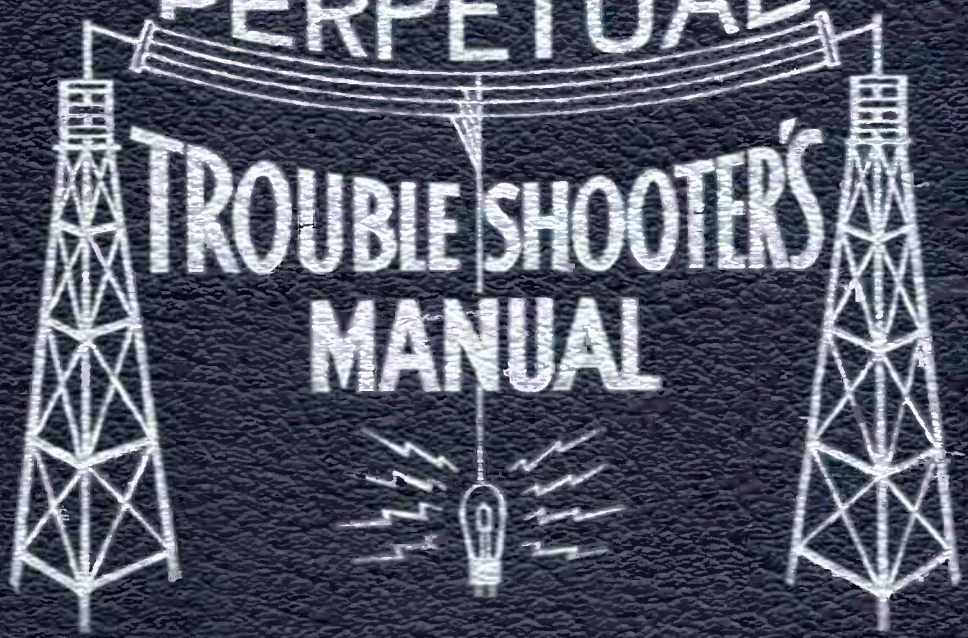
VOLUME VI

PERPETUAL TROUBLE SHOOTER'S MANUAL



JOHN F. RIDER

WELLS-GARDNER & CO.

MODEL 22B5
Chassis 2B
Schematic, Socket, Trimmers
Parts List

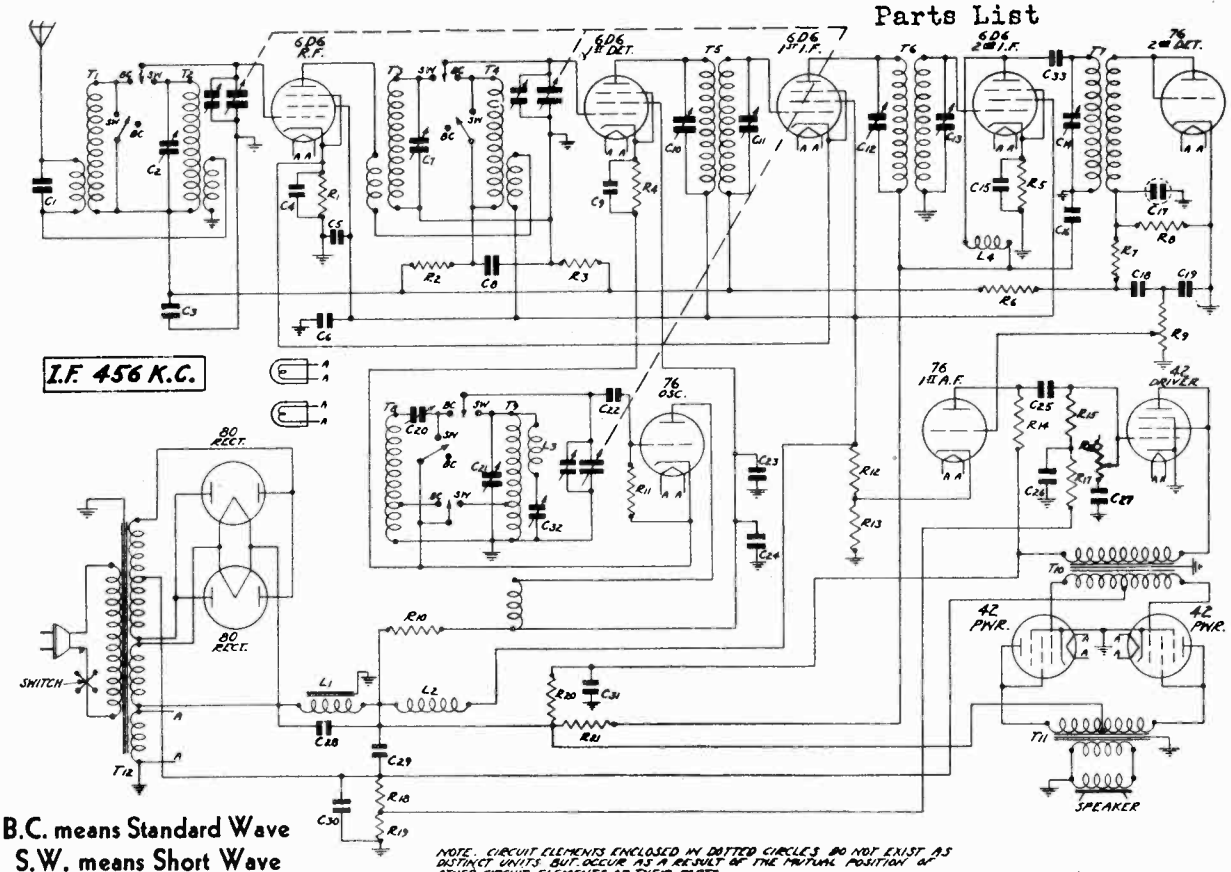


Fig. 1—Schematic Circuit Diagram

Aug., 1934

RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-A93141ww	R1	140 Ohm		Wire Wound
P-A95204	R2	200,000 Ohm	0.2	Carbon
P-A95105	R3	1.0 Megohm	0.2	Carbon
P-A94252	R4	2,500 Ohm	0.2	Carbon
P-A93401ww	R5	400 Ohm	0.2	Wire Wound
P-A95205	R6	2.0 Megohm	0.2	Carbon
P-A95104	R7	100,000 Ohm	0.2	Carbon
P-A94304	R8	300,000 Ohm	0.2	Carbon
P- 96005	R9	2.0 Megohm		Volume Control and Switch
P-E94403	R10	40,000 Ohm	3.0	Carbon
P-A95104	R11	100,000 Ohm	0.2	Carbon
P- 98038	R12	4,000 Ohm	2.5	Armored Wire Wound
	R13	390 Ohm	0.5	
	R18	128 Ohm	2.5	
	R19	145 Ohm	3.0	
P-B95603	R14	60,000 Ohm	0.5	Carbon
P-A95603	R15	60,000 Ohm	0.2	Carbon
P- 97011	R16	150,000 Ohm		Tone Control
P-A95203	R17	20,000 Ohm	0.2	Carbon
P- 98037	R20	4,000 Ohm	4.0	Armored Wire Wound
	R21	6,000 Ohm	2.0	

CONDENSERS

Part No.	Code	Capacity	Voltage	Type
P-80919	C1	250 mmf	600V	Moulded
P-2102	C2	3—40 mmf		Short Wave Ant. Trimmer
P-81076	C3	0.05 mf	200V	Tubular
P-81111	C4	0.25 mf	200V	Tubular
P-81117	C5	0.25 mf	200V	Tubular
P-81056	C6	6.0 mf	150V	Dry Electrolytic
	C24	2.0 mf	350V	
P-2102	C7	3—40 mmf		Short Wave Inter. Trimmer
P-81076	C8	0.05 mf	200V	Tubular
P-81076	C9	0.05 mf	200V	Tubular
P-2103	C10	150—250 mmf		Double (Part of 1st I. F. Trans. Trimmer)
	C11	150—250 mmf		
P-2103	C12	150—250 mmf		Double (Part of 2nd I. F. Trans. Trimmer)
	C13	150—250 mmf		
P-1685	C14	40—100 mmf		3rd I. F. Trans. Pri. Trimmer
P-81076	C15	0.05 mf	200V	Tubular
P-81097	C16	0.10 mf	500V	Tubular
	C17			Integral Part of 3rd I. F. Assem.
P-81076	C18	0.05 mf	200V	Tubular
P-81081	C19	35 mmf		Wire Capacitor
P-2112	C20	300—500 mmf		Osc. Std. W. Padding Cond.
P-2102	C21	3—40 mmf		Osc. Sho. W. Trimmer
P-81081	C22	35 mmf		Wire Capacitor
P-81118	C23	0.10 mf	400V	Tubular
P-81096	C25	0.25 mf	400V	Tubular
P-81117	C26	25 mf	200V	Tubular
P-81076	C27	0.05 mf	200V	Tubular
P-81099	C28	0.15 mf	220V	AC Tubular
P-81058	C29	16 mf	450V	Wet Electrolytic
P-82000	C30	30 mf	50V	Dry Electrolytic
P-81039A	C31	16 mf	400V	Wet Electrolytic
P-1685	C32	40—100 mmf		Osc. Sho. W. Padding Cond.
P-80919	C33	250 mmf	600V	Moulded

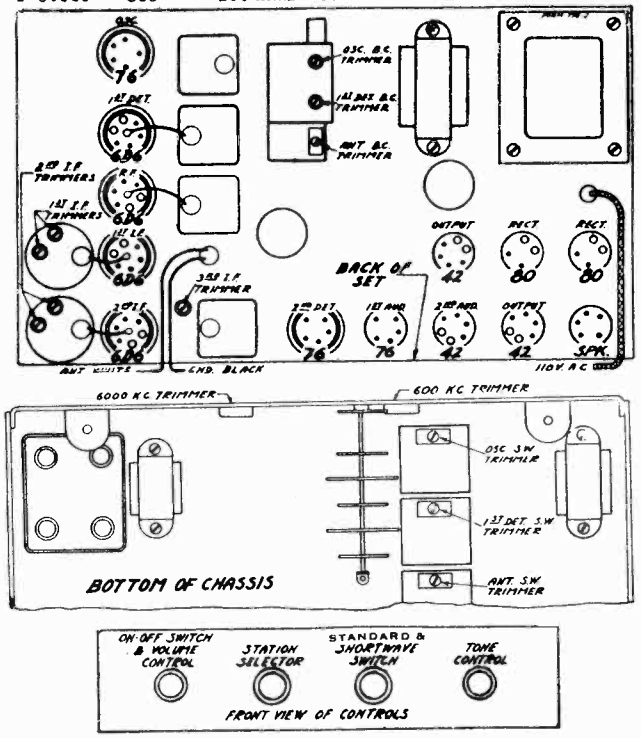


Fig. 2—Location of Tubes, Trimmers and Controls

MODEL 22B5
Chassis 2B
Alignment, Voltage
Resistance Data

WELLS-GARDNER & CO.

Intermediate Frequency Adjustment

Set the signal generator for 456 K. C. Connect the antenna lead of the signal generator to the grid of the 1st detector through a .05 mfd. condenser. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. The volume control should be at the maximum position. Reduce the signal so that A. V. C. action is not obtained.

Then adjust the five I. F. trimmer condensers until maximum output is obtained. The adjusting screws for the 1st and 2nd trimmer condensers are reached from the top of the chassis and are in the round I. F. cans—See Fig. 2. The openings to these trimmer condensers are covered over by small cover plates which are held in position by screws. Loosen these screws until the cover plates can be swung around. **CAUTION - Use an insulated screwdriver for adjust ng trimmers to prevent short circuiting to ground.** In the 3rd I. F. coil, only the primary has a variable trimmer condenser. This condenser is mounted on the top panel of the chassis as shown in Fig. 2 and the adjustment screw is reached through a hole in the top panel.

Standard Wave Band Adjustment

The standard-short wave switch should be in the standard wave position. Set the signal generator for 1740 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator is in this instance connected to the antenna lead of the receiver. Reduce the signal so that A. V. C. action is not obtained. Adjust the oscillator standard wave trimmer until maximum output is obtained. This trimmer is on the tuning condenser and its location is shown in Fig. 2.

Then set the signal generator for 1500 K. C. Turn the rotor until maximum output is obtained. Loosen the set screw in the pointer hub and set the pointer at the 1500 K. C. mark on the standard wave band scale. Retighten the hub set screw. Then adjust the antenna and 1st detector standard wave trimmers until maximum output is obtained.

Next set the signal generator for 600 K. C. and adjust the 600 K. C. trimmer. The adjusting screw is reached through a hole in the front panel of the chassis as shown in Fig. 2. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting at the same time adjusting the 600 K. C. trimmer screw until the highest output is obtained.

Short Wave Band Adjustment

CAUTION—After the standard wave band alignment as described above has been made, do not change the adjustment of any of the standard wave band trimmers.

In aligning the short wave band of the receiver, it will be noted that the signal will be heard with the signal generator set at two points 912 K. C. apart. That is, if the receiver is tuned to 15,000 K. C. a signal will be heard when the signal generator is set at 15,000 K. C. and again at approximately 15,912 K. C. This is due to image reception or the fact that a 456 K. C. beat is obtained when the signal is 456 K. C. lower than the receiver oscillator and also when the signal is 456 K. C. higher than the receiver oscillator. Care should be taken to see that the receiver is tracked with the signal generator adjusted to the lower of the two frequencies at which a signal is heard, in order that the oscillator in the receiver will be 456 K. C. higher in frequency than the signal.

Turn the standard-short wave switch to the short wave position. Turn the rotor to the full open position. As explained above, the volume control should be at the maximum position and the signal should be reduced to prevent A. V. C. action. Set the signal generator for 18,300 K. C. Then adjust the oscillator short wave trimmer for maximum output. This trimmer is reached from under the chassis and its position is shown in Fig. 2. If a maximum output peak cannot be reached, it may be due to the fact that the antenna and 1st detector short wave trimmers are screwed down too far. Back off these two trimmer screws two or three turns and then adjust the oscillator short wave trimmer for maximum output.

Next set the signal generator for 15,000 K. C. Turn the rotor until maximum output is obtained. Then adjust the antenna and 1st detector short wave trimmers for maximum output.

Next set the signal generator for 6000 K. C. and adjust the 6000 K. C. trimmer. This condenser is mounted on the front panel of the chassis as shown in Fig. 2 and is reached through a hole in the front panel. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 6000 K. C. trimmer screw until the highest output is obtained.

Voltages at Sockets

LINE VOLTAGE — 115
ANTENNA SHORTED TO GROUND

Type of Tube	Function	Across Fila. or Heater	Plate to Cath.	Screen to Cathode	Grid to Cath.	Normal Plate M. A.
6D6	R. F.	6.3	105	105	2.8	8.8
6D6	1st Detector	6.3	95	105	10.0	3.3
76	Oscillator	6.3	115		0.0	5.8 (1) 7.7 (2)
6D6	1st I. F.	6.3	260	105	2.8	8.8
6D6	2nd I. F.	6.3	260	105	3.2	7.2
76	2nd Detector	6.3				
76	1st Audio	6.3	170		11.0	1.2
42	Driver Stage	6.3	235	235	18 (3)	26.5
42	Output	6.3	350	350	38.0	21.0
80	Rectifier	4.6	435			35.5 per plate

(1) Switch in Standard Wave position.
(2) Switch in Short Wave position (No Signal).
(3) Measured across resistor R19.

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis.

Part No.	Item	Code	D. C. Resistance in Ohms
P-5176	B. C. Antenna Transformer Primary	T1	28.
	B. C. Antenna Transformer Secondary	T1	4.9
	S. W. Antenna Transformer Primary	T2	.3
	S. W. Antenna Transformer Secondary	T2	Small
P-5241	B. C. & S. W. Interstage R. F. Transformer Primaries in series	T4	2.9
	B. C. Interstage R. F. Trans. Sec.	T4	7.8
	S. W. Interstage R. F. Trans. Sec.	T3	Small
P-5243	1st I. F. Transformer Primary	T5	4.8
	1st I. F. Transformer Secondary	T5	4.8
P-5244	2nd I. F. Transformer Primary	T6	5.
	2nd I. F. Transformer Secondary	T6	5.
P-5245	3rd I. F. Transformer Primary	T7	12.0
	3rd I. F. Transformer Secondary	T7	30.0
P-5183	B. C. Oscillator Grid Coil	T8	3.3
	S. W. Oscillator Grid Coil	T9	Small
	S. W. Oscillator Plate Coil	T9	0.25
P-50653-2B	Audio Input Transformer Primary	T10	400.
	Audio Input Transformer Secondary (Center Top to Inside)	T10	200.
	Audio Input Transformer Secondary (Center Tap to Outside)	T10	280.
P-50642A-2B	Audio Output Transformer primary (Center Tap to Inside)	T11	300.
	Audio Output Transformer Primary (Center Tap to Outside)	T11	340.
	Audio Output Transformer Secondary	T11	.4
P-50620-2B	Power Trans. (115V 60 Cycles) prim.	T12	2.5
	Power Transformer (115V 60 Cycles) H. T. Sec. (Center Tap to Inside)	T12	150.
	H. T. Sec. (Center Tap to Outside)	T12	165.
	Power Transformer (115V 60 Cycles) Secondary (80 Filament)	T12	Small
	Power Transformer (115V 60 Cycles) Secondary A-A (Filament)	T12	Small
P-50650-2B	Power Choke	L1	140.
P-5190	H. F. Oscillator Tracking Coil	L3	1.2
P-5246	2nd I. F. Plate Reactor	L4	57.
P-1925	Speaker Voice Coil		1.6
	Speaker Field Coil	L2	5300.

Power Output

The maximum undistorted power output is 15 watts, measured with a 7000 ohm load resistor connected between the plates of the type 42 PWR tubes. The speaker voice coil must be disconnected for this measurement.

Sensitivity

Standard Wave Band
Over entire band—2 microvolts absolute
Short Wave Band
6.0 MC—5 microvolts absolute
15.0 MC—2 microvolts absolute

MODEL 22B5
Chassis 2B
Circuit Data, Parts

WELLS-GARDNER & CO.

Circuit

This model is a standard and short wave receiver with a coverage of 530 to 1740 K. C. on the standard wave band and 5.8 to 18.3 M.C. on the short wave band. Dual band coverage is accomplished by means of dual sets of R. F. and oscillator coils and a three section double throw switch. The various circuits made and broken as this switch is thrown, are indicated in the schematic circuit diagram Fig. 1.

Referring to the antenna transformer in Fig. 1, T1 is the standard wave transformer and T2 the short wave transformer. The two primaries are connected in series. With the switch in the short wave position, the short wave secondary is connected to the grid circuit of the 6D6 R. F. amplifier tube and the standard wave secondary is short circuited. When the switch is in the standard wave position, the short wave secondary circuit is opened up and the standard wave secondary is connected to the grid circuit of the tube. The secondary being used is tuned by the R. F. section of the three gang condenser. A separate variable trimmer condenser C2 is used for the short wave secondary.

The output of the R. F. 6D6 tube is fed through another R. F. transformer with tuned secondary into a second 6D6 tube which functions as the first detector. The first detector section of the three gang condenser is used for tuning this circuit. This interstage R. F. transformer consists of two portions shown as T3 and T4 on the diagram. T3 is the short wave transformer and T4 is the standard wave transformer. The connections to the two portions are made in the same manner as described above for the antenna R. F. transformer. A separate trimmer condenser C7 is used for the short wave secondary.

A type 76 tube is employed in a separate oscillator circuit. Referring to the diagram, T8 is the standard wave oscillator coil and T9 is the short wave oscillator coil. The coil being used is tuned by the oscillator section of the three gang condenser and these circuits are always resonant at 456 K. C. above the frequency to which the R. F. amplifier is tuned. When the switch is in the standard wave position, the connections are completed to the standard wave oscillator coil and the short wave oscillator coil is opened up. When the switch is in the short wave position, the connections are completed to the short wave coil and the standard wave coil is connected between ground and the short wave tap in order to render it ineffective. A separate trimmer condenser C21 is used for the short wave oscillator coil. A 600 K. C. padding condenser C20 is used in conjunction with the standard wave oscillator and a 6000 K. C. padder C32 is used for the short wave oscillator circuit.

The oscillator potential is fed into the cathode circuit of the 6D6 first detector tube. This results in the intermediate or beat frequency of 456 K. C. being present in the plate circuit of this tube.

Two stages of I. F. amplification are employed using two 6D6 tubes. The primaries and secondaries of the first and second I. F. transformers are tuned by small trimmer condensers located in the I. F. coil cans. The primary of the third I. F. transformer is tuned by a trimmer condenser located on the chassis top panel as shown in Fig. 2.

A 76 tube functions as the second detector and also as the automatic volume control tube. This tube operates as a diode or two element rectifier. When the standard and short wave switch is in the standard wave position, A V. C. voltage is applied to the R. F., 1st Detector and 1st I. F. tubes. In the short wave position A. V. C. voltage is not applied to the 1st detector tube.

A 76 type tube is used in the 1st Audio Stage. The output of this stage is fed through a resistance coupled unit into a Driver Stage which employs a 42 type tube. The output stage uses two 42 type tubes operating in a class A' amplifier circuit.

The power supply in this receiver makes use of two 80 type, full wave rectifying tubes operating in parallel.

It should be noted that with the exception of the 80's all tubes and dial lamps are of the 6 volt type.

REPAIR PARTS LIST FOR 12 TUBE SUPERHETERODYNE RECEIVER

When ordering parts be sure and give the part number. Also give the series number which will be found in the License Notice label. If there is a spot of paint on the chassis, give this color.

MISCELLANEOUS

Part No.	ITEM
P-5176	Sho. W. and Std. W. Antenna R. F. Transformer less can T1, T2
P-5241	Sho. W. and Std. W. Interstage R. F. Transformer less can T3, T4
P-5183	Oscillator Coil Assembly less can T8, T9
P-5245	3rd I. F. Transformer less can T7
P-40433	Cans for the above assemblies
P-5243	1st I. F. Trans. & Can Assem. T5
P-5244	2nd I. F. Trans. & Can Assem. T6
P-5190	H. F. Oscillator Tracking Coil L3
P-5246	2nd I. F. Plate Reactor L4
P-50650-2B	Power Choke L1
P-50653-2B	Input Transformer T10
P-50642A-2B	Output Transformer T11
P-50620-2B	Power Transformer 115V 60 Cycle T12
P-50652-2B	Power Transformer 115V 25 Cycle T12
P-50651-2B	Power Transformer 115–230V 40–60 Cycle T12
P-2025	No. 80 Tube Socket
P-1884	No. 42 Tube Socket
P-2022	No. 76 Tube Socket
P-1885	No. 6D6 Tube Socket
P-1637	Speaker Socket
P-40445	Tube Shield
P-40443	Tube Shield Base
P-1925	Speaker
P-10320	Glass Crystal
P-20875	Crystal Retainer Ring
P-2060	Knob, Small
P-2062	Knob, Large
P-10272	Rubber Chassis Cushion
P-20912	Large Double End Pointer
P-2101	Band Change Switch
P-2012	Pilot Light Bulb
P-20905	Condenser Shield
P-10369	8" Black Drive Cord (V. C. or T. C. Ind.)
P-10370	29" Black Drive Cord (Con. Drive)
P-2126	Pilot Light Socket and Clip Assem.
P-70702	Cord and Plug Assem.
P-30342	Grid Cap Only
P-1504	8 Lug Terminal Srip
P-1421	Single Lug Terminal Strip

Voltages

Check the voltages at the sockets to see if the power unit is delivering the correct voltages. The antenna and ground should be disconnected and the antenna and ground leads from the set connected together.

All of the D.C. voltage readings as shown on the chart are read with a 1,000 ohm per volt meter. As high a range as possible should be used. In general, the higher the resistance of the meter, the more accurate the reading will be.

The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition, with the volume at a minimum.

These voltages are typical of the sets but will vary slightly with variations in individual receivers and variations in tube characteristics. All voltages in the chart are taken with a line voltage of 115. Differences in line voltage as well as difference in test equipment used will introduce other variations in the voltage readings.

MODEL 5D Series
Schematic, Voltage
Parts

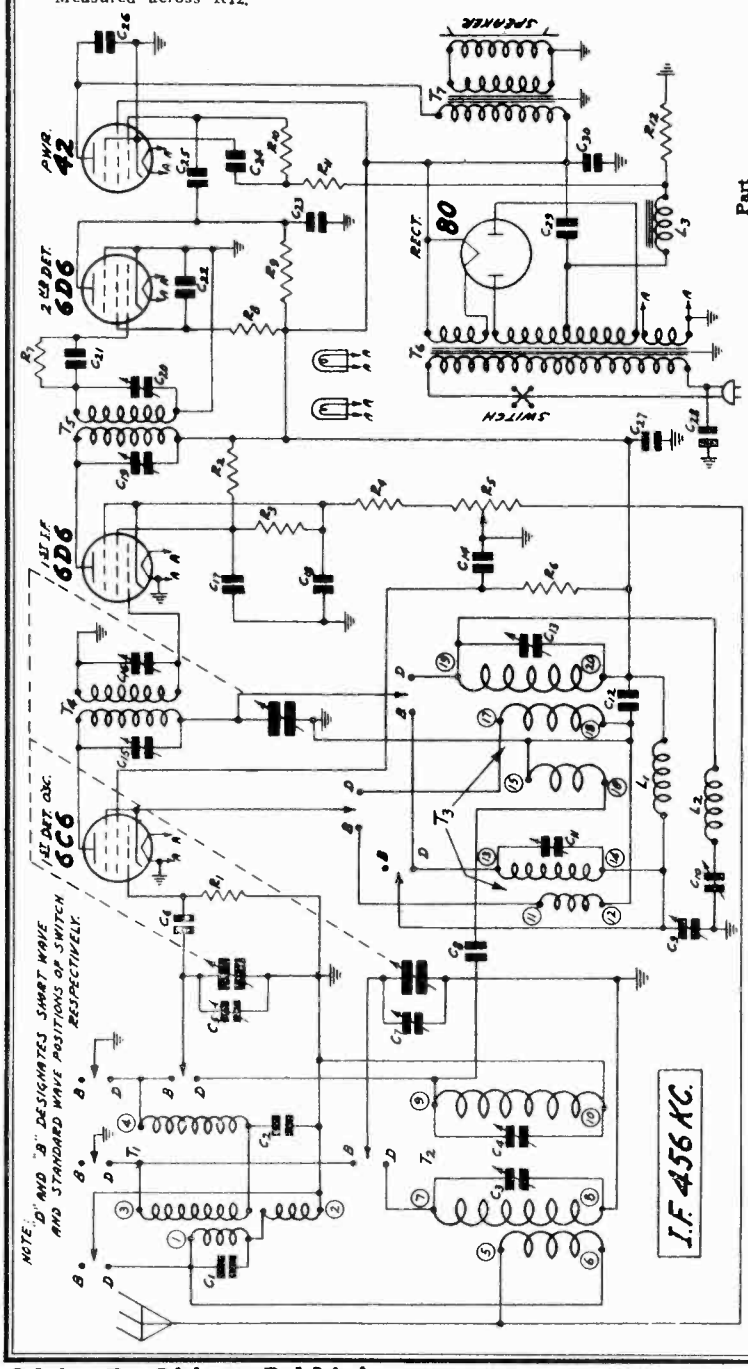
WELLS-GARDNER & CO.

VOLTAGES AT SOCKETS

Input - 115 Volts 60 Cycles Antenna Shorted to Ground

Type of Tube	Function	Across Filament or Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6C6	1st Det. & Osc.	6.3	250	175	4.0	8.8
6D6	I. F.	6.3	250	100	4.0	7.0
6D6	2nd Det.	6.3	35	26	0	1.1
42	Output	6.3	230	250	*20.0	28
80	Rectifier	5.0	—	—	—	32.0

Volume control in maximum position.
*Measured across R12.



Jan., 1935

Sensitivity

Standard Wave Band
600 KC — 15 microvolts absolute
1500 KC — 10 microvolts absolute

Short Wave Band
6 MC — 20 microvolts absolute
15 MC — 5 microvolts absolute

Part No.	Description	Code
P-5266	Std. Wave Ant. Coil Assem. Complete with Can	T1
P-5267	Short Wave Ant. Coil Assem. Less Can	T2
P-40451	Can for above Assembly	
P-5268	Oscillator Coil Assem. less Can	T3
P-40433	Can for above Assembly	
P-5265	Oscillator Plate Choke Coil	L1
P-5190	High Frequency Oscillator Tracking Coil	L2
P-5271	1st I. F. Coil Assembly. Complete with Can	T4
P-5272	2nd I. F. Coil Assembly. Complete with Can	T5
P-50667-5D	Output Transformer	T7
P-50661-5D	Power Transformer, 60 cycle, 115 volt	T6
P-50664	Power Transformer, 50 cycle, 230 volt	
P-50663	Power Transformer, 40-60 cycle, 115-230 volts	
P-50662	Power Transformer, 25 cycle, 115 volt	

Part No.	Code	Resistance	Wattage	Type
P-A94304	R1	300,000 ohm	.2W	Carbon
P-C94283	R2	28,000 ohm	1.0W	Carbon
P-B94303	R3	30,000 ohm	.5W	Carbon
P-B93261ww	R4	260 ohm	.5W	Flexible Wire Wound
P-96019	R5	16,000 ohm		Volume Control and Switch
P-B94603	R6	60,000 ohm	.5W	Carbon
P-A95205	R7	2 megohm	.2W	Carbon
P-A94504	R8	500,000 ohm	.2W	Carbon
P-B94104	R9	100,000 ohm	.5W	Carbon
P-A95504	R10	500,000 ohm	.2W	Carbon
P-A94104	R11	100,000 ohm	.5W	Carbon
P-98041	R12	400 ohm	2.5W	Flexible Wire Wound

Fig 3—Arrangement of Controls

CONDENSERS

Part No.	Code	Capacity	Voltage	Type
P-81817	C1	250 mmf.		Moulded
P-81076	C2	.05 mf.	200V	Tubular
P-2278	C3	2- 25 mmf.		Trimmer
P-2278	C4	2- 25 mmf.		Trimmer
	C5	Std. Wave	Ant.	Trimmer on Gang Cond. Assem.
P-81822	C6	35 mmf.		Moulded
	C7	Sh. Wave	Ant.	Trimmer on Gang Cond. Assem.
P-81824	C8	7 mmf.		Moulded
P-2263	C9	300-500 mmf.		Double Trimmer Cond. Assem.
	C10	40-100 mmf.		
P-2278	C11	Trimmer		(Std. Wave Oscillator Coil Sec.)
P-81129	C12	.05 mf.	400V	Tubular
P-2278	C13	Trimmer		(Sh. Wave Oscillator Coil Sec.)
P-81071	C14	.05 mf.	400V	Tubular
P-1386	C15	60-120 mmf.		Double Trimmer Cond. Assem. 1st I.F.
	C16	60-120 mmf.		
P-81134	C17	.25 mf.	200V	Tubular
P-81131	C18	.25 mf.	140V	Tubular
P-1386	C19	60-120 mmf.		Dbl. Trim. Cond. Assem. 2nd I. F.
	C20	60-120 mmf.		
P-81821	C21	35 mmf.		Moulded
P-81070	C22	.10 mf.	400V	Tubular
P-81072	C23	.002 mf.	600V	Tubular
P-81086	C24	.01 mf.	600V	Tubular
P-81086	C25	.01 mf.	600V	Tubular
P-81086	C26	.01 mf.	600V	Tubular
P-81135	C27	.10 mf.	400V	Tubular
P-81133	C28	.01 mf.	600V	Tubular
P-82004	C29	10.0 mf.	350V	Wet Electrolytic (Insltd. Mtg.)
P-82003	C30	8.0 mf.	300V	Wet Electrolytic (Grnded Mtg.)
P-82502		3 Section Gang Condenser		

Intermediate Frequency Adjustment

Set the signal generator for 456 KC. The antenna lead of the signal generator should be connected to the grid circuit of the 1st detector on the band switch side of the grid condenser, C6, thru a .05 mfd. condenser. There is a lead which connects the center stator of the tuning condenser and one of the terminals of the band switch. Connect the signal lead to this terminal on the band switch. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. The volume control should be at the maximum position.

Then adjust the four I. F. trimmer condensers until maximum output is obtained. The adjusting screws for the 1st I. F. trimmer condensers are reached thru the two holes at the righthand side of the rear panel of the chassis.

CAUTION—Use an insulated screwdriver for adjusting trimmers to prevent short circuiting to ground.

The adjusting screws for the 2nd I. F. trimmer condensers are reached from the top of the chassis and are in the round I. F. can—See Fig. 2. The openings to these trimmer condensers are covered over by a small cover plate which is held in position by a screw. Loosen this screw until the cover plate can be swung around.

Standard Wave Band Adjustment

The standard-short wave switch should be in the standard wave position. Set the signal generator for 1740 K C. Turn the rotor to the full open position. The antenna lead from the signal generator is in this instance connected to the antenna lead of the receiver. Adjust the oscillator standard wave trimmer until maximum output is obtained. This trimmer is on the underside of the chassis and its location is shown in Fig. 2.

Then set the signal generator for 1500 K C. Turn the rotor until maximum output is obtained. Loosen the set screws which secure the pointer extension shaft and set the pointer at the 1500 K C mark on the standard wave band scale. Retighten the shaft set screw. Then adjust the antenna and 1st detector standard wave trimmers until maximum output is obtained. These trimmer condensers are mounted on the tuning condenser. See Fig. 2.

Next set the signal generator for 600 K C and adjust the 600 KC padder, C9. The adjusting screw is reached through a hole in the right side panel of the chassis as shown in Fig. 2. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 600 K C padder screw until the highest output is obtained.

Short Wave Band Adjustment

CAUTION—After the standard wave band alignment as described above has been made, do not change the adjustment of any of the standard wave band trimmers.

In aligning the short wave band of the receiver, it will be noted that the signal will be heard with the signal generator set at two points 912 K C apart. That is, if the receiver is tuned to 15,000 K C a signal will be heard when the signal generator is set at 15,000 K C and again at approximately 15,912 K C. This is due to image reception or the fact that a 456 K C beat is obtained when the signal is 456 K C lower than the receiver oscillator and also when the signal is 456 K C higher than the receiver oscillator. Care should be taken to see that the receiver is tracked with the signal generator adjusted to the lower of the two frequencies at which a signal is heard, in order that the oscillator in the receiver will be 456 K C higher in frequency than the signal.

Turn the standard-short wave switch to the short wave position. Turn the rotor to the full open position. The volume control should be at the maximum position. Set the signal generator for 18,000 K C. Then adjust the oscillator short wave trimmer for maximum output. This trimmer is reached from under the chassis and its position is shown in Fig. 2. If a maximum output peak cannot be reached, it may be due to the fact that the antenna and 1st detector short wave trimmers are screwed down too far. Back off these two trimmer screws two or three turns and then adjust the oscillator short wave trimmer for maximum output.

Next set the signal generator for 16,500 K C. Turn the rotor until maximum output is obtained. Then adjust the antenna and 1st detector short wave trimmers for maximum output.

Next set the signal generator for 6000 K C and adjust the 6000 KC padder C10. The adjusting screw is reached through a hole in the right side panel of the chassis as shown in Fig. 2. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 6000 K C padder screw until the highest output is obtained.

Caution

The can of the wet electrolytic condenser C29 is not at ground potential. Therefore in any work on the chassis, care should be taken not to touch this can and any grounded point or to remove the cardboard shim separating the condenser and power transformer.

The oscillator stator section of the gang condenser is "HOT". It will be noted from the circuit diagram that the stator of the oscillator section of the gang condenser is in the plate circuit of the 6C6 1st detector-oscillator tube. Care should be taken, therefore, not to short this section to ground or to touch the section to any point of lower potential.

Twenty-five Cycle Receivers

The twenty-five cycle receiver differs from the sixty-cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

A 115-230 Volt, 40-60 cycle Power Transformer is also available for this model.

Replacing Glass Crystal

The glass dial crystal is held in place by means of four metal tabs which form a part of the dial ring. To remove the cracked or broken crystal, bend the upper two tabs back just far enough to enable removing the broken crystal.

Place the new crystal in the dial ring frame, putting it behind the lower two metal tabs, which are still in the correct position, and holding it firmly against the dial cushion ring.

BEND THE TOP TWO TABS OVER THE EDGE OF THE GLASS CRYSTAL JUST FAR ENOUGH TO PREVENT THE CRYSTAL FROM FALLING OUT OF THE FRAME. A crystal is very easily cracked by forcing the tabs over the edge of the glass.

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Item	Code	Ohms D.C.
5266	Double Tuned Antenna Std. W. Coil	T1	
	(1-2) Primary Windings in Series	T1	20.0
	(3-4) Secondary Windings in Series	T1	10.0
5267	Double Tuned Antenna Sh. W. Coil	T2	
	(5-6) Primary Winding	T2	0.2
	(7-8) 1st Secondary Winding	T2	Small
	(9-10) 2nd Secondary Winding	T2	Small
5268	Oscillator Coil	T3	
	(11-12) Std. W. Cathode Winding	T3	1.5
	(13-14) Std. W. Plate Winding	T3	3.0
	(15-16) Sh. W. Neutralizing Winding	T3	.43
	(17-18) Sh. W. Cathode Winding	T3	.53
	(19-20) Sh. W. Plate Winding	T3	Small
5271	1st I. F. Coil Primary	T4	12.65
	1st I. F. Coil Secondary	T4	12.75
5272	2nd I. F. Coil Primary	T5	12.65
	*2nd I. F. Coil Secondary	T5	12.75
50661	Power Transformer Primary	T6	7.0
	H. V. Secondary (Center tap to outside)	T6	197.0
	H. V. Secondary (Center tap to inside)	T6	187.0
	Tube Filament Secondary (A-A)	T6	Small
	Rect. Tube Fil. Secondary	T6	Small
50667	Output Trans. Primary	T7	565.0
	Output Trans. Secondary	T7	0.75
2258	Speaker Voice Coil		3.25
	Speaker Field Coil	L3	1100.0
5265	Oscillator Plate Reactor	L1	70.0
5190	Tracking Coil	L2	Small

Remarks Volume Control moveable arm should be disconnected from ground when measuring Antenna Coil primaries.
Band switch position should be in Std. W. when making Std. W. Ant. and Osc. coil measurements.
Band switch position should be in Sh. W. when making Sh. W. Ant. and Osc. Coil measurements.
*If measured from grid clip to ground, will include 2.0 meg. resistance. To get resistance value shown, measure from trimmer condenser rivet, which is plainly visible through hole in top of 2nd I. F. can, to ground.

Replacing Drive Cord

Remove chassis from cabinet.

Remove the tension spring and the old drive cord.

Do not remove the glass crystal or dial assembly.

Using the old cord as a sample, measure off very nearly the exact length of cord for this drive before proceeding to put it on the assembly. This length should be approximately 30¼ inches.

Turn the drive drum until the opening in this drum is approximately vertical and with the hole at the top as shown in Fig. 4. The condenser rotor plates should be in the completely open position.

See that the eyelet is in the hole in the drive drum as shown in Fig. 4. Insert one end of the new drive cord from the outside through the hole in the eyelet in the drive drum.

Tie the end of the cord which has been inserted in the hole to one end of the tension spring.

Wrap the cord in a clock wise direction (facing front of chassis) around the drive drum approximately one-fifth turn.

Then wrap the cord around back of the offset in the drive bracket as shown by the dotted lines in Fig. 4.

Bring this cord up from the drive bracket offset and wrap it around the drive drum approximately one-half turn in a clockwise direction until it is just past the eyelet in this drum as illustrated. Cross it over the other cord at this point, as shown in Fig. 4, and continue to wind it around the drive drum in a clockwise direction nearly one complete turn until it is again up to the eyelet in the drum as illustrated.

Now insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring.

Then tilt the chassis up on its back panel and pull the cord which was wrapped in back of the offset in the drive bracket down to the drive shaft. Wrap it two and one-third times around the drive shaft as shown in Fig. 4.

Now secure the other end of the tension spring over the spur on the drive drum with a pair of long nose pliers, grip the two ends of the cord just above the tension spring and pull down to take all slack out of the cord.

Replace the chassis in the cabinet.

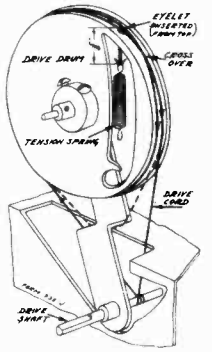
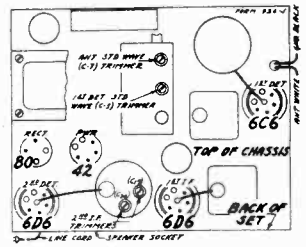


Fig. 4—*Drive Cord Replacement*

REPAIR PARTS LIST

When ordering parts be sure and give the part number. Also give the complete serial number which includes the Series No. and the large letter which is stamped at the left of the rear panel of the chassis base.

Part No.	Item
P-1637	Speaker Socket
P-1884	42 Tube Socket
P-1885	6D6 Tube Socket
P-1886	6C6 Tube Socket
P-2025	80 Tube Socket
P-40445	Tube Shields (Bottle Neck)
P-40443	Tube Shield Bases
P-20787	Line Cord and Plug Assembly
P-2258A	6" Dynamic Speaker
P-2060	Small Knob (Spring)
P-2133	Small Knob (Set Screw)
P-10272	Rubber Chassis Cushions
P-10157	Ferrules for mounting Trimmer Condenser
P-2266	2 Section Band Change Switch
P-2130	3 Lug Terminal Strip (2 Lugs Insltd)
P-2106	2 Lug Terminal Strip (1 Lug Insltd)
P-2170	2 Lug Terminal Strip (2 Lugs Insltd)
P-2286	2 Lug Terminal Strip (1 Lug Insltd - Gnd Lug Ext
P-20923	Gang Condenser Shield
P-10318	Rubber Mounting Cushions for Gang Condenser
P-20981	Pilot Light Bracket
P-2261	Long Drive Shaft Bracket and Bushing Assembly
P-20981	Drive Shaft
P-20339	Drive Shaft Lock Spring
P-39986	Small Double End Pointer
P-10377	Dial Cushion Ring
P-2265	Dial Strip
P-30480	Pointer Shaft
P-10373	Glass Crystal
P-2262	Dial Ring and Bracket Assembly
P-20840	Dial Drum
P-20900	Drive Tension Spring
P-10X7	32" Black Drive Cord
P-2126	Pilot Light Socket and Spring Clip
P-3012	Pilot Light Bulb (6-8V)



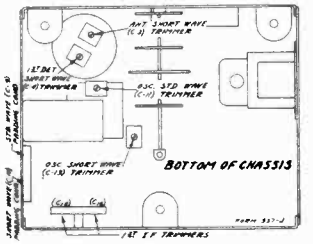
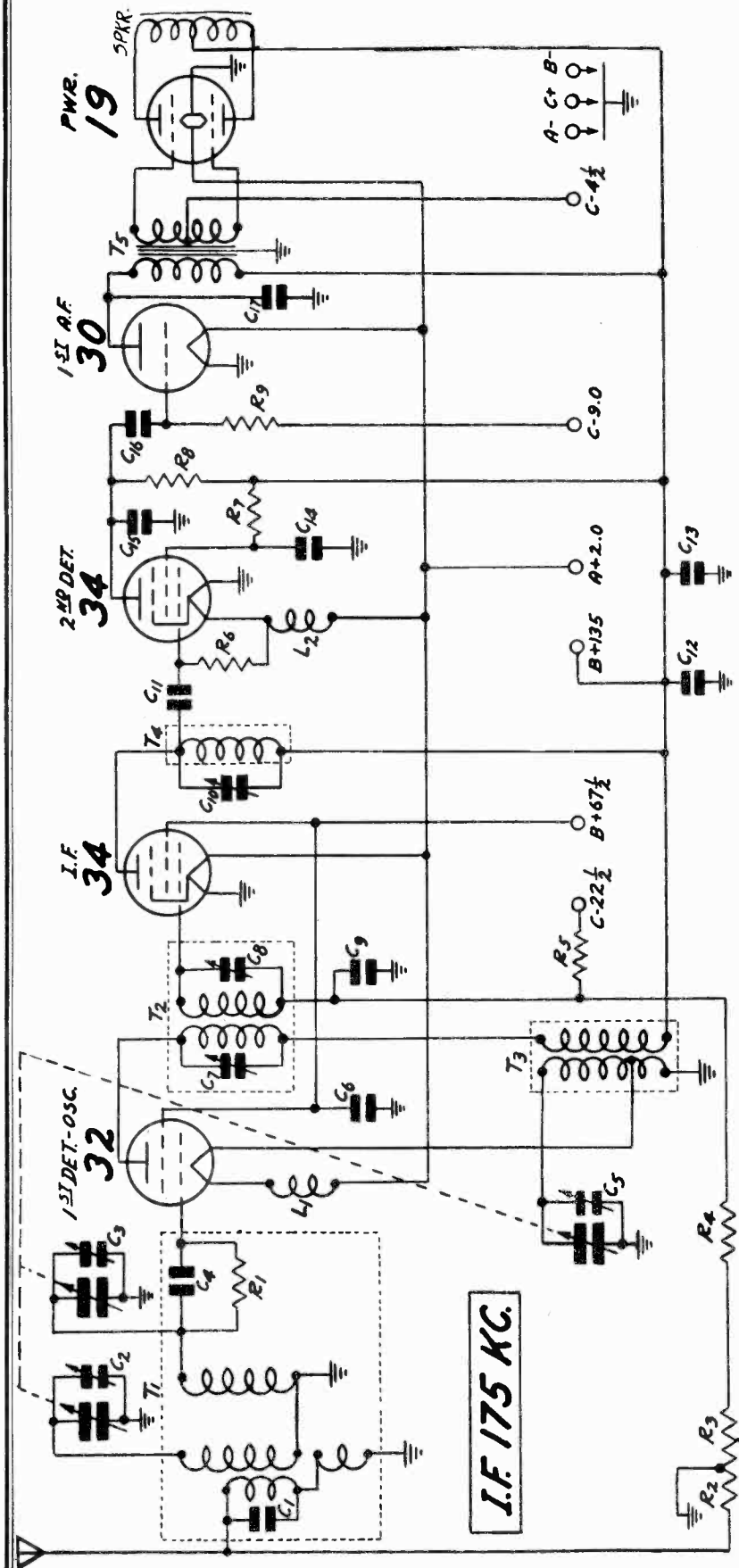


Fig. 2—*Tube Arrangement and Location of Trimmers*

MODELS 35G510, 35G560
Chassis 5G
Schematic

WELLS - GARDNER & CO.



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

C1 150 MMF MOULDED
C2 GANG TRIMMER
C3 GANG TRIMMER
C4 35 MMF MOULDED
C5 GANG TRIMMER
C6 .25 MF 180 V.
C7 40-100 MMF } DUAL
C8 20-70 MMF } (P-17A37)
C9 .05 MF 180 V.
C10 40-100 MMF (P-17A38)
C11 50 MMF MOULDED
C12 .10 MF 180 V.
C13 4.0 MF 150 V. ELECTROLYTIC (P-45X28)
C14 .10 MF 180 V.
C15 .002 MF 300 V.
C16 .006 MF 300 V.
C17 .002 MF 300 V.

R1 1.0 MEGOHM .2 W.
R2 10 000 OHM } VOLUME CONTROL (P-36X201)
R3 60 000 OHM }
R4 900 OHM .2 W.
R5 6 500 OHM .2 W.
R6 2.0 MEGOHM .2 W.
R7 100 000 OHM .5 W.
R8 40 000 OHM .5 W.
R9 1.0 MEGOHM .2 W.

L1 SINGLE FILAMENT REACTOR (P-9A281)
L2 SINGLE FILAMENT REACTOR (P-9A281)

T1 DOUBLE TUNED ANTENNA COIL (P-9A381)
T2 1ST I.F. COIL (P-9A383)
T3 OSC. COIL (P-9A382)
T4 2ND I.F. COIL (P-9A384)
T5 AUDIO INPUT TRANS. (P-50XII)

"A" Battery and Regulator

This receiver is designed to operate with a 2 volt storage cell, but may be operated with a 3 volt dry "A" battery if used with a voltage regulator. The receiver may also be used with an air cell "A" battery provided a series resistor is used.

3 Volt "A" Battery—The voltage regulator required with this type of battery as illustrated in Fig. 4 is not supplied with the receiver unless specified. This device consists of a rheostat which controls the voltage, a voltmeter for measuring its value as supplied to the receiver and a small push button switch for cutting the voltmeter in and out of the circuit. It has two prongs at the bottom which plug into the socket in the platform at the rear left corner of the chassis. The circuit diagram of the regulator is shown in Fig. 5.

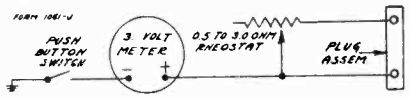


Fig. 5—Schematic Diagram of Voltage Regulator

The receiver is shipped from the factory with a jumper between the two socket connections and a fibre strip over the socket. This strip must be removed and the jumper taken out as illustrated in Figs. 6 and 7 before the regulator can be inserted as shown in Fig. 4. The jumper is in the "A+" line.

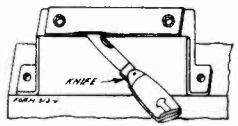


Fig. 6—Prying off Fiber Cover

When a new 3 volt "A" battery is inserted, the adjusting knob must be turned to the left hand position and then turned up until the voltmeter indicates 1.9 to 2 volts. The push button must be held in until the adjustment is completed. **Caution the user never to operate the receiver with the adjustment beyond 2 volts.**

Air Cell "A" Battery—If an air cell "A" battery is used, a series resistor will be required to reduce the voltage to the proper level of 2 volts for the tube filaments. Although the voltage regulator mentioned above can be used, the series resistor is cheaper and is satisfactory as the voltage of one of these batteries drops very little during the useful life of the battery

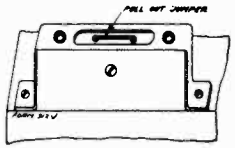


Fig. 7—Removing Jumper Wire

Replacing Drive Cord

Remove chassis from cabinet.

Take off the pointer by removing the screw at the center of the dial.

Remove the dial by taking out the six rivets from the dial assembly.

Remove the on-off indicator dial by pulling it forward.

With the condenser plates in a completely open position, slip the new drive cord thru hole "A" (from the front) in the drive drum. See Fig. 9.

Pull the cord thru this hole far enough to tie a knot near the end. Make this knot large enough so that it will not pull back thru the hole.

Slip the opposite end of the drive cord thru hole "B" of the drive drum.

Now slip the piece of fine tubing (about ¾" long) over the drive cord and insert about half of this tubing into hole "B" as shown in the illustration. This is important to prevent the cord from being cut.

Bring the drive cord down to the drive shaft and wrap the cord in a clockwise direction about two and one-half times around this shaft, progressing toward the front.

Bring the cord up from the drive shaft and wrap it around the drive drum approximately one and one-half times in a clockwise direction, progressing toward the front until the cord is up to the turned-in portion of the flange "C". See Fig. 9.

Pull the cord tight and tie the end of the cord to the tension spring as shown in the illustration. The knot should be at the bend in the flange so that the spring will be under sufficient tension to prevent the drive cord from slipping.

Now, by applying a little tension on the spring, hook the other end of the spring into hole "D" on the opposite side of the drum. Hook the spring from the inside (in later models hole "D" is replaced by a hook on the inside of the drive drum).

Turn the drive shaft back and forth several times to take out the slack and see if the drive is operating properly. *If the cord slips on the drive shaft, remove the spring from the drive drum and add an additional knot in the cord at the spring in order to put greater tension on the spring.*

Replace the on-off indicator dial, care being taken that the indicator is so placed that it will properly show the on and off positions.

Re-assemble the pointer and dial to the drive assembly. If the rivets are broken use No. 2 by ¼" long round head machine screws and nuts.

Testing Batteries

If the receiver does not operate satisfactorily test the batteries under load. A high resistance meter is required for the "B" and "C" voltages. If any of the batteries are considerably below their rated voltage, new ones should be used. When the "B" batteries are replaced the "C" batteries should also be replaced. The reason for this is that the "C" drain is such that the "C" batteries are run down in about the same time as the "B" batteries.

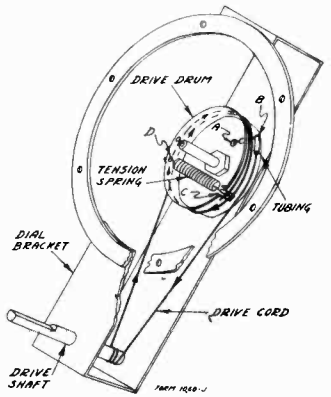


Fig. 9—Replacing Drive Cord

VOLTAGES AT SOCKETS
Volume Control at Maximum—Antenna Shorted to Ground. B+135 Volts Voltages to Chassis

Type of Tube	Function	Across Filament	Plate to Gnd.	Screen to Gnd.	Grid to Gnd.	Normal Plate M. A.
32	1st Det. & Osc.	2.0	135	67.5	7.5 (1) (2)	2.5
34	I. F.	2.0	135	67.5	2.5 (3)	2.8
34	2nd Det.	2.0	50	40 (1)	0	1.8
30	1st Audio	2.0	135		9 (4)	3.0
19	Output	2.0	135		4.5	3.2 Total

(1) With 250,000 ohm meter. (3) With 25,000 ohm meter.
(2) Subject to variation. (4) Read at "C" battery.

Alignment Procedure and Dial Calibration

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide accurately calibrated signals over the standard wave band and at the intermediate frequency and an output meter are required for indicating the effect of adjustments.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the antenna lead of the signal generator thru a .1 MF condenser to the coil end of the grid leak resistor R1. There is a lead which runs from the center tuning condenser stator to a lug at the bottom of the R. F. coil assembly. This connection can be made at the lug on the coil to which this lead is connected.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the volume control to the maximum position.

Then adjust the three I. F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 8.

As stated above, use a non-metallic screwdriver to make the adjustment.

1750 KC Adjustment

Set the signal generator for 1750 KC.

Turn the rotor of the tuning condenser to the full open position.

Connect the antenna lead of the receiver thru a 250 mmf. condenser to the output of the signal generator.

Keep the volume control at the maximum position.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained. The location of this trimmer is shown in Fig. 8.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

Dial Calibration

To obtain dial scale calibration tune in an 800 KC signal and set the dial pointer at that mark on the dial scale. When calibrated in this manner, the setting will be approximately correct at both ends of the scale.

SPECIFICATIONS

Input Voltages
"A" Battery - - - - - - 2 Volts (.5 Amperes)
"B" Batteries - - - - - - 67½ and 135 Volts
"C" Batteries - - - - - 4½, 9 and 22½ Volts
Power Output - - - - 1 Watt (Undistorted)

Sensitivity - - - - 15 Microvolts Absolute
Tuning Range - - - - - - 530 to 1750 KC
Intermediate Frequency - - - - - 175 KC
Speaker - - - - - - - - - 6" Magnetic

MODELS 35G510,35G560
Chassis 5G
Socket,Trimmers,Parts
Resistance Data

WELLS - GARDNER & CO.

Replacement Parts List

There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts please be sure to mention the model number and this large letter.

MISCELLANEOUS

Part No.	DESCRIPTION	Selling Price
P-3A64	Type 30 Tube Socket (4 Prong)	$ .06
P-3A65	Type 34 Tube Socket (4 Prong)	.06
P-3A133	Type 32 Tube Socket (4 Prong)	.06
P-3A110	Type 19 Tube Socket (6 Prong)	.06
P-13X212	Speaker Cable and Socket Assembly	.30
P-13X215	"B" and "C" Battery Cable	.40
P-13X66	"A" Battery Cable	.20
P-13X214	Antenna and Ground Lead Assembly	.14
P-12A217	5" Magnetic Speaker	2.84
P-12A218	8" Magnetic Speaker	3.16
P-17X7	Glass Crystal	.06
P-28X38	Crystal Retainer Ring	.04
P-10A32	Knobs	.10
P-2X38	Felt Washers (for use behind knobs)	.04
P-32X18	Tube Shield Base	.04
P-32X1	Tube Shields	.06
P-8X23	Rubber Chassis Mounting Cushions	.01
P-4A18	Lug Terminal Strip	.04
P-30X14	Grid Clip Only	.01

DIAL ASSEMBLY

Part No.	DESCRIPTION	Selling Price
P-15A36	Dial and Drive Assembly Complete	$1.30
P-5A28	Drive and Dial Bracket Assembly Only	.32
P-15X37	Indicator Disc and Hub Assembly Only	.12
P-26X203	Drive Shaft Only	.06
P-19X21	Horse Shoe Lockwasher for use on above shaft	.01
P-26X213	Pointer Shaft	.06
P-24X20	Drive Drum	.06
P-28X19	Tension Spring (used in drive drum)	.01
P-10X10	16" Black Drive Cord doz.	.12
P-10X11	10" Black Indicator Cord doz.	.08
P-29X20	Brass Collar and 6-32 x 3/16" Set Screw for securing above Indicator Cord to Shaft of Volume Control and On-Off Switch	.04
P-58X69	Dial Strip	.18
P-15X25	Double End Pointer	.04
P28X34	Indicator Spring	.04
P-19X43	Spring Washer	.04

Following are the D. C. resistances of the various windings in the chassis.

Part No.		Code	D. C. Resistance in Ohms
9A381	Double Tuned Ant. Trans. Pri. (in series)	T1	17.
	Double Tuned Ant. Trans. Sec. (Antenna)	T1	3.5
	Double Tuned Ant. Trans. Sec. (1st Det.)	T1	3.5
9A383	1st I.F. Trans. Primary	T2	80.
	1st I.F. Trans. Secondary	T2	105.
9A382	Oscillator Coil Cathode Winding	T3	2.
	Oscillator Coil Plate Winding	T3	7.
9A384	2nd I.F. Reactor Coil	T4	50.
9A281	Filament Reactor (In 1st Det. Ckt.)	L1	Small
9A281	Filament Reactor (In 2nd Det. Ckt.)	L2	Small
50X11	Audio Transformer Primary	T5	950.
	Audio Transformer Secondary (Center Tap to outside)	T5	600.
	Audio Transformer Secondary (Center Tap to inside)	T5	550.
12A217	Magnetic Speaker (Center Tap to outside)		290.
	Magnetic Speaker (Center Tap to inside)		250.

TRANSFORMERS AND COILS

Part No.	Code	DESCRIPTION	Selling Price
P-9A381	T1	Double Tuned Antenna Transformer Less Can	.80
P-42X23		Transformer Can for above Assembly	.08
P-9A383	T2	1st I.F. Transformer and Can Assembly	.96
P-9A382	T3	Oscillator Coil and Can Assembly	.48
P-9A384	T4	2nd I.F. Reactor Coil and Can Assembly	.84
P-50X11-5G	T5	Push Pull Audio Input Transformer	1.02
P 9A281	L1	Filament Reactor in 1st Det. Circuit	.12
P-9A281	L2	Filament Reactor in 2nd Det. Circuit	.12

RESISTORS

Part No.	Code	Resistance	Watts	Type	Selling Price
P-A95105	R1	1.0 Megohm	0.2	Carbon	.06
P-36X201	R2 R3	10,000 Ohms 60,000 Ohms		Dual Volume Control	.58
P-A94901	R4	900 Ohms	0.2	Carbon	.03
P-A94652	R5	6,500 Ohms	0.2	Carbon	.03
P-A95205	R6	2.0 Megohm	0.2	Carbon	.06
P-B94104	R7	100,000 Ohms	0.5	Carbon	.08
P-B94403	R8	40,000 Ohms	0.5	Carbon	.03
P-A95105	R9	1.0 Megohm	0.2	Carbon	.06

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	Selling Price
P-47X55	C1	150 mmf.		Moulded	.08
	C2	Antenna Trimmer—Part of Gang Condenser			
	C3	1st Det. Trimmer—Part of Gang Condenser			
P-47X53	C4	35 mmf.		Moulded	.06
	C5	Oscillator Trimmer—Part of Gang Cond.			
P-46X97	C6	.250 mf.	180	Tubular	.14
P-17A37	C7 C8	40-100 mmf. 20- 70 mmf.		1st I.F. Trimmer Cond.	.16
P-46X80	C9	.050 mf.	180	Tubular	.08
P-17A38	C10	40-100 mmf.		2nd I.F. Trimmer Cond.	.12
P-47X56	C11	50 mmf.		Moulded	.06
P-46X98	C12	.100 mf.	180	Tubular	.10
P-45X28	C13	4.00 mf.	150	Electrolytic	.40
P-46X96	C14	.100 mf.	180	Tubular	.10
P-46X111	C15	.002 mf.	300	Tubular	.14
P-46X112	C16	.006 mf.	300	Tubular	.08
P-46X111	C17	.002 mf.	300	Tubular	.14
P-14A38	3 Section Gang Condenser				1.80

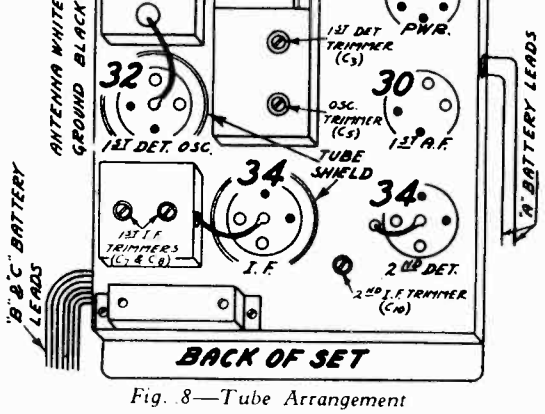


Fig. 8—Tube Arrangement

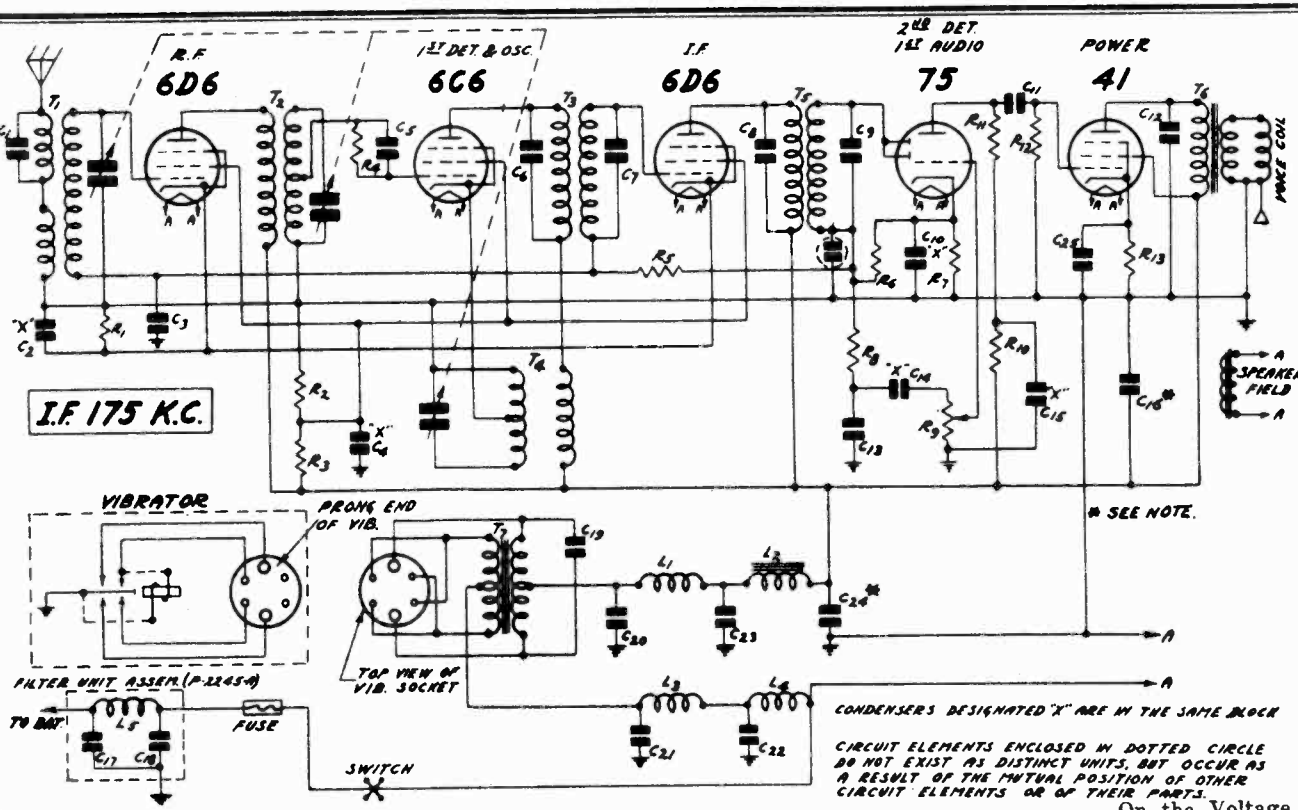


Fig. 1—*Schematic Circuit Diagram*

VOLTAGES AT SOCKETS

Input 6.3 Volts—Antenna Disconnected at Connector

Type of Tube	Function	Volts at Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6D6	R. F.	6.2	154	95	3.0	5.2
6C6	1st Det. & Osc.	6.2	160	97	0	3.0
6D6	I. F.	6.2	154	95	3.0	5.2
75	2nd Det. & 1st A. F.	6.2	110	—	1.	.25
41	Power	6.2	143	146	14.	13.0

On the Voltage Chart are given the voltages at the sockets with all tubes in and the set in operating condition. The antenna should be disconnected at the bavonet connector.

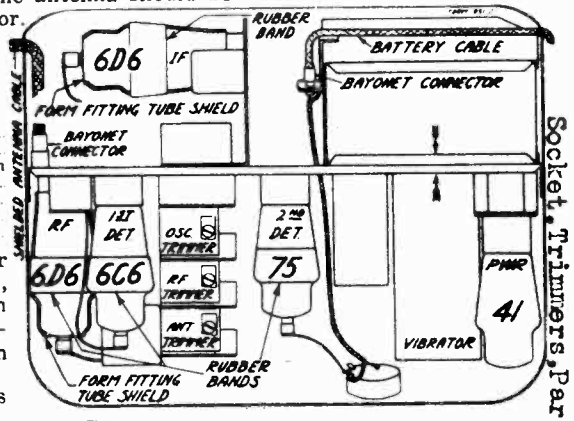


Fig. 2—*Location of Tubes and Vibrator*

CONDENSERS

Part No.	Code	Capacity	Voltage	Type
P-81814	C1	250 mmf.		Part of Antenna Coil Assembly
P-82600D	C2	.50 mf.	200V.	Bypass Block
	C4	.10 mf.	140V.	
	C10	.25 mf.	140V.	
	C14	.05 mf.	300V.	
	C15	.10 mf.	200V.	
P-81116	C3	.05 mf.	200V.	Tubular
P-81815	C5	.35 mmf.		Part of Grid Leak Assembly
P-81806	C6	70 mmf.		Part of 1st I. F. & Osc. Coil Assembly
	C7	70 mmf.		
P-81806	C8	70 mmf.		Part of 2nd I. F. Coil Assembly
	C9	70 mmf.		
P-81115	C11	.05 mf.	300V	Tubular
P-81114	C12	.006 mf.	600V.	Tubular
P-81814	C13	250 mmf.		Moulded
P-81132	C16	.10 mf.	300V.	Tubular
	C17	.01 mf.	120V.	In Choke Condenser Unit
	C18	.01 mf.	120V.	
P-81120	C19	.007 mf.	1600V.	Tubular
P-81122	C20	.10 mf.	300V.	Tubular
P-81121	C21	.50 mf.	140V.	Tubular
P-81816	C22	.002 mf.		Moulded
P-82002	C23	4.0 mf.	250V.	Dry Electrolytic Block
	C24	2.0 mf.	250V.	
	C25	4.0 mf.	25V.	
P-82500		Gang Condenser		

RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-B94351ww	R1	350 Ohm	.5	Flexible Wire Wound
P-B95253	R2	25,000 Ohm	.5	Carbon
P-B95103	R3	10,000 Ohm	.5	Carbon
P-A95105	R4	1 Megohm	.2	Carbon
P-A95105	R5	1 Megohm	.2	Carbon
P-A95504	R6	500,000 Ohm	.2	Carbon
P-A94752	R7	7,500 Ohm	.2	Carbon
P-A95104	R8	100,000 Ohm	.2	Carbon
P- 96017	R9	2 Megohm		Volume Control and Switch
P-A95503	R10	50,000 Ohm	.2	Carbon
P-A95204	R11	200,000 Ohm	.2	Carbon
P-A95504	R12	500,000 Ohm	.2	Carbon
P-B94801ww	R13	800 Ohm	.5	Flexible Wire Wound

In the first models of this receiver a bypass condenser block (P-82600) containing condensers: C2, C4, C10, C14, C15 and C16 was used. Condenser C16 was removed in the later models and added as a separate tubular condenser (P-81132) while the other condensers remained in the block (P-82600-D).

A second condenser change from the earlier models was in the electrolytic filter block (P-82002). In this block section C24 was changed from an 8 mfd., 250 volt to a 2 mfd., 250 volt condenser.

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide accurately calibrated signals over the standard wave band and an output meter are required for indicating the effect of adjustments.

First remove the cover of the box. Leave the antenna and battery cables connected to the chassis.

Disconnect the car antenna and connect antenna cable lead to the lead from the signal generator.

Set the signal generator for 1650 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator adjustment is connected to the antenna lead of the receiver. Adjust the trimmer of the oscillator section of the 3 gang condenser until maximum output is obtained. The oscillator section is the one with the cut plate rotor.

Now set the signal generator for 1400 K. C. and turn the rotor until maximum output is obtained. Adjust the other two trimmers on the gang condenser for maximum output.

To calibrate the receiver, tune in a station of known frequency at about the center of the dial. Remove the escutcheon plate and glass. The pointer is held in position by friction. Grasp the pointer at the center and turn it until it points to the frequency of the station being received.

The use of the cut plate type of condenser eliminates the necessity of a 600 K. C. padder and, therefore, no adjustment at this frequency is required.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 K. C. with the volume control about three-fourths on. Drop the chassis from the cover. The location of the antenna trimmer is shown in Fig. 2. Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

Removing Chassis From Case

First unsolder the black, brown, yellow, and green speaker leads which connect to the terminal strip adjacent to the vibrator unit. Next, notice the small length of braided shielding which is soldered to the solder lug that is secured to the chassis case between the dial scale and the right selector control shaft. Unsolder this shielding at the lug.

Remove the 4 screws which hold the chassis in the case — 2 are in the side and 2 on the speaker panel of the chassis case. (Do not remove the four speaker mounting screws.)

Remove the two control knobs by pulling them off of the shaft.

Next remove the volume control. To do this first loosen the hexagonal nut on the inside of the case with a flat wrench. Then unscrew and remove the round knurled nut from the front.

The chassis may then be taken out.

Replacing Vibrator Unit

The vibrator unit is plugged in in the same manner as a tube. This unit may, in case of failure, be readily replaced. CAUTION—Polarity, as explained in the label on the unit and in the label on the metal box in the chassis, must be observed when plugging in vibrator unit.

In replacing the vibrator unit be sure to replace the corrugated cardboard pad, which prevents the unit from working its way out of the socket.

When servicing this receiver, a new vibrator unit should be tried out in the same manner as a new set of tubes would be tried out.

One or more vibrator units should be kept on hand for replacement purposes.

Replacing Volume Control

To remove the volume control and the switch, first pull the knob from the volume control shaft. Next loosen the hexagonal nut on the inside of the case with a flat wrench. Then unscrew and remove the round knurled nut from the front.

The old volume control and switch connections may now be unsoldered and the new unit put in its place and the leads resoldered.

Fasten the volume control to the case in the reverse order in which it was removed.

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Item	Code	D.C. Resistance in Ohms
P-5247	Antenna Trans. Pri. in Series	T1	17.50
	Antenna Trans. Sec.	T1	5.25
P-5248	R. F. Interstage Trans. Pri.	T2	2.31
	R. F. Interstage Trans. Sec. (Center Tap to Inside)	T2	3.23
	R. F. Interstage Trans. Sec. (Center Tap to Outside)	T2	3.98
P-5249	1st I. F. Trans. Primary	T3	100.00
	1st I. F. Trans. Secondary	T3	100.00
	Oscillator Cathode Coil (Total)	T4	4.50
	Oscillator Plate Coil	T4	9.00
P-5250	2nd I. F. Trans. Pri.	T5	100.00
	2nd I. F. Trans. Sec.	T5	100.00
P-50656	Power Trans. Pri.	T7	0.36
	Power Trans. Sec.	T7	860.00
P-5174	"B" R. F. Choke.	L1	1.65
P-50657	Power Choke	L2	390.00
P-5251	"A" Choke	L3	Small
P-5253	Line Choke	L4	Small
P-5252	Choke Coil	L5	Small
P-2228	Output Trans. Pri.	To	690.00
	Output Trans. Sec. and Voice Coil in Par.		0.80
	Speaker Field		6.00

When ordering parts be sure and give the part number. Also give the complete serial number which includes the Series No.

Part No.	Item
P-1883	6H6 Tube Socket
P-1886	6C6 Tube Socket
P-1775	75 Tube Socket
P-1911	41 Tube Socket
P-5247	Antenna Coil Assembly Less Can
P-40415B	Can for above assembly Part of Gang Condenser Assembly
P-5248	R. F. Interstage Coil Assembly Less Can
P-40447C	Can for above assembly Part of Chassis Assembly
P-5249	1st I. F. and Oscillator Coils and Can Assembly
P-5250	2nd I. F. Coil and Can Assembly
P-2228	Dynamic Speaker
P-10359	Cardboard Baffle for Speaker
P-2229	Vibrator Unit
P-3030	Vibrator Socket
P-50656	Power Transformer
P-5251	R. F. "A" Choke Coil
P-5174	R. F. "B" Choke Coil
P-50657	Power Choke Coil Assembly
P-5253	Filament Choke Coil
P-2220	2 Half Tube Shields with Clamping Ring
P-2240	Grid Leak and Condenser Assembly
P-2224	Knobs
P-20960	Thumb Screws
P-10356	Glass Crystal
P-10361	Gasket for Glass Crystal
P-30342A	Grid Clip only
P-10213	Wide Rubber Bands for Tubes
P-70774	Shielded Antenna Cable
P-70781	"A" Battery Cable
P-1421	Single Lug Terminal Strip
P-3082	Double Insulated Terminal Strip
P-2232	Five Lug Terminal Strip
P-1931	Cinch Terminal Lug
P-20701	Drive Tension Spring
P-20963	Horse-shoe Lock (Washer)
P-2227	Dial Strip
P-39954	Dial Pointer

Replacing Drive Cord

The drive cord in this receiver may be replaced as follows:

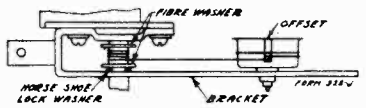


Fig. 3—*Cord Drive—Top View*

First remove the chassis from the case as explained on page 4.

Some of the first models did not have two fibre "end" washers on the drive shaft to protect the drive cord as shown in Fig. 3. If this is the case, these washers should be put on as follows:

Separate and take off the horse-shoe lock washer which holds the drive shaft in position. This may be done with a fine jawed, long nose plier.

Now pull the drive shaft out just far enough to permit the two fibre washers to be slipped over the end of the shaft.

Then slip the shaft back into place and replace the horse-shoe lock washer.

Knot one end of the new drive cord and with the condenser plates in a completely closed position, slip the drive cord through the small hole "A" in the drive drum — see Fig. 4. The knot will then be on the inside of the drum.

Now wrap the cord around the lower half of the drive drum as indicated and bring it up to the drive shaft Proceed by wrapping it in a clockwise direction (from front) around the drive shaft three and one-quarter turns between the two fibre washers, progressing towards the front of the chassis. Be sure that the condenser plates are kept in a closed position and that the cord is held tight.

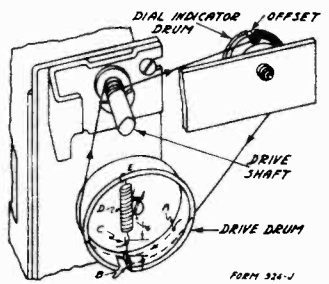


Fig. 4—*Cord Drive Replacement*

Set the dial indicator drum so that the offset is at the top or a little to the right of the center — see Fig. 4.

Wrap the cord from the drive shaft once around the offset in the dial indicator drum and then approximately one and one-half turns around the drum itself in a clockwise direction, progressing toward the back.

From the dial indicator drum draw the cord over the lower right hand quarter of drive drum as shown in Fig. 4.

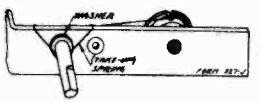


Fig. 5—*Drive "Take-up" Spring*

Then bring the cord inside of the drum by way of the turned-in portion of the flange at "B".

Tie the drive tension spring "D" to the loose end of the cord at the point "C" just above the top edge of the lip "B" as shown in the illustration. This should be done so that the lower hook of spring "D" at point "C" will be between ⅛" and ⅜" from top edge of the turned-in portion of the flange "B" in the flange of the drive drum. After the spring is hooked and the drive turned over several times the tension in the cord will cause this distance to become about ¼".

Now, by applying a tension on the drive spring "D", hook the other end of the spring into the small hole "E" near the top of the drive drum. Hook spring from the inside out.

After the cord has been put on it may be necessary to calibrate the receiver as explained in the article on condenser alignment.

All of the earlier models did not have drive shaft "take-up" springs. This spring will prevent any tendency toward change of setting should the receiver be subjected to vibration. To insert these springs and fibre washers on the drive shaft proceed as follows:

Remove the station selector knob by pulling it off of the shaft.

Slip the small fibre washer over the shaft and clip the "take-up" spring to the drive bracket as shown in Fig. 5.

The chassis may now be replaced into the case in the reverse order of the manner in which it was removed.

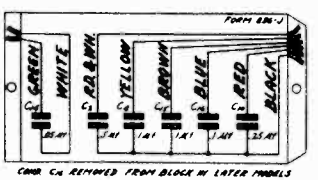


Fig. 6—*Condenser Block Internal Wiring*

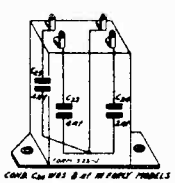


Fig. 7—*Electrolytic Block Internal Wiring*

WELLS-GARDNER & CO.

MODEL 25Y1
Chassis 5Y
Mounting Notes

Mounting the Receiver

The receiver is mounted by first securing the cover to the car body. The two slots in the chassis box proper are then slipped over the two hooks on the cover (see Figs. 2 and 3) and the chassis is then secured to the cover by means of the four screws provided.

The complete receiver should be held in position in the tentative locations to determine if there is space available. After a location is chosen, the cover may be removed and held in position to see if it can be attached to the car supports.

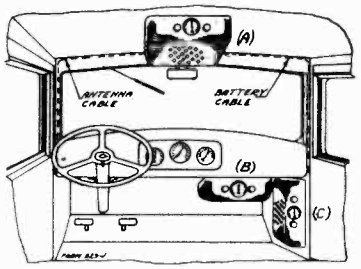


Fig. 1—General Mounting Positions

Top Mounting

The top mounting or securing of the receiver to the roof of the car is the method of attachment for which this receiver is primarily designed—see Fig. 1 (A). The receiver is very low in height and will mount in back of the car header without obscuring front or rear vision. Less difficulty will be experienced with ignition noise when the set is mounted in this position.

The best position for the receiver is at the center of the header as shown in the illustration, as the controls will then be accessible to the person in either front seat. If mounted at the left side of the header (facing forward) the controls will, of course, be more accessible to the driver. The best position on the header at which to mount the set will be determined in many cases by car devices, including sun visor, rear vision mirror mounting, windshield wiper control, etc.

In Figs. 2 and 3 are shown the details of the roof mounting.

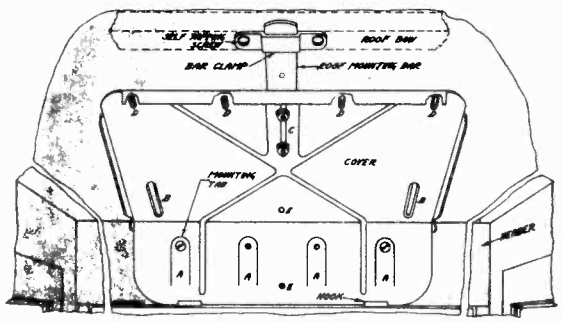


Fig. 2—Mounting Cover to Car Roof

First remove the cover from the box by taking out the four cover screws. The cover may then be removed from the chassis box.

In most cases the cover will be secured to the header of the car and one of the roof bows. The method of fastening it to the bow will depend on the location of the bow. In general it will be necessary to attach the roof mounting bar to the cover at slot C, as shown in Fig. 2. Two 8-32 screws, nuts and lockwashers are provided for this.

Use the holes in the bar which allow it to extend only to the roof bow. As shown in the illustration, the bar is held in position at the bow by means of the bar clamp which is screwed to the bow. If the bar extends beyond the clamp, it may, in some cases, have to be cut off. Two No. 8 screws and lockwashers are provided with the bar clamp. These are self tapping and may be used in either wood or metal. Drill 7/64 inch holes (No. 35 drill) for these screws. Do not deviate more than .005 inch. *Care should be taken not to drill through the car roof.*

If there is a roof bow over slots C or D, it will not be necessary to use the roof mounting bar. Any two of the slots D may be used. If the roof bow is curved, do not tighten the screws through slots D enough to bend the cover. Should it be necessary to use slot C, only one screw is then used.

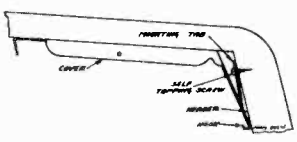


Fig. 3—Mounting Cover to Car Roof - Side View

For attachment to the header, two or more of the mounting tabs A shown in Fig. 2 may be employed. If the angle of the header from the perpendicular is less than the angle of the back of the cover, the mounting tab may be bent as shown in Fig. 3 to fit tightly against the header. No. 8 screws and lockwashers are provided. These are self tapping screws and may be used in either wood or metal. Drill 7/64 inch holes (No. 35 drill) for these screws.

In some cases it may be desirable to mount the set away from the header in order to clear car devices. This can be done if there is a roof bow near the header which coincides with slots B. Use the self tapping screws and lockwashers mentioned above. If the header is of cardboard construction it may be necessary to secure the set in this manner.

Before reassembling the receiver to the cover, refer to the articles, "Attaching the Cables" and "Trying Out the Set and Adjusting."

Instrument Panel Mounting

If top mounting cannot be used the receiver may be mounted to the instrument panel as shown in Fig. 1 (B). In general it will be mounted at the right side (facing forward) in order to clear car controls.

Details of this method of mounting are shown in Fig. 4. First remove the cover as explained under "Top Mounting." Then attach the curved bracket to the cover as shown in Fig. 4. Holes E are used—see Fig. 2. Two 8-32 machine screws, nuts and lockwashers are provided. Reassemble the cover to the chassis box.

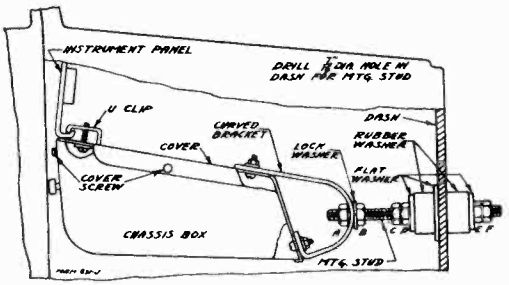


Fig. 4—Details of Instrument Panel Mounting

Next hold the complete receiver in position under the instrument panel and determine the best mounting position. Consideration should be given to leg room and interference with car controls, including gear shift and hand brake levers, cowl ventilator, glove compartment hinges, etc. Consideration should also be given to whether a hole can be drilled in the dash for the mounting stud at the location chosen.

Another matter to consider is the angle of the front of the box. In general this angle will be less than the angle of the instrument panel—see Fig. 4. The angle of the front of the box should be such that the dial scale can be easily seen. On the other hand the box should not be down so far at the back that leg room will be materially reduced.

The next step is to locate the mounting stud hole. The vertical position of this hole can vary because of the curved bracket. The horizontal position, however, must be more accurately determined. Place a short pencil or pointed tool through the slot in the curved bracket and mark the dash at the point closest to the bracket. This point should line up with the center line of the chassis box.

Drill a 7/16 inch hole through the dash at this point, care being taken not to drill through any car apparatus, such as vacuum tanks, etc.

Then, again remove the cover. Next, assemble the mounting stud to the curved bracket and to the dash loosely, putting the parts on as shown in Fig. 4.

Most cars of the later models have a bead or upturned edge at the back of the flange on the bottom of the instrument panel, as illustrated. If this is the case the front end of the cover is secured to the flange by means of holes D (see Fig. 2) and two U clips, as shown. Two 1 inch 10-32 machine screws and lockwashers are provided. The U clips are tapped.

If the bottom of the instrument panel is straight, the two outer holes D may be used. If the bottom is curved or offset, use any two of the holes D which will not bend the cover. In some cases spacers may be necessary.

In some cars the flange of the instrument panel is flat. In a case of this kind it will be necessary to drill the flange. The front of the cover is then held in position by extending the two No. 10-32 machine screws through holes D and through the two holes drilled in the flange. The same conditions as mentioned above govern the choice of the two holes D. If the set is mounted at the extreme right, it may be necessary to tap the holes in the flange as it is difficult to hold a nut in position.

Next, tighten up the stud mounting. First raise the cover to the desired position. Turn down nut D (see Fig. 4) until it is snug. Then tighten nut C with a wrench. Next tighten down nuts E and F in the same manner. Make final adjustment of the cover position and tighten nuts A and B.

Before reassembling the receiver to the cover, refer to the articles, "Attaching the Cables" and "Trying Out the Set and Adjusting."

Side Mounting

In extreme cases it may be necessary to use side mounting as shown in Fig. 1 (C). In most cars the receiver will be mounted on the right side but can also be mounted on the left if it clears the clutch pedal or other car devices.

The cover is secured to the corner post by using two of the D holes (see Fig. 2). Two self tapping screws and lockwashers are provided. Drill two 7/64 inch holes (No. 35 drill). Longer wood screws may be used if the screws supplied with the receiver are not of sufficient length to get a secure hold in the wood.

The mounting stud is secured to the dash as explained in "Instrument Panel Mounting." In this method of mounting it will be necessary to turn the dial scale 90 degrees as explained in the article on adjustments.

Miscellaneous Mounting

Certain other positions may be used for this receiver, depending on the space available and the construction of the car body. Among these may be mentioned: back of the front seat, between the two front seats, and the shelf in back of the seat in a Coupe.

Attaching the Cables

Top Mounting

Five foot antenna and battery cables are supplied. These may be cut to length if they are too long.

Antenna Cable—This cable is connected at the chassis by means of a bayonet connector in the chassis box as shown in Fig. 5. If the car has a built-in antenna, the lead-in is usually brought to a point under the cowl and it will be most convenient to bring the antenna cable from the receiver down to this location to make the connection.

As illustrated in Fig. 1 (A), this cable is secured along the edge of the car roof, and then brought down the corner post. In many cars it can be concealed behind the header or under the trim and may be run down inside of the corner post, if the latter is hollow.

In Fig. 1 the antenna cable is shown on the left side as it is brought out of this side of the chassis and the antenna lead-in is usually on this side. However, if the latter is on the right side, the antenna cable can be crossed over the top of the chassis and brought down the right corner post.

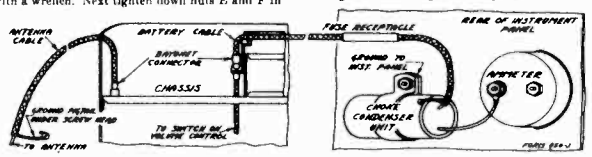


Fig. 5—External Wiring Connections

Connect the antenna wire to the lead-in wire from the antenna. *Ground the pigtail of the antenna cable shield at the antenna end to a nearby convenient ground.* Keep the antenna cable as high as possible and as far away from any car wiring as possible.

The unshielded portion of the antenna lead-in may be responsible for interference pick-up, and it may therefore, in some instances, be necessary to extend the antenna shield as shown in Fig. 6. Any coiled up and excess length of the lead-in from the car antenna should be cut off, and after it is connected to the shielded lead from the receiver, should be tucked back into the corner post so that only the shielded portion will be exposed.

When it is necessary to install an antenna in the car roof, the antenna cable can be connected directly to the roof antenna without being brought down the corner post.

Battery Cable—The battery connection is made at the ammeter. The battery cable is secured to the edge of the car roof and brought down the front corner post in the same manner as described above for the antenna cable. In Fig. 1 this cable is shown on the right side. If the ammeter is on the left side, this cable may be crossed over the top of the chassis and brought down the left corner post.

The battery cable is made up of two portions which are joined together by the fuse receptacle. The long portion of the cable is connected by the bayonet connector at the chassis as shown in Fig. 5. The short portion of this cable has a choke condenser connected to it. This unit is mounted on the back of the instrument panel and is grounded by means of its mounting clamp under a convenient screw-head or nut. *Clean the contact surfaces before attaching the clamp as this must be a good ground.*

When the receiver is top mounted, the battery cable shield should also be grounded to the car body at a point as close to the chassis as possible. Use a small piece of braided shielding for this.

If the battery cable is not long enough, extend the unshielded lead between the choke condenser unit and the ammeter.

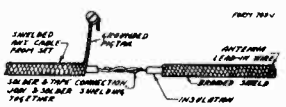


Fig. 6—Extension of Antenna Cable Shield

Instrument Panel Mounting

Antenna Cable—Connect the cable lead to the lead-in from the antenna in the same manner as described for top mounting. Keep this cable as high as possible and as far away from car wiring as possible. *Ground the pigtail of the antenna cable shield at the antenna end.*

In some cases the shielded antenna lead from the receiver is not long enough to reach to the column at which the antenna lead-in comes down. Ignition interference may be picked up by the unshielded portion and it may be necessary to extend the shielding of this lead. To do this, cover the lead from the antenna with braided shielding and push this shielding as far up in the corner post at which this lead comes down, as possible. The antenna lead wire should be covered with heavy insulation such as loom to properly separate the shielding from the wire. Connect the two wires together and connect the two shields together, care being taken that no strand of the shield touches the antenna wire—see Fig. 6.

Battery Cable—This lead is connected in the same manner as described for top mounting.

MODELS 26B1, 26B5
Chassis 6B
Schematic, Socket
Parts. Data

WELLS-GARDNER & CO.

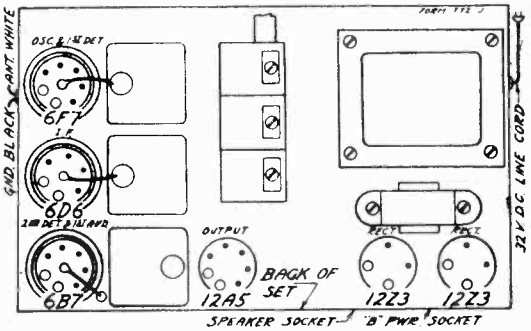


Fig. 2—Arrangement of Tubes

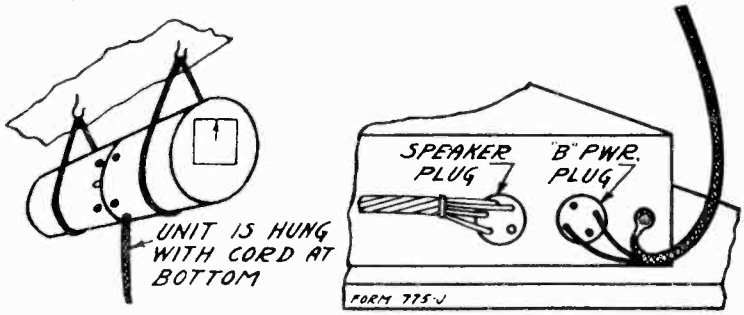
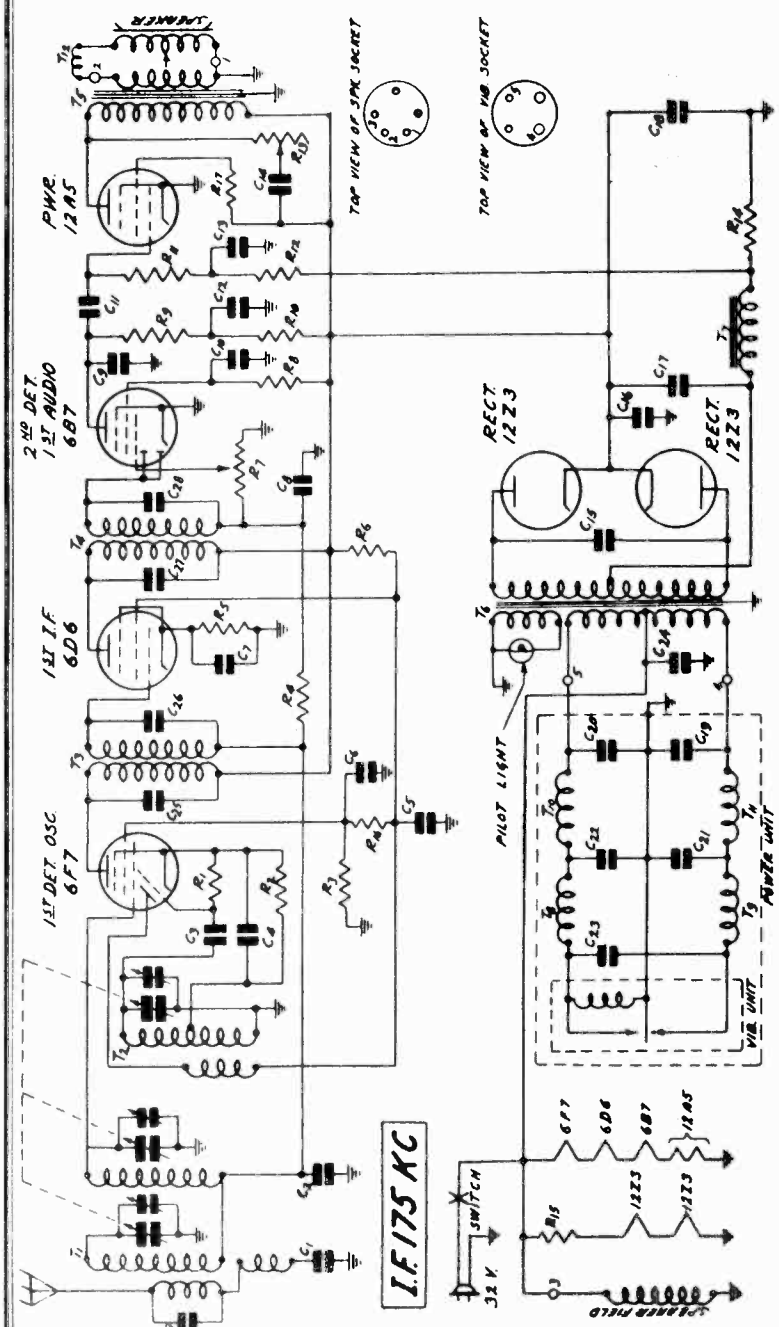


Fig. 3—Method of Installing "B" Power Unit



The numbers on the 2 sockets shown at the right above, correspond with the numbers as shown in the circuit.

Fig. 1—Schematic Circuit Diagram

CONDENSERS

Part No.	Code	Capacity	Voltage	Type
P-80862	C1	.05 Mf.	200V	Tubular
P-80862	C2	.05 Mf.	200V	"
P-81801	C3	35 Mmf.		Wire Capacitor Part of Osc. Assem
P-80862	C4	.05 Mf.	200V	Tubular
P-80888	C5	.25 Mf.	200V	"
P-81049	C6	.05 Mf.	200V	"
	C7	.05 Mf.	200V	"
P-81811	C8	100 Mmf.		Wire Capacitor
P-81051	C9	.002 Mf.	600V	Tubular
P-80888	C10	.25 Mf.	200V	"
P-80872	C11	.01 Mf.	600V	"
P-80888	C12	.25 Mf.	200V	"
P-81062	C13	.01 Mf.	140V	"
P-81055	C14	.05 Mf.	400V	"
P-81052	C15	.015 Mf.	1600V	"
P-80887	C16	.10 Mf.	400V	"
P-81016	C17	8.0 Mf.	300V	Electrolytic Block
	C18	8.0 Mf.	300V	"
P-80993	C24	.5 Mf.	140V	Tubular
P-81806	C25	70 Mmf.		Wire Capac. Part of 1st I.F. Assem.
P-81804	C26	45 Mmf.		Wire Capac. Part of 1st I.F. Assem.
P-81808	C27	90 Mmf.		Wire Capac. Part of 2nd I.F. Assem.
P-81810	C28	100 Mmf.		Wire Capac. Part of 2nd I.F. Assem
P-81812	C29	200 Mmf.		Wire Capac. Part of Ant. Assem.
P-81015				Three Gang Condenser

RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-A95104	R1	100,000 Ohm	.2	Carbon
P-A95152	R2	1,500 Ohm	.2	Carbon
P-B94303	R3	30,000 Ohm	.5	Carbon
P-A982[illegible]	R4	2 Megohm	.2	Carbon
P- 98021	R5	400 Ohm	.2	Wire Wound
P-C93702	R6	7,000 Ohm	1.0	Carbon Control
P- 96014	R7	500,000 Ohm		Volume Control
P- B94204	R8	200,000 Ohm	.5	Carbon
P- B94603	R9	60,000 Ohm	.5	Carbon
P- A95203	R10	20,000 Ohm	.2	Carbon
P- A95504	R11	500,000 Ohm	.2	Carbon
P- A94104	R12	100,000 Ohm	.2	Carbon
P- 97011	R13	150,000 Ohm		Tone Control
P- 98035	R14	450 Ohm	2.0	Wire Wound
P- 98034	R15	25 Ohm	3.0	Wire Wound
P- B95602	R16	6,000 Ohm	.5	Carbon

Oct, 1934

WELLS-GARDNER & CO.,

MODELS 26B1,26B5
Chassis 6B
Voltage,Circuit Data
Resistances, Parts

Circuit

This receiver is designed to operate from a power supply source of 32 volts D. C. Six and twelve volt tubes are used. The heaters of these tubes are connected in series across the 32 volt line as shown in Fig. 1. As shown in this illustration, the heaters of the 6F7, 6D6, 6B7 and 12A5 tubes are in one series while the heaters of the two 12Z3 tubes and a 25 ohm resistor are in another series across the 32 volt line. A third connection across the line consists of the speaker field winding. A vibrator unit is used to provide the necessary high voltage which is rectified by the two 12Z3 tubes and then filtered for use in the plate and screen circuits.

A pre-selector stage incorporating two tuned circuits is used. These circuits provide pre-selection of the desired R. F. signal and have a high image rejection ratio. The signal from the pre-selector stage actuates the control grid of the pentode of the 6F7 tube. The latter is a pentode triode tube with the pentode being used as the 1st detector and the triode as an oscillator.

The oscillator circuit is tuned by the cut plate section (section closest to back of chassis) of the gang condenser, and is always resonant at 175 K. C. above the frequency to which the R. F. circuits are tuned. The oscillator potential is fed into the cathode circuit of the 6F7 tube. This results in the intermediate or beat frequency of 175 K. C. being present in the pentode plate circuit of this tube.

One stage of I. F. amplification is employed using a 6D6 tube. Fixed condensers tune the primaries and secondaries of the 1st and 2nd I. F. transformers.

A 6B7 tube is employed as the 2nd detector, A.V.C. tube, and one stage audio amplifier. A.V.C. voltage is applied to the grid circuits of the 1st detector and I. F. tubes. The audio voltage developed across volume control resistor R7 is applied thru the movable arm to the control grid of the pentode section of the 6B7 tube. Resistance coupling is used between the first audio and output stage which employs a 12A5 tube. A dynamic speaker is used.

The receiver uses 1.56 amps. at 32 volts input.

The maximum undistorted power output is 1.5 watts, measured with a load impedance of 4000 ohms.

