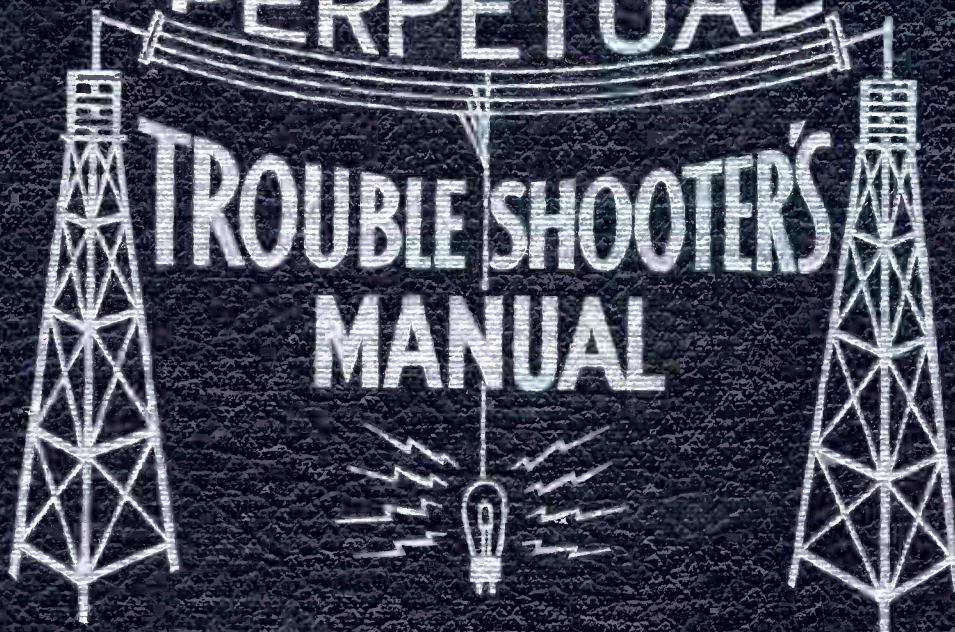


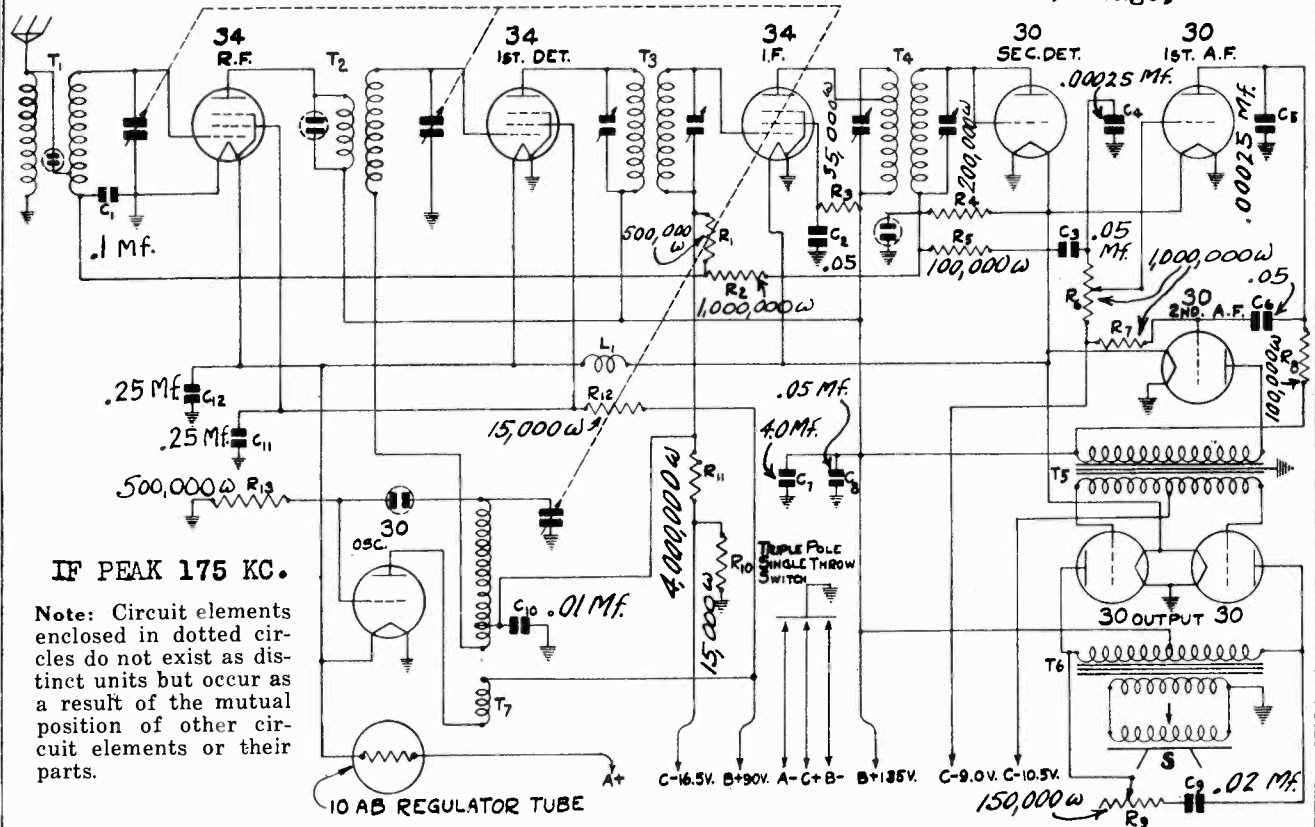
VOLUME IV
PERPETUAL
TROUBLE SHOOTER'S
MANUAL



JOHN F. RIDER

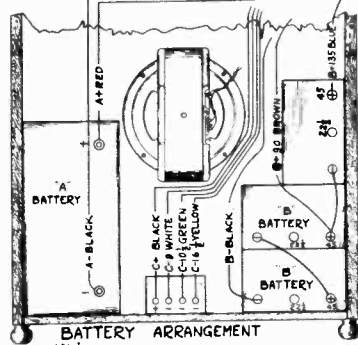
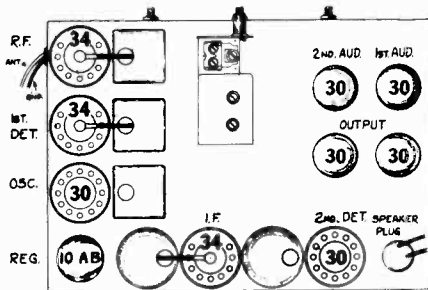
WELLS - GARDNER & CO.

MODEL OOA
Schematic, Layout
Voltage, Notes



IF PEAK 175 KC.

Note: Circuit elements enclosed in dotted circles do not exist as distinct units but occur as a result of the mutual position of other circuit elements or their parts.



Tube Arrangement and Battery Connections

Set the signal generator for 175 K. C. Connect the signal lead from the signal generator to the grid of the 1st detector tube 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. Then adjust the four intermediate frequency condensers for maximum output. The adjusting screws for these condensers are reached from the bottom of the chassis.

Next set the signal generator for a signal of exactly 1400 K. C. The antenna lead from the signal generator

Voltages at Sockets

Antenna Shorted to Ground
Batteries Up to Rated Voltages. See Fig. 1
Voltages Read From Negative Filament Terminal

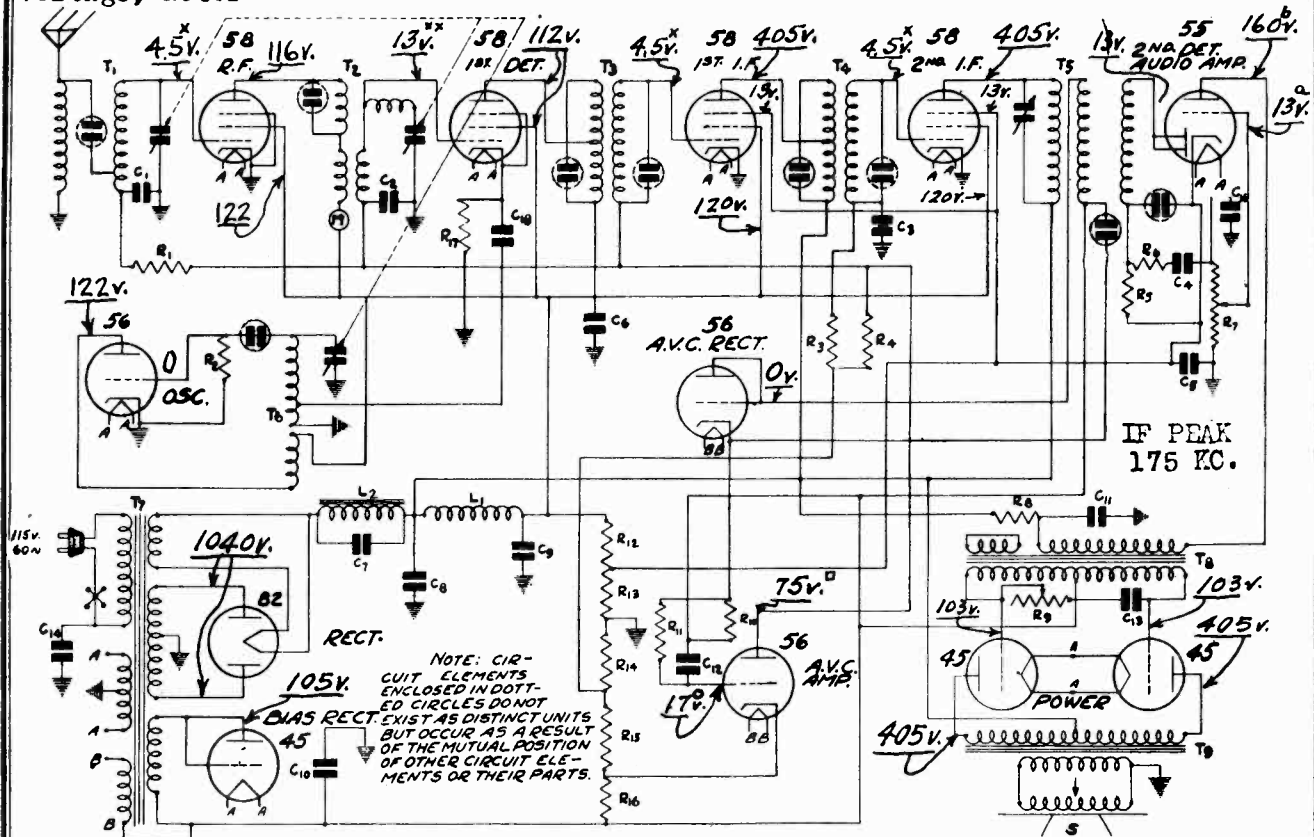
Type of Tube	Function	Across Filament	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.
34	R.F.	2.0	135	65	3.0(1)	2.6
34	1st Det.	2.0	135	65	4.5(1)	2.5
30	Osc.	2.0	90		2-4(2)	3.3
34	I.F.	2.0	135	90	4.5(1)	3.0
30	2nd Det.	2.0				
30	1st Audio	2.0	90		9.0(3)	.45
30	2nd Audio	2.0	130		9.0(4)	3.4
30	Output	2.0	135		10.5	2.5

- (1) Computed figure—cannot be read because of high resistance circuit.
- (2) Varies with frequency setting.
- (3) Volume Control at minimum.
- (4) As read at battery.

is, in this instance, connected to the antenna lead of the receiver. Set the dial pointer on the 1400 K. C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

MODEL O2A
Schematic, Layout
Voltage, Notes

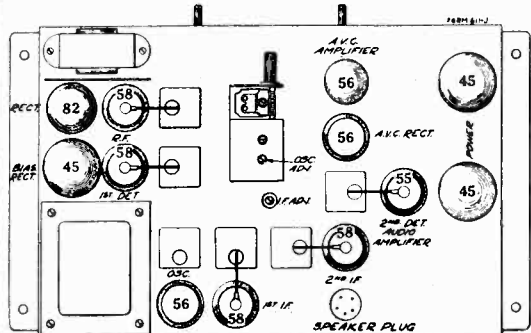
WELLS - GARDNER & CO.



* As read across R-14. ** As read across R-17 and R-14. □ As read across R-15
 ○ As read across R-16. a Vol. Cont. at Minimum. with 100,000 ohm meter
 b Triode plate to cathode

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	List Price
P-80862	C1	.050 mfd.	200 V.	Tubular	\$.30
P-80987	C2	.150 mfd.	200 V.	Tubular	.25
P-80862	C3	.050 mfd.	200 V.	Tubular	.30
P-80862	C4	.050 mfd.	200 V.	Tubular	.30
P-80888	C5	.250 mfd.	200 V.	Tubular	.40
P-80888	C6	.250 mfd.	200 V.	Tubular	.40
P-80985	C7	.150 mfd.	200 V. AC	Tubular	.55
P-80984	C8	16.	mfd. 450 V.	Electrolytic Block	4.00
	C9	6.	mfd. 150 V.		
	C10	8.	mfd. 100 V.		
	C11	4.	mfd. 350 V.		
		16 mfd. Section—Term. 3+	Term. 1-		
		6 mfd. Section—Term. 5+	Term. 1-		
		4 mfd. Section—Term. 4+	Term. 1-		
		8 mfd. Section—Term. 6+	Term. 2-		
P-80862	C12	.050 mfd.	200 V.	Tubular	.30
P-80863	C13	.004 mfd.	600 V.	Tubular	.25
P-80997	C14	.010 mfd.	600 V.	Metal Can	.50
P-80919	C16	.00025 mfd.	600 V.	Moulded	.20
P-80914	C18	.002 mfd.	200 V.	Tubular	.20
P-80991		3 Gang Condenser			3.85
P-1922		3rd I. F. Trimmer Condenser			.50



RESISTORS

Part No.	Code	Resistance	Type	Price
P-A95204	R1	200,000 ohm	Carbon	\$.20
P-A95504	R2	.5 megohm	Carbon	.25
P-A95105	R3	1 megohm	Carbon	.25
P-A95504	R4	.5 megohm	Carbon	.25
P-B94803	R5	80,000 ohm	Carbon	.25
P-A95104	R6	100,000 ohm	Carbon	.25
P-96008	R7	2 megohm	Vol. Con. & Switch	1.20
P-C94403	R8	40,000 ohm	Carbon	.25
P-97006	R9	3 megohm	Tone Control	.90
P-A95204	R10	200,000 ohm	Carbon	.20
P-A95105	R11	1 megohm	Carbon	.25
P-98003	R12	4000 ohm	Armoured Wire Wound	.50
	R13	390 ohm		
P-A94902	R14	9,000 ohm	Carbon	.25
P-A94154	R15	150,000 ohm	Carbon	.25
P-A94353	R16	35,000 ohm	Carbon	.25
P-A95352	R17	3,500 ohm	Carbon	.20

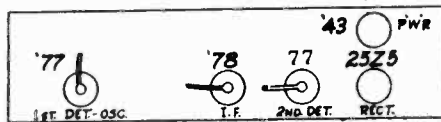
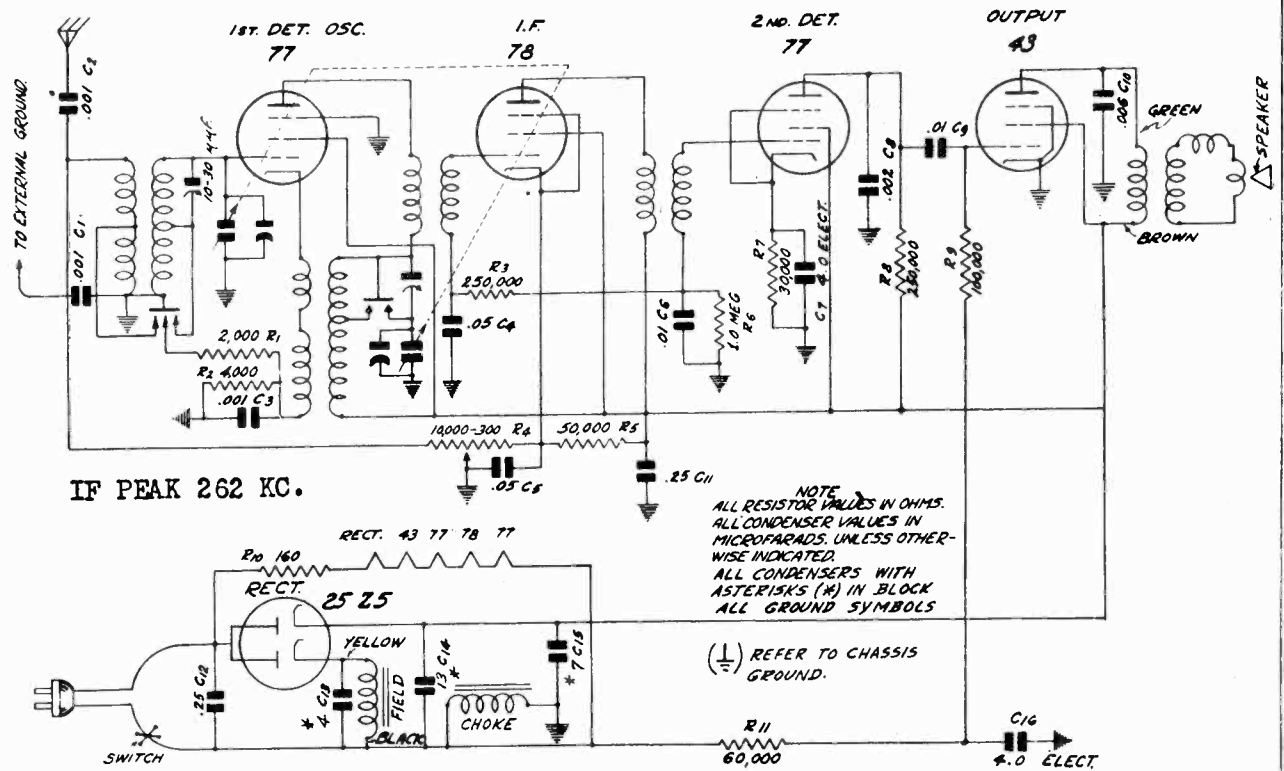
"A" preceding the number signifies .2 watt
 "B" preceding the number signifies .5 watt
 "C" preceding the number signifies 1.0 watt

Set the signal generator for 175 K. C. Connect the .25 signal lead from the signal generator to the grid of the 1st detector tube 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. Then adjust the 3rd .25 I. F. primary condenser for maximum output. The .90 adjusting screw for this condenser is reached from the top of the sub-panel and will be seen in back of the tuning condenser.

Next set the signal generator for a signal of exactly 1400 K. C. The antenna lead from the signal generator is, in this instance, connected to the antenna lead of the receiver. Set the dial pointer on the 1400 K. C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

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MODEL 05A
Schematic, Layout
Voltage



Voltages at Sockets

Antenna lead connected to ground lead (not external ground).—Volume Control at Maximum.
CAUTION—Do not put chassis on any grounded surface or let chassis touch any ground.

Type of Tube	Function	A.C. Line Voltage—115 Use High Resistance A.C. Meter, Rectifier Type, for Heater Voltage Measurements					D.C. Line Voltage—110 Use High Resistance D.C. Meter for Heater Voltage Measurements				
		Across Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.	Across Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.
77	1st Det. Osc.	5.8	106	106	5.2	.8	5.6	87	87	4.3	.6
78	I.F.	5.8	108	108	3.0 ⁽¹⁾	7.4	5.6	88	88	2.4 ⁽¹⁾	6.0
77	2nd Det.	5.8	65 ⁽²⁾	104	6.0 ⁽³⁾	.14	5.6	58 ⁽²⁾	82	5.0 ⁽³⁾	.11
43	Output	24.	95	110	18.0 ⁽⁴⁾	22.0	23.0	80	90	15.0 ⁽⁴⁾	17.0
25Z5	Rect.	24.	110 ⁽⁵⁾ 155			84.0 Total	23.0	5.0 ⁽⁵⁾ 6.0			74.0 Total

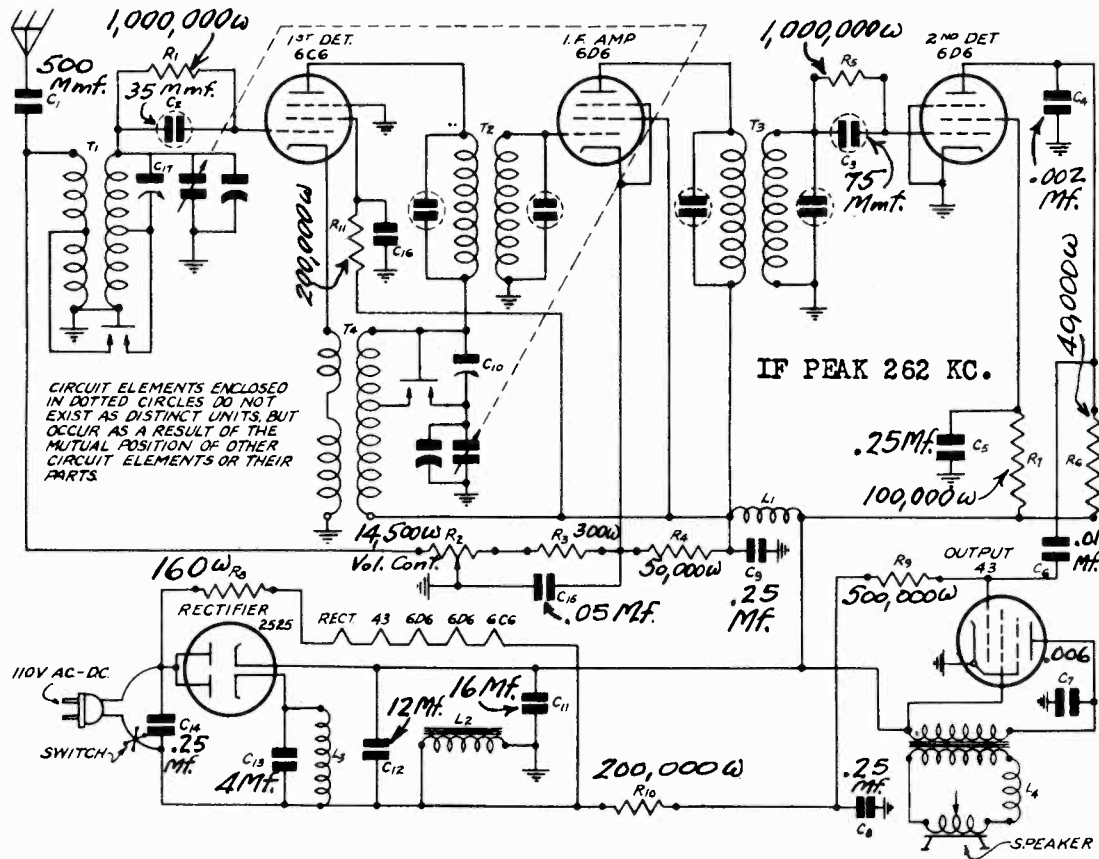
- (1) Cathode to Ground.
- (2) With 1,000,000 ohm meter—reading will be lower with lower resistance meter.
- (3) Cathode to ground—read with 100,000 ohm meter.
- (4) Read across filter choke.
- (5) Readings from plate to two cathodes with 250,000 ohm meter

MODEL O5AA.

Schematic

Voltage

WELLS - GARDNER & CO.



Voltages at Sockets

Antenna lead connected to subpanel.—Volume Control at Maximum.

CAUTION—Do not put chassis on any grounded surface or let chassis touch any ground.

		A.C. Line Voltage—115 Use High Resistance A.C. Meter, Rectifier Type, for Heater Voltage Measurements					D.C. Line Voltage—110 Use High Resistance D.C. Meter for Heater Voltage Measurements				
Type of Tube	Function	Across Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.	Across Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.
6C6	1st Det.	5.8	108	50		1.0 ⁽¹⁾	5.6	90	47		.9 ⁽¹⁾
6D6	I.F.	5.8	105	105	3.0	7.5	5.6	86	86	2.4	6.0
6D6	2nd Det.	5.8	20 ⁽²⁾	40 ⁽²⁾	.3	2.3	5.6	17 ⁽²⁾	34 ⁽²⁾	.2	2.0
43	Output	24.0	95	108	17.0 ⁽³⁾	20.0	23.0	80	90	14.0 ⁽³⁾	17.0
25Z5	Rect.	24.0	105 } ⁽⁴⁾ 125 }			84.0 Total	23.0	6 } ⁽⁴⁾ 7 }			74.0 Total

(1) Subject to variation.

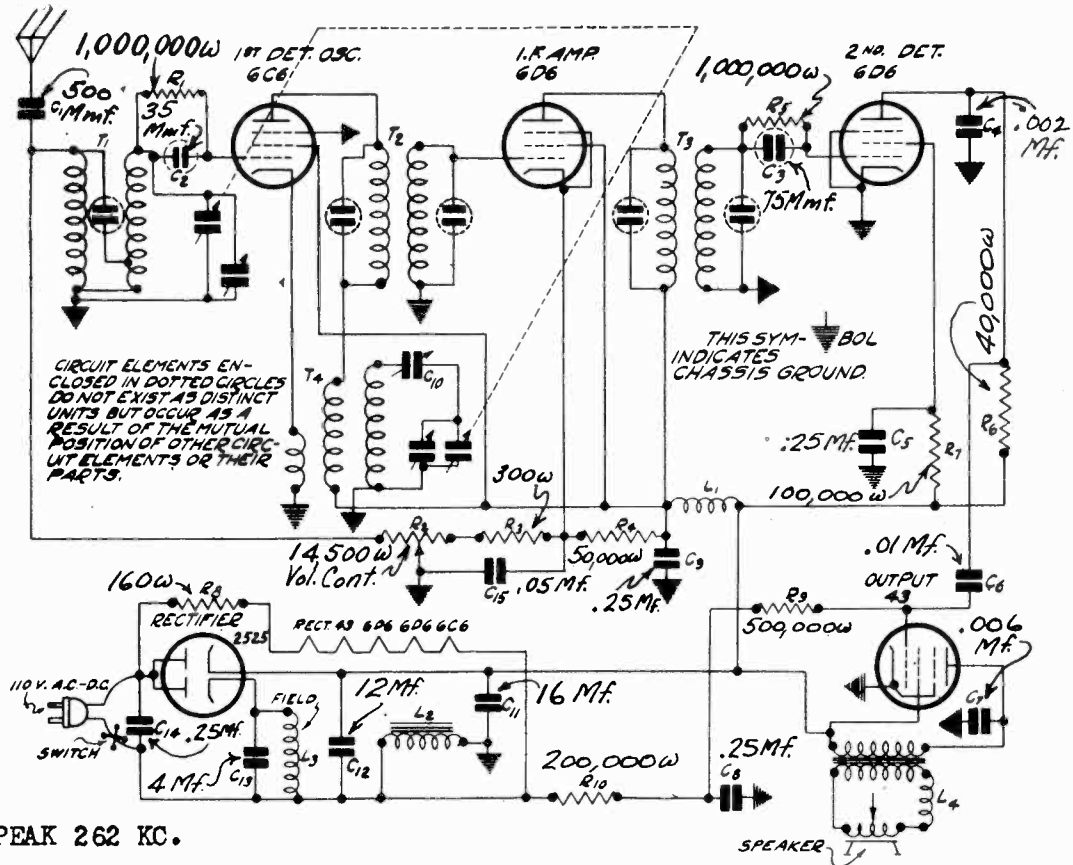
(2) As read with 1,000,000 ohm meter.

(3) Read across filter choke.

(4) Readings from plate to two cathodes.

WELLS - GARDNER & CO.

MODEL O5BA
Schematic
Layout
Voltage



IF PEAK 262 KC.

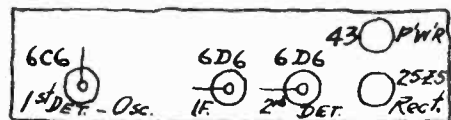
Voltages at Sockets

Antenna lead connected to subpanel.—Volume Control at Maximum.

CAUTION—Do not put chassis on any grounded surface or let chassis touch any ground.

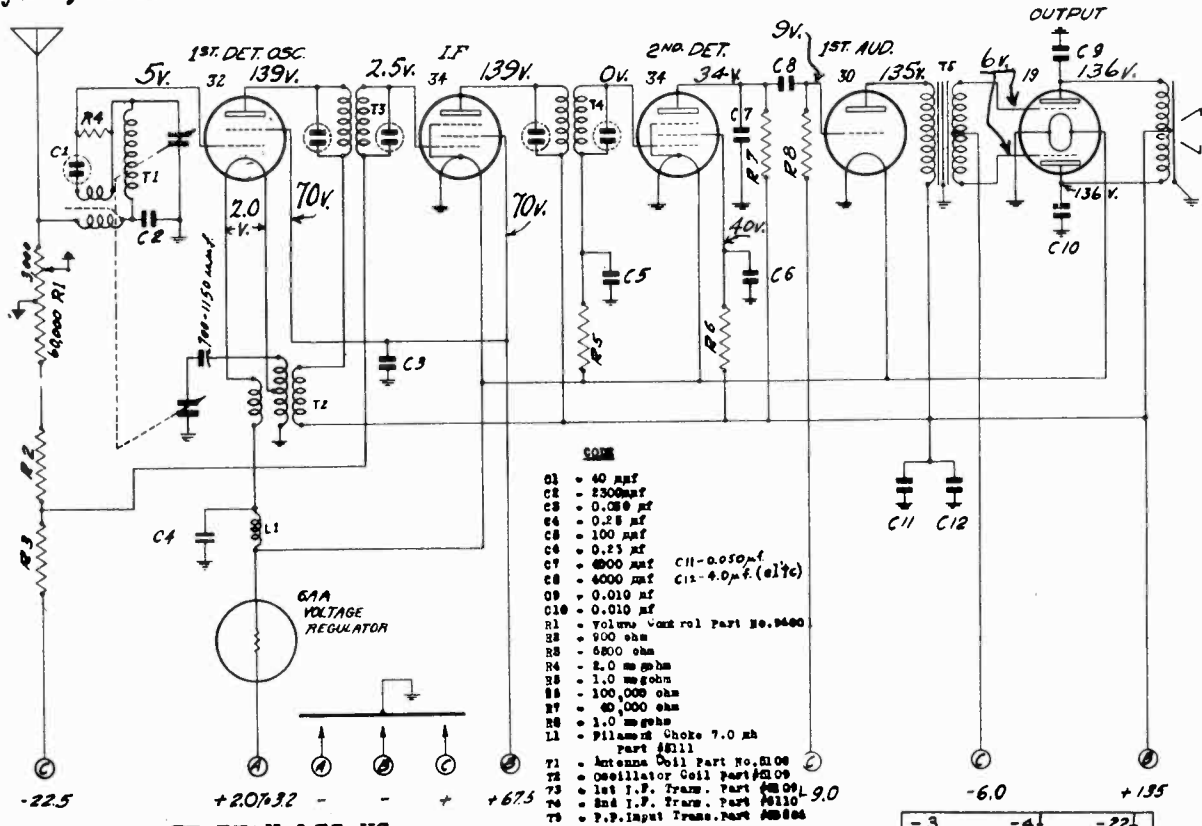
Type of Tube	Function	A.C. Line Voltage—115 Use High Resistance A.C. Meter, Rectifier Type, for Heater Voltage Measurements					D.C. Line Voltage—110 Use High Resistance D.C. Meter for Heater Voltage Measurements				
		Across Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.	Across Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.
6C6	1st Det.	5.8	108	108	12.0 ⁽¹⁾	6.0 ⁽¹⁾	5.6	90	90	10.0 ⁽¹⁾	4.0 ⁽¹⁾
6D6	I.F.	5.8	105	105	3.0	7.5	5.6	86	86	2.4	6.0
6D6	2nd Det.	5.8	20 ⁽²⁾	40 ⁽²⁾	.3	2.3	5.6	17 ⁽²⁾	34 ⁽²⁾	.2	2.0
43	Output	24.0	95	108	17.0 ⁽³⁾	20.0	23.0	80	90	14.0 ⁽³⁾	17.0
25Z5	Rect.	24.0	105 ⁽⁴⁾ 125			84.0 Total	23.0	6 ⁽⁴⁾ 7			74.0 Total

- (1) Subject to variation.
- (2) As read with 1,000,000 ohm meter.
- (3) Read across filter choke.
- (4) Readings from plate to two cathodes.

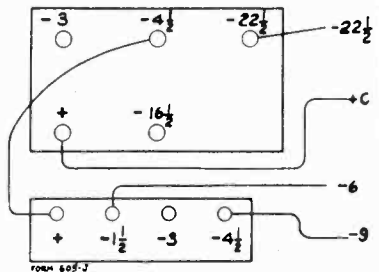


MODEL 06A
Schematic
Layout, Notes

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- COMP**
- C1 - 40 μmf
 - C2 - 2500 μmf
 - C3 - 0.001 μf
 - C4 - 0.25 μf
 - C5 - 100 μmf
 - C6 - 0.25 μf
 - C7 - 4000 μmf
 - C8 - 6000 μmf
 - C9 - 0.010 μf
 - C10 - 0.010 μf
 - R1 - Volume Vactrol Part No. 9400
 - R2 - 900 ohm
 - R3 - 6800 ohm
 - R4 - 2.0 megohm
 - R5 - 1.0 megohm
 - R6 - 100,000 ohm
 - R7 - 40,000 ohm
 - R8 - 1.0 megohm
 - L1 - Pilbeam's Choke 7.0 mh Part #E111
 - T1 - Antenna Coil Part No. 5100
 - T2 - Oscillator Coil part #5109
 - T3 - 1st I.F. Trans. Part #2099L 9.0
 - T4 - 2nd I.F. Trans. Part #2110
 - T5 - P.P. Input Trans. Part #2098



Condenser Alignment

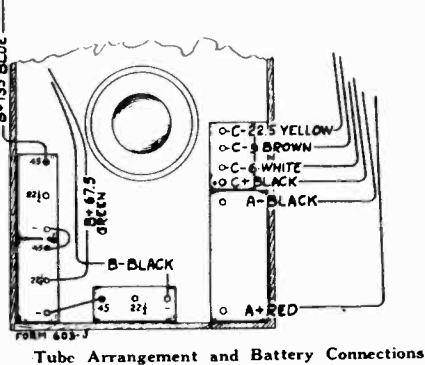
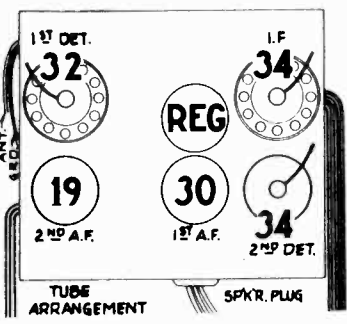
Optional "C" Battery Connections

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 an output indicating meter are advisable. The procedure is as follows:

As the I.F. stages are self-tuned, no I.F. aligning at the intermediate frequency of 175 K.C. is required.

