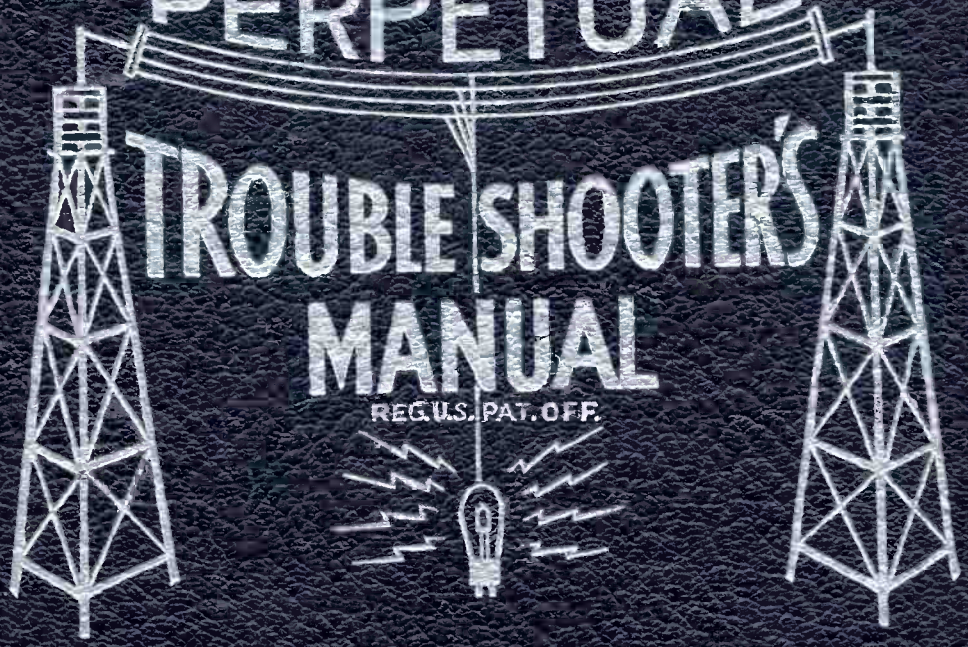
VOLUME VII

PERPETUAL TROUBLE SHOOTER'S MANUAL

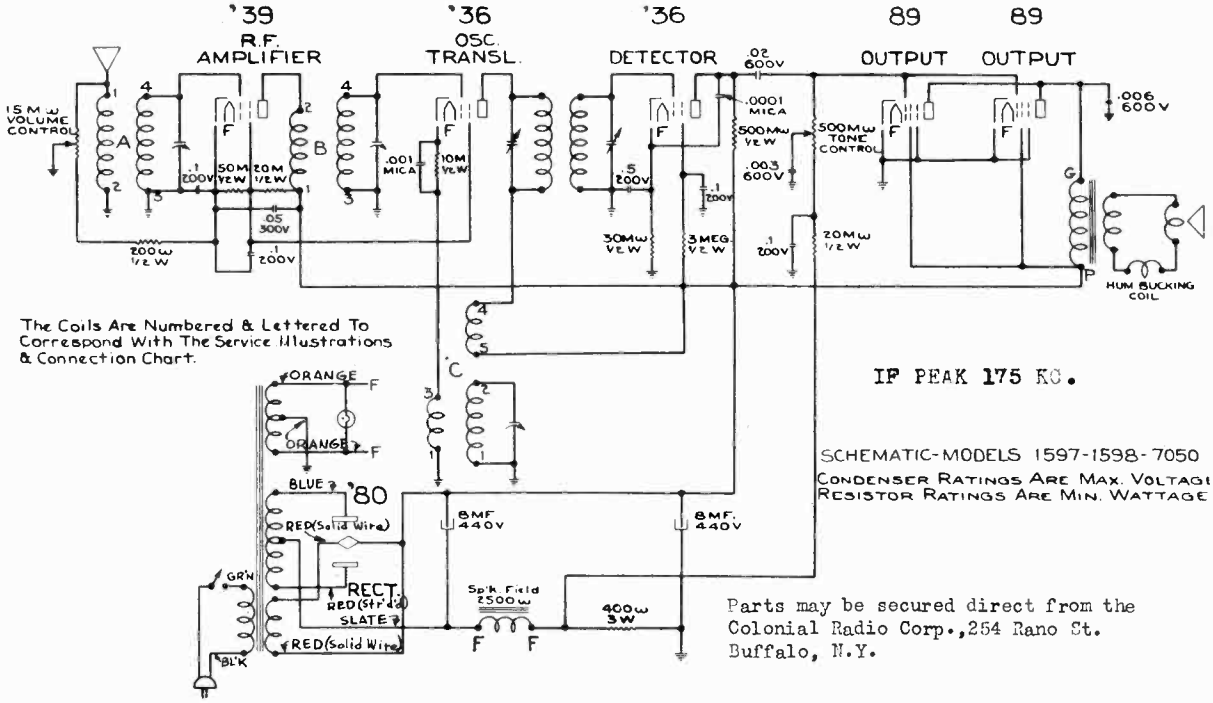
REG. U.S. PAT. OFF.



JOHN F. RIDER

SEARS-ROEBUCK & CO.

MODELS 1597,1598,7050
Schematic, Voltage
Alignment



Parts may be secured direct from the Colonial Radio Corp., 254 Rano St. Buffalo, N.Y.

TUBE VOLTAGE AND CURRENT CHART

TYPE OF TUBE	Plate Voltage Vol. Cont. at		Screen Voltage Vol. Cont. at		Grid Voltage Vol. Cont. at		Plate M. A. Vol. Cont. at		Screen M. A. Vol. Cont. at	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
'39 - R. F.	160	140	90	95	-2	-30	6	0	1.6	0
'36 - Osc.-Transl.	160	160	85	115	-5	-6.7	.5	.65	.1	.15
'36 - Detector	75	75	30	30	-5*	-5*	.2	.2	(a)	(a)
89 - Output	150	155	165	170	*	*	15.5	18	3	3
80 - Rectifier	Max. d. c. = 295 v.						Plate current = 22 m.a. per plate			

* - High series resistance, (a) - Too low to read, Watts = 60, Speaker field voltage = 110v.

Control grid readings taken on 150 volt scale of 1000 ohms per voltmeter; others on 750 volt scale. Readings taken with antenna and ground shorted together and no signal received. These are average values. Ordinarily, deviations up to 20% are permissable and do not necessarily indicate a fault. Where series grid resistors prevent grid voltage readings, proper plate current at the rated plate voltage will serve as an indication of proper grid bias and normal functioning of the tube. Care must be used when readings are taken with an analyzer since the capacity of the cable may cause the circuit to oscillate and give erratic readings. Usually, touching a finger to the grid or plate will stop oscillation. These readings were taken with the speaker field hot. Readings taken when the field is cold will be higher because of the lowered field resistance.

ALIGNMENT PROCEDURE

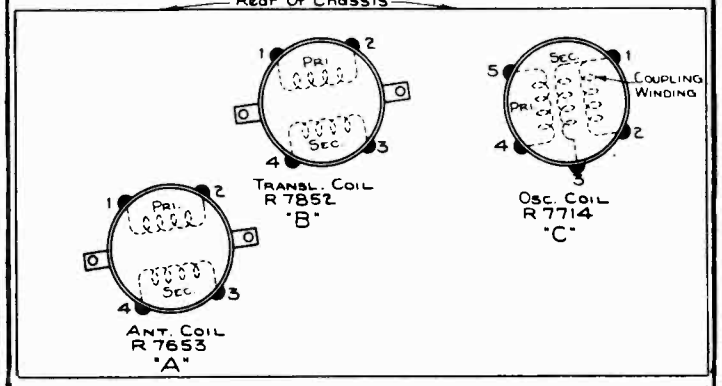
If it becomes necessary to align the oscillator-translator and R. F. stages, it should be done at about 1250 kc and then "touched up" at about 1600 kc. Trouble may be experienced if an attempt is made to secure alignment at 1600 kc without having obtained approximate alignment at 1250 kc. At 1600 kc the capacity of the oscillator-translator trimmer may be sufficient to tune the oscillator-translator stage to the same frequency as the R. F. stage, resulting in feedback and violent oscillation.

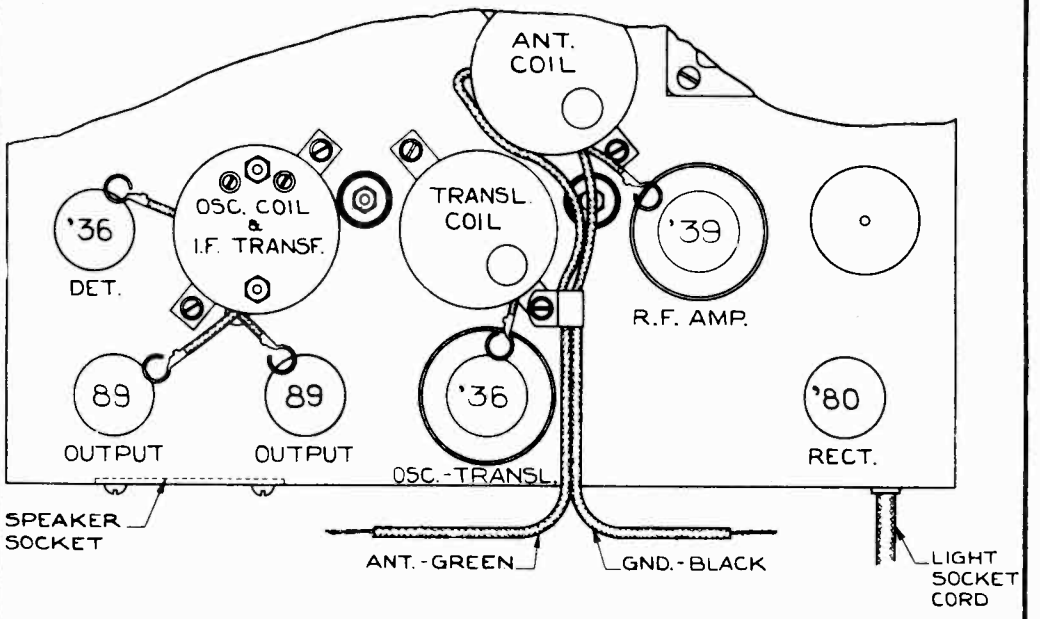
SERVICE NOTE

The 2500 ohm speaker field is used as the filter choke. It carries the plate and screen current of all the tubes as well as the bleeder current flowing through the screen supply resistors to ground. Should the output transformer, plug, or voice coil be replaced, it is important that it be reconnected with polarity correct as shown in the service illustration. Otherwise the hum due to the field will be in phase with that in the hum bucking coil, intensifying instead of eliminating the speaker hum.

Illustration For Coil Replacement And Continuity Checking

Coils Are Mounted On Top Of The Chassis And Lug Connections Are Viewed From The Top.





Coil "A"

Lug #1	To Volume Control & Antenna Lead.
Lug #2	To Middle Terminal Of Volume Control. (Gnd.)
Lug #3	To Variable Tuning Condenser Rotors. (Gnd.)
Lug #4	To '39 Grid & Stator #1 Of Variable Tuning Condenser. (Unit Nearest Dial)

Coil "B"

Lug #1	To Screen Of 89 Tubes (B+)
Lug #2	To Plate Prong Of '39 Tube Socket.
Lug #3	To Variable Tuning Condenser Rotors. (Gnd.)
Lug #4	To Grid Of '36 Osc.-Transl. Tube & Stator #2 Of Variable Tuning Condenser.

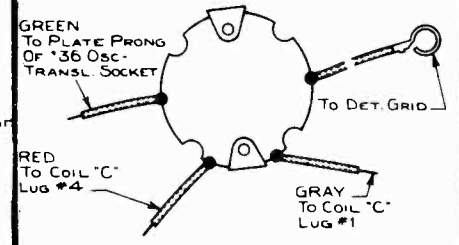
Coil "C"

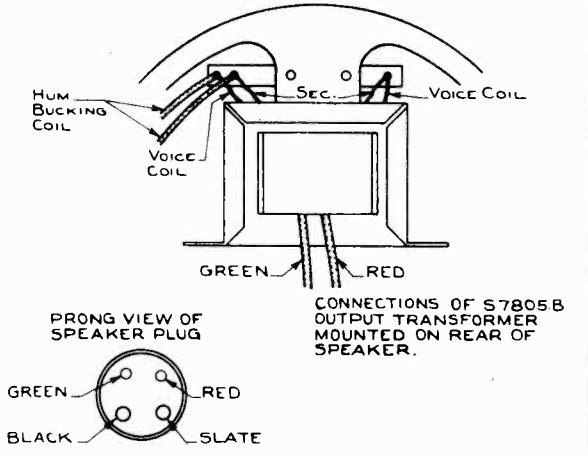
Lug #1	To Gnd. & To Gray Lead Of R 7713A I.F. Transformer.
Lug #2	To Stator #3 Of Variable Tuning Condenser.
Lug #3	To .001 Bi-pass Condenser & 10M Ohm Osc.-Transl. Cathode Resistor
Lug #4	To Red Lead Of R 7713A I.F. Transformer.
Lug #5	To B+

The Coils Are Numbered & Lettered In The Schematic To Correspond With This Chart.

I.F. Transformer R 7713A

Mounted On Top Of R 7714 Oscillator Coil

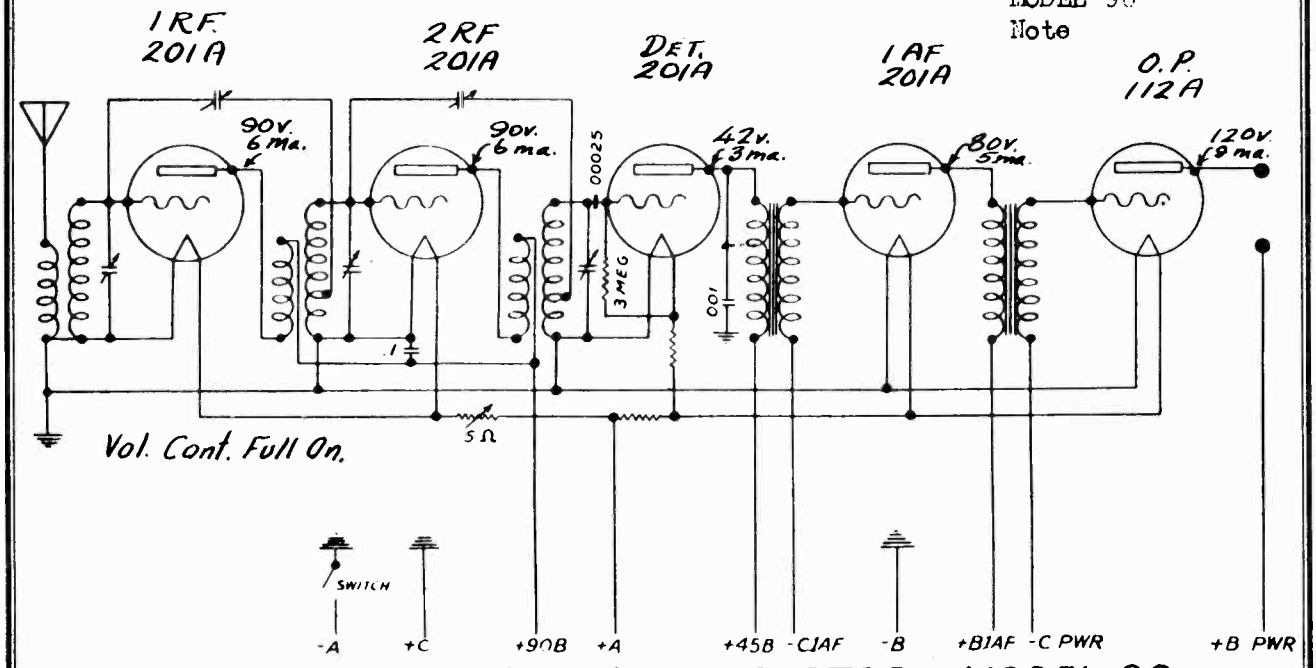




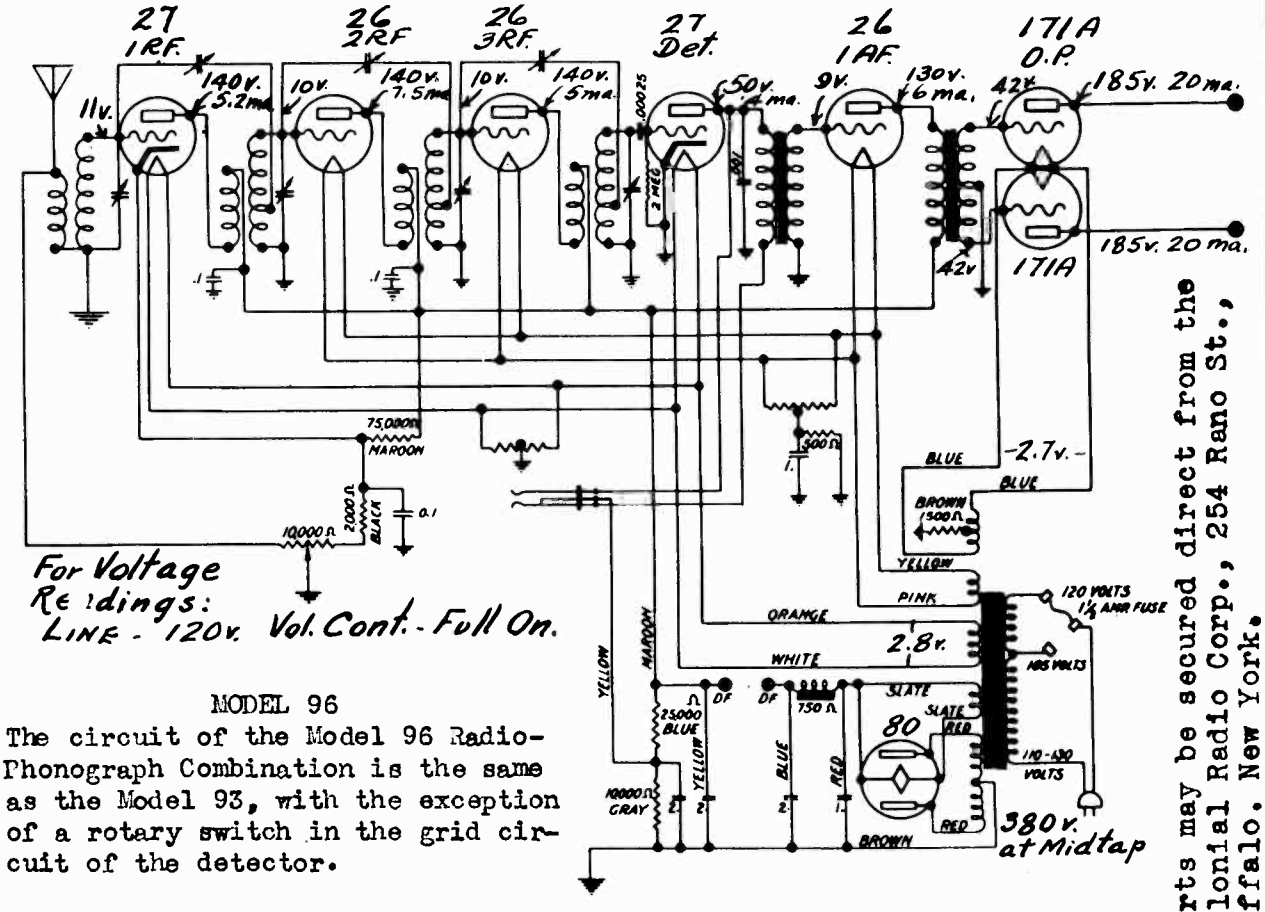
Connections Of S 7805 B Output Transformer Mounted On Rear Of Speaker.

MODELS 44,45,90
MODELS 51,93
Schematics,Voltage
MODEL 96
Note

SEARS ROEBUCK & CO.



SEARS MODELS 44 & 45 - FACTORY MODEL 90



MODEL 96

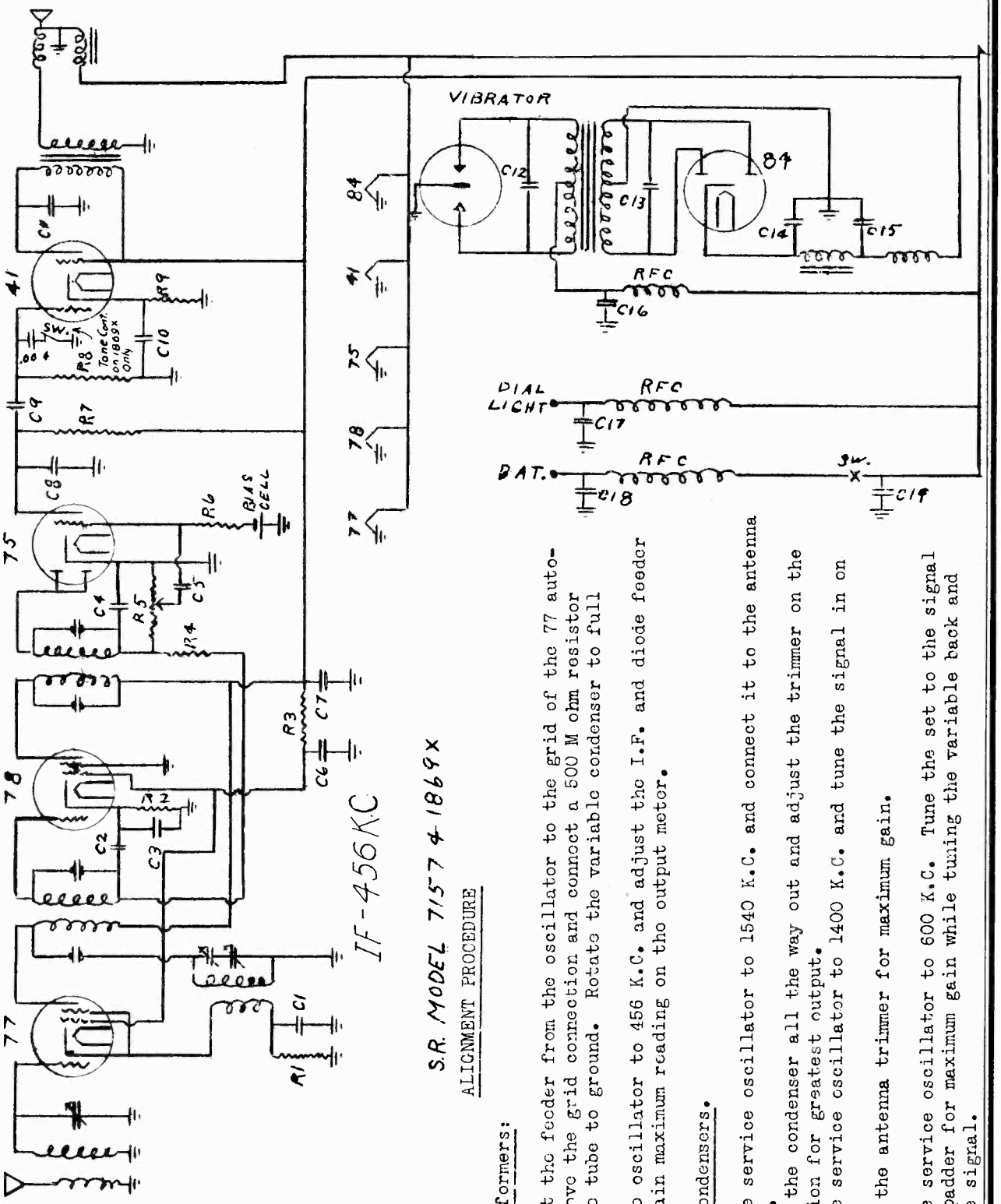
The circuit of the Model 96 Radio-Phonograph Combination is the same as the Model 93, with the exception of a rotary switch in the grid circuit of the detector.

SCHEMATIC DIAGRAM
SEARS MODEL 51- FACTORY MODEL 93

Parts may be secured direct from the Colonial Radio Corp., 254 Rano St., Buffalo, New York.

MODELS 1869X, 7157
Schematic, Alignment

SEARS-ROEBUCK & CO.



S.R. MODEL 7157 & 1869X

ALIGNMENT PROCEDURE

I.F. Transformers:

1. Connect the feeder from the oscillator to the grid of the 77 autodyne tube. Remove the grid connection and connect a 500 M ohm resistor from grid of the tube to ground. Rotate the variable condenser to full open position.
2. Set the oscillator to 456 K.C. and adjust the I.F. and diode feeder trimmers to obtain maximum reading on the output meter.

Variable Condensers.

1. Set the service oscillator to 1540 K.C. and connect it to the antenna lead of the set.
2. Rotate the condenser all the way out and adjust the trimmer on the oscillator section for greatest output.
3. Set the service oscillator to 1400 K.C. and tune the signal in on one set.
4. Adjust the antenna trimmer for maximum gain.
5. Set the service oscillator to 600 K.C. Tune the set to the signal and adjust the padder for maximum gain while tuning the variable back and forth across the signal.

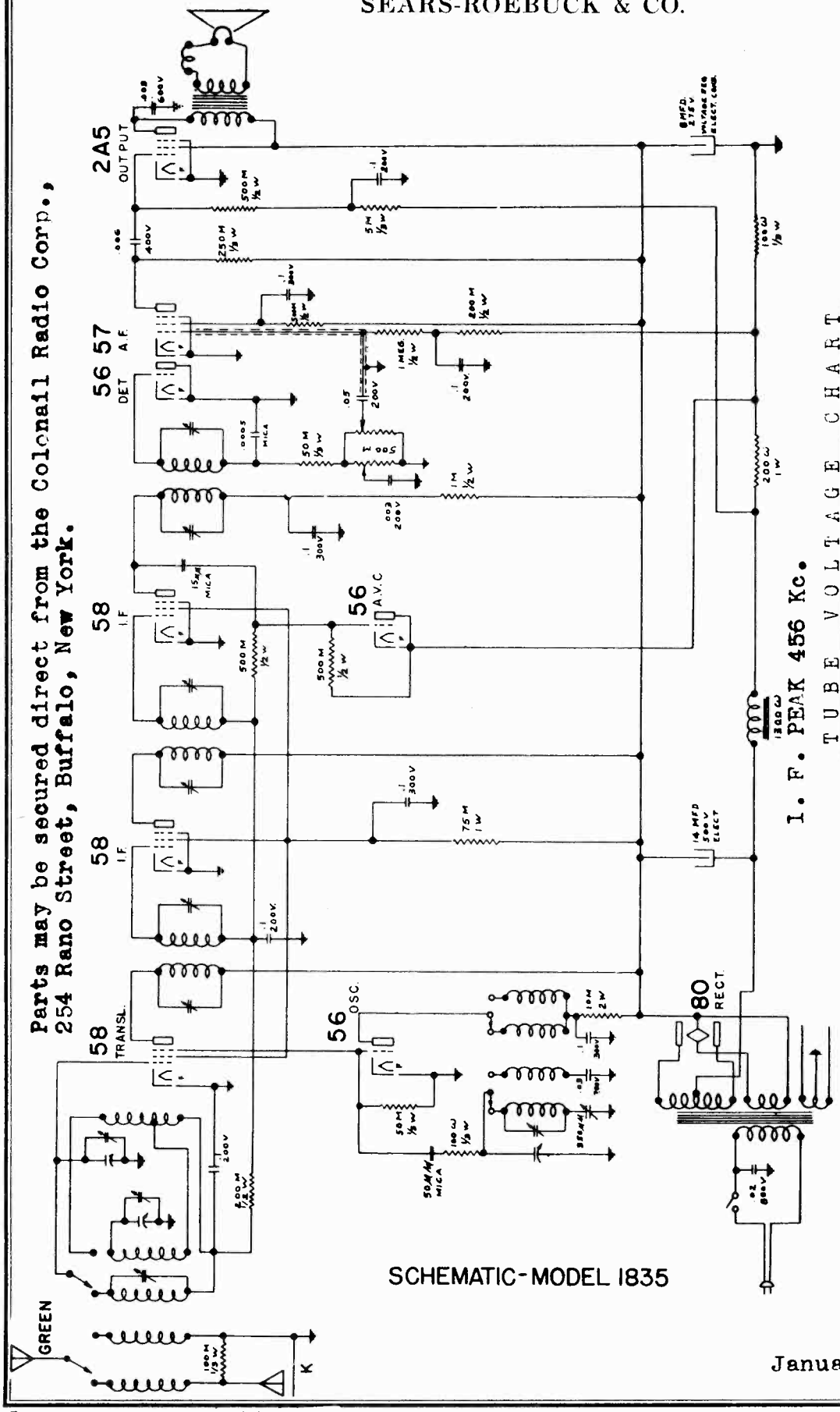
Parts for this model may be ordered from

Echophone Radio Corporation,

2611 Indiana Avenue, Chicago, Ill.

SEARS-ROEBUCK & CO.

MODEL 1835
Schematic
Voltage



SCHEMATIC-MODEL 1835

Parts may be secured direct from the Colonail Radio Corp.,
254 Rano Street, Buffalo, New York.

I. F. PEAK 456 Kc.

TUBE VOLTAGE CHART

All readings are to be taken between chassis and respective tube element.

TUBE	PLATE	SCREEN	TUBE	PLATE	SCREEN
55-Translator	260	95	56-AVC, Used as diode with-out applied DC.		
56-Oscillator	140		56-Detector,	"	
58-First IF	260	95	57-Audio	85	80
58-Second IF	255	95	2A5-Output	250	260

January 4, 1935

ALIGNMENT PROCEDURE

The IF Stages:

1. Connect the low scale of the output meter across the loud speaker voice coil.

2. Connect the ground lead of the test oscillator to the receiver chassis.

3. Connect the other lead of the test oscillator, through a .1 mfd. condenser, to the control grid of the 58 second IF tube. The grid clip should be left attached to the cap.

4. Set the test oscillator to 445 kc and tune the IF output transformer. The locations of its tuning adjustments are shown in the Service Illustration.

5. Change the test oscillator connection to the control grid cap of the 58 first IF tube and tune the IF interstage transformer.

6. Change the test oscillator connection to the control grid cap of the 58 translator tube and tune the IF input transformer.

In all of these adjustments the tone control should be in the brilliant position, the volume control on full, and the test oscillator adjusted to give the lowest possible output consistent with a readable deflection of the output meter. After all three IF transformers have been peaked, it is advisable to repeat the operations, starting with the IF output transformer, to secure greater accuracy.

RF Alignment; Broadcast:

1. Set the test oscillator to 1750 kc.

2. Loosely couple the output of the test oscillator to the antenna lead of the set, with the antenna connected. Leave the output meter connected to the loud speaker voice coil as for IF alignment. The tone control and volume control also should be left full "on" as for RF alignment.

3. Turn the variable condenser plates all the way. Then adjust the oscillator trimmer for maximum output. The locations of the trimmers are indicated in the Service Illustrations.

4. Set the test oscillator to 1400 kc and adjust the trimmers on the antenna and translator sections of the variable condenser.

5. Set the test oscillator to 600 kc and tune in its signal. Then slowly rotate the variable condenser back and forth a degree or two and, at the same time, adjust the broadcast oscillator padder for maximum output.

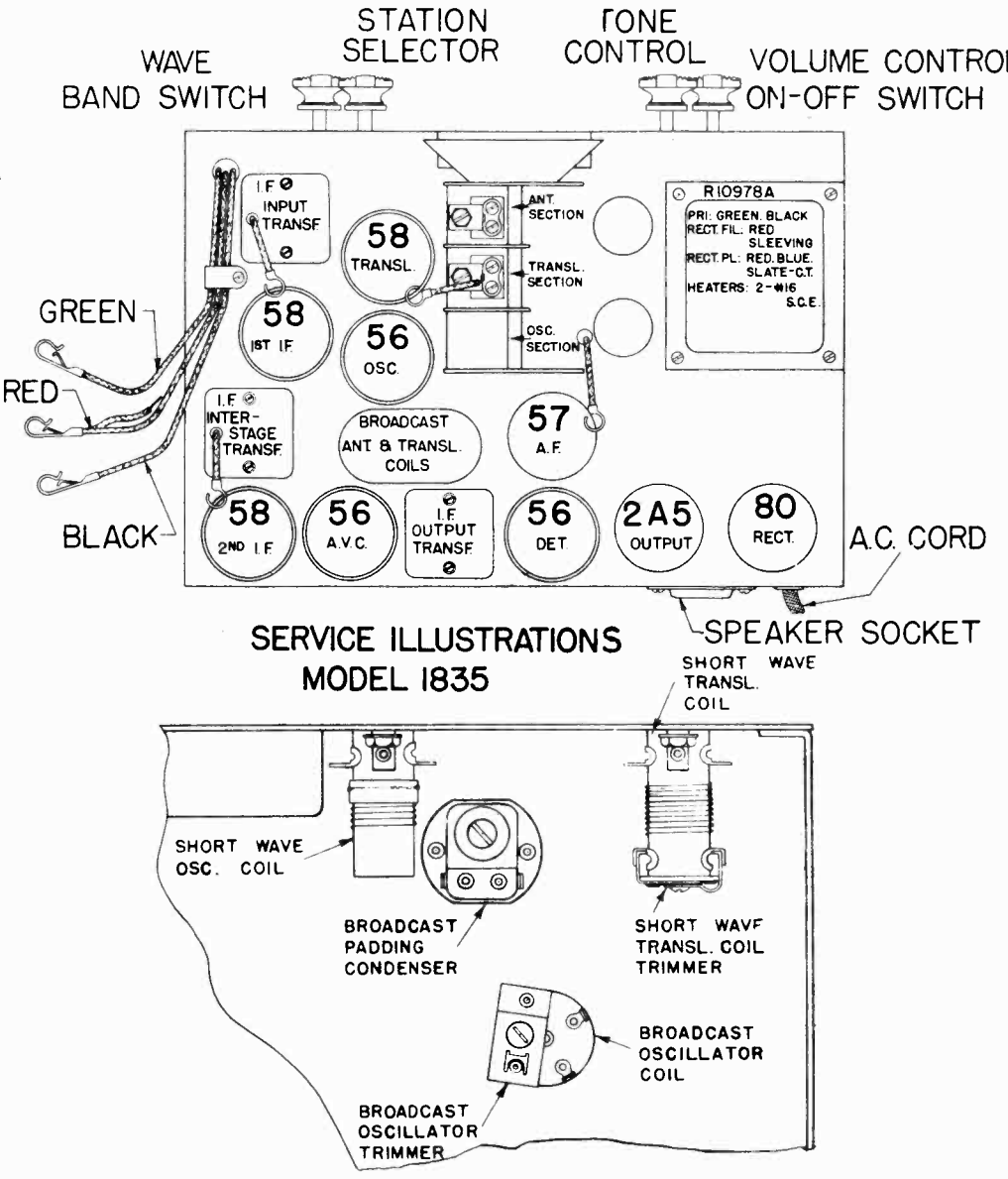
6. Repeat the 1750 kc and 1400 kc adjustments to secure greater accuracy. Always use the lowest possible output from the test oscillator.

RF Alignment; Short Wave:

1. Set the test oscillator to 15 megacycles, leaving it coupled to the set's antenna lead as for broadcast alignment.

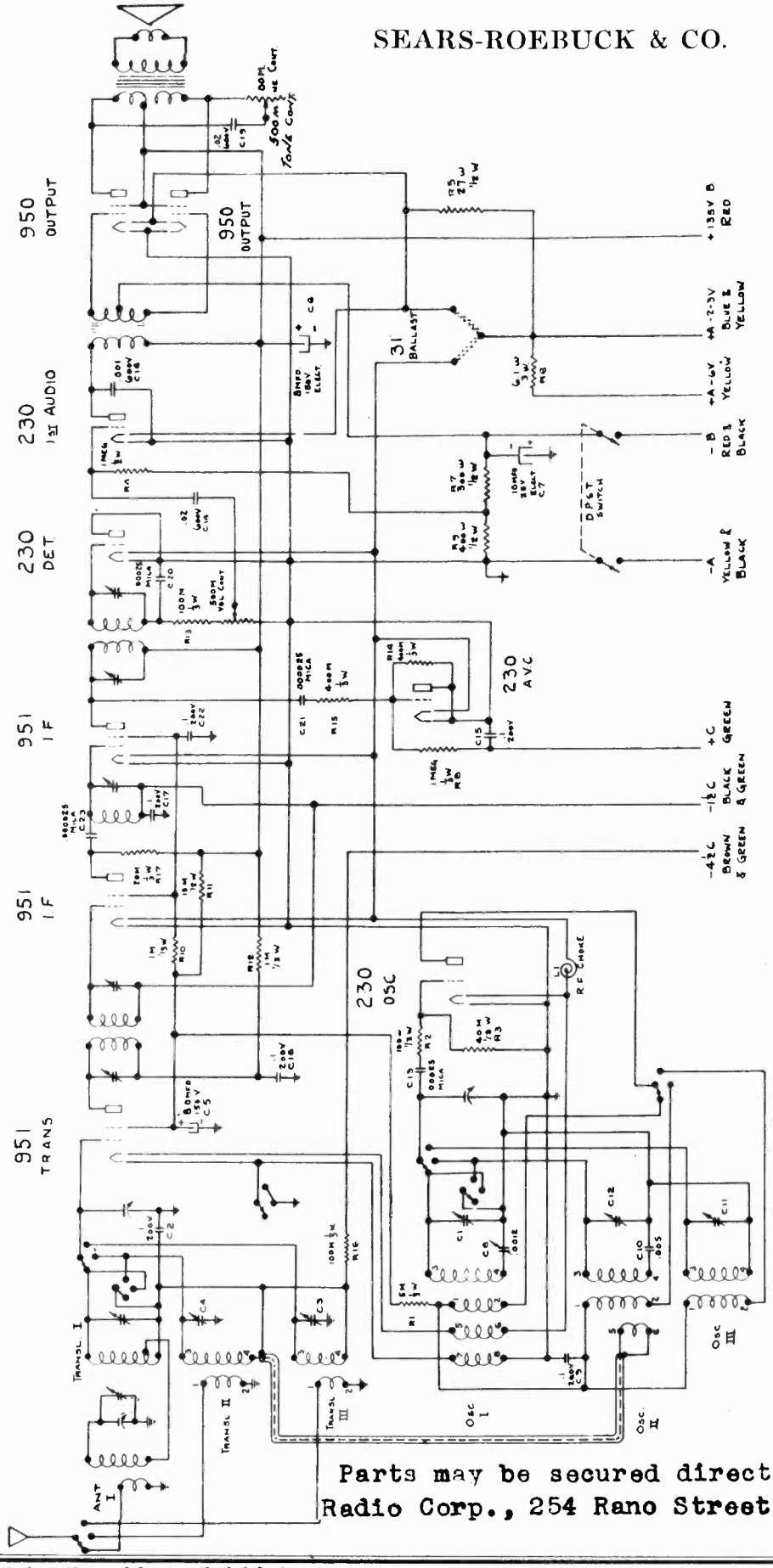
2. Turn the wave band switch to the short wave position and tune in the test oscillator signal. Then adjust the trimmer on the short wave translator coil for maximum output.

The lead from the wave switch to the center condenser section should be kept as far away as possible from the short wave oscillator coil.



SEARS-ROEBUCK & CO.

MODEL 1854A
Schematic
Voltage



IF PEAK 175 Kc.

November 30, 1934.

SCHEMATIC-MODEL 1854A

TUBE VOLTAGE CHART

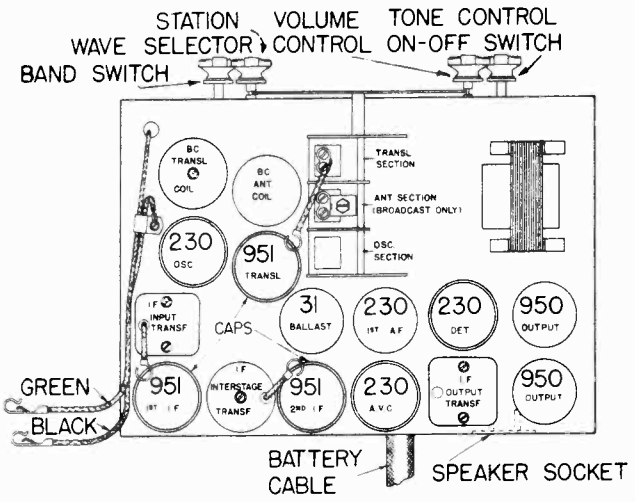
All readings are to be taken between the chassis and the respective element of each tube.

TUBE	PLATE	SCREEN	TUBE	PLATE	SCREEN
951- Translator	118	65	230- AVC, Used as diode with no applied D.C.		
230- Oscillator	50		230- Detector,	"	
951- 1st. I.F.	80	60	230- Audio	120	
951- 2nd. I.F.	120	60	950- Output	120	120

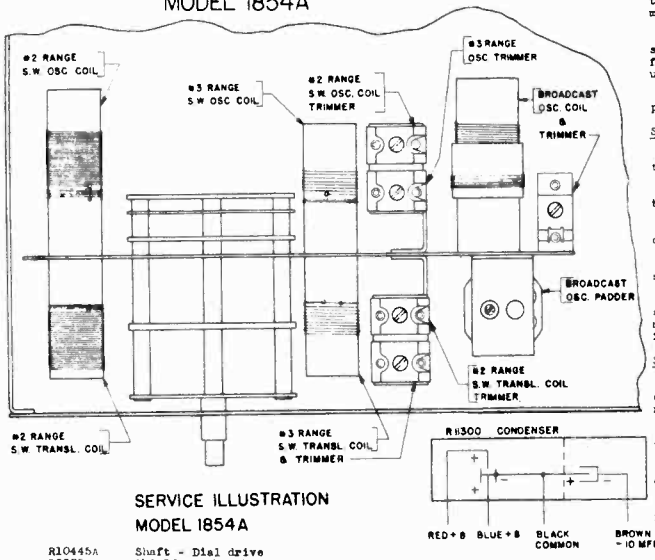
Parts may be secured direct from the Colonial Radio Corp., 254 Rano Street, Buffalo, New York

MODEL 1854A
Socket, Trimmers
Chassis, Alignment
Parts

SEARS-ROEBUCK & CO.