Sensitivity

600 K. C.—25 microvolts absolute.
1500 K. C.—15 microvolts absolute.

D. C. RESISTANCE OF WINDINGS

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Item	Code	D. C. Resistance in Ohms
P-5300	Primaries of Antenna Trans. in Series	T1	Small
	1st Secondary of Antenna Transformer	T1	3.2
	2nd Secondary of Antenna Transformer	T1	2.4
P-5202	Oscillator Plate Coil	T2	2.0
	Oscillator Grid Coil	T2	3.5
P-5221	1st I. F. Transformer Primary	T3	67
	1st I. F. Transformer Secondary	T3	93
P-5203	2nd I. F. Transformer Primary	T4	63
	2nd I. F. Transformer Secondary	T4	63
P-50624	Output Transformer Primary	T5	243
	Output Transformer Secondary and Bucking Coil in Series	T5 & L12	Small
P-50637	"B" Filter Reactor	T7	300
P-2147	Speaker Field		97
P-2173	Speaker Voice Coil		Small
P-50626	Power Transformer Primary	T6	
	Center Tap to Inside	T6	3.6
	Center Tap to Outside	T6	4.4
	Power Transformer H. V. Secondary	T6	
	Center Tap to Inside	T6	322
	Center Tap to Outside	T6	350
	Power Transformer Pilot Lamp Sec.	T6	.3
P-2153	Vibrator Unit Magnetizing Coil		1025
	Vibrator Unit Filter Chokes		3.0

VOLTAGES AT SOCKETS

Input 32 Volts—Antenna Shorted to Ground

Type of Tube	Function	Across Filament	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6F7	1st Det. & Osc.	6.3	167(1)	90	2.6	7.0(1)
			117(2)		0	2.8(2)
6D6	I. F.	6.3	172	120	3.2	8.2
6B7	2nd Det.	6.3	25	25	7.25	2.0
12A5	Output	12.6	180	180	25	32
12Z3	Rectifier	12.6	225			25

(1) Pentode Section of Tube
(2) Triode Section of Tube

REPAIR PARTS LIST FOR 6 TUBE, 32 VOLT D. C. RECEIVER

When ordering parts be sure and give the part number. Also give the series number which will be found in the License Notice label. If there is a spot of paint on the chassis, give this color.

MISCELLANEOUS

Part No.	ITEM
P-5200	Antenna Transformer Assembly less Can
P-40433	Can for Above Assembly
P-5202	Oscillator Coil and Can Assembly
P-5221	1st I. F. Coil and Can Assembly
P-5203	2nd I. F. Coil and Can Assembly
P-50626	Power Transformer
P-50624A	6B. Output Transformer
P-50637	"B" Filter Reactor
P-1885	6D6 Tube Socket
P-1944	6B7 Tube Socket
P-1945	6F7 Tube Socket
P-1946	12A5 Tube Socket
P-2020	12Z3 Tube Socket
P-1637	Speaker Socket
P-2060	Knob, Small
P-2062	Knob, Large
P-10273	Rubber Chassis Cushions
P-40445	Tube Shield
P-40443	Tube Shield Base
P-10320	Glass Crystal
P-20875	Crystal Retainer Ring
P-1421	Single Lug Mtg.
P-2130	Double Insulated Mtg. Lug
P-27912	Large Double End Pointer
P-10337	Celluloid Indicator Disc
P-30342	Grid Cap Only
P-70702	115 Volt Line and Plug Assembly
P-70703	Antenna and Ground Wires
P-2012	Pilot Light Bulbs (6.8 volts)
P-2147	Speaker 6" Mantel
P-2173	Speaker 8" Console
P-10347	Rubber Grommet (Small Gang Con. Mtg.)
P-10296	Rubber Grommet (Large)

"B" POWER UNIT PARTS

P-70770	Shield Cable and Plug
P-40439	Vibrator Shield Can
P-2153	Vibrator Unit
P-5172	R. F. Choke Coils
P-2021	Vibrator Socket
P-10349	Rubber Band (For Mtg. Vib.)
P-20926	Screw Hook (For Mtg. Vib.)
P-81101	C19 .01 Mf. 400V Tubular Condenser
P-81101	C20 .01 Mf. 400V Tubular Condenser
P-80888	C21 .25 Mf. 200V Tubular Condenser
P-80888	C22 .25 Mf. 200V Tubular Condenser
P-81054	C23 .5 Mf. 140V Tubular Condenser

INTERFERENCE ELIMINATION PARTS

Part No.	
P-91011	Spark Plug Suppressor
P-80933	Dual .5 Mfd. Generator Condenser

MODELS 26B1,26B5
Alignment,Notes

WELLS-GARDNER & CO.

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide accurately calibrated signals over the broadcast band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

First set the signal generator for 1730 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator adjustment is connected to the antenna lead of the receiver. Adjust the trimmer of the oscillator section of the 3 gang condenser until maximum output is obtained. The oscillator section is the one with the cut plate rotor.

Now set the signal generator for 1400 K. C. and turn the rotor until maximum output is obtained. Adjust the other two trimmers on the gang condenser for maximum output.

To obtain dial scale calibration tune in an 800 K. C. signal and set the dial pointer at that mark on the dial scale. When calibrated in this manner, the setting will be approximately correct at both ends of the scale.

The use of the cut plate type of condenser eliminates the necessity of a 600 K. C. padder and no adjustment at this frequency, therefore, is required.

32 Volt Power Supply

This receiver is designed for use on farms and in those places where the power supply consists of a 32 volt direct current generating plant. The receiver may not be satisfactory on plants which do not use storage batteries.

Line Voltage Range

The receiver will operate satisfactorily within a line voltage range of 27 to 38 volts. If the line voltage runs higher, it will have to be cut down and one method of doing this is to use a series resistor.

Series Resistor

Let us say the line voltage is 40. The receiver uses 1.56 amps. at 32 volts. A resistance of 5.13 ohms, therefore, capable of dissipating 12.5 watts will be required in the receiver line to cut the voltage down to 32. If the line voltage varies a variable resistor may be required.

Starting Current

When first turned on the drain for a few seconds is slightly higher than normal until the tubes heat up. Some automatic plants are adjusted to start under a load of 200 to 300 watts. If a number of devices such as lights or motors are being used and the radio set is turned on the total drain may be sufficient to start the plant.

No Polarity

When inserting the line plug no attention need be paid to polarity.

Servicing Power Unit

Vibrator Unit

The vibrator is mounted inside the "B" power unit. Normally the vibrator will last upward of 1000 hours. However, in the same manner as a tube it may become defective in less time and require replacement.

If the tubes light and by touching the power unit case, no vibration is felt, then the vibrator unit is probably not operating. If the pilot lamp is not lighted this will be a further indication of the same fact.

To replace the vibrator unit in the power supply remove the end of the case on which the label is placed by taking out the four screws which hold the vibrator shield can to the framework. The old vibrator may then be withdrawn and a new unit inserted in the same manner as a tube.

One or more of the vibrator units should be kept on hand for replacement purposes. It is advisable when servicing the receiver, to try one out in the same manner as a new set of tubes would be tried.

Filter Unit

The other side of the power unit case contains the filter unit which is made up of several chokes and condensers as shown in Fig. 1. The purpose of this filter is to prevent high frequency currents from getting out of the power unit case.

Failure in the unit may affect the voltage supply to the power transformer or it may result in radio frequency noise. The chokes and condensers should be tested and replaced, if necessary. A resistance continuity test should be made of the wiring in the unit and to the chassis, using the circuit diagram as a guide.

Hum

If a hum is heard this may be caused by the power unit case touching the speaker frame.

Defective tubes are very often the cause of excessive hum. Try out a complete new set of tubes and note any difference. The hum may be due to external pick-up. Disconnect the antenna and ground and see if the hum disappears.

A faulty power transformer, shorted filter choke, open filter condensers, and defective grid circuits are some of the other causes of excessive hum.

If Microphonic hum or howl is encountered see if the mounting bolts have been loosened or taken out so that the chassis is resting on the rubber cushions. If this does not remedy the condition, try out a new set of tubes.

Eliminating Ignition and Generator Noise

After the receiver is in working order, the following procedure must be followed in practically all cases to eliminate ignition and generator noise caused by the charging plant. If the charging plant causes no noise, then of course, these steps do not have to be taken.

One spark plug suppressor must be placed on each spark plug of the engine. One spark plug suppressor for example would be required on a one-cylinder engine and four must be used on a four-cylinder engine. To connect the spark plug suppressor, remove the wire from the top of the plug, put the suppressor on and attach the wire to the other end of the suppressor.

The generator condenser consists of two .5 mfd. sections in one unit. The two sections have one side grounded to the metal case of the condenser. Mount the condenser on the frame of charging plant. This will ground it. Then connect the two leads to the charging switch, one on each side of the line.

In some large installations, where the charging unit is on only two or three times a week, the above steps do not have to be taken, as interference is only caused when the generating plant is in operation.

Noisy Operation

Noisy operation may be due to a faulty antenna system. The action of the automatic volume control, due to the low pickup, causes the set to operate at its maximum sensitivity, thereby increasing noisy reception due both to external pickup and internal conditions.

The receiver may be partially detuned, causing it to operate at maximum sensitivity. The signal should be very carefully tuned in until it is clearest and strongest.

If the reception is noisy only when the generating plant is in operation, then the noise is due to the latter and several things can be done. There may be loose parts in the generator plant rubbing together. Tighten up all parts and be sure that all parts of the engine are well grounded. Dirty spark plugs may cause noise. Clean and respace the plugs or try out a new set. In some instances it may be necessary to filter the power supply line to the receiver.

If any motor driven devices, such as pumps, are operated from the 32 volt line, the motor may cause noisy reception in the receiver. This can be corrected in most cases by connecting one of the dual .5 mfd. condensers mentioned above across the line at the motor. The common connection to the two condensers which is grounded to the can is grounded externally by mounting the unit on the motor or on a nearby point which is well grounded.

A faulty "B" power unit may cause noisy operation. See Article on "Servicing Power Unit".

WELLS - GARDNER
SERIES 6C

6 Tube, 3 Band Receiver
SERVICE MANUAL AND PARTS LIST

Nov. 1934

FORM 885 J(A)

Circuit

Series 6C is a three band receiver with a coverage on each band as shown on page three. Triple band coverage is accomplished by means of three sets of R.F. and oscillator coils, and a four section, three position switch.

Referring to the schematic circuit diagram (Fig.1) T1 are the Antenna coils, T2 are the interstage coils and T3 are the oscillator coils. By means of the "Ant." and the "Ant. and PL" section of the band switch, connections for the band being used are completed to the grid circuit of the 6D6 R.F. amplifier tube.

The output of this tube is fed into an interstage R.F. transformer. Connections to this transformer are made by the "Int." section of the band switch.

A type 6A7 pentagrid converter tube functions as the oscillator and 1st detector. The three oscillator windings are shown to the right of this tube in the circuit diagram, and connections to these coils are completed by the "osc." sections of the band switch. The oscillating circuits are resonant at 456 K.C. above the frequency to which the R.F. amplifier is tuned. This frequency beating against the R.F. frequency results in the intermediate frequency of 456 K.C. being present in the plate circuit of this tube.

One stage of I.F. amplification is employed using a 6D6 tube. Three windings are used in the 1st I.F. transformer for added selectivity. These three windings and the two windings in the 2nd I.F. transformer are tuned by small adjustable condensers.

A 6B7 duo-diode pentode tube is employed as a diode 2nd detector, AVC tube and one stage audio amplifier. AVC voltage is applied to the grid circuits of the 6D6 R.F. and I.F. tubes. The audio voltage developed across volume control resistor R18 is applied thru the movable arm to the control grid of the pentode section of the 6B7 tube.

Resistance coupling is used between the 1st audio and output stage which employs a type 42 power pentode tube. A dynamic speaker is used.

A type 80 full wave rectifier tube is employed in the power unit.

The silencer switch as shown in the circuit diagram affects the sensitivity of the receiver by changing the bias voltage on the R.F. and I.F. tubes. When this switch is closed, resistor R3 is short-circuited and the bias voltage is reduced, thus increasing the sensitivity.

Phonograph connections are made by inserting a double throw switch in the diode circuit as shown.

Power Output

The maximum undistorted output is 3.0 watts when dissipated across a load resistance of 6500 ohms from 42 plate to B+.

Sensitivity

Long Wave Band 2-4 microvolts

Standard Wave Band 2-4 "

Short Wave Band 4-10 "

Alignment and Calibration

Correct alignment is extremely important in connection with multi-band receivers. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide an accurately calibrated signal of 456 K.C. and accurately calibrated signals over the long wave, standard wave and short wave bands, 145 to 380 K.C. 505 to 1520 K.C. and 5.84 to 18.0 Megacycles, is required. An output indicating meter is also necessary. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screw driver for adjustments.

Seventeen trimmer condensers are used in aligning the R.F. and I.F. circuits as follows: The location of these trimmers is shown in Figs. 2,3 and 4.

1st I.F. Primary Trimmer
1st I.F. Secondary "
1st I.F. Tertiary "
2nd I.F. Primary "
2nd I.F. Secondary "

Long Wave Padding Condensers
Oscillator Long Wave Trimmer
Antenna Long Wave Trimmer
Interstage Long Wave Trimmer
Standard Wave Padding Condenser
Oscillator Standard Wave Trimmer
Antenna Standard Wave Trimmer
Interstage Standard Wave Trimmer

Short Wave Padding Condenser
Oscillator Short Wave Trimmer
Antenna Short Wave Trimmer
Interstage Short Wave Trimmer

The procedure is as follows:

Intermediate Frequency Adjustment

Set the signal generator for 456 K.C. and connect the antenna lead of the signal generator to the grid of the 1st detector thru a .05 MFD condenser. Set the switch to the standard wave position and turn the gang condenser completely out.

Adjust the five I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Figs. 2 and 4.

Alignment and Calibration (cont.)

Setting The Pointer

With the condenser plates completely meshed, the pointer should coincide with the last heavy line at the low frequency end of the short wave band.

Long Wave Band Adjustment

The antenna lead from the signal generator is connected to the antenna lead of the receiver through a standard dummy antenna. Turn the band switch to the long wave position.

Set the signal generator for a signal of 165 K.C. and adjust the long wave padding condenser for maximum output. As this adjustment is made, turn the tuning condenser rotor back and forth until maximum output is obtained.

Set the signal generator to 380 K.C. and turn the tuning control until the condenser rotor is at the completely open position.

Adjust the oscillator long wave trimmer for maximum output.

Set the signal generator to 330 K.C. and tune in the signal very accurately by turning the tuning control.

Adjust the antenna long wave and interstage long wave trimmers for maximum output.

Check the 165 K.C. padding condenser adjustment. If this has to be readjusted, check and readjust again at 380 and 330 K.C. as before.

Standard Wave Band Adjustment

Turn the band switch to the standard wave position.

Set the signal generator for a signal of 550 K.C. and adjust the standard wave padding condenser for maximum output. As this adjustment is made, turn the tuning condenser rotor back and forth until maximum output is obtained.

Set the signal generator to 1520 K.C. and turn the tuning control until the condenser rotor is at the completely open position.

Adjust the oscillator standard wave trimmer for maximum output.

Set the signal generator to 1400 K.C. and tune in the signal very accurately by turning the tuning control.

Adjust the antenna standard wave and interstage standard wave trimmers for maximum output.

Check the 550 K.C. padding condenser adjustment. If this has to be readjusted, check and readjust again at 1520 and 1400 K.C. as before.

Short Wave Band Adjustment

Turn the band switch to the short wave position.

Adjust the short wave padding condenser at 6.0 megacycles for maximum output.

Set the signal generator to 18.0 megacycles and turn the tuning control until the condenser rotor is at the completely open position.

Adjust the oscillator short wave trimmer for maximum output.

Set the signal generator to 15 megacycles and tune in the signal very accurately by turning the tuning control.

Adjust the antenna and R.F. Short Wave trimmers for maximum output.

Check the 6.0 megacycle padding condenser adjustment. If this has to be readjusted, check and readjust again at 18 megacycles and 15 megacycles as before.

General

Be sure that the adjustments are made in the order given above and be careful not to disturb any of the preceding adjustments.

Power Supply

This receiver may be used on a power supply of 40 to 60 cycle, 110, 130 or 230 volts.

It is shipped from the factory connected for the voltage as specified on the tag on the power cord of the receiver.

The method of connecting the power transformer for the three voltages as specified is shown in Figure 7.

Band Coverage

This receiver covers three bands, the range of each being as follows:

LONG WAVE

145 to 380 Kilocycles
2069 to 799.5 Meters

STANDARD WAVE

505 to 1520 Kilocycles
594. to 197.4 Meters

SHORT WAVE

5.84 to 18.0 Megacycles
51.4 to 16.7 Meters

VOLTAGES AT SOCKETS

INPUT - 110 VOLTS - 60 CYCLE

ANTENNA SHORTED TO GROUND

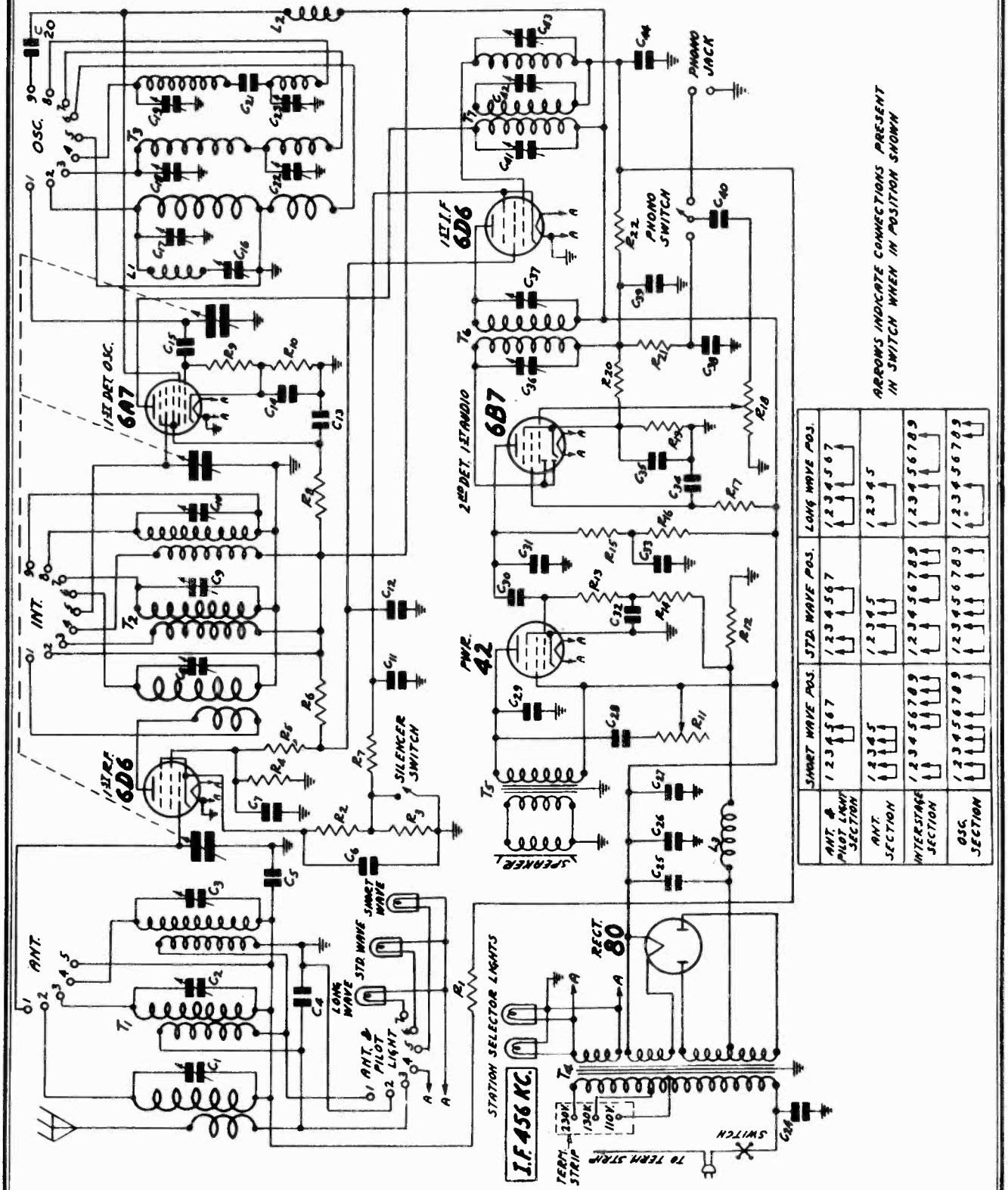
(Silencer Switch Down)

Type of Tube	Function	Heater Voltage	Plate to Cathode	Screen to Cathode	Gnd. to Cathode	Normal Plate M. A.
6D6	R. F.	6.3	250	100	6.0	8.0
6A7	1st Det. & Osc.	6.3	250(1) 250(2)	100	3.0	3.4(1) 3.6(2)
6D6	I. F.	6.3	250	125	6.5	9.5
6B7	2nd Det. & 1st.A.F.	6.3	55	60	3.0	2.5
'42	Power Output	6.3	235	250	17(3)	33
'80	Rectifier	5.0	700V. A.C. pl.to pl.			40 Per Plate

(1) Plate
(2) Anode Grid
(3) Grid bias as measured across R 12

MODEL 6C Series
Schematic

WELLS-GARDNER & CO.,



WELLS-GARDNER & CO.,

MODEL 6C Series
Socket, Trimmers
Condenser Data, Parts

SERIES 6C
Replacement Parts List

MISCELLANEOUS

PART. NO.	ITEM	CODE	LIST
P 1885	6D6 Tube Socket		.10
P 1945	6A7 Tube Socket		.10
P 1944	6B7 Tube Socket		.10
P 1884	No. 42 Tube Socket		.10
P 2025	No. 80 Tube Socket		.15
P 1637	Speaker Socket		.10
P 5254	Antenna Coil Assembly Less Can	T1	2.75
P 5257	R. F. Interatage Coil Assembly Less Can	T2	2.35
P 5260	Oscillator Coil Assembly Less Can	T3	2.50
P 40461	Cans for the Above Assemblies		.10
P 5253	1st I.F.Coil Assembly Complete with Can	T7	2.15
P 5264	2nd I.F.Coil Assembly Complete with Can	T6	2.05
P 5265	Oscillator Plate Reactor	L2	.35
P 5190	High Frequency Oscillator Tracking Coil	L1	.35
P 2255	Gang Condenser and Dial Assembly		6.25
P 50659-6C	40-60 Cycle Power Transformer; 110-150-230V	T4	6.05
P 50660-6C	Output Transformer	T5	1.40
P 70785	110 Volt Line Cord & Plug Assembly		.70
P 2258	"6" Dynamic Speaker		4.50
P 10375	Glass Crystal		.10
P 2133	Small Knob (Set Screw)		.25
P 2060	Small Knob (Spring)		.20
P 10272	Rubber Chassis Cushion		.10
P 40445	Tube Shields		.15
P 2012	Pilot Light (6.8 volt)		.15
P 1165	Pilot Light Socket & Spring Clip		.10
P 2136	4 Lug Terminal Strip (3 insulated)		.10
P 2150	3 Lug Terminal Strip (2 insulated)		.10
P 1421	2 Lug Terminal Strip (1 insulated)		.10
P 2170	2 Lug Terminal Strip (2 insulated)		.10
P 30542	Grid Cap Only		.10

RESISTORS

PART NO.	CODE	RESISTANCE	TYPE	WATTAGE	LIST
P A95204	R1	200,000 Ohm.	Carbon	0.2	.15
P A95401ww	R2	400 Ohm.	Wire Wound	0.2	.15
P B95252	R3	2,500 Ohm.	Carbon	0.5	.15
P B94503	R4	30,000 Ohm.	Carbon	0.5	.15
P B95502	R5	5,000 Ohm.	Carbon	0.5	.15
P C95153	R6	15,000 Ohm.	Carbon	1.0	.15
P A95451ww	R7	450 Ohm.	Wire Wound	0.2	.15
P B94703	R8	70,000 Ohm.	Carbon	0.5	.15
P A94104	R9	100,000 Ohm.	Carbon	0.2	.15
P A95351ww	R10	350 Ohm.	Wire Wound	0.2	.15
P 97014	R11	150,000 Ohm.	Tone Control		.75
P 98015	R12	235 Ohm.	Wire Wound	2.0	.15
P A95504	R13	500,000 Ohm.	Carbon	0.2	.15
P A95104	R14	100,000 Ohm.	Carbon	0.2	.15
P B94603	R15	60,000 Ohm.	Carbon	0.5	.15
P A95203	R16	20,000 Ohm.	Carbon	0.2	.15
P A94254	R17	250,000 Ohm.	Carbon	0.2	.15

RESISTORS - (CONT'D.)

PART NO.	CODE	RESISTANCE	TYPE	WATTAGE	LIST
P 96018	R18	2 Megohm.	Volume Control		1.05
P A94801	R19	800 Ohm.	Carbon	0.2	.15
P A94504	R20	500,000 Ohm.	Carbon	0.2	.15
P A95503	R21	50,000 Ohm.	Carbon	0.2	.15
P A95205	R22	2 Megohm.	Carbon	0.2	.15

CONDENSERS

PART NO.	CODE	CAPACITY	VOLTAGE	TYPE	LIST
P 2260	C1	2-25 mmf.	Sh.W.	Antenna Trimmer	.20
P 2260	C2	2-25 mmf.	Std.W.	" "	.20
P 2260	C3	2-25 mmf.	L.W.	" "	.20
P 81817	C4	250 mmfd.	Moulded		.15
P 81125	C5	.05 mfd.	200 V	Tubular	.20
	(C6	.05 mf.	140 V)		
	(C7	.05 mf.	200 V)		
	(C11	.25 mf.	140 V)		
	(C12	.10 mf.	300 V)		
P 82603	(C27	.10 mf.	400 V)	Condenser Block	2.40
	(C33	.25 mf.	400 V)		
	(C34	.25 mf.	400 V)		
	(C40	.05 mf.	140 V)		
P 2260	C8	2-25 mmf.	Sh.W.R.F.	Interstage Trimmer	.20
P 2260	C9	2-25 mmf.	Std.W.R.F.	" "	.20
P 2260	C10	2-25 mmf.	L.W.R.F.	" "	.20
P 81127	C13	.10 mfd.	300 V	Tubular	.20
P 81079	C14	.25 mfd.	200 V	Tubular	.25
P 81819	C15	35 mmfd.		Moulded	.15
P 2263	C16&C22	40-100 mfd &300-500 mmfd.		Double Trimmer	.65
P 2260	C17	2-25 mmf.	Sh.W.	Oscillator Trimmer	.20
P 2260	C18	2-25 mmf.	Std.W.	" "	.20
P 2260	C19	2-25 mmf.	L.W.	Oscillator Trimmer	.20
P 81071	C20	.05 mfd.	400 V	Tubular	.20
P 81817	C21	250 mmfd.		Moulded	.15
P 2103	C23&C41	200-50 mmfd. ea.		Double Trimmer	.60
P 81042	C25	14 mfd.	400 V	Wet Elec. (Inakd Mtg.)	1.45
P 81043	C26	18 mfd.	300 V	Wet Elec. (Gnd Mtg.)	1.30
	(C28	.05	600 V)		
	(C29	.002	600 V)		
P 82604	(C30	.01	400 V)	Condenser Block	1.20
	(C31	.002	600 V)		
P 81128	C32	.03 mfd.	200 V	Tubular	.20
P 81003	C35	12 mfd.	25 V	Dry Electrolytic	.75
P 2252	(C36	150-250 mmf.	)	2nd I.F.Trimmers	.65
	(C37	150-250 mmf.	)		
P 81818	C38	100 mmfd.		Moulded	.15
P 81817	C39	250 mmfd.		Moulded	.15
P 2252	(C42	150-250 mmf.	)	1st I.F.Trimmers	.65
	(C43	150-250 mmf.	)		
P 81076	(C44	.05 mfd.	200 V	Tubular	.20
P 82501		3 Section Gang Condenser			2.85

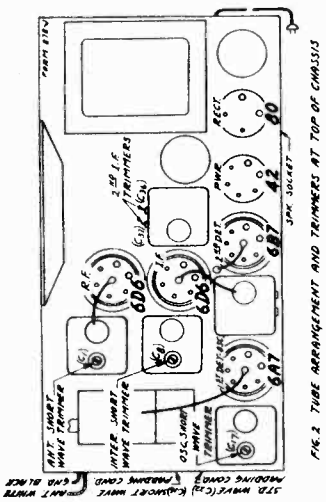


FIG. 2 TUBE ARRANGEMENT AND TRIMMERS AT TOP OF CHASSIS

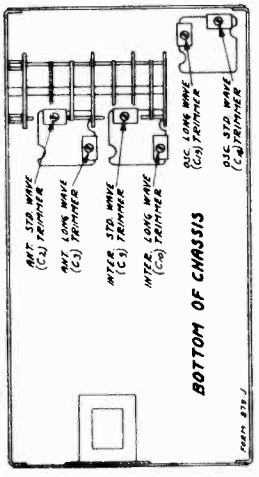


FIG 3 TRIMMERS AT BOTTOM OF CHASSIS

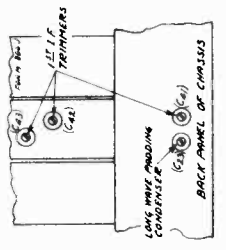


FIG 4 TRIMMERS AT BACK OF CHASSIS

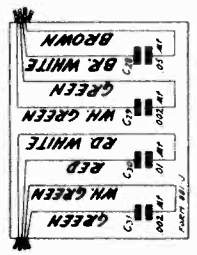


FIG 6 SMALL BLOCK CONDENSER

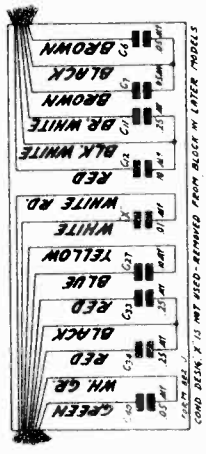


FIG 5 LARGE BLOCK CONDENSER

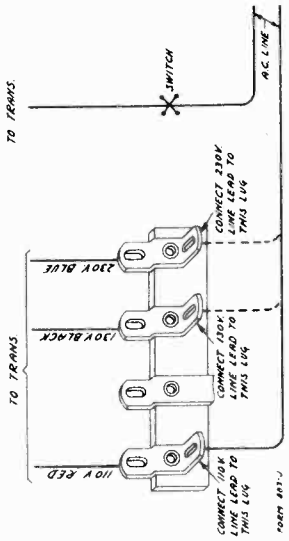


FIG 7 POWER TRANSFORMER CONNECTIONS

MODELS 27C1,27C5
Chassis 7C
Schematic,Voltage
Socket,Trimmers

WELLS-GARDNER & CO.,

RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-A95104	R1	100,000 Ohm	.2	Carbon
P-A93803	R2	30,000 Ohm	.2	Carbon
P-A95104	R3	100,000 Ohm	.2	Carbon
P-A93602	R4	6,000 Ohm	.2	Carbon
P-B93902	R5	9,000 Ohm	.5	Carbon
P-A95505	R6	5 Megohm	.2	Carbon
P- 96012	R7	1 Megohm		Volume Control
P-A95505	R8	5 Megohm	.2	Carbon
P-A94603	R9	60,000 Ohm	.2	Carbon
P-A95104	R10	100,000 Ohm	.2	Carbon
P-A95104	R11	100,000 Ohm	.2	Carbon

Voltages at Sockets
ANTENNA SHORTED TO GROUND

Type of Tube	Function	Filament Volt.	Plate to Neg. Filament	Screen to Neg. Filament	Grid to Neg. Filament	Normal Plate M. A.
34	1st Detector	2.0	135	55	3.0 av.	1.90
30	Oscillator	2.0	75		0.0	3.70
34	I. F.	2.0	135	70	3.0 av.	3.00
30	2nd Detector	2.0	2			
34	1st A. F.	2.0	140	65	4.0	2.30
30	2nd A. F.	2.0	135		8.0	3.10
19	Output	2.0	137		6.0	1.00 per plate

CONDENSERS

Part No.	Code	Capacity		Voltage	Type
P-80862	C1	0.050	Mf.	200V	Tubular
P-80862	C2	0.050	Mf.	200V	Tubular
P-80862	C3	0.050	Mf.	200V	Tubular
P-80864	C4	0.100	Mf.	200V	Tubular
P-81801	C5	35	Mmf.	Cap. Part of Osc. Coil Assem.	
P-80888	C6	0.250	Mf.	200V	Tubular
P-80862	C7	0.050	Mf.	200V	Tubular
P-80988	C8	1.500	Mf.	140V	Tubular
P-1965	C9	70-140	Mmf.		Trimmer
P-81800	C10	50	Mmf.	Cap. Part of 2nd I.F. Coil As.	
P-80981	C11	0.010	Mf.	400V	Tubular
P-80888	C12	0.250	Mf.	200V	Tubular
P-80945	C13	500	Mmf.		Moulded
P-80862	C14	0.050	Mf.		Tubular
P-80888	C15	0.250	Mf.	200V	Tubular
P-81014	C16	16.00	Mf.		Electrolytic Block
	C17	16.00	Mf.		
P-80914	C22	0.002	Mf.	600V	Tubular
P-80914	C23	0.002	Mf.	600V	Tubular
P-81812	C24	200	Mmf.	Cap. Part of Ant. Assem.	
P-81807	C25	70	Mmf.	Cap. Part of 1st I.F. Coil As.	
P-81805	C26	45	Mmf.	Cap. Part of 1st I.F. Coil As.	
P-81019		Three Gang Condenser			

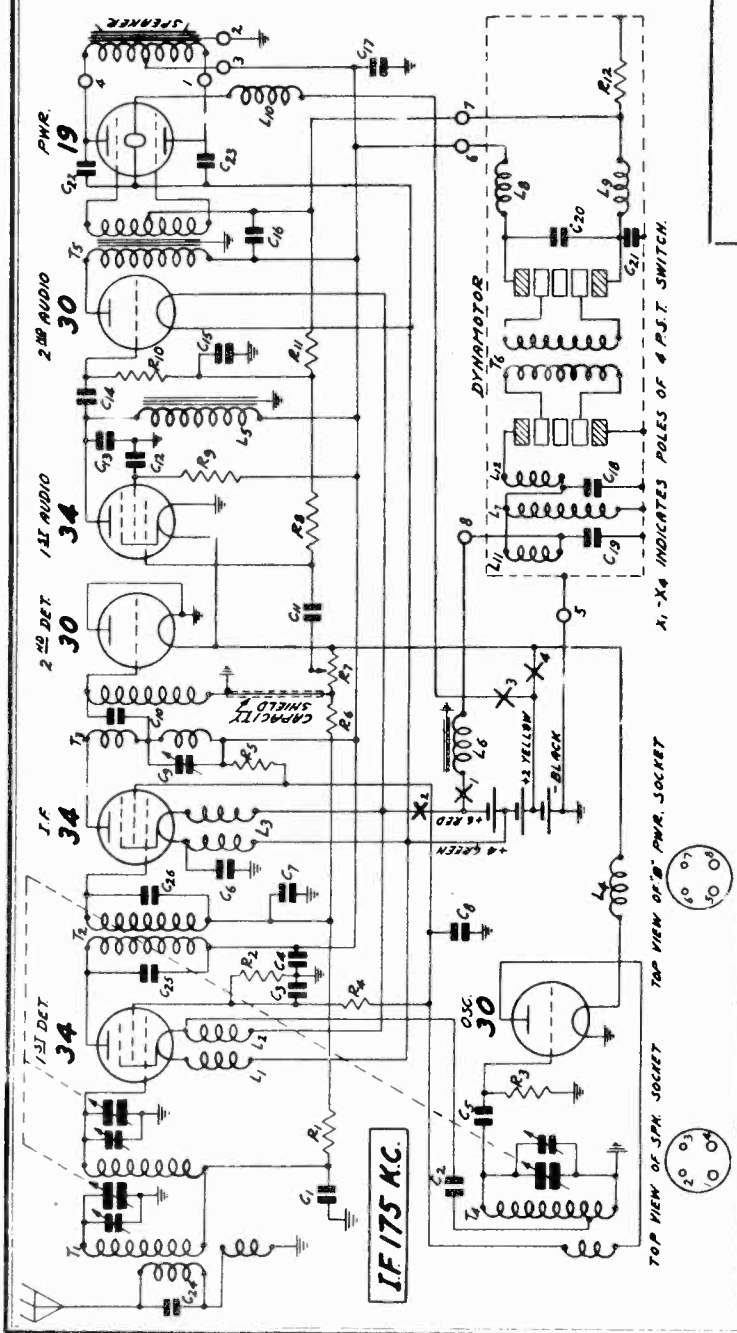


Fig. 1. Schematic Circuit Diagram

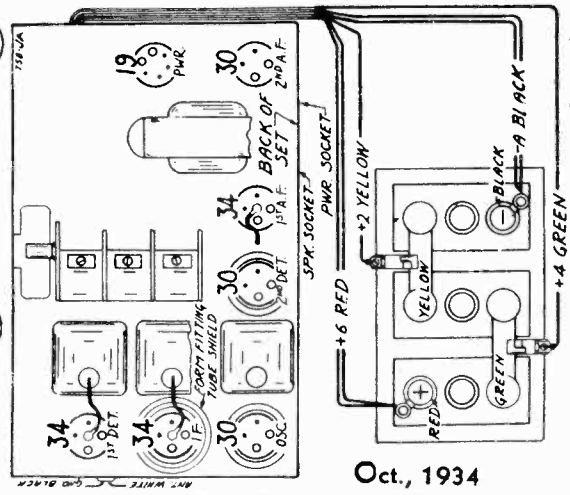


Fig. 2. Location of Tubes and Battery Connections

Oct., 1934

MODELS 27C1, 27C5
Chassis 7C
Alignment, Resistances
Drive Cord Data

WELLS-GARDNER & CO.

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide accurately calibrated signals over the standard wave band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

First set the signal generator to a frequency of 175 KC. Connect the antenna lead of the lead generator to the grid of the 1st detector thru a .05 mfd. condenser. The ground lead from the signal generator goes to the ground lead of the receiver. Adjust trimmer condenser C9 on the back panel of the chassis until maximum output is obtained. **A non-metallic screw driver should be used in making this adjustment as the I. F. trimmer is at B+ potential.**

Next set the signal generator for 1730 KC. Turn the rotor to the full open position. The antenna lead from the signal generator is in this instance connected to the antenna lead of the receiver. Adjust the trimmer of the oscillator section of the 3 gang condenser until maximum output is obtained. The oscillator section is the one with the cut plate rotor.

Then set the signal generator for 1400 KC and turn the rotor until maximum output is obtained. Adjust the other two trimmers on the gang condenser for maximum output.

To obtain dial scale calibration tune in an 800 KC signal and set the dial pointer at that mark on the dial scale. When calibrated in this manner, the setting will be approximately correct at both ends of the scale.

The use of the cut plate type of condenser eliminates the necessity of a 600 KC padder and no adjustment at this frequency, therefore, is required.

Replacing Drive Cord

Remove chassis from cabinet.

Take off the pilot light assembly by lifting off the two sockets and spring clips.

Detach the large pointer by removing the screw at the center of the dial.

Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis.

Then lay the complete dial assembly face downward in front of the chassis. It is not necessary to remove the volume control and Off-On switch collars which hold the indicator cords of these two controls in position.

Turn the drive drum until the opening in this drum is approximately vertical and with the hole at the top as shown in Fig. 4.

Remove the tension spring and the old drive cord.

See that the eyelet is in the hole in the drive drum as shown in Fig. 4. Insert one end of the drive cord from the outside through the hole in the eyelet in the drive drum.

Tie the end of the cord which has been inserted in the hole to one end of the tension spring.

Wrap the cord in a clockwise direction (facing front of chassis) around the drive drum approximately one-half turn.

Then tilt the chassis up on its back panel and bring the cord mentioned in the previous paragraph down to the drive shaft. Wrap it two and one-half times around the drive shaft as shown in Fig. 4.

Then bring this cord up from the drive shaft and wrap it around the drive drum approximately one and one fifth turns in a clockwise direction until it is up to the hole in this drum as illustrated.

Insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. The end of the spring, when hanging free, should be approximately ¾" from the flange of the drum as shown in Fig. 4. Cut off the surplus length of cord after it is knotted.

Then secure the other end of the tension spring over the spur on the drive drum.

Replace the dial assembly and pointer.

Replace the pilot light assembly after which the chassis may be reinstalled in the cabinet.

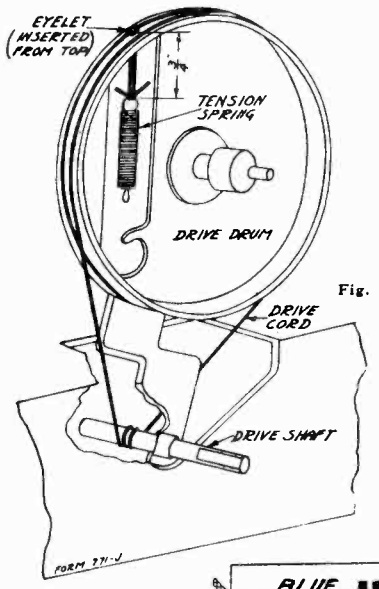


Fig. 4 Drive Cord Replacement.

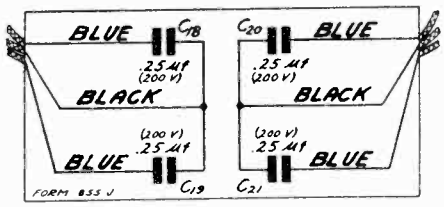


Fig. 3. Four Section Condenser in Power Unit Box

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Item	Code	D. C. Resistance in Ohms
P-5200	Double Tuned Antenna Transformer, Primaries in series	T1	20.1
	Double Tuned Antenna Transformer Secondary Preselector	T1	3.3
	Double Tuned Antenna Transformer Secondary Detector	T1	3.1
P-5169	Oscillator Grid Coil	T4	3.6
	Oscillator Plate Coil	T4	1.6
P-5170	I. F. Coil Primary	T2	89.
	I. F. Coil Secondary	T2	126.
P-5171	I. F. Reactor Coil Plate Winding	T3	99.
	I. F. Reactor Coil Grid Winding	T3	429.
P-5172	Double Filament Reactor Assembly each section	L1, L2	Small
P-5173	Combined Filament Reactor Assembly each section	L3, L4	Small
P-50621	Audio Plate Reactor	L5	4940.
P-50622	Iron Core Isolating Reactor	L6	Small
P-5222	Filament Reactor	L10	Small
P-50625	Audio Transformer Primary	T5	1066.
	Audio Transformer Secondary (center tap to inside)	T5	614.
	Audio Transformer Secondary (center tap to outside)	T5	666.
P-2010	6" Magnetic Speaker (center tap to inside)		260.
	6" Magnetic Speaker (center tap to outside)		300.

MODELS 37G508, 37G566
Chassis 7GM
Schematic, Trimmers
Parts

WELLS-GARDNER & CO.

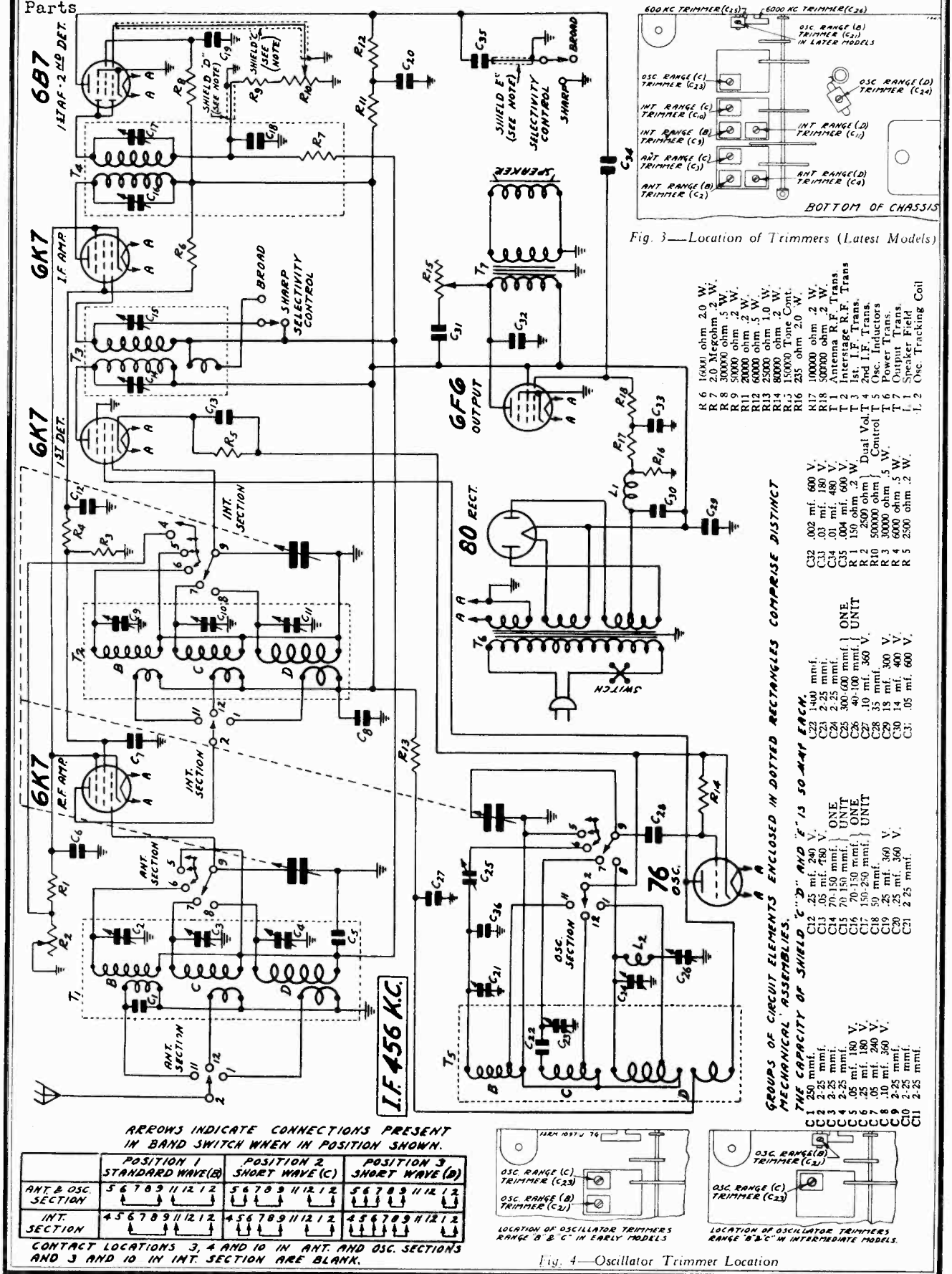


Fig. 3—Location of Trimmers (Latest Models)

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
ANT. & OSC. SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2
INT. SECTION	4 5 6 7 8 9 11 12 1 2	4 5 6 7 8 9 11 12 1 2	4 5 6 7 8 9 11 12 1 2

CONTACT LOCATIONS 3, 4 AND 10 IN ANT. AND OSC. SECTIONS AND 3 AND 10 IN INT. SECTION ARE BLANK.

Fig. 4—Oscillator Trimmer Location

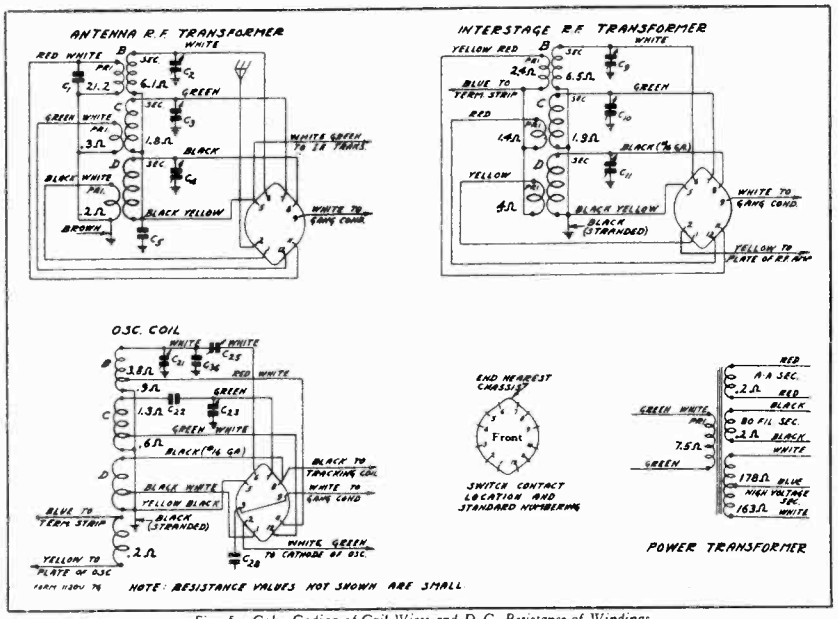


Fig. 5—Color Coding of Coil Wires and D. C. Resistance of Windings
(Also see complete D. C. Resistance List in this Manual)

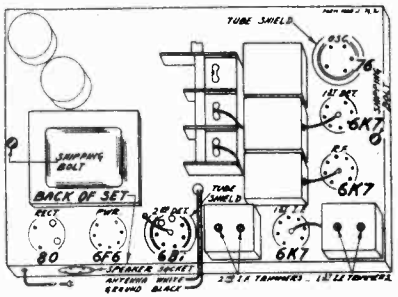


Fig. 6—Location of Tubes

VOLTAGES AT SOCKETS
Line Voltage, 115 - Volume Control at Maximum
Antenna Shorted to Ground

Type of Tube	Function	Heater or Filam't	Plate to Ground	Screen to Ground	Cathode to Ground	Plate M. A.
6K7 (6D6)	R. F.	6.1	230	95	3.0	6.4
6K7 (6D6)	1st Det.	6.1	230	100	9.0	3.2
76	Osc.	6.1	100			5.2
6K7 (6D6)	I. F.	6.1	230	120	3.0	9.
6B7	2nd Det.	6.1	55(1)	40		2.3
6F6 (42)	Power	6.1	215	230	17(2)	30.0
80	Rectifier	4.7				34. per plate

(1) As read with 500,000 ohm meter
(2) As read across R16

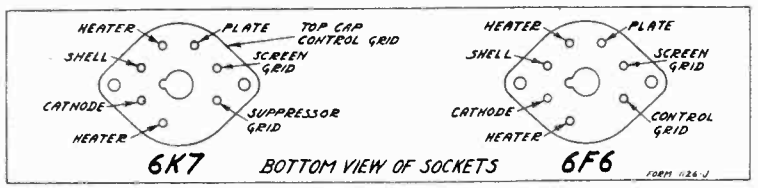


Fig. 7—Metal Tubes—Bottom View of Sockets

Servicing R. F. Coil Assemblies

The R. F. transformers and oscillator coil assemblies in this receiver are sold complete with can. This is due to the fact that the trimmers are soldered to the can, and cannot be easily disassembled.

The lead colors and resistances of the various windings in each assembly are shown in Fig. 5.

If it is ever necessary to remove one of coil assemblies from the can, proceed as follows: First remove the nuts from the screws at the top of the can. The outside lug on the trimmer condenser is inserted in a slot in the coil can, and this lug is soldered into position.

Apply a soldering iron to the can at the point of the soldered connection. Then with a screw driver lift up on the outside edge of the trimmer (edge soldered to can) until the trimmer is clear of the can. After the trimmers are all unsoldered, the coil can be taken out.

Twenty-five Cycle Receivers

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-230 Volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

A standard arrangement for switch contact location numbering has been adopted. This numbering is illustrated in Fig. 5. In contact locations not used, the number applying to that particular location is not employed.

Changes in Early Models

In the early models of this receiver, the antenna transformer (T1) had two Range B Primary windings as shown in Fig. 8.

The oscillator Range B and C trimmer locations varied in the early and intermediate models of this receiver as shown in Figs. 3 and 4.

Referring to Fig. 2, in the early models of this receiver, contact No. 4 in the interstage section of the band selector was not used. The purpose of this contact arrangement is to short out variable resistor R2 in the second short wave position. In these models the relative positions of resistors R1 and R2 were reversed. The common connection from the suppressor grid and cathodes of the R. F. and I. F. amplifier tubes was connected to the control arm of variable resistor R2. The latter was connected to resistor R1 which was grounded at the other end. The by-pass condenser C6 remains connected as before, to the cathode and suppressor grid connection.

The type 6K7 and 6F6 metal tubes replace the types 6D6 and 42 glass tubes respectively which were used in the early models.

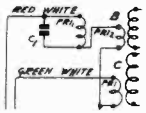


Fig. 8—Antenna Transformer in Early Models

Phonograph Connections

Phonograph connections can be made as shown in Fig. 9. The parts required are shown in the parts list. Knockouts are provided in the back panel of the chassis for mounting the phono jack and phono switch—See Fig. 10.

For mounting the 12 mfd. 25 volt dry electrolytic condenser, two No. 27 drill holes should be drilled in the side of the chassis directly below the wet electrolytic condensers. These holes are 1¼" from the bottom, ⅞" and 3¼" from the front of chassis. The ground lug which extends out from the side of the chassis should be bent back into the chassis wall.

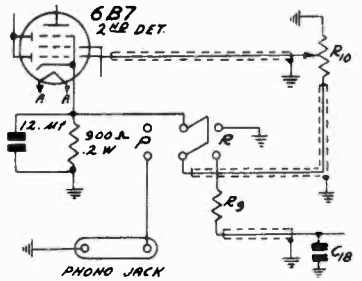


Fig. 9—Phonograph Connections

Replace the single lug insulated terminal strip (located on the rear panel, directly in back of the band selector switch) with (P-4A39) double lug insulated terminal strip with ground lug. Be sure to solder back to this new terminal strip any leads that were connected to the other terminal strip.

The connections are made by opening the diode return circuit at the volume control. Unsolder the 50,000 ohm resistor R9 (covered with saturated sleeving in early models) from the lug at the volume control and from the shielded lead which runs from the I. F. transformer. Cut this shielded lead to length and connect to the open lug on the new terminal strip. Connect one side of the 50,000 ohm resistor R9 to the same lug and the other side to the phono switch—see Fig. 9. Ground the shield to the ground lug of the terminal strip.

The extra shielded lead which is provided should be inserted into a piece of saturated sleeving.

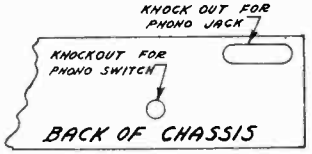


Fig. 10—Location of Phono Knockouts

Series 7GM—Replacement Parts

NOTICE—A change has been made in our parts numbering system. Old parts which are used in new receivers will have a new number assigned to them. For your convenience we are listing below the new part number and the corresponding old part number, should there be one. **Order by new part number only.**

There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts please be sure to mention the series number and this large letter.

MISCELLANEOUS

New Part No.	Old Part No.	Description	List Price
3A129	2025	Type 80 Tube Socket (4 Prong), Glass Tube	$ .10
3A112	1884	Type 42 Tube Socket (6 Prong), Glass Tube	.10
3A210		Type 6F8 Tube Socket (Metal Tube)	.15
3A126	2022	Type 76 Tube Socket (5 Prong), Glass Tube	.10
3A120	1944	Type 6B7 Tube Socket (7 Prong), Glass Tube	.15
3A113	1885	Type 6L6 Tube Socket (6 Prong), Glass Tube	.10
3A211		Type 6K7 Tube Socket (Metal Tube)	.15
3A58	1635	5 Prong Speaker Socket	.10
12A211		8" Dynamic Speaker Complete with Output Transformer (T7)	5.95
12A221		10" Dynamic Speaker Complete with Output Transformer (T7)	6.45
12A222		6" Dynamic Speaker Complete with Output Transformer (T7)	4.15
17X1	10320	Glass Dial Crystal	.15
28X25	20875	Crystal Retainer Ring	.10
Specify Name of Knob & Model of Receiver		Small Push-on Type Knob Large Set Screw Type Knob Special Selectivity Control Knob (Set Screw Type)	.15 .20 .45
2N38	10387	Felt Washers (Used behind Knobs)	.10
8X23	10272	Rubber Chassis Mounting Cushions	.10
32X32	40434	Tube Shields	.15
32X30	40424	Tube Shield Bases	.10
4A38	2106	Single Lug Terminal Strip (Mounting foot to Left of lug)	.10
4A17	1421	Single Lug Terminal Strip (Mounting foot to Right of lug)	.10
4A49		Single Lug Terminal Strip (Mounting hole used)	.10
4A50		Two Lug Terminal Strip (Both lugs insulated-Mounting hole in center)	.10
18X80	70786	Line Cord and Plug	.50
11X214		Antenna and Ground Lead Assembly	.30
2A40		3 Section, 3 Position, Band Change Switch	1.70
2A42		Selectivity Switch	.45
30X14	30342	Grid Clip Only—for Glass Tubes	.10
31X44		Grid Clip Only—for Metal Tubes	.10

TRANSFORMERS AND COILS

New Part No.	Code	Description	List Price
9A376	T1	Antenna Trans. and Can Assembly	$2.80
9A377	T2	R. F. Interstage Trans. and Can Assembly	2.25
9A379	T3	1st I. F. Trans. and Can Assembly	1.70
9A380	T4	2nd I. F. Trans. and Can Assembly	2.10
9A378	T5	Oscillator Coil and Can Assembly	2.25
53X91	T6	115 volt 60 cycle Standard Power Transformer	3.60
53X93	T6	115 volt 25 cycle Special Power Transformer	5.95
53X91		115-230 volt 40-60 cycle Special Power Transformer	4.95
53X99	T6	230 volt, 50 cycle Special Power Transformer	4.10
9A391	L2	High Frequency Oscillator Tracking Coil	.25

CONDENSERS

New Part No.	Code	Capacity	Voltage	Type	List Price
42X59	C1	250 mmf.		Moulded	$ .15
17A36	C2	2-25 mmf.		Range B—Antenna Trimmer (1800 KC Adjustment)	.10
17A36	C3	2-25 mmf.		Range C—Antenna Trimmer (5000 KC Adjustment)	.10
17A36	C4	2-25 mmf.		Range D—Antenna Trimmer (15000 KC Adjustment)	.10
46X80	C5	.050 mf.	180	Tubular	.15
46X103	C6	.250 mf.	180	Tubular	.30
46X103	C7	.050 mf.	240	Tubular	.15
46X105	C8	.100 mf.	360	Tubular	.20
17A36	C9	2-25 mmf.		Range B—1st Detector Trimmer (1500 KC Adjustment)	.10
17A36	C10	2-25 mmf.		Range C—1st Detector Trimmer (5000 KC Adjustment)	.10
17A36	C11	2-25 mmf.		Range D—1st Detector Trimmer (15000 KC Adjustment)	.10
8bX104	C12	.250 mf.	240	Tubular	.25
46X80	C13	.050 mf.	180	Tubular	.15
17A33	C14 C15	70-150 mmf. 70-150 mmf.		1st I. F. Trimmer Condensers	.40
17A34	C16 C17	70-150 mmf. 150-250 mmf.		2nd I.F. Trimmer Condensers	.40
47X36	C18	50 mmf.		Moulded	.10
46X116	C19	.250 mf.	360	Tubular	.35
46X107	C20	.250 mf.	360	Tubular	.30
17A36	C21	2-25 mmf.		Range B—Oscillator Trimmer (1730 KC Adjustment)	.10
47X60	C22	.1400 mmf.		Moulded	.30
17A36	C23	2-25 mmf.		Range C—Oscillator Trimmer (5800 KC Adjustment)	.10
17A36	C24	2-25 mmf.		Range D—Oscillator Trimmer (18300 KC Adjustment)	.10
17A35	C25	300-600 mmf.		Oscillator Padding Condenser (600 KC Adjustment)	.45
	C26	40-100 mmf.		Oscillator Padding Condenser (6000 KC Adjustment)	
46X105	C27	.100 mf.	360	Tubular	.20
47X53	C28	35.0 mmf.		Moulded	.10
44X11	C29	18.0 mf.	300	Wet Electrolytic	1.10
44X10	C30	14.0 mf.	400	Wet Electrolytic	1.25
46X108	C31	.050 mf.	600	Tubular	.20
46X100	C32	.062 mf.	600	Tubular	.15
46X110	C33	.030 mf.	180	Tubular	.15
46X109	C34	.010 mf.	480	Tubular	.15
46X114	C35	.004 mf.	600	Tubular	.15
25A38		3 Gang Condenser Complete with Drive Assembly—less Dial Assembly			4.75

DIAL AND DRIVE ASSEMBLY

New Part No.	Description	List Price
5A27	Gang Condenser Bracket & Bearing	$ .45
26X220	Drive Shaft	.15
24X207	Drive Pulley with Set Screw	.10
20X70	Main Shaft Pointer Stud	.10
24X205	Gear (Rotary)	.10
24X210	Gear (Stationary)	.10
28X35	Gear Spreader Spring	.10
26X205	Main Pointer Shaft Assembly	.45
26X209	Micrometer Pointer Shaft Assembly	.55
24X209	Compound Gear Assembly	.25
37X33	Tension Pulley Arm Assembly	.15
28X42	Tension Pulley Spring	.10
8X35	Drive Belt	.20
30X36	Dial Clamp to secure Dial Strip to Frame with 6-32 x 3/16" mounting screw)	.10
	Dial Strip Only (Specify Series No. and Name of Receiver)	.50
15X22	Double End Pointer	.10
15X26	Micrometer Pointer	.10
2012	Pilot Lamp Bulb (6-8V)	.15
2126	Pilot Lamp Sockets and Spring Clips	.10
15A38	Dial Bracket Assembly Complete	3.90
28X34	Pointer Slide, Take-up Spring Only	.10
10X9	4" Black Drive Cord Only Dozen	.10
29X42	Brass Collars and Set Screws Only for Securing above Drive Cord to Shaft	.10

NOTE: The Gang Condenser and Drive Assembly, less Dial Assembly, can be purchased complete—see Condenser List.

RESISTORS

New Part No.	Code	Resistance	Watts	Type	List Price
A94151	R1	151 ohm	0.2	Carbon	$ .15
36X204	R2 R10	2.500 ohm 500,000 ohm		Dual Volume Control	1.75
B93303	R3	30,000 ohm	0.5	Carbon	.20
B94602	R4	6,000 ohm	0.5	Carbon	.15
A95232	R5	2,500 ohm	0.2	Carbon	.15
D93163	R6	16,000 ohm	2.0	Carbon	.45
A95205	R7	2.0 Megohm	0.2	Carbon	.10
B94304	R8	300,000 ohm	0.5	Carbon	.15
A95203	R9	50,000 ohm	0.2	Carbon	.10
A94203	R11	20,000 ohm	0.2	Carbon	.15
B94603	R12	60,000 ohm	0.5	Carbon	.15
C94253	R13	25,000 ohm	1.0	Carbon	.15
A94803	R14	80,000 ohm	0.2	Carbon	.15
40X203	R15	150,000 ohm	Tone	Control	.75
41X42	R16	235 ohm	2.0	Armored Wire Wound	.25
A94104	R17	100,000 ohm	0.2	Carbon	.15
A95504	R18	500,000 ohm	0.2	Carbon	.10

PHONO ATTACHMENT PARTS

New Part No.	Description	List Price
2A31	Phono Switch (Double Pole Double Throw Switch)	$ .60
3A12	Phono Jack	.10
10A36	Switch Knob	.20
45X37	12.0 mf. - 25 Volt - Dry Electrolytic Condenser	.75
A94901	900 Ohm 0.2 Watt Resistor	.15
	12 Inches of No. 722G Shielded Hookup Wire	.10
4A39	Terminal Strip	.10

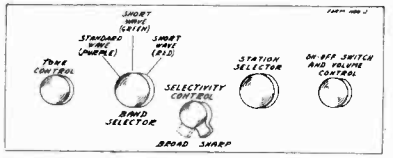


Fig. 1—Arrangement of Controls

General Service Data

D. C. Resistance of Windings

Refer to Fig. 5.

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Item	Code	D. C. Resistance in Ohms
9A376	Antenna Transformer	T1	
	Range B Primary Winding		21.2
	Range C Primary Winding		0.3
	Range D Primary Winding		0.2
	Range B Secondary Winding		6.1
	Range C Secondary Winding		1.8
	Range D Secondary Winding		Small
9A377	R. F. Interstage Transformer	T2	
	Range B Primary Winding		2.4
	Range C Primary Winding		1.4
	Range D Primary Winding		0.1
	Range B Secondary Winding		6.0
	Range C Secondary Winding		1.9
	Range D Secondary Winding		Small
9A378	Oscillator Coils	T5	
	Range B Grid Coil		
	Red White Tap to White		3.8
	Red White Tap to Ground		0.9
	Range C Grid Coil		
	Green White Tap to Green		1.3
	Green White Tap to Ground		0.6
	Range D Grid Coil		
	Black White Tap to Black		Small
	Black White Tap to Ground		Small
	Oscillator Plate Coil		0.2
9A379	1st I. F. Transformer	T3	
	Primary Winding		11.6
	Secondary Winding		
	Long Portion		11.4
	Short Portion		0.5
9A380	2nd I. F. Transformer	T4	
	Primary Winding		14.3
	Secondary Winding		4.4
*12A223	Dynamic Speaker (8")	L1	
	Output Transformer Primary Winding	T7	510
	Output Transformer Sec. Winding	T7	1.0
	Speaker Field		1025
	Speaker Voice Coil		4.1
	Speaker Bucking Coil		0.2
53X91	115 Volt 60 Cycle Power Transformer	T6	
	Primary Winding		7.5
	Tube Filament Winding (A-A)		0.2
	80 Filament Secondary		0.2
	High Voltage Secondary Winding		
	Center Tap to Inside		163.
	Center Tap to Outside		178.
9A391	High Frequency Oscillator Tracking Coil.	L2	1.1

*Speakers with other part numbers may have slightly different values of D. C. resistance.

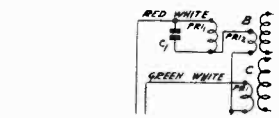


Fig. 8—Antenna Transformer in Early Models

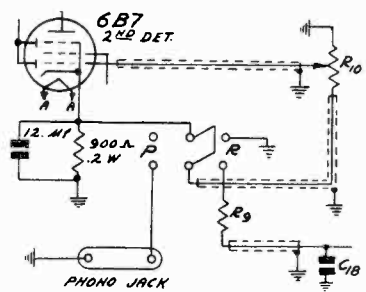


Fig. 9—Phonograph Connections

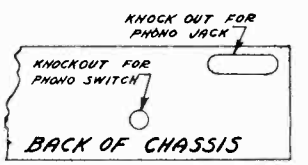


Fig. 10—Location of Phono Knockouts

Circuit

This model is a three band receiver with a tuning range in each band as shown in the specifications above. Three band coverage is accomplished by means of three sets of R. F. and oscillator coils and a three section triple throw switch.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna and interstage R. F. transformer assemblies and T5 is the oscillator coil assembly. The standard wave, 1st and 2nd short wave coils in each assembly are indicated by the letters B, C and D respectively. The three sections of the band switch are designated in the schematic as the antenna, interstage and oscillator sections.

The band switch completes connections to the coils in use. It also short circuits the R. F. transformer secondary and oscillator coil of lower frequency not in use.

The antenna transformer with tuned secondary feeds into a type 6K7 R. F. amplifier tube. The output of this tube is fed through the interstage R. F. transformer with tuned secondary into another 6K7 tube which functions as the 1st detector.

A separate type 76 tube is employed in the oscillator circuit. Referring to the oscillator assembly T5, Fig. 2, B, C and D refer to the standard wave, 1st short wave and 2nd short wave oscillator coils respectively. The oscillating circuit is always resonant at 456 KC above the frequency to which the R. F. amplifier is tuned.

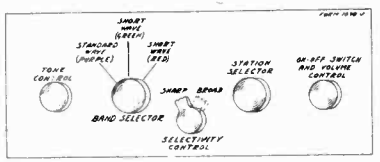


Fig 1—Arrangement of Controls

The oscillator potential is fed into the cathode circuit of the 6K7 first detector tube. This results in the intermediate or beat frequency of 456 KC being present in the plate circuit of this tube.

One stage of I. F. amplification is employed using a 6K7 tube. The primaries and secondaries of the first and second I. F. transformers are tuned by small trimmer condensers.

Selectivity Control—Referring to the 1st I. F. transformer T3 in Fig. 2, it will be noted that there is a coupling winding shown in the illustration below the primary. Refer also to the by-pass arrangement in the pentode plate circuit of the 6B7.

When the selectivity control is in the sharp position the coupling winding is open circuited and the loose coupling which exists between the primary and secondary of this transformer results in high selectivity. High audio frequencies are by-passed to ground through condenser C35.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary is connected in series with the secondary. This provides overcoupling which results in a greatly widened resonance curve. Passage of a wide range of audio frequencies is thus obtained.

In order to allow passage of the higher audio frequencies in the broad position, the capacity of the by-pass condenser to ground is greatly reduced (C35 and the capacity of shield E in series).

Dual Volume Control—A dual manual volume control is employed. In one section the audio voltage applied to the 1st audio section of the 6B7 tube is varied (R10). In the other section the R. F. and I. F. bias is varied (R2). The purpose of the latter section is to reduce the sensitivity of the receiver at low volume settings in order to cut down noise pick-up between stations. The variable section R2 is shorted out through contact No. 4 of the interstage section of the band selector when in the 2nd short wave position.

A type 6B7 duo diode pentode tube functions as the second detector and a one stage audio amplifier. The two diode plates are connected together. AVC voltage is applied through isolating resistors to the control grid circuits of the R. F. and I. F. tubes. The audio voltage developed across volume control resistor R10 is applied through the movable arm to the control grid of the 6B7 tube. Resistance coupling is used between the first audio stage and the output stage which employs a type 6F6 output pentode tube. A type 80 full wave rectifier tube is used in the power unit.

Alignment and Calibration

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band selector to the Range B position (standard wave band—purple dial color).

Turn the selectivity switch to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the A.V.C.

Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 6.

Range B Alignment

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band selector in the standard wave position.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range B trimmer (C21) until maximum output is obtained. The location of this trimmer is shown in Figs. 3 and 4.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

There is a lever arm in front of the large gear on the tuning condenser shaft by means of which the position of the station pointer may be adjusted. Set the station pointer at the 1500 KC mark on the dial scale by adjusting this lever arm.

Adjust the interstage Range B trimmer (C9) and antenna Range B trimmer (C2) to maximum.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range C Alignment

5800 KC Adjustment

Set the signal generator for 5800 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range C position (1st short wave band—green dial color).

Adjust the oscillator Range C trimmer (C23) until maximum output is obtained. See Figs. 3 and 4 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C10) and antenna Range C trimmer (C3) to maximum.

Do not change the setting of the oscillator Range C trimmer.

Range D Alignment

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range D position (2nd short wave band—red dial color).

Adjust the oscillator Range D trimmer (C24) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C11) and antenna Range D trimmer (C4) to maximum.

When adjusting the interstage Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Then go back and repeat the procedure as given for the 18,300 KC adjustment. If it is found necessary to make any appreciable change in the setting of the oscillator Range D trimmer, the 15,000 KC adjustment must be repeated.

Do not make any further change in the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Tuning Frequency Range

B Range	535 to 1730 KC.
C Range	1715 to 5800 KC.
D Range	5750 to 18300 KC.

Sensitivity

B Range Average	0.5 Microvolts Absolute
C Range Average	1.0 Microvolts Absolute
D Range Average	2.0 Microvolts Absolute

Power Consumption - 68 Watts (At 115 volts 60 cycles)

Power Output - 3 Watts Undistorted

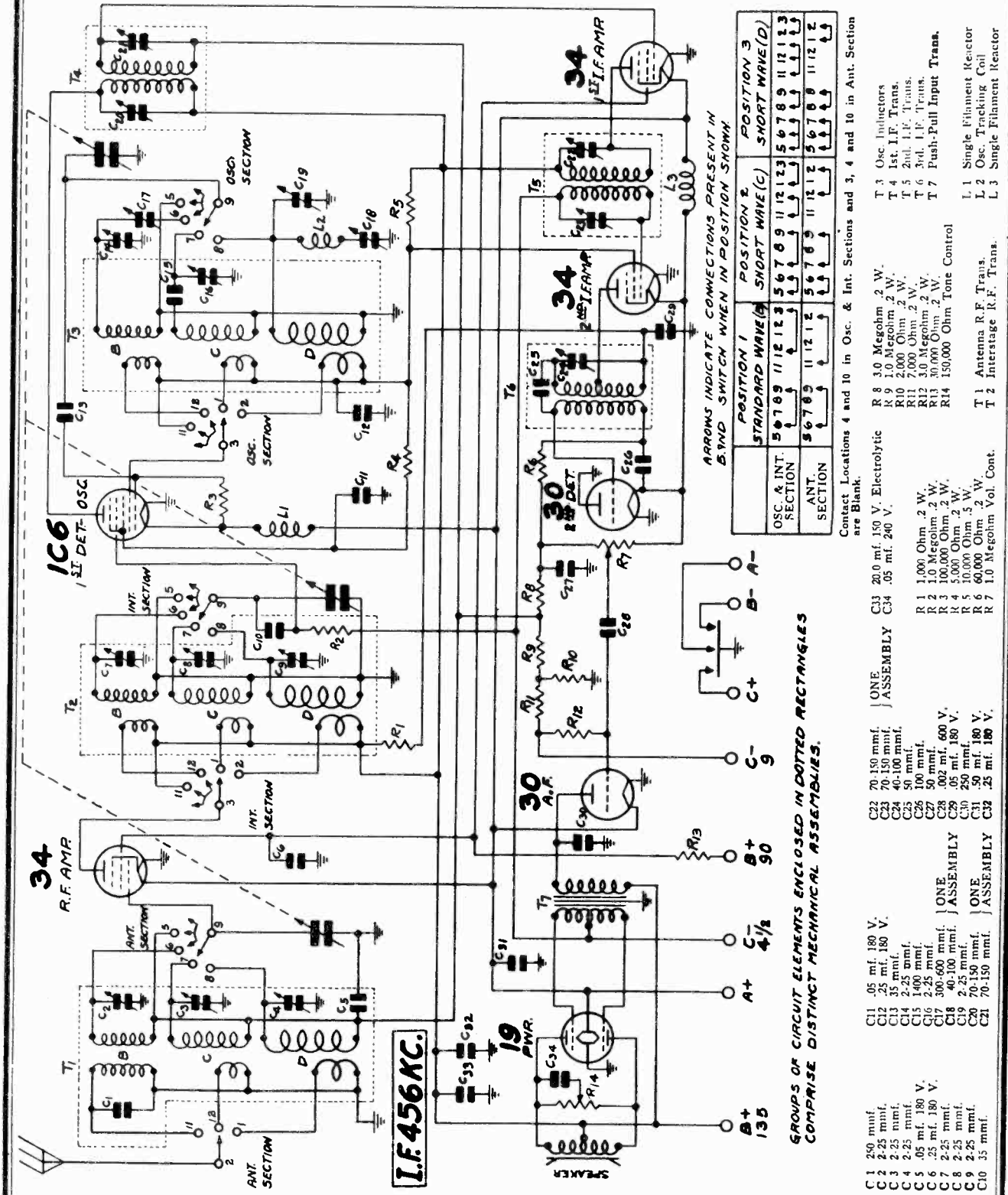
Selectivity - 28 KC Broad at 1000 times Signal (Sharp)

Intermediate Frequency - 456 KC.

Speaker - 6" and 8" Dynamic

MODELS 37H508, 37H566
Chassis 7H
Schematic

WELLS-GARDNER & CO.



	POSITION 1 STANDARD WAVE(B)	POSITION 2 SHORT WAVE(C)	POSITION 3 SHORT WAVE(D)
OSC. & INT. SECTION	5 6 7 8 9 10 11 12 1 2 3	5 6 7 8 9 10 11 12 1 2 3	5 6 7 8 9 10 11 12 1 2 3
ANT. SECTION	5 6 7 8 9 10 11 12 1 2	5 6 7 8 9 10 11 12 1 2	5 6 7 8 9 10 11 12 1 2

Contact Locations 4 and 10 in Osc. & Int. Sections and 3, 4 and 10 in Ant. Section are Blank.

C1 250 mmf.
C2 2-25 mmf.
C3 2-25 mmf.
C4 2-25 mmf.
C5 .05 mf. 180 V.
C6 .25 mf. 180 V.
C7 2-25 mmf.
C8 2-25 mmf.
C9 2-25 mmf.
C10 35 mmf.
C11 .05 mf. 180 V.
C12 .25 mf. 180 V.
C13 35 mmf.
C14 2-25 mmf.
C15 1400 mmf.
C16 2-25 mmf.
C17 300-600 mmf. } ONE
C18 40-100 mmf. } ASSEMBLY
C19 2-25 mmf.
C20 70-150 mmf. } ONE
C21 70-150 mmf. } ASSEMBLY
C22 70-150 mmf. } ONE
C23 70-150 mmf. } ASSEMBLY
C24 40-100 mmf.
C25 50 mmf.
C26 100 mmf.
C27 50 mmf.
C28 .002 mf. 600 V.
C29 .05 mf. 180 V.
C30 250 mmf.
C31 .50 mf. 180 V.
C32 .25 mf. 180 V.
C33 20.0 mf. 150 V. Electrolytic
C34 .05 mf. 240 V.

R 1 1,000 Ohm .2 W.
R 2 1.0 Megohm .2 W.
R 3 100,000 Ohm .2 W.
R 4 5,000 Ohm .2 W.
R 5 10,000 Ohm .5 W.
R 6 60,000 Ohm .2 W.
R 7 1.0 Megohm Vol. Cont.
R 8 3.0 Megohm .2 W.
R 9 1.0 Megohm .2 W.
R10 2,000 Ohm .2 W.
R11 7,000 Ohm .2 W.
R12 3.0 Megohm .2 W.
R13 30,000 Ohm .2 W.
R14 150,000 Ohm Tone Control

T 1 Antenna R.F. Trans.
T 2 Interstage R.F. Trans.
T 3 Osc. Inductors
T 4 1st. I.F. Trans.
T 5 2nd. I.F. Trans.
T 6 3rd. I.F. Trans.
T 7 Push-Pull Input Trans.

L 1 Single Filament Reactor
L 2 Osc. Tracking Coil
L 3 Single Filament Reactor

WELLS-GARDNER & CO.

MODELS 37H508, 37H566
Chassis 7H
Voltage, Socket,
Trimmers, Coil Data

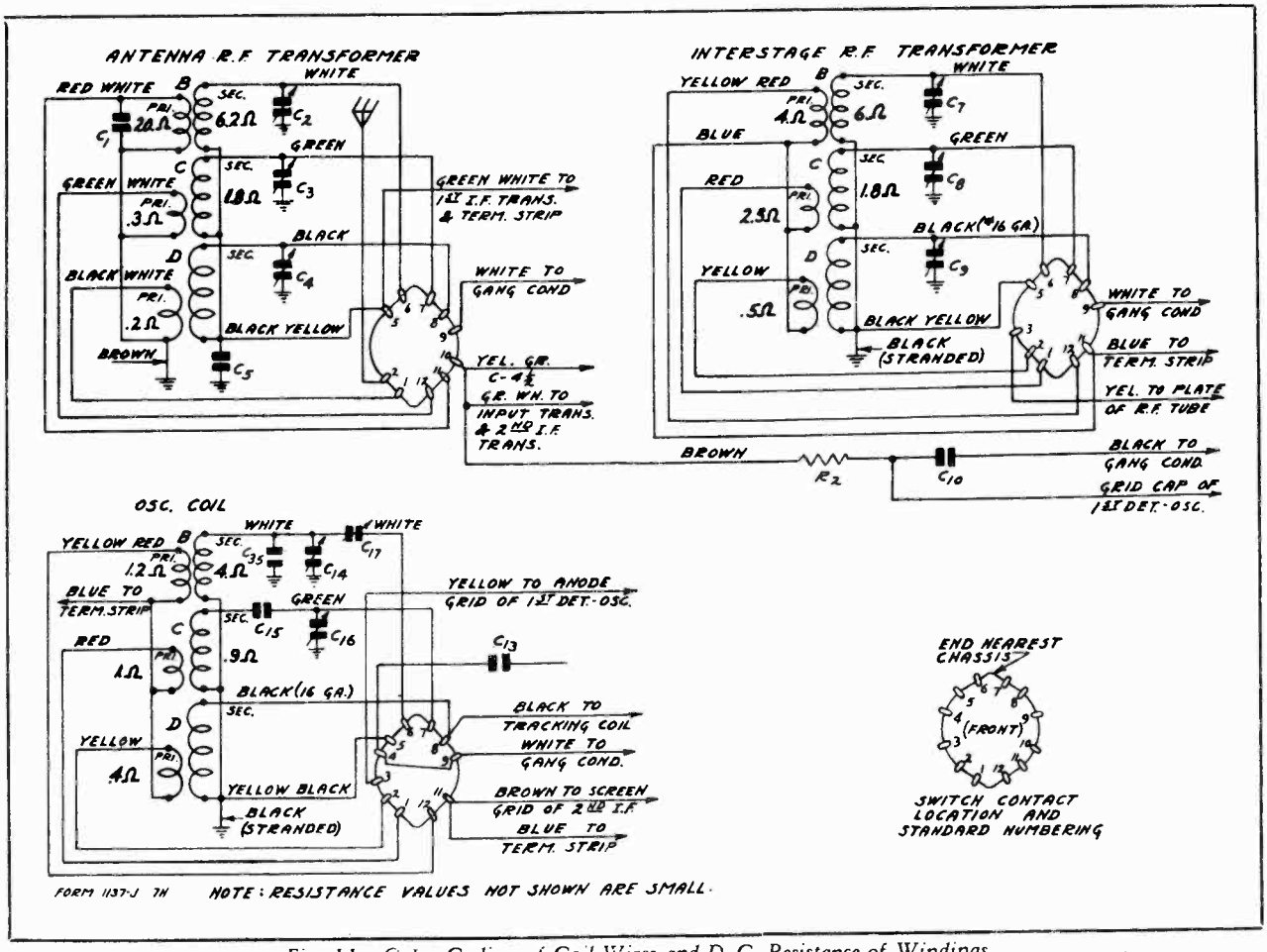
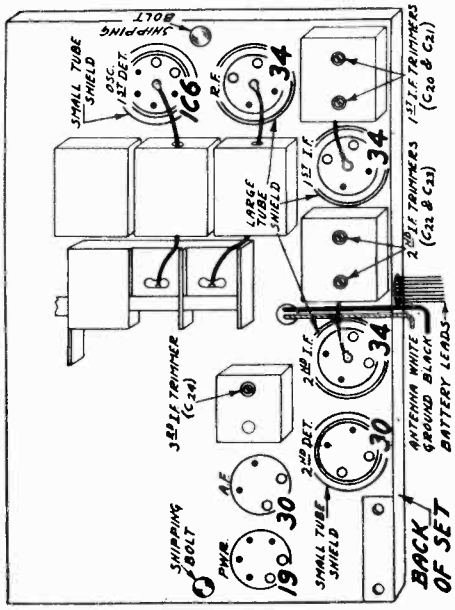


Fig. 11—Color Coding of Coil Wires and D. C. Resistance of Windings (Also See Complete D. C. Resistance List Below)

VOLTAGES AT SOCKETS

Batteries up to Rated Voltages Ant. Shorted to Ground
Voltages Read from Negative Fil. Terminal
Volume Control at Maximum

Type of Tube	Function	Across Filam't	Plate to Ground	Screen to Ground	Control Grid to Ground	Normal Plate M. A.
34	R. F. Amp.	2.0	135	45		1.8
1C6	1st Detector Oscillator	2.0	135 75(1)	65		2.6 1.8(1)
34	1st I. F. Amp.	2.0	135	45		1.8
34	2nd I. F. Amp.	2.0	133	75	4.5	2.25
30	2nd Detector	2.0				
30	A. F. Amp.	2.0	135			3.0
19	Power Amp.	2.0	135		4.5	1.0 (Per Plate)



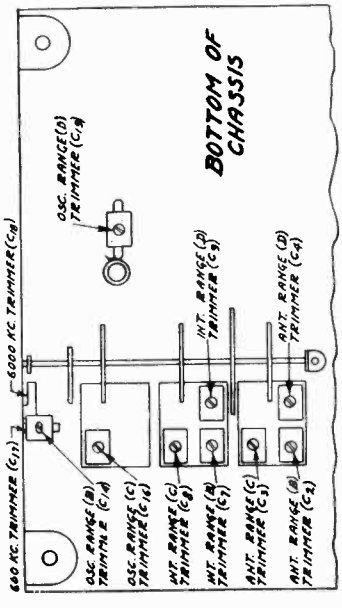


Fig. 9—Arrangement of Trimmers

MODELS 37H508, 37H566
Chassis 7H
Drive Cord Data,
Resistances

WELLS-GARDNER & CO.

Replacing Drive Cord

Take off the station pointer by removing the screw at the center of the dial.

Loosen the two set screws in the collar on the band selector shaft.

Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis and one screw at the top which secures this assembly to the bracket.

Pull the dial assembly forward until the collar is free of the band selector shaft; and lay the assembly face downward in front of the chassis.

Turn the drive drum until the opening in this drum is approximately vertical and with the hole at the top as shown in Fig. 12.

Remove the tension spring and the old drive cord.

See that the eyelet is in the hole in the drive drum as shown in Fig. 12. Insert one end of the new drive cord from the outside through the hole in the eyelet in the drive drum.

Tie the end of the cord, which has been inserted through the hole, to one end of the tension spring.

Wrap the cord in a counter clockwise direction (facing front of chassis) around the drive drum approximately one and one half turns, progressing toward the front.

Then tilt the chassis up on its back panel and bring the cord mentioned in the previous paragraph down to the drive shaft. Wrap it two and one half times around this shaft as shown in Fig. 12, progressing toward the back of chassis.

Wrap the cord on directly under the drive drum above.

Then bring this cord up to the drive drum until it is up to the hole in the drive drum as shown in the illustration.

Now insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. The end of the spring when hanging free should be approximately 3/8" from the flange of the drum as shown in Fig. 12. Cut off the surplus length of cord after it is knotted.

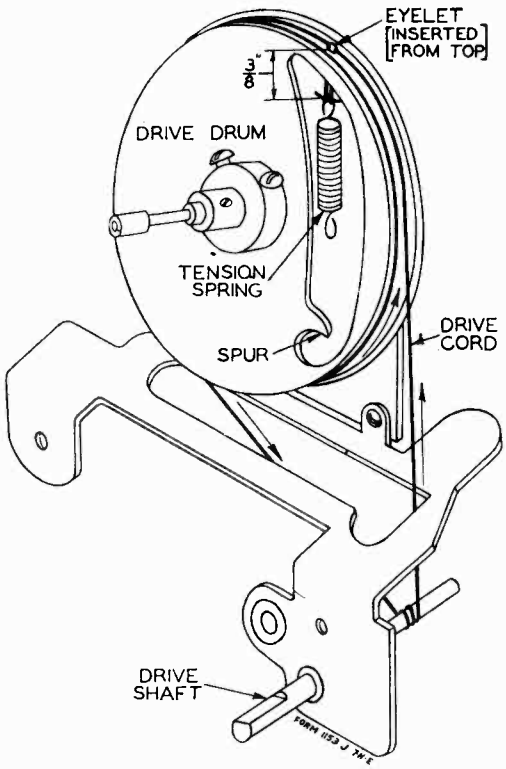


Fig. 12—Drive Cord Replacement

Then secure the other end of the tension spring over the spur on the drive drum.

Turn the drive shaft back and forth several times.

Replace the drive assembly and pointer.

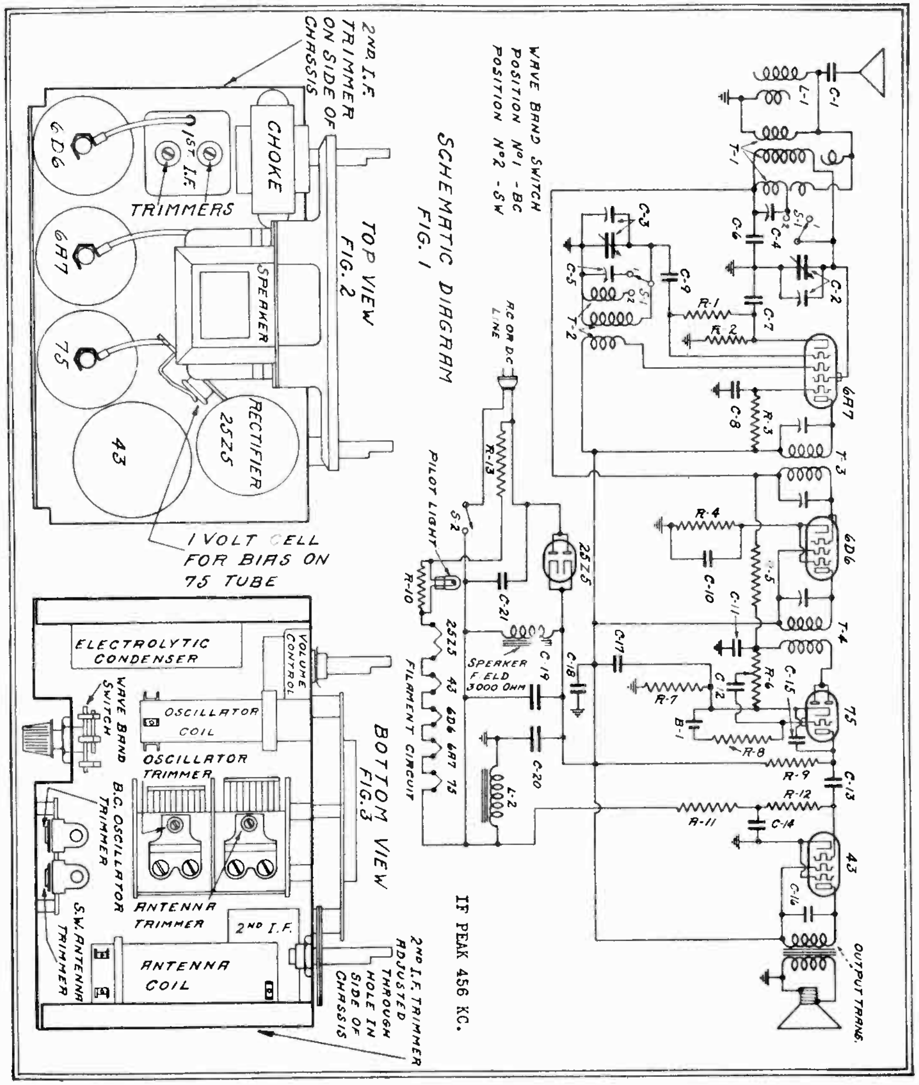
Replace the chassis in the cabinet.

Following are the D. C. resistances of the various coil windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
P-9A416	Antenna R. F. Transformer	T1	
	Range B Primary Winding		20.0
	Range C Primary Winding		0.3
	Range D Primary Winding		0.2
	Range B Secondary Winding		6.2
	Range C Secondary Winding		1.8
	Range D Secondary Winding		Small
P-9A392	Interstage R. F. Transformer	T2	
	Range B Primary Winding		4.0
	Range C Primary Winding		2.5
	Range D Primary Winding		0.5
	Range B Secondary Winding		6.0
	Range C Secondary Winding		1.8
	Range D Secondary Winding		Small
P-9A393	Oscillator Coils	T3	
	Range B Plate Coil		1.2
	Range C Plate Coil		1.0
	Range D Plate Coil		0.4
	Range B Grid Coil		4.0
	Range C Grid Coil		0.9
	Range D Grid Coil		Small
P-9A394	1st I. F. Transformer	T4	
	Primary Winding		11.4
	Secondary Winding		11.4
P-9A395	2nd I. F. Transformer	T5	
	Primary Winding		11.4
	Secondary Winding		11.4
P-9A396	3rd I. F. Transformer	T6	
	Primary Winding		
	Tap to B+		8.0
	Tap to Variable Trimmer		8.2
	Secondary Winding		126.0
P-50X11	Audio Input Transformer	T7	
	Primary Winding		1005.0
	Secondary Winding		
	Center Tap to Inside		580.0
	Center Tap to Outside		630.0
*P-12A218	Magnetic Speaker		
	Speaker Coil		
	Center Tap to Inside		275.0
	Center Tap to Outside		300.0
P-9A281	Single Filament Reactor	L1	1.2
P-9A391	High Frequency Oscillator Tracking Coil	L2	0.7
P-9A281	Single Filament Reactor	L3	1.2

WESTINGHOUSE ELEC. & MFG. CO.

MODEL WR-100
Schematic, Socket
Trimmers, Parts



REPLACEMENT PARTS

*Item	Part No.	DESCRIPTION	List Price Effective as of Sept. 1st, 1935 PRICE
L2	ZZT-196	Filter choke—500 ohms	$ .60
T1, L1	2DT-199	Two-band antenna coil with 456 kc wave trap	.75
T2	2DT-200	Two-band oscillator coil	.50
T3	2DT-201	456 first i-f transformer	.90
T4	2DT-202A	456 kc second i-f transformer	.90
R1	KR-53	50,000 ohm 1/4 watt carbon resistor	.16
R2	CCR-140	350 ohm 1/2 watt wire-wound resistor	.16
R3	ZZR-196	30,000 ohm 1/4 watt carbon resistor	.16
R4	AAR-119	300 ohm 1/2 watt wire-wound resistor	.16
R5, R8	KR-57	1 megohm 1/4 watt carbon resistor	.16
R6, S2	2DR-169	Volume control with line switch—0.5 megohm	.80
R7	PR-79	1,000 ohm 1/4 watt carbon resistor	.16
R9, R11, R12	KR-56	0.5 megohm 1/4 watt carbon resistor	.16
R10	2DR-200	25 ohm wire-wound metal clad resistor	.16
R13	2DW-62	145 ohm, 15 watt resistor wire in line cord	.60
C1, C11	IC-47A	0.0005 mf mica condenser	.16
C2, C3	2DC-202	Two gang variable condenser	2.20
C4, C5	2DC-212	Dual trimmer on bakelite strip 3 to 30 mmf—each trimmer	.15
C6, C14, C21	AC-6	0.1 mf, 200 volt tubular condenser	.16
C7, C8, C10	BC-12	0.05 mf, 200 volt tubular condenser	.16
C9	EC-24A	0.0001 mf mica condenser	.16
C12, C13	CCC-127	0.01 mf, 200 volt tubular condenser	.16
C15	AC-7A	0.00025 mf mica condenser	.16
C16	HC-34	0.006 mf, 600 volt tubular condenser	.16
C17	EC-19	0.5 mf, 200 volt tubular condenser	.25
C18	BC-13	0.25 mf, 200 volt tubular condenser	.16
C19, C20	2DC-203	Multiple 8 and 16 mf electrolytic filter condenser C19—16 mf, 150 volts. C20—8 mf, 150 volts.	1.5[illegible]
B1	XXZ-213	Bias cell, one volt	.15
S1	2DS-102A	Wave-band switch	.35
	KS-38B	5" dynamic speaker	3.50
	KL-6	Pilot light, 6-8 volt, .15 amp.	.15
	2DW-62	Line cord with built-in resistor wire (R-13)	.60
		Dial Assembly consists of:	
	2DD-21A	Dial scale and bracket	.60
	2DD-21B	Pyralin drive disc	.20
	2DD-21C	Vernier friction drive	.35
	2DD-21D	Dial crystal	.10
	2DD-21E	Dial pointer	.05

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.

MODEL WR-101
Schematic, Changes
Parts

WESTINGHOUSE ELEC. SUPPLY CO.

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.

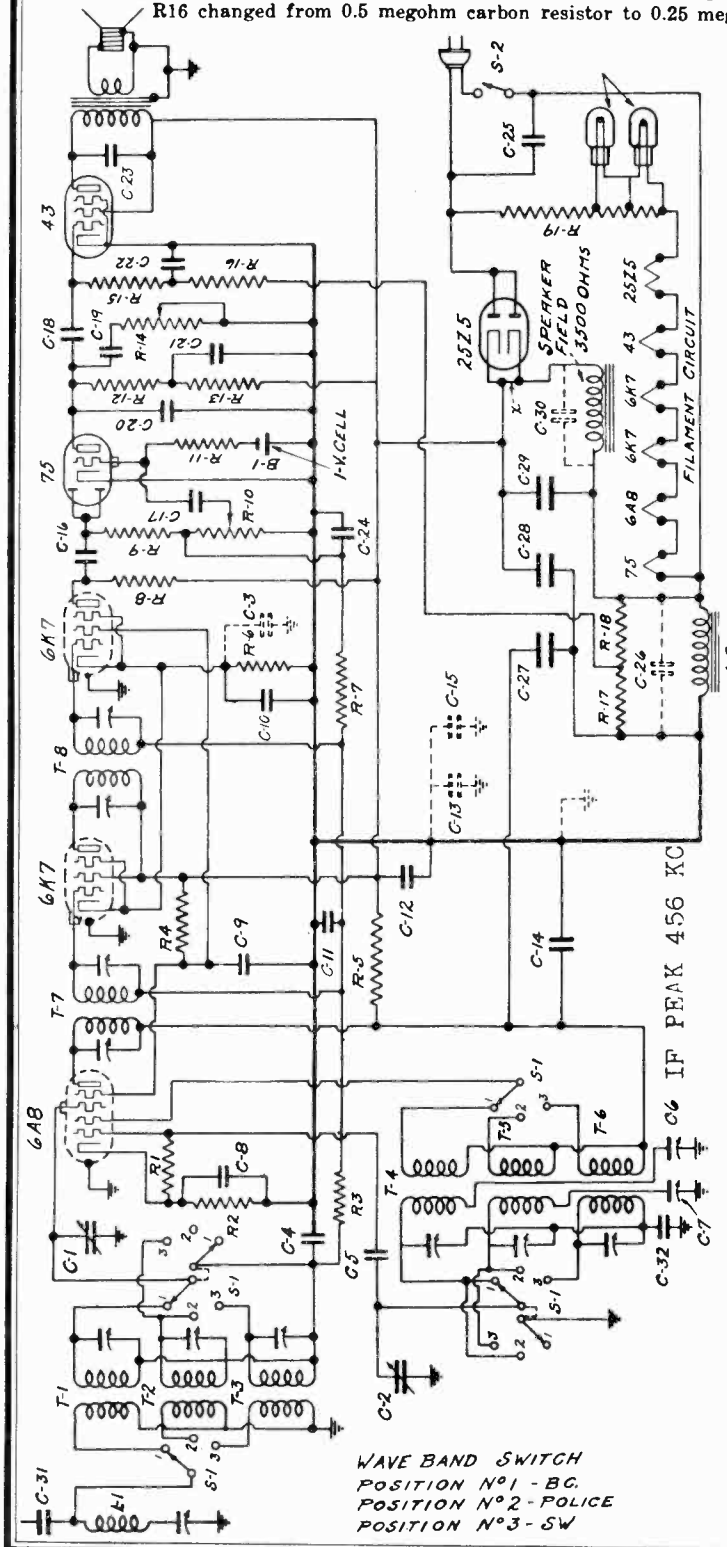
In later production runs, the following changes were made:

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.