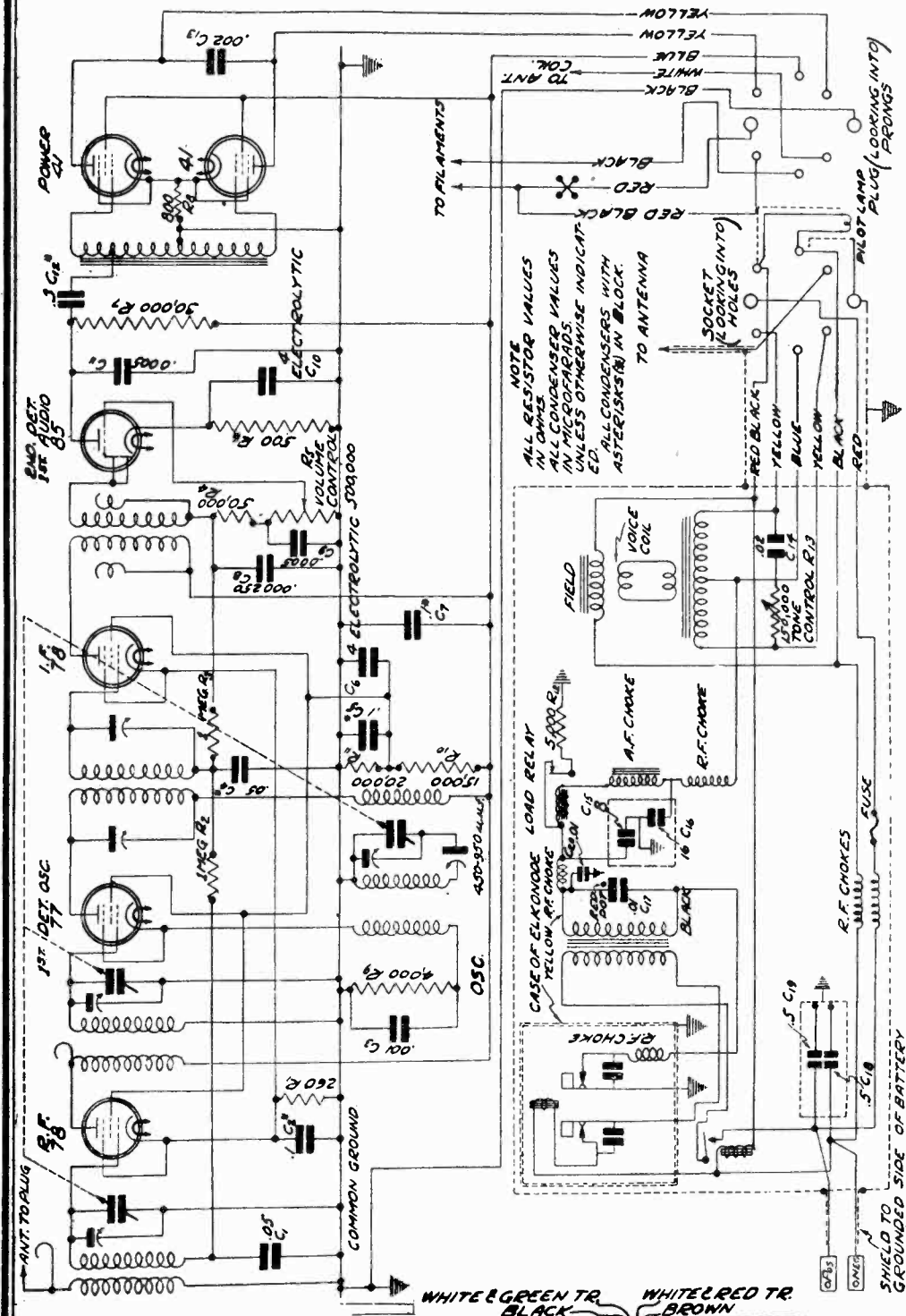
First set the signal generator for a signal of exactly 1400 K.C. Connect the antenna lead from the signal generator to the antenna lead of the receiver and the ground lead of the signal generator to the ground of the receiver. Then turn the tuning condenser rotor until the marker is at 1400 K.C. on the dial scale. Adjust the two trimmers on the tuning condenser for maximum output adjusting the oscillator trimmer first.

Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The adjusting screw will be seen at the side of the tuning condenser and is reached from the top of the chassis. A non-metallic screw-driver 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.



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MODEL O6W
Schematic
Layout, Voltage

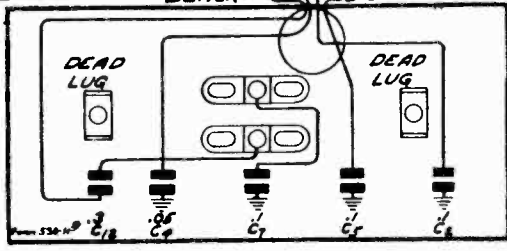


NOTE
ALL RESISTOR VALUES
IN OHMS
ALL CONDENSER VALUES
IN MICROFARADS.
UNLESS OTHERWISE INDICAT-
ED.
ALL CONDENSERS WITH
ASTERISKS (*) IN BLOCK:

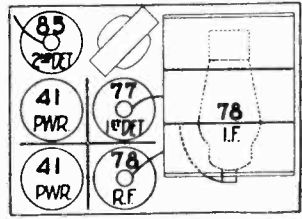
Across	Plate to	Screen to	Grid to	Normal
Heater	Cathode	Cathode	Cathode	Plate MA
6.1	182	80	3**	7.0
6.1	178	77	5 x	1.3 x
6.1	182	80	3**	7.0
6.1	70*	168.5	1.8**	3.5
6.1	162	17	17	11.0

*-Triode Plate to Cathode. **-Cathode to Ground x-Subject to variation
NOTE:- All voltages are at 185 volts input from "B" Eliminator

IF PEAK 262 KC



Condenser Block—Internal Wiring



Location of Tubes

MODEL O6-W
Alignment
Speaker Data

WELLS - GARDNER & CO.

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 equip-

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.

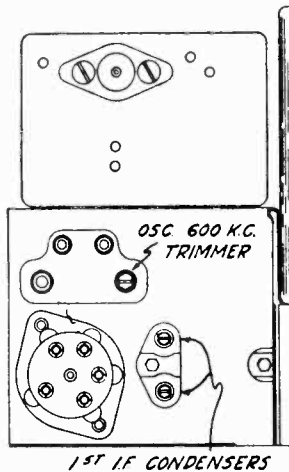


Fig. 12—Location of Trimmers

ment. 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

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. The location of the adjusting screws for these condensers is shown in Fig. 12.

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 (section farthest from drive gear).

Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The location of this condenser is shown in Fig. 12.

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.

Mounting the Speaker—"B" Eliminator

The speaker—"B" eliminator is mounted on the back of the dash by means of two brackets, as shown in Fig. 5. Usually the space available will govern the location of the speaker and position of it on the mounting brackets. However, the matter of acoustics should be given careful consideration. One of the most desirable positions from the standpoint of

speaker is mounted and regardless of the position of the brackets, loosen the bracket bolts and turn it to several positions in order to get the best one from the standpoint of tone quality.

Other considerations governing the location of the speaker are the cables and the tone control. The speaker should be so mounted that the two shielded cables, one to the storage battery and one to the chassis, will be long enough and can be most conveniently brought over. The tone control knob on the speaker box should be preferably on the bottom, so that it can be reached easily.

After the position of the speaker is decided on, drill the four $\frac{1}{16}$ " holes required for the bracket mounting bolts. A template for these holes is supplied with the receiver. The holes are arranged in a rectangle. The centers of the holes, the small dimension are $2\frac{3}{8}$ " apart and the long dimension 10" apart. In Fig. 5 is shown how the brackets can be mounted horizontally (A) or vertically (B), and the different positions in which the speaker itself can be placed. There are two holes in each bracket as shown in Fig. 5 (C) which determine the distance of the speaker box from the dash. The grilled portion of the box at the front should face the listener.

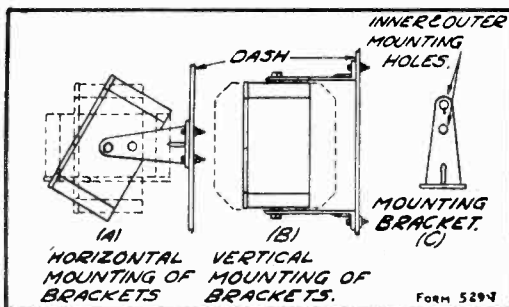
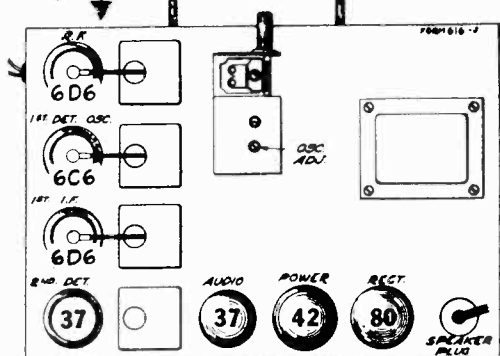
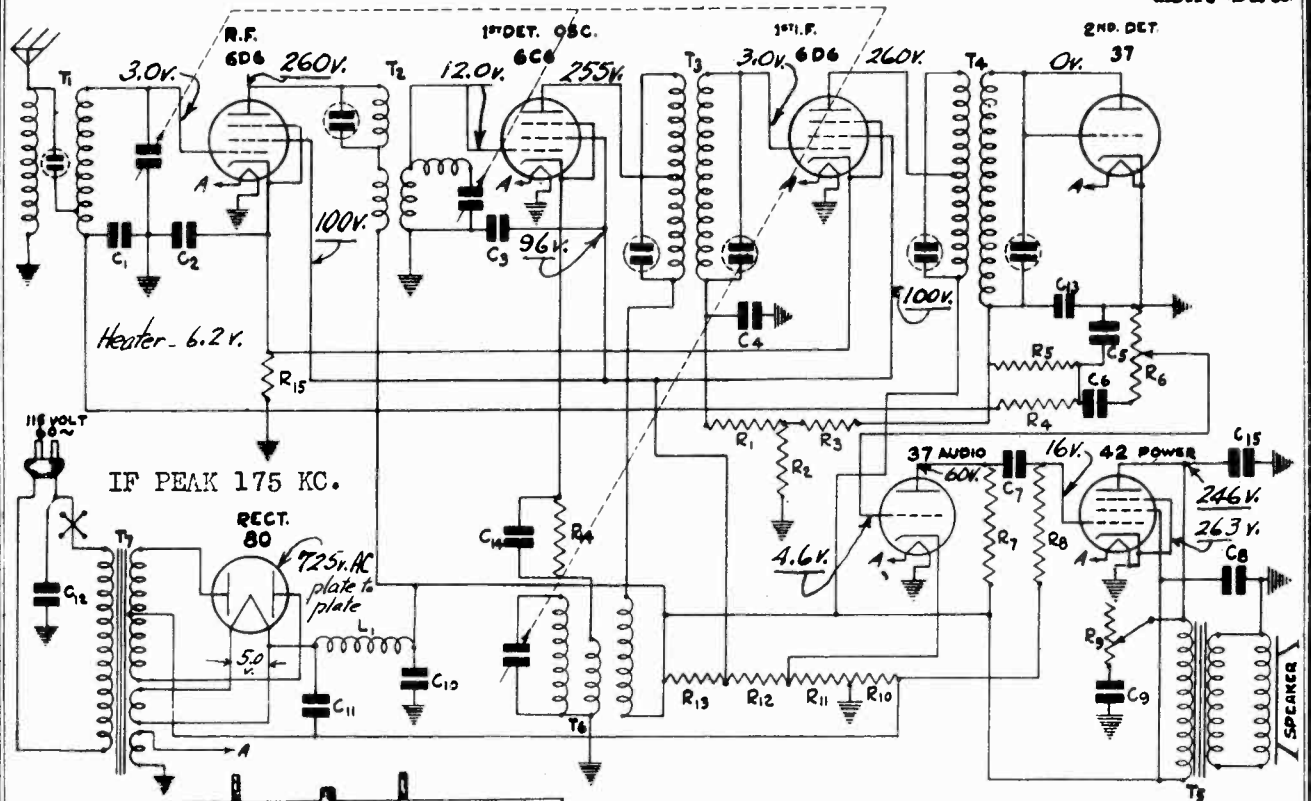


Fig. 5—Method of Mounting Speaker

acoustics is that shown by the solid lines in Fig. 5 (A). In this position the sound waves travel in the most direct lines toward the listener. After the

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MODEL 07A
Schematic
Voltage
Alignment Data



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 an output indicating meter are desirable. The procedure is as follows:

As the I. F. stages are fixed tuned, no I. F. alignment at the intermediate frequency of 175 K. C. is required.

First set the signal generator for a signal of exactly 1400 K. C. Connect the antenna lead from the signal generator to the antenna lead of the receiver, and the ground lead from the signal generator to the ground lead of the receiver. Set the dial pointer on the 1400 K. C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

RESISTORS

Part No.	Code	Resistance	Type	List Price
P-A95105	R1	1 megohm	Carbon	\$0.25
P-A95503	R2	50,000 ohm	Carbon	.25
P-A95154	R3	150,000 ohm	Carbon	.25
P-A95205	R4	2 megohm	Carbon	.25
P-A95104	R5	100,000 ohm	Carbon	.25
*	R6	1 megohm	Vol. Control & Switch	1.25
P-A95204	R7	200,000 ohm	Carbon	.20
P-A95204	R8	200,000 ohm	Carbon	.20
*	R9	150,000 ohm	Tone Control	.80
	R10	250 ohm		
	R11	800 ohm		
P-A98002	R12	20,000 ohm	Armoured Wire Wound	1.00
	R13	18,000 ohm		
P-A93452	R14	4,500 ohm	Carbon	.25
P-A94201	R15	200 ohm	Carbon	.20

"A" preceding the number signifies .2 watt.
"B" preceding the number signifies .5 watt.
"C" preceding the number signifies 1.0 watt.

*When ordering these parts specify shaft length and series number of receiver.

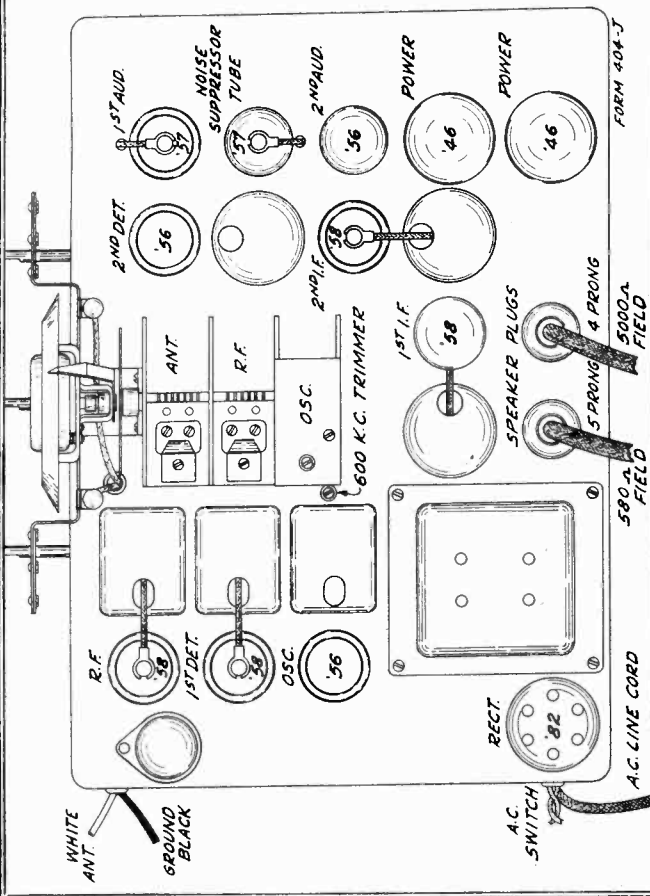
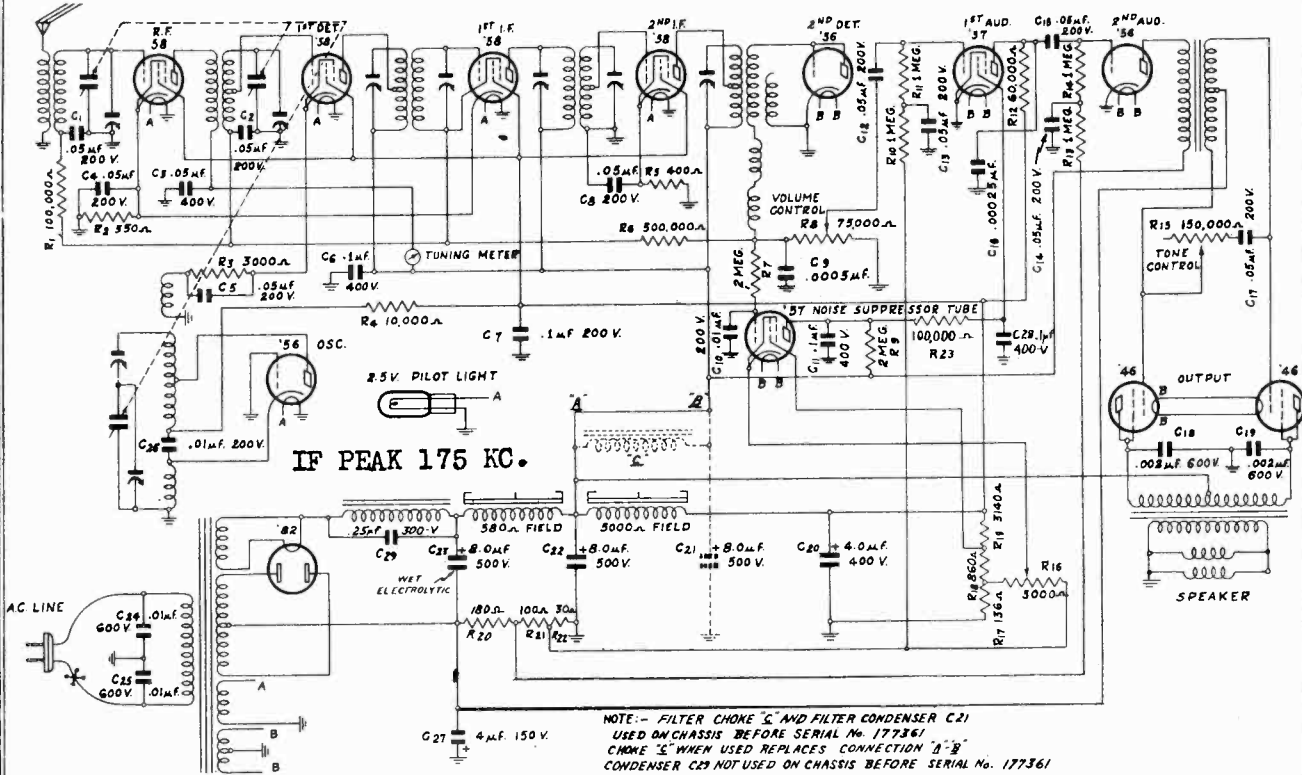
CONDENSERS

Part No.	Code	Capacity	Voltage	Type	List Price
P-80862	C1	.050 mfd.	200 V.	Tubular	\$0.30
P-80864	C2	.10 mfd.	200 V.	Tubular	.30
P-80888	C3	.25 mfd.	200 V.	Tubular	.40
P-80862	C4	.050 mfd.	200 V.	Tubular	.30
P-80919	C5	250 mmfd.	600 V.	Moulded	.20
P-80862	C6	.050 mfd.	200 V.	Tubular	.30
P-80890	C7	.050 mfd.	100 V.	Tubular	.20
P-80930	C8	.25 mfd.	400 V.	Tubular	.30
P-80890	C9	.050 mfd.	400 V.	Tubular	.20
P-80916	C10	8.0 mfd.	450 V.	Electrolytic	1.50
P-80990	C11	16.0 mfd.	450 V.	Electrolytic	2.00
P-80997	C12	.010 mfd.	600 V.	Metal can	.50
P-80919	C13	250 mmfd.	600 V.	Moulded	.20
P-80914	C14	.002 mfd.	600 V.	Tubular	.20
P-80914	C15	.002 mfd.	600 V.	Tubular	.20
P-80991		Three Gang	Condenser		3.85

The tuning condensers are all adjusted at the factory for the correct relative capacity between the oscillator section and the other two sections. As a rule no adjustment other than at 1400 K. C., as mentioned above, is required.

MODEL 022
Schematic
Layout
Voltage

WELLS - GARDNER & CO.



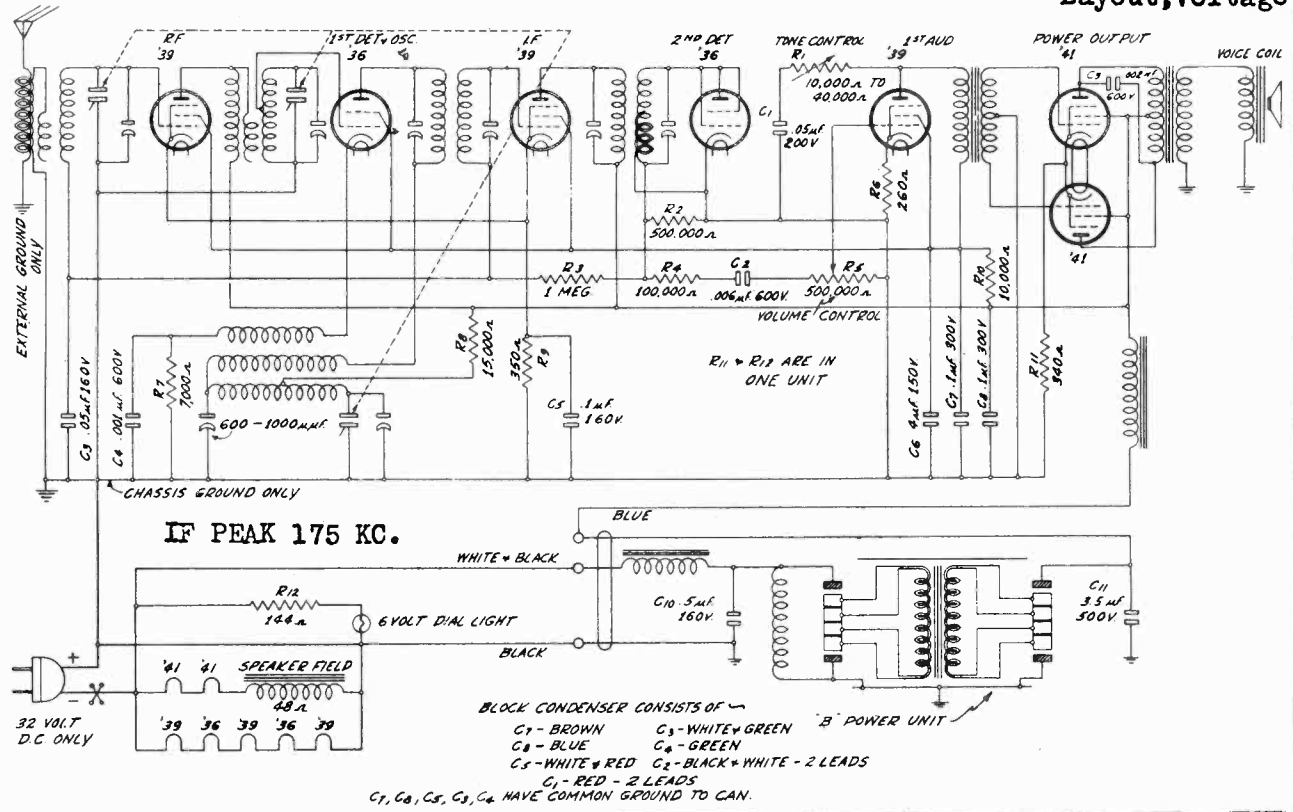
Voltages at Sockets
LINE VOLTAGE 115—ANTENNA SHORTED TO GROUND—NOISE SUPPRESSOR AT MAXIMUM CLOCKWISE POSITION

Type of Tube	Function	Across Filament or Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.
58	R.F.	2.4	242	90	4 ⁽¹⁾	4
58	1st Det.	2.4	250	86	7 ⁽¹⁾	2
56	Osc.	2.4	24		0	8
58	1st I.F. ⁽²⁾	2.4	252	90	4 ⁽¹⁾	4
58	2nd I.F. ⁽²⁾	2.4	254	91	3	5.7
56	2nd Det.	2.4	0		0	0
57	1st Audio	2.4	65	55	4 ⁽³⁾	.4
57	NoiseSup.	2.4	55	20	3 ⁽¹⁾	0
56	2nd Audio	2.4	255		14 ⁽⁴⁾	3.3
46	Power	2.4	260	260	34	23
82	Rectifier	2.4	880 volts plate to plate			53 per plate

- (1) Read from cathode to ground.
- (2) If I.F. readings are made with a cord and plug, ground the control grid through a condenser to prevent oscillation and motor boating.
- (3) Read across 30 ohm section of voltage divider.
- (4) Read across 30-ohm and 100 ohm section of voltage divider.

WELLS - GARDNER & CO.

MODEL 073
Schematic
Layout, Voltage



Voltages at Sockets

INPUT 32 VOLTS—GROUND R.F. GRID

Type of Tube	Function	Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate MA
'39	R.F.	6.4	190	90	3.0 ⁽¹⁾	5.0
'36	1st Det. & Osc.	6.4	170	86	6.5 ⁽²⁾	.6
'39	I.F.	6.4	190	90	3.0 ⁽¹⁾	5.0
'36	2nd Det.	6.4	0	0	0	0
'39	1st A.F.	6.4	70	90	1.75 ⁽¹⁾	6.0
'41	Output	6.4	180	185	14.0	18.0

(1) Cathode to Ground.
 (2) Subject to Variation with dial setting.

Polarity of Power Supply

IMPORTANT—POLARITY OF THE POWER SUPPLY TO THE RECEIVER MUST BE OBSERVED.

There is a red mark on the plug. The prong of the plug at which the red mark is placed must be plugged into the positive side of the line. Use a receptacle on the 32 volt line from which the plug will not have to be removed after it has once been correctly inserted.

MODEL 5B

Schematic

LAYOUT, VOLTAGE

WELLS - GARDNER & CO.

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	List Price
P-80821-B	C-1	.001 mfd.	600 V.	Moulded	\$.25
P-80821-B	C-2	.001 "	600 V.	Moulded	.25
P-80906-A	C-3	.001 "	400 V.	Tubular	.15
P-80862-C	C-5	.05 "	200 V.	Tubular	.25
P-80872-B	C-6	.01 "	600 V.	Tubular	.25
P-80936-C	C-7	4.0 "	30 V.	Electrolytic	.65
P-80914	C-8	.002 "	600 V.	Tubular	.20
P-80872-B	C-9	.01 "	600 V.	Tubular	.25
P-80998	C-10	.006 "	600 V.	Tubular	.15
P-80888-A	C-11	.25 "	200 V.	Tubular	.35
P-80888-A	C-12	.25 "	200 V.	Tubular	.35
P-80944	C-13	4.0 "	150 "	Elec. Block	2.15
	C-14	13.0 "	150 "		
	C-15	7.0 "	150 "		
P-80878-C	C-16	4.0 "	150 V.	Electrolytic	.80
P-15350	600 K.C. Trimmer Cond.				.45
P-80982	2-gang Condenser—Gear Drive.				2.25

RESISTORS

Part No.	Code	Resistance	Type	List Price
P-A-90947	R-2	4,000 ohm	Carbon	.20
P-91019C	R-4	300-10,000 ohm	Vol. Contr. & Switch	1.40
P-A-90941	R-5	50,000 ohm	Carbon	.20
P-A-90948	R-6	1 Megohm	Carbon	.25
P-A-90956	R-7	30,000 ohm	Carbon	.20
P-A-90954	R-8	250,000 ohm	Carbon	.25
P-A-90912	R-9	100,000 ohm	Carbon	.25
P-91064	R-10	150 ohm	Armored Wire Wound	.50
P-A-91056	R-11	60,000 ohm	Carbon	.20

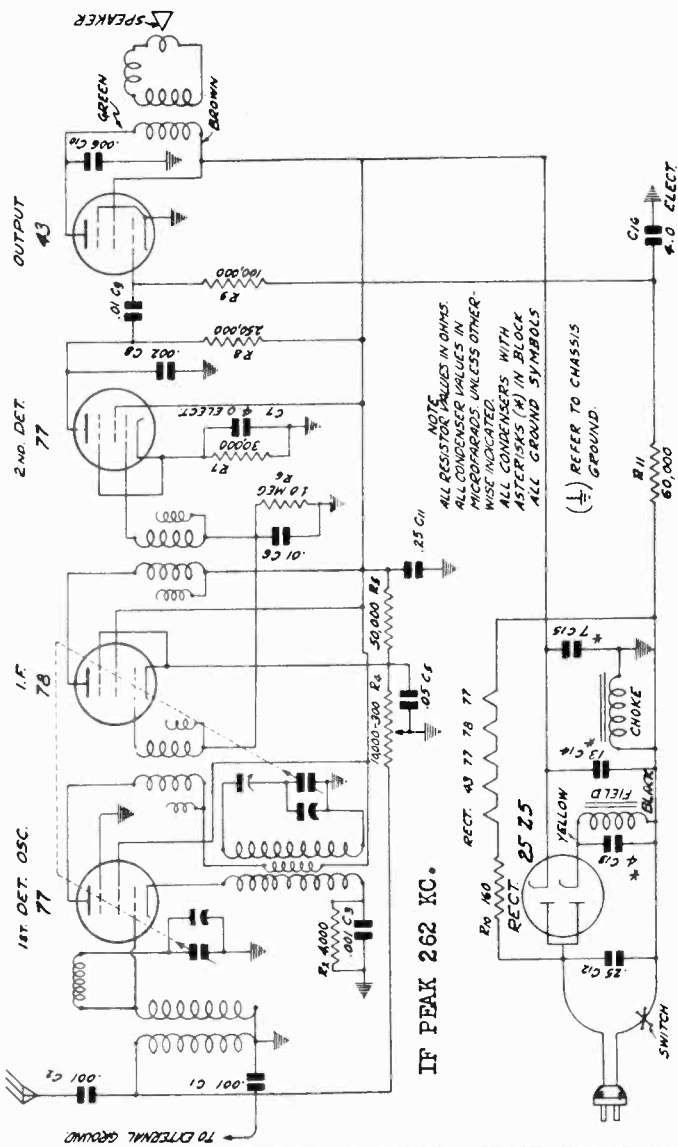


As the I.F. stages are self-tuned, no I.F. aligning at the intermediate frequency of 262 K.C. is required.

First set the signal generator for a signal of exactly 1400 K.C. Connect the antenna lead from the signal generator to the antenna lead of the receiver and the ground lead of the signal generator to the ground of the receiver. Then turn the tuning condenser rotor until the marker is at 1400 K.C. on the dial scale. In order to do this, it will be necessary to put the chassis back in the cabinet. Adjust the two trimmers on the tuning condenser for maximum output adjusting the oscillator trimmer first.

Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. This adjusting screw will be seen on the back panel of the chassis.

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.



Voltages at Sockets

Antenna lead connected to ground lead (not external ground).—Volume Control at Maximum.
CAUTION—Do not put chassis on any grounded surface or let chassis touch any ground.