SERVICE ILLUSTRATION
MODEL 1854A



SERVICE ILLUSTRATION
MODEL 1854A

R10445A	Shaft - Dial drive		
R8395	Shield - Tube, base		
R10440	Shield - Tube, top		
R10441	Shield - Tube, cap		
R10684	Shield - Coil, base		
R10653	Shield - Coil, top		
R8315	Socket - 4 prong		
R8366	Socket - 4 prong, speaker		
R8253	Socket - 5 prong		
R10481	Spacer - Wood, shipping		
		R10514	Bezel
		R8297A	Board - Terminal, double
		R8308A	Board - Terminal, triple
		R9446A	Board - Terminal, 4 terminals
		R8900A	Board - Terminal, 6 terminals
		R11291	Cable - Battery
		R11192	Card - Operating

ALIGNMENT PROCEDURE

The IF Stages:

1. Connect the low scale of the output meter across the loud speaker terminals.

2. Connect the ground lead of the test oscillator to the chassis.

3. Connect the other lead of the test oscillator, in series of .1 mfd. condenser, to the grid of the second IF tube. Leave the grid clip attached to the cap.

4. Set the test oscillator to 175 kc and tune the IF output transformer. The locations of the tuning adjustments are shown in the Service Illustrations.

5. Change the test oscillator connection to the grid of the first IF tube and peak the IF interstage circuit. This circuit contains a single tuning adjustment.

6. Change the test oscillator connection to the grid of the translator tube and tune the IF input transformer.

7. Repeat all of the adjustments to secure greater accuracy. Start with the IF output transformer.

Always use as low an output as possible from the test oscillator in order to render the AVC action of the receiver inoperative.

Broadcast Alignment; #1 Range:

1. Set the test oscillator to exactly 1700 kc.

2. Loosely couple the output of the test oscillator to the antenna lead of the receiver, with the antenna connected.

3. Turn the variable condenser plates all the way out and adjust the broadcast oscillator trimmer for maximum output. The location of this trimmer is shown in the Service Illustration.

4. Set the test oscillator to 1400 kc and tune in its signal. Adjust the broadcast translator coil trimmer and the trimmer on the antenna section of the variable condenser for maximum output.

5. Set the test oscillator to 600 kc and tune in its signal. Then slowly rotate the variable condenser back and forth a degree or two and, at the same time, adjust the padder until maximum output is obtained.

6. Repeat all of the adjustments, always using the lowest possible output from the test oscillator.

Short Wave Alignment; #2 Range:

1. Set the test oscillator to 5250 kc, leaving it coupled to the set's antenna lead, as for broadcast alignment.

2. Open the variable condenser plates all the way and turn the wave switch to the #2 range position.

3. Adjust the #2 range oscillator coil trimmer for maximum output.

4. Set the test oscillator to 4500 kc and tune in its signal. Then adjust the #2 range translator coil trimmer.

5. Set the test oscillator to 1750 kc and tune in its signal. If necessary, turns on the #2 range translator coil may be shifted to secure maximum output. If turns are shifted it will be necessary to repeat the 4500 kc trimmer adjustment.

Short Wave Alignment; #3 Range:

1. Set the test oscillator to 15,500 kc, leaving it coupled to the set's antenna lead as for the lower frequency ranges.

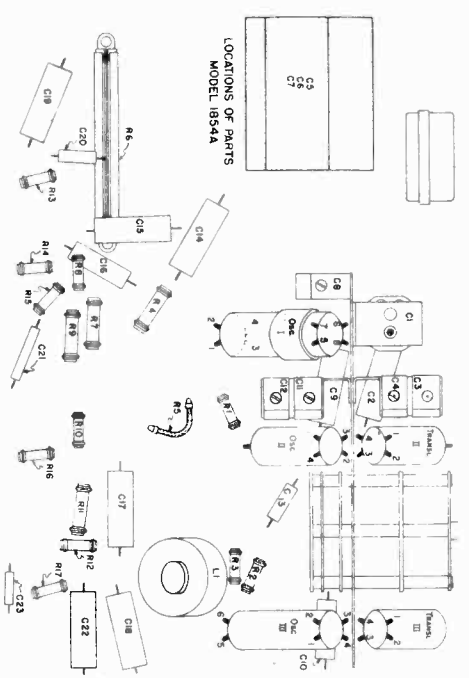
2. Open the variable condenser plates all the way and turn the wave switch to the #3 range position.

3. Adjust the #3 range oscillator coil trimmer for maximum output.

4. Set the test oscillator to 14,000 kc and adjust the #3 range translator coil trimmer.

ace orders for parts direct with Colonial Radio Corp., 254 Reno St., Buffalo, N. Y., on form #F5284

R11174	Control - Tone, with switch		
R11161	Control - Volume		
S11293A	Speaker - 10" PM, dynamic		
R11182A	Switch - Wave		
RJ0484	Tube - Rubber, chassis mounting		
R10488	Washer - Rubber, chassis mounting		

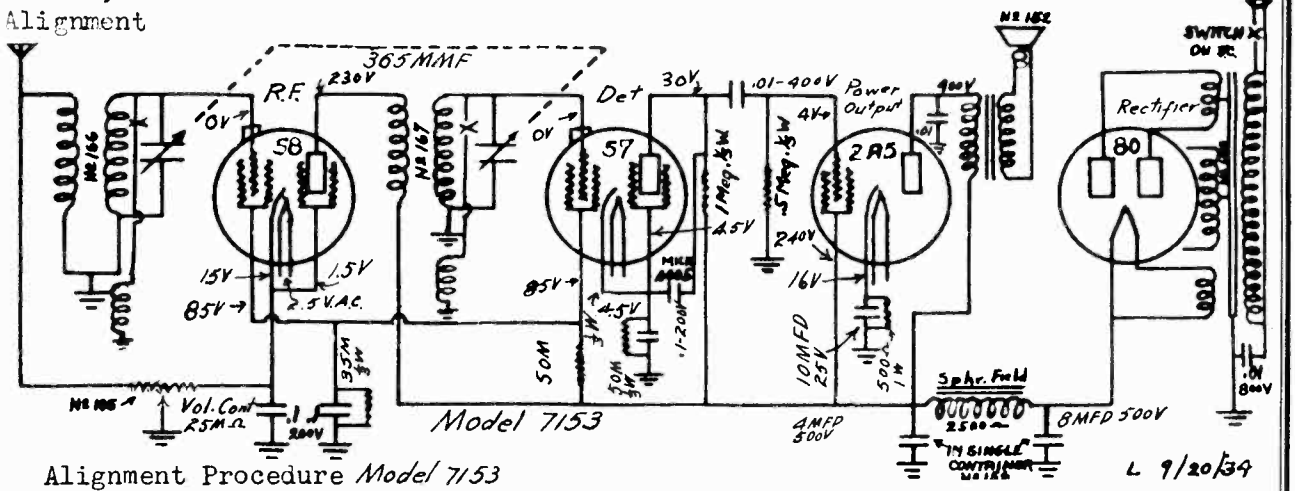


PART NO.	DESCRIPTION
R8352	Choke - RF, filament circuit
R5241	Clamp - Battery cable
R7011A	Clip - Antenna and ground leads
R11043	Clip - Grid
R8446	Coil - Antenna, broadcast
R8447	Coil - Translator, broadcast
R11185	Coil - Oscillator, broadcast
R11235A	Coil - Antenna, short wave, #2 range
R11234A	Coil - Oscillator, short wave, #2 range
R11235B	Coil - Antenna, short wave, #3 range
R11235C	Coil - Oscillator, short wave, #3 range
R11160	Condenser - Variable
R11160A	Condenser - Variable with drive assembly
R11300	Condenser - Electrolytic, 8-8-10 mfd.
R9426	Condenser - Padding
R10197	Condenser - Trimmer, single
R10736	Condenser - Trimmer, double
R9513	Condenser - Trimmer
R6444	Condenser - .1 mfd. 200 volts
R6761	Condenser - .02 mfd. 600 volts
R6954	Condenser - .005 mfd. 600 volts
R6952	Condenser - .001 mfd. 600 volts
R4592	Condenser - .00025 mfd. mica
R8711	Condenser - .000025 mfd. mica
R6436	Resistor - 400 ohms, 1/2 watt carbon
R6447	Resistor - 300 ohms, 1/2 watt carbon
R8922	Resistor - 100 ohms, 1/3 watt carbon
R11180	Resistor - Candohm
R10859	Resistor - 27 ohms, 1/2 watt flexible
R5823	Resistor - 1 megohm, 1/2 watt carbon
R7585	Resistor - 1 megohm, 1/3 watt carbon
R5710	Resistor - 400 M ohms, 1/3 watt carbon
R7586	Resistor - 100 M ohms, 1/3 watt carbon
R6115	Resistor - 40 M ohms, 1/3 watt carbon
R6640	Resistor - 20 M ohms, 1/3 watt carbon
R7291	Resistor - 15 M ohms, 1/2 watt carbon
R7226	Resistor - 5 M ohms, 1/3 watt carbon
R6636	Resistor - 1 M ohms, 1/3 watt carbon
R10717B	Transformer - IF input
R10584B	Transformer - IF interstage
R10599A	Transformer - IF output
R11303A	Transformer - Audio, interstage

Schematics
Socket, Trimmers
Alignment

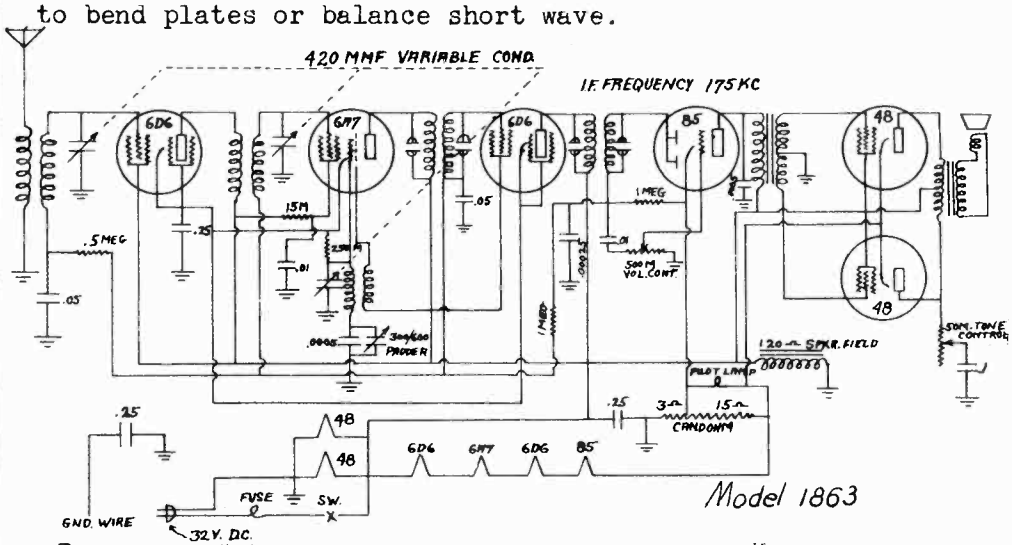
SEARS-ROEBUCK & CO.

MODEL 1863
MODEL 7153



Alignment Procedure *Model 7153*

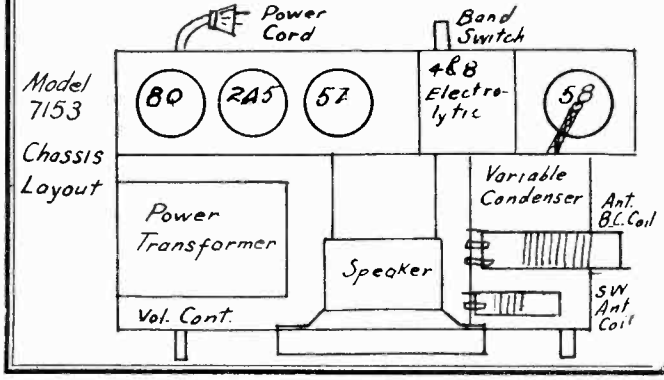
1. Turn volume control all the way up, then back down until oscillation stops.
2. Turn variable condenser all the way open (Minimum capacity)
3. Apply a 1720 K C oscillator note into antenna.
4. Adjust variable condenser trimmers to maximum output - it will not be necessary to bend plates or balance short wave.

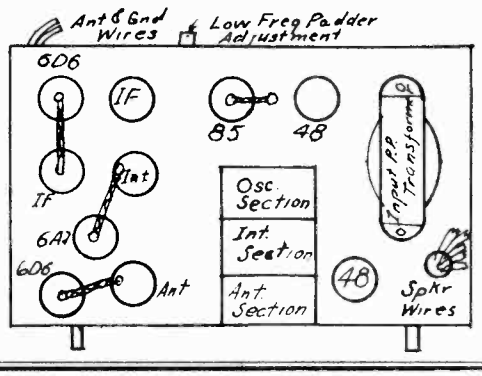


This set is designed to operate on 32V D.C., and does not have a separate power supply. The plate voltage is 32V.

Parts may be secured direct from Echophone Radio Corp. 2611 Indiana Ave. Chicago, Ill.

1 - Rebalance I.F. Transformers, applying a 175 K.C. note at 6A7 control grid.
2 - Open variable condenser all the way (minimum capacity) apply a 1720 K C note an oscillator at the antenna of receiver.
3 - Check oscillator section of variable to 1720 K C, then adjust Interstage and antenna to maximum peak.
4 - Adjust low frequency padder by applying a 600 K C oscillator note into antenna and while rocking variable condenser across signal adjust padder until maximum output is obtained.





MODEL 1863
Generator Data
Parts

SEARS-ROEBUCK & CO.

AVERAGE INSTALLATIONS ON 32 VOLT D C SYSTEMS.

CAUTION: Disconnect the batteries from the generator before installing suppressor equipment.

Connect one of the .5 mfd 200 V condensers between the positive brush and the generator frame, and the other .5 mfd condenser between one negative brush and the generator frame, as shown in Fig. 1. For four cylinder plants attach condensers as shown in Fig. 2.

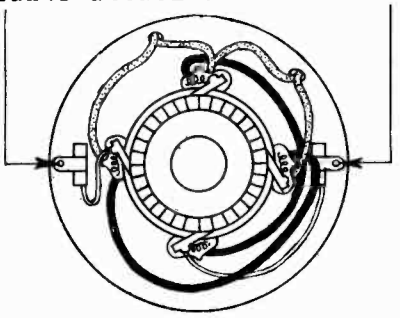


Fig.1

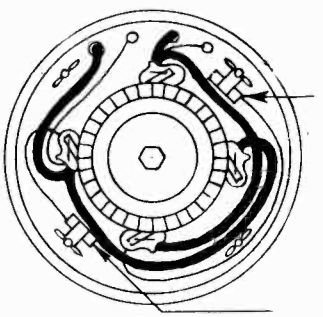


Fig.2

Connect the spark plug suppressor between the top of the spark plug and the high tension lead coming from the coil. When four cylinder plants are used to operate generator, three more .5 mfd, Part No. 617 may be obtained and attach one to each spark plug.

In extreme cases it may be necessary to shield the high tension lead coming from the coil to the spark plug. This should be done by using 3/8 copper shielded loom and ground each end of the shielding to the generator frame.

Some cases may require a good grounding of the system. This may be best accomplished by using No. 12 gauge solid copper wire and running it from the frame of the generator to a very good ground making the lead as short as possible.

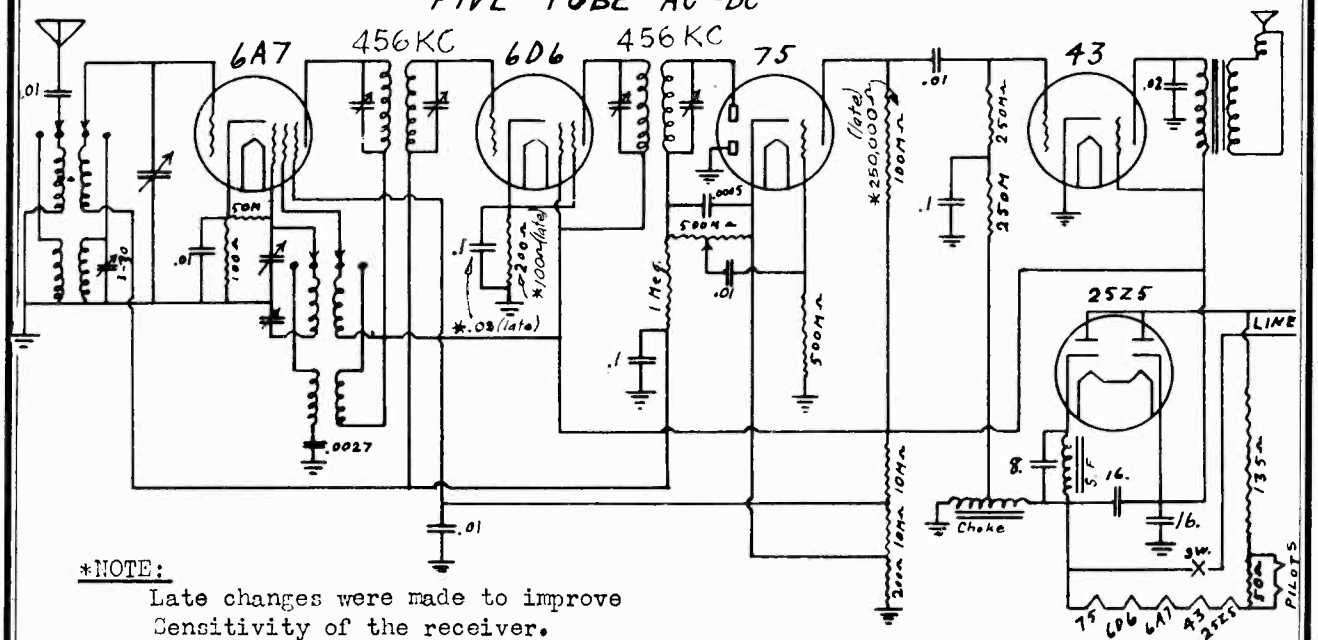
Do not attempt to ground one side of the line unless it is absolutely necessary and great care must be taken that the opposite side of the line is not grounded in some unknown place.

Part No.	Description	List Price
73	3 lug terminal strip	.03
158	Power cord & plug	.30
601	Output 1 F transformer	1.25
602	Input I F transformer	1.25
603	Interstage coil shielded	.93
604	Antenna coil shielded	.93
605	Oscillator Coil	.68
606	Input push pull Trans.	1.93
607	3 gang variable condenser	2.25
608	Volume control 500 M W/S	.80
609	Tone control 50M	.68
610	6" Speaker	5.48
611	Airplane Dial	3.22
612	Flat type Dial	1.07
613	Fuse Clip Block	.15
614	Cand.ohm 3 ohms-15 ohms	
615	.25-200V Tubular Cond.	.18
616	Spark Plug suppressors	.29
617	.5 mfd. Generator condenser	.32
108	300/600 MMF Padder Cond.	.18
	Any tube Socket	
	State marking	.08
	Any Carbon Resistor	
	State value	.09
	Any By Pass condenser not listed above	.13

SEARS-ROEBUCK & CO.

MODELS 1903,1953
Early,Late
Schematic,Socket
Trimmers,Alignment

FIVE TUBE AC-DC



*NOTE:
Late changes were made to improve Sensitivity of the receiver.

A L I G N M E N T

If for any reason the set should be re-aligned,ie, if changes are made; proceed as follows.

1-Apply a 456KC note to the control grid of 6A7 tube and peak I.F. Transformers.

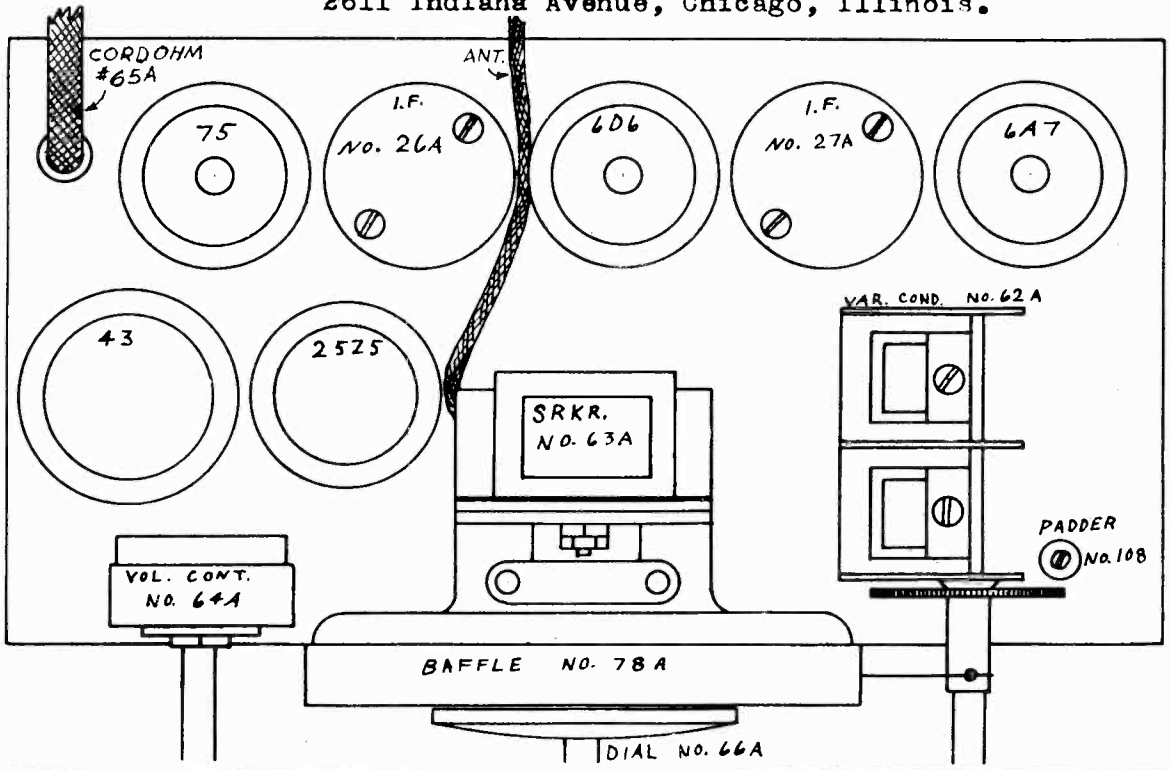
2-Rotate variable condensers all the way out, apply a 1720KC note to the antenna wire, and balance with the trimmers on top of variable condenser for maximum gain.

3-Apply a 600KC note to antenna wire and adjust padder for maximum signal while swinging the variable condenser back and forth across the 600KC note.

4-Turn back to 1400KC and check for alignment. Do not bend plates of variable condenser.

5-To align the short wave band, adjust trimmer underneath chassis for greatest noise level around the 25 meter band

Parts may be secured direct from Echophone Radio Corp 2611 Indiana Avenue, Chicago, Illinois.



MODELS 1905,1915,1955,1965
MODELS 1917,1967,1967A
MODELS 1918,1968
MODELS 1918A,1968A
MODELS 1936,1996

SEARS-ROEBUCK & CO.

MODEL 1945
MODEL 1946
Dual Ratio
Drive Data

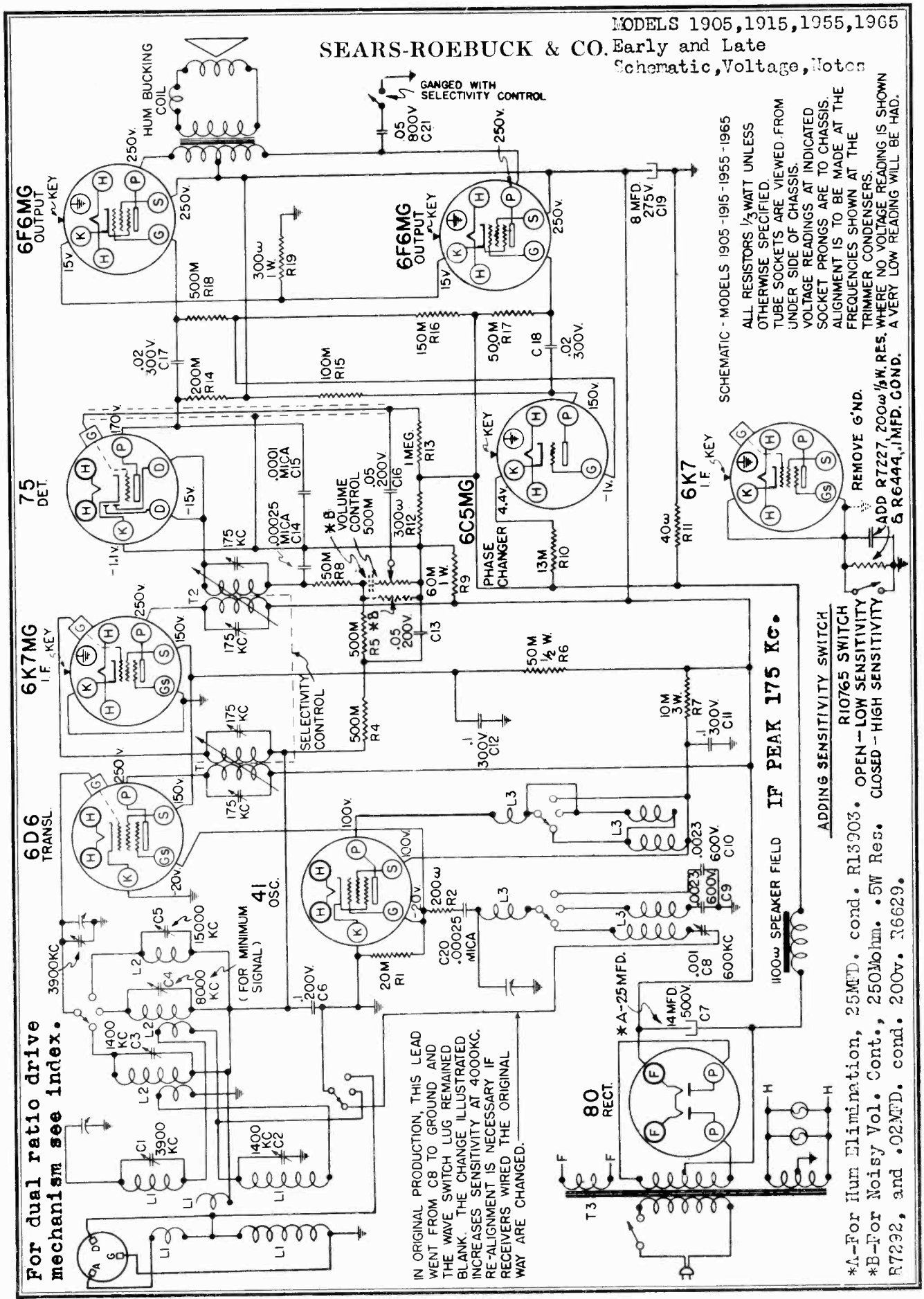
THE DUAL RATIO CONDENSER DRIVE SHAFT

There are two positions in which the Station Selector knob can be put before turning it. When the knob is pushed in the condenser drive ratio is approximately 17 to 1. When the knob is pulled out, the dial ratio becomes approximately 70 to 1, making possible very precise tuning.

The mechanism proper is of the planetary drive type, using ball bearings in contact with a cone shaped retainer. Do not attempt to take the mechanism apart. Should any difficulty with slippage occur, it can be corrected as described in the following paragraph. Slippage that occurs when the condenser reaches its limit of rotation in either direction is normal. However, if there is slippage at any other part of the condenser travel, proceed as follows:

Determine whether or not the Shaft End (11) is turning. See the illustration. If the shaft end turns but the gears (8 & 9) do not turn, remove the U shaped tension washer (10) and bend it to increase its curvature and tension. Then replace it. Note that the convex side of the washer should face the shaft end and the concave side should face the gears. If the shaft end does not turn, the slippage is occurring in the planetary drive mechanism. This will occur only when the knob is in its "out" or slow position. In this case, squeeze the tabs (6) slightly with a pair of pliers to increase the pressure. Do not squeeze them too much or the drive will become stiff and hard to turn.

When placing the knob on its shaft be careful not to use force in pressing it on or the splines (3 & 4) will become burred. The floating sleeve (2) must be centered on the shaft in order to permit the knob to slip over it. If the knob does not go on easily, do not force it, but try it several times until the sleeve gets into such position that it allows the knob to slip on. Care must be taken when tightening the set screw, that it is not tightened down on the splines but comes in the space between the two splines. This is best done by removing the set screw, positioning the knob so that the set screw hole comes over the sleeve, between the splines. Then insert and tighten the set screw.



MODELS 1905,1915,1955,1965
Alignment,Chassis,Trimmers SEARS-ROEBUCK & CO.

ALIGNMENT PROCEDURE

IF ALIGNMENT

1. Connect the output meter across the speaker voice coil. The low scale of the meter should be used (approximately 5 volts). Turn the wave switch to the BROADCAST position.

2. Turn the Variable Selectivity and Tone Control knob all the way to the right (clockwise). Loosen the set screws holding the flexible cables that change the IF coupling. Push the cables into the tubes as far as possible and tighten the set screws. Be sure the knob is kept at its extreme clockwise position during this procedure. Be careful when tightening the set screws that they are not screwed down so far that the cable wires are cut.

3. Set the test oscillator to 175 kc. Connect the ground lead of the test oscillator in series with .1 MFD condenser, to the receiver chassis. Attach the "hot" lead of the test oscillator to the control grid cap of the 6K7 tube.

4. Turn the Variable Selectivity control all the way to the left (sharpest position). Then carefully tune the IF output transformer for maximum output. The IF output transformer is the square can unit nearer the rear of the chassis. The volume control of the receiver should be turned all the way on during the adjustment and the output from the test oscillator kept at the lowest possible value.

5. Change the test oscillator connection from the control grid cap of the 6K7 to the control grid cap of the 6D6 tube. Then adjust the IF input transformer for maximum output meter reading. The receiver volume control must be all the way on and the output from the test oscillator kept at its lowest value, as mentioned in the preceding paragraph.

6. Change the test oscillator connection back to the 6K7 tube and repeat the IF output transformer adjustment for greater accuracy. Then change the test oscillator connection back to the 6D6 tube and repeat the IF input transformer adjustment for greater accuracy.

7. Connect the "hot" lead of the test oscillator to the control grid of the 6D6 tube and turn the variable Selectivity and tone control knob all the way to the right (broadest position). Starting with the test oscillator adjusted to about 150 KC., slowly increase the frequency of the test oscillator until it goes through resonance with the receiver and then on beyond resonance. It will be found that as resonance is approached a peak reading is had on the output meter. As the frequency of the test oscillator is increased, the output meter reading decreases and then increases again as the test oscillator frequency is further increased. That is, the resonance curve of the IF transformers, in the broad position, has a peak at either side and a hollow in the center. The output meter readings of the two peaks should be the same. If they are not, tune the test oscillator to resonance with the weaker peak. Then adjust the upper of the two tuning condensers of the IF output transformer (the square unit nearer the rear of the chassis) to increase the output meter reading. Only a very slight adjustment is necessary. Recheck the relative readings of the two peaks by tuning the test oscillator through resonance with the receiver as before. When properly adjusted, the two peaks will give equal output meter readings.

RF ALIGNMENT

Preliminary:

Alignment must be made in the same sequence as described below. During all of the alignment, the Variable Selectivity and Tone Control should be turned all the way to the left (sharpest position). Connect the ground lead of the test oscillator, in series with a .1 MFD condenser to the receiver chassis. Connect the output meter across the loud speaker voice coil as for IF alignment. The volume control of the receiver should be turned all the way on and the output from the test oscillator kept at its lowest possible value during all of the alignment procedure. Fully mesh the variable condenser and see that the station selector dial is horizontal. The Band Spread pointer should point straight up.

Short Wave (C) Band:

1. Turn the wave band switch to the "C" position. Connect the "hot" lead of the test oscillator, in series with a 400 Ohm resistor, to the terminal marked "A" on the antenna terminal block at the rear of the chassis.

2. Set the test oscillator to 15,000 kc. and tune in its signal. Adjust C5 for maximum output. The Variable Condenser should be rocked back and forth a degree or two while making the adjustment. It may be found that two peaks can be obtained at two different settings of the trimmer. Use the one in which the trimmer is screwed further in (greater capacity).

3. Change the signal generator frequency to 8,000 kc. and tune in its signal. Then adjust C4 for minimum output meter reading. (Note that this adjustment is to be for minimum output meter reading, not maximum reading).

Short Wave (B) Band:

1. Turn the wave band switch to the "B" position. Leave the test oscillator leads connected as for alignment on the "C" band.

2. Set the test oscillator to 3,900 kc. and adjust the translator trimmer condenser on the variable condenser section nearest the dial. Also adjust the antenna trimmer in the round can unit mounted behind the Variable Selectivity and Tone Control shaft. The variable should be rocked back and forth a degree or two while making the adjustments. If two peaks can be obtained, use the adjustment in which the trimmers are screwed furthest in.

CAUTION:- All of the adjustments must be made in the order stated and must not be changed during succeeding operations.

3. Repeat operation #2 of Short Wave "C" band for greater accuracy.

Broadcast (A) Band:

1. Disconnect the 400 Ohm resistor from the "hot" lead of the test oscillator and in its place, connect a .00025 MFD condenser. The condenser in turn is connected to the "A" terminal on the antenna terminal block at the rear of the chassis.

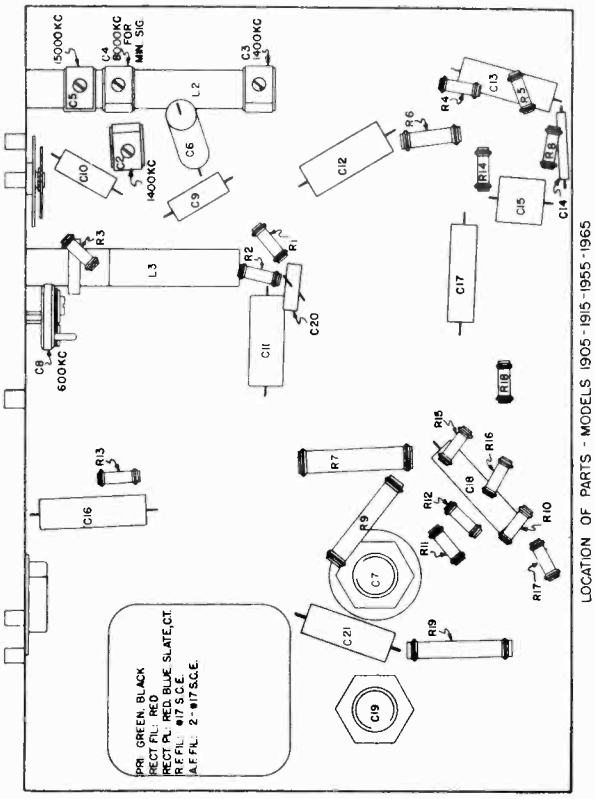
2. Turn the wave band switch to the BROADCAST position. Set the test oscillator to 600 kc. and tune in its signal. Then adjust the broadcast oscillator padder, C8, for maximum output meter reading. The variable condenser should be rocked a degree or two while making the adjustments.

3. Set the test oscillator to 1400 kc. and tune in its signal. Then adjust C2 and C3 for maximum output meter reading. The variable should be rocked back and forth a degree or two while making the adjustments. If two peaks can be obtained, use the adjustments in which the trimmers are screwed furthest in.

4. Repeat operation #2 for greater accuracy.

SERVICE NOTE ON DIAL DRIVE RATIO MECHANISM

There is a "U" shaped tension washer which fits into a groove at the back end of the variable selectivity control shaft. This washer must be placed on the shaft so that the convex side of the washer faces the back end of the shaft. If the washer is put on wrong, with the concave side facing the back of the shaft, the washer will work itself off the shaft and the shaft then will become loose and can be pulled off.



LOCATION OF PARTS - MODELS 1905-1915-1955-1965

TO REDUCE IMAGE RESPONSE

To reduce image response, turn the variable selectivity and tone control to its sharpest position (all the way to the left) and turn the volume control all the way one. Couple a test oscillator, adjusted to 1000 KC, to the antenna lead of the receiver and tune in its signal. The test oscillator must be adjusted to give high output.

Leaving the receiver tuned to 1000 KC, change the test oscillator frequency to approximately 1350 KC. Carefully adjust the test oscillator frequency so that its signal (the image) will be heard loudest in the receiver.

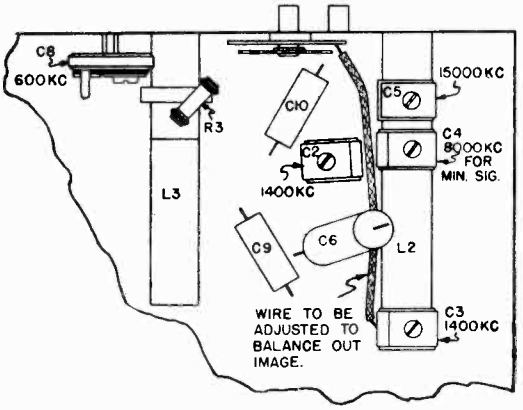
There is a wire that runs from the stator of the trimmer, C5, to a lug on the wave switch. Using a piece of bakelite or wood, to prevent hand capacity effects, push this wire up under the coil, L2. The wire should be to hug the coil closely. By pushing just the right amount of this lead under the coil, the image response can be balanced out.

It is not necessary to change any of the alignment adjustments of the receiver.

If a test oscillator is not available and a strong station of about 1350 KC, can be tuned in, this adjustment to eliminate image response can be made as follows:

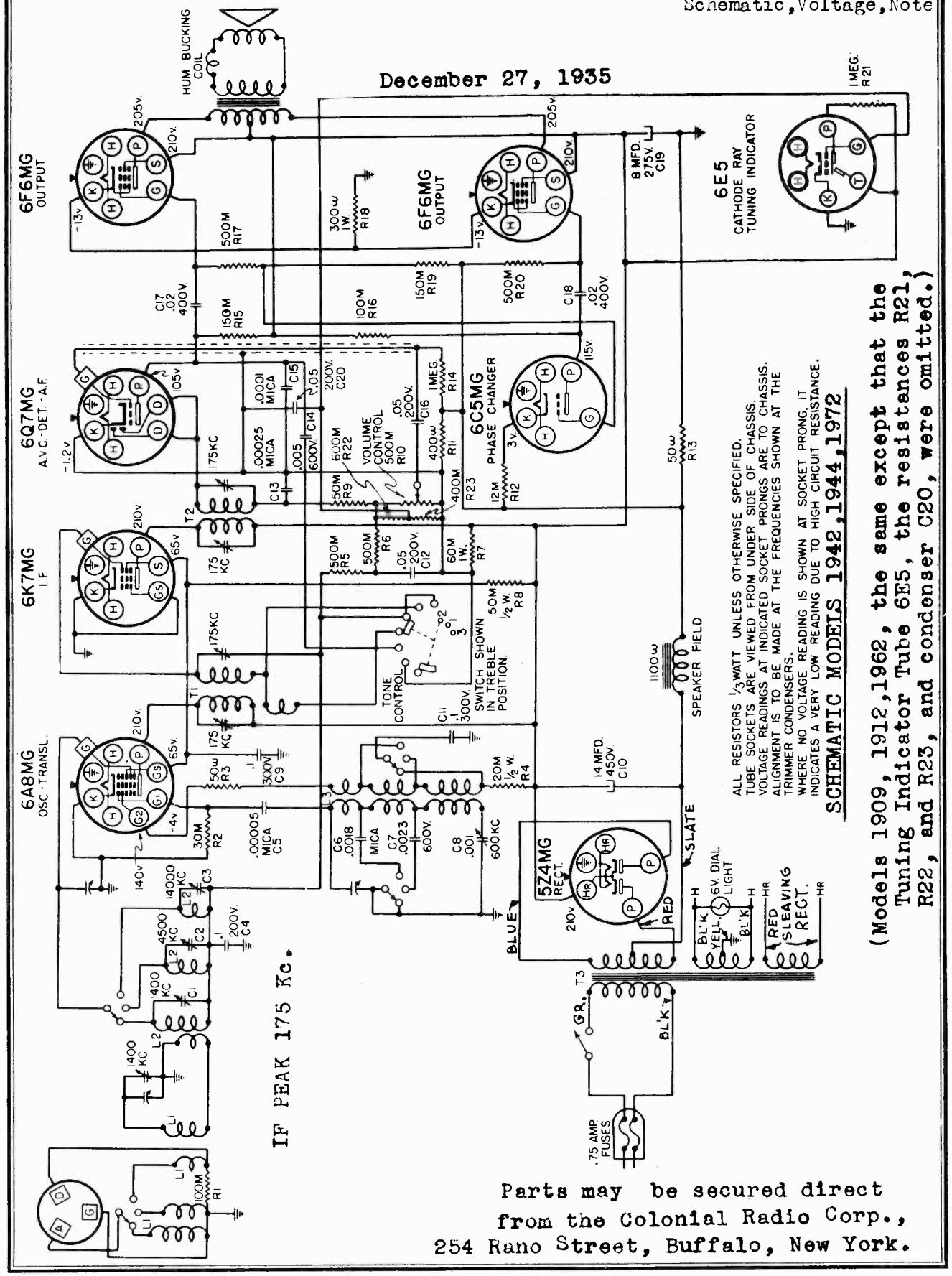
Turn the volume control of the receiver all the way on and turn the variable selectivity control to its sharpest position, as before. Tune in the image of the station at a frequency 650 KC lower than the assigned frequency of the station. For example, if a station's assigned frequency is 1350 KC, tune in its image at a dial setting of 1000 KC on the receiver and balance out the image by shifting the wire in the same manner as described above for the method using a test oscillator.

