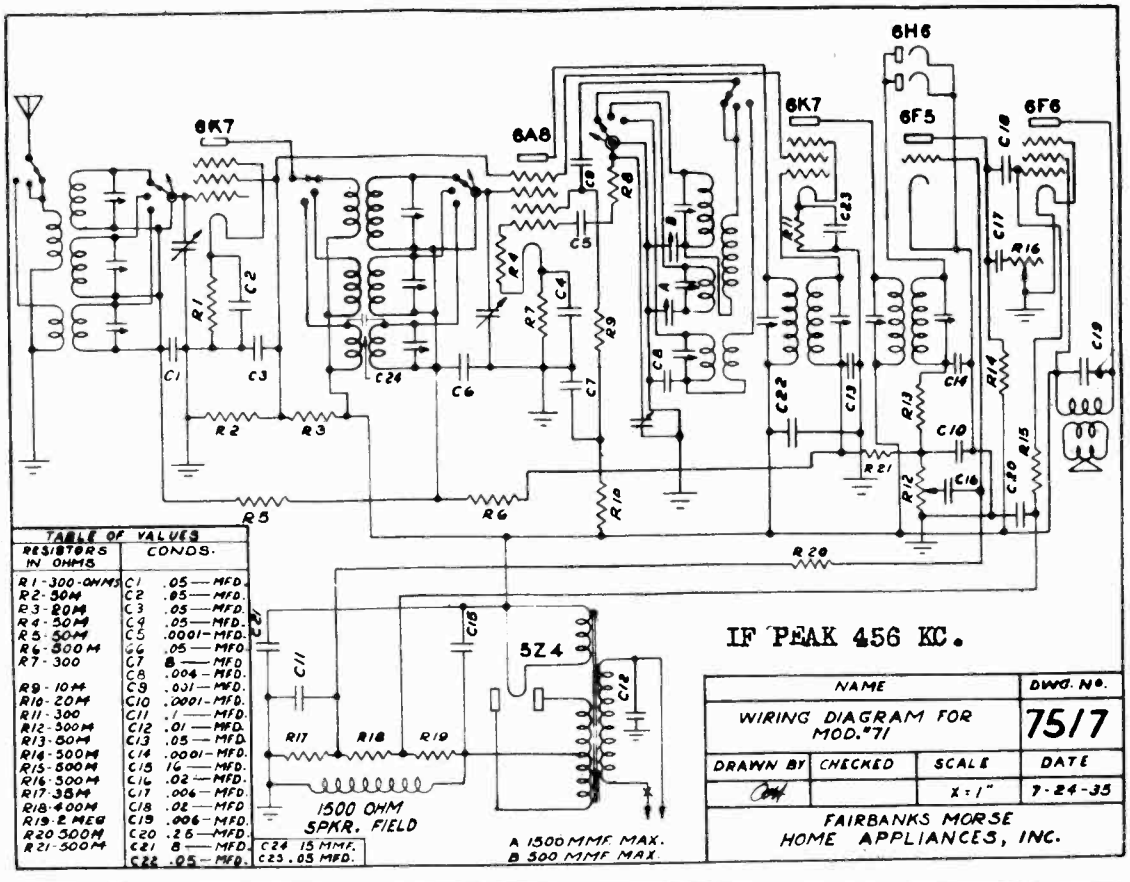


RESISTORS		CONDENSERS	
R 1	50M	C 1	10
R 2	10M	C 2	.05
R 3	50M	C 3	100
R 4	500M	C 4	.004
R 5	5M	C 5	.001
R 6	500M	C 6	.05
R 7	50M	C 7	.1
R 8	1MEG.	C 8	.1
R 9	2500	C 9	.02
R 10	5M	C 10	100
R 11	500M	C 11	100
R 12	100M	C 12	500
R 13	500M	C 13	50
R 14	50M	C 14	.02
R 15	50M	C 15	.05
		C 16	.25
		C 17	8
		C 18	.25
		C 19	800

RESISTORS		CONDENSERS IN MFD UNLESS SHOWN	
R 1	50M	C1	.05
R 2	300	C2	.05
R 3	300.	C3	100 MMF.
R 4	100	C4	.001 MMF.
R 5	50M	C5	.1
R 6	20M	C6	.05
R 7	10M	C7	.05
R 8	500M	C8	.02
R 9	300	C9	100 MMF
R 10	500M	C10	100 MMF
R 11	50M	C11	.006
R 12	800M	C12	.02
R 13	35M	C13	.25
R 14	400M	C14	.006
R 15	2 MEG	C15	.01
R 16	500M	C16	16
R 17	500M	C17	.1
R 18	500M	C18	18
		C20	.05
		C21	10MMF
			.004

FAIRBANKS-MORSE HOME APP., INC.

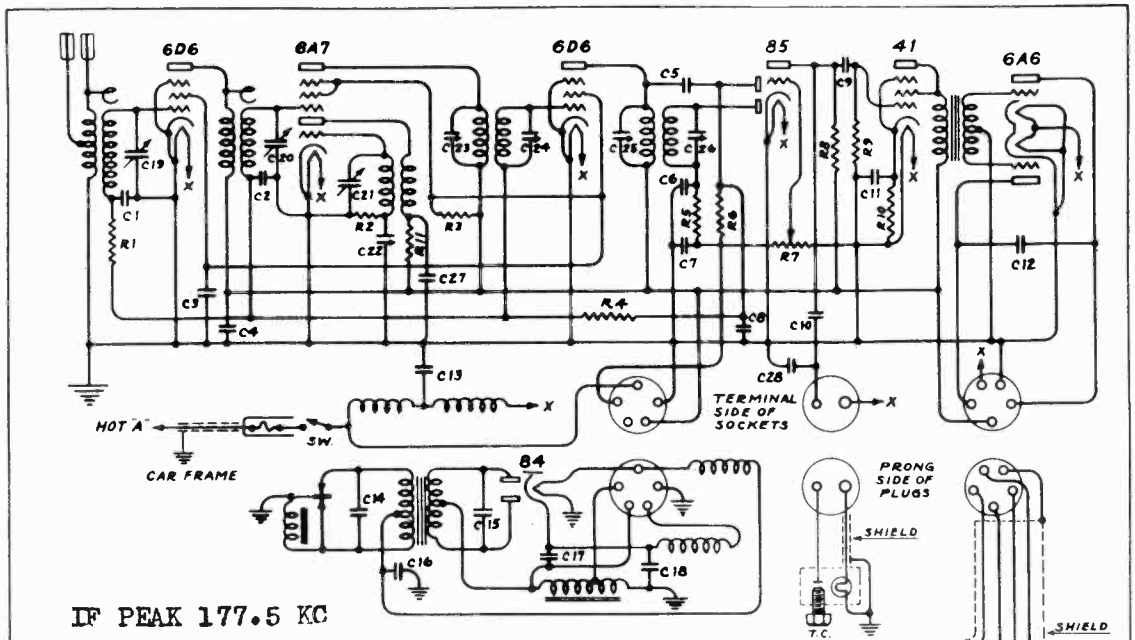
MODEL 71
MODEL 74
Schematics



IF PEAK 456 KC.

TABLE OF VALUES	
RESISTORS IN OHMS	CONDS.
R1 - 300 OHMS	C1 .05 — MFD.
R2 - 50M	C2 .05 — MFD.
R3 - 20M	C3 .05 — MFD.
R4 - 50M	C4 .05 — MFD.
R5 - 50M	C5 .0001 — MFD.
R6 - 300 M	C6 .05 — MFD.
R7 - 300	C7 8 — MFD.
	C8 .004 — MFD.
R9 - 10M	C9 .031 — MFD.
R10 - 20M	C10 .0001 — MFD.
R11 - 300	C11 .1 — MFD.
R12 - 300 M	C12 .01 — MFD.
R13 - 50M	C13 .05 — MFD.
R14 - 500 M	C14 .0001 — MFD.
R15 - 800 M	C15 1G — MFD.
R16 - 500 M	C16 .02 — MFD.
R17 - 35M	C17 .006 — MFD.
R18 - 400 M	C18 .02 — MFD.
R19 - 2 MEG	C19 .006 — MFD.
R20 500 M	C20 .25 — MFD.
R21 - 500 M	C21 8 — MFD.
	C22 .05 — MFD.
	C24 15 MMF.
	C23 .05 MFD.

NAME			DWG. NO.
WIRING DIAGRAM FOR MOD. "71"			7517
DRAWN BY	CHECKED	SCALE	DATE
		X:1"	7-24-35
FAIRBANKS MORSE HOME APPLIANCES, INC.			



IF PEAK 177.5 KC

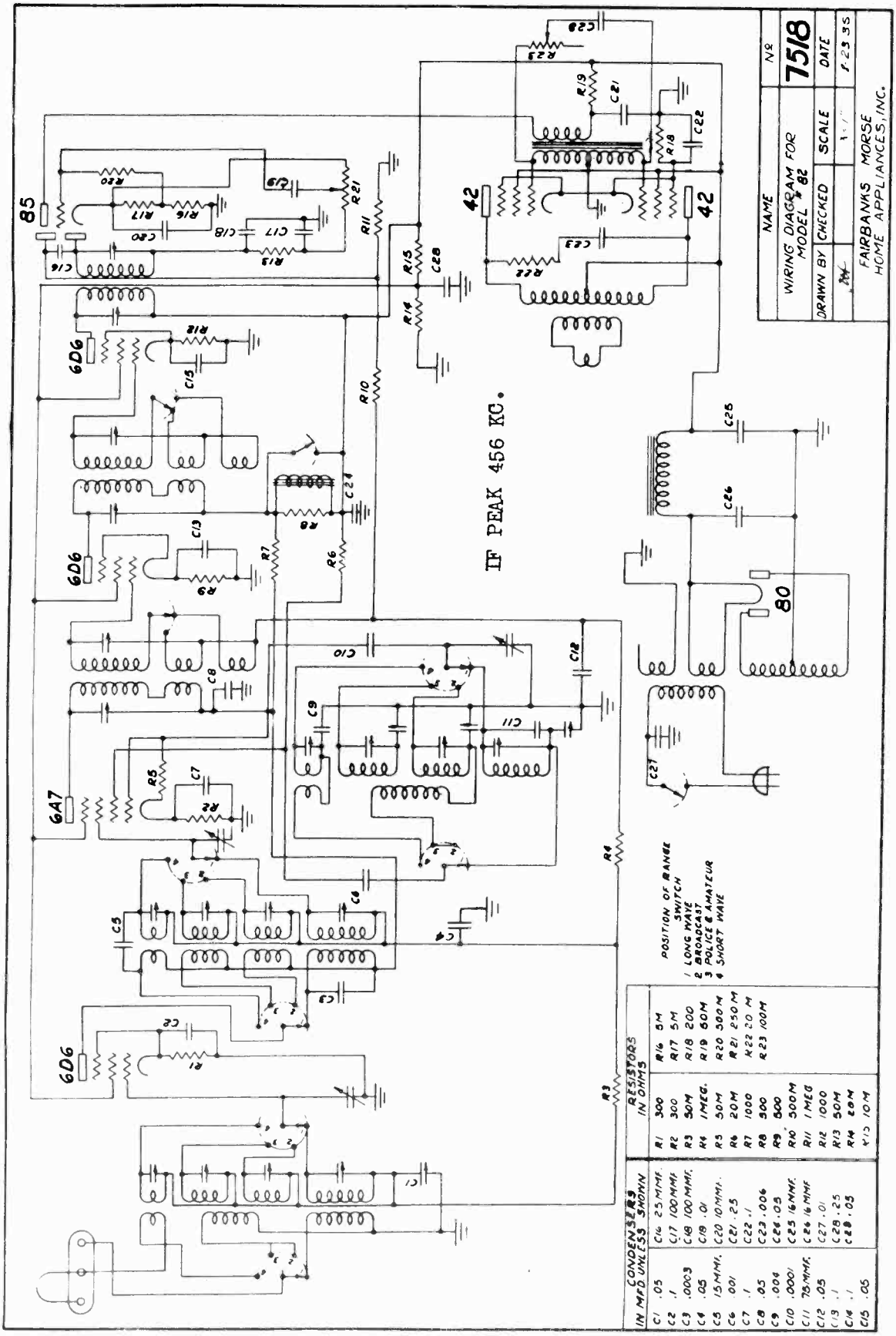
TABLE OF VALUES		
C1 - .05 MFD.	C11 - 8 MFD.	R1 - 250 M OHMS
C2 - .05 MFD.	C12 - .006 MFD.	R2 - 50 M OHMS
C3 - 1 MFD.	C13 - .5 MFD.	R3 - 20 M OHMS
C4 - 25 MFD.	C14 - .25 MFD.	R4 - 250 M OHMS
C5 - 50 MMFD.	C15 - .01 MFD.	R5 - 25 M OHMS
C6 - 200 MMFD.	C16 - .25 MFD.	R6 - 250 M OHMS
C7 - 200 MMFD.	C17 - 8 MFD.	R7 - 250 M OHM V.C.
C8 - 500 MMFD.	C18 - 8 MFD.	R8 - 250 M OHMS
C9 - .05 MFD.	CZ7 - .01 MFD.	R9 - 250 M OHMS
C10 - .03 MFD.	CZ8 - 500 MMFD.	R10 - 3000 OHMS
		R11 - 40 M OHMS

MOD. 74
AUTO RADIO RECEIVER

FAIRBANKS-MORSE
HOME APPLIANCES, INC.
CHICAGO, U.S.A.
SD-31935
H.L.D.

MODEL 82
Schematic

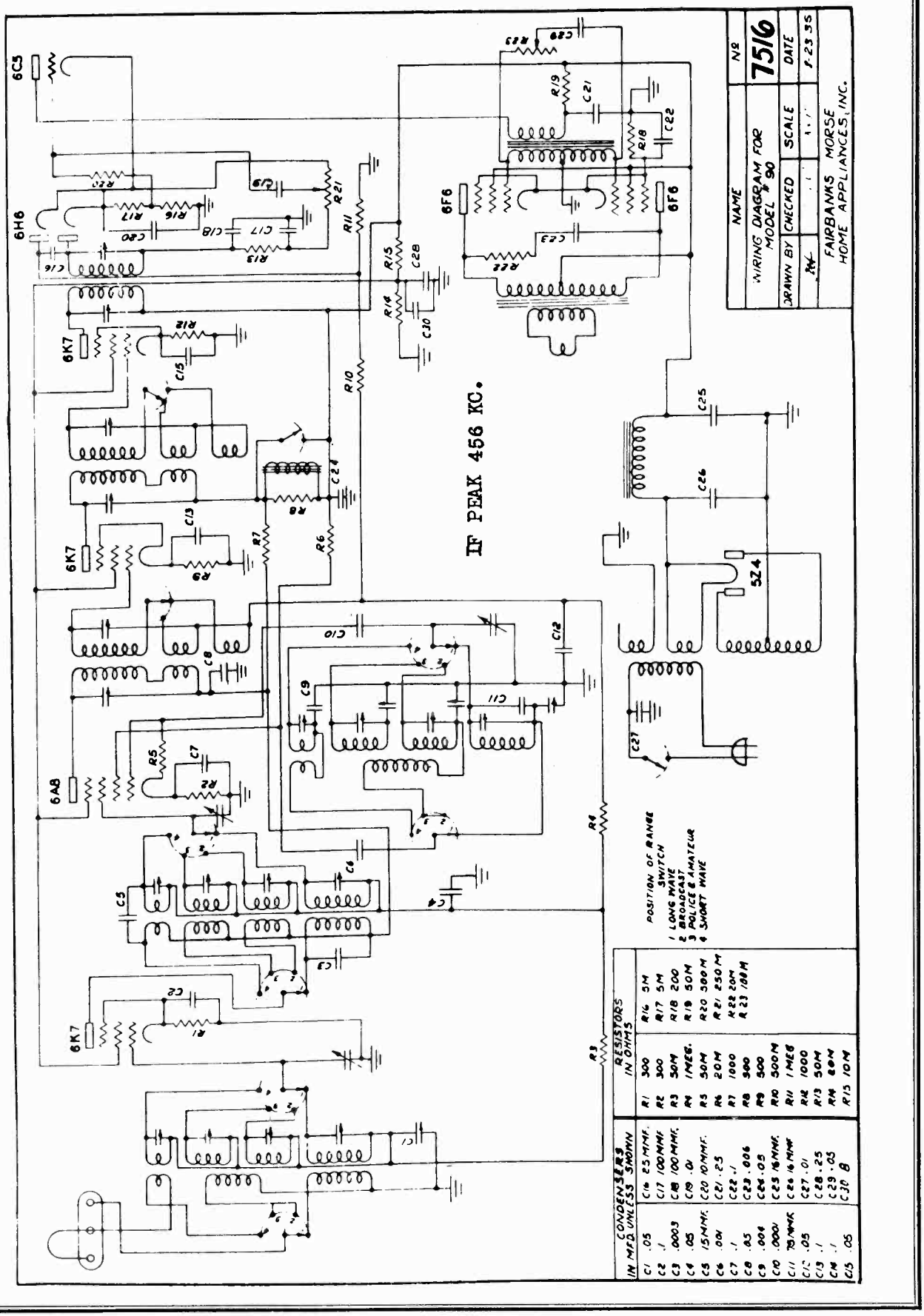
FAIRBANKS-MORSE HOME APP., INC.



CONDENSERS IN MFD UNLESS SHOWN		RESISTORS IN OHMS			
C1 .05	C16 25 MMF.	R1 300	R16 5M		
C2 .1	C17 100 MMF.	R2 300	R17 5M		
C3 .0003	C18 100 MMF.	R3 50M	R18 200		
C4 .05	C19 .01	R4 1MEG.	R19 60M		
C5 15 MMF.	C20 10 MMF.	R5 50M	R20 300M		
C6 .001	C21 .25	R6 20M	R21 250M		
C7 .1	C22 .1	R7 1000	R22 20M		
C8 .05	C23 .006	R8 500	R23 100M		
C9 .004	C24 .05	R9 500			
C10 .0001	C25 16 MMF.	R10 300M			
C11 75 MMF.	C26 16 MMF	R11 1MEG			
C12 .05	C27 .01	R12 1000			
C13 .1	C28 .25	R13 50M			
C14 .1	C29 .05	R14 20M			
C15 .05		R15 10M			

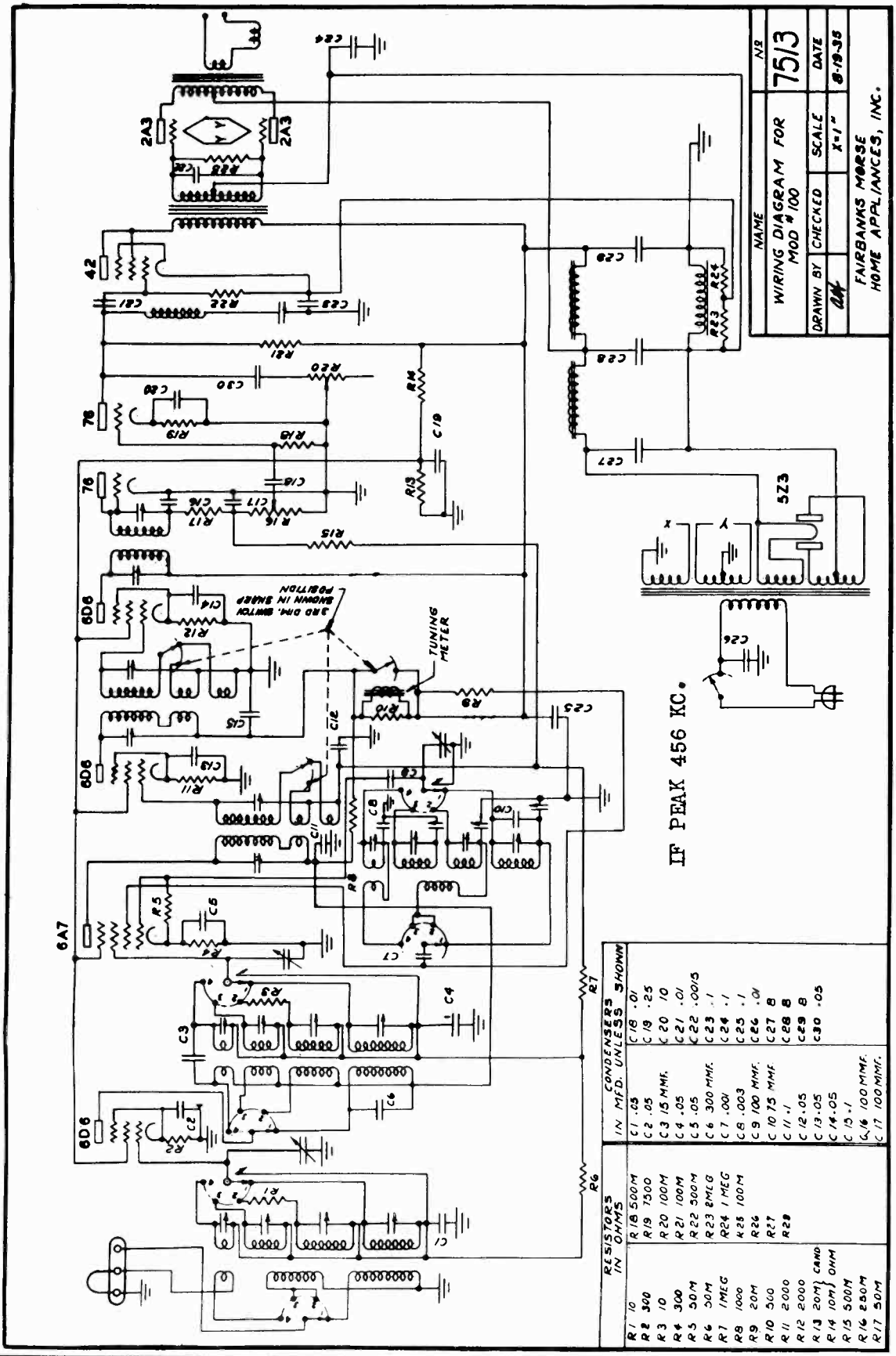
FAIRBANKS-MORSE HOME APP., INC.