Type of Tube	Function	Line Voltage—115			Line Voltage—110		
		Across Heater	Plate to Cathode	Grid to Cathode	Screen to Cathode	Plate to Cathode	Grid to Cathode
77	1st Det. Osc.	5.8	106	5.2	87	4.3	.6
78	I.F.	5.8	108	3.0(1)	88	2.4(1)	6.0
77	2nd Det.	5.8	65(2)	6.0(3)	82	5.0(3)	.11
43	Output	24.	95	110	90	15.0(4)	74.0
25Z5	Rect.	24.	155(5)		80	5.0(5)	17.0
					23.0	6.0(5)	Total

- (1) Cathode to Ground.
- (2) With 1,000,000 ohm meter—reading will be lower with lower resistance meter.
- (3) Cathode to ground—read with 100,000 ohm meter.
- (4) Read across filter choke.
- (5) Readings from plate to two cathodes with 250,000 ohm meter

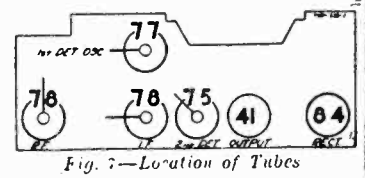
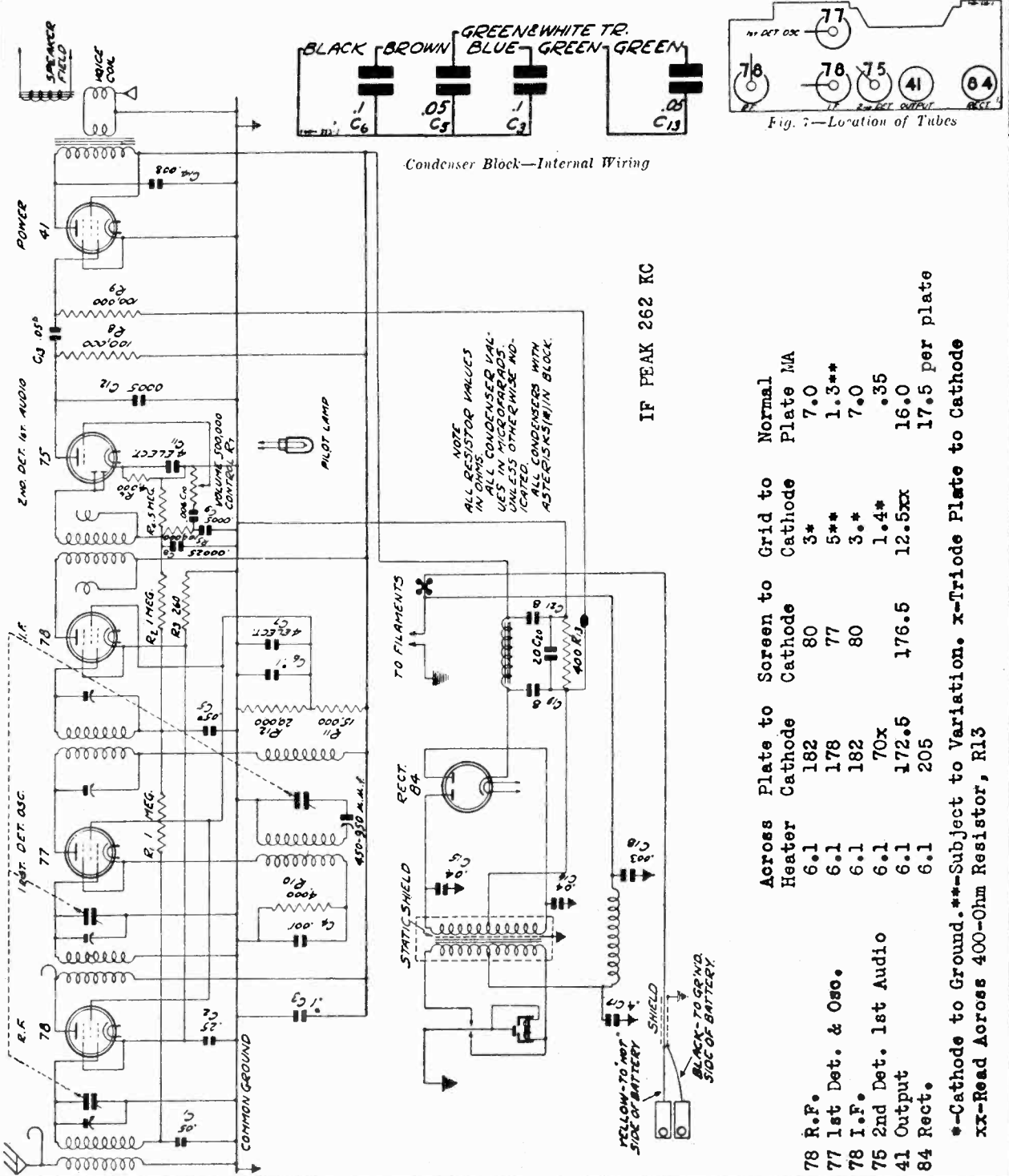
WELLS - GARDNER & CO.

MODEL V622
Schematic
Voltage

Trying Out the Set and Adjusting

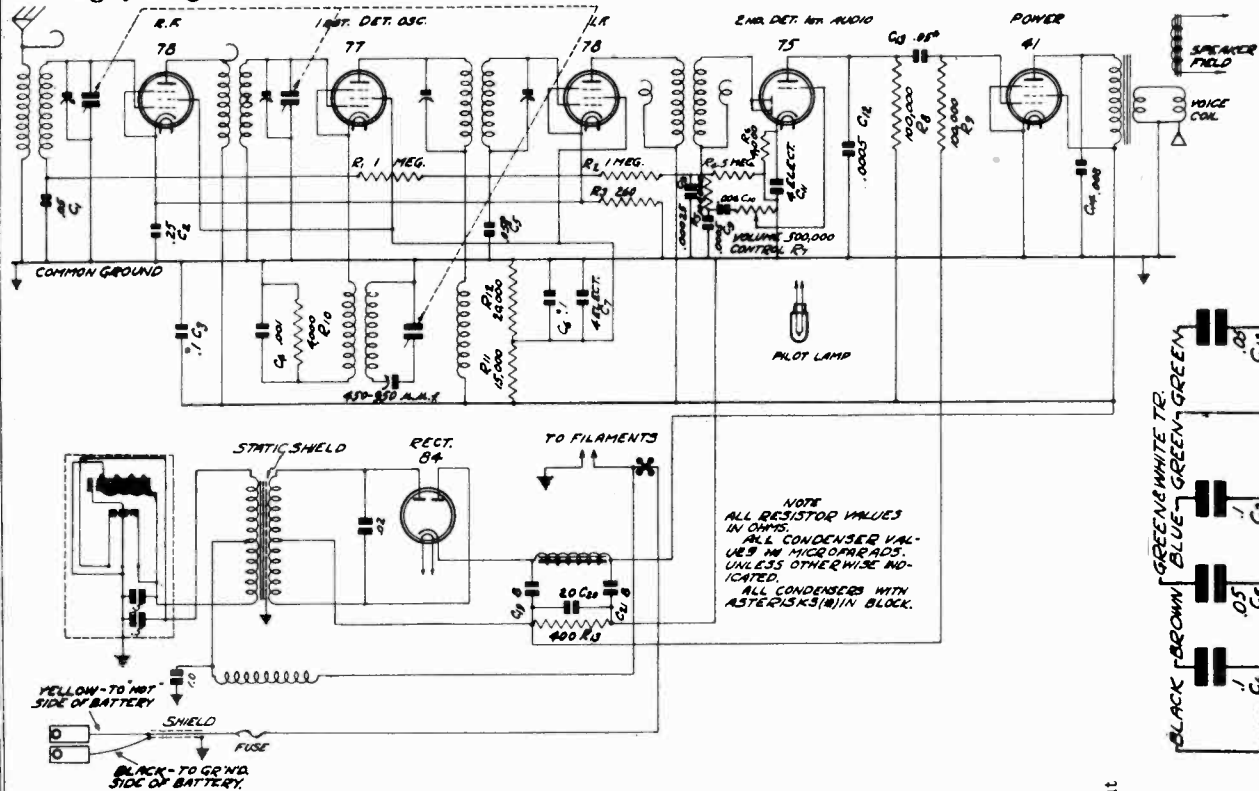
After the wiring* has all been completed and before the chassis is permanently installed, try out the set and adjust the antenna trimmer. The location of the tubes is shown in Fig. 7 To adjust the antenna trimmer, tune in a weak signal between 1200

and 1400 K.C. with the volume control about three-fourths on. On one end of the chassis box is a small metal plate. Remove this plate. Directly under the hole in the chassis box is the antenna trimmer condenser screw. Turn this adjusting screw up or down until maximum output is obtained.



MODEL Z6Z1
Schematic, Layout
Voltage, Alignment

WELLS - GARDNER & CO.



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. ⁽²⁾	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

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.

Trying Out the Set and Adjusting

adjusting screw up or down until maximum output is obtained.

After the wiring has all been completed and before the chassis is permanently installed, try out the set and adjust the antenna trimmer. The location of the tubes is shown in Fig. 8. To adjust the antenna trimmer, tune in a weak signal between 1200 and 1400 K.C. with the volume control about three-fourths on. On one end of the chassis box are two small metal plates. Remove the smaller of these two plates. Directly under the hole in the chassis box is the antenna trimmer condenser screw. Turn this

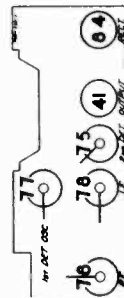
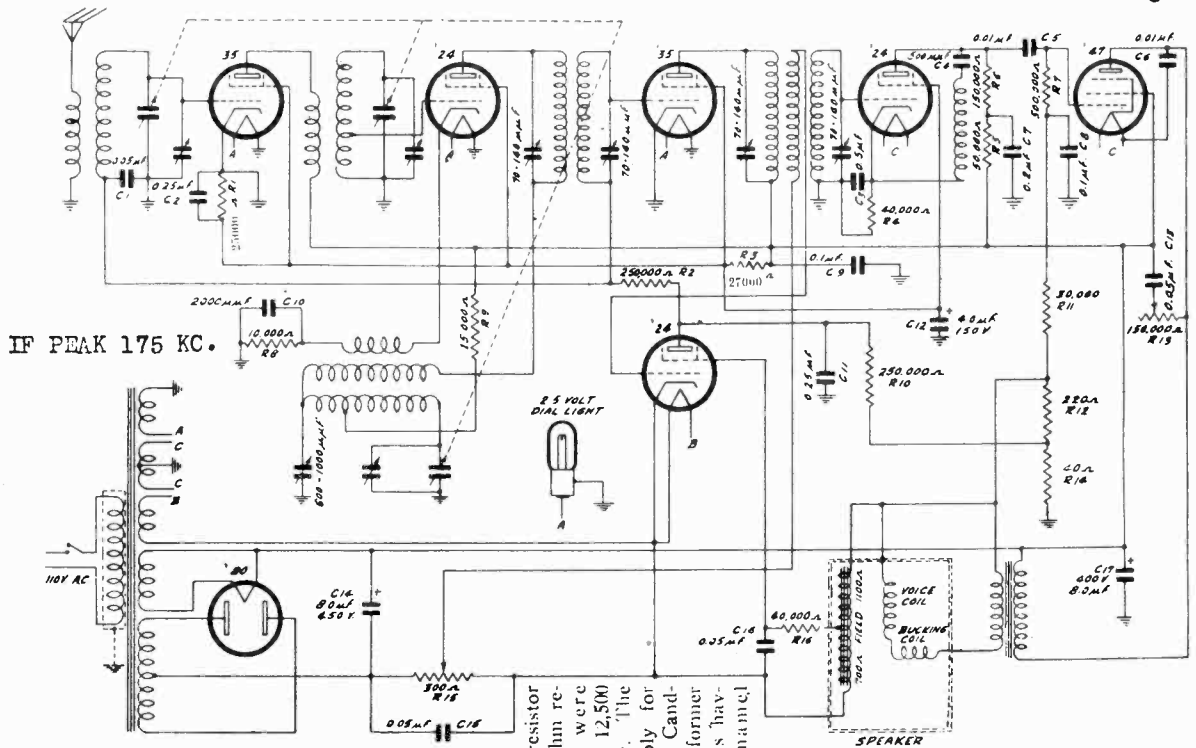


Fig. 8—Location of Tubes

Condenser Block—Internal Wiring

WELLS - GARDNER & CO.

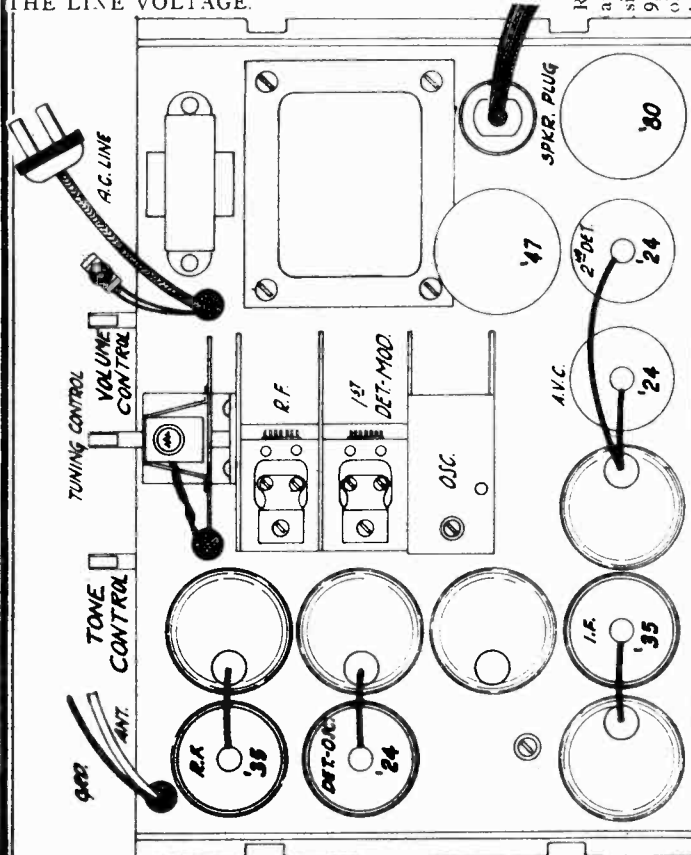
MODEL 50
Schematic
Layout
Voltage



IF PEAK 175 KC.

TURN THE VOLUME CONTROL ALL THE WAY ON, CONNECT THE ANTENNA AND GROUND LEADS TOGETHER AND TURN THE GANG CONDENSER PLATES ALL THE WAY OUT. CHECK THE LINE VOLTAGE.

R1—25,000 ohm resistor and R3—27,000 ohm resistor formerly were 9,000 ohms and 12,500 ohms respectively. The latter values apply for all sets having Cand-ohm units; the former values for all sets having vitreous enamel units.

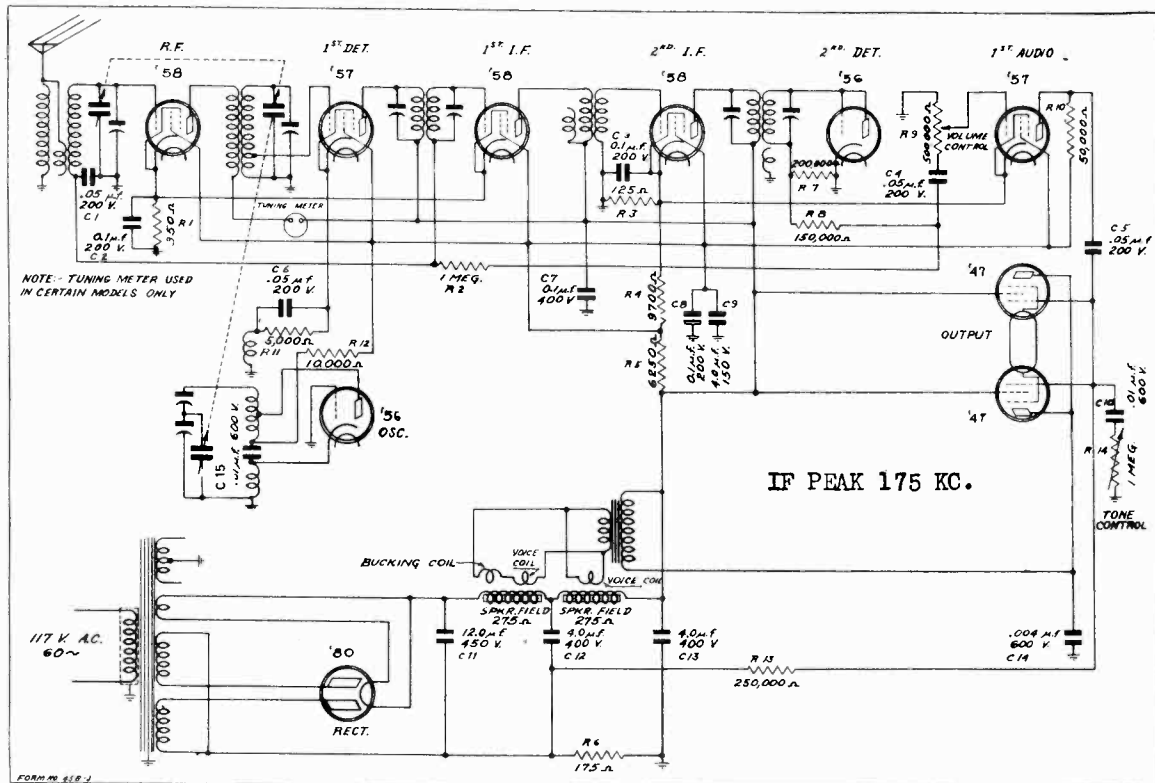


The voltages shown are measured to the cathode of the heater type tubes and to filament of the 47 Pentode.

TUBE	CIRCUIT	LINE VOLTAGE				
		90 V.	100 V.	110 V.	120 V.	130 V.
R.F. 35	Screen-Grid Plate	70 192	78 213	85 234	92 256	100 277
Det.-Modulator 24	Screen-Grid Plate	70 192	78 213	85 234	92 256	100 277
I.F. 35	Screen-Grid Plate	70 192	78 213	85 234	92 256	100 277
2nd Detector 24	Screen-Grid Plate	70 154	78 171	85 187	92 204	100 221
Audio 47	Accelerating Grid Plate	199 181	221 200	244 220	267 240	280 260
A. V. C. 24	Grid Screen-Grid	12.3 34.5	13.7 38.5	15.1 42	16.5 46	17.8 50
Rectifier 80	Plate to Plate Current (both plates)	308 52.3 MA	342 58.1 MA	376 64 MA	410 69.7 MA	445 75.5 MA

MODEL 502
Schematic
Layout
Voltage

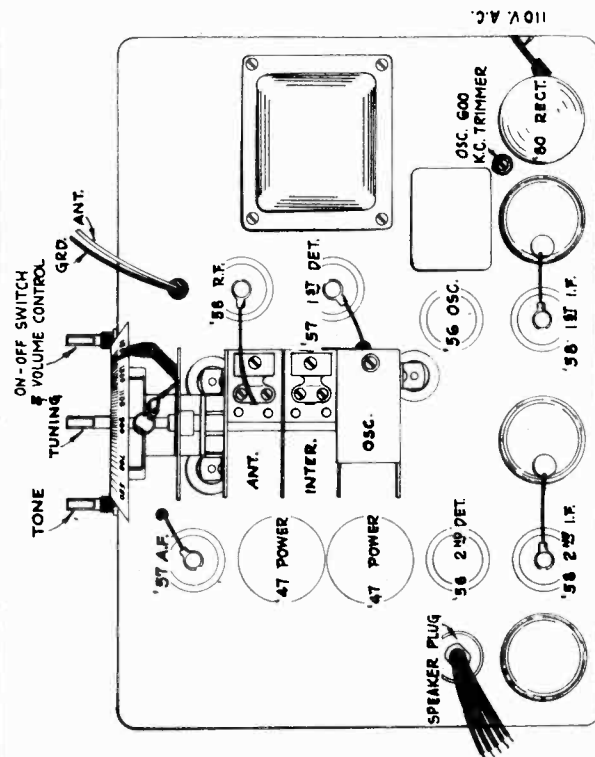
WELLS - GARDNER & CO.



Set the signal generator for 175 K.C. Connect the signal lead from the signal generator to the grid of the 1st detector tube 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. Then adjust the four intermediate frequency condensers for maximum output. The adjusting screws for these condensers are reached from the bottom of the chassis.

Next set the signal generator for a signal of exactly 1400 K.C. The antenna lead from the signal generator is, in this instance, connected to the antenna lead of the receiver. Set the dial pointer on the 1400 K.C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer 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 from the top of the chassis and is between the I.F. and oscillator coil cans.



Voltages at Sockets
LINE VOLTAGE, 115 — ANTENNA LEAD
SHORTED TO GROUND

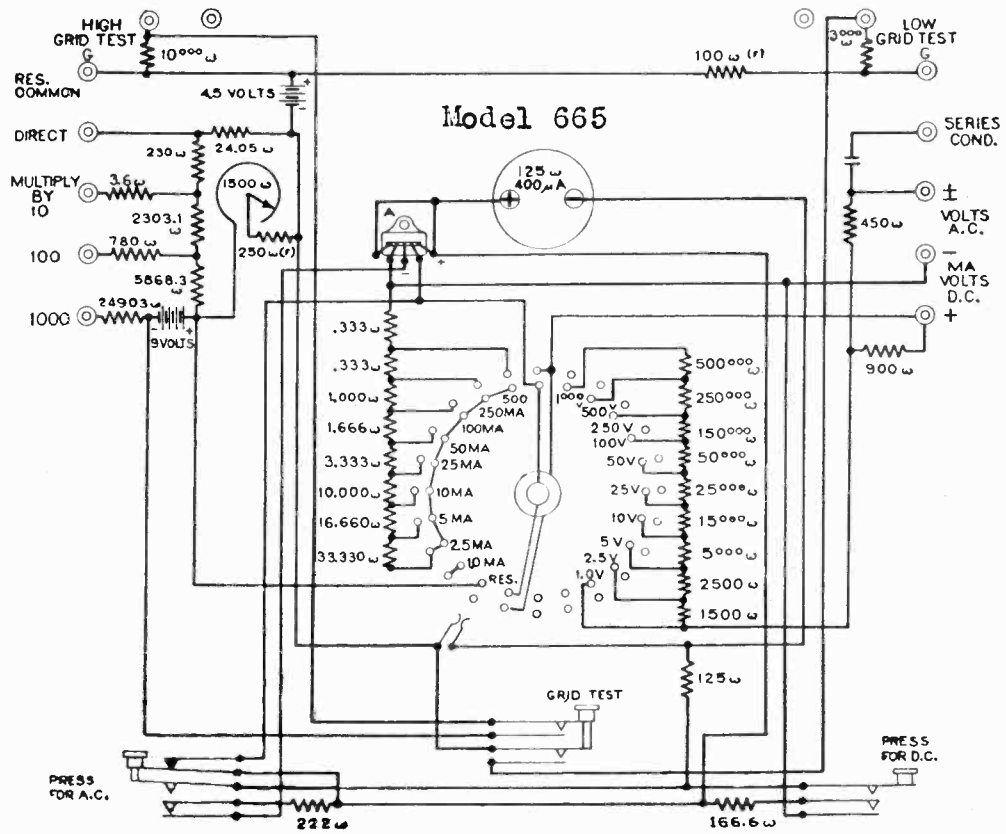
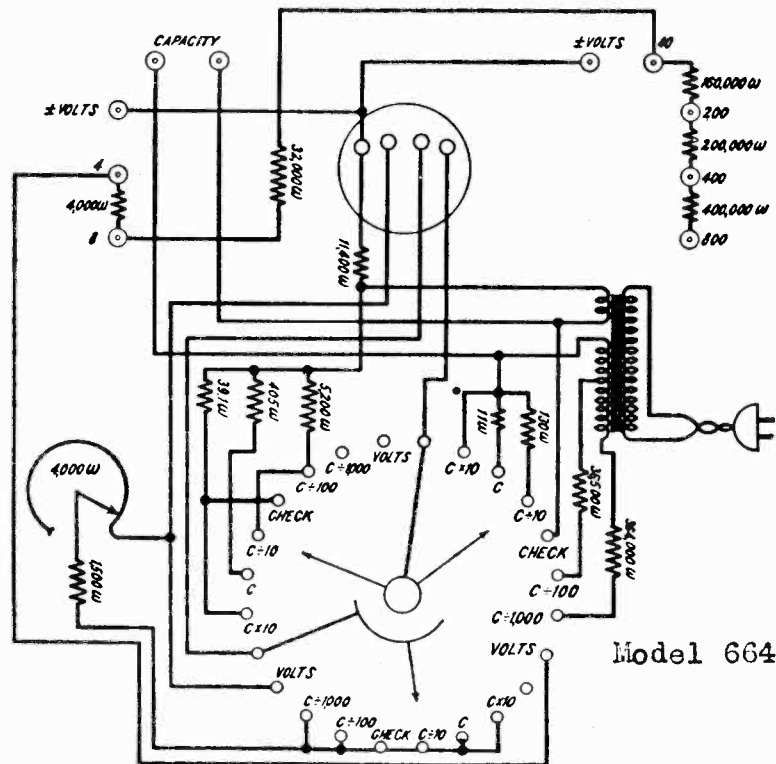
Type of Tube	Function	Across Filament or Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
58	R.F.	2.4	275	100	4.2 ⁽¹⁾	5.2
57	1st Det.	2.4	265	99	5.4	.9
56	Osc.	2.4	28		0	8.6
58	1st I.F.	2.4	275	100	4.2 ⁽¹⁾	5.2
58	2nd I.F.	2.4	275	102	3.0	8.5
56	2nd Det.	2.4	0		0	0
57	1st Audio	2.4	12	102	3.0 ⁽¹⁾	1.8
47	Output	2.4	265	280	18.5 ⁽²⁾	30.0
80	Rect.	4.9				55.0 per plate

(1) Measured from cathode to ground.

(2) Measured across Resistor R6.

WESTON ELECTRICAL INSTRUMENT CORP.

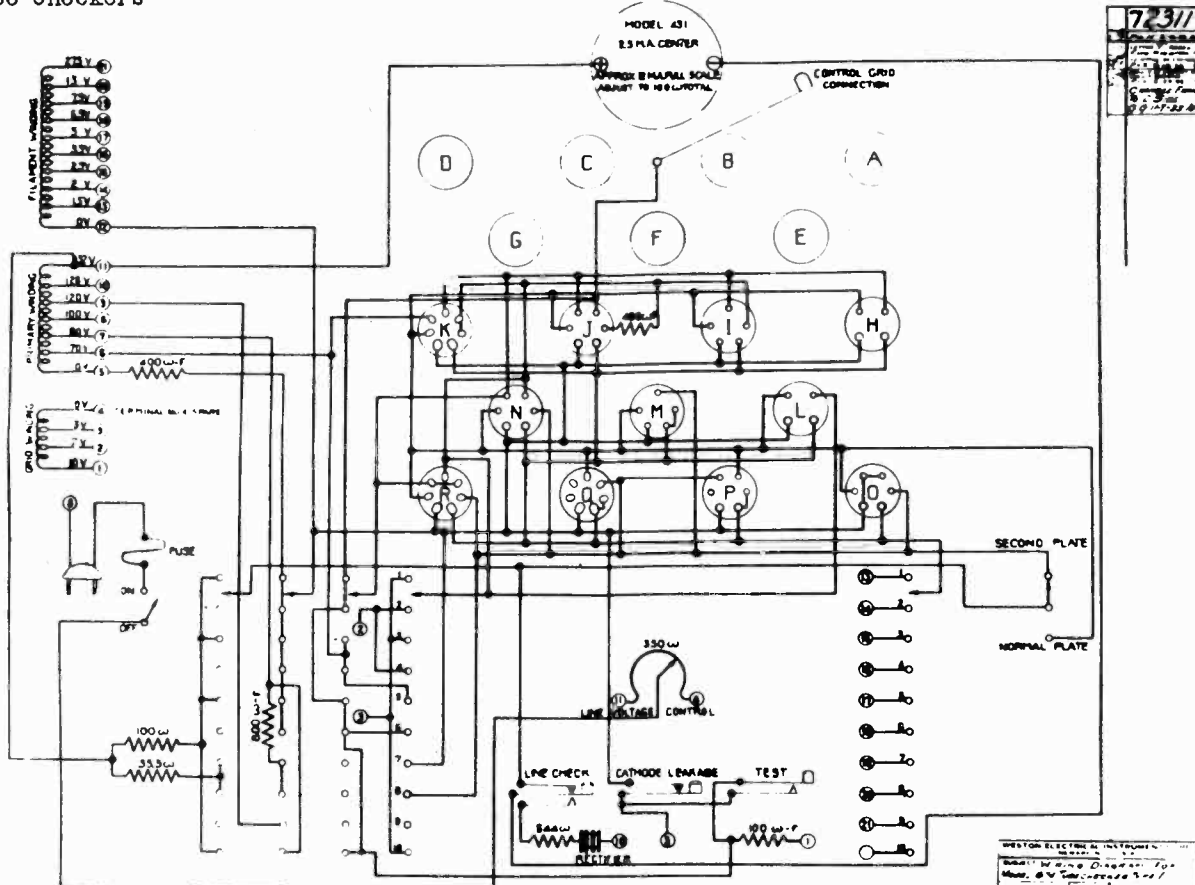
MODEL 664
Capacity-
Voltmeter
MODEL 665
Selective
Analyzer



MODEL 674
 MODEL 675
 Tube Checkers

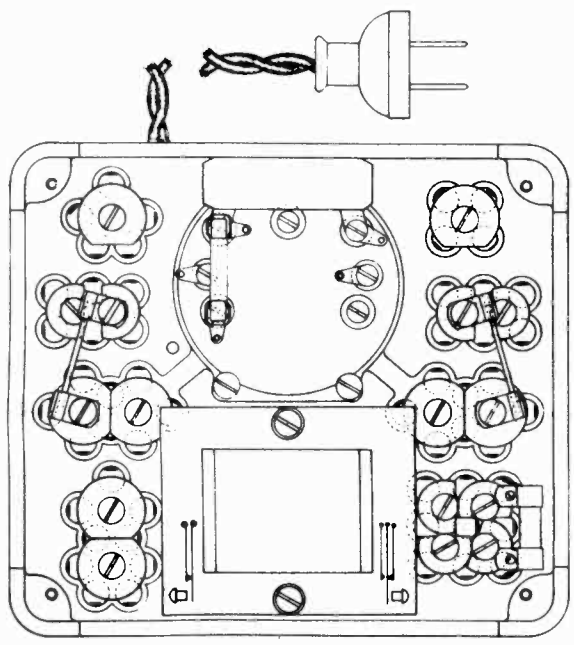
WESTON ELECTRICAL INSTRUMENT CORP.

72311
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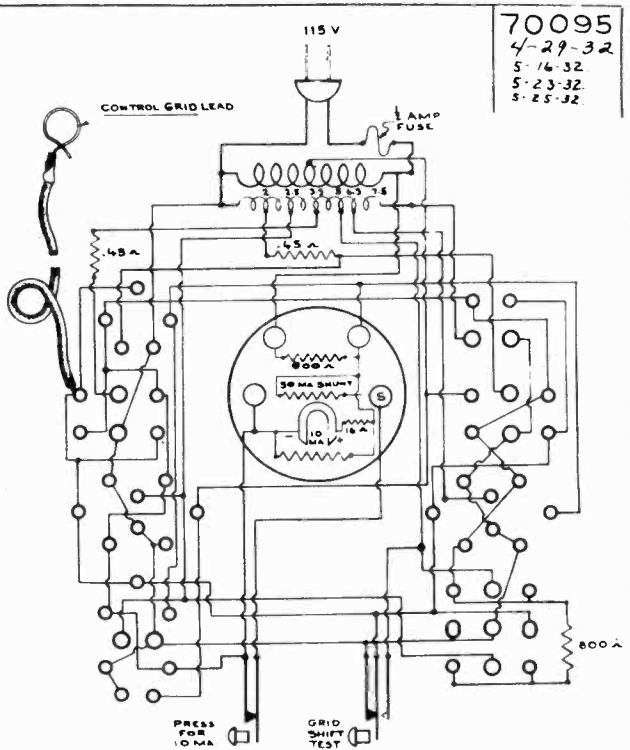


SCHEMATIC DIAGRAM LOOKING AT BACK OF INSTRUMENT

WESTON ELECTRICAL INSTRUMENT CORP.
 Model 674 & 675 Tube Checker
 7-1-32



LOOKING AT BACK OF CASE



SCHEMATIC LOOKING AT BACK OF CASE

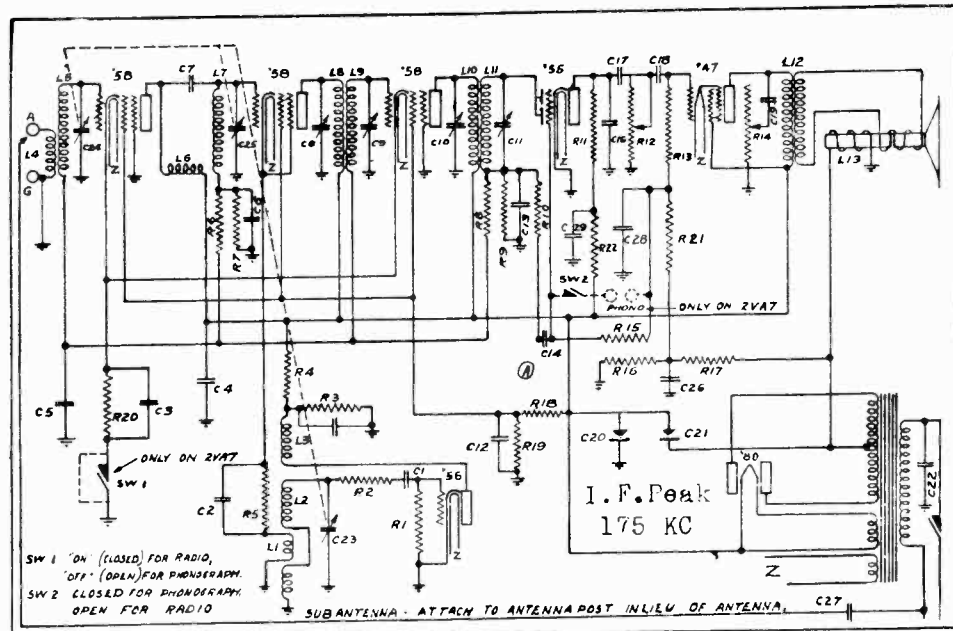
70095
 4-29-32
 5-16-32
 5-23-32
 5-25-32

WESTON ELECTRICAL INSTRUMENT CORP.
 MODEL 675
 WIRING DIAGRAM FOR
 PATTERN 675 TUBE CHECKER

NOTE -
 WIRE WITH #20 B & S GA. (OSB) TINNED BARE
 CU WIRE #10, #14 & #18 OR COLORED WIRE,
 COLORS BLACK, RED AND GREEN

WILCOX-GAY CORP.