L1	MMT-149	456 kc adjustable wave-trap	ZZC-191B	C8—0.1 mf, 200 v.	C12—0.1 mf, 200 v.
L2	ZZT-196	Filter choke—500 ohms		C9—0.1 mf, 200 v.	C13—0.1 mf, 200 v.
T1, T2, T3	ZZT-192A	Three-band antenna coil assembly		C10—0.2 mf, 200 v.	C14—0.1 mf, 200 v.
T4, T5, T6	ZZT-193	Three-band oscillator coil assembly		C11—0.05 mf, 200 v.	
T7	ZZT-194	456 kc first i-f transformer			
T8	ZZT-195	456 kc second i-f transformer			
R1, R8	KR-53	50,000 ohm, ¼ watt carbon resistor	C15	ZZC-205	0.02 mf, 200 v. tubular condenser
R2	FFR-126	500 ohm, ½ watt wire-wound resistor	C16, C20, C24	AC-7A	0.00025 mf mica condenser
R3, R7, R11	KR-57	1 megohm, ¼ watt carbon resistor	C17, C18	CCC-127	0.01 mf, 200 v. tubular condenser
R4	ZZR-196	30,000 ohm, ¼ watt carbon resistor	C19	ZZC-213	0.006 mf, 200 v. tubular condenser
R5, R17	LR-65	10,000 ohm, ¼ watt carbon resistor	C23, C31	AAC-114	0.001 mf mica condenser
R6	ZZR-197	850 ohm, ½ watt wire-wound resistor	C26	BC-13	0.25 mf, 200 v. tubular condenser
R9, R13	KR-54	100,000 ohm, ¼ watt carbon resistor	C27, C28, C29	ZZC-192A	4, 8 and 16 mf electrolytic filter condenser block
R10, S2	ZZR-190A	Volume control with line switch—0.5			C27—4 mf, 150 v. C29—16 mf, 150 v.
R12	LR-61	200,000 ohm, ¼ watt carbon resistor			C28—8 mf, 150 v.
R14	ZZR-191A	Tone control—0.25 megohms	C30	YC-98A	Tubular 4 mf, 150 v. electrolytic condenser
R15, R16	KR-56	500,000 ohm, ¼ watt carbon resistor	C32	ZZC-206	0.005 mf mica condenser
R18	LR-64	5,000 ohm, ¼ watt carbon resistor		ZZS-128A	5" dynamic speaker
R19	ZZR-192A	Wire-wound ballast resistor—130 ohms			
C1, C2	ZZC-184	Two-gang variable condenser	S1	ZZS-129A	Wave-band switch
C3, C4, C21, C22, C25	AC-6	0.1 mf, 200 volt tubular condenser		KL-6	Pilot light, 6-8 volt, .15 amp.
C5	EC-24A	0.0001 mf mica condenser		ZZD-26A	Airplane dial
C6, C7	JJC-144C	Dual adjustable padding condenser	B1	XXZ-213	Bias cell, one volt
		C6—250 to 550 mmf.		ZZZ-209	Escutcheon with crystal
		C7—800 to 1400 mmf.			

WESTINGHOUSE ELEC. & MFG. CO.

MODEL WR-101
Alignment
Voltage

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.

VOLTAGE ANALYSIS

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.

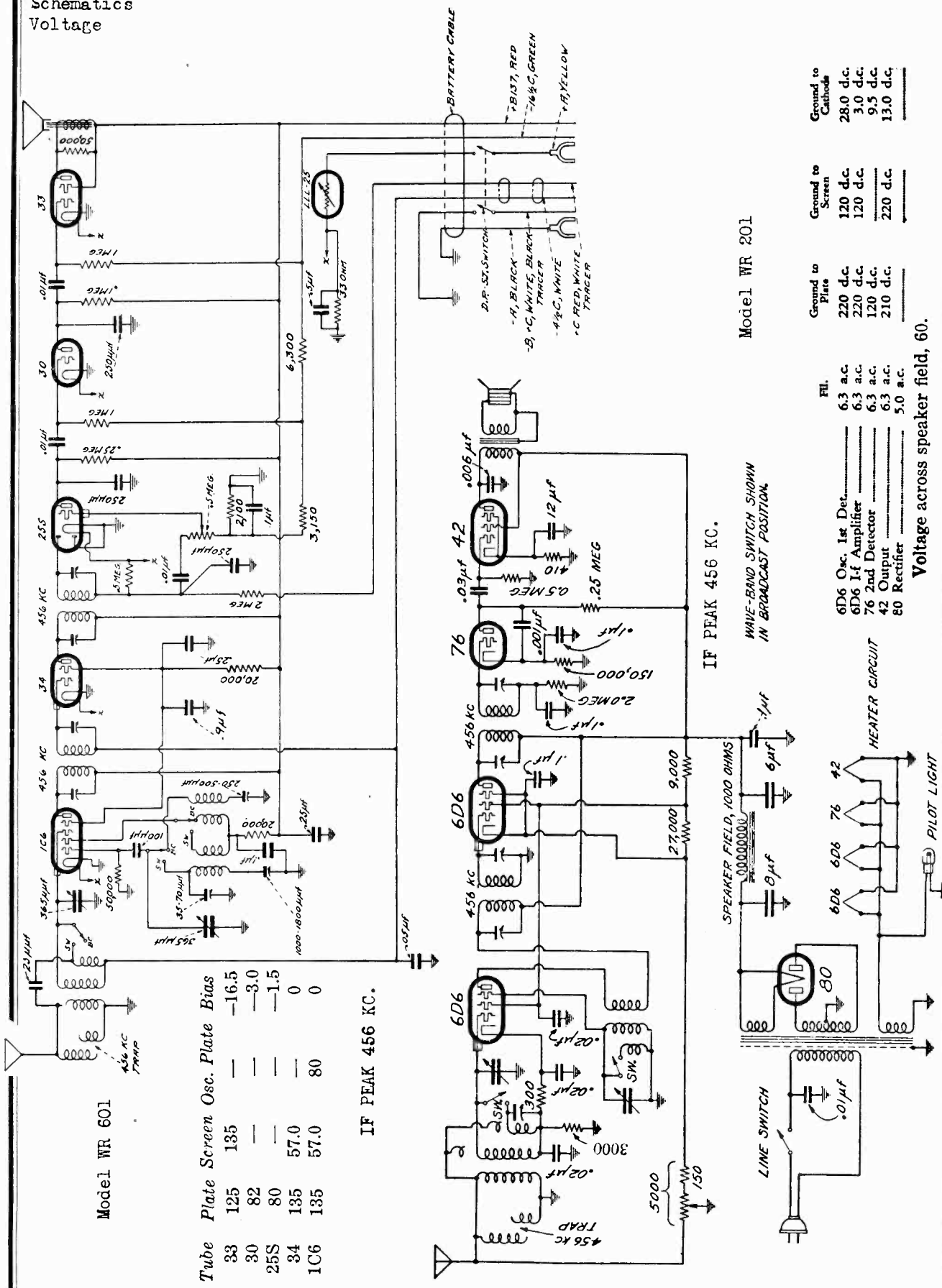
Tube	*Plate*	*Screen*	*Cathode*	*Osc. Plate*	*Fil.*
6A8	82	50	2	82	6
6K7 1st i-f	107	107	5	—	6
6K7 2nd i-f	65	50	5	—	6
75	50	—	0	—	6
43	95	107	0	—	24

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

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

MODEL WR-201
MODEL WR-601
Schematics
Voltage

WESTINGHOUSE ELEC. SUPPLY CO.



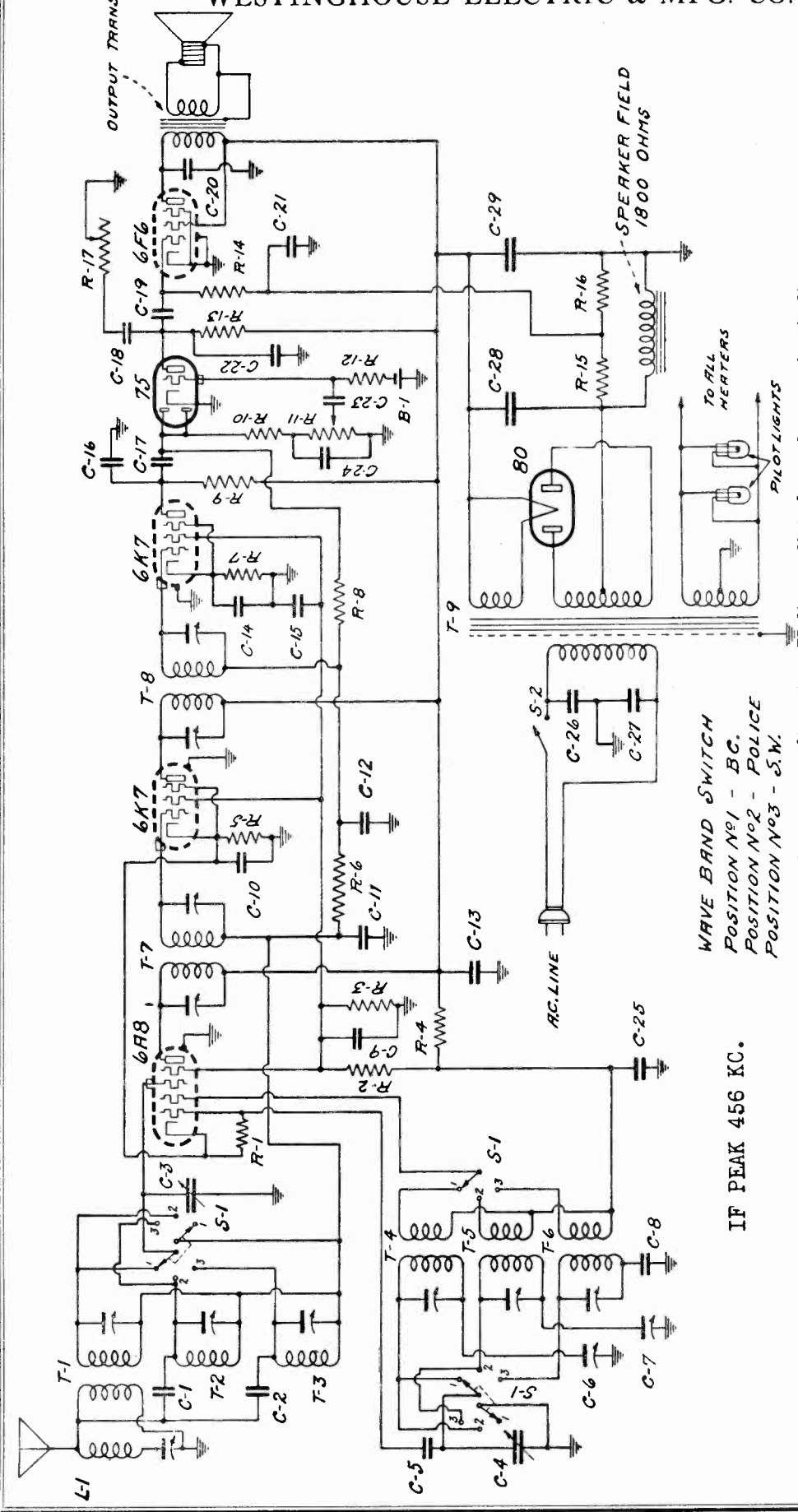
Tube	Plate	Screen	Osc. Plate	Bias
33	125	135	—	—16.5
30	82	—	—	—3.0
25S	80	—	—	—1.5
34	135	57.0	—	0
1C6	135	57.0	80	0

	Fil.	Ground to Plate	Ground to Screen	Ground to Cathode
6D6 Osc. 1st Det.	6.3 a.c.	220 d.c.	120 d.c.	28.0 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.

WESTINGHOUSE ELECTRIC & MFG. CO. MODELS WR-203, WR-303

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.

Replacements Should Be Made With Genuine Factory Parts For Best Results

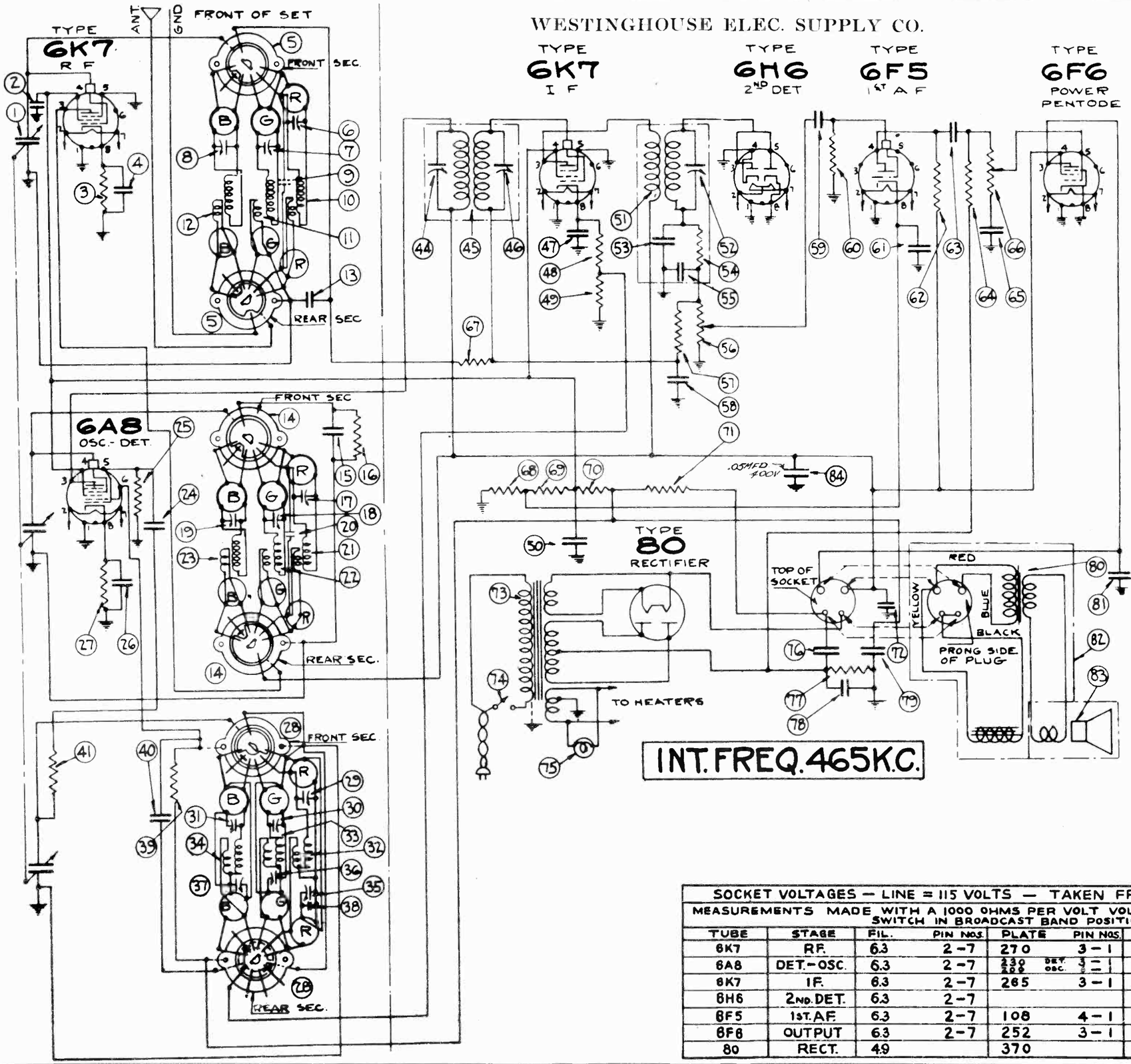
REPLACEMENT PARTS

*ITEM	PART NO.	DESCRIPTION	List Price Effective as of Sept. 1st, 1935 PRICE
L1	MMT-149	456 kc tunable wave trap	$ .35
T1, T2, T3	XXT-186	Three band antenna coil assembly	1.75
T4, T5, T6	XXT-187	Three band oscillator coil assembly	1.75
T7	XXT-188A	456 kc 1st i-f transformer	1.15
T8	XXT-189A	456 kc 2nd i-f transformer	1.15
T9	XXT-190	Power transformer	2.85
R11	XXR-185A	Volume control—.25 megohm	.60
R17, S2	XXR-186A	Tone control with switch—.25 megohm	.80
R7	KR-51	2,500 ohm—¼ watt carbon resistor	.16
R1, R9	KR-53	50,000 " " " " "	.16
R10, R14	KR-54	100,000 " " " " "	.16
R13	LR-61	200,000 " " " " "	.16
R16	XXR-202	210,000 " " " " "	.16
R6	KR-55	250,000 " " " " "	.16
R12	KR-56	500,000 " " " " "	.16
R8	KR-57	1 meg. " " " " "	.16
R15	XXR-203	1.1 " " " " " "	.16
R5	FFR-126	500 ohm wire-wound resistor—½ watt	.16
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	.40
C3, C4	XXC-187	Two-gang variable condenser	2.15
C28, C29	XXC-188	Dual 8 mf dry electrolytic condenser	1.65
C6, C7	JJC-144D	Dual padding condenser C6—250 to 600 mmf. C7—800 to 1600 mmf.	.60
C1, C2, C16	IIC-133A	.000025 mf mica condenser	.16
C5	EC-24A	.0001 mf mica condenser	.16
C17	AC-7A	.00025 mf mica condenser	.16
C22, C24	IC-47	.0005 mf mica condenser	.16
C8	XXC-197	.0038 mf mica condenser	.25
C18	XXC-207	.005 mf-400 v. tubular condenser	.16
C20	ZC-115	.006 mf-1000 v. tubular condenser	.16
C23	CCC-127	.01 mf-200 v. tubular condenser	.16
C19	KC-58	.01 mf-400 v. tubular condenser	.16
C11, C12	BC-12	.05 mf-200 v. tubular condenser	.16
C26, C27	XXC-220	Dual .01 mf, 250 volt condenser	.30
C9, C14 C10, C15	AC-6	.1 mf-200 v. tubular condenser	.16
C13, C25	EEC-132	.1 mf-400 v. tubular condenser	.16
C21	BC-13	.25 mf-200 v. tubular condenser	.16
	XXS-127	6" dynamic speaker	4.25
	2BS-130	10" dynamic speaker	6.25
S1	XXS-117A	Wave-band switch	1.10
	KL-6	Pilot light, 6-8 volt, .15 amp	.15
	XXD-25C	Airplane dial	2.10
	XXZ-195	Escutcheon with crystal	.50
B1	XXZ-213	Bias cell, one volt	.15

When Ordering Replacement Parts Specify Part Number

MODELS WR-204, WR-304
Schematic, Voltage
Resistance Data

WESTINGHOUSE ELEC. SUPPLY CO.



D.C. RESISTANCE

MEASURED WITH WAVE-CHANGE SWITCH IN CORRESPONDING BAND POSITION

COIL	DIA.Nº	PRIM.	SEC.
B-ANT.	12	22 OHMS	4 OHMS
B-RF.	23	5 .	4.5 .
B-OSC.	34	1.5 .	3 .
G-ANT.	11	32 .	1 .
G-RF.	22	1.5 .	1 .
G-OSC.	33	.5 .	1 .
R-ANT.	10	1 .	.04 .
R-RF.	21	2 .	.04 .
R-OSC.	32	.5 .	.04 .
1ST. IF.	45	13 .	13 .
2ND. IF	51	11.5 .	11.5 .
OUTPUT TRANS.	80	450 .	.5 .
SPKR. FIELD		1900 .	
VOICE COIL	83	3 .	

SOCKET VOLTAGES — LINE = 115 VOLTS — TAKEN FROM BOTTOM OF SOCKETS

MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE-CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL.	PIN NOS.	PLATE	PIN NOS.	SCREEN	PIN NOS.	CATHODE	PIN NOS.
6K7	RF.	6.3	2-7	270	3-1	108	4-1	2.6	1-8
6A8	DET.-OSC.	6.3	2-7	230 DET. 208 OSC.	3-1			4.0	1-8
6K7	IF.	6.3	2-7	265	3-1	105	4-1	5.5	1-8
6H6	2ND. DET.	6.3	2-7						
6F5	1ST. AF.	6.3	2-7	108	4-1			1.2	1-8
6F6	OUTPUT	6.3	2-7	252	3-1	270	4-1	18.5 ACROSS 177 OHMS	
80	RECT.	4.9		370					

WESTINGHOUSE ELEC. SUPPLY CO.

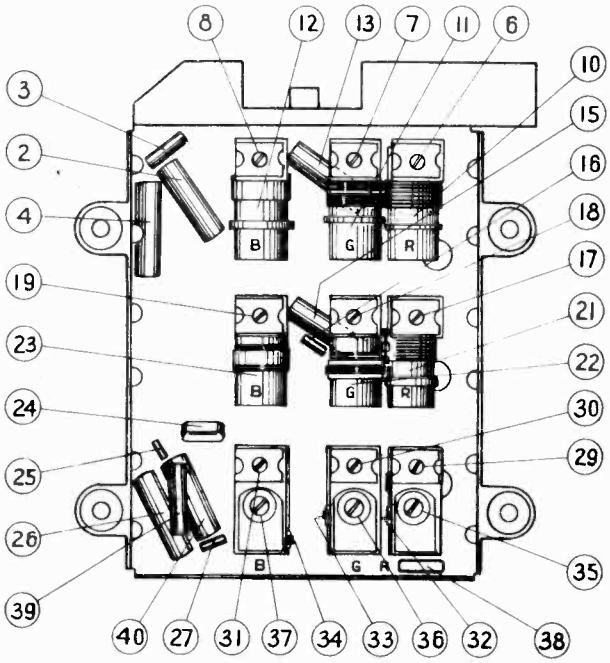


Figure No. 2

DIA.#	PART#	DESCRIPTION
1	CG 9527	Variable gang condenser
2	SA 106386	.05 mfd. 200 V. condenser
3	RE 9529	300 ohm ½ W. resistor
4	SA 106386	.05 mfd.200 V. condenser
5	SW 9527	Ant. section of "Centr-O-matic" unit complete with coils,switch and trimmers
6	CS 9511	4 to 25 mmf. antenna trim condenser (Red Band)
7	CS 9511	4 to 25 mmf. antenna trim condenser (Green Band)
8	CS 9511	4 to 25 mmf. antenna trim condenser(Broadcast Band)
9		Twisted pair of wire-part of RC 9571
10	RC 9571	Antenna coil assembly (Red Band)
11	RC 9574	Antenna coil assembly (Green Band)
12	RC 9577	Antenna coil assembly (Broadcast Band)
13	CW 9513	.05 mfd. 200 V. condenser
14	SW 9589	R.F. unit complete with coils,switch and trimmers
15	CW 9513	.05 mfd. 200 V. condenser
16	RE 9527	5000 ohm ½ W. resistor
17	CS 9511	4 to 25 mmf. R.F. trim condenser (Red Band)
18	CS 9512	1.5 to 10. mmf. R.F. trim condenser (Green Band)
19	CS 9512	1.5 to 10. mmf. R.F. trim condenser (Broadcast Band)
20	CW 9512	6 mmf. mica condenser
21	RC 9572	R.F. coil assembly (Red Band)
22	RC 9575	R.F. coil assembly (Green Band)
23	RC 9578	R.F. coil assembly (Broadcast Band)
24	SA 106417	.0001 mica condenser
25	RE 9524	50,000 ohm ½ W. resistor
26	SA 106386	.05 mfd. 200 V. condenser
27	RE 9529	300 ohm ½ W. resistor
28	SW 9529	Oscillator section of "Centr-O-matic" unit,complete with coils,switch, trim and lag condensers
29		3 to 15 mmf. oscillator trim condenser-part of CS 9520 (Red Band)
30		3 to 15 mmf. oscillator trim condenser-part of CS 9520 (Green Band)
31		5 to 25 mmf. oscillator trim condenser-part of CS 9517 (Broadcast Band)
32	RC 95109	Oscillator coil assembly (Red Band)
33	RC 9576	Oscillator coil assembly (Green Band)
34	RC 9579	Oscillator coil assembly (Broadcast Band)
35		800 to 1600 mfd. osc. lag condenser-part of CS 9520 (Red Band)
36		800 to 1600 mfd. osc. lag condenser-part of CS 9520 (Green Band)
37		300 to 600 mfd. oscillator lag condenser-part of CS 9517 (Broadcast Band)
38	CW 959	.002 mfd. mica condenser
39	RE 9526	5000 ohm 1 W. resistor
40	CW 9513	.05 mfd. 200 V. condenser
41	RE 9537	50 ohm ½ W. resistor
44		30 to 100 mmf. trim condenser-part of IC 9527
45	IC 9527	1st I.F. transformer assembly
46		30 to 100 mmf. trim condenser-part of IC 9527
47	SA 102493	.05 mfd. 200 V. condenser
48	SA 105261	400 ohm ½ W. resistor
49	SA 105267	1000 ohm ½ W. resistor
50	SA 102497	.25 mfd. 200 V. condenser
51	IC 9537	2nd I.F. transformer assembly
52		30 to 100 mmf. trim condenser-part of IC 9537.
53		50 mmf. mica condenser - part of IC 9537
54		50,000 ohm ½ W. resistor-part of IC 9537
55		100 mmf. mica condenser-part of IC 9537
56	VR 959	Volume control (½ meg.)
57	RE 9530	1 meg. ½ W. resistor
58	SA 106386	.05 mfd. 200 V. condenser
59	CW 9512	.02 mfd. 400 V. condenser
60	RE 9530	1 meg. ½ W. resistor
61	CE 9515	12. mfd. 25 V. condenser
62	SA 105279	250,000 ohm ½ W. resistor
63	CW 9512	.02 mfd. 400 V. condenser
64	RE 9531	250,000 ohm ½ W. resistor
65	SA 106403	.001 mfd. 600 V. condenser
66	VR 9512	Tone control (½ meg.)
67	SA 105278	100,000 ohm ½ W. resistor
68	SA 105260	300 ohm ½ W. resistor
69	SA 104966	30,000 ohm ½ W. resistor
70	SA 101404	15,000 ohm 1 W. resistor
71	SA 103835	10,000 ohm 2 W. resistor
72		4. mfd. 450 V. elect. condenser-part of CE 954
73	TR 959	Power transformer
74		Line switch-part of VR9512
75	SA 106809	Dial lights 6 V. (3 used)
76		8. mfd. 475 V. elect. condenser-part of CE 954
77	RE 9523	300 ohm resistor
78		20. mfd. 25 V. elect. condenser-part of CE 954
79	CE 9511	8. mfd. 300 V. elect. condenser
80	TR 9515	Speaker output transformer
81	SA 103659	.005 mfd. 400 V. condenser
82	SK 9511	Speaker

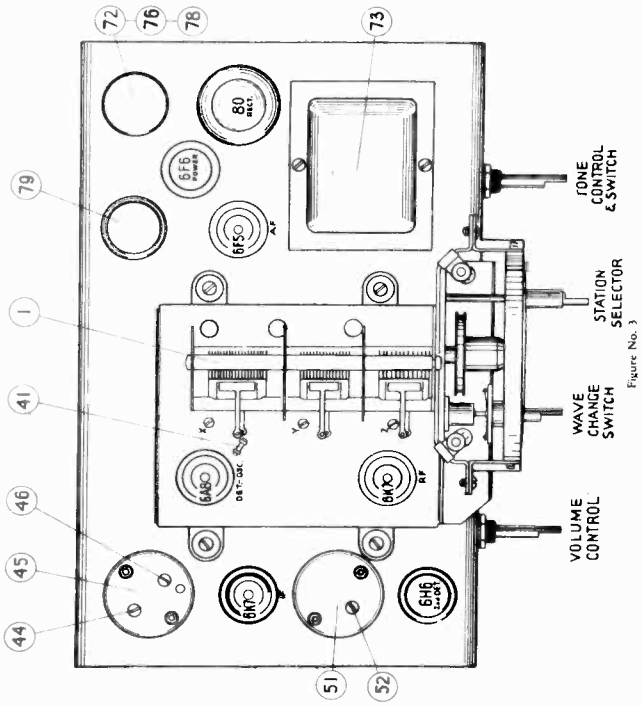


Figure No. 3

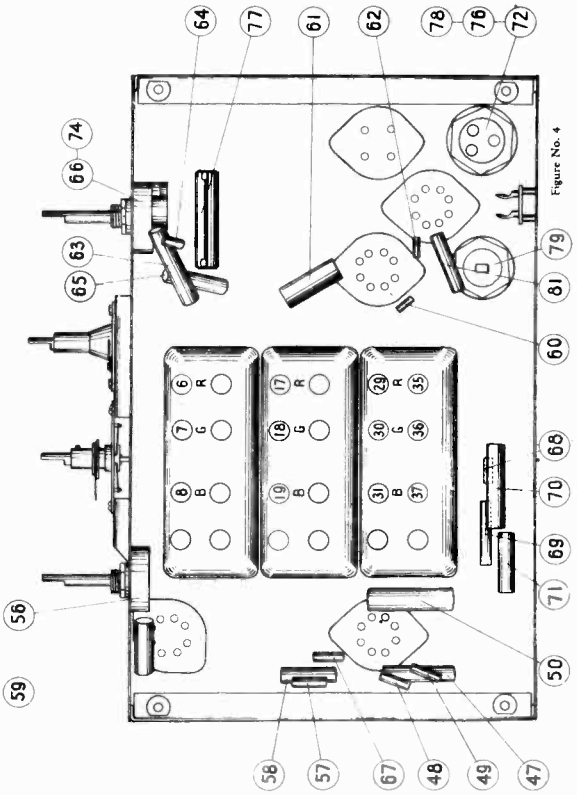


Figure No. 4

WESTINGHOUSE RADIO MODELS WR 204 AND WR 304

Seven-Tube, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes --------- 2 #6K7, 1 #6A8, 1 #6H6, 1 #6F5, 1 #6F6, 1 #80 Total 7
Power Supply ---------- 105 to 125 volts, 50 to 60 cycles A.C.
Power Consumption ---------- 60 Watts
Maximum Undistorted Output ---------- 2.5 Watts
Maximum Output ---------- 3.3 Watts
Tuning Ranges ---------- (Black Band 540 to 1800 K.C. (Green Band 1800 to 6000 K.C. (Red Band 6000 to 18500 K.C.
Line-up Frequencies-I.F.465K.C.,1600K.C.,570K.C.,5500K.C.,1900K.C.,17000K.C., & 6000K.C.

GENERAL DESCRIPTION

This model is a seven-tube, three-band superheterodyne receiver designed for world wide reception and employs the new all-metal tubes.

The circuit employs a high frequency amplifier using the new type 6K7 tube. This is followed by a combined first detector-oscillator circuit employing a 6A8 tube. These tubes with their associated circuits, (coils, variable condensers, trim condensers for R.F. and detector stages, and trim and lag condensers for the oscillators) comprise a complete assembly in compact form separately cushioned from the main chassis. This assembly is known as the "Precision Tuner". From the high frequency assembly the energy passes thru an I.F. selective transformer and to an I.F. amplifier tube (type 6K7). From here further selection takes place and the energy is sent to the diode (type 6H6) where second detection takes place and voltages are provided for automatic volume control. A first audio amplifier tube (type 6F5) follows the diode and this is further followed by a pentode power amplifier tube (type 6F6). A type 80 rectifier supplies the direct current for energizing the tubes.

REMOVING INDIVIDUAL COIL AND SWITCH SECTIONS OF PRECISION TUNER

If a component part located underneath the switch and coil assemblies of the "Precision Tuner" has to be replaced or a section of the unit has to be removed for inspection, each section can easily be removed separately. To do this proceed with care as follows:

1. Remove the three coil shields.
2. Remove the two self-tapping screws which fastens the mounting plate of the wave - change switch shaft to the chassis. Pull switch shaft out straight.
3. Unsolder the stator and rotor leads from the gang condenser.
4. The fastening screws for the switch sections are located on top of the "Precision Tuner" and are indicated by X, Y and Z in figure #3. Remove the corresponding screw.
5. Each individual section can then be pulled out straight.
   Note: On the R.F. section, the plate lead from the 6K7 socket will have to be unsoldered from the socket before the section can be removed. On the oscillator section, the blue lead from the 6A8 detector-oscillator socket will have to be unsoldered at the switch terminal.
6. After repairs have been made resolder the leads mentioned above and replace the section being careful to observe that the slotted holes in the switch bracket line up with the round guide pins on the base plate of the "Precision Tuner". This is IMPORTANT as the switch shaft cannot be inserted if the switch brackets do not line up.
7. Replace the section fastening screw.
8. Resolder the stator and rotor leads on the gang condenser.
9. Replace the switch shaft and the mounting plate fastening screws. When inserting the switch shaft, be careful that all the switch discs are in the same position. Otherwise the switch shaft will not slide in. NEVER force the shaft into the switch discs. If shaft does not slide in freely, examine the position of the slots in each switch disc.
10. Before replacing the coil shields, it might be advisable to bend the shields slightly to assure that positive contact is made. To do this hold the shield with your two hands using the thumbs and the first two fingers as shown in figure #1. Pull out the ends of the shields slightly and at the same time apply a little pressure on the sides of the shield as indicated by the arrows in the drawing. Then replace the shields and observe that they fit tightly. In addition to assuring positive contacts, this will also prevent the shields from rattling.

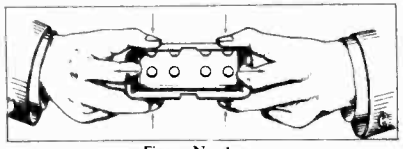


Figure No. 1

LINE-UP CAPACITOR ADJUSTMENTS

To align the circuits of this receiver it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied with absence from overload when the individual circuits of the receiver are brought into alignment. A conventional output meter can be connected across the terminals of the speaker voice coil to indicate when the circuits are aligned. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal. Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. Top and bottom views of the chassis are shown in figures #2, #3 and #4 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 K.C.)

1. Set volume control on full and turn tone control to the bass position.
2. Connect output meter across voice coil of speaker.
3. Set test oscillator to 465 K.C. and adjust its output to produce a measureable reading on output meter when test signal is applied to the grid of the 6K7 I.F. tube thru a .5 mfd. blocking condenser.
4. Adjust trimmer #52 to maximum output, reducing output of test oscillator as required.
5. Apply test signal to grid of 6A8 detector-oscillator and adjust #44 and #46 to maximum output.

ADJUSTMENT OF BROADCAST BAND

1. Set wave-change switch to the Black or Broadcast Band position.
2. Set test oscillator and dial indicator to 1600 K.C.
3. Apply test signal to antenna terminal of chassis thru a .0002 mfd. series condenser and adjust #31, #19 and #8 to maximum output.
4. Set test oscillator and dial indicator to 570 K.C. and adjust #37 to maximum output.
5. Return to 1600 K.C. setting with both test oscillator and dial indicator and readjust #31, #19 and #8 for accuracy.

ADJUSTMENT OF GREEN BAND

Note: In adjusting the two short-wave Bands (Green and Red) a .0002 mfd. condenser and a 400 ohm resistor connected in series should be inserted in the high side of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short wave antenna.

1. Set wave-change switch to the Green Band position.
2. Set test oscillator and dial indicator to 5500 K.C. and adjust #30, #18 and #7 to maximum output.
3. Set test oscillator and dial indicator to 1900 K.C. and adjust #36 to maximum output.
4. Return to 5500 K.C. setting and make readjustment of #30, #18 and #7.

ADJUSTMENT OF RED BAND

1. Set wave change switch to the Red Band position.
2. Set test oscillator and dial indicator to 17000 K.C. and adjust #29, #17 and #6 to maximum output.
3. Set test oscillator and dial indicator to 6000 K.C. and adjust #35 to maximum output.
4. Return to 17000 K.C. setting and make readjustment of #29, #17 and #6.
   Note: The adjustment of the two short-wave oscillator lag condensers (#35 and #36) is best made by the max-max. method. This is done as follows:

Tune the receiver with the left hand by means of the tuning knob and adjust the lag condenser in either direction and then without changing it, tune the receiver thru a maximum, noting reading on the output meter. Change the lag condenser further in the same direction retune receiver and note reading. If the output drops with the second adjustment, reverse direction of the adjust of lag condenser. Continue the type of trial and error adjustment until no further improvement can be made when either the tuning control or the lagging condenser are changed. While this proceedure may appear to be difficult, facility can easily be acquired by practice and the operation requires only a few minutes.

IMPORTANT: While testing or making repairs on this receiver, the chassis should not be turned upside down or on its side for any long period of time while the set is turned on as the chemicals in the electrolytic filter condenser will come out thru the air vents making the condenser appear to be defective. If the set is left in this position too long the condenser may be injured.

MODELS WR-204, WR-304

Socket, Trimmers, Parts

WESTINGHOUSE ELEC. SUPPLY CO.

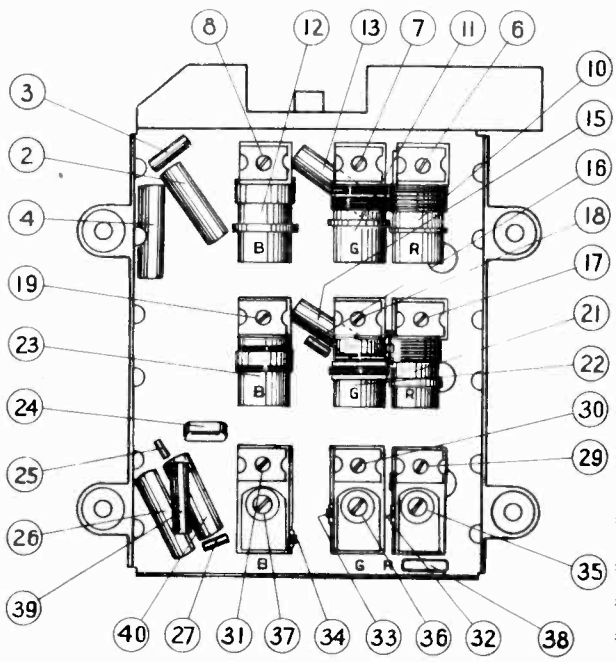


Figure No. 2

DIA.#	PART#	DESCRIPTION
1	CG 9527	Variable gang condenser
2	SA 106386	.05 mfd. 200 V. condenser
3	RE 9529	300 ohm ½ W. resistor
4	SA 106386	.05 mfd.200 V. condenser
5	SW 9527	Ant. section of "Centr-O-matic" unit complete with coils,switch and trimmers
6	CS 9511	4 to 25 mmf. antenna trim condenser (Red Band)
7	CS 9511	4 to 25 mmf. antenna trim condenser (Green Band)
8	CS 9511	4 to 25 mmf. antenna trim condenser(Broadcast Band)
9		Twisted pair of wire-part of RC 9571
10	RC 9571	Antenna coil assembly (Red Band)
11	RC 9574	Antenna coil assembly (Green Band)
12	RC 9577	Antenna coil assembly (Broadcast Band)
13	CW 9513	.05 mfd. 200 V. condenser
14	SW 9588	R.F. unit complete with coils,switch and trimmers
15	CW 9513	.05 mfd. 200 V. condenser
16	RE 9527	5000 ohm ½ W. resistor
17	CS 9511	4 to 25 mmf. R.F. trim condenser (Red Band)
18	CS 9511	1.5 to 10. mmf. R.F. trim condenser (Green Band)
19	CS 9512	1.5 to 10. mmf. R.F. trim condenser (Broadcast Band)
20	CM 9512	6 mmf. mica condenser
21	RC 9572	R.F. coil assembly (Red Band)
22	RC 9575	R.F. coil assembly (Green Band)
23	RC 9578	R.F. coil assembly (Broadcast Band)
24	SA 106417	.0001 mica condenser
25	RE 9524	50,000 ohm ½ W. resistor
26	SA 106386	.05 mfd. 200 V. condenser
27	RE 9529	300 ohm ½ W. resistor
28	SW 9529	Oscillator section of "Centr-O-matic" unit,complete with coils,switch, trim and lag condensers
29		3 to 15 mmf. oscillator trim condenser-part of CS 9520 (Red Band)
30		3 to 15 mmf. oscillator trim condenser-part of CS 9520 (Green Band)
31		5 to 25 mmf. oscillator trim condenser-part of CS 9517 (Broadcast Band)
32	RC 95109	Oscillator coil assembly (Red Band)
33	RC 9576	Oscillator coil assembly (Green Band)
34	RC 9579	Oscillator coil assembly (Broadcast Band)
35		900 to 1600 mfd. osc. lag condenser-part of CS 9520 (Red Band)
36		800 to 1600 mfd. osc. lag condenser-part of CS 9520 (Green Band)
37		300 to 600 mfd. oscillator lag condenser-part of CS 9517 (Broadcast Band)
38	CM 959	.002 mfd. mica condenser
39	RE 9526	5000 ohm 1 W. resistor
40	CW 9513	.05 mfd. 200 V. condenser
41	RE 9537	50 ohm ½ W. resistor
44		30 to 100 mmf. trim condenser-part of IC 9527
45	IC 9527	1st I.F. transformer assembly
46		30 to 100 mmf. trim condenser-part of IC 9527
47	SA 102493	.05 mfd. 200 V. condenser
48	SA 105261	400 ohm ½ W. resistor
49	SA 105267	1000 ohm ½ W. resistor
50	SA 102497	.25 mfd. 200 V. condenser
51	IC 9537	2nd I.F. transformer assembly
52		30 to 100 mmf. trim condenser-part of IC 9537
53		50 mmf. mica condenser - part of IC 9537
54		50,000 ohm ½ W. resistor-part of IC 9537
55		100 mmf. mica condenser-part of IC 9537
56	VR 959	Volume control (½ meg.)
57	RE 9530	1 meg. ½ W. resistor
58	SA 106386	.05 mfd. 200 V. condenser
59	CW 9512	.02 mfd. 400 V. condenser
60	RE 9530	1 meg. ½ W. resistor
61	CE 9515	12. mfd. 25 V. condenser
62	SA 105279	250,000 ohm ½ W. resistor
63	CW 9512	.02 mfd. 400 V. condenser
64	RE 9531	250,000 ohm ½ W. resistor
65	SA 106403	.001 mfd. 600 V. condenser
66	VR 9512	Tone control (½ meg.)
67	SA 105278	100,000 ohm ½ W. resistor
68	SA 105260	300 ohm 1 W. resistor
69	SA 104966	30,000 ohm ½ W. resistor
70	SA 101404	15,000 ohm 1 W. resistor
71	SA 103835	10,000 ohm 2 W. resistor
72		4. mfd. 450 V. elect. condenser-part of CE 954
73	TR 959	Power transformer
74		Line switch-part of VR9512
75	SA 106809	Dial lights 6 V. (3 used)
76		8. mfd. 475 V. elect. condenser-part of CE 954
77	RE 9523	300 ohm resistor
78		20. mfd. 25 V. elect. condenser-part of CE 954
79	CE 9511	8. mfd. 300 V. elect. condenser
80	TR 9515	Speaker output transformer
81	SA 103659	.005 mfd. 400 V. condenser
82	SK 9511	Speaker

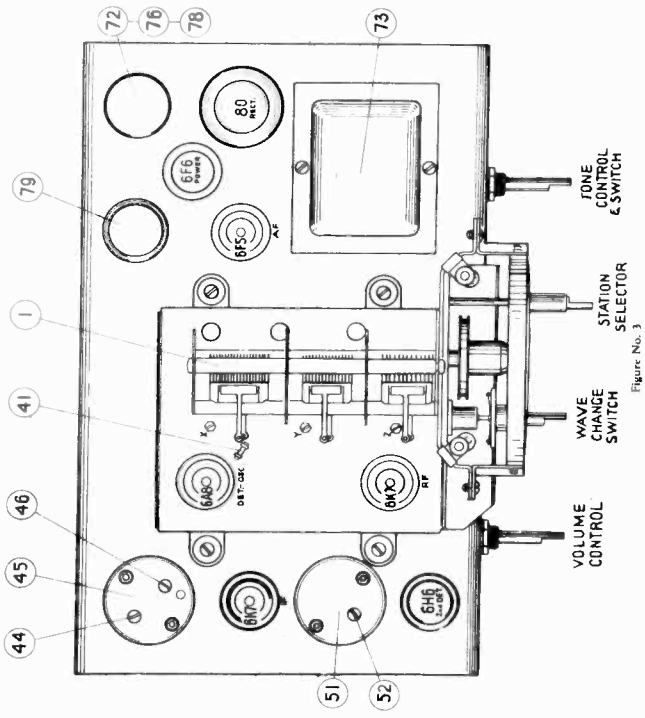


Figure No. 3

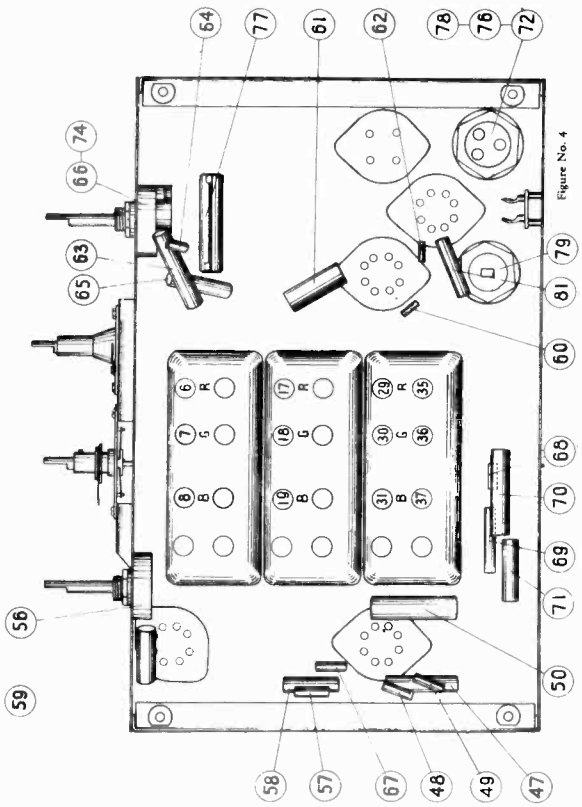


Figure No. 4

WESTINGHOUSE RADIO MODELS WR 204 AND WR 304

Seven-Tube, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes --------- 2 #6K7, 1 #6A8, 1 #6H6, 1 #6F5, 1 #6F6, 1 #80 Total 7
Power Supply ---------- 105 to 125 volts, 50 to 60 cycles A.C.
Power Consumption ---------- 60 Watts
Maximum Undistorted Output ---------- 2.5 Watts
Maximum Output ---------- 3.3 Watts
Tuning Ranges ---------- (Black Band 540 to 1800 K.C. (Green Band 1800 to 6000 K.C. (Red Band 6000 to 18500 K.C.
Line-up Frequencies-I.F.465K.C.,1600K.C.,570K.C.,5500K.C.,1900K.C.,17000K.C., & 6000K.C.

GENERAL DESCRIPTION

This model is a seven-tube, three-band superheterodyne receiver designed for world wide reception and employs the new all-metal tubes.

The circuit employs a high frequency amplifier using the new type 6K7 tube. This is followed by a combined first detector-oscillator circuit employing a 6A8 tube. These tubes with their associated circuits, (coils, variable condensers, trim condensers for R.F. and detector stages, and trim and lag condensers for the oscillators) comprise a complete assembly in compact form separately cushioned from the main chassis. This assembly is known as the "Precision Tuner". From the high frequency assembly the energy passes thru an I.F. selective transformer and to an I.F. amplifier tube (type 6K7). From here further selection takes place and the energy is sent to the diode (type 6H6) where second detection takes place and voltages are provided for automatic volume control. A first audio amplifier tube (type 6F5) follows the diode and this is further followed by a pentode power amplifier tube (type 6F6). A type 80 rectifier supplies the direct current for energizing the tubes.

REMOVING INDIVIDUAL COIL AND SWITCH SECTIONS OF PRECISION TUNER

If a component part located underneath the switch and coil assemblies of the "Precision Tuner" has to be replaced or a section of the unit has to be removed for inspection, each section can easily be removed separately. To do this proceed with care as follows:

1. Remove the three coil shields.
2. Remove the two self-tapping screws which fastens the mounting plate of the wave - change switch shaft to the chassis. Pull switch shaft out straight.
3. Unsolder the stator and rotor leads from the gang condenser.
4. The fastening screws for the switch sections are located on top of the "Precision Tuner" and are indicated by X, Y and Z in figure #3. Remove the corresponding screw.
5. Each individual section can then be pulled out straight.
   Note: On the R.F. section, the plate lead from the 6K7 socket will have to be unsoldered from the socket before the section can be removed. On the oscillator section, the blue lead from the 6A8 detector-oscillator socket will have to be unsoldered at the switch terminal.
6. After repairs have been made resolder the leads mentioned above and replace the section being careful to observe that the slotted holes in the switch bracket line up with the round guide pins on the base plate of the "Precision Tuner". This is IMPORTANT as the switch shaft cannot be inserted if the switch brackets do not line up.
7. Replace the section fastening screw.
8. Resolder the stator and rotor leads on the gang condenser.
9. Replace the switch shaft and the mounting plate fastening screws. When inserting the switch shaft, be careful that all the switch discs are in the same position. Otherwise the switch shaft will not slide in. NEVER force the shaft into the switch discs. If shaft does not slide in freely, examine the position of the slots in each switch disc.
10. Before replacing the coil shields, it might be advisable to bend the shields slightly to assure that positive contact is made. To do this hold the shield with your two hands using the thumbs and the first two fingers as shown in figure #1. Pull out the ends of the shields slightly and at the same time apply a little pressure on the sides of the shield as indicated by the arrows in the drawing. Then replace the shields and observe that they fit tightly. In addition to assuring positive contacts, this will also prevent the shields from rattling.

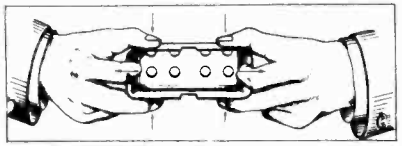


Figure No. 1

LINE-UP CAPACITOR ADJUSTMENTS

To align the circuits of this receiver it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied with absence from overload when the individual circuits of the receiver are brought into alignment. A conventional output meter can be connected across the terminals of the speaker voice coil to indicate when the circuits are aligned. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal. Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. Top and bottom views of the chassis are shown in figures #2, #3 and #4 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 K.C.)

1. Set volume control on full and turn tone control to the bass position.
2. Connect output meter across voice coil of speaker.
3. Set test oscillator to 465 K.C. and adjust its output to produce a measureable reading on output meter when test signal is applied to the grid of the 6K7 I.F. tube thru a .5 mfd. blocking condenser.
4. Adjust trimmer #52 to maximum output, reducing output of test oscillator as required.
5. Apply test signal to grid of 6A8 detector-oscillator and adjust #44 and #46 to maximum output.

ADJUSTMENT OF BROADCAST BAND

1. Set wave-change switch to the Black or Broadcast Band position.
2. Set test oscillator and dial indicator to 1600 K.C.
3. Apply test signal to antenna terminal of chassis thru a .0002 mfd. series condenser and adjust #31, #19 and #8 to maximum output.
4. Set test oscillator and dial indicator to 570 K.C. and adjust #37 to maximum output.
5. Return to 1600 K.C. setting with both test oscillator and dial indicator and readjust #31, #19 and #8 for accuracy.

ADJUSTMENT OF GREEN BAND

Note: In adjusting the two short-wave Bands (Green and Red) a .0002 mfd. condenser and a 400 ohm resistor connected in series should be inserted in the high side of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short wave antenna.

1. Set wave-change switch to the Green Band position.
2. Set test oscillator and dial indicator to 5500 K.C. and adjust #30, #18 and #7 to maximum output.
3. Set test oscillator and dial indicator to 1900 K.C. and adjust #36 to maximum output.
4. Return to 5500 K.C. setting and make readjustment of #30, #18 and #7.

ADJUSTMENT OF RED BAND

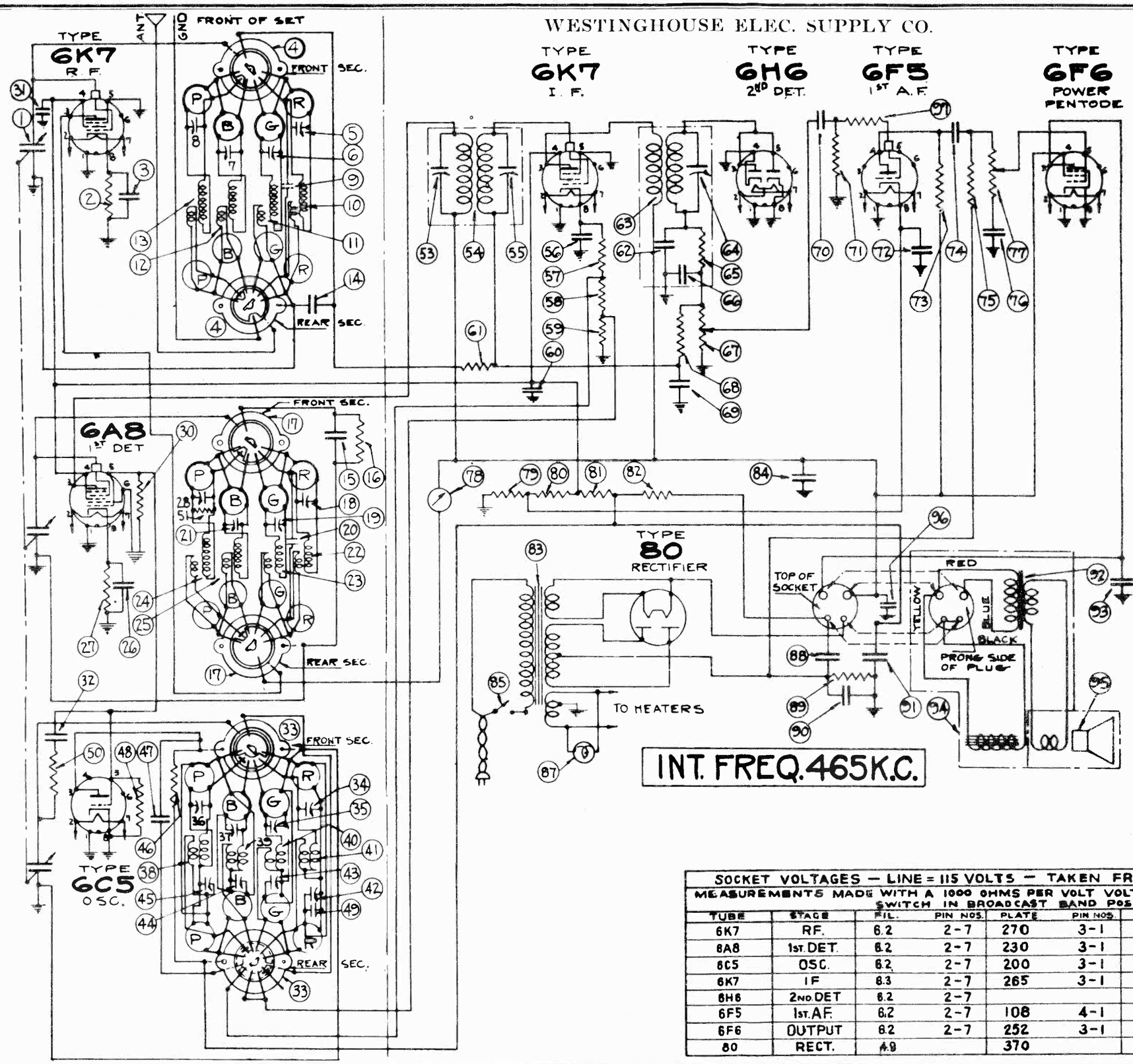
1. Set wave change switch to the Red Band position.
2. Set test oscillator and dial indicator to 17000 K.C. and adjust #29, #17 and #6 to maximum output.
3. Set test oscillator and dial indicator to 6000 K.C. and adjust #35 to maximum output.
4. Return to 17000 K.C. setting and make readjustment of #29, #17 and #6.
   Note: The adjustment of the two short-wave oscillator lag condensers (#35 and #36) is best made by the max-max. method. This is done as follows:

Tune the receiver with the left hand by means of the tuning knob and adjust the lag condenser in either direction and then without changing it, tune the receiver thru a maximum, noting reading on the output meter. Change the lag condenser further in the same direction retune receiver and note reading. If the output drops with the second adjustment, reverse direction of the adjust of lag condenser. Continue the type of trial and error adjustment until no further improvement can be made when either the tuning control or the lagging condenser are changed. While this proceedure may appear to be difficult, facility can easily be acquired by practice and the operation requires only a few minutes.

IMPORTANT: While testing or making repairs on this receiver, the chassis should not be turned upside down or on its side for any long period of time while the set is turned on as the chemicals in the electrolytic filter condenser will come out thru the air vents making the condenser appear to be defective. If the set is left in this position too long the condenser may be injured.

WESTINGHOUSE ELEC. SUPPLY CO.

MODELS WR-205, WR-305
Schematic, Voltage
Resistance Data



D.C. RESISTANCE MEASURED WITH WAVE-CHANGE SWITCH IN CORRESPONDING BAND POSITION			
COIL	DIA. Nº	PRIM.	SEC.
P-ANT.	13	130 ohms	25 ohms
P-RF.	24	38 "	25 "
P-OSC.	38	8 "	13.5 "
B-ANT.	12	22 "	4 "
B-RF.	25	.5 "	4.5 "
B-OSC.	39	1.5 "	3 "
G-ANT.	11	3.2 "	1 "
G-RF.	23	1.5 "	1 "
G-OSC.	40	.5 "	1 "
R-ANT.	10	1 "	.4 "
R-RF.	22	2 "	.4 "
R-OSC.	41	.5 "	.4 "
1ST. I.F.	54	13 "	13 "
2ND I.F.	83	11.5 "	11.5 "
OUTPUT TRANS.	92	450 "	.5 "
SPKR. FIELD		1900 "	
VOICE COIL	95	3 "	

SOCKET VOLTAGES — LINE = 115 VOLTS — TAKEN FROM BOTTOM OF SOCKETS
MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE-CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL.	PIN NOS.	PLATE	PIN NOS.	SCREEN	PIN NOS.	CATHODE	PIN NOS.
6K7	RF.	6.2	2-7	270	3-1	108	4-1	2.6	1-8
6A8	1st. DET.	6.2	2-7	230	3-1	108	4-1	4.0	1-8
6C5	OSC.	6.2	2-7	200	3-1				
6K7	IF	6.3	2-7	265	3-1	105	4-1	5.5	1-8
6H6	2ND. DET	6.2	2-7						
6F5	1st. A.F.	6.2	2-7	108	4-1			1.2	1-8
6F6	OUTPUT	6.2	2-7	252	3-1	270	4-1	18.5	ACROSS 89 RES.
80	RECT.	4.9		370					

MODELS WR-205,WR-305
Alignment,
Service Notes
Parts List

WESTINGHOUSE ELEC. SUPPLY CO.

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes--2 #6K7, 1 #6A8, 1 #6C6, 1 #6H6, 1 #6F5, 1 #6F6, 1 #80-Total 8
Power Supply ---------- 105 to 125 volts, 50 to 60 cycles
Power Consumption ---------- 65 Watts
Maximum Undistorted Output ---------- 2.5 Watts
Maximum Output ---------- 3.3 Watts
Tuning Ranges ---------- (Purple Band 120 to 350 K.C. (Black Band 540 to 1600 K.C. (Green Band 1600 to 6000 K.C. (Red Band 6000 to 18500 K.C.
Line-up Frequencies -- I.F.465 K.C.,350 K.C.,130 K.C.,1600 K.C.,570 K.C.,5500 K.C.,1900 K.C.,17000 K.C., and 6000 K.C.

GENERAL DESCRIPTION

This model is an eight-tube four-band superheterodyne receiver designed for world wide reception including the U.S. Weather Band and employs the new all-metal tubes. The circuit employs a high frequency amplifier using the new type 6K7 tube. This is followed by the first detector circuit employing a 6A8 tube and a separate oscillator (type 6C5). These tubes with their associated circuits, (coils, variable condensers, trim condensers for R.F. and detector stages, and trim and lag condensers for the oscillators) comprise a complete assembly in compact form separately cushioned from the main chassis. This assembly is known as the "Precision Tuner". From the high frequency assembly the energy passes thru an I.F. selective transformer and to an I.F. amplifier tube (type 6K7). From here further selection takes place and the energy is sent to the diode (type 6H6) where second detection takes place and voltages are provided for automatic volume control. A first audio amplifier tube (type 6F5) follows the diode and this is further followed by a pentode power amplifier tube (type 6F6). A type 80 rectifier supplies the direct current for energizing the tubes.

REMOVING INDIVIDUAL COIL AND SWITCH SECTIONS OF PRECISION TUNER

If a component part located underneath the switch and coil assemblies of the "Precision Tuner" has to be replaced or a section of the unit has to be removed for inspection, each section can easily be removed separately. To do this proceed with care as follows:

1. Remove the three coil shields.
2. Remove the two self-tapping screws which fasten the mounting plate of the wave-change switch shaft to the chassis frame. Pull switch shaft straight out.
3. Unsolder the stator and rotor leads from the gang condenser.
4. The fastening screws for the switch sections are located on top of the "Precision Tuner" and are indicated by X, Y, and Z in figure #3. Remove the corresponding screw.
5. Each individual section can then be pulled out straight.

Note: On the R.F. section, the plate lead from the 6K7 socket will have to be unsoldered from the switch terminal before the section can be removed.

On the oscillator section, the plate lead will have to be unsoldered from the 6C5 socket.

6. After repairs have been made resolder the plate leads mentioned above and replace the section being careful to observe that the slotted holes in the switch bracket line up with the round guide pins on the base plate of the "Precision Tuner". This is IMPORTANT as the switch shaft cannot be inserted if the switch brackets do not line up.
7. Replace the section fastening screw.
8. Resolder the stator and rotor leads on gang condenser.
9. Replace the switch shaft and the mounting fastening screws. When inserting the switch shaft, be careful that all the switch discs are in the same position. Otherwise the switch shaft will not slide in. NEVER force the shaft into the switch discs. If shaft does not slide in freely, examine the position of the slot in each switch disc.
10. Before replacing the coil shields, it might be adviseable to bend the shields slightly to assure that positive contact is made. To do this hold the shield with your two hands using the thumbs and the first two fingers as shown in Figure #1. Pull out the ends of the shield slightly and at the same time apply a little pressure on the sides of the shield as indicated by the arrows in the drawing. Then replace the shields and observe that they fit tightly. In addition to assuring positive contacts, this will also prevent the shields from rattling.

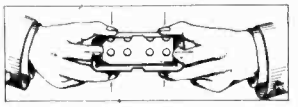


Figure No. 1

LINE-UP CAPACITOR ADJUSTMENTS

To align the circuits of this receiver it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied with absence from overload when the individual circuits of the receiver are brought into alignment. A conventional output meter can be connected across the terminals of the speaker voice coil to indicate when the circuits are aligned. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. Top and bottom views of the chassis are shown in Figures #2, #3 and #4 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 K.C.)

1. Set volume control on full and turn tone control to bass position.
2. Connect output meter across voice coil of speaker.
3. Set test oscillator to 465 K.C. and adjust its output to produce a measurable reading on output meter when test signal is applied to the grid of 6K7 I.F. tube thru a .5 mfd. blocking condenser.
4. Adjust trimmer #64 for maximum output reducing output of test oscillator as required.
5. Apply test signal to grid of 6A8 first detector and adjust #53 and#55 for maximum output.

ADJUSTMENT OF PURPLE BAND

1. Set wave-change switch to Purple Band position.
2. Set test oscillator and dial indicator to 350 K.C.
3. Apply test signal to antenna terminal of the chassis thru a .0002 mfd. series condenser and adjust #36,#28 and #8 for maximum output.
4. Set test oscillator and dial indicator to 130 K.C. and adjust #45 for maximum output.
5. Return to 350 K.C. setting with both test oscillator and dial indicator and repeat adjustment of #36, #28 and #8 for accuracy.

ADJUSTMENT OF BROADCAST BAND

1. Set wave-change switch to the Black or Broadcast Band position.
2. Set test oscillator and dial indicator to 1600 K.C. and adjust #37, #21 and #7 for maximum output.
3. Set test oscillator and dial indicator to 570 K.C. and adjust #44 for maximum output.
4. Return to 1600 K.C. setting and make readjustment of #37, #21 and #7.

ADJUSTMENT OF GREEN BAND

Note: In adjusting the Green and Red Bands, a .0002 mfd. condenser and a 400 ohm resistor connected in series should be inserted in the high side of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short-wave antenna.

1. Set wave change-switch to Green Band position.
2. Set test oscillator and dial indicator to 5500 K.C. and adjust #35, #19 and #6 for maximum output.
3. Set test oscillator and dial indicator to 1900 K.C. and adjust #43 for maximum output.
4. Return to 5500 K.C. setting and make readjustment of #35, #19 and #6.

ADJUSTMENT OF RED BAND

1. Set wave-change switch to Red Band position.
2. Set test oscillator and dial indicator to 17000 K.C. and adjust #34, #18 and #5 for maximum output.
3. Set test oscillator and dial indicator to 6000 K.C. and adjust #42for maximum output.
4. Return to 17000 K.C. setting and make readjustment of #34, #18 and #5.

Note: The adjustment of the two short-wave oscillator lag condensers (#42 and #43) is best made by the max-max. method.

Dia. No.	Part No.	Description of Parts	List Price
1	CG 9527	Variable condenser assembly	$ 4.25
2	RE 9529	300 ohm 1/4 W. resistor	.10
3	SA 106386	.05 mfd. 200 V. condenser	.25
4	SW 9524	Antenna section "Precision Tuner" assembly complete with switch, coils and trimmers	5.75
5	CS 9511	4 to 25 mmf. antenna trim condenser (Red Band)	.20
6	CS 9511	4 to 25 mmf. antenna trim condenser (Green Band)	.20
7	CS 9511	4 to 25 mmf. antenna trim condenser (Black Band)	.20
8	CS 9511	4 to 25 mmf. antenna trim condenser (Purple Band)	.20
9		Twisted pair of wires - part of RC 9571	
10	RC 9571	Antenna coil assembly (Red Band)	.70
11	RC 9574	Antenna coil assembly (Green Band)	.65
12	RC 9577	Antenna coil assembly (Black Band)	1.10
13	RC 9580	Antenna coil assembly (Purple Band)	1.25
14	CW 9513	.05 mfd. 200 V. condenser	.25
15	CW 9513	.05 mfd. 200 V. condenser	.25
16	RE 9527	5000 ohms 1/4 W. resistor	.10
17	SW 9525	R.F. section "Precision Tuner" assembly complete with switch, coils and trimmers	6.00
18	CS 9511	4 to 25 mmf. R.F. trim condenser (Red Band)	.20
19	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Green Band)	.20
20	CM 9512	6. mmf. mica condenser	.15
21	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Black Band)	.20
22	RC 9572	R.F. coil assembly (Red Band)	.70
23	RC 9575	R.F. coil assembly (Green Band)	.95
24	RC 9581	R.F. coil assembly (Purple Band)	1.10
25	RC 9578	R.F. coil assembly (Black Band)	1.15
26	SA 106386	.05 mfd. 200 V. condenser	.25
27	RE 9529	300 ohm 1/4 W. resistor	.10
28	CS 9512	1.5 to 10 mmf. R.F. trim condenser (Purple Band)	.20
29	CM 9511	.000065 mfd. mica condenser	.15
30	RE 9534	100,000 ohm 1/4 W. resistor	.10
31	SA 106386	.05 mfd. 200 V. condenser	.25
32	CM 9511	.000065 mfd. mica condenser	.15
33	SW 9526	Oscillator section "Precision Tuner" assembly complete with switch, coils and trimmers	9.75
34		1.5 to 10 mmf. trim condenser part of CS 9519 (Red Band)	
35		3. to 15 mmf. trim condenser - part of CS 9520 (Green Band)	
36		10 to 35 mmf. trim condenser - part of CS 9518 (Purple Band)	
37		5 to 25 mmf. trim condenser - part of CS 9517 (Black Band)	
38	RC 9582	Oscillator coil assembly (Purple Band)	1.40
39	RC 9579	Oscillator coil assembly (Black Band)	1.50
40	RC 9576	Oscillator coil assembly (Green Band)	1.50
41	RC 9573	Oscillator coil assembly (Red Band)	1.25
42		800 to 1600 mmf. lag condenser - part of CS 9519 (Red Band)	
43		800 to 1600 mmf. lag condenser - part of CS 9520 (Green Band)	
44		300 to 600 mmf. lag condenser - part of CS 9517 (Black Band)	
45		60 to 150 mmf. lag condenser - part of CS 9518 (Purple Band)	
46	RE 9526	5000 ohm 1 W. resistor	.20
47	CW 9513	.05 mfd. 200 V. condenser	.25
48	RE 9524	50,000 ohm 1/4 W. resistor	.10
49	CM 959	.002 mfd. mica condenser	.25
50	RE 9537	50 ohm 1/4 W. resistor	.10
51	RE 9534	100,000 ohm 1/4 W. resistor	.10
53		I.F. trimmer - part of IC 9527	
54	IC 9527	1st I.F. transformer	1.75
55		I.F. trimmer - part of IC 9527	
56	SA 102493	.05 mfd. 200 V. condenser	.25

No.	Part No.	Description of Parts	List Price
57	SA 105261	400 ohm 1/4 W. resistor	$ .20
58	SA 105267	1000 ohm 1/4 W. resistor	.20
59	SA 105249	5000 ohm 1/4 W. resistor	.20
60	SA 102497	.25 mfd. 200 V. condenser	.35
61	SA 105278	100,000 ohm 1/4 W. resistor	.20
62		50 mmf. mica condenser - part of IC 9537	
63	IC 9537	2nd I.F. transformer	1.75
64		I.F. trim condenser - part of IC 9537	
65		50,000 ohm 1/4 W. resistor - part of IC 9537	
66		100 mmf. mica condenser - part of IC 9537	
67	VR 959	Volume control - 500,000 ohm	1.00
68	RE 9530	1 meg. 1/4 W. resistor	.10
69	SA 106386	.05 mfd. 200 V. condenser	.25
70	CW 9512	.02 mfd. 400 V. condenser	.20
71	RE 9530	1 meg. 1/4 W. resistor	.10
72	CE 9515	12 mfd. electrolytic condenser	.65
73	SA 105279	250,000 ohms 1/4 W. resistor	.20
74	CW 9512	.02 mfd. 400 V. condenser	.20
75	RA 9531	250,000 ohm 1/4 W. resistor	.10
76	SA 106403	300 ohm 1/4 W. resistor	.20
77	VR 9512	Tone control (500,000 ohm)	1.10
78	SI 9538	Tuning meter assembly	2.30
79	SA 105260	300 ohm 1/4 W. resistor	.20
80	SA 104966	30,000 ohm 1/2 W. resistor	.20
81	SA 105815	10,000 ohm 1 W. resistor	.25
82	RE 9540	7000 ohm 2 W. resistor	.30
83	TR 959	Power transformer	5.75
84	SA 102492	.05 mfd. 400 V. condenser	.25
85		Line switch - part of VR 9512	
86	CW 959	.01 mfd. 600 V. condenser	.40
87	SA 106809	Dial light (6.3 volt)	.15
88	CE 954	8 mfd. 475 V. section of electrolytic condenser	3.50
89	RE 9523	300 ohm muter resistor	.30
90		20 mfd. 25 V. electrolytic condenser - part of CE 954	
91	CE 9518	8 mfd. 300 V. electrolytic condenser	1.10
92	TR 9515	Speaker output transformer	1.85
93	SA 103659	.005 mfd. 400 V. condenser	.30
94	SK 9511	Speaker - complete	7.50
95	SA 107282	Diaphragm and coil assembly	1.15
96		4 mfd. electrolytic condenser - part of CE 954	
97	RE 9534	100,000 ohm 1/4 W. resistor	.10

Part No.	Description of Parts	List Price
	MAIN ASSEMBLIES	
CH 9555	Chassis assembly	
CH 9537	Chassis assembly "Precision Tuner"	
KA 9527	Cabinet	
SK 9511	Speaker	7.50
	CABLE AND CABLE ASSEMBLIES	
CB 9512	Line cable with plug	.50
PH 97160	Cable - dial drive	.05
PP 103164	Spring for dial cable	.05
	CONDENSERS	
CS 9517	Dual trim condenser (Black Band)	.55
CS 9518	Dual trim condenser (Purple Band)	$ .50
CS 9519	Dual trim condenser (Red Band)	.75
CS 9520	Dual trim condenser (Green Band)	.75

WESTINGHOUSE RADIO MODELS WR-205 AND WR-305

Tune the receiver with the left hand by means of the tuning knob and adjust the lag condenser in either direction and then without changing it, tune the receiver thru a maximum, noting reading of the output meter. Change the lag condenser further in the same direction, retune receiver and note reading. If output drops with second adjustment, reverse direction of the adjustment of lag condenser. Continue this type of trial and error adjustment until no further improvement can be made when either the tuning control or the lag condenser are changed. While this procedure may appear difficult, facility can be easily acquired by practice and the operation requires only a few minutes.

IMPORTANT: WHILE TESTING OR MAKING REPAIRS ON THIS RECEIVER, THE CHASSIS SHOULD NOT BE TURNED UPSIDE DOWN OR ON ITS SIDE FOR ANY LONG PERIOD OF TIME WHILE THE SET IS TURNED ON AS THE CHEMICALS IN THE ELECTROLYTIC FILTER CONDENSER WILL COME OUT THRU THE AIR VENTS MAKING THE CONDENSER APPEAR TO BE DEFECTIVE. IF LEFT IN THIS POSITION TOO LONG THE CONDENSER MAY BE INJURED.

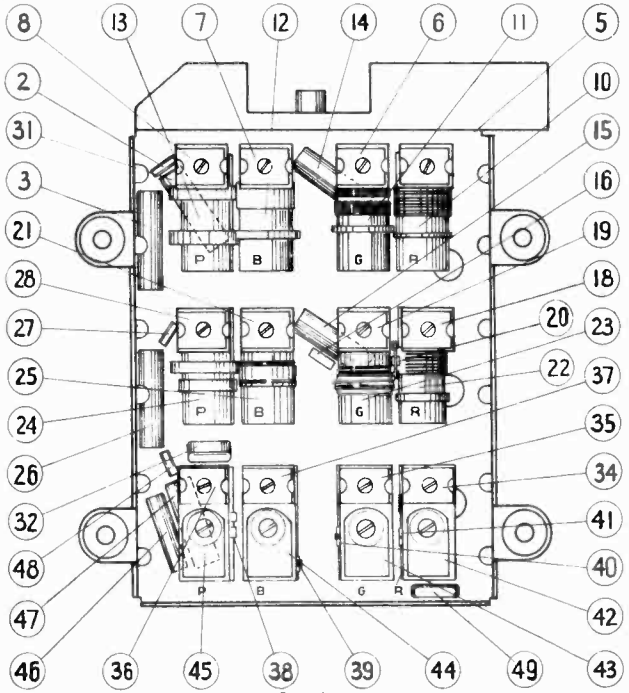


Figure No. 2

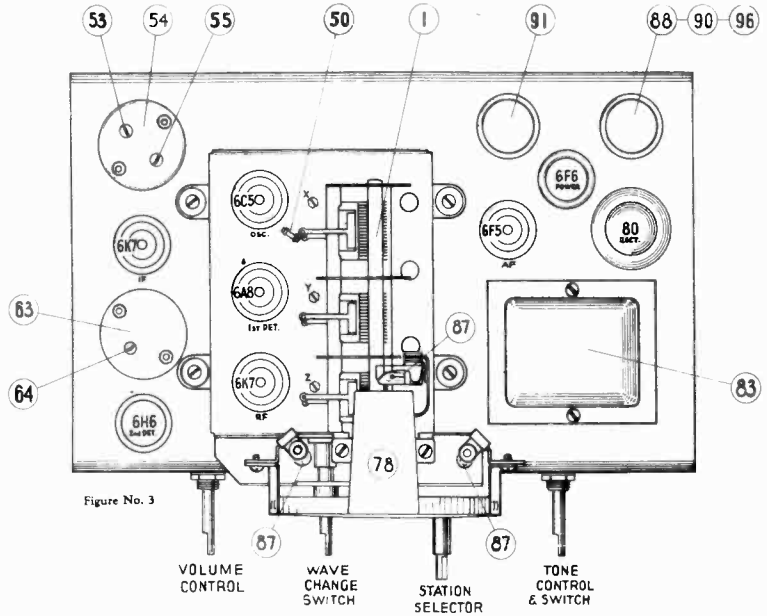


Figure No. 3

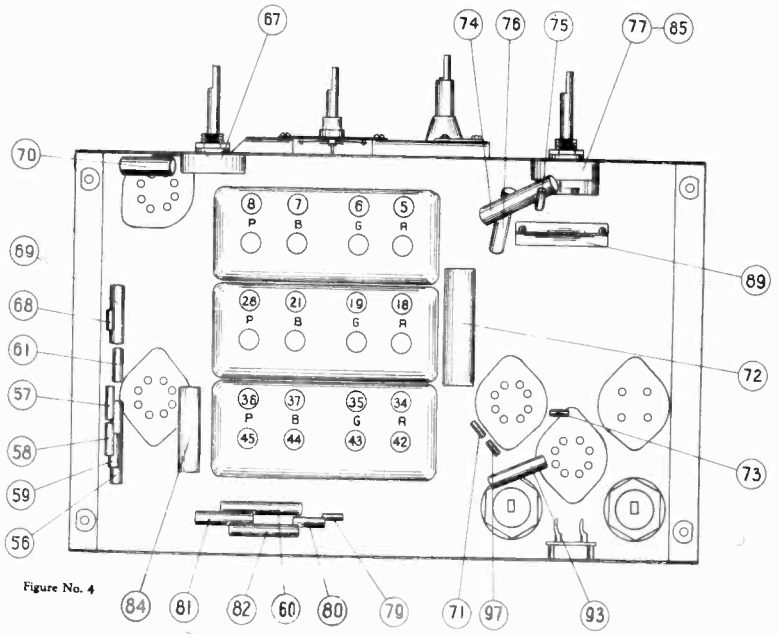
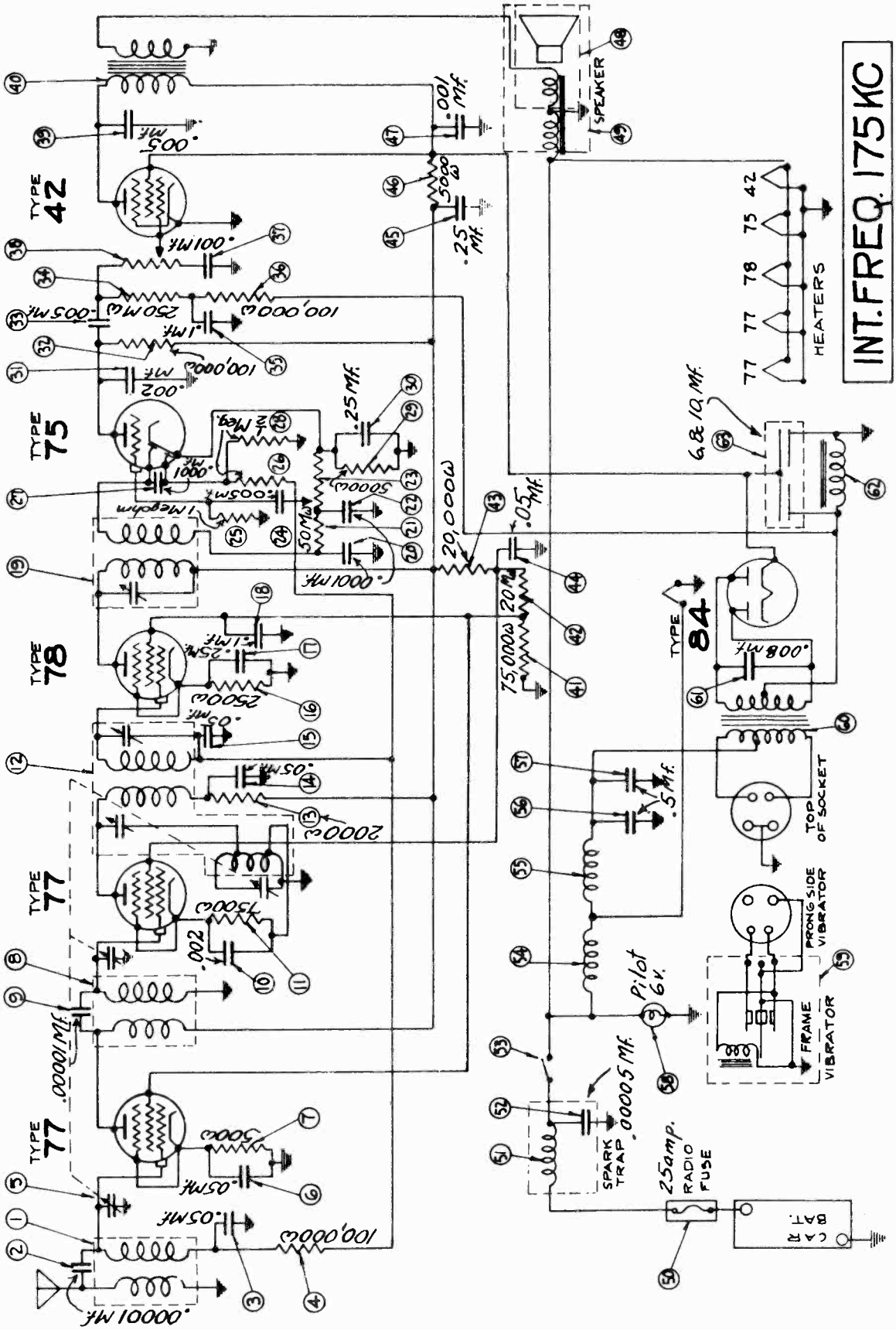


Figure No. 4

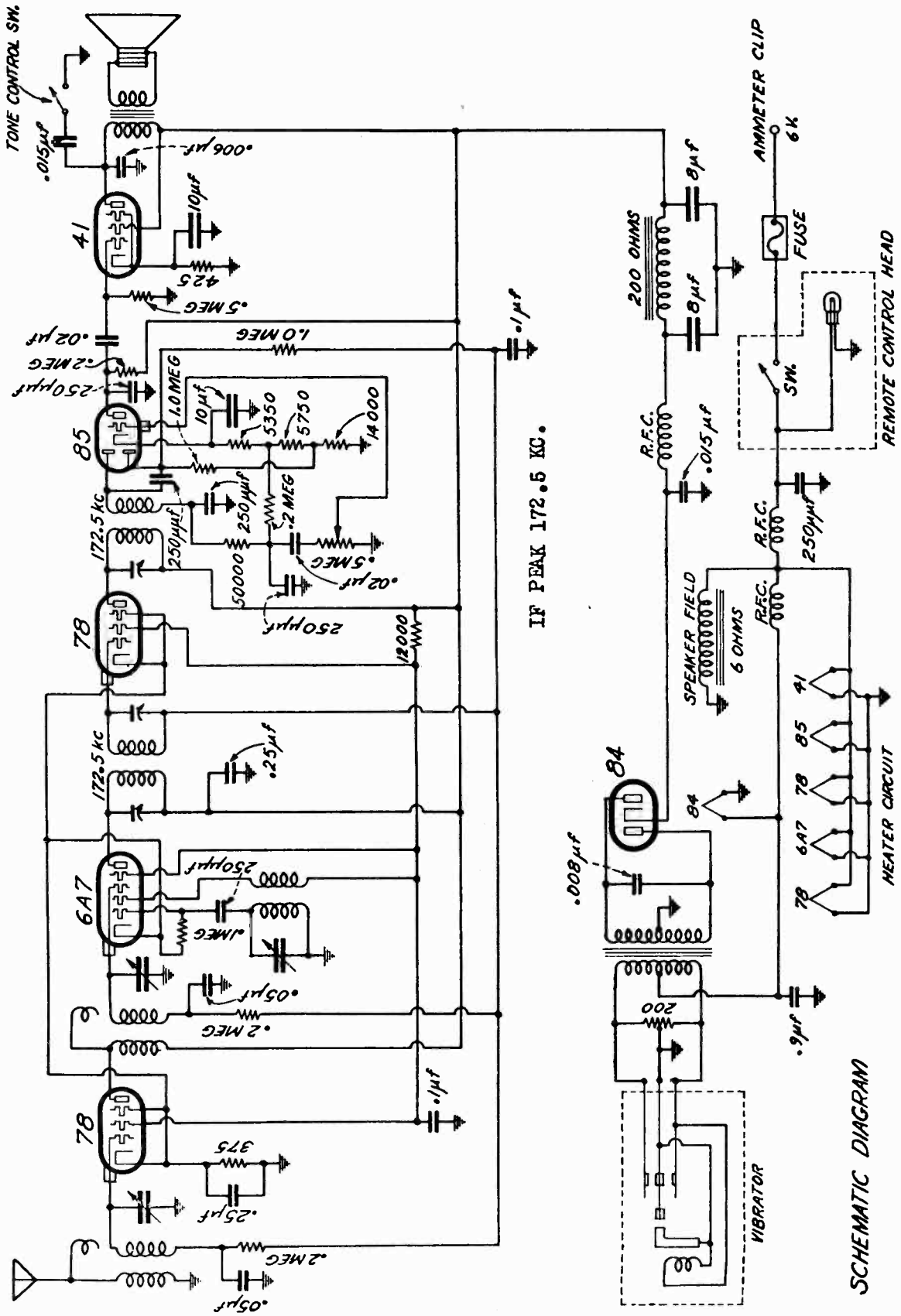
MODEL WR-500
Schematic

WESTINGHOUSE ELEC. SUPPLY CO.



MODEL WR-501
Schematic

WESTINGHOUSE ELEC. SUPPLY CO.



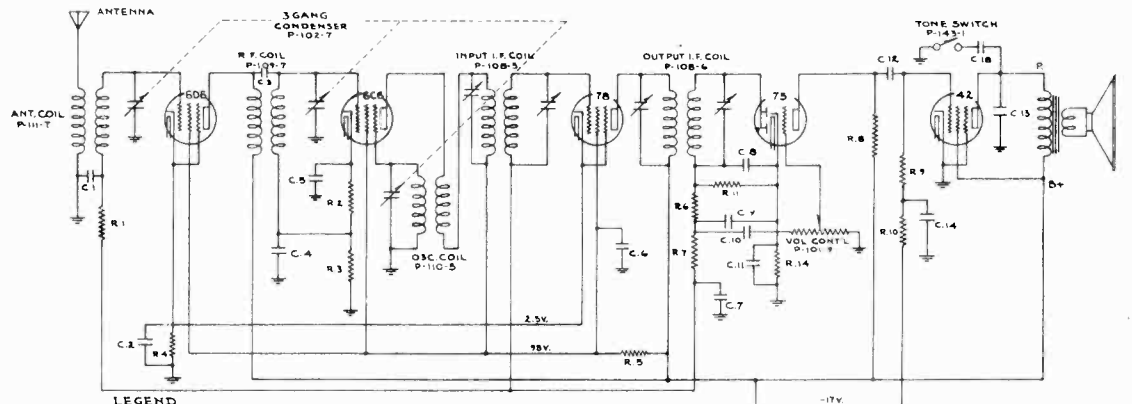
WESTERN AUTO SUPPLY CO.

MODEL 670
Schematic
Socket, Trimmers

Vibrators can be reconditioned at a cost of $3.00 each, if the old unit is returned.

All resistors are RMA color coded - specify value and/or resistor number (per schematic diagram) and model number.

MODEL 670



LEGEND

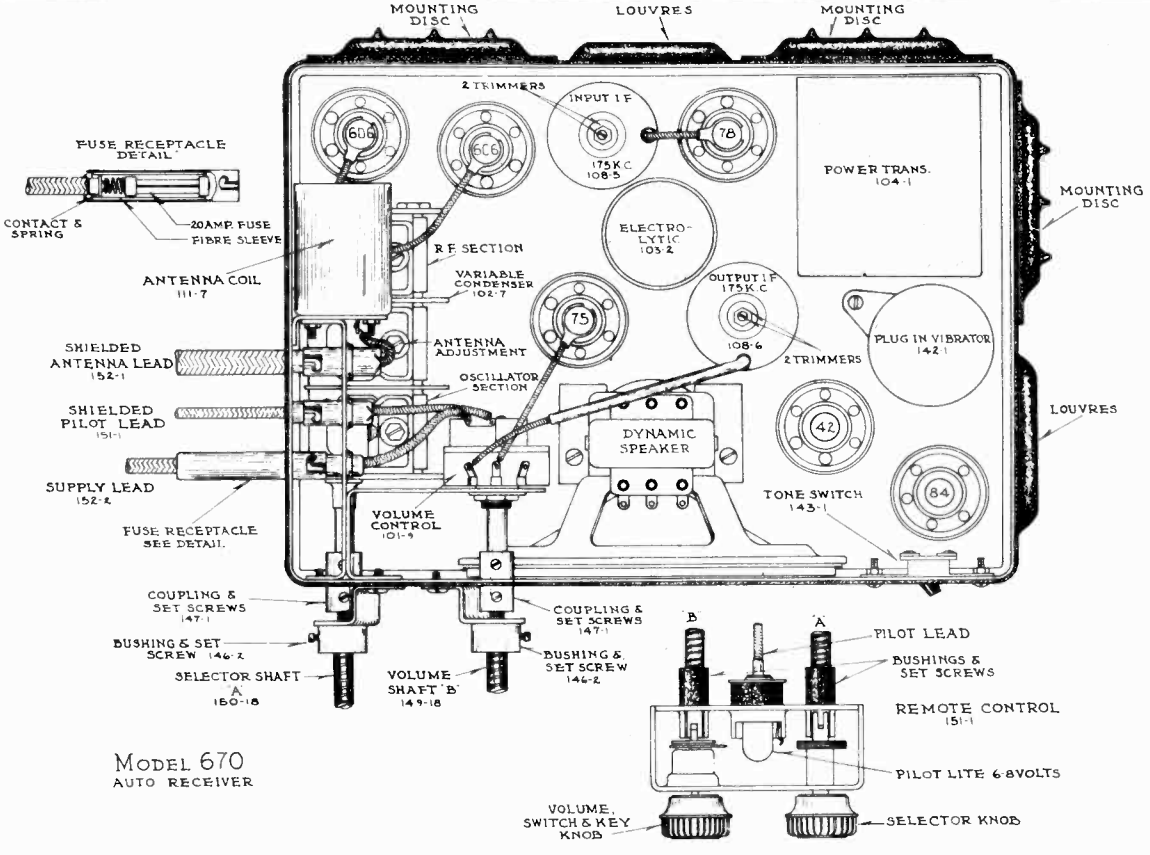
RESISTORS		CONDENSERS	
Nº	VALUE	Nº	VALUE
R.1 -	250M. 1/2W.	C.1 -	.05 X 200V.
R.2 -	450Ω	C.2 -	.1 X 200V.
R.3 -	5M.	C.3 -	11.5 mmf GIMMICK
R.4 -	150Ω	C.4 -	.05 X 200V.
R.5 -	1 M.	C.5 -	.05 X 200V.
R.6 -	50M. 1/2W.	C.6 -	.1 X 200V.
R.7 -	250M. 1/2W.	C.7 -	.1 X 200V.
R.8 -	250M. 1/2W.	C.8 -	.0005 MICA
R.9 -	200M. 1/2W.	C.9 -	.0005 MICA
R.10 -	300M. 1/2W.	C.10 -	.01 X 400V.
R.11 -	250M. 1/2W.	C.11 -	20MFD. X 20V.
R.12 -	100Ω	C.12 -	.01 X 400V.
R.13 -	100Ω	C.13 -	.003 X 600V.
R.14 -	4M. 1/2W.	C.14 -	.1 X 200V.
VAR. RESISTOR - 500M. (VOL. CONT'L)		C.15 -	1MFD X 120V.
		C.16 -	8MFD X 350V.
		C.17 -	8MFD X 350V.
		C.18 -	.01 X 400V.
		C.19 -	.02 X 1000V.
		C.20 -	1MFD X 120V.
		C.21 -	.002 MICA

- NOTE -

NUMBERS PREFIXED BY LETTERS ARE PART NUMBERS.
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL.
THE PHRASE GIMMICK MEANS, A WIRE WOUND AROUND ANOTHER WIRE.
RESISTORS IN ONE UNIT, P-106-3, - R. 2, 3, 4, 5.
CONDENSERS IN ONE UNIT, P-103-2, C. 16, 17.
CONDENSERS IN DUAL UNIT: - C. 2, 7
CONDENSERS IN DUAL UNIT: - C. 5, 6
RESISTORS AND CONDENSERS IN OUTPUT I.F. CAN, P-108-6, - C. 8, 9, 10 AND R. 6, 7, 11.
CONDENSER, C.1, IN ANT. COIL CAN P-111-7.

IF PEAK 175 KC.

54133



MODEL 670
AUTO RECEIVER

MODEL 670
Alignment
Service Notes

WESTERN AUTO SUPPLY CO.

ELIMINATION OF MOTOR NOISE: (Cont'd)

In some few cases, such as Buicks, it is necessary to use screw type suppressors. Cut lead about two inches from distributor and screw one end of suppressor into the wire attached to distributor, screw wire from coil into other end of suppressor.

Generator capacitor, number 148-1, is connected to generator side of cutout. The ground side of capacitor can be fastened to the generator housing under the same screw that holds the relay housing to generator. In some cases, an additional capacitor, number 148-1, (obtainable from your dealer) must be installed between the battery side of ignition coil and the car frame.

If after connecting suppressors and condensers as outlined above there is still motor noise, make the following tests:

Shield high tension leads.

Bond flexible shaft leads, such as free wheeling, which run close to distributor, radiating ignition interference which is picked up by the antenna inside of car.

Cars using wooden floor boards, place a grounded copper screen under toe board.

Excessive gap between distributor rotor and high tension contacts, replace with a special radio rotor arm or build up end with solder and dress end with file so that its original shape is retained. The rotor should not brush or wipe the contacts, but should just clear them.

In some cases, such as V-8 Ford, it is necessary to pull battery and primary leads out of special tube which houses high tension leads, shield and ground these leads. Also on V-8 Fords it is necessary to install a capacitor at primary terminal of coil housing.

Additional suppressors can be obtained from your dealer.

The ignition system of car must be kept in good condition.

Fouled plugs or plugs with improperly adjusted gaps will affect the operation of receiver as well as of the automobile. Burned or poorly adjusted braker points will also impair the performance. It is advisable to advance the generator charging rate in order to compensate for the additional drain of the receiver on car storage battery.

It is sometimes necessary to connect a condenser (148-3) between the hot side of the dome light switch and ground.

BALANCING SET TO ANTENNA:

When this set has been installed and is ready for operation, it may be found necessary (depending on antenna) to balance set to this antenna. This is accomplished as follows:

With the receiver tuned to a very weak station, about 130 to 140 (1300 to 1400 kilocycles) on the dial, adjust the antenna trimmer with a screw driver until maximum volume is attained. To reach the antenna trimmer remove the plug button from the top of the case.

••••••••••••••••
SERVICE NOTES
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Should it ever be necessary or desirable to re-align this receiver, the proper method is as follows:

Adjustments can be made with the receiver mounted in the cabinet, being necessary only to remove the top cover.

I.F. ALIGNMENT:

1. With variable condenser at its maximum capacity position and with volume control full on, connect in series with a .1 mfd. condenser, an oscillator set at 175 kilocycles to the grid cap of the 6Q6 tube.
2. Adjust trimming condensers of both input and output I.F. transformers, parts number 108-5 and 108-6 (see top view of chassis) to resonance with oscillator, as indicated on an output meter connected across the primary terminals of the speaker input transformer. Maximum deflection on the meter indicates resonance

Note: Each I.F. transformer trimmer has two adjustments, one nut and one screw, both of which are adjustable through the top of the can.

FREQUENCY ALIGNMENT:

1. Attach oscillator connected in series with a 200 mmfd. condenser to the antenna lead and with the variable condenser at its minimum capacity position (extreme right of its rotation) and with an oscillator set at 1550 kilocycles, adjust condenser trimmer of oscillator section (shaft end) to resonance.
2. Re-set oscillator to 1400 kilocycles, rotate variable condenser to pick up signal, adjust antenna and R.F. trimmers to resonance.
3. Check alignment at 1200-1000-800-600-530 kilocycles by setting oscillator to these frequencies and picking up signal by rotating condenser.
4. Bend slotted plates of antenna and R.F. sections only if necessary. UNDER NO CIRCUMSTANCES BEND PLATES OF OSCILLATOR SECTION.

NOTES:

Voltages from chassis to different points are indicated on schematic circuit diagram, and should be measured with a volt meter having a resistance of 1000 ohms per volt.

Failure to operate, noisy or weak reception, may be due to defective tubes or poor contact between cap on top of tube and grid clip.

Tubes may be checked by replacing with another tube which is known to be good.

If fuse blows out frequently, and insulating sleeve has been properly placed over fuse, the trouble probably is in the vibrator and vibrator should be replaced.

NEVER ATTEMPT TO ADJUST VIBRATOR POINTS.

Circuit

The circuit consists of an antenna stage, a 78 R.F. stage, a 77 1st detector-oscillator stage, a 78 I.F. stage, a 75 dual diode-triode tube, which functions as a diode 2nd-detector and triode 1st audio stage, and a single 41 output stage. An 84 full wave rectifier is used in the power unit. The intermediate frequency is 262 K.C. The diode current establishes a drop across a resistor which is used as additional bias voltage for the R.F. and I.F. tubes giving automatic volume control action. Noise suppression between stations is obtained by the resistor in the cathode circuit of the 75 tube, the drop across which must be overcome before rectification in this tube begins. The manual volume control varies the audio voltage applied to the grid of the 75 tube.

A vibrator interrupts the current through the primary of the power transformer in the power unit. This, together with the turns ratio in this transformer, results in the high voltage AC being present in the secondary of the transformer. The full wave rectifier tube, filter choke, and filter condensers convert this high voltage AC into high voltage DC for the plate and screen circuits.

Current for the receiver is obtained from the car storage battery. In Fig. 11 is shown the condenser block internal wiring.

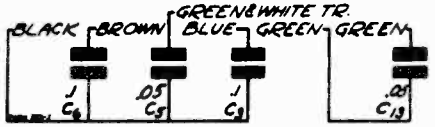


Fig. 11—Condenser Block—Internal Wiring

Voltages at Sockets

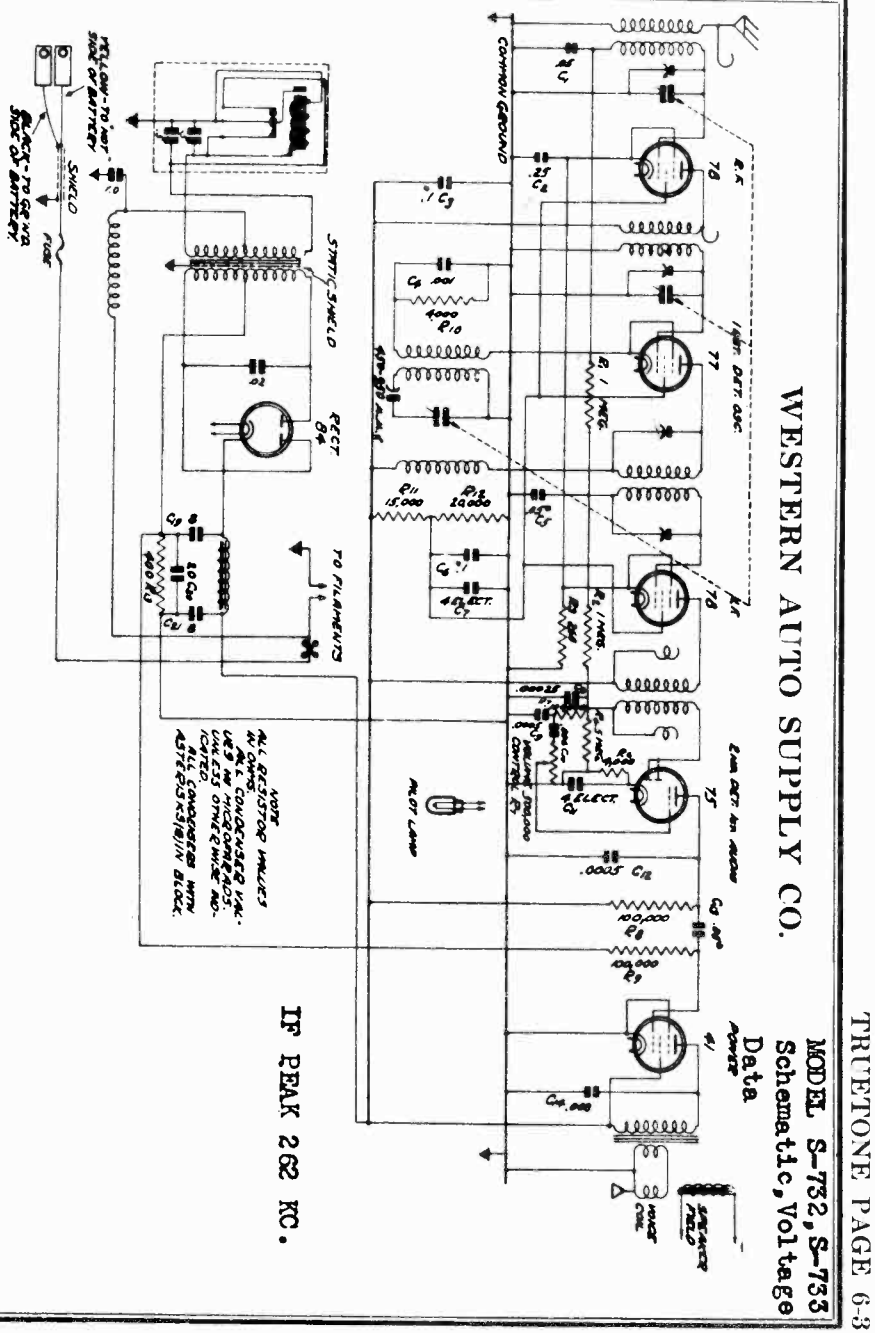
In the following chart are given the voltages at the sockets with all the tubes in, all units connected, and the set in operating condition, but with no signal being received. The antenna should be grounded.