Parts may be secured direct from the Colonial Radio Corp., 254 Rano Street, Buffalo, New York.



SEARS-ROEBUCK & CO.

MODELS 1909,1912,1962
1942,1944,1972
Schematic,Voltage,Note



SCHEMATIC MODELS 1942,1944,1972

(Models 1909, 1912,1962, the same except that the Tuning Indicator Tube 6E5, the resistances R21, R22, and R23, and condenser C20, were omitted.)

Parts may be secured direct from the Colonial Radio Corp., 254 Rano Street, Buffalo, New York.

MODELS 1909,1912,1962
MODELS 1942,1944,1972
Alignment

SEARS-ROEBUCK & CO.

ALIGNMENT PROCEDURE

IF Alignment:

1. Connect a jumper wire between terminals "D" and "G" on the antenna terminal block. Turn the Wave Band switch to the BROADCAST (A) position, the dial pointer to 900 kc, and the Tone Control to the #1 position. Connect the low scale of the output meter across the loud speaker voice coil. Connect the ground lead of the test oscillator to the receiver chassis. Turn the receiver volume control all the way on and keep the output from the test oscillator at the lowest value consistent with a satisfactory output meter reading.

2. Set the test oscillator to 175 kc. Connect the output lead of the test oscillator, in series with a .1 mfd condenser, to the control grid of the 6K7MG IF tube. Then peak the IF transformer, T2, for maximum output meter reading. This transformer is the square can unit mounted at the extreme left rear corner of the chassis, as one faces the rear of the chassis.

3. Change the test oscillator output lead connection (and the .1 mfd condenser) to the control grid of the 6A8MG oscillator-translator tube. Peak the IF transformer, T1, for maximum output meter reading. This transformer is the square can unit with a grid lead coming out of its top.

4. Repeat the adjustments in their original order for greater accuracy. Always keep the test oscillator output at its lowest possible value.

Important:

RF ALIGNMENT

Alignment of band "B" or "C" affects the alignment of the other lower frequency bands. Therefore band "C" must be aligned first, then band "B", then band "A".

Short Wave Band "C":

1. Connect the ground lead of the test oscillator to the receiver chassis. Connect a jumper wire between antenna block terminals "D" and "G", as for IF alignment. Connect the output lead of the test oscillator, in series with a 400 ohm resistor, to the "A" terminal of the antenna terminal block. Turn the Wave Band switch to position "C" and the Tone Control to position "1". During all of the alignment the receiver volume control should be turned all the way on and the output from the test oscillator kept at its lowest possible value.

2. Set the test oscillator to 14,000 kc and tune in its signal. Then adjust the short wave translator trimmer, C3, for maximum output meter reading. The locations of all of the trimmers are shown in the Location of Parts Illustration. The variable should be rocked a degree or two while making the adjustment. If two peaks are found at two different settings of C3, use the adjustment in which the trimmer is screwed further in (greater capacity).

Short Wave Band "B":

1. Turn the Wave Band switch to position "B". All other receiver connections and control settings remain the same as for band "C" alignment.

2. Set the test oscillator to 4500 kc and tune in its signal. Then peak the translator trimmer, C2, for maximum output meter reading. The variable should be rocked a degree or two during the adjustment. If two peaks can be obtained at two different settings of the trimmer, use the adjustment in which the trimmer is screwed further in (greater capacity).

Broadcast Band "A":

1. Remove the 400 ohm resistor that was connected in series with the test oscillator output lead, for alignment on the other two bands. Replace this resistor with a .00025 mfd mica condenser. Turn the Wave Band switch to the "A" position. Other connections and settings remain the same as for previous alignment.

2. Set the test oscillator to 1400 kc and tune in its signal. Then adjust the broadcast antenna and translator trimmers for maximum output meter reading. The antenna trimmer is the one on the middle section of the variable condenser. The broadcast translator trimmer, C1, is mounted on the translator coil as shown in the Location of Parts Illustration.

3. Set the test oscillator to 600 kc and tune in its signal. Then adjust the broadcast oscillator padding condenser, C8, for maximum output meter reading. The variable should be rocked a degree or two during the adjustment.

4. Repeat the 1400 kc adjustments and then the 600 kc adjustments for greater accuracy. Always keep the test oscillator at its lowest possible value.

5. Recheck the setting of band "C" translator trimmer, C3, at 14,000 kc.

Dial Calibration:

Set the test oscillator to 900 kc and tune in its signal, or tune in a 900 kc station. Then set the dial pointer to 900 kc without changing the setting of the variable.

Adjustment To Minimize Image Response:

1. Set the test oscillator to 1000 kc and tune in its signal. If the test oscillator output is calibrated it should be set to .1 volts. Leaving the receiver tuned to 1000 kc, change the test oscillator frequency until the image is heard. This will occur when the test oscillator is tuned to 1550 kc.

2. There is a yellow lead running from the wave switch to one side of the translator trimmer condenser, C3. The image response can be minimized by placement of this yellow lead.

SENSITIVITIES

The following are average sensitivities and they will serve as a guide in trouble shooting. In order to make the measurements a test oscillator having a calibrated attenuator must be used. The figures given are those required to obtain an output meter reading of 1.1 volts. Readings for the IF stage are to be made with a .1 mfd condenser, in series with the test oscillator output lead. Readings for the Broadcast band are with a .00025 mfd mica condenser, and for the Short Wave bands with a 400 ohm resistor in series with the test oscillator output lead, as used during the alignment procedure. The receiver volume control must be left on full.

6K7MG	IF Grid (175 kc) - 2000 uv.
6A8MG	Translator (175 kc) - 30 uv.
6A8MG	Translator (1000 kc, and with a .00025 mfd mica condenser in series with test oscillator output lead) - 35 uv.

Broadcast Band (To be measured with Tone Control in #1 position):

600 KC.	- 15 uv.
1000 KC.	- 20 uv.
1400 KC.	- 20 uv.

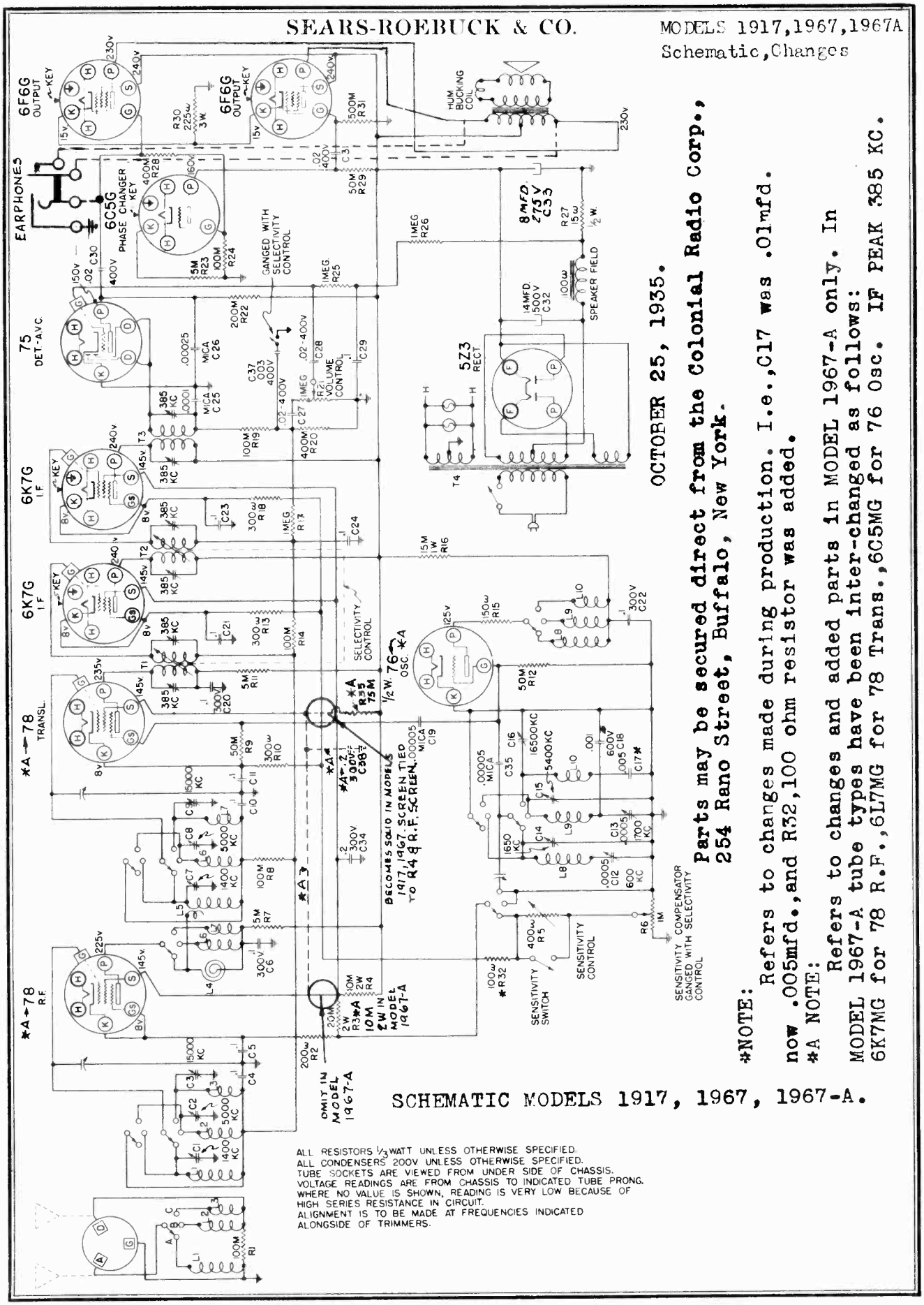
(Continued)

Band "B" (To be measured with Tone Control in #2 pos

1800 KC.	- 15 uv.
3000 KC.	- 12 uv.
4500 KC.	- 12 uv.

Band "C" (To be measured with Tone Control in #2 pos

6,000 KC.	- 35 uv.
10,000 KC.	- 15 uv.
14,000 KC.	- 5 uv.



MODELS 1917,1967,1967A
Chassis,Trimmers,Notes

SEARS-ROEBUCK & CO.

The Variable Selectivity And Tone Control:

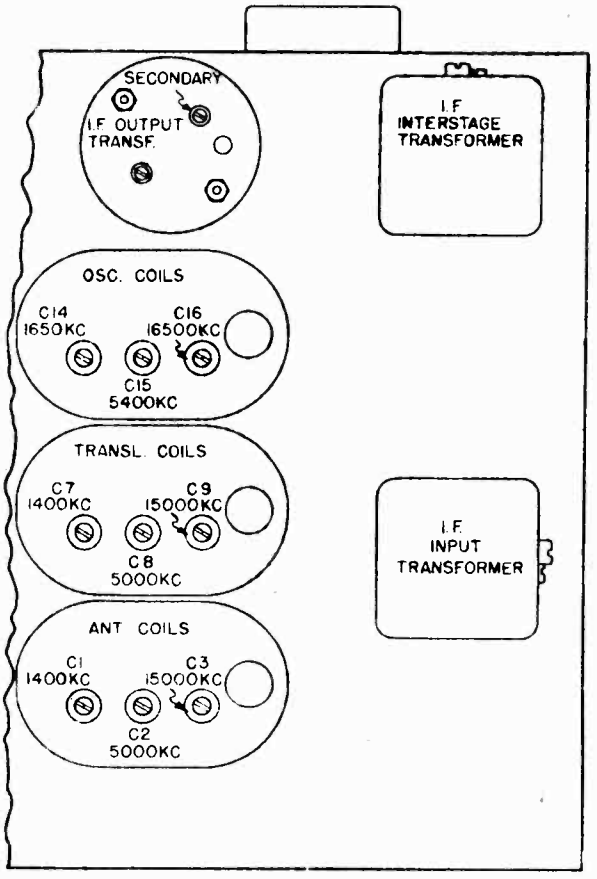
Earlier production used a bakelight cam for varying the coupling of the IF transformers. In sets using the bakelight cam it is necessary to turn the control all the way to the left (the sharpest position) before tuning in any broadcast station. For short wave reception the knob should be turned all the way to the left so that the numeral "1" comes opposite the marker pin.

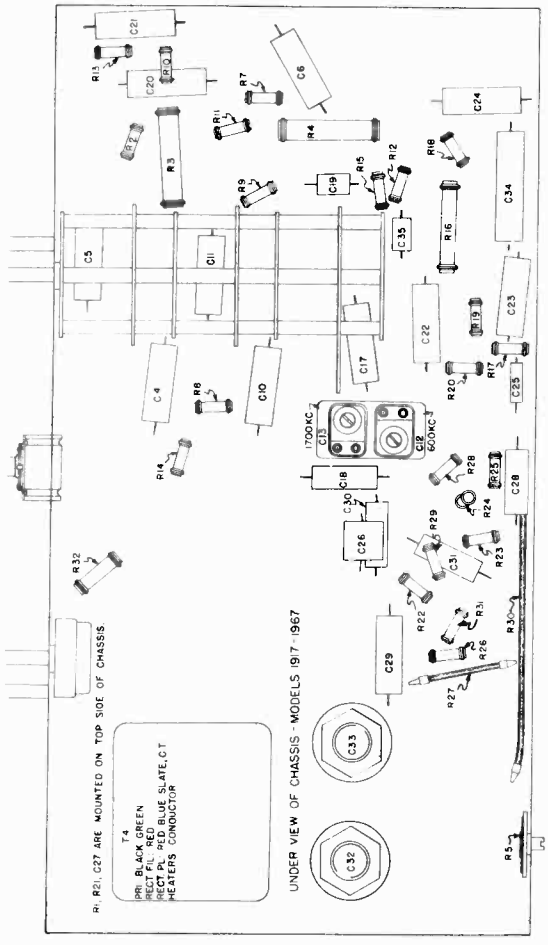
Later production used a metal rack and pinion for actuating the variable coupling of the IF transformers. In sets using the metal rack and pinion the Variable Selectivity and Tone Control knob may be left in the "P" position for simplified operation of the receiver. This position is an "average" one giving excellent tone quality and sufficient selectivity. However, to obtain the full range of adjustment possible with this control it must be operated the same as the bakelight cam type of control. That is, the control knob must be turned all the way to the left before tuning in any station and then turned to the point giving the desired tone after the station has been tuned in properly.

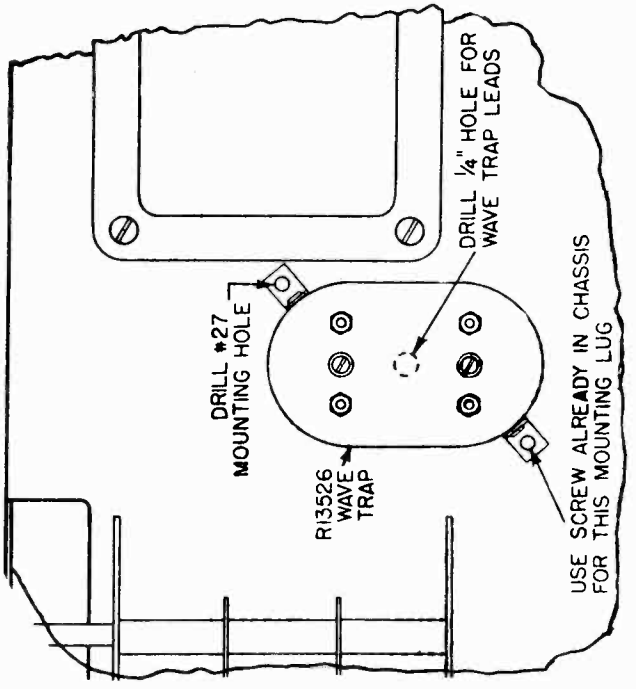
In some of these sets when the Variable Selectivity and Tone Control knob is turned all the way to the left an additional .003 mfd. condenser is switched into the circuit. This results in a still further deepening of the tone thereby increasing the tone control range provided by the Variable Selectivity and Tone Control knob.

The AVC Circuit:

The diode current of the 7E tube, flowing through the 100M ohm resistor, R19, creates a voltage drop across it. This voltage is applied to the control grids of the 7B and 6X70 tubes to provide AVC.







ALIGNMENT PROCEDURE

IF Alignment:

1. Connect the output meter (low scale) across the loud speaker voice coil. Turn the wave band switch to the broadcast position and the "On-Off" switch knob only far enough to turn the receiver on.

2. Turn the Variable Selectivity and Tone Control knob all the way to the left (sharpest position). Loosen the set screws holding the flexible cables that actuate the variable coupling of the IF transformers. Push the cables all the way into the tubes and tighten the set screws. Be sure the Variable Selectivity and Tone Control knob remains in its extreme clockwise position during the operation. Be careful when tightening the set screws that they are not screwed down so far that the cable wires are cut.

3. Connect the ground lead of the test oscillator, in series with .1 mfd. condenser, to the receiver chassis. Set the test oscillator to 38f kc.

4. Connect the "hot" lead of the test oscillator to the control grid of the 7S translator tube. With the Variable Selectivity and Tone Control knob turned all the way counter clockwise (sharpest position), adjust the IF output transformer for maximum output meter reading. This transformer is the round can unit mounted at the top rear of the chassis. The Volume Control of the receiver should be turned all the way on and the output of the test oscillator kept at its lowest possible value during the adjustment.

5. Leaving the receiver controls and the test oscillator connections the same as in the preceding paragraph, adjust the IF interstage transformer for maximum output meter reading. This transformer is the square can unit at the rear left of the chassis (as one faces the rear of the chassis).

6. Leaving all connections and controls as before, tune the IF input transformer for maximum output meter reading. This transformer is the square can unit at the front left of the chassis (as one faces the rear of the chassis).

7. Repeat operations #4, #5, #6 in the order named to insure accurate alignment. Always use the lowest possible output from the test oscillator to render the AVC action of the receiver inoperative and to insure precise alignment.

8. Leave the "hot" lead of the test oscillator connected to the control grid of the 7S translator tube and turn the Variable Selectivity and Tone Control knob all the way to the right (broadest position). Starting with the test oscillator adjusted to about 350 kc, slowly increase its frequency until it goes through resonance with the receiver and then on past resonance. It will be found that the output meter registers a peak as the test oscillator approaches resonance with the IF stages. The output meter reading decreases as the test oscillator goes through resonance and then increases again as the test oscillator frequency is increased beyond resonance. In other words, the resonance curve of the IF transformers, in the broad position, has a peak at either side and a hollow in the middle. These two peaks, as indicated on the output meter, should be equal in value. If they are not, tune the test oscillator to resonance with the weaker peak. Then adjust the IF output transformer secondary to increase the output meter reading. Only a slight adjustment is necessary. The location of the IF output transformer secondary adjustment is shown in the service illustration.

RF ALIGNMENT

During all of the alignment the Variable Selectivity and Tone Control should be turned all the way to the left (sharpest position). The "On-Off" switch should be turned only far enough to turn the receiver on. Connect the ground lead of the test oscillator, in series with a .1 mfd. condenser, to the receiver chassis. The output meter is to be connected across the loud speaker voice coil, as for IF alignment. The Volume Control of the receiver should be turned all the way on and the output from the test oscillator kept at its lowest possible value during all of the alignment procedure. Fully mesh the variable condenser and see that the Station Selector dial pointer is horizontal. The Band Spread pointer should point straight up.

Broadcast (A) Band:

1. Turn the wave band switch to the "A" position. Connect the "hot" lead of the test oscillator, in series with a .00025 mfd. condenser, to the terminal marked "A" on the antenna terminal block at the rear of the chassis.

2. Set the test oscillator to 1650 kc. Open the variable condenser all the way and tune in the test oscillator signal. Adjust the broadcast oscillator trimmer condenser, C14, for maximum output meter reading. The locations of all of the trimmers are shown in the Service Illustrations. It may be found that two peaks can be obtained at two different settings of the trimmer. Use the one in which the trimmer is screwed further out (lesser capacity).

3. Set the test oscillator to 1400 kc and tune in its signal. Then adjust the antenna and translator trimmer condensers, C1 and C7. The variable condenser should be rocked a degree or two while making this adjustment. If two peaks can be obtained, use the adjustment in which the trimmers are screwed further in (greater capacity).

4. Set the test oscillator to 600 kc and tune in its signal. Then adjust the broadcast oscillator padder, C12, for maximum output. This padder is mounted under the chassis. Rock the condenser back and forth a degree or two while making the adjustment.

5. Repeat the 1650 kc and 1400 kc adjustments for greater accuracy. Always keep the output from the test oscillator at its lowest possible value in order to render the AVC action of the receiver inoperative and to insure precise alignment.

Short Wave (B) Band:

1. Turn the wave band switch to the "B" position. Leave the "hot" lead of the test oscillator connected, in series with a .00025 mfd. condenser, to the "A" terminal of the antenna terminal block, as for BROADCAST alignment.

2. Set the test oscillator to 5400 kc. Open the variable condenser all the way and adjust the oscillator trimmer, C15, for maximum output meter reading. It may be found that two peaks can be obtained at two different settings of the trimmer. Use the one in which the trimmer is screwed further out (lesser capacity).

3. Set the test oscillator to 5000 kc and tune in its signal. Then adjust the antenna and translator trimmers, C2 and C8, for maximum output meter reading. The variable should be rocked during the adjustment. If two peaks can be obtained, use the adjustment in which the trimmers are screwed further in (greater capacity).

4. Set the test oscillator to 1700 kc and tune in its signal. Then adjust the padding condenser, C13, for maximum output meter reading. The variable condenser is mounted under the chassis.

Short Wave (C) Band:

1. Connect the "hot" lead of the test oscillator, in series with a 400 ohm resistor, to the "A" terminal on the antenna terminal block at the rear of the chassis. This 400 ohm resistor replaces the .00025 mfd. condenser used for the other two bands.

2. Set the test oscillator to 16500kc. Open the variable condenser plates all the way and adjust the oscilletor trimmer, C16, for maximum output meter reading. It may be found that two peaks can be obtained at two different settings of the trimmer. Use the one in which the trimmer is screwed further out (lesser capacity).

3. Set the test oscillator to 15000 kc and tune in its signal. Then adjust the antenna and translator trimmers, C3 and C9, for maximum output. The variable should be rocked during the adjustment. If two peaks can be obtained use the adjustment in which the trimmers are screwed further in (greater capacity).

Adjustment of The Sensitivity Control At The Rear Of The Receiver:

There is a Sensitivity Control adjustment at the rear of the receiver. This control determines the sensitivity of the receiver when the Sensitivity Control knob at the front of the cabinet is in the "NORMAL" position. When the Sensitivity Control knob is in the "HIGH" position the maximum possible sensitivity of the receiver is obtained regardless of the setting of the control at the rear of the chassis. The adjustment is correctly set for average conditions and ordinarily should not be touched. However, if the receiver is installed in an electrically noisy location it may be desirable to decrease the sensitivity to prevent between-station noise as the receiver is tuned from station to station. This adjustment can also be used to increase the sensitivity of the receiver, when the front Sensitivity Control knob is in the "NORMAL" position, for locations remote from broadcasting stations. However, this should be done only if there is no difficulty with between-station noise. The maximum sensitivity of the receiver can always be had, regardless of the setting of the Sensitivity Control adjustment at the rear of the chassis, by turning the front control knob to the "HIGH" position. To make the adjustment proceed as follows:

Turn the front Sensitivity Control knob to the "NORMAL" position. Turn the Variable Selectivity and Tone Control knob so that the numeral "1" is opposite the marker pin and tune in some broadcast station from which satisfactory reception can be had. Adjust the Volume Control to the level ordinarily used. Leaving all other controls untouched turn the Station Selector knob to some point where no station will be heard. If one part of the scale seems noisier than the rest of the scale turn the pointer to this noisier position. It will be found that turning the screw driver adjustment at the rear of the chassis, near the speaker socket, either increases or decreases the noise, depending upon which direction the adjustment is turned. Turn the adjustment to that point where the noise is reduced enough to be no objectionable. Do not turn the control further than necessary to eliminate the objectionable noise.

Installing A Jack For The Use Of Earphones:

A hole is provided in the rear of the chassis, near the speaker socket, for installing an earphone jack when desired by the customer. This hole is plugged with a brass insert that can be removed. The connections are shown on SCHEMATIC IN DOTTED LINES.

ELIMINATING CODE INTERFERENCE FROM AIRPORT BEACONS

Under certain conditions code interference from airport beacons may be experienced. These conditions are:

1. When the receiver is located very near to the airport.

2. When the beacon transmitter frequency is near the IF frequency of the receiver.

This type of interference can be identified through the fact that it occurs only when the Wave band switch of the receiver is in the BROADCAST position and also that it occurs at all settings of the Station Selector pointer.

When this type of interference is encountered it can be eliminated by adding a wave-trap to the receiver as described below. (Part #R13526 - $2.10 each.)

1. Mount the wave-trap as shown in the illustration. It will be necessary to drill a hole for the mounting screw next to the power transformer. There is a screw already in the chassis that can be used for the other mounting lug of the wave-trap. It also will be necessary to drill a 1/4" hole in the chassis, under the wave-trap, for the wave-trap leads.

2. Remove the coil shield nearest the front of the chassis.

3. There is a green wire running from the broadcast antenna coil primary to the wave switch. Unsolder this wire from the wave switch.

4. Solder the blue lead of the wave-trap to the antenna coil primary lead which originally ran to the wave switch. A piece of spaghetti or tape should be placed over the soldered connection.

5. Solder the yellow lead of the wave-trap to the wave switch terminal from which the original antenna coil lead was removed. It may be necessary to splice on an additional piece of wire if the yellow lead does not reach to the wave switch.

6. Connect the green lead of the wave-trap to ground (chassis).

7. The wave-trap is pre-tuned to the IF frequency of the receiver. Therefore, it is not necessary to make any tuning adjustments after it is installed. Neither is it necessary to change any of the alignment adjustments of the receiver.

The Dual Ratio Condenser Drive Shaft:

There are two positions in which the Station Selector knob can be put before turning it. When the knob is pushed in, the condenser drive ratio is approximately 17 to 1. When the knob is pulled out, the dial ratio becomes approximately 70 to 1, making possible very precise tuning.

The mechanism proper is of the planetary drive type, using ball bearings in contact with a cone shaped retainer. Do not attempt to take the mechanism apart. Should any difficulty with slippage occur, it can be corrected as described in the following paragraph. Slippage that occurs when the condenser reaches its limit of rotation in either direction is normal. However, if there is slippage at any other part of the condenser travel, proceed as follows:

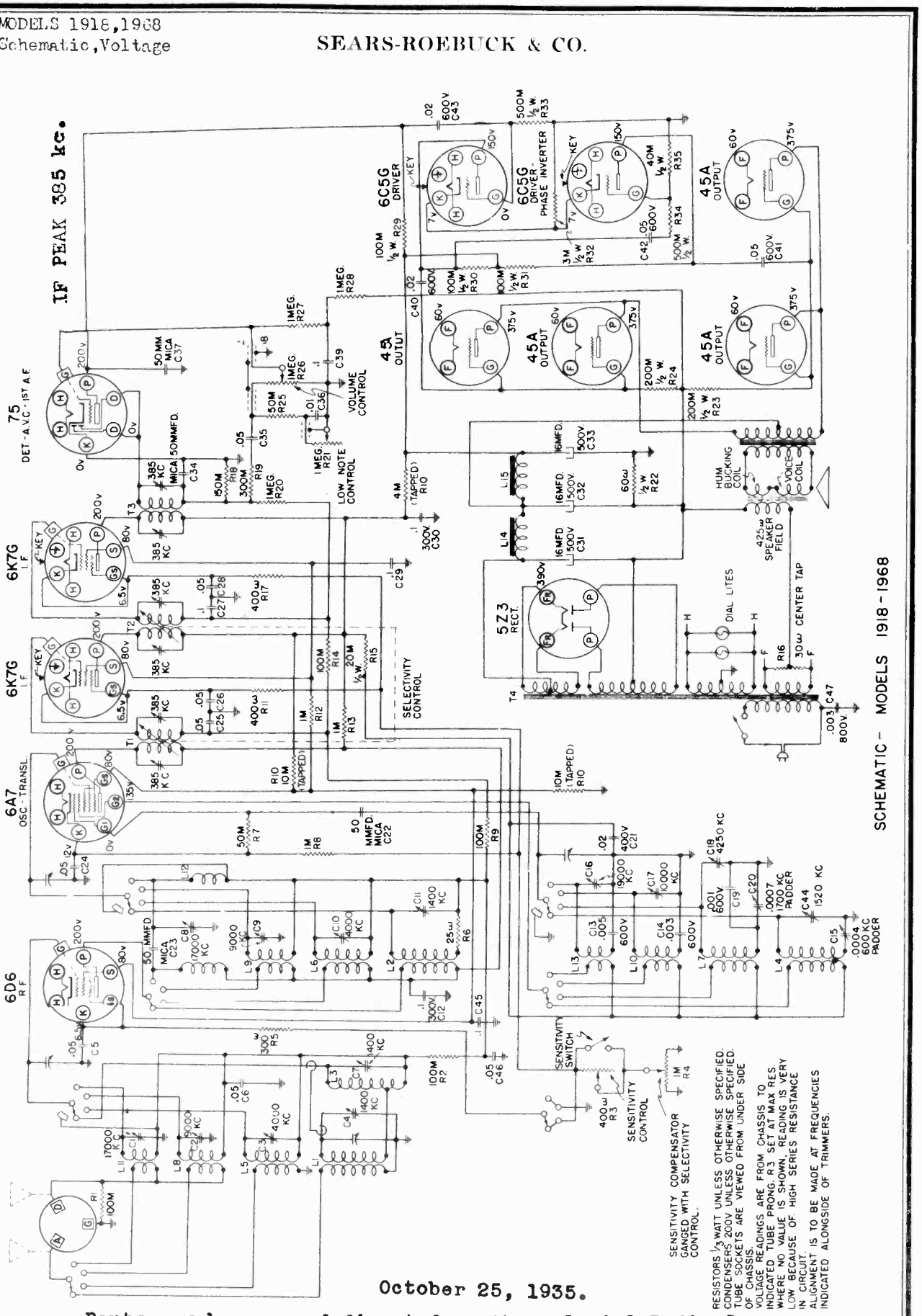
Determine whether or not the shaft end (11) is turning. See the illustration. If the shaft end turns but the gears (8 and 9) do not, remove the U shaped tension washer (10) and bend it to increase its curvature and tension. Then replace it. Note that the convex side of the washer should face the shaft end and the concave side should face the gears. It is advisable to put a drop of solder across the open end of the U washer to prevent all possibility of its working off the shaft.

If the shaft end does not turn, the slippage is occuring in the planetary drive mechanism. This will occur only when the knob is in its "out" or slow position. In this case, squeeze the tabs (6) slightly, with a pair of pliers to increase the pressure. Do not squeeze them too much, or the drive will become stiff and hard to turn.

When placing the knob on its shaft, be careful not to use force in pressing it on or the splines (3 and 4) will become burred. The floating sleeve (2) must be centered on the shaft in order to permit the knob to slip over it. If the knob does not go on easily, do not force it but try it several times, until the sleeve falls into such a position that it allows the knob to slip on. Care must be taken when tightening the set screw that it is not tightened down on the splines, but comes in the space between the two splines. This is best done by removing the set screw and positioning the knob so that the set screw hole comes over the sleeve. between the splines. Then insert and tighten the set screw.

MODELS 1918,1968
Schematic,Voltage

SEARS-ROEBUCK & CO.



October 25, 1935.

Parts may be secured direct from the Colonial Radio Corp., 254 Rano Street, Buffalo, New York.

SILVERTONE MODELS 1918, 1968

ELIMINATING CODE INTERFERENCE FROM AIRPORT BEACONS

Under certain conditions code interference from airport beacons may be experienced. These conditions are:

1. When the receiver is located very near to the airport.

2. When the beacon transmitter frequency is near the IF frequency of the receiver.

This type of interference can be identified through the fact that it occurs only when the Wave Band switch of the receiver is in the BROADCAST position and also that it occu s at all settings of the Station Selector pointer.

When this type of interference is encountered it can be eliminated by adding a wave-trap to the receiver as described below. (Part #R13526 - $2.10 each.)

1. Mount the wave-trap at the back of the chassis as shown in the illustration. In addition to the holes for the mounting screws it will be necessary to drill a 1/4" hole under the wave-trap for the wave-trap leads.

2. Remove the round shield covering the Broadcast Antenna coil. This shield is at the top front of the chassis, left of the variable condenser.

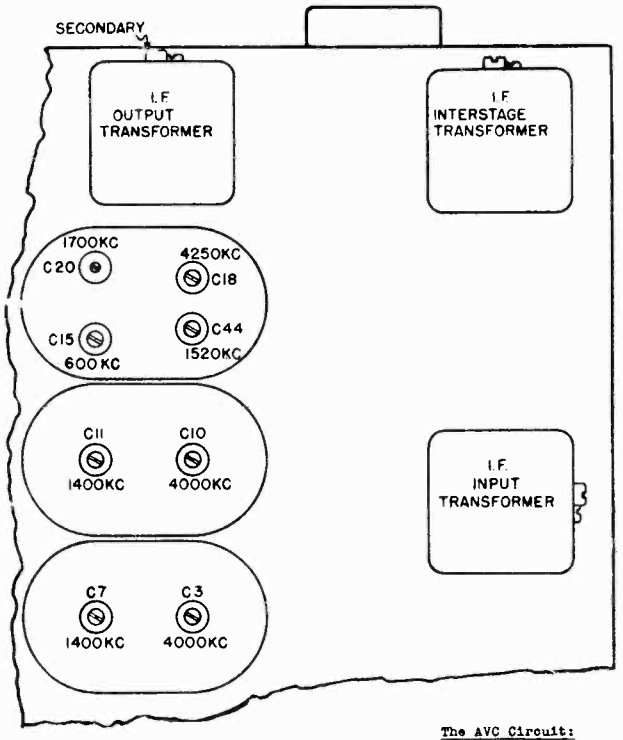
3. There is a green lead running from the antenna coil primary to the wave switch. (This lead comes from the front right hand lug of the antenna coil.) Remove this wire from the wave switch and from the coil.

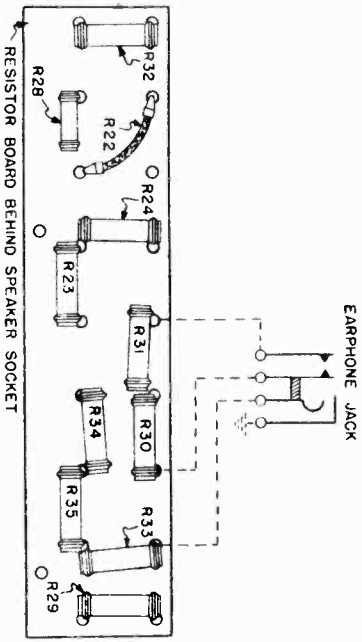
4. Solder the blue lead of the wave-trap to the broadcast antenna coil primary lug from which the original wire was removed in operation #3.

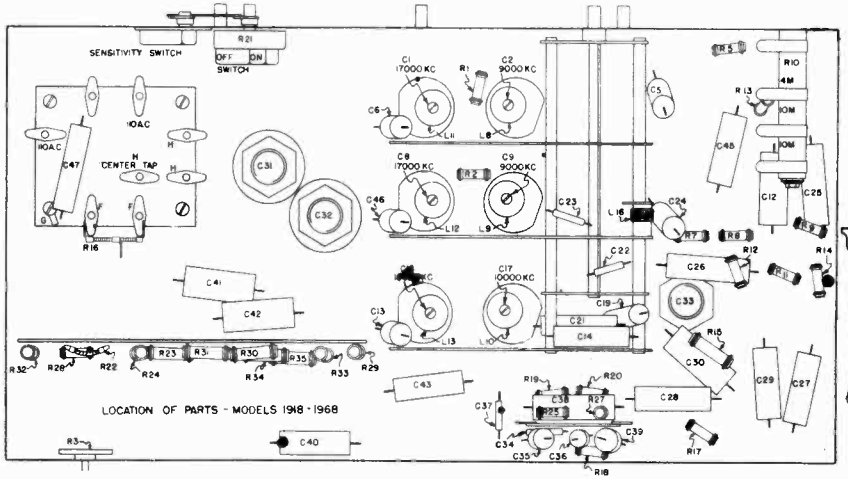
5. Solder the yellow lead of the wave-trap to the wave switch terminal from which the original wire was removed in operation #3. If the wave-trap leads are not long enough, solder additional lengths of wire to them.

6. Connect the green lead of the wave-trap to ground (chassis).

7. The wave-trap is pre-tuned to the IF frequency of the receiver. Therefore, it is not necessary to make any tuning adjustments after it is installed. Neither is it necessary to change any of the alignment adjustments of the receiver.





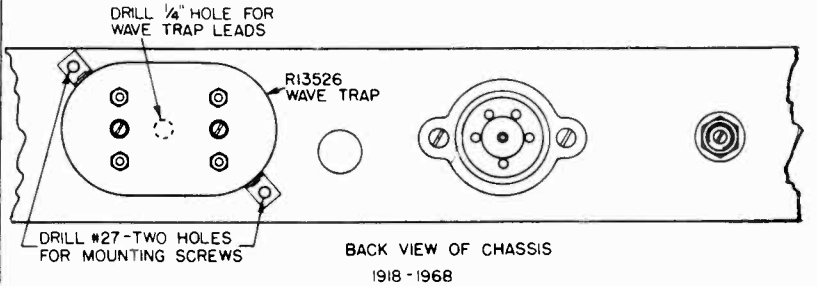


The AVC Circuit:

The diode current of the 75 tube, flowing through the 150M ohms of R18, creates a voltage drop across this resistor. This voltage is applied to the control grid of the 6D6, 6A7 and 6K7G tubes to provide AVC. R20, R14, R9 and R2 are filter resistors to isolate the grid circuits of each stage.

The Audio Circuit:

The output of the triode section of the 75 tube is used to drive the 6C5G tubes which act as a push pull driver stage. These in turn drive the 4-45A's which are connected in parallel push pull.



ALIGNMENT PROCEDURE

IF Alignment:

1. Turn the receiver Volume Control all the way on, the Sensitivity Control lever to the right and the lower left knob turned only far enough to switch the receiver on. Connect a wire between terminals "D" and "G" on the antenna terminal block at the rear of the chassis. Turn the wave band switch knob to the BROADCAST, "B", position.

2. Turn the Variable Selectivity and Tone Control knob all the way to the right (sharpest position). Loosen the set screws holding the flexible cables that actuate the variable coupling of the IF transformers. Push the cables all the way into the tubes and retighten the set screws. Be sure the Variable Selectivity and Tone Control knob remains in its extreme clockwise position during the operation. Be careful when tightening the set screws that they are not screwed down so far that the cable wires are cut. The Variable Selectivity and Tone Control Knob must be left at its sharpest position (all the way left) during all of the alignment procedure unless otherwise stated in the procedure.

3. Connect the ground lead of the test oscillator, in series with a .1 mfd. condenser, to the receiver chassis. Set the test oscillator to 385 kc.

4. Connect the "hot" lead of the test oscillator to the control grid of the 6K7G second IF tube. This is the tube that is next to the type 75 tube. Adjust the IF output transformer for maximum output meter reading. The locations of all of the tuning adjustments are shown in the Service Illustrations. Be sure that the Volume Control of the receiver is turned all the way on during all adjustments and that the output of the test oscillator is kept at its lowest possible value.

5. Connect the "hot" lead of the test oscillator to the control grid of the 6K7G first IF tube and adjust the IF interstage transformer. As before, the output from the test oscillator must be kept at its lowest possible value in order to render the AVC ineffective and to insure precise alignment.

6. Connect the "hot" lead of the test oscillator to the control grid cap of the 6A7 oscillator-translator tube and adjust the IF input transformer for maximum output meter reading.

7. Carefully repeat operations #4, #5, and #6 for greater accuracy. As the sensitivity of the receiver is brought up by alignment, the output from the test oscillator should be decreased so that it is always kept at the lowest value that will give a satisfactory reading on the output meter.