Automatic Volume Control



RESISTORS

Part No.	Value	Description
200 R1	100,000 Ohm	Oscillator Grid Resistor
475 R2	1,000 Ohm	Oscillator Grid Suppressor Resistor
192 R3	40,000 Ohm	Oscillator Plate Bleeder Resistor
278 R4	20,000 Ohm	Oscillator Plate Resistor
282 R5	2,000 Ohm	First Detector Cathode Resistor
198 R6	1 Megohm	First Detector Grid Feed Resistor
91 R7	250,000 Ohm	First Detector Grid Bleeder Resistor
201 R8	500,000 Ohm	Diode Resistor
201 R9	500,000 Ohm	Diode Resistor
200 R10	100,000 Ohm	Diode Resistor
200 R11	100,000 Ohm	Second Detector Plate Resistor
535 R12	500,000 Ohm	Volume Control
201 R13	500,000 Ohm	47 Grid Bias Resistor
534 R14	1/4 Meg.	Tone Control
201 R15	500,000 Ohm	Second Detector Grid Resistor
200 R16	100,000 Ohm	47 Grid Bias Network Resistor
198 R17	1 Meg.	47 Grid Bias Network Resistor
337 R18	20,000 Ohm	Screen Grid Resistor (Type E)
192 R19	40,000 Ohm	Screen Grid Bleeder Resistor
539 R20	150 Ohm	First R.F. & First I.F. Cathode Resistor
201 R21	500,000 Ohm	Grid Bias Resistor
200 R22	100,000 Ohm	Second Detector Plate Resistor

CONDENSERS

Part No.	Value	Description
339 C1	.0001 MFD.	Oscillator Grid Feed Condenser
269 C2	.01 MFD.	First Detector Cathode Condenser
272 C3	.1 MFD.	First R.F. and First I.F. Cathode Condenser 200 Volt D.C.
266 C4	1 MFD. B+	Supply Condenser 300 Volt D. C., Paper
272 C5	.1 MFD.	R.F. and I.F. Grid Isolation Condenser 200 V. D.C. Paper
272 C6	.1 MFD.	First Detector Grid Isolation

Part No.	Value	Description
347 C7	.00001 MFD.	First R.F. Feed Condenser
C8	75 - 150 MMFD.	I.F. Tuning Condenser
C9	75 - 150 MMFD.	I.F. Tuning Condenser
C10	75 - 150 MMFD.	I.F. Tuning Condenser
C11	75 - 150 MMFD.	I.F. Tuning Condenser
272 C12	.1 MFD.	Screen Grid By-pass Condenser 200 Volt D.C.
307 C13	.0005 MFD.	Diode Condenser
269 C14	.01 MFD.	Audio Feed Condenser 400 Volt D.C. Paper
339 C15	.0001 MFD.	R.F. By-pass Condenser
514 C16	.001 MFD.	Plate Filter Condenser 350 Volt D.C. Mica
269 C17	.01 MFD.	Audio Feed Condenser
269 C18	.01 MFD.	Audio Feed Condenser
552 C19	.1 MFD.	Tone Control Condenser (300 V.)
533 C20	4 MFD.	Electrolytic Condenser 500 Volt
533 C21	4 MFD.	Electrolytic Condenser 500 Volt
269 C22	.01 MFD.	110 Primary By-pass Condenser
547 C23	350	Oscillator Variable Condenser
547 C24	365	Preselector Variable Condenser
547 C25	365	First Detector Variable Condenser
267 C26	.5 MFD.	247 Grid Bias By-pass (200 Volt)
307 C27	.0005 MFD.	Subantenna Condenser
272 C28	.1 MFD.	200 Volt Grid Bias By-pass Condenser
272 C29	.1 MFD.	200 Volt Second Detector Plate By-pass

INDUCTANCES

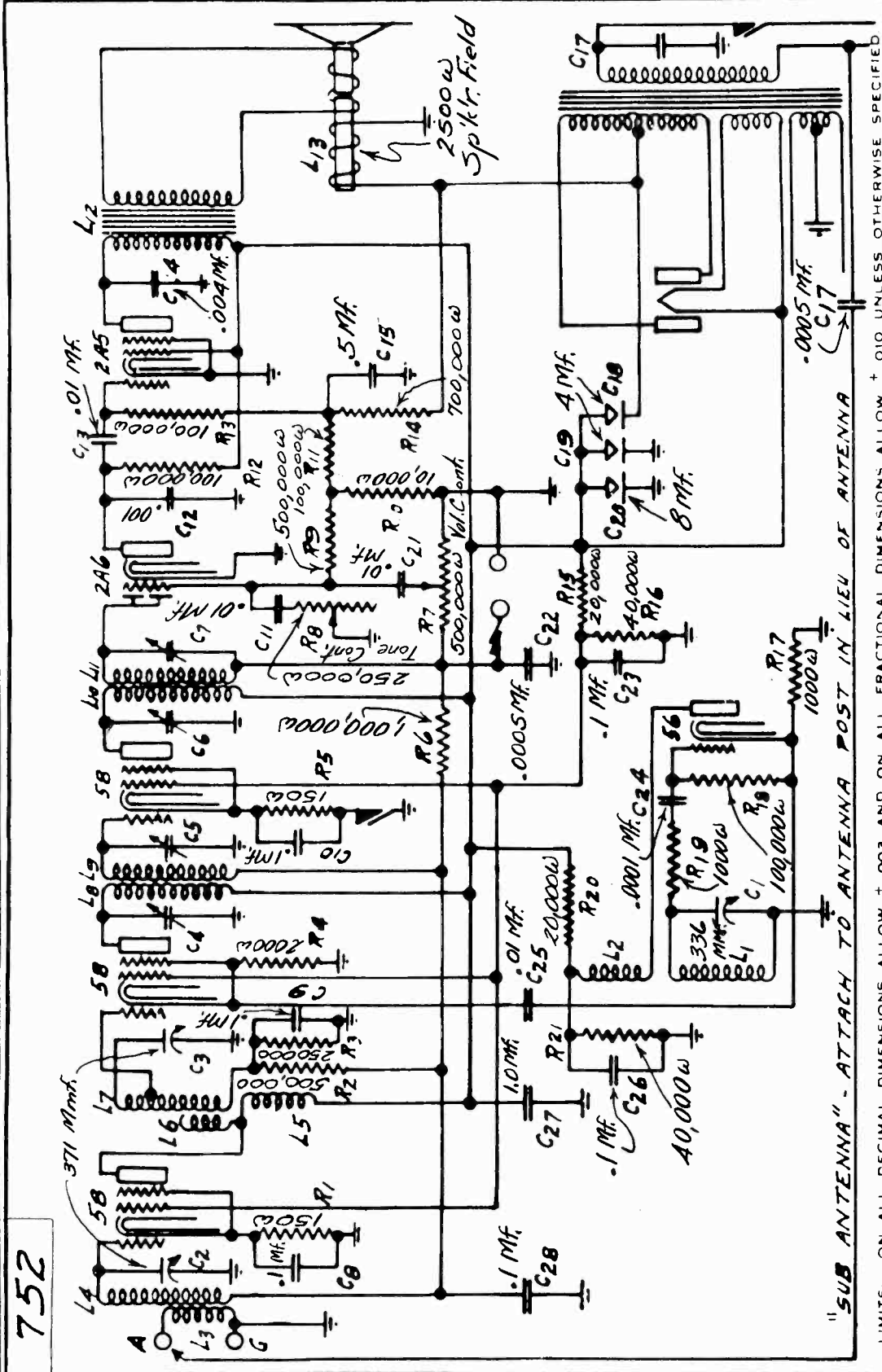
Part No.	Value	Description
549 L1	30 Turns #36	Oscillator Coupling Winding
549 L2	83 Turns #32	Oscillator Secondary Tapped at 30 Turns
549 L3	20 Turns #36	Oscillator Plate Winding
582 L4	10 Turns #36	Ant. Coil Pri.
582 L5	115 Turns #32	Ant. Coil Sec.
179 L6	5.5 M.H.	Choke Coil
588 L7	115 Turns	First Detector Coil Secondary
260 L8	6,000 M.H.	First I.F. Primary
260 L9	6,000 M.H.	First I.F. Secondary
260 L10	6,000 M.H.	Second I.F. Primary
260 L11	6,000 M.H.	Second I.F. Secondary
L12		Output Transformer
L13	2,500 Ohm	Speaker Field

Connection to the speaker assembly is made through the means of four wires extending from the chassis to the speaker. These wires are color-coded and are attached to the speaker terminal board as follows:

- Black - - - - Field and ground terminal
- Red - - - - Input Transformer Primary (B+)
- White - - - - Input Transformer Primary (Pentode Plate)
- Yellow - - - - Field

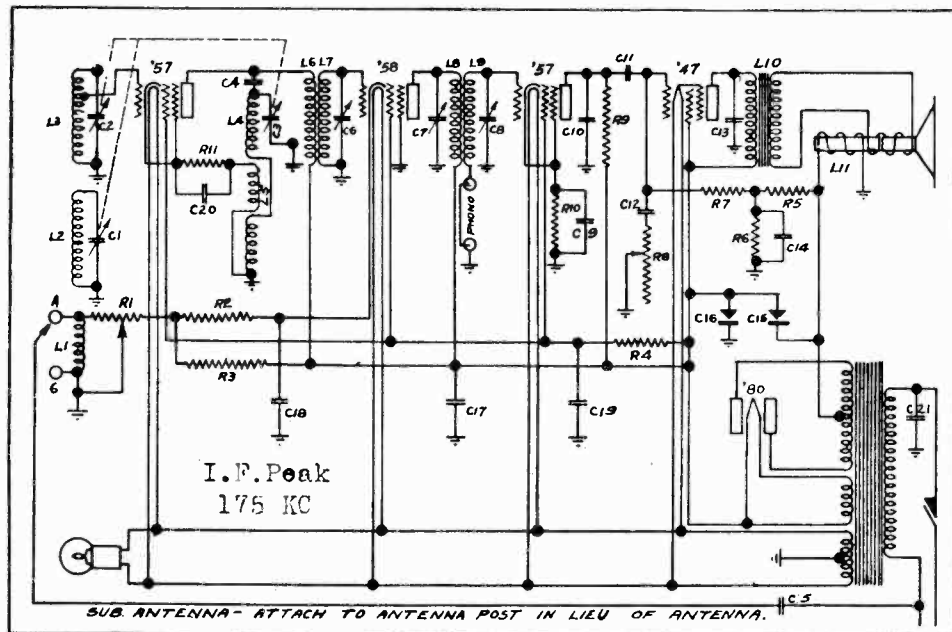
MODEL 2-VB-7
Schematic

WILCOX-GAY CORP.



CHANGES	MATERIAL	TITLE - SCHEMATIC CIRCUIT	SCALE	DATE	PART NO	DRWG NO
		DIAGRAM MODEL 2VB7	DWNCain	9-27-33		752
			CK Howard	9-27-33		
			TR			
			APP			
THE WILCOX-GAY CORP. CHARLOTTE MICHIGAN						ISSUED DEC 1 9 1933

WILCOX-GAY CORP.



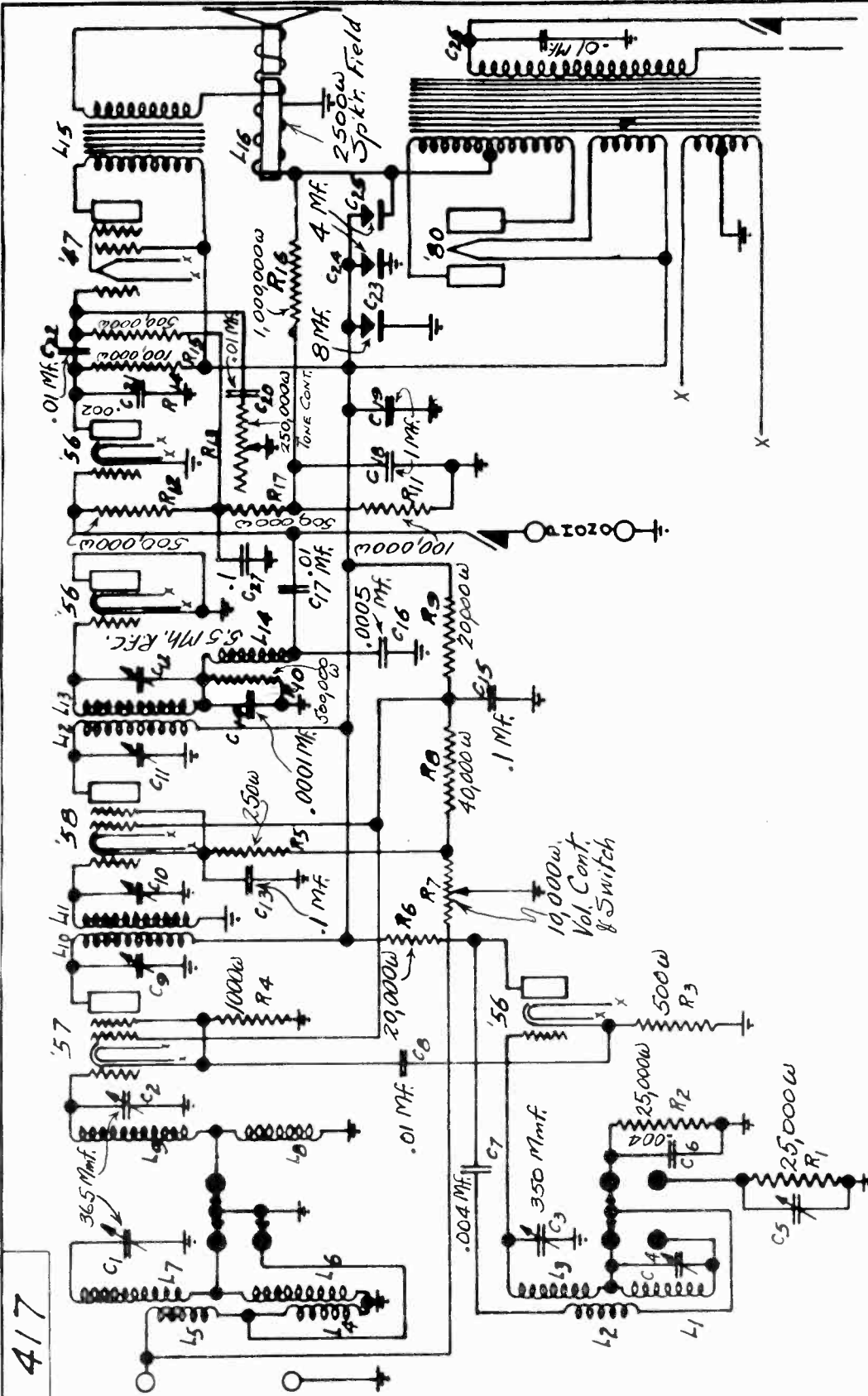
RESISTORS			
Part No.		569	C9 .2 MFD. 300 Volt Second Detector Cathode By-pass Condenser
445	R1 10,000 Ohm Volume Control & Switch	516	C10 .001 MFD. 350 Volt Second Detector Plate Filter Mica
279	R2 500 Ohm Type J Resistor First I. F. Cathode	269	C11 .01 MFD. 400 Volt Audio Feed Condenser, Paper, Tubular
494	R3 75,000 Ohm Type J Resistor First I. F. Cathode Feed	269	C12 .01 MFD. 400 Volt Tone Control Condenser, Paper, Tubular
200	R4 100,000 Ohm Type J Resistor Screen Grid Feed	516	C13 .001 MFD. 350 Volt, 247 Plate Filter, Mica
198	R5 1 Megohm Type J Resistor 247 Grid Bias Network	267	C14 .5 MFD. 200 Volt 247 Bias By-pass
281	R6 330,000 Ohm Type J Resistor 247 Grid Bias Network	496	C15 4 MFD. 400 Volt Working - 500 Volt Peak
201	R7 500,000 Ohm Type J Resistor 247 Grid Bias	496	C16 4 MFD. Micamold Type 441 W.P. Condenser
534	R8 250,000 Ohm Potentiometer Tone Control	266	C17 1 MFD. 300 Volt B Supply By-pass Condenser
91	R9 250,000 Ohm Type J Resistor Second Detector Plate Feed	272	C18 .1 MFD. 200 Volt First I.F. Cathode By-pass Condenser
192	R10 40,000 Ohm Type J Resistor Second Detector Cathode	272	C19 .1 MFD. 200 Volt Screen By-pass Condenser
280	R11 5,000 Ohm Type J Resistor First Detector Cathode	516	C20 .001 MFD. 350 Volt First Detector By-pass Mica Condenser
200	R12 100,000 Ohm Type J Resistor Audio Feed	269	C21 .01 MFD. 400 Volt Line By-pass
CONDENSERS		INDUCTANCES	
547	C1 365 MMFD. Preslector Section of 3 Gang Condenser	604	L1 Preslector Ant. Primary 30 Turns #36 P.E. Wire
547	C2 365 MMFD. Preslector Section of 3 Gang Condenser	604	L2 Preslector Ant. Secondary 90 Turns Tap at 30 T. Grid End #32 P.E.W.
547	C3 350 MMFD. Oscillator Section of 3 Gang Condenser	514	L3 Preslector Secondary 91 Turns #32 P.E.W.
339	C4 .0001 MFD. R.F. Condenser	514	L4 Oscillator Secondary 87 T. Tapped at 30 Turns #32 P.E.W.
307	C5 .0005 MFD. Mica - Stamp Type S, Sub. Antenna	514	L5 Oscillator Coupling 5 Turns & 5 Turns #36 P. E. Wire
	C6 75 - 150 MMFD. I.F. Trimming Condenser	259	L6 First I.F. Primary 6,000 Microhenrys
	C7 75 - 150 MMFD. I.F. Trimming Condenser	259	L7 First I.F. Secondary 6,000 Microhenrys
	C8 75 - 150 MMFD. I.F. Trimming Condenser	260	L8 Second I.F. Primary 6,000 Microhenrys
		260	L9 Second I.F. Secondary 6,000 Microhenrys
			L10 Output Transformer
			L11 1,000 Ohm Speaker Field

Connection to the speaker assembly is made through the means of four wires extending from the chassis to the speaker. These wires are color-coded and are attached to the speaker terminal panel as follows:

- Black - - - - Field and ground terminal
- Red - - - - Input Transformer Primary (B+)
- White - - - - Input Transformer Primary (Pentode Plate)
- Yellow - - - - Field

MODEL 3-F-7
Schematic

WILCOX-GAY CORP.



LIMITS ON ALL DECIMAL DIMENSIONS ALLOW .003 AND ON ALL FRACTIONAL DIMENSIONS ALLOW 1/10 UNLESS OTHERWISE SPECIFIED.

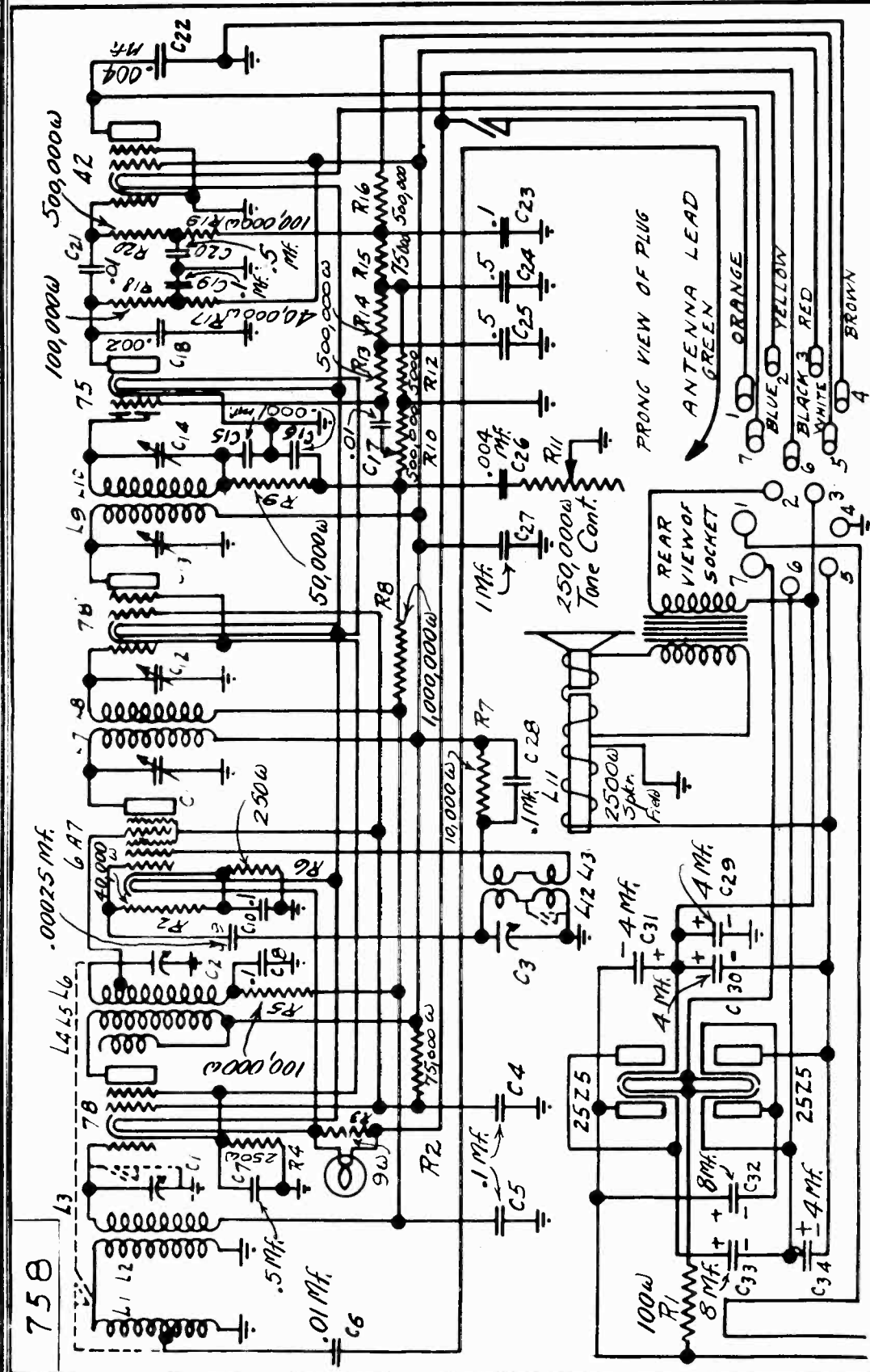
417

CHANGES	MATERIAL	TITLE-SCHEMATIC CIRCUIT DIAGRAM	SCALE	DATE	PART NO	DRWG NO
		MODEL 3F7	DWN	1-1-33		417
			CK	1-18-33		
			TR			
			APP			
	THE WILCOX-GAY CORP. CHARLOTTE MICHIGAN			ISSUED		

DEC 19 1933

WILCOX-GAY CORP.

MODEL 3-LB-7
Schematic

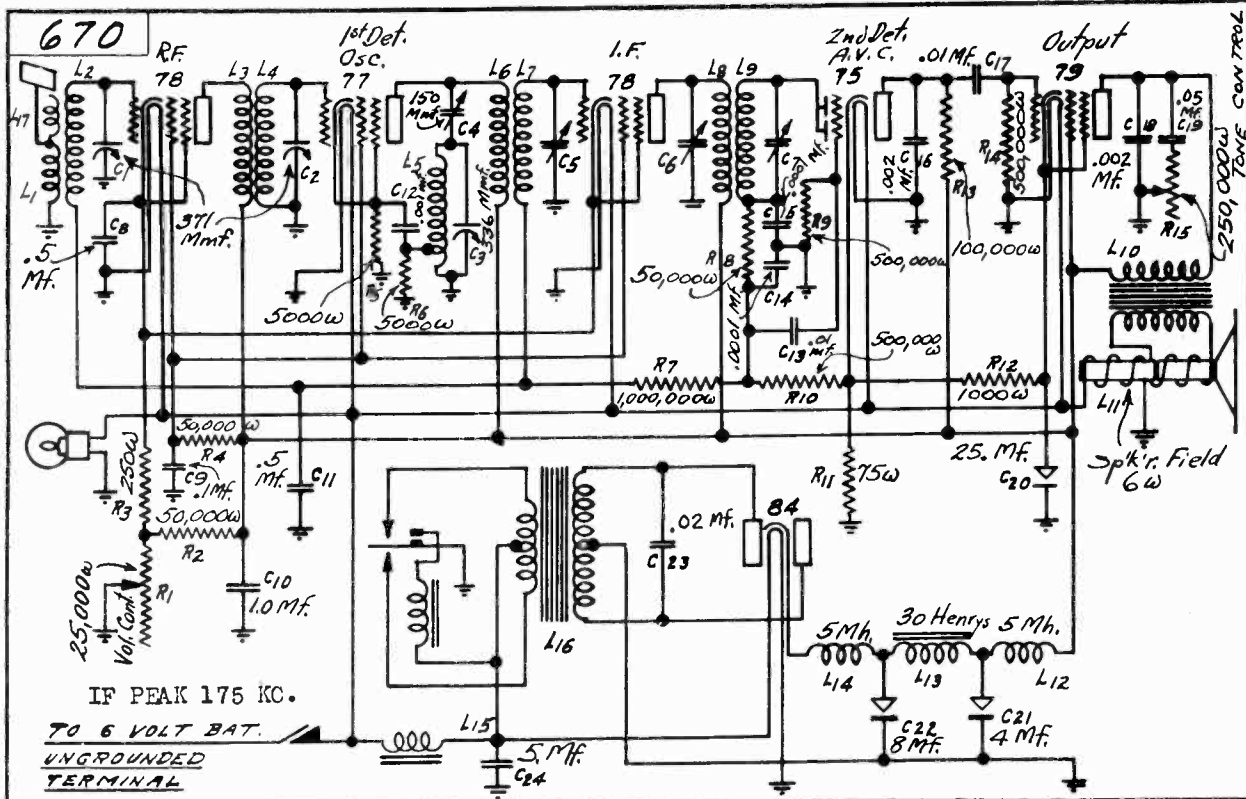


LIMITS: ON ALL DECIMAL DIMENSIONS ALLOW ±.003 AND ON ALL FRACTIONAL DIMENSIONS ALLOW ±.010 UNLESS OTHERWISE SPECIFIED.

CHANGES	MATERIAL	TITLE-SCHEMATIC DIAGRAM	SCALE	DATE	PART NO.	DRWG. NO.
		MODEL 3LB7 - 1217	DOWN	12-9-33		758
		NEW CIRCUIT OF 12-8-33		CK #12-24		
		SUPERSEDING NO. 746		12-9-35		
	THE WILCOX-GAY CORP.					
	CHARLOTTE					
	MICHIGAN					
					ISSUED	DEC 19 1933

MODEL 3-R-6
Schematic

WILCOX-GAY CORP.



R. F. Adjustment:

The three R. F. trimming condensers are adjusted at 1400 K. C. Proceed as follows:

Procure a modulated oscillator giving a signal at 1400 K. C.

	Cath. to Plate	Cath. to Screen	Cath. to Ground	Plate Current MA	Heater Volts
78	180	80	2	4	6.3
77	180	80	4	58	6.3
78	180	80	2	4	6.3
75	120	-	2	1	6.3
89	180	180	17	20	6.3

Remove the cover of the case, couple the out-put of the oscillator from antenna to ground, set the dial at 1400 and the oscillator at 1400 K.C.

Place the oscillator and receiver in operation and adjust the oscillator out-put so that a weak signal is heard in the loudspeaker when the volume control is at its maximum position.

Then adjust the trimming condensers starting with C 3, C 2 and then C 1 until maximum output is obtained. Readjust a second time as there is a slight interlocking of adjustments.

A more accurate adjustment can be made with an out-put meter.

I. F. Adjustment:

The four I. F. trimming condensers are adjusted at 175 K. C. Proceed as follows:

Procure a modulated oscillator giving a signal at 175 K. C., a non-metallic screw driver and an out-put meter.

Volume Control Full on.

Remove the bottom, top, cap, drive pulley and the speaker leads and remove the chassis.

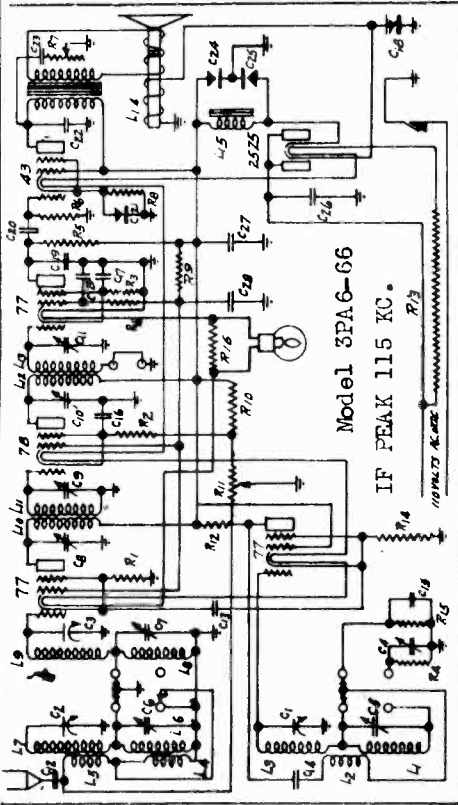
Reconnect the speaker. Connect the oscillator out-put between the first detector grid and ground. Connect out-put meter.

Adjust the tuning condenser so that no signal except the I. F. oscillator is heard at maximum volume. With the volume control at maximum, reduce the oscillator out-put until a small deflection is obtained. Unless this is done the action of the A.V.C. will make it impossible to obtain correct adjustments.

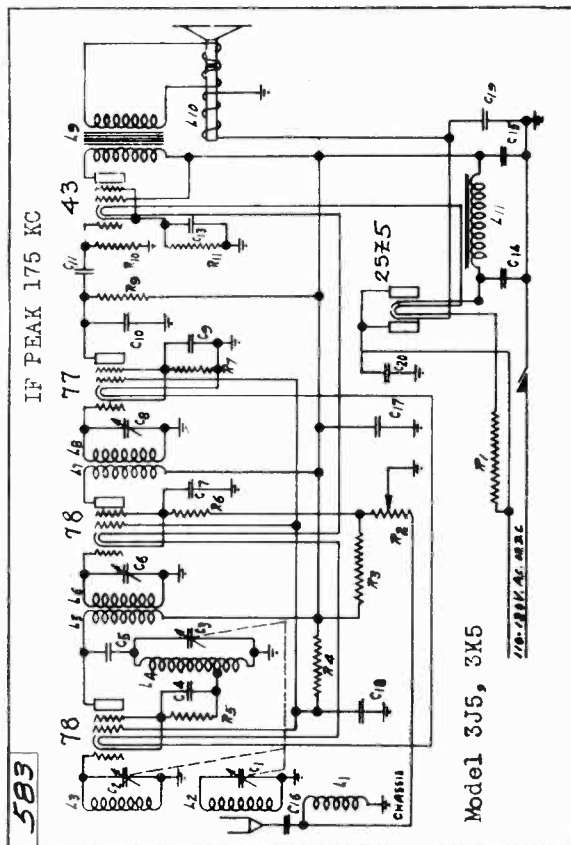
Trim in order C 4, C 5, C 6 and C 7, repeat adjustments and then follow with the R. F. adjustments.

WILCOX-GAY CORP.