A thousand ohm-per-volt meter of 0-250 volt range is required for the plate and screen voltages. Lower ranges will be necessary for the grid and heater voltages. It is not absolutely necessary to have a high resistance meter for the heater or "A" battery reading.

These voltages will vary with variations in receivers, tubes, test equipment used, and "B" eliminator output voltage.

Type of Tube	*Function*	*Across Heater*	*Plate to Cathode*	*Screen to Cathode*	*Grid to Cathode*	*Normal Plate MA*
78	R. F.	6.1	182	80	3.(1)	7.0
77	1st Det. and Osc.	6.1	178	77	5.(3)	1.3(2)
78	I. F.	6.1	182	80	3.(1)	7.0
75	2nd Det. 1st Audio	6.1	70(3)		1.4(1)	.35
41	Output	6.1	172.5	176.5	12.5(4)	16.0
84	Rect.	6.1	205			17.5 per plate

(1) Cathode to Ground
(2) Subject to Variation
(3) Triode Plate to Cathode
(4) Read Across 400-Ohm Resistor, R13



Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself in broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide accurately calibrated signals over the broadcast band and accurately calibrated signals at and around 262 K.C., the intermediate frequency and an output indicating meter are desirable.

First set the signal generator at approximately 262 K.C. Connect the antenna lead from the generator to the control grid of the I.F. 78 tube, through a .05 mfd. condenser. The ground lead of the generator goes to the ground of the receiver. Turn the rotor plates of the tuning condenser completely out and keep the signal weak enough to prevent A.V.C. action. Note from Fig. 10 that the second I.F. transformer is self tuned and cannot be adjusted. Adjust the frequency of the signal generator until the output meter shows maximum output. The intermediate frequency setting of the generator is then correct, although it may be a very small percentage higher or lower than 262 K.C.

Next connect the signal lead from the signal generator to the grid of the 1st detector tube through a .05 mfd. condenser. Then adjust the two intermediate frequency condensers for maximum output. One of the I.F. condenser screws is reached through the hole on the top of the 1st I.F. assembly can. The other I.F. condenser screw is reached from the bottom of the sub-panel through a hole at the bottom of this assembly.

Now set the signal generator for a signal of exactly 1400 K.C. The antenna lead from the generator is, in this instance, connected to the antenna lead of the receiver. Connect the flexible drive shaft to the chassis if it has been disconnected. As explained previously, the dial scale should be at the low frequency end stop when the rotor is completely in mesh. Then turn the station selector knob until the dial scale is at 1400 K.C.

Then adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator section first.

Next, set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The adjusting screw for this condenser is reached through a hole in the back wall of the sub-panel.

A non-metallic screwdriver is necessary for this adjustment. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 600 K.C. trimmer screw until the highest output is obtained.

Then set the signal generator again for a signal of 1400 K.C. and check the adjustment of the tuning condenser trimmers at this frequency for maximum output.

Rattle

If rattle is experienced when a signal is being received, it is, in practically all cases, due to mechanical vibration at some point in the chassis. Inspect the chassis and look for a loose tube shield or a loose part at some point which can rattle against another part. When the vibrating part is found, secure it in place in some manner. This can generally be done with a wedge made of a piece of paper, cardboard or wood. Rattle may, in some instances, be due to a loose cover. If this is the case, remove the cover and bend the edge of the chassis box outward between the screw holes so that the cover will fit tightly when it is put on.

If the Receiver Fails to Operate

"A" Fuse—Check the "A" line fuse in the cable.

"A" Line Open—See if power is being supplied to the speaker, tube heaters, and "B" eliminator.

"B" Eliminator Not Working—See if the "B" eliminator is in proper working order by checking the high voltage points at the tube plate terminals (see Fig. 10).

Antenna and Lead—See if antenna is properly connected to lead-in wire and antenna lead from set. Be sure antenna system is not grounded at any point.

All Tubes Not Inserted—See if all tubes are inserted as per Fig. 8.

Defective Tubes—Try out a new set of tested tubes.

Grid Caps Not Connected—See if all grid caps are properly connected to top of top grid connection tubes.

Variable Condenser Plates Shorted—Check condenser sections in chassis carefully for foreign particles or rotor stator rubbing.

CHASSIS PARTS

Part No.	Description	List Price
P-1780	No. 75 Tube Socket	$0.10
P-1761	No. 77 Tube Socket	.10
P-1762	No. 78 Tube Socket	.10
P-1665	No. 41 Tube Socket	.10
P-1803	No. 84 Tube Socket	.10
P-1805	Single Pin Jack	.10
P-1799	Tube Shield Assembly	.25
P-20656	Chassis Box	4.00
P-20657	Chassis Box Cover	1.10
P-70740	Shielded Antenna Lead	.40
P-70744	Shielded "A" Battery Lead	1.15
P-1926	Interrupter with Condensers in Rubber Boot and Metal Case	6.35
P-10260	Cardboard Baffle	.20
P-1924	15 Amp. Fuse	.10
P-1774	Electrodynamic Speaker	3.75
P-20585	Cond. Drive Gear	.25
P-1801	Volume Control and Drive Bracket	.30
P-20635	Cond. Drive Pinion	.15
P-20677	Pinion Adjustment Plate	.10
P-20614	Lock Lever	.10
P-20658	Tension Spring	.10
P-30419	Entry Plate Assembly	.10
P-1830	Dial Gear and Strip Assembly	.40
P-1816	Celluloid Dial Strip only	.15
P-1810	Pilot Lamp Socket and Spring Clip	.10
P-1563	6-8 Volt Pilot Lamp	.25
P-10263	Rubber Tube Bumper—Square	.10
P-10210	Rubber Tube Bumper—Round	.10
P-10213	Rubber Band for Tube	.10
P-50569	Filter Choke Assembly	1.60
P-50595	Power Trans. Assembly	2.90
P-5099	Antenna R. F. Transformer—Less Can	1.20
P-5065	Interstage R. F. Transformer—Less Can	1.00
P-5105	Second I. F. Transformer and Can Assembly	.95
P-5096	First I. F. and Oscillator Transformer and Can Assembly	2.70
P-5097	Single Solenoid "A" Choke	.25
P-40431	Antenna R. F. Can	.15
P-1826	Interstage R. F. Can	.10

Resistors

Part No.	Code No.	Resistance	Type	List Price
P-A95103	R-1	1 Megohm	Carbon	$0.25
P-A95105	R-2	1 Megohm	Carbon	.25
P-B94261	R-3	260 ohm	Carbon	.35
P-A95504	R-4	.5 Megohm	Carbon	.25
P-A95104	R-5	100,000 ohm	Carbon	.25
P-A94402	R-6	4,000 ohm	Carbon	.20
P-91066	R-7	0-500,00 ohm	Volume Control and Switch	$1.15
P-A95104	R-8	100,000 ohm	Carbon	.25
P-A95104	R-9	100,000 ohm	Carbon	.25
P-A94402	R-10	4,000 ohm	Carbon	.20
P-B94153	R-11	15,000 ohm	Carbon	.25
P-B94203	R-12	20,000 ohm	Carbon	.25
P-C94401	R-13	400 ohm	Carbon	.20

Condensers

Part No.	Code No.	Capacity	Voltage	Type	List Price
P-80862	C-1	.05 mfd.	200 V.	Tubular	$0.30
P-80888	C-2	.25 mfd.	200 V.	Tubular	.35
P-80821-B	C-4	.001 mfd.	600 V.	Molded	.25
P-80937	C-7	4.0 mfd.		Electrolytic Block in can	1.25
	C-11	4.0 mfd.			
P-80919	C-8	.00025 mfd.	600 V.	Molded	.20
P-80945	C-9	.0005 mfd.	600 V.	Molded	.15
P-80898	C-10	.006 mfd.	600 V.	Tubular	15
P-80945	C-12	.0005 mfd.	600 V.	Molded	.15
P-80966	C-14	.008 mfd.	600 V.	Tubular	20
P-80962A	.02 mfd.	800 V.	Tubular Condenser		.25
P-80978A	1. mfd.	120 V.	Tubular Condenser		.45
P-80976A	Dual .5 mfd.	120 V.	Tubular Condenser In Paper Box		.80
P-80956	C-19	8.0 mfd.	225 V.	Electrolytic Block in Can	2.25
	C-20	20.0 mfd.	25 V.		
	C-21	8.0 mfd.	225 V.		
P-80955	C-3	.1 mfd.	300 V.	Bypass Block in Can	1.35
	C-5	.05 mfd.	200 V.		
	C-6	.1 mfd.	200 V.		
	C-13	.05 mfd.	300 V.		
P-1539	600 K. C. Trimmer Condenser				.45
P-80957	Three-Gang Variable Condenser				3.00

CONTROL UNIT PARTS

(When Separate Control Unit Is Used)

Part No.	Description	List Price
P-1816	Celluloid Dial Strip	$0.15
P-1825	Dial Gear and Strip Assembly	.40
P-20509B	Control Unit Swivel	.15
P-20510A	Steering Post Apron	.30
P-20511	Steering Post Clamp	.15
P-20693	Control Box Cover	.35
P-20635	Cond. Drive Pinion	.15
P-70746	Pilot Lamp Cable only	.40
P-1415A	Pilot Lamp Socket and Clip	.13
P-1563A	6-8 Volt Pilot Lamp	.25
P-30426	Ornamental Plug	.10
P-30414	Key	.15

Replacing Drive Cord

The drive cord in this receiver may be replaced as follows:

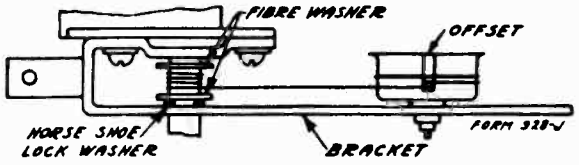


Fig. 3—*Cord Drive—Top View*

First remove the chassis from the case as explained on page 4.

Some of the first models did not have two fibre "end" washers on the drive shaft to protect the drive cord as shown in Fig. 3. If this is the case, these washers should be put on as follows:

Separate and take off the horse-shoe lock washer which holds the drive shaft in position. This may be done with a fine jawed, long nose plier.

Now pull the drive shaft out just far enough to permit the two fibre washers to be slipped over the end of the shaft.

Then slip the shaft back into place and replace the horse-shoe lock washer.

Knot one end of the new drive cord and with the condenser plates in a completely closed position, slip the drive cord through the small hole "A" in the drive drum — see Fig. 4. The knot will then be on the inside of the drum.

Now wrap the cord around the lower half of the drive drum as indicated and bring it up to the drive shaft. Proceed by wrapping it in a clockwise direction (from

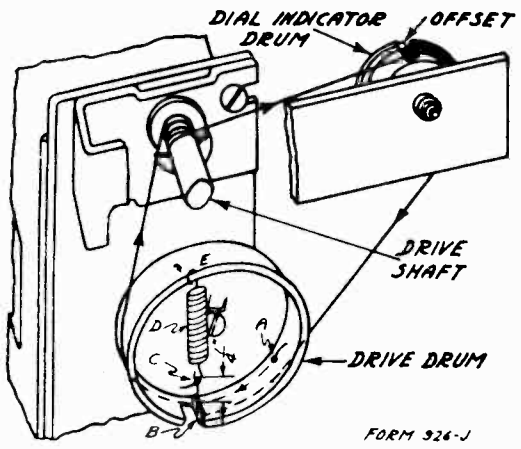


Fig. 4—*Cord Drive Replacement*

front) around the drive shaft three and one-quarter turns between the two fibre washers, progressing towards the front of the chassis. Be sure that the condenser plates are kept in a closed position and that the cord is held tight.

Set the dial indicator drum so that the offset is at the top or a little to the right of the center — see Fig. 4.

Wrap the cord from the drive shaft once around the offset in the dial indicator drum and then approximately one and one-half turns around the drum itself in a clockwise direction, progressing toward the back.

From the dial indicator drum draw the cord over the lower right hand quarter of drive drum as shown in Fig. 4.

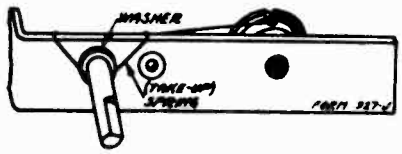


Fig. 5—*Drive "Take-up" Spring*

Then bring the cord inside of the drum by way of the turned-in portion of the flange at "B".

Tie the drive tension spring "D" to the loose end of the cord at the point "C" just above the top edge of the lip "B" as shown in the illustration. This should be done so that the lower hook of spring "D" at point "C" will be between ⅛" and ⅝" from top edge of the turned-in portion of the flange "B" in the flange of the drive drum. After the spring is hooked and the drive turned over several times the tension in the cord will cause this distance to become about ¼".

Now, by applying a tension on the drive spring "D", hook the other end of the spring into the small hole "E" near the top of the drive drum. Hook spring from the inside out.

After the cord has been put on it may be necessary to calibrate the receiver as explained in the article on condenser alignment.

All of the earlier models did not have drive shaft "take-up" springs. This spring will prevent any tendency toward change of setting should the receiver be subjected to vibration. To insert these springs and fibre washers on the drive shaft proceed as follows:

Remove the station selector knob by pulling it off of the shaft.

Slip the small fibre washer over the shaft and clip the "take-up" spring to the drive bracket as shown in Fig. 5.

The chassis may now be replaced into the case in the reverse order of the manner in which it was removed.

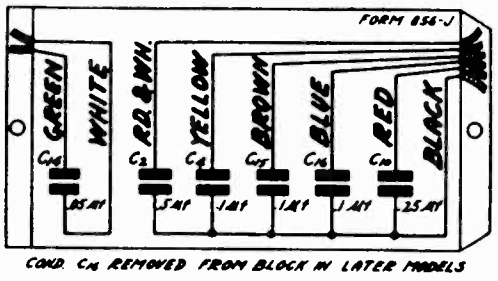


Fig. 6—*Condenser Block Internal Wiring*

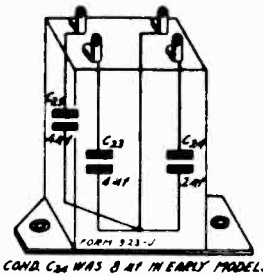


Fig. 7—*Electrolytic Block Internal Wiring*

MODEL S-735
Schematic, Voltage
Socket, Trimmers, Parts

WESTERN AUTO SUPPLY CO.

VOLTAGES AT SOCKETS

Input 6.3 Volts—Antenna Disconnected at Connector

Type of Tube	Function	Volts at Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6D6	R. F.	6.2	154	95	3.0	5.2
6C6	1st Det. & Osc.	6.2	160	97	0	3.0
6D6	I. F.	6.2	154	95	3.0	5.2
75	2nd Det. & 1st A. F.	6.2	110	—	1.	.25
41	Power	6.2	143	146	14.	13.0

Dec, 1934

On the Voltage Chart are given the voltages at the sockets with all tubes in and the set in operating condition. The antenna should be disconnected at the bayonet connector.

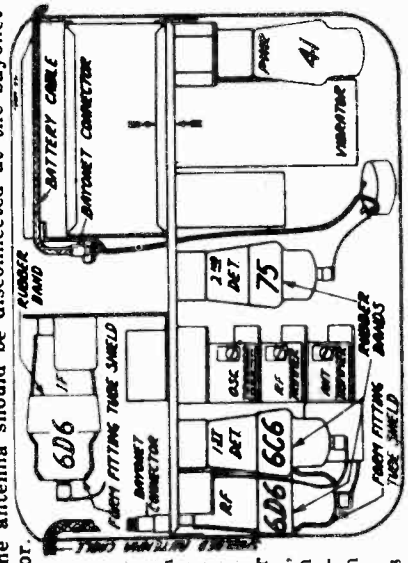


Fig. 2—*Location of Tubes and Vibrator*

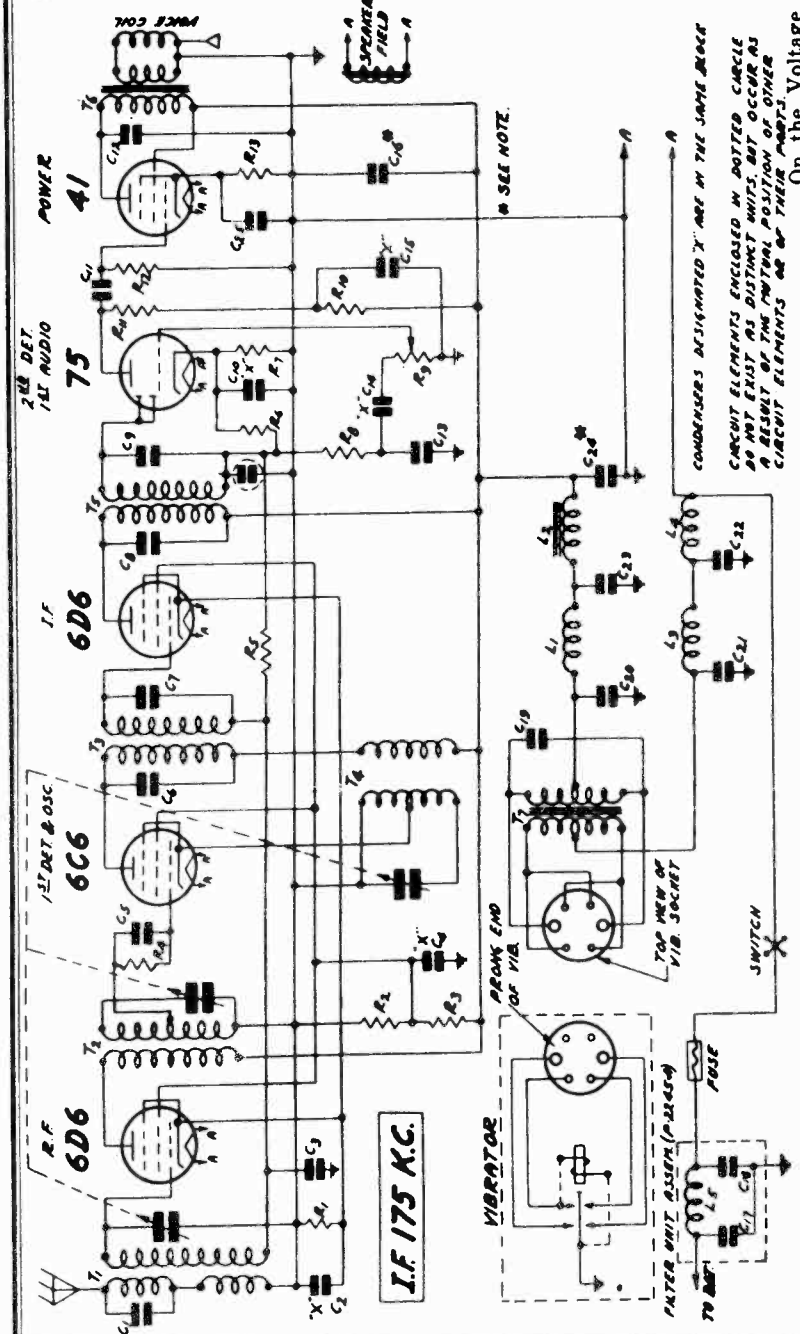


Fig. 1—*Schematic Circuit Diagram*

CONDENSERS

Part No.	Code	Capacity	Voltage	Type
P-81814	C1	250 mmf.	Part of	Antenna Coil Assembly
	C2	.50 mf.	200V.	
	C4	.10 mf.	140V.	Bypass Block
P-82600D	C10	.25 mf.	300V.	
	C14	.05 mf.	200V.	
	C15	.10 mf.	200V.	
P-81116	C3	.05 mf.	200V.	Tubular
P-81815	C5	35 mmf.	Part of	Grid Leak Assembly
P-81806	C6	70 mmf.	Part of	1st I. F. & Osc. Coil Assembly
	C7	70 mmf.		
P-81806	C8	70 mmf.	Part of	2nd I. F. Coil Assembly
	C9	70 mmf.		
P-81115	C11	.05 mf.	300V	Tubular
P-81114	C12	.006 mf.	600V.	Tubular
P-81814	C13	250 mmf.		Moulded
P-81132	C16	.10 mf.	300V.	Tubular
	C17	.01 mf.	120V.	In Choke Condenser Unit
	C18	.01 mf.	120V.	
P-81120	C19	.007 mf.	1600V.	Tubular
P-81122	C20	.10 mf.	300V.	Tubular
P-81121	C21	.50 mf.	140V.	Tubular
P-81816	C22	.002 mf.		Moulded
P-82002	C23	4.0 mf.	250V.	Dry Electrolytic Block
	C24	2.0 mf.	250V.	
	C25	4.0 mf.	25V.	
P-82500	Gang Condenser			

RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-B94351ww	R1	350 Ohm	.5	Flexible Wire Wound
P-B95253	R2	25,000 Ohm	.5	Carbon
P-B95103	R3	10,000 Ohm	.5	Carbon
P-A95105	R4	1 Megohm	.2	Carbon
P-A95105	R5	1 Megohm	.2	Carbon
P-A95504	R6	500,000 Ohm	.2	Carbon
P-A94752	R7	7,500 Ohm	.2	Carbon
P-A95104	R8	100,000 Ohm	.2	Carbon
P- 96017	R9	2 Megohm	.2	Volume Control and Switch
P-A95503	R10	50,000 Ohm	.2	Carbon
P-A95204	R11	200,000 Ohm	.2	Carbon
P-A95504	R12	500,000 Ohm	.2	Carbon
P-B94801ww	R13	800 Ohm	.5	Flexible Wire Wound

In the first models of this receiver a bypass condenser block (P-82600) containing condensers: C2, C4, C10, C14, C15 and C16 was used. Condenser C16 was removed in the later models and added as a separate tubular condenser (P-81132) while the other condensers remained in the block (P-82600-D).

A second condenser change from the earlier models was in the electrolytic filter block (P-82002). In this block section C24 was changed from an 8 mfd., 250 volt to a 2 mfd., 250 volt condenser.

MODEL 550
Schematic, Parts Data

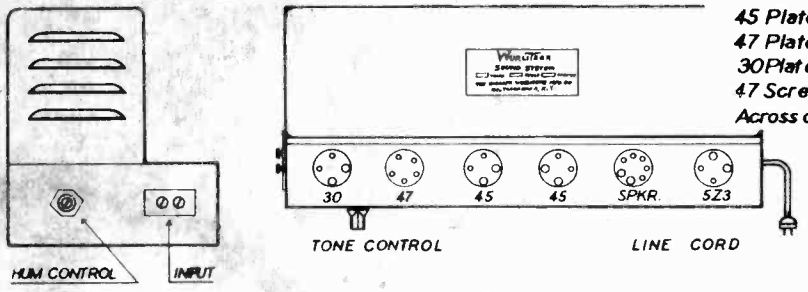
THE RUDOLPH WURLITZER CO.

SIMPLEX POWER AMPLIFIER
MODEL 550
SERIAL NUMBER SERIES 5 500 001
DRAWING NUMBER 97
9-1-35

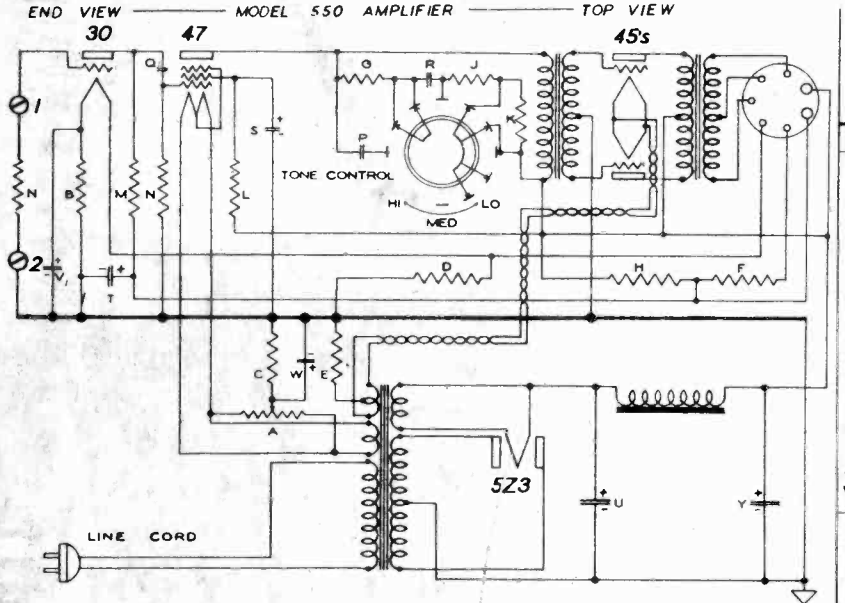
Measure all D.C. voltages from chassis with a 1000 ohm per volt meter with the line at 115 volts 60 cycles.

AVERAGE D.C. VOLTAGES

45 Plates	338v.	45 Bias	57.5v
47 Plate	313v.	47 Bias	19v.
30 Plate	75v.	30 Bias	4.1v.
47 Screen	294v.	5Z3 Fil.	365v.
Across cond. Y	340v.	Across cond. T	170v.



END VIEW — MODEL 550 AMPLIFIER — TOP VIEW



LEGEND

- Connection
- NO Connection
- Ground
- Ω Ohm
- MΩ Kilohm
- Ω Megohm

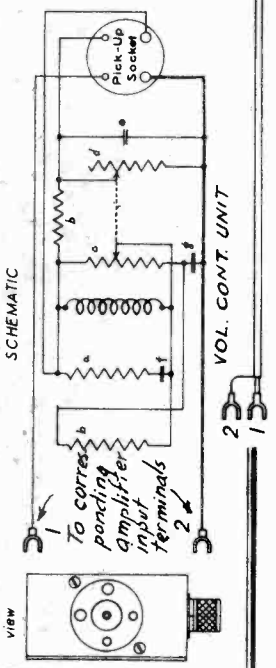
PARTS LIST

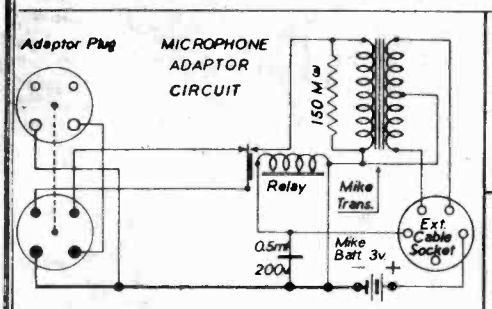
amplifier unit

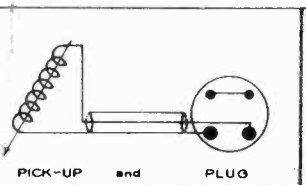
A	20Ω	Hum Control
B	65Ω	w.w. res.
C	500Ω	w.w. res.
D	280Ω	volt. div.
E	775Ω	volt. div.
F	1850Ω	volt. div.
G	4500Ω	carbon.
H	7000Ω	volt. div.
J	1500Ω	carbon w/2
K	4 MΩ	carbon w/2
L	5 MΩ	carbon w/1
M	100MΩ	carbon w/4
N	0.5Ω	carbon w/4
P	.01mf.	600v. paper
Q	.05mf.	400v. paper
R	.3mf.	400v. paper
S	2 mf.	450v. dry
T	8 mf.	200v. dry
U	8 mf.	475v. wet
V	10 mf.	25v. dry
W	25mf.	25v. dry
Y	30mf.	400v. wet

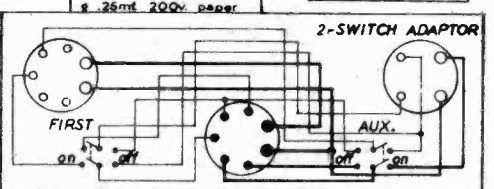
volume control unit

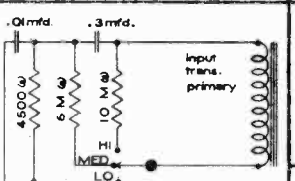
a	1.5MΩ	carbon w/4
b	50MΩ	carbon w/4
c	50 MΩ	dual var.
d	150MΩ	dual var.
e	0.0015mf.	mica
f	0.004mf.	mica
g	.25mf.	200v. paper



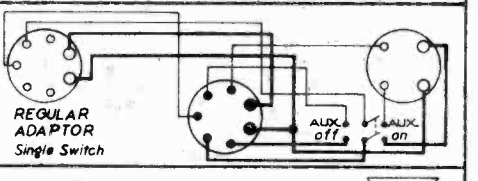


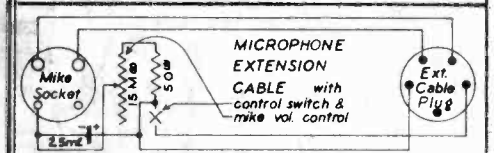


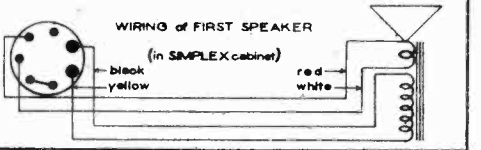


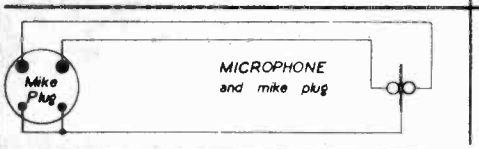


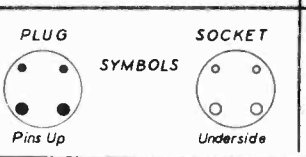
ELECTRICAL EQUIVALENT
not wiring equivalent
OF TONE CONTROL CIRCUITS
Presented only for simplicity of checking tone control operation.

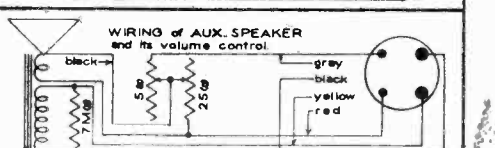






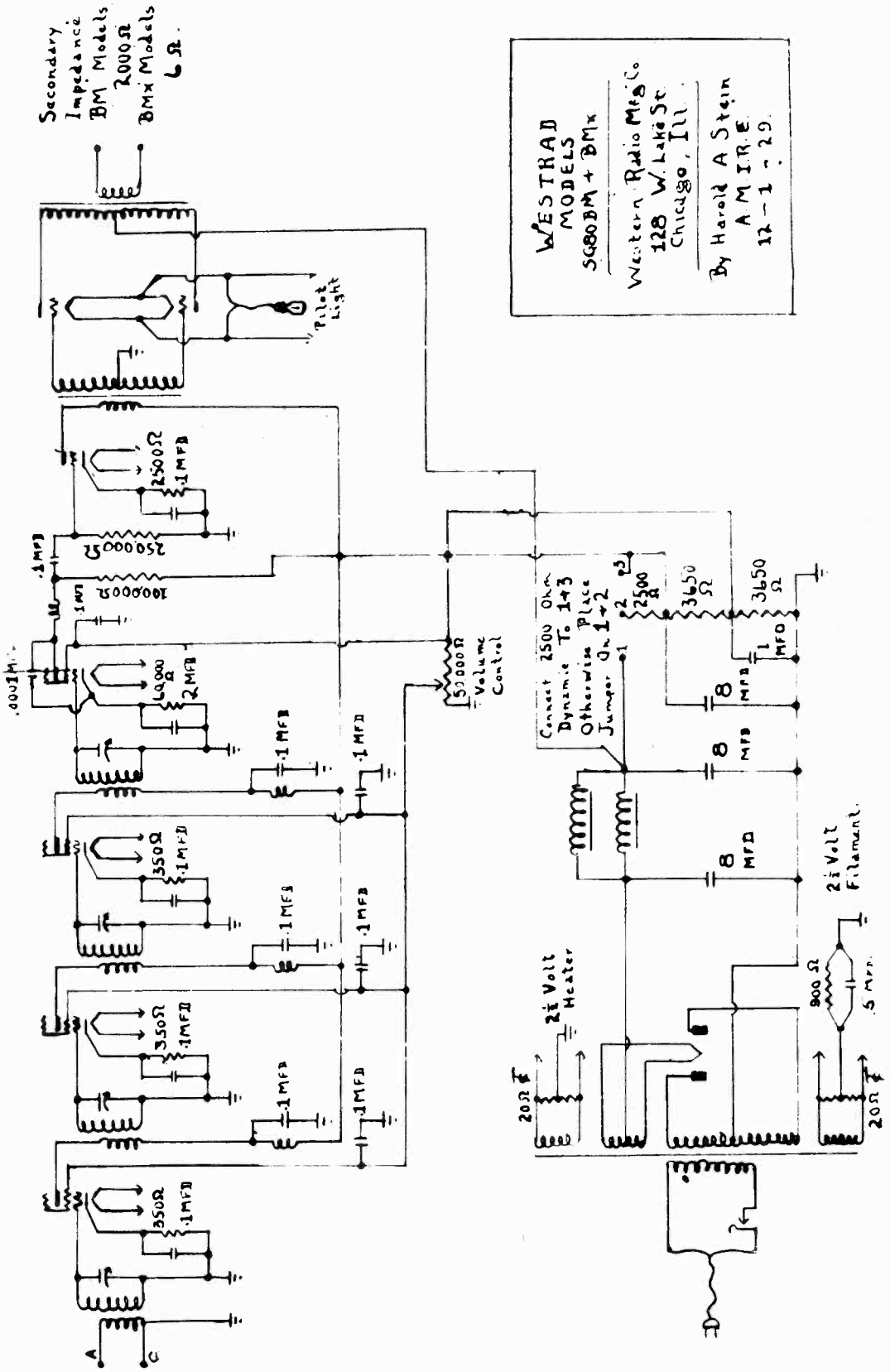






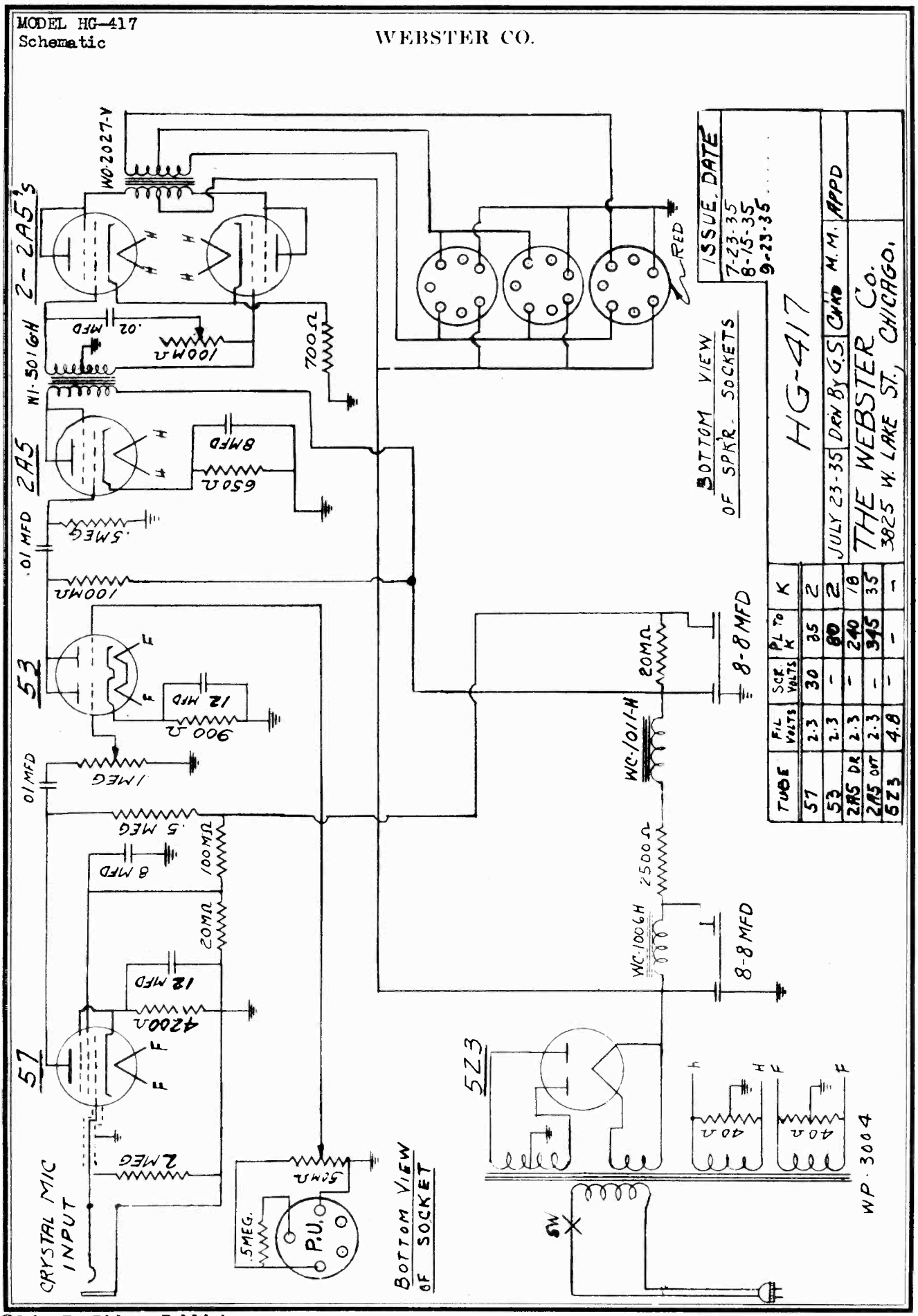
MODEL SG 80 BM
Schematic

WESTERN RADIO MFG. CO.



MODEL HG—417
Schematic

WEBSTER CO.



TUBE	FIL VOLTS	SCR. VOLTS	PL TO K	K
57	2.3	30	35	2
53	2.3	-	80	2
2A5 DR	2.3	-	240	18
2A5 OUT	2.3	-	345	35
523	4.8	-	-	-

ISSUE DATE	
7-23-35	
8-15-35	
9-23-35	

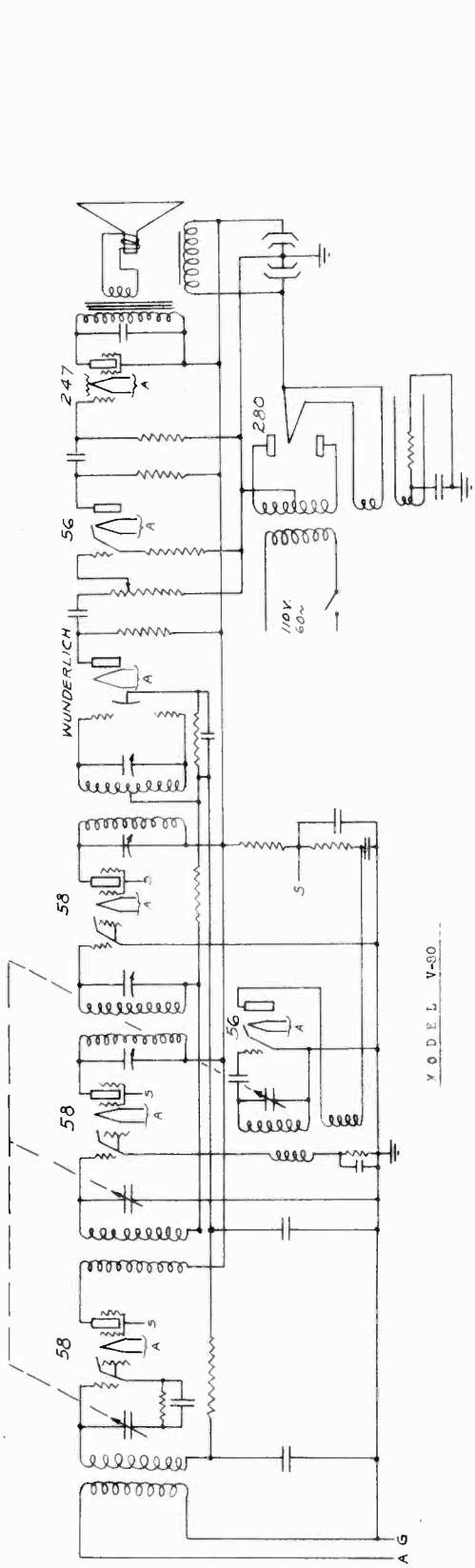
JULY 23-35	DRN BY G.S.	CHK'D M.M.	APPD

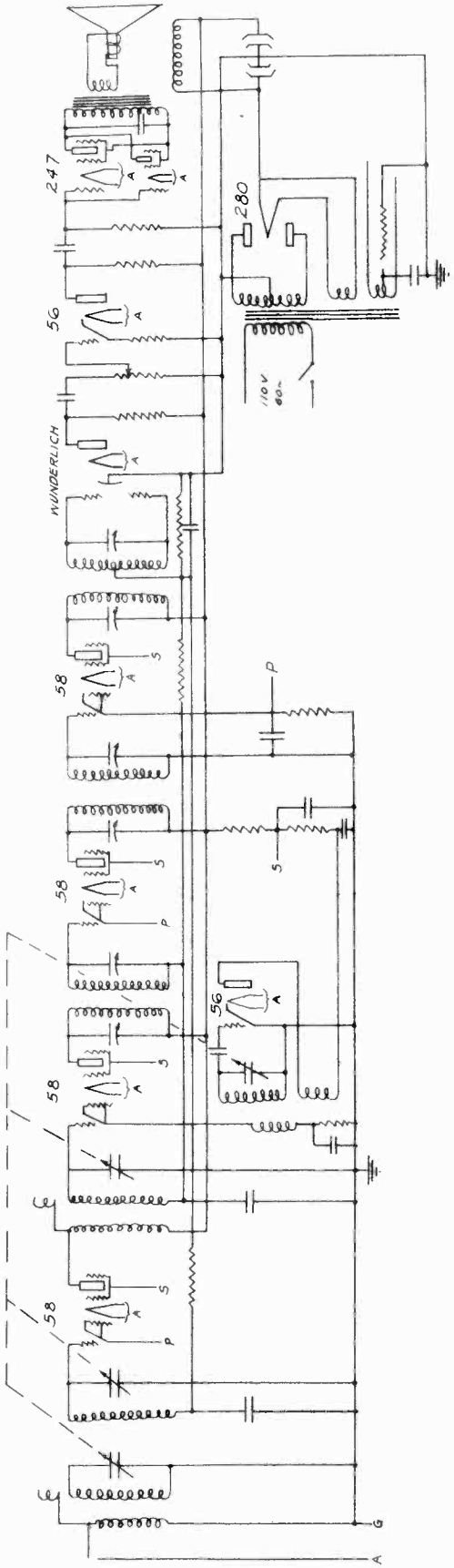
HG-417

THE WEBSTER Co.
3825 W. LAKE ST., CHICAGO.

VOCO RADIO MFG. CO., INC.

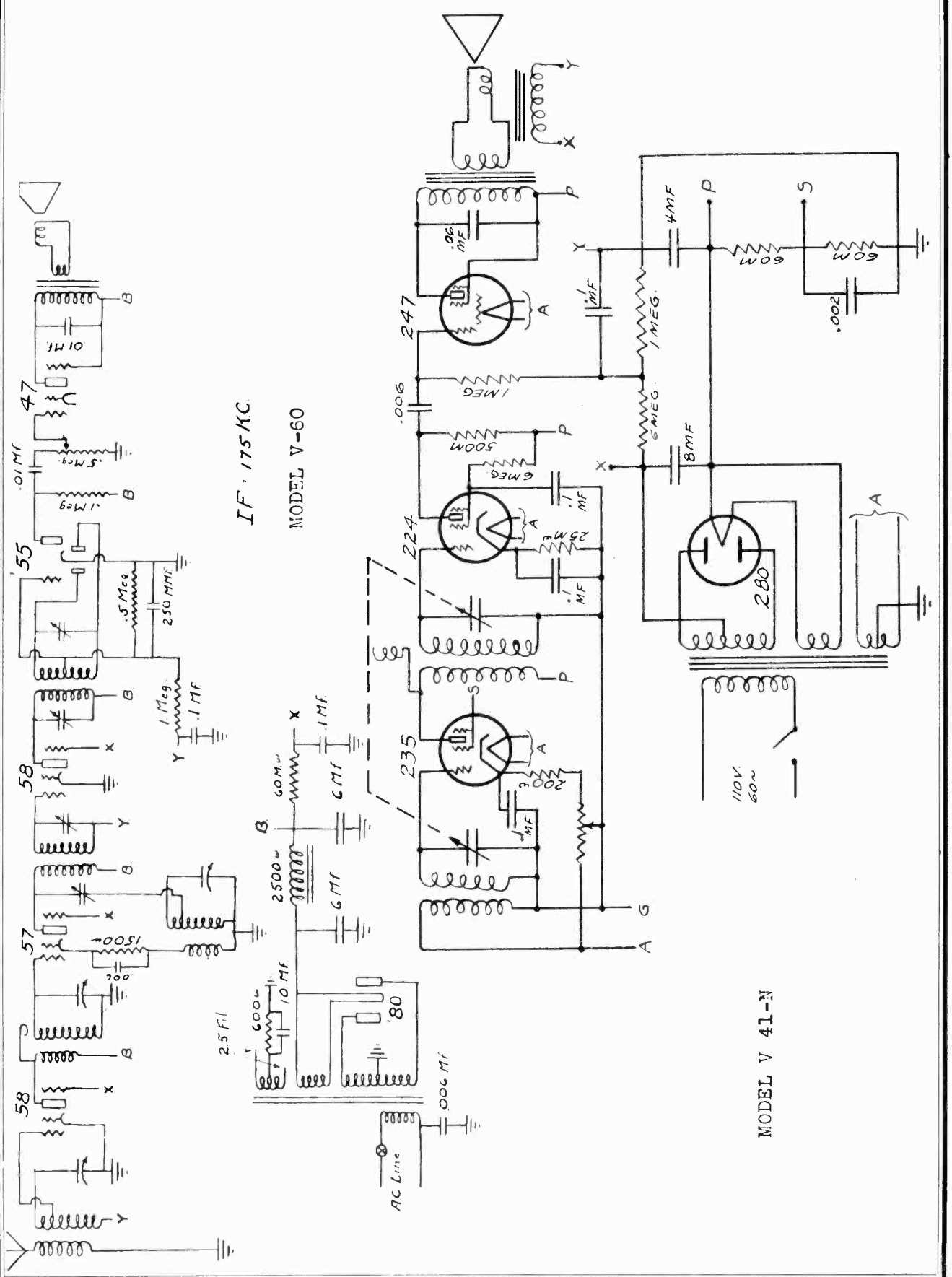
MODEL V-80
MODEL V-100
Schematics





MODEL V-60
MODEL V-41-N
Schematics

VOCO RADIO MFG. CO., INC.



UNIVERSAL BATTERY CO.

MODEL 613V
MODELS 7232, 7332
Schematics, Parts
Socket Layouts

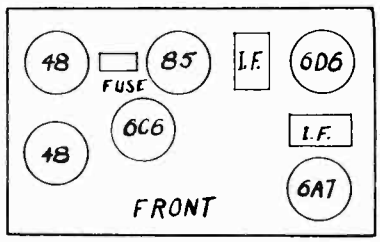
PARTS

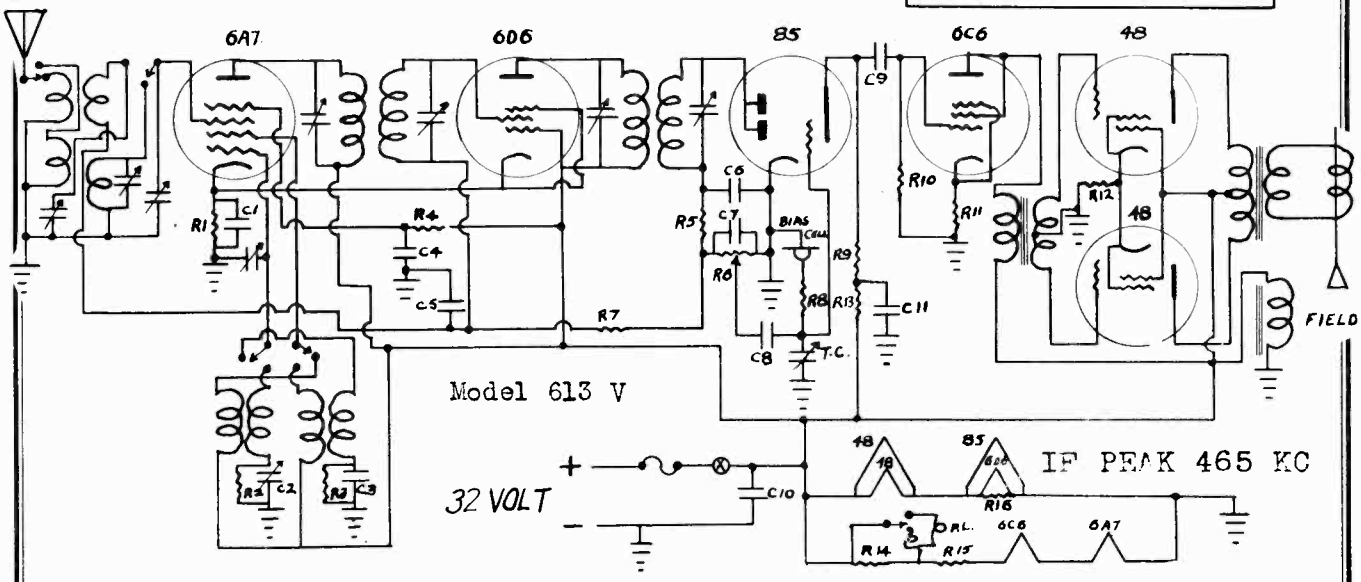
R1-250Ω RESISTOR
R2-50M Ω "
R3-15M Ω "
R4-25M Ω "
R5-50M Ω "
R6-500M VOL. CONTROL
R7-1 MEG. RESISTOR
R8-500M Ω "
R9-100M Ω "
Model 613 V

R10-500M Ω RESISTOR
R11-750 Ω "
R12-350 Ω "
R13-100M Ω "
R14-40 Ω 2 Watt "
R15-40 Ω 2 " "
R16-40 Ω 2 " "
C1-.1-200 V. CONDENSER
C2-500MMF PAD. "
I.C.-TONE CONTROL

C3-.004 MICA CONDENSER
C4-.1-200V. "
C5-.01-200V. "
C6-.0001 MICA "
C7-.0001 " "
C8-.05-200V. "
C9-.05-200V. "
C10-.25-200V. "
C11-.1-200V. "

TUBE LOCATIONS





PARTS

R1-250Ω RESISTOR
R2-50M Ω "
R3-1MEG. "
R4-25M Ω "
R5-1MEG. "
R6-250Ω "
R7-50M Ω "
R8-500M Ω "
R9-500M VOL. CONTROL

R10-5M Ω RESISTOR
R11-100M Ω "
R12-100M Ω "
R13-250M Ω "
R14-1M Ω "
R15-10M Ω "
R16-30Ω 1½ WATT
R17-60Ω ½ WATT
R18-30Ω 5 WATT

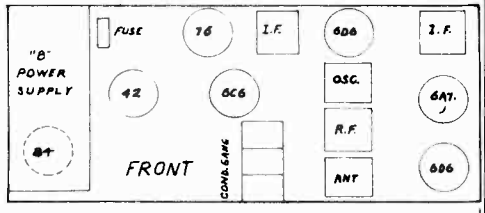
R19-15Ω 2½ WATT
C1-.1-200V. CONDENSER
C2-.0001 MICA "
C3-450MMF PAD.
C4-1000MMF PAD.
C5-.003 MICA COND.
C6-.01-200V. "
C7-.01-200 V. "
C8-.1-400V. "
C9-.1-200V. "

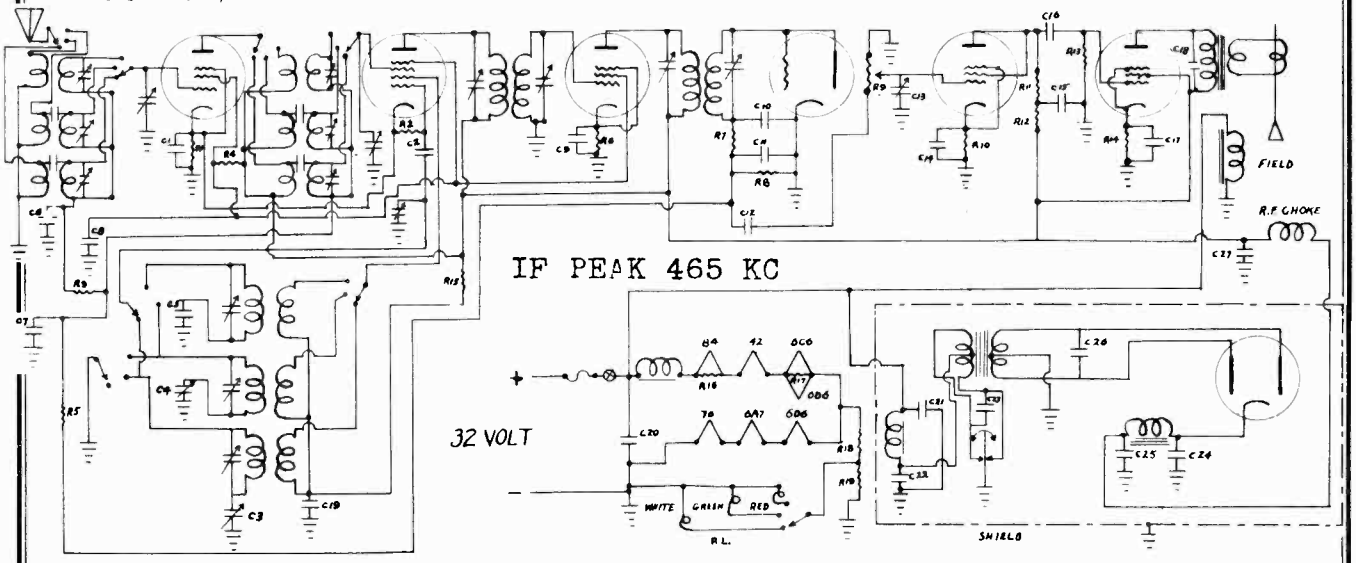
C10-.0001 MICA COND.
C11-.0001 MICA "
C12-.05-200V. "
C13-TONE CONTROL
C14-.25-200V. COND.
C15-.1-400 V. "
C16-.05-400V. "
C17-10MFD-35 V.
C18-.005-600V. COND.

C19-.1-400V. COND.
C20-.004 MICA "
C21-.25-200V. "
C22-.25-200V. "
C23-.5-200V. "
C24-12 MFD.-500 V.
C25-6 MFD.-500V.
C26-.02-800 V.
C27-.25-600V.

Models 7232, 7332

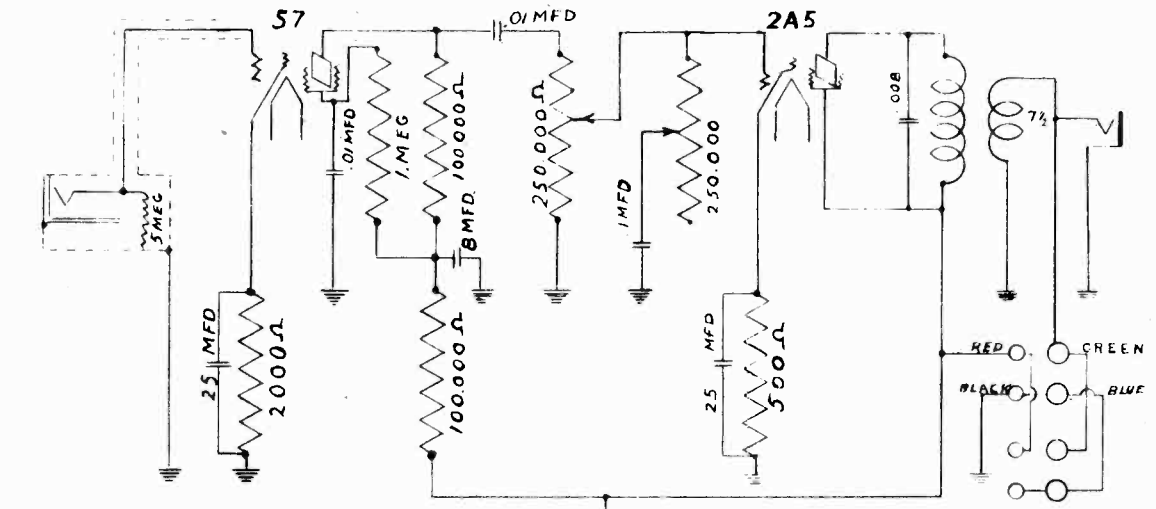
TUBE LOCATIONS



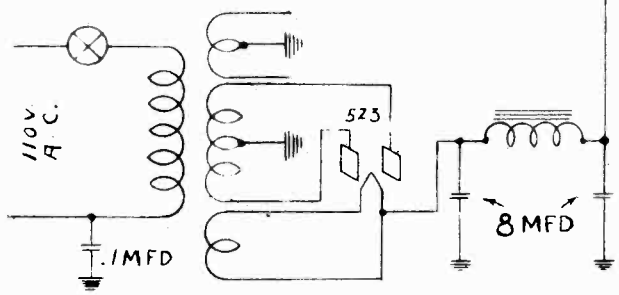


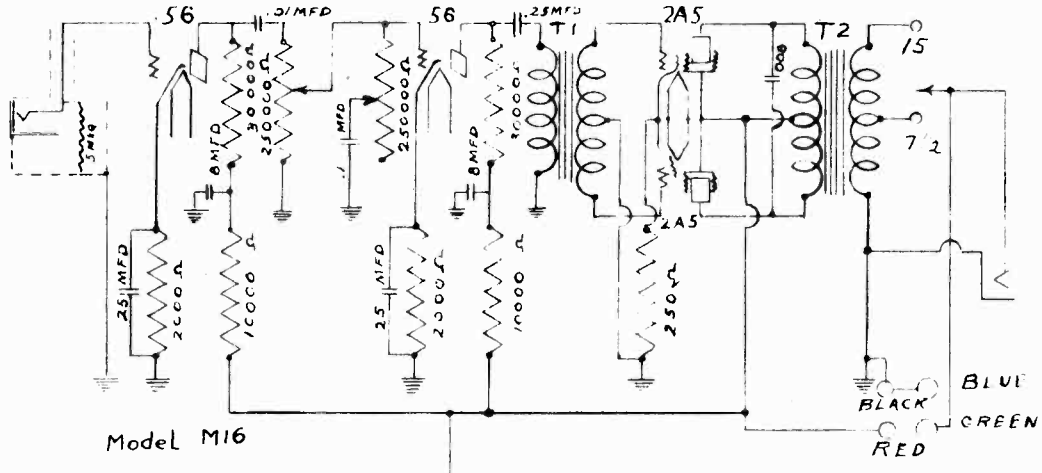
MODEL M-8
MODEL M-16
Schematics

THE TURNER CO.

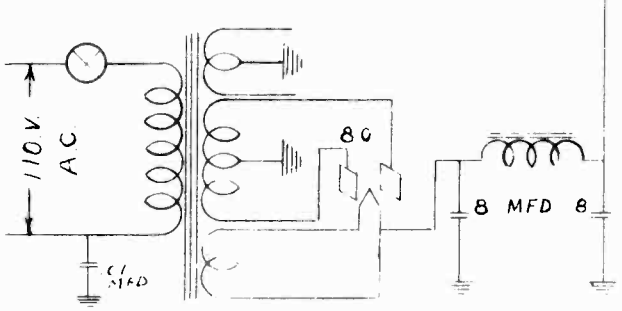


Model M8





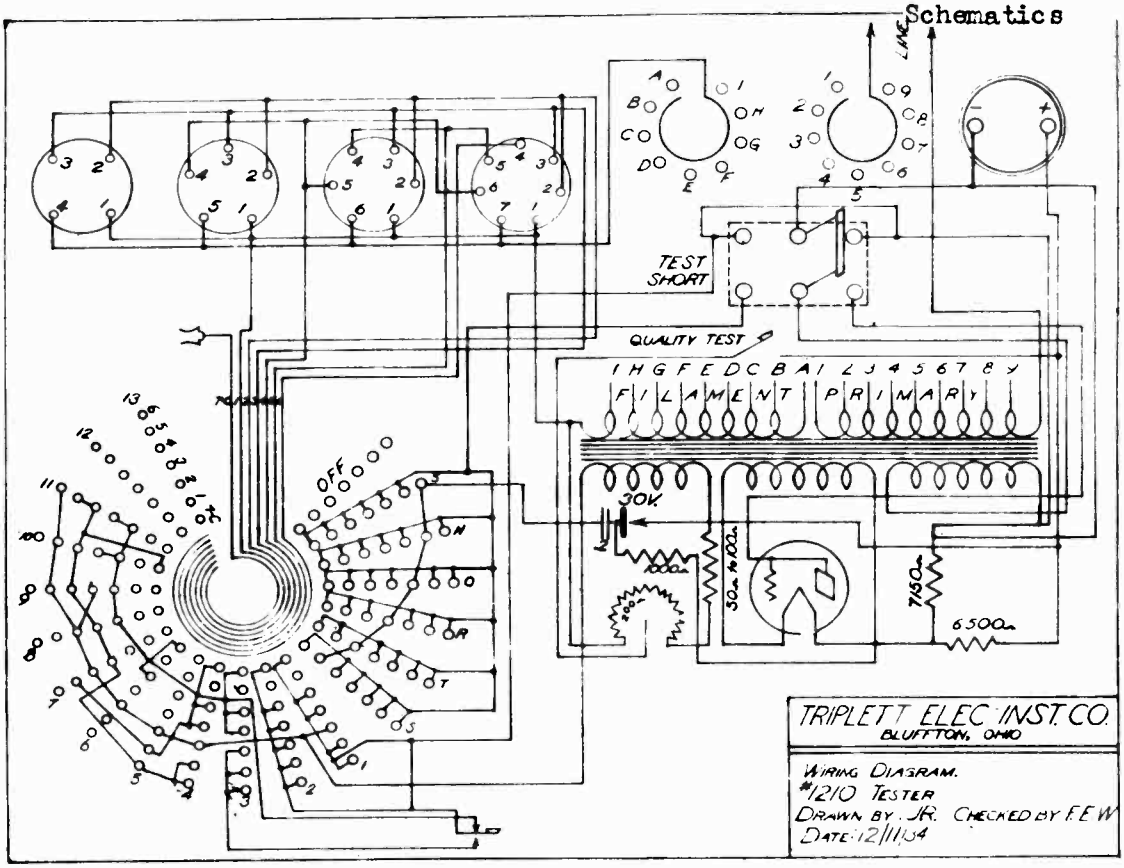
Model M16

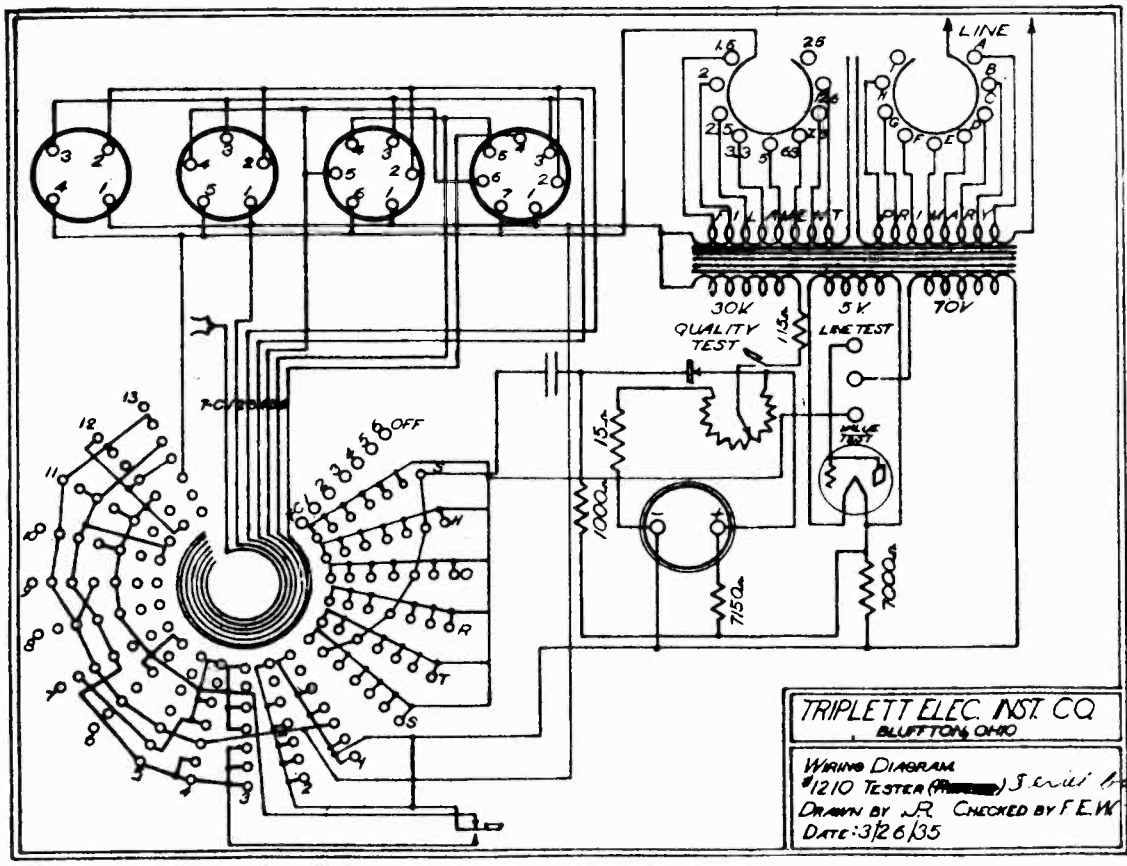


The Turner Company
700 Third Avenue S. E.
CEDAR RAPIDS, IOWA

TRIPLETT ELECTRICAL INSTRUMENT

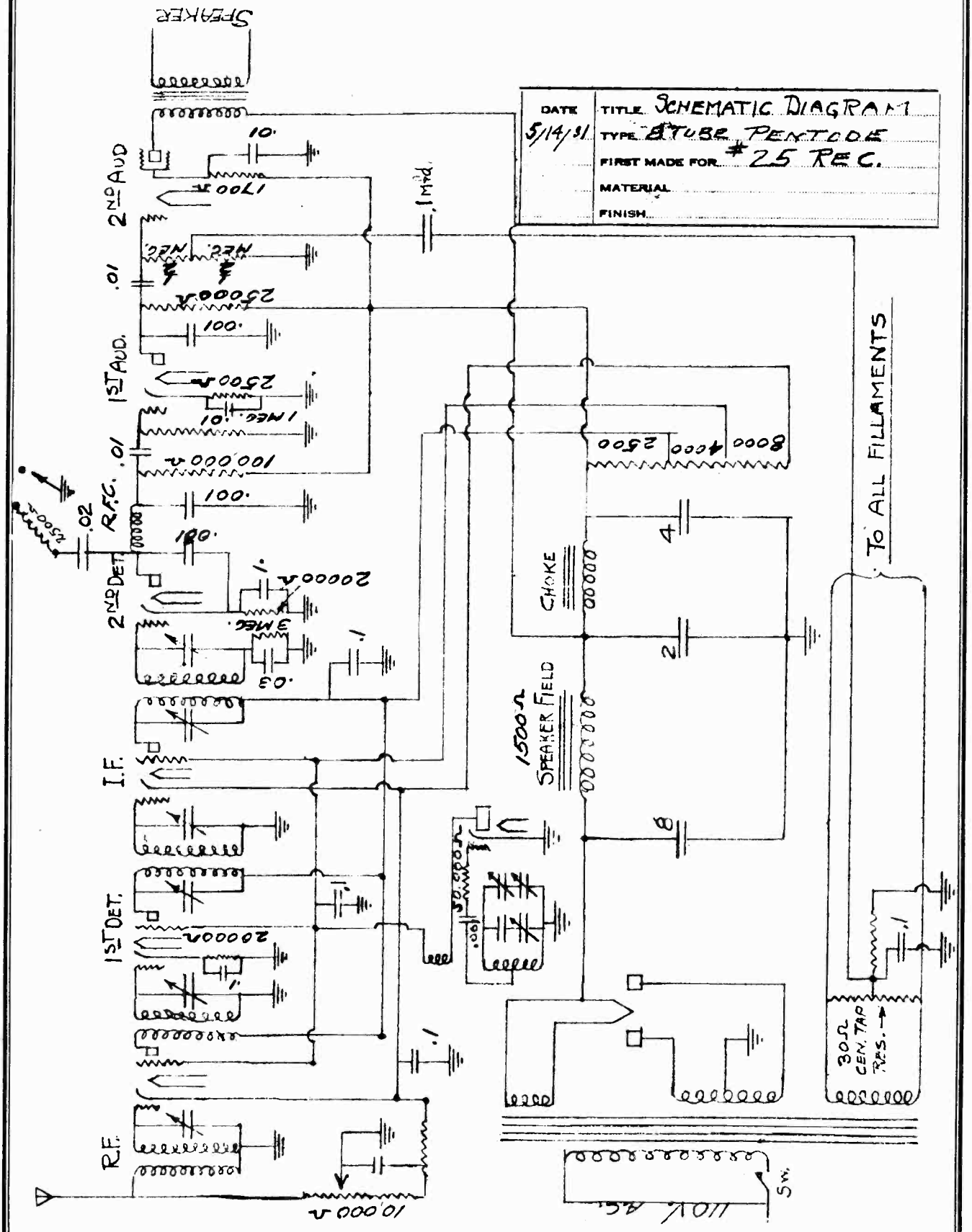
MODEL 1210 Tester
2 Types, Above and Below Serial 100,000
Schematics





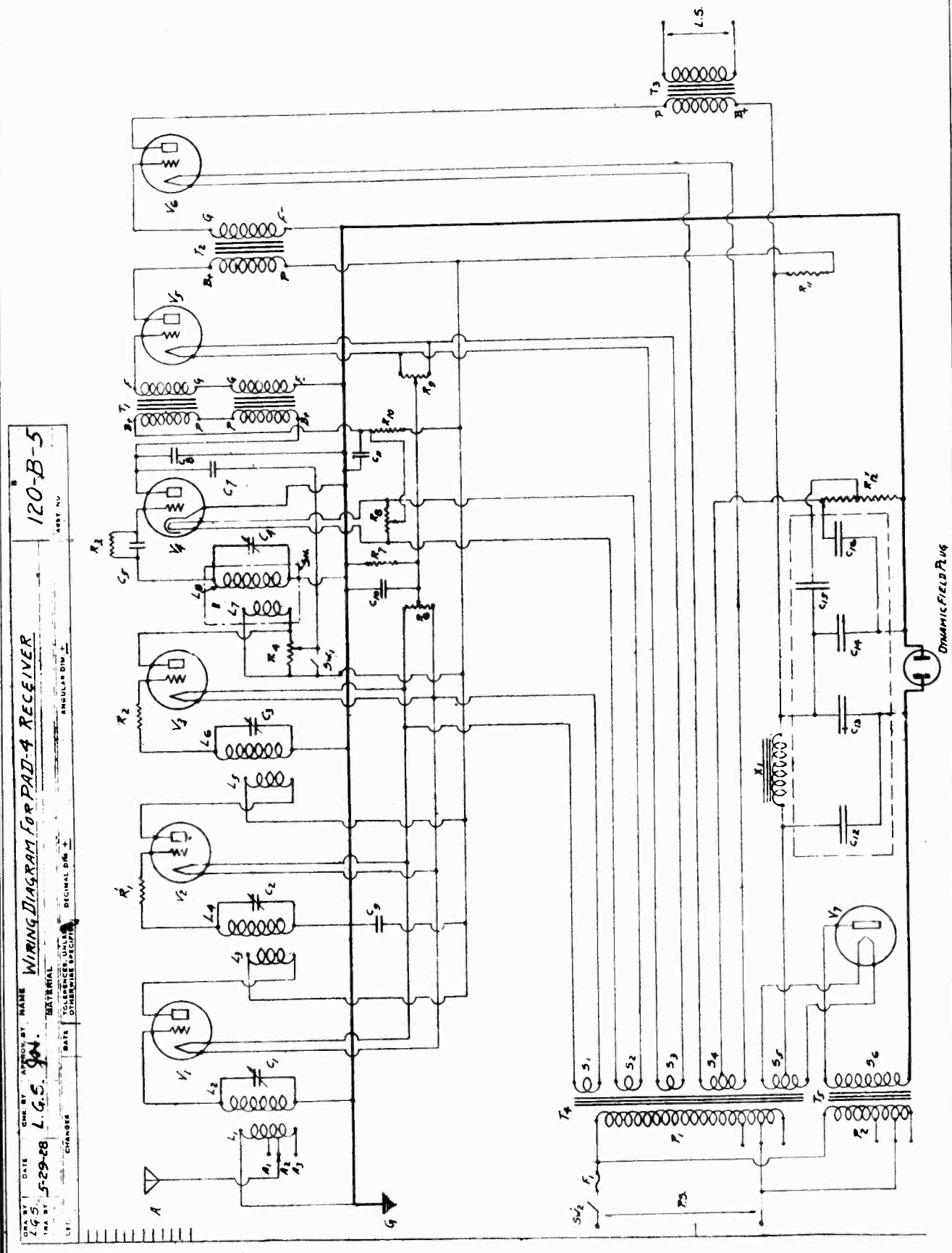
MODEL 8-Tube Pentode
Schematic

STEINITE RADIO CO.



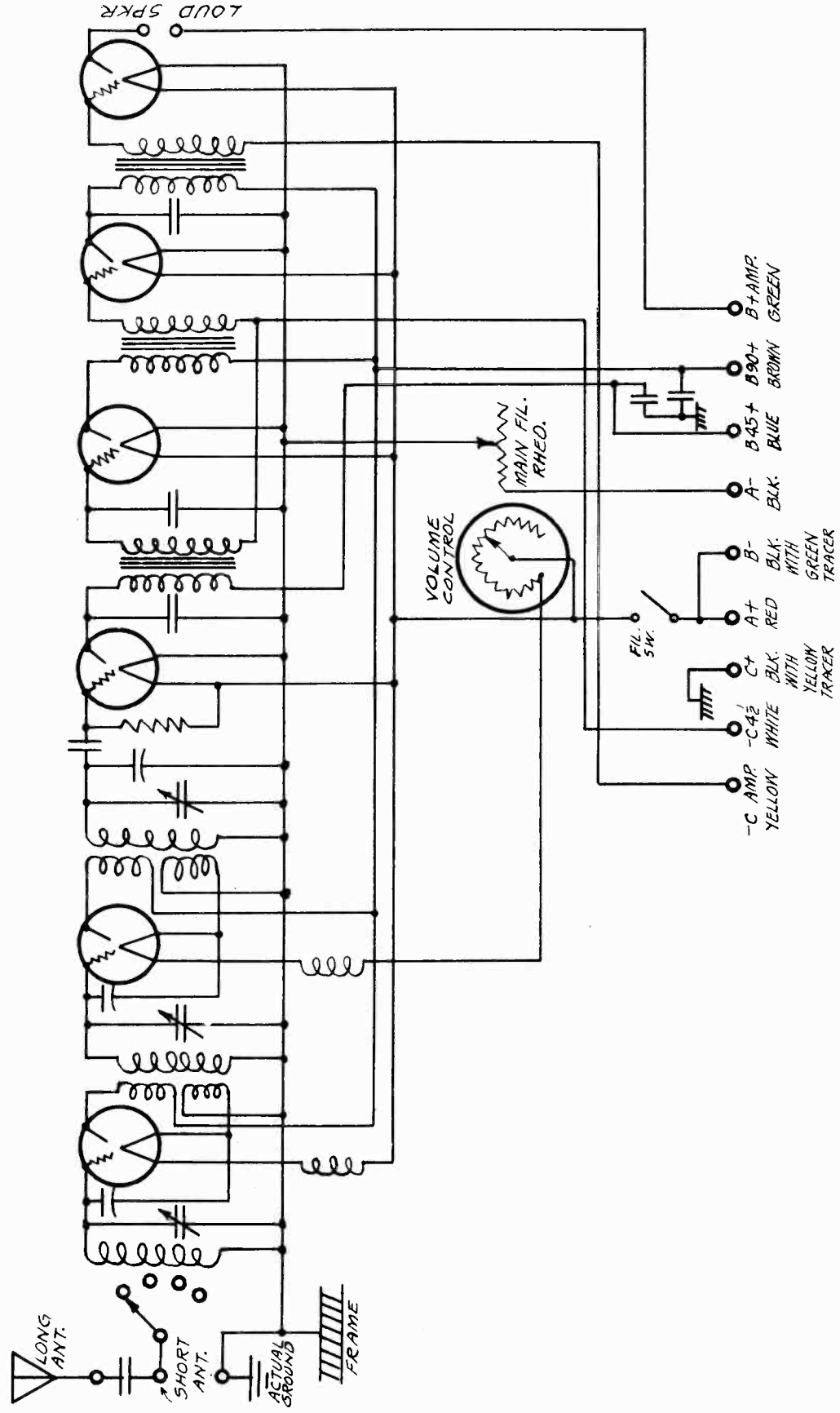
MODEL PAD-4
Schematic

SPLITDORF RADIO CORP.



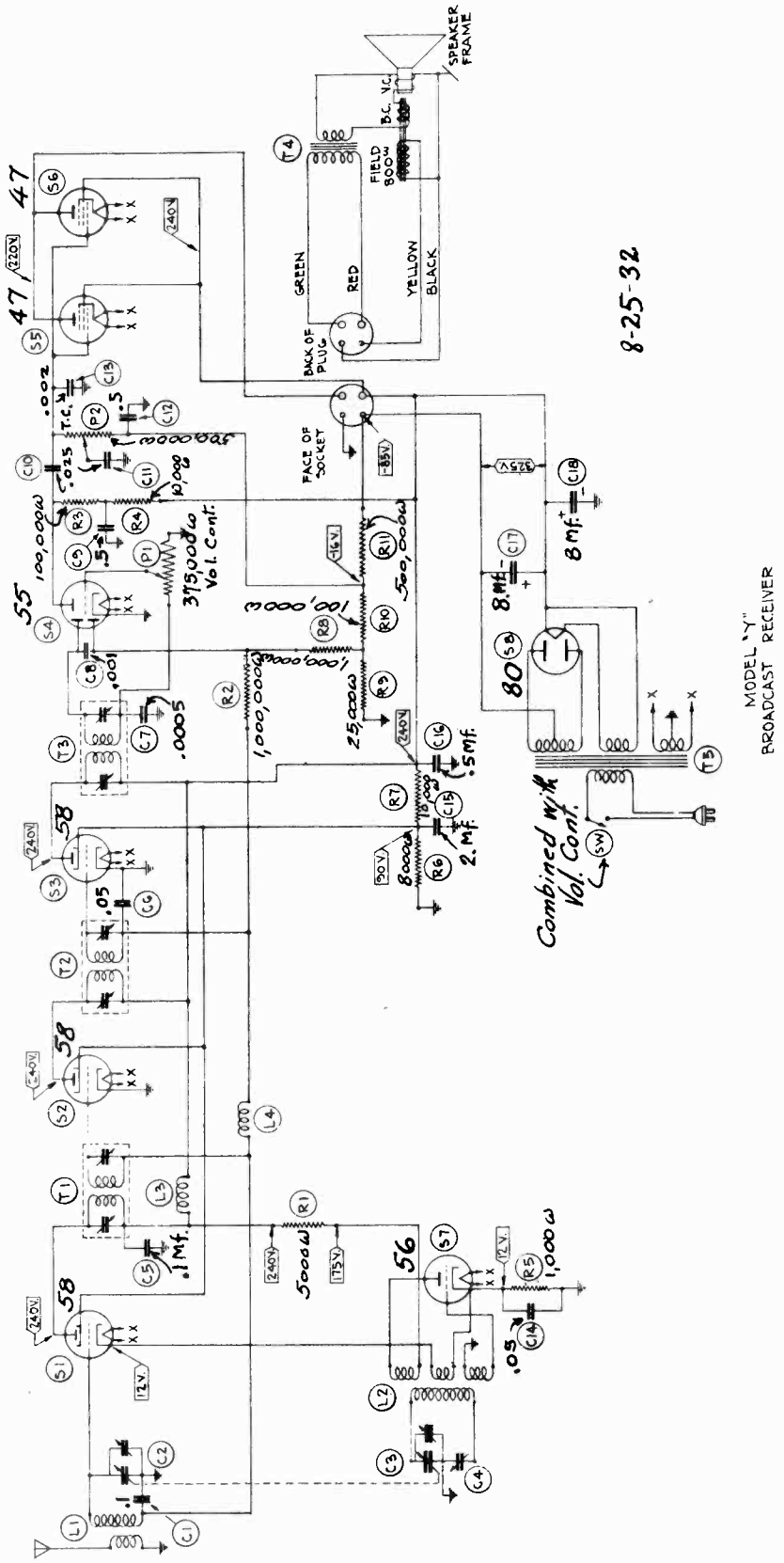
MODEL D
Schematic

SONORA PHONOGRAPH CO. Inc.



MODEL Y
Schematic

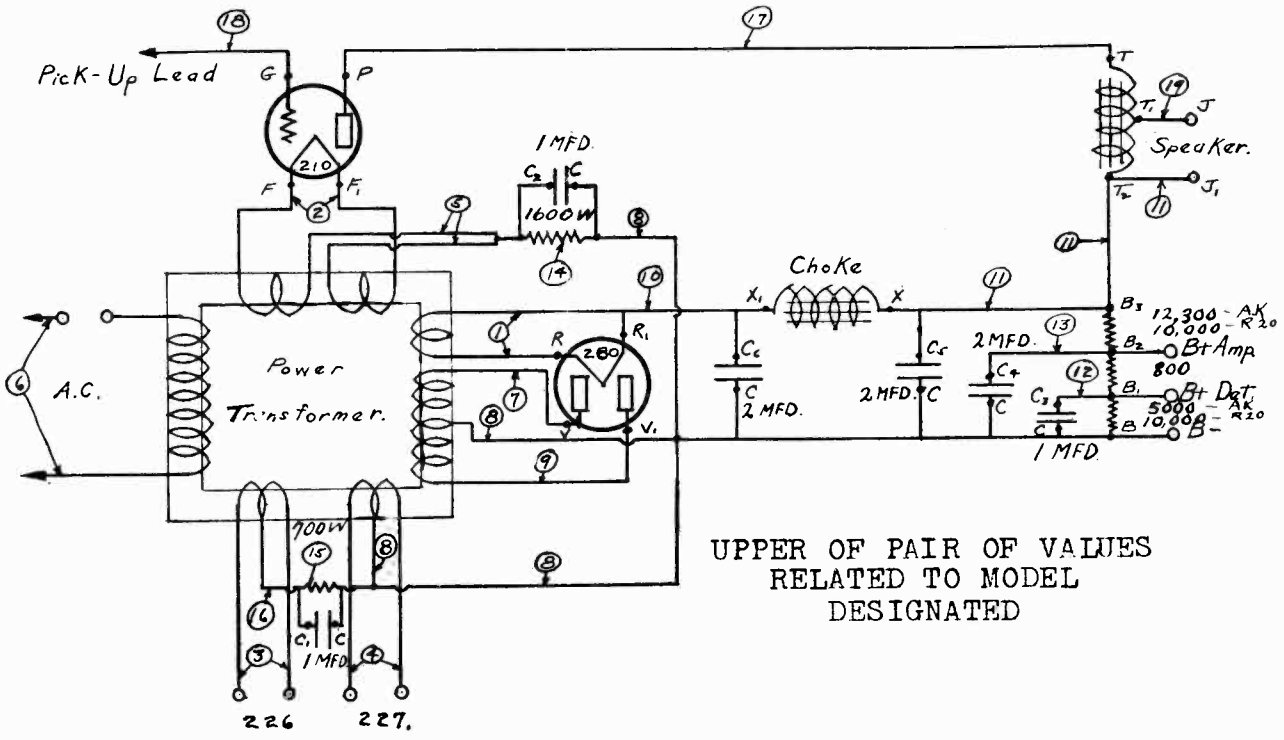
SILVER - MARSHALL, Inc.



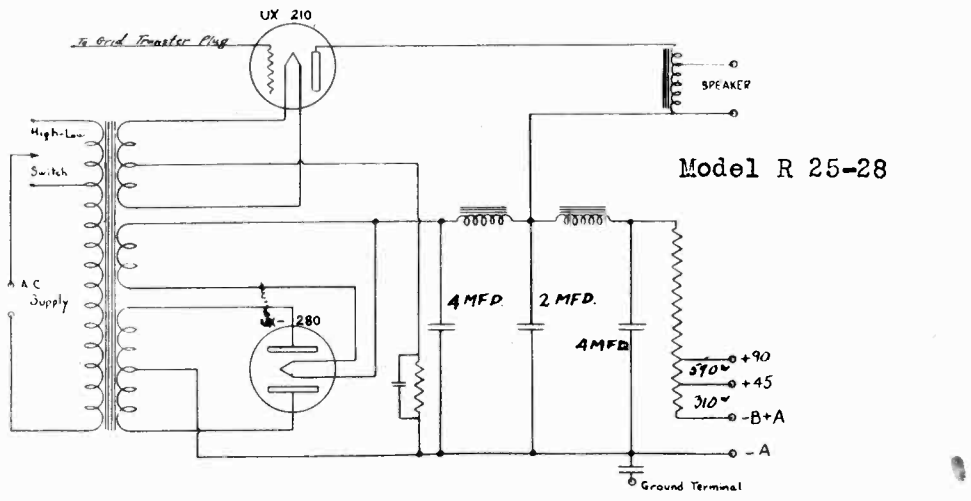
MODELS AK, R-20
MODELS R 25-28
Schematics

RADIO RECEPTOR CO.

SCHEMATIC DIAGRAM OF POWERIZER



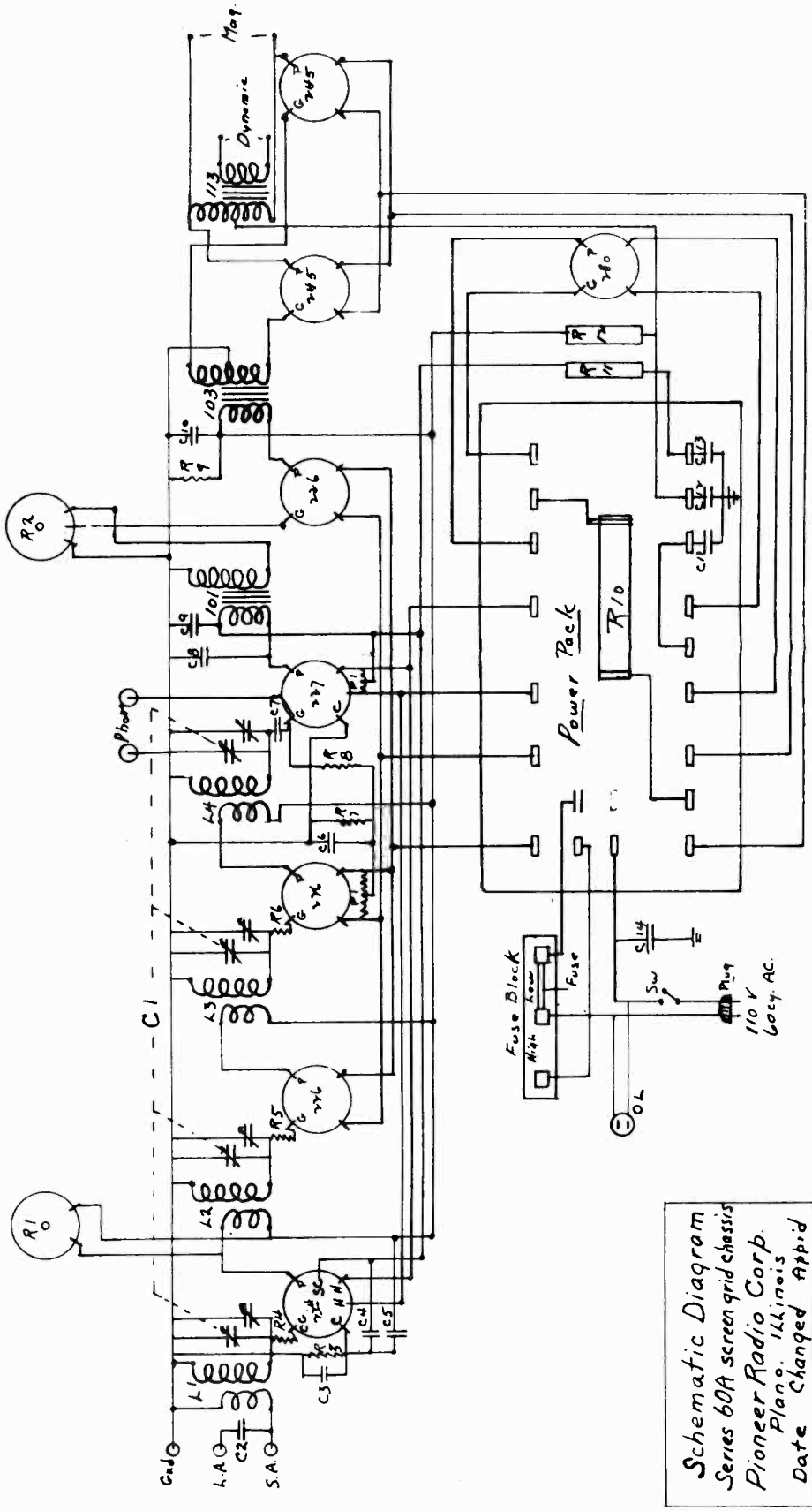
UPPER OF PAIR OF VALUES
RELATED TO MODEL
DESIGNATED



Model R 25-28

MODEL 60-A Series
Schematic

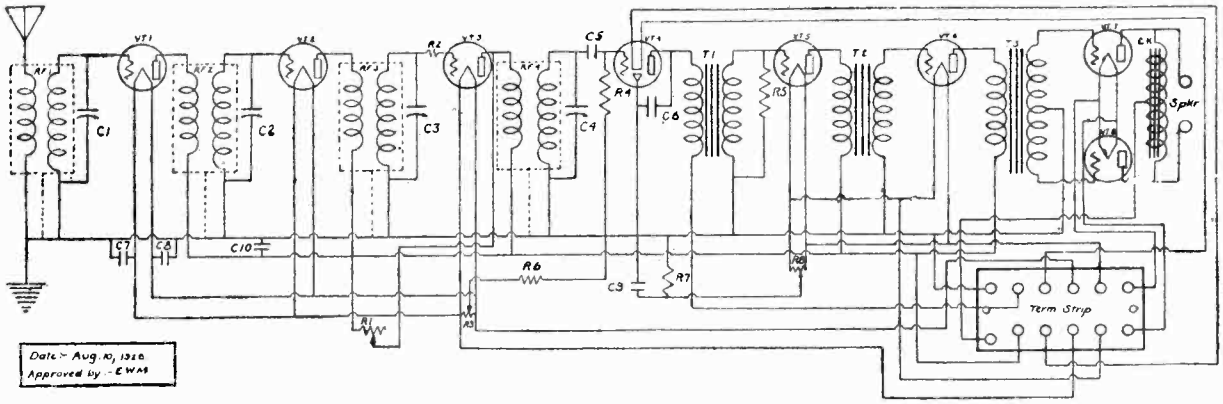
PIONEER RADIO CORPORATION



Schematic Diagram
Series 60A screen grid chassis
Pioneer Radio Corp.
Plano, Illinois
Date Changed 8/pd
7-1-29

MODEL 8 AC
Schematic, Parts

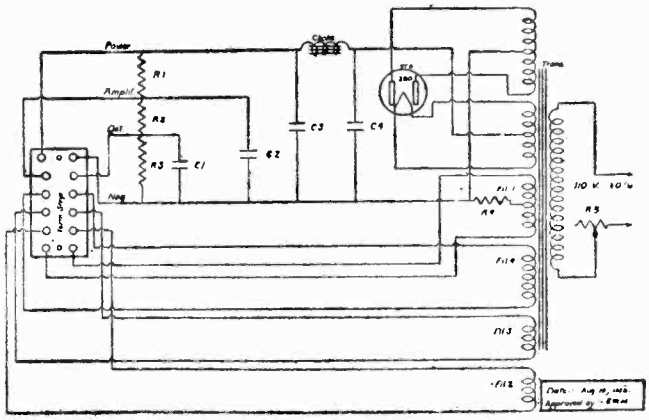
PACKARD RADIO CO.



C1, C2, C3, C4 —Variable tuning condensers.
RF1, RF2, RF3, RF4—Radio frequency shielded coils (dotted lines indicate shields).
VT1, VT2, VT3 —Radio frequency amp. tubes of '26 type.
VT4 —Detector tube of 5-prong '27 type.
VT5, VT6 —Audio frequency amp. tubes of '26 type.
VT7, VT8 —Power tubes of '71A type.
T1, T2 —Audio transformers.
T3 —Push-pull input transformer.
Ck —Push-pull output choke.
C5 —Grid condenser.
C6 —R. F. by-pass condenser.
C7, C8 —By-pass condenser.
C9 —By-pass condenser.
C10 —By-pass condenser.
R1 —Volume control.
R2 —Grid suppressor.
R3 —Center tapped fixed resistor.
R4 —Grid leak.
R5 —Resistor.
R6 —Biasing resistor.
R7 —Biasing resistor.
R8 —Center tapped variable resistor.
Spkr. —Jacks for speaker cord tips.
Term. Strip—Terminal strip on cord attached to set by which Pack is connected.

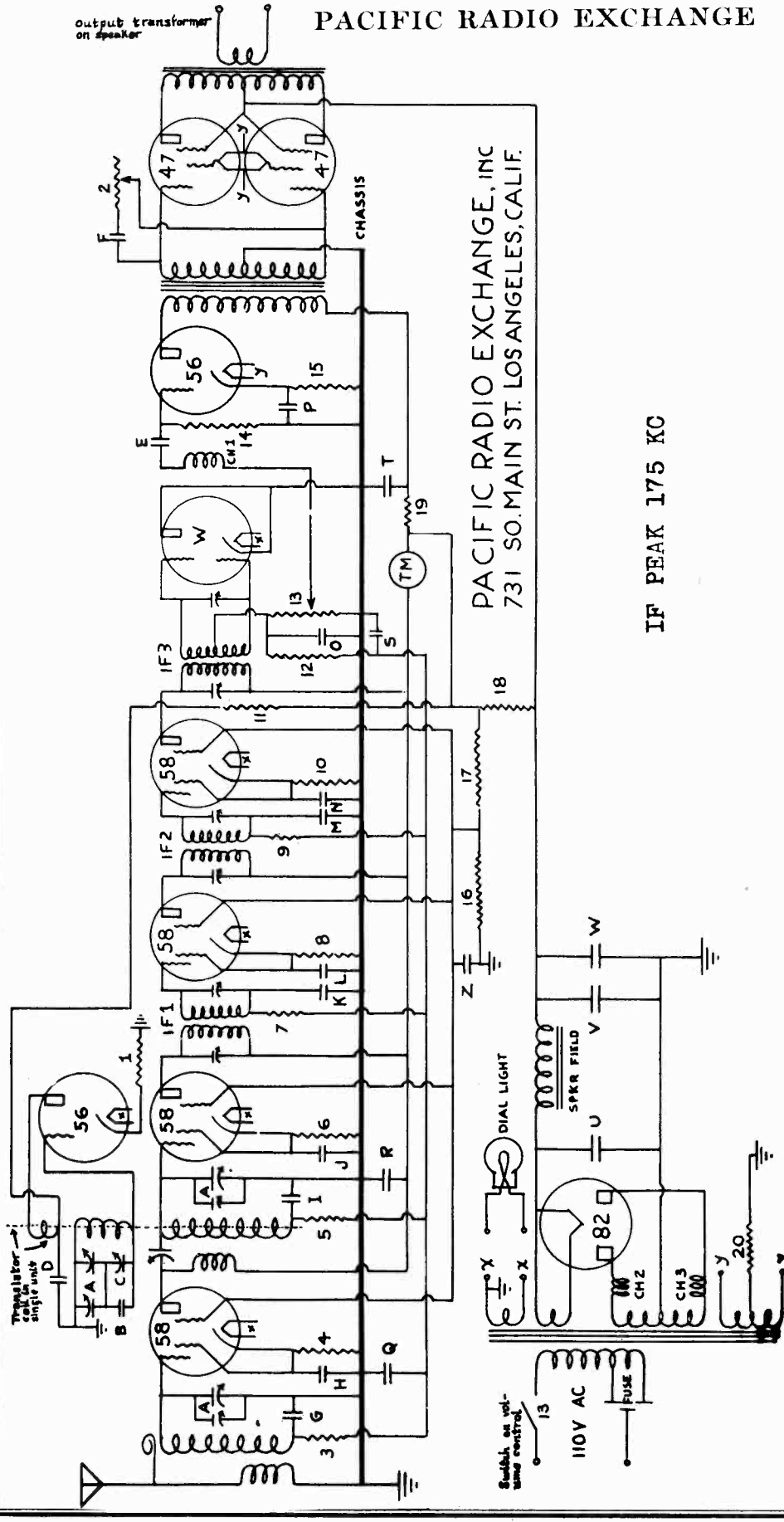
Circuit Diagram of Power Pack

Choke —Filter choke.
Trans. —Power transformer.
VT9 —Full-wave rectifier tube of '80 type.
C1, C2 —Filter condenser.
C3 —Filter condensers.
C4 —Filter condensers.
R1 —Resistor.
R2 —Resistor.
R3 —Resistor.
R4 —Biasing resistor.
R5 —Variable resistor for line volt. control.
Power —Plate voltage for power tubes.
Amplif. —Plate voltage for audio frequency and radio frequency amp. tubes.
Det. —Plate voltage for detector tube.
Neg. —Negative or ground potential terminal of Pack.
Term. Strip—Terminal strip where Pack is connected to set.
Fil. 1 —Filament supply for '71 tubes.
Fil. 2 —Filament supply for audio amp. tubes.
Fil. 3 —Filament supply for radio amp. tubes.
Fil. 4 —Filament supply for detector tube.