8. Connect the "hot" lead of the test oscillator to the control grid cap of the 6A7 oscillator-translator tube and turn the Variable Selectivity and Tone Control knob all the way to the right (broadest position). Starting with the test oscillator adjusted to about 350 kc, slowly increase its frequency until it goes through resonance with the receiver (385 kc) and then on past resonance. It will be found that the output meter registers a peak as the test oscillator approaches resonance with the IF stages. The output meter reading decreases as the test oscillator goes through resonance and then increases again as the test oscillator frequency is increase beyond resonance. In other words, the resonance curve of the IF transformers, in the broad position, has a peak at either side and a hollow in the middle. These two peaks, as indicated on the output meter, should be equal in value. If they are not, tune the test oscillator to resonance with the weaker peak. Then, adjust the secondary of the IF output transformer (the upper of the two tuning adjustments) to increase the output meter reading. Only a very slight adjustment is necessary. Recheck the relative readings of the two peaks by tuning the test oscillator through resonance with the receiver, as before. When properly adjusted the two peaks will give equal output meter readings.

9. Leave the "hot" lead of the test oscillator connected to the control grid cap of the 6A7 oscillator-translator tube. With the test oscillator set accurately at 385 kc and the Variable Selectivity and Tone Control all the way to the left (sharp) position, note the output meter reading. Then, turn the Variable Selectivity and Tone Control knob all the way to the right and note the output meter reading. Use as low an output from the test oscillator as is consistent with a satisfactory output meter reading. There should be little or no difference in output meter readings for the two positions of the Variable Selectivity and Tone Control knob. Any great difference indicates improper alignment or improper setting of the IF coupling control cables.

RF ALIGNMENT

Preliminary:

1. Turn the receiver Volume Control all the way on; the Sensitivity Control lever to the right and the lower left knob turned only far enough to switch the receiver on. Connect a wire between terminals "D" and "G" on the antenna terminal block at the rear of the chassis. Keep the output from the test oscillator at its lowest possible value during all of the alignment. Fully mesh the variable condenser and see that the Station Selector dial pointer is horizontal. The band spread pointer should point straight up.

Broadcast (A) Band:

1. Turn the Wave Band Switch knob to the "A" position. Connect the "hot" lead of the test oscillator, in series with a .00025 mfd. condenser, to the terminal marked "A" on the antenna terminal block at the rear of the chassis.

2. Set the test oscillator to 1520 kc and open the variable condenser plates all the way. Adjust the broadcast oscillator trimmer condenser, C44, for maximum output meter reading. It may be found that two peaks can be obtained at two different settings of the trimmer. Use the one in which the trimmer is screwed further out (lesser capacity).

3. Connect a .0001 mfd. mica condenser from the stator of the RF section of the variable to ground. The RF section is the one second from the dial end of the condenser.

4. Set the test oscillator to 1400 kc and tune in its signal. Then, adjust the broadcast antenna trimmer, C4, for maximum output meter reading. This trimmer is the one on the variable condenser section nearest the dial. The variable should be rocked a degree or two during the adjustment. If two peaks can be obtained use the adjustment in which the trimmer is screwed further in (greater capacity).

5. Remove the .0001 mfd. mica condenser that was used in the preceding operation.

7. Set the test oscillator to 1400 kc and tune in its signal. Then, adjust the RF and translator trimmers, C7 and C11, for maximum output meter reading. The variable should be rocked a degree or two during the adjustment. If two peaks can be obtained, use the adjustment in which the trimmers are screwed further in (greater capacity).

8. Set the test oscillator to 600 kc and tune in its signal. Then, adjust the broadcast oscillator padder, C15, for maximum output meter reading. The variable should be rocked a degree or two during the adjustment.

10. Repeat operations #2 to #9 for greater accuracy. Always keep the test oscillator at its lowest possible value and the Volume Control of the receiver on full.

Short Wave (B) Band:

1. Turn the Wave Band Switch knob to the "B" position. Replace the .00025 mfd. condenser, that was used in the "hot" lead of the test oscillator for the BROADCAST band, with a 400 ohm resistor.

2. Screw the oscillator padding condenser, C20, down tightly.

3. Set the test oscillator to 4250 kc and open the variable condenser plates all the way. Then, adjust the oscillator trimmer, C18, for maximum output meter reading. It may be found that two peaks can be obtained at two different settings of the trimmer. Use the one in which the trimmer is screwed further out (lesser capacity).

4. Set the test oscillator to 4000 kc and tune in its signal. Then, adjust the RF and translator trimmers, C3 and C10, for maximum output meter reading. The variable should be rocked a degree or two during the adjustment. If two peaks can be obtained, use the adjustment in which the trimmers are screwed further in (greater capacity).

5. Set the test oscillator to 1700 kc and tune in its signal. Then, adjust the oscillator padding condenser, C20, for maximum output meter reading. The variable should be rocked a degree or two during the adjustment to insure proper peaking.

6. Repeat operations #3, #4, and #5. Always keep the test oscillator output at its lowest possible value.

Short Wave (C) Band:

1. Leave the "hot" lead of the test oscillator connected to the receiver through a 400 ohm resistor as for "B" band alignment

2. Turn the wave band switch knob to the "C" position. Set the test oscillator to 10,000 kc. Open the variable condenser plates all the way and adjust the oscillator trimmer, C17, for maximum output meter reading. If two peaks can be obtained at two different settings of the trimmer, use the adjustment in which the trimmer is screwed further out (lesser capacity).

3. Set the test oscillator to 9000 kc and tune in its signal. Then, adjust the RF and translator trimmers, C2 and C9, for maximum output meter reading. The variable should be rocked during the adjustment. If two peaks can be obtained at two different settings of the trimmers use the adjustment in which the trimmers are screwed further in (greater capacity).

4. Set the test oscillator to 4500 kc and tune in its signal. If necessary, shift turns on L8 and L9. If turns are shifted it will be necessary to repeat operation #3.

Short Wave (D) Band:

1. Leave the test oscillator connected as for "C" band alignment. Turn the Wave Band Switch knob to the "D" position.

2. Set the test oscillator to 19,000 kc. Open the variable condenser plates all the way and adjust the oscillator trimmer, C16, for maximum output meter reading. If two peaks can be obtained at two different settings of the trimmer, use the adjustment in which the trimmer is screwed further out (less capacity).

3. If the calibration of the test oscillator is accurate, set it to exactly 18,000 kc. If the calibration cannot be depended upon, tune in an 18,000 kc station. (This step in the procedure is for the purpose of accurately setting the calibration. If the test oscillator calibration cannot be depended upon and if no 18,000 kc station can be tuned in, this step in the procedure should be omitted). With an 18,000 kc signal tuned in and the dial pointer set to 18,000 kc, readjust C16, if necessary, to secure maximum output meter reading.

4. Set the test oscillator to 9000 kc and tune in its signal. If the dial calibration is off more than one division, shift the turns on the oscillator coil, L13, to make the dial pointer come to its correct dial reading. If it is found necessary to shift turns, operation #3 should be repeated.

5. Set the test oscillator to 17,000 kc and tune in its signal. Then, adjust the RF and translator trimmers, C1 and C8, for maximum output meter reading. The variable should be rocked during the adjustment. If two peaks can be obtained at two different settings of the trimmers, use the adjustment in which the trimmers are screwed further in (greater capacity).

6. Set the test oscillator to 9000 kc and adjust the turns of L11 and L12, if necessary. The use of a "Tuning Wand" is of great help in determining whether shifting of turns is necessary. If it is found necessary, operation #5 must be repeated.

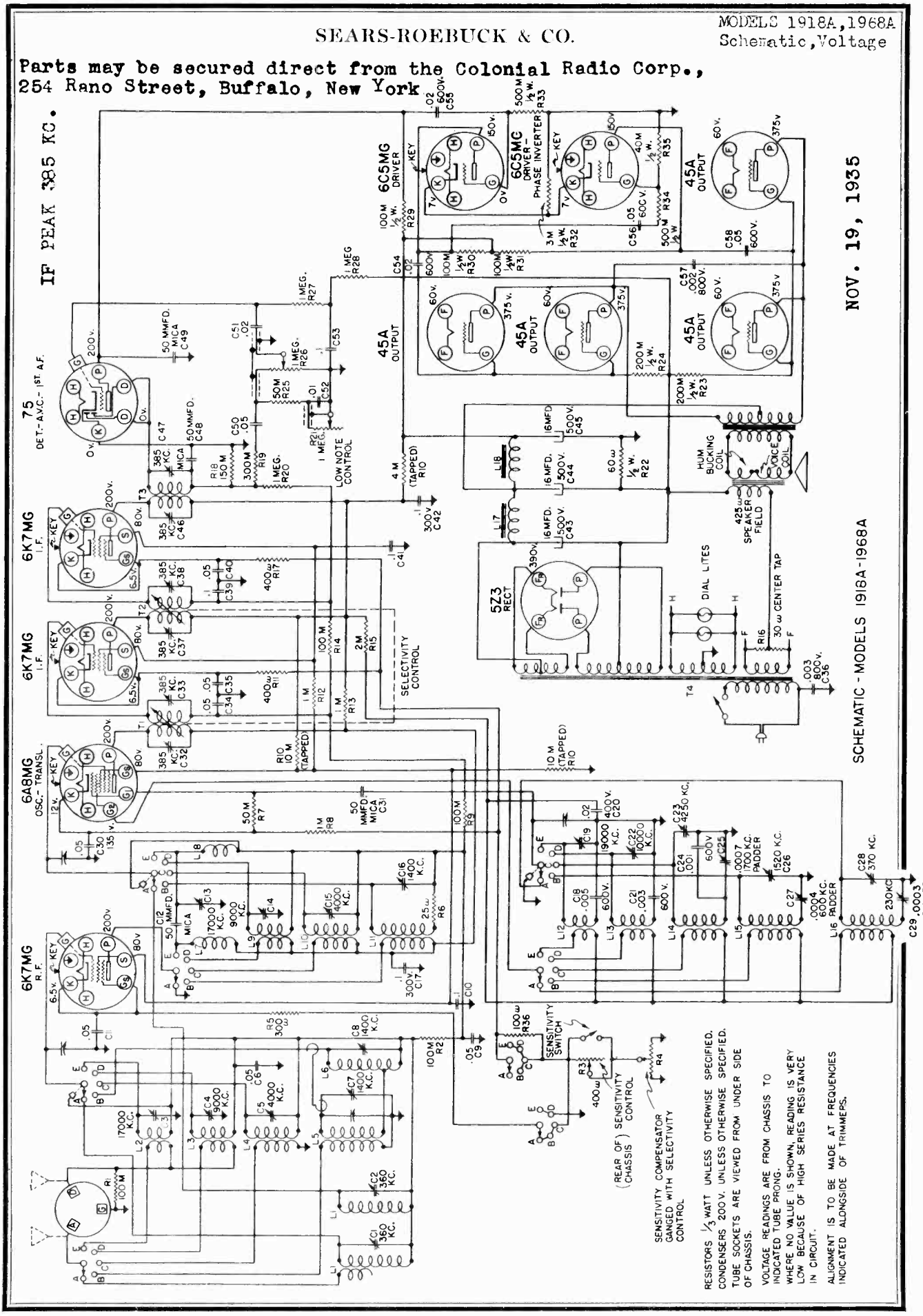
Overall Test:

Connect the test oscillator to the receiver through a .00025 mfd. condenser as for BROADCAST (A) band alignment. Set the test oscillator to 600 kc and tune in its signal with the Variable Selectivity and Tone Control in the sharp position. Leave the Station Selector at 600 kc and turn the Variable Selectivity and Tone Control to the broad position. Change the test oscillator frequency to 590 kc. Then, slowly increase the frequency of the test oscillator until it goes through resonance (600 kc) with the receiver and on beyond resonance to about 620 kc. It will be found that the output meter registers a peak as the test oscillator approaches resonance (600 kc). The meter reading then decreases as the test oscillator goes through resonance and then increases again as the test oscillator frequency is increased beyond resonance. Care must be used in making these observations since the two peaks lie quite close together. The two peaks as indicated on the output meter should be equal in value. If they are not, tune the test oscillator to resonance with the weaker peak. Then, adjust the broadcast oscillator padder, C15, to increase the reading of the weaker peak. Only a very slight adjustment should be necessary. When properly adjusted the two peaks should give equal output meter readings. If any great adjustment of C15 seems necessary it is an indication that alignment has not been properly made.

SEARS-ROEBUCK & CO.

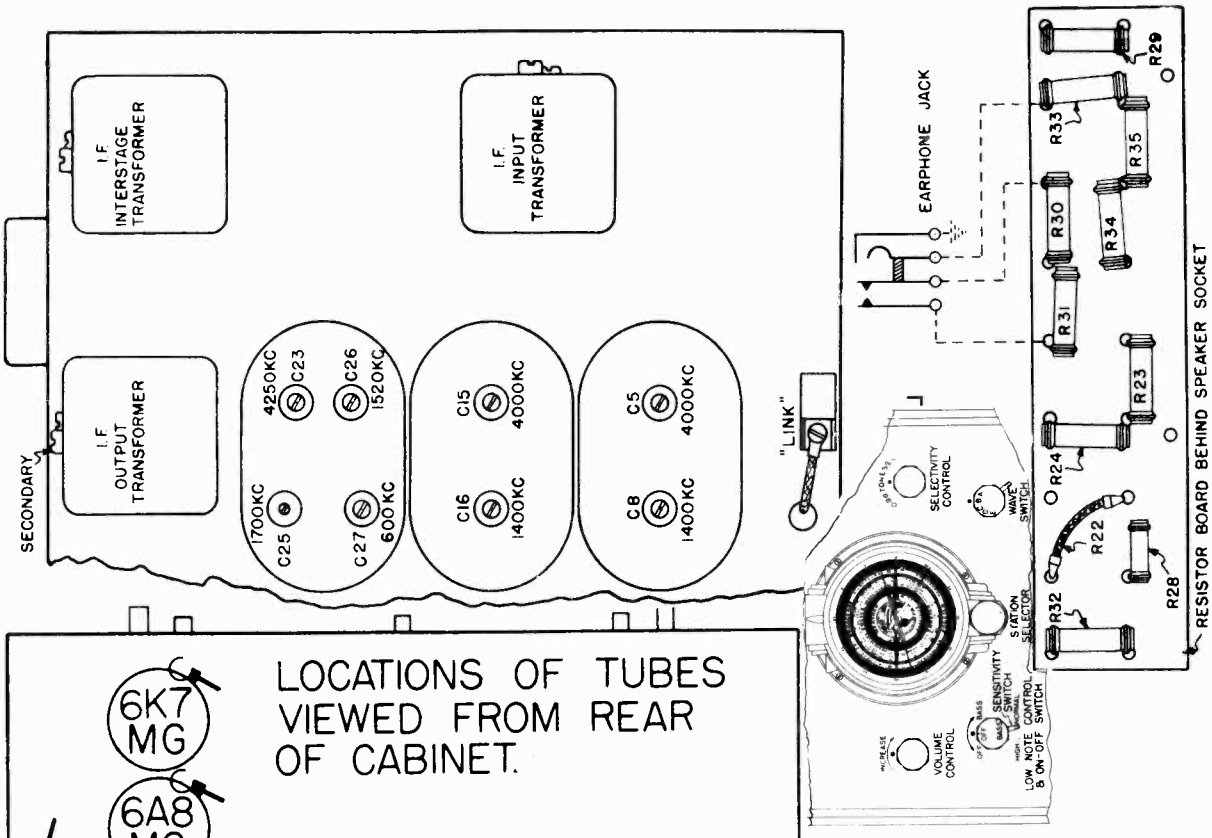
MODELS 1918A, 1968A
Schematic, Voltage

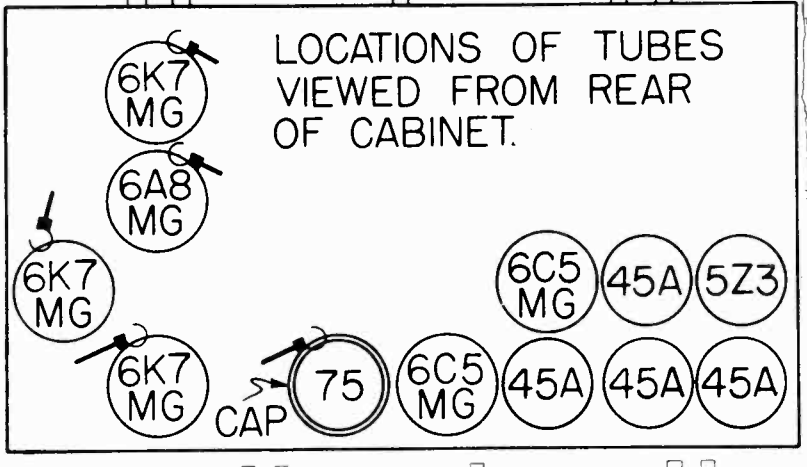
Parts may be secured direct from the Colonial Radio Corp., 254 Rano Street, Buffalo, New York

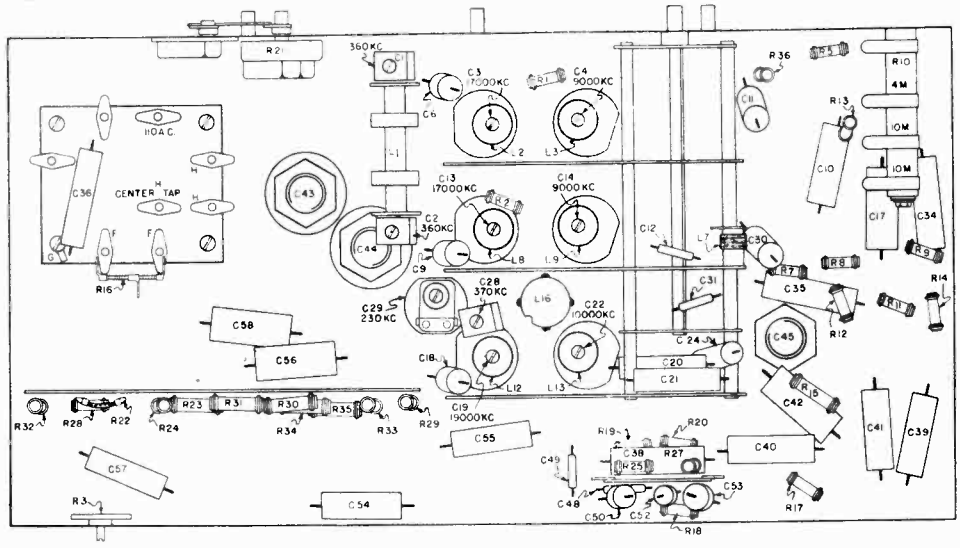


MODELS 1918A, 1968A
Chassis, Trimmers
Note

SEARS-ROEBUCK & CO.







LOCATION OF PARTS - MODELS 1918A-1968A

Adjustment Of The Sensitivity Control At The Rear Of The Receiver:

There is a Sensitivity Control adjustment at the rear of the receiver. This control determines the sensitivity of the receiver when the Sensitivity Control lever at the front of the cabinet is in the "NORMAL" position (lever to the right). When the Sensitivity Control lever is in the "HIGH" position (lever to the left) the maximum possible sensitivity of the receiver is obtained regardless of the setting of the control at the rear of the chassis. The adjustment is correctly set for "average" conditions and ordinarily should not be touched. However, if the receiver is installed in an electrically noisy location it may be desirable to decrease the sensitivity to prevent station noise as the receiver is tuned from station to station. This adjustment also can be used to increase the sensitivity of the receiver with the front control

SEARS-ROEBUCK & CO.

MODELS 1918A, 1968A
Alignment

ALIGNMENT PROCEDURE

IF Alignment:

1. Turn the receiver Volume Control all the way on, the Sensitivity Control lever to the right and the lower left knob turned only far enough to switch the receiver on. Connect a wire between terminals "D" and "G" on the antenna terminal block at the rear of the chassis. Turn the wave band switch knob to the BROADCAST, "B", position.

2. Turn the Variable Selectivity and Tone Control knob all the way to the right (broadest position). Loosen the set screws holding the flexible cables that actuate the variable coupling of the IF transformers. Push the cables all the way into the tubes and retighten the set screws. Be sure the Variable Selectivity and Tone Control knob remains in its extreme clockwise position during the operation. Be careful when tightening the set screws that they are not screwed down so far that the cable wires are cut. The Variable Selectivity and Tone Control knob must be left at its sharpest position (all the way left) during all of the alignment procedure unless otherwise stated in the procedure.

3. Connect the ground lead of the test oscillator, in series with a .1 mfd condenser, to the receiver chassis. Set the test oscillator to 385 kc.

4. Connect the output lead of the test oscillator to the control grid of the 6K7MG second IF tube. This is the tube that is next to the type 76 tube. Adjust the IF output transformer for maximum output meter reading. The locations of all of the tuning adjustments are shown in the Service Illustratione. Be sure that the Volume Control of the receiver is turned all the way on during all adjustments and that the output of the test oscillator is kept at its lowest possible value.

5. Connect the output lead of the test oscillator to the control grid of the 6K7MG first IF tube and adjust the IF interstage transformer. As before, the output from the test oscillator must be kept at its lowest possible value in order to render the AVC ineffective and to insure precise alignment.

6. Connect the output lead of the test oscillator to the control grid cap of the 6A8MG oscillator-translator tube and adjust the IF input transformer for maximum output meter reading.

7. Carefully repeat operations #4, #5, and #6 for greater accuracy. As the sensitivity of the receiver is brought up by alignment, the output from the test oscillator should be decreased so that it is always kept at the lowest value that will give a satisfactory reading on the output meter.

8. Connect the output lead of the test oscillator to the control grid cap of the 6A8MG oscillator-translator tube. With the test oscillator set accurately at 385 kc and the Variable Selectivity and Tone Control all the way to the left (sharp) position, note the output meter reading. Then, turn the Variable Selectivity and Tone Control knob all the way to the right and note the output meter reading. Use as low an output from the test oscillator as is consistent with a satisfactory output meter reading. There should be little or no difference in output meter readings for the two positions of the Variable Selectivity and Tone Control knob. Any great difference indicates improper alignment or improper setting of the IF coupling control cables.

RF ALIGNMENT

Preliminary:

1. Turn the receiver Volume Control all the way on; the Sensitivity Control lever to the right and the lower left knob turned only far enough to switch the receiver on. Connect a wire between terminals "D" and "G" on the antenna terminal block at the rear of the chassis. Keep the output from the test oscillator at its lowest possible value during all of the alignment. All adjustments of trimmers should be made with the bottom chassis plate on.

Broadcast (B) Band:

1. Turn the Wave Band Switch to the "B" position. Connect the output lead of the test oscillator, in series with a .00025 mfd mica condenser, to the terminal marked, "A", on the antenna terminal block at the rear of the chassis.

2. Set the test oscillator to 1520 kc and open the variable condenser plates all the way. Adjust the broadcast oscillator trimmer condenser, C26, for maximum output meter reading.

3. Connect a .0001 mfd mica condenser from the stator of the RF section of the variable to ground. The RF section is the one second from the dial end of the condenser.

4. Set the test oscillator to 1400 kc and tune in its signal Then adjust the broadcast antenna trimmer, C7, for maximum output meter reading. This trimmer is the one on the variable condenser section nearest the dial.

5. Remove the .0001 mfd mica condenser that was used in the preceeding operation.

6. There is a "link" connection, mounted at the bottom of the Variable Selectivity control, as shown in the Service Illustration. Remove the screw and open the link connection before preceeding with the next operation, #7.

7. Leave the test oscillator at 1400 kc and tune in its signal. Then adjust the RF and translator trimmers, C8 and C16, for maximum output meter reading.

8. Close the link connection that was opened in operation #6.

9. Leave the receiver tuned accurately to 1400 kc and set the dial pointer to 1400 kc. The pointer is merely held by friction and can be moved without turning the variable condenser plates.

10. Set the test oscillator to 600 kc and tune in its signal. Then adjust the Broadcast oscillator padder, C27, for maximum output meter reading. The variable should be rocked a degree or two during the adjustment.

11. Repeat operations #2 to #10 for greater accuracy. Always keep the test oscillator at its lowest possible value and the Volume Control of the receiver on full.

Weather (A) Band:

1. Turn the Wave Band Switch to the "A" position. Leave the test oscillator connected to the receiver, as for Broadcast band alignment.

2. Set the test oscillator to 370 kc. Open the variable condenser plates all the way and adjust the oscillator trimmer, C28, for maximum output meter reading. This trimmer is mounted under the chassis, as shown in the Service Illustration.

3. Set the test oscillator to 360 kc and tune in its signal. Adjust the antenna and translator trimmers, C1 and C2, for maximum output meter reading. These trimmers are mounted under the chassis, as shown in the Service Illustration.

4. Set the test oscillator to 230 kc and adjust the oscillator padding condenser, C29, for maximum output meter reading. The variable should be rocked a degree or two during the adjustment. C29 is mounted under the chassis, as shown in the Service Illustration.

5. Repeat all of the operations in their original order to insure proper alignment.

Short Wave (C) Band:

1. Turn the Wave Band Switch to the "C" position. Remove the .00025 mfd condenser, that was used in the output lead of the test oscillator for alignment on bands "A" and "B". Connect a 400 ohm resistor in place of the .00025 mfd condenser.

2. Set the test oscillator to 4250 kc and open the variable condenser plates all the way. Then adjust the oscillator trimmer, C23, for maximum output meter reading. It may be found that two peaks can be obtained at two different settings of the trimmer. Use the one in which the trimmer is screwed further out (lesser capacity).

3. Set the test oscillator to 4000 kc and tune in its signal. Adjust the RF and translator trimmers, C5 and C15, for maximum output meter reading. The variable should be rocked a degree or two during the adjustment. If two peaks can be obtained, use the adjustment in which the trimmers are screwed further in (greater capacity).

4. Set the test oscillator to 1700 kc and tune in its signal. Adjust the oscillator padding condenser, C25, for maximum output meter reading. The variable should be rocked a degree or two during the adjustment to insure proper peaking.

5. Repeat all of the operations in their original order. Always keep the test oscillator output at its lowest possible value.

Short Wave (D) Band:

1. Leave the test oscillator connected to the receiver, as for "C" band alignment.

2. Turn the Wave Band Switch knob to the "D" position. Set the test oscillator to 10,000 kc. Open the variable condenser plates all the way and adjust the oscillator trimmer, C22, for maximum output meter reading. If two peaks can be obtained at two different settings of the trimmer, use the adjustment in which the trimmer is screwed further out (lesser capacity).

3. Set the test oscillator to 9000 kc and tune in its signal. Adjust the RF and translator trimmers, C4 and C14, for maximum output meter reading. The variable should be rocked during the adjustment. If two peaks can be obtained at two different settings of the trimmers, use the adjustment in which the trimmers are screwed further in (greater capacity).

4. Set the test oscillator to 4500 kc and tune in its signal. If necessary, shift turns on L3 and L9. If turns are shifted it will be necessary to repeat operation #3. A "Tuning Wand" is of great help in determining whether or not it is necessary to shift turns.

Short Wave (E) Band:

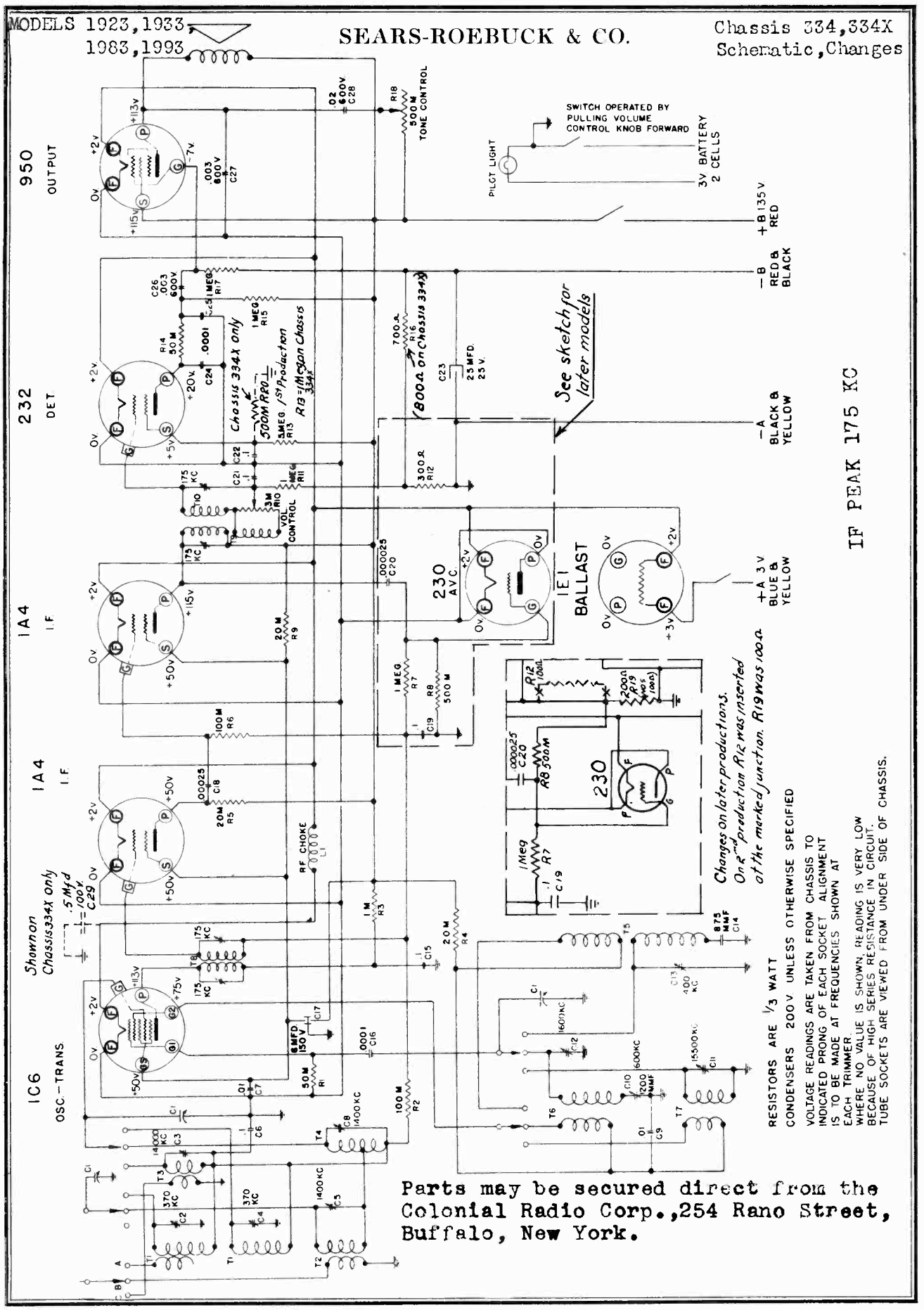
1. Leave the test oscillator connected as for "C" and "D" band alignment. Turn the Wave Band Switch knob to the "E" position.

2. Set the test oscillator to 19,000 kc. Open the variable condenser plates all the way and adjust the oscillator trimmer, C19, for maximum output meter reading. If two peaks can be obtained at two different settings of the trimmer, use the adjustment in which the trimmer is screwed further out (lesser capacity).

3. Set the test oscillator to 9000 kc and tune in its signal. If the dial calibration is off more than one division, shift the turns on the oscillator coil, L12, to make the dial pointer come to its correct dial reading. If it is found necessary to shift turns, operation #2 should be repeated.

4. Set the test oscillator to 17,000 kc and tune in its signal. Adjust the RF and translator trimmers, C3 and C13, for maximum output meter reading. The variable should be rocked during the adjustment. If two peaks can be obtained at two different settings of the trimmers, use the adjustment in which the trimmers are screwed further in (greater capacity).

5. Set the test oscillator to 9000 kc and adjust the turns on L2 and L8, if necessary. The use of a "Tuning Wand" is of great help in determining whether shifting of turns is necessary. If it is found necessary, operation #4 must be repeated.



Parts may be secured direct from the Colonial Radio Corp.,254 Rano Street, Buffalo, New York.

SEARS-ROEBUCK & CO

MODELS 1923,1933
1983,1993
Chassis 334,334X
Chassis,Alignment
Parts,Notes

Circuit Description:

These SILVERTONE Models are 7 tube, battery powered superheterodynes, having a "WEATHER", or long wave range; a broadcast range; and a short wave range. A filament Ballast tube is used to maintain the filament voltage at its proper value when the receiver is supplied by a 3 volt "A" block or an air cell. If a 2 volt storage battery is to be used, the Ballast tube should be replaced by a 4 prong plug having its filament prongs connected together.

The AVC Circuit:

The 230 AVC tube is used as a diode with its plate connected to one of the filament prongs so that the usual grid acts as the diode plate. A portion of the IF signal is applied to the tube through C20. The resulting diode current, flowing through R8, creates a voltage drop which is applied to the control grids of the 1C6 and 1A4 tubes to secure AVC.

1. Connect the high range of the output meter across the loud speaker. Connect a 175 kc test oscillator between the chassis and the control grid of the 1C6. A .1 mfd. condenser should be connected in series with one of the test oscillator leads.

2. Turn the volume control of the receiver full "on" and put the tone control in its "brilliant" position. Then adjust the IF output stage for maximum output. The tuning adjustment for the primary of this stage (T9) is accessible from the rear of the chassis. The secondary, T10, is the single adjustment unit mounted on top of the chassis. The output from the test oscillator must be kept at its lowest possible value.

ALIGNMENT PROCEDURE

The IF Stages:

3. Adjust the IF input transformer to secure maximum deflection on the output meter.

4. Repeat the output stage adjustments and then the input stage adjustments for greater accuracy. Always keep the test oscillator at its lowest possible value and the volume control of the receiver at its full "on" position.

RF Alignment; Band A:

1. Loosely couple the test oscillator to the antenna of the receiver, leaving the antenna connected. The volume control of the receiver should be in its full "on" position and the tone control in its "brilliant" position.

2. Set the test oscillator to 400 kc and open the variable condenser plates all the way. Then adjust C13 for maximum output. The locations of the trimmers are shown in the Service Diagrams.

3. Set the test oscillator to 370 kc and tune in its signal. Then adjust C2 and C4 for maximum output. The variable should be rocked back and forth a degree or two while making this adjustment. Always keep the test oscillator output at its lowest possible value.

4. Repeat the 400 kc adjustment and then the 370 adjustments to secure greater accuracy.

RF Alignment; Band B:

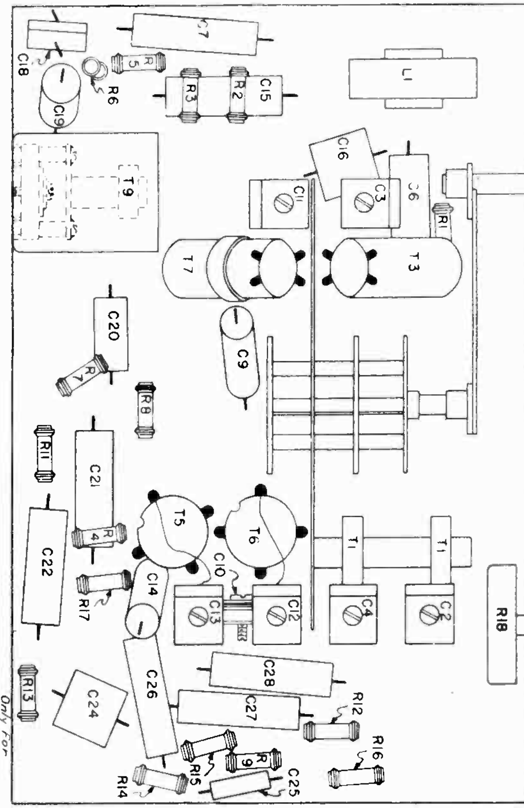
1. Leave the test oscillator coupled to the antenna lead; the volume control on full; and the tone control in its "Brilliant" position, as for Band A.

2. Set the test oscillator to 1600 kc. Open the variable condenser plates all the way and adjust C12 for maximum output.

3. Set the test oscillator to 1400 kc and adjust C5 and C8 for maximum output. The variable should be rocked back and forth during this adjustment.

4. Set the test oscillator to 600 kc and tune in its signal. Then adjust C10 for maximum output. The variable should be rocked during the adjustment.

5. Repeat the 1600 kc adjustment, then the 1400 kc adjustments, and then the 600 kc adjustment for greater accuracy. Always keep the test oscillator at its lowest possible value.



NOTE: T2, T4, T8, T10, C5, C8, C17, & C23 ARE MOUNTED ON TOP OF CHASSIS. / Only For 1st Production

RF Alignment; Band C:

1. Leave the test oscillator loosely coupled to the antenna lead; the volume control on full; the tone control in its "brilliant" position, as for alignment on the other bands.

2. Set the test oscillator to 15,500 kc. Open the variable condenser plates all the way and adjust C11 for maximum output.

3. Set the test oscillator to 14,000 kc and tune in its signal. Then adjust C3 for maximum output. The variable should be rocked during the adjustment.

4. Repeat the 15,500 kc and 14,000 kc adjustments for greater accuracy. Always keep the test oscillator at its lowest possible value.

Occasionally, a set is found in which the condenser-drive gears do not mesh properly. To correct this, proceed as follows:

Remove the dial pointers, the Station Selector dial, and the metal pointer-drive gear. Then adjust the lower bracket, that mounts the small condenser-drive gear, by slightly loosening its two mounting screws and shifting the bracket until proper meshing of the gears is secured. Then re-assemble the dial and pointers. Correct dial calibration can be secured either by tuning in a station of known frequency and setting the pointer to that frequency, or by fully meshing the condenser plates and putting the dial pointer horizontal.

SCHEMATIC LOCATION	PART NO.	DESCRIPTION	PRICE
	R11603	Adapter - Dial pointer	.12
	R12432A	Bracket - For dial light batteries	.17
	R12360B	Bracket - Volume control, with dial light switch assembly	.26
	R10562	Bushing - Rubber, chassis mtg.	.05
	R12345	Cable - Battery, Models 1923-1983	.19
	R12346	Cable - Battery, Models 1933-1993	.29
L1	R8352	Choke - RF	.28
	R7011A	Clip - Antenna and ground leads	.04
	R11043	Clip - Grid	.01
T2	R10670	Coil - Antenna, broadcast	.33
T6	R12376	Coil - Oscillator, broadcast	.31
T4	R10671	Coil - Translator, broadcast	.46
T5	R12378	Coil - Oscillator, weather band	.34
T1	R12377	Coil - Translator, weather band	.47
T7	R10931D	Coil - Oscillator, short wave	.60
T3	R10931C	Coil - Translator, short wave	.54
C1	R12352	Condenser - Variable	3.01
	R12352A	Condenser - Variable, with drive assembly	6.08
C17,C23	R12117	Condenser - Electrolytic block	1.76
C10	R9426	Condenser - Padding	.39
C3,C5,C11	R10197	Condenser - Trimmer	.12
C2,C4,C13	R12381	Condenser - Trimmer	.15
C8,C12	R12415	Condenser - Trimmer	.11
C6,C15,C19, C21,C22	R6444	Condenser - .1 mfd. 200 volts	.16
C28	R6761	Condenser - .02 mfd. 600 volts	.14
C7,C9	R8433	Condenser - .01 mfd. 300 volts	.13
C26,C27	R7681	Condenser - .003 mfd. 600 volts	.13
C14	R12380	Condenser - .000875 mfd. 600 volts	.15
C18	R4592	Condenser - .00025 mfd. mica	.24
C16,C24, C25	R4303	Condenser - .0001 mfd. mica	.23
C20	R8711	Condenser - .000025 mfd. mica	.16
R18	R12457	Control - Tone	.53
R10	R12371	Control - Volume	.71
	R12353	Lamp - Dial light	.11
	R12455A	Lead - Antenna	.12
	R12456A	Lead - Ground	.12
R13	R8393	Resistor - 5 megohms, 1/3 watt carbon	.15
R7,R11, R15,R17	R7585	Resistor - 1 megohm, 1/3 watt carbon	.17
R8	R7228	Resistor - 500M ohms, 1/3 watt carbon	.15
R2,R6	R7586	Resistor - 100M ohms, 1/3 watt carbon	.17
R1,R14	R6637	Resistor - 50M ohms, 1/3 watt carbon	.15
R4,R5,R9	R6640	Resistor - 20M ohms, 1/3 watt carbon	.15
R3	R6636	Resistor - 1M ohms, 1/3 watt carbon	.15
R16	R8037	Resistor - 700 ohms, 1/3 watt carbon	.15
R12	R10621	Resistor - 300 ohms, 1/3 watt carbon	.15
	R12458	Ring - Glass clamping	.02
	R5424	Ring - Retaining, wave switch shaft	.01
	R12431A	Shaft - Dial drive assembly	.32
	R12373	Shaft - Wave switch actuating	.08
	R8395	Shield - Tube, base	.02
	R10440	Shield - Tube, top	.08
	R10441	Shield - Tube, cap	.04
	R10654	Shield - Coil, base	.03
	R10653	Shield - Coil, top	.10
	R7031	Socket - Pilot light	.10
	R8315	Socket - 4 prong	.06
	R8253	Socket - 5 prong	.06
	R8092	Socket - 6 prong	.07
	R11046	Spacer - Wood, shipping	.01
	S10120	Speaker - 6½", Models 1923-1983	4.33
	S10573	Speaker - 8", Models 1933-1993	4.98
	R12443	Switch - Filament	.43
	R12409	Switch - Wave	1.04
T8	R12349A	Transformer - IF Input	1.21
T9	R12347	Transformer - IF Output, Primary	.77
T10	R12348	Transformer - IF Output, Secondary	.77
	R4794	Washer - Insulating, filament switch mounting	.02

The additions to the Replacement Parts List are:

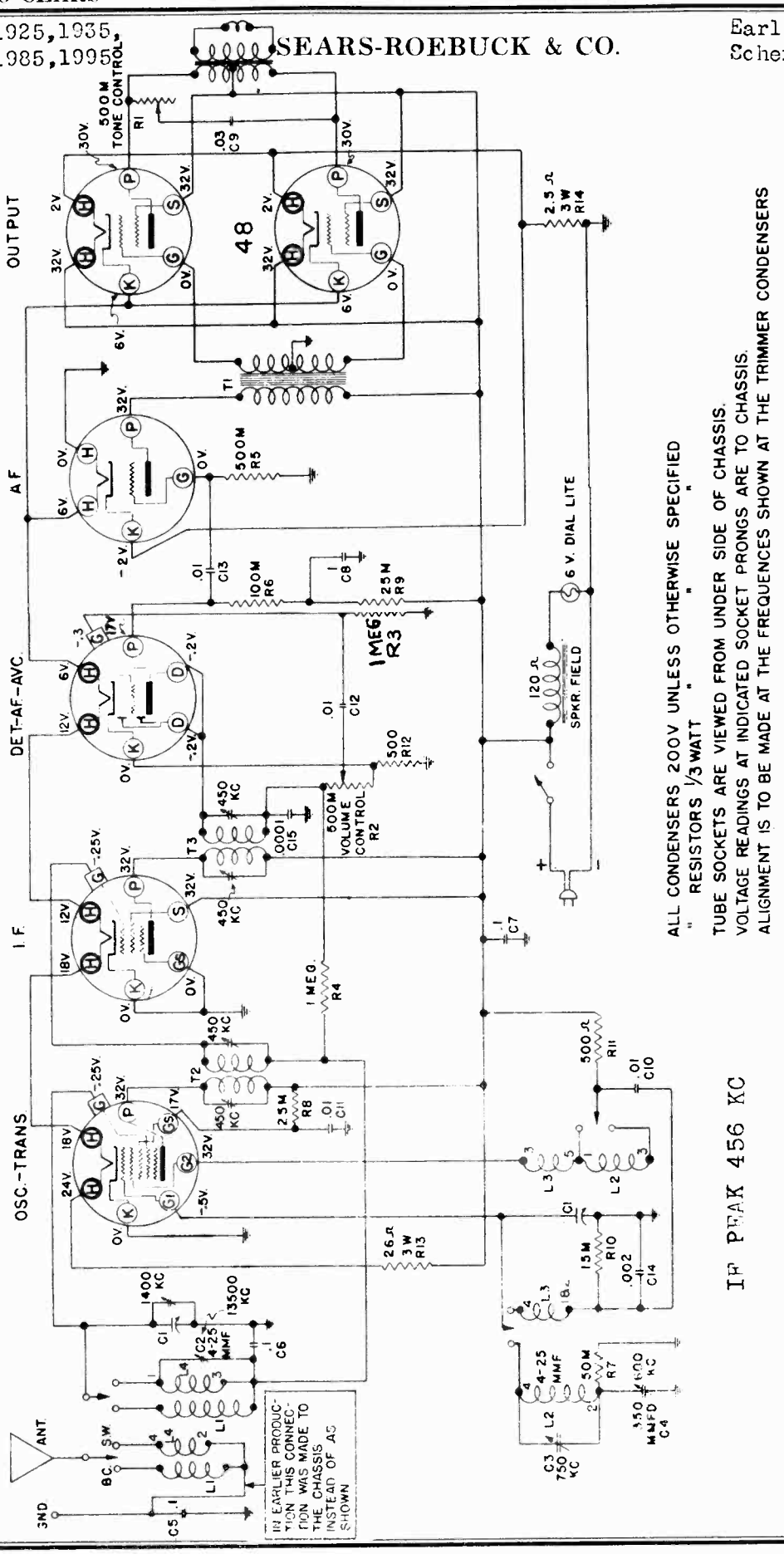
SCHEMATIC LOCATION	PART NO.	DESCRIPTION	PRICE
L1	R14003	Choke - RF	.25
C29	R13917	Condenser - .5 mfd. 100 volts	.23
	R14005	Leaflet - Instruction	.09
	R13739	Leaflet - Weather Band	.11

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 1925,1935,
1985,1995

SEARS-ROEBUCK & CO.