MODEL 90
Schematic



MODEL 100
Schematic

FAIRBANKS-MORSE HOME APP., INC.



RESISTORS IN OHMS

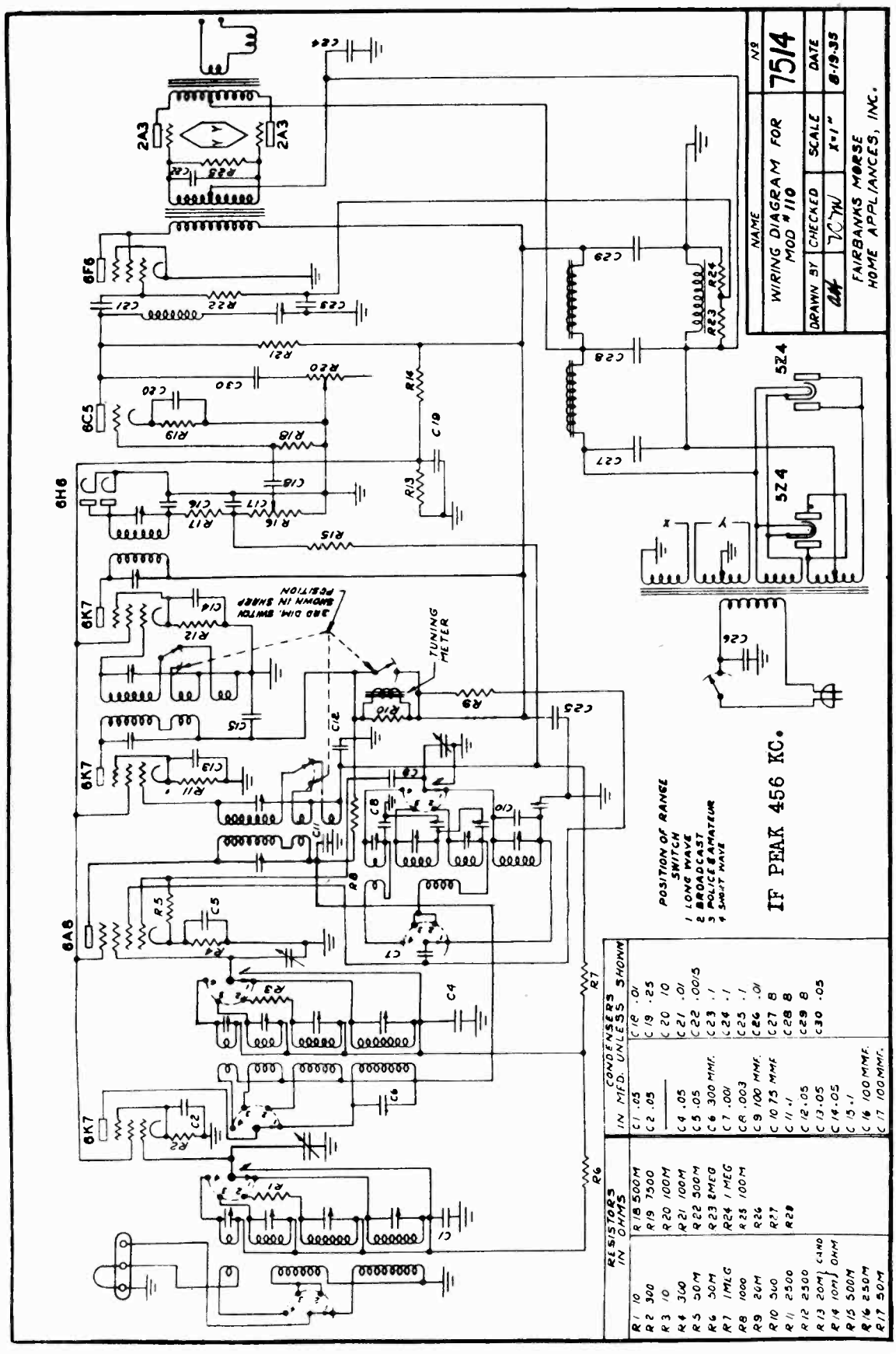
R1 10	R18 500M	
R2 300	R19 750Ω	
R3 10	R20 100M	
R4 300	R21 100M	
R5 50M	R22 300M	
R6 50M	R23 2MEG	
R7 1MEG	R24 1 MEG	
R8 1000	R25 100M	
R9 20M	R26	
R10 500	R27	
R11 2000	R28	
R12 2000		
R13 20M } CAND		
R14 10M } OHM		
R15 500M		
R16 250M		
R17 50M		

CONDENSERS IN MFD. UNLESS SHOWN

C1 .05	C18 .01	
C2 .05	C19 .25	
C3 15 MMF.	C20 10	
C4 .05	C21 .01	
C5 .05	C22 .0015	
C6 300 MMF.	C23 .1	
C7 .001	C24 .1	
C8 .003	C25 .1	
C9 100 MMF.	C26 .01	
C10 75 MMF.	C27 8	
C11 .1	C28 8	
C12 .05	C29 8	
C13 .05	C30 .05	
C14 .05		
C15 .1		
C16 100 MMF.		
C17 100 MMF.		

MODEL 110
Schematic

FAIRBANKS-MORSE HOME APP., INC.



MODELS 6010,6044
Chassis 60
Resistance Test
Voltage, Data

FAIRBANKS-MORSE HOME APP., INC.

RESISTANCE TESTS

These tests should be made with an accurate ohm-meter. The speaker should be connected. All tubes should be removed from the set. The volume and tone controls should be full "on." The A. C. line plug must be removed from the A. C. outlet.

VOLTAGE TESTS

These readings should be taken with all tubes in their sockets. The volume and tone controls should be full "on." The antenna should be disconnected. Tune the set to a point where no signal is received.

RESISTANCE AND VOLTAGE ANALYSIS CHART

LINE VOLTAGE 115

FROM†	TO	Resistance in Ohms	MEASURED VOLTAGE B. C. Band	MEASURED VOLTAGE S. W. Band	**Meter Range in Volts	If Reading Differs More Than 10% plus or minus from Stated Value Check These Units.
6D6 Ant. R. F. Stage						
1. Heater	Ground	.2	6.2 A. C.	6.2 A. C.		Fil. Winding; Pilot Light Socket
2. Plate	Ground	55,000	217.5	217.	300	RFC-1; C-2; C-5; C-6; C-31; C-32; R-3; R-4
3. Screen	Ground	40,000	90	80	300	C-2; R-3; R-4
4. Suppressor	Ground	300	2.4	2.2	3	R-1; C-4
5. Cathode	Ground	300	2.4	2.2	3	R-1; C-4
6. Heater	Ground	0	0	0		Defective Ground
7. Grid	Ground	1,251,000				Coil; R-2; R-9; R-10; C-20
6A7 Converter						
8. Heater	Ground	0	0	0		Defective Ground
9. Plate	Ground	55,000	217.5	217	300	Coil; R-3; R-4; C-2; C-31; C-32
10. Screen G-3 G-5	Ground	40,000	90	80	300	C-2; R-3; R-4
11. Osc. Plate G-2	Ground	65,000	165	145	300	Coil; RFC-2; R-7; R-3; R-4; C-2; C-31; C-32
12. Osc. Grid G-1	Ground	50,300	*−5	*1.5	30	R-6; R-5; C-8
13. Cathode	Ground	300	*3	*4.25	30	R-5; C-8
14. Heater	Ground	.2	6.2 A. C.	6.2 A. C.		Fil. Winding; Pilot Light Socket
15. Grid	Ground	1,250,000				Switch; Coil; R-9; R-10; C-20
6D6 I. F. Stage						
16. Heater	Ground	.2	6.2 A. C.			Fil. Winding; Pilot Light Socket
17. Plate	Ground	55,000	217.5	217	300	Coil; R-3; R-4; C-2; C-31; C-32
18. Screen	Ground	40,000	90	80	300	C-2; R-3; R-4
19. Suppressor	Ground	300	2.35	2.05	3	R-19; C-19
20. Cathode	Ground	300	2.35	2.05	3	R-19; C-19
21. Heater	Ground	0	0	0		Defective Ground
22. Grid	Ground	1,750,000				Coil; R-8; R-9; R-10; C-18; C-20
6B7 Det. AVC & A. F.						
23. Heater	Ground	.2	6.2 A. C.	6.2 A. C.		Fil. Winding; Pilot Light Socket
24. Plate	Ground	305,000	*75	*75	300	R-13; R-3; R-4; C-27, C-2; C-31; C-32
25. Screen	Ground	2,055,000	*22.5	*22.5	300	R-12; R-3; R-4; C-26; C-2; C-31; C-32
26. Diode Plate	Ground	250,000				Coil; R-10; C-20
27. Diode Plate	Ground	0	0	0		Defective Ground
28. Cathode	Ground	0	0	0		Defective Ground
29. Heater	Ground	0	0	0		Defective Ground
30. Grid	Ground	2,004,890				R-11, R-16; C-21, C-33
42 Output						
31. Heater	Ground	.2	6.2 A. C.	6.2 A. C.		Defective Ground
32. Plate	Ground	55,600	205	205	300	Coil; R-3; R-4; C-29; C-30; C-31; C-32; C-2
33. Screen	Ground	55,000	215	215	300	R-3; R-4; C-2; C-31; C-32
34. Grid	Ground	761,000				R-14; R-16; R-17; R-18; C-27; C-28; Field
35. Cathode	Ground	0	0	0		Defective Ground
36. Heater	Ground	0	0	0		Defective Ground
80 Rectifier						
37. Filament	Ground	55,000	215	215	300	Fil. Winding; C-31; C-32; C-2; R-3; R-4
38. Plate	Ground	2,200	−130	−130	300	H. V. Winding; Field
39. Plate	Ground	2,200	−130	−130	300	H. V. Winding; Field
40. Filament	Ground	55,000	215	215	300	C-31; C-32; C-2; R-3; R-4
Miscellaneous						
41. A. C. Line	Ground					Pri. Winding; Switch; C-34
42. A. C. Line	Ground					Pri. Winding; Switch; C-34
43. Ant. (Blue)	Ground	5.7				Coil; C-1
44. Ant. (Blue & Black)	Ground	.02	(OPEN ON B	ROADCAST)		Switch
45. Ground	Ground	0				Defective Ground
41. A. C. Line	42. A. C. Line	8				Switch; Primary; Cord; Plug
38. Plate 80	39. Plate 80	400				H. V. Winding
37. Filament 80	40. Filament 80	.12				Filament Winding

If Resistance Readings are low, try reversing polarity of Ohm-Meter.

*Subject to large variations.

†Figures in the first column refer to socket hole numbers on Figure 3.

**Meter must be 1,000 ohms per volt.

STANDARD R M A
Resistor and Condenser Color Code

0 Black 1 Brown 2 Red 3 Orange 4 Yellow 5 Green 6 Blue 7 Purple 8 Grey 9 White

Resistors

The **Body Color** represents the **first figure** of the resistance value.

The **End Color** represents the **second figure** of the resistance value.

The **Dot Color** represents the **number of ciphers** following the first two figures.

Mica Condensers

(Capacity in Micro-Microfarads)

The **First Dot** on the condenser represents the **first figure** of the capacity.

The **Second Dot** on the condenser represents the **second figure** of the capacity.

The **Third Dot** on the condenser represents the **number of ciphers** following the first two figures.

The colors on the condensers should be read from left to right with the condenser in an upright position.

FIRST I. F. TRANSFORMER

Plate	Blue
Plus "B"	Red
Grid Return	Black
Grid (Top)	Green

SECOND I. F. TRANSFORMER

Plate	Blue
Plus "B"	Red
Diode Return	Black
Diode	Green

POWER TRANSFORMER

Primary	Two Brown Leads
6.3 Volt Filament	Two Black Leads
5. Volt Filament	Two Yellow Leads
High Voltage	Two Green Leads
C. T. High Voltage	Red

MODELS 6010, 6044
Chassis 60
Schematic, Trimmers
Socket

FAIRBANKS-MORSE HOME APP., INC.

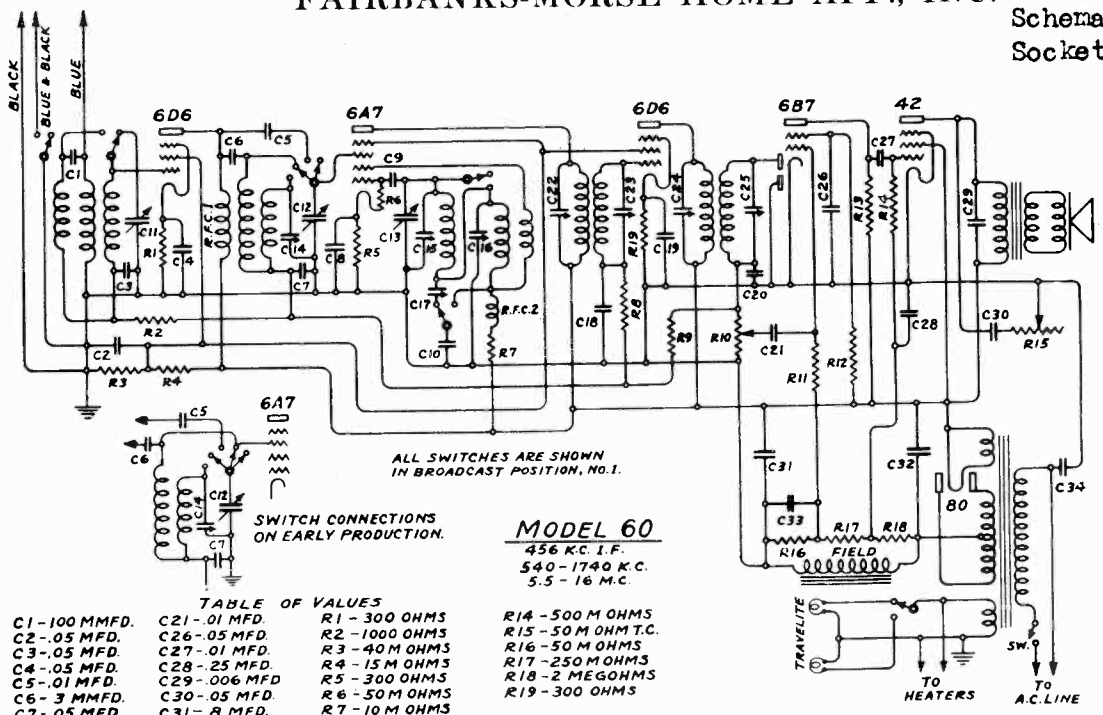
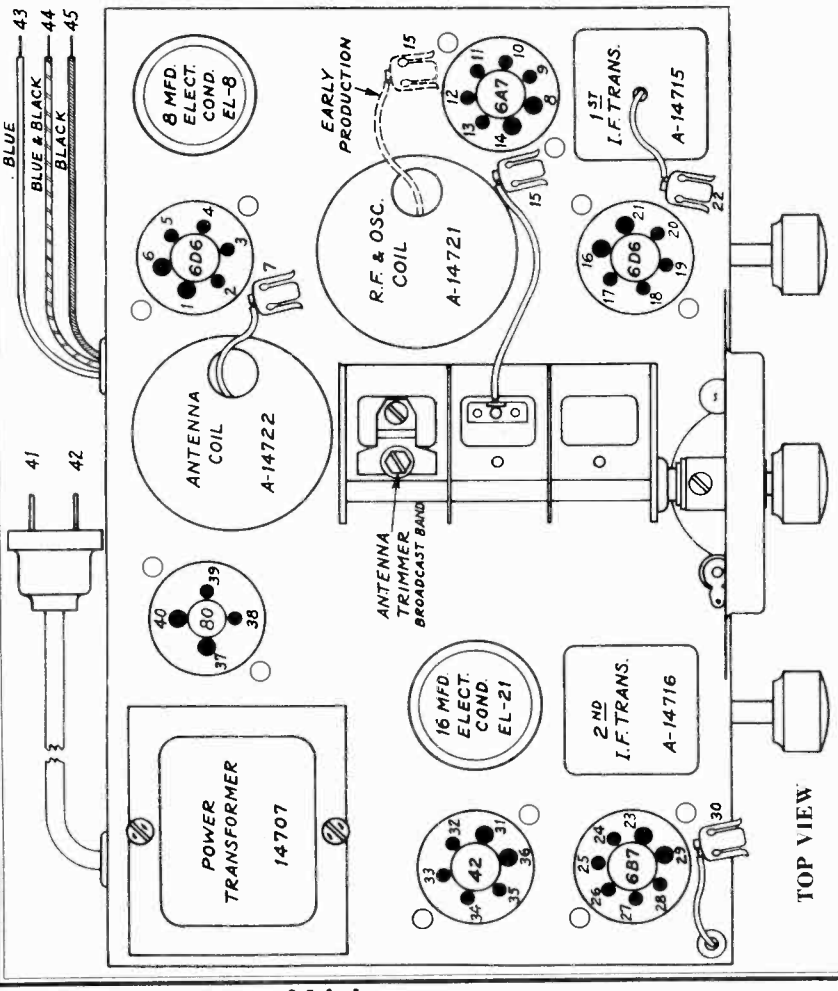
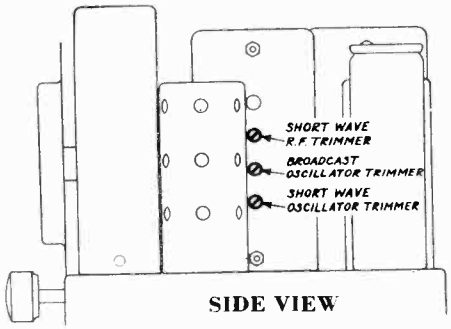


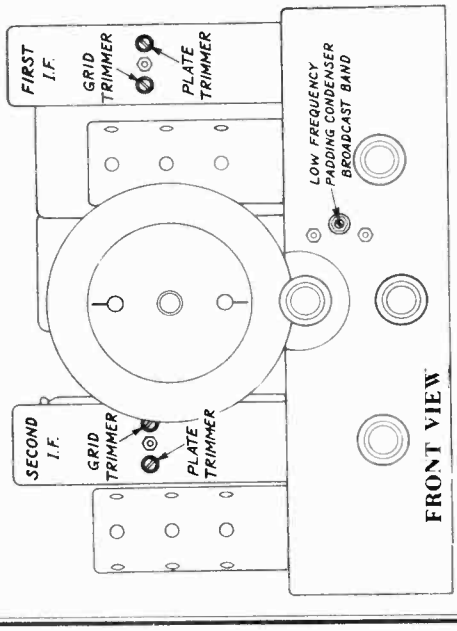
TABLE OF VALUES

C1 - 100 MMFD.
C2 - .05 MFD.
C3 - .05 MFD.
C4 - .05 MFD.
C5 - .01 MFD.
C6 - 3 MMFD.
C7 - .05 MFD.
C8 - .05 MFD.
C9 - 50 MMFD.
C10 - .01 MFD.
C18 - .05 MFD.
C19 - .05 MFD.
C20 - 200 MMFD.
C21 - .01 MFD.
C26 - .05 MFD.
C27 - .01 MFD.
C28 - .25 MFD.
C29 - .006 MFD
C30 - .05 MFD.
C31 - .8 MFD.
C32 - 16 MFD.
C33 - .1 MFD.
C34 - .01 MFD.
R1 - 300 OHMS
R2 - 1000 OHMS
R3 - 40 M OHMS
R4 - 15 M OHMS
R5 - 300 OHMS
R6 - 50 M OHMS
R7 - 10 M OHMS
R8 - 500 M OHMS
R9 - 1 MEGOHM
R10 - 250 M OHM V.C.
R11 - 1 MEGOHM
R12 - 2 MEGOHMS
R13 - 250 M OHMS
R14 - 500 M OHMS
R15 - 50 M OHM T.C.
R16 - 50 M OHMS
R17 - 250 M OHMS
R18 - 2 MEGOHMS
R19 - 300 OHMS
FIELD - 2000 OHMS
R.F.C.1 - R.F. PLATE CHOKE
R.F.C.2 - OSC. PLATE CHOKE

FAIRBANKS - MORSE
HOME APPLIANCES, INC.
SD-103134







MODELS 6010,6044
Chassis 60
Alignment,Coil Data

FAIRBANKS-MORSE HOME APP., INC.