MODEL 3-J-5,3-K-5
Schematic
MODEL 3-PA-6-66
Schematic



Code	Part No.	RESISTORS	Part No.	Comments
R1	919	5,000 Ohm First Detector Cathode	C17	569 .2 Mfd. Second Detector Cathode By-pass Condenser
R2	1082	250 Ohm Cathode	C18	1085 4. Mfd. Dry Electrolytic Filter Condenser
R3	1083	15,000 Ohm Second Detector Cathode	C19	544 .001 Mfd. Filter Condenser
R4	1042	25,000 Ohm Long Wave Oscillator Grid	C20	269 .01 Mfd. Audio Feed Condenser
R5	924	250,000 Ohm Second Detector Plate	C21	928 25 Mfd. Electrolytic 45 Cathode 30 Volt Tubular
R6	925	500,000 Ohm 45 Grid	C22	503 .004 Mfd. Detector Filter Condenser
R7	534	250,000 Ohm Tune Control	C23	272 1 Mfd. Tune Control Condenser
R8	1063	500 Ohm 43 Cathode	C24	1085 4 Mfd. Dry Electrolytic Condenser
R9	921	40,000 Ohm Screen Grid	C25	1085 12 Mfd. Dry Electrolytic Condenser
R10	921	40,000 Ohm Screen Grid	C26	272 1 Mfd. Power Line By-pass Condenser
R11	512	10,000 Ohm Volume Control & Switch	C27	266 1. Mfd. B Supply By-pass Condenser
R12	941	20,000 Ohm Oscillator Plate	C28	267 .5 Mfd. Screen By-pass Condenser
R13	1125	130 Feed Resistance in Power Grid	C29	269 .01 Mfd. Second Detector Screen By-pass Condenser
R14	1064	600 Ohm Oscillator Cathode	L1	782 Long Wave Oscillator Secondary
R15	1042	25,000 Ohm Broadcast Oscillator Grid	L2	782 Long Wave & Broadcast Oscillator Primary 10 Turns
R16	924	250,000 Ohm Second Detector Plate	L3	782 Long Wave Oscillator Secondary
R17	1119	36 Ohm Pilot Light Shunt Resistor	L4	761 Long Wave First Presetor Primary U.W. 800 Turns
C1	833	26 - 536 MFD. Oscillator Section of 3 Gang	L5	976 Broadcast First Presetor Primary U.W. 178 Turns #36 S.S.E.
C2	833	26 - 571 MFD. Presetor Section of 3 Gang	L6	761 Long Wave First Presetor Secondary U.W. 3360 Turns #36 S.S.E.
C3	833	26 - 571 MFD. Presetor Section of 3 Gang	L7	976 Broadcast First Presetor Secondary U.W. 139 Turns #32 S.S.E.
C4	784	4 Plate Long Wave Oscillator Trimmer	L8	761 Long Wave Second Presetor Secondary U.W. 139 Turns #32 S.S.E.
C5	972	2 Plate Long Wave Oscillator Trimmer	L9	976 Broadcast Second Presetor Secondary U.W. 132 Turns #36 S.S.E.
C6	971	2 Plate First Presetor Trimmer	L10	999 25,000 Microhenries First I.F.
C7	971	2 Plate Second Presetor Trimmer	L11	999 25,000 Microhenries Second I.F.
C8	993	75 - 150 MFD. First I.F. Primary Trimmer U.F. Sec.	L12	1156 14,000 Microhenries Second I.F.
C9	994	75 - 150 MFD. Second I.F. Primary Trimmer U.F. Sec.	L13	1156 14,000 Microhenries Second I.F.
C10	995	75 - 150 MFD. Second I.F. Primary Trimmer U.F. Sec.	L14	917 3,000 Ohm Speaker Field Condenser
C11	996	75 - 150 MFD. Second I.F. Secondary Trimmer U.F. Sec.	L15	940 20 Henry Choke
C12	289	.01 Antenna Coupling Condenser		
C13	269	.01 Oscillator Feed Condenser		
C14	269	.01 Mfd. Oscillator Plate Condenser		
C15	503	.004 Mfd. Broadcast Oscillator Condenser		
C16	272	.1 Mfd. I.F. Cathode By-pass Condenser		



Code	Part No.	RESISTORS	Part No.	Comments
R1	809	170 Ohm Filament Resistor	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	921 40,000 Ohm Screen Grid
R4	921	40,000 Ohm Resistor Screen Grid	C13	921 40,000 Ohm Screen Grid
R5	919	5,000 Feed Resistor First Detector & Oscillator	C14	965 12 MFD. Voltage Filter Condenser
R6	1063	500 Ohm Resistor I.F. Cathode Feed	C15	965 4 MFD. Voltage Filter Condenser
R7	941	20,000 Ohm Resistor Second Detector Cathode	C16	265 .001 MFD. Antenna Series Condenser
R8	924	250,000 Ohm Resistor Second Detector Plate Load	C17	267 .5 Mfd. Screen By-pass Condenser
R9	925	500,000 Ohm Resistor Output Grid Bias	C18	272 1 Mfd. Power Line By-pass Condenser
R10	1063	500 Ohm Resistor 43 Bias	C19	965 4 MFD. Voltage Filter Condenser
R11	1063	500 Ohm Resistor 43 Bias	C20	272 .1 MFD. 200 Volt Line By-pass Condenser
C1	833	365 MFD. Presetor Section of Variable Condenser	L1	647 Presetor Primary 178 Turns #36 S.S.E. U.W.
C2	833	365 MFD. Presetor Section of Variable Condenser	L2	847 Presetor First Secondary 128 Turns #36 S.S.E. U.W.
C3	833	350 MFD. Oscillator Section of Variable Condenser	L3	847 Presetor Second Secondary 133 Turns #36 S.S.E. U.W.
C4	265	.001 MFD. First Detector & Oscillator Cathode Condenser	L4	936 Oscillator Coil 98 Turns Tap 15 Turns #36 S.S.E. U.W.
C5	264	.00005 MFD. Oscillator Coupler Condenser	L5	938 First I.F. Primary 650 Turns #36 S.S.E. U.W.
C6	477	75-150 MFD. 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 MFD. Second I.F. Trimmer Condenser	L8	937 Second I.F. Secondary 450 Turns #36 S.S.E. U.W.
C9	569	.2 MFD. Second Detector Cathode	L9	917 Single #43 Output Transformer 3,000 Ohm Speaker Field
			L10	940 32 Henry Choke
			L11	

MODEL 3-S5-66

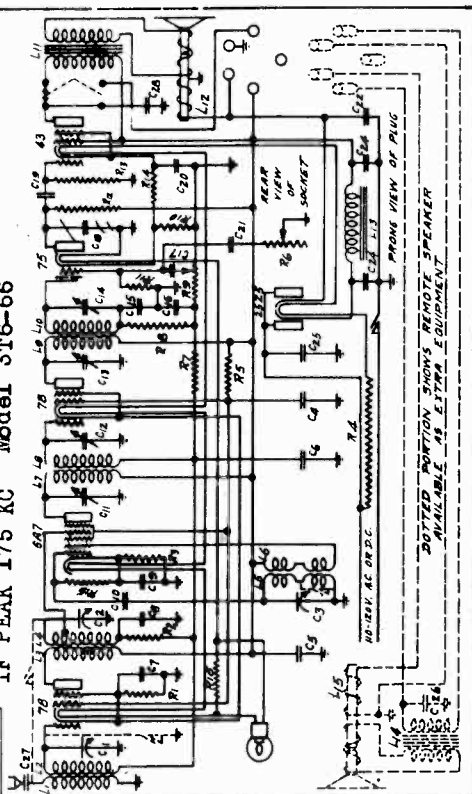
Schematic

MODEL 3T6-66

Schematic

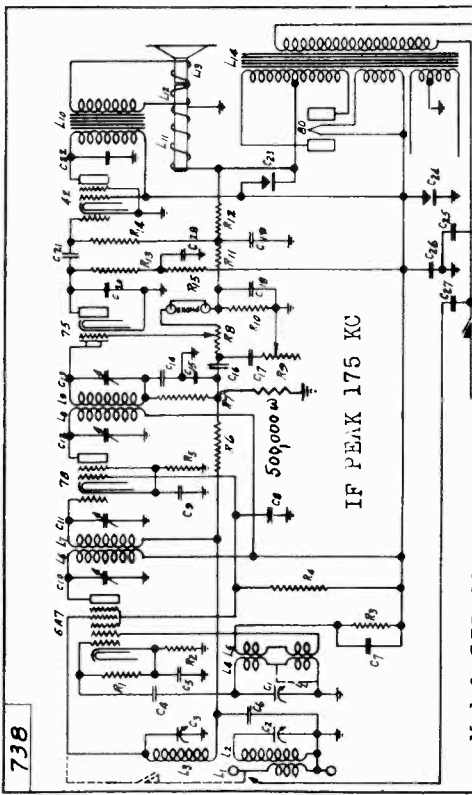
WILCOX-GAY CORP.

742 IF PEAK 175 KC Model 3T6-66



Part Code	Part No.	RESISTORS	Part Code	Part No.	CONDENSERS
R1	1062	250 Ohm R.P.P. I.F. Cath- distor	C15	335	.0001 MFD. Diode Filter Con- denser
R2	923	100,000 Ohm A.V.C. Network Re- sistor	C16	339	.0001 MFD. Diode Filter Con- denser
R3	1082	250 Ohm 6A7 Cathode Bias- istor	C17	369	.01 MFD. Detector Feed Condenser
R4	1125	130 Ohm Resistor In Power Grid	C19	269	.01 MFD. Audio Feed Conden- sator
R5	941	20,000 Ohm 78 & 6A7 Screen Resistor	C20	929	25 MFD. 45 Cathode Electro- lytic By-pass Condenser
R6	534	250,000 Ohm Tone Control Resistor	C21	289	.01 MFD. Tone Control Con- denser
R7	926	1 Megohm A.V.C. Network Re- sistor	C22	1085	4 MFD. 45 Electrolytic Con- denser
R8	898	50,000 Ohm A.V.C. Network Fil- ter Resistor	C23	1085	4 MFD. 45 Electrolytic Con- denser
R9	535	500,000 Ohm Volume Control & Power Switch	C24	1085	11 MFD. 45 Electrolytic Condenser
R10	1122	40 Ohm Bias Network Re- sistor	C25	272	.1 MFD. Line By-pass Conden- sator
R11	925	500,000 Ohm 75 Grid Leak Re- sistor	C26	1085	19 MFD. 45 Electrolytic Condenser
R12	925	500,000 Ohm 75 Plate Resistor	C27	289	.01 MFD. Antenna Series Con- denser
R13	1063	500,000 Ohm Bias Resistor	C28		Output Plate Fil- ter Condenser
R14	921	50,000 Ohm Oscillator Grid Leak Resistor			INDUCTANCES
R15	998	50,000 Ohm 75 Plate Resistor			L1 L139 Preselector Primary 450 Turns
R16	1119	36 Ohm Pilot Light Shunt Resistor			L2 L136 Preselector Secondary 144 Turns #36 S.S.E.
					L3 L137 Detector Coil Primary 750 Turns #36 S.S.E.
					L4 L137 Detector Coil Secondary 118 Turns #36 S.S.E.
					L5 L111 Oscillator Secondary 72 Turns #36 S.S.E.
					L6 L111 Oscillator Primary 35 Turns #36 S.S.E.
					L7 L101 8,000 Microhenries First I.F.
					L8 L101 8,000 Microhenries First I.F.
					L9 L101 8,000 Microhenries Second I.F.
					L10 L101 8,000 Microhenries Second I.F.
					L11 #43 Output Transformer
					L12 3,000 Ohm Speaker Field
					L13 20 Henry Choke
					L14 #43 Output Transformer
					L15 2,500 Ohm Speaker Field

738

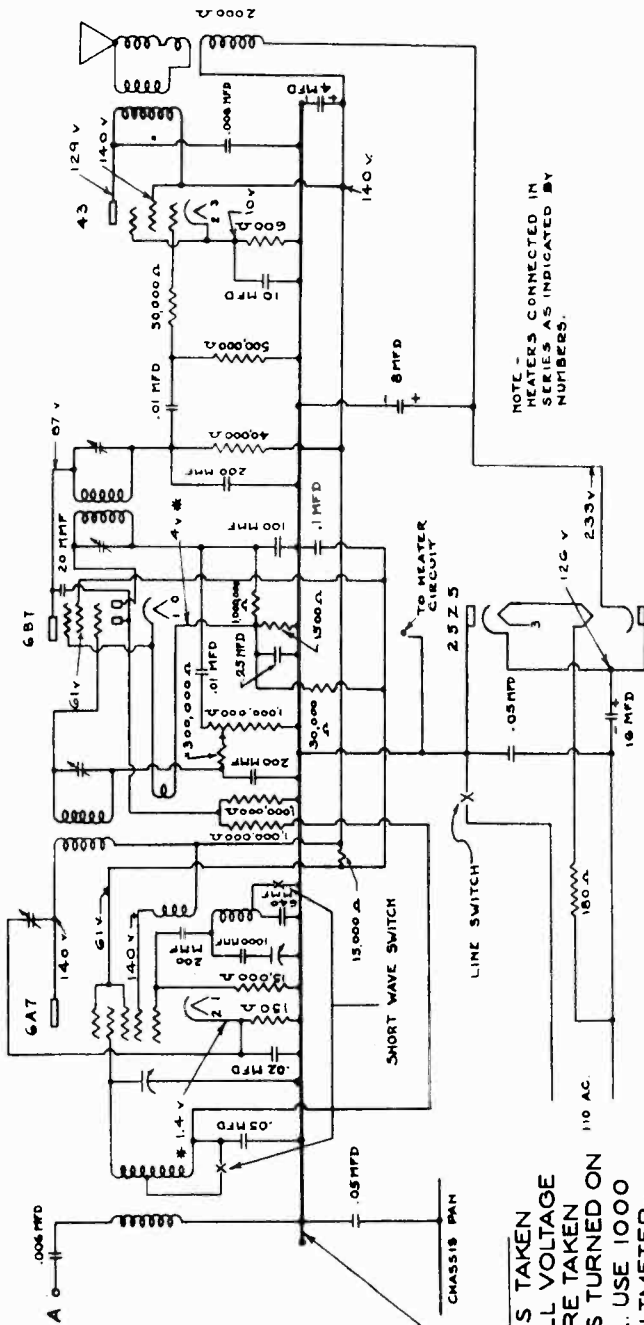


Part Code	Part No.	RESISTORS	Part Code	Part No.	CONDENSERS
C14	339	.0001 Diode Filter Condenser	L1	1109	Antenna Coil Primary 178 Turns #36 S.S.E.
C15	339	.0001 MFD. Diode Filter Conden- sator	L2	1109	Antenna Coil Secondary 136 Turns #36 S.S.E.
C16	269	.01 MFD. Second Detector Feed Condenser	L3	1109	Preselector Secondary 126 Turns #36 S.S.E.
C17	269	.01 MFD. Tone Control Condenser	L4	1111	Oscillator Secondary 72 and 50 Turns #36 S.S.E.
C18	929	25 MFD. 45 Cathode Electro- lytic By-pass Condenser	L5	1111	Oscillator Primary 35 Turns #36 S.S.E.
C19	269	.01 MFD. 45 Bias By-pass Conden- sator	L6	1101	8,000 Microhenries First I.F.
C20	269	.01 MFD. 45 Bias By-pass Conden- sator	L7	1101	8,000 Microhenries First I.F.
C21	316	.001 MFD. 75 Cathode Filter Con- denser	L8	1101	8,000 Microhenries Second I.F.
C22	1132	.002 MFD. 45 Plate Filter Con- denser	L9	1101	8,000 Microhenries Second I.F.
C23	486	4 MFD. 45 Electrolytic Conden- sator	L10	1104	Single 42 Output Transformer
C24	496	4 MFD. 45 Electrolytic Conden- sator	L11	1105	Run Backing Coil
C25	289	.01 MFD. Line By-pass Conden- sator	L12	1106	any Trimmer Condenser
C26	794	1 MFD. 45 Supply By-pass Con- denser	L13	1106	any Trimmer Condenser
C27	307	.0005 MFD. Sub. Antenna Con- denser	L14	1068	Power Transformer 115 Volts A. C. 80 Cycle
C28	272	.1 MFD. 75 Plate Hum Filter Condenser			
					INDUCTANCES
					L1 L109 Antenna Coil Primary 178 Turns #36 S.S.E.
					L2 L109 Antenna Coil Secondary 136 Turns #36 S.S.E.
					L3 L109 Preselector Secondary 126 Turns #36 S.S.E.
					L4 L111 Oscillator Secondary 72 and 50 Turns #36 S.S.E.
					L5 L111 Oscillator Primary 35 Turns #36 S.S.E.
					L6 L101 8,000 Microhenries First I.F.
					L7 L101 8,000 Microhenries First I.F.
					L8 L101 8,000 Microhenries Second I.F.
					L9 L101 8,000 Microhenries Second I.F.
					L10 Single 42 Output Transformer
					L11 Run Backing Coil
					L12 any Trimmer Condenser
					L13 any Trimmer Condenser
					L14 Power Transformer 115 Volts A. C. 80 Cycle

Model 3S5-66

THE RUDOLPH WURLITZER CO.

MODEL C-4, M-4
Schematic, Data



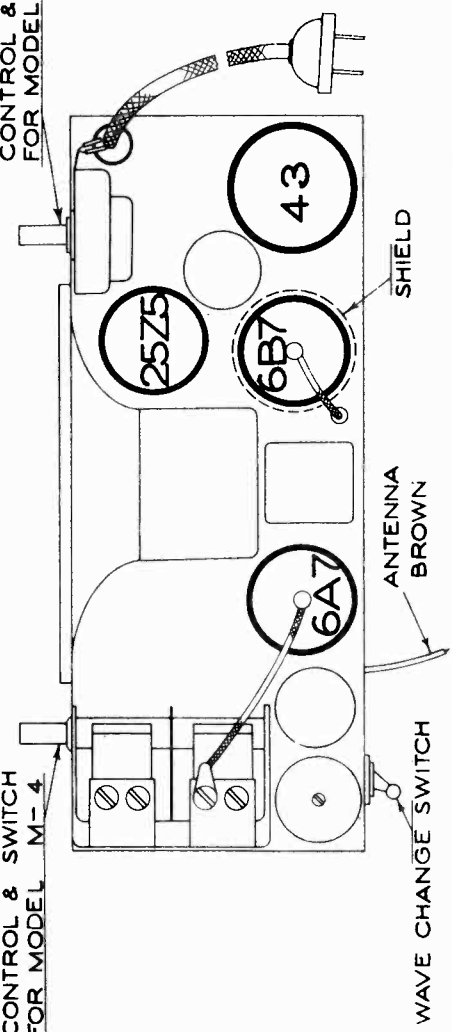
NOTE - ALL VOLTAGES TAKEN FROM THIS POINT. ALL VOLTAGE READINGS LISTED ARE TAKEN WITH ALL CONTROLS TURNED ON FULL AND NO SIGNAL. USE 1000 OHMS PER VOLT VOLTMETER. USE 300V. SCALE, EXCEPT AT POINTS MARKED * USE 7.5 V. SCALE. LINE USED 120V. 60CYC.

IF PEAK 456 KC

NOTE - HEATERS CONNECTED IN SERIES AS INDICATED BY NUMBERS.

POSITION OF VOLUME CONTROL & SWITCH FOR MODEL C-4

POSITION OF VOLUME CONTROL & SWITCH FOR MODEL M-4

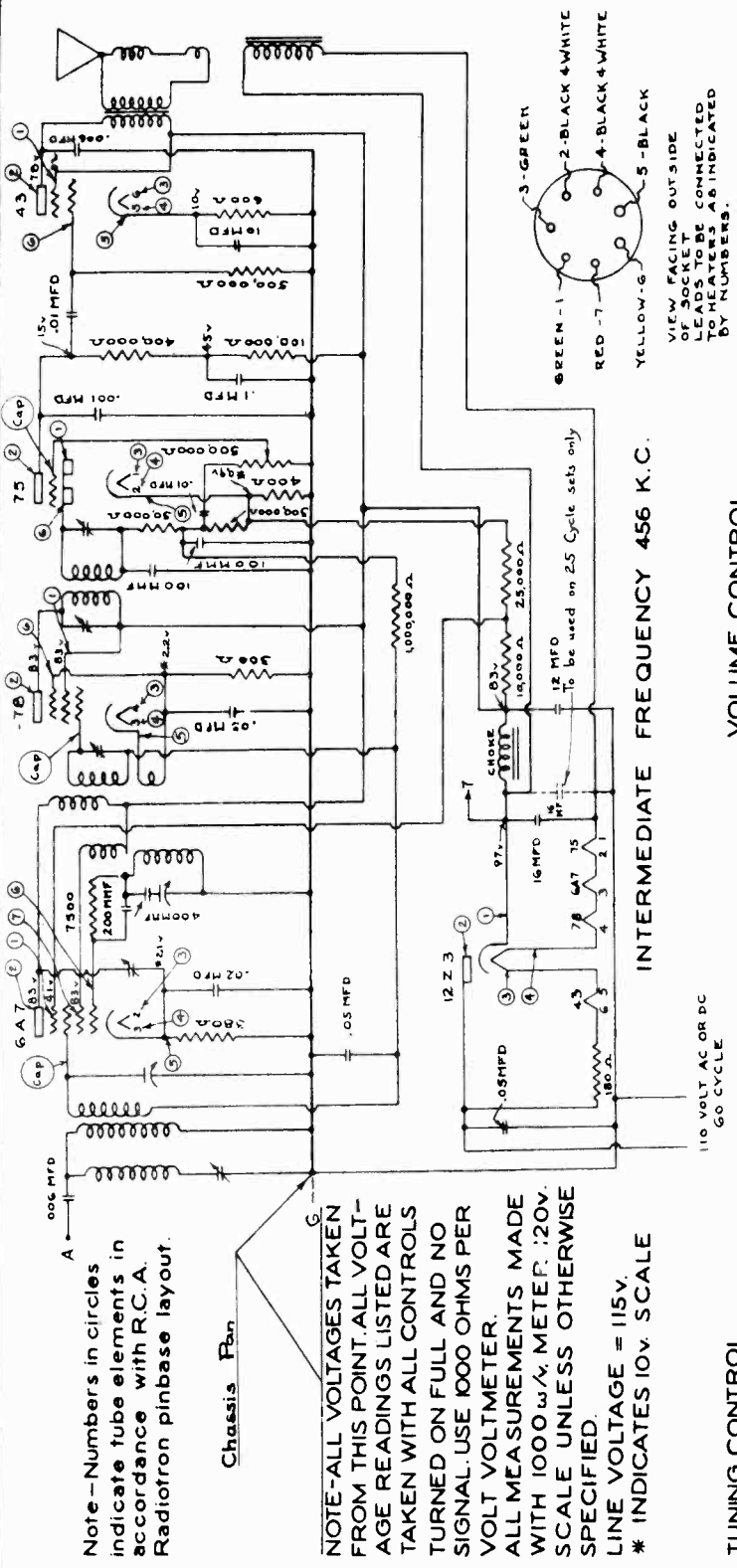


SERVICE SCHEMATIC
MODEL C-4 & M-4
SERIAL SERIES 3700001

DWG. NO. 76

MODEL P-5
Schematic, Data

THE RUDOLPH WURLITZER CO.

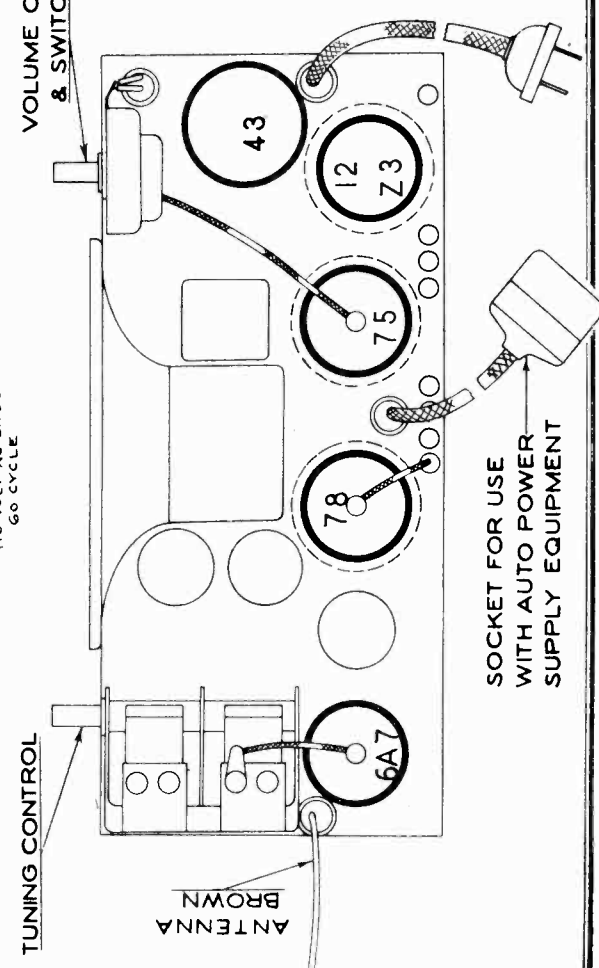


IMPORTANT!
 WHEN USING D.C. IF SET DOES NOT OPERATE
 AFTER TUBES ARE HEATED, REVERSE PLUG
 TO GET PROPER POLARITY.

SERVICE SCHEMATIC
 MODEL P-5

SERIAL NO. SERIES 3,900,001 & UP

DWG. NO. 78



Note - Numbers in circles indicate tube elements in accordance with R.C.A. Radiotron pinbase layout.

Chassis Pin

NOTE - ALL VOLTAGES TAKEN FROM THIS POINT. ALL VOLTAGE READINGS LISTED ARE TAKEN WITH ALL CONTROLS TURNED ON FULL AND NO SIGNAL. USE 1000 OHMS PER VOLT VOLTMETER. ALL MEASUREMENTS MADE WITH 1000 Ω/V METER. 20V. SCALE UNLESS OTHERWISE SPECIFIED. LINE VOLTAGE = 115V. * INDICATES 10V. SCALE

110 VOLT AC OR DC
 60 CYCLE

INTERMEDIATE FREQUENCY 456 K.C.

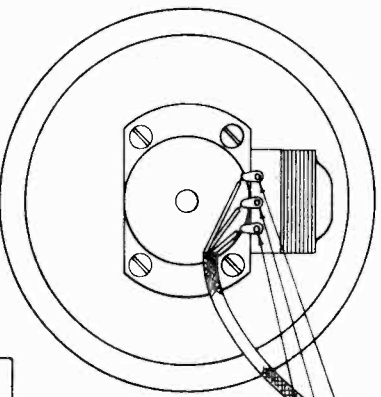
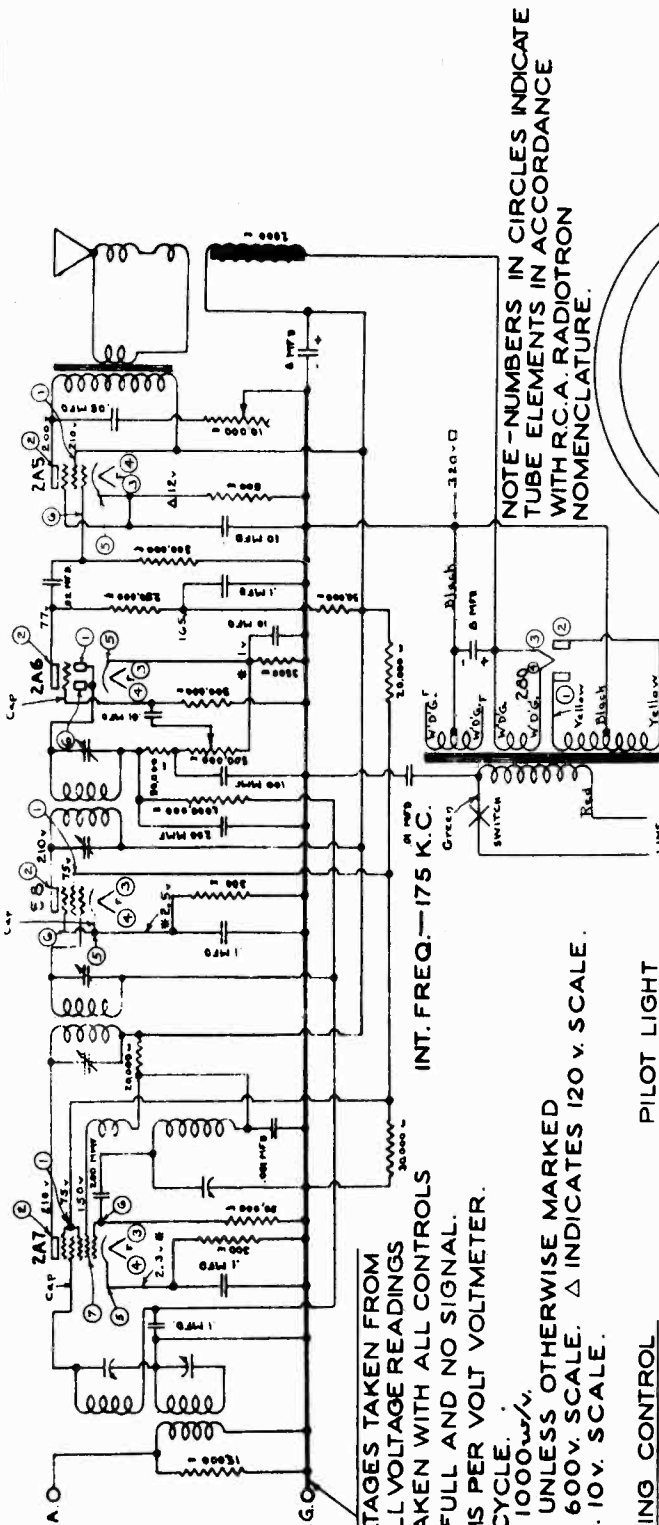
VOLUME CONTROL
 & SWITCH

TUNING CONTROL

SOCKET FOR USE
 WITH AUTO POWER
 SUPPLY EQUIPMENT

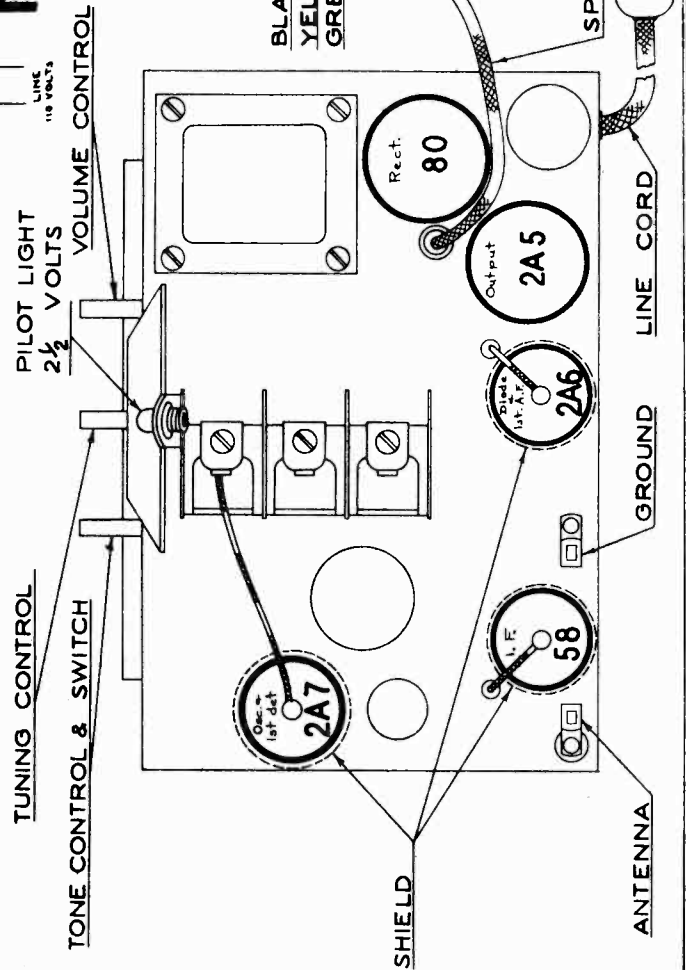
THE RUDOLPH WURLITZER CO.

MODEL SA-5
Schematic, Data



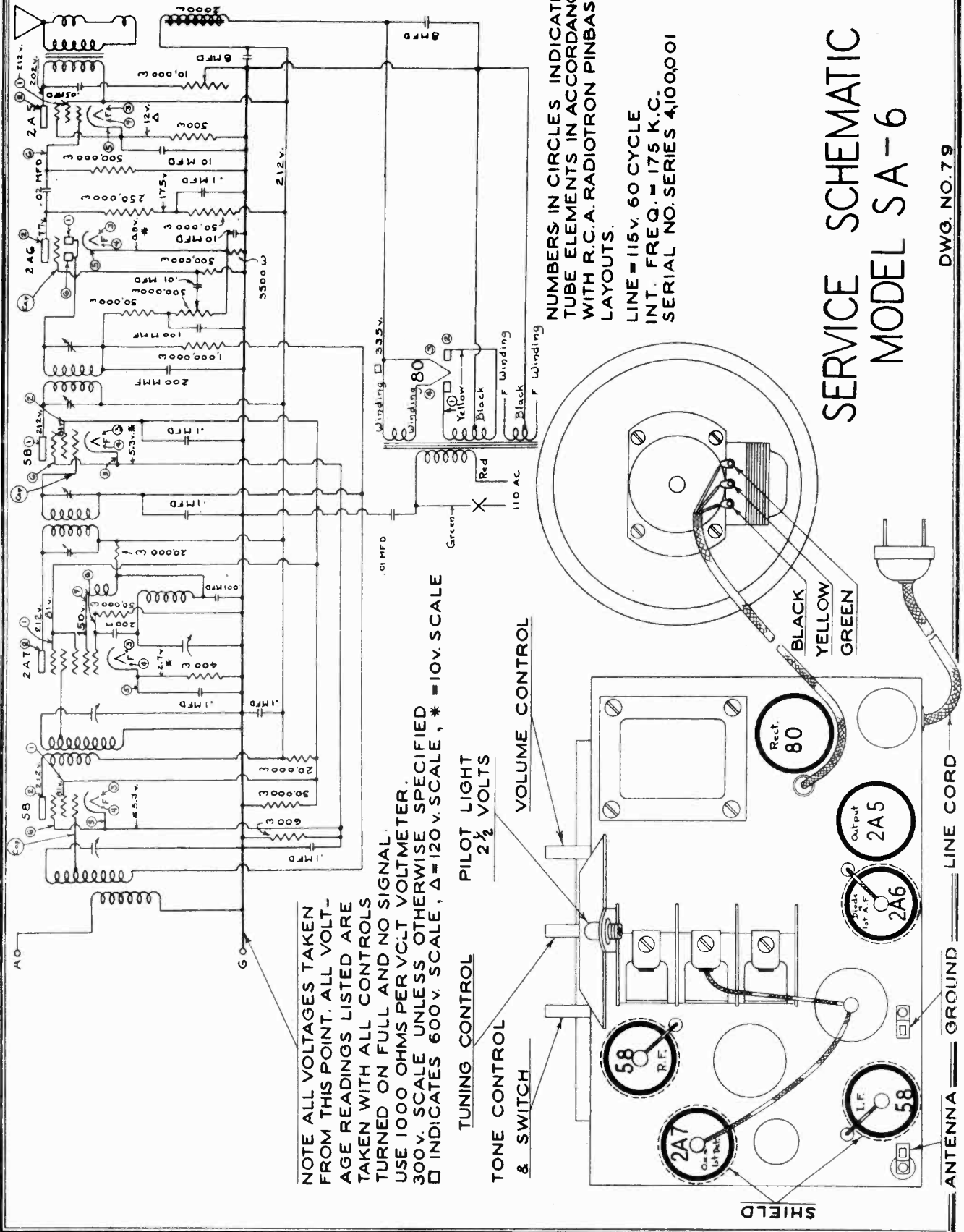
SERVICE SCHEMATIC
MODEL SA-5
SERIAL NO. SERIES 3500,001 & UP.

DWG. NO. 74.



MODEL SA-6
Schematic, Data

THE RUDOLPH WURLITZER CO.

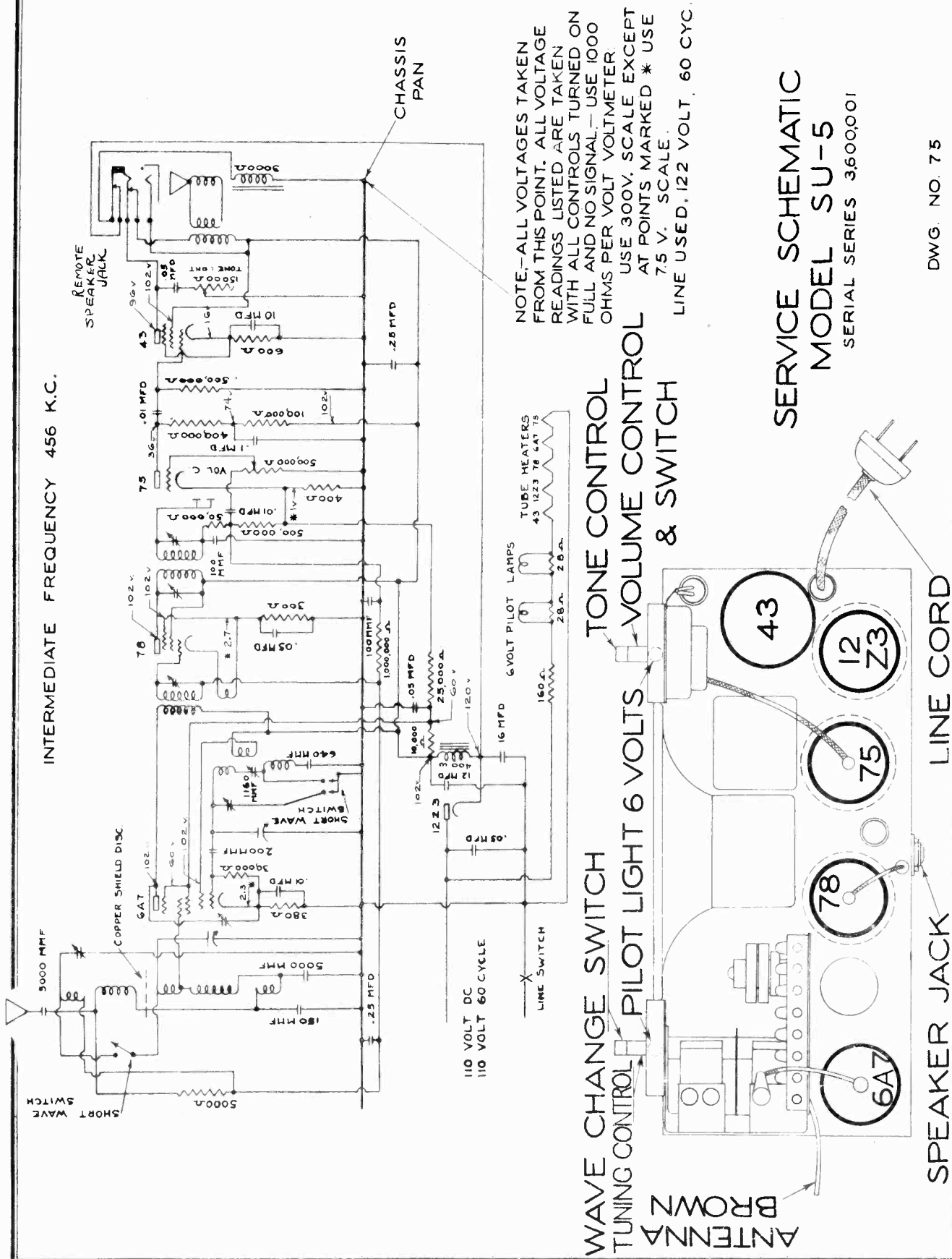


SERVICE SCHEMATIC
MODEL SA-6

DWG. NO. 79

THE RUDOLPH WURLITZER CO.