Early,Late
Schematic,Voltage



ALL CONDENSERS 200V UNLESS OTHERWISE SPECIFIED
" RESISTORS 1/3 WATT "
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCES SHOWN AT THE TRIMMER CONDENSERS

IF PEAK 456 KC

SCHEMATIC - MODELS 1925-1935-1985-1995
(Early and Late)

July 9, 1935.

Parts may be secured direct from the Colonial Radio Corp.,
254 Rano Street, Buffalo, New York.

MODELS 1925,1935,1985,1995

SEARS-ROEBUCK & CO. Chassis,Alignment,Notes

Because of the low voltage at which these models are operated, more than usual care must be used in selecting 6A7 and 75 tubes that will operate properly on the short wave band. This will be particularly true for installations where the line voltage is lower than average. Tubes which do not operate properly in these models may be entirely satisfactory for use in other sets operating at a higher voltage.

The output from the test oscillator should always be kept at the lowest possible value and the coupling between it and the receiver should be made as loose as possible. In the case of RF alignment, where the test oscillator is coupled to the antenna lead of the receiver, alignment will be most accurate if the coupling to the antenna is made very loose. (The antenna lead and the oscillator lead separated.) If the test oscillator has a variable control for its power output, it is better to turn this control to its high position and then decrease the signal input to the receiver by decreasing the amount of coupling between the test oscillator and the receiver's antenna lead.

IF Alignment:

1. Connect the test oscillator lead to the control grid of the 6D6 tube. Set the test oscillator to 456 kc and tune the IF output transformer, T3.

2. Change the test oscillator connection to the control grid of the 6A7 tube and tune the IF input transformer, T2.

3. Repeat the IF output transformer adjustment and then the IF input transformer adjustment.

Broadcast RF Alignment:

1. Loosely couple the output of the test oscillator to the antenna lead of the receiver, leaving the antenna connected.

2. Set the test oscillator to 600 kc and adjust the broadcast oscillator padding condenser, C4, for maximum output. The variable condenser should be continuously rocked back and forth a degree or two while the padder is being adjusted.

3. Set the test oscillator to 1720 kc. Open the variable condenser plates all the way and adjust C3 for maximum output.

4. Set the test oscillator to 1400 kc and tune in its signal. Then adjust the trimmer on the variable condenser for maximum output. The variable should be rocked back and forth a degree or two while the trimmer is being adjusted.

5. Repeat the 600 kc oscillator padder condenser adjustment to secure greater accuracy.

6. Repeat the 1720 kc and the 1400 kc adjustments for greater accuracy.

Short Wave RF Alignment:

1. Leave the test oscillator loosely coupled to the antenna lead as for broadcast RF alignment.

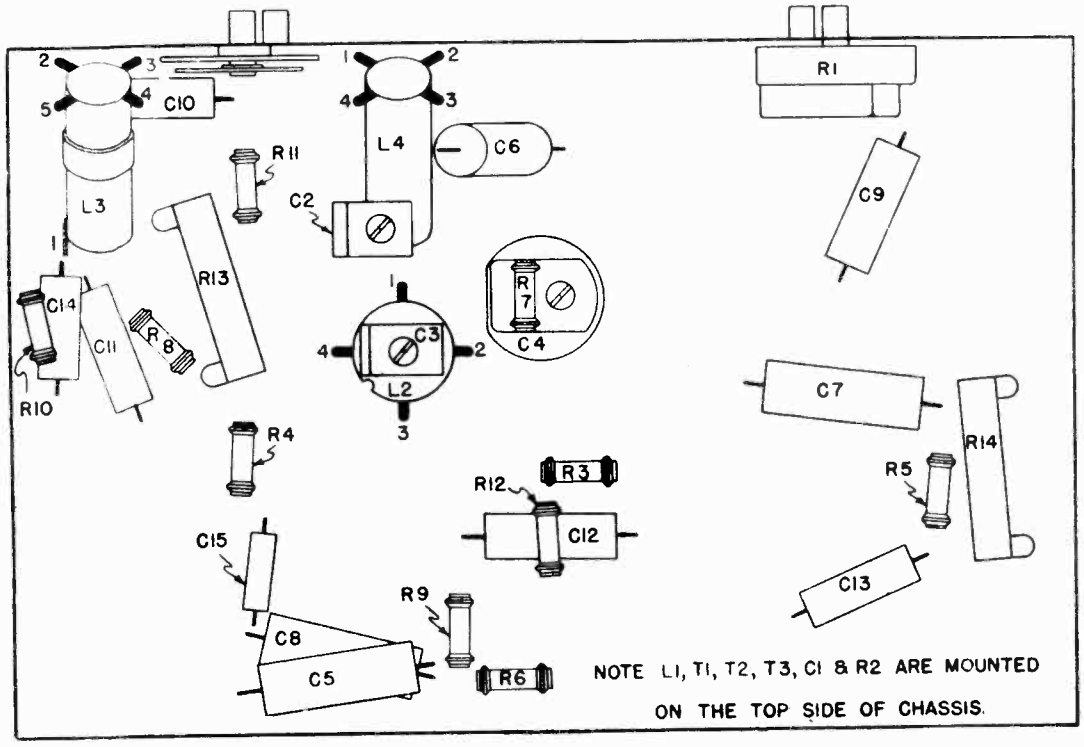
2. Set the test oscillator to 14,500 kc and tune in its signal. Then adjust C2 for maximum output. The variable should be rocked a degree or two during the adjustment to insure most accurate peaking. Two peaks may be found, one of them with the trimmer screwed out further than the other. The correct setting is the one with the trimmer screwed further in, (greator capacity).

Tube Voltages:

The proper voltage reading to be obtained from each of the tube prongs to chassis is indicated on the schematic, immediately alongside of the respective tube prong.

General:

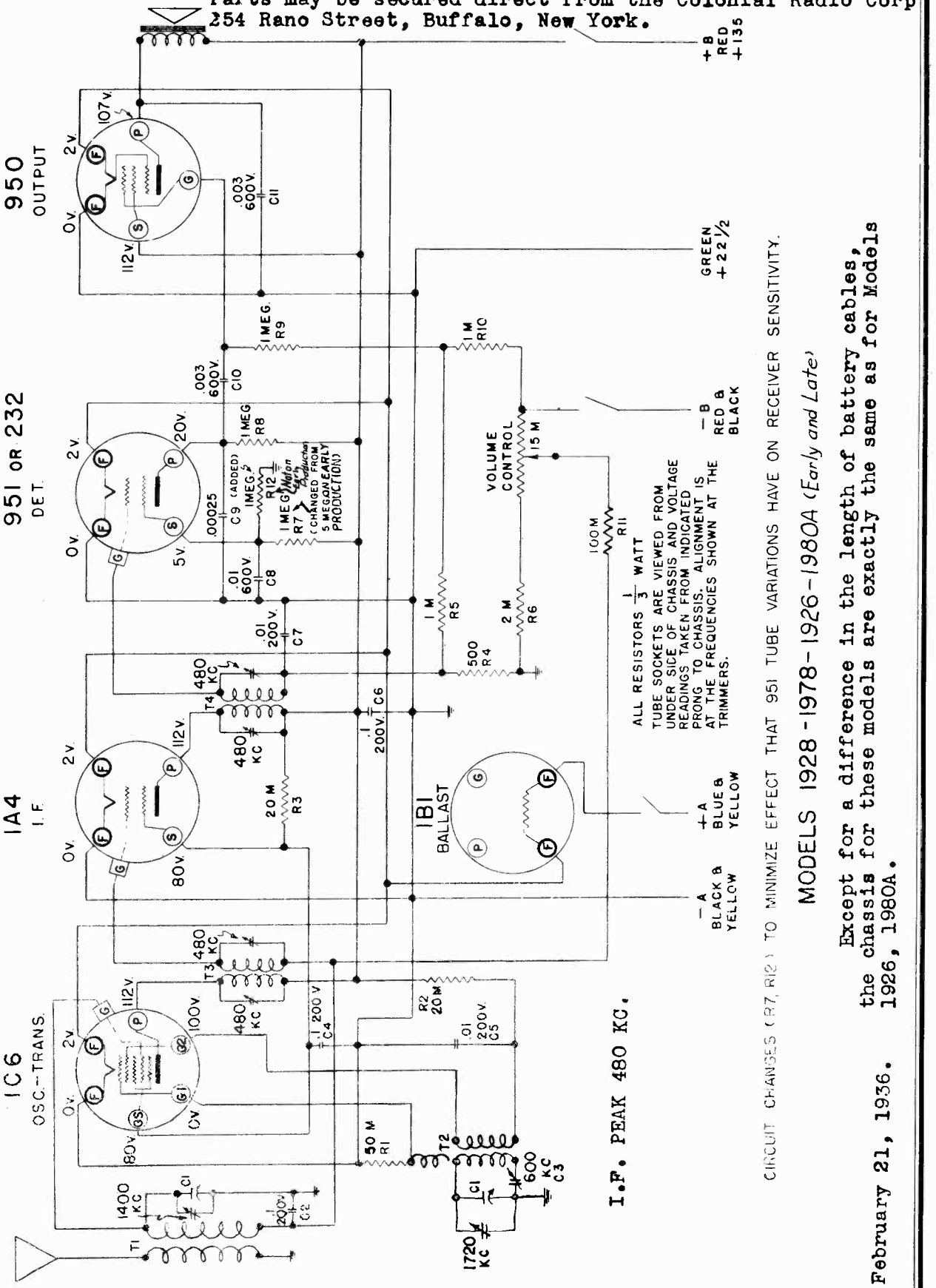
During all of the alignment procedure, the tone control and the volume control must be turned all the way to the right. The ground lead of the test oscillator should be connected to the chassis through a .1 mfd. condenser. The other lead of the test oscillator is to be connected to the grid clip of the proper tube as described in the procedure. It is important to leave the grid clip attached to the clip and to leave the tube shields in place. The oscillator tube of the receiver also should be in its socket. In the case of 6A7 oscillator-translators, no attempt should be made to "kill" the oscillator section.



MODELS 1926,1928,1978,1980A
Early and Late
Schematic, Voltage

SEARS-ROEBUCK & CO.

Parts may be secured direct from the Colonial Radio Corp 254 Rano Street, Buffalo, New York.



CIRCUIT CHANGES (R7, R12) TO MINIMIZE EFFECT THAT 951 TUBE VARIATIONS HAVE ON RECEIVER SENSITIVITY.

MODELS 1928-1978-1926-1980A (*Early and Late*)

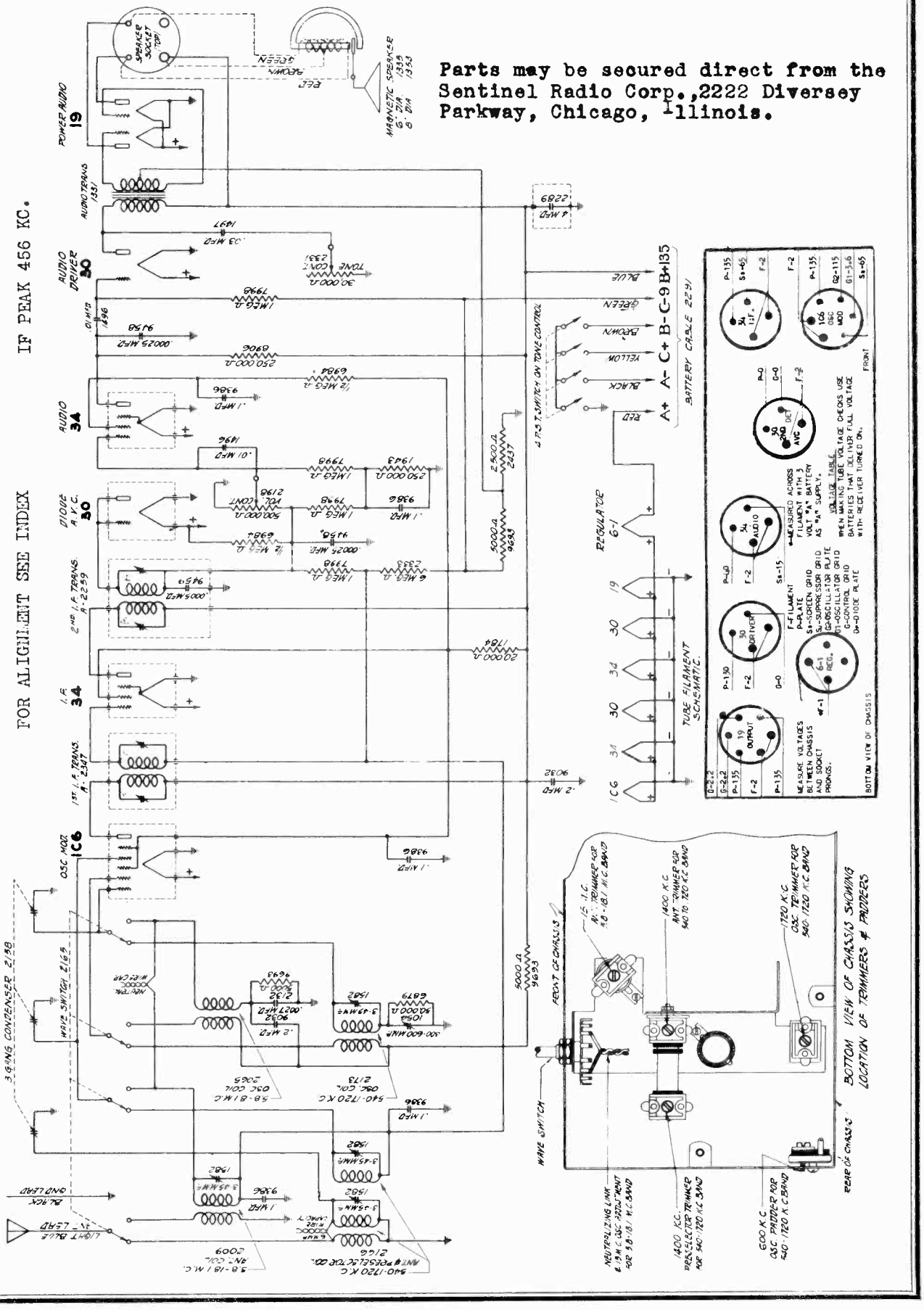
Except for a difference in the length of battery cables, the chassis for these models are exactly the same as for Models 1926, 1980A.

February 21, 1936.

SEARS-ROEBUCK & CO.

MODELS 1927X, 1937X
Schematic, Voltage
Trimmers

Parts may be secured direct from the Sentinel Radio Corp., 2222 Diversey Parkway, Chicago, Illinois.

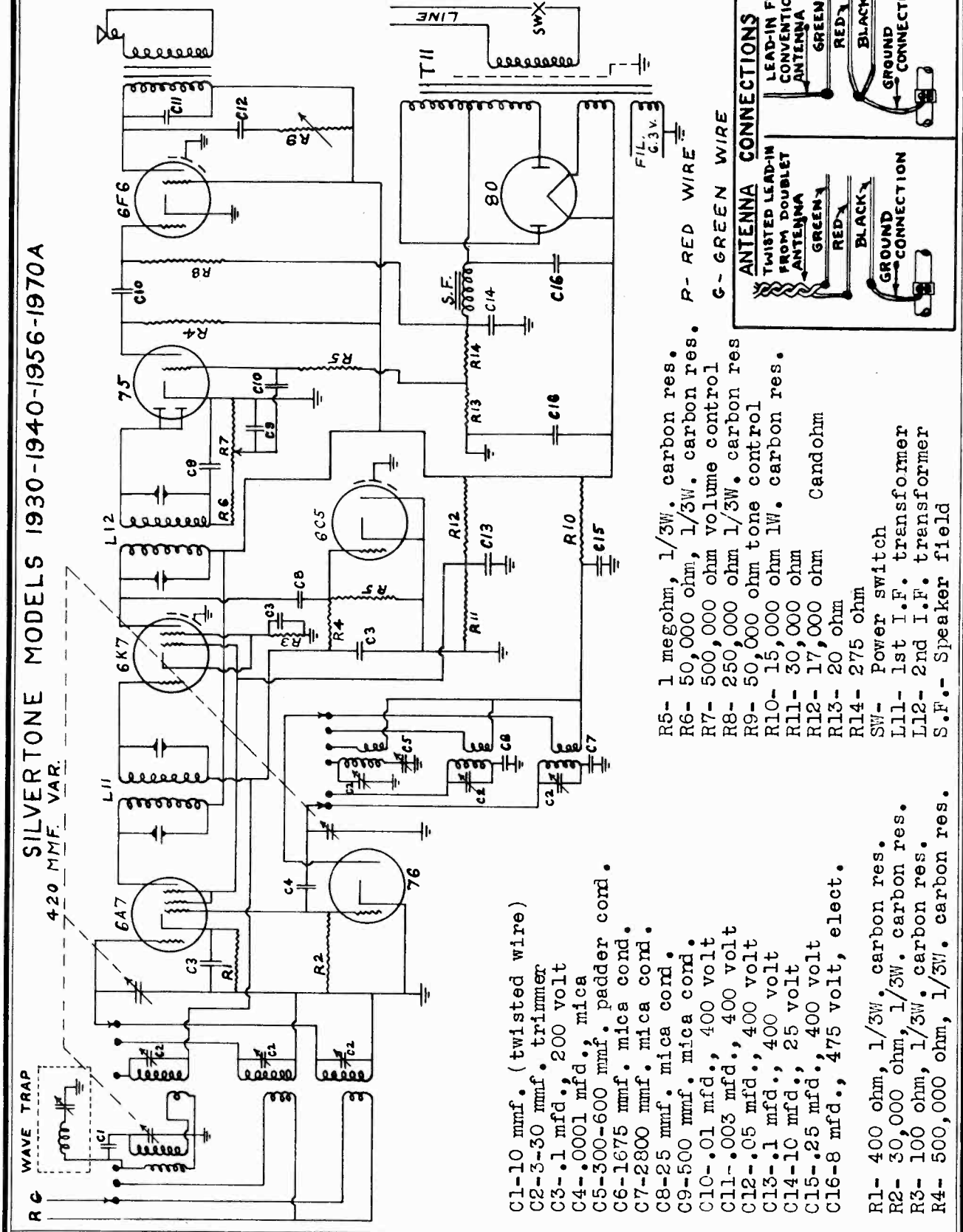


MODELS 1930,1940,1956,1970A
Schematic

SEARS-ROEBUCK & CO.

Parts may be secured direct from Echophone Radio Corp., 2611 Indiana Avenue, Chicago, Illinois.

SILVERTONE MODELS 1930-1940-1956-1970A

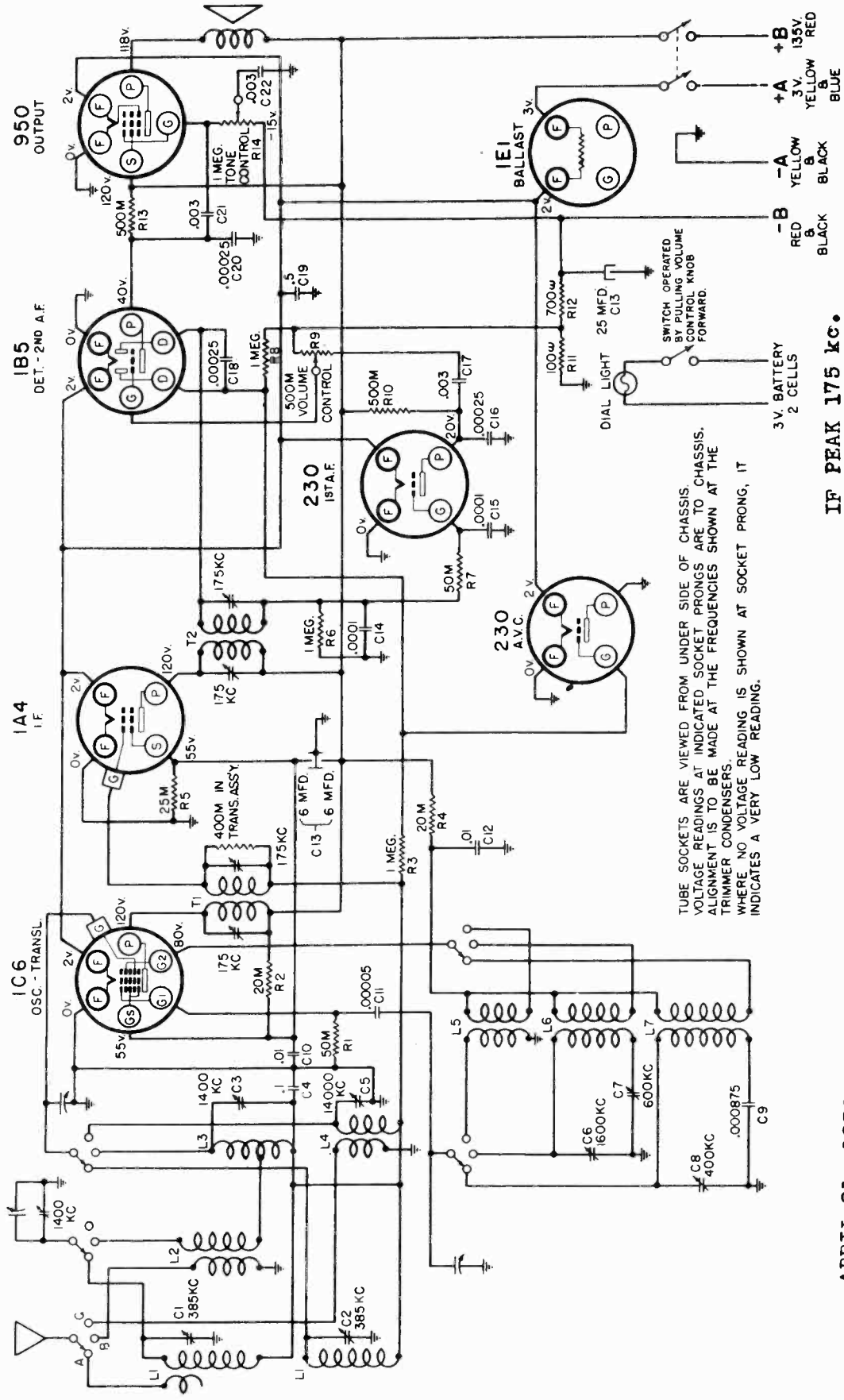


C1-10 mmf. (twisted wire)
C2-3-30 mmf. trimmer
C3-.1 mfd., 200 volt
C4-.0001 mfd., mica
C5-300-600 mmf. padder cond.
C6-1675 mmf. mica cond.
C7-2800 mmf. mica cond.
C8-25 mmf. mica cond.
C9-500 mmf. mica cond.
C10-.01 mfd., 400 volt
C11-.003 mfd., 400 volt
C12-.05 mfd., 400 volt
C13-.1 mfd., 400 volt
C14-10 mfd., 25 volt
C15-.25 mfd., 400 volt
C16-8 mfd., 475 volt, elect.

R1- 400 ohm, 1/3W. carbon res.
R2- 30,000 ohm, 1/3W. carbon res.
R3- 100 ohm, 1/3W. carbon res.
R4- 500,000 ohm, 1/3W. carbon res.
R5- 1 megohm, 1/3W. carbon res.
R6- 50,000 ohm, 1/3W. carbon res.
R7- 500,000 ohm volume control
R8- 250,000 ohm 1/3W. carbon res
R9- 50,000 ohm tone control
R10- 15,000 ohm 1W. carbon res.
R11- 30,000 ohm
R12- 17,000 ohm Candohm
R13- 20 ohm
R14- 275 ohm
SW- Power switch
L11- 1st I.F. transformer
L12- 2nd I.F. transformer
S.F.- Speaker field

SEARS-ROEBUCK & CO.

MODELS 1933A, 1983A
Schematic, Voltage



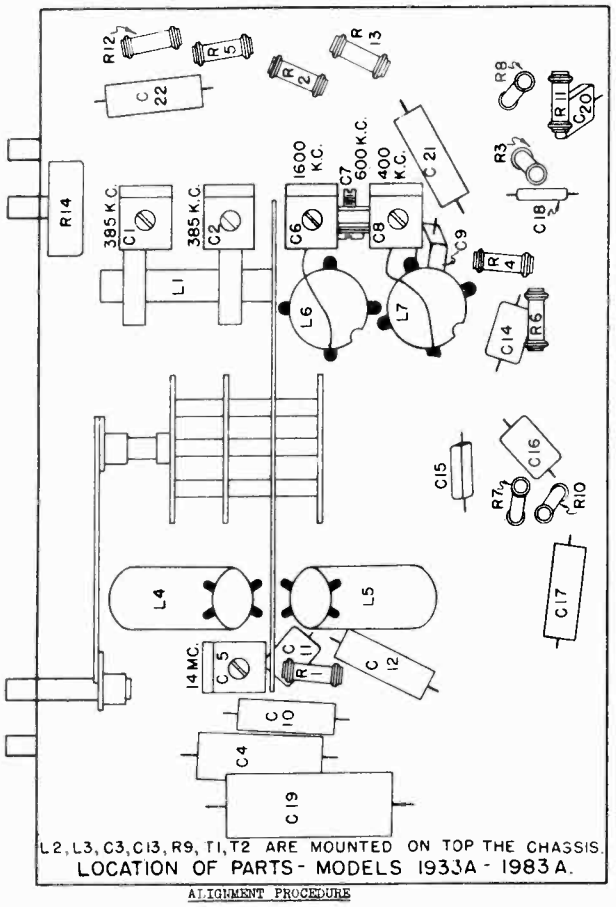
IF PEAK 175 kc.

APRIL 21, 1936. SCHEMATIC - MODELS 1933A - 1983A

Parts may be secured direct from the Colonial Radio Corp.,
254 Rano Street, Buffalo, New York.

MODELS 1933A, 1983A
Chassis, Alignment
Sensitivity

SEARS-ROEBUCK & CO.



L2, L3, C3, C13, R9, T1, T2 ARE MOUNTED ON TOP THE CHASSIS.
LOCATION OF PARTS - MODELS 1933A - 1983A.

ALIGNMENT PROCEDURE

IF ALIGNMENT

1. Connections:

Connect the ground lead of the test oscillator to the receiver chassis. Connect the output lead of the test oscillator, in series with a .1 mfd condenser, to the tube grid caps indicated below under ALIGNMENT. Connect the output meter, in series with a .5 mfd condenser across the loud speaker terminals. The meter should be switched to a scale of approximately 10 volts.

2. Receiver Settings:

Turn the Wave Band switch to the BROADCAST position and the Station Selector to about 550 kc. Turn the receiver Volume Control all the way on, and the Tone Control to its brilliant position (clockwise)

3. Alignment:

(a) Set the test oscillator to 175 kc. Connect its output (through the .1 mfd condenser) to the control grid of the 1A4 tube. Peak the IF output transformer, T2.

(b) Change the test oscillator output connection to the control grid cap of the 1C6 tube. Peak the IF input transformer, T1.

(c) Change the test oscillator output connection back to the control grid cap of the 1A4 tube and repeat the T2 adjustment. Then change the test oscillator output connection to the 1C6 tube again and repeat the T1 adjustment for greator accuracy. Always keep the test oscillator output at its lowest possible value and the receiver Volume Control all the way on.

RF ALIGNMENT

Important:

The Broadcast band must be aligned before the Weather band or the Short Wave band.

BROADCAST (B) BAND ALIGNMENT

1. Connections:

Connections for Broadcast band alignment are the same as for IF alignment except that the .1 mfd condenser is disconnected from the output lead of the test oscillator. In its place a .0002 mfd mica condenser is connected from the test oscillator output lead to the green antenna lead on the chassis.

2. Receiver Settings:

Turn the Volume Control all the way on, the Tone Control all the way to the right, and the Wave Band switch to the BROADCAST (B) position.

3. Alignment:

(a) Set the test oscillator to 1600 kc. Open the variable condenser plates all the way and peak the broadcast oscillator trimmer, C6. The locations of the trimmers are shown in the Service Illustration.

(b) Set the test oscillator to 1400 kc and tune in its signal. Then peak the antenna trimmer and the translator trimmer, C3. The antenna trimmer is the one on the variable condenser section nearest the dial. The translator trimmer is accessible through the hole in the top of the translator shield can mounted on top of the chassis next to the 1C6 tube.

(c) Set the test oscillator to 600 kc and tune in its signal. Then peak the broadcast oscillator padder, C7. The variable should be rocked a degree or two during the adjustment.

(d) Repeat the 1600 kc adjustment, then the 1400 kc adjustments, and then the 600 kc adjustment for greater accuracy. Always keep the test oscillator output at its lowest possible value.

WEATHER (A) BAND ALIGNMENT

1. Connections:

All connections remain the same as for Broadcast band alignment.

2. Receiver Settings:

Turn the Wave Band switch to the "A" position. All other settings remain the same as for Broadcast band alignment.

3. Alignment:

(a) Set the test oscillator to 400 kc. Open the variable condenser plates all the way and peak the oscillator trimmer, C8.

(b) Set the test oscillator to 385 kc and tune in its signal. Peak the antenna trimmer, C1, and the translator trimmer, C2.

(c) Repeat the 400 kc adjustment and then the 385 kc adjustments for greater accuracy.

SHORT WAVE (C) BAND ALIGNMENT

Note: The oscillator frequency on this band is 175 kc lower than the translator frequency, instead of being 175 kc higher, as is usual.

1. Connections:

Remove the .0002 mfd condenser used in series with the output lead of the test oscillator for alignment on the other two bands. Replace this condenser with a 400 ohm carbon resistor.

2. Receiver Settings:

Turn the Wave Band switch to the "C" position. Other receiver settings remain the same as for previous alignment.

3. Alignment:

(a) The top frequency for this band must not go higher than 16,000 kc. This is governed entirely by positioning of the leads. If the top frequency is allowed to go higher than 16,000 kc, the calibration for the band will be incorrect. Check the top frequency by opening the variable condenser plates all the way, setting the test oscillator to 16,000 kc, and positioning leads so that a peak reading is had on the output meter.

(b) Set the test oscillator to 14,000 kc and tune in its signal Peak the translator trimmer, C5.

SENSITIVITIES

The figures in the following chart, although approximate, will serve as an indication of the sensitivities that should be had at various points in the receiver and at various frequency settings. They will be useful for trouble shooting. It is necessary to have a test oscillator with an accurately calibrated attenuator so that its output power can be known. The figures in the last column represent the output voltage from the test oscillator necessary to secure an output meter reading of 8½ volts, with a .5 mfd condenser in series with the meter. The meter should have a resistance of 4000 ohms or more.

The Wave Band switch must be turned to the BROADCAST position and the Variable Condenser to about 550 kc for the measurements at 175 kc.

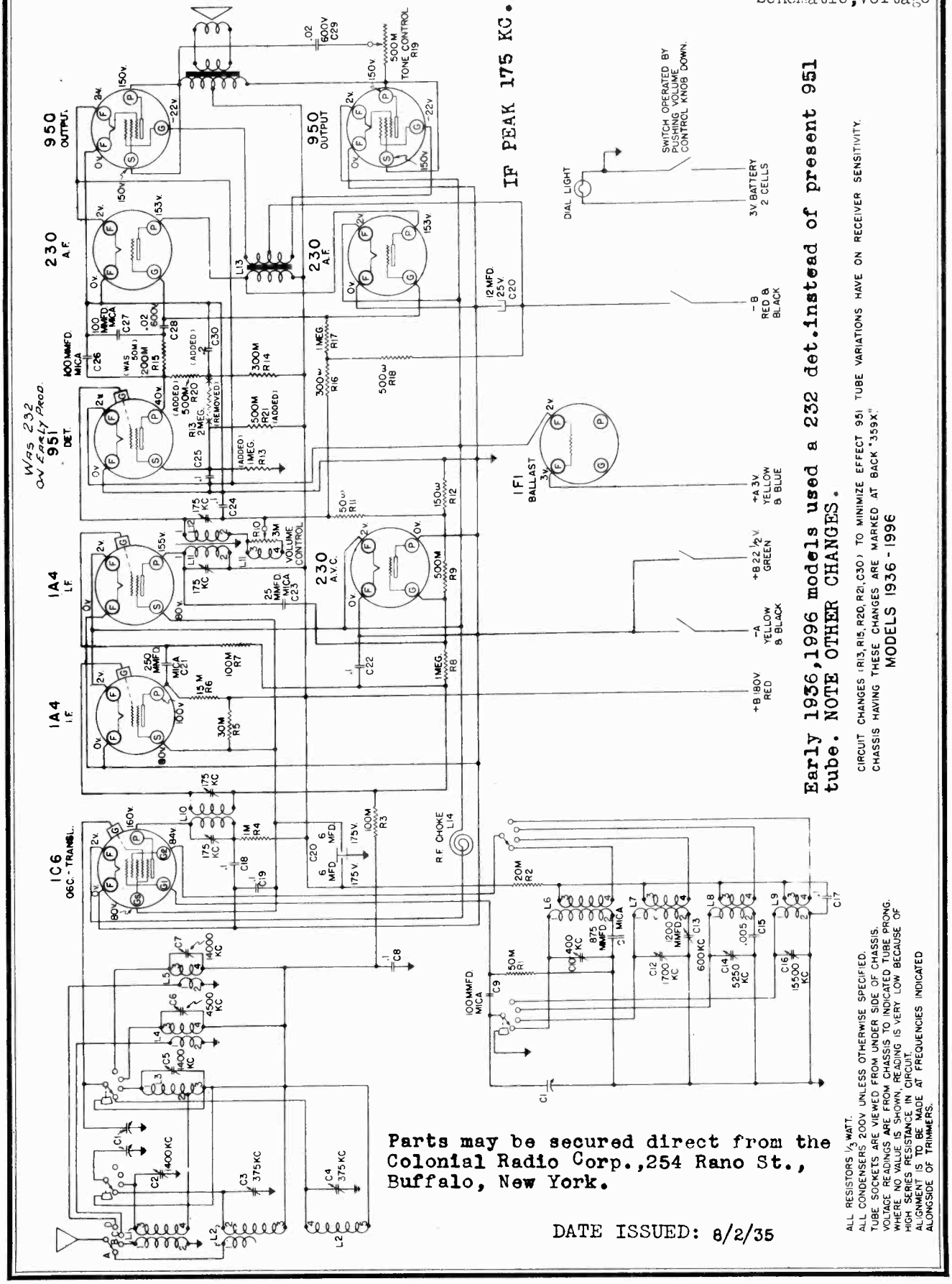
The value of condenser or resistor shown in the second column of the chart must be connected in series with the test oscillator output lead.

The receiver Volume Control must be turned all the way on and the Tone Control all the way to the right for all measurements.

Test Oscillator Connected To:	Dummy Antenna In Test Oscillator Output Lead	Frequency	Microvolts Input
1C6 - Grid Cap	.1 mfd	175 kc	65
1A4 - Grid Cap	.1 mfd	175 kc	4000
1C6 - Grid Cap	.1 mfd	1000 kc	90
Stator, Var. Cond. Section nearest dial	.1 mfd	1000 kc	200
Antenna Lead	.0002 mfd	600 kc	35
Antenna Lead	.0002 mfd	1000 kc	40
Antenna Lead	.0002 mfd	1400 kc	60
Antenna Lead	.0002 mfd	225 kc	125
Antenna Lead	.0002 mfd	385 kc	35
Antenna Lead	.0002 mfd	400 kc	30
Antenna Lead	400 ohms	6000 kc	55
Antenna Lead	400 ohms	10000 kc	20
Antenna Lead	400 ohms	14000 kc	25

SEARS-ROEBUCK & CO.

MODELS 1936,1996
Early,Chassis 359
Late,Chassis 359X
Schematic,Voltage



MODELS 1936,1996
Early,Chassis 359
Late,Chassis 359X
Chassis,Alignment
Changes

SEARS-ROEBUCK & CO.

SILVERTONE MODELS 1936, 1996

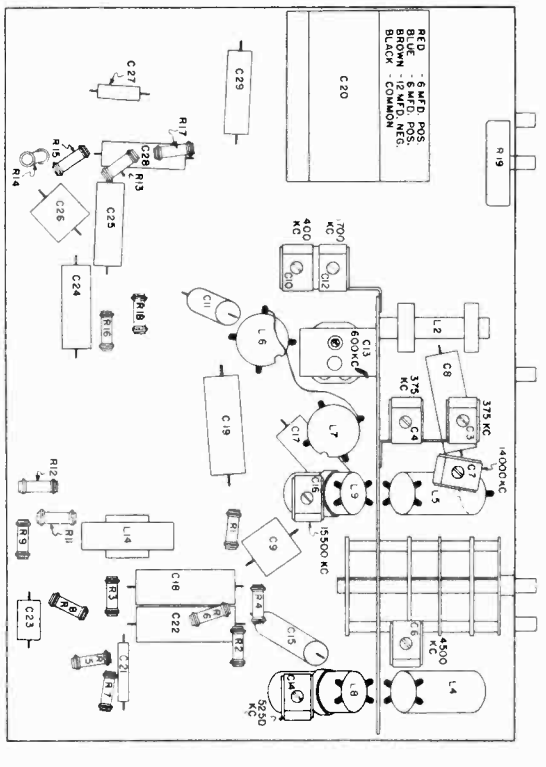
CIRCUIT CHANGES (359X CHASSIS) TO MINIMIZE SENSITIVITY VARIATIONS DUE TO VARIATIONS IN 951 TUBES

APRIL 7, 1936

Circuit changes were incorporated in later production and the chassis designation changed to 359X (marked on the license sticker and on back of the chassis). These circuit changes are for the purpose of minimizing the effect that variations in type 951 tubes have on the uniformity of receiver sensitivity in production. It is not necessary to attempt to make these changes on earlier production receivers in the field.