I. F. ALIGNMENT

All Intermediate Frequency alignment adjustments must be made with the band selector switch in the broadcast (left hand) position.

1. Supply a 456 Kilocycle signal from an accurate service oscillator, to the grid of the 6A7 tube. It is advisable to connect a small condenser, about .00005 Mfd. (50 MMFD) in series with the lead from the service oscillator to prevent the characteristics of the service oscillator circuit from affecting the set.

2. Adjust the grid circuit trimmer condenser of the first intermediate frequency transformer, carefully, for maximum output with minimum input from the service oscillator. The grid circuit trimmer condenser of the first intermediate frequency transformer is controlled by the left hand adjustment screw located on the front of the intermediate frequency transformer can (see Figure 4).

3. Adjust the plate circuit trimmer condenser of the first intermediate frequency transformer, carefully, for maximum output with minimum input from the service oscillator. The plate circuit trimmer condenser of the first intermediate frequency transformer is contolled by the right hand adjustment screw located on the front of the intermediate frequency transformer can (see Figure 4).

4. Adjust the diode circuit trimmer condenser of the second intermediate frequency transformer, carefully, for maximum output with minimum input from the service oscillator. The diode plate circuit trimmer condenser of the second intermediate frequency transformer is controlled by the right hand adjustment screw located on the front of the intermediate frequency transformer can (Grid Trimmer Figure 4).

5. Adjust the plate circuit trimmer condenser of the second intermediate frequency transformer carefully, for maximum output with minimum input from the service oscillator. The plate circuit trimmer condenser of the second intermediate frequency transformer is controlled by the left hand adjustment screw located on the front of the intermediate frequency transformer can (see Figure 4).

6. Much of the sensitivity and selectivity of the receiver depends upon the proper setting of these critical adjustments, for this reason it is necessary to go back over them to make sure they are correct.

R. F. AND OSCILLATOR ALIGNMENT

An alignment jig is available for use in aligning the broadcast and short wave bands of the Model 60. The part number of this jig is 14726, it may be obtained through any Fairbanks-Morse jobber.

BROADCAST BAND

1. Place the alignment jig on the front of the chassis. Tune the gang condenser to 1700 Kilocycles. Supply a 1700 Kilocycle signal from the service oscillator to the antenna of the set. Adjust the broadcast band oscillator trimmer (see Figure 5) for maximum output with minimum input from the service oscillator. It is advisable to turn the gang condenser back and forth across the signal while this adjustment is being made to make sure the peak of greatest intensity is obtained. This is necessary to bring the oscillator into track with the R. F. circuit since, in most cases, the R. F. circuit has no trimmer. If the dial reading is incorrect after this adjustment has been made the travelite disc should be adjusted until the reading is correct.

2. Adjust the broadcast band antenna trimmer (Figure 3) for maximum output with minimum input from the service oscillator.

3. Supply a 600 Kilocycle signal to the antenna of the set. Turn the gang condenser to 600 Kilocycles. Adjust the low frequency padding condenser (Figure 4) for maximum output with minimum input from the service oscillator. While making this adjustment turn the gang condenser back and forth across the signal to make sure the peak of greatest intensity is obtained.

SHORT WAVE BAND

1. Supply a 15 megacycle signal to the antenna of the set. Turn the gang condenser to 15 megacycles. Adjust the short wave oscillator trimmer (Figure 5) for maximum output with minimum input from the service oscillator.

2. Adjust the short wave R. F. trimmer (Figure 5) for maximum output with minimum input from the service oscillator. While making this adjustment it is advisable to turn the gang condenser back and forth across the signal to make sure the peak of greatest intensity is obtained. This is desirable because of the reflected effect of the adjustment of one stage on the other.

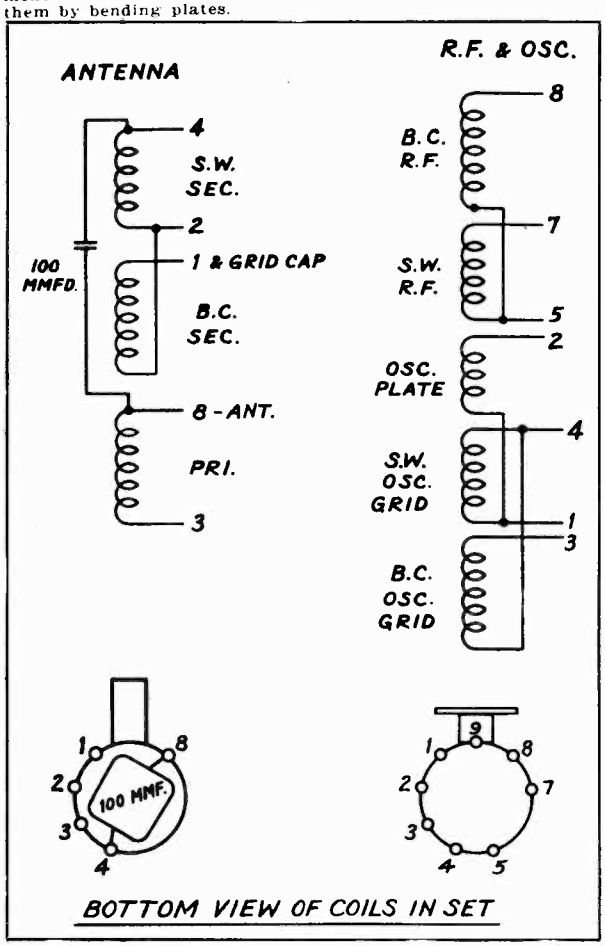
NOTE: After all alignment adjustments have been completed the set should be tuned slowly from one end of the dial to the other, on the short wave band. If a howl or "squak" is heard at any point, the set is "crossing track." To remedy this condition loosen the short wave oscillator trimmer (Figure 5) slowly and carefully to the point where the howl disappears.

DIAL CALIBRATION IN CABINET

After the set has been aligned in accordance with the foregoing instructions the dial readings will be approximately correct on all frequencies. When the chassis is placed in the cabinet it should be bolted down and any differences in calibration should be adjusted by loosening the set screw in the travelite disc hub and turning the travelite disc until the reading is correct and then tightening the set screw.

GANG CONDENSER PLATES

The adjustment of the slotted end plates on the gang condenser is very critical since it must be accurate on both bands. These adjustments are made in the factory with precision equipment and under no condition should it be necessary to change them by bending plates.



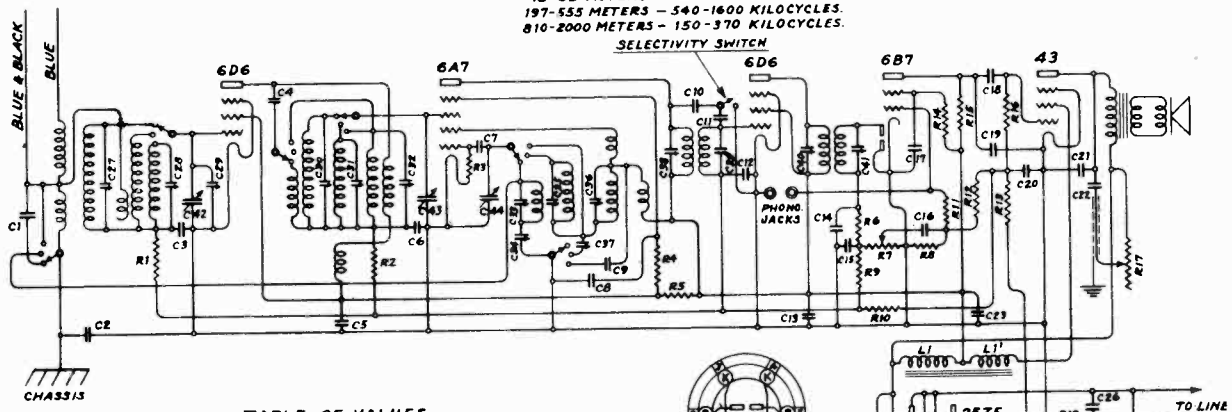
COIL	FROM	TO	D. C. RESISTANCE
ANTENNA COIL	Lug 3	Lug 8	5.5 Ohms
	Lug 1	Lug 2	4. Ohms
	Lug 2	Lug 4	.5 Ohm
RADIO FREQUENCY AND OSCILLATOR COILS	Lug 3	Lug 4	2.8 Ohms
	Lug 4	Lug 1	.1 Ohm
	Lug 1	Lug 2	.35 Ohm
	Lug 7	Lug 5	.1 Ohm
	Lug 5	Lug 8	4. Ohms
FIRST I. F. TRANSFORMER	Black	Green	9. Ohms
	Red	Blue	7.25 Ohms
SECOND I. F. TRANSFORMER	Black	Green	7.5 Ohms
	Red	Blue	4.5 Ohms
OSCILLATOR PLATE CHOKE	B+End	Plate End	12. Ohms
R. F. PLATE CHOKE	B+End	Plate End	75. Ohms
POWER TRANSFORMER 115 VOLT 60 CYCLE	Brown	Brown	7.5 Ohms
	Black	Black	.12 Ohm
	Yellow	Yellow	.1 Ohm
	Green	Red	185. Ohms
	Green	Red	185. Ohms

MODELS 6210, 6244
Chassis 62
Schematic, Parts

FAIRBANKS-MORSE HOME APP., INC.

MODEL NO. 62

A.C.-D.C. RECEIVER 456 K.C. I.F.
18-52 METERS – 5.8-16.5 MEGACYCLES.
197-555 METERS – 540-1600 KILOCYCLES.
810-2000 METERS – 150-370 KILOCYCLES.



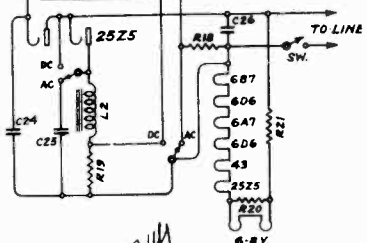
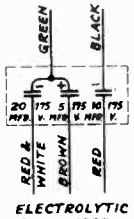


TABLE OF VALUES

C1-1000 MMFD.	C15-200 MMFD.	R1-1000 OHMS	R15-250 M OHMS
C2-.1 MFD.	C16-.05 MFD.	R2-2 MEGOHMS	R16-250 M OHMS
C3-.05 MFD.	C17-.1 MFD.	R3-25 M OHMS	R17-50 M OHMS T.C.
C4-500 MMFD.	C18-.01 MFD.	R4-25 M OHMS	R18-300 OHMS
C5-.1 MFD.	C19-100 MMFD.	R5-300 OHMS	R19-350 OHMS
C6-.05 MFD.	C20-.25 MFD.	R6-20 M OHMS	R20-40 OHMS
C7-50 MMFD.	C21-.006 MFD.	R7-250 M OHMS V.C.	R21-75 OHMS
C8-.1 MFD.	C22-.05 MFD.	R8-1 MEGOHM	
C9-.004 MFD.	C23-10 MFD.	R9-1 MEGOHM	
C10-5 MMFD.	C24-20 MFD.	R10-5 MEGOHMS	L1-350 OHMS
C11-5 MMFD.	C25-5 MFD.	R11-50 M OHMS	L1'-15 OHMS
C12-.05 MFD.	C26-.05 MFD.	R12-5 MEGOHMS	L2-2000 OHMS SPEAKER FIELD.
C13-.1 MFD.		R13-100 M OHMS	
C14-100 MMFD.		R14-1 MEGOHM	



FAIRBANKS-MORSE
HOME APPLIANCES, INC.
SD-11835

PARTS LIST MODEL 62

Part Number	Description	List Price
A-14715	I. F. Transformer, First	$ 2.00
A-14716	I. F. Transformer, Second	2.00
A-14853	Coil Assembly in Can, Antenna	3.00
A-14854	Coil Assembly in Can, Oscillator	3.00
A-14855	Coil Assembly in Can, R. F.	3.00
14851	Choke Coil, Iron Core, Tapped	2.50
14728	Dial Assembly complete	2.50
14729	Dial Drive Roller (small)	.25
14730	Dial Drive Spring	.25
14731	Dial Drive Shaft	.50
14856	Dial Scale, Calibrated	.75
14704	Dial Face, extruded celluloid	.50
14404	Dial Escutcheon	1.00
14720	Pilot Lamp 6-8 Volt Tubular	.10
14849	Pilot Lamp Leads, 2 Conductor Tinsel	.25
K-868	Knob, Inlaid Wood	.20
K-551	Knob, Black Bakelite	.20
X-7220	Screw, Chassis Mounting, 10-24 x 7/8"	.05
X-7228	Screw, Decorative Head, 8-32 x 1"	.05
P-625	Tip Jack with washers	.10
S-5907	Socket, Speaker	.10
S-5918	Socket, 6D6	.10
S-5919	Socket, 6A7	.10
S-5920	Socket, 6B7	.10
S-5922	Socket, 43	.10
S-5923	Socket, 25Z5	.10
S-5819	Shield Base, Vacuum Tube	.05
S-5820	Shield, Vacuum Tube	.15
S-5821	Shield Cap, Vacuum Tube	.05
R-5009	Terminal Strip, Common, Metal Clad	.15
SW-6102	Switch, Selectivity	.30
14852	Switch, Band Selector	3.50
14962	Switch, AC-DC	1.25
14537	Power Cord and Plug, 110-120 Volt	2.00
14864	Adapter Cord and Pluge, 220-240 Volt	1.50

Part Number	Description	List Price
V-6507	Tone Control and Switch, 50,000 ohms	1.20
V-6508	Volume Control, 250,000 ohms	.80
R-846	Resistor, 300 ohms ½ watt	.20
R-1116	Resistor, 25,000 ohms ½ watt	.20
R-1146	Resistor, 50,000 ohms ½ watt	.20
R-1191	Resistor, 100,000 ohms ½ watt	.20
R-1236	Resistor, 250,000 ohms ½ watt	.20
R-1296	Resistor, 1 Megohm ½ watt	.20
R-1311	Resistor, 2 Megohm ½ watt	.20
R-1331	Resistor, 5 Megohm ½ watt	.20
R-1446	Resistor, 300 ohms 1 watt	.20
R-1451	Resistor, 350 ohms 1 watt	.20
R-1491	Resistor, 1000 ohms 1 watt	.20
R-1701	Resistor, 20,000 ohms 1 watt	.20
R-1716	Resistor, 25,000 ohms 1 watt	.20
R-5010	Resistor, 75 and 40 ohms, metal clad	.50
14702	Condenser, Variable, 3 gang	4.50
C-212	Condenser, trimmer strip, 3 gang	.60
EL-23	Condenser, Dry Electrolytic	2.25
EC-7	Condenser, .25 Mfd., 300 volt, Tubular	.30
EC-5	Condenser, .1 Mfd., 300 volt, Tubular	.25
EC-2	Condenser, .01 Mfd., 400 volt Tubular	.20
EC-4	Condenser, .05 Mfd., 400 volt, Tubular	.20
EC-26	Condenser, .05 Mfd., 300 volt, Tubular	.20
EC-12	Condenser, .006 Mfd., 400 volt, Tubular	.20
C-310	Condenser, 50 Mmfd., Moulded	.20
C-307	Condenser, 100 Mmfd., Moulded	.20
C-305	Condenser, 200 Mmfd., Moulded	.20
C-313	Condenser, .001 Mfd., Moulded	.25
C-320	Condenser, .004 Mfd., Moulded	.25
14863	Alignment Jig	2.25
T-688	Alignment Tool, Insulated	1.50
14857	Dynamic Speaker, 6 Inch, 2000 ohm Field	8.00
14865	Dynamic Speaker, 8 inch, 2000 ohm Field	12.00

SPEAKER CONES

Speaker cones cannot be supplied. Speakers on which cones have been damaged will be repaired at the following list prices:

6 inch speaker cone repair	$2.50
8 inch speaker cone repair	2.50

We reserve the right to make changes in specifications and prices at any time without incurring any obligation on parts or sets previously sold. All sets are subject to standard RMA or Code guarantee.

MODELS 6210,6244
Chassis 62
Voltage
Alignment

FAIRBANKS-MORSE HOME APP., INC.

Line Voltage 110 Volts AC or DC

Tube	AC or DC	Plate	Screen	Grid	Osc. Plate	Osc. Grid
6D6 R.F.	AC DC	100 80	100 80	-- --		
6A7 Det.Osc.	AC DC	105 85	50 40	-- --	105 85	-5 to 10 -5 to 10
6D6 I.F.	AC DC	105 85	105 85	-- --		
6B7 A.F.	AC DC	25 20	25 20	-- --		
43 A.F.	AC DC	105 85	105 85	-10 -10		
25Z5 Rect.	AC	From P5 to P2 90 V.D.C. From P5 to K3 200 V.D.C. From P2 to K3 115 V.D.C.		See schematic diagram for reference points		

MEASURED VOLTAGES

Model 62

All measurements made from cathode with 1000 ohms per volt meter, 300 volt scale.

ALIGNMENT PROCEDURE

General: To insure the performance the model 62 is capable of delivering the following instructions should be carefully studied before any adjustments are undertaken.

Proper adjustment of the various tuned circuits will only be possible through the use of a reliable all wave, service oscillator and an output meter.

The output meter should be connected across the secondary of the output transformers. The voice coil need not be disconnected but a larger meter indication will be obtained, on a given signal, when the voice coil is disconnected.

All adjustments should be made with the volume control "Full on". Any desired variations in signal strength should be obtained by adjusting the output of the service oscillator.

I. F. ALIGNMENT

General: All intermediate frequency alignments must be made with the band selector switch on the center position. The 197 to 555 meter band.

1. Supply a 456 kilocycle signal, from an accurate service oscillator, to the grid of the 6A7 tube.

2. Adjust the grid and plate circuit trimmer condensers, of the first I. F. transformer, from maximum output with minimum input from the service oscillator. The first I. F. transformer is located at the rear center of the chassis.

3. Adjust the grid and plate circuit trimmer condensers of the second I. F. transformer for maximum output with minimum input from the service oscillator. The second I. F. transformer is located at the left of the gang condenser on the front of the chassis.

OSCILLATOR, R.F. and ANTENNA ALIGNMENT

General: The adjustment condensers, or trimmers, for the antenna, R. F., and oscillator stages are located in the same shields that house the coils for these stages. These coils are contained in the three large round shield cans located at the right of the gang condenser on the chassis. Three holes are located in the side of each of these cans, through each of which a trimmer adjusting screw is accessible. The center trimmer adjusting screw on the antenna coil is not used. When adjusting the antenna stage on the 197 to 555 meter band the trimmer located on the front section of the gang condenser should be used.

The bands must be aligned in the following order: The 197 to 555 meter band first, the 810 to 2000 meter band second, and the 19 to 52 meter band third.

Padding Condensers: A dual padding or low frequency adjusting condenser is located on the left rear of the chassis. The adjustment nut and screw are accessible through a hole in the chassis. The Hexagon nut is the adjustment for the 197 to 555 meter band. The center screw is the adjustment for the 810 to 2000 meter band.

197 to 555 Meter Band:

1. Place the alignment jig on the front of the chassis. Turn the gang condenser all the way out of mesh. Supply a 187 meter (1600 kilocycle) signal to the antenna of the set. Adjust the oscillator trimmer condenser for maximum output with minimum input from the service oscillator.

2. Turn the gang condenser to 220 meters. Supply a 220 meter signal (1360 kilocycles) to the antenna of the set. Adjust the R. F. trimmer condenser for maximum output with minimum input from the service oscillator.

3. Adjust the antenna trimmer condenser for maximum output with minimum input from the service oscillator. This trimmer is located on the front section of the gang condenser.

4. Supply a 500 meter (600 kilocycle) signal to the antenna of the set. Tune the gang condenser to 500 meters. Adjust the low frequency padding condenser for maximum output with minimum input from the service oscillator. The gang condenser should be tured back and forth, across the signal, while this adjustment is being made to insure the peak of greatest intensity.

810 to 2000 Meter Band:

1. Supply an 800 meter (375 kilocycle) signal to the antenna of the set. Turn the gang condenser all the way out of mesh. Adjust the oscillator trimmer for maximum output with minimum input from the service oscillator.

2. Supply a 900 meter (333 kilocycle) signal to the antenna of the set. Tune the gang condenser to 900 meters. Adjust the R. F. trimmer condenser for maximum output with minimum input from the service oscillator.

3. Adjust the antenna trimmer for maximum output with minimum input from the service oscillator.

4. Supply an 1800 meter (167 kilocycle) signal to the antenna of the set. Tune the gang condenser to 1800 meters. Adjust the low frequency padding condenser for maximum output with minimum input from the service oscillator. The gang condenser should be tuned back and forth, across the signal, while this adjustment is being made to insure the peak of greatest intensity.