PACIFIC RADIO EXCHANGE

MODEL Spero Super
Schematic



1 Chassis
1 Power transformer
113 gang condenser .00035
1 Tuning dial with light
3 Knobs
1 Antenna and ground binding post
1 Fuse clip
1 T. M. (Tuning Meter)
1 Antenna coil
1 Translator coil
1 #212 input intermediate trans. #1
1 #212 Litz " " #2
1 #212 W center tapped " " #3
3 R. F. Choke coils
1 Audio transformer push-pull input

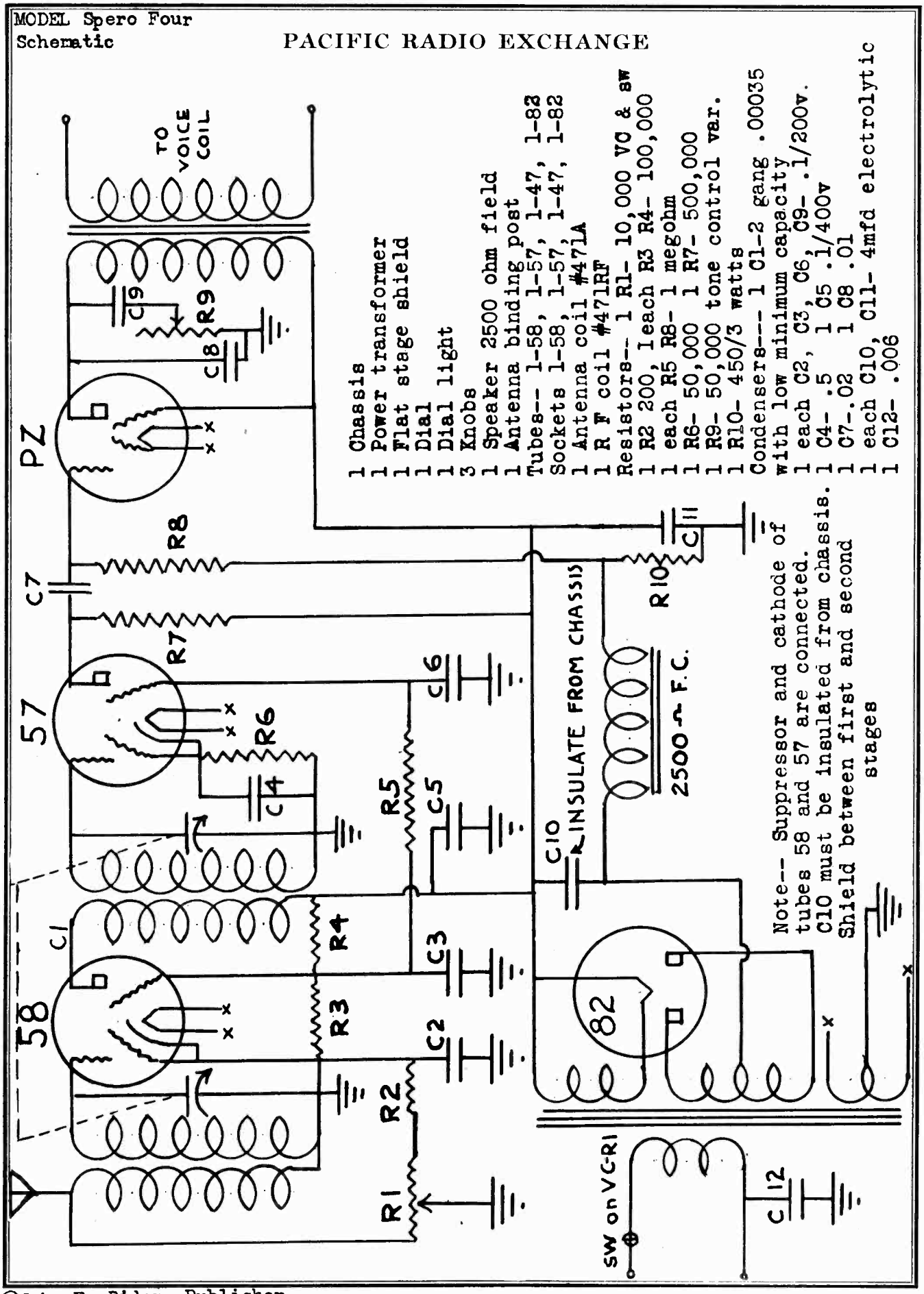
6 Tube Shields
4 #58 tubes
2 #56 tubes
2 #47 tubes
1 Sunderlich detector tube
1 #82 Mercury vapor rectifier
Sockets for same
1 Socket for speaker output cable
1 Plug for speaker output cable
1 Length of speaker cable
Resistors
1--1000, 2--200,000 variable TC
3, 5, 7, 9, 11 and 17--10,000 ohms
4--300, 6 and 19--5000 ohms
8 and 10--300 ohms, 15--2500 ohms

12 and 14--2 megohms
13--500,000 var. VC & SW
16--15,000, 18--500/3 watts
20--225/3 watts
RF Chokes 1, 2 and 3--1000

Condensers
4--3 gang, .00035 low min.
B--.001, C--.00014, D and E--.01
F--.006
G, H, I, J, K, L, M and N--.1
O--.001, P, Q, R and T--.5
S--.02, U and V--8 mfd. W--4 mfd.
Z--.25

MODEL Spero Four
Schematic

PACIFIC RADIO EXCHANGE

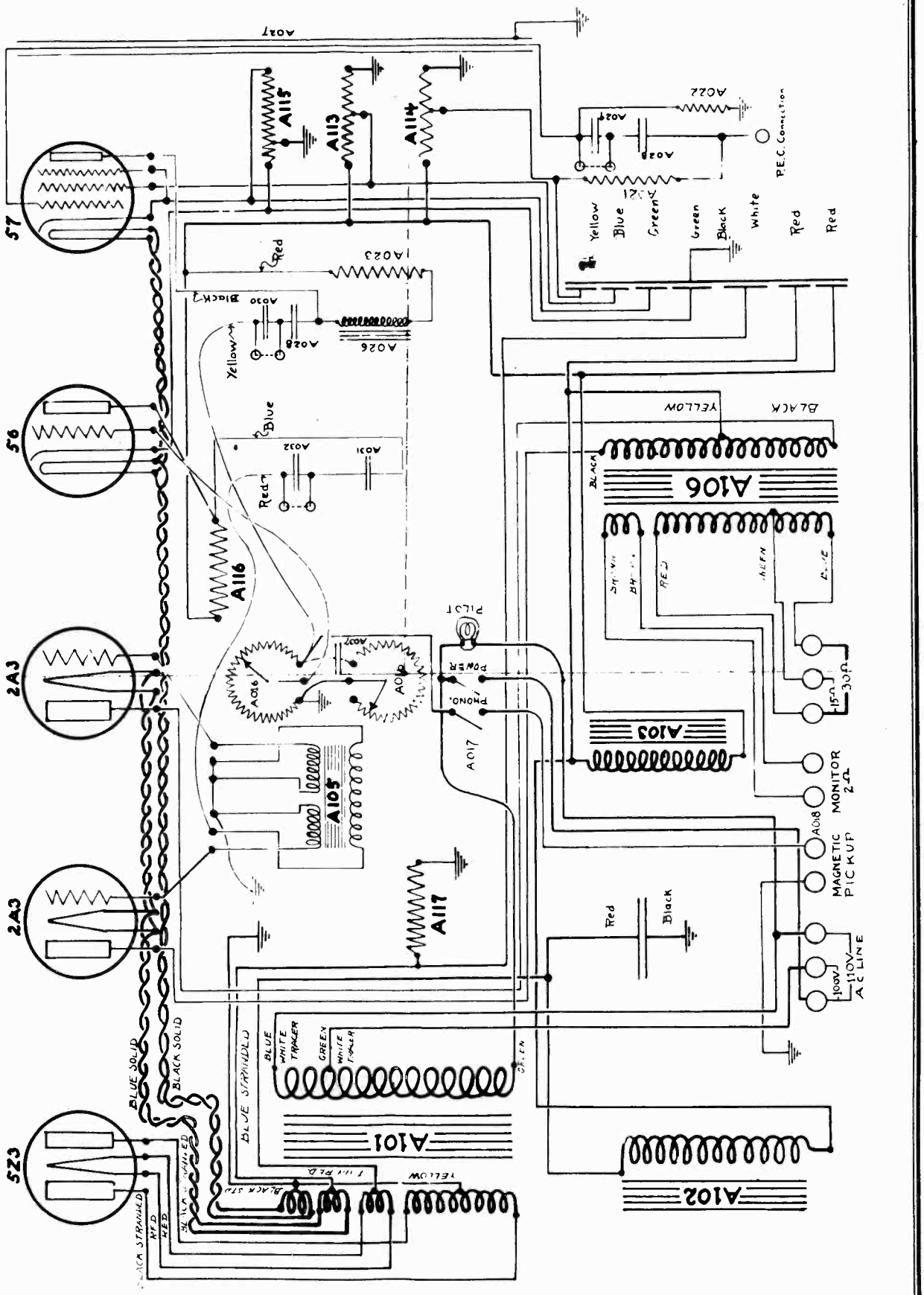


1 Chassis
1 Power transformer
1 Flat stage shield
1 Dial
1 Dial light
3 Knobs
1 Speaker 2500 ohm field
1 Antenna binding post
Tubes-- 1-58, 1-57, 1-47, 1-83
Sockets 1-58, 1-57, 1-47, 1-82
1 Antenna coil #471A
1 R F coil #471RF
Resistors-- 1 R1- 10,000 VC & sw
1 R2 200, 1each R3 R4- 100,000
1 each R5 R8- 1 megohm
1 R6- 50,000 1 R7- 500,000
1 R9- 50,000 tone control var.
1 R10- 450/3 watts
Condensers--- 1 C1-2 gang .00035
with low minimum capacity
1 each C2, C3, C6, C9- .1/200v.
1 C4- .5 1 C5 .1/400v
1 C7-.02 1 C8 .01
1 each C10, C11- 4mfd electrolytic
1 C12- .006

Note-- Suppressor and cathode of tubes 58 and 57 are connected. C10 must be insulated from chassis. Shield between first and second stages

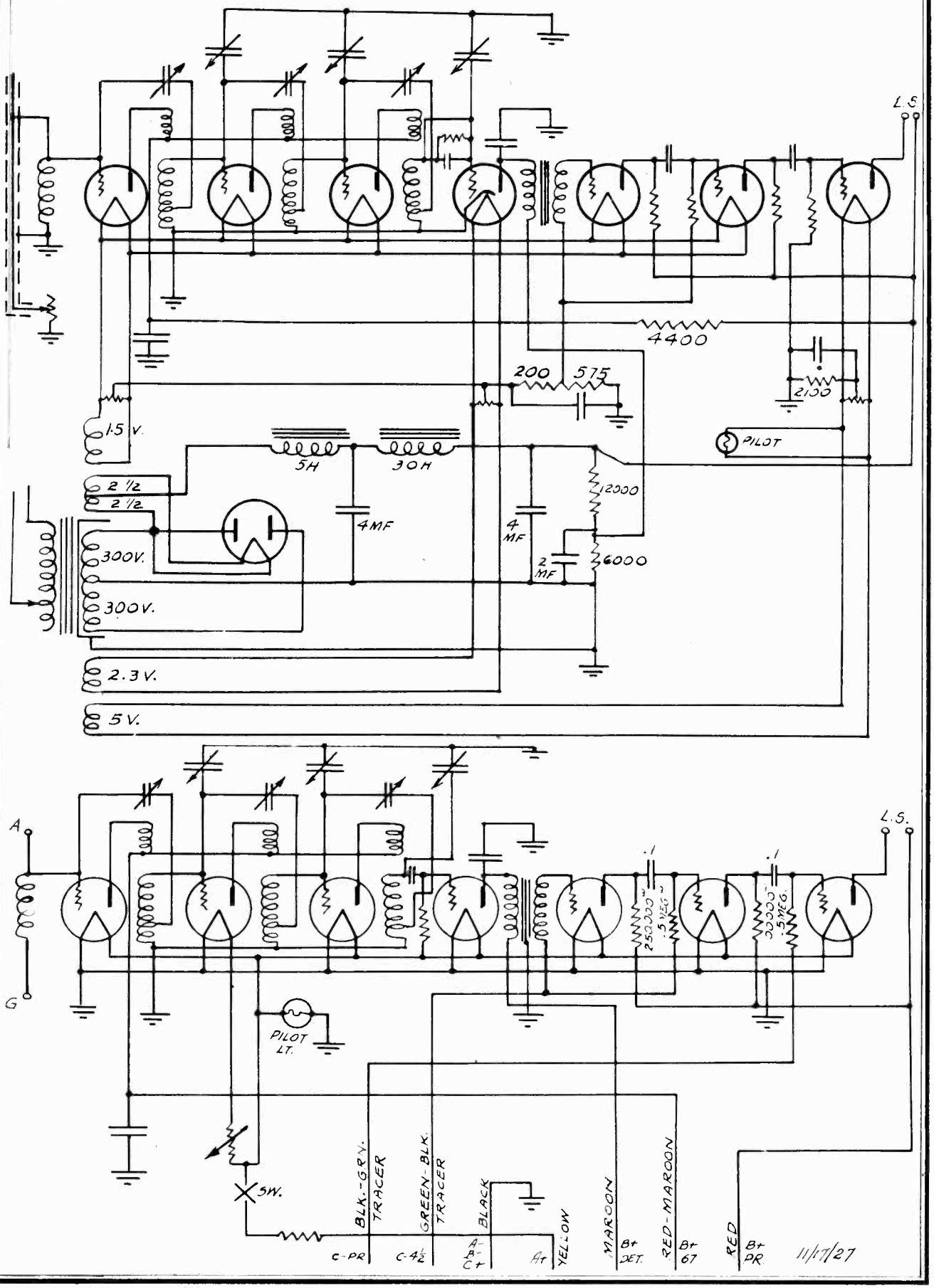
PACENT ELECTRIC CO., INC.

MODEL HFA 112 Amplifier
Schematic



MODEL 8-Tube AC
MODEL 7-Tube Battery
Schematics

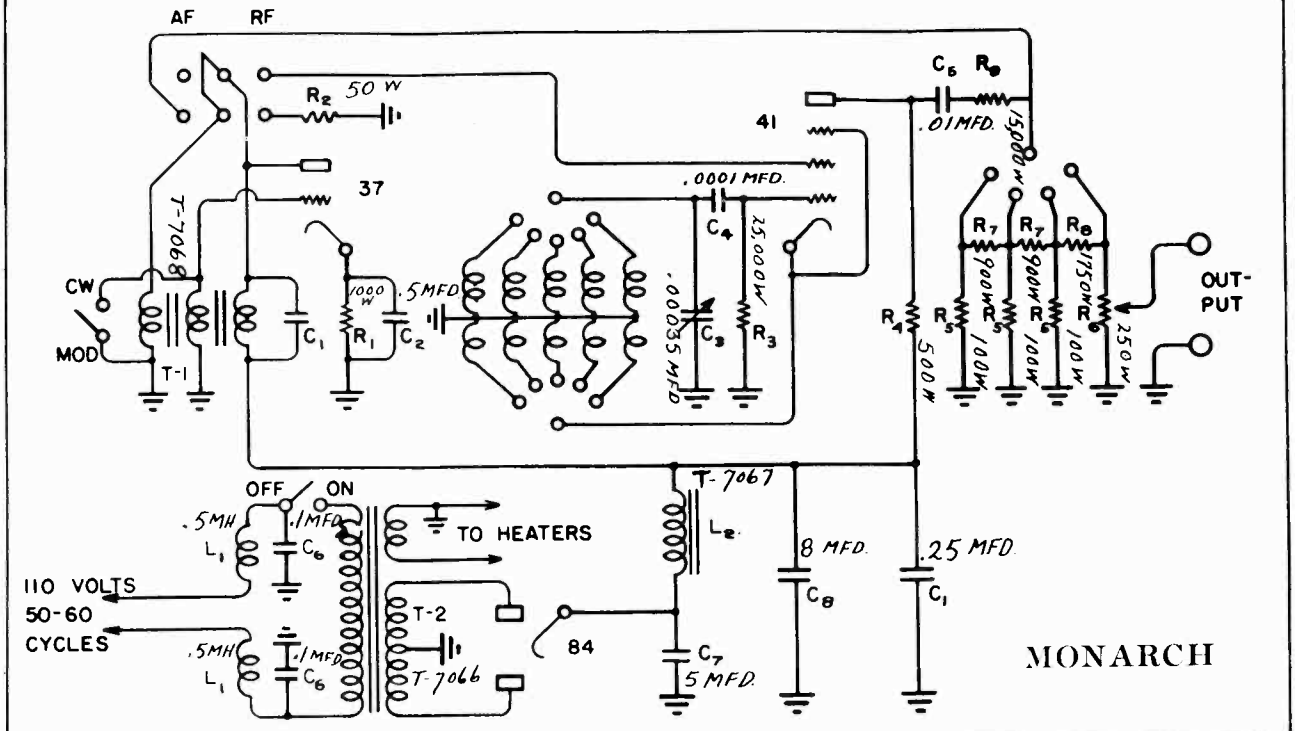
WILLIAM J. MURDOCK CO.



MONARCH MFG. CO.
ELECTRONIC LABS.

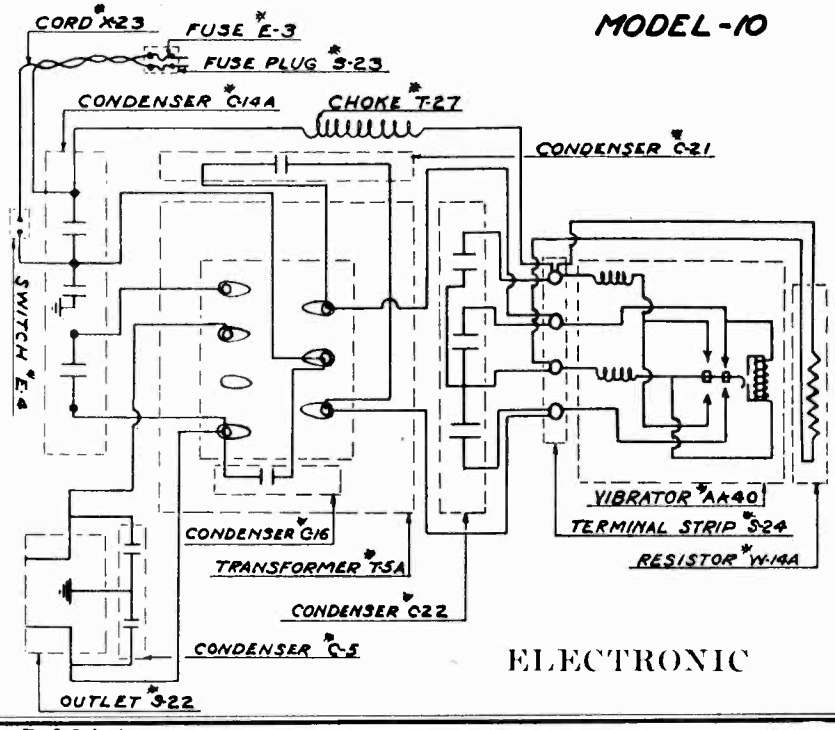
MODEL A-W. Signal Generator
MODEL 10, 32-Volt Converter
Schematics

ALL-WAVE STANDARD SIGNAL GENERATOR



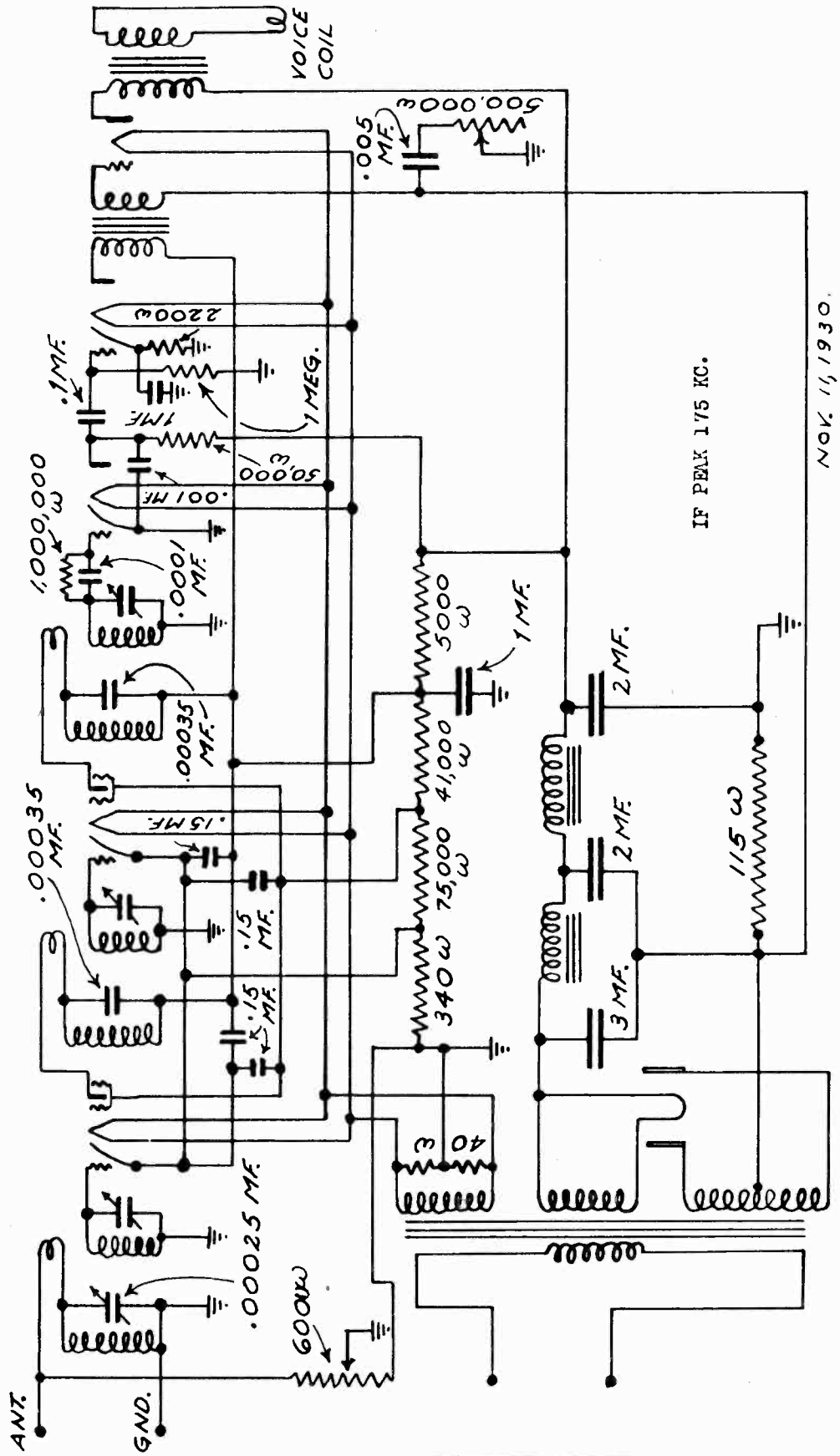
SCHEMATIC DIAGRAM

MODEL 10 32 VOLT CONVERTER



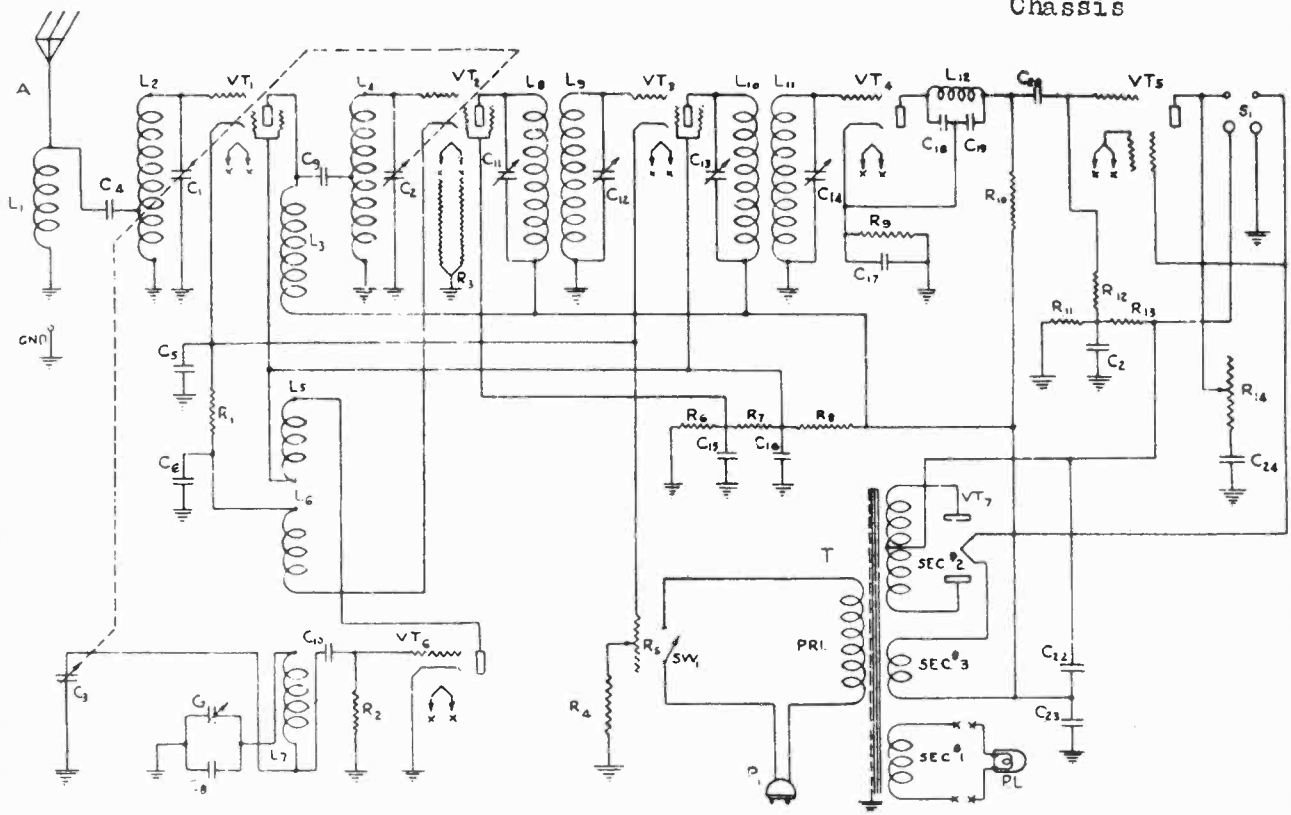
MODEL 84
Schematic

LARKIN CO., INC.

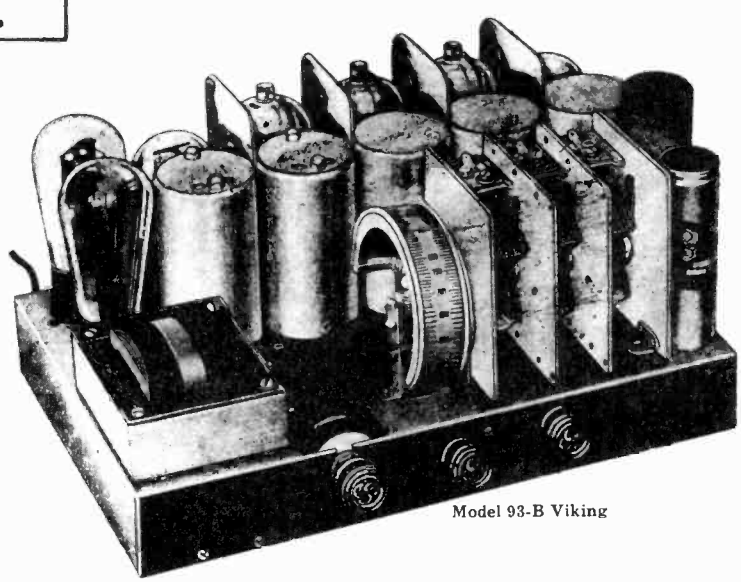


KROHLER MFG. CO.

MODEL 93-B Viking
Schematic, Voltage
Chassis



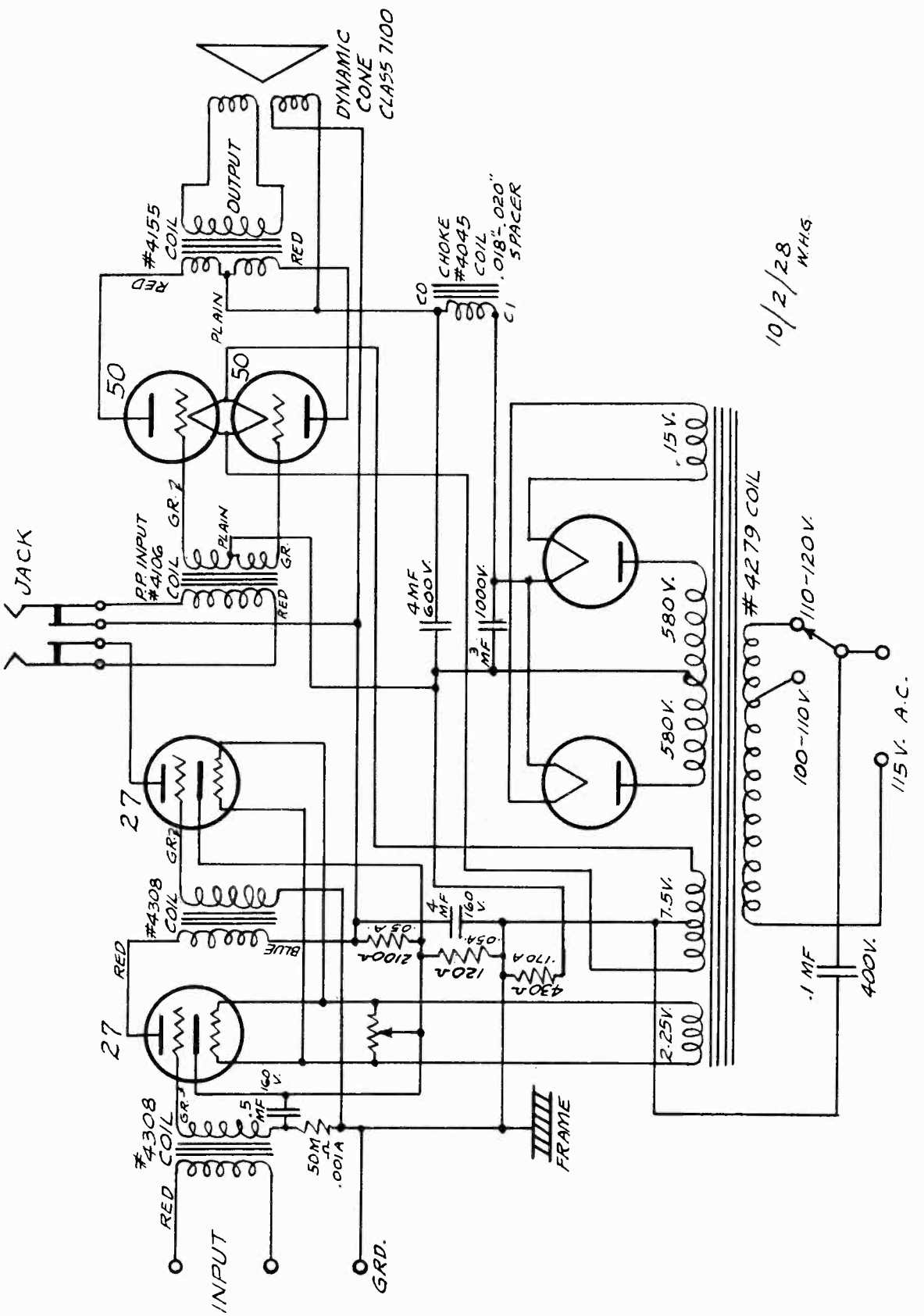
MODEL 93-B				
Tube	Type	Plate	S.Grid	Cath.
Osc.	'27	80	--	--
R.F.	'36	190	85	1.5
Det.	'35	190	45	2.
I.F.	'35	190	85	1.5
Det.	'27	125	--	12.
Pwr.	'47	175	190	
Rect.	'80			
Vol.-Max.		Volts To Ground.		



Model 93-B Viking

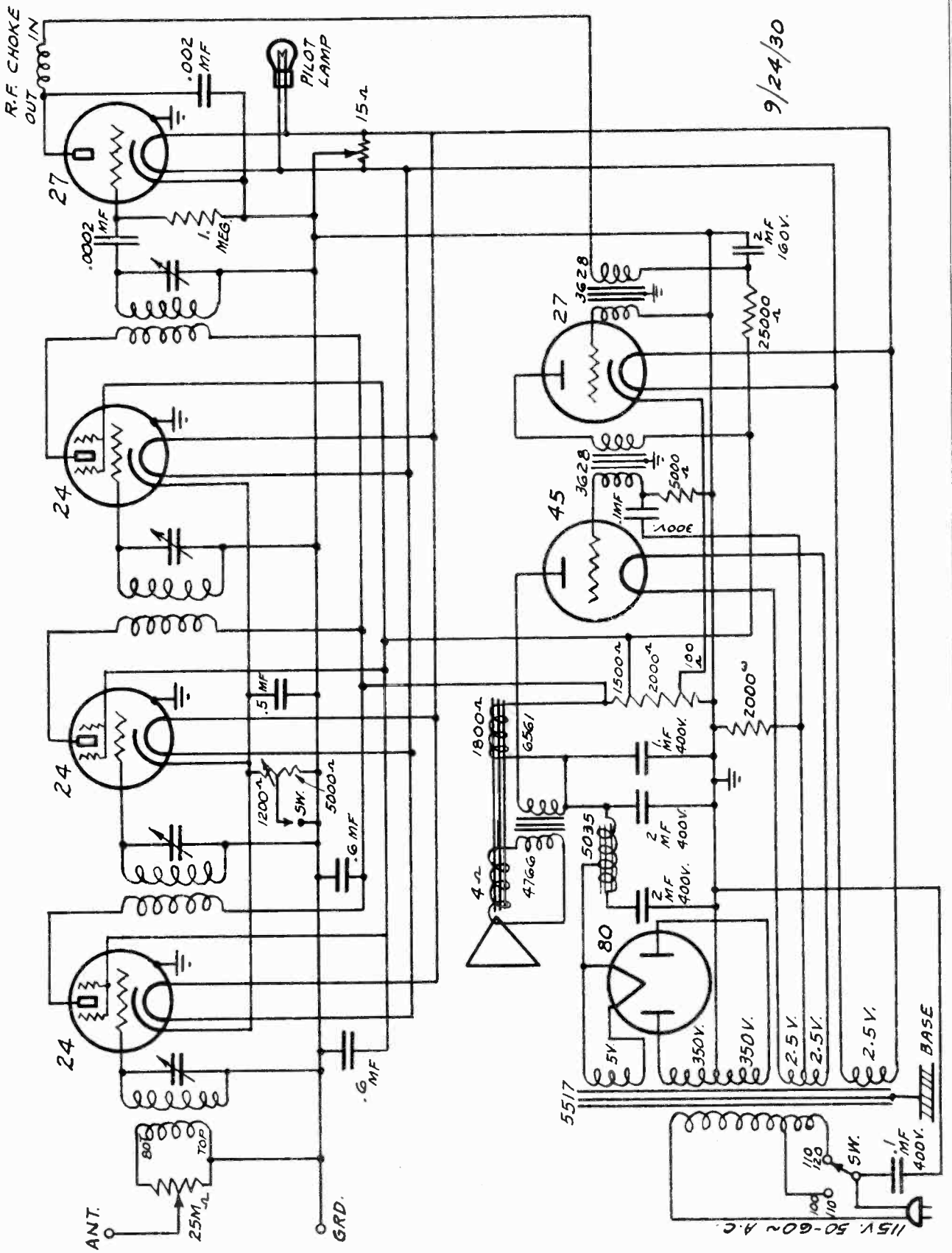
MODEL Power Amplifier
Schematic

KOLSTER RADIO CORP.



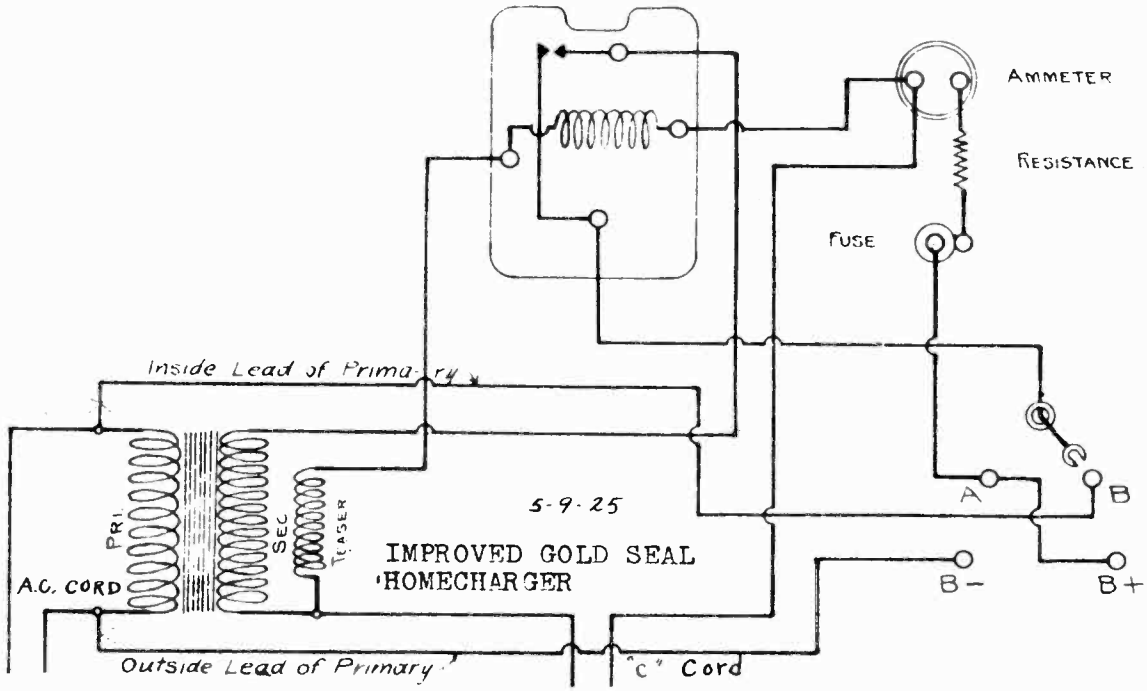
MODEL K-48
Schematic

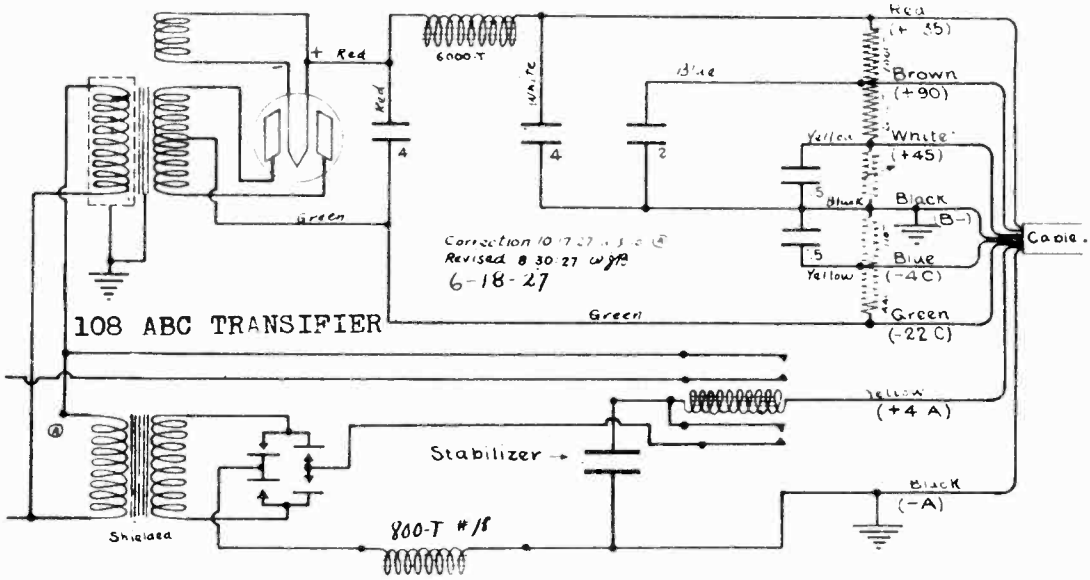
KOLSTER RADIO CORP.

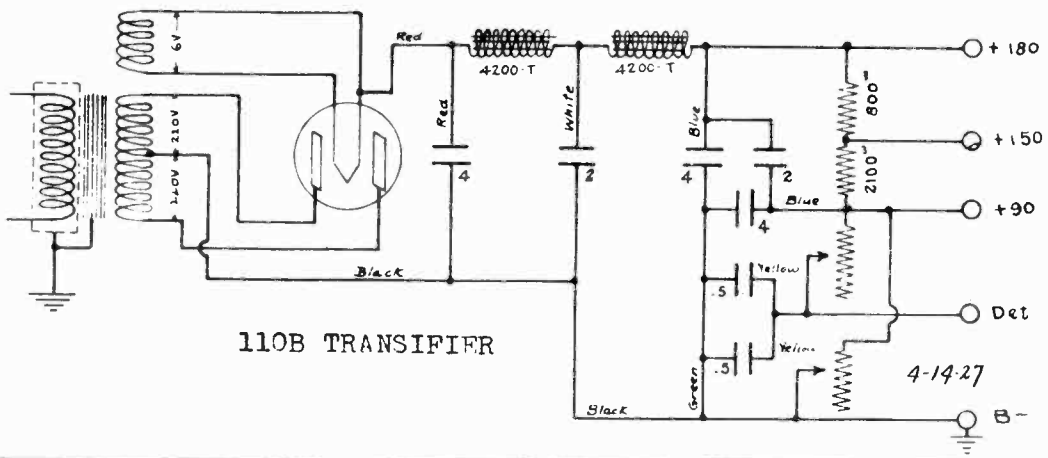


MODEL Improved Gold Seal
MODEL 108 ABC Transifier
MODEL 110B Transifier
Schematics

KODEL RADIO CORP.

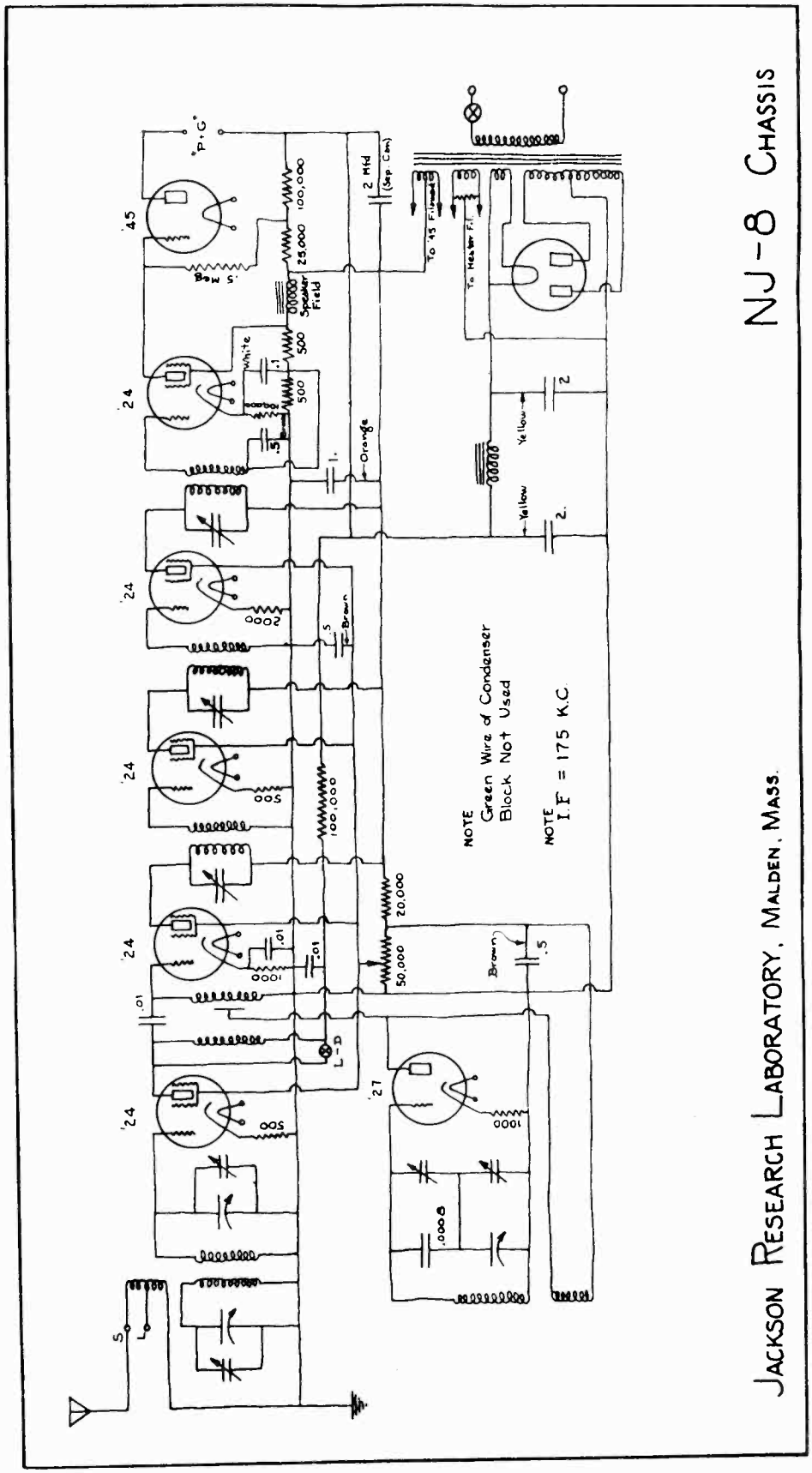






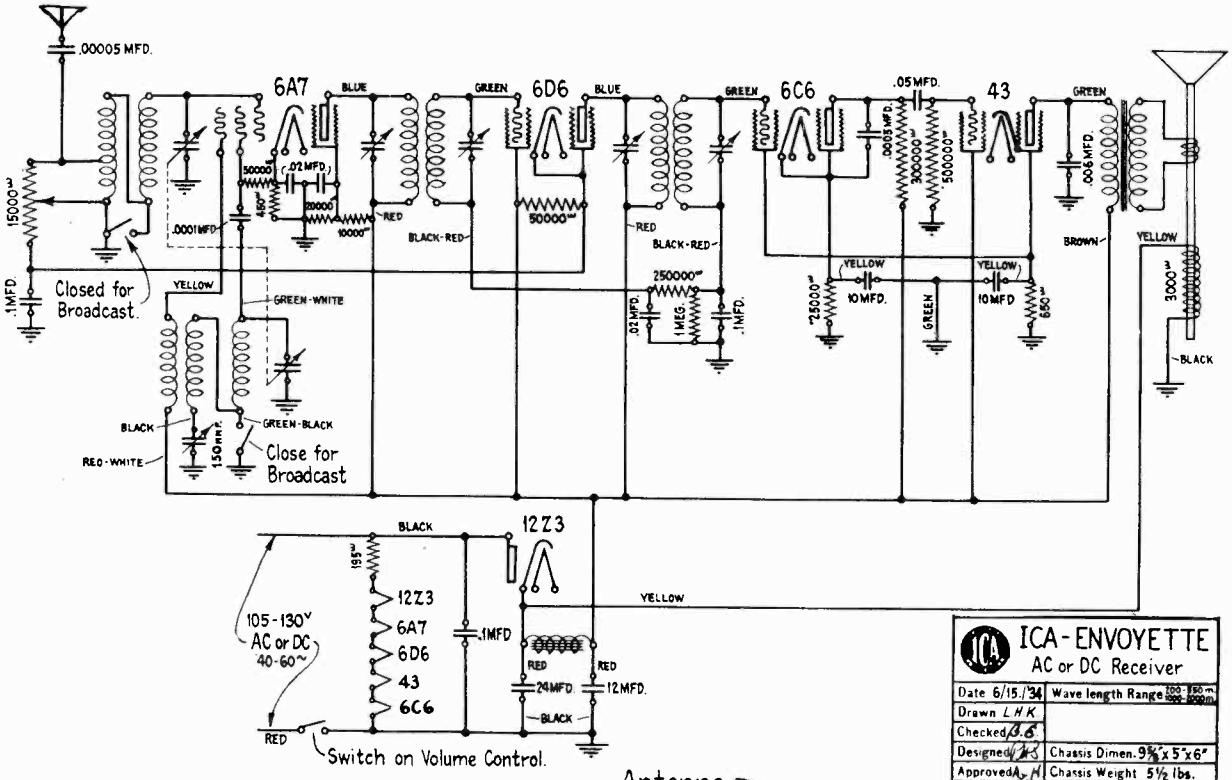
JACKSON RESEARCH LAB.

MODEL NJ-8
Schematic

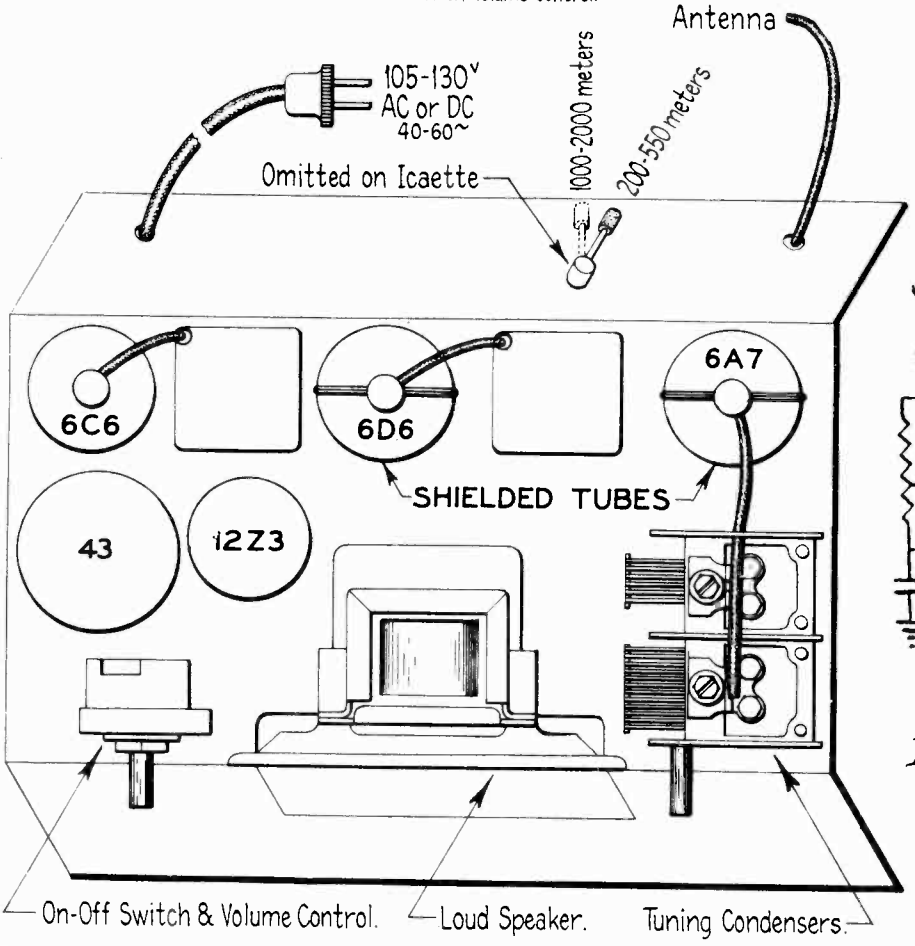


MODEL Envoyette
Schematic, Socket
MODEL ICA-ette
Schematic

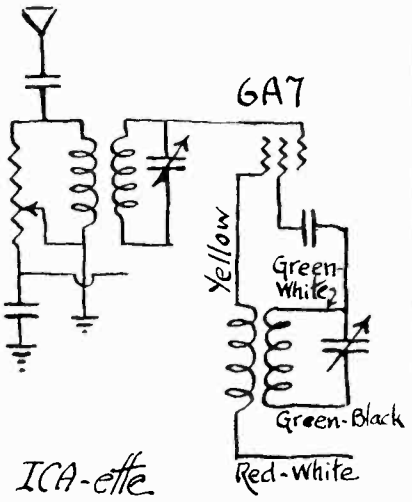
INSULINE CORP. OF AMERICA



ICA-ENVOYETTE AC or DC Receiver	
Date 6/15/'34	Wave length Range 200-550m 1000-2000m
Drawn L.H.K.	
Checked B.G.	
Designed	Chassis Dimen. 9½"x5"x6"
Approved	Chassis Weight 5½ lbs.
INSULINE CORP. OF AMERICA 23-25 Park Place, New York, N.Y., U.S.A.	

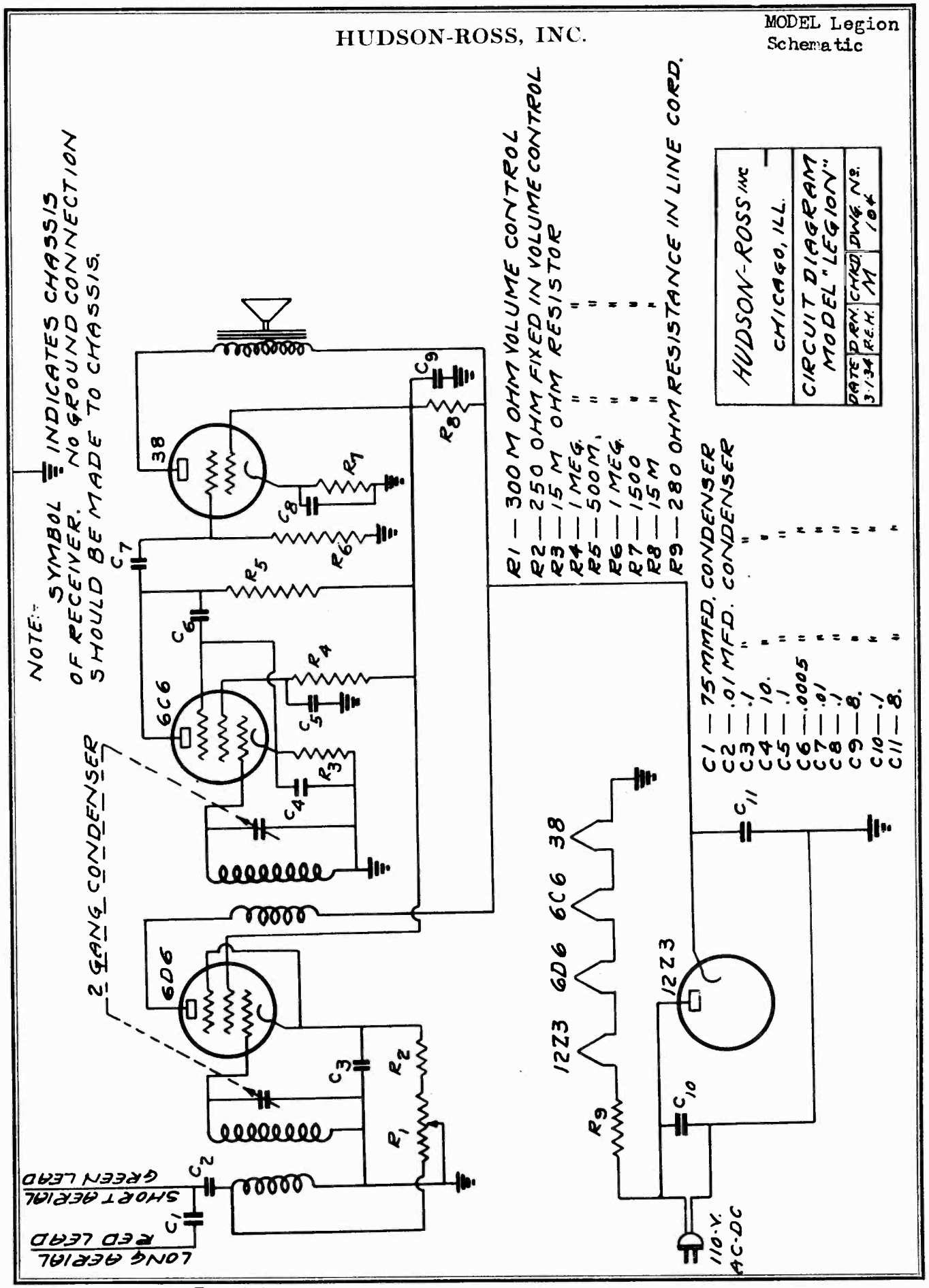


ICA-ette Broadcast Receiver same as above, with change shown below.



HUDSON-ROSS, INC.

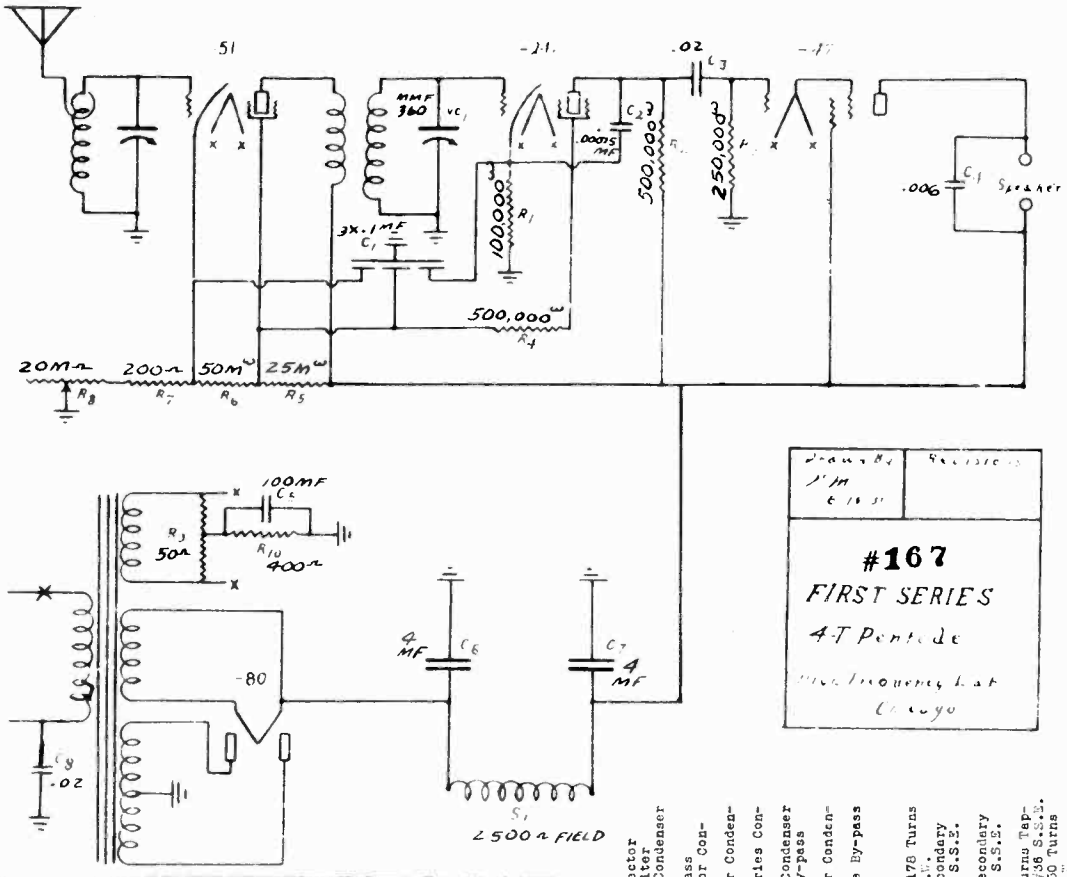
MODEL Legion
Schematic



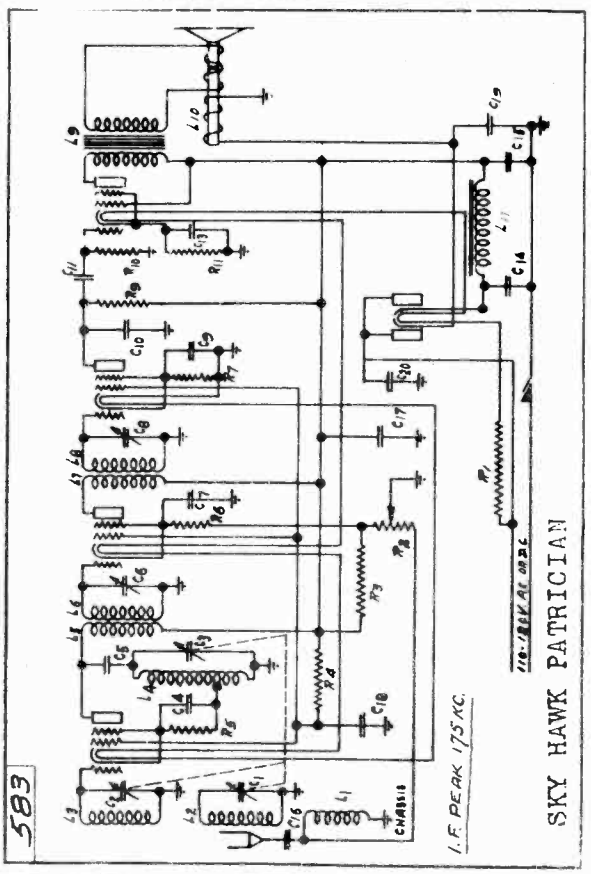
MODEL 4-Tube Pentode
Schematic
MODEL Sky Hawk Patrician
Schematic,Parts

HIGH FREQUENCY LABORATORIES

REPUBLIC INDUSTRIES



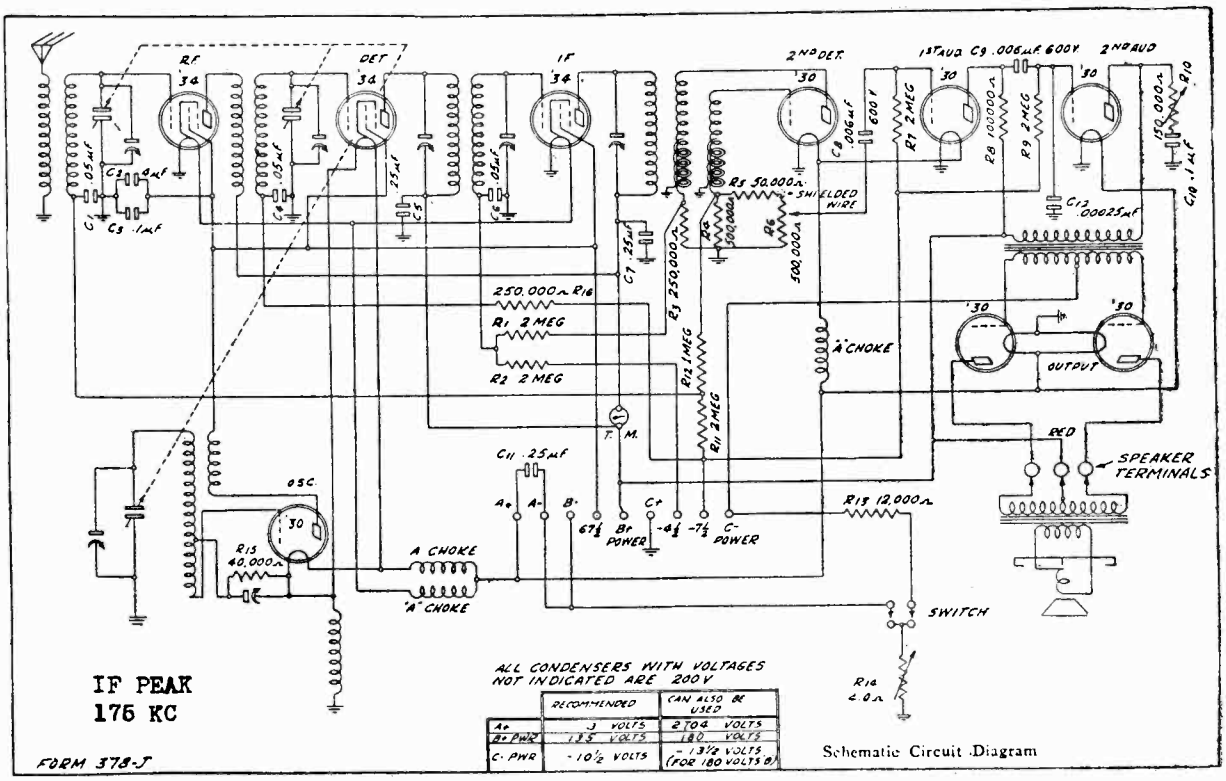
#167
FIRST SERIES
4-T Pentode



Code No.	Part No.	RESISTORS		CONDENSERS			
R1	809	170 Ohm Filament Resistor In Power Cord	C10	285	.001 MFD. Second Detector Plate R.F. Filter		
R2	853	10,000 Ohm Volume Control and Switch	C11	269	.01 MFD. Audio Feed Condenser		
R3	922	75,000 Ohm Resistor I.F. Cathode Feed	C12	928	25 MFD. C. Bias By-pass		
R4	921	40,000 Ohm Resistor Screen Feed	C13	965	12 MFD. Voltage Filter Condenser		
R5	919	5,000 Ohm Resistor First Detector & Oscillator Cathode	C14	965	4 MFD. Voltage Filter Condenser		
R6	1063	500 Ohm Resistor I.F. Cathode Feed	C15	965	4 MFD. Antenna Series Condenser		
R7	941	20,000 Ohm Resistor Second Detector Cathode	C16	265	.001 MFD. Antenna Series Condenser		
R8			C17	267	.5 B Supply By-pass Condenser		
R9	924	250,000 Ohm Resistor Second Detector Plate Load	C18	272	.1 200 Volt Screen By-pass Condenser		
R10	925	500,000 Ohm Resistor Output Grid Bias	C19	965	4 MFD. Voltage Filter Condenser		
R11	1063	500 Ohm Resistor 45 Bias	C20	272	.1 MFD. 200 Volt Line By-pass Condenser		
					INDUCTANCES		
C1	833	365 MMFD. Preselector Section of Variable Condenser	L1	847	Preselector Primary 178 Turns #36 S.S.E. U.W.		
C2	833	365 MMFD. Preselector Section of Variable Condenser	L2	847	Preselector First Secondary 128 Turns #36 S.S.E. U.W.		
C3	833	330 MMFD. Oscillator Section of Variable Condenser	L3	847	Preselector Second Secondary 133 Turns #36 S.S.E. U.W.		
C4	265	.001 MFD. First Detector & Oscillator Cathode Condenser	L4	938	Oscillator Coil 98 Turns Tapped 15 Turns #36 S.S.E.		
C5	264	.00005 MFD. Oscillator Coupling Condenser	L5	938	First I.F. Primary 650 Turns #36 S.S.E. U.W.		
C6	477	75-150 MMFD. First I.F. Trimmer Condenser	L6	938	First I.F. Secondary 650 Turns #36 S.S.E. U.W.		
C7	272	.1 MFD. I.F. Cathode By-pass Condenser	L7	937	Second I.F. Primary 650 Turns #36 S.S.E. U.W.		
C8	849	75-150 MMFD. Second I.F. Trimmer Condenser	L8	937	Second I.F. Secondary 650 Turns #36 S.S.E. U.W.		
C9	569	.2 MFD. Second Detector Cathode	L9		Single #43 Output Transformer 3,000 Ohm Speaker Field		
			L10	917	32 Henry Choke		
			L11	940			

GULBRANSEN CO.

MODEL 392
Schematic, Voltage
Socket, Trimmers



Voltages at Sockets

"B" AND "C" BATTERIES UP TO RATED VOLTAGE—FILAMENT CONTROL KNOB SET SO THAT FILAMENT VOLTAGE IS 2—ANTENNA LEAD SHORTENED TO GROUND—VOLTAGES READ FROM NEGATIVE FILAMENT LEG

Type of Tube	Function	Across Filament	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate MA.
'34	R.F	2.0	125	65	2.88(1)	2.3
'34	1st Det.	2.0	130	65	7.5(1)	1.4
'30	Osc.	2.0	67		4-15(2)	1.6-4(2)
'34	I.F	2.0	120	65	2.38(1)	2.4
'30	2nd Det.	2.0	0		0	0
'30	1st Audio	2.0	85		7.5(1)	.5
'30	Driver	2.0	125		7.5(1)	4.0
'30	Output	2.0	130		10.	1.1

(1) Computed figure—cannot be read with ordinary voltmeter because of high resistance in this circuit. See article "Voltages" for further information

(2) Subject to variation with dial setting.

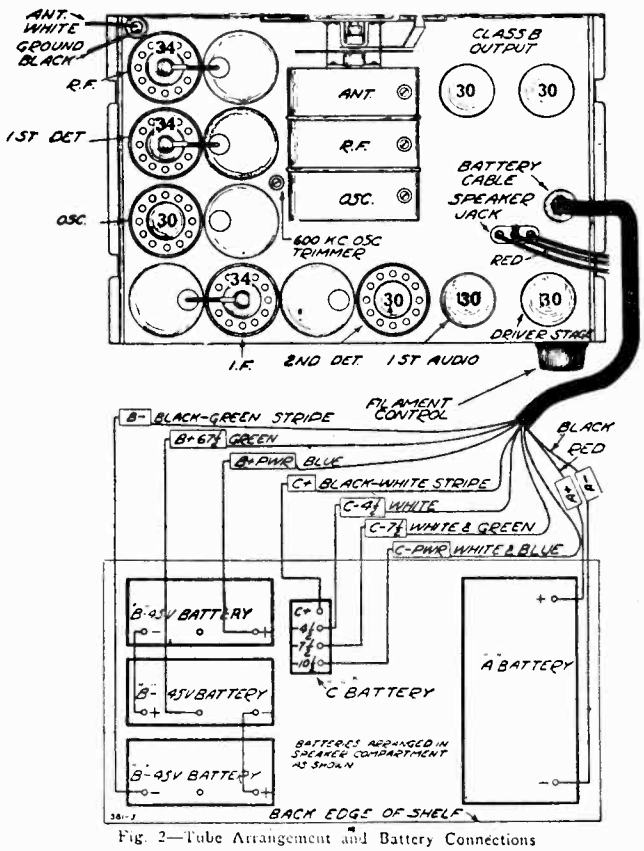


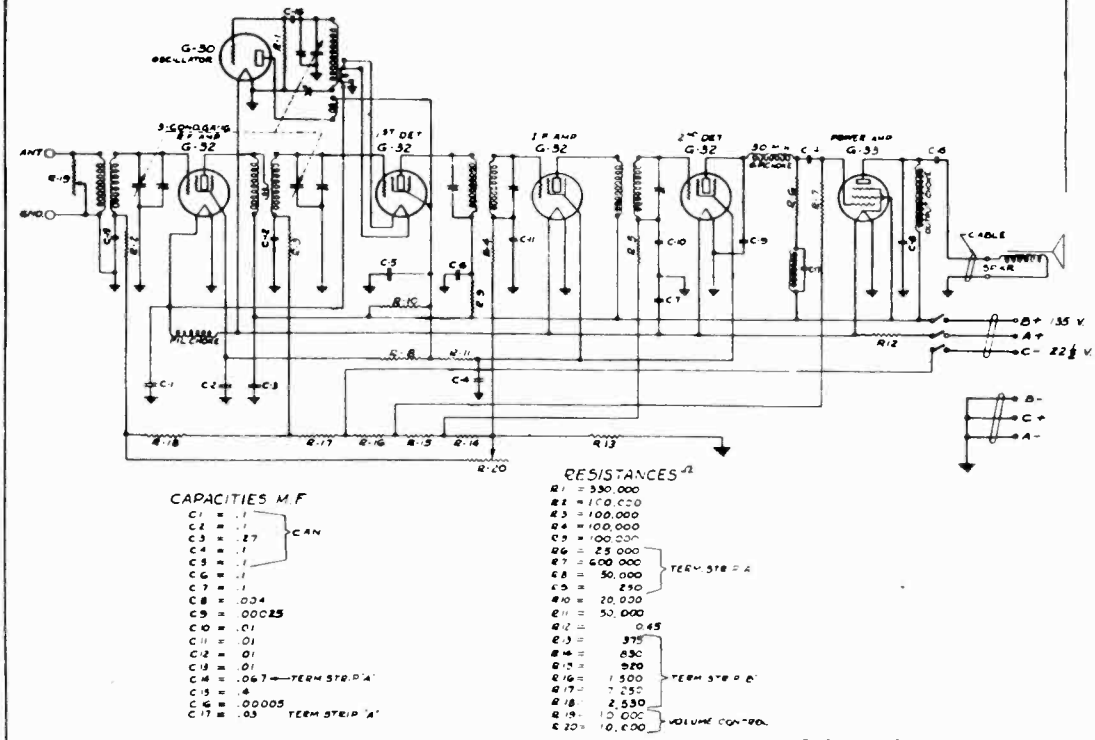
Fig. 2—Tube Arrangement and Battery Connections

MODEL 123
Chassis 120-B
Schematic, Alignment
Voltage

GRIGSBY - GRUNOW CO.

SCHEMATIC DIAGRAM OF SCREEN GRID SUPERHETRODYNE BATTERY RECEIVER MODEL C-120-B

FIG. 150
ISSUE #1 8-22-32



Schematic Diagram Chassis 120-B

COLOR CODE

SPEAKER—Red and green or black (with small lugs)
"A" Plus—Red (with large lug)
"A" Minus—Black (with large lug)
"B" Plus—Red 135 volt
"B" Minus—Black
"C" Plus—Black 22½ volt
"C" Minus—Blue

ALIGNMENT

Align with the volume control in maximum position and the input reduced to keep the output below 1 watt.

An output meter should be used to insure the proper adjustment of all aligning condensers.

Supply a 175 K.C. signal to the grid of the first detector tube and align all intermediate frequency condensers for maximum output.

Supply a 1,500 K.C. signal to the input of the receiver and tune the receiver to this signal. Then adjust all radio frequency alignment condensers for maximum output.

Supply a 600 K.C. signal to the input of the receiver and tune the receiver to this signal. Then adjust the oscillator tracking condenser and tuning control simultaneously for maximum output. For each adjustment of the oscillator tracking condenser there will be a different dial setting which gives maximum output. The combination of tracing condenser adjustment and dial setting which give maximum output, disregarding the calibration point is the correct adjustment.

VOLUME CONTROL

The Model 120-B chassis is equipped with a double volume control unit. Each section of the unit has a value of 10,000 ohms. One section of the volume control governs the voltage input to the antenna whereas the other section adjusts the bias voltages obtainable of the voltage divider.

TABLE OF VOLTAGES

Tube Purpose	Type	Fil Volts D.C	Plate Volts D.C	Plate Current M.A.-D.C	Screen Volts D.C.	Screen Current * M.A.-D.C.
R.F. Amp.	G-32	2.0	135	1.2	40	.3
Oscil.	G-30	2.0	55	3.0	....	....
1st Det.	G-32	2.0	135	.2	55	.2
I F. Amp.	G-32	2.0	135	.3	22	.3
2nd Det.	G-32	2.0	20	*	22	.4
Pentode	G-33	2.0	130	12	135	2.6

*Less than 1 M.A.

BIAS VOLTAGES

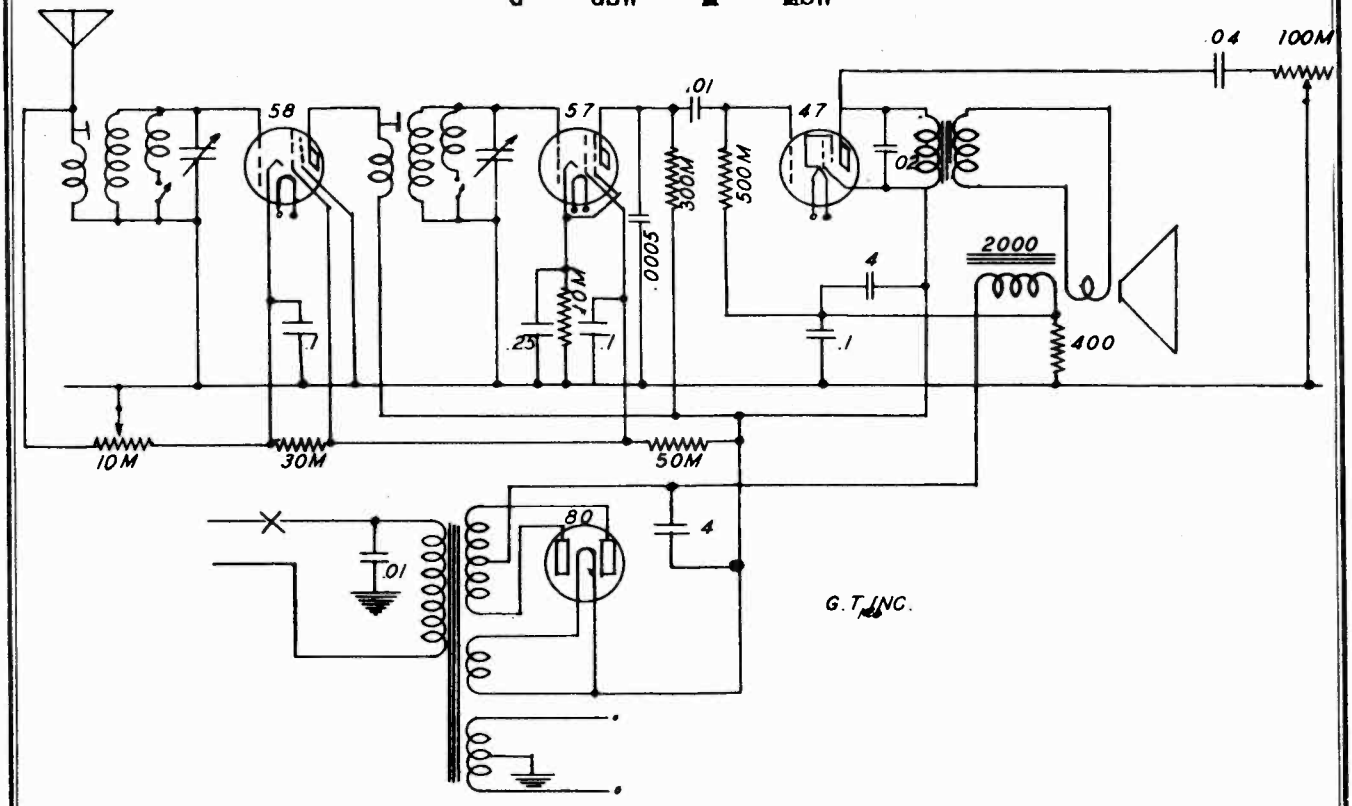
	Volume Control at Maximum	Volume Control at Minimum
R.F. Ampl.	—3 Volt	—11 Volt
Oscillator	0 Volt	0 Volt
1st Det.	—8 Volt	—14 Volt
I.F. Amp.	—3 Volt	—3 Volt
2nd Det.	—8 Volt	—8 Volt
Pentode	—13.5 Volt	—13.5 Volt

GENERAL TELEVISION, INC.

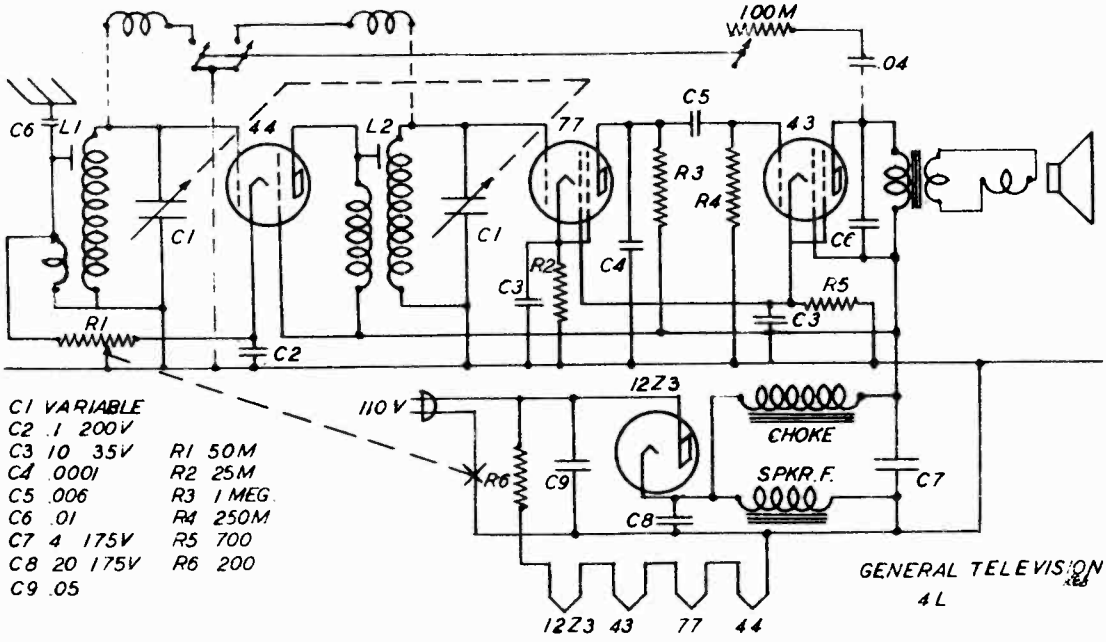
MODELS G,GSW,M,MSW
MODELS A,B,C,E
Regular & SW Models
Schematics

SCHEMATIC DIAGRAMS

AC MODELS
"G" "GSW" "M" "MSW"



AC-DC MODELS
"A" "B" "C" "E" REGULAR AND "SW" MODELS

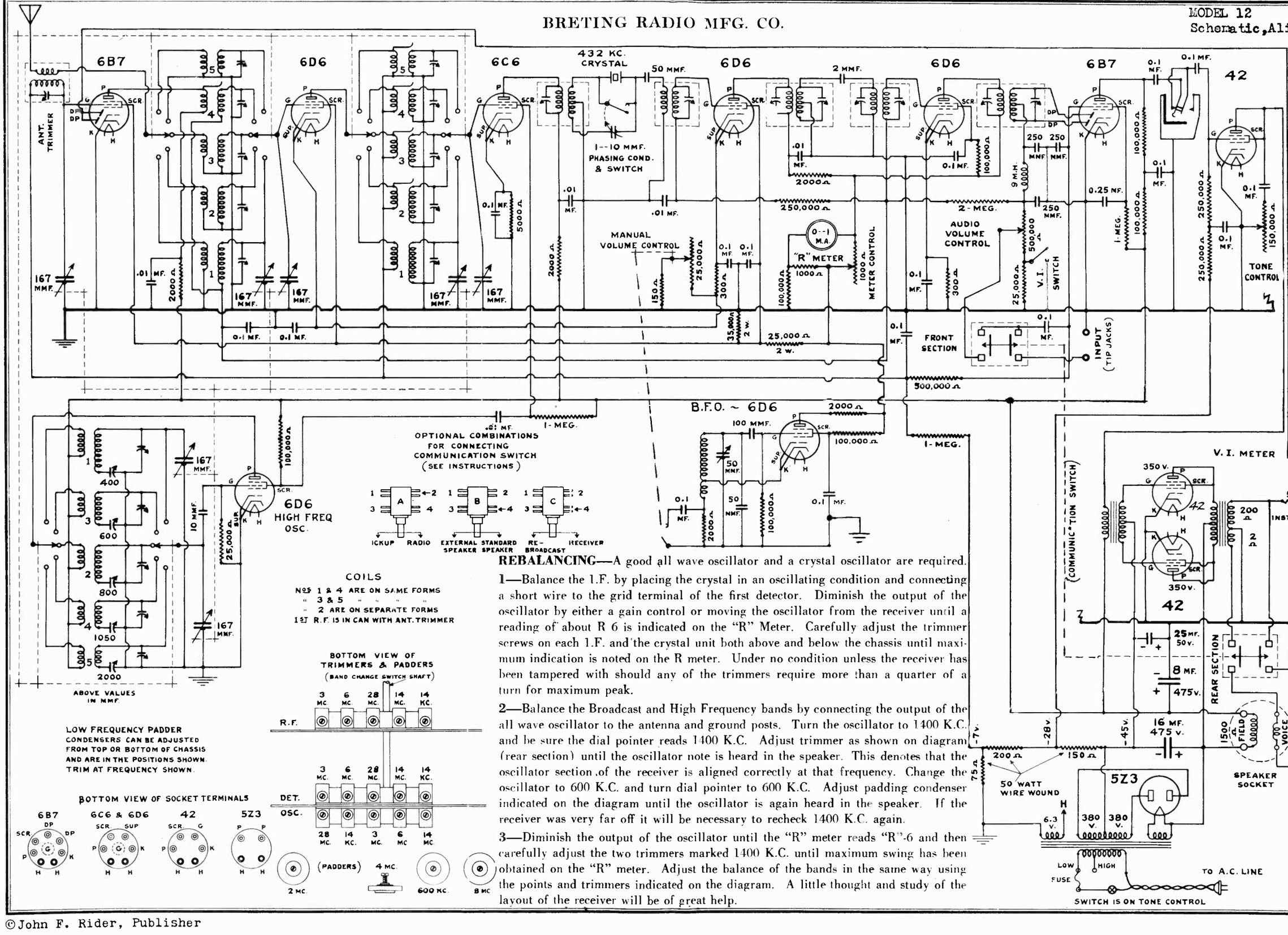


C1 VARIABLE
C2 .1 200V
C3 10 35V
C4 .0001
C5 .006
C6 .01
C7 4 175V
C8 20 175V
C9 .05

R1 50M
R2 25M
R3 1 MEG.
R4 250M
R5 700
R6 200

BRETING RADIO MFG. CO.

MODEL 12
Schematic, Alignment



REBALANCING—A good all wave oscillator and a crystal oscillator are required.

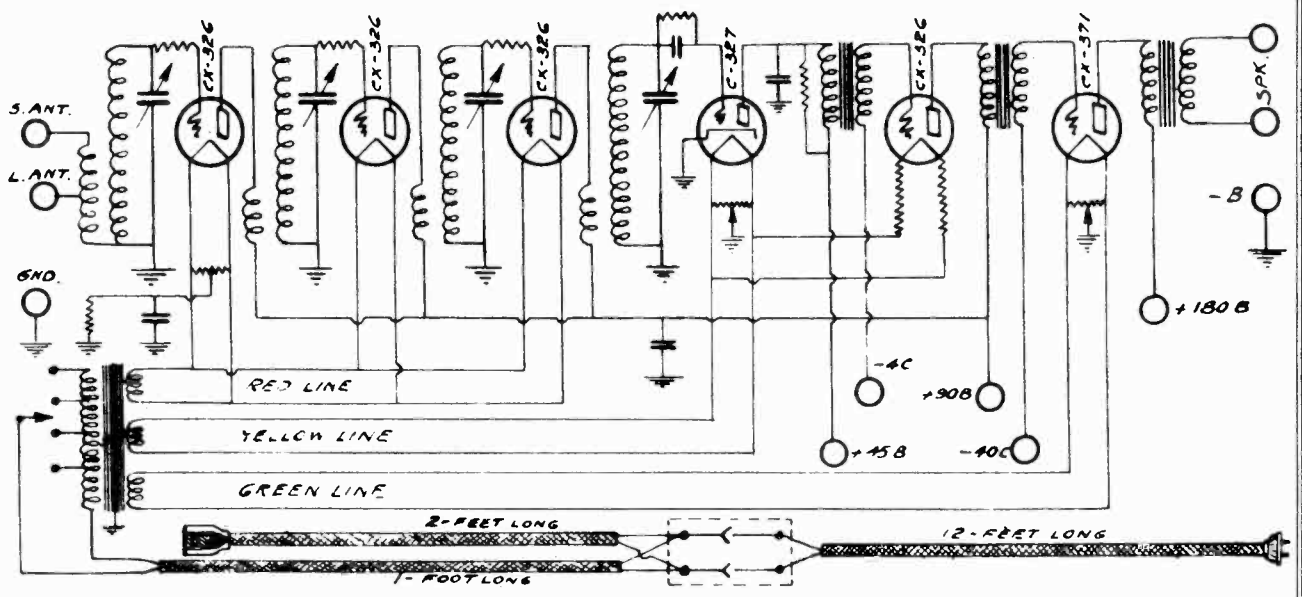
1—Balance the I.F. by placing the crystal in an oscillating condition and connecting a short wire to the grid terminal of the first detector. Diminish the output of the oscillator by either a gain control or moving the oscillator from the receiver until a reading of about R 6 is indicated on the "R" Meter. Carefully adjust the trimmer screws on each I.F. and the crystal unit both above and below the chassis until maximum indication is noted on the R meter. Under no condition unless the receiver has been tampered with should any of the trimmers require more than a quarter of a turn for maximum peak.

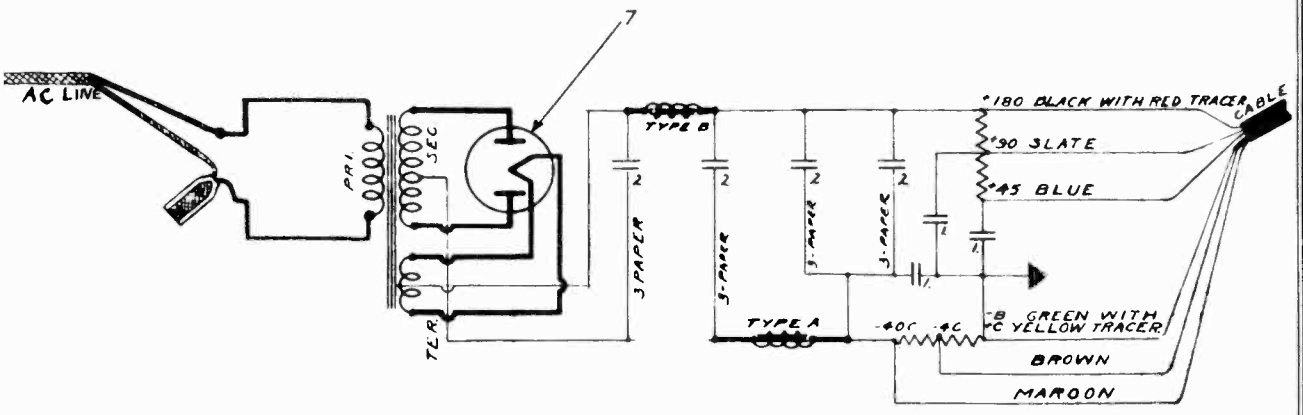
2—Balance the Broadcast and High Frequency bands by connecting the output of the all wave oscillator to the antenna and ground posts. Turn the oscillator to 1400 K.C. and be sure the dial pointer reads 1400 K.C. Adjust trimmer as shown on diagram (rear section) until the oscillator note is heard in the speaker. This denotes that the oscillator section of the receiver is aligned correctly at that frequency. Change the oscillator to 600 K.C. and turn dial pointer to 600 K.C. Adjust padding condenser indicated on the diagram until the oscillator is again heard in the speaker. If the receiver was very far off it will be necessary to recheck 1400 K.C. again.

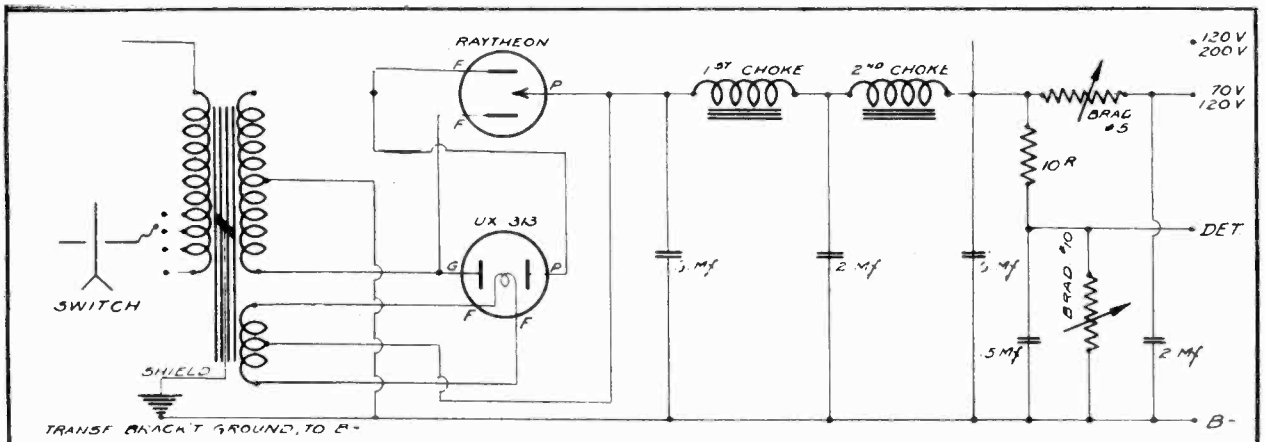
3—Diminish the output of the oscillator until the "R" meter reads "R"-6 and then carefully adjust the two trimmers marked 1400 K.C. until maximum swing has been obtained on the "R" meter. Adjust the balance of the bands in the same way using the points and trimmers indicated on the diagram. A little thought and study of the layout of the receiver will be of great help.

MODEL 7-Tube AC
MODEL B-Eliminator
Schematics

FARRAND MFG. COMPANY





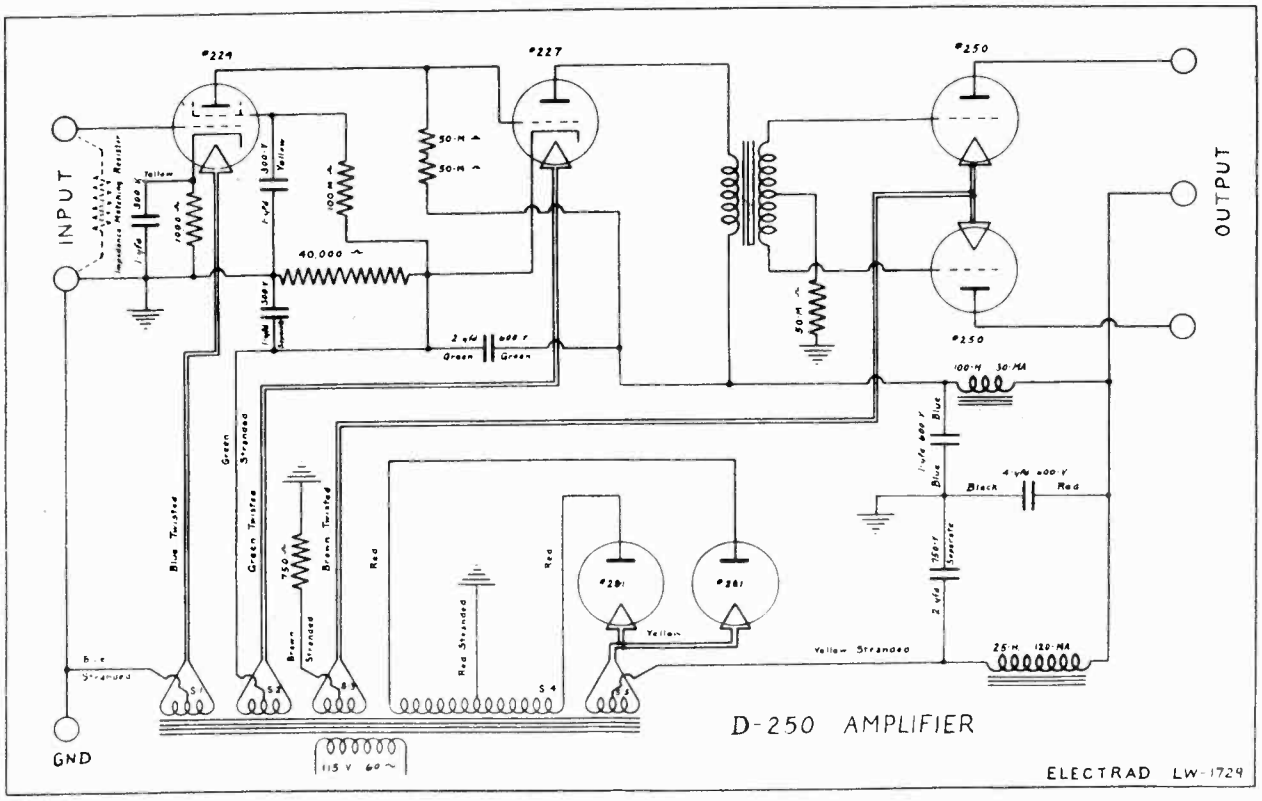


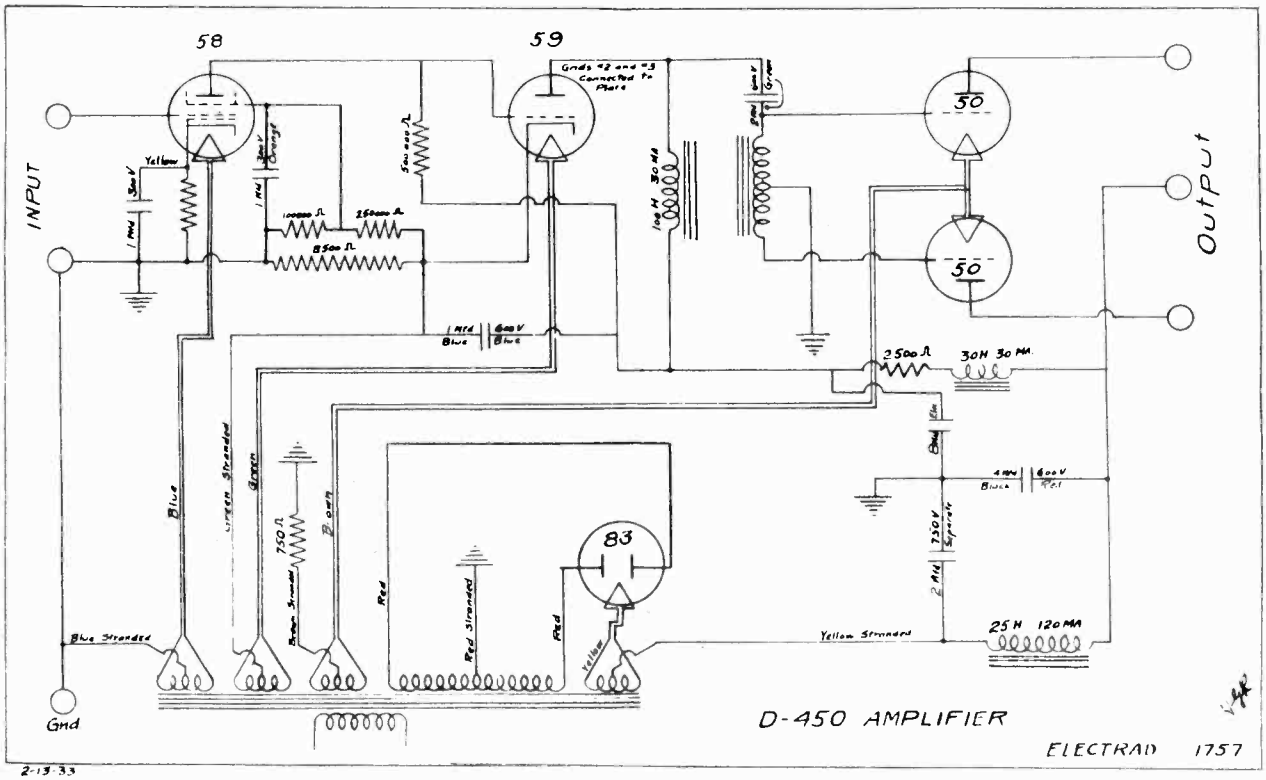
SCHEMATIC DIAGRAM

DIAGRAMS for FARRAND "B" ELIMINATOR	DWN BY CLL	DESIGN H.V.N.	APPVD BY WD
	DATE 11-1-26	DATE 11-1-26	DATE

ELECTRAD, INC.

MODEL D-250
MODEL D-450
Schematics



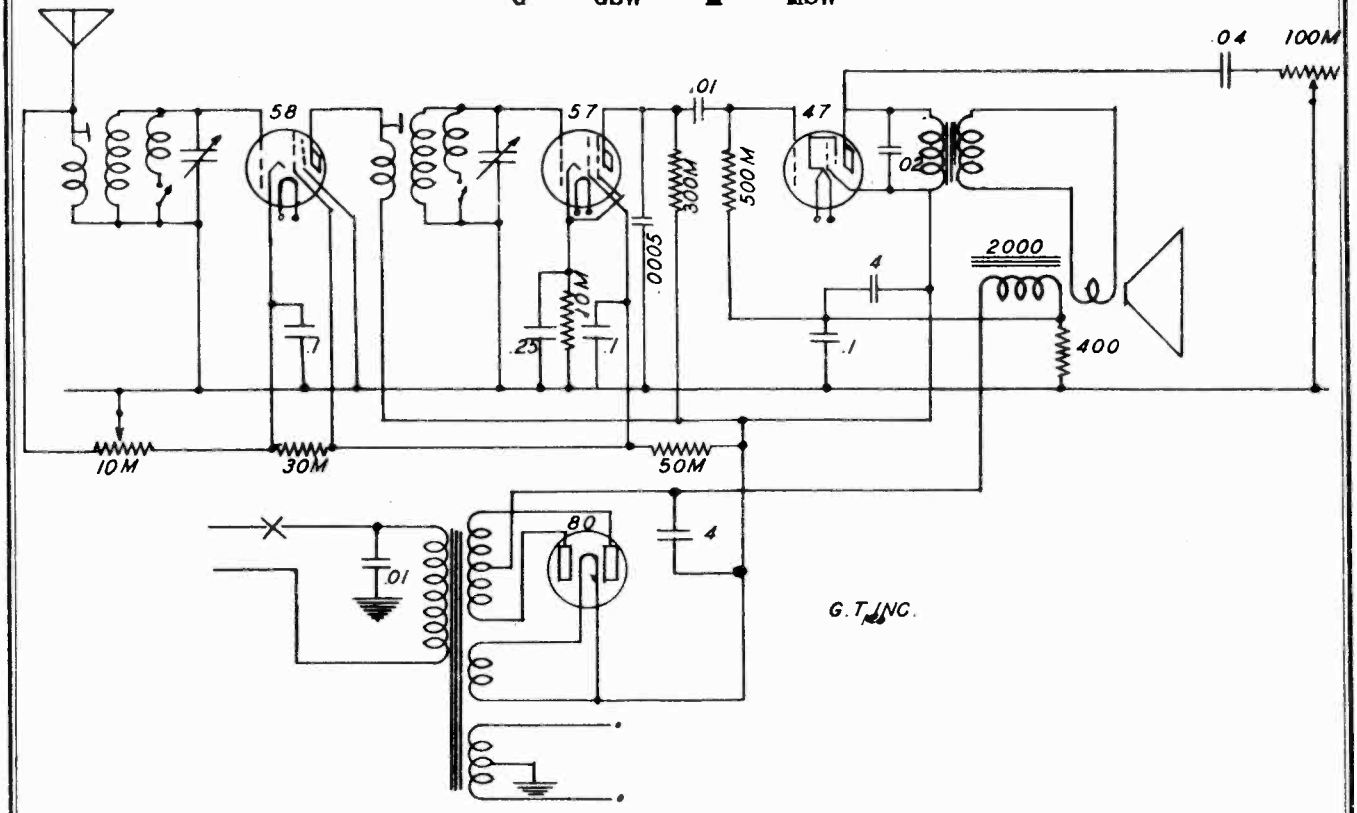


GENERAL TELEVISION, INC.