As shown in the attached schematic, the circuit changes are:

R15 changed from 50M ohms to 200M ohms
.2 mfd condenser, C30, added
500M ohm resistor, R20, added
1 megohm resistor, R13, added
500M ohm resistor, R21, added
2 megohm resistor, original R13, previously connected from detector screen to B plus, removed from circuit



LOCATIONS OF PARTS - MODELS 1936-1996 (EARLY)

ALIGNMENT PROCEDURE

General:

During all of the alignment procedure, the tone control and the volume control must be turned all the way to the right. The ground lead of the test oscillator should be connected to the chassis through a .1 mfd. condenser. The other load of the test oscillator is to be connected in the manner described in the procedure. Where connection is made to a control grid cap, it is important to leave the grid clip attached to the grid cap and to leave the tube shields in place. No attempt should be made to "kill" the oscillator section of the 106 during the alignment.

The output from the test oscillator always should be kept at the lowest possible value that will give a satisfactory output meter reading and the coupling between the test oscillator and the receiver should be made as loose as possible. In the case of RF alignment on any of the bands, where the test oscillator is coupled to the antenna lead of the receiver with an antenna connected, alignment will be most accurate if the coupling to the antenna lead is made very loose. (The antenna lead and the oscillator lead separated.) If the test oscillator has a variable control for its power output, it is better to turn this control to its high position and then decrease the signal input to the receiver by decreasing the amount of coupling between the test oscillator and the receiver's antenna lead. If an actual antenna is not used and is replaced by a condenser or resistor, as described in the procedure, the input to the receiver should be kept low by decreasing the power output from the test oscillator.

When peaking the antenna and translator trimmers, for all wave bands, the variable condenser should be "rocked" back and forth a degree or two while the trimmer is being adjusted. This should not be done when peaking the oscillator trimmers; in this case, the variable condenser is turned so that the plates are completely out of mesh and left in this position during the adjustment. When adjusting the oscillator trimmers, if it is found that two peaks can be obtained, use the one in which the trimmer is screwed further out (less capacity). When adjusting the antenna and translator trimmers, if two peaks are found, use the adjustment in which the trimmer is screwed in furthest. Note that this is exactly opposite to the procedure for the oscillator trimmers.

IF Alignment:

1. Connect the test oscillator lead, in series with a .00025 mfd. condenser, to the control grid of the 106 tube. Turn the wave switch to position, "B". With the test oscillator set at 175 kc peak the IF output transformer, L11, L12, and then the IF input transformer, L10. L10 is the square can unit mounted at the right hand end of the chassis. L11 is the round can unit mounted behind the variable condenser and which does not have a grid lead. L12 is the other round can unit with a grid lead.

2. Repeat the IF adjustments in the same order as mentioned in (1). As the output meter reading is increased by aligning, the test oscillator power should be decreased. This will prevent the AVC action from interfering with accurate alignment.

RF Alignment, Band A:

1. Loosely couple the output of the test oscillator to the antenna lead of the receiver, leaving the antenna connected. If it is impractical to use an actual antenna, it can be duplicated by connecting the test oscillator lead to the receiver's antenna lead, in series with a .00025 mfd. condenser.

2. Turn the wave switch to Band A. Set the test oscillator to 400 kc and couple it to the antenna lead of the receiver by either of the two methods mentioned in the preceding paragraph.

3. Open the variable condenser plates all the way and adjust the oscillator trimmer, C10, for maximum output. Trimmer condenser locations are shown in the Location of Parts Diagram.

4. Set the test oscillator to 375 kc and tune in its signal. Then peak the antenna and translator trimmers, C3 and C4. The variable should be "rocked" during the adjustment, as described in the third paragraph of General Alignment Information.

RF Alignment, Band B:

1. Couple the test oscillator to the antenna lead of the receiver with the antenna connected, or connect the oscillator directly to the receiver antenna lead, in series with a .00025 mfd. condenser, as mentioned in (1) under "RF Alignment, Band A".

2. Set the test oscillator to 1700 kc. Open the variable condenser plates all the way and peak the oscillator trimmer, C12.

3. Set the test oscillator to 1400 kc and tune in its signal. Then adjust the antenna and translator trimmers, C2 and C5. C2 is contained in the round can immediately alongside of the variable condenser. C5 is contained in the round can unit mounted behind the "On-Off" switch.

4. Set the test oscillator to 600 kc and tune in its signal. Then adjust the padder condenser, C13, for maximum output. The variable should be continuously "rocked" a degree or two while making the padder condenser adjustment.

5. Repeat the 1700 kc and then the 1400 kc adjustments.

RF Alignment, Band C:

1. Loosely couple the test oscillator lead to the antenna lead of the receiver, leaving the antenna connected. If it is impractical to use an actual antenna, the test oscillator can be connected directly to the antenna lead of the receiver, in series with a 400 ohm resistor and with no antenna connected to the receiver.

2. Set the test oscillator to 5250 kc. Turn the wave switch to Band C, open the variable condenser plates all the way and peak the oscillator trimmer, C14.

3. Set the test oscillator to 4500 kc and tune in its signal. Then peak the translator trimmer, C6.

4. Substitute a .00025 mfd. condenser for the 400 ohm resistor in the test oscillator lead. Set the test oscillator to 1700 kc and tune in its signal. If necessary, shift turns on the translator coil, L4.

5. Repeat the entire procedure for greater accuracy.

RF Alignment, Band D:

1. Loosely couple the test oscillator lead to the antenna lead of the receiver, leaving the antenna connected or else connect the test oscillator directly to the antenna lead of the receiver, in series with a 400 ohm resistor, without using an actual antenna.

2. Turn the wave switch to Band D. Set the test oscillator to 15500 kc. Open the variable condenser plates all the way and peak the oscillator trimmer, C16.

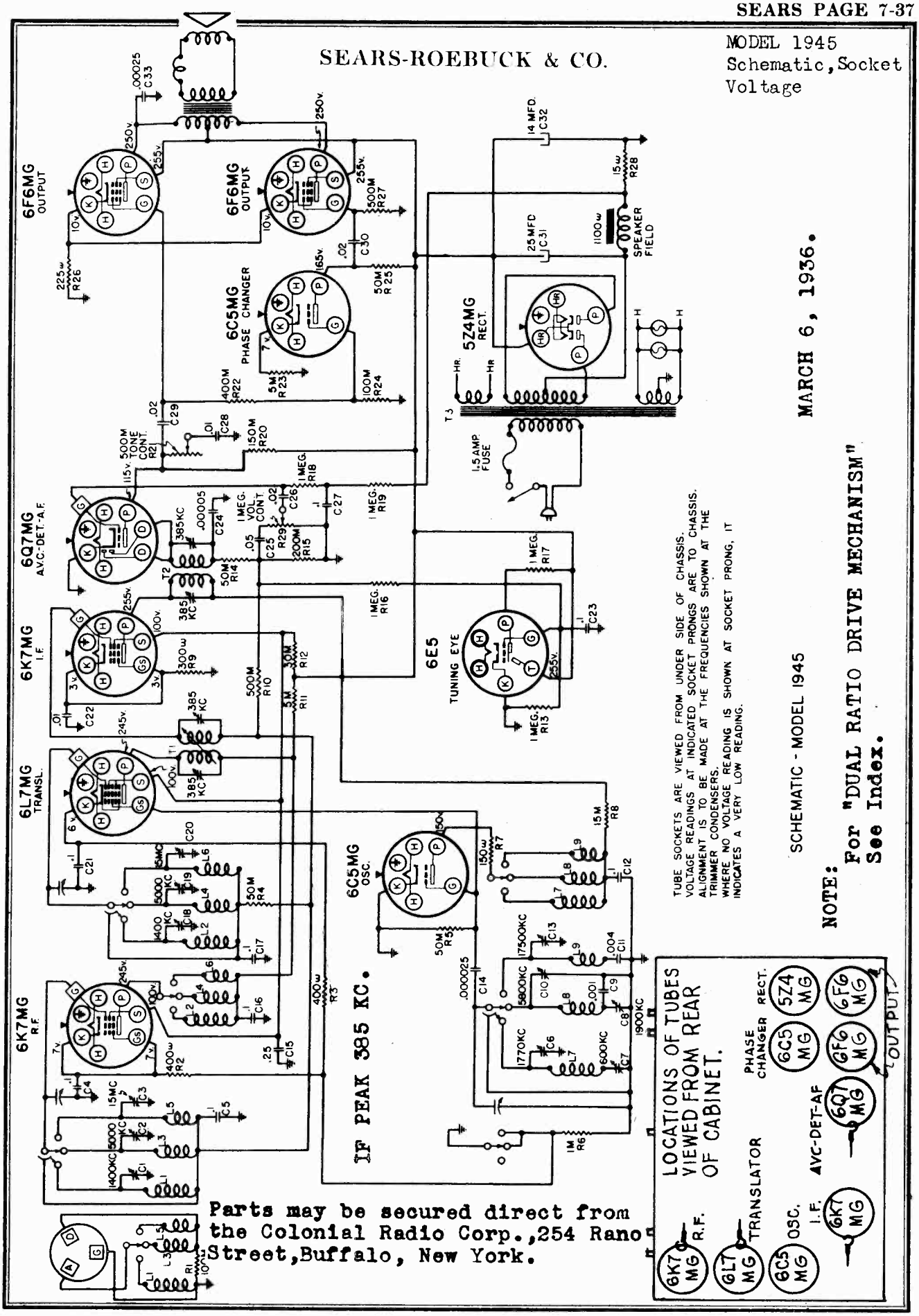
3. Set the test oscillator to 14000 kc and tune in its signal. Then peak the translator trimmer, C7.

4. Set the test oscillator to 6000 kc and tune in its signal. If necessary, shift turns on the translator coil, L5.

5. Repeat the procedure for greater accuracy.

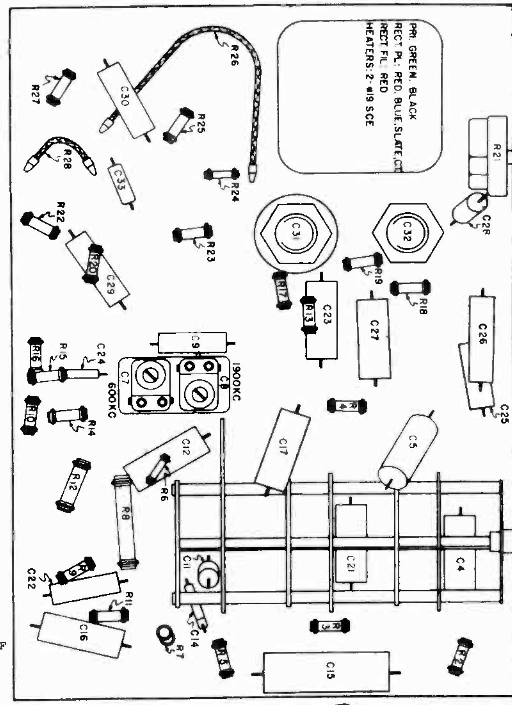
FAILURE TO OPERATE WHEN SWITCHED OFF AND THEN ON AGAIN

It sometimes happens that the receiver will fail to operate after it is switched off and then switched on again within approximately a second. This is due to blocking of the 230 AF tubes. It happens only when the receiver is switched on after exactly the right interval which will vary with different tubes. The condition will seldom be encountered since the interval of time between switching the receiver off and then on is very critical. If the receiver is left switched off for a half minute or more, it will resume operation when turned on without any trouble. The condition can be entirely eliminated by connecting another 300M ohm resistor in series with the detector plate resistor, R14, and then connecting a .2 mfd. 200 volt condenser from the junction of these two resistors to the chassis.

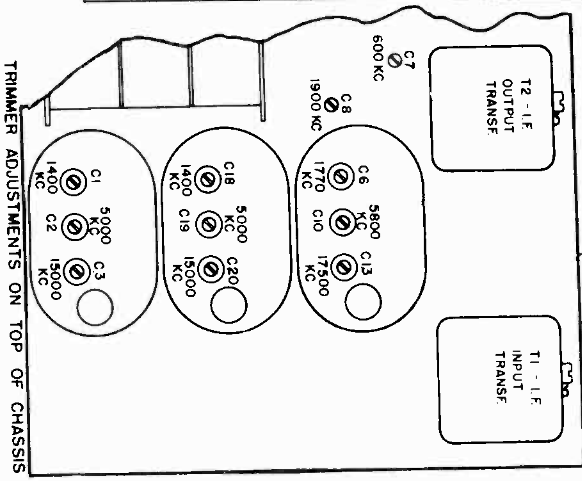


MODEL 1945
Trimmers, Chassis, Data
Alignment, Sensitivity

SEARS-ROEBUCK & CO.



LOCATIONS OF PARTS UNDER CHASSIS - MODEL 1945



TRIMMER ADJUSTMENTS ON TOP OF CHASSIS

IF ALIGNMENT

1. Connections:

Connect the ground lead of the test oscillator to the receiver chassis. Connect the output lead of the test oscillator, in series with a .1 mfd condenser, to the various points mentioned below for alignment. Connect the low scale of an output meter across the loud speaker voice coil. A reading of one volt or less will be obtained during most of the alignment. Connect a jumper between the "D" and "G" terminals of the antenna terminal block at the rear of the chassis.

2. Receiver Settings:

Turn the Wave Band switch to the BROADCAST position and the Station Selector to about 550 kc. Turn the receiver Volume Control all the way on, the Tone Control to its brilliant position (clockwise), and the Selectivity Control to its SHARP position (counter clockwise).

3. Alignment:

(a) Turn the Variable Selectivity Control all the way to the right (broad position). Loosen the set screw that binds the flexible cable and push the cable all the way into its tube. Then tighten the set screw. Be careful that it is not tightened so much that the flexible cable is cut. Be sure that the Variable Selectivity Control knob remains at its full clockwise position during the operation.

After this has been done turn the Variable Selectivity Control knob all the way to the left (sharpest position) and leave it in this position for the remainder of the alignment procedure.

(b) Set the test oscillator to 385 kc. Connect its output (through the .1 mfd condenser) to the control grid of the 6K7MG IP tube. Adjust the IF output transformer, T2, for maximum output meter reading.

(c) Change the test oscillator output connection to the control grid of the 6L7MG translator tube and adjust the IF input transformer, T1, for maximum output meter reading.

(d) Change the test oscillator output connection back to the 6K7MG tube and repeat the IF output transformer adjustment. Then repeat the IF input transformer adjustment with the test oscillator connected to the 6L7MG tube. The output power from the test oscillator should be kept at the lowest possible value consistent with a satisfactory output meter reading-

BROADCAST BAND ALIGNMENT

1. Connections:

Connections for Broadcast band alignment are the same as for IF alignment except that the .1 mfd condenser is disconnected from the output lead of the test oscillator. In its stead a .00025 mfd mica condenser is connected from the test oscillator output lead to the "A" terminal on the antenna terminal block at the rear of the chassis.

2. Receiver Settings:

Turn the Volume Control all the way on, the Tone Control all the way to the right, and the Wave Switch to the BROADCAST position. Turn the Variable Selectivity Control to its sharp position (counter clockwise).

3. Alignment:

(a) Set the test oscillator to 1770 kc. Open the variable condenser all the way and peak the broadcast oscillator trimmer, C6. The locations of all of the trimmers are shown in the Illustrations.

(b) Set the test oscillator to 1400 kc and tune in its signal. Peak the broadcast antenna and translator trimmers, C1 and C18.

(c) Set the test oscillator to 600 kc and tune in its signal. Peak the broadcast oscillator padder, C7. The variable should be rocked a degree or two during the adjustment.

(d) Repeat the 1770 kc and then the 1400 and 600 kc adjustments for greater accuracy. Always keep the test oscillator output at its lowest possible value, to render the AVC action inoperative.

SHORT WAVE BAND "B" ALIGNMENT

1. Connections:

Connections remain the same as for Broadcast band alignment except that the .00025 mfd condenser in series with the test oscillator output lead is disconnected and a 400 ohm resistor connected in its stead.

2. Receiver Settings:

Turn the Wave Band switch to the "B" position. Other settings remain the same as for Broadcast band alignment.

3. Alignment:

(a) Set the test oscillator to 5800 kc. Open the variable condenser all the way and peak the oscillator trimmer, C10.

(b) Set the test oscillator to 5000 kc and tune in its signal. Peak the antenna and translator trimmers, C2 and C19.

(c) Set the test oscillator to 1900 kc and tune in its signal. Peak the oscillator padder, C8. The variable should be rocked a degree or two during the adjustment.

(d) Repeat the 5800 kc and then the 5000 kc and 1900 kc adjustments. Always keep the test oscillator output power at its lowest possible value.

SHORT WAVE BAND "C" ALIGNMENT

1. Connections:

All connections remain the same as for band "B".

2. Receiver Settings:

Turn the Wave Band switch to the "C" position. Other receiver settings remain the same as for band "B" alignment.

3. Alignment:

(a) Set the test oscillator to 17500 kc. Open the variable condenser all the way and peak the oscillator trimmer, C13.

(b) Set the test oscillator to 15000 kc and tune in its signal. Peak the antenna and translator trimmers, C3 and C20. Keep the test oscillator output power at its lowest possible value.

SENSITIVITIES

The following figures are given as an indication of the sensitivities that should be had at various frequency settings of the receiver. It is necessary to have a test oscillator with an accurately calibrated attenuator so that its output power can be known. The figures represent the input voltage necessary to secure an output meter reading of 1 volt.

For measurements on the Broadcast band the test oscillator output lead is to be connected, in series with a .00025 mfd condenser, to the "A" terminal at the rear of the chassis, as for alignment. For Short Wave band measurements a 400 ohm resistor is to be connected instead of the .00025 mfd condenser. Turn the receiver Volume Control knob all the way on, the Tone Control all the way to the right, and the Selectivity Control all the way to the left.

	Frequency	MICROVOLTS INPUT
Broadcast Band:	600 kc	45
	1000 kc	35
	1400 kc	25
Band "B":	1900 kc	35
	3000 kc	15
	4000 kc	9
	5000 kc	6
Band "C":	6000 kc	50
	10000 kc	30
	15000 kc	8

Tubes And Their Functions:

6K7MG - RF
6C5MG - Oscillator
6L7MG - Translator
6K7MG - IF
6Q7MG - AVC - Detector - AF
6C5MG - Phase Changer
2-6F6MG - Push Pull Output
5Z4MG - Rectifier
6E5 - Tuning Eye

General Description:

This is a ten tube (including Tuning Eye) superheterodyne. In addition to the BROADCAST band it incorporates POLICE and FOREIGN SHORT WAVE bands. A Variable Tone Control is incorporated as well as a separate Variable Selectivity Control. The 6E5 Tuning Eye simplifies accurate tuning.

Antenna And Ground Connections:

These receivers are designed for use with either a conventional type of antenna or with a Doublet Antenna. There is a terminal block at the rear of the chassis. When a conventional antenna is used, the leadin from the antenna is to be connected to the terminal marked, "A", on the terminal block. The end of the ground wire should be bared for a great enough length so that it can be connected both under the terminal marked, "G" and under the terminal marked, "D".

When a Doublet Antenna is used, one wire of the twisted down lead should be connected under the terminal marked, "A" and the other wire under the terminal marked, "D". Either wire may be connected to either terminal. The ground connection is made to the terminal marked, "G".

The Fuse:

There is a 1½ ampere fuse mounted under the cover marked, "FUSE", at the rear of the chassis. Remove the power cord plug from its receptacle before taking off the fuse cover. The 5Z4MG tube should be tested before replacing the fuse since a defect in this tube will cause the fuse to blow.

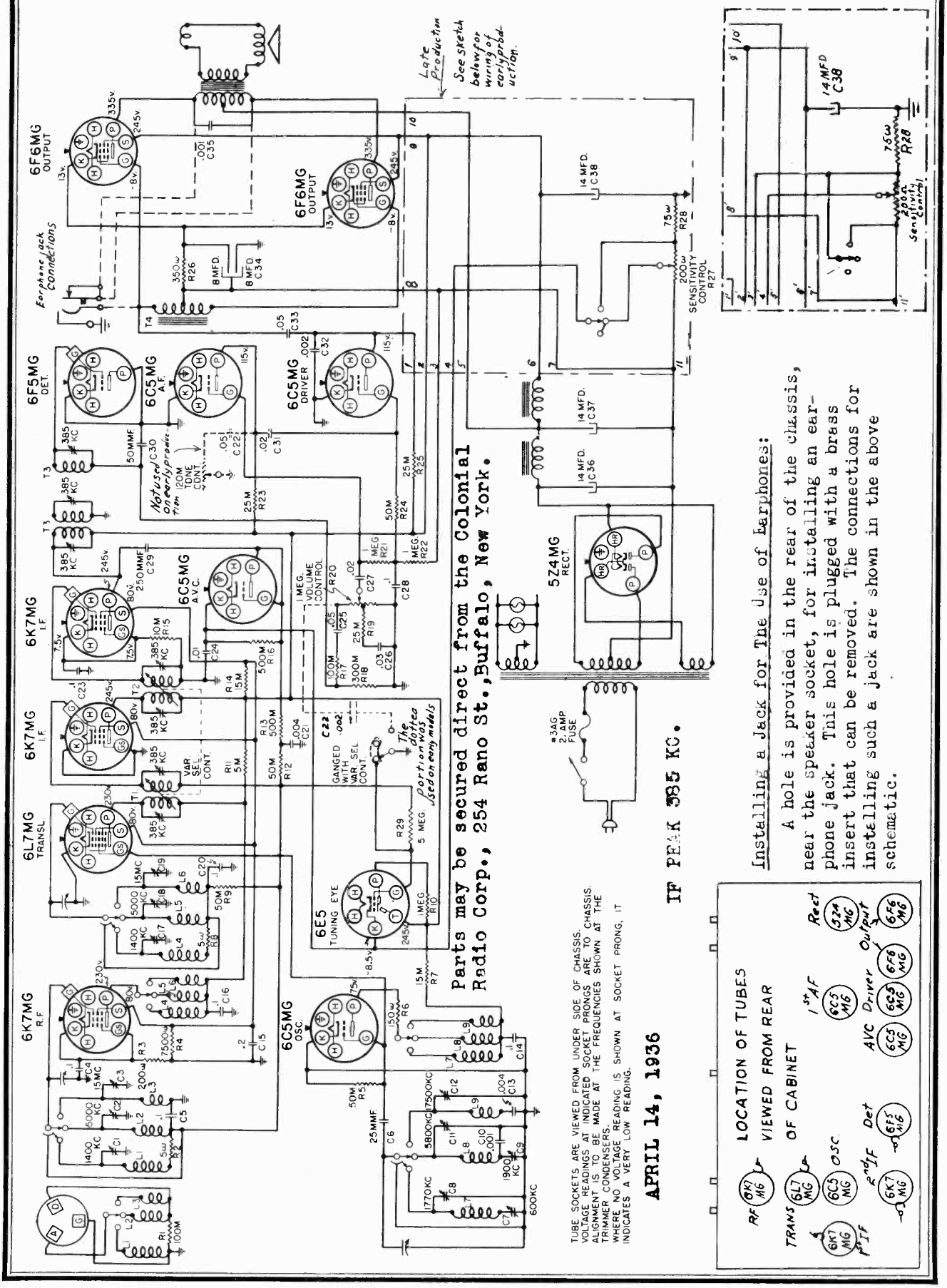
The AVC Circuit:

The diode current of the 6Q7MG tube flowing through the 200M ohm resistor, R15, creates a voltage drop across it. This voltage is applied to the control grids of the RF, Translator, and IF tubes to provide AVC

Schematic, Socket Voltage, Changes

SEARS-ROEBUCK & CO.

MODEL 1946
Early, Chassis 388
Late, Chassis 388X



MODEL 1946
Early, Chassis 388
Late, Chassis 388X

SEARS-ROEBUCK & CO.

Chassis, Trimmers
Alignment, Sensitivity

ALIGNMENT PROCEDURE

IF Alignment

1. Connections:

Connect the ground lead of the test oscillator to the receiver chassis. Connect the output lead of the test oscillator, in series with a .1 mfd condenser, to the positions mentioned below under "Alignment". Connect the low scale of an output meter across the loud speaker voice coil. Connect a jumper between terminals "p" and "g" of the antenna terminal block at the rear of the chassis.

2. Receiver Settings:

Turn the Wave Band switch to the BROADCAST position and the Station Selector to about 600 kc. Turn the Variable Selectivity Control all the way on and the Sensitivity Control to its sharpest position (all the way counter clockwise).

3. Alignment:

(a) Turn the Variable Selectivity Control all the way to the right. Loosen the set screws on the IF transformer flexible shafts and push the cables as far as possible into their copper tubes. Then re-tighten the set screws, making sure that the Variable Selectivity Control remains in its extreme clockwise position. Do not tighten the set screws so much that they cut the flexible cables. Then turn the Variable Selectivity Control all the way counter clockwise and leave it in this position for the remainder of the alignment procedure.

(b) Set the test oscillator to 385 kc and connect its output lead (in series with a .1 mfd condenser) to the control grid of the 6U7MG second IF tube. Peak the IF output transformer, T3.

(c) Change the test oscillator output lead to the 6K7MG first IF tube and peak the IF interstage transformer, T2.

(d) Change the test oscillator output lead to the control grid of the 6U7MG translator tube and peak the IF input transformer, T1.

(e) Repeat operations (b), (c) and (d), connecting the test oscillator output lead to the control grid of the first IF tube and the translator tube. As was done originally. Always keep the test oscillator output power at its lowest possible value to render the AVC action inoperative.

BROADCAST BAND ALIGNMENT

1. Connections:

Disconnect the .1 mfd condenser from the output lead of the test oscillator. Connect a .00025 mfd mica condenser in series with the test oscillator output lead and the "A" terminal of the antenna terminal block at the rear of the chassis. All other connections remain the same as for IF alignment.

2. Receiver Settings:

Turn the Wave Band switch to the BROADCAST position, the Volume Control all the way on, and the Variable Selectivity Control to its sharpest position, as for IF alignment.

3. Alignment:

(a) Set the test oscillator to 1770 kc. Open the Variable Condenser plates all the way and peak the broadcast oscillator trimmer, C8.

(b) Set the test oscillator to 1400 kc and tune in its signal. Peak the Broadcast antenna trimmer, C1, and the Broadcast translator trimmer, C17. The locations of all the trimmers are shown in the Service Illustrations.

(c) Set the test oscillator to 600 kc and tune in its signal. Peak the Broadcast oscillator padder, C7. The variable should be rocked a degree or two while making this adjustment.

(d) Repeat the 1770 kc, then the 1400 kc, and then the 600 kc adjustment for greatest accuracy. Always keep the test oscillator output at its lowest possible value.

(e) To check the dial calibration, set the test oscillator at 1000 kc and tune in its signal. If necessary, turn the dial pointer to 1000 kc, being careful not to allow the variable condenser to turn.

SHORT WAVE BAND "g" ALIGNMENT

1. Connections:

Disconnect the .00025 mfd mica condenser from the output lead of the test oscillator and replace it with a 400 ohm carbon resistor. Other connections remain the same as for Broadcast alignment.

2. Receiver Settings:

Turn the Wave Band switch to the "g" position. Other settings remain the same as for Broadcast alignment.

3. Alignment:

(a) Set the test oscillator to 5800 kc. Open the Variable Condenser plates all the way and peak the oscillator trimmer, C11.

(b) Set the test oscillator to 5000 kc and peak the antenna trimmer, C2, and the translator trimmer, C18.

(c) Set the test oscillator to 1900 kc and tune in its signal. Peak the oscillator padder, C9. The variable should be rocked a degree or two during the adjustment.

(d) Repeat the alignment operations in their original order for greatest accuracy. Always keep the test oscillator output at its lowest possible value.

SHORT WAVE BAND "C" ALIGNMENT

1. Connections:

All connections remain the same as for band "g" alignment.

2. Receiver Settings:

Turn the Wave Band switch to the "c" position. Other settings remain the same as for band "g" alignment.

3. Alignment:

(a) Set the test oscillator to 17,500 kc. Open the Variable Condenser plates all the way and adjust the oscillator trimmer, C12.

(b) Set the test oscillator to 15,000 kc and tune in its signal. Peak the antenna trimmer, C3, and the translator trimmer, C19.

(c) Repeat the 17,500 kc adjustment and then the 15,000 kc adjustment for greatest accuracy. Always keep the test oscillator output power at its lowest possible value.

SENSITIVITIES

The following figures are given as an indication of the approximate sensitivities that should be had at various settings of the receiver. It is necessary to have a test oscillator with an accurately calibrated attenuator so that its power output can be known. The output meter is to be connected across the loud speaker voice coil. An output meter reading of 2.6 volts should be obtained for each of the input voltages shown for the frequencies listed.

The Volume Control of the receiver must be all the way on and the Variable Selectivity Control all the way counter clockwise for the "c" and "g" positions. The ground lead of the test oscillator is to be connected to the receiver chassis. The output lead of the test oscillator, in series with the value of condenser or resistor shown below, is to be connected as indicated for the particular frequency at which the measurement is being made.

The Sensitivity Control at the rear of the chassis is to be adjusted so that an output meter reading of 2.6 volts is obtained with a 400 microvolt input connected to the translator grid.

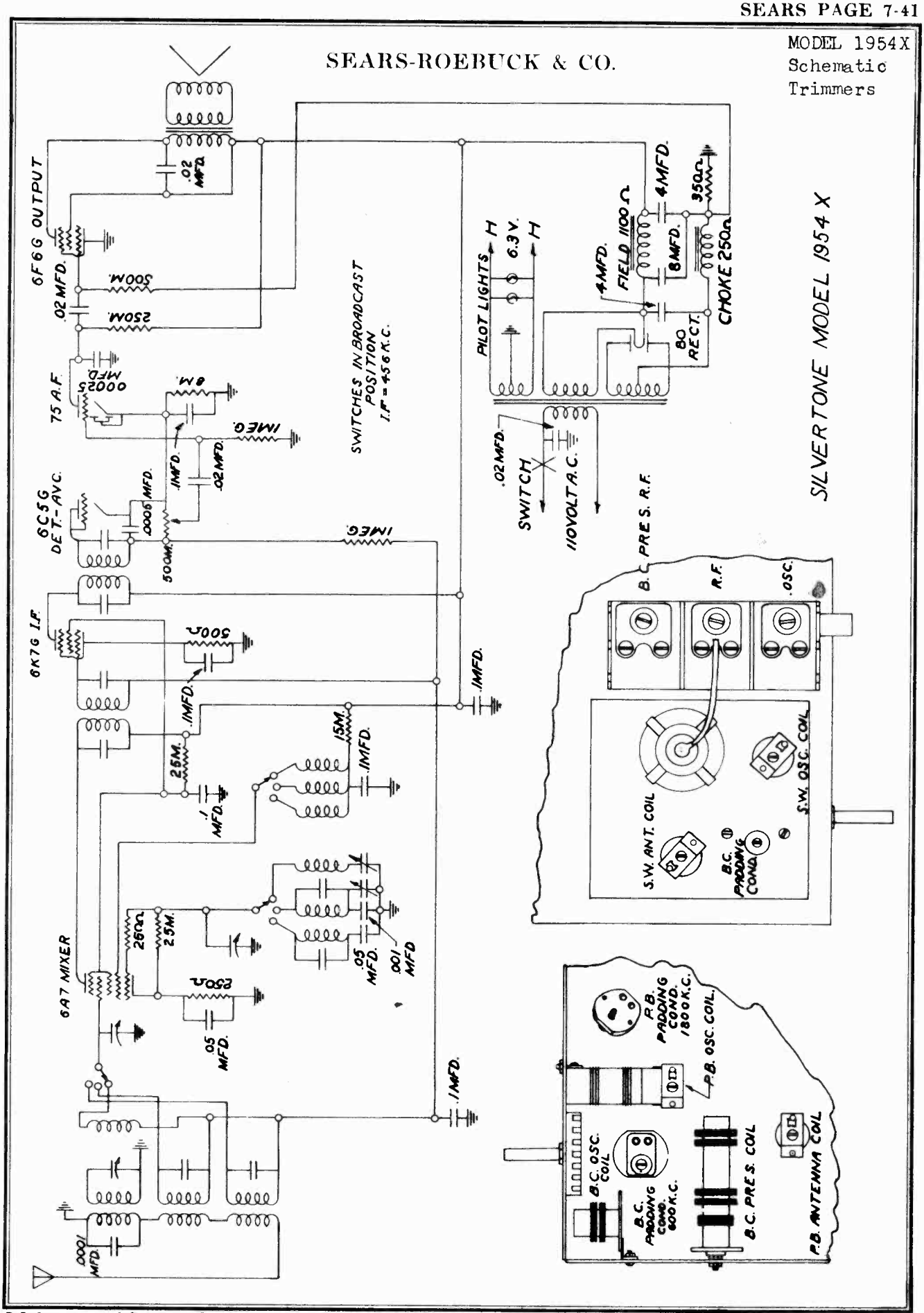
INPUT POINT	DUMMY ANTENNA	FREQUENCY	MICROVOLTS
Translator Grid	.1 mfd	385 kc	400
Antenna Terminal "A"	.00025 mfd	600 kc	65
Antenna Terminal "A"	.00025 mfd	1000 kc	*50
Antenna Terminal "A"	.00025 mfd	1400 kc	50
Antenna Terminal "A"	400 ohms	1900 kc	100
Antenna Terminal "A"	400 ohms	2800 kc	80
Antenna Terminal "A"	400 ohms	4000 kc	25
Antenna Terminal "A"	400 ohms	5000 kc	20
Antenna Terminal "A"	400 ohms	6000 kc	45
Antenna Terminal "A"	400 ohms	10000 kc	20
Antenna Terminal "A"	400 ohms	15000 kc	10

* FINAL SENSITIVITY CONTROL ADJUSTMENT

After all bands have been aligned, repeat the 1000 kilocycle adjustment, and reset the Sensitivity Control so that an output meter reading of 2.6 volts is obtained with a 10 microvolt input from the test-oscillator.

RE IS MOUNTED ON L1, L2, L3 ASSEMBLY. R8 IS MOUNTED ON L4, L5, L6 ASSEMBLY. ALL COILS, TRIMMERS, TRANSFORMERS AND R19, R20, C22, C25, C26 ARE MOUNTED ON TOP OF THE CHASSIS. R1 IS MOUNTED INSIDE OF ANTENNA TERMINAL BLOCK.

LOCATIONS OF PARTS - MODEL 1946



MODEL 1954X
Alignment

SEARS-ROEBUCK & CO.

Parts

The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400, 1800, 4000, 6000 and 14,000 K.C. and an output meter to be connected across the primary or secondary of the output transformers. If possible, all alignment should be made with the volume control on maximum and the test oscillator output as low as possible, to prevent the AVC from operating and giving false readings.

I. F. ALIGNMENT: Adjust the test oscillator to 456 K.C. and connect the output to the grid of the first detector tubes (6A7) through a .05 or .1 mfd. condenser, The ground on the test oscillator can be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

R. F. ALIGNMENT: Adjust the oscillator to 1400 K. C. and connect the output to the antenna post through a .0001 mfd. mica condenser to give the equivalent of an antenna about 60 feet. Set the receiver pointer to 1400 K. C. and adjust the rear gang condenser trimmer to peak. Next re-set the dial pointer on the receiver and the test oscillator to 600 K.C. Slowly increase or decrease the oscillator padding condenser and at the same time continuously tuning back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment seems a little complicated but is the easiest way to adjust the oscillator to the pre-selector or R.F. section. The padding condenser is located on the top of the removable R. F. assembly. Return to 1400 K.C. and again go over the adjustments at that frequency to be sure they have not been thrown out of adjustment.

SHORT WAVE BANDS

The foreign band of 19 to 49 meters can be adjusted by the two trimmers on the short wave coil located on the top of the chassis. Set the test oscillator to 14 megacycles. The oscillator coil is located near the dial.

The police and aviation band can be adjusted by the trimmers on the two coils underneath the chassis. Adjust the oscillator coil (the one near the wave change switch) so that the dial pointer is on the scale at 4000 K.C., then adjust the R. F. coil to resonance. The low frequency end or 1800 K.C. can be adjusted by the police band padding condenser using the same method as the 600 K.C. adjustment. The gang condenser trimmers are not to be used for alignment of either of the short wave bands.

Part No.	Description	List Price
P176	Power Cord & Plug	$0.26
P540	Power Transformer	2.18
P516	Band Switch	.47
P517	Volume Control	.69
P518	On-Off Switch	.29
P524	Airplane Dial	1.70
P160	Electrolytic Condenser	1.28
P474	4 mfd. Wet Electrolytic Condenser	.73
P483	1st I.F. Transformer	1.10
P484	2nd I.F. Transformer	1.10
P477	Three Gang Condenser	2.25
P485	Filter Choke	.36
P210	Padding Condenser	.38
P193	Broadcast Pre-Selector Coil	.60
P173	Broadcast Oscillator Coil	.35
P170	350 ohm Resistor	.15
	6" Dynamic Speaker	3.75
	Police Band Oscillator	.25
	Police Band Antenna Coil	.25
	S. W. Oscillator Coil	.30
	S. W. Antenna Coil	.30
	Tube Socket - state marking	.08
	Any mica condenser not listed	.15
	Any by-pass condenser not listed, state capacity and voltage	.13

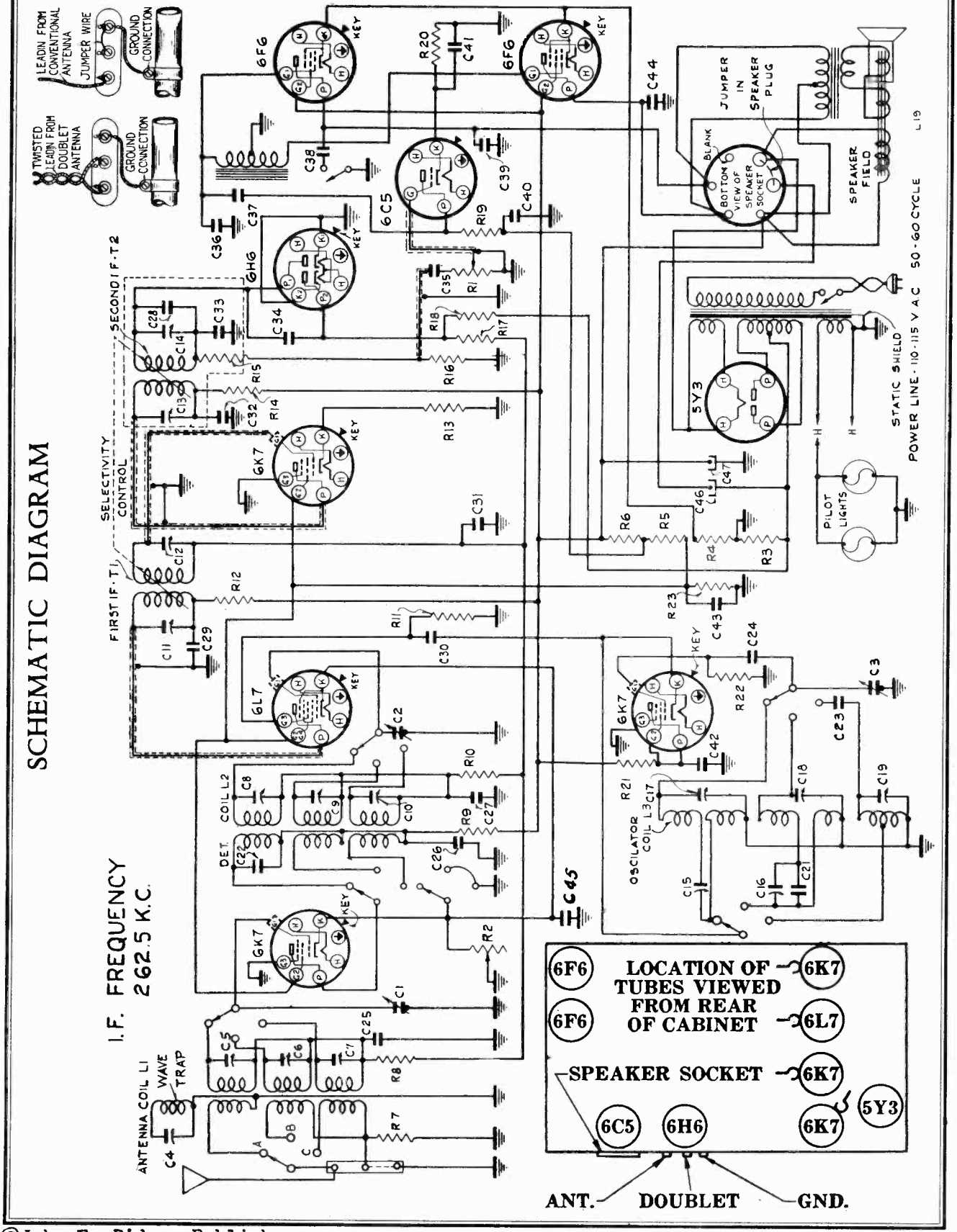
Parts for this model may be ordered from the Continental Radio and Television Corp. 325 W. Huron ST. Chicago Illinois
The above prices are subject to a discount of 50% net 10 days

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 1981,1981C,1941

SEARS-ROEBUCK & CO. Schematic

SCHEMATIC DIAGRAM



MODELS 1927X, 1937X
MODEL 1992X
MODEL 1993X
Alignment

SEARS-ROEBUCK & CO.