19 to 52 Meter Band:

1. Supply an 18.7 meter (16 megacycle) signal to the antenna of the set. Turn the gang condenser all the way out of mesh. Adjust the oscillator trimmer condenser for maximum output with minimum input from the service oscillator.

2. Supply a 22 meter (13.6 megacycle) signal to the antenna of the set. Tune the gang condenser to 22 meters. Adjust the R. F. trimmer condenser for maximum output with minimum input from the service oscillator.

3. Adjust the antenna trimmer condenser for maximum output with minimum input from the service oscillator.

DIAL CALIBRATION IN CABINET

After the set has been aligned in accordance with the foregoing instructions the dial readings will be approximately correct on all frequencies. When the chassis has been bolted down in the cabinet any differences in calibration can be adjusted by loosening the set screw in the travelite disc hub and turning the travelite disc until the reading is correct and then tightening the set screw.

Figure 4

RECOMMENDED PHONO CONNECTIONS.

On each coil can the upper screw is for the 810 to 2000 meter band, the center screw is for the 197 to 555 meter band, and the lower screw is for the 19 to 52 meter band.

The first shield, from the front of the chassis, contains the antenna coils and trimmers, the second or center shield contains the R. F. coils and trimmers, and the third or rear shield contains the oscillator coils and trimmers.

An alignment jig is available for use in aligning the various bands on the model 62. The part number of this jig is given in the parts list. It may be obtained through any Fairbanks-Morse Radio Agency.

FAIRBANKS-MORSE HOME APP., INC.

MODELS 8110,8141 Chassis 81 Schematic,Parts Trimmers

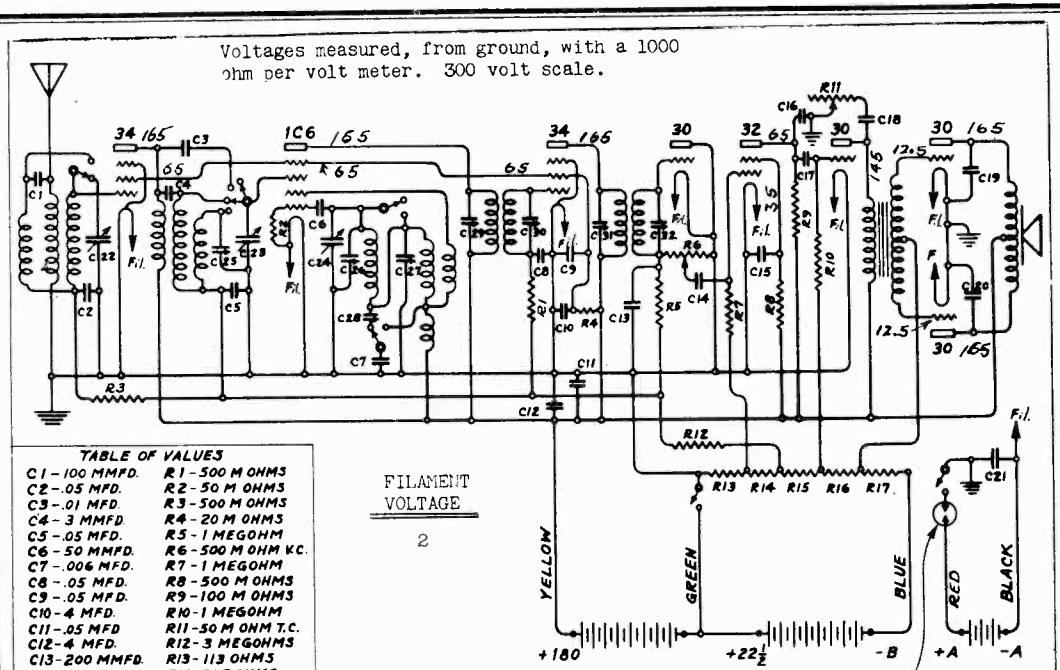


TABLE OF VALUES

C1 - 100 MMFD.	R1 - 500 M OHMS
C2 - .05 MFD.	R2 - 50 M OHMS
C3 - .01 MFD.	R3 - 500 M OHMS
C4 - 3 MMFD.	R4 - 20 M OHMS
C5 - .05 MFD.	R5 - 1 MEGOHM
C6 - 50 MMFD.	R6 - 500 M OHM K.C.
C7 - .006 MFD.	R7 - 1 MEGOHM
C8 - .05 MFD.	R8 - 500 M OHMS
C9 - .05 MFD.	R9 - 100 M OHMS
C10 - 4 MFD.	R10 - 1 MEGOHM
C11 - .05 MFD	R11 - 50 M OHM T.C.
C12 - 4 MFD.	R12 - 3 MEGOHMS
C13 - 200 MMFD.	R13 - 113 OHMS
C14 - .01 MFD.	R14 - 225 OHMS
C15 - .05 MFD.	R15 - 87 OHMS
C16 - 200 MMFD.	R16 - 135 OHMS
C17 - .01 MFD.	R17 - 282 OHMS
C18 - .05 MFD.	
C19 - .006 MFD.	
C20 - .006 MFD.	
C21 - .25 MFD.	

MODEL NO. 81
456 K.C. I.F.
540 - 1740 K.C.
5.5 - 16 M.C.

FAIRBANKS-MORSE
HOME APPLIANCES, INC. 3D-121134

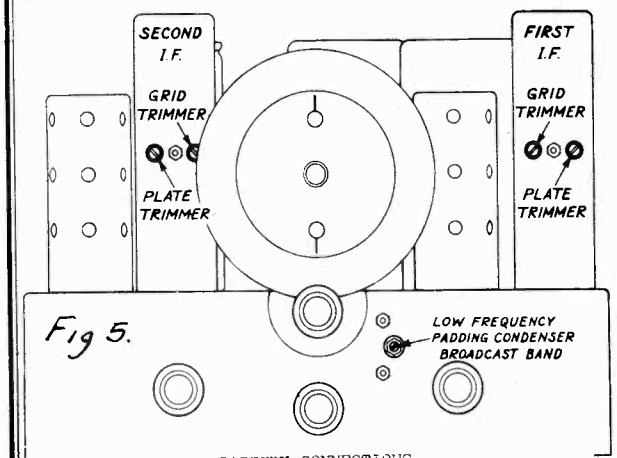


Fig 5.

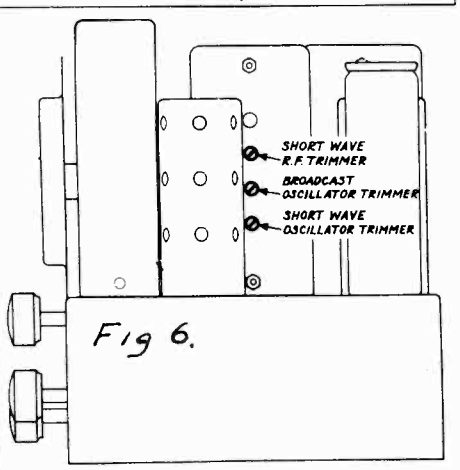


Fig 6.

BATTERY CONNECTIONS

The Model 81 will operate equally well on an Air Cell or a two volt storage battery for filament supply. A three volt dry battery may be used also but an Amperite 6-1 ballast tube must be employed.

Part Number	Description	List Price
14808	First I. F. Transformer (square can)	1.50
14544	First I. F. Transformer (round can)	3.00
14809	Second I. F. Transformer	1.50
14813	R. F. and Osc. Coil Assembly	3.50
A-14722	Antenna Coil Assembly	3.00
A-14465	R. F. Plate Choke Assembly	1.00
A-14550	Osc. Plate Choke Assembly	1.00
14701	Band Selector Switch	1.00
14728	Dial Assembly Complete	2.50
14729	Dial Drive Roller (small)	.25
14730	Dial Drive Spring	.25
14731	Dial Drive Shaft	.50
14719	3 Conductor Dial Light Cable (tinsel)	.30
14404	Escutcheon for Dial	1.00
14708	Calibrated Dial Scale	.75
14704	Extruded celluloid Dial Face	.50
14806	2 Volt Tubular Pilot Lamp .06 AMPS.	.20
S-5907	Speaker Socket	.10
S-5927	30 Tube Socket	.10
S-5928	32 Tube Socket	.10
S-5929	34 Tube Socket	.10
S-5926	1C6 Tube Socket	.10
S-5930	Ballast Socket	.10
S-5819	Tube Shield Base	.05
S-5820	Tube Shield	.15
14807	5 Wire Battery Cable	.75
14802	Class "B" Input Transformer	4.00
X-7220	10-24 x 7/8" Chassis Mounting Screws	.05
X-7228	8-32 x 1" Decorative Head Screws	.05
K 868	Inlaid Wood Knobs	.20
14702	3 Gang Variable Condenser	4.50
C-213	Padding Condenser	1.00
EC-2	.01 Mfd. Tubular Condenser C-3, C-14, C-17	.20
EC-4	.05 Mfd. Tubular Condenser C-9, C-11, C-15, C-18	.20
EC-7	.25 Mfd. Tubular Condenser C-21	.30
EC-12	.006 Mfd. Tubular Condenser C-19, C-20	.20
EC-31	.003 Mfd. Tubular Condenser	.20
C-305	200 MMfd. Moulded Condenser C-13, C-16	.20
C-307	100 MMfd. Moulded Condenser C-1	.20
C-312	50 MMfd. Moulded Condenser C-6	.20
V-6514	Volume Control and Dual Switch R-6	1.50
V-6504	Tone Control R-11	.80
R-1701	20000 Ohms, Carbon Resistor 1/2 Watt R-4	.20
R-1146	50000 Ohms, Carbon Resistor 1/4 Watt R-2	.20
R-1191	100000 Ohms, Carbon Resistor 1/4 Watt R-9	.20
R-1266	500000 Ohms, Carbon Resistor 1/4 Watt R-1,R-3,R-8	.20
R-1296	1 Megohm, Carbon Resistor 1/4 Watt R-5, R-7, R-10	.20
R-1326	3 Megohms, Carbon Resistor 1/4 Watt R-12	.20
R-5008	842 Ohms, Metal Clad Resistor R-13, to R-17	.75
14811	Jumper Link	.05
14805	Resistance Plug .55 Ohm	.30
6-1	Amperite Ballast Tube	1.75
14726	Alignment Jig	2.25
T-688	Insulated Alignment Tool	1.50
14803	6½ Inch Special Class "B" Kinematic Speaker	5.00
14804	8 Inch Special Class "B" Kinematic Speaker	6.00

MODELS 8110,8141
Chassis 81
Alignment, Data

FAIRBANKS-MORSE HOME APP., INC.

ALIGNMENT PROCEDURE

The following instructions should be carefully studied before any alignment adjustments are attempted. All adjustments should be made with volume control "full on". Any desired variations in signal strength should be obtained by adjusting the output of the service oscillator.

I. F. ALIGNMENT

All Intermediate Frequency alignment adjustments must be made with the band selector switch in the broadcast (left hand) position.

1. Supply a 456 kilocycle signal to the grid of the 1C6 tube.
2. Adjust the Grid circuit and the plate circuit trimmer condensers of the first I. F. transformer, carefully, for maximum output with minimum input from the service oscillator (see Figure 6).
3. Repeat Number 2. on the second I. F. transformer.

R. F. AND OSCILLATOR ALIGNMENT

An alignment jig is available for use on the Model 81. The part number is 14726, it may be obtained from any Fairbanks-Morse jobber.

BROADCAST BAND

1. Place the alignment jig on the front of the chassis. Tune the gang condenser to 1400 Kilocycles. Supply a 1400 Kilocycle signal from the service oscillator to the antenna of the set. Adjust the broadcast band oscillator trimmer (see Figure 5) for maximum output with minimum input from the service oscillator. It is advisable to turn the gang condenser back and forth across the signal while this adjustment is being made to make sure the peak of greatest intensity is obtained. This is necessary to bring the oscillator into track with the R.F. circuit since, in most cases, the R.F. circuit has no trimmer. If the dial reading is incorrect after this adjustment has been made the travelite disc should be adjusted until the reading is correct.

2. Adjust the broadcast band antenna trimmer (on gang condenser) for maximum output with minimum input from the service oscillator.

3. Supply a 600 Kilocycle signal to the antenna of the set. Turn the gang condenser to 600 Kilocycles. Adjust the low frequency padding condenser (Figure 6) for maximum output with minimum input from the service oscillator. While making this adjustment turn the gang condenser back and forth across the signal to make sure the peak of greatest intensity is obtained.

SHORT WAVE BAND

1. Supply a 15 megacycle signal to the antenna of the set. Turn the gang condenser to 15 megacycles. Adjust the short wave oscillator trimmer (Figure 5) for maximum output with minimum input from the service oscillator.

2. Adjust the short wave R. F. trimmer (Figure 5) for maximum output with minimum input from the service oscillator. While making this adjustment it is advisable to turn the gang condenser back and forth across the signal to make sure the peak of greatest intensity is obtained. This is desirable because of the reflected effect of the adjustment of one stage on the other.

DIAL CALIBRATION IN CABINET

After the set has been aligned in accordance with the foregoing instructions the dial readings will be approximately correct on all frequencies. When the chassis is placed in the cabinet it should be bolted down and any differences in calibration should be adjusted by loosening the set screw in the travelite disc hub and turning the travelite disc until the reading is correct and then tightening the set screw.

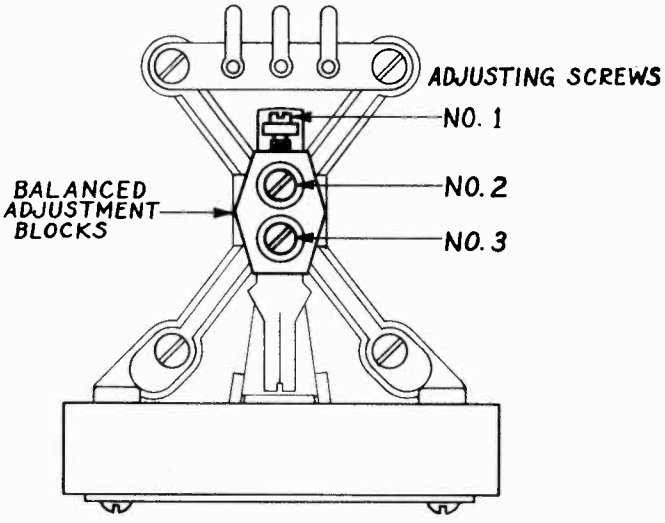
SPEAKER ADJUSTMENT PROCEDURE

1. Loosen adjustment screw number two about one fourth turn (see Figure 4).

2. Turn screw number one (Figure 4) until the correct adjustment is obtained.

3. Tighten screw number two.

In extreme cases it may be necessary to reset the balanced adjustment blocks (see Figure 4). This can be accomplished by turning screws number two and three. Loosen either screw number two or three about one fourth turn. Tighten the other screw the same amount. If this does not correct the condition the procedure should be reversed.



SPEAKER UNIT

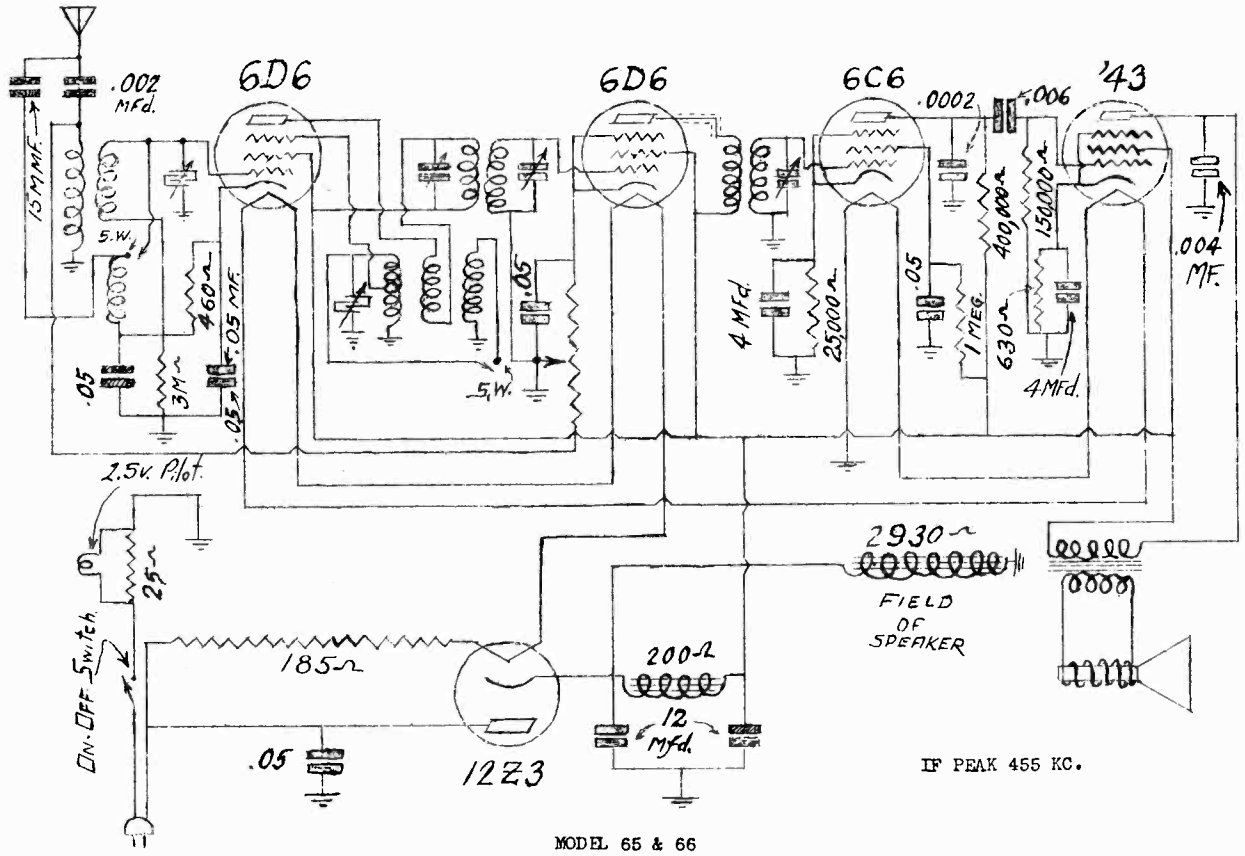
Figure 4

MODEL 81 CHASSIS

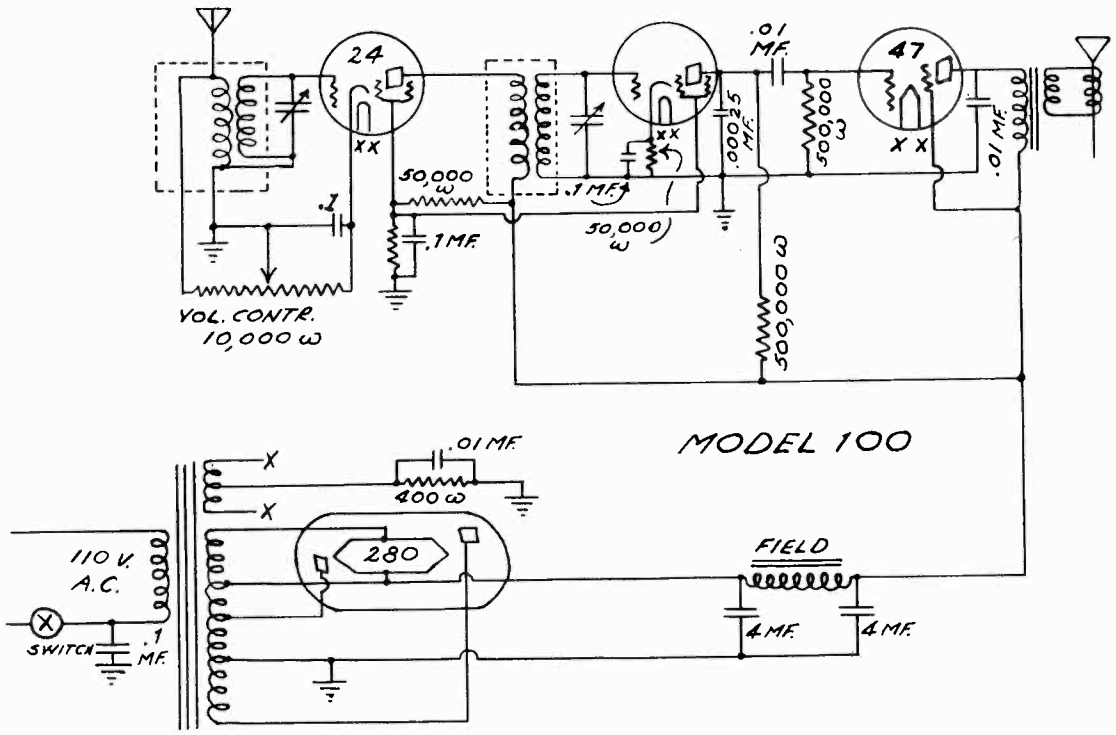
The Model 81 is a battery operated, standard and short wave broadcast superheterodyne chassis covering frequency ranges of 540 to 1740 kilocycles and 5.5 to 16 megacycles. Several outstanding battery set developments are incorporated. These include a multipurpose pentagrid converter; full automatic volume control; new type, high efficiency intermediate frequency transformers; individual low loss, radio frequency coils; class "B" output stage; and a new style, high efficiency, speaker.