MODEL SU-5
Schematic, Data



INTERMEDIATE FREQUENCY 456 K.C.

NOTE—ALL VOLTAGES TAKEN FROM THIS POINT. ALL VOLTAGE READINGS LISTED ARE TAKEN WITH ALL CONTROLS TURNED ON FULL AND NO SIGNAL.— USE 1000 OHMS PER VOLT VOLTMETER. USE 300V. SCALE EXCEPT AT POINTS MARKED * USE 75 V. SCALE. LINE USED, 122 VOLT, 60 CYC.

WAVE CHANGE SWITCH
TUNING CONTROL
PILOT LIGHT 6 VOLTS
TONE CONTROL
VOLUME CONTROL
& SWITCH

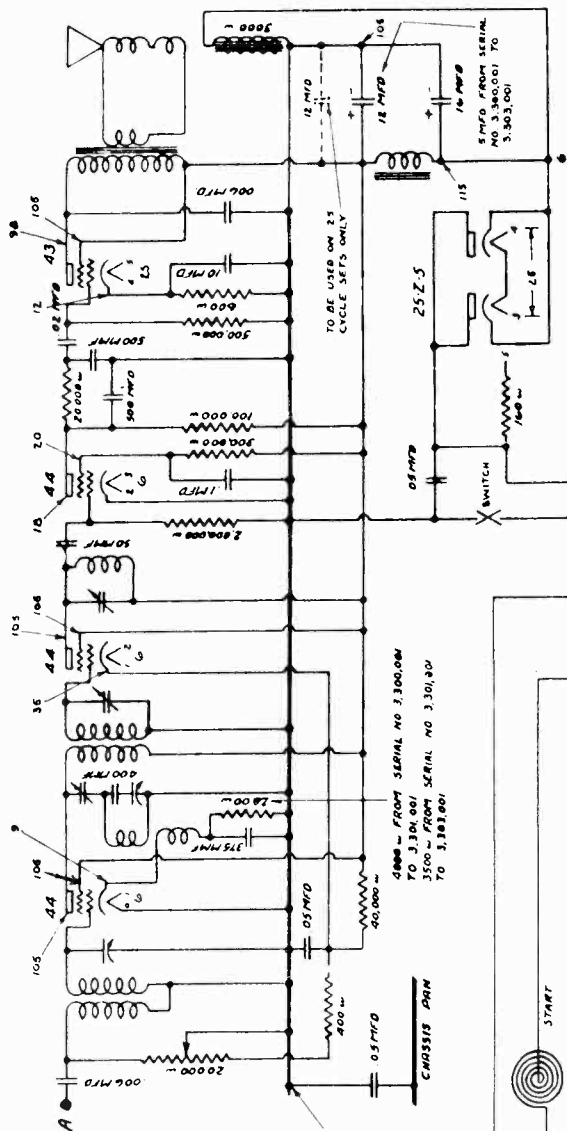
SERVICE SCHEMATIC
MODEL SU-5
SERIAL SERIES 36000,001

DWG. NO. 7.5

SPEAKER JACK
LINE CORD

MODEL U-50
Schematic, Data

THE RUDOLPH WURLITZER CO.

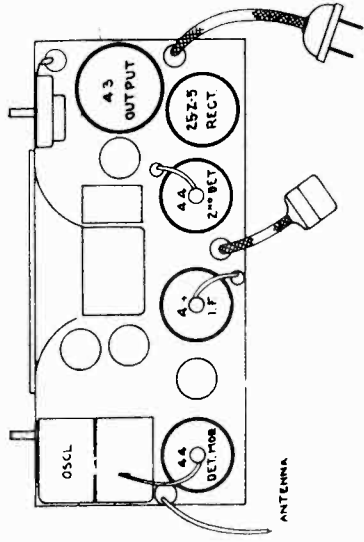


TO BE USED ON 23
CYCLE SETS ONLY

5MFD. FROM SERIAL
NO. 3,340,001 TO
3,363,001

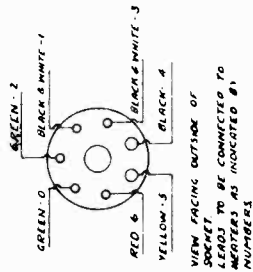
ALL HEATERS CONNECTED IN SERIES
AS INDICATED BY NUMBERS

LINE
110 VOLTS A.C. OR 23
25 ON 50 CYCLE

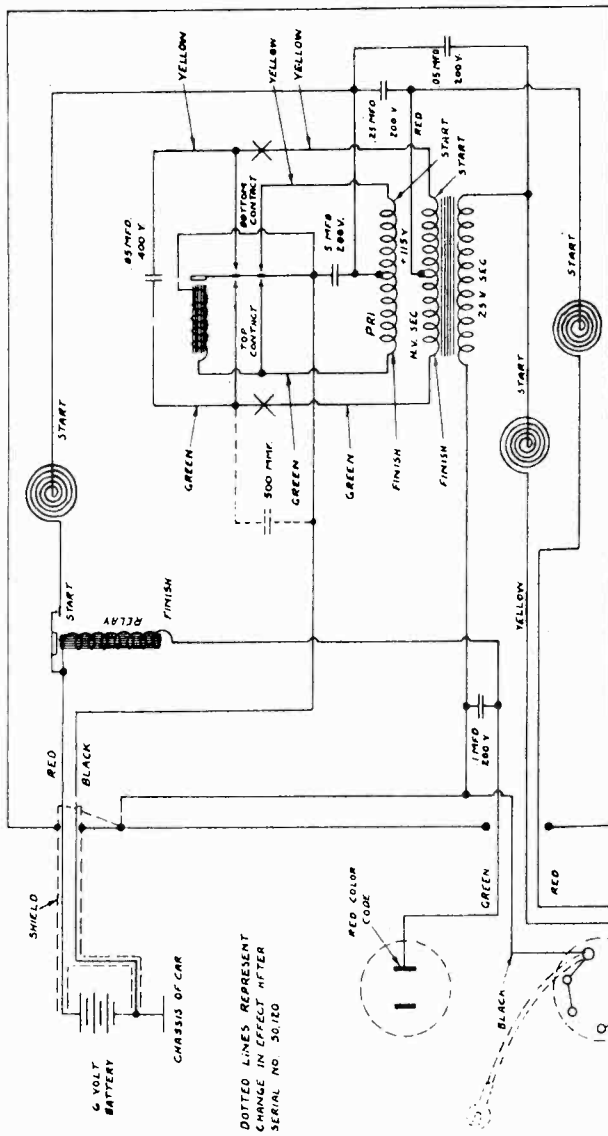


DRWG. NO 70

SERVICE SCHEMATIC MODEL U-50



NOTE: ALL VOLTAGES TAKEN FROM THIS POINT
ALL VOLTAGE READINGS LISTED ARE TAKEN
WITH ALL CONTROLS TURNED ON FULL
AND NO SIGNAL. USE 1000 OHMS PER VOLT
VOLTMETER.



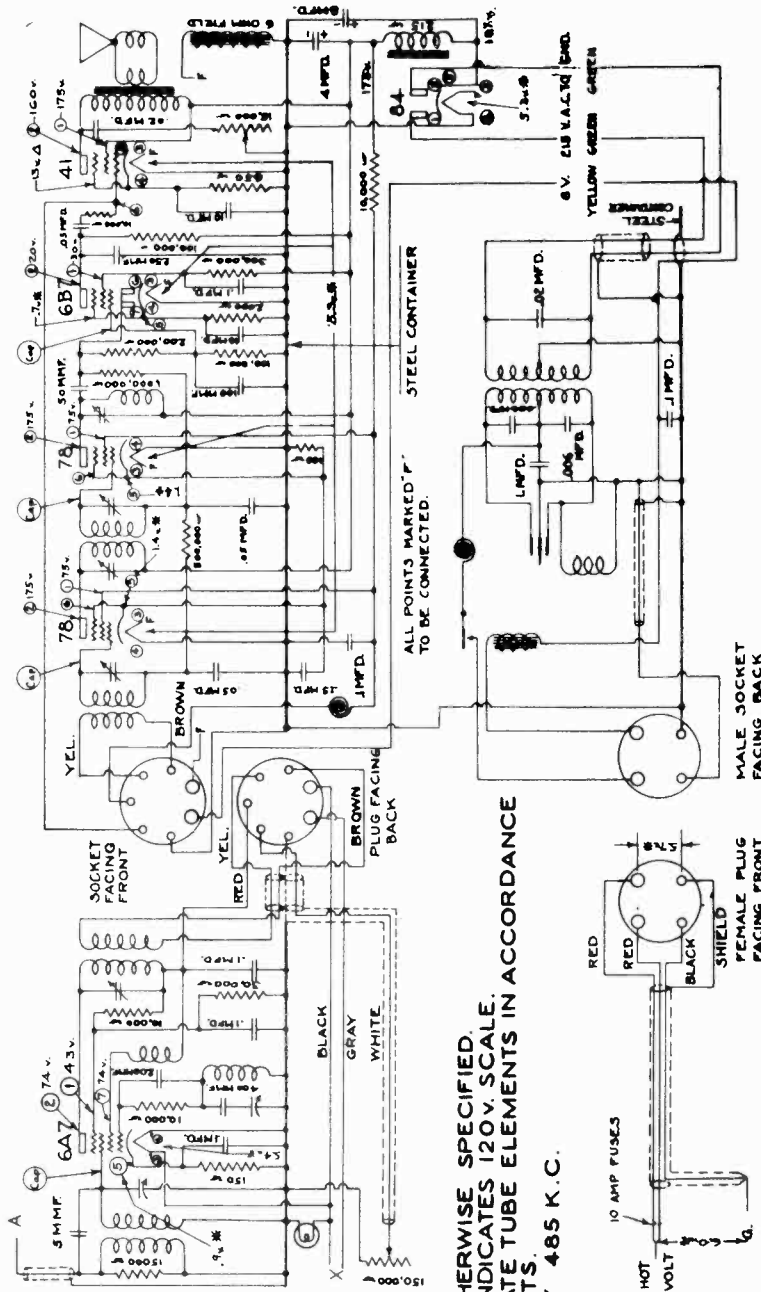
XX INDICATE SCREEN TERMINALS WITH SPACED
CONNECTIONS FOR REVERSING SECONDARY TO
TAKE CARE OF DIFFERENT POLARITY OF CAR BATTERY.
POLARITIES AS SHOWN ARE FOR NEGATIVE GROUND
315 VOLT AUTO STORAGE BATTERY.

SCHEMATIC OF AUTODAPTER

The IF peak of this model is 485 KC, unless there is a
yellow dot on the bottom of the 110-volt line plug; in this
case the IF peak is 456 KC.

THE RUDOLPH WURLITZER CO.

MODEL A-60
Schematic, Data



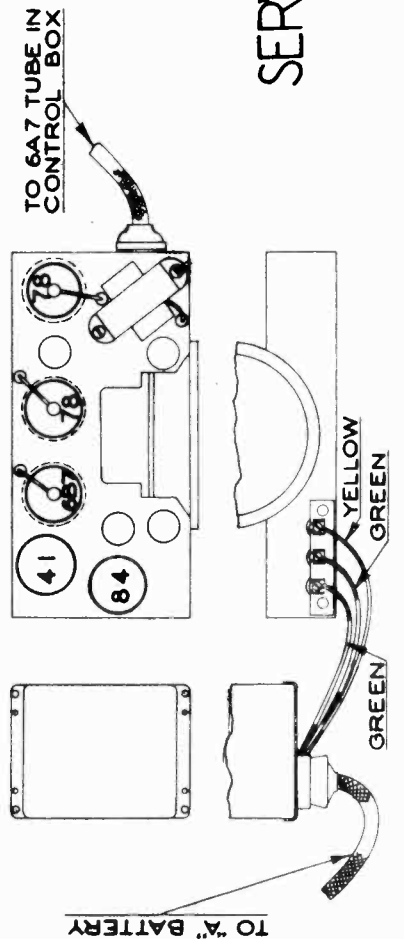
NOTE—ALL VOLTAGES TAKEN FROM THIS POINT. ALL VOLTAGE READINGS LISTED ARE TAKEN WITH ALL CONTROLS TURNED ON FULL AND NO SIGNAL. USE 1000 OHMS PER VOLT VOLTMETER.

* USE 300V SCALE UNLESS OTHERWISE SPECIFIED.

△ INDICATES 10V SCALE, △ INDICATES 120V SCALE.

NUMBERS IN CIRCLES INDICATE TUBE ELEMENTS IN ACCORDANCE WITH R.C.A. PINBASE LAYOUTS.

INTERMEDIATE FREQUENCY 485 K.C.



SERVICE SCHEMATIC MODEL A-60

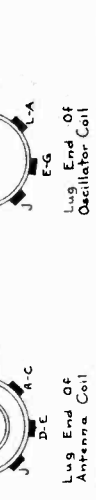
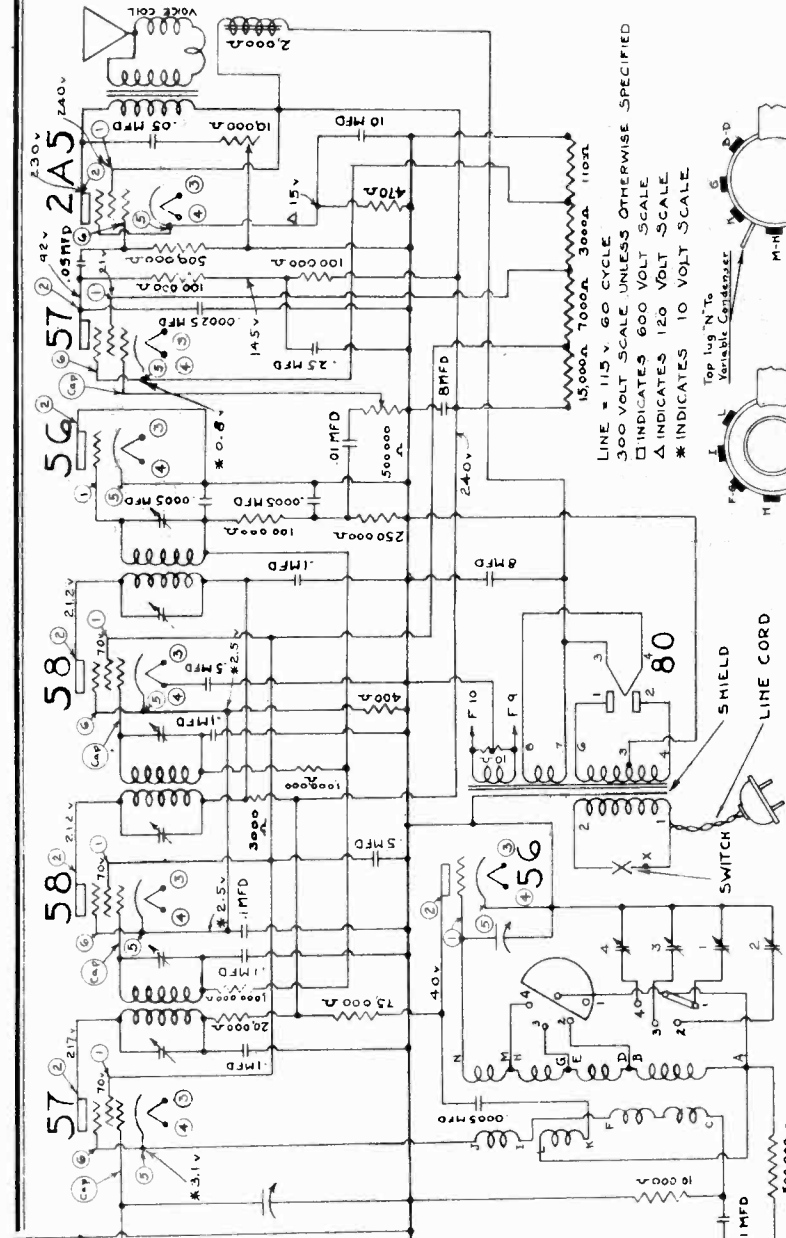
SERIAL NO. SERIES 34000001

DWO. NO. 73

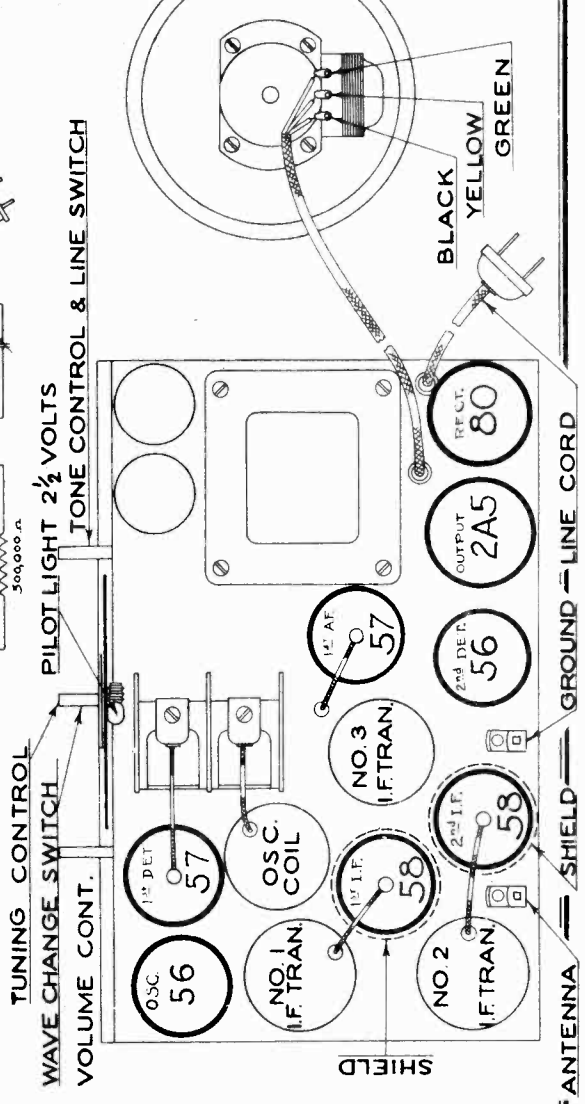
MODEL SW-88

Schematic, Data

THE RUDOLPH WURLITZER CO.

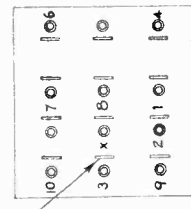


SERVICE SCHEMATIC
MODEL SW-88



NOTE ALL VOLTAGES TAKEN FROM THIS POINT. ALL VOLTAGE READINGS LISTED ARE TAKEN WITH ALL CONTROLS TURNED ON FULL AND NO SIGNAL. USE 1000 OHMS PER VOLT VOLTMETER.

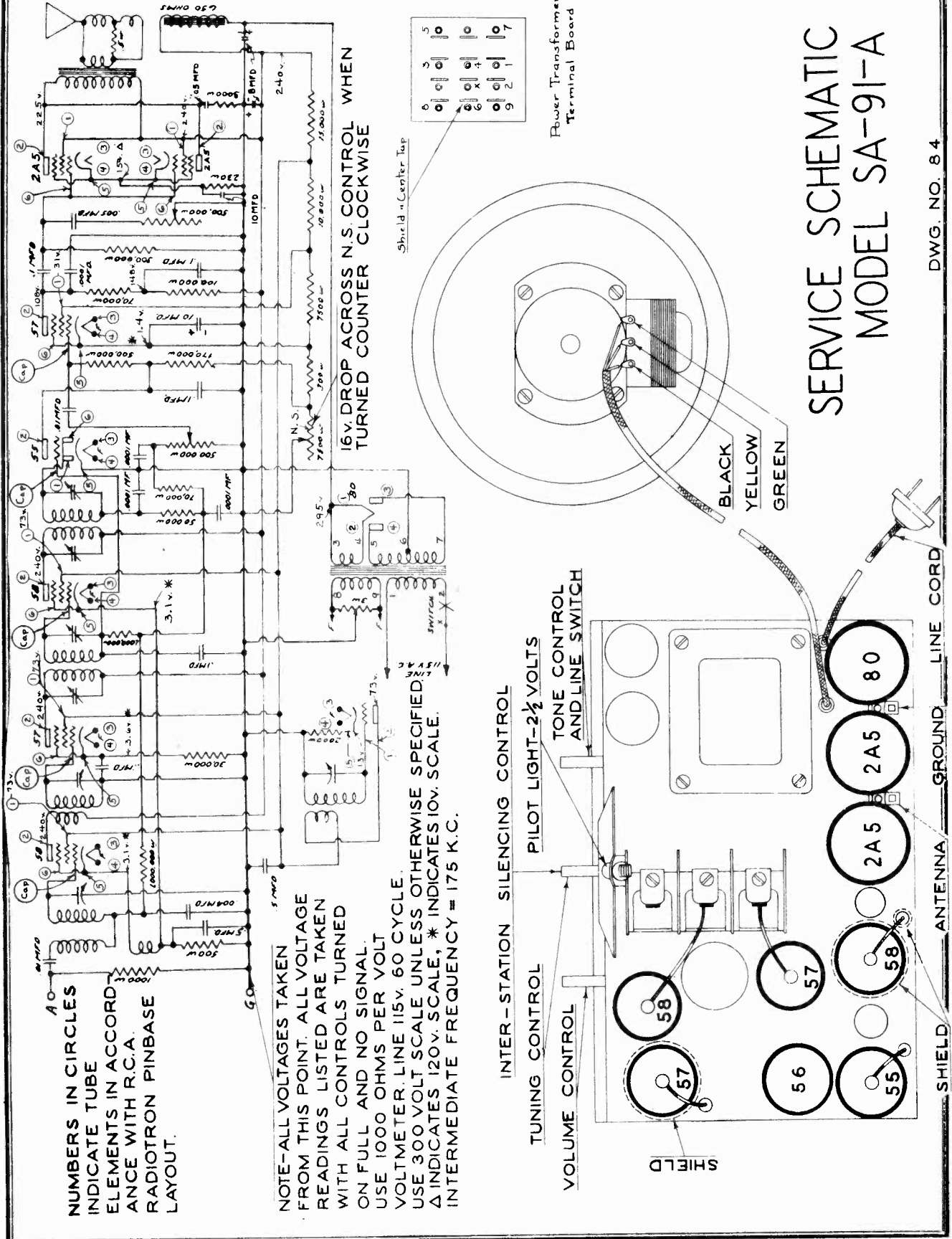
NOTE - NUMBERS IN CIRCLES INDICATE TUBE ELEMENTS IN ACCORDANCE WITH R.C.A. TRIODION PINBASE LAYOUT.



DWG. NO. 83

THE RUDOLPH WURLITZER CO.

MODEL SA-91-A
Schematic Data

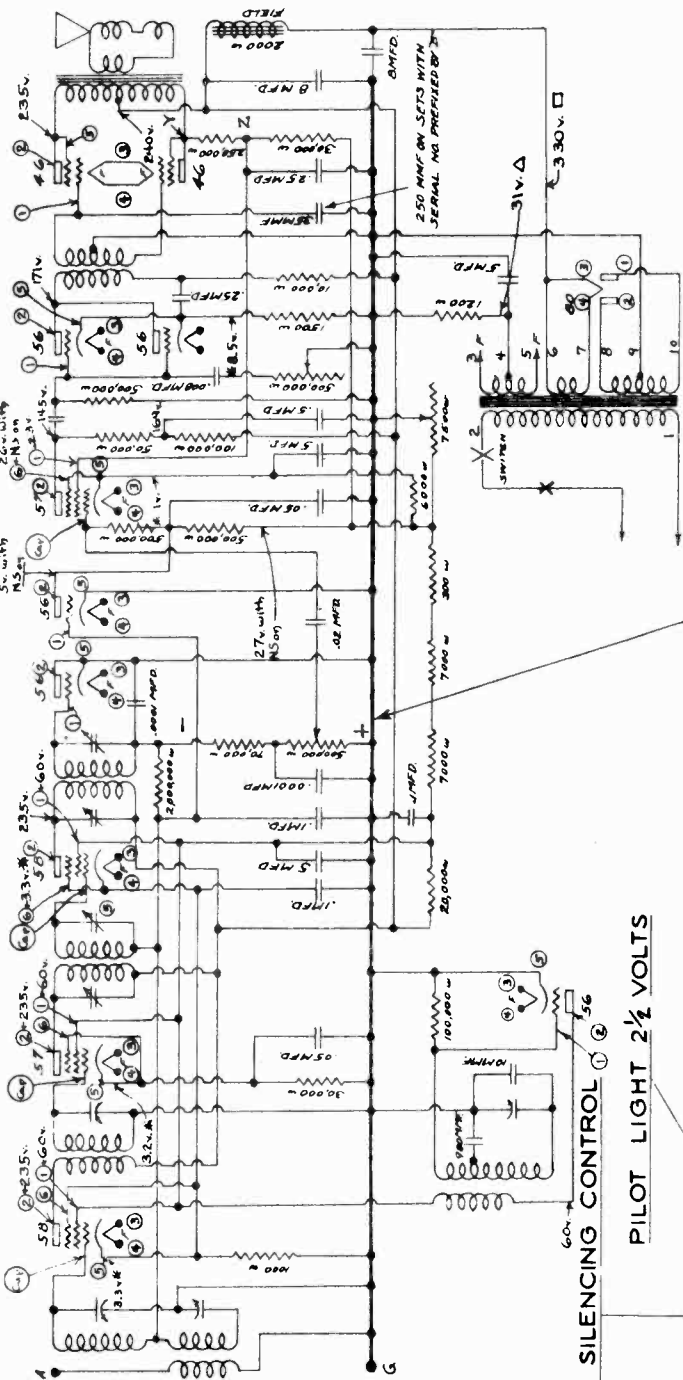


SERVICE SCHEMATIC
MODEL SA-91-A

MODEL SA-120

Schematic, Data

THE RUDOLPH WURLITZER CO.



NOTE - ALL VOLTAGES TAKEN FROM THIS POINT. ALL VOLTAGE READINGS LISTED ARE TAKEN WITH ALL CONTROLS TURNED ON FULL AND NO SIGNAL. USE 1000 OHMS PER VOLT VOLTMETER. \square INDICATES 600v. SCALE Δ = 120v. * = 10v. LINE = 115v. 60 CYCLE. INTERMEDIATE FREQUENCY = 175 K.C. NUMBERS IN CIRCLES INDICATE TUBE ELEMENT IN ACCORDANCE WITH R.C.A. RADIOTRON PINBASE LAYOUT.

SERVICE SCHEMATIC MODEL SA-120

SERIAL NO. SERIES 3200,001 & UP

POWER TRANSFORMER TERMINAL BOARD

1	⊙	Z	⊙	6	⊙
2	⊙	Y	⊙	7	⊙
X	⊙	8	⊙	10	⊙
3	⊙	9	⊙	4	⊙
4	⊙			5	⊙

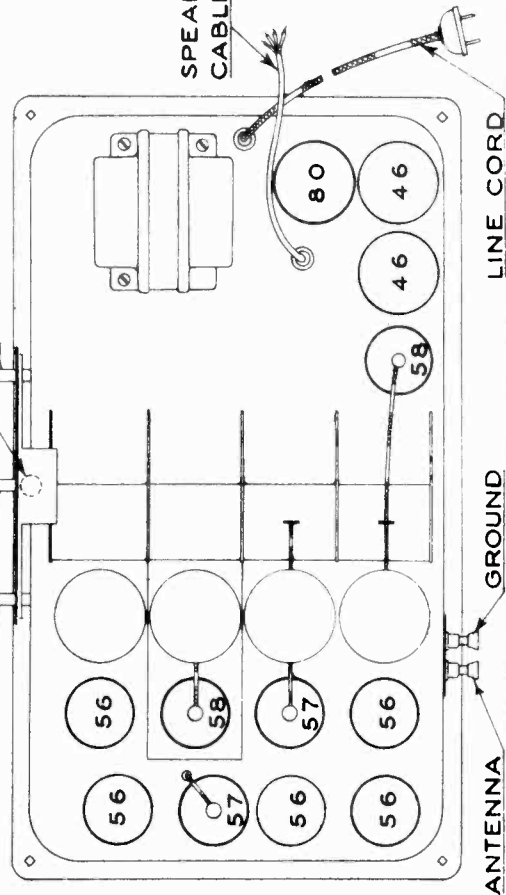
NS or INTER-STATION SILENCING CONTROL

TUNING CONTROL

VOLUME CONTROL

PILOT LIGHT 2 1/2 VOLTS

TONE CONTROL



SPEAKER CABLE

LINE CORD

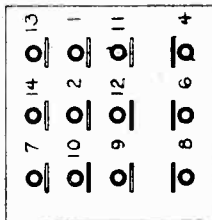
GROUND

ANTENNA

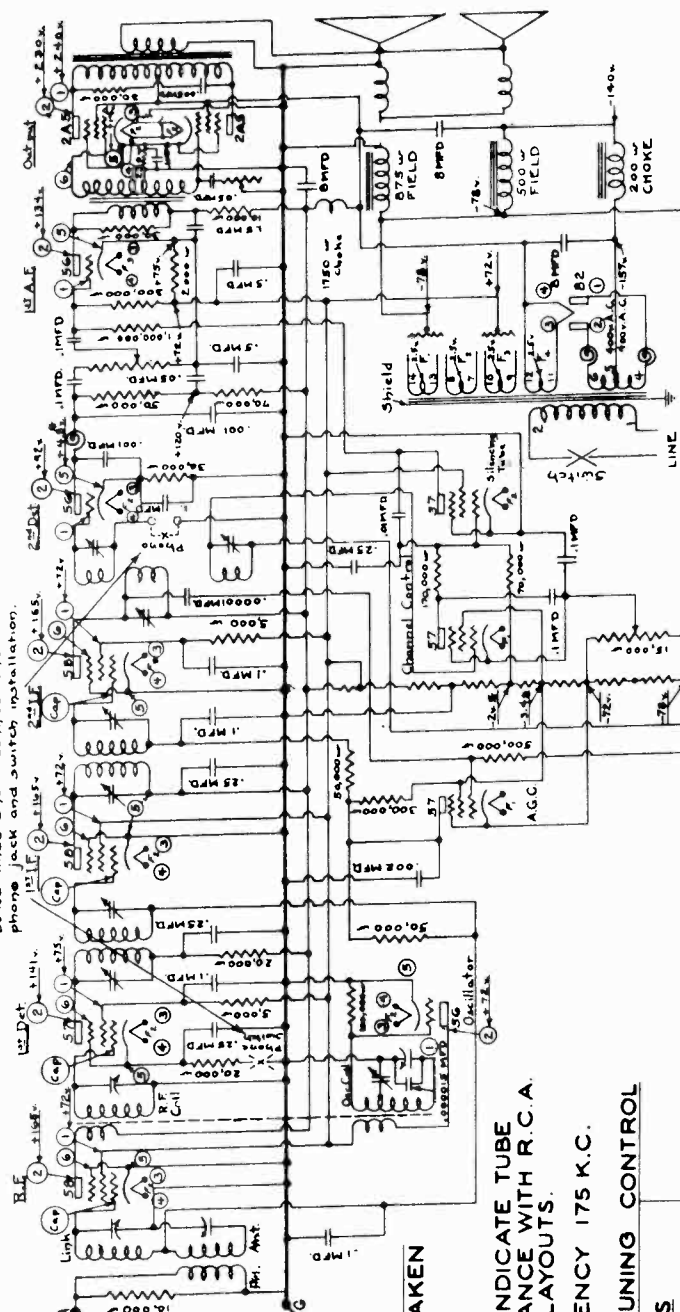
THE RUDOLPH WURLITZER CO.