Models 1927X and 1937X

INTERMEDIATE ALIGNMENT:

1. Connect the high side of the test oscillator output to the control grid of the 1C6 modulator tube through a .02 Mfd. condenser. Leave the grid cap connected to the grid terminal of the tubes, and connect the ground side of the test oscillator to the receiver ground.

2. Set the test oscillator frequency to 465 kilocycles (this must be accurate).

3. Align the second intermediate transformer by turning one of the trimmer screws accessible through holes in the top of the transformer shields up and down (increasing and decreasing capacity) until maximum reading is obtained on the output meter, after which adjust the other trimmer screw of the same transformer for maximum sensitivity.

4. Adjust the first intermediate transformer in the same manner as the second I.F. transformer.

TO ALIGN THE VARIABLE CONDENSER: It is important when aligning the gang condenser, padding and trimmer condensers to follow the procedure carefully, otherwise the receiver will be insensitive and the dial calibration will be incorrect. The padding and trimmer condensers located underneath the chassis will be referred to by their functions as indicated on the circuit diagram.

1. Connect the high output side of the test oscillator through a 400 ohm resistor to the receiver antenna lead and the low side to the set ground.

2. Place the band selector switch for operation on the 5.8 to 18 megacycle band, tune the receiver dial, and set the test oscillator frequency to exactly 15 megacycles. Twist and untwist neutralizing link for best 15 megacycle signal response. Note: This adjustment will be found to be broad. Next adjust the 15 megacycle antenna trimmer for maximum 15 megacycle signal sensitivity.

3. Replace the 400 ohm resistor in series with test oscillator lead with a 200 mmfd. condenser, place the band selector switch for operation on the 540 to 1720 kilocycle band and set test oscillator frequency to exactly 1720 kilocycles.
Rotate gang condenser so that plates are completely out of mesh and bring in the 1720 kilocycle signal to maximum output by adjusting 1720 kilocycle oscillator trimmer.

4. With band selector switch placed for operation on the 540 to 1720 kilocycle band set test oscillator frequency and receiver dial to exactly 1400 kilocycles. Adjust 1400 kilocycle preselector and antenna trimmers for maximum 1400 kilocycle signal sensitivity.

5. Leave band selector switch for operation on 540 to 1720 kilocycle band, tune receiver dial and set test oscillator frequency to approximately 600 kilocycles. While rocking gang condenser slightly to right and left adjust 600 kilocycle oscillator padder for maximum sensitivity.

Model 1993X

INTERMEDIATE ALIGNMENT:
1. Connect the high side of the test oscillator output to the control grid of the 1C6 modulator tube through a .02 Mfd. condenser. Leave the grid cap connected to the grid terminal of the tube, and connect the ground side of the test oscillator to the receiver ground.
2. Set the test oscillator frequency to 465 kilocycles (this must be accurate).
3. Align the second intermediate transformer by turning one of the trimmer screws accessible through holes in the top of the transformer shields up and down (increasing and decreasing capacity) until maximum reading is obtained on the output meter, after which adjust the other trimmer screw of the same transformer for maximum sensitivity.
4. Adjust the first intermediate transformer in the same manner as the second I. F. transformer.
TO ALIGN THE VARIABLE CONDENSER: It is important when aligning the gang condenser, padding and trimmer condensers to follow the procedure carefully, otherwise the receiver will be insensitive and the dial calibration will be incorrect. The padding and trimmer condensers located underneath the chassis will be referred to by their function as indicated on the circuit diagram.
1. Connect the high output side of the test oscillator through a 400 ohm resistor to the receiver antenna lead and the low side to the set ground.
2. Place the band selector switch for operation on the 6 to 18 megacycle band, tune the receiver dial, and set the test oscillator frequency to exactly 15 megacycles. Adjust 15 megacycle antenna trimmer for maximum 15 megacycle signal sensitivity.
3. Replace the 400 ohm resistor in series with test oscillator lead with a 200 mmfd. condenser, place the band selector switch for operation on the 540 to 1720 kilocycle band and set test oscillator frequency to exactly 1720 kilocycles.
Rotate gang condenser so that plates are completely out of mesh and bring in the 1720 kilocycle signal to maximum output by adjusting 1720 kilocycle oscillator trimmer.
4. With band selector switch placed for operation on the 540 to 1720 kilocycle band set test oscillator frequency and receiver dial to exactly 1400 kilocycles. Adjust 1400 kilocycle preselector and antenna trimmers for maximum 1400 kilocycle signal sensitivity.
5. Leave band selector switch for operation on 540 to 1720 kilocycle band, tune receiver dial and set test oscillator frequency to approximately 600 kilocycles. While rocking gang condenser slightly to right and left adjust 600 kilocycle padder for maximum sensitivity.
6. Place band selector switch for operation on the 390-140 kilocycle band, rotate gang condenser so plates are completely out of mesh, and set test oscillator frequency to exactly 390 kilocycles. Bring in 390 kilocycle signal to maximum output with 390 oscillator trimmer.
7. With band selector switch for operation on 390-140 kilocycle band, tune receiver dial and set test oscillator frequency to exactly 350 kilocycles. Adjust 350 kilocycle antenna preselector trimmers for maximum 350 kilocycle signal response.
8. Leave band selector switch for operation on the 390-140 kilocycle band, tune receiver dial and set test oscillator frequency to approximately 150 kilocycles. Then while rocking gang condenser slightly to right and left adjust 150 kilocycle padding condenser for maximum sensitivity.

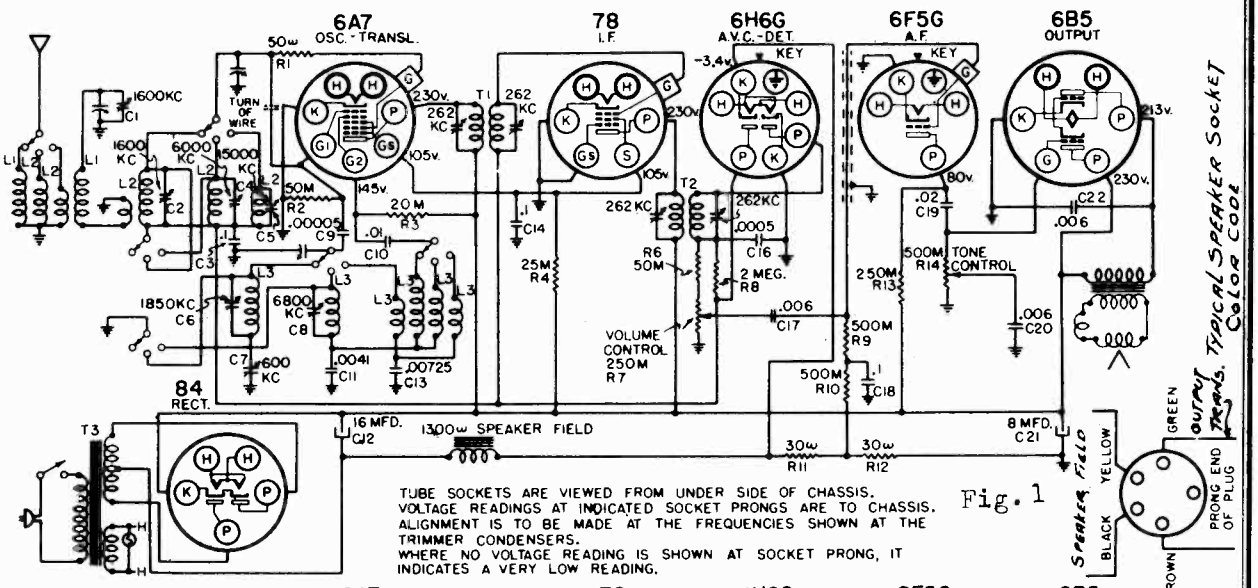
Model 1992X

INTERMEDIATE ALIGNMENT:
1. Connect the high side of the test oscillator output to the control grid of the 1C6 modulator tube through a .02 Mfd. condenser. Leave the grid cap connected to the grid terminal of the tube, and connect the ground side of the test oscillator to the receiver ground.
2. Set the test oscillator frequency to 465 kilocycles (this must be accurate).
3. Align the second intermediate transformer by turning one of the trimmer screws accessible through holes in the top of the transformer shields up and down (increasing and decreasing capacity) until maximum reading is obtained on the output meter, after which adjust the other trimmer screw of the same transformer for maximum sensitivity.
4. Adjust the first intermediate transformer in the same manner as the second I. F. transformer.
TO ALIGN THE VARIABLE CONDENSER: It is important when aligning the gang condenser, padding and trimmer condensers to follow the procedure carefully, otherwise the receiver will be insensitive and the dial calibration will be incorrect. The padding and trimmer condensers located underneath the chassis will be referred to by their function as indicated on the circuit diagram.
1. Connect the high output side of the test oscillator through a 400 ohm resistor to the receiver antenna lead and the low side to the set ground.
2. Place the band selector switch for operation on the 5.8 to 18 megacycle band, tune the receiver dial, and set the test oscillator frequency to exactly 18 megacycles.
Rotate gang condenser so that plates are completely out of mesh and then tune in the 18 megacycle signal to maximum output by adjusting the 18 megacycle oscillator trimmer. When adjusting this trimmer, two peaks, the fundamental and the image peak will be noticed. Care must be taken that the fundamental peak and not the image peak is used for aligning the receiver at 18 megacycles. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the first peak which is the fundamental and the proper one to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received, the incorrect image peak will be tuned in. After completing adjustment of the oscillator trimmer at 18 megacycles always check to see if the proper peak has been used. To do this leave the test oscillator frequency at 18 megacycles, increase the output of the test oscillator and tune the receiver dial to approximately 17 megacycles. Then vary the receiver dial slightly to the right and left of 17 megacycles, and if the fundamental peak was used in aligning at 18 megacycles the test oscillator signal will be heard at approximately 17 megacycles on the receiver dial. If it is not possible to receive the signal, then the fundamental peak was not used and the 18 megacycle oscillator trimmer must be properly readjusted.
3. With band selector switch set for operation on 5.8 to 18 megacycle band tune the receiver dial and set test oscillator frequency to exactly 15 megacycles and adjust 15 megacycle antenna trimmer for maximum 15 megacycle signal sensitivity.
4. Replace the 400 ohm resistor in series with test oscillator lead with a 200 mmfd. condenser, place the band selector switch for operation on the 540 to 1720 kilocycle band and set test oscillator frequency to exactly 1720 kilocycles.
Rotate gang condenser so that plates are completely out of mesh and bring in the 1720 kilocycle signal to maximum output by adjusting 1720 kilocycle oscillator trimmer.
5. With band selector switch placed for operation on the 540 to 1720 kilocycle band set test oscillator frequency and receiver dial to exactly 1400 kilocycles. Adjust 1400 kilocycle preselector and antenna trimmers for maximum 1400 kilocycle signal sensitivity.
6. Leave band selector switch for operation on 540 to 1720 kilocycle band, tune receiver dial and set test oscillator frequency to approximately 600 kilocycles. While rocking gang condenser slightly to right and left adjust 600 kilocycle oscillator padder for maximum sensitivity.

Three Types
Schematics, Voltage

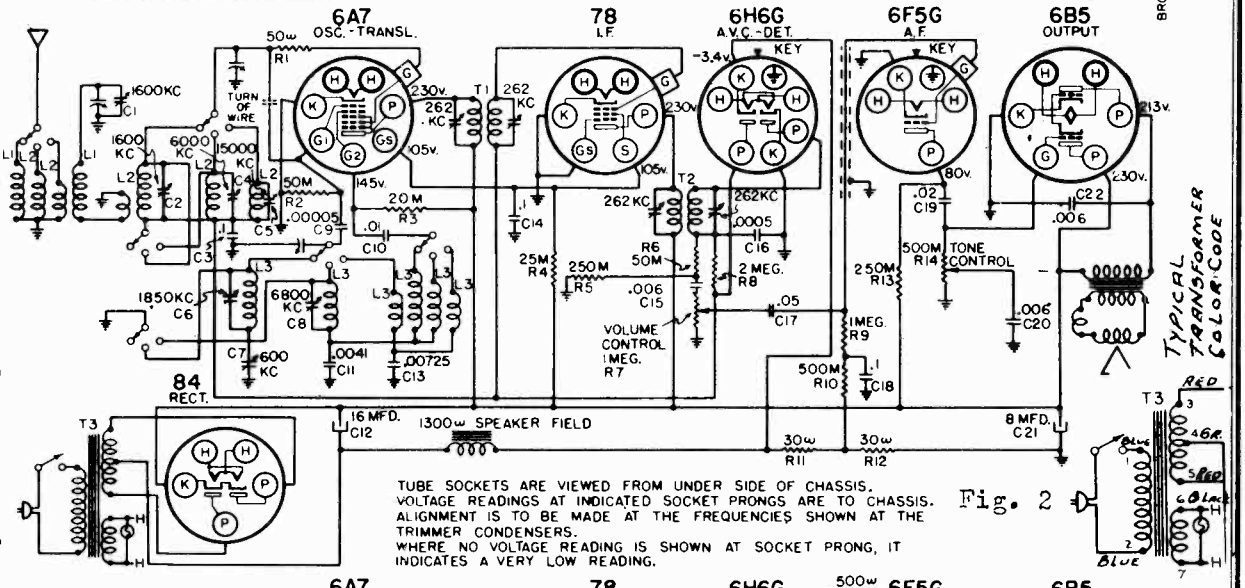
SEARS-ROEBUCK & CO.

MODELS 1986, 1987, 4403, 4463
4484, 4563, 4564, 4584



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

Fig. 1



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
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Fig. 2

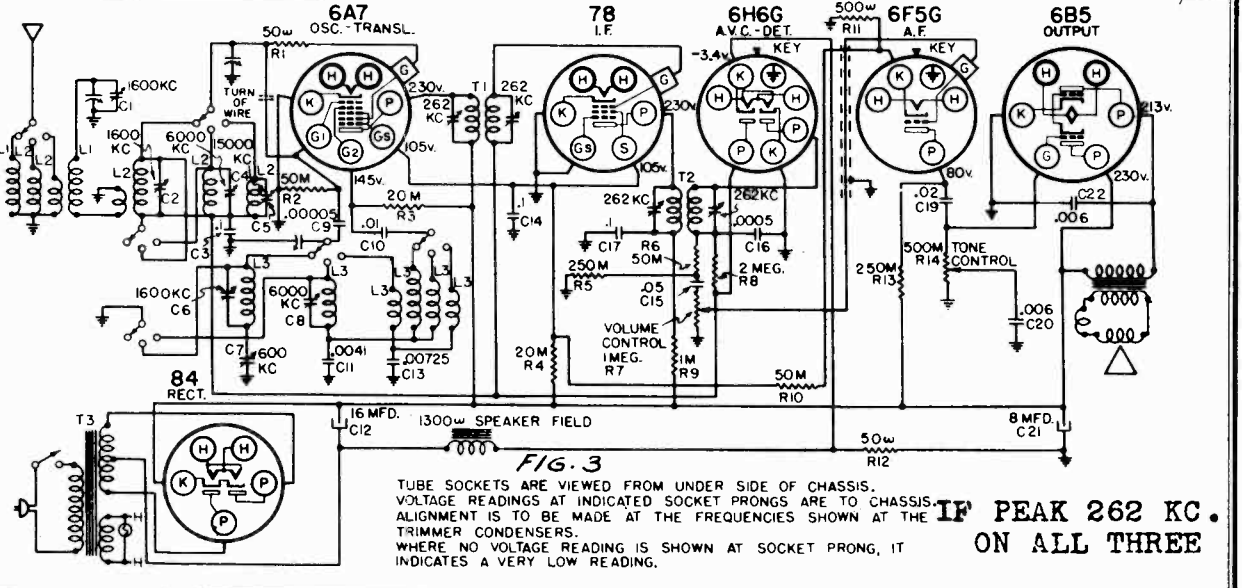


FIG. 3

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

IF PEAK 262 KC. ON ALL THREE

MODELS 1986,1987,4403,4463 4484,4563,4564,4584 Socket,Chassis,Alignment Changes

SEARS-ROEBUCK & CO.

ELECTRICAL SPECIFICATIONS

POWER SUPPLY:
- All models available - - - - - - - - - - - - - - - 105-125 volts, 50-60 cycle, 48 watts
- All models available - - - - - - - - - - - - - - - 105-125 volts, 25 cycle, 50 watts

FREQUENCY RANGES:
- Band "A" - - - - - - - - 545-1750 kc
- Band "P" - - - - - - - - 2.2-6.5 mc
- Band "F" - - - - - - - - 6.2-18 mc

ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant.-Transl. Trimmer	Padder
Band "A"	1600 kc	1600 kc	600 kc
Band "P"	6 mc	6 mc	Fixed
Band "F"	-	15 mc	Fixed

INTERMEDIATE FREQUENCY - 262 kc

POWER OUTPUT:
- Type - - - - - - - - - Single Pentode
- Undistorted - - - - - - - 2.66 watts
- Maximum - - - - - - - - - - - 4 watts

LOUD SPEAKER:
- Type - - - - - - - - - - - - Dynamic
- Size - - - - - - - - - - - - 6" and 8"
- Field coil resistance - - - 1300 ohms
- Field coil voltage - - - - - 75 volts

OPERATING FEATURES:
- Fidelity Range - - 50 - 5000 cycles
- Tone Control - - - - - - - - - Variable
- Automatic Volume Control

CHASSIS FEATURES:
- Preselector on band "A"
- Antenna - - - - - - - - - Conventional

GENERAL INFORMATION

DIFFERENCES IN VOLUME CONTROL CIRCUITS:

Earlier production used a 250M ohm volume control and the circuit shown in Fig. 1. In later production, shown in the circuit of Fig. 2, the volume control value was changed to one megohm. Also, R5 and C15 were added; the value of C17 changed from .006 to .05; the value of R9 changed from 500M ohms to one megohm. The effect of this change is to remove the DC diode current from the volume control to prevent noisy operation of the control.

CHASSIS MARKED 407P AND LATER:

Chassis that are rubber stamped 407P or any later letter incorporate the circuit shown in Fig. 3. The differences as compared to Fig. 2 are:

C15 changed from .006 mfd. to .05 mfd.
C17 changed from .05 mfd. to .1 mfd. and its location changed.
The resistors R9, R10, and R11 shown in Fig. 2 were removed.
A new 1M ohm resistor was added and R9 designation assigned to it.
A new 50M ohm resistor was added and R10 designation assigned to it.
A new 500 ohm resistor was added and R11 designation assigned to it.
R4 changed from 25M ohms to 20M ohms.

These changes were made to provide more uniform operation with different makes of tubes.

HEATER CIRCUIT:

Earlier production used a center tapped power transformer heater winding. Later production omitted the center tap and grounded one end of the heater winding.

MODULATION HUM:

Modulation hum, which occurs only when a station is tuned in, can be eliminated by connecting a .003 mfd. 800 volt condenser from one side of the power transformer primary to ground.

Send Purchase Orders DIRECT to Colonial Radio Corp., 254 Rano St., Buffalo, N. Y.

ALIGNMENT PROCEDURE

PRELIMINARY:

- Output meter connections - Across voice coil leads
- Output meter reading to indicate .5 watts output - - - - - - - - - - - - - - 1.3 volts
- Average sensitivity in microvolts for .5 watts output - - - - - - - - - - See chart below
- Dummy antenna value to be in series with generator output - - - - - - - - See chart below
- Connection of generator output lead - - - - - - - - - - - - - - - - - - See chart below
- Generator modulation percentage - 30%
- Position of volume control - Fully clockwise
- Position of tone control - Fully clockwise

WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	MICROVOLTS
"A"	-	262 kc	.1 mfd.	6A7 Grid	T2, T1	-
-	To fall on center line of dial when variable is fully meshed.	-	-	-	-	-
"A"	1600 kc	1600 kc	.0002 mfd.	Antenna Terminal	C6, C2, C1	40
"A"	600 kc (rock)	600 kc	.0002 mfd.	Antenna Terminal	C7	40
"P"	6 mc	6 mc	400 ohms	Antenna Terminal	C8	-
"P"	6 mc (rock)	6 mc	400 ohms	Antenna Terminal	C4	25
"F"	15 mc (rock)	15 mc	400 ohms	Antenna Terminal	C5	30
"F"	7 mc	7 mc	400 ohms	Antenna Terminal	Loop at bracket end of L3	80

IMAGE ADJUSTMENT

Set the generator to 1524 kc and tune in the signal image at about 1000 kc on the receiver. The generator should be adjusted for high output (.1 volts). There is a lead running from L1 through a hole in the chassis to the wave switch. Adjust the position of this lead under the chassis for minimum image response.

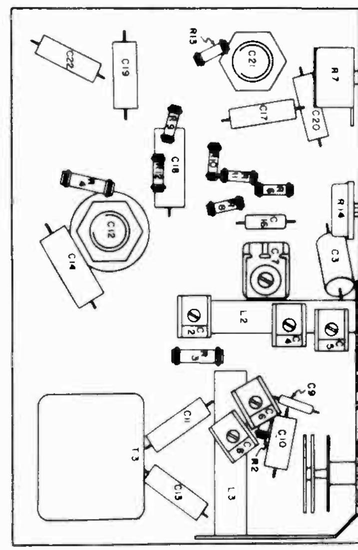
IMPORTANT ALIGNMENT NOTES

Where indicated by the word, "rock", the variable should be rocked back and forth a degree or two while making the adjustment.

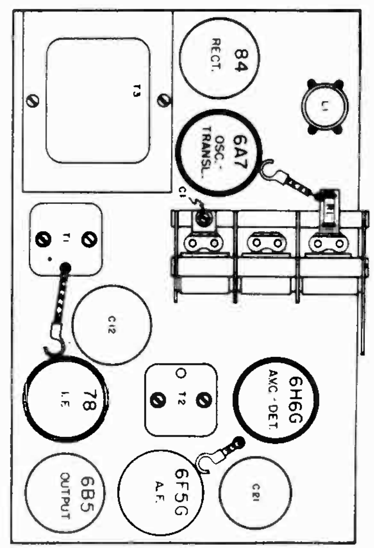
It is advisable to repeat the entire alignment procedure band by band and in the original order to insure greater accuracy.

Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.

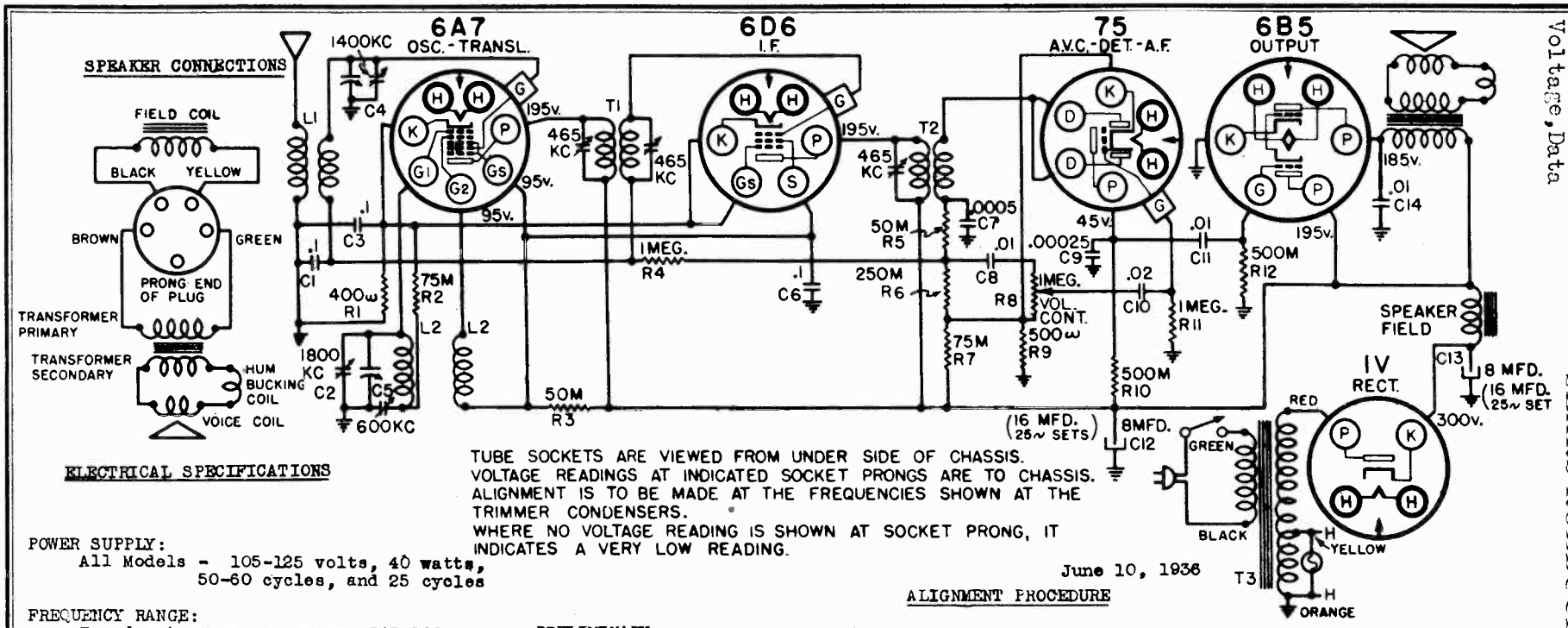
After the alignment procedure has been completed, tune in a broadcast signal at about 1000 kc. If necessary shift the dial pointer so that it indicates this frequency.



LOCATIONS OF PARTS UNDER CHASSIS - MODEL 101407



TOP OF CHASSIS - MODEL 101407



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

June 10, 1936

ELECTRICAL SPECIFICATIONS

POWER SUPPLY:
All Models - 105-125 volts, 40 watts, 50-60 cycles, and 25 cycles

FREQUENCY RANGE:
Broadcast - - - - - - - - 545-1800 kc

ALIGNMENT FREQUENCIES:
1800 kc - - - - (oscillator trimmer)
1400 kc - - - - (translator trimmer)
600 kc - - - - (oscillator padder)

INTERMEDIATE FREQUENCY - - - - - - - 465 kc

LOUD SPEAKER:
Type - - - - - - - - - - - - Dynamic
Size - - - - - - - - - - - - 6 inch
Field resistance - - - - - 1950 ohms

POWER OUTPUT:
Type - - - - - - - - - - - dual triode
Undistorted - - - - - - - - 1.15 watts
Maximum - - - - - - - - - 3.7 watts

OPERATING FEATURES:
Dial calibrated in kc and in meters.

CHASSIS FEATURES:
Number RF stages - - - - - - - - None
Number IF stages - - - - - - - - One
Number condensers in gang - - - Two
Antenna - - - - - - - - - conventional

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections - - - - - - - - - - - - - - - - - Connect meter across voice coil.

Output meter reading to indicate .5 watts output - - - - - - - - - - - - - - - - - 1.2 volts

Average sensitivity in microvolts for .5 watts output - - - - - - - - - - - See chart below

Generator ground lead connection - Receiver chassis

Dummy antenna value to be in series with generator output - - - - - - - - See chart below

Connection of generator output lead - See chart below

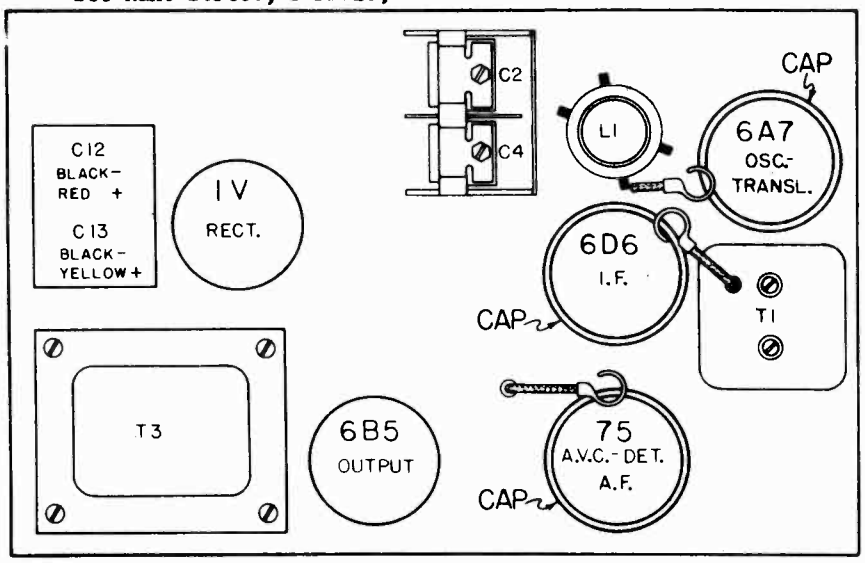
Position of volume control - All the way on

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	MICROVOLTS
-	465 kc	.1 mfd.	6A7 Grid	T2,T1	-
Completely open	1800 kc	.0002 mfd.	Antenna Lead	C2	-
1400 kc	1400 kc	.0002 mfd.	Antenna Lead	C4	100
600 kc (rock)	600 kc	.0002 mfd.	Antenna Lead	C5	70

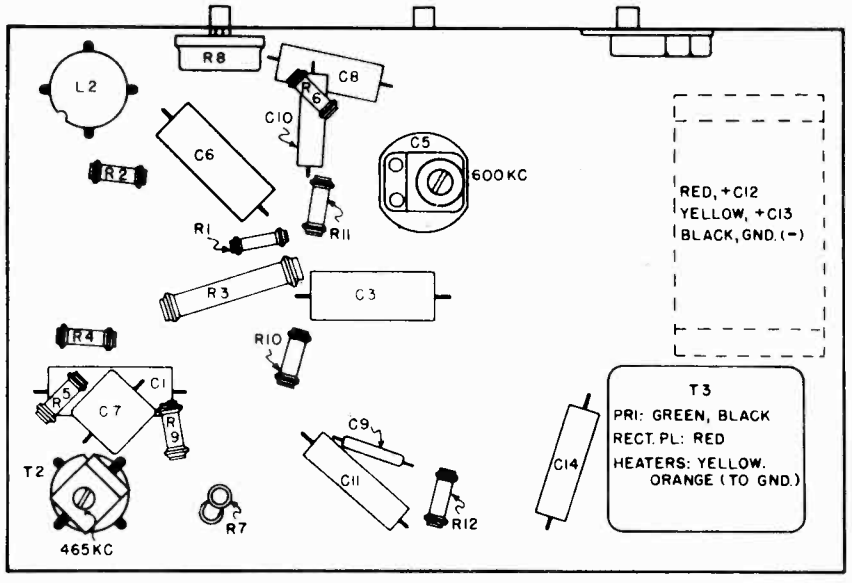
MODELS 1988,4401,4402
4461,4462
Socket,Trimmers,Notes
Chassis

SEARS-ROEBUCK & CO.

Parts may be secured direct from the Colonial Radio Corp., 254 Rano Street, Buffalo, New York.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

SUBJECT: ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF, and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc.

Align the IF at the new frequency and then realign the rest of the receiver as described in Service Instructions #57RL 8 for this receiver.

ELECTROLYTIC CONDENSERS IN 25 CYCLE MODELS:

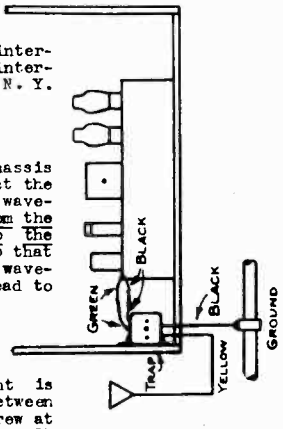
The 25 cycle models use 16 mfd. wet electrolytic condensers, C12 and C13, instead of the dual dry electrolytic used in the 60 cycle models.

SUBJECT: WAVE-TRAP TO ELIMINATE INTERFERENCE FROM SHIP OR AIRPORT TRANSMITTERS

In locations near ship transmitters or airports or air beacon stations, code interference may be experienced. Part #1013114256 wave-trap is designed to eliminate such interference. It can be ordered from Colonial Radio Corporation, 254 Rano Street, Buffalo, N. Y. Use Purchase Order blank, form F5284. The retail selling price is $1.00.

INSTALLATION OF THE TRAP:

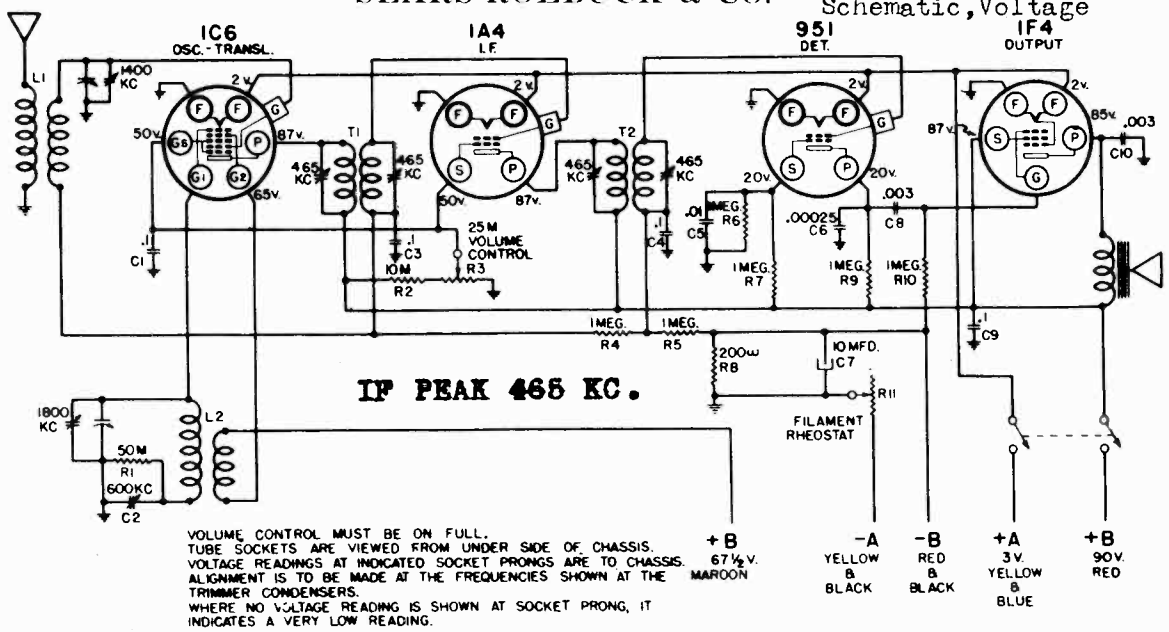
Mount the trap, by means of two wood screws, at any convenient place on the chassis shelf or cabinet where it will be near the antenna terminal of the receiver. Connect the yellow lead of the wave-trap to the antenna downlead. Splice the green lead of the wave-trap to the green antenna lead of the receiver. Cut off any excess length of wire from the trap and from the chassis antenna lead so that the green lead from the wave trap to the chassis is as short as possible. The yellow lead from the wave-trap should be run so that it is as far as possible from the green lead. Splice one of the black leads from the wave-trap to the black ground lead of the receiver. Connect the other wave-trap black lead to the ground used for the installation.



ADJUSTMENT OF THE TRAP:

The trap is pre-tuned to the IF frequency so that normally no further adjustment is necessary. However, should interference still be experienced, tune the receiver between approximately 550 and 600 kc. Then adjust the wave-trap, by means of the trimmer screw at the bottom of the container, until the interference is eliminated. Addition of the trap will reduce the sensitivity of the receiver around 600 kc by approximately 50%. The customer should be forewarned of this to avoid complaints of reduced sensitivity.

Alignment, Sensitivity — SEARS-ROEBUCK & CO. — MODELS 1989, 4408, 4420, 4520 Schematic, Voltage



VOLUME CONTROL MUST BE ON FULL.
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
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ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

ALIGNMENT PROCEDURE

PRELIMINARY **Parts may be secured direct from the Colonial Radio Corp., 254 Rano Street, Buffalo, New York.**

Output meter connections - - - - - - - - 4000 ohm meter, in series with a .5 mfd. condenser, across speaker terminals.

Output meter reading to indicate 50 milliwatts - - - - - - - - - - - - - - - - - 8.5 volts

Generator ground lead connection - Receiver chassis

Dummy antenna value to be in series with generator output - - - - - - - - - See chart below

Connection of generator output lead - See chart below

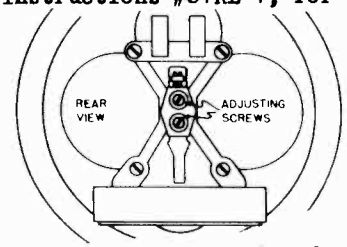
Position of volume control - On full

Position of power economizer - - - - - - - - - - - - - - to give two volts at tube filaments

GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED	POSITION OF VARIABLE
465 kc	.1 mfd.	1A4 Grid	T2	-
465 kc	.1 mfd.	1C6 Grid	T1	-
1800 kc	.0002 mfd.	Antenna Lead	V1	Completely open
1400 kc	.0002 mfd.	Antenna Lead	V2	1400 kc (rock)
600 kc	.0002 mfd.	Antenna Lead	C2	600 kc (rock)

SUBJECT: APPROXIMATE AVERAGE SENSITIVITY IN MICROVOLTS FOR 50 MILLIWATTS OUTPUT:

The generator connections and the receiver settings are to be as described in Service Instructions #57RL 7, for this model. The generator modulation is to be 30% at 400 cycles.



Rear View of Speaker

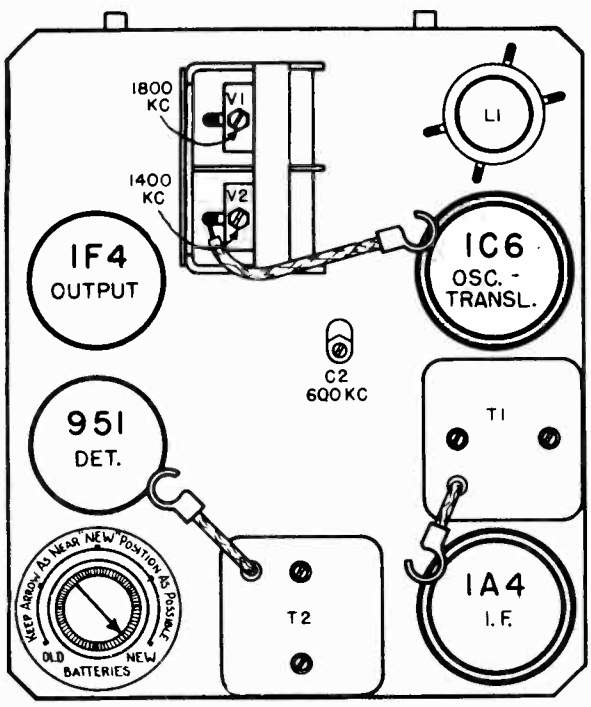
Frequency	Microvolts
600 kc	80
1000 kc	85
1400 kc	100
1600 kc	200
1750 kc	350

8500 microvolts, at IF grid, with variable closed and .1 mfd. dummy antenna.

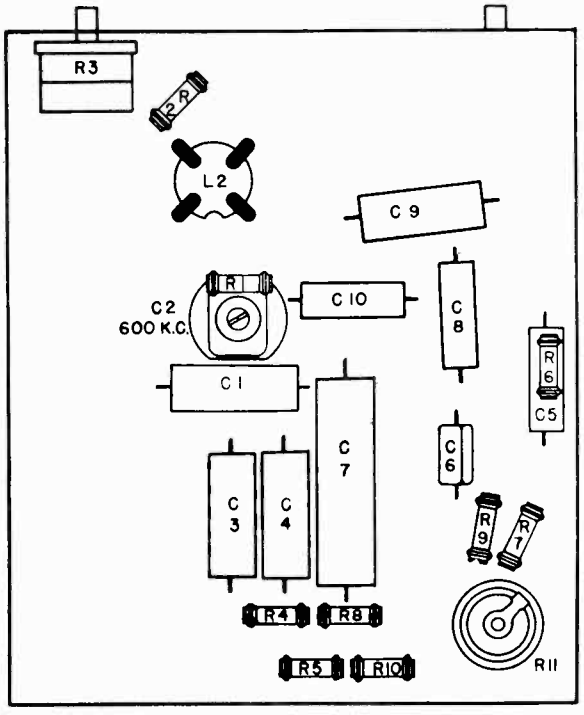
150 microvolts, at translator grid, with variable closed and .1 mfd. dummy antenna.

MODELS 1989,4408,4420,4520
Trimmers,Chassis,Data

SEARS-ROEBUCK & CO.



LOCATIONS OF PARTS ON TOP OF CHASSIS - MODEL 101414



LOCATIONS OF PARTS UNDER CHASSIS - MODEL 101414

ELECTRICAL SPECIFICATIONS

POWER SUPPLY:
"A" Battery (Dry) - - - - - 1 - #5023P
"B" Batteries - - - - - - - 2 - #5505P
"A" Drain - - - - - - - - - .36 amperes
"B" Drain - - - - - - - - - - 15 ma
For 2 VOLT STORAGE "A" - - - - - - - 1 - #734

ALIGNMENT FREQUENCIES:
1800 kc - - - - - (oscillator trimmer)
1400 kc - - - - - (translator trimmer)
600 kc - - - - - (oscillator padder)

FREQUENCY RANGE:
Broadcast - - - - - - - - - 540-1800 kc

INTERMEDIATE FREQUENCY - - - - - - - 465 kc

LOUD SPEAKER:
Type - - - - - - - - - - - - - Magnetic
Size - - - - - - - - - - - - - 6 inch
DC resistance - - - - - - - - - 1000 ohms

POWER OUTPUT:
Type - - - - - - - - - - - Single Pentode
Undistorted- - - - - - - - - - .25 watts
Maximum - - - - - - - - - - - .5 watts

OPERATING FEATURES:
Dial calibrated in kc and in meters.