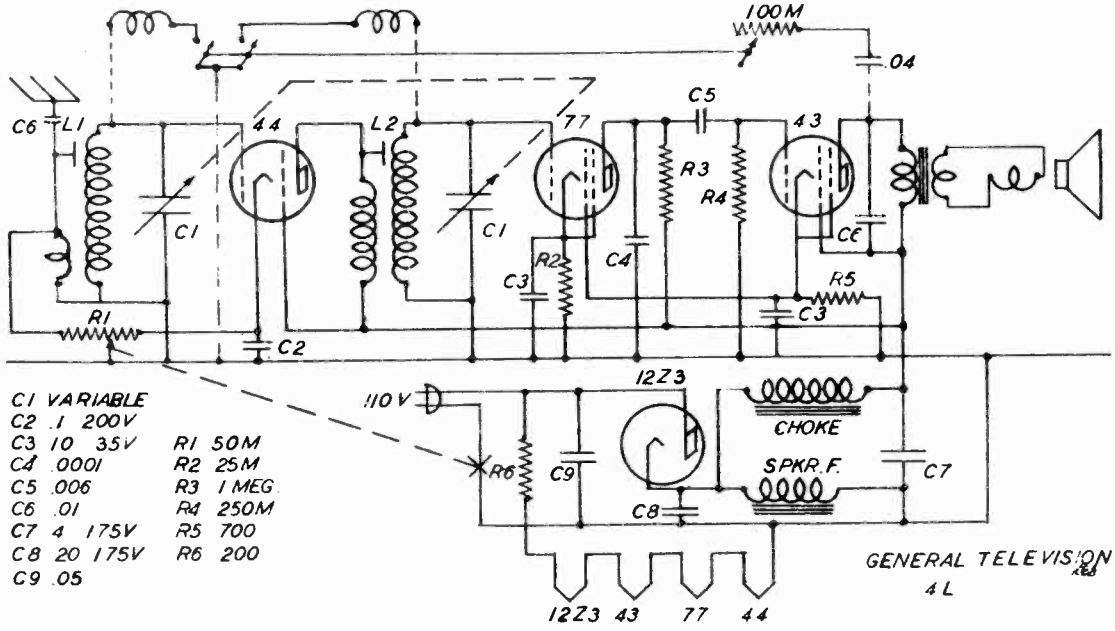
MODELS G,GSW,M,MSW
MODELS A,B,C,E
Regular & SW Models
Schematics

SCHEMATIC DIAGRAMS

AC MODELS
"G" "GSW" "M" "MSW"



AC-DC MODELS
"A" "B" "C" "E" REGULAR AND "SW" MODELS



C1 VARIABLE
C2 .1 200V
C3 10 35V
C4 .0001
C5 .006
C6 .01
C7 4 175V
C8 20 175V
C9 .05

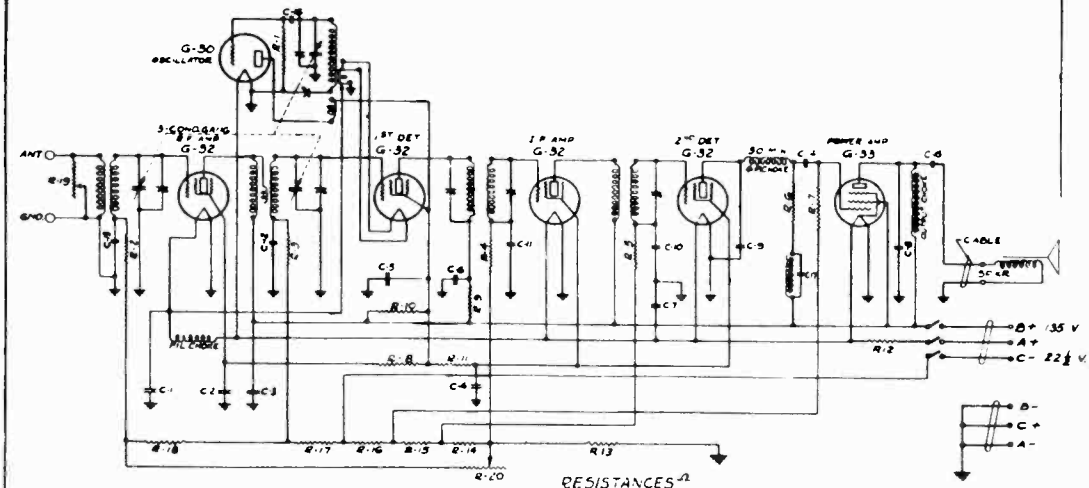
R1 50M
R2 25M
R3 1 MEG.
R4 250M
R5 700
R6 200

MODEL 123
Chassis 120-B
Schematic, Alignment
Voltage

GRIGSBY - GRUNOW CO.

SCHEMATIC DIAGRAM OF SCREEN GRID SUPERHETRODYNE BATTERY RECEIVER MODEL C-120-B

FIG 150
ISSUE #1 8-22-32



CAPACITIES M.F

C1	= .1	
C2	= .1	
C3	= .27	CAN
C4	= .1	
C5	= .1	
C6	= .1	
C7	= .1	
C8	= .004	
C9	= .00025	
C10	= .01	
C11	= .01	
C12	= .01	
C13	= .01	
C14	= .067	TERM STR P A
C15	= .4	
C16	= .00005	
C17 A	.03	TERM STRIP "A"

RESISTANCES Ω

R1	= 330,000	
R2	= 100,000	
R3	= 100,000	
R4	= 100,000	
R5	= 100,000	
R6	= 25,000	
R7	= 600,000	TERM STR P A
R8	= 50,000	
R9	= 250	
R10	= 20,000	
R11	= 50,000	
R12	= 0.45	
R13	= 375	
R14	= 850	
R15	= 520	
R16	= 1,500	TERM STR P B
R17	= 7,250	
R18	= 2,550	
R19	= 10,000	VOLUME CONTROL
R20	= 10,000	

Schematic Diagram Chassis 120-B

COLOR CODE

SPEAKER—Red and green or black (with small lugs)
"A" Plus—Red (with large lug)
"A" Minus—Black (with large lug)
"B" Plus—Red 135 volt
"B" Minus—Black
"C" Plus—Black 22½ volt
"C" Minus—Blue

ALIGNMENT

Align with the volume control in maximum position and the input reduced to keep the output below 1 watt.

An output meter should be used to insure the proper adjustment of all aligning condensers.

Supply a 175 K.C. signal to the grid of the first detector tube and align all intermediate frequency condensers for maximum output.

Supply a 1,500 K.C. signal to the input of the receiver and tune the receiver to this signal. Then adjust all radio frequency alignment condensers for maximum output.

Supply a 600 K.C. signal to the input of the receiver and tune the receiver to this signal. Then adjust the oscillator tracking condenser and tuning control simultaneously for maximum output. For each adjustment of the oscillator tracking condenser there will be a different dial setting which gives maximum output. The combination of tracing condenser adjustment and dial setting which give maximum output, disregarding the calibration point is the correct adjustment.

VOLUME CONTROL

The Model 120-B chassis is equipped with a double volume control unit. Each section of the unit has a value of 10,000 ohms. One section of the volume control governs the voltage input to the antenna whereas the other section adjusts the bias voltages obtainable of the voltage divider.

TABLE OF VOLTAGES

Tube Purpose	Type	Fil Volts D.C	Plate Volts D.C	Plate Current M.A.-D.C	Screen Volts D.C	Screen Current * M.A.-D.C
R.F. Amp.	G-32	2.0	135	1.2	40	.3
Oscil.	G-30	2.0	55	3.0	...	...
1st Det.	G-32	2.0	135	.2	55	.2
I F. Amp.	G-32	2.0	135	.3	22	.3
2nd Det.	G-32	2.0	20	*	22	.4
Pentode	G-33	2.0	130	12	135	2.6

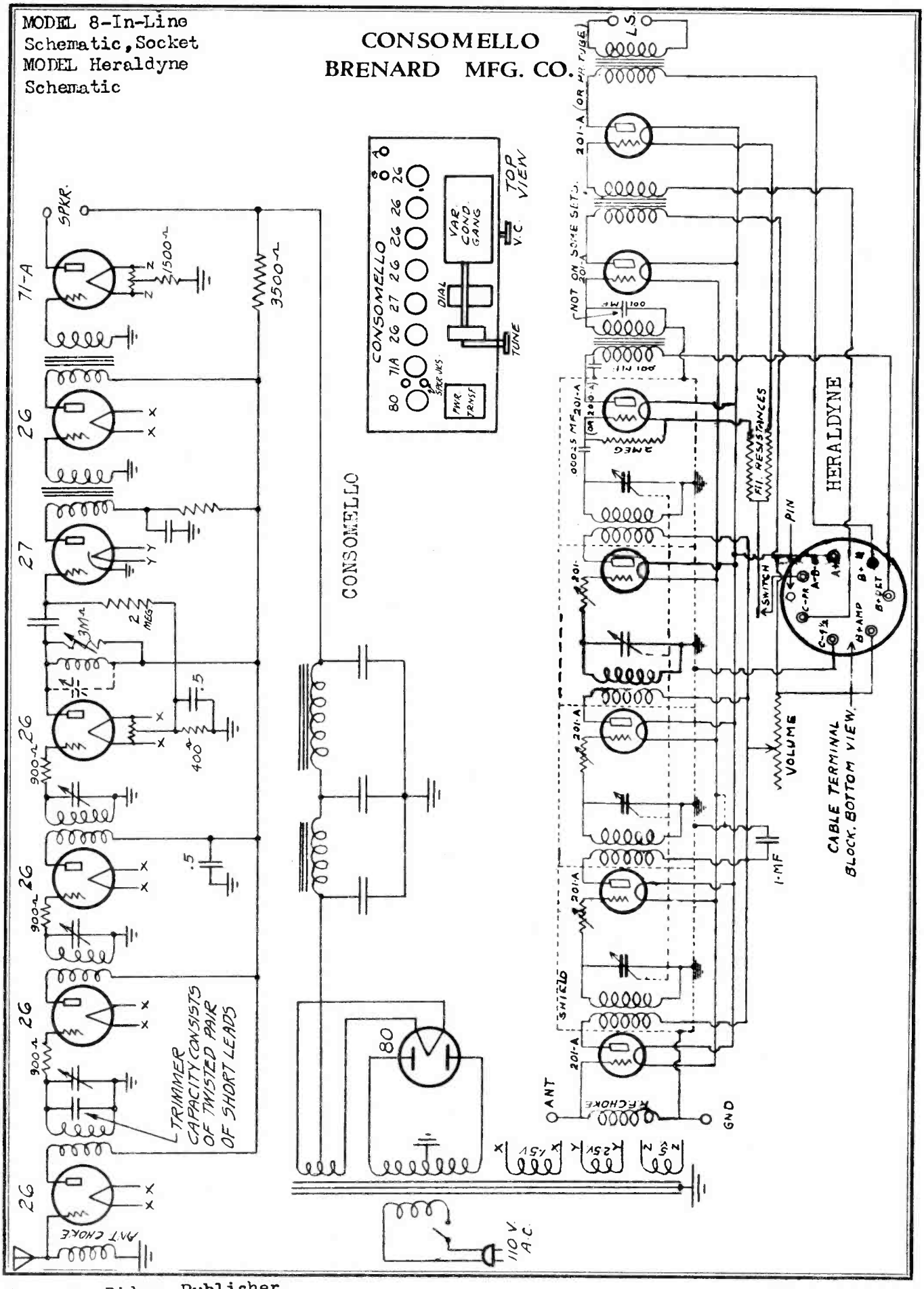
*Less than .1 M.A.

BIAS VOLTAGES

	Volume Control at Maximum	Minimum
R.F. Ampl.	—3 Volt	—11 Volt
Oscillator	0 Volt	0 Volt
1st Det.	—8 Volt	—14 Volt
I.F. Amp.	—3 Volt	—3 Volt
2nd Det.	—8 Volt	—8 Volt
Pentode	—13.5 Volt	—13.5 Volt

MODEL 8-In-Line
Schematic, Socket
MODEL Heraldyne
Schematic

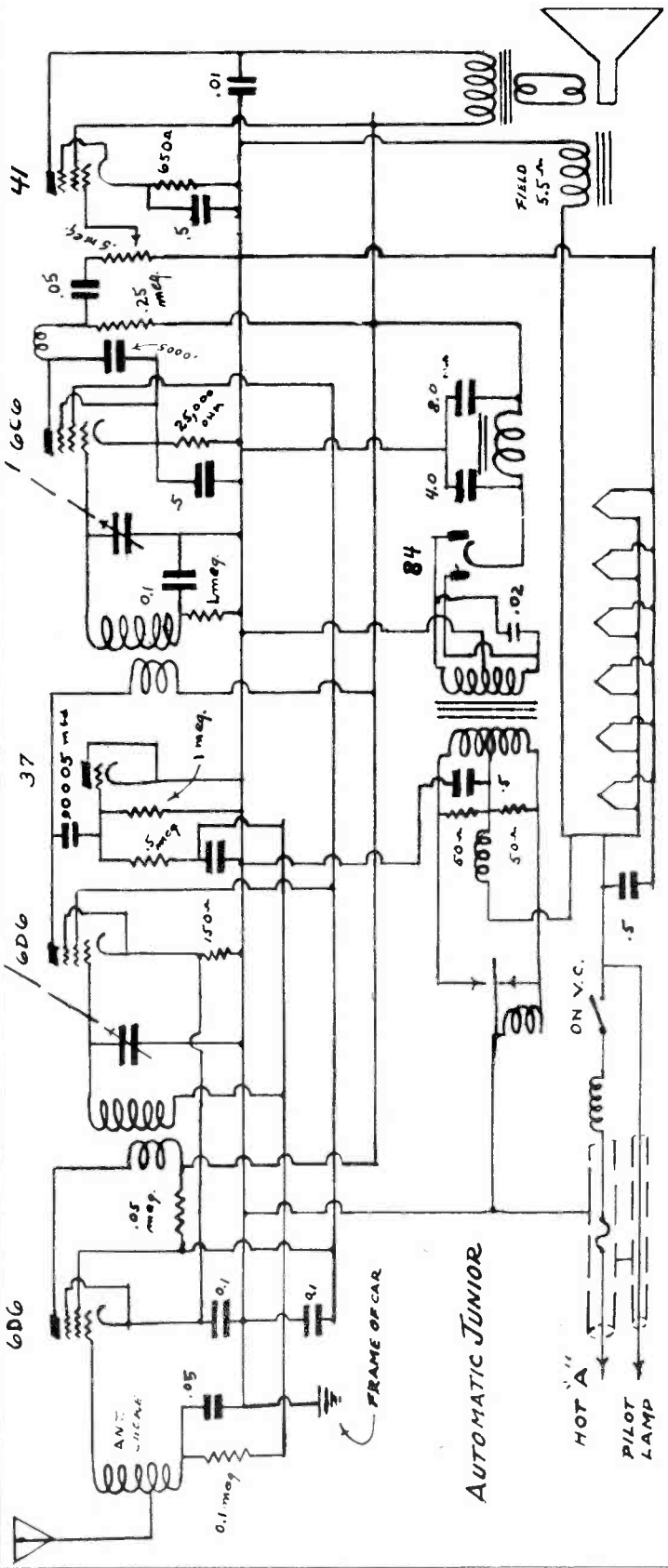
CONSOMELLO
BRENARD MFG. CO.

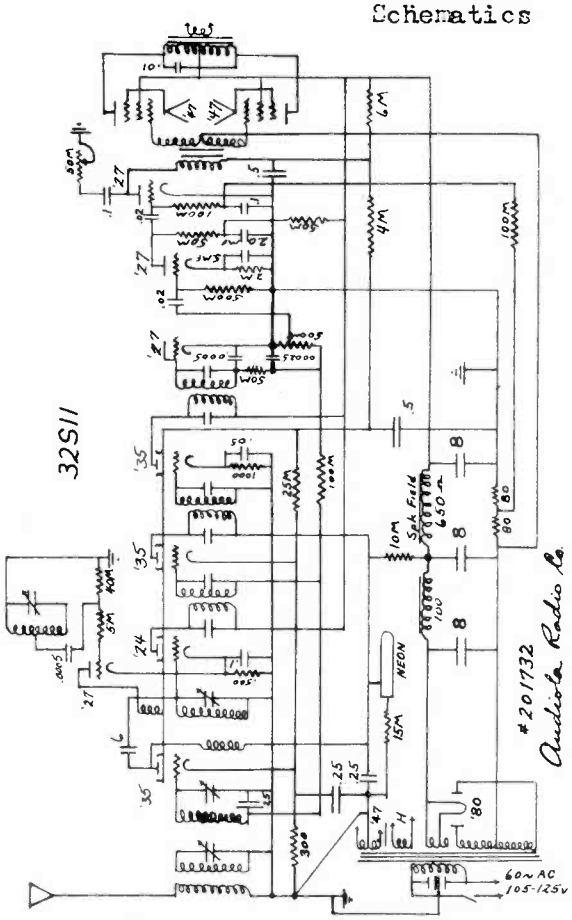


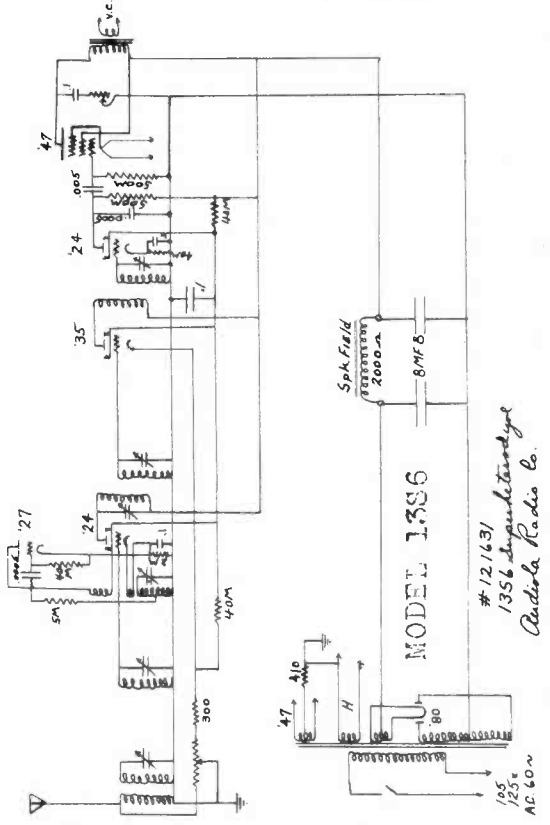
AUTOMATIC RADIO MFG. CO.

AUDIOLA RADIO CO.

MODEL Junior
MODEL 1336
MODEL 3211
Schematics



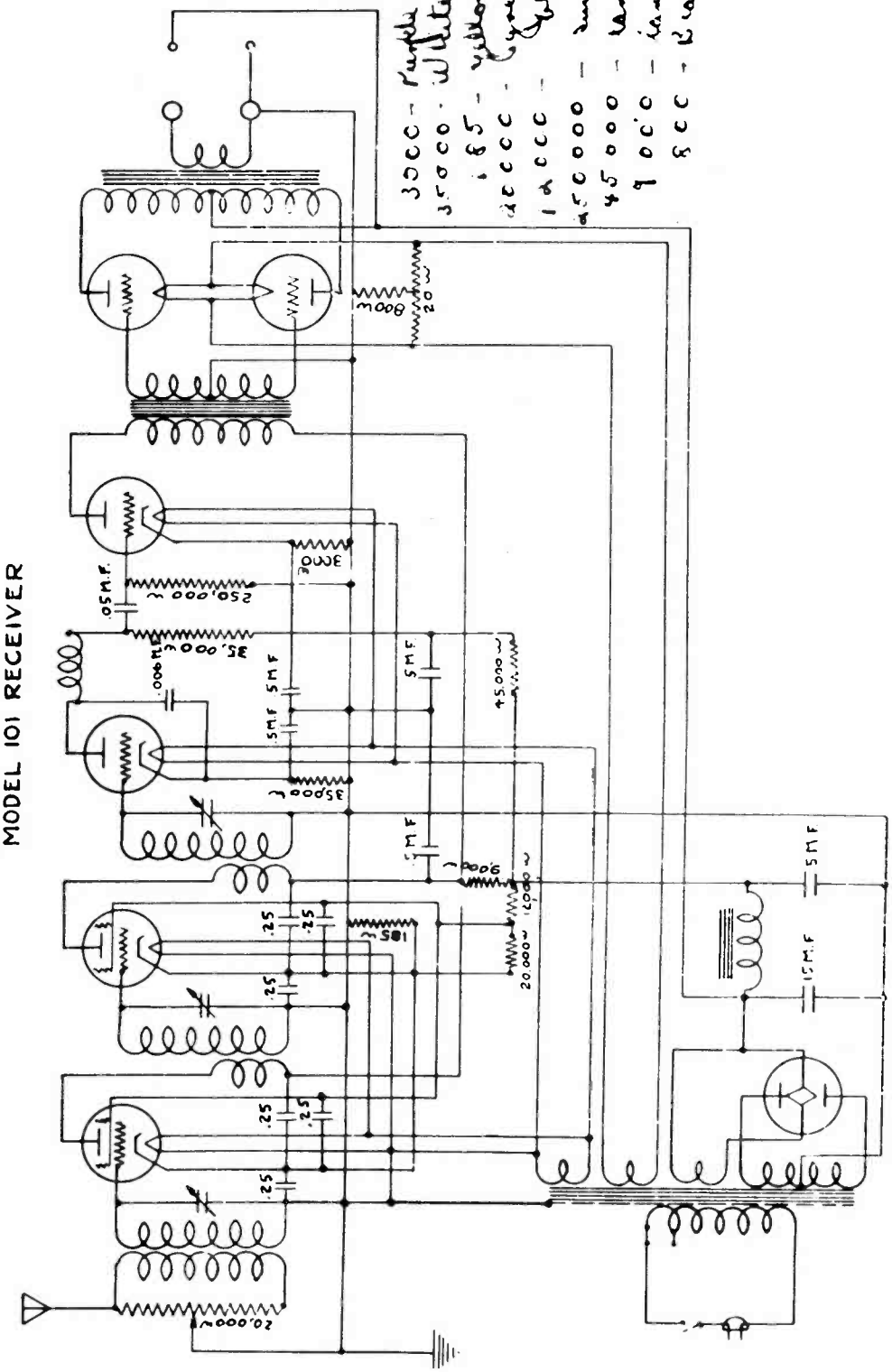




MODEL 101
Schematic

ARIEL RADIO INC.

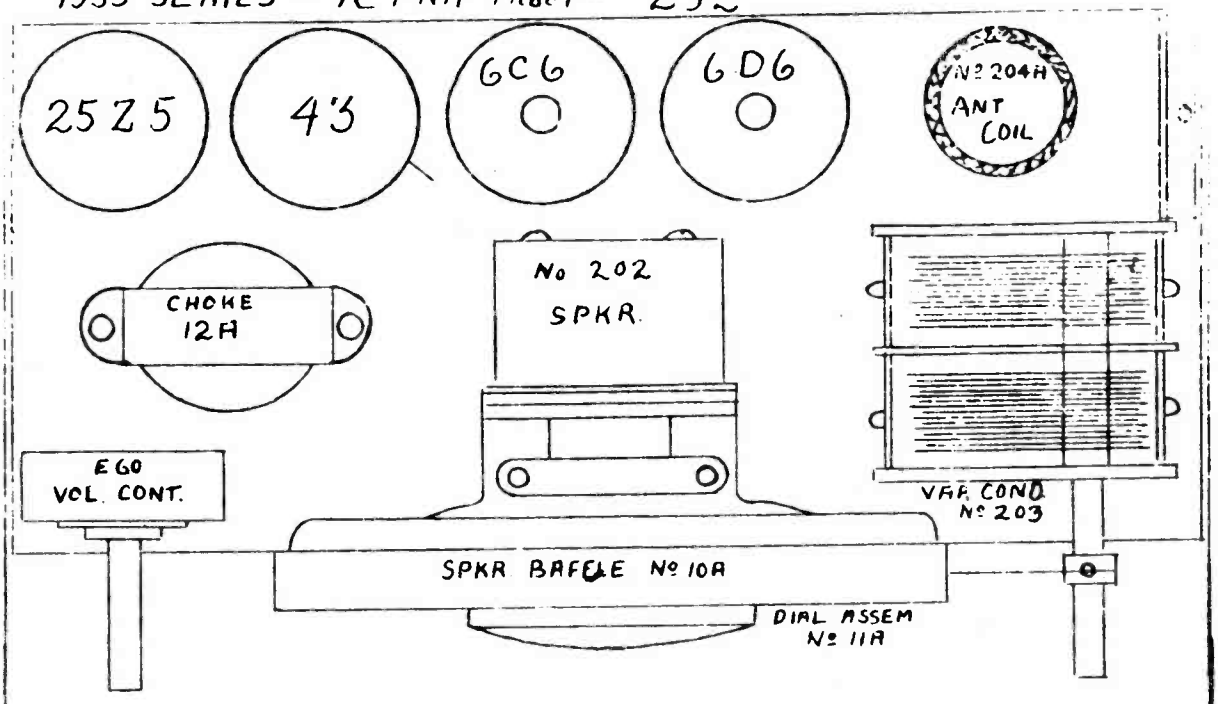
SCHEMATIC DIAGRAM
ARIEL RADIO INC.
MODEL 101 RECEIVER

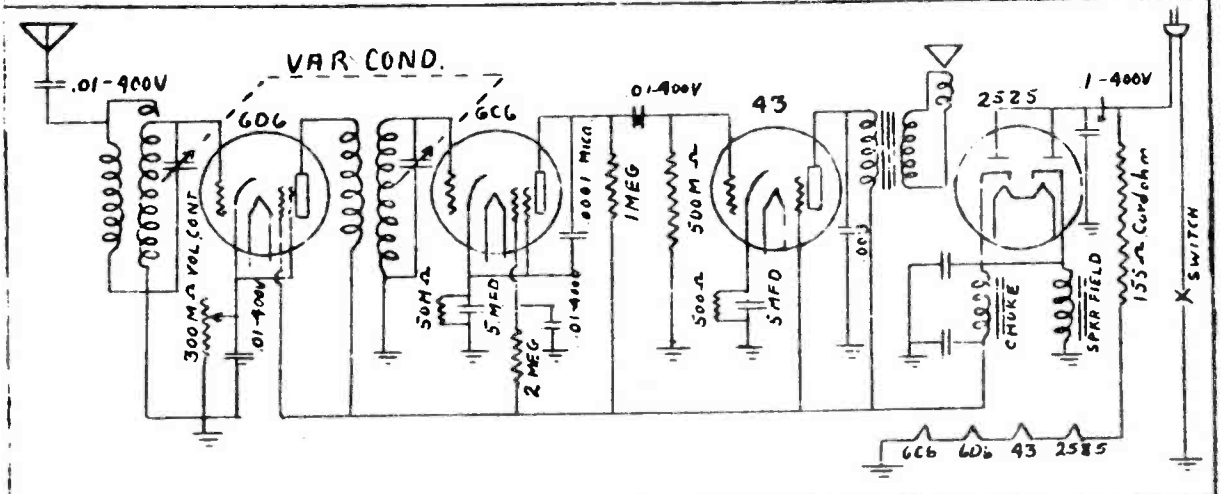


AETNA

MODEL 252
Schematic
Socket, Voltage

1935 SERIES - AETNA Model - 252





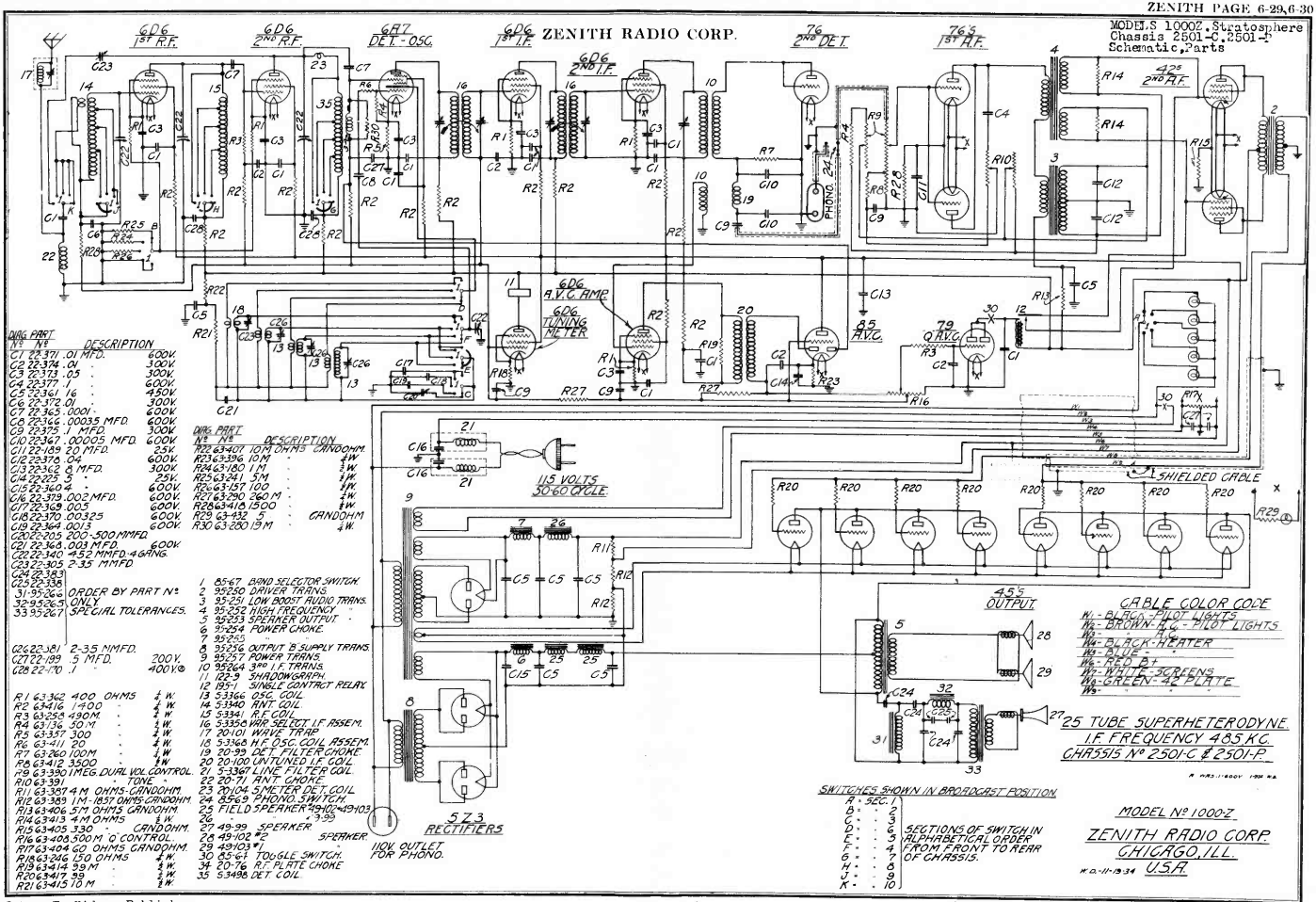
SOCKET VOLTAGES —

TUBE	POSITION	EF	EK	EG2	EG3	EP
6D6	RF	6.3	2.1	110	2.1	108
6C6	DET.	6.3	1.4	14	1.4	18
43	PR OUTPUT	25	16	110	—	100

All voltages taken with 1000 ohms per volt DC Meter except Heaters.
LINE VOLTAGE 115 VOLTS

F = Filaments
K = Cathode
G2 = Screen Grid
G3 = Suppressor Grid
P = Plate

10-5-35 - WB.



DWG. PART Nº	DESCRIPTION	
C1	22-371 .01 MFD.	600V.
C2	22-374 .01	300V.
C3	22-373 .05	300V.
C4	22-377 .1	600V.
C5	22-361 .16	450V.
C6	22-372 .01	300V.
C7	22-365 .0001	600V.
C8	22-366 .00035 MFD.	600V.
C9	22-375 .1 MFD.	300V.
C10	22-367 .00005 MFD.	600V.
C11	22-189 20 MFD.	25V.
C12	22-378 .04	600V.
C13	22-362 8 MFD.	300V.
C14	22-225 .5	25V.
C15	22-360 .4	600V.
C16	22-379 .002 MFD.	600V.
C17	22-369 .005	600V.
C18	22-370 .0325	600V.
C19	22-364 .0013	600V.
C20	22-205 200-500 MMFD	
C21	22-363 .003 MFD.	600V.
C22	22-340 452 MMFD. 4 GANG.	
C23	22-305 2-35 MMFD	
C24	22-383	
C25	22-338	

31 - 95264 ORDER BY PART Nº
32 - 95265 ONLY.
33 - 95267 SPECIAL TOLERANCES.

C26	22-381 2-35 MMFD.	
C27	22-189 .5 MFD.	200V.
C28	22-170 .1	400V.

DWG. PART Nº	DESCRIPTION	
R1	63-362 400 OHMS	½ W.
R2	63-416 1400	1 W.
R3	63-258 490 M.	1 W.
R4	63-136 .50 M	1 W.
R5	63-357 300	½ W.
R6	63-411 20	1 W.
R7	63-260 1.0 M	1 W.
R8	63-412 3500	1 W.
R9	63-390 1 MEG. DUAL VOL CONTROL.	
R10	63-391 TONE	
R11	63-357 4 M. OHMS - GANDOHM.	
R12	63-389 1 M-1857 OHMS - GANDOHM.	
R13	63-406 5 M. OHMS GANDOHM.	
R14	63-413 4 M OHMS	1 W.
R15	63-405 330 GANDOHM.	
R16	63-408 500 M. 'Q' CONTROL.	
R17	63-404 60 OHMS GANDOHM.	
R18	63-386 150 OHMS	½ W.
R19	63-414 .99 M	1 W.
R20	63-417 .98	1 W.
R21	63-415 1.0 M	1 W.

DWG. PART Nº	DESCRIPTION	
R22	63-401 10M OHMS - GANDOHM.	
R23	63-396 10 M	½ W.
R24	63-180 1 M	1 W.
R25	63-241 .5 M	1 W.
R26	63-157 100	½ W.
R27	63-290 .260 M	1 W.
R28	63-416 1500	1 W.
R29	63-432	GANDOHM
R30	63-280 1.9 M	4 W.

1	85-67 BAND SELECTOR SWITCH.	
2	95250 DRIVER TRANS.	
3	95-251 LOW BOOST AUDIO TRANS.	
4	95-252 HIGH FREQUENCY	
5	95253 SPEAKER OUTPUT	
6	95254 POWER CHOKE.	
7	95255	
8	95256 OUTPUT B SUPPLY TRANS.	
9	95257 POWER TRANS.	
10	95264 3RD I.F. TRANS.	
11	122-9 SHADOWGRAPH.	
12	185-1 SINGLE CONTACT RELAY.	
13	53366 OSC. COIL	
14	5-3340 ANT. COIL	
15	5-3341 R.F. COIL	
16	5-3356 VAR. SELECT. I.F. ASSEM.	
17	20-101 WAVE TRAP	
18	5-3368 H.F. OSC. COIL ASSEM.	
19	20-99 DET. FILTER CHOKE.	
20	20-100 UNTUNED I.F. COIL	
21	5-3367 LINE FILTER COIL	
22	20-71 ANT. CHOKE	
23	20-104 S. METER DET. COIL	
24	8569 PHONO. SWITCH.	
25	FIELD SPEAKER 49-102-49-103	
26	4-399	
27	49-99 SPEAKER	
28	49-102 #2 SPEAKER	
29	49-103 #1	
30	85-61 TOGGLE SWITCH.	
34	20-76 R.F. PLATE CHOKE	
35	5-3498 DET. COIL	

MODELS 1000Z, Stratosphere Chassis 2501-C, 2501-P Circuit Data, Voltage, Alignment

ZENITH RADIO CORP.

GENERAL INFORMATION

Tubes used are as follows:

6D6	First Radio Frequency Amplifier
6D6	Second Radio Frequency Amplifier
6A7	First Detector and Oscillator
6D6	First Intermediate Amplifier
6D6	Second Intermediate Amplifier
76	Second Detector
2 - 76	First Audio Amplifier
2 - 42	Push-Pull Second Audio Amplifier
8 - 45	Parallel Push-Pull Power Amplifier
79	Electron Relay for Q Circuit
6D6	Shadowgraph Amplifier
85	Automatic Volume Control
6D6	A.V. C. Amplifier
2 - 5Z3	Rectifier for Power Amplifier
5Z3	Rectifier for remainder for receiver.

CIRCUIT

Radio Frequency Amplifier. This receiver employs two stages of radio frequency amplification using pentode tubes in conjunction with tuned plate circuits resulting in high R. F. gain at all frequencies. The bias voltage on both stages is varied through the band switch to secure stability and preserve maximum gain on all bands. Both stages are used on all bands except the fifth or ultra-high frequency band. Double shielding is employed on the entire R. F. section to prevent signal pick-up by the wiring.

First Detector and Oscillator. A 6A7 tube is used as first detector and oscillator. The input circuit of the first detector is an R.F. choke and a 50,000 ohm resistor in parallel. The input grid of a 6A7 type of tube has a tendency to become positive whenever a strong signal is impressed on it, if there is any appreciable resistance in the grid circuit. The grid return connection of the choke is connected to one diode plate of the 85 A.V.C. tube so that if at any time the input grid of the 6A7 should become positive, due to overload, the diode plate will provide a low D.C. path to ground preventing detector overload distortion.

Intermediate Amplifier. The circuit employed in the two stages of intermediate amplification is conventional. The unusual feature of this portion of the receiver is in the transformers which are so designed that the mechanical coupling and, in turn, the band width or selectivity may be varied continuously without changing the natural period of either primary or secondary coils. This variation of selectivity has no effect on the sensitivity of the receiver.

Delayed Automatic Volume Control. A pick-up winding is incorporated in the third I.F. transformer which feeds I.F. to the control grid of a 6D6 A.V.C. amplifier. The output of this stage is coupled through an untuned transformer to the diode plate of an 85 tube. The plate of the 85 is connected directly to B plus and the control grid to a tap in the diode load resistor. This tube is biased at approximately 10 volts which places a negative bias on the diode plate and no A.V.C. voltage is developed until a signal is tuned in of a strong enough value to swing the diode plate positive. At this point A.V.C. voltage is developed, which in turn makes the grid of the 85 negative and reduces the plate current which reduces the bias and allows still more A.V.C. voltage to be developed. This accumulative action allows excellent automatic control of the stronger signals and eliminates the detrimental effects of A.V.C. on weak signals.

Q.A.V.C. A portion of the resistance load of the 85 diode is incorporated in a potentiometer on the rear of the upper chassis. The arm of this potentiometer is connected to the grids of a 79 tube. The two plates of the 79 are connected in parallel and operate a magnetic relay which short-circuits the grids of the push-pull 42 audio driver stage. When a signal is tuned in the grids of the 79 tube become negative stopping the plate current and the relay opens, allowing the audio system of the receiver to operate. The signal level at which this occurs is determined by the setting of the potentiometer arm. A switch, operated by a lever under the band switch knob on the front panel is in series with the 79 plate circuit and when opened makes the Q.A.V.C. circuit inoperative. The shadowmeter is connected in the plate circuit of a separate 6D6 whose control grid is controlled by the A.V.C. voltage. The amplifying action of this tube allows the shadowmeter to operate on very weak stations.

First Audio and Driver. In order to eliminate any possibility of overloading, two 76 tubes are used in parallel in the first audio stage. Two audio transformers of special design couple the first audio stage to a push-pull driver stage using two 42 tubes. The smaller transformer only handles frequencies above 400 cycles and has a rising high characteristic. The large transformer handles frequencies below 400 cycles and is resonated at 30 cycles. The voltage output of each of these transformers is controlled by the tone control.

The Power Output Stage. This consists of eight 45 tubes connected in parallel push-pull. A much better balance is preserved in this stage by using several medium size power tubes rather than a pair of high-power tubes. Also, the voltage requirements are greatly reduced. A 99 ohm resistor is incorporated in the grid circuit of each tube to prevent parasitic oscillation.

Power Supply. There are two rectifying and filtering systems incorporated in the lower power amplifier chassis. One uses a single 5Z3 full wave rectifier and supplies plate current for the upper chassis and bias voltage for the output stage. The second uses two 5Z3 tubes and supplies plate current for the output stage only. Special electrolytic condensers are used in both power supplies. These condensers will make a slight frying sound while the tubes are heating, unlike the more common type of electrolytic condensers. This is not an indication of deterioration.

Reproducers. There are three dynamic reproducers used. The small one in the center reproduces the higher register above 4000 cycles. A filtering system is used in conjunction with this speaker which prevents the lower frequencies from being reproduced. The two large concert dynamics handle all frequencies lower than 4000 cycles. Two are necessary to handle the 50 watts output of the power stage without distortion. The leads and connections on all three speakers are color coded so as to insure correct connections and proper phasing. These connections must not be reversed.

Tuning Ranges.

Color	Kilocycles	Megacycles	Meters
Green	535 - 1,550	.53 - 1.55	560 - 190
Orange	1,530 - 4,575	1.53 - 4.57	196 - 65.7
Yellow	3,725 -11,150	3.72 -11.15	80.5 - 27
Red	9,500 -31,600	9.5 - 31.6	31.5 - 9.4
Blue	19,500 -63,500	19.5 - 63.6	15.3 - 4.7

The high efficiency and unexcelled performance of this receiver has been achieved by the careful selection and high quality of all components. It is therefore most important that when service is required only genuine Zenith parts and tubes be used.

Socket Voltages

TUBE	POSITION	Af	Ek	Eg1	Eg2	Eg3	Ep
6D6	1st R. F.	6.3	10	0	100	10	270
6D6	2nd R. F.	6.3	3	0	100	3	270
6A7	1st Det.	6.3	3	0	100	-	270
	Osc.			0	-	-	165
6D6	1st I.F.	6.3	3	0	100	3	255
6D6	2nd I.F.	6.3	3	0	100	3	255
76	2nd Det.	6.3	0	0	-	-	0
76	Parallel 1st. Audio	6.3	12	0	-	-	192
42	P.P.Driver	6.3	19	0	-	-	258
45	Power Aud.	2.5	63	0	-	-	330
79	Q.A.V.C.	6.3	0	.5	-	-	240
6D6	Shadowmeter Amplifier	6.3	1.3	0	100	1.3	255
6D6	A.V.C. Amplifier	6.3	3	0	100	3	255
85	A.V.C.	6.3	7	0	-	-	100
5Z3	Rect.Power Amplifier	5	-	-	-	-	-
5Z3	Rect. for Upper Chassis.	5	-	-	-	-	-

Line voltage 112. Antenna and Ground shorted.

f - filament; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

Balance Procedure: Caution - Test set thoroughly for defective tubes, antenna and ground, check line voltage and chassis voltages before any attempt is made to re-balance.

Set volume control in full position, fidelity control in selective position, tone control at high position. Output meter usually connected across plates of 45 tubes.

Connect 485 K.C. service oscillator to grid of 6A7 and chassis ground. Adjust I.F. transformers to maximum output with minimum signal input. Rotate selectivity control to broad position, I.F. output should remain constant six K.C. plus and minus of 485 K.C.

Set band switch on 550 to 1500 scale, rotate gang to 1400 K.C. Set test oscillator at 1400 and connect to aerial and ground.

Adjust oscillator trimmer screw, top padder screw on oscillator coil, to scale.

Rotate gang to 600 K.C., set test oscillator at 600. Adjust padder inside left front corner of shield can, near oscillator coil, for maximum output.

Rotate gang and padder together near 600 K.C. while making this adjustment. Set pointer to exactly 600 K.C. Re-adjust service oscillator to 1400, rotate gang back to 1400 and re-check for maximum output and scale. The two R. F. and detector gang condenser trimmers should be adjusted to maximum output at 1400 K.C

The short wave bands are adjusted at 3.5 and 9 and 28 Meg. Adjust for maximum signal or noise level. Under no circumstances should wires in oscillator and 5-meter circuits be disturbed. Adjust screws following in sequence below 1400 oscillator screw on oscillator coil.

Resistance Checks: The following D. C. resistances are given as help for continuity test, taken with the average type of ohmmeter.

Chassis - Power pack disconnected.
Driver transformer, Part #95-250 - #2853 -- Center tap of secondary to each side, numbers, 5 to 4, and 6 to 6 - 675 and 700 Ohms.
Primary - Center tap to each side 450 and 525 Ohm, numbers 2 to 1 and 2 to 3.
High Boost, #95-252, with low boost disconnected.
Primary (White wire
(White and black tracer - 200 Ohms
Secondary -(Blue - 200 Ohm
(Yellow
Secondary- (Red
(White and Red tracer - 200 Ohms.
Low Boost, #95-251, with high boost and tone control disconnected.
Primary - 650 Ohms.
Secondary center tap to each side 5000 Ohms.
Antenna choke - #20-71 - 15 Ohms.
Wave Trap - #20-101 - 5 Ohms.
Relay - #195-1 - 3000 Ohms.
Detector filter choke - #20-99 - 150 Ohms.
3rd I.F. -#20-100 -(Brown - 7 Ohms
(Green
(Red -
(Blue - 6.5 Ohms
(Black
(Green grid cap wire - 3 Ohms.
High fidelity I.F. - #S-3356 - 2 used.
(Green - Brown - 3.2 Ohms.
(Blue - Red - 3.2 Ohms.

R.F. Coil - Check from Grid cap, green wire to brown wire coming out of bottom of coil 490,000 Ohms. This high resistance is due to series resistor mounted on coil form of 490,000 value. Black to White - Yellow to Blue - ½ ohms approximately.

Oscillator Coil -
Brown to Slate - ½ Ohm.
Brown to Black - 3.9 Ohm.
Brown to White - 1.5 Ohm.
Red Green tracer to Blue - 4.8 Ohms.
Red Green tracer to Yellow - .8 Ohms.
Red Green tracer to Red - 1.5 Ohms.
Red to Blue - 3.2 Ohms.
Red to Yellow - 6.8 Ohms.

Antenna Coil - Check for continuity - Red wire through to Green wire - This will include all coils on this form.

These coil readings are given on coils only, disconnected from associating circuits.

Power pack readings taken with set disconnected and pack cold, tubes in sockets.

Both A. C. primary windings #95-256 and #95-257 less than ½ Ohm. 45 and 6 volt winding practically no D.C. resistance, - check for continuity only and check center tap of 45 winding.

5Z3 filament same as above.
5Z3 plate windings 100 Ohms.
Check center tap, approximately ½ of total winding or 50 Ohms.
Filter chokes - #95-255 - #95-254 - 70 Ohms.
Line filter #S-3367 - Check for continuity.
See voltage readings supplement.

SERVICE NOTES

Hums - Defective tubes and check filters - Voltages, etc.

Hums - Weak and Distorted. Check #95-250 transformer for open winding, weak audio if shorted.

Too Much High, Lacks Low Notes - #95-250 open center tap. #22-225 condenser open 50,000 ohm resistor grounded on tone control to bottom plate. ½ of low boost shorted secondary.

Motorboats On All Bands - #22-228 - .5 condenser to 85 socket open, I. F. shorted, graph won't narrow and set will distort on edge of carrier.

Weak And Distorted All Bands. 1500 Ohm resistor across #22-189 25-volt 2 Mmfd. open.

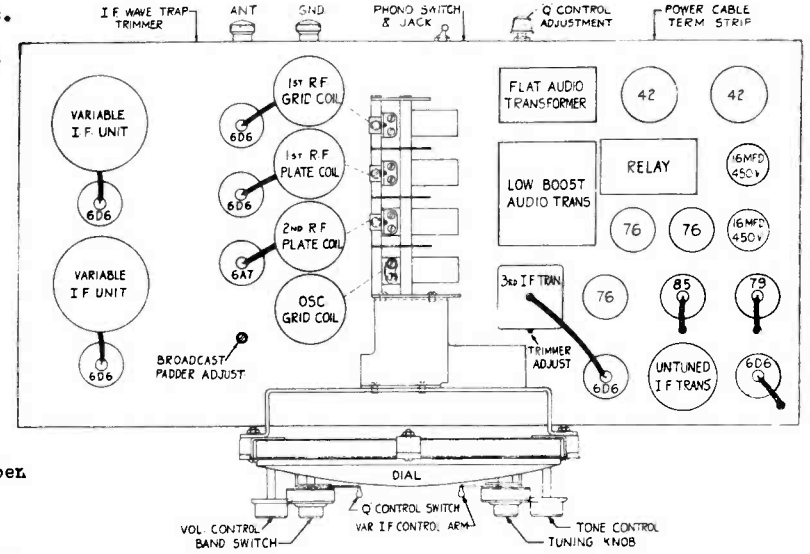
Blocks Up - Tendency to Slow Motorboat. Check red wire from #63-407 to 10,000 ohm on 5-meter coil for ground. Set seems alive but no signal if this resistor is open.

Set Dead- Check tubes, filters, coils and transformers and I.F. for grounds or open.

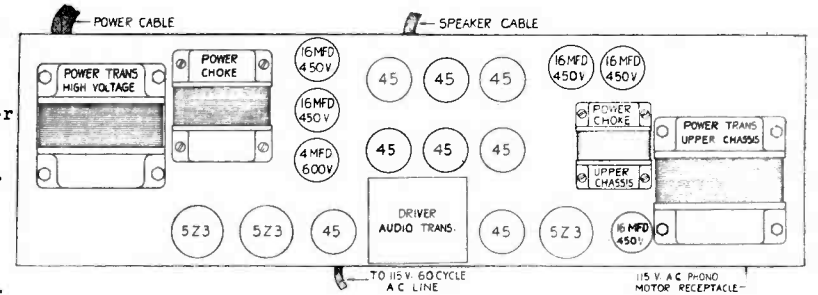
Dead - No Radio - Open 'Phono Switch.

Weak Audio And High Notes - Hum level increases slightly if you pull one push-pull #42 tube. Open secondary on low boost #95-251. Disconnect high boost and tone control circuit before testing.

Tone Control No Effect On Highs. Set flutters as tone control is rotated to bass. Check .1-22 -3770 for open or short.



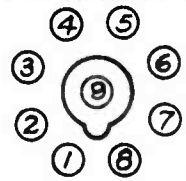
Receiver Chassis Drawing



Power Pack Chassis Drawing

TUBE	POSITION	1	2	3	4	5	6	7	8	9
6K7	R.F.	0	3_{ac}	230	95	0	-	3_{ac}	0	-.1
6A8	1st.Det. Osc.	0	3_{ac}	230	95	0	140	3_{ac}	0	-.1
6K7	I.F.	0	3_{ac}	230	95	0	-	3_{ac}	0	-.1
6H6	2nd Det. A.V.C.	0	3_{ac}	-1	-1	0	-	3_{ac}	-1	-
6C5	1st.Aud.	0	3_{ac}	22	-	-2	-	3_{ac}	-2	-
6C5	2nd Aud.	0	3_{ac}	210	-	-2	-	3_{ac}	0	-
6F6	PWR.	0	3_{ac}	350	350	-3	-	3_{ac}	27	-
5Y3	Rect.	0	360	-	350_{AC}	-	350_{AC}	-	360	-

Line Voltage 115 Antenna and Ground Disconnected



BOTTOM VIEW OF SOCKET

Voltages measured from point indicated to ground, using a 1000 ohm per volt meter, except heaters. (2 - 7)

Alignment

The use of an accurately calibrated service oscillator is imperative in the alignment of modern superheterodynes. The alignment procedure is as follows:

(1) Connect service oscillator to grid of 6A8 and ground. Balance I. F. trimmers at 456 K.C.

(2) Connect service oscillator to antenna and ground binding posts and set at 6 megacycles. Adjust oscillator trimmer on gang for correct dial reading, (6 megacycles on Band B).

(3) Set service oscillator and pointer to 21 megacycles and adjust S.W. trimmer (through hole in top of chassis) for correct dial reading.

(4) Recheck 6 megacycle adjustment.

(5) Set service oscillator and pointer to 1700 K.C. (Band A) and adjust broadcast trimmer (through hole in top of chassis) for correct dial reading.

(6) Set service oscillator at 600 K.C. Adjust broadcast padder (through hole in top of chassis next to I.F. transformer), meanwhile rocking pointer to and fro past 600 K.C. on dial to combination giving greatest output.

(7) Readjust at 1700 K.C.

Note: These adjustments affect each other slightly and the entire procedure should be repeated to secure maximum results.

ZENITH RADIO

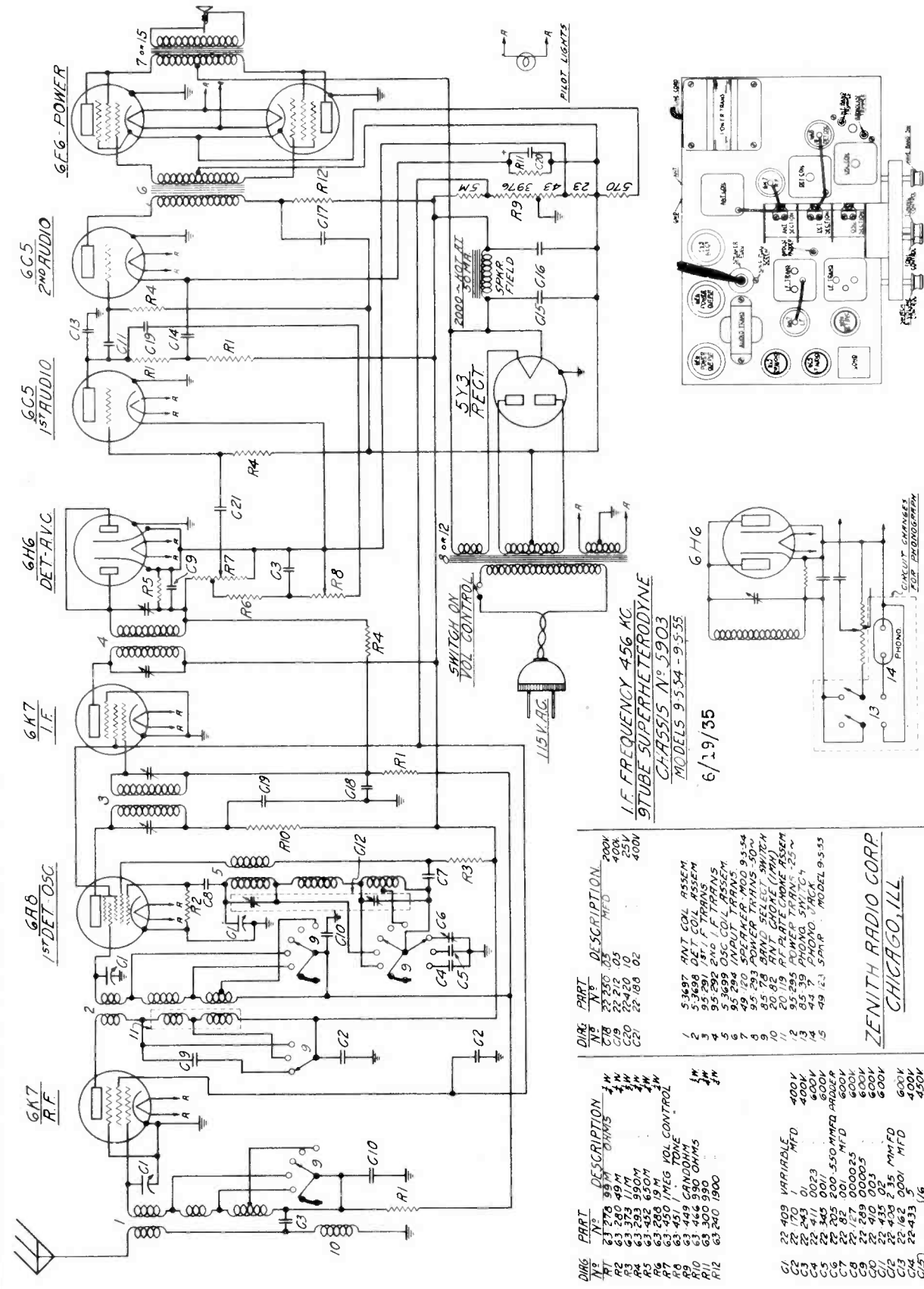
PARTS AND PRICES — Models 9-S-30, 9-S-54 and 9-S-55

Chassis #5903 - Domestic
#5903 A - Export

	Dial Assembly	
7-6	Dial Glass Bezel (part of 57-511)	-
26-94	Aeroplane Dial Scale	$1.00
32-8	Drive Belt	.20
34-49	Condenser Shaft Gear	.25
34-50	Pinion Gear	.05
34-51	Lower Pinion and Gear	.15
56-44	Planetary Guide Pin (furnished with 76-181)	-
59-40	Special Z Pointer	.15
59-41	Split Second Pointer	.10
61-35	Shaft Pulley and Sleeve	.25
61-36	Tension Pulley	.05
61-37	Dial Pulley	.05
76-180	Tension Pulley Shaft	.05
76-181	Planetary Drive Assembly	1.00
80-111	Dial Spring	.25
80-112	Tension Pulley Spring	.10
83-407	Dial Light Diffusion Strip	.05
100-23	6.3 Volt Pilot Lamp	.15
116-10	Band Switch Indicator Link	.05
159-11	Snap Buttons	.02
188-2	Retainer Ring	.10
196-4	Dial Glass Gasket (part of 57-511)	-
S-3777	Tension Pulley and Spring Assembly	.30
S-3782	Band Indicator Lever Arm and Bushing Assembly	.30
S-3783	" " Scale and Arm Assembly	1.00
S-2918	Dial Lamp Socket and Clip Assembly	.15
	Condensers	
22-82	.001 Mfd. 600 Volt	.25
22-127	.000025 " 600 "	.20
22-162	.001 " 600 "	.20
22-170	.5 " 400 "	.25
22-188	.02 " 400 "	.15
22-205	200-500 Mmfd. Padder	.35
22-212	.05 Mfd. 400 Volt	.20
22-243	.01 " 400 "	.15
22-250	.05 " 200 "	.15
22-289	.00005 " 600 "	.12
22-345	.0011 " 600 "	.15
22-406	2-35 Mmfd. Padder	.25
22-409	3-Gang Variable Condenser	3.50
22-410	.003 Mfd. 600 Volt	.40
22-411	.0023 " 600 "	.25
22-412	16 x 4 x 2 Mfd. 450 Volt (domestic only)	3.00
22-420	10. Mfd. 25 Volt	.65
22-433	.5 " 400 "	.30
22-435	.02 " 600 "	.15
22-421	16 x 4 x 2 Mfd. 450 Volt (export only)	3.25
	Resistors	
63-240	1900 Ohm $\frac{1}{4}$ Watt	.20
63-278	99 M Ohm $\frac{1}{4}$ Watt	$ .20
63-280	49 M " $\frac{1}{4}$ "	.20
63-288	19 M " $\frac{1}{4}$ "	.20
63-293	990 M " $\frac{1}{4}$ "	.20
63-300	990 " $\frac{1}{4}$ "	.20
63-373	11 M " $\frac{1}{2}$ "	.20
63-449	Candohm Resistor	1.00
63-450	Volume Control and Switch Assembly (domestic only)	1.00
63-451	Tone Control Assembly	.80
63-452	650 M Ohm $\frac{1}{4}$ Watt	.20
63-466	990 " $\frac{1}{2}$ "	.20
63-472	Volume Control and Switch Assembly (export only)	1.00
	Coils and Chokes	
20-82	Antenna Choke	.25
20-119	R. F. Plate Choke Assembly	.50
95-291	1st I.F. Transformer Assembly	1.25
95-292	2nd " " " "	1.25
S-3697	Antenna Coil Assembly	1.00
S-3698	Detector Coil Assembly	.85
S-3699	Oscillator Coil Assembly	.85
	Miscellaneous	
44-7	Phonograph Jack (export only)	.15
46-123	Band Selector Switch Knob	.20
46-124	Volume and Tone Control Knobs	.20
46-125	Tuning Knob (small)	.15
46-126	" " (large)	.15
49-120	12" Dynamic Speaker (Models 54 and 55)	10.00
	Cone and Voice Coil for 49-120	3.25
	Field Coil for 49-120	2.00
	Output Transformer for 49-120	2.00
49-126	8" Dynamic Speaker (Model 30)	8.00
	Cone and Voice Coil for 49-126	2.50
	Field Coil for 49-126	2.00
	Output Transformer for 49-126	2.00

ZENITH RADIO CORP.

MODELS 9-S-30, 9-S-54, 9-S-55
Schematic, Socket, Trimmers
Parts



I.F. FREQUENCY 456 KC.
9 TUBE SUPERHETERODYNE
CHASSIS Nº 5903
MODELS 9-S-54 - 9-S-55

6/19/35

DIAG. Nº	PART Nº	DESCRIPTION	
C18	23360	MFD	200V
C19	22 212	05	400V
C20	22 420	10	25V
C21	22 188	02	400V

1	53697	ANT COIL ASSEM	
2	53698	DET COIL ASSEM	
3	95 291	1ST I.F. TRANS	
4	95 292	2ND I.F. TRANS	
5	53699	OSC COIL ASSEM.	
6	49 204	OUTPUT TRANS	
7	95 293	SPEAKER MOD 9-S-54	
8	95 73	POWER TRANS -50~	
9	85 78	BAND SELECT SWITCH	
10	20 82	ANT CHOKE (MW)	
11	20 119	RF PLATE CHOKE ASSEM	
12	95 295	POWER TRANS -25~	
13	85 39	PHONO SWITCH	
14	43 7	PHONO JACK	
15	49 23	SPKR. MODEL 9-S-55	

DIAG Nº	PART Nº	DESCRIPTION OHMS	
R1	63 278	95M	1W
R2	63 280	49M	1W
R3	63 293	990M	1W
R4	63 292	630M	1W
R5	63 452	1M	1W
R6	63 288	19M	1W
R7	63 450	1MEG VOL CONTROL	
R8	63 451	TONE	
R9	63 449	CANDOHM	
R10	63 446	990 OHMS	1W
R11	63 300	990	1W
R12	63 240	1900	1W

C1	22 409	VARIABLE	400V
C2	22 170	MFD	400V
C3	22 243	01	600V
C4	22 411	0023	600V
C5	22 345	001	600V
C6	22 205	200-550 MMFD PADDER	600V
C7	22 82	001 MFD	600V
C8	22 127	00025	600V
C9	22 289	00005	600V
C10	22 403	025	600V
C11	22 402	235 MMFD	600V
C12	22 162	0001 MFD	450V
C13	22 433	5	450V
C14	22 4/2	1/6	450V
C15		4	
C16			
C17			

Chassis 5618

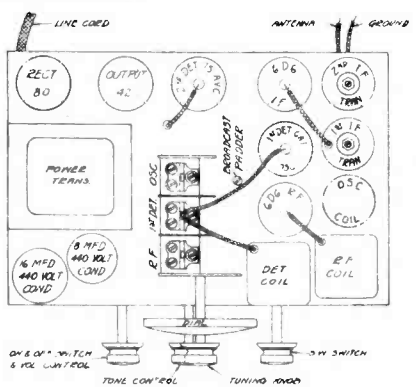
TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.6	2.4	0	70	2.4	200
6A7	1st.Det.	5.6	3	0	70	-	250
	Osc.			3.6	-	-	230
6D6	I.F.	5.6	2.6	0	70	2.6	250
75	2nd.Det. 1st Audio	5.6	1.4	0	-	-	148
42	PWR.	5.6	0	-.6	250	-	250
80	RECT.	4.6	-	-	-	-	-

Line Voltage 112 Antenna and Ground Disconnected

All measurements taken from point indicated to ground, using a 1000 ohm per volt D.C. meter (except heaters). F - filament; K - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

Alignment

1. Balance intermediate transformers at 252.5 K.C. with oscillator connected to grid of first detector and ground.
2. Adjust wave trap padder (located underneath chassis at rear right side) for weakest signal with 252.5 K.C. oscillator connected to aerial and ground.
3. Turn wave band switch clockwise to the highest frequency band. Connect 17,500 K.C. oscillator to aerial and ground. Balance oscillator trimmer on three-gang condenser for correct dial reading at this frequency.
4. Turn wave band switch counter-clockwise to standard broadcast position. Adjust broadcast oscillator trimmer (located underneath chassis at right center) for correct dial reading at 1400 K.C. and balance R.F. and 1st detector trimmers on three-gang condenser for loudest signal.
5. Adjust oscillator padder (located next to oscillator section of gang on top of chassis) while rocking pointer back and forth past 600 K.C. for combination giving maximum output.
6. Recheck 1400 K.C.



TUBE-POSITION

Tube Position

PARTS AND PRICES

Models S-908, 909, S-961, 1167

Chassis 5618

Dial Assembly

S-3552	Complete split second dial assembly	$3.75
26-84	Dial scale only	.40
59-32	Split second pointer	.10
59-33	Special Z pointer	.20
93-231	Glass cushion washer	.05
192-6	Dial glass	.20

Coils and Chokes

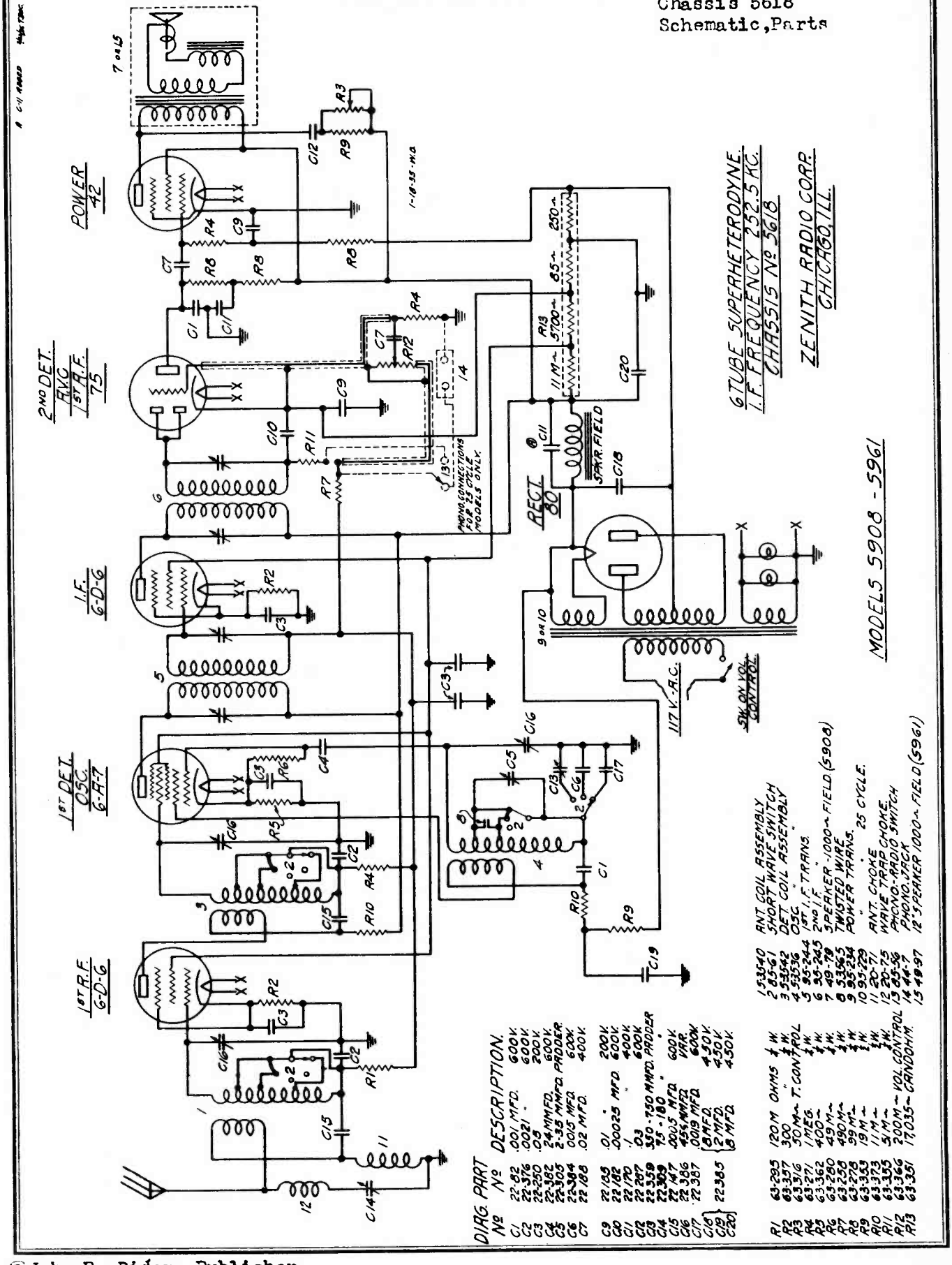
20-71	Antenna Choke	.20
20-75	Wave trap choke	.25
95-244	1st I.F. transformer	1.50
95-245	2nd I.F. transformer	1.50
S-3536	Oscillator coil assembly	1.25
S-3540	Antenna coil assembly	1.75
S-3542	Detector " "	2.00

Miscellaneous

46-108	Band selector switch knob (Models 909, S-961, 1167)	.15
46-109	Tuning control knob	.10
46-110	Tone control knob	.10
46-111	Volume control knob	.10
46-112	Band selector switch knob (Model S-908)	.15
49-79	8" Dynamic speaker for S-908, 909	8.00
	Cone and voice coil for 49-79	2.50
	Output transformer for 49-79	2.00
	Field coil for 49-79	2.00
49-97	12" Dynamic speaker for S-961, 1167	10.00
	Cone and voice coil for 49-97	3.25
	Output transformer for 49-97	2.00
	Field coil for 49-97	2.00
57-483	Dial escutcheon plate	.45
78-82	Type 80 tube socket	.10
78-100	" 6D6 " "	.10
78-101	" 75 " "	.10
78-102	" 42 " "	.10
78-106	" 6A7 " "	.10
85-56	Phono switch (25 cycle)	.35
85-61	Band selector switch	1.10
95-229	All voltage, 25 cycle power transformer	6.50
100-23	Pilot lamp	.15
126-131	Coat tube shield	.10
S-3021	#95-234 power transformer and mounting plate, 117 V.,60 C.	4.00

ZENITH RADIO CORP.

MODELS S-908, S-909, S-961
1167
Chassis 5618
Schematic, Parts



DIAG. No.	PART No.	DESCRIPTION.		
C1	22-82	.001 MFD.	600 V.	
C2	22-376	.0021 "	600 V.	
C3	22-250	.05 "	200 V.	
C4	22-382	24 MMFD.	600 V.	
C5	22-305	2-35 MMFD.	PRODER.	
C6	22-384	.005 MFD.	600 V.	
C7	22-188	.02 MFD.	400 V.	
C9	22-135	.01 "	200 V.	
C10	22-182	.00025 MFD.	600 V.	
C11	22-170	.05 "	400 V.	
C12	22-287	.03 "	600 V.	
C13	22-359	330-730 MMFD.	PRODER	
C14	22-309	15-180 "	600 V.	
C15	22-147	.005 MFD.	VAR.	
C16	22-386	455 MMFD.	600 V.	
C17	22-387	.0019 MFD.	450 V.	
C18	22365	.8 MFD.	450 V.	
C19		.2 MFD.	450 V.	
C20		.8 MFD.	450 V.	
R1	63-295	120 M OHMS	½ W.	
R2	63-357	300 M~	½ W.	
R3	63-316	30 M~ T. CONTROL		
R4	63-271	1 MEG.	1 W.	
R5	63-362	400 M~	1 W.	
R6	63-280	49 M~	1 W.	
R7	63-258	490 M~	1 W.	
R8	63-278	99 M~	1 W.	
R9	63-353	19 M~	1 W.	
R10	63-373	1 M~	1 W.	
R11	63-355	5 M~	1 W.	
R12	63-366	200 M~ VOL. CONTROL		
R13	63-351	17,035~ CARBOHM.		

1	53340	ANT. COIL ASSEMBLY
2	85-61	SHORT WAVE SWITCH
3	53542	DET. COIL ASSEMBLY
4	53536	OSC. "
5	85-244	1ST I.F. TRANS.
6	85-245	2ND I.F. "
7	49-79	SPEAKER-1000~ FIELD (5908)
8	53565	TWISTED WIRE
9	85234	POWER TRANS. 25 CYCLE.
10	85-229	"
11	20-71	ANT. CHOKE
12	20-75	WAVE TRAP CHOKE
13	85-56	PHONO-RADIO SWITCH
14	44-7	PHONO. JACK
15	49-97	12" SPEAKER 1000~ FIELD (5961)

MODELS S-829,S-870,S-871
1170
Chassis 5701R,5702R,5703R
Voltage,Socket,Trimmers
Alignment

ZENITH RADIO CORP.

5703R

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.4	3	0	76	3	250
6D6	1st.Det.	5.4	6.2	0	76	6.2	250
76	Osc.	5.4	0	0	-	-	165
6D6	I.F.	5.4	6.2	0	76	6.2	250
75	2nd.Det. A.V.C. 1st.Aud.	5.4	1	0	-	-	125
42	PWR	5.4	0	-.5	-	250	240
80	Rect.	4.6	-	-	-	-	-

Line voltage 112 Antenna and Ground Disconnected

F - heaters; K - cathode; G1 - control grid; G2 - screen grid; G3 suppressor grid; P - plate.

Alignment

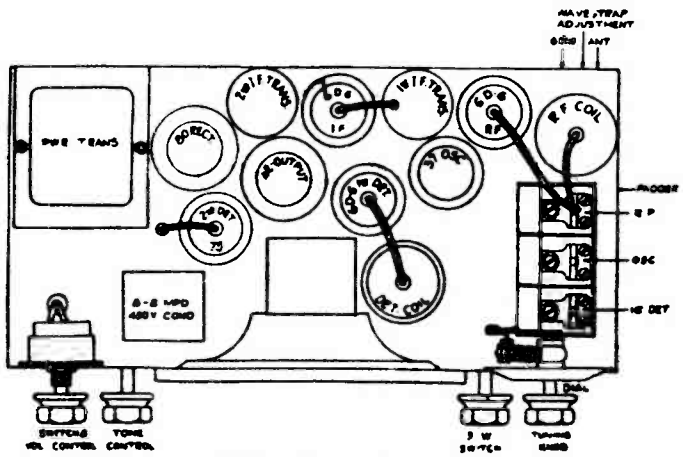
(1) Balance intermediate transformers at 252.5 K.C. with service oscillator connected to grid of first detector and ground.

(2) Adjust wave trap padder (located on rear of chassis at right side) at 252.5 K.C. for weakest signal with service oscillator connected to aerial and ground.

(3) Turn wave band switch clockwise to the highest frequency band. Set service oscillator at 15 megacycle (still connected to aerial and ground). Adjust trimmer on oscillator section of 3-gang condenser for correct dial reading at this frequency.

(4) Turn wave band switch counter-clockwise to standard broadcast. Adjust oscillator trimmer (located underneath chassis next to band switch) for correct dial reading at 1400 K.C. and balance R.F. and 1st detector trimmers on gang condenser for loudest signal at this frequency.

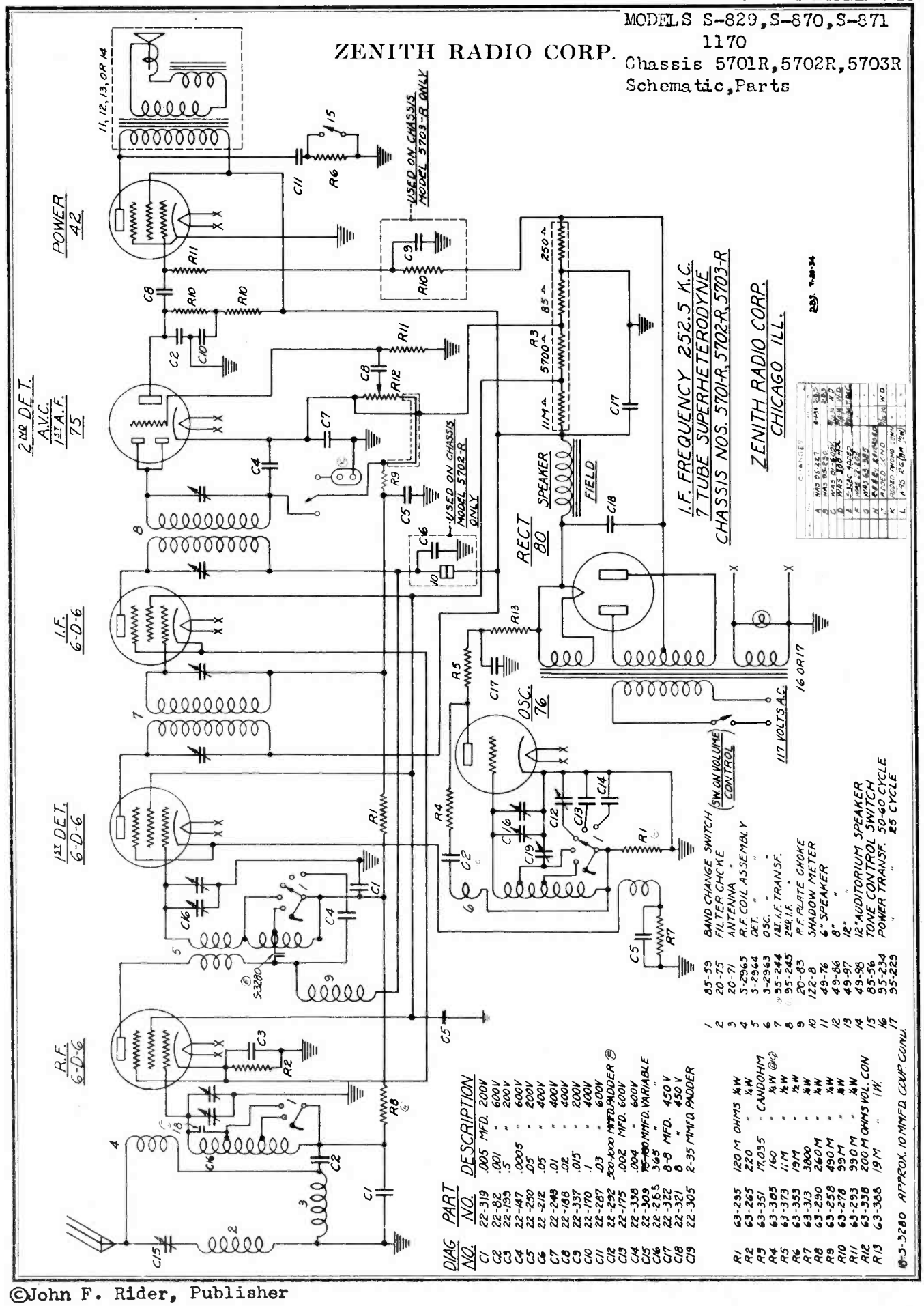
(5) Adjust broadcast oscillator padder (through hole in right side of chassis) at 600 K.C. meanwhile rocking dial pointer past this point on dial, to position giving loudest signal.



Tube Layout

ZENITH RADIO CORP.

MODELS S-829, S-870, S-871
1170
Chassis 5701R, 5702R, 5703R
Schematic, Parts



DIAG NO.	PART NO.	DESCRIPTION
C1	22-319	.005 MFD. 200V
C2	22-82	.001 " 600V
C3	22-195	.5 " 200V
C4	22-147	.0005 " 600V
C5	22-230	.05 " 200V
C6	22-212	.05 " 400V
C7	22-248	.01 " 400V
C8	22-188	.02 " 200V
C9	22-337	.015 " 400V
C10	22-170	.1 " 600V
C11	22-287	.03 " 600V
C12	22-292	300-1000 MMFD. PADDER (S)
C13	22-175	.002 MFD. 600V
C14	22-338	.004 " 600V
C15	22-309	75-160 MMFD. VARIABLE
C16	22-265	345 " "
C17	22-322	8-8 MFD. 450 V
C18	22-321	8 " 450 V
C19	22-305	2-35 MMFD PADDER
R1	63-295	120 M OHMS ½W
R2	63-265	220 " ½W
R3	63-351	17,035 " CANDOHM
R4	63-305	160 " ½W (S)
R5	63-373	1 M " ½W
R6	63-353	1 M " ½W
R7	63-313	3800 " ½W
R8	63-290	260 M " ½W
R9	63-258	490 M " ½W
R10	63-278	99 M " ½W
R11	63-293	990 M " ½W
R12	63-338	200 M OHMS VOL. CON
R13	63-368	1 M " 1W.
S-3280		APPROX. 10 MMFD. COMP. COND.

1	85-59	BAND CHANGE SWITCH	
2	20-75	FILTER CHOKE	
3	20-71	ANTENNA "	
4	5-2965	R.F. COIL ASSEMBLY	
5	5-2964	DET. " "	
6	3-2963	OSC. "	
7	95-244	1ST I.F. TRANSF.	
8	95-245	2ND I.F. "	
9	20-83	R.F. PLATE CHOKE	
10	122-8	SHADOW METER	
11	49-76	6" SPEAKER	
12	49-86	8" "	
13	49-97	12" "	
14	49-98	12" AUDITORIUM SPEAKER	
15	85-56	TONE CONTROL SWITCH	
16	95-234	POWER TRANSF. 50-60 CYCLE	
17	95-229	" " 25 CYCLE	

SOCKET VOLTAGES

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
15	R. F.	2	1.5	0	70	-	125
6A7	Det.-Osc.	6	2	0	150	-	150
				-1	-	-	150
15	I. F.	2	2	0	70	-	150
75	2nd Det. A.V.C.	6	1.5	0	-	-	40
76	1st Audio	6	8	0	-	-	140
19	PWR.	2	-	0	-	-	160
				0			160

Battery Voltage 6 Volts Antenna and Ground Disconnected

All voltages measured from socket contacts to ground with 1000 ohm per volt D. C. meter.

F - Filament; K - Cathode; g1 - Control grid; g2 - Screen grid; g3 - Suppressor grid; p - plate.

Alignment

1. Attach service oscillator to grid cap of 6A7 tube and adjust I.F. trimmers at 456 K.C.
2. Place band switch in "A" (Standard broadcast) position and attach 1400 K.C. service oscillator to antenna and ground posts. Set dial indicator to 1400 K.C. and adjust trimmers "A" (Osc.); "B" (R.F.); "C" (Det.) to maximum output.
3. Set service oscillator to 600 K.C. and rock indicator over 600 K.C. on dial of receiver while adjusting standard broadcast padder "D".
4. Repeat operations 2 and 3.
5. Place band switch in "B" or 1st short wave position (2100 - 6800 K.C.) and set white dial pointer on 6 megacycles. Set service oscillator to 6 megacycles and adjust trimmer "E" for maximum output while rocking dial pointer slowly over 6 megacycle division.
6. Place band switch on "C" position (7000- 23000 K.C.) and set service oscillator and white dial pointer to 18 megacycles. Adjust trimmer "F" to resonance while rocking dial indicator slowly over 18 megacycle division.
7. Set dial and service oscillator at 9 megacycles and twist or untwist tinned bare wire tuning "loop" (on front section of band switch under chassis) for maximum output.
8. Align standard broadcast band again at 1400 K.C. by adjusting trimmer "A" only. Repeat all eight operations for final accuracy.

Dial Assembly

7-6	Dial Glass Bezel....	-	76-180	Tension Pulley Shaft...	.05
26-104	Aeroplane Dial Scale.	1.00	80-111	Dial Spring.....	.25
32-7	Dial Drive Belt.....	.20	80-112	Tension Pulley Spring.....	.10
34-49	Condenser Shaft Gear.	.25	83-407	Dial Light Diffusion Strip	.05
34-50	Pinion Gear.....	.05	100-23	6.3 V. Pilot Lamp.....	.15
34-51	Lower Pinion and Gear	.15	159-11	Snap Buttons.....	.02
59-40	Special Z Pointer....	.15	188-2	Retaining Ring.....	.10
59-41	Split Second Pointer	.10	192-10	Dial Glass.....	-
61-34	Drive Pulley.....	.10	196-4	Dial Glass Gasket.....	-
61-35	Shaft Pulley and Sleeve	.25	198-1	Dial Reflector.....	.40
61-36	Tension Pulley.....	.05	S-3777	Tension Pulley and Spring Assembly	.30
76-178	Drive Shaft.....	.10			

Coils and Chokes

20-82	Antenna Choke.....	.25
20-88	R. F. Choke	.25
20-119	R. F. Plate Choke Assembly.....	.50
95-291	1st I. F. Transformer Assembly.....	1.25
95-292	2nd I. F. " "	1.25
S-3697	Antenna Coil Assembly	1.00
S-3698	Detector " "	.85
S-3699	Oscillator " "	.85

Miscellaneous

19-59	Battery Lead Clip (Positive).....	.15
19-60	" " " (Negative).....	.15
46-124	Volume Control Knob.....	.20
46-127	Tone and Tuning Knobs.....	.20
46-132	Band Selector Switch Knob.....	.20
49-131	12" Magnetic Speaker Assembly (Model 62).	8.00
	Cone Assembly for 49-131.....	1.00
	Felt Ring " " "	.15
	Coil for 49-131	1.25
	Motor Drive Assembly for 49-131.....	6.50
	Cord and Plug Assembly for 49-131.....	.75
49-132	8" Magnetic Speaker Assembly (Model 27).....	6.00
	Cone Assembly for 49-132.....	.60
	Paper Ring " " "	.10
	Coil for 49-132.....	1.25
	Motor Drive Assembly for 49-132.....	4.75
	Terminal Strip Cord and Plug Assembly for 49-132	.60
57-511	Dial Glass and Escutcheon Plate Assembly.....	1.50
58-30	Four Prong Speaker Plug.....	.25
78-101	Type 75 Wafer Tube Socket.....	.10
78-106	" 6A7 " " "	.10
78-109	" 76 " " "	.10
78-124	" 19 " " "	.10
78-128	Five Prong Speaker Plug Socket.....	.10
78-139	Type 15 Wafer Tube Socket	.10
78-141	Vibrator " " "	.10
83-334	Antenna and Ground Terminal Strip.....	.10
85-78	Band Selector Switch.....	1.50
95-298	Power Choke.....	.75
95-305	Rectifier Transformer.....	1.75
95-311	Audio Transformer.....	1.25
126-127	Tube Shield.....	.10
126-201	Vibrator Shield.....	.15
190-5	Special Zenith Vibrator.....	5.00

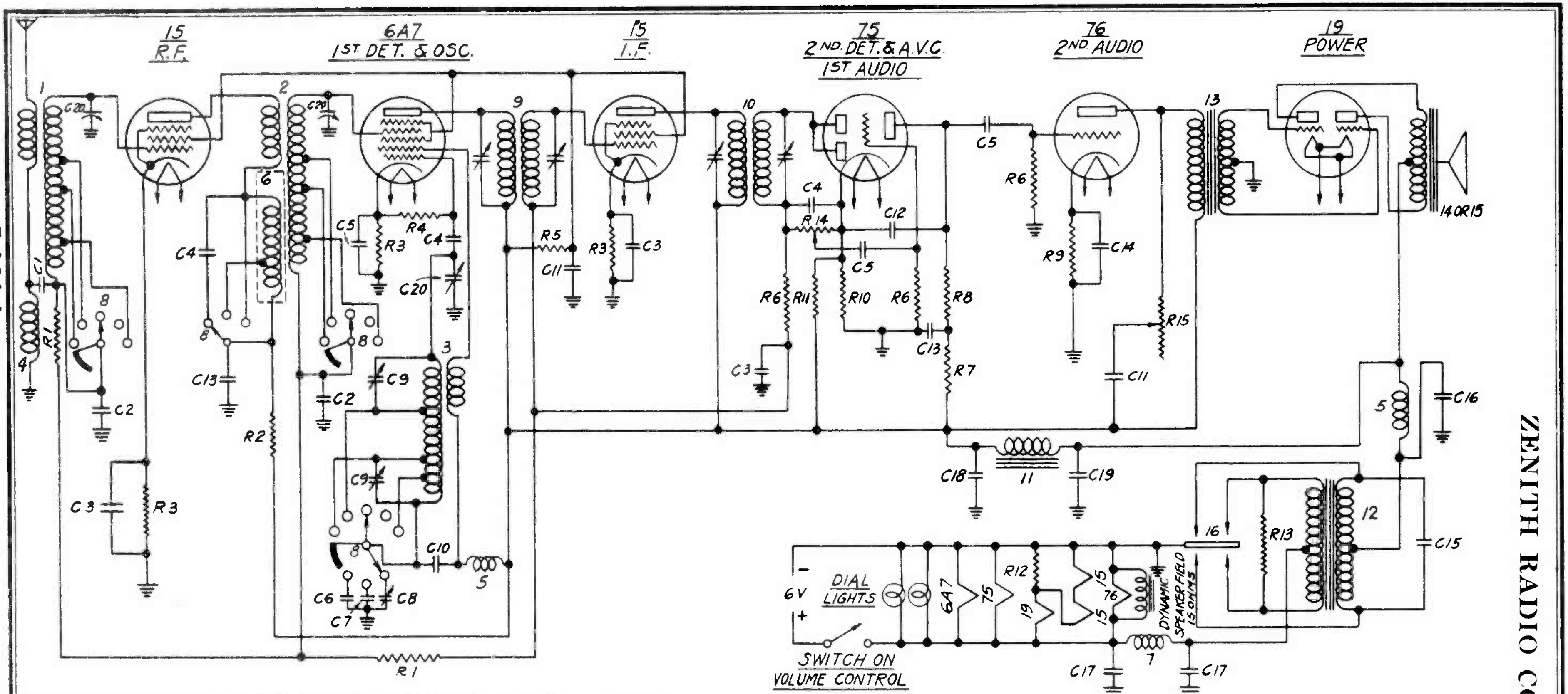
ZENITH RADIO CORP.

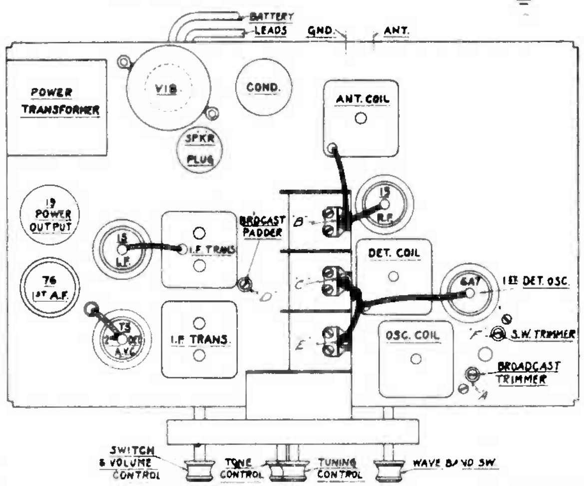
MODELS 6V27, 6V62
Chassis 5621
Schematic, Socket Trimmers, Parts

3 BAND: 550 KC. - 1780 KC. / 2100 KC. - 6800 KC. / 7000 KC. - 23000 KC.

I.F. FREQUENCY 456 KC.
6 TUBE BATTERY SUPERHETERODYNE
CHASSIS No 5621

MODELS - 6V27, 6V62





DIAG NO.	PART NUMBER	DESCRIPTION			DIAG NO.	PART NUMBER	DESCRIPTION		
R1	63-278	9.9 M	OHMS	1/4 W.	C9	22-408	2-35 MMFD. PADDER		
R2	63-361	5 M	"	1/4 W.	C10	22-82	.001	MFD.	600 V.
R3	63-362	400	"	1/4 W.	C11	22-212	.05	"	400 V.
R4	63-280	49 M	"	1/4 W.	C12	22-182	.00025	"	600 V.
R5	63-353	1.9 M	"	1/2 W.	C13	22-224	.1	"	300 V.
R6	63-293	990 M	"	1/4 W.	C14	22-225	5	"	25 V.
R7	63-290	260 M	"	1/4 W.	C15	22-437	.01	"	1400 V.
R8	63-258	490 M	"	1/4 W.	C16	22-228	.5	"	300 V.
R9	63-272	4 M	"	1/4 W.	C17	22-251	.5	"	200 V.
R10	63-238	1 M	"	1/4 W.	C18 } C19 }	22-432	8 / 2		250 V
R11	63-260	100 M	"	1/4 W.	C20	22-409	456 MMF. VAR. COND.		
R12	63-477	100	FLEXIBLE WIRE WOUND	1/4 W.	1	S-3697	ANT. COIL ASSEM.		
R13	63-394	200	OHMS	1/2 W.	2	S-3698	DET. COIL ASSEM.		
R14	63-456	200 M	VOL CONTROL & SWITCH		3	S-3699	OSC. COIL ASSEM.		
R15	63-458	50 M	TONE CONTROL		4	20-82	ANT. CHOKE		
					5	20-88	R.F. CHOKE		
					6	20-119	R.F. PLATE CHOKE		
					7	S-2778	R.F. CHOKE		
C1	22-243	.01	MFD.	400 V.	8	85-78	BAND SELECTOR SWITCH		
C2	22-410	.003	"	600 V.	9	95-291	1ST I.F. TRANS.		
C3	22-250	.05	"	200 V.	10	95-292	2ND I.F. TRANS.		
C4	22-289	50	MMFD.	600 V.	11	95-298	POWER CHOKE		
C5	22-188	.02	MFD.	400 V.	12	95-305	RECTIFIER TRANS.		
C6	22-411	.0023	"	600 V.	13	95-311	AUDIO TRANS.		
C7	22-345	.0011	"	600 V.	14	49-132	8" MAG. SPEAKER	MOD. 6V27	
C8	22-205	200-350 MMFD. PADDER			15	49-134	12" DYN. " "	MOD. 6V62	

Socket Voltages

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
15	1st Det. Osc.	2	8	0	115	-	155
15	I. F.	2	3.5	0	115	-	155
75	2nd Det. A.V.C.	6	1.5	0	-	-	30
38	PWR	6	14	0	155	-	148

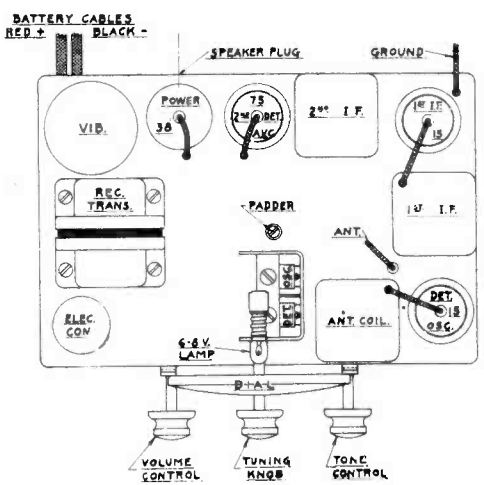
Battery - 6 volts Antenna and ground disconnected.

f - filament; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

All measurements taken from point indicated to ground using a 1000 ohm per volt D. C. meter.

Alignment

(1) Balance intermediate transformers at 456 K.C. with service oscillator connected to grid of 15 first detector and ground.
(2) Connect service oscillator to antenna and ground.
(3) Adjust oscillator trimmer on gang condenser for correct dial reading at 1400 K.C.
(4) Adjust detector trimmer on gang condenser to resonance.
(5) Adjust oscillator padder (located in rear of gang) meanwhile rocking pointer past 600 K.C. to combination giving greatest output.
(6) Repeat operations 3 and 4.

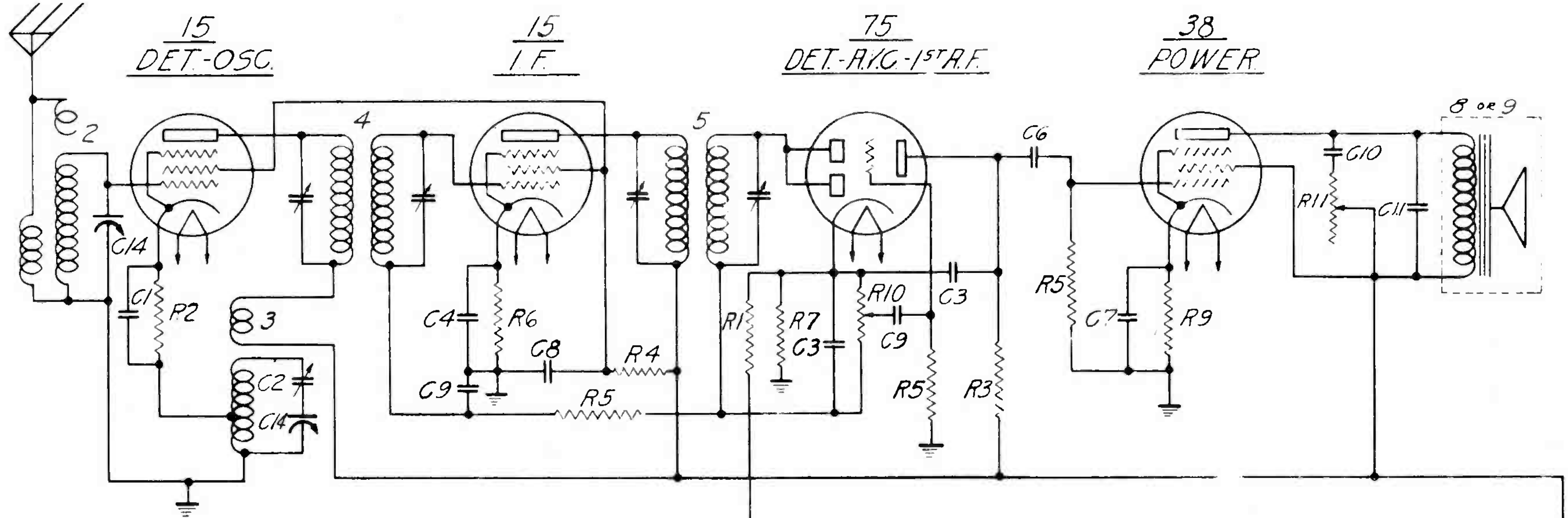


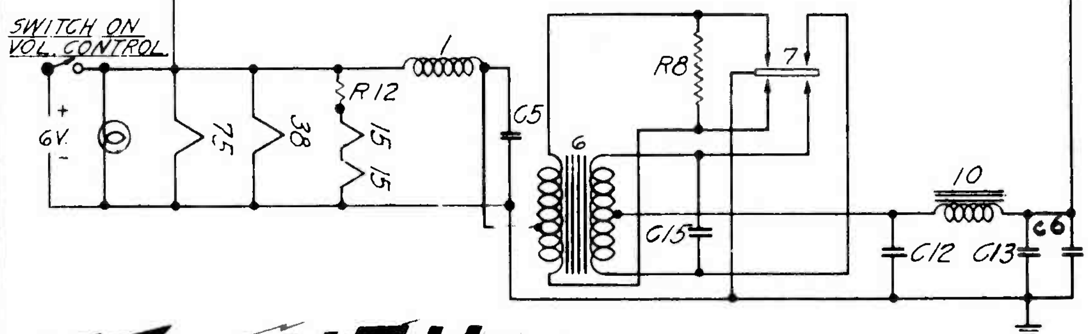
PARTS AND PRICES Models 4-V-31, 4-V-59
Chassis #5405

	Dial Assembly	
7-7	Dial Glass and Scale Bezel and Mounting Bracket	.40
26-98	Dial Scale	.50
59-45	Dial Pointer and Busing Assembly	.15
61-38	Dial Pulley	.40
76-182	Dial Drive Shaft	.10
80-69	Dial Tension Spring	.02
94-200	Dial Shaft Bushing	.10
100-23	6.3 Volt Dial Lamp	.15
132-13	Dial Glass Retaining Ring	.05
188-2	Retaining Rings	.10
192-11	Dial Glass	.15
196-5	Dial Glass Gasket	.03
	Condensers	
22-82	.001 Mfd. 600 Volts	.25
22-182	.00025 " 600 "	.12
22-185	.01 " 200 "	.20
22-199	.5 " 200 "	.35
22-205	200-550 Mmfd. Padder	.35
22-212	.05 Mfd. 400 Volts	.20
22-225	5. " 25 "	.65
22-243	.01 " 600 "	.15
22-250	.05 " 200 "	.15
22-287	.03 " 600 "	.15
22-358	.002 " 600 "	.20
22-419	2 x 8 " 250 "	1.75
22-426	2-Gang Variable Condenser	2.00
22-427	.006 Mfd. 1200 Volts	.15
	Resistors	
63-238	1 M Ohm ½ Watt	.20
63-247	8 M " ½ "	.20
63-258	490 M " ½ "	.20
63-281	29 M " ½ "	.20
63-293	990 M " ½ "	.20
63-303	700 " ½ "	.20
63-378	250 " ½ "	.20
63-394	200 " ½ "	.20
63-418	1500 " 2 "	.20
63-468	200 M Volume Control and Switch Assembly	1.00
63-469	50 M Tone Control Assembly	.60
63-476	9.1 Ohm ½ Watt	.20
	Coils and Chokes	
95-308	1st I.F. Transformer Assembly	1.25
95-309	2nd I.F. Transformer Assembly	1.25
S-3755	Antenna Coil Assembly	1.25
S-3756	Oscillator Coil Assembly	1.50
S-2778	Vibrator R. F. Choke Assembly	.15

MODELS 4V31,4V59
Chassis 5405
Schematic,Parts

ZENITH RADIO CORP.