MODEL SA-133
Schematic, Data

POWER TRANSFORMER
TERMINAL BOARD

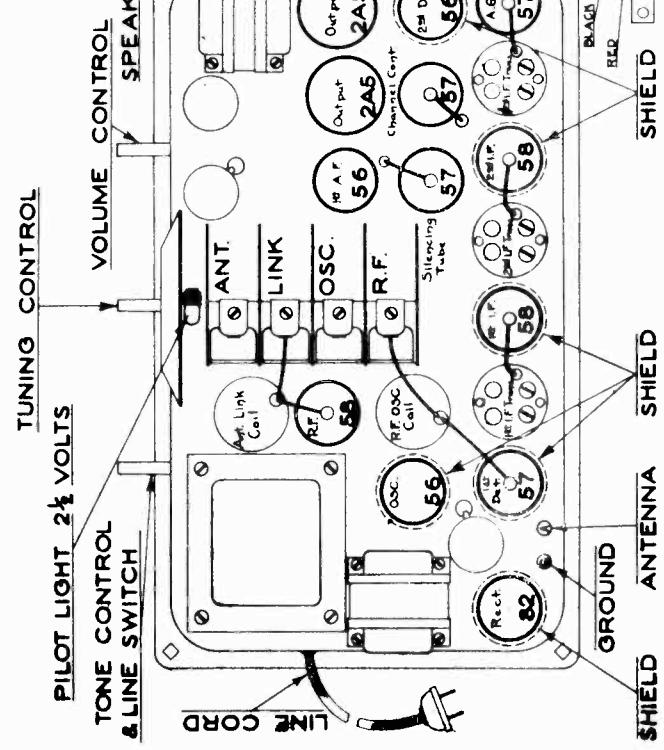


Dotted lines show connections for phone jack and switch installation.



NOTE - ALL VOLTAGES TAKEN FROM THIS POINT.
LINE 115 V. 60 CYCLE.
NUMBERS IN CIRCLES INDICATE TUBE ELEMENTS IN ACCORDANCE WITH R.C.A. RADIOTRON PINBASE LAYOUTS.
INTERMEDIATE FREQUENCY 175 K.C.

NOTE - ALL VOLTAGE READINGS LISTED ARE TAKEN WITH ALL CONTROLS TURNED ON FULL AND NO SIGNAL. USE 1000 OHMS PER VOLT VOLTMETER. USE 300V. SCALE UNLESS OTHERWISE SPECIFIED.
* INDICATES 10V. SCALE, Δ = 120V. SCALE.
PLUS - ABOVE GROUND, MINUS BELOW GROUND

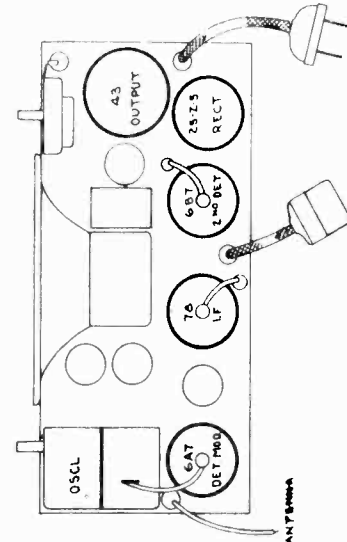
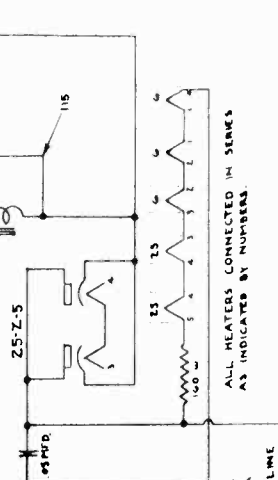
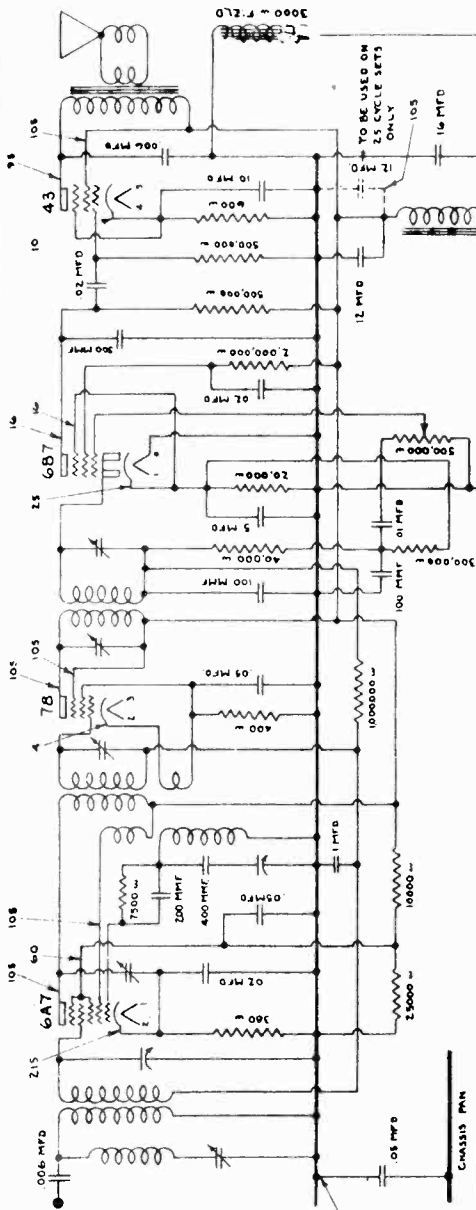


SERVICE SCHEMATIC
MODEL SA-133

SERIAL NO. SERIES 4,300,001 & UP
DWG. NO. 82

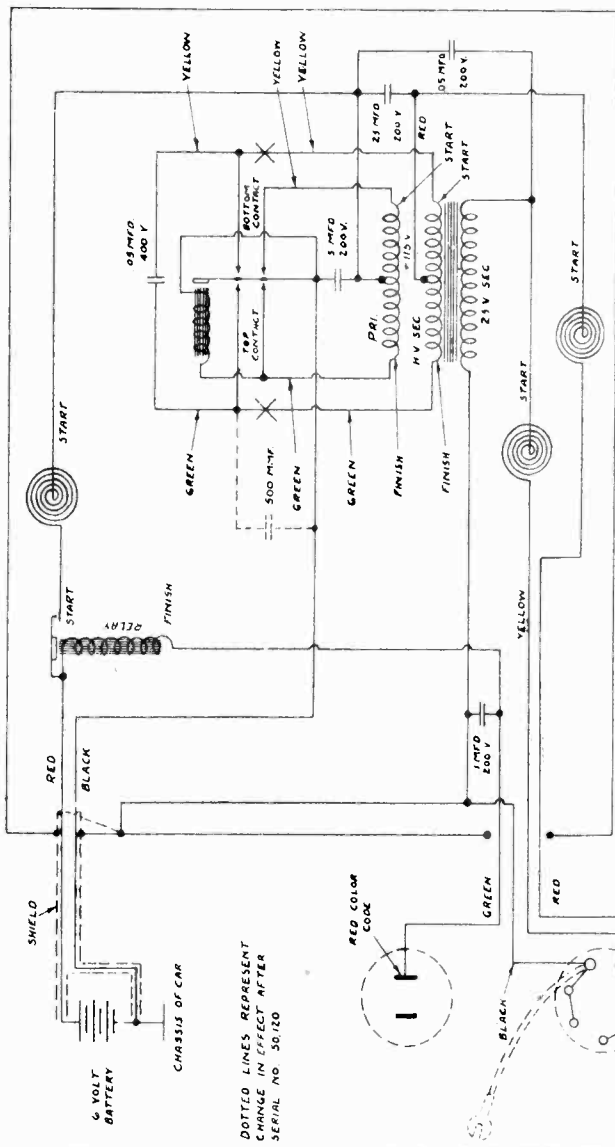
MODEL U-500
Schematic, Data

THE RUDOLPH WURLITZER CO.



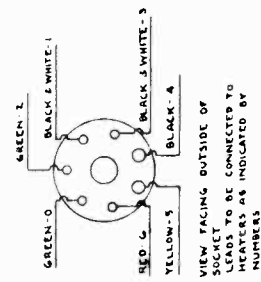
DRWG NO 72

SERVICE SCHEMATIC MODEL U-500



X X INDICATE SCREEN TERMINALS WITH SPARE CONNECTIONS FOR REVERSING SECONDARY TO TAKE CARE OF DIFFERENT POLARITY OF CAR BATTERY. VALUES AS SHOWN ARE FOR NEGATIVE GROUND. SIX VOLT 4000 STORAGE BATTERY.

SCHEMATIC OF AUTODAPTER



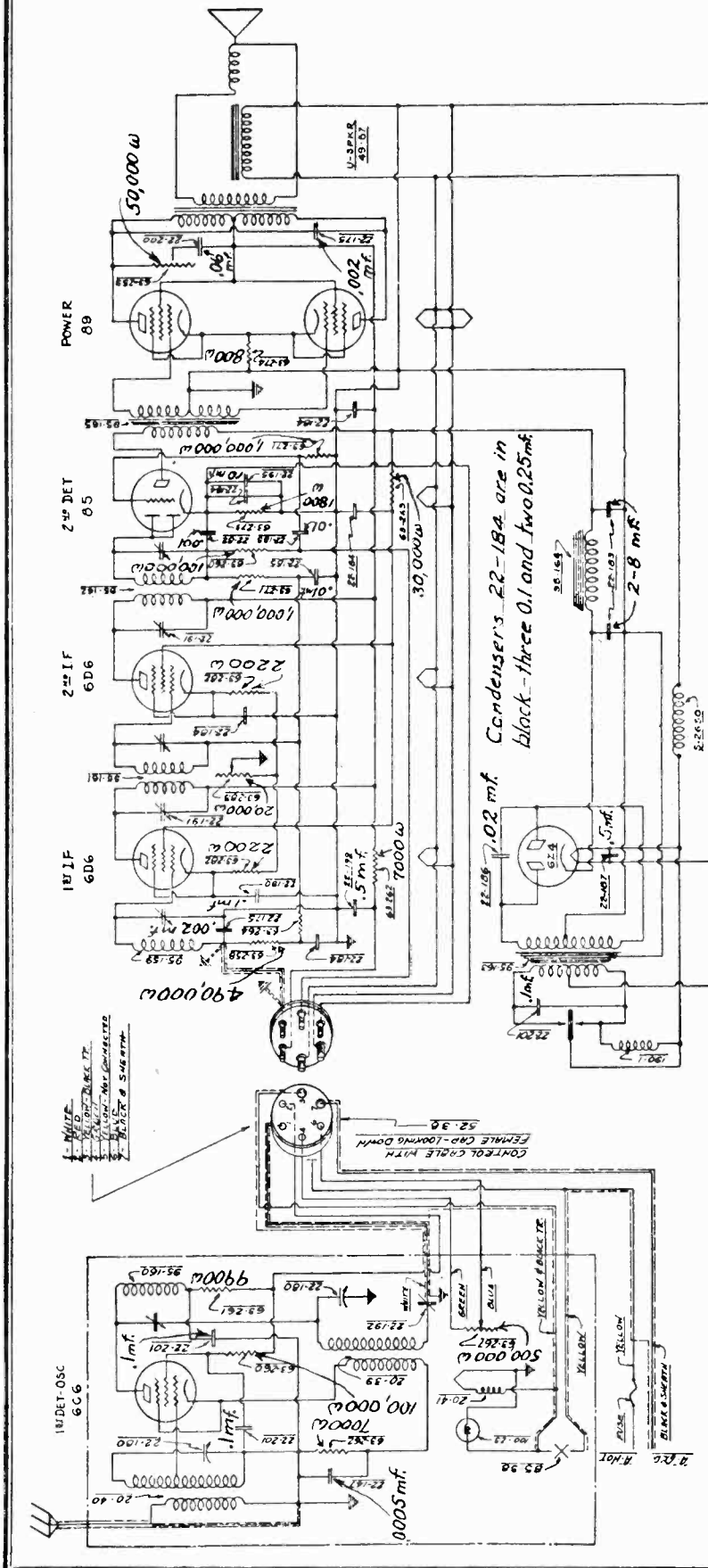
NOTE- ALL VOLTAGES TAKEN FROM THIS POINT. ALL VOLTAGE READINGS LISTED ARE TAKEN WITH ALL CONTROLS TURNED ON FULL AND NO SIGNAL- USE 1000 OHMS PER VOLT VOLTMETER.

DOTTED LINES REPRESENT CHANGE IN EFFECT AFTER SERIAL NO 50,120

VIEW FACING INSIDE OF PLUG

ZENITH RADIO CORP.

MODEL 460
Schematic
Voltage



Intermediate Frequency 485 K.C.
Sensitivity in Microvolts 1.5
Power in Milliwatts 2200
Power Consumption in Watts 36

TUBE OPERATING VOLTAGES

Position	Tube	Ef	Ek	Eg ¹	Eg ²	Eg ³	Ep
1st Detector	6C6	4.8	6.5	0	6.5	120	150
1st I.F. Amp.	6D6	5.3	10.5	*	10.5	103.5	165
2nd I.F. Amp.	6D6	5.3	10.5	*	10.5	103.5	165
2nd Detector	85	5.3	8.	0	—	—	156
P. P. Audio	89	5.3	17.	0	17.	165	165
	89	5.3	17.	0	17.	165	165

f—Filament. k—Cathode. g¹—Control grid. g²—Suppressor grid. g³—Screen grid. p—Plate.
*Depends on applied signal strength. All voltages measured from indicated points to ground.

MODEL 460
Socket, Trimmers
Alignment

ZENITH RADIO CORP.

If the receiver is entirely inoperative the fuse should be examined. It is contained in an insulated holder at the "Hot" battery terminal. Be sure to replace the spaghetti insulator over the fuse if necessary to change it. The next important step is to very carefully check the tubes both in the control head and speaker chassis. This has been found to be the most common cause of service in an auto receiver. The extreme vibration to which the tubes are subjected will occasionally develop a short in the elements in spite of the precautions that have been taken in their construction. A loud hum and lack of sensitivity can usually be attributed to a defective 6C6. Microphonic howl can be traced to the 89's. Replacement is recommended for such complaints, since the average tube checker will not show up this condition. An intermittent cutting out accompanied with rasping and other noises will usually be found in either of the 6D6's. The chassis may be taken out for inspection by simply removing the cable plug and three round-head hexagon nuts on the front of the case.

Alignment

Every Zenith Automobile receiver is balanced on an accurate, temperature controlled crystal oscillator before leaving the factory and unless a part is changed or the calibration has shifted, the adjustments should not be tampered with. Where it is absolutely necessary, however, a good test oscillator capable of delivering a modulated signal at 1500, 600 and 485 K.C. will be required.

To balance the I.F. circuit remove the cap and lead from the grid of the 6C6 tube in the control head and attach the test oscillator to the grid and to ground. Set to 485 K.C. and first adjust the primary I.F. trimmer shown (A) in Figure 1. Next trim the secondary (B). Now turn the plate trimmer (C) on the side of the chassis base to resonance, with a No. 4 Spintite wrench. Its (2nd I.F.) transformer is directly above the adjustment. Set the screw (D) in the top of the transformer shield to resonance also. The third I.F. transformer is adjusted through a hole in the rear of the chassis and also on top of the transformer indicated at E and F. This completes the I.F. circuit. Replace the grid lead on the 6C6 and screw the metal cap back in position.

Next attach the test oscillator to the antenna and ground lead of the control head and set it to 1500 K.C. Remove the control head cover and set the variable condenser trimmers (G and H) to a point where the 1500 K.C. signal is loudest at that frequency on the dial. Then set the test oscillator to 600 K.C. and rock the dial slowly at that frequency; at the same time turn the padder condenser adjusting screw. This trimmer is reached by removing the button plug on the bottom of the control head. The adjustments should be gone over twice to insure greater precision.

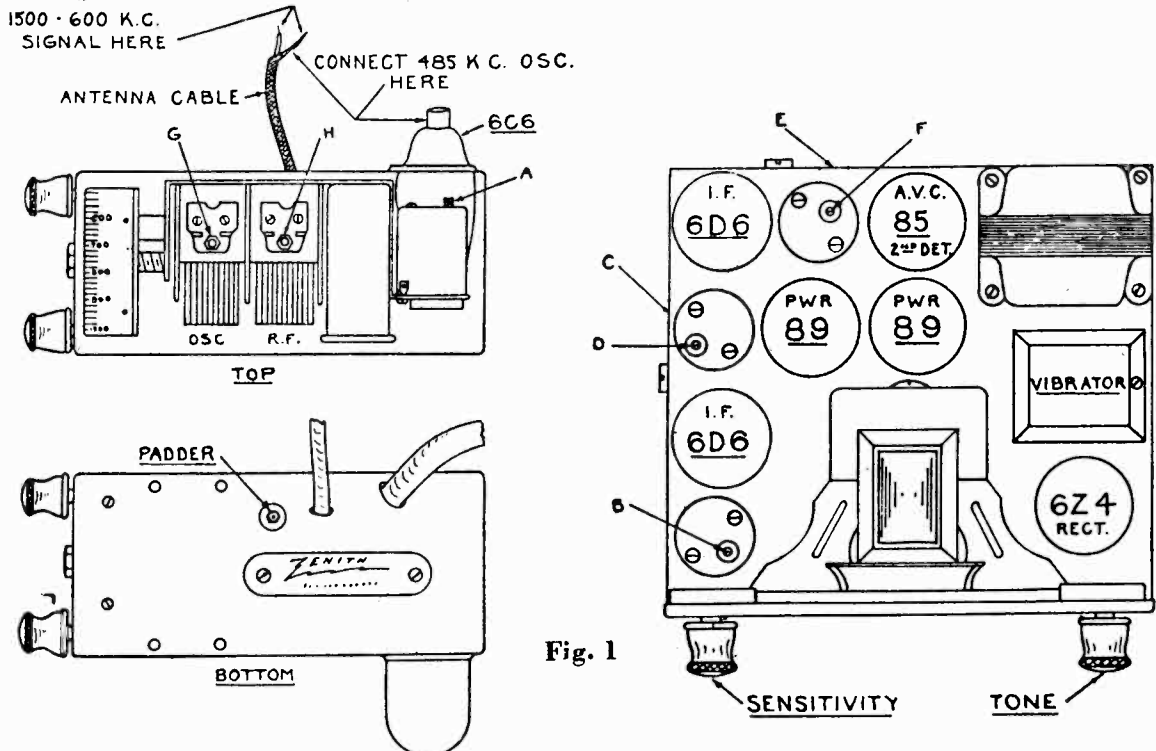
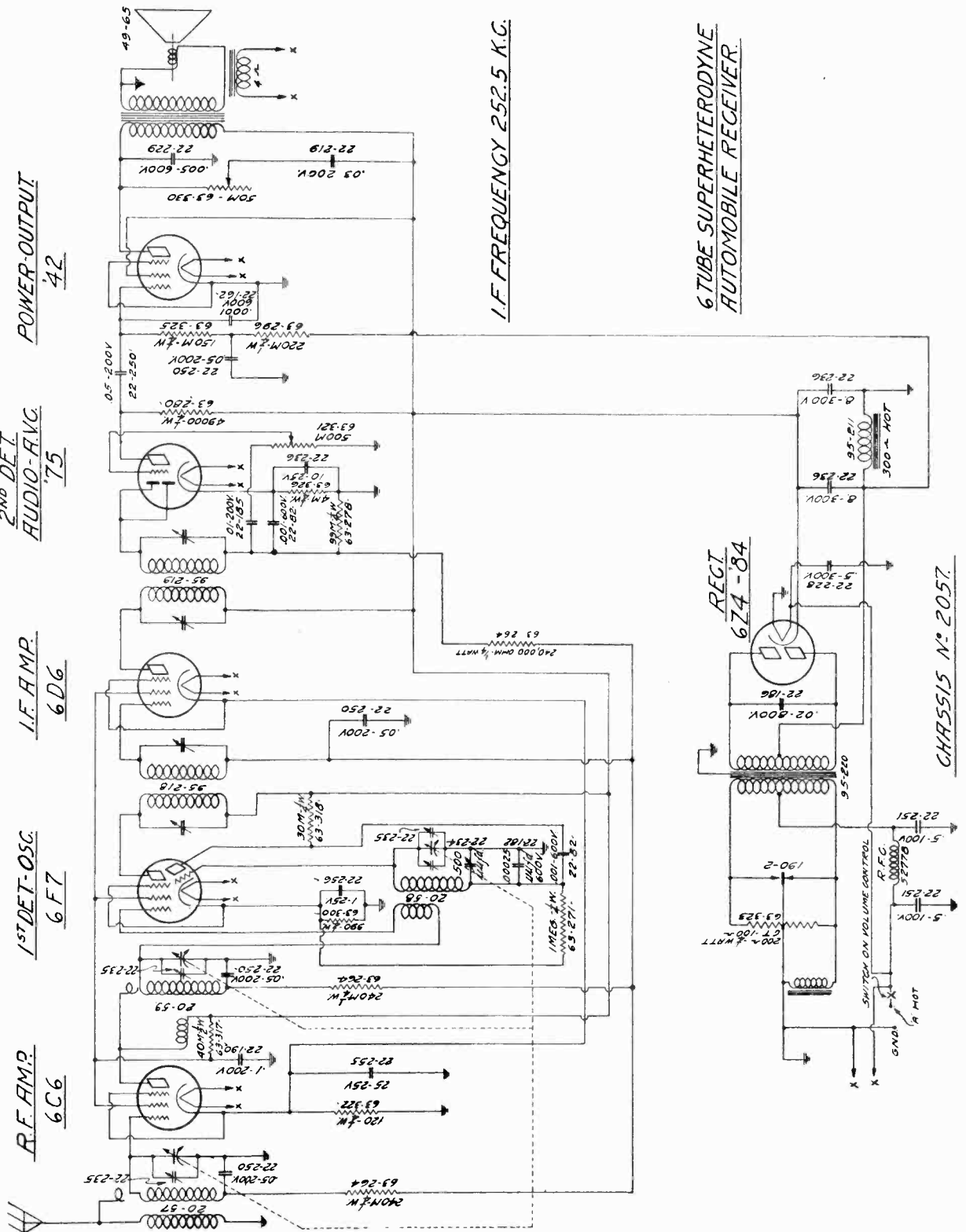


Fig. 1

ZENITH RADIO CORP.

MODEL 462
Chassis 2057
Schematic



I.F. FREQUENCY 252.5 K.C.

6-TUBE SUPERHETERODYNE
AUTOMOBILE RECEIVER

CHASSIS N° 2057

Intermediate Frequency—252½ K.C.
Sensitivity in Microvolts—1
Power Output in Milliwatts—2500
Power consumption—40 watts at 6 volts.

February 8, 1934

MODEL 462
 Chassis 2057
 Voltage, Socket
 Alignment Data

ZENITH RADIO CORP.

Position	Tube	Ef	Ek	Eg ¹	Eg ²	Eg ³	Ep
R. F. Amplifier	6C6	5.6	1.5	*	1.5	72	174
1st Det.-Osc.	6F7	5.6	3.5	0	3.5	72	Det. 174 Osc. 130
I. F. Amplifier	6D6	5.6	1.5	*	1.5	72	174
2nd Det. A. V. C.	75	5.6	1.2	0	0	—	156
Power Amp.	42	5.6	0	—11.5	0	174.6	165
Rectifier	6Z4	5.6	174.6	—	—	—	—

f—Filament; k—Cathode; g¹—Control Grid; g²—Suppressor Grid; g³—Screen Grid; p—Plate; *—Depends on applied signal strength. All voltages measured from indicated points to ground. Battery voltage 6 volts.

Alignment

Every Zenith automobile receiver is balanced on an accurate crystal controlled oscillator before leaving the factory; and, unless a part is changed or the calibration has shifted, the adjustments should never be tampered with. Where it is absolutely necessary, however, a good test oscillator capable of delivering a modulated signal at 1500, 600 and 252½ K. C. will be essential.

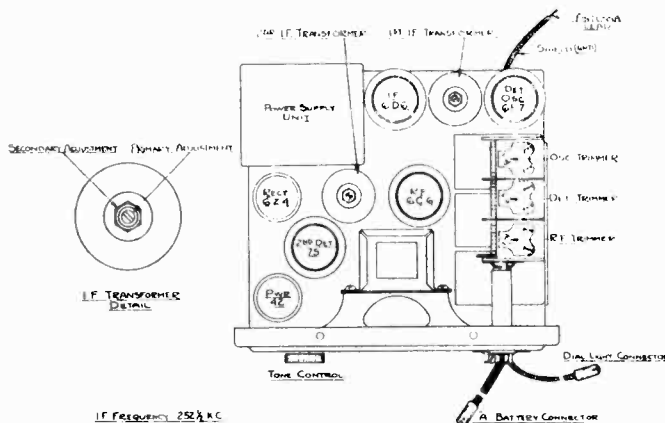
Before attempting to make any adjustments, the dial indicator must be set to 540 K. C. with the tuning condenser plates in full mesh. This is done as follows:

1. Turn control knob toward the left until the stop is reached.
2. Remove tuning knob.
3. Loosen two set screws in tuning shaft bushing (under knob).
4. Turn bushing until dial reads 540 K. C.
5. Tighten set screws and replace tuning knob.

The receiver may now be aligned and will dial accurately when the operation is completed.

To balance the I.F. circuit, remove the grid lead from the 6F7 and connect the 252½ K.C. test oscillator signal to the grid of the tube 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. Place the grid lead back on the 6F7 tube.

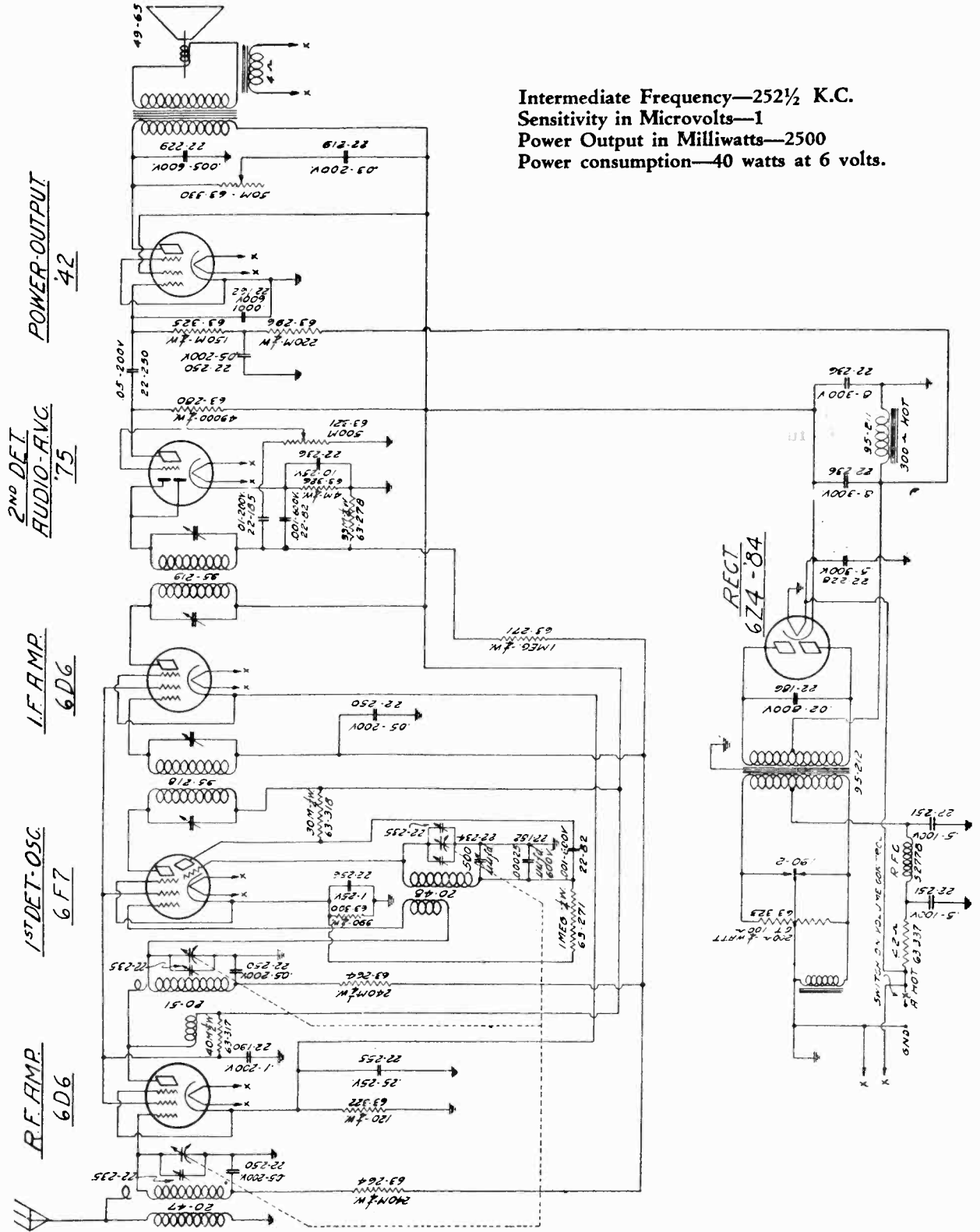
Next attach the test oscillator to the antenna and ground leads and set it to 1500 K.C. Turn the dial indicator to 1500 and adjust the oscillator, detector and R.F. trimmers, on the condenser gang, for maximum output. Set the test oscillator to 600 K.C. and rock the pointer slowly over the same frequency on the dial at the same time adjust the padder condenser for greatest signal strength. All adjustments should be gone over twice—at least twice—to insure greatest accuracy.



ZENITH RADIO CORP.

MODELS 650-HD, 651-HE,
660-TD, 661-TE
Terraplane Hudson
Schematic

Intermediate Frequency—252½ K.C.
Sensitivity in Microvolts—1
Power Output in Milliwatts—2500
Power consumption—40 watts at 6 volts.



MODELS 650-HD, 651-HE,
660-TD, 661-TE

ZENITH RADIO CORP.

Terraplane Hudson
Voltage, Socket, Alignment

Position	Tube	Ef	Ek	Eg ¹	Eg ²	Eg ³	Ep
R. F. Amplifier	6D6	5.6	1.5	*	1.5	72	174
1st Det.-Osc.	6F7	5.6	3.5	0	3.5	72	Det. 174 Osc. 130
I. F. Amplifier	6D6	5.6	1.5	*	1.5	72	174
2nd Det. A. V. C.	75	5.6	1.2	0	0	—	156
Power Amp.	42	5.6	0	—11.5	0	174.6	165
Rectifier	6Z4	5.6	174.6	—	—	—	—

f—Filament; k—Cathode; g¹—Control Grid; g²—Suppressor Grid; g³—Screen Grid; p—Plate; *—Depends on applied signal strength. All voltages measured from indicated points to ground. Battery voltage 6 volts.

Alignment

Every Zenith automobile receiver is balanced on an accurate crystal controlled oscillator before leaving the factory; and, unless a part is changed or the calibration has shifted, the adjustments should never be tampered with. Where it is absolutely necessary, however, a good test oscillator capable of delivering a modulated signal at 1500, 600 and 252½ K. C. will be essential.

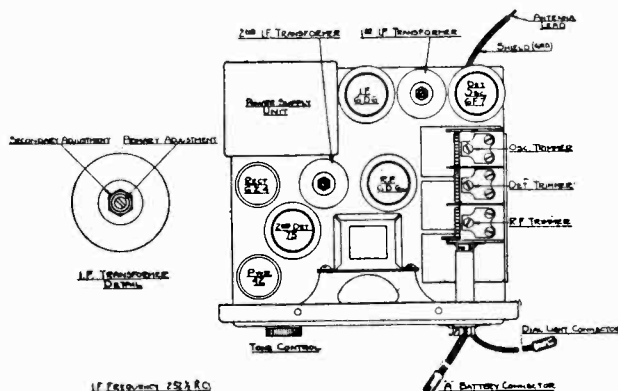
Before attempting to make any adjustments, the dial indicator must be set to 540 K. C. with the tuning condenser plates in full mesh. This is done as follows:

1. Turn control knob toward the right until the stop is reached.
2. Remove pilot lamp from rear of control head.
3. Reach through pilot lamp hole with a small screwdriver and turn indicator screw until indicator points to 540 K.C.

The receiver may now be aligned and will dial accurately when the operation is completed.

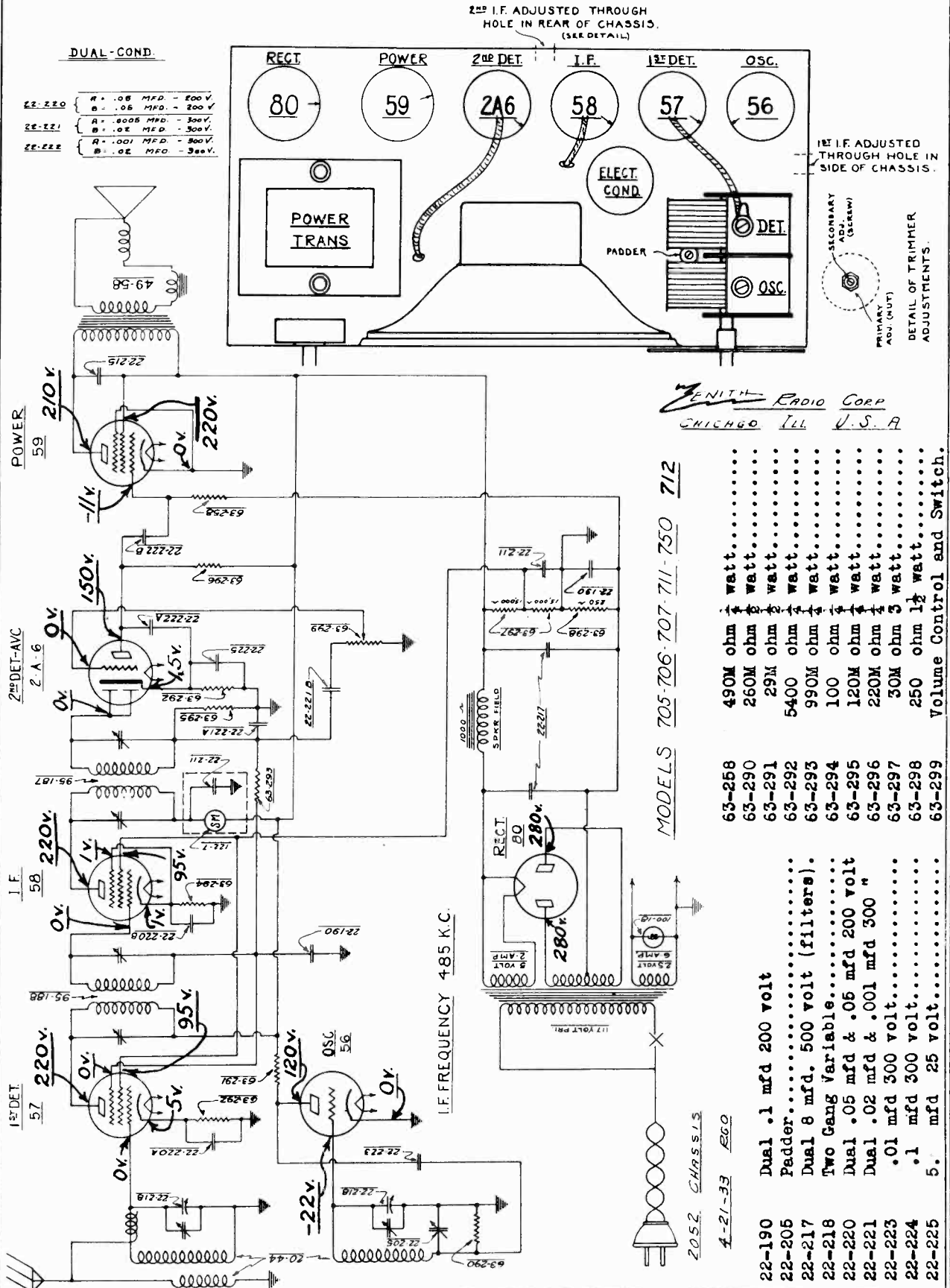
To balance the I.F. circuit, remove the grid lead from the 6F7 and connect the 252½ K.C. test oscillator signal to the grid of the tube and to ground. Adjust the 1st I.F. primary trimmer to maximum output from either the speaker or an output meter. Follow in the same manner with the secondary, and the primary and secondary of the 2nd I.F. transformer. This completes the I.F. circuit. Place the grid lead back on the 6F7 tube.