MODELS 65,66
MODEL 100
Schematics

FEDERATED PURCHASER

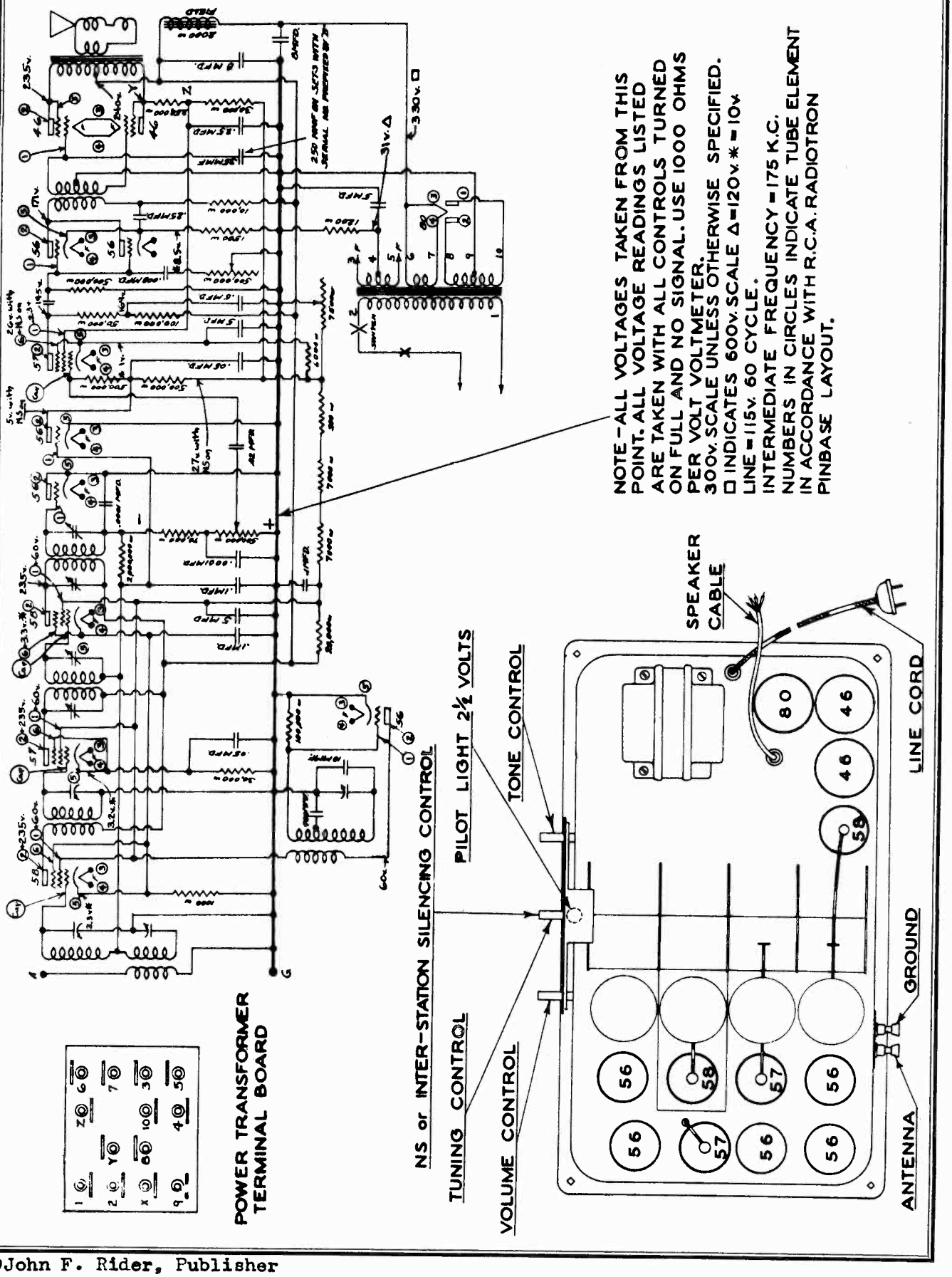


MODEL 65 & 66



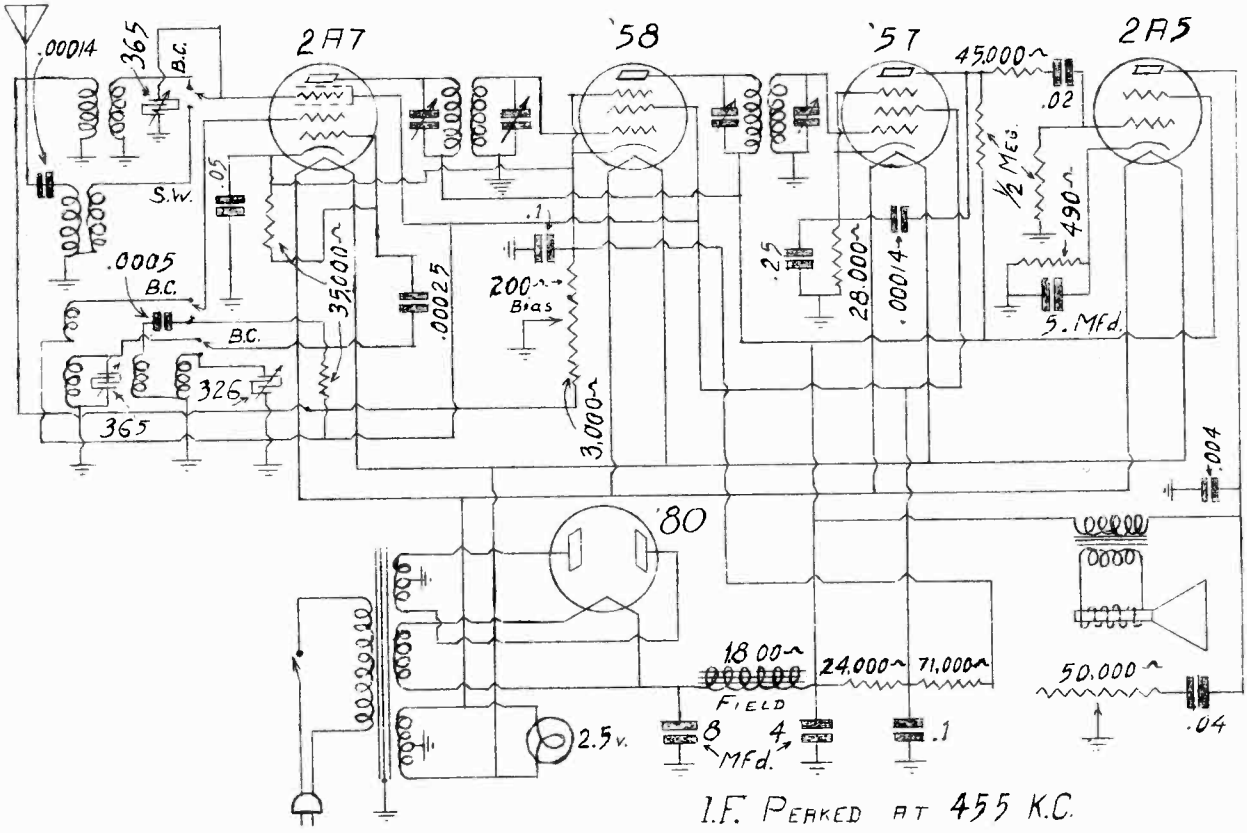
MODELS 79,80
Schematic
Voltage, Socket

FEDERATED PURCHASER



FEDERATED PURCHASER

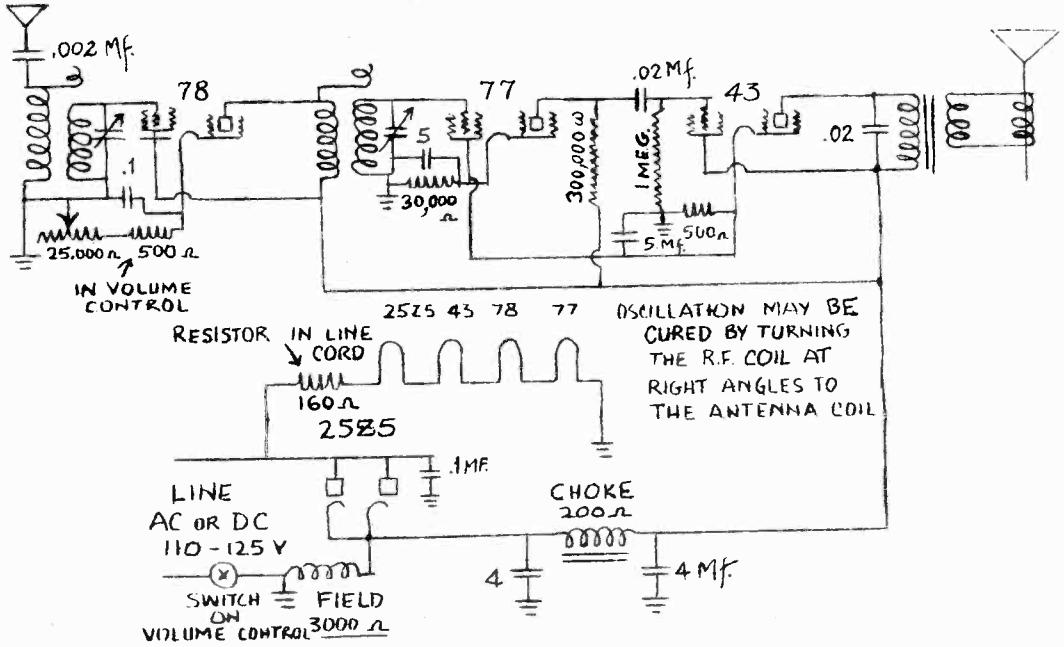
MODEL 88
MODEL Royal 9A
Schematics



MODEL 88

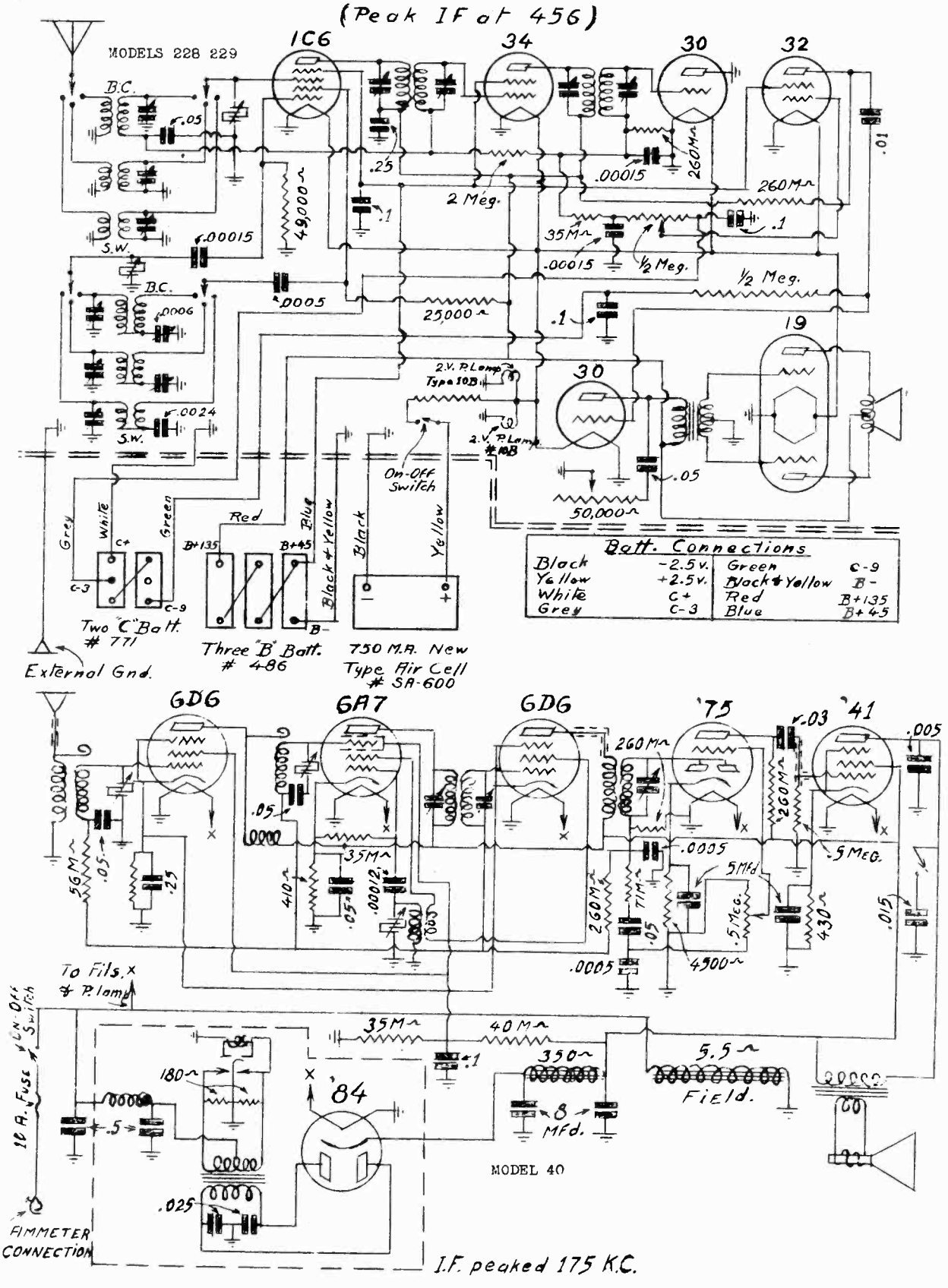
STENCIL 147

MODEL ROYAL 9A



MODEL 40
MODELS 228,229
Schematics

FEDERATED PURCHASER



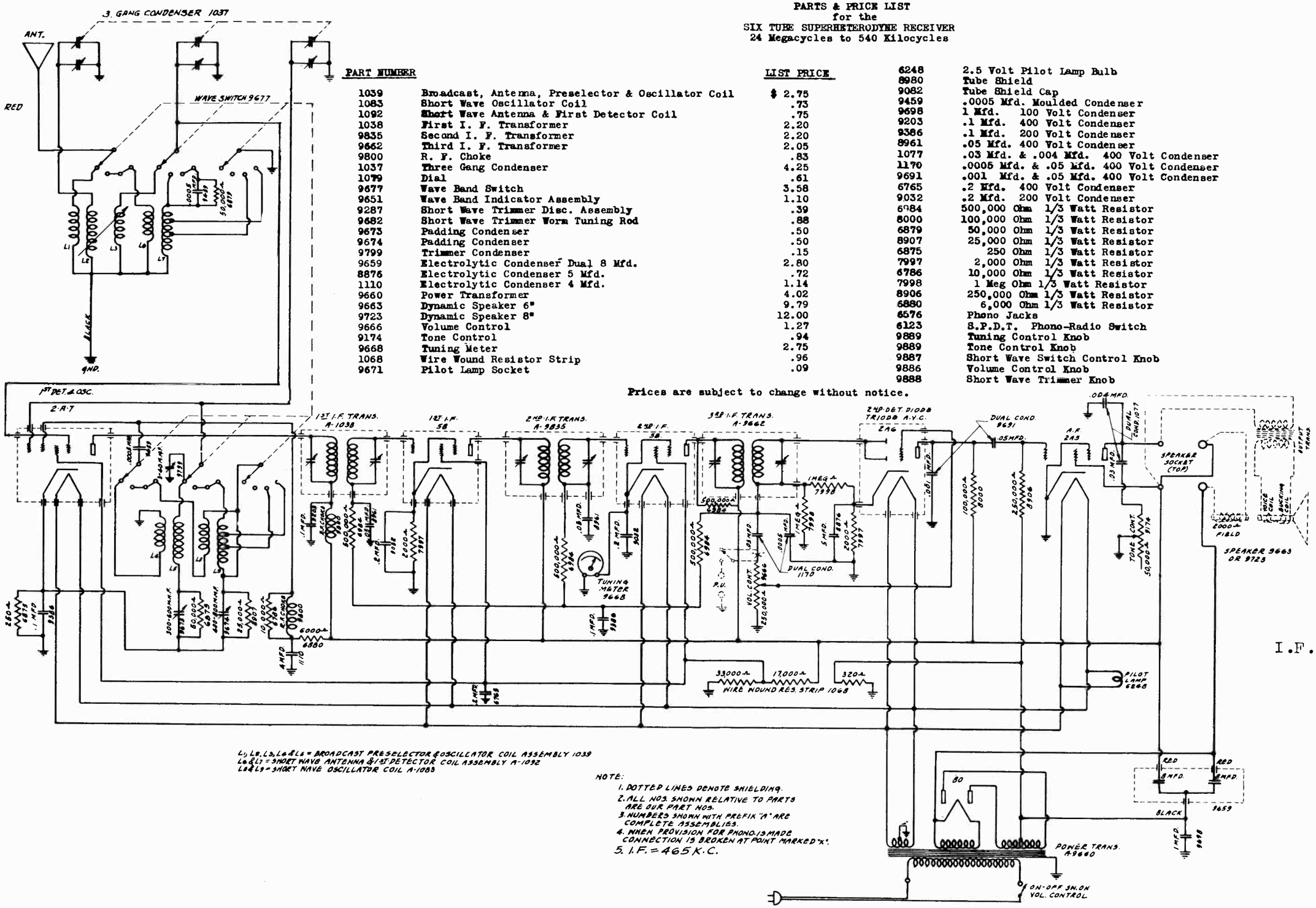
MODEL 117
Schematic
Parts List

FEDERATED PURCHASER

PARTS & PRICE LIST
for the
SIX TUBE SUPERHETERODYNE RECEIVER
24 Megacycles to 540 Kilocycles

PART NUMBER		LIST PRICE
1039	Broadcast, Antenna, Preselector & Oscillator Coil	$ 2.75
1083	Short Wave Oscillator Coil	.73
1092	Short Wave Antenna & First Detector Coil	.75
1038	First I. F. Transformer	2.20
9835	Second I. F. Transformer	2.20
9662	Third I. F. Transformer	2.05
9800	R. F. Choke	.83
1037	Three Gang Condenser	4.25
1079	Dial	.61
9677	Wave Band Switch	3.58
9651	Wave Band Indicator Assembly	1.10
9287	Short Wave Trimmer Disc. Assembly	.39
9682	Short Wave Trimmer Worm Tuning Rod	.88
9673	Padding Condenser	.50
9674	Padding Condenser	.50
9799	Trimmer Condenser	.15
9659	Electrolytic Condenser Dual 8 Mfd.	2.80
8876	Electrolytic Condenser 5 Mfd.	.72
1110	Electrolytic Condenser 4 Mfd.	1.14
9660	Power Transformer	4.02
9663	Dynamic Speaker 6"	9.79
9723	Dynamic Speaker 8"	12.00
9666	Volume Control	1.27
9174	Tone Control	.94
9668	Tuning Meter	2.75
1068	Wire Wound Resistor Strip	.96
9671	Pilot Lamp Socket	.09
6248	2.5 Volt Pilot Lamp Bulb	.17
8980	Tube Shield	.11
9082	Tube Shield Cap	.04
9459	.0005 Mfd. Moulded Condenser	.21
9698	1 Mfd. 100 Volt Condenser	.56
9203	.1 Mfd. 400 Volt Condenser	.21
9386	.1 Mfd. 200 Volt Condenser	.19
8961	.05 Mfd. 400 Volt Condenser	.18
1077	.03 Mfd. & .004 Mfd. 400 Volt Condenser	.62
1170	.0005 Mfd. & .05 Mfd. 400 Volt Condenser	.34
9691	.001 Mfd. & .05 Mfd. 400 Volt Condenser	.39
6765	.2 Mfd. 400 Volt Condenser	.26
9032	.2 Mfd. 200 Volt Condenser	.25
6984	500,000 Ohm 1/3 Watt Resistor	.19
8000	100,000 Ohm 1/3 Watt Resistor	.19
6879	50,000 Ohm 1/3 Watt Resistor	.19
8907	25,000 Ohm 1/3 Watt Resistor	.19
6875	250 Ohm 1/3 Watt Resistor	.19
7997	2,000 Ohm 1/3 Watt Resistor	.19
6786	10,000 Ohm 1/3 Watt Resistor	.19
7998	1 Meg Ohm 1/3 Watt Resistor	.19
8906	250,000 Ohm 1/3 Watt Resistor	.19
6880	6,000 Ohm 1/3 Watt Resistor	.19
6576	Phono Jacks	.14
6123	S.P.D.T. Phono-Radio Switch	.55
9889	Tuning Control Knob	.22
9889	Tone Control Knob	.22
9887	Short Wave Switch Control Knob	.22
9886	Volume Control Knob	.22
9888	Short Wave Trimmer Knob	.22

Prices are subject to change without notice.