DIAG Nº	PART Nº	DESCRIPTION	
C1	22-82	.001 MFD.	600V.
C2	22-205	200-550 MMFD. PADDER	
C3	22-182	.00025	600V.
C4	22-185	.01	200V.
C5	22-199	.5	200V.
C6	22-212	.05	400V.
C7	22-225	5. MFD.	25V.
C8	22-243	.01	400V.
C9	22-250	.05	200V.
C10	22-287	.03	600V.
C11	22-358	.002	600V.
C12	22-419	2 MFD.	250V.
C13	22-419	8 "	250V.
C14	22-426		VARIABLE
C15	22-427	.006	1200V.

R1	63-238	1M OHMS	¼W.
R2	63-247	8M "	¼W.
R3	63-258	490M "	¼W.
R4	63-281	29M "	¼W.
R5	63-293	990M "	¼W.
R6	63-303	700 "	¼W.
R7	63-378	250 "	¼W.
R8	63-394	200 "	½W.
R9	63-418	1500 "	½W.
R10	63-468	200M "	V. CONTROL
R11	63-469	50M "	T "
R12	63-476	9.1 "	½W.

DIAG Nº	PART Nº	DESCRIPTION
1	52778	VIB. R.F. CHOKE
2	53755	ANT. COIL ASSEM.
3	53756	OSC. COIL ASSEM.
4	95308	1ST I.F. TRANS.
5	95309	2ND I.F. TRANS.
6	95300	RECT. TRANS.
7	190-5	VIBRATOR
8	49-127	6" MAG. SPKR.-MOD. 4V-31
9	49-130	8" " " 4V-59
10	95-298	POWER CHOKE

ZENITH 6-22-35

TUNING RANGE 550-1700 K.C.

4 TUBE BATTERY SUPERHETERODYNE
I.F. FREQUENCY 456 K.C.
CHASSIS Nº 5405.
MODELS 4V-31 - 4V-59

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6A7	1st. Det.	6.1	27	0	111	-	231
	Osc.			12	-	-	150
6F7	I.F.	6.1	25	0	111	-	231
	2nd. Det.			0	-	-	195
42	PWR.	6.1	0	-15	231	-	219
80	RECT.	5	-	-	-	-	231

Line 115 V.

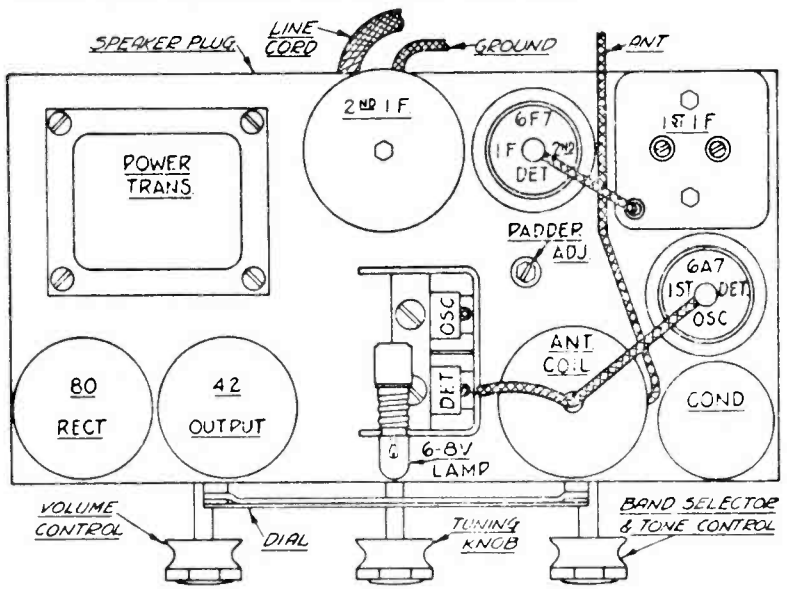
f - heaters; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

All measurements taken from point indicated to ground, using a 1,000 ohm per volt D.C. meter (except heater).

Alignment

(1) Balance I. F. transformer at 456 K.C.

(2) Place switch in left or broadcast position. Set dial pointer at 1500 K.C. and align trimmers on gang to resonance. Align broadcast padder at 540 K.C. slowly rocking pointer past 540 on dial to position giving strongest signal.
There are no adjustments for the short wave band.



Tube Position

78-103	Type 6F7 Socket (Wafer Type)	.10
78-106	" 6A7 " " "	.10
78-128	Speaker Plug Socket	.10
78-129	Voltage Indicator Socket (25 Cycle only)	.10
85-76	Band Selector and Tone Control Switch	.35
95-297	115 V., 60 Cycle Power Transformer	2.50
95-296	All Voltage 25 Cycle Power Transformer	4.75
100-23	6.3 V. Pilot Lamp	.15
126-191	Tube Shield	.15

Resistors

63-258	490 M Ohm ½ Watt Resistor	$ .20
63-263	30M " " "	.20
63-265	220 " " "	.20
63-280	49M " " "	.20
63-290	260M " " "	.20
63-293	990M " " "	.20
63-300	990 " " "	.20
63-376	190M " " "	.20
63-455	Volume Control Assembly	1.00

Condensers

22-147	.0005 Mfd. 600 V.	.15
22-162	.0001 " 600 V.	.20
22-205	200-500M Mfd. Padder	.35
22-229	.005 Mfd. 600 V.	.15
22-243	.01 " 400 V.	.15
22-250	.05 " 200 V.	.20
22-319	.005 " 200 V.	.20
22-345	.0011 " 600 V.	.15
22-358	.002 " 600 V.	.20
22-406	2-Gang Variable	2.50
22-407	2 x 4 x 8 Mfd. 450 V.	1.75

Coils, Chokes,

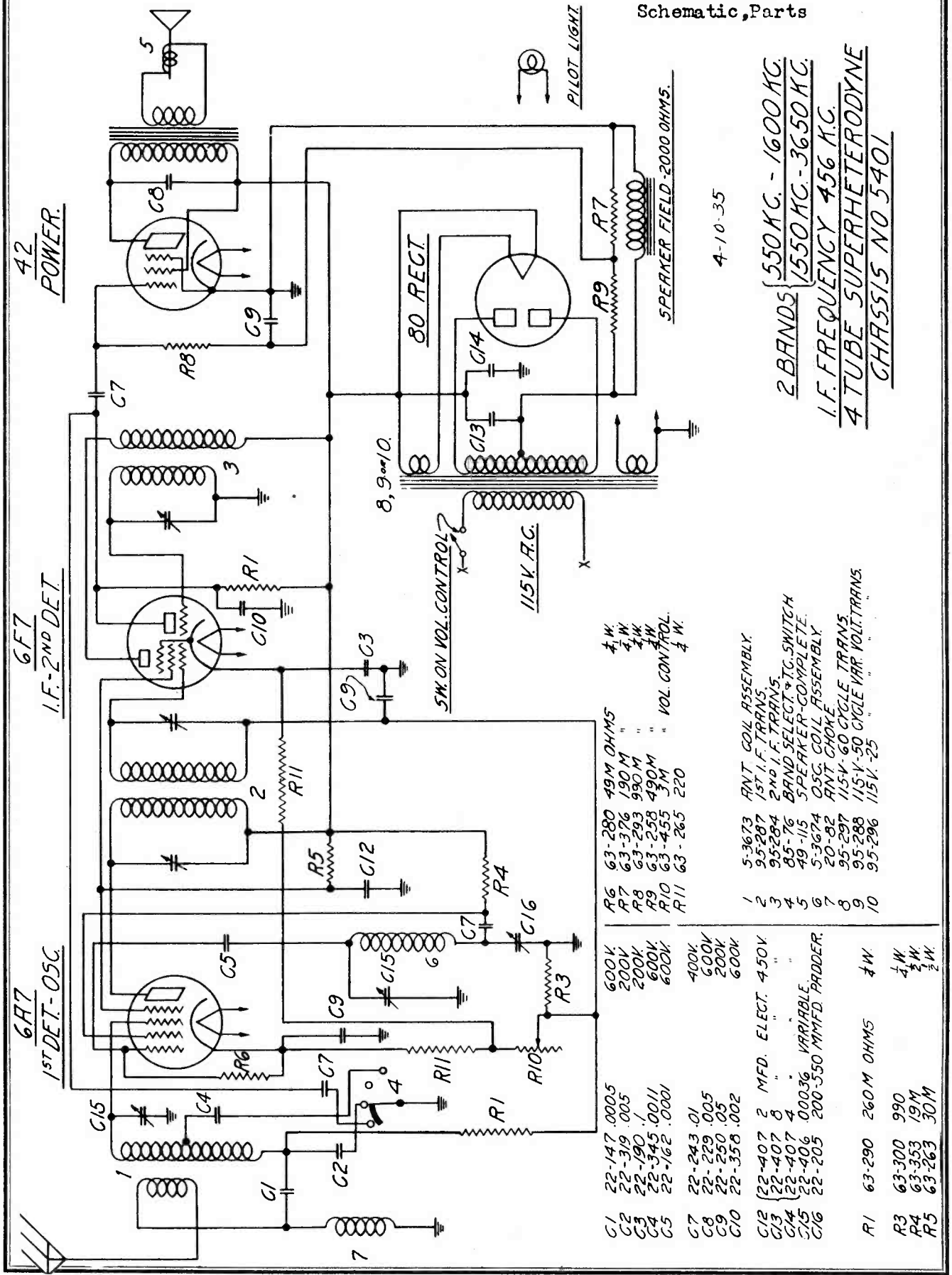
S-3673	Antenna Coil Assembly	1.00
S-3674	Oscillator Coil Assembly	.65
S-3720	1st I.F. Transformer Assembly	1.25
95-284	2nd I.F. Transformer Assembly	1.00
20-82	Antenna Choke	.25

Miscellaneous

S-3717	Dial Pointer and Pushing Assembly	.25
S-3718	Dial Scale and Frame Assembly	.50
46-122	Tuning Knobs	.10
49-115	5" Dynamic Speaker (Model 26)	4.50
	Cone and Voice Coil for 49-115	2.00
	Output Transformer for 49-115	1.75
	Field Coil for 49-115	1.50
49-116	8" Dynamic Speaker for Model 51	6.00
	Cone and Voice Coil for Model 51	2.50
	Output Transformer for Model 51	1.75
	Field Coil for Model 51	1.50

ZENITH RADIO CORP.

MODELS 4P26, 4T26, 4P51, 4T51
Chassis 5401
Schematic, Parts



C1	22-147	.0005	600 V.	R6	63-280	49 M OHMS 1/4 W.
C2	22-319	.005	200 V.	R7	63-376	190 M " 1/4 W.
C3	22-190	.1	200 V.	R8	63-293	990 M " 1/4 W.
C4	22-345	.0011	600 V.	R9	63-258	3 M " 1 W.
C5	22-162	.0001	600 V.	R10	63-455	VOL. CONTROL. 1 W.
				R11	63-265	220 " 1/4 W.
C7	22-243	.01	400 V.			
C8	22-229	.005	600 V.	1	5-3673	ANT. COIL ASSEMBLY.
C9	22-250	.05	200 V.	2	95-287	1ST I.F. TRANS.
C10	22-358	.002	600 V.	3	95-284	2ND I.F. TRANS.
				4	85-76	BAND SELECT. & TC. SWITCH
C12	22-407	2 MFD. ELECT.	450 V.	5	49-115	SPEAKER-COMPLETE.
C13	22-407	8 " "	"	6	5-3674	OSC. COIL ASSEMBLY.
C14	22-407	4 " "	"	7	20-82	ANT. CHOKE
C15	22-406	.00036 VARIABLE.		8	95-297	115 V. 60 CYCLE TRANS.
C16	22-205	200-350 MMFD. PADDER.		9	95-288	115 V. 50 CYCLE VAR. VOLT. TRANS.
				10	95-296	115 V. 25 " " "
R1	63-290	260 M OHMS	1/4 W.			
R3	63-300	990	1/4 W.			
R4	63-353	19 M	1/2 W.			
R5	63-263	30 M	1 W.			

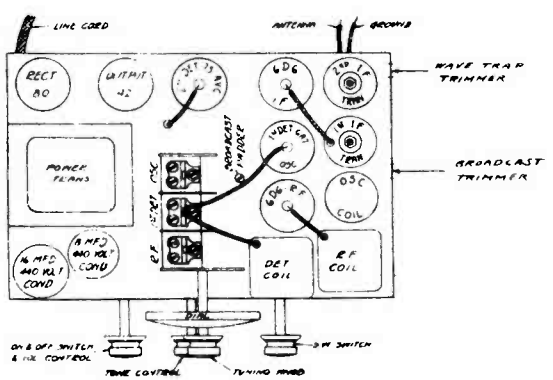
TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.6	2.4	0	70	2.4	200
6A7	1St. Det.	5.6	3	0	70	-	250
	Osc.			3.6	-	-	230
6D6	I.F.	5.6	2.6	0	70	2.6	250
75	2nd.Det. 1st Audio	5.6	1.4	0	-	-	148
42	PWR.	5.6	0	-.6	250	-	250
80	RECT.	4.6	-	-	-	-	300

Line Voltage 112 Antenna and Ground Disconnected

All measurements taken from point indicated to ground, using a 1000 ohm per volt D.C. meter (except heaters).
F - Filament; K - Cathode; g1 - Control Grid; g2 - Screen Grid; g3 - Suppressor Grid; p - Plate.

Alignment

1. Balance intermediate transformers at 252.5 K.C. with oscillator connected to grid of first detector and ground.
2. Adjust wave trap padder (located underneath chassis at rear right side) for weakest signal with 252.5 K.C. oscillator connected to aerial and ground.
3. Turn wave band switch clockwise to the highest frequency band. Connect 15,000 K.C. oscillator to aerial and ground. Balance oscillator trimmer on three-gang condenser for correct dial reading at this frequency.
4. Turn wave band switch counter-clockwise to standard broadcast position. Adjust broadcast oscillator trimmer (located underneath chassis at right center) for correct dial reading at 1400 K.C. and balance R.F. and 1st detector trimmers on three-gang condenser for loudest signal.
5. Adjust oscillator padder(located next to oscillator section of gang on top of chassis) while rocking pointer back and forth past 600 K. C. for combination giving maximum output.
6. Recheck 1400 K.C.



TUBE-POSITION

ZENITH

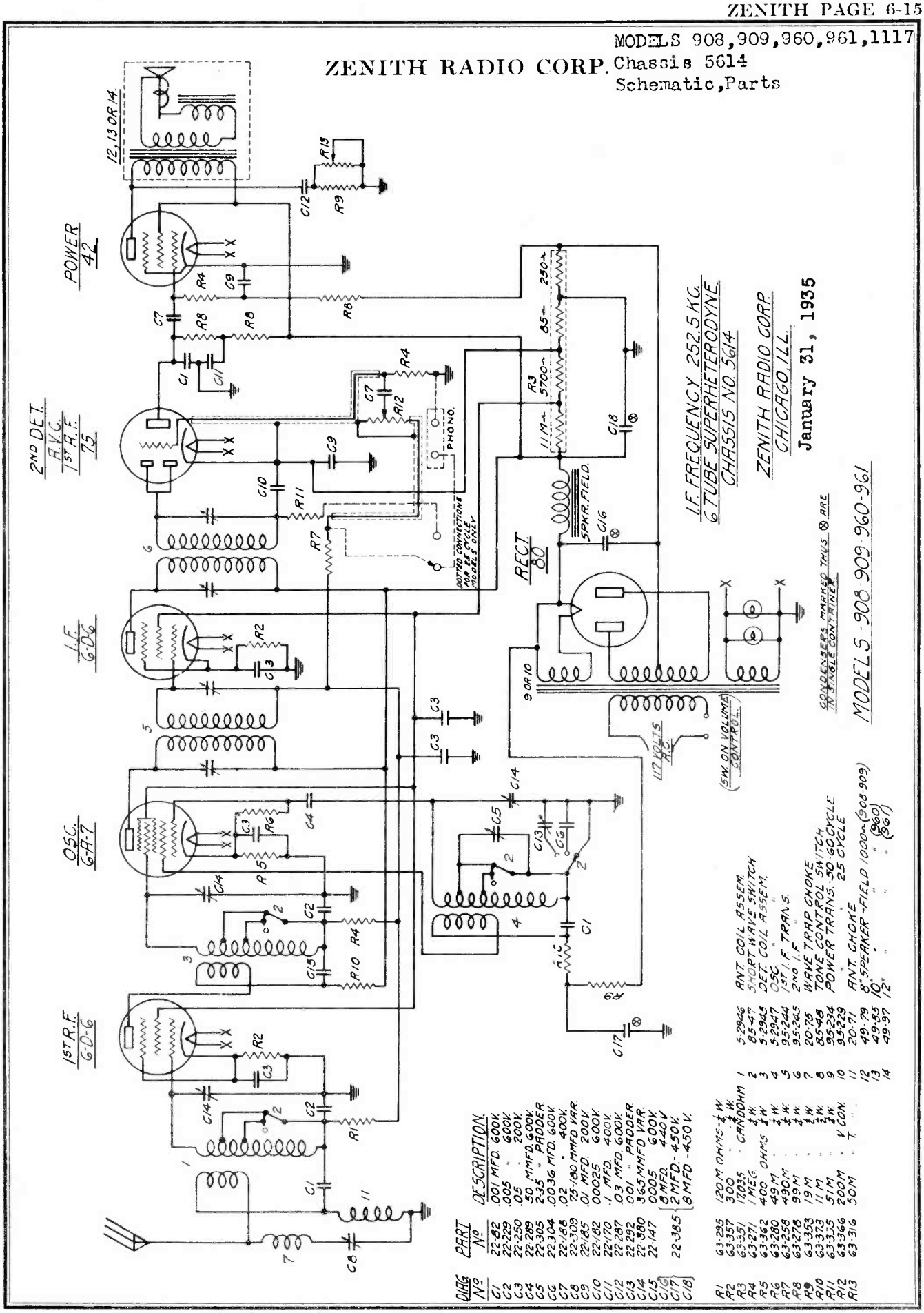
PARTS AND PRICES
Chassis #5614

MODELS 908 960 961 1117

	Dial Assembly	
S-3421	Complete Split Second Dial Assembly	$3.75
26-79	Dial Scale Only	.40
59-32	Split Second Pointer	.10
59-33	Special "Z" Pointer	.20
93-231	Glass Cushion Washer	.05
192-6	Dial Glass	.20
	Coils and Chokes	
20-71	Antenna Choke	.20
20-75	Wave Trap Choke	.25
95-244	1st I.F. Transformer	1.50
95-245	2nd I.F. Transformer	1.50
S-2957	Detector Coil Assembly	1.60
S-2955	Antenna Coil Assembly	$1.25
S-2953	Oscillator Coil Assembly	1.00
	Miscellaneous	
46-108	Band Selector Switch Knob (960-961)	.15
46-109	Tuning Control Knob	.10
46-110	Tone Control Knob	.10
46-111	Volume Control Knob	.10
46-112	Band Selector Switch Knob (908)	.15
49-79	8" Dynamic Speaker for Model 908	8.00
	Cone and Voice Coil for 49-79	2.50
	Output Transformer for 49-79	2.00
	Field Coil for 49-79	2.00
49-85	10" Dynamic Speaker	8.50
	Cone and Voice Coil for 49-85	3.00
	Output Transformer for 49-85	2.00
	Field Coil for 49-85	2.00
57-483	Dial Escutcheon Plate	.45
78-82	Type 80 Tube Socket	.10
78-100	Type 6D6 " "	.10
78-101	Type 75 " "	.10
78-102	Type 42 " "	.10
78-103	Type 6A7 " "	.10
85-47	Wave Change Switch	1.10
85-56	Phono Switch (25 Cycle only)	.35
95-229	All Voltage 25 Cycle Power Transformer	6.50
95-234	117 Volt 50/60 Cycle Power Transformer	3.75
100-23	Pilot Lamp	.15
126-131	Goat Tube Shield	.10

MODELS 908,909,960,961,1117

ZENITH RADIO CORP. Chassis 5614
Schematic, Parts



DIAG. No.	PART No.	DESCRIPTION			
C1	22182	.001 MFD. 600V.			
C2	22229	.005 " 600V.			
C3	22250	.05 " 200V.			
C4	22289	50 MMFD. PADDER			
C5	22305	235 " " 600V.			
C6	22304	.0036 MFD. 600V.			
C7	22165	.02 " 400V.			
C8	22309	25-180 MMFD. VAR.			
C9	22185	.01 MFD. 200V.			
C10	22182	.00025 " 600V.			
C11	22170	.1 " 400V.			
C12	22287	.03 " 600V.			
C13	22292	.001 " PADDER			
C14	22380	365 MMFD. VAR.			
C15	22147	.0005 " 600V.			
C16	22385	8 MFD. 440 V.			
C17		2 MFD. - 450 V.			
C18		8 MFD. - 450 V.			
R1	63295	120 M OHMS - ½ W.			
R2	63357	300 " - ½ W.			
R3	63351	17035 " CARBOHM	1	5-2946	ANT. COIL ASSEM.
R4	63271	1 MEG OHMS ½ W.	2	85-47	SHORT WAVE SWITCH
R5	63362	400 " ½ W.	3	5-2945	DET. COIL ASSEM.
R6	63280	49 M ½ W.	4	5-2947	OSC. "
R7	63258	490 M ½ W.	5	95-244	1ST I.F. TRANS.
R8	63278	99 M ½ W.	6	95-245	2ND I.F. "
R9	63353	19 M 1 W.	7	20-75	WAVE TRAP CHOKE
R10	63373	11 M 1 W.	8	85-48	TONE CONTROL SWITCH
R11	63335	5 M 1 W.	9	95-234	POWER TRANS. 50-60 CYCLE
R12	63366	200 M ½ W. V. CON.	10	95-229	" 25 CYCLE
R13	63316	50 M " T. "	11	20-71	ANT. CHOKE
			12	49-79	8" SPEAKER - FIELD 1000Ω (908-909)
			13	49-85	10" " " " (960)
			14	49-97	12" " " " (961)

ZENITH RADIO CORP.

MODEL 980-1201 CHASSIS. 985-990-1201-L CHASSIS

MODELS 980, 985, 990
Chassis 1201, 1201A
Schematic, Parts

6D6 1ST R.F. | 6A7 1ST DET. OSC. | 6D6 1ST I.F. | 6D6 2ND I.F. | 76 SHADOWGRAPH | 42S POWER | 76S PUSH-PULL DRIVER | 76 1ST AUDIO | 76 2ND DET.

DIAG. Nº	PART Nº	DESCRIPTION
C1	22-250	.05 - 200V.
C2	22-289	.00005 - 600V.
C3	22-285	.00001 - 600V.
C4	22-185	.01 200V.
C5	22-219	.03 200V.
C6	22-292	500-1000 MMFD.
C7	22-182	.00025 600V.
C8	22-82	.001 600V.
C9	22-212	.05 400V.
C10	22-127	.000025 600V.
C12	22-331	8 500V.
C13	22-125	8 440V.
C14	22-284	75-275 MMFD.
C15	22-190	.1 200V.
C16	22-333	4 GANG VAR.
C17	22-341	.00092 - 600V.
C18	22-228	.5 300V.
C19	22-243	.01 400V.
C20	22-342	.0029 600V.
C21	22-147	.0005 600V.
C22	22-325	2-35 MMFD.
C23	22-324	2-35 "
C24	22-323	2-35 "
C25	22-188	.02 400V.
R1	63-238	1000 ~ 1/4 W.
R2	63-291	29 M ~ 1/2 W.
R3	63-258	490 M ~ 1/4 W.
R4	63-410	1200 ~ 1/4 W.
R5	63-281	29 M ~ 1/4 W.
R6	63-278	99 M ~ 1/4 W.
R8	63-245	1500 ~ 1/4 W
R11	63-261	9900 ~ 1/4 W.
R12	63-431	2400-4000 ~ GANDOHM
R13	63-430	300-730 ~ "
R14	63-384	500M ~ VOL. CON.
R15	63-377	170 ~ 1/4 W.
R16	63-372	50M ~ 1/4 W.
R17	63-305	160 ~ 1/4 W.
R18	63-388	19M ~ 1 W.

DIAG. Nº	PART Nº	DESCRIPTION
R19	63-361	5M ~ 1/4 W.

1	20-64	WAVE TRAP COIL
2	5-3078	R.F. COIL
3	20-85	BAND PASS COIL
4	20-81	R.F. PL. CHOKE
5	5-3537	DET. COIL
6	20-84	7 METER DET COIL
7	5-3080	OSC. COIL
8	5-3115	7 METER OSC. COIL
9	95-242	1ST I.F. TRANS.
10	95-242	2ND I.F. TRANS.
11	95-243	3RD I.F. TRANS.
12	95-241	POWER TRANS. - 50-60~
13	95-269	AUDIO TRANS.
14	95-240	FILTER CHOKE
15	85-39	PHONO. SWITCH
16	20-88	ANT. CHOKE
17	49-107	SPEAKER - 6" } MOD. 985-990
18	49-108	" 12" }
19	49-107	SPKR. FIELD
20	49-108	"
21	95-268	DRIVER TRANS.
22	49-92	SPEAKER - 12" MOD. 980
23	49-92	SPKR FIELD
24	85-60	TONE C. SWITCH.
25	95-246	POWER TRANS. - 25 CYCLE
26	85-58	BAND SELECTOR SWITCH.
27	5-3538	PL. CHOKE.

ITEMS 17 AND 19 USED ON DOUBLE SPEAKER MODELS ONLY - FOR SINGLE 4M OHMS AND R12 2400 OHMS TOGETHER.

SWITCH SECTIONS SHOWN IN BROADCAST POSITION. SWITCH SECTIONS ARE NUMBERED FROM FRONT TO REAR OF CHASSIS.

12 TUBE SUPERHETERODYNE
I.F. FREQUENCY 485 KC.
CHASSIS MODEL
Nº 1201
Nº 1201-L

ZENITH RADIO CORP.
CHICAGO, ILL.

12-22-34

Service Bulletin

ZENITH RADIO

MODELS
980-985-990

Chassis
1201 - 1201A

SERVICE NOTES

Dial Slips or Binds. Tighten lugs on planetary drive. See that both pointers are free. Make sure gang is squarely lined up with dial.
Off Calibration. Check for loose set screws on dial assembly to condenser shaft. Black pointer may be loose on shaft. Check alignment as outlined in Alignment Procedure.
Poor Tone. Defective tubes in audio. One side of push-pull circuit faulty. Check audio and output transformers. See A.V.C. blocking.
Insensitive. Out of alignment, weak tubes or defective by-pass condenser.
Shadowgraph Inoperative. Weak 76 tube, burnt out shadowgraph, open resistor in 76 plate circuit.
Distortion at Medium Volume. Defective 75 tube, defective volume control. Separate green volume control-lead and speaker-lead close to grid of 42 tube.
Insensitive on Any Short Wave Band. Check alignment, make sure R.F. circuit is not aligned to image frequency. Change 6A7 tube. Change position of fixed condensers adjacent to rear section of wave change switch. Location of these condensers in relation to each other and their distance from the chassis will affect dial calibration and sensitivity.
Stops Oscillating Around 9 M.C. Change 6A7 tube, leakage in 50 Mmfd. or .0029 Mfd. condenser.
A.V.C. Blocks. Shorted resistor on antenna choke. C-14 padder shorted. Grounded R.F. grid circuit.
Oscillates on Broadcast. Check alignment. Push brown wire away from 6A7 socket. Grounded cathode on 1st I.F. or grounded to 600 K.C. padder. Check for open by-pass condenser.
Noisy. Shorting plates in gang condenser. Poor contact in band switch. Loose shields or shield bases. Static shields may be touching leads under gang condenser.
Overheats. Check pilot light and heater circuits for partial short or ground.
Hum on D and E Bands. Antenna lead too close to AC line or 5Z3 socket short in 6D6 in R.F. socket.
Flutters. Rearrange leads adjacent to 6A7 socket. Open antenna coil. Push yellow band pass lead away from detector trimmer assembly and yellow choke leads. Replace 6D6 in R.F. socket.
Oscillates on Short Wave Bands. Make sure brown R.F. grid return lead is pushed away from 6A7 socket. Check for ground on any A.V.C. lead. Open by-pass condenser.
Tone Control Inoperative. Loose ground lug on 63-430 ca-dohm. Defective condensers in tone control circuit.
Whistles. Rearrange leads in audio circuits. Speaker wires couple with 1st I.F.
Warning. The wiring to the switch is a part of the tuned circuit on the "E" band. Do not change the position of any leads.

Alignment

The diagram on page 2 shows position of major components and aligning adjustments. It should be studied carefully before any attempt is made to adjust the various circuits. The Clough-Brengle type is the only commercial service oscillator found practical for this work.

Separate coils are used for each band. Mounted on the coils are individual trimmers that align each band, independent of the other bands.

Connect 485 K.C. service oscillator to grid of 6A7 and chassis ground. Adjust I.F. trimmers on rear of I.F. transformers for strongest signal.

Connect 485 K.C. service oscillator to antenna and ground. Turn dial to 540 K.C. on broadcast band and adjust wave trap trimmer on right rear side of chassis for weakest signal.

Broadcast - "A" Band

Set service oscillator at 1400 K.C., remaining attached to antenna ground posts. Turn dial to same point and adjust #1 trimmer (top one on oscillator coil) to resonance. Adjust #1 R.F. trimmer (top one on R.F. coil); #1 detector trimmer (through hole in chassis base) and band pass trimmer (top front section of gang) all to resonance.

Set service oscillator at 600 K.C. Adjust padder (located in center rear of chassis) for correct dial reading.

Recheck 1400 K.C. alignment.

"B" Band

Set service oscillator at 4 M.C.(still attached to antenna and ground) and adjust trimmer #2 (2nd from top) on oscillator coil for correct dial reading. Adjust #2 R.F. trimmer (2nd from top on R.F. coil) and #2 detector trimmer (center hole through chassis) to resonance.

"C" Band

Loosen #3 detector trimmer (top one on detector coil). Set service oscillator at 10.5 M.C. Adjust #3 oscillator trimmer (third from top on oscillator coil) for correct dial reading. Adjust #3 R.F. trimmer (third from top of R.F.coil) and #3 detector trimmer (rear one through hole in top of chassis). Adjust #3 detector trimmer on coil to resonance.

"D" Band

Tighten #4 detector trimmer (bottom one on detector coil). Set service oscillator at 21 M.C. Adjust #4 oscillator trimmer (bottom one on oscillator coil) for correct dial reading. Adjust #4 R.F. trimmer (lower one on R.F. coil) and #4 detector trimmer (lower one on detector coil) to resonance.

It is very easy to mistake the image frequency for the fundamental on this band. Rotate dial and if shadowmeter narrows at any point, especially at 15 M.C., the band should be rebalanced.

"E" Band

There are no adjustments to be made on this band.

ZENITH RADIO CORP.

MODELS 980,985,990
Chassis 1201,1201A
Voltage, Socket
Trimmers

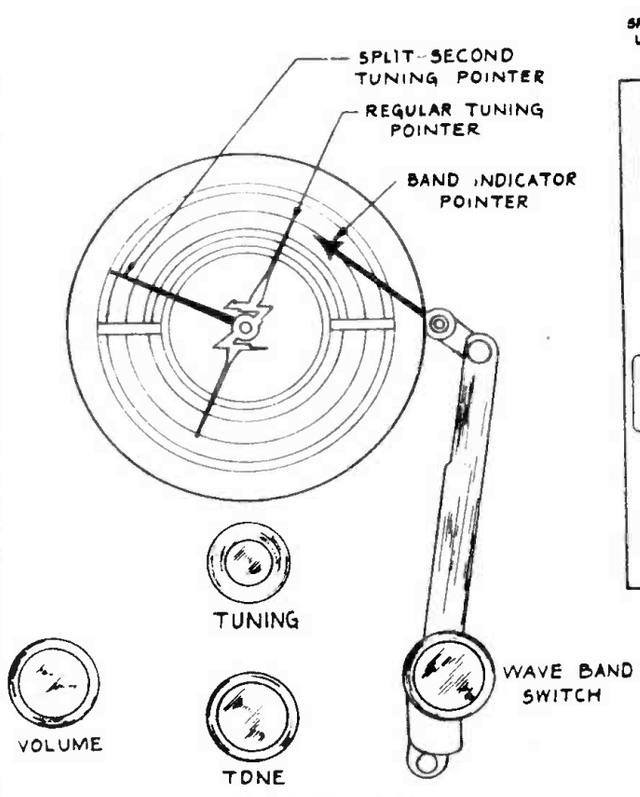
Socket Voltages

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.8	1	0	78	1	220
6A7	1st Det.	5.8	1.5	0	86	-	220
	Osc.			-10	-	-	220
6D6	1st I.F.	5.8	7	0	86	7	220
6D6	2nd I.F.	5.8	7	0	86	7	220
76	2nd Det.	5.8	0	0	-	-	0
76	Shadow-meter AMP.	5.8	10	0	-	-	210
76	1st Aud.	5.8	11	0	-	-	210
76	P.P. Driver	5.8	11	0	-	-	220
76	P.P. Driver	5.8	11	0	-	-	220
42	PWR.	5.8	26	0	260	-	260
42	PWR.	5.8	26	0	260	-	260
5Z3	RECT.	4.8	-	-	-	-	-

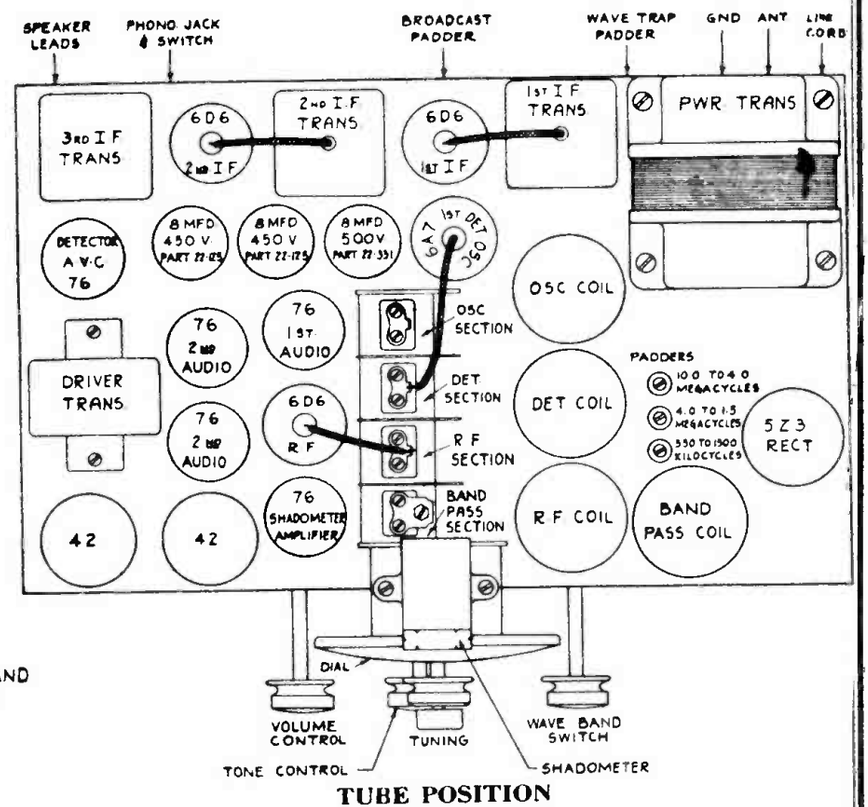
Line Voltage 110 Volts

Antenna and Ground Disconnected.

f - filament; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppresso grid; p - plate.



Control Panel



TUBE POSITION

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
58	R.F.	2.6	A 14 B 9.5 C 3 D 3	0	110	A 14 B 9.5 C 3 D 3	250
2A7	1st Det.	2.6	3	0	110	-	250
	Osc.			-1	-	-	180
58	I.F.	2.6	2.8	0	110	2.8	250
56	2nd Det.	2.6	0	0	-	-	0
56	1st Aud.	2.6	6	0	-	-	120
56	2nd Aud.	2.6	13.5	0	-	-	250
2A5	P.P.	2.6	18	0	250	-	250
2A5	P.P.	2.6	18	0	250	-	250
80	Rect.	4.6	-	-	-	-	-

Line 116 V. Antenna and Ground Disconnected

F - filament; K - cathode; G1 - control grid; G2 - screen grid; G3 - suppressor grid; P - plate.

Alignment

The diagram on page 3 shows position of major components and aligning adjustments. It should be studied carefully before any attempt is made to adjust the various circuits. A suitable high frequency service oscillator capable of excellent attenuation is required and no adjustments should be made without one. Separate coils are used for each band. Mounted on the coils are individual trimmers that align each band, independent of the other bands.

(I.F.) - Connect 175 K.C. service oscillator to grid of 6A7 and chassis ground. Adjust I.F. trimmers to point of maximum output.

(A) - Set service oscillator at 1400 K.C. and connect to antenna and ground leads. Place pointer at 1400 K.C. on dial and first adjust top trimmer on oscillator coil, then top trimmer on detector coil and top trimmer on R.F. coil to resonance. There is no 600 K.C. adjustment necessary.

(B) - Set service oscillator at 3 megacycle. Adjust second from top trimmer on oscillator coil to secure correct dial reading. Adjust second from top trimmers on detector and R.F. coils to resonance.

(C) - Set service oscillator at 6 megacycle. Adjust third from top trimmer on oscillator coil to secure correct dial reading. Adjust third from top trimmers on detector and R.F. coils to resonance.

(D) - Set service oscillator at 18 megacycle. Adjust bottom trimmer on oscillator coil to secure correct dial reading. Adjust bottom trimmers on detector and R.F. coils to resonance. Check for scale at 9 megacycle, if off, either twist or untwist blue wire loop on rear section of gang-switch and rebalance.

NOTE: It may be possible to obtain two settings on the oscillator and detector trimmers, particularly on bands C and D. If this occurs the oscillator should always be left on the loosest setting and the detector on the tightest one. Otherwise, reception over the band will be very erratic.

Mushy on full volume. Tendency to oscillate on edge of carrier. Check C9 .0005 micamold condenser for open.

Dead, or very distorted on strong signal only. Check for open R 4 100,000 ohm resistor on 56 tube - 2nd detector and A.V.C.

Weak and distorted - Check R 13 49,000 ohms for open.

Too much audio hiss and flutter on broadcast, .005 - C15 across 2A5 open. Weak audio if condenser is shorted or leaky.

Too much highs. Check C 14 .00075 from 2A5 to ground for open. Set dead if shorted.

Weak - Audio lacks bass. Poor quality. Check 1500 ohm resistor and 22-225 in 56 circuits for open or shorts.

Dead - 280 plates red - Check filter and plate circuits for shorts or grounds.

Carrier hum, on stations. Usually caused by static shield in power transformer not being grounded. Check tubes and by-passes first. If carrier hum still present, replace power transformer.

Weak and Distorted - A.V.C. seems to block. C5 near 2nd I.F. shorted.

Weak and Oscillates on B.C. - Open antenne coil or open .001 - C1 grounded. Also set will be weak on R.F.

Weak on D and dead at 3 Meg. Stops oscilleting around 10-11. Check C8 micamold .000025 for open or high leakage. Check tubes and coils for opens.

Weak on all S.W. bands. Check C2 .0011 micamold for open or high leakage.

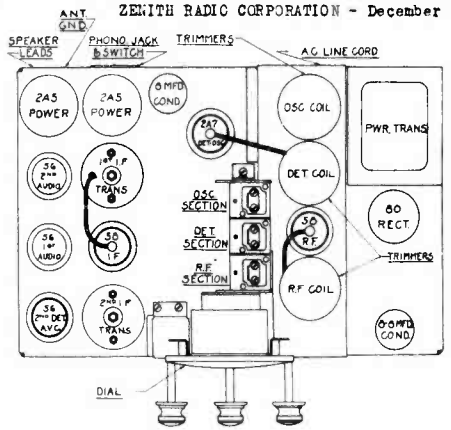
Microphonic - Try tubes, put cotton in oscillator coil to suppress grid wire vibrations. Check by-passes.

Dead on B.C. - Shorted coil trimmer condenser, usually oscillator coil.

Balance proceedure must be done very carefully on this model, and tubes checked carefully in particular for satisfactory S.W. operation. In addition to above, an occasional open coil or shorted trimmer will cause either weak or no reception on one or more bands. Check for poor contacts on band switch, rosin or loose connections.

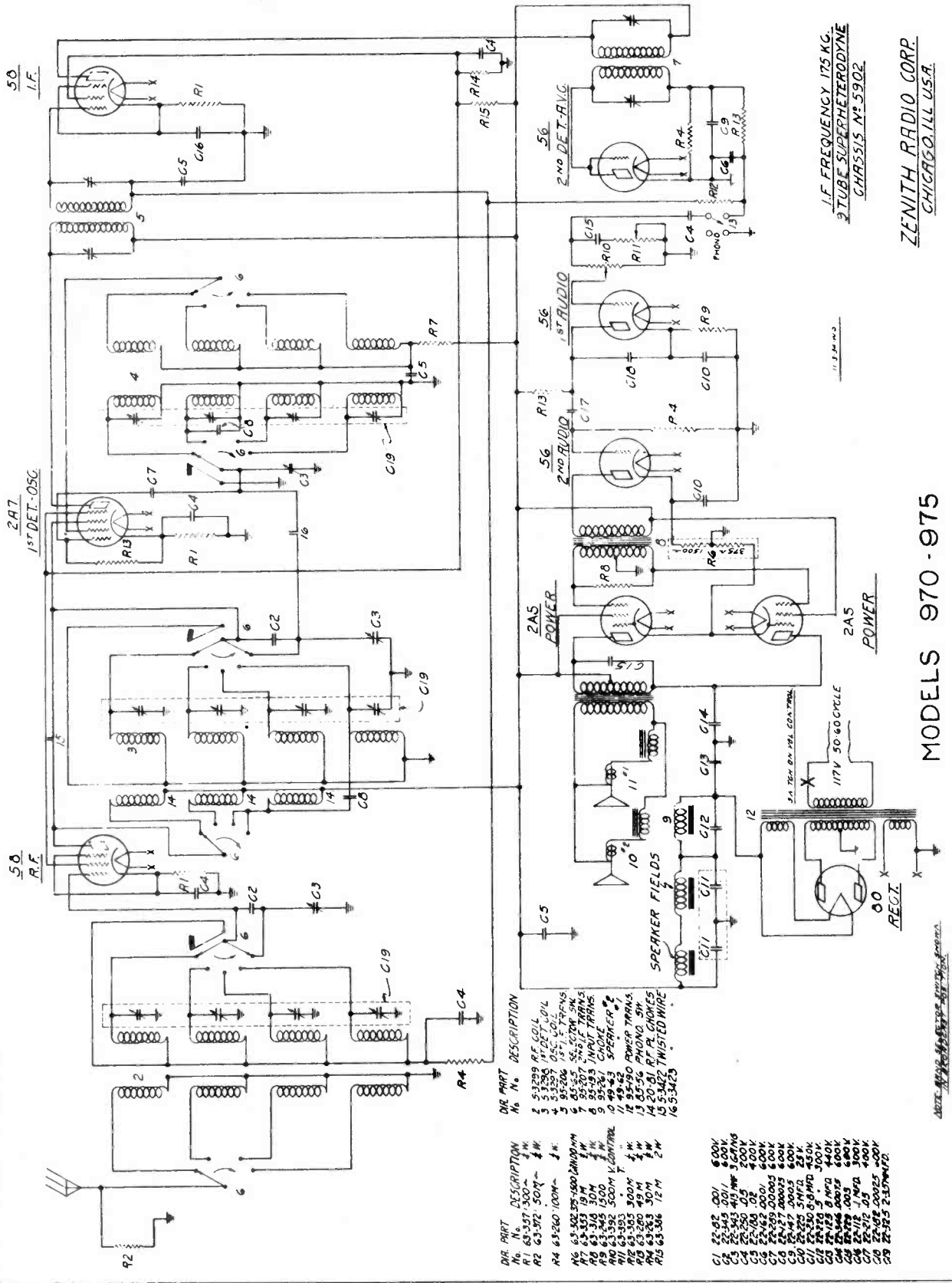
Oscillates on S.W. - Ground 56 detector cathode directly at socket prong. Remove black ground wire to #2 I.F. ground at C5 condenser

ZENITH RADIO CORPORATION - December 17, 1934.



MODELS 970,975
Chassis 5902
Schematic

ZENITH RADIO CORP.

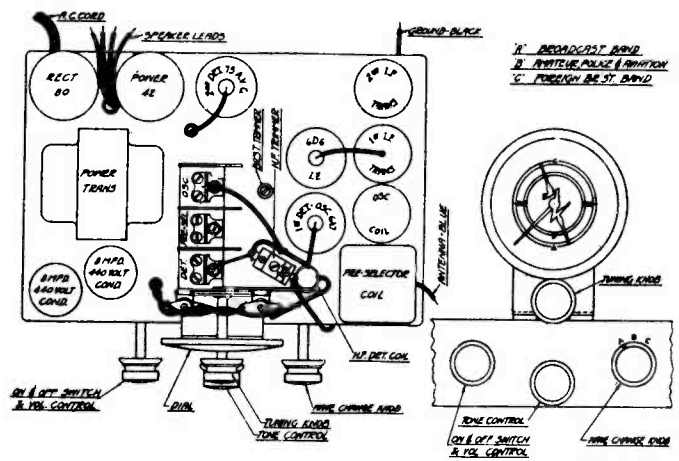


TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6A7	1st Det.	5.8	4	0	80	-	260
	Osc.			.6	-	-	210
6D6	I.F.	5.8	5.2	0	80	5.2	260
75	2nd Det.	5.8	1.5	0	-	-	135
42	PWR.	5.8	0	-.7	260	-	245
80	RECT.	4.8	-	-	-	-	-

Line Voltage 112 Antenna and Ground Disconnected.
All measurements taken from point indicated to ground, using a 1000 ohm per volt D.C. meter (except filaments).
F- Filament; K - Cathode; G1 - Control Grid; G2 - Screen Grid; G3 - Suppressor Grid; P - Plate

Alignment

1. Balance I.F.transformers at 252.5 K.C. with test oscillator connected to control grid of 6A7 and ground.
2. Turn band switch to C band. Connect test oscillator to antenna and ground leads. Set test oscillator at 15 Megacycles. Adjust oscillator trimmer on gang condenser for correct dial reading.
3. Adjust detector trimmer (located on top of chassis between front section of gang condenser and coil) for maximum output.
4. Turn band switch to A band. Adjust oscillator trimmer (located on right side underneath chassis) for correct dial reading at 1400 K.C. also adjust preselector and detector trimmers on gang for maximum output.
5. Adjust oscillator padder (next to oscillator section of gang on top of chassis) while rocking pointer back and forth past 600 K.C. to the combination giving greatest output.
6. Recheck 1400 K.C.



ZENITH RADIO

PARTS AND PRICES
Chassis #5508 & #5509

MODELS 945, 950

	Dial Assembly	
S-3403	Complete Split Second Dial Assembly	$3.75
26-78	Dial Scale Only	.40
59-27	Special "Z" Pointer	.15
59-32	Split Second Pointer	.10
93-231	Dial Glass Cushion Washer	.05
192-6	Dial Glass	.20
	Miscellaneous	
49-79	8" Dynamic Speaker for Model 945	$8.00
	Cone and Voice Coil for Model 945	2.50
	Output Transformer for Model 945	2.00
	Field Coil for Model 945	2.00
49-85	10" Dynamic Speaker for Model 950	8.50
	Cone and Voice Coil for Model 950	3.00
	Output Transformer for Model 950	2.00
	Field Coils for Model 950	2.00
57-483	Dial Escutcheon Plate	.45
78-82	Type 80 Tube Socket	.10
78-100	" 6D6 " "	.10
78-101	" 75 " "	.10
78-102	" 42 " "	.10
78-106	" 6A7 " "	.10
85-62	Wave Change Switch	.80
95-229	Power Transformer 25 Cycle	6.50
95-234	Power Transformer 50/60 Cycle	3.75
100-23	6.3 Volt Pilot Lamp	.15
126-131	Coat Tube Shield	.10
	Coils, Etc.	
95-244	1st I.F. Transformer	1.50
95-245	2nd I.F. Transformer	1.50
S-3129	Oscillator Coil Assembly	1.00
S-3397	Selector Detector Coil Assembly	2.00
S-3377	16 Meter Detector Coil Assembly	.65
	Miscellaneous	
46-108	Band Selector Knob	.15
46-109	Tuning Control Knob	.10
46-110	Tone Control Knob	.10
46-111	Volume Control Knob	.10

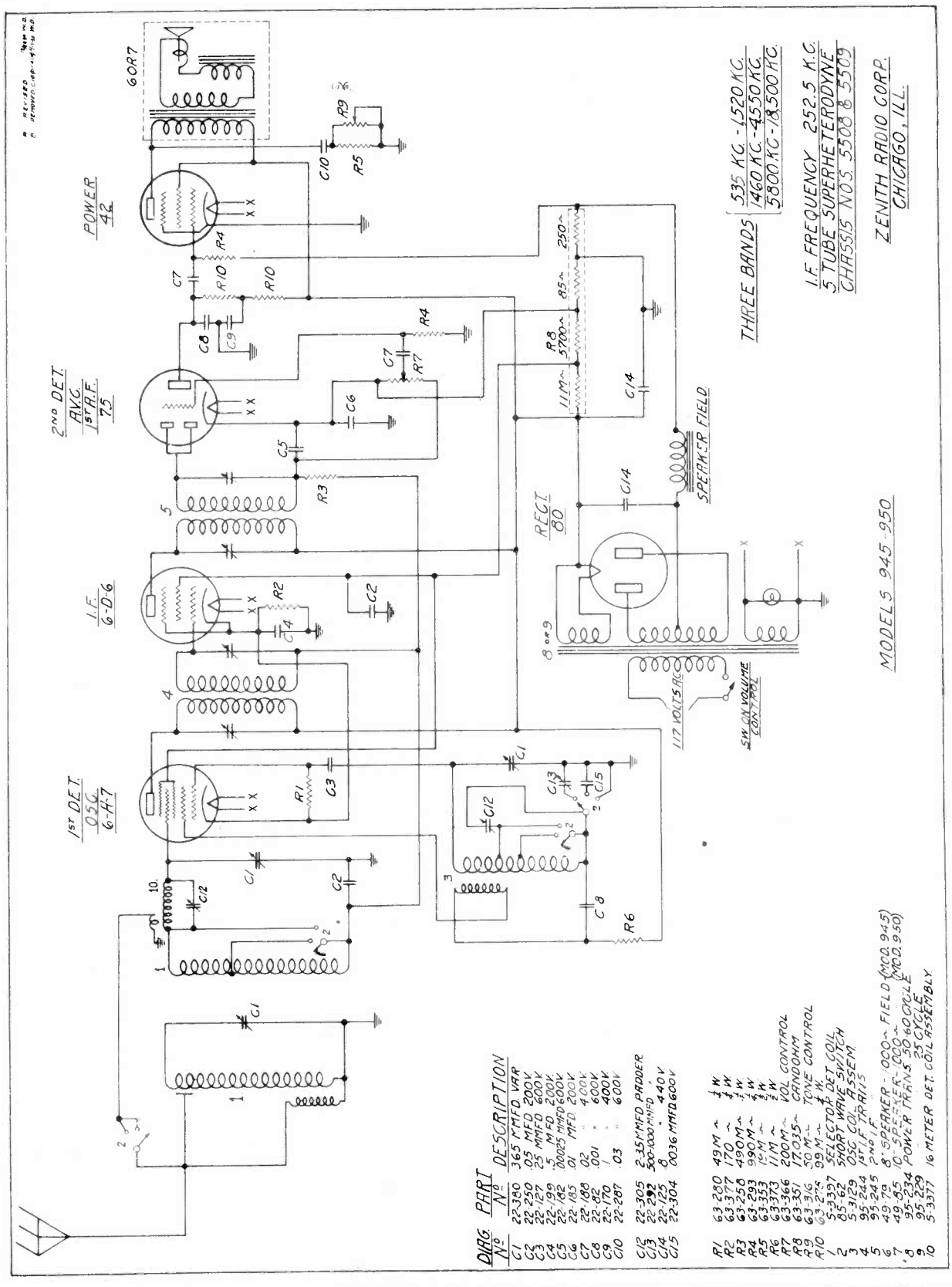
THESE PRICES SUPERSEDE ALL OTHER PREVIOUS QUOTATIONS AND ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

January 31, 1935

ZENITH RADIO CORPORATION

ZENITH RADIO CORP.

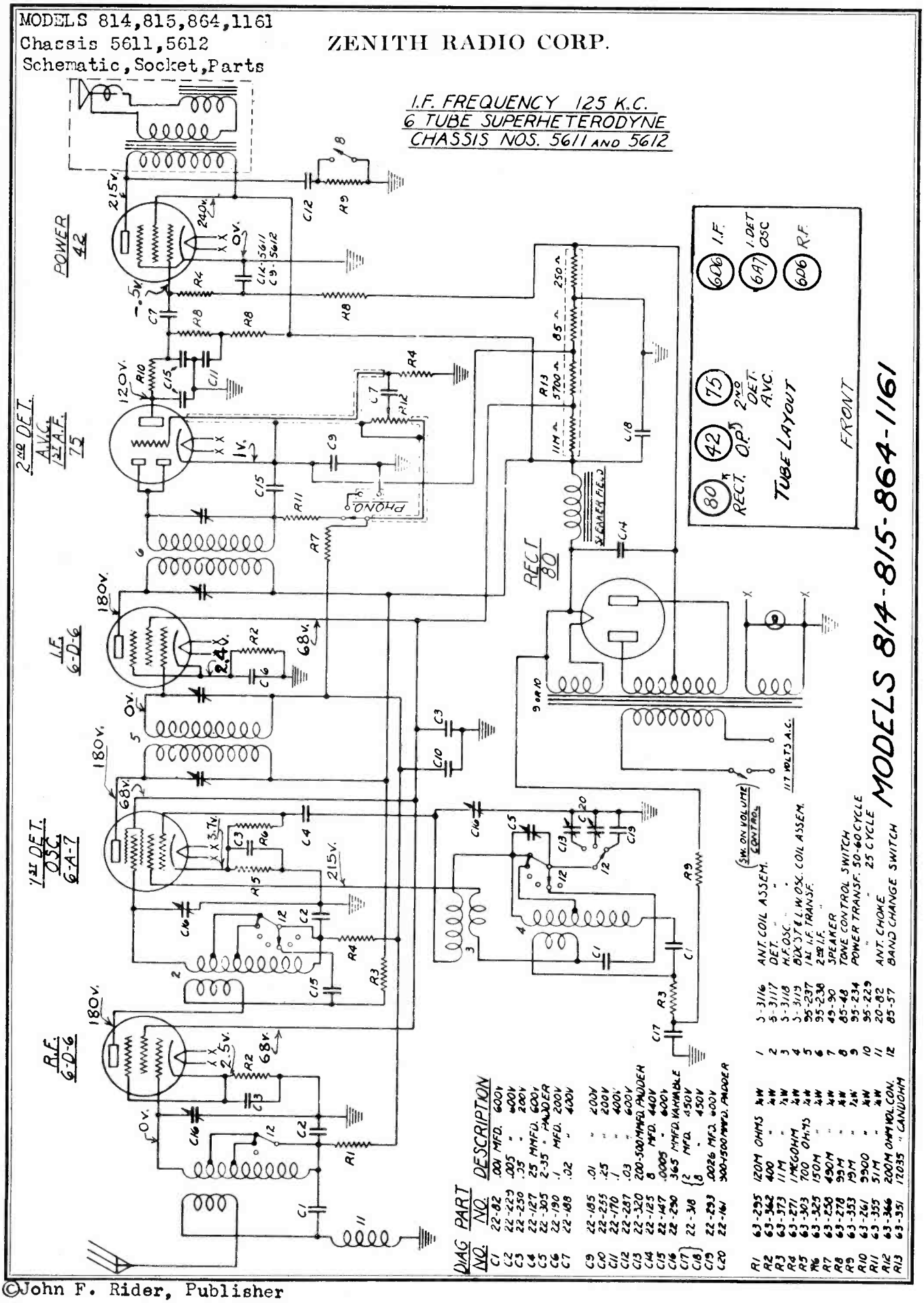
MODELS 945,950
Chassis 5508,5509
Schematic



DIAG. No.	PART No.	DESCRIPTION
C1	22-380	365 MMFD. VAR.
C2	22-250	.05 MFD 200V
C3	22-127	25 MMFD 600V
C4	22-199	.5 MFD 200V
C5	22-182	.0025 MMFD 600V
C6	22-185	.01 MFD 200V
C7	22-186	.02 " 400V
C8	22-82	.001 " 600V
C9	22-170	/ " 400V
C10	22-287	.03 " 600V
C12	22-305	2.35 MFD PADDER
C13	22-292	50-4000 MMFD " 440V
C14	22-22	.8 " 600V
C15	22-304	.0036 MMFD 600V
R1	63-280	49M ~ 1/4 W
R2	63-377	170 ~ 1/4 W
R3	63-250	490M ~ 1/4 W
R4	63-293	990M ~ 1/4 W
R5	63-353	1.6M ~ 1/4 W
R6	63-373	11M ~ 1/4 W
R7	63-366	200M ~ VOL CONTROL
R8	63-351	17,035 ~ CANDOHM
R9	63-316	50M ~ TONE CONTROL
R10	63-275	99M ~ 1/4 W.
1	53397	SELECTOR DET COIL
2	85-62	SHORT WAVE SWITCH
3	53129	OSC COIL ASSEM.
4	95-244	1ST I.F. TRANS
5	95-245	2ND I.F.
6	49-79	8" SPEAKER - 1000 ~ FIELD (MOD. 945)
7	49-85	10" SPEAKER - 1000 ~ FIELD (MOD. 950)
8	95-234	POWER TRANS. 50-60 CYCLE
9	95-229	25 CYCLE
10	53377	16 METER DET. COIL ASSEMBLY

MODELS 814,815,864,1161
Chassis 5611,5612
Schematic, Socket, Parts

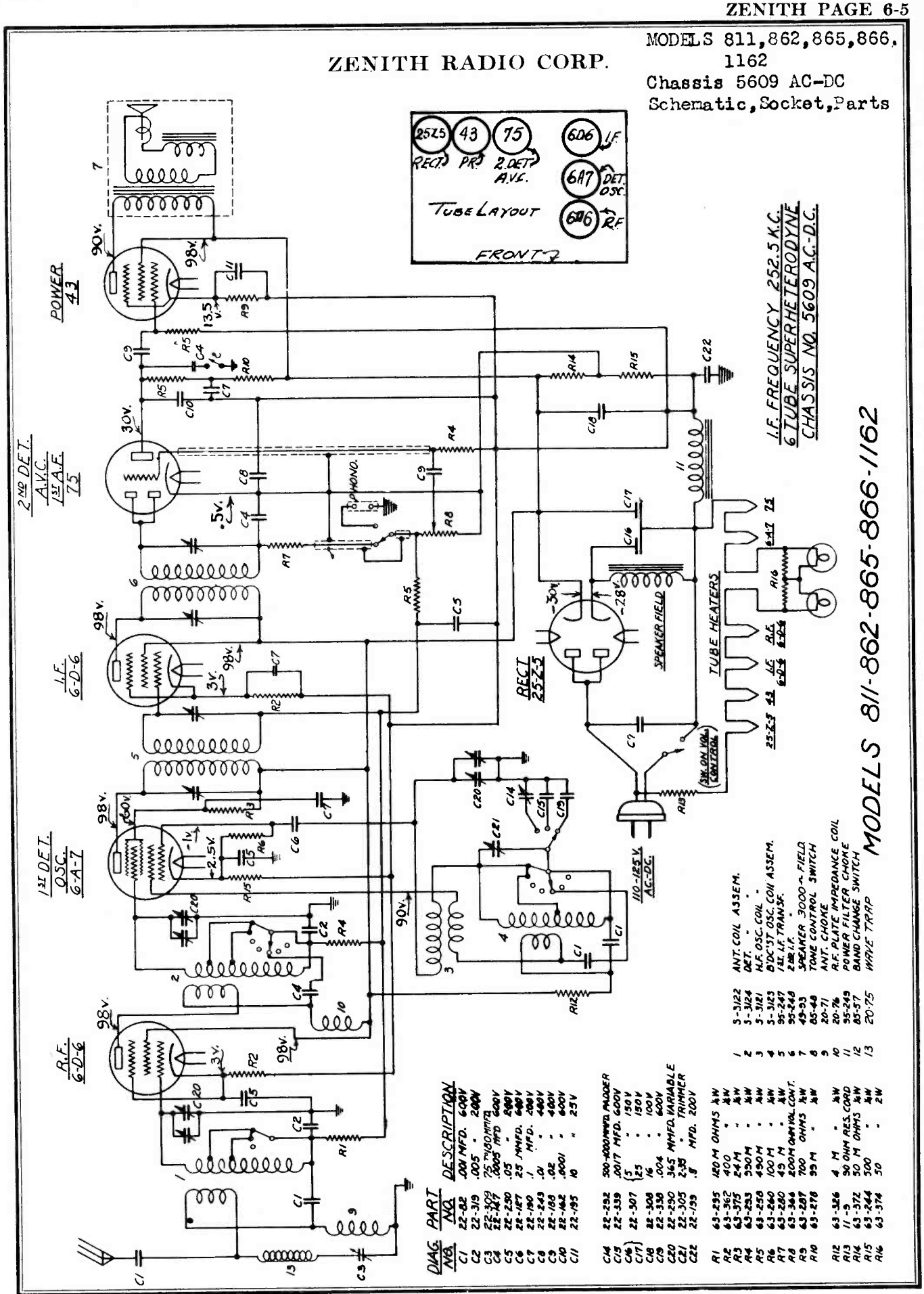
ZENITH RADIO CORP.



DIAG NO.	PART NO.	DESCRIPTION
C1	22-82	.001 MFD. 600V
C2	22-223	.005 " 600V
C3	22-230	.35 " 200V
C4	22-127	25 MMFD. 600V
C5	22-305	2-35 " PADDER
C6	22-190	.1 MFD. 200V
C7	22-188	.02 " 400V
C9	22-185	.01 " 200V
C10	22-255	.25 " 200V
C11	22-170	.1 " 400V
C12	22-287	.03 " 600V
C13	22-320	200-500 MMFD. PADDER
C14	22-125	8 MFD. 440V
C15	22-147	.0005 " 600V
C16	22-230	365 MMFD. VARIABLE
C17	22-38	2 MFD. 450V
C18		8 " 450V
C19	22-293	.0026 MFD. 600V
C20	22-161	300-1500 MMFD. PADDER
R1	63-295	120M OHMS ½W
R2	63-362	400 " ½W
R3	63-373	11M " ½W
R4	63-271	1 MEGOHM ½W
R5	63-303	700 OHMS ½W
R6	63-325	150M " ½W
R7	63-256	490M " ½W
R8	63-278	99M " 1W
R9	63-353	19M " 1W
R10	63-261	9500 " ½W
R11	63-355	51M " ½W
R12	63-366	200M OHM VOL. CON.
R13	63-351	12035 " CANDOHM
1	3-3116	ANT. COIL ASSEM.
2	3-3117	DET. "
3	3-3118	H.F. OSC. "
4	3-3119	BAND 3 & 4 L.W. OSC. COIL ASSEM.
5	95-237	1st I.F. TRANSF.
6	95-238	2nd I.F. "
7	45-90	SPEAKER
8	85-48	TONE CONTROL SWITCH
9	95-234	POWER TRANSF. 50-60 CYCLE
10	95-229	" 25 CYCLE
11	20-82	ANT. CHOKE
12	85-57	BAND CHANGE SWITCH

ZENITH RADIO CORP.

MODELS 811,862,865,866, 1162
Chassis 5609 AC-DC
Schematic, Socket, Parts



DIAG. NO.	PART NO.	DESCRIPTION
C1	22-82	.001 MFD. 600V
C2	22-319	.005 " 200V
C3	22-309	75 MMFD MTD 600V
C4	22-247	.0005 MFD 600V
C5	22-250	.05 " 400V
C6	22-127	25 MMFD. 600V
C7	22-190	.1 MFD. 200V
C8	22-243	.01 " 400V
C9	22-186	.02 " 400V
C10	22-142	.0001 " 600V
C11	22-195	10 " 25V
C14	22-232	300-1000 MMFD. PADDER
C15	22-339	.0017 MFD. 600V
C16	22-307	.5 " 150V
C17		.25 " 150V
C18	22-308	.16 " 100V
C19	22-338	.004 " 600V
C20	22-230	365 MMFD. VARIABLE
C21	22-305	2.35 " TRIMMER
C22	22-139	.1 MFD. 200V
R1	63-235	120 M OHMS ½W
R2	63-362	400 " " ½W
R3	63-375	24 M " " ½W
R4	63-253	350 M " " ½W
R5	63-250	490 M " " ½W
R6	63-260	100 M " " ½W
R7	63-280	45 M " " ½W
R8	63-364	200 M VOL. CONT.
R9	63-227	700 OHMS ½W
R10	63-278	95 M " " ½W
R12	63-326	4 M " " ½W
R13	11-3	30 OHM RES. CORD
R14	63-372	50 M OHMS ½W
R15	63-244	500 " " ½W
R16	63-374	50 " " 2W

1	3-3122	ANT. COIL ASSEM.
2	3-3124	DET. "
3	3-3121	H.F. OSC. COIL "
4	3-3123	1ST OSC. COIL ASSEM.
5	95-247	1ST I.F. TRANSF.
6	95-248	2ND I.F. "
7	49-93	SPEAKER 3000 Ω FIELD
8	85-48	TONE CONTROL SWITCH
9	20-71	ANT. CHOKE
10	20-76	R.F. PLATE IMPEDANCE COIL
11	95-249	POWER FILTER CHOKE
12	85-57	BAND CHANGE SWITCH
13	20-75	WAVE TRAP

MODEL 680 Hudson
Voltage, Socket Trimmers, Parts

ZENITH RADIO CORP.

Voltages:

Position	Tube	EF	EK	EG[1]	EG[2]	EG[3]	EP
R. F. Amplifier	6D6	5.6	4.1	*	4.1	76	200
1st Det.-Osc.	6C6	5.6	4.5	0	4.5	76	200
I. F. Amplifier	6D6	5.6	4.1	*	4.1	76	200
2nd Det. A. V. C.	75	5.6	1.3	0	0	—	165
Power Amp.	42	5.6	0	3	0	200	192
Rectifier	6Z4	5.6	200	—	—	—	—

f—Filament; k—Cathode; g[1]—Control Grid; g[2]—Suppressor Grid; g[3]—Screen Grid; p—Plate; *—Depends on applied signal strength. All voltages measured from indicated points to ground. Battery voltage 6 volts. (Check voltages with condenser gang in full mesh.)

RESISTORS (CHASSIS ONLY)

Zenith Number	Hudson Number	Description
63-396	48013	10M Ohm ¼ Watt
63-398	48015	40M Ohm ½ Watt
63-400	48017	250M Ohm ¼ Watt
63-401	48018	500M Ohm ¾ Watt
63-402	48019	500M Ohm Vol. Control & Switch Ass'mbly
63-420	48009	500 Ohm ¼ Watt
63-421	48010	700 Ohm ¼ Watt
63-422	48011	200 Ohm ½ Watt
63-423	48012	600 Ohm ¼ Watt
63-424	48014	35M Ohm 1 Watt
63-425	48016	75M Ohm ¾ Watt
63-428	48084	1200 Ohm ¼ Watt

CONDENSERS (CHASSIS ONLY)

22-82	46375	.001 Mfd. 600 V
22-102	46378	.0001 Mfd. 600 V
22-170	46370	.1 Mfd. 400 V
22-190	48021	.1 Mfd. 200 V
22-182	46853	.00025 Mfd. 600 V
22-212	48020	.05 Mfd. 400 V
22-250	46372	.05 Mfd. 200 V
22-251	46774	.5 Mfd. 100 V
22-327	48022	.02 Mfd. 200 V
22-344	48023	Three-Gang Variable
22-347	48024	4. x 8. Mfd. 350 V.
22-348	48025	.001 Mfd. 600 V
22-350	48026	.25 Mfd. 120 V
22-354	48027	.007 Mfd. 750 V
22-355	48028	.01 Mfd. 1400 V
22-357	48029	.01 x .02 Mfd. 750 V
22-358	48030	.002 Mfd. 600 V
22-359	48031	Padder

MISCELLANEOUS CHASSIS PARTS
COILS AND CHOKES

20-96	48032	Antenna Coil Assembly
20-97	48033	R. F. Coil Assembly
20-98	48034	Oscillator Coil Assembly
20-103	48035	Filament "A" Choke
95-262	48036	1st I. F. Transformer
95-263	48037	2nd I. F. Transformer
S-2778	46773	R. F. Choke
S-3364	46952	Motor Noise Filter
46-101	48038	Tone Control Knob (Knob Spring only, see 80-107)
52-54	48040	"A" Battery Cable
52-55	48041	Antenna Cable
54-76	48042	¼ x 20 Knurled Coupling Shaft Nuts
78-100	48043	Socket 6D6
78-101	48044	Socket 75
78-102	48045	Socket 42
78-113	48046	Socket 6D6
78-114	48047	Socket 6Z4
78-115	48048	Socket Vibrator
80-107	48049	Tone Control Knob Spring
85-66	48050	Tone Control Switch

SPEAKER

*49-101	48062	6" Dynamic Speaker (less output transformer)
	48063	Cone & Voice Coil Assemb. (for 48062 Speaker)
	48064	Field Coil (for 48062 Speaker)
S-3328	48065	Speaker Box and Grill Cloth

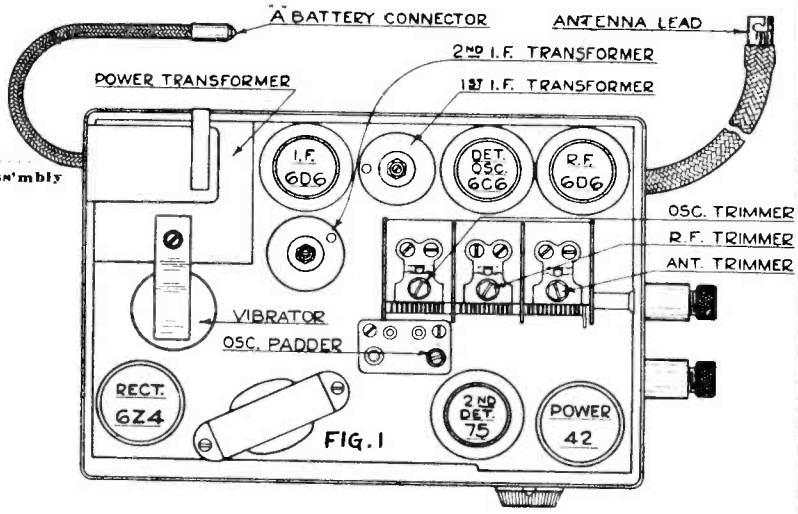


FIG. 1

Zenith Number	Hudson Number	Description
93-125	48051	No. 6 Lock Washers
93-220	48052	Bakelite Washer for Chassis Mtg. Screws
94-185	48053	Rubber Bushing for Chassis Mtg. Screws
95-258	48054	Power Transformer
95-259	48055	Hum Filter Choke
95-260	48056	Speaker Output Transformer
97-75	48057	10/32 x ¾ Wing Screw for Box Cover
114-27	48058	No. 8 x ¼ Chassis Box Screws
190-4	48075	Vibrator
MS-246	48059	Chassis Box Top Cover and Bushing Assem.
MS-247	48060	Chassis Box Bottom Cover and Bushing Assem.
MS-253	48061	Chassis Box Body Less Cover and Top

REMOTE CONTROL UNIT

170-11	48066	Hudson Remote Control (less cables)
7-3	45738	Control Unit Bezel & Glass Assembly
26-77	48067	Hudson Dial Scale and Pointer Bushing Assembly
46-72	45740	Volume Control Knob
46-73	45741	Tuning Control Knob (for Spring only, see 80-109)
52-62	48068	Pilot Lamp Cable & Socket Assembly
76-155	48069	Volume Control Coupling & Shaft Assem.
76-154	48070	Tuning Control Coupling & Shaft Assem.
80-109	46563	Tuning Knob Spring only
100-26	48071	6 V. - 18 V. Pilot Lamp

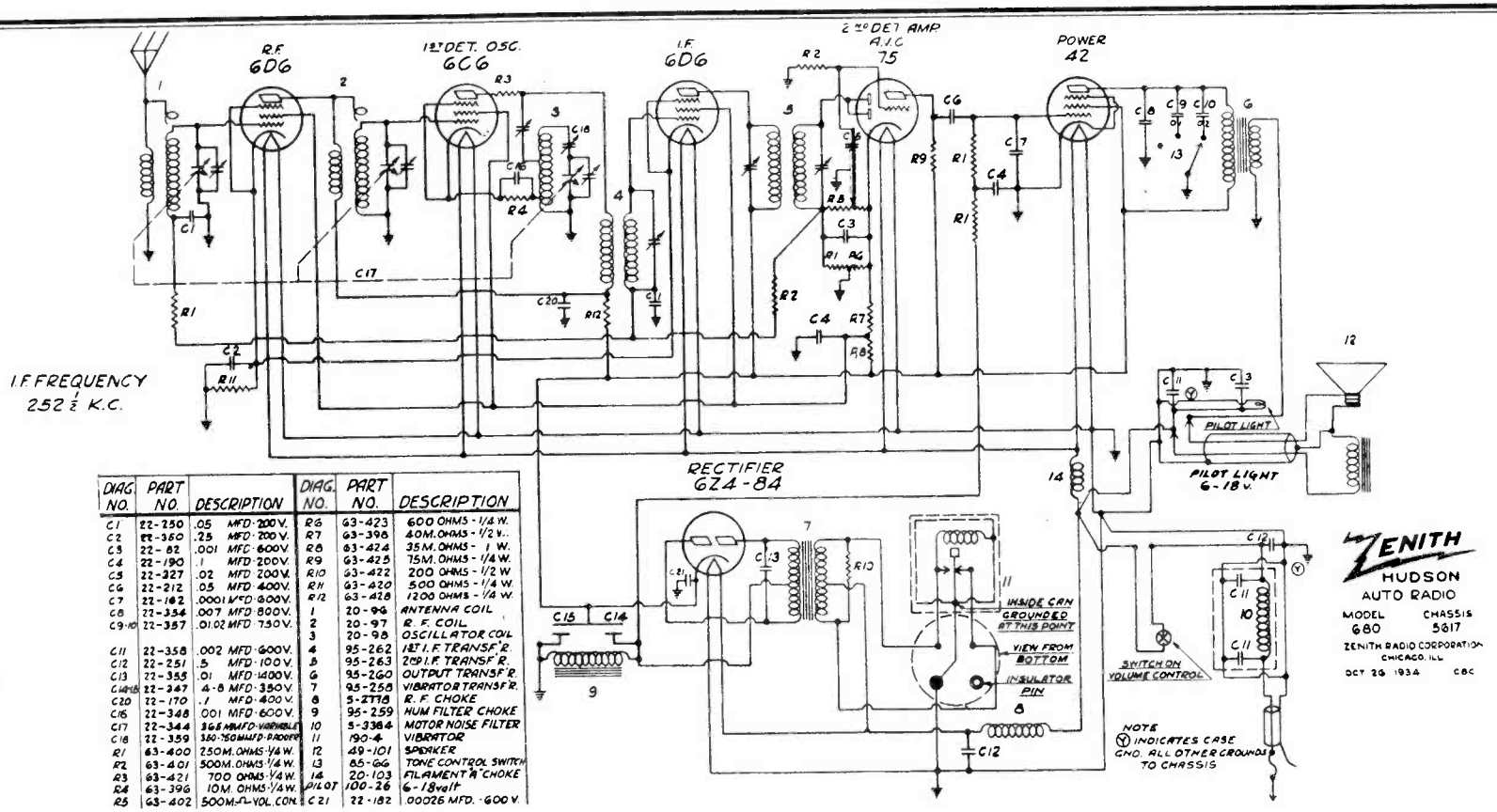
SUPPRESSOR AND SPEAKER MOUNTING PARTS

22-260	45923	.5 - 120 V. Coil Condenser
22-262	45900	.5 - 120 V. Generator Condenser
22-282	47974	.05 - 120 V. Condenser
54-77	48072	Hex Nut for Speaker Mtg. Bolt
63-403	47908	1500 Ohm Distributor Suppressor
97-73	48073	Speaker Mtg. Stud
147-21	48074	Wood Spacer Block for Speaker Mtg.

*Speakers are numbered 49-101-U, 49-101-R, 49-101-M designating three different types. Therefore, when ordering speaker or speaker parts refer to the number on speaker at all times and order by that part number accordingly.

ZENITH RADIO CORP.

MODEL 680 Hudson
Schematic
Alignment Data



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C1	22-250	.05 MFD 200 V.	R6	63-423	600 OHMS - 1/4 W.
C2	22-360	.25 MFD 200 V.	R7	63-396	40M. OHMS - 1/2 W.
C3	22-82	.001 MFD 600 V.	R8	63-424	35M. OHMS - 1 W.
C4	22-190	.1 MFD 200 V.	R9	63-425	75M. OHMS - 1/4 W.
C5	22-327	.02 MFD 200 V.	R10	63-422	200 OHMS - 1/2 W
C6	22-212	.05 MFD 400 V.	R11	63-420	500 OHMS - 1/4 W.
C7	22-182	.0001 MFD 600 V.	R12	63-428	1200 OHMS - 1/4 W.
C8	22-334	.007 MFD 800 V.	1	20-94	ANTENNA COIL
C9-10	22-357	.01-.02 MFD 750 V.	2	20-97	R. F. COIL
			3	20-98	OSCILLATOR COIL
C11	22-358	.002 MFD 600 V.	4	95-262	1ST I.F. TRANSF'R.
C12	22-251	.5 MFD 100 V.	5	95-263	2ND I.F. TRANSF'R.
C13	22-355	.01 MFD 1400 V.	6	95-260	OUTPUT TRANSF'R.
C14-15	22-347	4-8 MFD 350 V.	7	95-258	VIBRATOR TRANSF'R.
C20	22-170	.1 MFD 400 V.	8	5-2778	R. F. CHOKE
C16	22-348	.001 MFD 600 V.	9	95-259	HUM FILTER CHOKE
C17	22-344	365 MMFD VARIABLE	10	5-3384	MOTOR NOISE FILTER
C18	22-359	350-750 MMFD PADDER	11	190-4	VIBRATOR
R1	63-400	250M. OHMS 1/4 W.	12	49-101	SPEAKER
R2	63-401	500M. OHMS 1/4 W.	13	65-66	TONE CONTROL SWITCH
R3	63-421	700 OHMS 1/4 W.	14	20-103	FILAMENT 'A' CHOKE
R4	63-396	10M. OHMS 1/4 W.	PILOT	100-26	6-18 volt
R5	63-402	500M. Ω VOL. CON.	C21	22-182	.00025 MFD. 600 V.

Fig. 2

I. F. Alignment:

To balance the I. F. Circuit, connect the 252½ K. C. test oscillator signal to the grid of the 6C6 tube through a 0.5 mfd. condenser and to ground. Adjust the 1st I. F. primary trimmer to maximum output from either the speaker or an output meter. Follow in the same manner with the secondary, and the primary and secondary of the 2nd I. F. transformer. This completes the I. F. circuit adjustment.

R. F. Alignment:

1. Next attach the test oscillator thru a 150 mmf. condenser to the antenna and ground leads.
2. Turn condenser plates completely out of mesh.
3. Set test oscillator to 1600 K. C.
4. Adjust the oscillator condenser trimmer (see fig. 1) to approximate resonance at 1600. Disregard dial setting for this operation.
5. Set test oscillator to 1400 K. C. and turn gang condenser to resonance and peak the three trimmers accurately. Now set pointer on dial to 1400 K. C. by turning indicator screw from rear of head through pilot light socket hole.
6. Set test oscillator to 600 K. C. and tune set to pick up the signal. Rock the dial over this point while adjusting the padder condenser (see fig. 1) for greatest output.

If the dial is off calibration at the low frequency end after this is done the indicator may be moved slightly in either direction to give a uniform accuracy over the entire scale.

MODEL 666
Voltage, Socket
Trimmers, Parts

ZENITH RADIO CORP.

Tube Operating Voltages:

Position	Tube	EF	EK	EG[1]	EG[2]	EG[3]	EP
R. F. Amplifier	6D6	5.6	4.1	*	4.1	76	200
1st Det.-Osc.	6C6	5.6	4.5	0	4.5	76	200
I. F. Amplifier	6D6	5.6	4.1	*	4.1	76	200
2nd Det. A. V. C.	75	5.6	1.3	0	0	—	165
Power Amp.	42	5.6	0	3	0	200	192
Rectifier	6Z4	5.6	200	—	—	—	—

f—Filament; k—Cathode; g[1]—Control Grid; g[2]—Suppressor Grid; g[3]—Screen Grid; p—Plate; *—Depends on applied signal strength. All voltages measured from indicated points to ground. Battery voltage 6 volts. (Check voltages with condenser gang in full mesh.)

RESISTORS (CHASSIS ONLY)

Part Number	Description
63-396	10M Ohm ¼ Watt
63-398	40M Ohm ½ Watt
63-400	250M Ohm ¼ Watt
63-401	500M Ohm ¼ Watt
63-402	500M Ohm Vol. Control & Switch Ass'mbly
63-420	500 Ohm ¼ Watt
63-421	700 Ohm ¼ Watt
63-422	200 Ohm ½ Watt
63-423	600 Ohm ¼ Watt
63-424	35M Ohm 1 Watt
63-425	75M Ohm ¼ Watt
63-428	1200 Ohm ¼ Watt

CONDENSERS (CHASSIS ONLY)

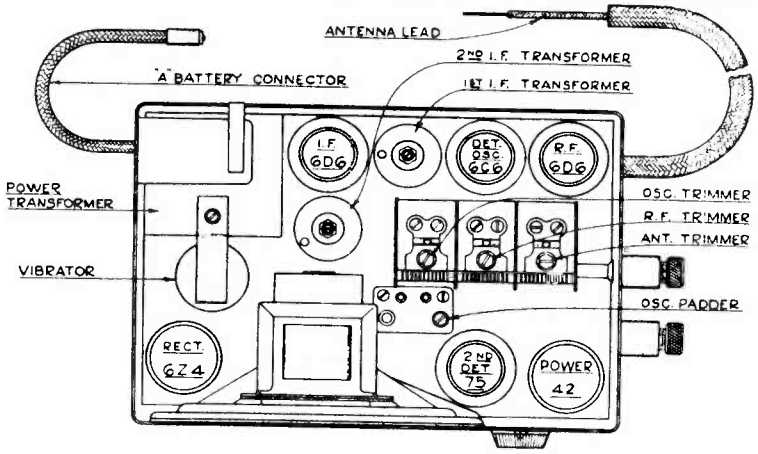
22-82	.001 Mfd. 600 V
22-162	.0001 Mfd. 600 V
22-170	.1 Mfd. 400 V
22-190	.1 Mfd. 200 V
22-182	.00025 Mfd. 600 V
22-212	.05 Mfd. 400 V
22-250	.05 Mfd. 200 V
22-251	.5 Mfd. 100 V
22-327	.02 Mfd. 200 V
22-344	Three-Gang Variable
22-347	4. x 8. Mfd. 350 V.
22-348	.001 Mfd. 600 V
22-350	.25 Mfd. 120 V
22-354	.007 Mfd. 750 V
22-355	.01 Mfd. 1400 V
22-357	.01 x .02 Mfd. 750 V
22-358	.002 Mfd. 600 V
22-359	Padder

MISCELLANEOUS CHASSIS PARTS
COILS AND CHOKES

20-96	Antenna Coil Assembly
20-97	R. F. Coil Assembly
20-98	Oscillator Coil Assembly
20-103	Filament "A" Choke
95-262	1st I. F. Transformer
95-263	2nd I. F. Transformer
S-2778	R. F. Choke
S-3364	Motor Noise Filter
46-101	Tone Control Knob (Knob Spring only, see 80-107)
52-44	"A" Battery Cable
52-59	Antenna Cable
54-76	¼ x 20 Knurled Coupling Shaft Nuts
78-100	Socket 6D6
78-101	Socket 75
78-102	Socket 42
78-113	Socket 6D6
78-114	Socket 6Z4
78-115	Socket Vibrator
80-107	Tone Control Knob Spring
85-66	Tone Control Switch

SPEAKER

*49-100	6" Dynamic Speaker (with output transformer
	Cone & Voice Coil Assemb.
	Field Coil



MISCELLANEOUS CHASSIS PARTS (Contd.)

Part Number	Description
93-125	No. 6 Lock Washers
93-220	Bakelite Washer for Chassis Mtg. Screws
94-185	Rubber Bushing for Chassis Mtg. Screws
95-258	Power Transformer
95-259	Hum Filter Choke
97-75	10/32 x ¾ Wing Screw for Box Cover
114-27	No. 8 x ¾ Chassis Box Screws
190-4	Vibrator
MS-350	Chassis Box Top Cover and Clip Assem.
24-88	Chassis Box Bottom
MS-256	Chassis Box Body Less Cover and Top

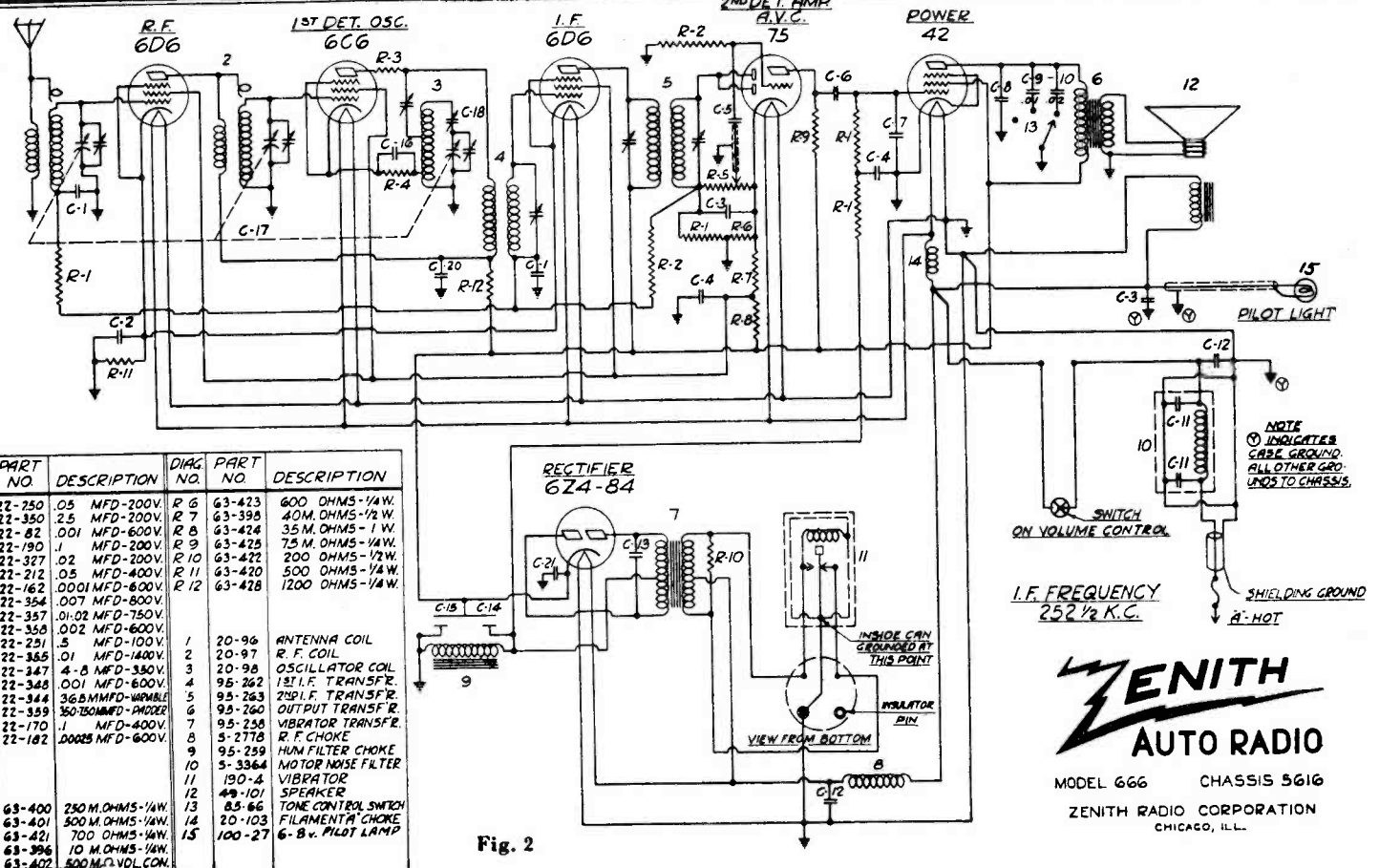
REMOTE CONTROL UNIT

170-12	Zenith Control Unit (with knobs and mounting brackets—less cable)
7-5	Control Unit Bezel
26-83	Zenith Dial Scale Assembly
49-117	Volume and Tuning Knobs
52-63	Pilot Lamp Cable and Socket Assemb.
76-156	24" Tuning Control Cables
26-157	24" Volume Control Cables
80-110	Knob Springs
100-27	6-8 V. Pilot Lamp
192-7	Unbreakable Dial Glass

SUPPRESSOR AND MOUNTING PARTS

22-193	.5 Mfd. Ignition Coil Condenser
22-194	.5 Mfd. Generator Coil Condenser
52-44	"A" Battery Cable
57-478	Set Mounting Plate
63-336	15 M Ohm Dist. Suppressor
67-107	10/32 x ⅜ RHM Screws (8 used)
93-127	No. 10 Lock Washer (8 used)
93-222	7/16 Lock Washer
93-223	Mounting Bolt Washer
136-6	15 Ampere Fuse
144-14	Mounting Bolt and Nut
196-1	Mounting plate Gasket

*Speakers are numbered 49-100U, 49-100-R, 49-100-M designating three different types. Therefore, when ordering speaker or speaker parts refer to the number on speaker at all times and order by that part number accordingly.



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C 1	22-350	.05 MFD-200V.	R 6	63-423	600 OHMS-1/4W.
C 2	22-350	.25 MFD-200V.	R 7	63-398	40M. OHMS-1/2 W.
C 3	22-82	.001 MFD-600V.	R 8	63-424	3.5 M. OHMS - 1 W.
C 4	22-190	.1 MFD-200V.	R 9	63-425	7.5 M. OHMS-1/4W.
C 5	22-327	.02 MFD-200V.	R 10	63-422	200 OHMS-1/2W.
C 6	22-212	.05 MFD-400V.	R 11	63-420	500 OHMS-1/4 W.
C 7	22-162	.0001 MFD-600V.	R 12	63-428	1200 OHMS-1/4 W.
C 8	22-354	.007 MFD-600V.			
C 9-10	22-357	.01-.02 MFD-750V.			
C 11	22-358	.002 MFD-600V.			
C 12	22-251	.5 MFD-100V.	1	20-96	ANTENNA COIL
C 13	22-365	.01 MFD-1400V.	2	20-97	R. F. COIL
C14-15	22-347	4-8 MFD-350V.	3	20-98	OSCILLATOR COIL
C 16	22-348	.001 MFD-600V.	4	95-262	1ST I.F. TRANSF'R.
C 17	22-344	36.8 MMFD-VARIABLE	5	95-263	2ND I.F. TRANSF'R.
C 18	22-359	350-750MMFD-PADDER	6	95-260	OUTPUT TRANSF'R.
C 20	22-170	.1 MFD-400V.	7	95-258	VIBRATOR TRANSF'R.
C 21	22-182	.00025 MFD-600V.	8	5-2778	R. F. CHOKE
			9	95-259	HUM FILTER CHOKE
			10	5-3364	MOTOR NOISE FILTER
			11	190-4	VIBRATOR
			12	49-101	SPEAKER
R 1	63-400	250 M. OHMS-1/4W.	13	85-66	TONE CONTROL SWITCH
R 2	63-401	500 M. OHMS-1/4W.	14	20-103	FILAMENT "A" CHOKE
R 3	63-421	700 OHMS-1/4W.	15	100-27	6-8 v. PILOT LAMP
R 4	63-396	10 M. OHMS-1/4W.			
R 5	63-402	500 M.Ω VOL. CON.			

Fig. 2

I. F. Alignment:

To balance the I. F. Circuit, connect the 252½ K. C. test oscillator signal to the grid of the 6C6 tube through a 0.5 mfd. condenser and to ground. Adjust the 1st I. F. primary trimmer to maximum output from either the speaker or an output meter. Follow in the same manner with the secondary, and the primary and secondary of the 2nd I. F. transformer. This completes the I. F. circuit adjustment.

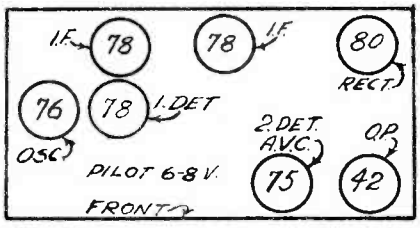
R. F. Alignment:

1. Next attach the test oscillator thru a 150 mmf. condenser to the antenna and ground leads.
2. Turn condenser plates completely out of mesh.
3. Set test oscillator to 1600 K. C.
4. Adjust the oscillator condenser trimmer (see fig. 1) to approximate resonance at 1600. Disregard dial setting for this operation.
5. Set test oscillator to 1400 K. C. and turn gang condenser to resonance and peak the three trimmers accurately. Now set pointer on dial to 1400 K. C. by turning indicator screw in rear center of head.
6. Set test oscillator to 600 K. C. and tune set to pick up the signal. Rock the dial over this point while adjusting the padder condenser (see fig. 1) for greatest output.

If the dial is off calibration at the low frequency end after this is done the indicator may be moved slightly in either direction to give a uniform accuracy over the entire scale.

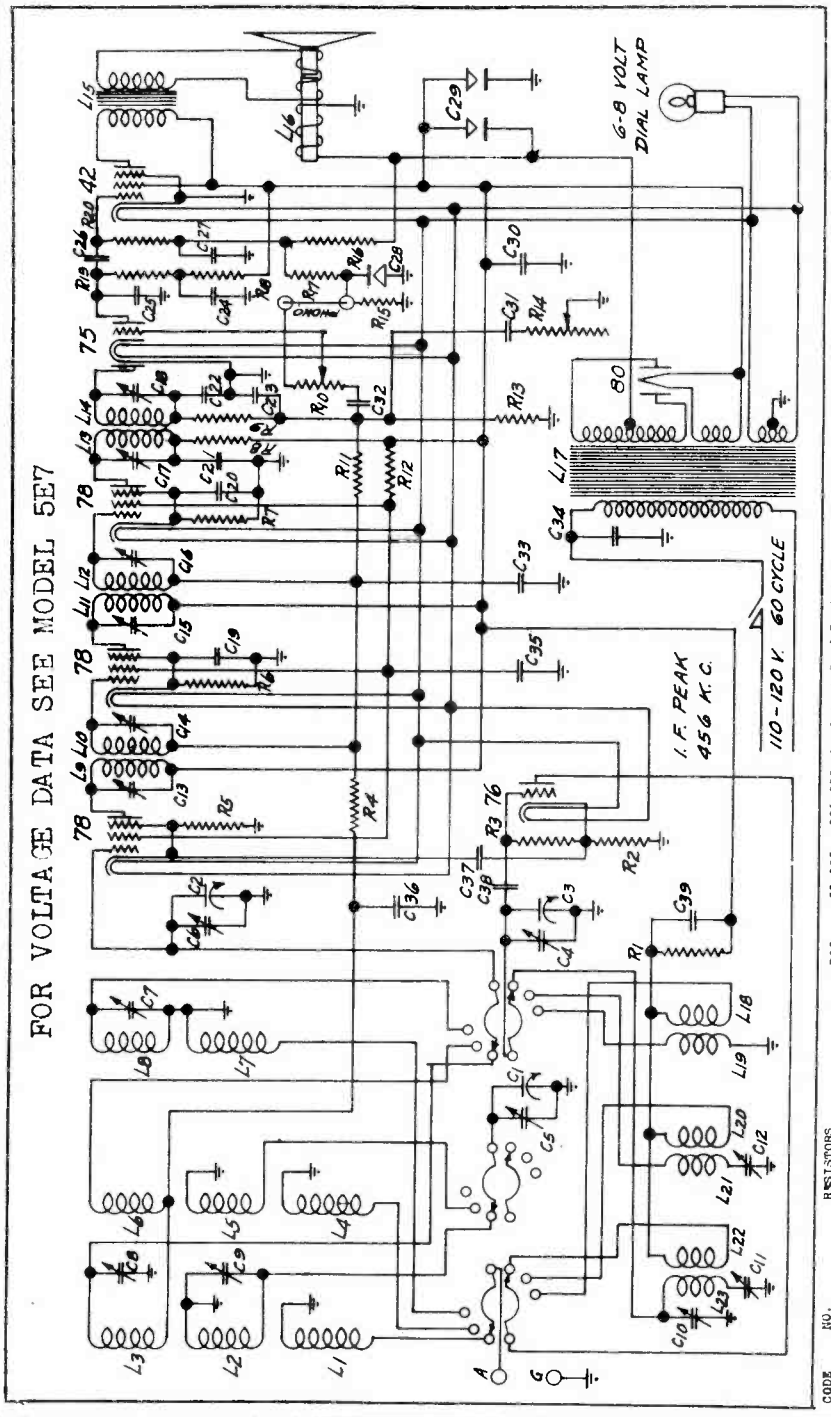
MODEL 5EA7
Schematic, Socket
Parts List

WILCOX-GAY CORP.