Next attach the test oscillator to the antenna and ground leads and set it to 1500 K.C. Turn the dial indicator to 1500 and adjust the oscillator, detector and R.F. trimmers, on the condenser gang, for maximum output. Set the test oscillator to 600 K.C. and rock the pointer slowly over the same frequency on the dial at the same time adjust the paddler condenser for greatest signal strength. All adjustments should be gone over twice—at least twice—to insure greatest accuracy.



ZENITH RADIO CORP.

MODELS 705, 706, 707
711, 712, 750
Schematic, Socket



22-190	Dual .1 mfd 200 volt	490M ohm	watt.....
22-205	Padder.....	260M ohm	watt.....
22-217	Dual 8 mfd, 500 volt (filters).	29M ohm	watt.....
22-218	Two Gang Variable.....	5400 ohm	watt.....
22-220	Dual .05 mfd & .06 mfd 200 volt	990M ohm	watt.....
22-221	Dual .02 mfd & .001 mfd 300 "	100 ohm	watt.....
22-223	.01 mfd 300 volt.....	120M ohm	watt.....
22-224	.1 mfd 300 volt.....	220M ohm	watt.....
22-225	5. mfd 25 volt.....	30M ohm	watt.....
		250 ohm	1/2 watt.....
			Volume Control and Switch.

ZENITH RADIO CORP.

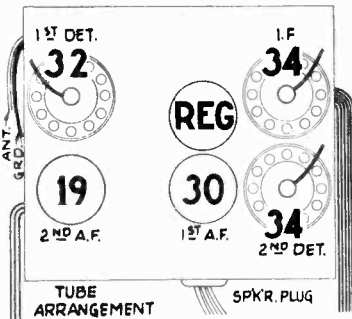
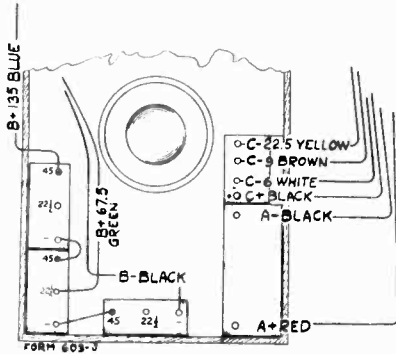
MODELS 730, 735
Schematic, Socket
Voltage
Alignment Data

As the I.F. stages are self-tuned, no I.F. aligning at the intermediate frequency of 175 K.C. is required.

First set the signal generator for a signal of exactly 1400 K.C. Connect the antenna lead from the signal generator to the antenna lead of the receiver and the ground lead of the signal generator to the ground of the receiver. Then turn the tuning condenser rotor until the marker is at 1400 K.C. on the dial scale. Adjust the two trimmers on the tuning condenser for maximum output adjusting the oscillator trimmer first.

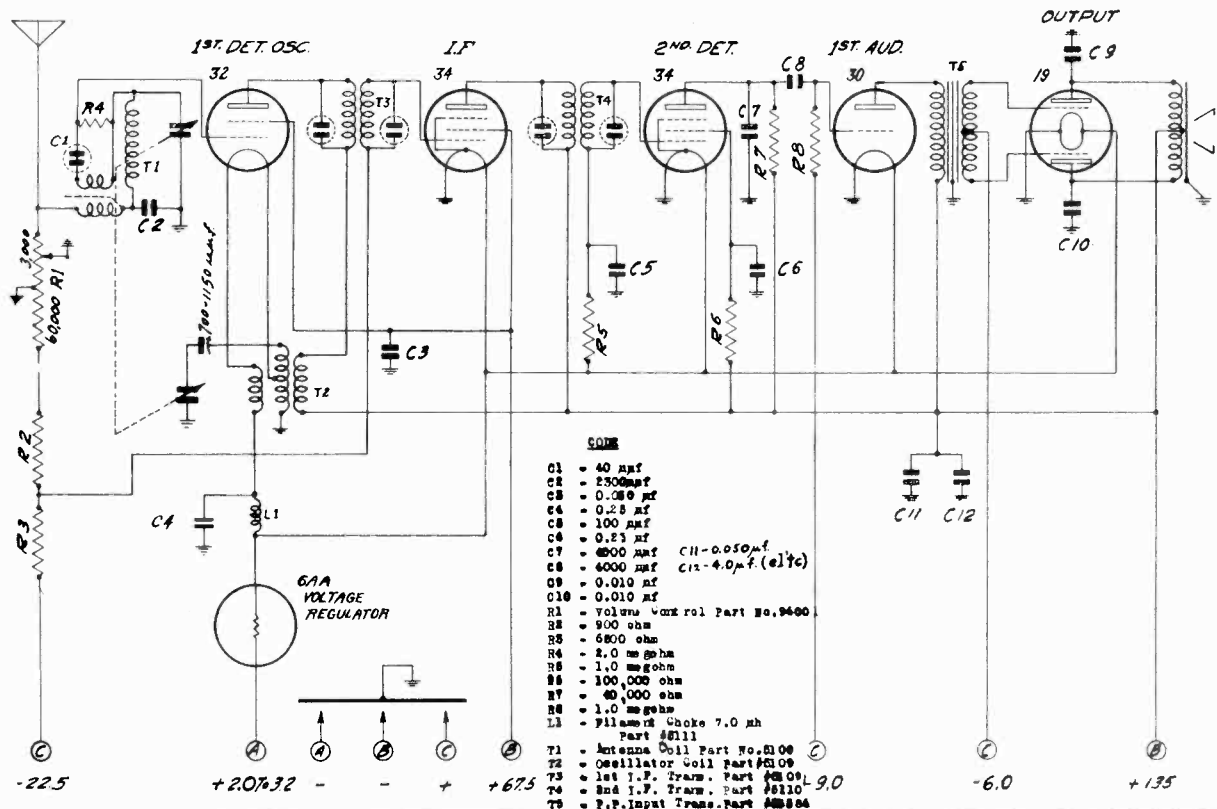
Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The adjusting screw will be seen at the side of the tuning condenser and is reached from the top of the chassis. A non-metallic screw-driver is necessary for this adjustment. Turn the tuning condenser rotor 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.



Tube	Function	Fil.	Plate	Screen	Grid
32	Det-Osc	2.0	139	70	5**
34	IF Amp	2.2	139	70	2.5
34	2nd Det	2.2	34*	40*	0
30	1st AF	2.2	135		9"
19	Output	2.2	136		6

Volume control at Maximum. Antenna grounded
* With 250000 ohm meter. **Varies with frequency. " As read at "C" battery.



- COMP**
- C1 - 40 µmf
 - C2 - 2500µmf
 - C3 - 0.020 µmf
 - C4 - 0.28 µmf
 - C5 - 100 µmf
 - C6 - 0.23 µmf
 - C7 - 4000 µmf
 - C8 - 6000 µmf
 - C9 - 0.010 µmf
 - C10 - 0.010 µmf
 - C11 - 0.050 µmf
 - C12 - 4.0 µmf (el) (c)
 - R1 - Volume varx rol Part No. 9460
 - R2 - 500 ohm
 - R3 - 6800 ohm
 - R4 - 1.0 megohm
 - R5 - 1.0 megohm
 - R6 - 100,000 ohm
 - R7 - 40,000 ohm
 - R8 - 1.0 megohm
 - L1 - Filament Choke 7.0 mh Part #1111
 - T1 - Antenna Coil Part No. #1109
 - T2 - Oscillator Coil Part #1109
 - T3 - 1st I.F. Trans. Part #1109
 - T4 - 2nd I.F. Trans. Part #1110
 - T5 - P.P. Input Trans. Part #1104

MODEL 740
Schematic
Socket, Voltage
Alignment Data

ZENITH RADIO CORP.

Set the signal generator for 175 K. C. Connect the signal lead from the signal generator to the grid of the 1st detector tube 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

Next set the signal generator for a signal of exactly 1400 K. C. The antenna lead from the signal generator is, in this instance, connected to the antenna lead of the receiver. Set the dial pointer on the 1400 K. C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

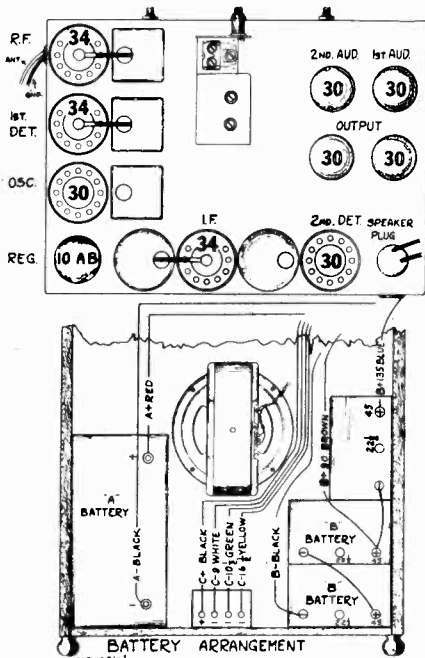
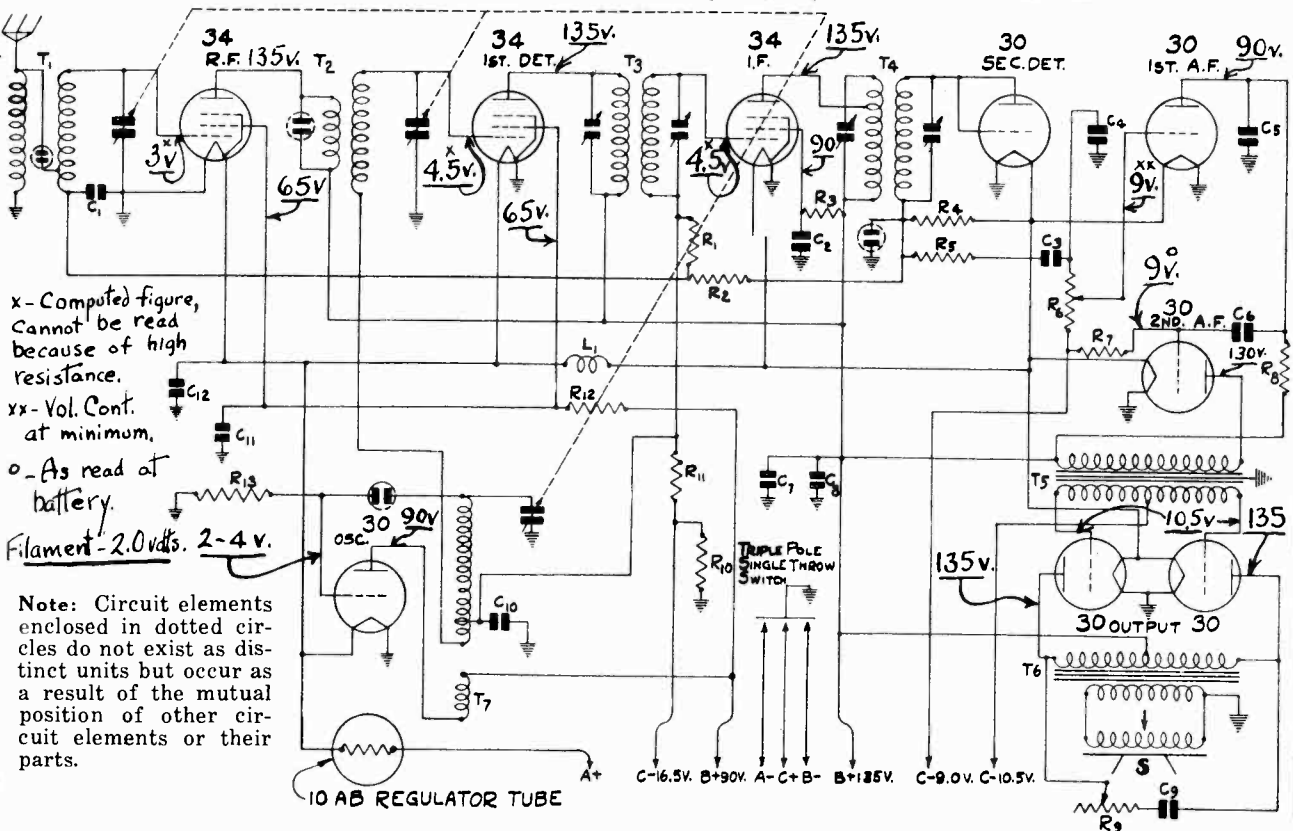


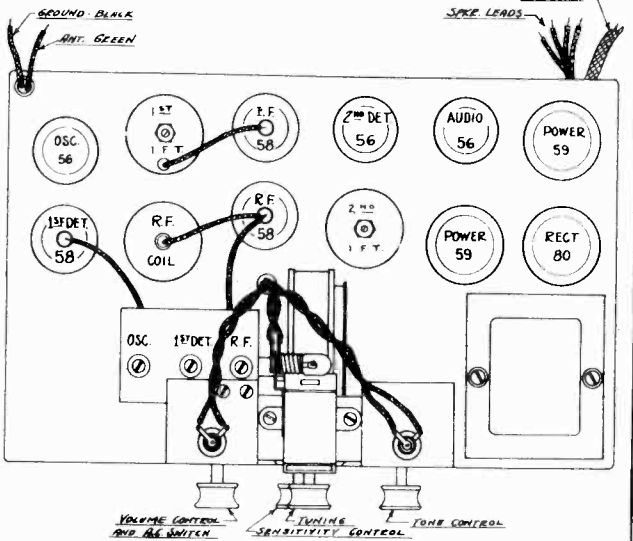
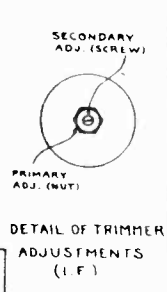
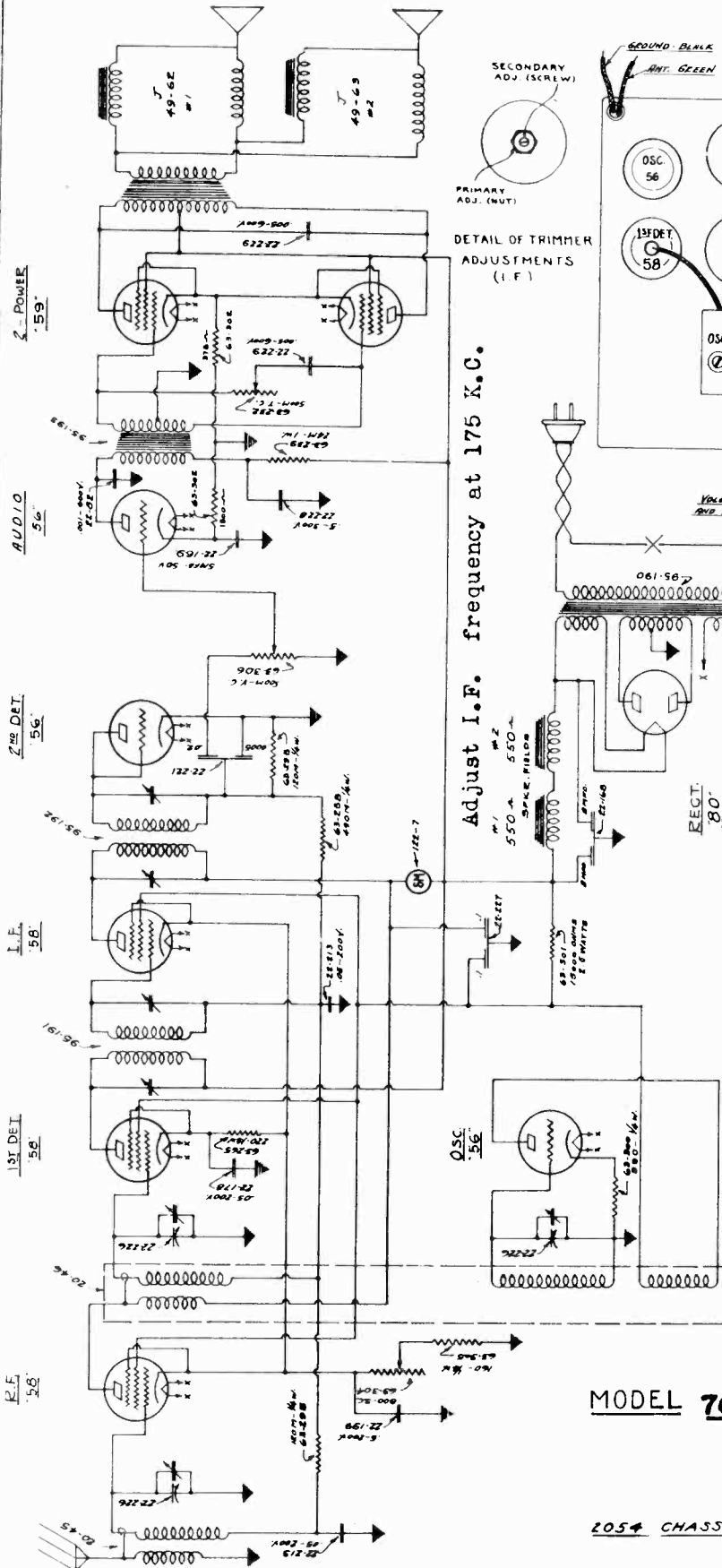
Fig. 2.—Tube Arrangement and Battery Connections

Part No.	Code	Capacity	Voltage	Type	List Price
P-80864	C1	.10 mfd.	200 V.	Tubular	\$.30
P-80862	C2	.050 mfd.	200 V.	Tubular	.30
P-80862	C3	.050 mfd.	200 V.	Tubular	.30
P-80919	C4	.00025 mfd.	600 V.	Moulded	.20
P-80919	C5	.00025 mfd.	600 V.	Moulded	.20
P-80862	C6	.050 mfd.	200 V.	Tubular	.30
P-80968	C7	4.00 mfd.	150 V.	Electrolytic	.70
P-80862	C8	.050 mfd.	200 V.	Tubular	.30
P-80940	C9	.02 mfd.	400 V.	Tubular	.15
P-80981	C10	.01 mfd.	400 V.	Tubular	.20
P-80888	C11	.25 mfd.	200 V.	Tubular	.40
P-80888	C12	.25 mfd.	200 V.	Tubular	.40
P-80980	Three Gang Variable Condenser				3.40
P-A95504	R1	.5 megohm	Carbon		\$.25
P-A94105	R2	1.0 megohm	Carbon		.25
P-A95353	R3	35,000 ohms	Carbon		.20
P-A94204	R4	200,000 ohms	Carbon		.20
P-A95104	R5	100,000 ohms	Carbon		.20
P-96009	R6	1 megohm	Volume Control		.90
P-A94105	R7	1 megohm	Carbon		.25
P-A95104	R8	100,000 ohms	Carbon		.25
P-97005	R9	150,000 ohms	Tone Control		.80
P-A94153	R10	15,000 ohms	Carbon		.25
P-A94405	R11	4 megohms	Carbon		.20
P-A94153	R12	15,000 ohms	Carbon		.25
P-A95504	R13	.5 megohm	Carbon		.25



ZENITH RADIO CORP.

MODELS 760, 765, 767, 475
Schematic, Socket
Voltage



Tube	Function	Fil	Cath.	Grid	Screen	Supp.	Plate
58	RF	2.5	3	0	100	3	260
58	1st Det	2.5	4	5	100	4	275
56	Osc	2.5	7	0	-	-	100
58	IF	2.5	3	2	100	3	255
56	2nd Det	2.5	0	0	-	-	0
56	1st AF	2.5	7	0	-	-	150
59	Power	2.5	20	0	270	20	260
59	Power	2.5	20	0	270	20	260
80	Rect	5.	-	-	-	-	364

Line voltage 117. All controls maximum. Antenna and Ground disconnected. Measured between ground and as stated.

MODEL 760 - 765 - 767 - 475

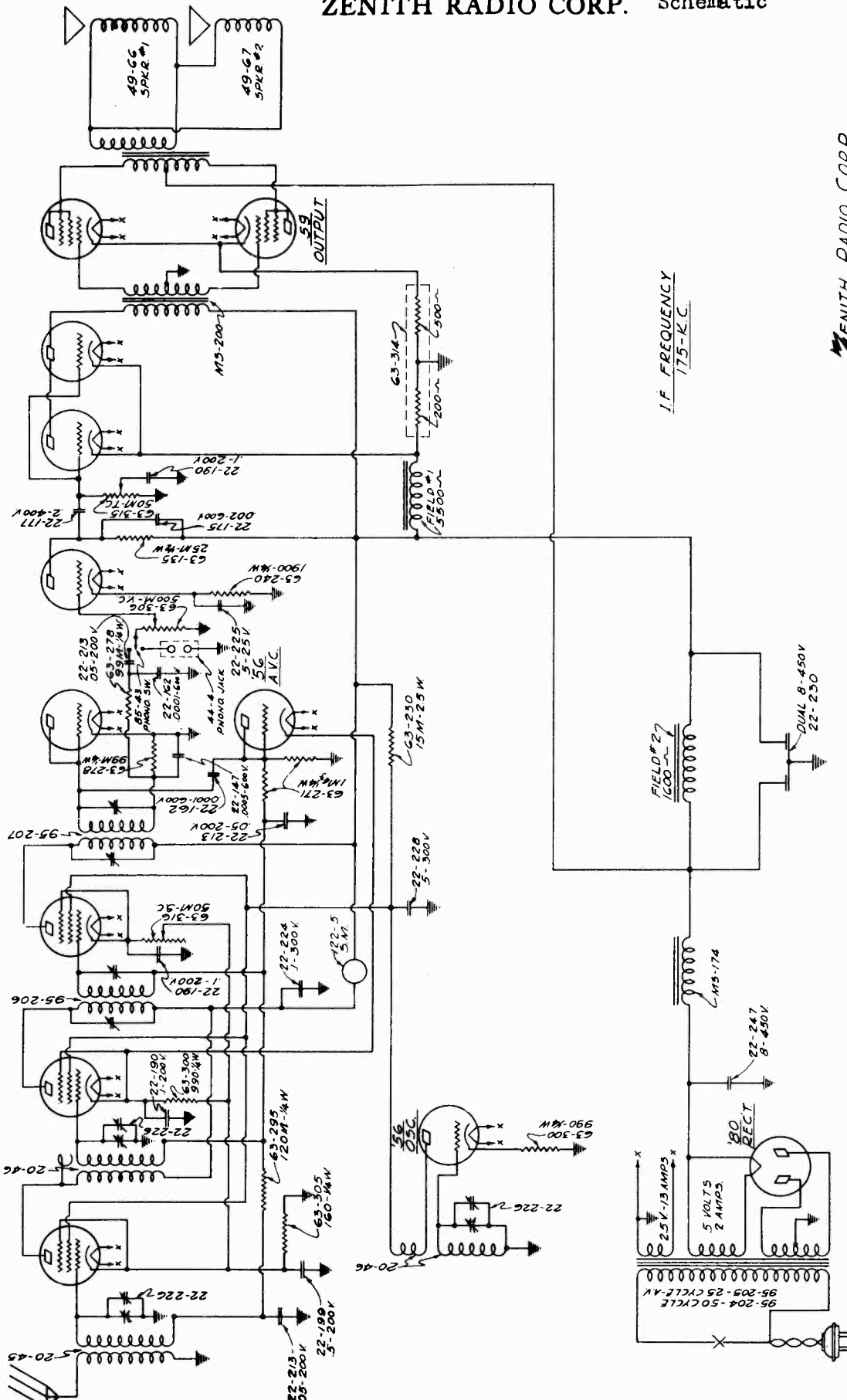
2054 CHASSIS

ZENITH RADIO CORP.
CHICAGO, ILL. U.S.A.
R.G.D. 5-15-33

MODELS 770-B, 775-B, 476-B

ZENITH RADIO CORP. Schematic

5B R.F. 5B 1/2 DET. 5B I.F. 5C 2 1/2 DET. 5C 1/2 AUDIO 5C DRIVER DRIVER 5C DRIVER 5C OUTPUT 5C OUTPUT



ZENITH RADIO CORP.
 CHICAGO - ILL.
 12 TUBE SUPERHETERODYNE
 CHASSIS NO. 2059
 W.H. 9-7-33

MODEL 770-B & 775-B

I.F. FREQUENCY
175-KC

MODELS 770-B, 775-B, 476-B

Voltage

Socket

ZENITH RADIO CORP.



770B - 775B - 476B

Socket Voltages

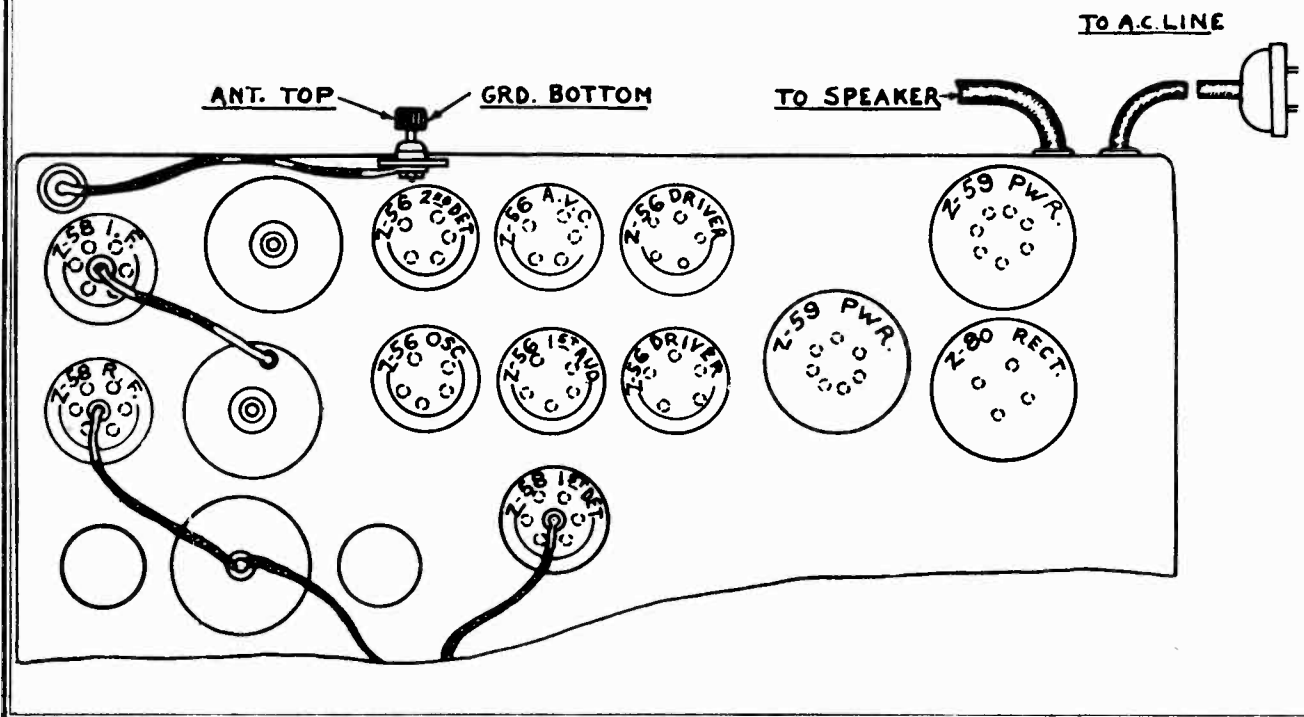
Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
Z-58	1st R.F.	2.5	200	2.2	82	2.2	4.6
Z-58	1st Det.	2.5	200	5.0	82	5.0	2.4
Z-56	Osc.	2.5	80	6.0	---	---	5.4
Z-58	1st I.F.	2.5	210	2.2	82	2.2	5.2
Z-56	2nd Det.	2.5	0	0	--	---	0
Z-56	A.V.C.	2.5	0	5.0	--	---	0
Z-56	1st A.F.	2.5	120	5.0	--	---	3.0
Z-56	Driver	2.5	200	9.0	--	---	3.0
Z-56	Driver	2.5	200	9.0	--	---	3.0
Z-59	Power	2.5	310	30.0	310	310	24.0
Z-59	Power	2.5	310	30.0	310	310	24.0
Z-80	Rect.	5.0	360	----	---	---	62.5

Line 115 Volts

All Controls Maximum

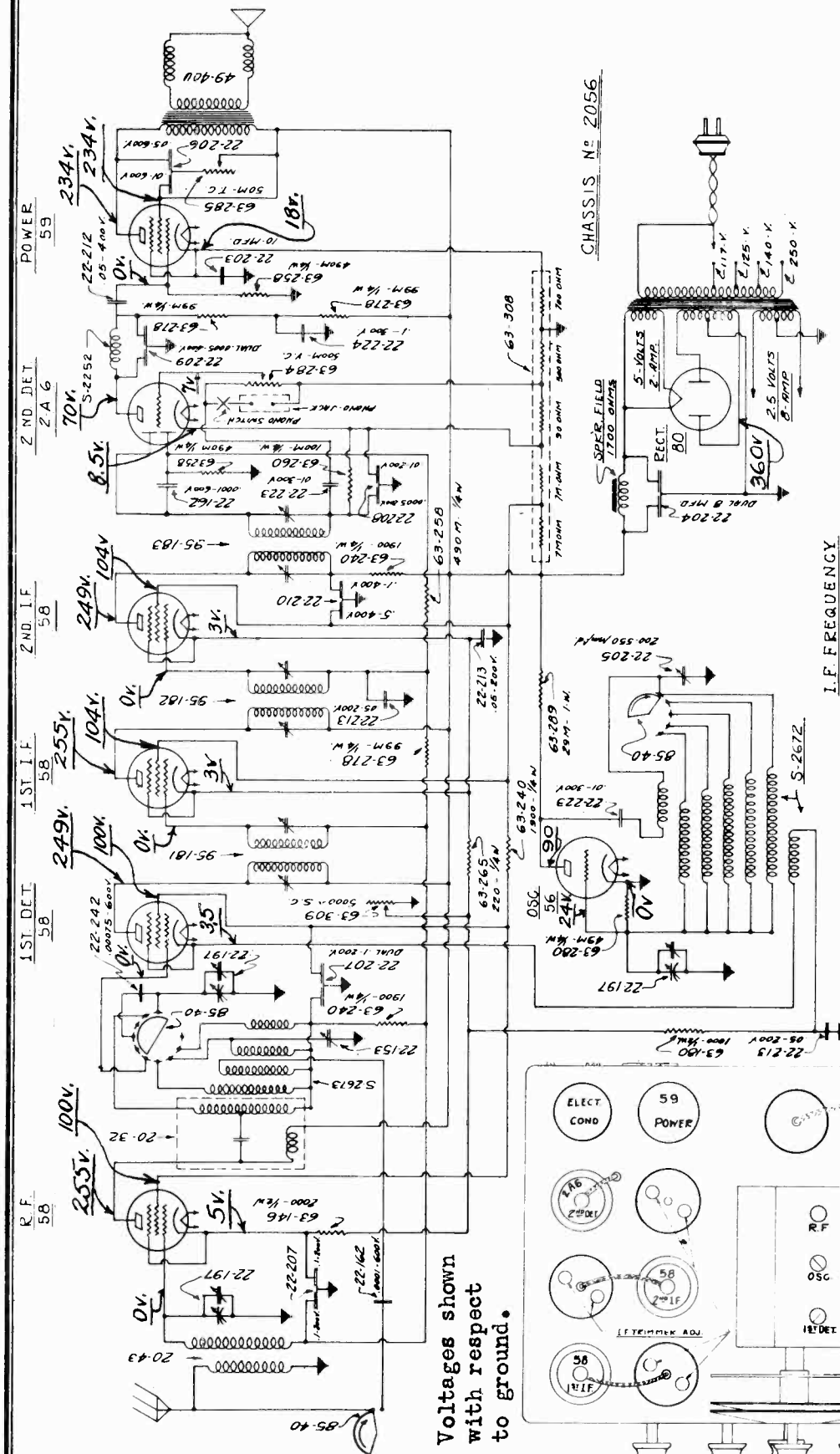
(All readings, with exception of heaters, taken from socket connections to ground. Use 1,000 ohm per volt D.C. meter.)

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. No padder adjustment required.



ZENITH RADIO CORP.

MODELS Chassis 2056,2056-I
Schematic
Socket, Voltage
Alignment Data



First set I.F. trimmers with an accurate 485 K.C. test oscillator connected to the grid of the 1st detector and ground. Remove oscillator tube and turn I.F. adjusting screws indicated on the diagram below. Insert oscillator tube and connect the test oscillator to the aerial and ground posts. Set the test oscillator and dial to 1500 K.C. and turn the three trimmers on the tuning condenser to resonance, then set the test oscillator and dial to 600 K.C. and adjust the paddler condenser for maximum output. Repeat the entire procedure for greater accuracy.