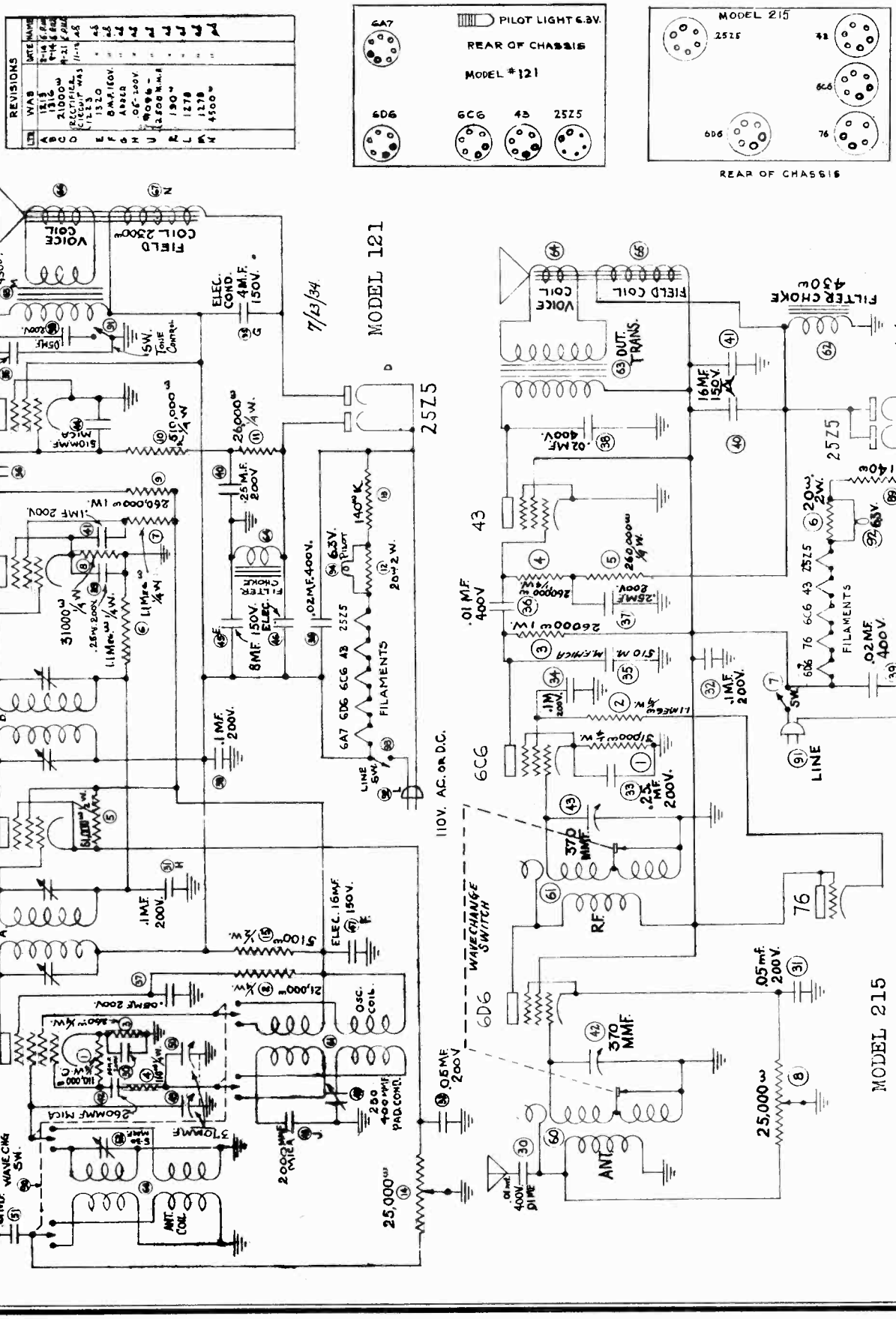


L1, L2, L3, L4 & L5 = BROADCAST PRESELECTOR & OSCILLATOR COIL ASSEMBLY 1039
L6 & L7 = SHORT WAVE ANTENNA & 1ST DETECTOR COIL ASSEMBLY A-1092
L8 & L9 = SHORT WAVE OSCILLATOR COIL A-1083

NOTE:
1. DOTTED LINES DENOTE SHIELDING.
2. ALL NOS. SHOWN RELATIVE TO PARTS ARE OUR PART NOS.
3. NUMBERS SHOWN WITH PREFIX 'A' ARE COMPLETE ASSEMBLIES.
4. WHEN PROVISION FOR PHONO IS MADE CONNECTION IS BROKEN AT POINT MARKED 'X'.
5. I.F. = 465 K.C.

MODEL 121
MODEL 215
Schematics
Socket Layouts

FEDERATED PURCHASER



FEDERATED PURCHASER

MODEL 117
Voltage
Alignment

SHORT WAVE TRIMMER: A short wave trimmer control is incorporated in the receiver and is used for a fine tuning adjustment when tuning for short wave reception from 1.5 megacycles to 24 megacycles. The band selector switch knob consists of two sections. The small front section knob is used for adjusting the short wave trimmer and the large rear section is the band selector switch knob. When tuning for short wave reception always rotate the tuning control slowly until a station is heard with maximum volume. Don't hurriedly skim over the dial or pass up any weak signals. After adjusting the tuning control so as to bring the station in at its loudest point adjust the short wave trimmer control by turning the trimmer knob first in the clockwise and then in the counter-clockwise direction to the position of greatest volume. Occasionally after tuning in this manner still better results may be obtained by readjusting the tuning control, and then further fine adjustment should be made with the short wave trimmer for maximum volume. It may be found that when adjusting the short wave trimmer that the signal will disappear, indicated by the elimination of signal, static and background noises. Rotating the short wave trimmer control slightly either clockwise or counter-clockwise will bring the signal in again. When operating the receiver on the broadcast band (1500 K.C. to 540 K.C.) the trimmer is inoperative.

VOLTAGE TABLE

Line Voltage : 115
Volume Control: Full on
Wave Band : Broadcast

TUBE	Fil.	Plate	Screen	Cathode Volts	Grid No.1	Grid No.2	Grid No. 3 & 5
2A7 Oscillator 1st Detector	2.45	220		2.2	3.5	200	90
58 First I. F. Amplifier	2.45	220	90	6			
58 Second I. F. Amplifier	2.45	220	90	3.5			
2A6 Second Detector	2.45	120##		1			
2A5 Output	2.45	210	220				
80 Rectifier	4.89						

Triode Plate. Comparative voltage only. The voltmeter is in series with a high resistance and is therefore not the true voltage applied. Read all voltages from socket to chassis unless otherwise specified.

ALIGNMENT PROCEDURE: Only when an atenna, oscillator or I. F. transformer has become defective due to an open or shorted winding should it be necessary to realign the receiver. For aligning either the intermediate transformer or variable condenser it is necessary that an oscillator be used with some type of output measuring device.

INTERMEDIATE ALIGNMENT:

1. Connect the high side of the oscillator output to the control grid of the 2A7 First Detector tube, leaving the grid clip disconnected. The ground side of the oscillator should be connected to the chassis.

2. Set the oscillator at 465 kilocycles (this must oe accurate) and adjust the output of the oscillator so that a convenient reading is obtained on the output meter.

3. Align the first intermediate transformer by turning the brass hex nut of the first intermediate transformer trimmer up and down until maximum reading is obtained on the output meter, then adjust the trimmer screw located inside of the brass hex nut in the same manner. The intermediate transformer trimmer screws are accessible through the small hole in the top of the intermediate transformer shields.

4. The second and third I. F. transformers should next be adjusted in the same manner as the first I.F. transformer.

TO ALIGN THE VARIABLE CONDENSER: It is important when aligning the variable condenser and padding condensers to follow the procedure given carefully, otherwise the receiver will be insensitive and the dial calibration will be incorrect.

1. Connect the high output side of the oscillator to the antenna and the ground to the chassis.

2. Place the band selector switch for operation on the 1.5 to 4 megacycle band. Tune the receiver to exactly 1.7 megacycles onthe dial, set the short wave trimmer about half the distance between maximum clockwise and counter-clockwise rotation and adjust the oscillator frequency to exactly 1.7 megacycles.

Next, bring this 1.7 megacycle signal in to maximum output by adjusting the padding condenser accessible through the hole in the right hand side and closest to the rear of the chassis.

3. Leave the band selector switch for operation on the 1.5 to 4 megacycle band and tune the receiver to exactly 3.4 megacycles on the dial.

Next, set the test oscillator to exactly 3.4 megacycles and tune the signal in by adjusting the oscillator variable condenser trimmer mounted on top of the variable condenser. The middle section of the variable condenser is the oscillator section. Recheck the 1.7 megacycle adjustment after making the adjustment at 4 megacycles. For best results it is always advisable to check each adjustment several times. NOTE: This completes the short wave adjustment.

4. Adjust the band selector switch for operation on the broadcast band (1500 to 540 kilocycles) and tune the receiver to exactly 1400 kilocycles on the dial and set the oscillator to this frequency. Turn the receiver on end and bring this 1400 kilocycle signal in to maximum output by adjusting the trimmer screw on the small trimmer, which is located adjacent to the short wave switch underneath the chassis.

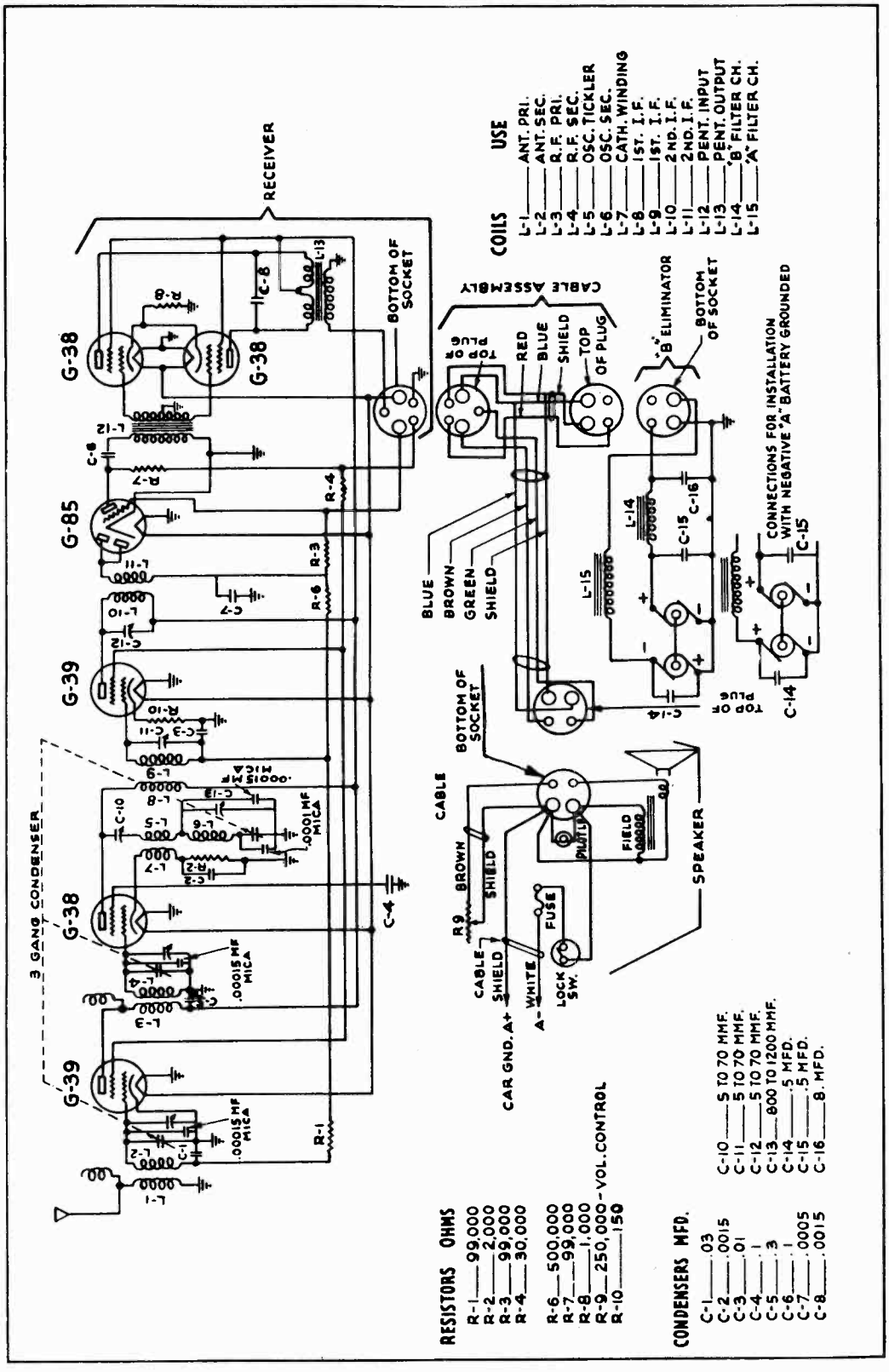
Next, adjust the antenna and preselector variable condenser section trimmers mounted on top of the variable condenser for maximum signal output. (These are the front and rear gang sections).

5. Leave the band selector switch for operation on the broadcast band (1500 to 540 kilocycles) and tune the receiver and oscillator to approximately 600 kilocycles. Then adjust the 600 kilocycle padding condenser which is located on the right hand side and towards the front of the chassis for maximum output reading. This adjustment is quite critical and it is necessary to rock the condenser slightly to the right and left to obtain maximum sensitivity.

Always recheck the 1400 kilocycle alignment after making the adjustment at 600 kilocycles.

FORD MOTOR CAR CO.

MODEL Ford Police
Auto Radio
Built by Grigsby-Grunow
Schematic



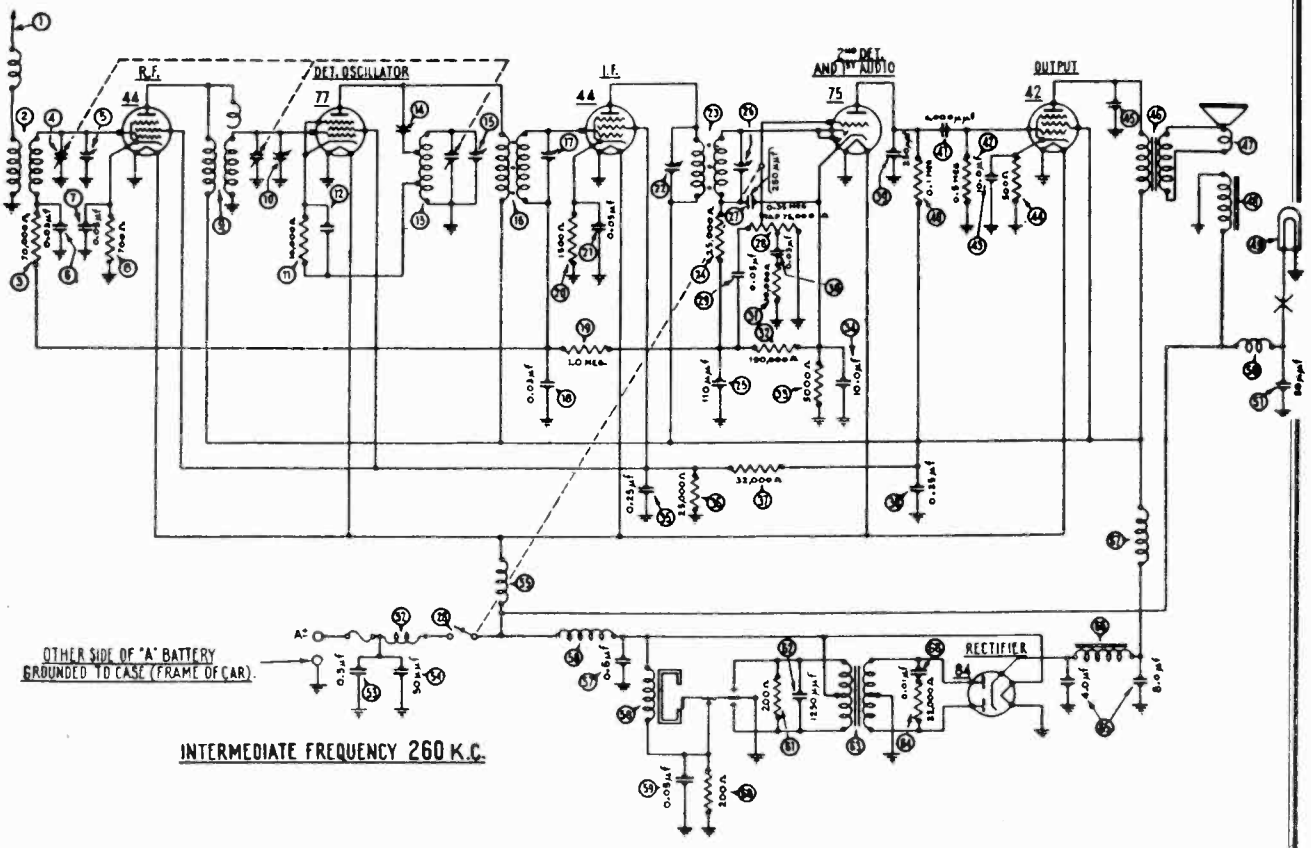
FORD TYPE POLICE AUTO RADIO RECEIVER WITH MOTOR-GENERATOR "B" SUPPLY

Model N, Center Control
Schematic
Parts List

FORD MOTOR CAR CO.

FORD CENTER CONTROL TYPE RADIO

Model N – Schematic Wiring Diagram



Model N Parts List

No Shown on Schematic	Description	Part No.
(1)	Antenna Choke	32-1372
(2)	Antenna Transformer	32-1331
(3)	Resistor (70,000 ohms)	33-1115
(4)	Tuning Condenser	31-1166
(5)	1st Padder (on tun. cond.)	
(6)	Condenser (.03 mfd.)	30-4025
(7)	Condenser (.05 mfd.)	30-4020
(8)	Resistor (700 ohms)	6443
(9)	R. F. Transformer	32-1332
(10)	2nd Padder (on tun. cond.)	
(11)	Resistor (10,000 ohms)	33-1000
(12)	Condenser (1000 mmfd.)	30-1007
(13)	Oscillator Transformer	32-1333
(14)	Padder (Prim. 1st I. F. Tran.)	
(15)	3rd Padder (on tun. cond.)	
(16)	First I. F. Transformer	32-1329
(17)	Padder (Sec. 1st I. F. Trans.)	
(18)	Condenser (.03 mfd.)	30-4025
(19)	Resistor (1,000,000 ohms)	33-1096
(20)	Resistor (2300 ohms)	33-3048
(21)	Condenser (.05 mfd.)	30-4020
(22)	Padder (Pri. 2nd I. F. Trans.)	
(23)	Second I. F. Transformer	32-1237

No. Shown on Schematic	Description	Part No.
(24)	Resistor (25,000 ohms)	33-1013
(25)	Condenser (110 mmfd.)	30-1031
(26)	Padder (Sec. 2nd I F. Trans.)	
(27)	Condenser (250 mmfd.)	30-1032
(28)	Vol. Con. & Switch Assm.	33-5067
(29)	Condenser (.05 mfd.)	30-4020
(30)	Condenser (.03 mfd.)	30-4025
(31)	Resistor (10,000 ohms)	33-1000
(32)	Resistor (190,000 ohms)	33-1116
(33)	Resistor (5000 ohms)	6096
(34)	Condenser (10 mfd.)	30-2076
(35)	Condenser (.25-.25 mfd.)	30-4126
(36)	Resistor (25,000 ohms)	3656
(37)	Resistor (32,000 ohms)	3525
(38)	Condenser (.25-.25 mfd.)	30-4126
(39)	Condenser (250 mmfd.)	30-1032
(40)	Resistor (100,000 ohms)	6099
(41)	Condenser (6000 mmfd.)	30-4125
(42)	Resistor (500,000 ohms)	6097
(43)	Condenser (10 mfd.)	30-2076
(44)	Resistor (500 ohms)	33-3031
(45)	Condenser (4000 mmfd.)	30-4185
(46)	Output Transformer	32-7019

No. Shown on Schematic	Description	Part No
(47)	Cone and Voice Coil	02861
(48)	Field Coil Assembly	36-3097
(49)	Pilot Lamp	34-2038
(50)	Interference Choke	32-1374
(51)	Condenser (50 mmfd.)	30-1029
(52)	Interference Choke	32-1374
(53)	Condenser (.5 mfd.)	30-4184
(54)	Condenser (50 mmfd.)	30-1029
(55)	"A" Choke	32-1368
(56)	Vibrator Choke	33-1367
(57)	Condenser (.5 mfd.)	30-4047
(58)	Vibrator	38-5036
(59)	Condenser (.05 mfd.)	30-4039
(60)	Resistor (200 ohms)	7217
(61)	Resistor (200 ohms)	7217
(62)	Condenser (1250 mmfd.)	5886
(63)	Power Transformer	32-7232
(64)	Resistor (32,000 ohms)	3525
(65)	Condenser (4-8 mfd.)	30-2030
(66)	"B" Choke	32-7233
(67)	R. F. Choke	32-1078
(68)	Condenser (.01 mfd.)	30-4051
	4-prong Socket	27-6015

Description	Part No.
5-prong Socket	27-6014
6-prong Socket	6417
Spark Plug Resistor	33-1015
Spark Plug Terminal	28-6179
Interference Cond. (Gen.)	30-4181
Interference Cond. (Dist.)	30-4176
Dial Assembly	42-5166
Knobs	27-4124
Knob Springs	28-1738
Battery Cable	38-5749
Fuse	7227
Fuse Insulator	27-7131
Flex. Control Shaft (Tuning)	28-8241
" " " (Volume)	28-8242
Glass for Control	27-7325
Dial Assembly	42-5166
Pointer	28-1956
Antenna Lead	L-1741
"T" Bolt (set mounting)	28-6161
Nut (set mounting)	W-518A

The New Ford Auto Radio Incorporates: New, advanced principles of circuit and tube design. Six tube Superheterodyne with bass compensation. Rugged, compact, single unit Chassis. Built-in Electro-dynamic speaker. Highly developed automatic volume control. Illuminated, custom-built instrument panel control, mounting in ash tray opening.