L13 17-2010 1200 Microhenry Third I.F.Primary
L14 17-2010 1200 Microhenry Third I.F.Secondary
L15 64-2003 Single 42 Output Transformer
L16 64-2003 2500 Ohm Speaker Field
L17 80-1068 Power Transformer
L18 17-2018 Foreign Band Oscillator Primary
L19 17-2018 Foreign Band Oscillator Secondary
L20 17-1646 Broadcast Band Oscillator Primary
L21 17-1646 Broadcast Band Oscillator Secondary
L22 17-1648 Long Wave Band Oscillator Primary
L23 17-1648 Long Wave Band Oscillator Secondary

68-2003 First I.F. Transformer Assembly
68-2003 Second I.F. Transformer Assembly
68-2004 Third I.F. Transformer Assembly



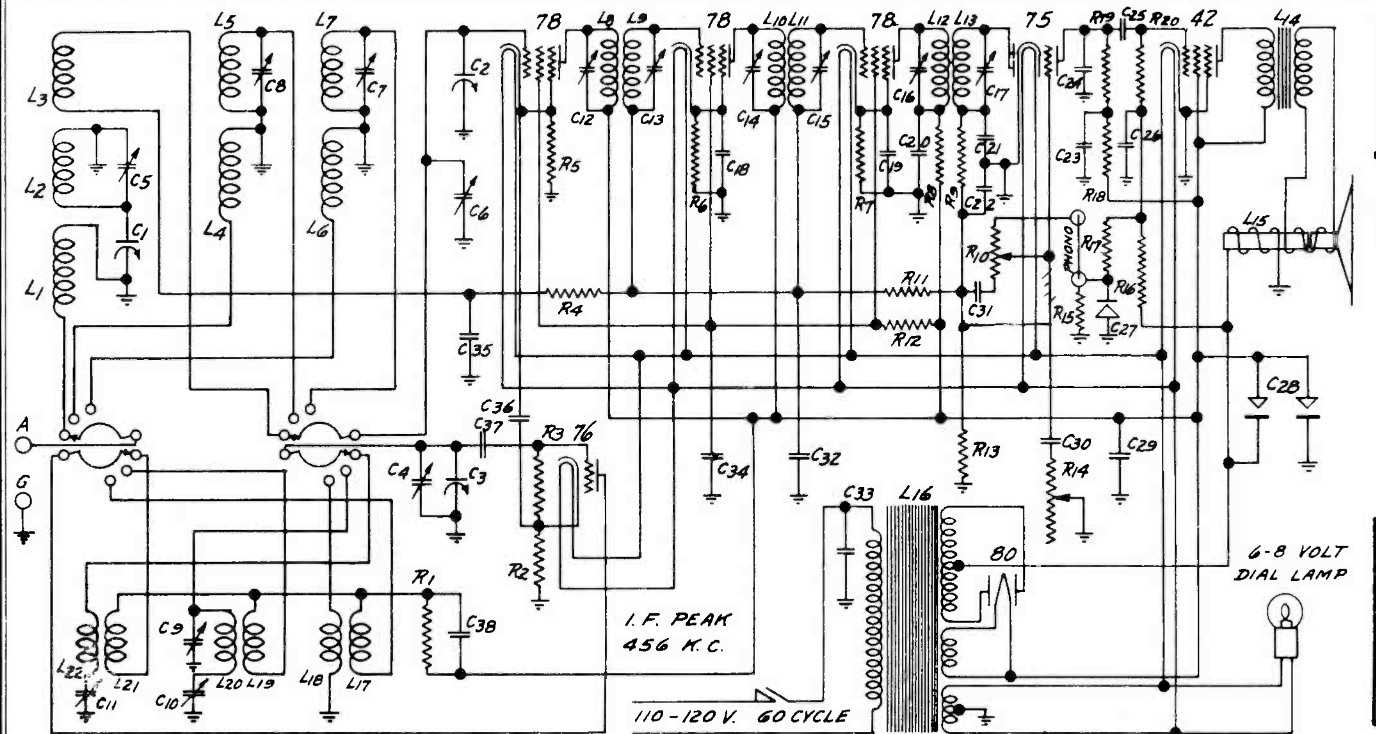
CODE	NO.	RESISTORS	R20	53-925	500,000 ohm Output Grid Resistor	C16	78-1561	70-120 MMFD. Second I.F. Secondary Trimmer	C34	75-269A	.01 MFD. 400 Volt Line By-Pass Condenser
R1	53-277	10,000 ohm Oscillator Plate Resistor			CONDENSERS	C17	78-1561	70-120 MMFD. Third I.F. Primary Trimmer	C35	75-272A	.1 MFD. 200 Volt Screen By-Pass Condenser
R2	53-1062	250 ohm Oscillator Cathode Resistor	C1	77-1581	16-366 MMFD. First Section of 3 Gang Condenser	C18	78-1561	70-120 MMFD. Third I.F. Secondary Trimmer	C36	75-272A	.1 MFD. 200 Volt A.V.C. Network By-Pass
R3	53-941	20,000 ohm Oscillator Grid Resistor	C2	77-1581	16-366 MMFD. Second Section of 3 Gang Condenser	C19	75-272A	.1 MFD. 200 Volt First I.F. Cathode By-Pass	C37	75-269A	.01 MFD. 400 Volt Oscillator Coupling Condenser
R4	53-923	100,000 ohm A.V.C. Network Resistor	C3	77-1581	16-366 MMFD. Third Section of 3 Gang Condenser	C20	75-272A	.1 MFD. 200 Volt Second I.F. Cathode By-Pass	C38	76-264	.00005 MFD. Mica Oscillator Grid Condenser
R5	53-1144	2,000 ohm First Detector Cathode Resistor	C4	77-1581	Broadcast Oscillator Parallel Trimmer on C3	C21	75-269A	.01 MFD. 400 Volt Second I.F. Plate Isolation Condenser	C39	75-269A	.01 MFD. 400 Volt Oscillator Plate Condenser
R6	53-1063	500 ohm First I.F. Cathode Resistor	C5	77-1581	Broadcast First Preselector Trimmer on C1	C22	76-339	.0001 MFD. Mica Diode Filter Condenser			INDUCTANCES
R7	53-1063	500 ohm Second I.F. Cathode Resistor	C6	77-1581	Broadcast Second Preselector Trimmer on C2	C23	76-339	.0001 MFD. Mica Diode Filter Condenser	L1	17-2038	Long Wave Band Preselector Primary
R8	53-919	5,000 ohm Second I.F. Plate Resistor	C7	78-1588	3-30 MMFD. Foreign Band Preselector Trimmer	C24	75-1326A	.1 MFD. 400 Volt Second Detector Plate Hum Filter	L2	17-2038	Long Wave Band First Preselector Secondary
R9	53-898	50,000 ohm Diode I.F. Filter Resistor	C8	78-1588	3-30 MMFD. Long Wave Second Preselector Trimmer	C25	76-265	.001 MFD. Mica Second Detector Plate By-Pass	L3	17-2038	Long Wave Band Second Preselector Secondary
R10	19-1291	500,000 ohm Volume Control & Switch	C9	78-1588	3-30 MMFD. Long Wave First Preselector Trimmer	C26	75-269A	.01 MFD. 400 Volt Audio Feed Condenser	L4	17-2025	Broadcast Preselector Primary
R11	53-926	1 Megohm A.V.C. Network Resistor	C10	78-2010	3-30 MMFD. Long Wave Oscillator Parallel Trimmer	C27	75-165A	.2 MFD. 200 Volt C Bias Network Condenser	L5	17-2025	Broadcast First Preselector Secondary
R12	53-921	40,000 ohm Screen Resistor	C11	78-1569	140 MMFD. Long Wave Oscillator Series Trimmer	C28	18-928	25 MFD. 25 Volt Electrolytic Condenser	L6	17-2025	Broadcast Second Preselector Secondary
R13	53-925	500,000 ohm Diode Load Resistor	C12	78-1569	450 MMFD. Broadcast Oscillator Series Trimmer	C29	1P-1274	4-4 MFD. 450 Volt Electrolytic Condenser	L7	17-2017	Foreign Band Preselector Primary
R14	19-1317	250,000 ohm Tone Control	C13	78-1561	70-120 MMFD. First I.F. Primary Trimmer	C30	75-266	1. MFD. 400 Volt B Supply By-Pass Condenser	L8	17-2017	Foreign Band Preselector Secondary
R15	53-919	5,000 ohm C Bias Network Resistor							L9	17-2010	1200 Microhenry First I.F. Primary
R16	53-926	1 Megohm C Bias Network Resistor	C14	78-1561	70-120 MMFD. First I.F. Secondary Trimmer	C31	75-269A	.01 MFD. Tone Control Condenser	L10	17-2010	1200 Microhenry First I.F.Secondary
R17	53-923	100,000 ohm C. Bias Network Resistor	C15	78-1561	70-120 MMFD. Second I.F. Primary Trimmer	C32	75-269A	.01 MFD. Audio Feed Condenser	L11	17-2010	1200 Microhenry Second I.F.Primary
R18	53-923	100,000 ohm Second Detector Hum Filter Resistor				C33	75-272A	.1 MFD. 200 Volt A.V.C. Network Condenser	L12	17-2010	1200 Microhenry Second I.F.Secondary
R19	53-924	250,000 ohm Second Detector Plate Resistor									

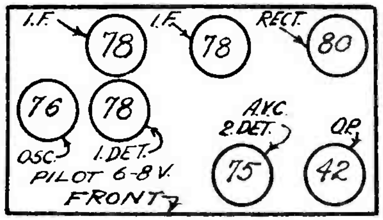
WILCOX-GAY CORP.

MODEL 5E7
Schematic, Socket Voltage, Parts

Tube	Plate	Screen	Cathode
Mixer	200	80	5
Osc	100	--	2
1 IF	190	80	3
2 IF	170	80	3
2 Det	45	--	-
Out	175	190	-

Output Grid to ground -18v
Field drop 135





R1	53-277	10,000	ohm Oscillator Plate Resistor
R2	53-1062	250	ohm Oscillator Cathode Resistor
R3	53-941	20,000	ohm Oscillator Grid Resistor
R4	53-923	100,000	ohm A.V.C. Network Resistor
R5	53-1144	2,000	ohm First Detector Cathode Resistor
R6	53-1063	500	ohm First I.F. Cathode Resistor
R7	53-1063	500	ohm Second I.F. Cathode Resistor
R8	53-919	5,000	ohm Second I.F. Plate Resistor
R9	53-898	50,000	ohm Diode I.F. Filter Resistor
R10	19-1291	500,000	ohm Volume Control & Switch
R11	53-926	1	Megohm A.V.C. Network Resistor
R12	53-921	40,000	ohm Screen Resistor
R13	53-925	500,000	ohm Diode Load Resistor
R14	19-1317	250,000	ohm Tone Control
R15	53-919	5,000	ohm C Bias Network Resistor
R16	53-926	1	Megohm C Bias Network Resistor
R17	53-923	100,000	ohm C Bias Network Resistor
R18	53-923	100,000	ohm Second Detector Hum Filter Resistor
R19	53-924	250,000	ohm Second Detector Plate Resistor
R20	53-925	500,000	ohm Output Grid Resistor

CONDENSERS

C1	77-1581	16-366	MMFD. First Section of 3 Gang Condenser
C2	77-1581	16-366	MMFD. Second Section of 3 Gang Condenser
C3	77-1581	16-366	MMFD. Third Section of 3 Gang Condenser
C4	77-1581		Broadcast Oscillator Parallel Trimmer on C3
C5	77-1581		Broadcast First Preselector Trimmer on C1
C6	77-1581		Broadcast Second Preselector Trimmer on C2
C7	78-1598	3-30	MMFD. Foreign Band Preselector Trimmer
C8	78-1598	3-30	MMFD. Police Band Preselector Trimmer
C9	78-1598	3-30	MMFD. Police Band Oscillator Parallel Trimmer
C10	78-1572	1600	MMFD. Police Band Oscillator Series Trimmer
C11	78-1572	600	MMFD. Broadcast Oscillator Series Trimmer
C12	78-1561	70-120	MMFD. First I.F. Primary Trimmer
C13	78-1561	70-120	MMFD. First I.F. Secondary Trimmer
C14	78-1561	70-120	MMFD. Second I.F. Primary Trimmer
C15	78-1561	70-120	MMFD. Second I.F. Secondary Trimmer
C16	78-1561	70-120	MMFD. Third I.F. Primary Trimmer
C17	78-1561	70-120	MMFD. Third I.F. Secondary Trimmer
C18	75-272A	.1	MFD. 200 Volt First I.F. Cathode By-Pass
C19	75-272A	.1	MFD. 200 Volt Second I.F. Cathode By-Pass
C20	75-269A	.01	MFD. 400 Volt Second I.F. Plate Isolation Condenser
C21	76-339	.0001	MFD. Mica Diode Filter Condenser
C22	76-339	.0001	MFD. Mica Diode Filter Condenser
C23	75-1326A	.1	MFD. 400 Volt Second Detector Plate Hum Filter
C24	76-265	.001	MFD. Mica Second Detector Plate By-Pass
C25	75-269A	.01	MFD. 400 Volt Audio Feed Condenser
C26	75-183A	.2	MFD. 200 Volt C Bias Network Condenser
C27	18-928	25	MFD. 25 Volt Electrolytic Condenser
C28	18-1274	4-4	MFD. 450 Volt Electrolytic Condenser
C29	75-266	1.	MFD. 400 Volt B Supply By-Pass Condenser
C30	75-269A	.01	MFD. Tone Control Condenser
C31	75-269A	.01	MFD. Audio Feed Condenser
C32	75-272A	.1	MFD. 200 Volt A.V.C. Network Condenser
C33	75-269A	.01	MFD. 400 Volt Line By-Pass Condenser
C34	75-272A	.1	MFD. 200 Volt Screen By-Pass Condenser
C35	75-272A	.1	MFD. 200 Volt A.V.C. Network By-Pass
C36	75-269A	.01	MFD. 400 Volt Oscillator Coupling Condenser
C37	76-264	.00005	MFD. Mica Oscillator Grid Condenser
C38	75-269A	.01	MFD. 400 Volt Oscillator Plate Condenser

INDUCTANCES

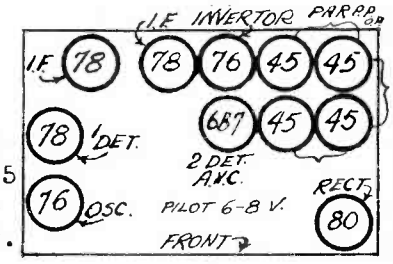
L1	17-2025	Broadcast Preselector Primary
L2	17-2025	Broadcast Preselector First Secondary
L3	17-2025	Broadcast Preselector Second Secondary
L4	17-1668	Police Band Preselector Primary
L5	17-1668	Police Band Preselector Secondary
L6	17-2017	Foreign Band Preselector Primary
L7	17-2017	Foreign Band Preselector Secondary
L8	17-2010	1200 Microhenry First I.F. Primary
L9	17-2010	1200 Microhenry First I.F. Secondary
L10	17-2010	1200 Microhenry Second I.F. Primary
L11	17-2010	1200 Microhenry Second I.F. Secondary
L12	17-2010	1200 Microhenry Third I.F. Primary
L13	17-2010	1200 Microhenry Third I.F. Secondary
L14	64-2003	Single 42 Output Transformer
L15	64-2003	2500 ohm Speaker Field
L16	80-1068	Power Transformer
L17	17-2018	Foreign Band Oscillator Primary
L18	17-2018	Foreign Band Oscillator Secondary
L19	17-1667	Police Band Oscillator Primary
L20	17-1667	Police Band Oscillator Secondary
L21	17-1646	Broadcast Oscillator Primary
L22	17-1646	Broadcast Oscillator Secondary
	68-2003	First I.F. Transformer Assembly
	68-2003	Second I.F. Transformer Assembly
	68-2004	Third I.F. Transformer Assembly

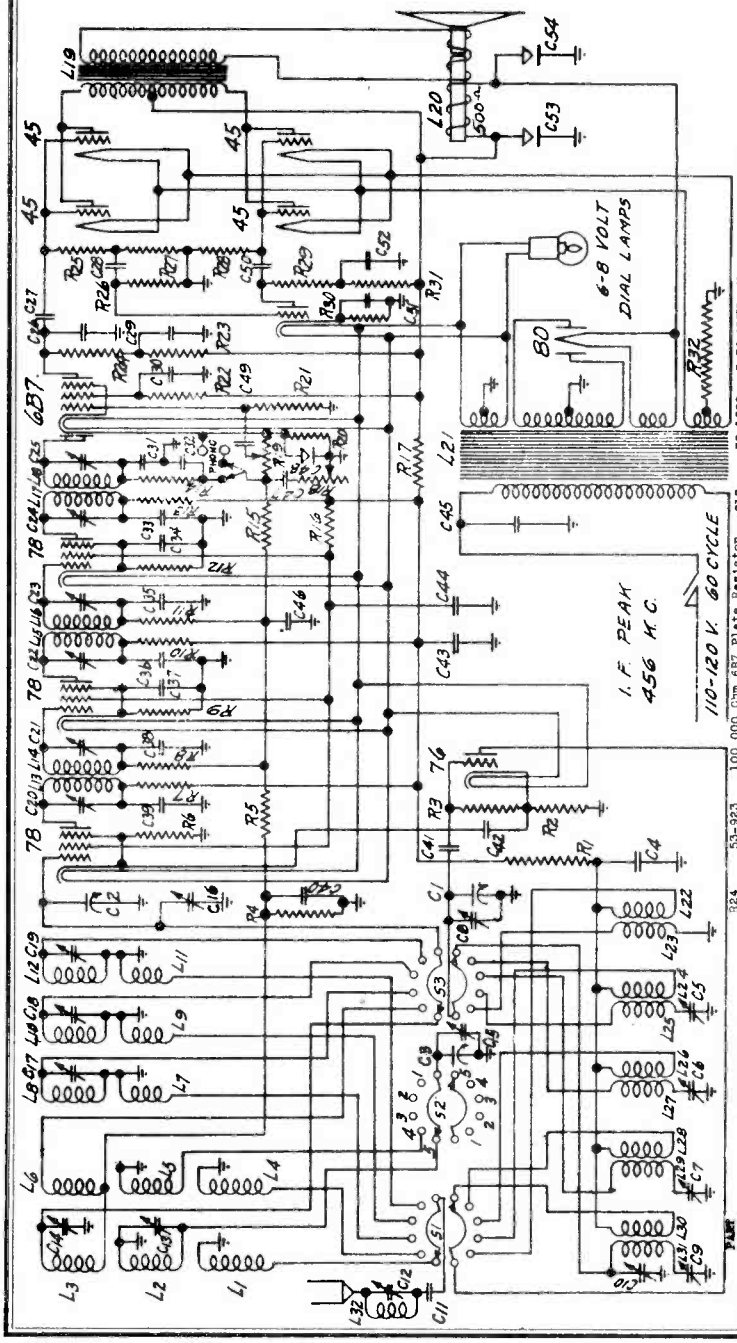
MODEL 4H11
Schematic, Socket
Voltage, Parts

WILCOX-GAY CORP.

Tube	Plate	Screen	Cathode
Mixer	245	95	8
Osc.	100	--	2
1 IF	235	95	4
2 IF	235	95	4
2 Det	70	--	1.5
Invert.	52	--	2.25
Output	330	--	---

Field 70 v. Output G-F 20 v.





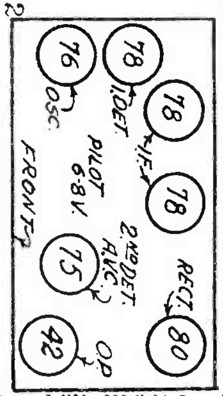
CODE	PART NO.	RESISTORS				CONDENSERS				
R1	53-878	20,000 Ohm Oscillator Feed Resistor Type J	R24	53-923	100,000 Ohm 687 Plate Resistor	C17	78-1588	3-30 MMFD. No. 3 Band Preselector Trimmer	C38	75-269A .01 Mfd. 400 Volt First I.F. Grid Isolation
R2	53-1063	250 Ohm Oscillator Cathode Resistor	R25	53-925	500,000 Ohm 45 Grid Resistor	C18	78-1588	3-30 MMFD. No. 4 Band Preselector Trimmer	C39	75-269A .01 Mfd. 400 Volt First Detector Plate Isolation
R3	53-941	20,000 Ohm Oscillator Grid Resistor	R26	53-925	500,000 Ohm 76 Grid Resistor	C19	78-1588	3-30 MMFD No. 5 Band Preselector Trimmer	C40	75-272A .1 Mfd. 200 Volt A.V.C. Network By-Pass Condenser
R4	53-926	1 Meg Ohm A.V.C. Network Resistor	R27	53-923	1,000,000 Ohm Push-Pull Network Resistor	C20	78-1561	70-120 MMFD. First I.F. Primary Trimmer	C41	76-264 .00005 Mfd. Mica Oscillator Coupling Condenser
R5	53-923	100,000 Ohm A.V.C. Network Resistor	R28	53-925	500,000 Ohm 45 Grid Resistor	C21	78-1561	70-120 MMFD. First I.F. Secondary Trimmer	C42	75-269A .01 Mfd. 400 Volt Oscillator Feed Condenser
R6	53-1144	2,000 Ohm First Detector Cathode Resistor	R29	53-923	100,000 Ohm 76 Plate Resistor	C22	78-1561	70-120 MMFD. Second I.F. Primary Trimmer	C43	75-266 1. Mfd. 400 Volt B. Supply By-Pass Condenser
R7	53-919	5,000 Ohm First Detector Plate Isolation	R30	53-1144	2,000 Ohm 76 Cathode Resistor	C23	78-1561	70-120 MMFD. Second I.F. Secondary Trimmer	C44	75-267A 5. Mfd. 200 Volt R.F. & I.F. Screen By-Pass Condenser
R8	53-923	100,000 Ohm First I.F. Grid Isolation	R31	53-923	100,000 Ohm 76 Plate Hum Filter Resistor	C24	78-1561	70-120 MMFD. Third I.F. Primary Trimmer	C45	75-269A .01 Mfd. 400 Volt Line By-Pass Condenser
R9	53-1063	500 Ohm First I.F. Cathode Resistor	R32	53-1419	650 Ohm 45 Cathode Bias Resistor	C25	78-1561	70-120 MMFD. Third I.F. Secondary Trimmer	C46	75-272A .1 Mfd. 200 Volt A.V.C. Network By-Pass Condenser
R10	53-919	5,000 Ohm First I.F. Plate Isolation			CONDENSERS	C26	76-265	.001 Mfd. Mica 687 Plate Filter Condenser	C47	75-269A .01 Mfd. 400 Volt One Control Condenser
R11	53-923	100,000 Ohm Second I.F. Grid Isolation	C1	77-1561	16-366 MMFD. First Section of 3 Gang Condenser	C27	75-269A .01 Mfd. 400 Volt Audio Feed Condenser		18-928	25 Mfd. 25 V. Dual Cathode By-Pass Condenser
R12	53-1063	500 Ohm Second I.F. Cathode Resistor	C2	77-1561	16-366 MMFD. Second Section of 3 Gang Condenser	C28	75-269A .01 Mfd. 400 Volt Push-Pull Network Condenser		C49	75-269A .01 Mfd. 400 Volt 687 Grid Feed Condenser
R13	53-919	5,000 Ohm Second I.F. Plate Isolation	C3	77-1561	16-366 MMFD. Third Section of 3 Gang Condenser	C29	75-1326A .1 Mfd. 400 Volt 687 Hum Filter Condenser		C50	75-269A .01 Mfd. 400 Volt Audio Feed Condenser
R14	53-895	50,000 Ohm Diode Filter Resistor	C4	75-272A .1 Mfd. 200 Volt Oscillator Feed Condenser		C30	75-1326A .1 Mfd. 400 Volt 687 Screen Condenser		C51	75-272A .1 Mfd. 200 Volt 76 Cathode By-Pass Condenser
R15	53-926	1 Meg Ohm A.V.C. Network Resistor	C5	78-1572	1600 MMFD. No. 2 Band Condenser for Reciprocal Trimmer	C31	76-339 .0001 Mfd. Mica Diode Filter Condenser		C52	75-1326A .1 Mfd. 400 Volt 76 Plate Hum Filter Condenser
R16	53-898	50,000 Ohm Screen Feed Resistor	C6	78-1572	600 MMFD. No. 3 Band Oscillator Reciprocal Trimmer	C32	76-339 .0001 Mfd. Mica Diode Filter Condenser		C53	18-721 .8 Mfd. 450 Volt Electrolytic Filter Condenser
R17	53-1420	2,500 Ohm B Supply Series Resistor	C7	78-1569	450 MMFD. No. 4 Band Oscillator Reciprocal Trimmer	C33	75-269A .01 Mfd. 400 Volt Second I.F. Plate Isolation Condenser		C54	18-721 .8 Mfd. 450 Volt Electrolytic Filter Condenser
R18	19-1317	250,000 Ohm Tone Control	C8	77-1561	No. 4 Band Oscillator Parallel Trimmer on C1	C34	75-272A .1 Mfd. 200 Volt Second I.F. Cathode By-Pass Condenser			
R19	19-1291	500,000 Ohm Volume Control & Switch	C9	78-1569	140 MMFD. No. 5 Band Oscillator Reciprocal Trimmer	C35	75-269A .01 Mfd. 400 Volt Second I.F. Grid Isolation			
R20	53-1035	1,000 Ohm 687 Cathode Resistor	C10	78-1588	3-30 MMFD. No. 5 Band Oscillator Parallel Trimmer	C36	75-269A .01 Mfd. 400 Volt First I.F. Plate Isolation			
R21	53-925	500,000 Ohm 687 Grid Resistor	C11	75-269A .01 Mfd. 400 Volt Antenna Series Condenser		C37	75-272A .1 Mfd. 200 Volt First I.F. Cathode By-Pass Condenser			
R22	53-926	1 Meg Ohm 687 Screen Resistor	C12		900 MMFD. Wave Trap Trimmer					
R23	53-923	100,000 Ohm 687 Plate Hum Filter Resistor	C13	78-1588	3-30 MMFD. No. 5 Band First Preselector Trimmer	C38	75-269A .01 Mfd. 400 Volt First I.F. Grid Isolation			
			C14	78-1588	3-30 MMFD No. 5 Band Second Preselector Trimmer	C39	75-269A .01 Mfd. 400 Volt First I.F. Plate Isolation			
			C15	77-1561	No. 4 Band First Preselector Trimmer on C3	C40	75-272A .1 Mfd. 200 Volt First I.F. Cathode By-Pass Condenser			
			C16	77-1561	No. 4 Band Second Preselector Trimmer on C2					

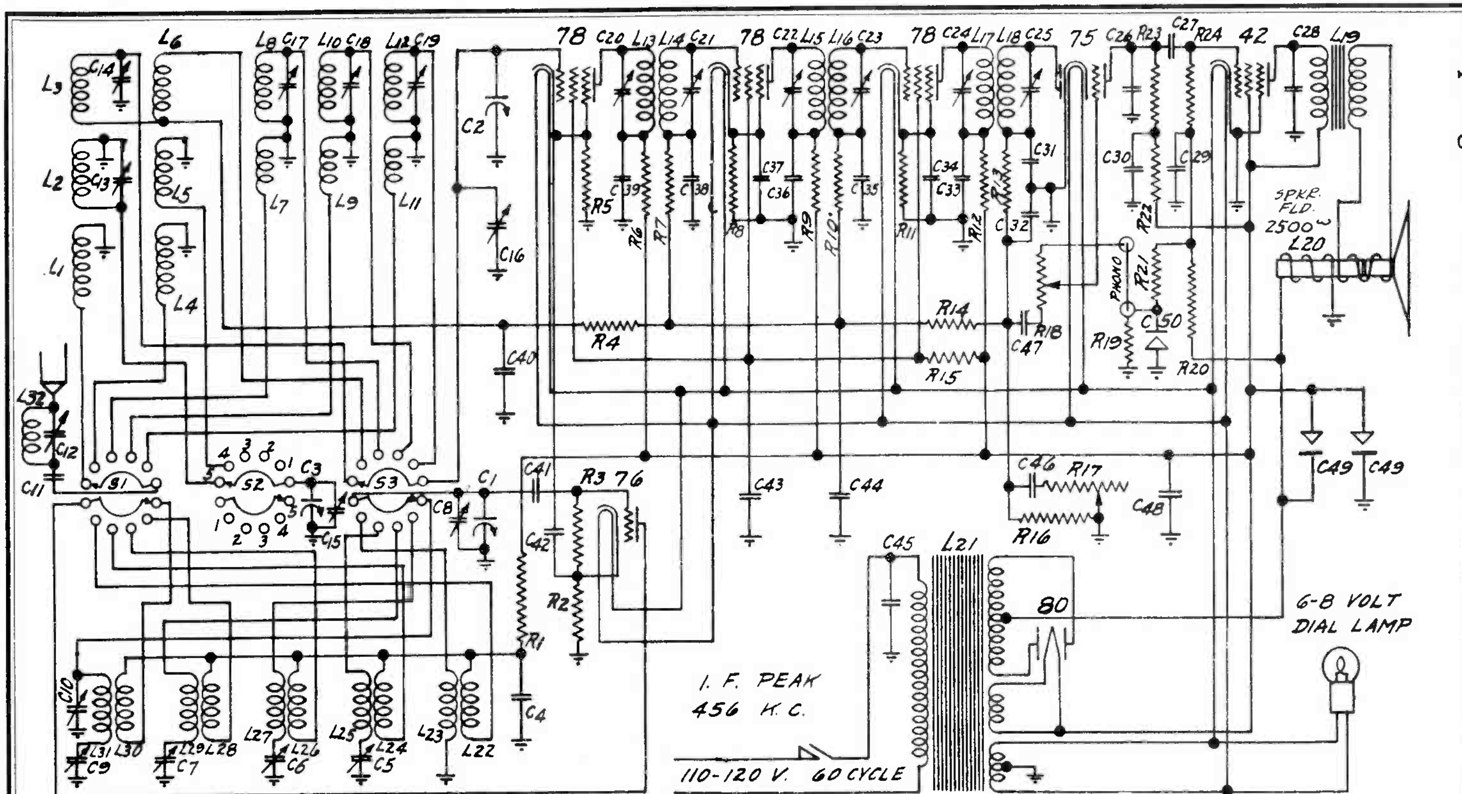
WILCOX-GAY CORP.

MODEL 4G7
Schematic, Socket Voltage, Parts

Tube	Plate	Screen	Cathode
1Det	192	82	6.
Osc.	110	--	2
1 IF	182	82	3
2 IF	180	82	3
2 Det	60	--	--
Output	187	210	--

Output grid -16. Field 162





CODE NO.	PART NO.	RESISTORS
R1	53-277	10,000 Ohm Oscillator Feed Resistor - Type J
R2	53-1062	250 Ohm Oscillator Cathode Resistor
R3	53-941	20,000 Ohm Oscillator Grid Resistor
R4	53-923	100,000 Ohm A.V.C. Network Resistor
R5	53-1144	2,000 Ohm First Detector Cathode Resistor
R6	53-919	5,000 Ohm First Detector Plate Isolation
R7	53-923	100,000 Ohm First I.F. Grid Isolation
R8	53-1063	500 Ohm First I.F. Cathode Resistor
R9	53-919	5,000 Ohm First I.F. Plate Isolation
R10	53-923	100,000 Ohm Second I.F. Grid Isolation
R11	53-1063	500 Ohm Second I.F. Cathode Resistor
R12	53-919	5,000 Ohm Second I.F. Plate Isolation
R13	53-898	50,000 Ohm Diode Filter Resistor
R14	53-926	1 Meg Ohm A.V.C. Network Resistor
R15	53-921	40,000 Ohm R.F. & I.F. Screen Feed Resistor
R16	53-925	500,000 Ohm A.V.C. Load Resistor
R17	19-1317	250,000 Ohm Tone Control
R18	19-1291	500,000 Ohm Volume Control & Switch
R19	53-919	5,000 Ohm C Bias Network Resistor
R20	53-926	1 Meg Ohm C Bias Network Resistor
R21	53-922	75,000 Ohm C Bias Network Resistor
R22	53-923	100,000 Ohm 75 Plate Hum Resistor
R23	53-924	250,000 Ohm 75 Plate Resistor
R24	53-925	500,000 Ohm 42 Grid Resistor

CONDENSERS

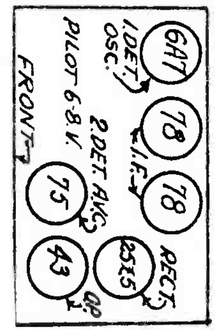
CODE NO.	PART NO.	CONDENSERS
C1	77-1581	16-366 MMFD. First Section of 3 Gang Condenser
C2	77-1581	16-366 MMFD. Second Section of 3 Gang Condenser
C3	77-1581	16-366 MMFD. Third Section of 3 Gang Condenser
C4	75-272A	.1 Mfd. 200 Volt Oscillator Feed By-Pass Condenser
C5	78-1572	1600 MMFD. No. 2 Band Oscillator Reciprocal Trimmer
C6	78-1572	600 MMFD. No. 3 Band Oscillator Reciprocal Trimmer
C7	78-1569	450 MMFD. No. 4 Band Oscillator Reciprocal Trimmer
C8	77-1581	No. 4 Band Oscillator Parallel Trimmer on C-1
C9	78-1569	140 MMFD. No. 5 Band Oscillator Reciprocal Trimmer
C10	78-1588	3-30 MMFD. No. 5 Band Oscillator Parallel Trimmer
C11	75-269A	.01 Mfd. 400 Volt Antenna Series Condenser
C12		900 MMFD. Wave Trap Trimmer
C13	78-1588	3-30 MMFD. No. 5 Band First Preselector Trimmer
C14	78-1588	3-30 MMFD. No. 5 Band Second Preselector Trimmer
C15	77-1581	No. 4 Band First Preselector Trimmer on C-3
C16	77-1581	No. 4 Band Second Preselector Trimmer on C-2
C17	78-1588	3-30 MMFD. No. 3 Band Preselector Trimmer
C18	78-1588	3-30 MMFD. No. 4 Band Preselector Trimmer
C19	78-1588	3-30 MMFD. No. 5 Band Preselector Trimmer
C20	78-1561	70-120 MMFD. First I.F. Primary Trimmer
C21	78-1561	70-120 MMFD. First I.F. Secondary Trimmer
C22	78-1561	70-120 MMFD. Second I.F. Primary Trimmer
C23	78-1561	70-120 MMFD. Second I.F. Secondary Trimmer
C24	78-1561	70-120 MMFD. Third I.F. Primary Trimmer
C25	78-1561	70-120 MMFD. Third I.F. Secondary Trimmer
C26	76-265	.001 Mfd. Mica 75 Plate Filter Condenser
C27	75-269A	.01 Mfd. 400 Volt Audio Feed Condenser
C28	75-1132	.002 Mfd. 600 Volt 42 Plate Filter Condenser
C29	75-183A	.2 Mfd. 200 Volt C Bias Network Condenser
C30	75-1326A	.1 Mfd. 400 Volt 75 Plate Hum Filter Condenser
C31	76-339	.0001 Mfd. Mica Diode Filter Condenser
C32	76-339	.0001 Mfd. Mica Diode Filter Condenser
C33	75-269A	.01 Mfd. 400 Volt Second I.F. Plate Isolation Condenser
C34	75-272A	.1 Mfd. 200 Volt Second I.F. Cathode By-Pass Condenser
C35	75-269A	.01 Mfd. 400 Volt Second I.F. Grid Isolation Condenser
C36	75-269A	.01 Mfd. 400 Volt First I.F. Plate Isolation Condenser
C37	75-272A	.1 Mfd. 200 Volt First I.F. Cathode By-Pass Condenser
C38	75-269A	.01 Mfd. 400 Volt First I.F. Grid Isolation Condenser
C39	75-269A	.01 Mfd. 400 Volt First Detector Plate Isolation Condenser
C40	75-272A	.1 Mfd. 200 Volt A.V.C. Network By-Pass Condenser
C41	76-264	.00005 Mfd. Mica Oscillator Coupling Condenser
C42	75-269-A	.01 Mfd. 400 Volt Oscillator Feed Condenser
C43	75-267A	.5 Mfd. 200 Volt R.F. & I.F. Screen By-Pass Condenser
C44	75-272A	.1 Mfd. 200 Volt A.V.C. Network By-Pass Condenser
C45	75-269A	.01 Mfd. 400 Volt 110 Line By-Pass Condenser
C46	75-269A	.01 Mfd. 400 Volt Tone Control Condenser
C47	75-269A	.01 Mfd. 400 Volt Audio Feed Condenser
C48	75-266	1. Mfd. 400 Volt B Supply By-Pass Condenser
C49	18-1129	4-4 Mfd. 450 Volt Electrolytic Filter Condenser
C50	18-928	25 Mfd. 25 Volt Electrolytic Condenser

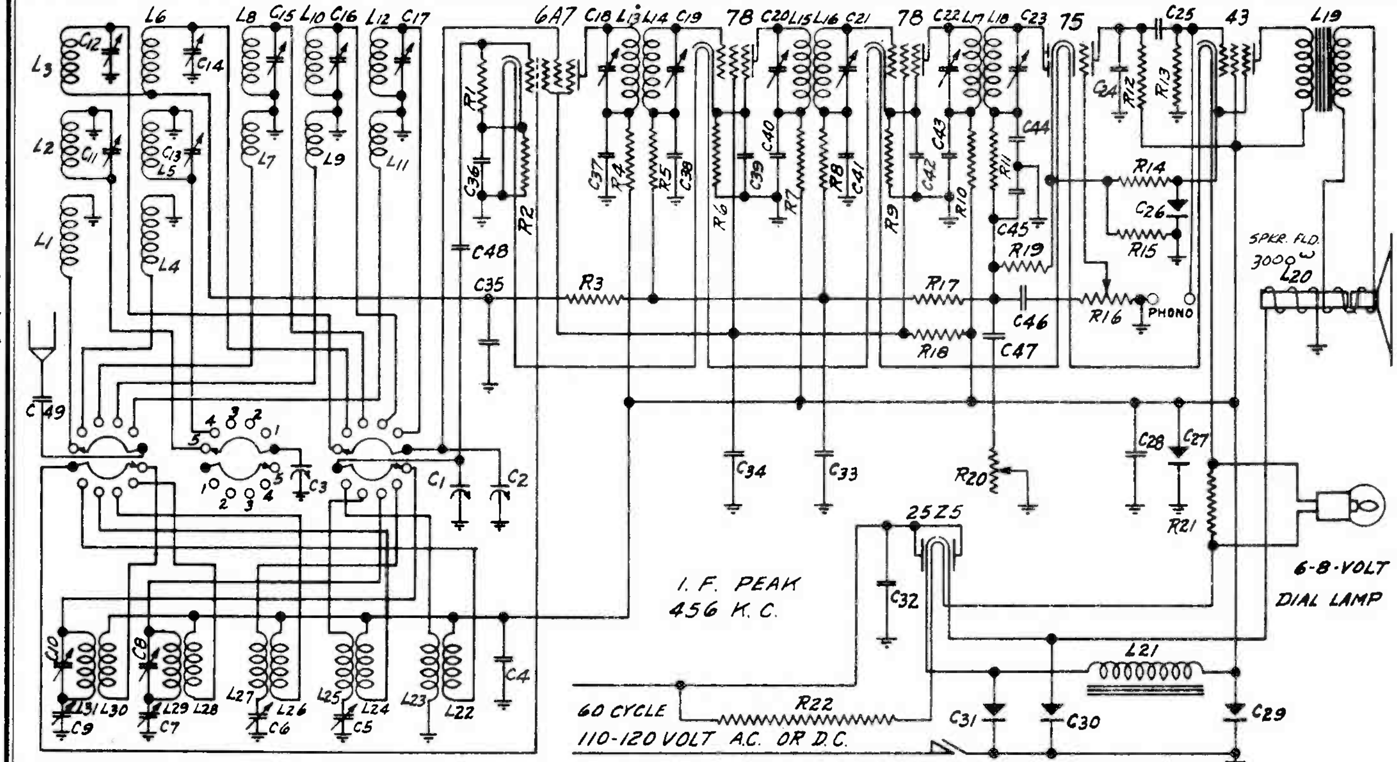
MODELS 4J6,4JC6
Schematic,Socket
Voltage,Parts

WILCOX-GAY CORP.

Tube	Plate	Screen	Cathode
6A7	80	70	2
1 IF	72	70	3
2 IF	72	70	3
2 Det	55	--	1
Out	80	95	12

6A7 P to Grd 95. G to Grd -6





CODE	PART NO.	RESISTORS
R1	941	20,000 Ohm Oscillator Grid Resistor
R2	1062	250 Ohm Oscillator Cathode Resistor
R3	923	100,000 Ohm A.V.C. Network Resistor
R4	919	5,000 Ohm 6A7 Plate Isolation Resistor
R5	923	100,000 Ohm First I.F. Grid Isolation Resistor
R6	1063	500 Ohm First I.F. Cathode Resistor
R7	919	5,000 Ohm First I.F. Plate Isolation Resistor
R8	923	100,000 Ohm Second I.F. Grid Isolation Resistor
R9	1063	500 Ohm Second I.F. Cathode Resistor
R10	919	5,000 Ohm Second I.F. Plate Isolation Resistor
R11	898	50,000 Ohm Diode Plate Filter Resistor
R12	923	100,000 Ohm 75 Plate Load Resistor
R13	925	500,000 Ohm 43 Grid Resistor
R14	1063	500 Ohm 43 Cathode Resistor
R15	1122	40 Ohm 75 Cathode Resistor
R16	1291	500,000 Ohm Volume Control & Switch
R17	926	1 Megohm A.V.C. Network Resistor
R18	919	5,000 Ohm R.F. & I.F. Screen Feed Resistor
R19	925	500,000 Ohm A.V.C. Load Resistor
R20	1317	250,000 Ohm Tone Control
R21	1308	20 Ohm Pilot Light Shunt Resistor
R22	1125	130 Ohm Resistor in Power Cord

CODE	PART NO.	CONDENSERS
C1	1581	16-366 MMFD. First Section of 3 Gang Condenser
C2	1581	16-366 MMFD. Second Section of 3 Gang Condenser
C3	1581	16-366 MMFD. Third Section of 3 Gang Condenser
C4	272A	.1 MFD. 200 Volt Oscillator Feed By-Pass Condenser
C5	1572	1600 MMFD. No. 2 Band Oscillator Reciprocal Trimmer
C6	1572	600 MMFD. No. 3 Band Oscillator Reciprocal Trimmer
C7	1569	450 MMFD. No. 4 Band Oscillator Reciprocal Trimmer
C8	1581	No. 4 Band Oscillator Parallel Trimmer on C1
C9	1569	140 MMFD. No. 5 Band Oscillator Reciprocal Trimmer
C10	1588	3-30 MMFD. No. 5 Band Oscillator Parallel Trimmer
C11	1588	3-30 MMFD. No. 5 Band First Preselector Trimmer
C12	1588	3-30 MMFD. No. 5 Band Second Preselector Trimmer
C13	1581	No. 4 Band First Preselector Trimmer on C3
C14	1581	No. 4 Band Second Preselector Trimmer on C2
C15	1588	3-30 MMFD. No. 3 Band Preselector Trimmer
C16	1588	3-30 MMFD. No. 2 Band Preselector Trimmer
C17	1588	3-30 MMFD. No. 1 Band Preselector Trimmer
C18	1561	70-120 MMFD. First I.F. Primary Trimmer
C19	1561	70-120 MMFD. First I.F. Secondary Trimmer
C20	1561	70-120 MMFD. Second I.F. Primary Trimmer
C21	1561	70-120 MMFD. Second I.F. Secondary Trimmer
C22	1561	70-120 MMFD. Third I.F. Primary Trimmer
C23	1561	70-120 MMFD. Third I.F. Secondary Trimmer
C24	265	.001 Mfd. Mica 75 Plate Filter Condenser
C25	269A	.01 Mfd. 400 Volt Audio Feed Condenser
C26	928	25 Mfd. 25 Volt Dry Electrolytic Condenser
C27	1379	4 Mfd. 375 Volt Dry Electrolytic Condenser
C28	266	1 Mfd. 400 Volt B Supply By-Pass Condenser
C29	1295	4 Mfd. 150 Volt Dry Electrolytic Condenser
C30	1295	4 Mfd. 150 Volt Dry Electrolytic Condenser
C31	1295	10 Mfd. 150 Volt Dry Electrolytic Condenser
C32	272A	.1 Mfd. 200 Volt Line By-Pass Condenser
C33	272A	.1 Mfd. 200 Volt A.V.C. Network By-Pass Condenser
C34	267A	.5 Mfd. 200 Volt Screen By-Pass Condenser
C35	269A	.01 Mfd. 400 Volt A.V.C. Network By-Pass Condenser
C36	272A	.1 Mfd. 200 Volt 6A7 Cathode By-Pass Condenser
C37	269A	.01 Mfd. 400 Volt 6A7 Plate Isolation Condenser
C38	269A	.01 Mfd. 400 Volt First I.F. Grid Isolation Condenser
C39	272A	.1 Mfd. 200 Volt First I.F. Cathode By-Pass Condenser
C40	269A	.01 Mfd. 400 Volt First I.F. Plate Isolation Condenser
C41	269A	.01 Mfd. 400 Volt Second I.F. Grid Isolation Condenser
C42	272A	.1 Mfd. 200 Volt Second I.F. Cathode By-Pass Condenser
C43	269A	.01 Mfd. 400 Volt Second I.F. Plate Isolation Condenser
C44	339	.0001 Mfd. Mica Diode Filter Condenser
C45	339	.0001 Mfd. Mica Diode Filter Condenser
C46	269A	.01 Mfd. 400 Volt 75 Grid Feed Condenser
C47	269A	.01 Mfd. 400 Volt Tone Control Condenser
C48	268	.00025 Mfd. Mica Oscillator Coupling Condenser
C49	268	.00025 Mfd. Mica Antenna Series Condenser

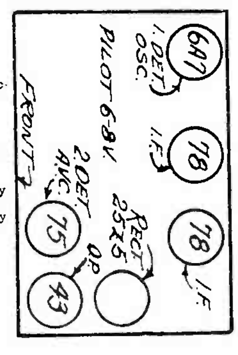
WILCOX-GAY CORP.

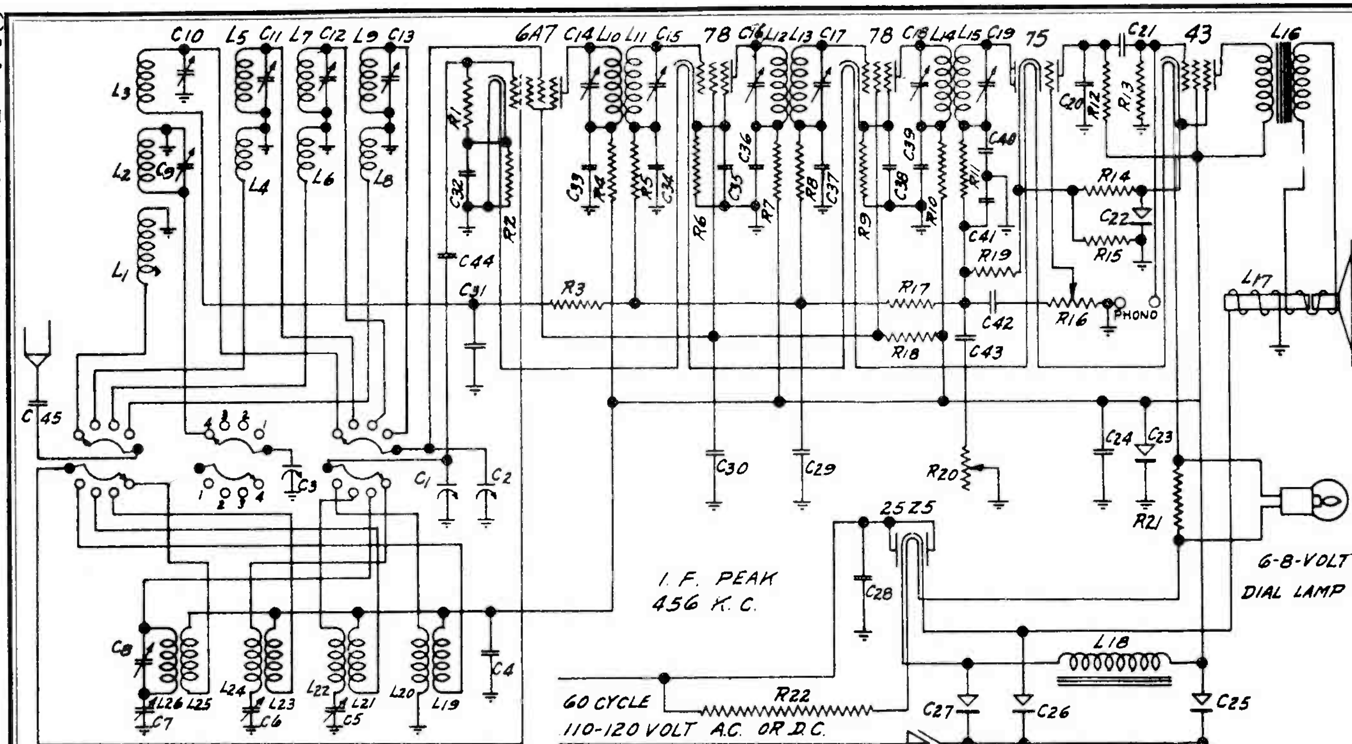
MODELS 4JA6, 4JB6
Schematic, Socket Voltage, Parts

6A7

Tube	Plate	Screen	Cathode
6A7	80*95**	70*	2*
78	72	70	3
78	72	70	3
75	55	--	1
43	80	95	12

* Mixer ** Oscillator



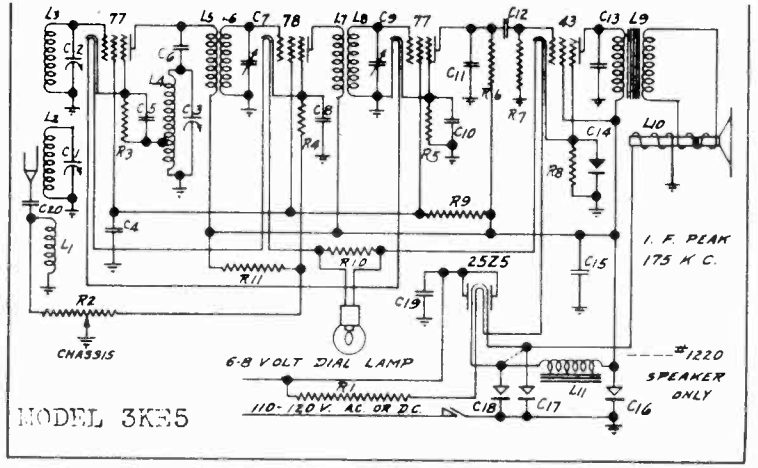


CODE	PART NO.	RESISTORS
R1	941	20,000 Ohm Oscillator Grid Resistor
R2	1062	250 Ohm Oscillator Cathode Resistor
R3	923	100,000 Ohm A.V.C. Network Resistor
R4	919	5,000 Ohm 6A7 Plate Isolation Resistor
R5	923	100,000 Ohm First I.F. Grid Isolation Resistor
R6	1063	500 Ohm First I.F. Cathode Resistor
R7	919	5,000 Ohm First I.F. Plate Isolation Resistor
R8	923	100,000 Ohm Second I.F. Grid Isolation Resistor
R9	1063	500 Ohm Second I.F. Cathode Resistor
R10	919	5,000 Ohm Second I.F. Plate Isolation Resistor
R11	898	50,000 Ohm Diode Plate Filter Resistor
R12	923	100,000 Ohm 75 Plate Load Resistor
R13	925	500,000 Ohm 43 Grid Resistor
R14	1063	500 Ohm 43 Cathode Resistor
R15	1122	40 Ohm 75 Cathode Resistor
R16	1291	500,000 Ohm Volume Control & Switch
R17	926	1 Megohm A.V.C. Network Resistor
R18	919	5,000 Ohm R.F. & I.F. Screen Feed Resistor
R19	925	500,000 Ohm A.V.C. Load Resistor
R20	1317	250,000 Ohm Tone Control
R21	1308	20 Ohm Pilot Light Shunt Resistor
R22	1125	130 Ohm Resistor in Power Cord

CODE	PART NO.	CONDENSERS
C1	1581	16-366 MMFD. First Section of 3 Gang Condenser
C2	1581	16-366 MMFD. Second Section of 3 Gang Condenser
C3	1581	16-366 MMFD. Third Section of 3 Gang Condenser
C4	272A	.1 MFD. 200 Volt Oscillator Feed By-Pass Condenser
C5	1572	1600 MMFD. No. 2 Band Oscillator Reciprocal Trimmer
C6	1572	500 MMFD. No. 3 Band Oscillator Reciprocal Trimmer
C7	1569	450 MMFD. No. 4 Band Oscillator Reciprocal Trimmer
C8	1581	No. 4 Band Oscillator Parallet Trimmer on C1
C9	1581	No. 4 Band First Preselector Trimmer on C3
C10	1581	No. 4 Band Second Preselector Trimmer on C2
C11	1588	3-30 MMFD. No. 3 Band Preselector Trimmer
C12	1588	3-30 MMFD. No. 2 Band Preselector Trimmer
C13	1588	3-30 MMFD. No. 1 Band Preselector Trimmer
C14	1561	70-120 MMFD. First I.F. Primary Trimmer
C15	1561	70-120 MMFD. First I.F. Secondary Trimmer
C16	1561	70-120 MMFD. Second I.F. Primary Trimmer
C17	1561	70-120 MMFD. Second I.F. Secondary Trimmer
C18	1561	70-120 MMFD. Third I.F. Primary Trimmer
C19	1561	70-120 MMFD. Third I.F. Secondary Trimmer
C20	265	.001 Mfd. Mica 75 Plate Filter Condenser
C21	269A	.01 Mfd. 400 Volt Audio Feed Condenser
C22	928	25 Mfd. 25 Volt Dry Electrolytic Condenser
C23	1379	4 Mfd. 375 Volt Dry Electrolytic Condenser
C24	266	1 Mfd. 400 Volt B Supply By-Pass Condenser
C25	1295	4 Mfd. 150 Volt Dry Electrolytic Condenser
C26	1295	4 Mfd. 150 Volt Dry Electrolytic Condenser
C27	1295	10 Mfd. 150 Volt Dry Electrolytic Condenser
C28	272A	.1 Mfd. 200 Volt Line By-Pass Condenser
C29	272A	.1 Mfd. 200 Volt A.V.C. Network By-Pass Condenser
C30	267A	.5 Mfd. 200 Volt Screen By-Pass Condenser
C31	269A	.01 Mfd. 400 Volt A.V.C. Network By-Pass Condenser
C32	272A	.1 Mfd. 200 Volt 6A7 Cathode By-Pass Condenser
C33	269A	.01 Mfd. 400 Volt 6A7 Plate Isolation Condenser
C34	269A	.01 Mfd. 400 Volt First I.F. Grid Isolation Condenser
C35	272A	.1 Mfd. 200 Volt First I.F. Cathode By-Pass Condenser
C36	269A	.01 Mfd. 400 Volt First I.F. Plate Isolation Condenser
C37	269A	.01 Mfd. 400 Volt Second I.F. Grid Isolation Condenser
C38	272A	.1 Mfd. 200 Volt Second I.F. Cathode By-Pass Condenser
C39	269A	.01 Mfd. 400 Volt Second I.F. Plate Isolation Condenser
C40	339	.0001 Mfd. Mica Diode Filter Condenser
C41	339	.0001 Mfd. Mica Diode Filter Condenser
C42	269A	.01 Mfd. 400 Volt 75 Grid Feed Condenser
C43	269A	.01 Mfd. 400 Volt Tone Control Condenser
C44	268	.00025 Mfd. Mica Oscillator Coupling Condenser
C45	269	.00025 Mfd. Mica Antenna Series Condenser

INDUCTANCES

CODE	PART NO.	INDUCTANCES
L1	1481	No. 4 Band Preselector Primary
L2	1481	No. 4 Band Preselector First Secondary
L3	1481	No. 4 Band Preselector Second Secondary
L4	1668	No. 3 Band Preselector Primary
L5	1668	No. 3 Band Preselector Secondary
L6	1668	No. 2 Band Preselector Primary
L7	1666	No. 2 Band Preselector Secondary
L8	1664	No. 1 Band Preselector Primary
L9	1664	No. 1 Band Preselector Secondary
L10	1663	First I.F. Primary
L11	1663	First I.F. Secondary
L12	1633	Second I.F. Primary
L13	1633	Second I.F. Secondary
L14	1633	Third I.F. Primary
L15	1633	Third I.F. Secondary
L16	1653	Single 43 Output Transformer
L17	1653	3000 Ohm Speaker Field
L18	940	20 Henry Filter Choke
L19	1663	No. 1 Band Oscillator Primary
L20	1663	No. 1 Band Oscillator Secondary
L21	1665	No. 2 Band Oscillator Primary
L22	1665	No. 2 Band Oscillator Secondary
L23	1667	No. 3 Band Oscillator Primary
L24	1667	No. 3 Band Oscillator Secondary
L25	1645	No. 4 Band Oscillator Primary
L26	1645	No. 4 Band Oscillator Secondary

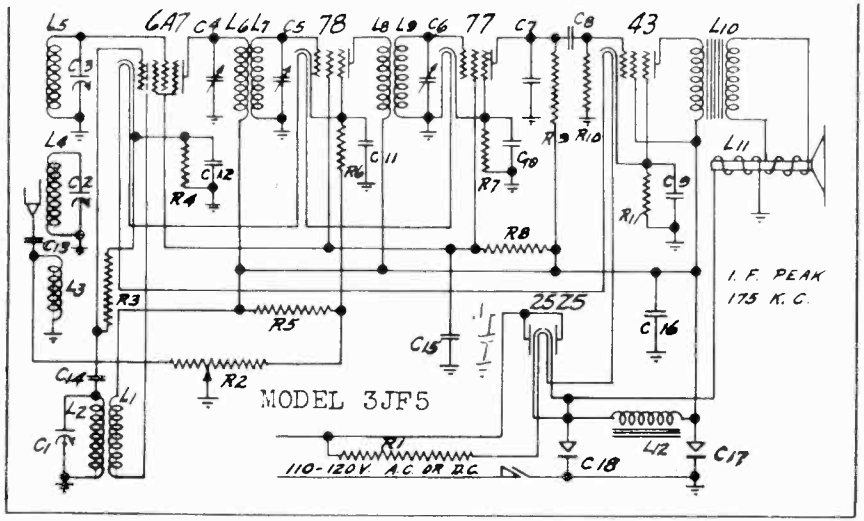


MODEL 3KE5

CODE	PART NO.	RESISTORS
R1	1125	150 Ohm Resistor in Power Cord
R2	1296	10,000 Ohm Volume Control & Switch
R3	919	5,000 Ohm Resistor First Detector & Osc. Cathode
R4	1063	500 Ohm Resistor I.F. Cathode
R5	941	20,000 Ohm Resistor Second Detector Cathode
R6	924	250,000 Ohm Resistor Second Detector Plate
R7	925	500,000 Ohm Resistor Output Grid Bias
R8	1063	500 Ohm Resistor Output Cathode
R9	921	40,000 Ohm Resistor Screen Feed
R10	308	20 Ohm Resistor Pilot light shunt
R11	922	75,000 Ohm Resistor I.F. Cathode Feed

CODE	PART NO.	CONDENSERS
C1	833	371 MMFD. Preselector Section of 3 Gang Condenser
C2	833	371 MMFD. Preselector Section of 3 Gang Condenser
C3	833	336 MMFD. Oscillator Section of 3 Gang Condenser
C4	272A	.1 Mfd. 200 Volt Screen By-Pass Condenser
C5	265	.001 Mfd. Mica First Detector & Osoillator Cathode
C6	264	.00005 Mfd. Mica Oscillator Coupling Condenser
C7	938	75-150 MMFD. First I.F. Trimmer Condenser
C8	272A	.1 Mfd. 200 Volt I.F. Cathode By-Pass Condenser
C9	849	75-150 MMFD. Second I.F. Trimmer Condenser
C10	183A	.2 Mfd. 200 Volt Second Detector Cathode By-Pass Condenser
C11	265	.001 Mfd. Mica Second Detector Plate Filter Condenser
C12	269A	.01 Mfd. 400 Volt Audio Feed Condenser
C13	662	.002 Mfd. Mica Output Plate Filter Condenser
C14	928	25 Mfd. 25 Volt C Bias By-Pass Condenser
C15	267-A	.5 Mfd. 200 Volt B Supply By-Pass Condenser
C16	1065	4 Mfd. 150 Volt Dry Electrolytic Condenser
C17	1065	4 Mfd. 150 Volt Dry Electrolytic Condenser
C18	1065	11 Mfd. 150 Volt Dry Electrolytic Condenser
C19	272A	.1 Mfd. 200 Volt Line By-Pass Condenser
C20	265	.001 Mfd. Antenna Series Condenser

	PART NO.	INDUCTANCES
L1	844	Preselector Primary 178 turns #36 S.S.E.
L2	844	Preselector First Secondary 133 turns #36 S.S.E.
L3	844	Preselector Second Secondary 128 turns #36 S.S.E.
L4	935	Oscillator Coil 98 turns #36 S.S.E. tapped at 15 T.
L5	935	First I.F. Primary 650 turns #36 S.S.E.
L6	935	First I.F. Secondary 650 turns #36 S.S.E.
L7	1172	Second I.F. Primary 650 turns #38 S.S.E.
L8	1172	Second I.F. Secondary 650 turns #38 S.S.E.
L9	917	Single #43 Output Transformer
L10	917	3000 Ohm speaker Field
L11	940	20 Henry Choke

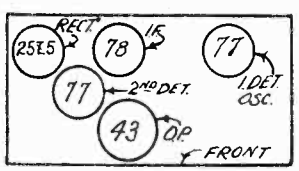


MODEL 3JF5

CODE	PART NO.	RESISTORS
R1	20-809	170 Ohm Resistor In Power Cord
R2	19-1296	10,000 Ohm Volume Control & Switch
R3	53-898	50,000 Ohm Resistor Oscillator Grid
R4	53-1062	250 Ohm Resistor Oscillator Cathode
R5	53-922	75,000 Ohm Resistor I.F. Cathode Feed
R6	53-1063	500 Ohm Resistor I.F. Cathode
R7	53-941	20,000 Ohm Resistor 77 Cathode
R8	53-919	5,000 Ohm Resistor Screen
R9	53-923	100,000 Ohm Resistor 77 Plate
R10	53-925	500,000 Ohm Resistor Output Grid
R11	53-1063	500 Ohm Resistor Output Cathode

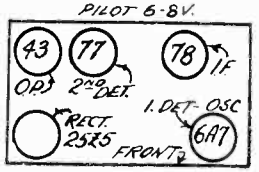
CODE	PART NO.	CONDENSERS
C1	77-833	336 Oscillator Section of 3 Gang
C2	77-833	371 Preselector Section of 3 Gang
C3	77-833	371 Preselector Section of 3 Gang
C4	78-2008	First I.F. Primary Trimmer
C5	78-2007	First I.F. Secondary Trimmer
C6	78-2009	Second I.F. Trimmer
C7	76-265	.001 Mfd. Mica 77 Plate Filter
C8	75-269A	.01 Mfd. 400 Volt Audio Feed Condenser
C9	75-267A	.5 Mfd. 200 Volt 43 Cathode By-Pass
C10	75-272A	.1 Mfd. 200 Volt 77 Cathode By-Pass
C11	75-272A	.1 Mfd. 200 Volt 78 Cathode By-Pass
C12	75-272A	.1 Mfd. 200 Volt 6A7 Cathode By-Pass
C13	76-265	.001 Mfd. Mica Antenna Series Condenser
C14	76-264	.00005 Mfd. Mica Oscillator Grid Cond.
C15	75-272A	.1 Mfd. 200 Volt Screen By-Pass
C16	75-272A	.1 Mfd. 200 Volt B supply By-Pass
C17	18-2001	6 Mfd. 150 Volt Dry Electrolytic Condenser
C18	18-2001	6 Mfd. 150 Volt Dry Electrolytic Condenser

	PART NO.	INDUCTANCES
L1	17-2030	Oscillator Coil Primary
L2	17-2030	Oscillator Coil Secondary
L3	17-2019	Preselector Coil Primary
L4	17-2019	Preselector Coil First Secondary
L5	17-2019	Preselector Coil Second Secondary
L6	17-2024	First I.F. Transformer Primary
L7	17-2024	First I.F. Transformer Secondary
L8	17-2023	Second I.F. Transformer Primary
L9	17-2023	Second I.F. Transformer Secondary
L10	64-2006	Output Transformer for #43 Tube
L11	64-2006	3000 Ohm Speaker Field
L12	14-940	20 Henry Choke



	Tube	Plate	Screen	Cathode
Mix-Osc	77	118	65	3.6
I-F	78	118	65	2.2
2 Det.	77	52	65	3.2
Output	43	111	118	17.

Field drop 155 v.

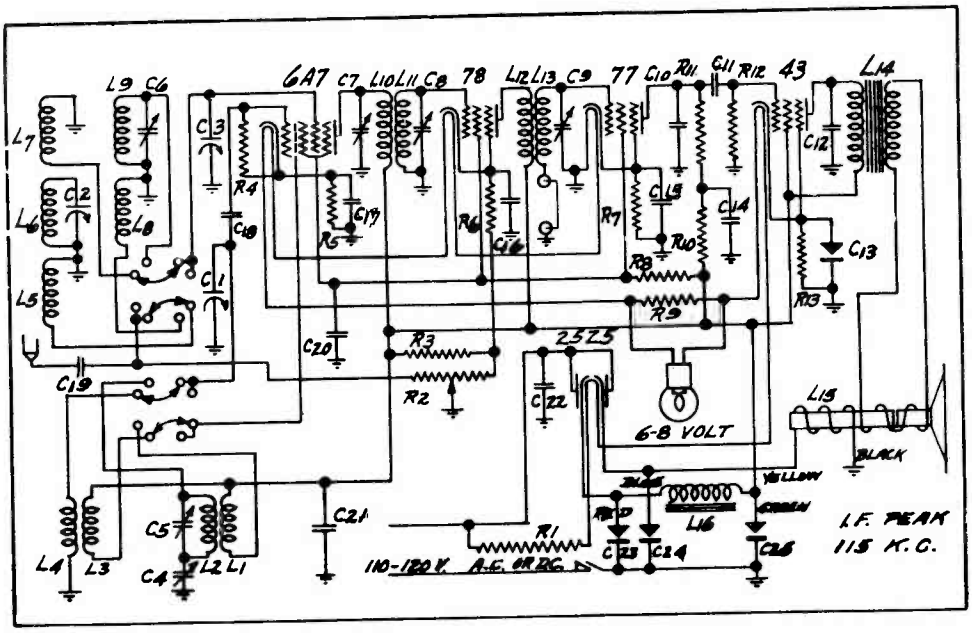


Tube	Plate	Screen	Cathode
6A7	80	60	2.
78	80	60	2.
77	25	60	3
43	70	80	15

Osc. Plate 80, Grid -2.
Field drop 90 v.

WILCOX-GAY CORP.

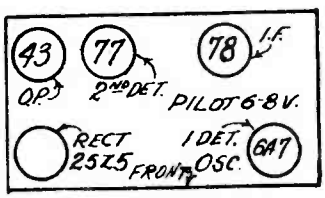
MODELS 3JD5, 3JG5
Schematic, Socket
Voltage, Parts



CODE	PART NO.	RESISTORS
R1	20-1125	130 Ohm Resistor in Power Cord
R2	19-1296	10,000 Ohm Volume Control & Switch
R3	53-922	75,000 Ohm Resistor I.F. Cathode Feed
R4	53-898	50,000 Ohm Resistor Oscillator Grid
R5	53-1062	250 Ohm Resistor 6A7 Cathode
R6	53-1063	500 Ohm Resistor I.F.Cathode
R7	53-941	20,000 Ohm Resistor Second Detector Cathode
R8	53-921	40,000 Ohm Resistor Screen Feed
R9	53-1308	20 Ohm Resistor Pilot Light Shunt
R10	53-923	100,000 Ohm 77 Plate Hum Resistor
R11	53-924	250,000 Ohm Resistor 77 Plate
R12	53-925	500,000 Ohm Resistor Output Grid
R13	53-1063	500 Ohm Resistor Output Cathode
		CONDENSERS
C1	77-833	336 MMFD. Oscillator Section of 3 Gang
C2	77-833	371 MMFD. Preselector Section of 3 Gang
C3	77-833	371 MMFD. Preselector Section of 3 Gang
C4	78-2006	Long Wave Oscillator Series Trimmer
C5	78-1597	Long Wave Oscillator Parallel Trimmer
C6	78-1597	Long Wave Preselector Trimmer
C7	78-993	First I.F. Primary Trimmer
C8	78-994	First I.F. Secondary Trimmer
C9	78-788	Second I.F. Trimmer
C10	76-265	.001 Mfd. Mica 77 Plate By-Pass
C11	75-269A	.01 Mfd. 400 Volt Audio Feed Condenser
C12	75-343A	.004 Mfd. Paper Output Plate By-Pass
C13	18-928	25 Mfd. 25 Volt Output Cathode
C14	75-272A	.1 Mfd. 200 Volt 77 Plate Hum Filter
C15	75-267A	5. Mfd. 200 Volt 77 Cathode By-Pass
C16	75-272A	.1 Mfd. 200 Volt 78 Cathode By-Pass
C17	75-272A	.1 Mfd. 200 Volt 6A7 Cathode By-Pass
C18	76-264	.00005 Mfd. Mica Oscillator Grid Condenser
C19	76-265	.001 Mfd. Mica Antenna Series Condenser
C20	75-272A	.1 Mfd. 200 Volt Screen By-Pass
C21	75-267A	.5 Mfd. 200 Volt B Supply By-Pass
C22	75-272A	.1 Mfd. 200 Volt 110 Volt Line By-Pass
C23	18-1085	10 Mfd. 150 Volt Dry Electrolytic Cond.
C24	18-1085	4 Mfd. 150 Volt Dry Electrolytic Cond.
C25	18-1085	4 Mfd. 150 Volt Dry Electrolytic Cond.
		INDUCTANCES
L1	17-2013	Long Wave Oscillator Primary
L2	17-2013	Long Wave Oscillator Secondary
L3	17-2013	Broadcast Oscillator Primary
L4	17-2013	Broadcast Oscillator Secondary
L5	17-2015	Broadcast Preselector Primary
L6	17-2015	Broadcast Preselector First Secondary
L7	17-2015	Broadcast Preselector Second Secondary
L8	17-2015	Long Wave Preselector Primary
L9	17-2015	Long Wave Preselector Secondary
L10	17-999	First I.F. Trans. Primary
L11	17-999	First I.F. Trans. Secondary
L12	17-2032	Second I.F. Trans. Primary
L13	17-2032	Second I.F. Trans. Secondary
L14	64-1260	Single 43 Output Trans.
L15	64-1260	3000 Ohm Speaker Field
L16	14-940	20 Henry Filter Choke

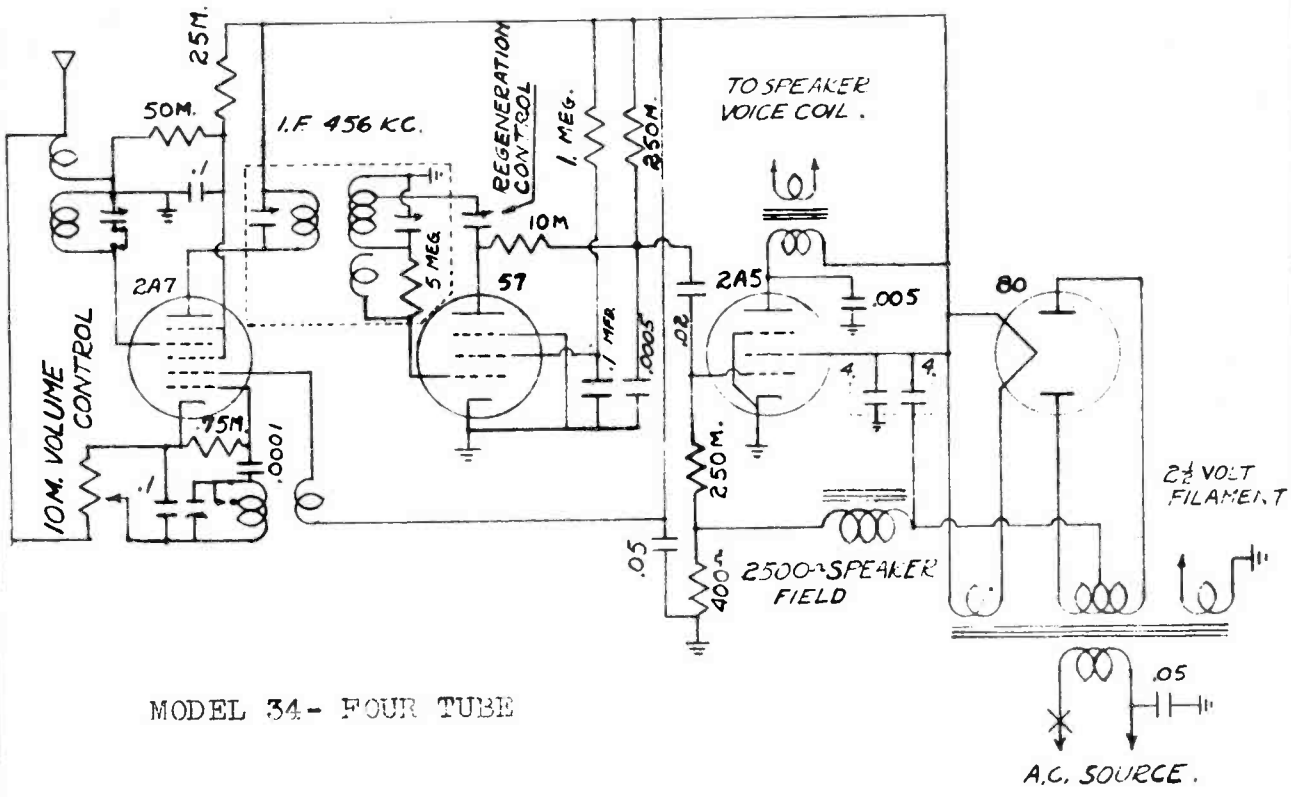
Tube	Plate	Screen	Cathode
6A7	106	40	1.
78	106	40	1.5
77	30	40	1.5
43	100	106	15.

Osc. Plate 106, Grid -2.
Field drop 112 v.

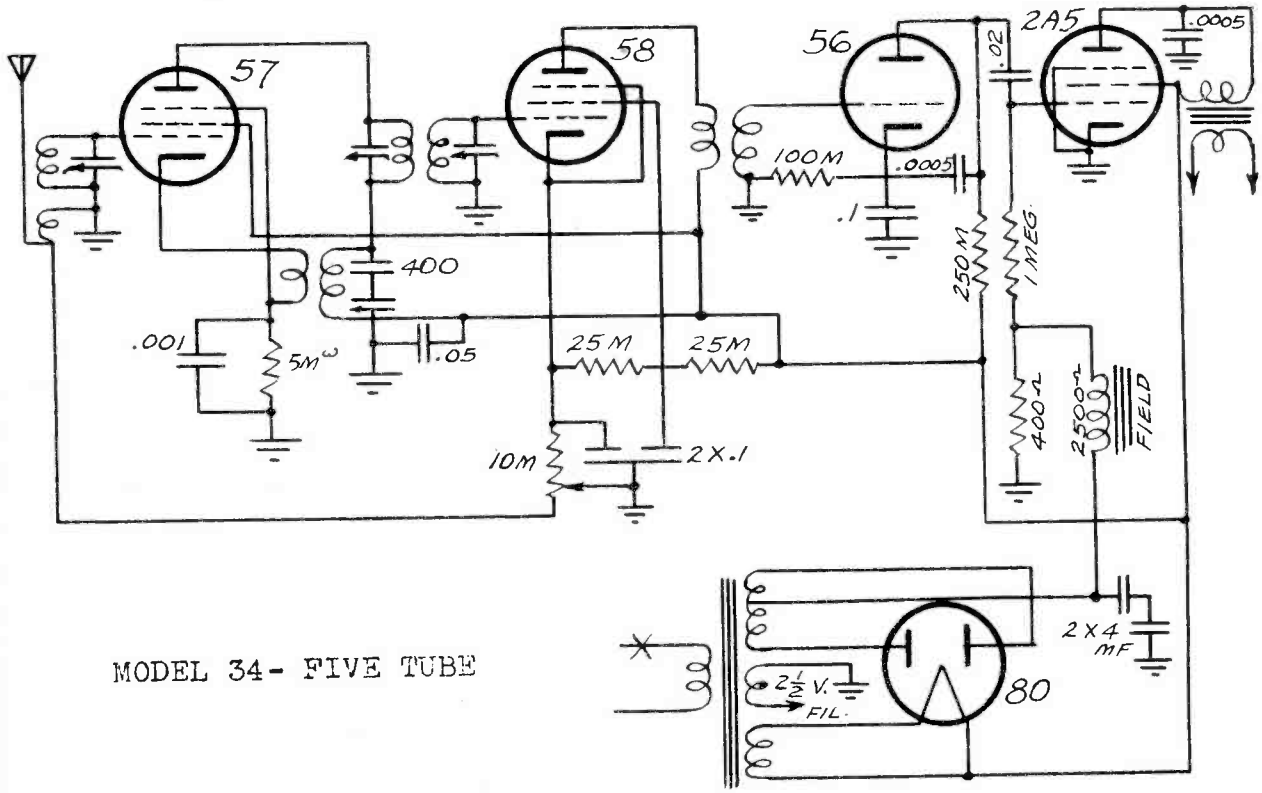


WESTONE RADIO CORP.

MODEL 34, 4-Tubes
MODEL 34, 5-Tubes
Schematics



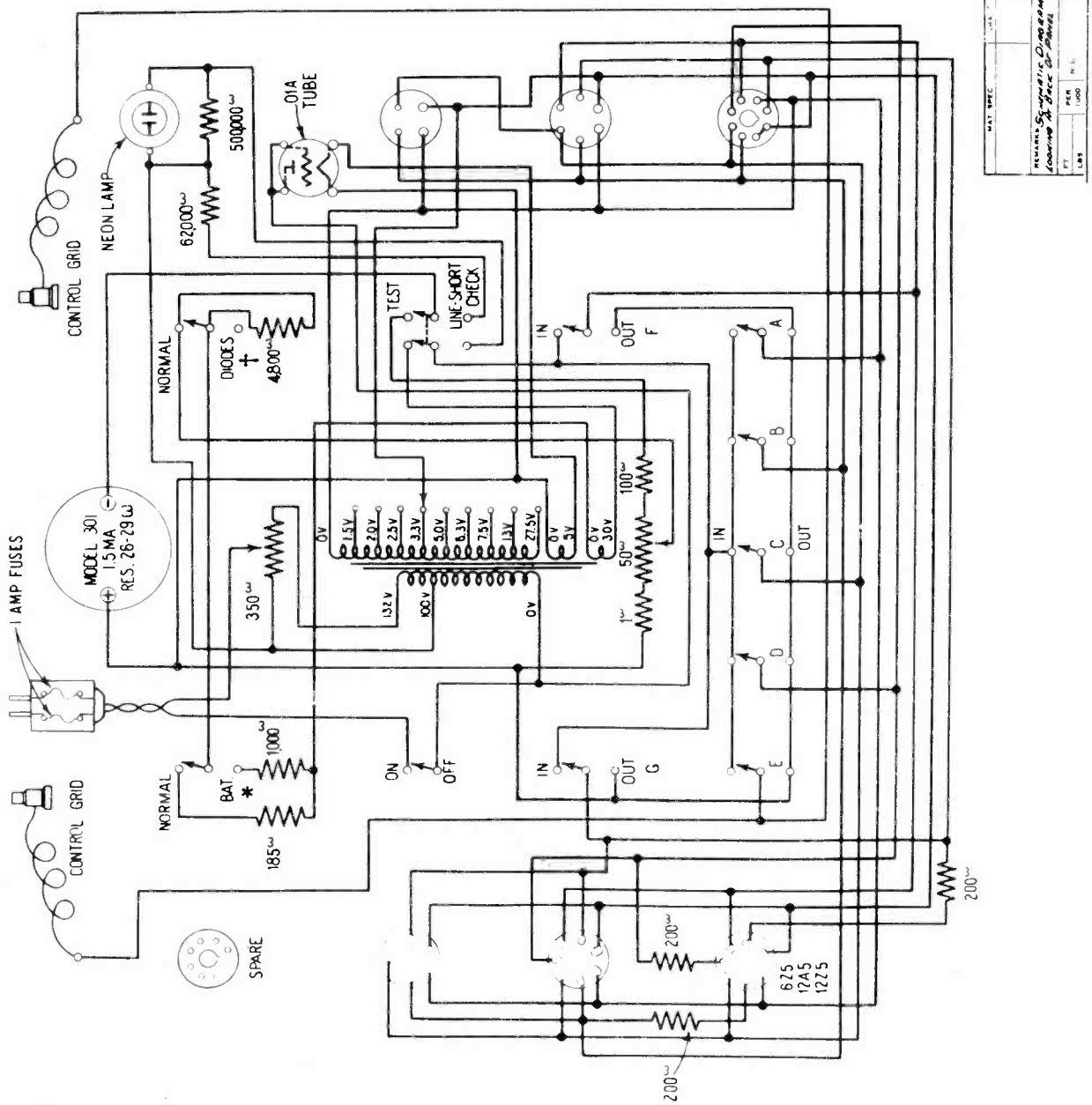
MODEL 34- FOUR TUBE



MODEL 34- FIVE TUBE

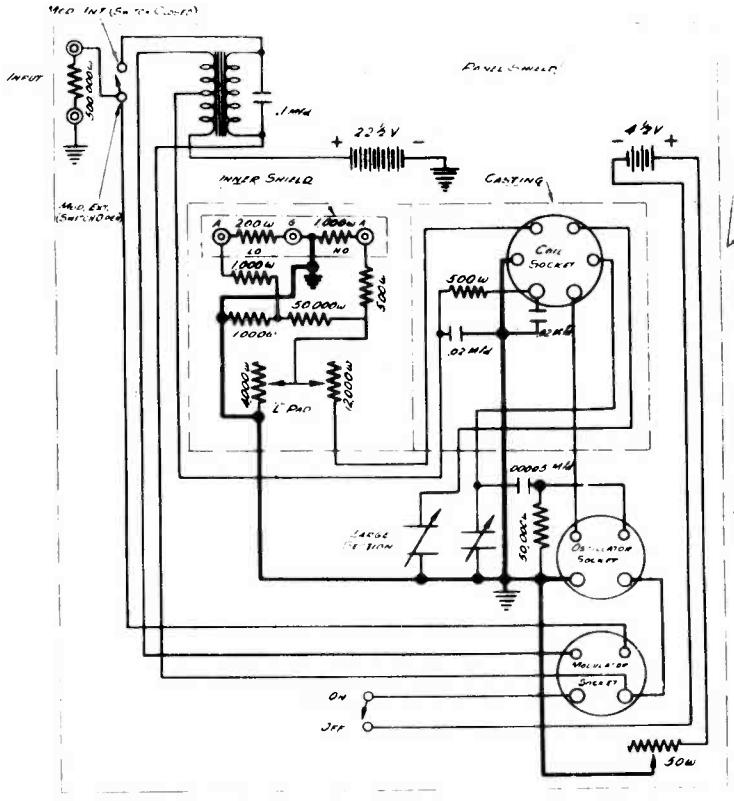
MODEL 770
Tube Checker
Schematic

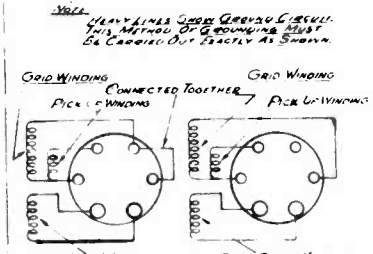
WESTON ELECTRICAL INSTRUM'T CORP.



WESTON ELECTRICAL INSTRUM'T CORP.

MODEL 692, Type 1 Oscillator
MODEL 780 Capacity Meter
Schematics





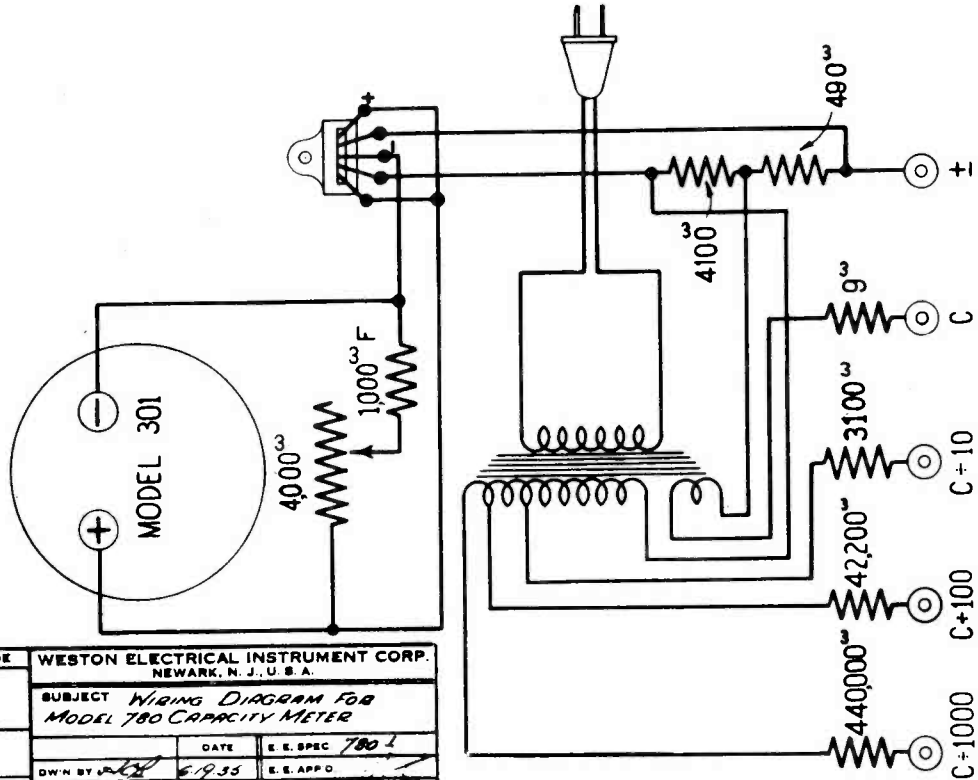
FEED BACK WINDING
VIEW LOOKING AT BOTTOM OF COIL
SCHEMATIC DIAGRAM SHOWING CONNECTIONS OF SELF CONTAINED WINDINGS ON THE FOLLOWING PLUG-IN COILS

Low Intermediate D-76378
High Intermediate D-76379
Broadcast D-76380
Short Wave #1 D-76381
Short Wave #2 D-76382

FEED BACK WINDING
VIEW LOOKING AT BOTTOM OF COIL
SCHEMATIC DIAGRAM SHOWING CONNECTIONS OF SELF CONTAINED WINDINGS ON THE FOLLOWING PLUG-IN COILS

Short Wave #3 D-76383

MAT. SPEC.	GRADE	WESTON ELECTRICAL INSTRUMENT CORP. NEWARK, N. J., U. S. A.
		SUBJECT Wiring Diagram For Model 692 Oscillator
REMARKS Schematic Diagram Looking At Back Of Instrument		DATE
FT / LBS	PER 1000 / N. D.	DW'N BY [illegible] 6-19-35 / E. E. SPEC / E. E. APP'D / TRACED BY / DESIGN APP'D
		CHECKED BY G G 3-35 / DATE



MAT. SPEC.	GRADE	WESTON ELECTRICAL INSTRUMENT CORP. NEWARK, N. J., U. S. A.
		SUBJECT Wiring Diagram For Model 780 Capacity Meter
REMARKS Looking At Back Of Instrument		DATE
FT / LBS	PER 1000 / N. D.	DW'N BY [illegible] 6-19-35 / E. E. SPEC 780-1 / E. E. APP'D / TRACED BY / DESIGN APP'D
		CHECKED BY G G 6-21-35 / DATE

WESTERN AUTO SUPPLY CO.

MODEL S-735
Alignment, Notes
Test Data, Parts

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attemped unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide accurately calibrated signals over the standard wave band and an output meter are required for indicating the effect of adjustments.

First remove the cover of the box. Leave the antenna and battery cables connected to the chassis.

Disconnect the car antenna and connect antenna cable lead to the lead from the signal generator.

Set the signal generator for 1650 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator adjustment is connected to the antenna lead of the receiver. Adjust the trimmer of the oscillator section of the 3 gang condenser until maximum output is obtained. The oscillator section is the one with the cut plate rotor.

Now set the signal generator for 1400 K. C. and turn the rotor until maximum output is obtained. Adjust the other two trimmers on the gang condenser for maximum output.

To calibrate the receiver, tune in a station of known frequency at about the center of the dial. Remove the escutcheon plate and glass. The pointer is held in position by friction. Grasp the pointer at the center and turn it until it points to the frequency of the station being received.

The use of the cut plate type of condenser eliminates the necessity of a 600 K. C. padder and, therefore, no adjustment at this frequency is required.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 K. C. with the volume control about three-fourths on. Drop the chassis from the cover. The location of the antenna trimmer is shown in Fig. 2. Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

Removing Chassis From Case

First unsolder the black, brown, yellow, and green speaker leads which connect to the terminal strip adjacent to the vibrator unit. Next, notice the small length of braided shielding which is soldered to the solder lug that is secured to the chassis case between the dial scale and the station selector control shaft. Unsolder this shielding at the lug.

Remove the 4 screws which hold the chassis in the case — 2 are in the side and 2 on the speaker panel of the chassis case. (Do not remove the four speaker mounting screws.)

Remove the two control knobs by pulling them off of the shaft.

Next remove the volume control. To do this first loosen the hexagonal nut on the inside of the case with a flat wrench. Then unscrew and remove the round knurled nut from the front.

The chassis may then be taken out.

Replacing Vibrator Unit

The vibrator unit is plugged in in the same manner as a tube. This unit may, in case of failure, be readily replaced. CAUTION—Polarity, as explained in the label on the unit and in the label on the metal box in the chassis, must be observed when plugging in vibrator unit.

In replacing the vibrator unit be sure to replace the corrugated cardboard pad, which prevents the unit from working its way out of the socket.

When servicing this receiver, a new vibrator unit should be tried out in the same manner as a new set of tubes would be tried out.

One or more vibrator units should be kept on hand for replacement purposes.

Replacing Volume Control

To remove the volume control and the switch, first pull the knob from the volume control shaft. Next loosen the hexagonal nut on the inside of the case with a flat end wrench. Then unscrew and remove the round knurled nut from the front.

The old volume control and switch connections may now be unsoldered and the new unit put in its place and the leads resoldered.

Fasten the volume control to the case in the reverse order in which it was removed.

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

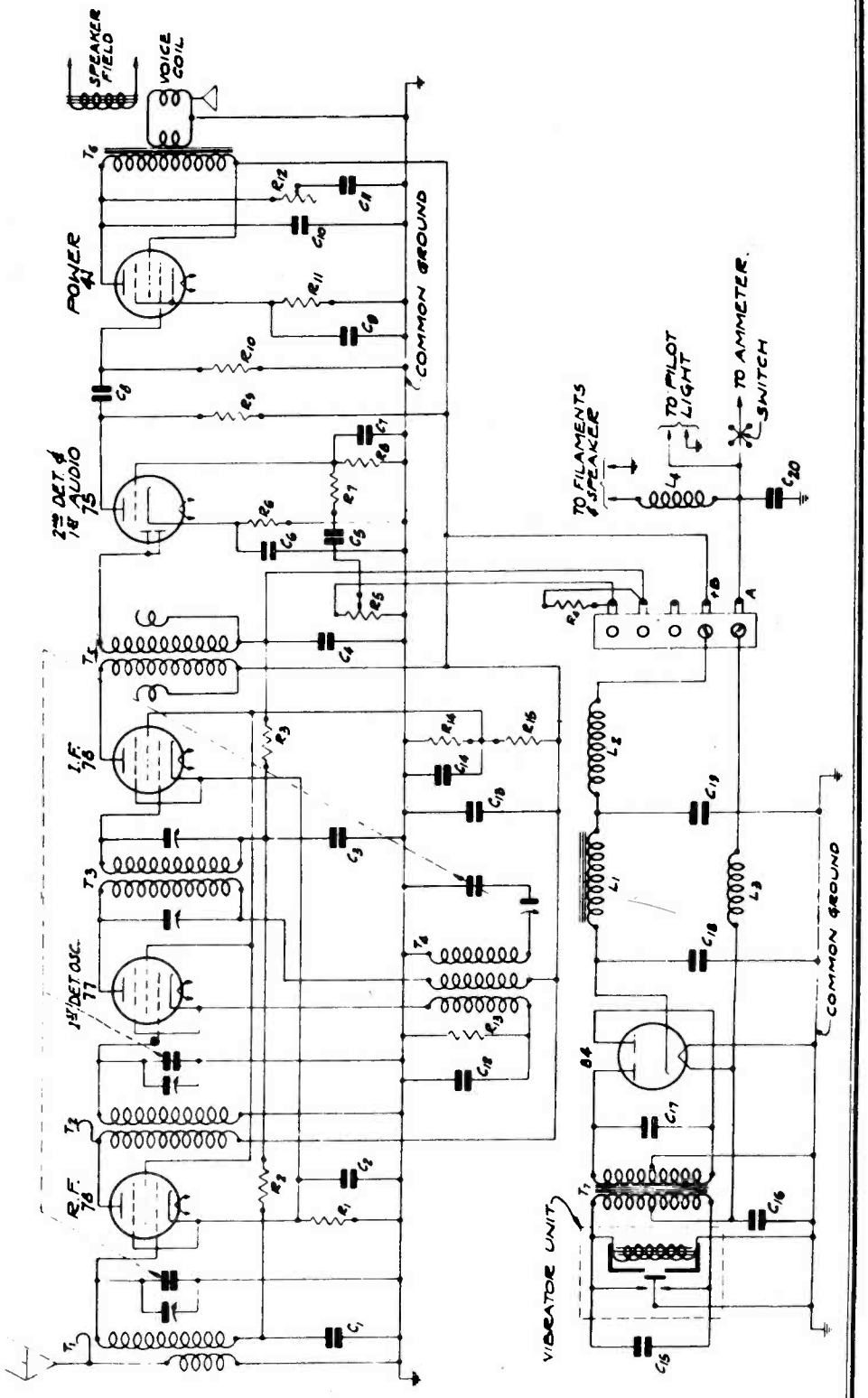
Part No.	Item	Code	D.C. Resistance in Ohms
P-5247	Antenna Trans. Pri. in Series	T1	17.50
	Antenna Trans. Sec.	T1	5.25
P-5248	R. F. Interstage Trans. Pri.	T2	2.31
	R. F. Interstage Trans. Sec. (Center Tap to Inside)	T2	3.23
	(Center Tap to Outside)		3.98
P-5249	1st I. F. Trans. Primary	T3	100.00
	1st I. F. Trans. Secondary	T3	100.00
	Oscillator Cathode Coil (Total)	T4	4.50
	Oscillator Plate Coil	T4	9.00
P-5250	2nd I. F. Trans. Pri.	T5	100.00
	2nd I. F. Trans. Sec.	T5	100.00
P-50656	Power Trans. Pri.	T7	0.36
	Power Trans. Sec.	T7	860.00
P-5174	"B" R. F. Choke	L1	1.65
P-50657	Power Choke	L2	390.00
P-5251	"A" Choke	L3	Small
P-5253	Line Choke	L4	Small
P-5252	Choke Coil	L5	Small
P-2228	Output Trans. Pri.	To	690.00
	Output Trans. Sec. and Voice Coil in Par.		0.80
	Speaker Field		6.00

When ordering parts be sure and give the part number. Also give the complete serial number which includes the Series No.

Part No.	Item
P- 1885	6D6 Tube Socket
P- 1886	6C6 Tube Socket
P- 1775	75 Tube Socket
P- 1911	41 Tube Socket
P- 5247	Antenna Coil Assembly Less Can
P-40415B	Can for above assembly Part of Gang Condenser Assembly
P- 5248	R. F. Interstage Coil Assembly Less Can
P-40447C	Can for above assembly Part of Chassis Assembly
P- 5249	1st I. F. and Oscillator Coils and Can Assembly
P- 5250	2nd I. F. Coil and Can Assembly
P- 2228	Dynamic Speaker
P-10359	Cardboard Baffle for Speaker
P- 2229	Vibrator Unit
P- 2030	Vibrator Socket
P-50656	Power Transformer
P- 5251	R. F. "A" Choke Coil
P- 5174	R. F. "B" Choke Coil
P-50657	Power Choke Coil Assembly
P- 5253	Filament Choke Coil
P- 2220	2 Half Tube Shields with Clamping Ring
P- 2240	Grid Leak and Condenser Assembly
P- 2224	Knobs
P-20960	Thumb Screws
P-10356	Glass Crystal
P-10361	Gasket for Glass Crystal
P-30342A	Grid Clip only
P-10213	Wide Rubber Bands for Tubes
P-70774	Shielded Antenna Cable
P-70781	"A" Battery Cable
P- 1421	Single Lug Terminal Strip
P- 2082	Double Insulated Terminal Strip
P- 2232	Five Lug Terminal Strip
P- 1933	Cinch Terminal Lug
P-20701	Drive Tension Spring
P-20953	Horse-shoe Lock (Washer)
P- 2227	Dial Strip
P-20954	Dial Pointer

MODEL S-740
Schematic

WESTERN AUTO SUPPLY CO.



T1 ANTENNA COIL (P-5039)
T2 R.F. INTERSTAGE COIL (P-5040)
T3 1ST I.F. & OSCILLATOR COIL (P-5063)
T4 2ND I.F. COIL (P-5022)
T5 OUTPUT TRANS. (P-50632)
T6 POWER TRANS. (P-50633)
L1 FILTER CHOKE (P-50637)
L2 R.F. "B" CHOKE (P-5174)
L3 ELIMINATOR "B" CHOKE (P-5175)
L4 R.F. "B" CHOKE (P-5167)

R1 240 OHMS
R2 1.0 MEGOHM
R3 2.0 "
R4 200,000 OHM
R5 250,000 OHM VOL. CONTROL
R6 6,000 OHM
R7 100,000 OHM
R8 .10 MEG OHM
R9 250,000 OHM
R10 250,000 OHM
R11 800 OHM
R12 150,000 OHM TONE CONTROL
R13 4,000 OHM
R14 20,000 OHM
R15 15,000 OHM

C1 0.050 MF 1800V. TUBULAR
C2 0.500 MF (BLOCK RED WH)
C3 0.050 MF (BLOCK GR. WH)
C4 0.00025 MF MICA
C5 0.050 MF 200V. TUBULAR
C6 12,000 MF ELECTROLYTIC IN BLOCK WITH C5
C7 0.00015 MF. MICA
C8 0.050 MF (BLOCK GR)
C9 12,000 MF ELECTROLYTIC
IN BLOCK WITH C6
C10 0.003 MF (BLOCK YELLOW)
C11 0.050 MF 400V. TUBULAR
C12 0.001 MF MICA
C13 0.500 MF (BLOCK BLUE)
C14 0.100 MF (BLOCK BROWN)
C15 0.500 MF 120V. TUBULAR
C16 1.000 MF 120V. TUBULAR
C17 0.010 MF 1500V TUBULAR
C18 18,000 MF BLOCK WITH C19
C19 18,000 MF BLOCK WITH C18
C20 0.500 MF 120V TUBULAR
COLOR CODE DESIGNATES CONDENSERS BY PASS BLOCK