Receiver mounts directly above steering column, out of sight and out of the way.

Controls go into ash tray opening. A special drilling template is furnished with each receiver by means of which the receiver can be mounted in cars without ash tray equipment.

These instructions have been carefully prepared for your use in installing the 40-18805-E receiver in Ford 1933 and 1934 cars. Read them carefully in every detail before attempting an installation.

Antenna

Antenna have been built in all closed Ford cars for some time with aerial lead coming down at the rear of the body or the right-hand windshield pillar. Closed cars of recent manufacture have aerial leads coming down the left-hand windshield pillar. (See Fig. 268.)

When installing this radio in a car having the antenna lead-in at the rear of the body, cut this lead-in (40-18812-AR) off as short as possible (taping the end and fastening it securely to prevent shorting the antenna through contact with the metal of the body) and install the new lead-in (40-18812-D). Loosen the front left-hand corner of the headlining sufficiently to pass the single end of the lead-in through the center of the front L.H. pillar and solder that portion of the lead-in which is stripped to the wire roof netting (after two turns of the lead-in have been made around the netting). See Figure 268 connection "X". The roof netting must be scraped clean of any paint where the lead-in is to be soldered. A braided "pigtail" which is soldered to the male connector at the receiver end of the aerial lead must be grounded to a body brace just at the base of the pillar. This can be soldered or fastened with a sheet metal screw. Scrape the surface of the brace clean with a file to insure a good connection. (See "S" Figure 268.)

The spare wheel antenna, Part No. 40-18812-C should be used on all open cars.

Antenna extension lead, Part No. 40-18818, will have to be used on some cars having lead-in coming down right-hand windshield pillar. For the majority of cars, the lead is long enough to reach without this extension. Connect lead below glove box, then slip up and over top of box. Plug the extension into receiver lead, place it over the top of the glove box and plug it into aerial lead socket at right-hand pillar.

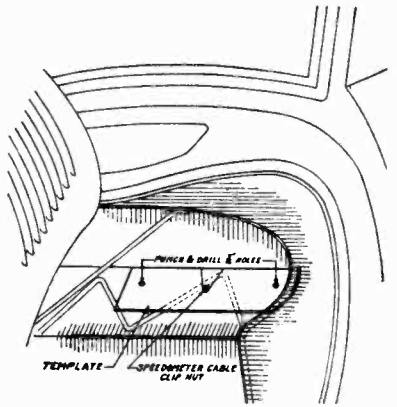


Fig. 269

Radio Location and Installation

Refer to Figure 269 for location of receiver mounting holes.

Place cardboard template on body ledge under left-hand hood as indicated in Figure 269 and prick punch hole locations. Drill 7/16" holes. Assemble T bolts loosely as shown in Figure 270.

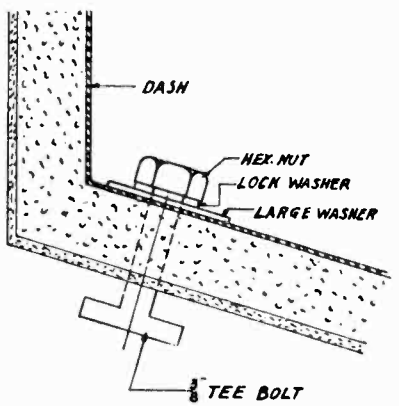


Fig. 270

Remove speedometer cable clip bolt and relocate speedometer cable to the left of the radio receiver. Relocate gas gauge line on the right of the radio receiver.

Install receiver above steering column with speaker facing towards driver and hook the T bolts into the brackets on top of the receiver. Tighten receiver into place. Bring aerial lead around rear of receiver and connect it into male plug on the end of the car antenna.

Ammeter Lead

Place the fuse and fuse insulator in the metal housing and assemble. Now connect the eyelet terminal to the hot (left) side of the fuse block.

Instrument Panel Control

Remove ash receptacle by dropping it forward and bending retaining clips toward the center. See Figure 271.

With a pair of pliers, bend upward ash receptacle back-stop to allow clearance for control head.

Assemble control head and cables in this hole by means of the U-clamp and two wing nuts. Draw up the wing nuts until the cover plate is against the instrument panel. See Figure 272.

The cowl ventilator handle should pass between the two flexible shafts. The shaft on the right with the male end is the station selector and is pushed into the right hand bushing on the receiver (closest to the dash). The left shaft is the switch and volume control. This has a female end and should be pushed into the bushing on the receiver nearest the instrument board. (See Figure 268.) After the shafts are properly seated, tighten the two shaft couplings. Plug the dial light wire into its receptacle close to the switch volume control bushing.

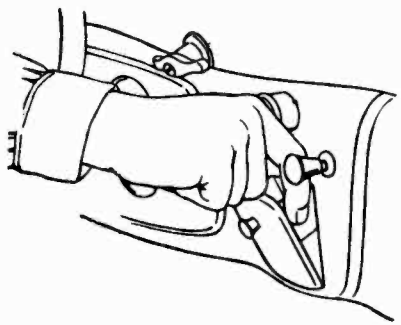


Fig. 271

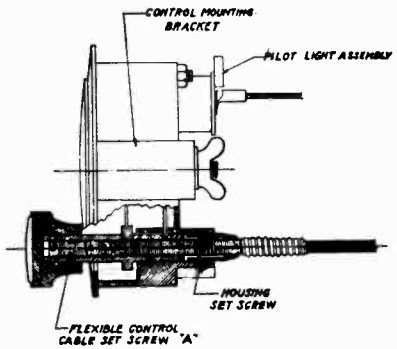


Fig. 272

Installing Dash Controls in Cars Without Ash Receptacle

Place the template on the instrument panel, as indicated in Figure 273.

Be sure that the throttle and choke rods come to the bottom of the slots in the top of the template and that the bottom of the template is flush with the bottom of the instrument panel. With a sharp-pointed instrument score the panel around the opening in the template. Cut out dash to these lines by drilling around inside of mark with a 1/8" drill and filing. Care must be taken not to mar the instrument board or file beyond line during this operation.

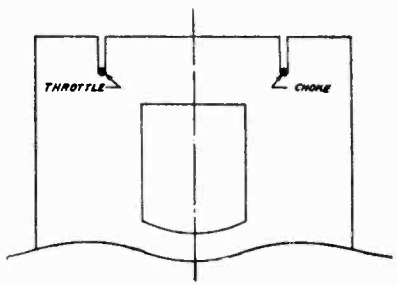


Fig. 273

MODEL N, Center Control Socket, Alignment Service Notes

FORD MOTOR CAR CO.

Dial Calibration

The receiver is calibrated in kilocycles with the last "0" omitted. Turn on receiver by rotating left-hand knob in clockwise direction. It will take a few moments for the tubes to heat up. Tune in a station of known frequency. Remove the right-hand knob by pulling it towards you. This is held in position by a spring clamp. Loosen the set screw on shaft (See "A"—Figure 272) under knob until pointer moves freely. Now turn the pointer to the frequency of the station which is tuned in, tighten set screw and replace knob. Check accuracy of calibration on other stations at different points on the dial and adjust further if necessary.

Spark Noise Elimination

Cut off the eyelet terminals on all spark plug wires at the spark plug and screw on the angle resistors. See Figure 274.

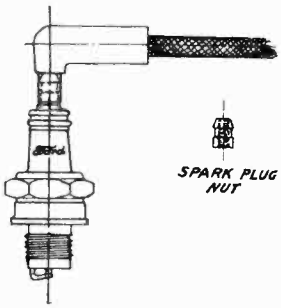


Fig. 274

Remove the round knurled nut and in its place use snap-type nut furnished. Press resistors on snap nuts.

The by-pass condenser with special coil bracket should be mounted on the ignition coil with the condenser wire on the terminal, as shown in Figure 275.

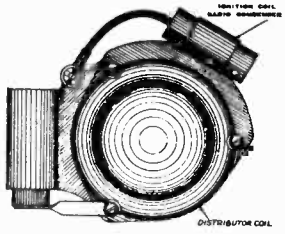


Fig. 275

These operations should reduce the interference to a satisfactory level. However, there may be an occasional car which will require an additional B-18827 condenser, either at the ignition switch or at the fuse block.

The condenser to be used at the fuse block can be mounted underneath the bolt which holds the loom adjacent to the fuse block. Connect the wire leading from the condenser to the terminal on either side of the fuse.

If this condenser is to be used at the ignition switch a small hole should be drilled in the instrument board flange just to the right of the steering column, using an 8-32 bolt, nut and lockwasher to mount the condenser. The wire from the condenser should be attached to either terminal at the ignition switch.

If the above operations do not reduce the electrical interference to a satisfactory point, it may be necessary to reduce the clearance between the distributor rotor and the terminal plate electrodes. Remove one distributor cap and terminal plate and clean electrodes with a small file or knife. Build up these contacts with **rosin core solder** about 1/32". Replace terminal plate and cap and revolve motor with crank, leaving ignition switch off. Remove terminal plate and inspect carefully, removing excess solder which may have sheared off.

Repeat this same operation on the other side of the distributor.

Operating Instructions

To turn on the receiver, turn the left-hand knob slightly in a clockwise direction. The balance of the rotation of this knob controls the volume of the radio receiver. This receiver is equipped with a highly developed automatic volume control system which tends to maintain the volume at a constant level. However, there are some places—under viaducts, tunnels, bridges, etc., where the radio signal becomes so weak that it cannot be heard. When driving under trolley lines or in noisy locations, it is advisable to tune in on a strong local station.

Be sure the receiver is tuned in accurately, otherwise distorted reception will result and local electrical interference will be magnified.

When turning off the receiver be sure the left-hand knob is turned counterclockwise until a snap is heard and the dial light goes off; otherwise the receiver will continue to operate and discharge the battery.

Generator Interference

Remove generator relay mounting screw and slip condenser bracket under the generator cut-out mounting lug. Re-insert cutout mounting screw and tighten down securely. Connect the condenser wire to the battery terminal of the cutout. See Figure 276.

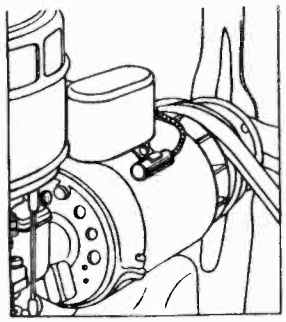
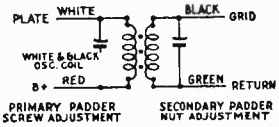


Fig. 276



1st I. F. Transformer

Fig. 277

The following instructions are intended for radio engineers only.

I. F. Transformers and Padders

A new type I. F. transformer complete with padders is used in the Ford center control radio receiver.

The padders are placed in the top of the shield can, one above the other.

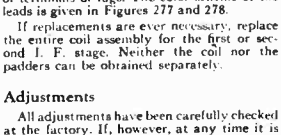
The primary padder is adjusted by means of the screw slot, accessible through the hole in the top of the shield can. The secondary padder is adjusted by means of the small hex nut, also accessible through the hole in the top of the shield. (See Figure 280.)

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figures 277 and 278.

If replacements are ever necessary, replace the entire coil assembly for the first or second I. F. stage. Neither the coil nor the padders can be obtained separately.

Adjustments

All adjustments have been carefully checked at the factory. If, however, at any time it is found necessary to readjust the padding condensers, this procedure must be followed carefully. Do not attempt to make any adjustments until the procedure is clearly understood or without the use of a good oscillator or signal generator and output meter.



2nd I. F. Transformer

Fig. 278

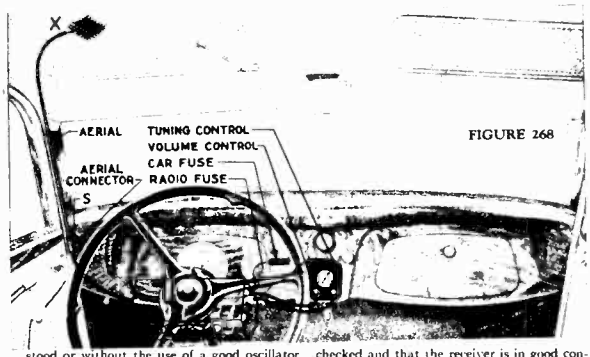


FIGURE 268

The receiver must be connected to a six-volt storage battery and turned on for operation. It is assumed that tubes have been checked and that the receiver is in good condition except for the padding adjustments.

Remove the lid from the receiver. Remove the grid cap terminal from the 77 tube (for location see Figure 280).

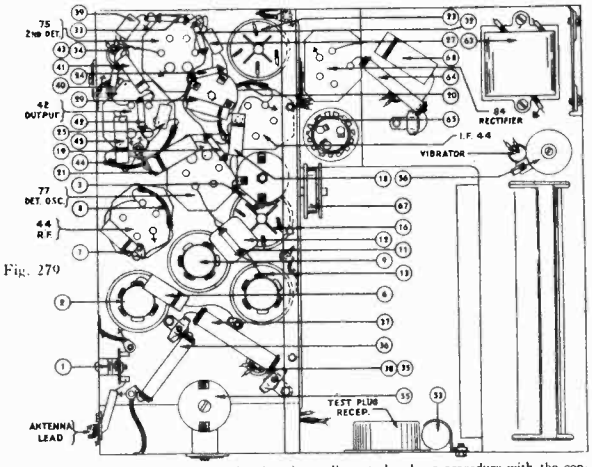


Fig. 279

Set up the signal generator and adjust it to exactly 260 K.C. Connect the generator lead to the grid cap of the 77 tube. (See Figure 280.) The output meter must be connected.

The receiver volume control must be turned on to approximately full volume and the attenuator in the generator set for a half-scale reading of the output meter.

The padders (22) and (26) are adjusted first (Figure 280). Turn the adjusting screw (22) all the way in. A metal screwdriver can be used for this. Then, with generator attenuator set so there is approximately half-scale reading, adjust the nut (26) with a fibre wrench for the maximum reading on the output meter. This applies to the sets to date, but sets of the future, with the broad tuning, the I. F. is close-coupled and will have two peaks, and must be tuned between the two peaks. This requires good judgment and careful adjustment.

Then adjust the screw (22) for maximum reading on the meter. This adjustment is critical. Note the maximum reading obtainable and then turn the screw in again and readjust, just bringing the adjustment up to the maximum reading. Do not pass it and then back off.

Repeat the above procedure with the condensers (14) and (17).

After padding the first I. F. stage, remove the generator lead from the 77 tube and reconnect the grid lead to the 77 tube. Set the generator to 1600 K.C. and then connect the generator lead to the antenna lead.

There are four holes in line, one in each of the sections of the tuning condenser housing. (See Figure 280.) Place a nail of the size that fits snugly through the holes and then turn the condenser plates out of mesh until they strike against the nail.

With the tuning condenser in this position adjust the high-frequency padder (15) until the maximum reading is obtained in the output meter. This is the true setting for 1600 K.C., 160 on the dial scale.

Next turn the condenser plates in mesh to 140 on the scale, 1400 K.C., and set the signal generator for 1400 K.C. The R. F. padder (10) and the antenna padder (5) are next adjusted for the maximum reading on the output meter.

Recheck the adjustments and then remove all test leads. If this procedure has been carefully followed and an accurately calibrated oscillator or signal generator used, the receiver is adjusted properly.

Schematic drawing of the center control type radio is given in Figure 281.

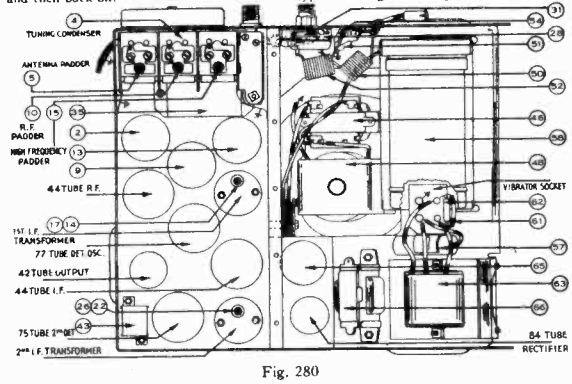
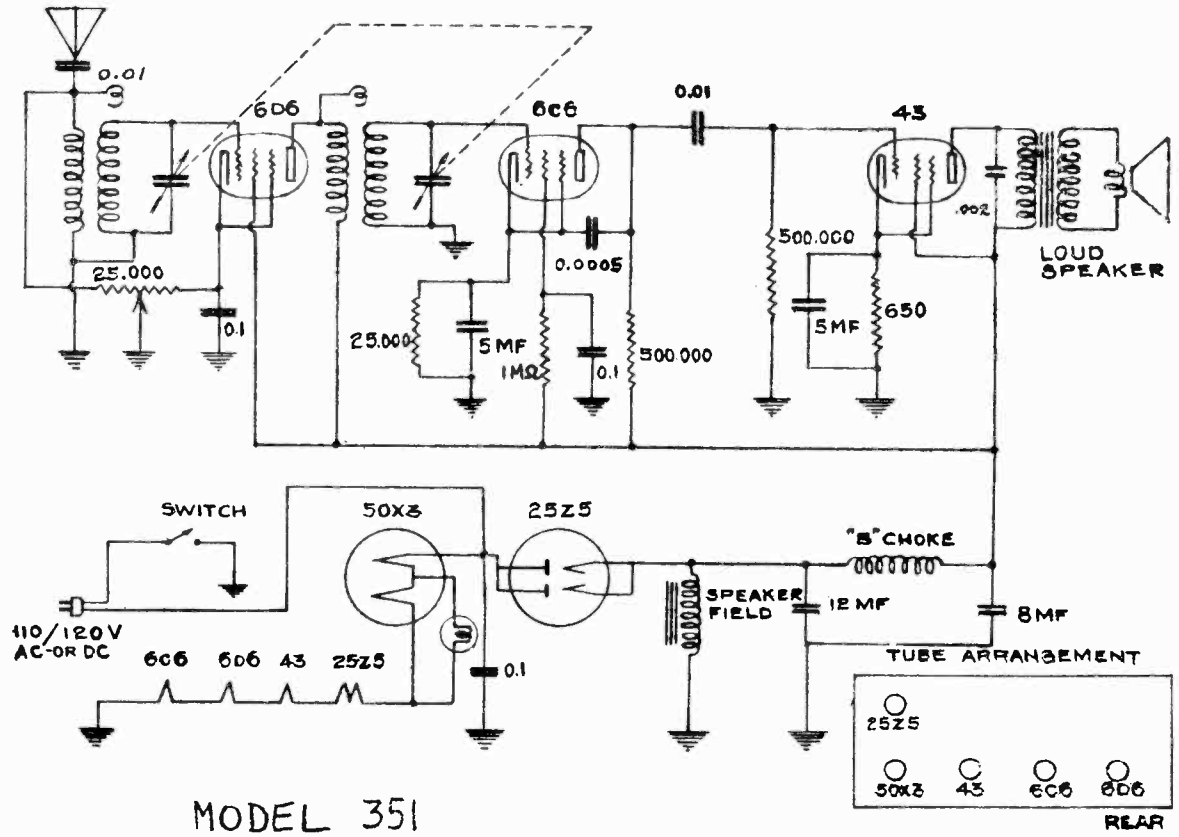


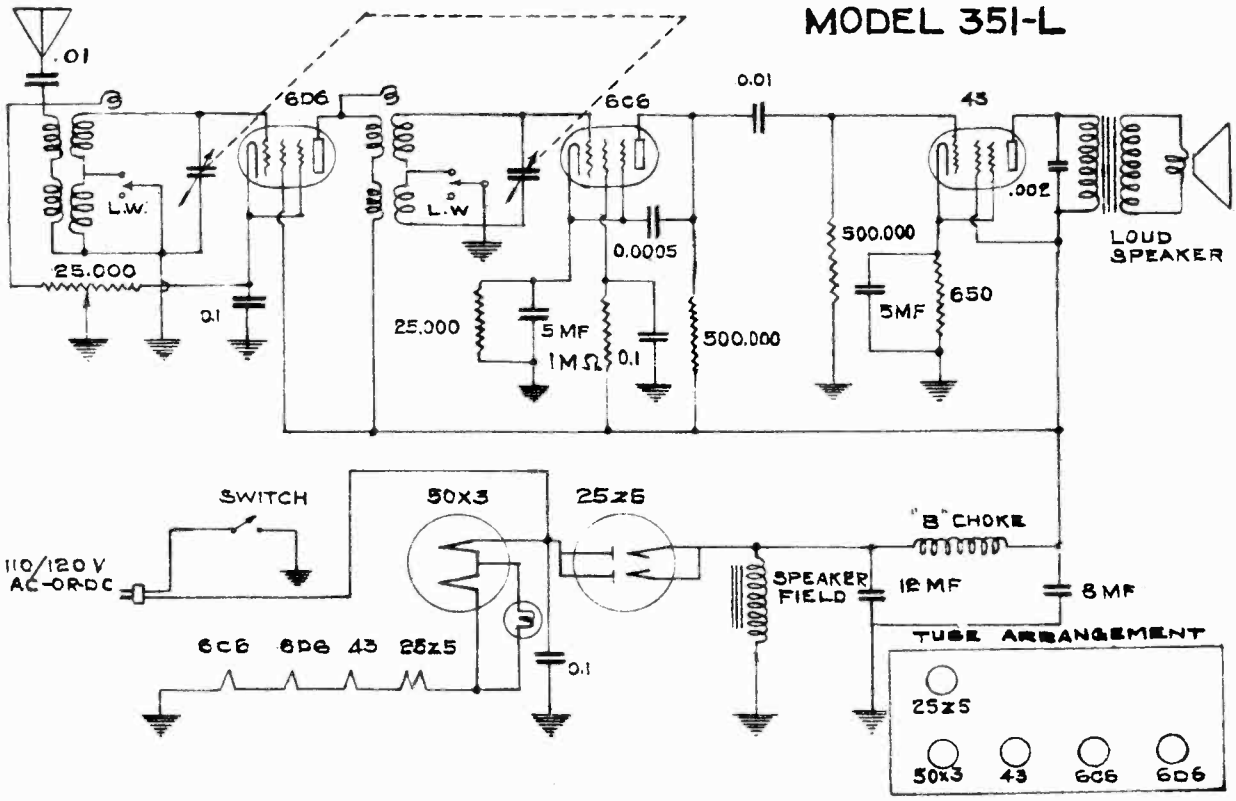
Fig. 280

MODEL 351
MODEL 351-L
Schematics
Socket

FREED MFG. CO., INC.

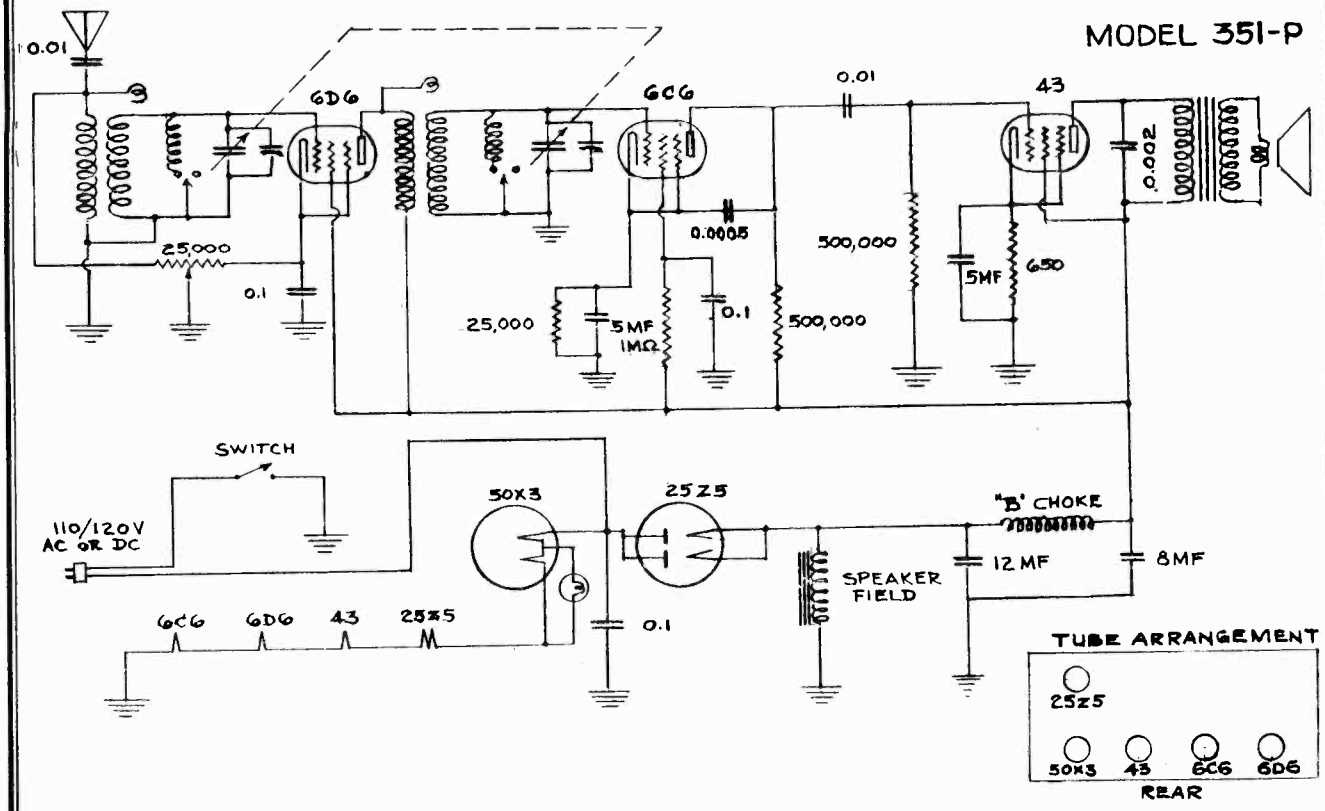


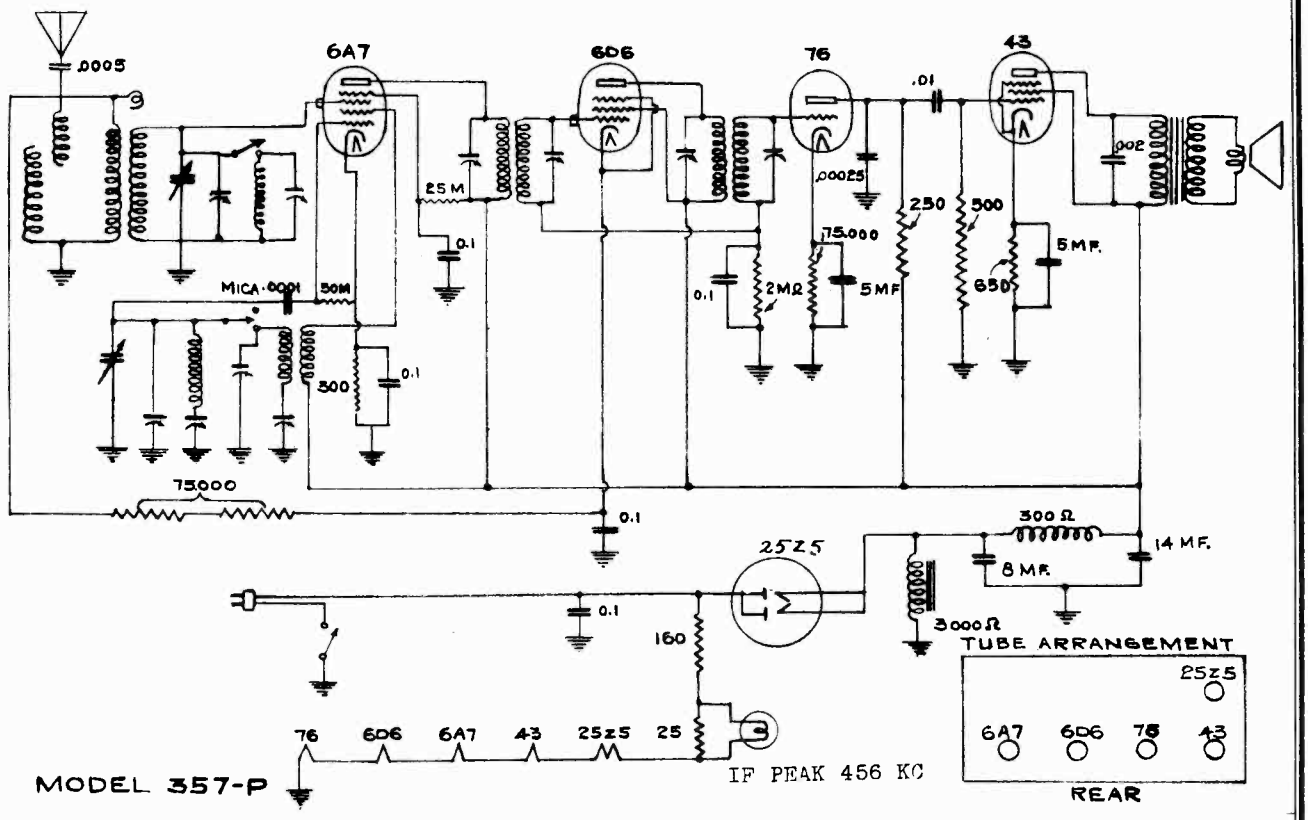
MODEL 351



MODEL 351-P
MODEL 357-P
Schematics, Socket

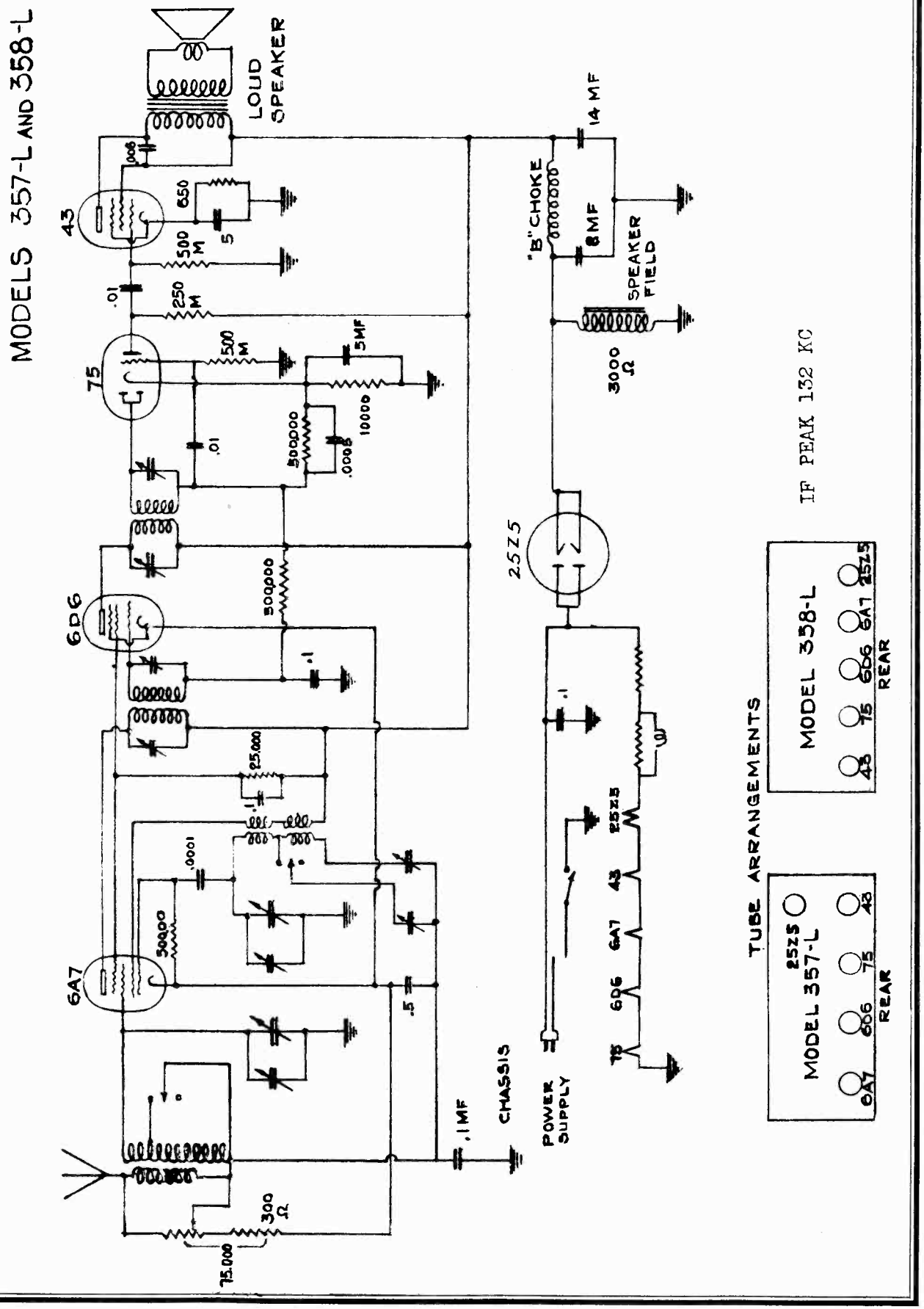
FREED MFG. CO., INC.





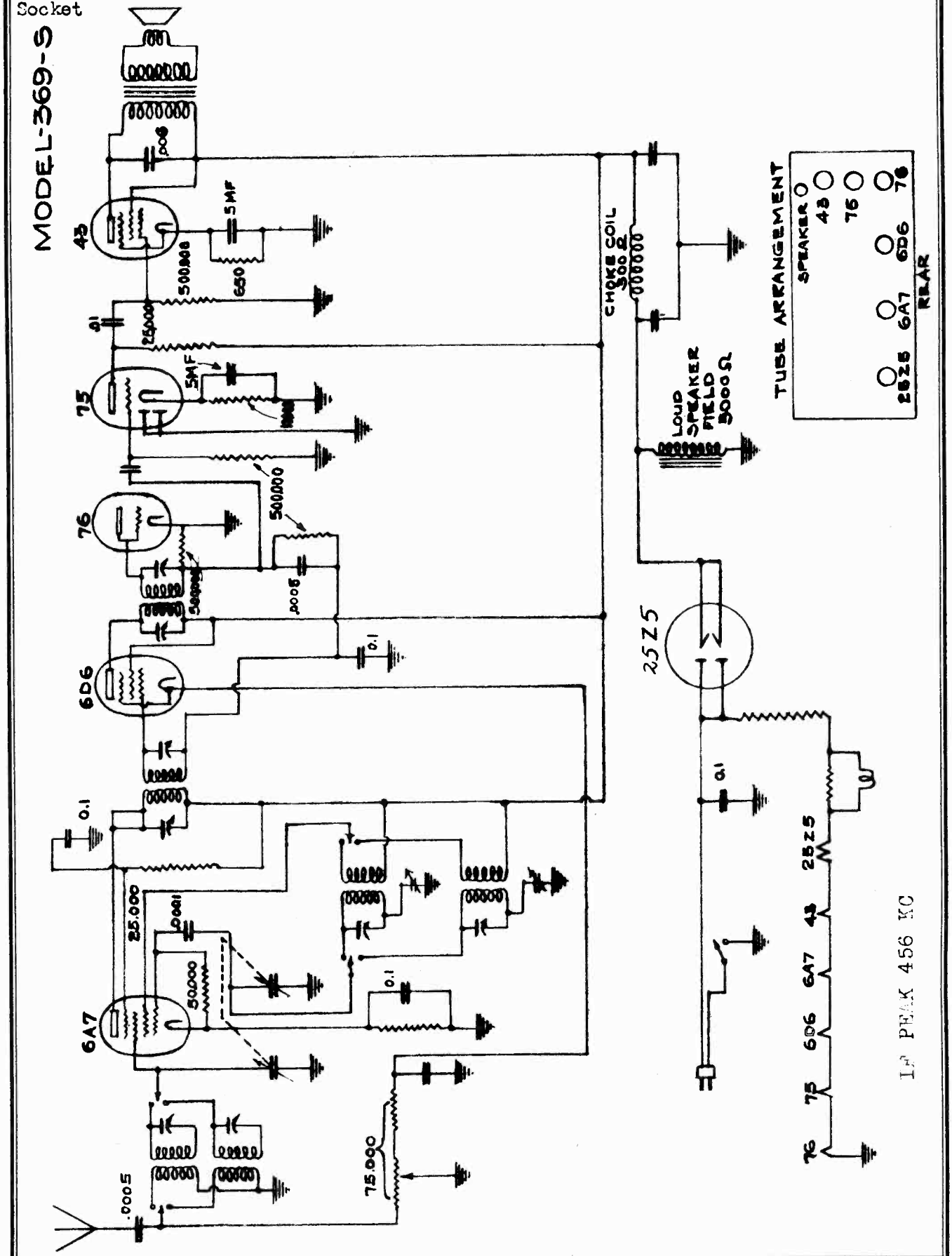
MODELS 357-L, 358-L
Schematic, Socket

FREED MFG. CO., INC.



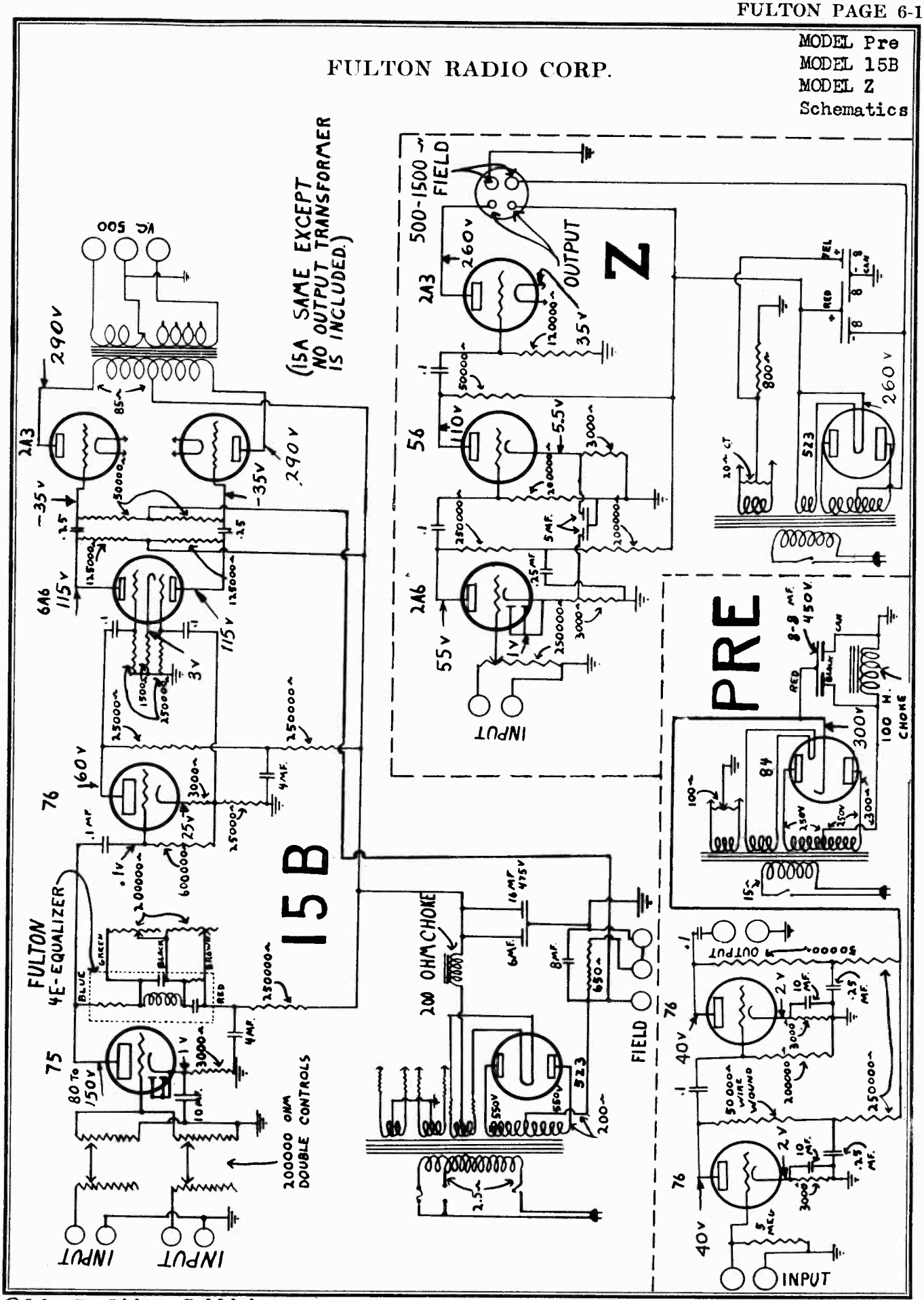
MODEL 369-S
Schematic
Socket

FREED MFG. CO., INC.



FULTON RADIO CORP.

MODEL Pre
MODEL 15B
MODEL Z
Schematics



MODEL 13B
MODEL 35B
Schematics

FULTON RADIO CORP.