GENERAL INFORMATION

ADJUSTMENT OF POWER ECONOMIZER:

A series filament rheostat, termed a POWER ECONOMIZER, is mounted on the top rear of the chassis. The arrow of the knob should always be kept as near the "NEW" position as possible, consistent with satisfactory reception This will result in greater life for the batteries and the tubes. As the batteries grow older and reception becomes poorer it will be necessary to turn the knob toward the "OLD" position to compensate. When the knob must be turned all the way to the "OLD" position the "A" battery is exhausted and should be replaced.

NOTE: ECONOMIZER SHOULD BE IN "OLD" POSITION AT ALL TIMES WHEN USING 2 VOLT STORAGE BATTERY.

SUBJECT: ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF, and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc.

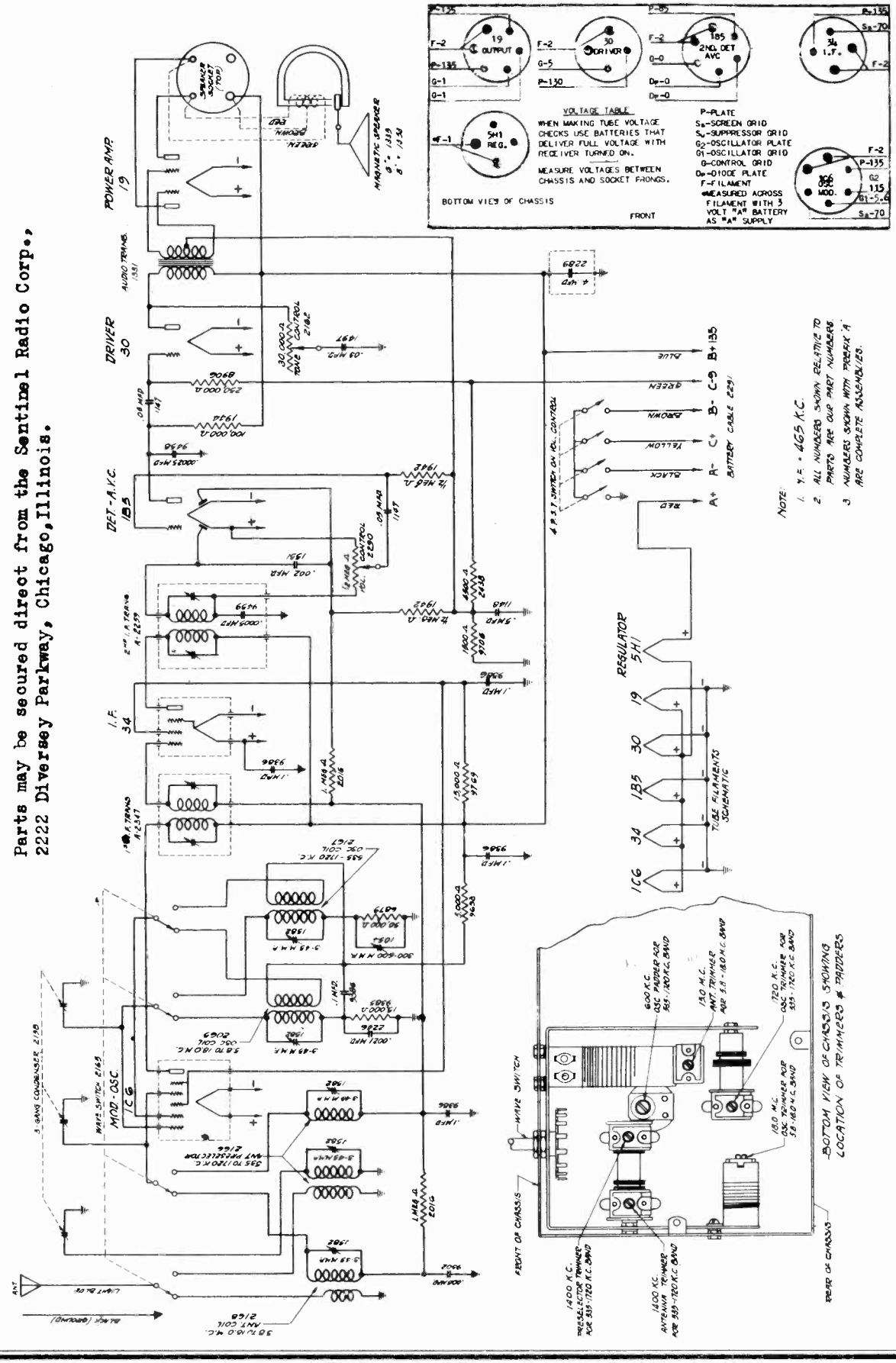
Align the IF at the new frequency and then realign the rest of the receiver as described in Service Instructions #57RL 7 for this receiver.

SPEAKER ADJUSTMENT

There are two adjusting screws at the rear of the speaker, as shown in the illustration. Speaker rattle can be corrected by turning these screws. Tighten one and loosen the other slightly until the rattle is eliminated.

SEARS-ROEBUCK & CO.

MODEL 1992X
Schematic, Voltage
Trimmers

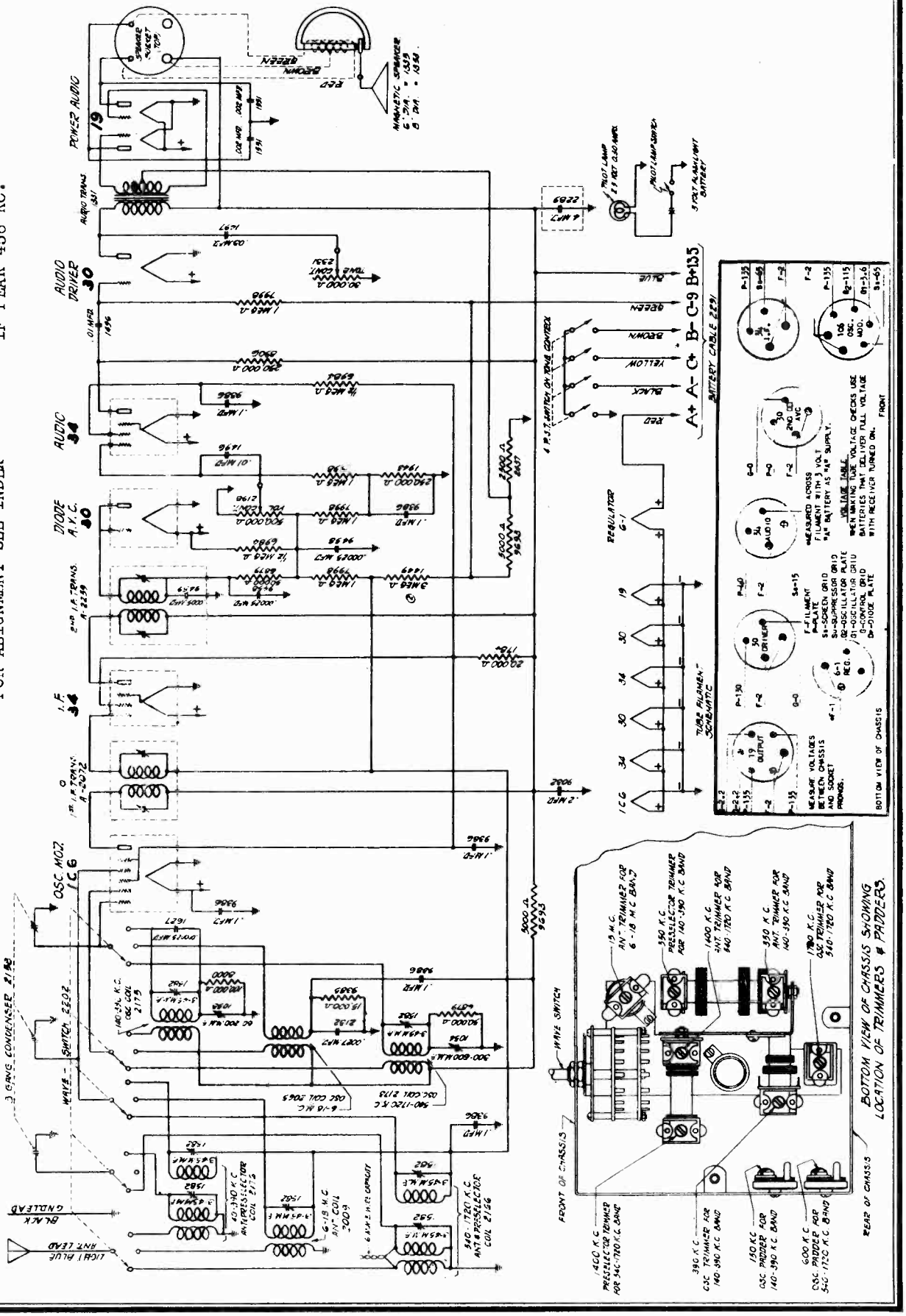


MODEL 1993X
Schematic
Voltage, Trimmers

SEARS-ROEBUCK & CO.

IF PEAK 456 KC.

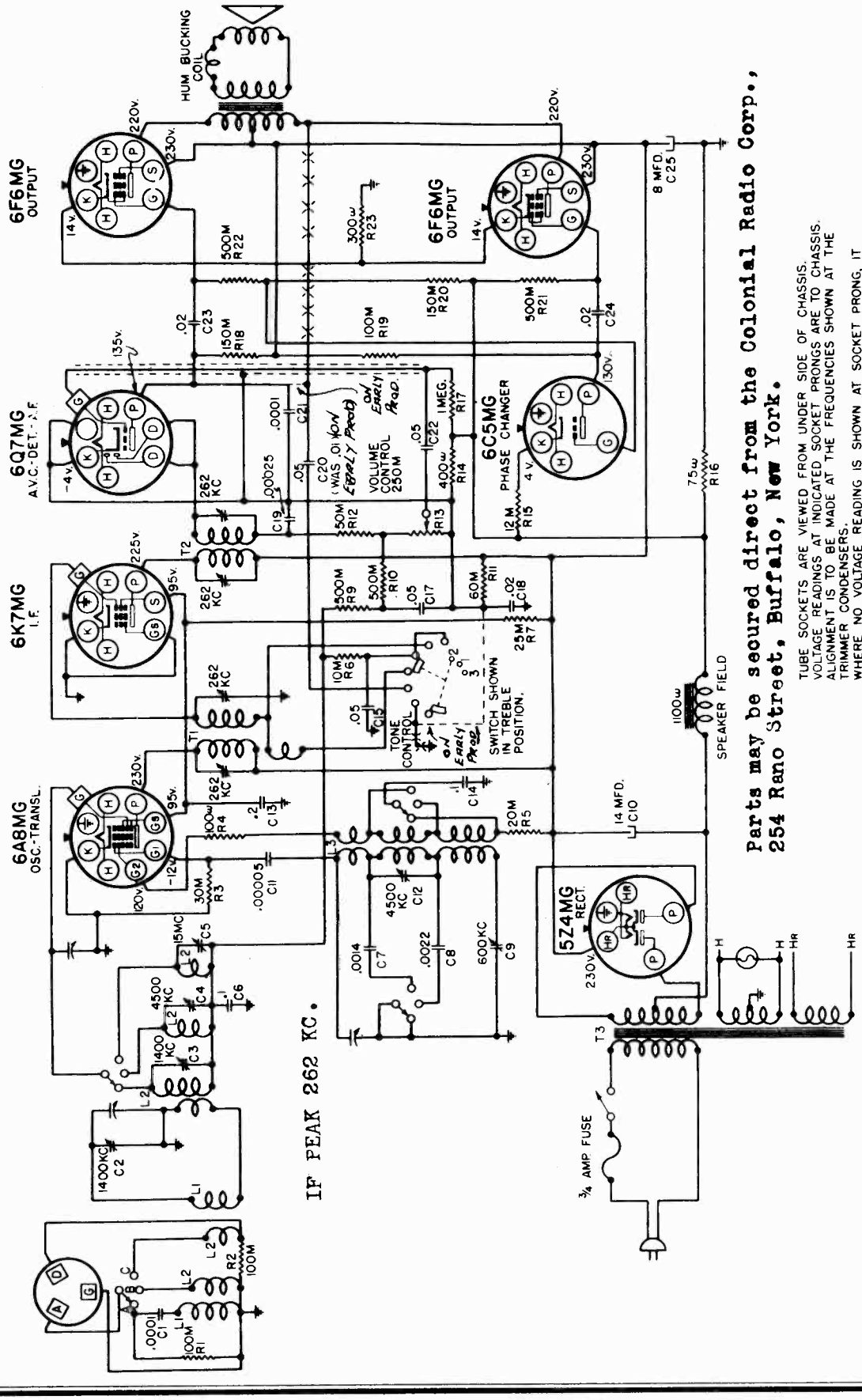
FOR ALIGNMENT SEE INDEX



Parts may be secured direct from the Sentinel Radio Corp., 2222 Diversey Parkway, Chicago, Illinois.

SEARS-ROEBUCK & CO.

MODEL 1998, Early, Late
Schematic
Voltage



Parts may be secured direct from the Colonial Radio Corp., 254 Rano Street, Buffalo, New York.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

MODEL 1998 EARLY & LATE

CIRCUIT CHANGES TO ELIMINATE HUM WHEN TONE CONTROL IS IN BASS POSITION. (C20 & TONE CONTROL SWITCH)
DOTTED LINES SHOW CIRCUIT BEFORE CHANGE WAS MADE.

APRIL 21, 1936

MODEL 1998
Early, Late
Alignment, Chassis
Sensitivity, Changes

SEARS-ROEBUCK & CO.

ALIGNMENT PROCEDURE

IF ALIGNMENT

1. Connections:

Connect the low side of the output meter across the loud speaker voice coil. Connect the ground lead of the test oscillator to the receiver chassis. Connect the output lead of the test oscillator, in series with a .1 mfd condenser, to the positions indicated below under "Alignment". Connect a jumper between terminals "p" and "g" of the antenna terminal block at the rear of the chassis.

2. Receiver Settings:

Turn the Volume Control all the way on, the Tone Control to position "1", the Wave Band switch to the BROADCAST position, and the Station Selector to about 550 Kc.

3. Alignment:

(a) Connect the test oscillator output lead (in series with the .1 mfd condenser) to the control grid of the 6K7MG IF tube. Set the test oscillator to 262 kc and peak the IF output transformer, T2.

(b) Change the test oscillator output lead connection to the control grid of the 6A8MG translator tube and peak the IF input transformer, T1.

(c) Change the test oscillator output connection back to the 6K7MG tube and repeat the IF output transformer adjustment. Change the test oscillator connection back to the IF input transformer and repeat. Always keep the test oscillator output at its lowest possible value.

BROADCAST BAND "A" ALIGNMENT

1. Connections:

Remove the .1 mfd condenser from the output lead of the test oscillator. Connect a .0002 mfd mica condenser between the test oscillator output lead and the "A" terminal of the antenna terminal block at the rear of the chassis. All other connections remain the same as for IF Alignment.

2. Receiver Settings:

Turn the Volume Control all the way on, the Tone Control to the "1" position, and the Wave Band switch to the "A" position, as for IF Alignment.

3. Alignment:

(a) Set the test oscillator to 1400 kc and tune in its signal. Peak the broadcast translator trimmer, C5, and the broadcast antenna trimmer, C2. The variable should be rocked a degree or two during the adjustment. The broadcast antenna trimmer is the one on the middle section of the variable condenser. The location of all of the other trimmers are shown in the Location of Parts diagram.

(b) Set the test oscillator to 600 kc and tune in its signal. Peak the broadcast oscillator padder, C9. The variable should be rocked a degree or two during the adjustment.

4. Dial Calibration:

Set the test oscillator to 900 kc and tune in its signal. If necessary, turn the dial pointer so that it reads 900 kc. Do not allow the variable condenser plates to turn while moving the dial pointer.

5. Image Adjustment:

Set the test oscillator to 1000 kc and tune in its signal. Adjust the test oscillator output to 10 microvolts and note the output meter reading. Leaving the set tuned to 1000 kc, change the test oscillator frequency to 1524 kc and increase its output to 100,000 microvolts. If necessary, slightly change the test oscillator frequency so that the image heard in the receiver will be loudest. Then note the output meter reading. It should be greater than 10 microvolts. If the test oscillator at 1000 kc and its output at 10 microvolts is not heard, or if the meter reading at 1524 kc is greater, proceed as follows:

There is a yellow lead that runs from the wave Band switch to C2. Move this lead until the lowest reading is had on the output meter. Now, with the test oscillator at 1524 kc, adjust the receiver for maximum output meter reading. Then, with the test oscillator at 1000 kc and its output at 10 microvolts, adjust the output meter reading (image) with the test oscillator at 1524 kc should not be greater than it was with the test oscillator at 1000 kc and its output at 10 microvolts.

If it is found necessary to make the image adjustment, repeat the alignment procedure, since alignment may be slightly affected.

SHORT WAVE BAND "B" ALIGNMENT

1. Connections:

Remove the .0002 mfd mica condenser used in series with the test oscillator output lead for Broadcast Band Alignment. In its stead connect a 400 ohm carbon resistor. All other connections remain the same as for Broadcast Band Alignment.

2. Receiver Settings:

Turn the Wave Band switch to the "B" position. Other receiver settings remain the same as for Broadcast Band Alignment.

3. Alignment:

(a) Turn the Station Selector knob so that the dial pointer reads exactly 4500 kc.

(b) Set the test oscillator to 4500 kc. Peak the oscillator trimmer, C12. (Be careful not to allow the Variable Condenser to turn during the operation.)

(c) Leave the test oscillator set at 4500 kc and peak the translator trimmer, C4. The variable should be rocked during this adjustment. Always keep the test oscillator output at its lowest possible value.

SHORT WAVE BAND "C" ALIGNMENT

1. Connections:

Connections remain the same as for Band "B" alignment.

2. Receiver Settings:

Turn the Wave Band switch to the "C" position. Other receiver settings remain the same as for band "B" alignment.

3. Alignment:

(a) Set the test oscillator to 15,000 kc and tune in its signal. Adjust the trimmer, C5. The variable should be rocked during the adjustment.

SENSITIVITIES

The following figures are given as an indication of the approximate sensitivities that should be obtained when the receiver is operating properly. To have a test oscillator with an accurately calibrated attenuator so that its power output can be known. The output meter is to be connected across the loud speaker voice coil. An output meter reading of 1 volt should be obtained for each of the input voltages shown for the frequencies listed.

The Volume Control of the receiver must be all the way on and the Tone Control in position "1". Terminals "p" and "g" on the antenna terminal block are to be connected together with a jumper. The ground lead of the test oscillator is to be connected to the receiver chassis. The output lead of the test oscillator is to be connected to the "A" terminal of the antenna terminal block, in series with a .0002 mfd mica condenser, for Broadcast Band measurements. The .0002 mfd condenser is to be disconnected and a 400 ohm carbon resistor used instead for the two Short Wave bands.

	Frequency	Microvolts Input
Broadcast Band	600 kc	35
	1000 kc	30
	1400 kc	35
Band "B"	1800 kc	50
	2500 kc	45
	3500 kc	30
	4500 kc	30
Band "C"	6000 kc	70
	10000 kc	50
	15000 kc	15

The Fuse:

There is a 3/4 ampere fuse at the rear of the chassis, under the cover marked, "Fuse". A spare fuse is contained in the envelope tacked to the inside of the cabinet. Be sure to remove the power supply cord from the receptacle before replacing the fuse since a defective tube will cause the fuse to blow. Repeated blowing of the fuse indicates a fault that should be corrected before making further fuse replacements. Use none but a 3/4 ampere fuse for replacement.

Antenna And Ground Connections:

This receiver is designed for use with either a conventional type of antenna or a doublet antenna. There is a terminal block at the rear of the chassis, marked "Antenna". If a conventional antenna is used, its lead-in is to be connected from a convenient point on the terminal block. The ground wire should be bared for a sufficient length so that it can be clamped under terminals "p" and "g".

When a Doublet Antenna is used, one wire of its twisted downlead is to be connected under the terminal marked, "A", and the other wire to either terminal marked, "p" and "g". The ground connection is made to terminal, "g". Where space permits of its installation, a Doublet Antenna is recommended as giving very much better, noise-free short wave reception.

C1, L1, R1, R13, T1, T2, T3 ARE MOUNTED ON TOP OF THE CHASSIS.

CIRCUIT CHANGES TO REDUCE HUM WHEN TONE CONTROL IS IN BASS POSITION

1. Remove the .01 condenser, C20, which is connected from the triode plate of the 6A7MG to a tie lug. (This tie lug connects to the Tone Control switch.)

2. Connect a .06 mfd 600 volt condenser (Part #R9145) from the tie lug to the plate of the 6P6MG tube near the 5Z4MG tube.

3. Remove the lead from the 6A7MG cathode to the Tone Control switch.

4. Ground the switch lug from which this wire was removed to the ground lug of the broadcast antenna coil.

INSTALLATION OF A WAVE-TRAP TO ELIMINATE CODE INTERFERENCE

If the receiver is located near an airport that uses a transmitter operating on or near the IF frequency of the receiver (262 kc), interference from the transmitter may be encountered.

To eliminate such interference a wave trap, part #R14477 - $1.00, should be ordered from COLONIAL RADIO CORPORATION, 254 Rano Street, Buffalo, N.Y.

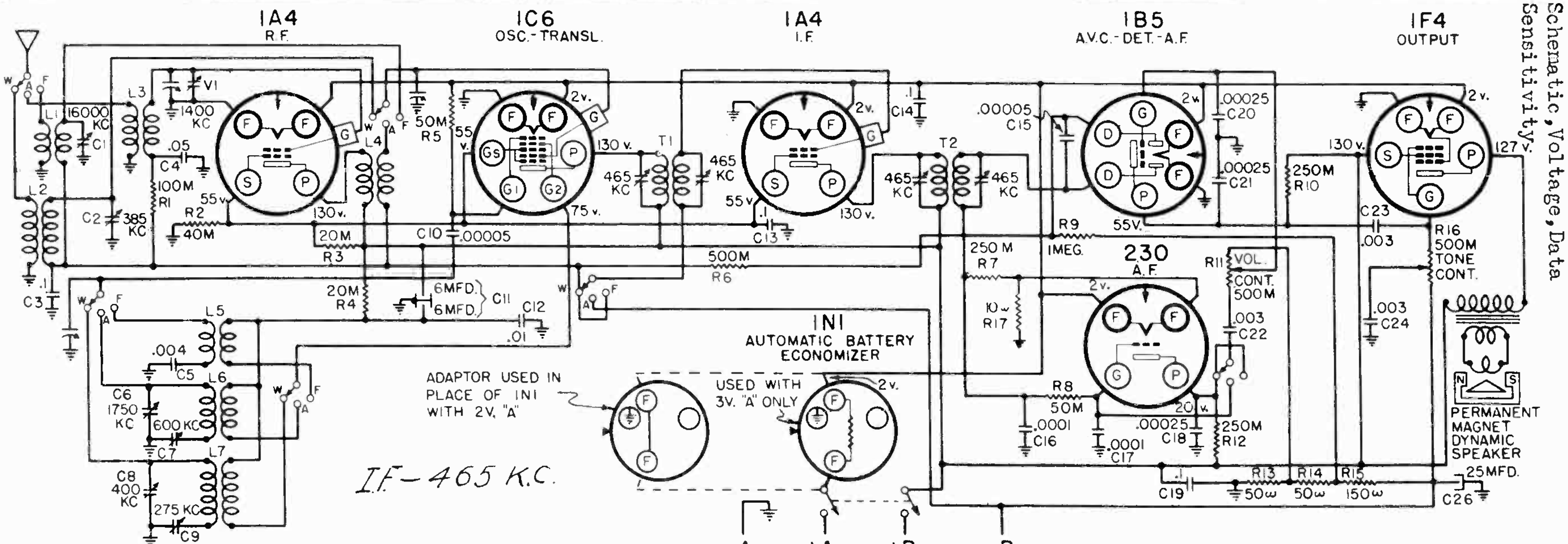
This trap may be mounted in any convenient place in the cabinet by means of two small wood screws. Mount the trap so that its adjustment screw is accessible. Connect one lead of the trap (either one) to the "A" terminal on the antenna terminal block at the rear of the chassis. The other lead of the trap is to be connected to the antenna lead-in or doublet lead which originally was connected to the antenna terminal block.

Turn the Wave Band switch to the BROADCAST position and the Variable Condenser to approximately 560 kc. If interference still is encountered, adjust the wave-trap with an insulated screw driver until the interfering signal is eliminated.

3-Volt Models
MODELS 4410,4411,4425,4445
2-Volt Models
Schematic,Voltage,Data
Sensitivity.

SEARS-ROEBUCK & CO.

MODELS 4404,4406,4424
4444,4524,4544



−A BLACK & YELLOW
+A 2V. OR 3V. BLUE & YELLOW
+B 135V. RED
−B RED & BLACK

July 24, 1936

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

POWER SUPPLY:
"A" Battery (three volt) - 1 - #5502P
"A" Battery (two volt) - - - 1 - #734
"B" Batteries - - - - - - 3 - #5503P

"A" Drain - - - - - - - - - .48 amperes
"B" Drain - - - - - - - - - - - 20 ma

FREQUENCY RANGES:
Band "A" - - - - - - - - 540-1750 kc
Band "W" - - - - - - - - 220-400 kc
Band "F" - - - - - - - - 5.6-17.4 kc

ALIGNMENT FREQUENCIES:

	Oscillator Trimmer	Antenna Trimmer	Padder
Band "A"	1750 kc	1400 kc	600 kc
Band "W"	400 kc	385 kc	275 kc
Band "F"	None	16 mc	Fixed

INTERMEDIATE FREQUENCY - 465 kc

SUBJECT: APPROXIMATE AVERAGE SENSITIVITY IN MICROVOLTS FOR 50 MILLIWATTS OUTPUT:

Band	Frequency	Microvolt
"W"	275 kc	80
"W"	385 kc	60
"A"	600 kc	30
"A"	1000 kc	30
"A"	1400 kc	25
"F"	6 mc	90
"F"	9 mc	75
"F"	14 mc	70
"F"	16 mc	60

POWER OUTPUT:
Type - - - - - - - - - Single Pentode
Undistorted - - - - - - - - - .36 watts
Maximum - - - - - - - - - - - .66 watts

LOUD SPEAKER:
Type - - - Permanent Magnet Dynamic
Size - - - - - - 6½", table models; 8", console models

OPERATING FEATURES:
Fidelity Range - - 40 - 5000 cycles
Variable Tone Control
Automatic Volume Control
"On-Off" Indicator

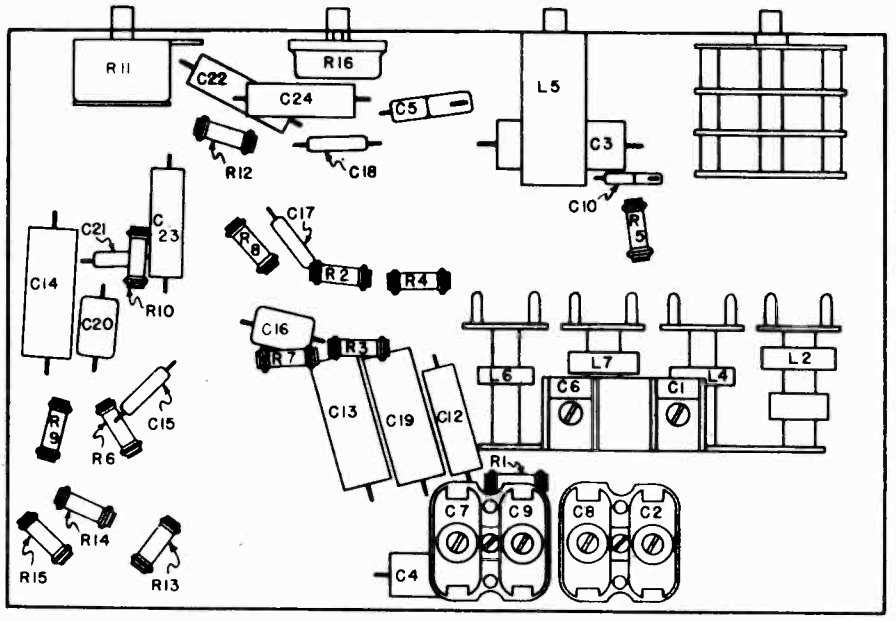
CHASSIS FEATURES:
Number RF stages - - - - - - - - - One
Number IF stages - - - - - - - - - One
Number condensers in gang - - Three
Antenna - - - - - - - - - conventional
Automatic Battery Economizer - - Automatically compensates for decreased voltage from ageing "A" battery. (Three volt models only. Replaced by plug adapter with two volt storage "A").

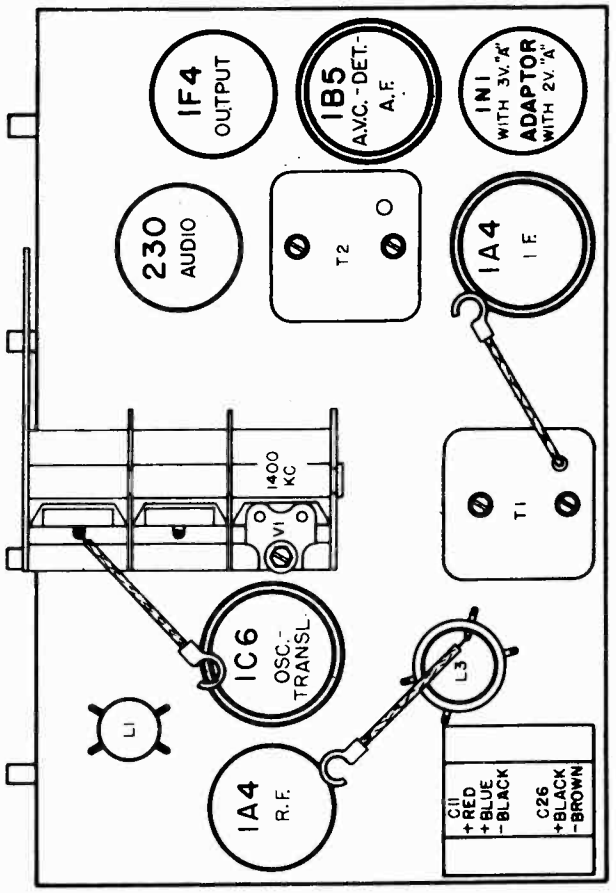
Parts may be secured direct from the Colonial Radio Corp., 254 Rano Street, Buffalo, New York.

MODELS 4404,4406,4424
4444,4524,4544
3-Volt Models

SEARS-ROEBUCK & CO.

MODELS 4410,4411,4425,4445
2-Volt Models
Socket,Trimmers,Chassis
Alignment





PRELIMINARY:

Output meter connection ---------- Across speaker voice coil.

Output meter reading to indicate 50 milliwatts ---------- .47 volts

Generator ground lead connection ---------- Receiver chassis

Dummy antenna value to be in series with generator output ---------- See chart below

Connection of generator output lead ---------- See chart below

Position of volume control ---------- All the way on

Position of tone control ---------- Fully clockwise

ALIGNMENT PROCEDURE

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)
"A"	-	455 kc	.1 mfd.	IC6 Grid	T2,T1
"A"	Fully open	1780 kc	.0002 mfd.	Antenna Lead	C6
"A"	1400 kc	1400 kc	.0002 mfd.	Antenna Lead	V1
"A"	600 kc (rock)	600 kc	.0002 mfd.	Antenna Lead	C7
"B"	Fully open	400 kc	.0002 mfd.	Antenna Lead	C8
"B"	385 kc	385 kc	.0002 mfd.	Antenna Lead	C2
"B"	276 kc (rock)	276 kc	.0002 mfd.	Antenna Lead	C9
"B"	16 mc (rock)	16 mc	400 ohms	Antenna Lead	C1

IMPORTANT ALIGNMENT NOTES

Alignment must be made in this sequence:

1. IF
2. Broadcast Band ("A")
3. Weather Band ("W")
4. Short Wave Band ("B")

The 1400 kc and 600 kc adjustments for the "A" band should be repeated for greater accuracy.

The complete alignment procedure for band "W" should be repeated two or three times for greater accuracy.

Always keep the output from the signal generator at its lowest possible value.

After the alignment procedure has been completed, tune in a signal of about 1000 kc and set the dial pointer to that frequency.

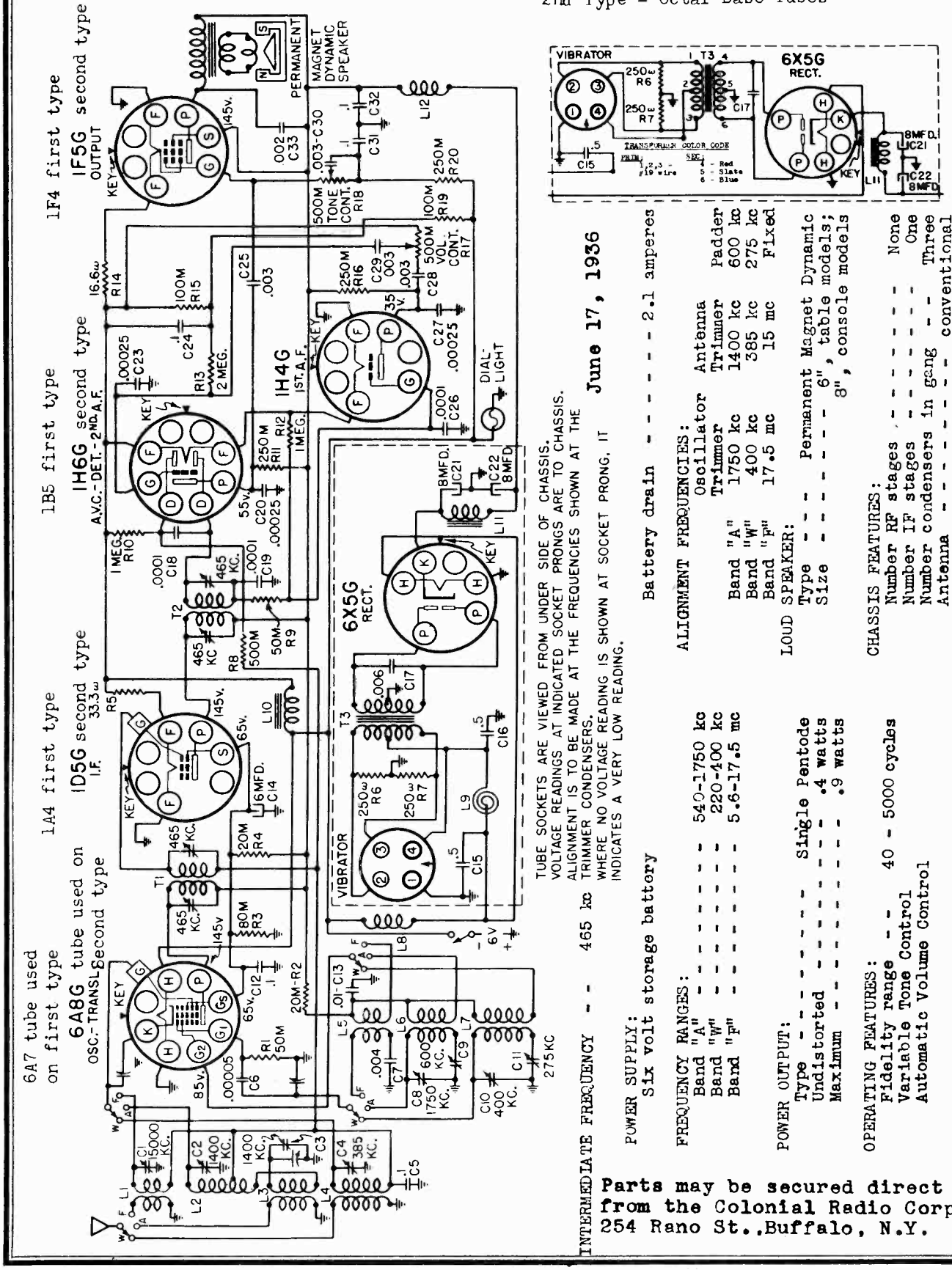
The receiver should go to 17,400 kc on band F. If it fails to do so, move the oscillator plate and grid leads into the clear, to reduce distributed capacity. The receiver then will have the proper frequency coverage.

SEARS-ROEBUCK & CO.

MODELS 4405,4407,4428
4448,4548

Two Types
Schematic,Voltage,Data

1st Type - Glass Tubes
2nd Type - Octal Base Tubes



June 17, 1936

INTERMEDIATE FREQUENCY - - 465 kc

POWER SUPPLY:
Six volt storage battery

Battery drain - - - - - - - - 2.1 amperes

FREQUENCY RANGES:

Band "A" - - - - - - - - - -	540-1750 kc
Band "W" - - - - - - - - - -	220-400 kc
Band "F" - - - - - - - - - -	5.6-17.5 mc

POWER OUTPUT:

Type - - - - - - - - - - -	Single Pentode
Undistorted - - - - - - - -	.4 watts
Maximum - - - - - - - - - -	.9 watts

OPERATING FEATURES:

Fidelity range - - -	40 - 5000 cycles
Variable Tone Control	
Automatic Volume Control	

ALIGNMENT FREQUENCIES:

	Oscillator	Antenna	
	Trimmer	Trimmer	Padder
Band "A"	1750 kc	1400 kc	600 kc
Band "W"	400 kc	385 kc	275 kc
Band "F"	17.5 mc	15 mc	Fixed

LOUD SPEAKER:

Type - - -	Permanent Magnet Dynamic
Size - - - - - - - - - -	6", table models; 8", console models

CHASSIS FEATURES:

Number RF stages - - - - - - - - - -	None
Number IF stages - - - - - - - - - -	One
Number condensers in gang - -	Three
Antenna - - - - - - - - - - - -	conventional

Parts may be secured direct from the Colonial Radio Corp 254 Rano St..Buffalo, N.Y.

MODELS 4405,4407,4428
4448,4548

SEARS-ROEBUCK & CO.

Two Types
Chassis,Socket,Trimmers
Alignment

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection - Across speaker voice coil

Output meter reading to Indicate 50 milliwatts - .47 volts

Generator ground lead connection - Receiver chassis

Dummy antenna value to be in series with generator output - - - - - - - - - - - - - - - - - - See chart below

Connection of generator output lead - See chart below

Position of volume control - All the way on

Position of tone control - Fully clockwise

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)
"A"	-	465 kc	.1 mfd.	IF tube grid cap	T2
"A"	-	465 kc	.1 mfd.	Translator tube grid cap	T1
"A"	Fully open	1750 kc	.0002 mfd.	Antenna Lead	C8
"A"	1400 kc	1400 kc	.0002 mfd.	Antenna Lead	C3,C2
"A"	600 kc (Do not rock)	600 kc	.0002 mfd.	Antenna Lead	C9
"W"	Fully open	400 kc	.0002 mfd.	Antenna Lead	C10
"W"	385 kc	385 kc	.0002 mfd.	Antenna Lead	C4
"W"	275 kc (rock)	275 kc	.0002 mfd.	Antenna Lead	C11
"P"	Fully open	17.5 mc	400 ohms	Antenna Lead	*
"P"	15 mc	15 mc	400 ohms	Antenna Lead	C1

* Twist or untwist the blue and yellow leads on the short wave oscillator coil, L5,for maximum output meter reading.

IMPORTANT ALIGNMENT NOTES

Alignment must be made in this sequence:

1. IF
2. Broadcast Band ("A")
3. Weather Band ("W")
4. Short Wave Band ("P")

The 1400 kc and 600 kc adjustments for the "A" band should be repeated for greater accuracy. Do not rock the variable while making the 600 kc padder adjustment.

The complete alignment procedure for band "W" should be repeated two or three times for greater accuracy.

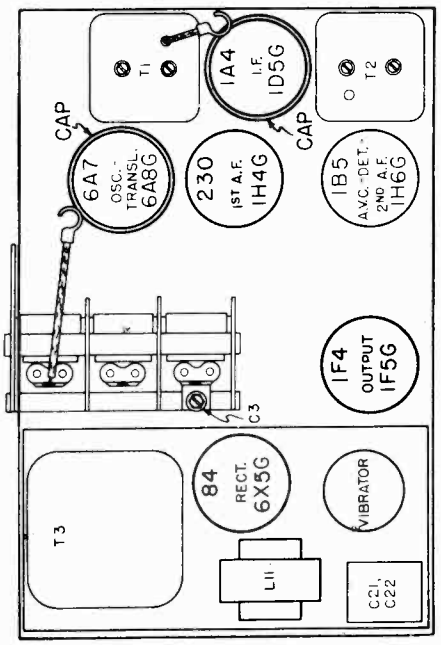
Always keep the output from the signal generator at its lowest possible value.

After the alignment procedure has been completed, tune in a signal of about 1000 kc and set the dial pointer to that frequency.

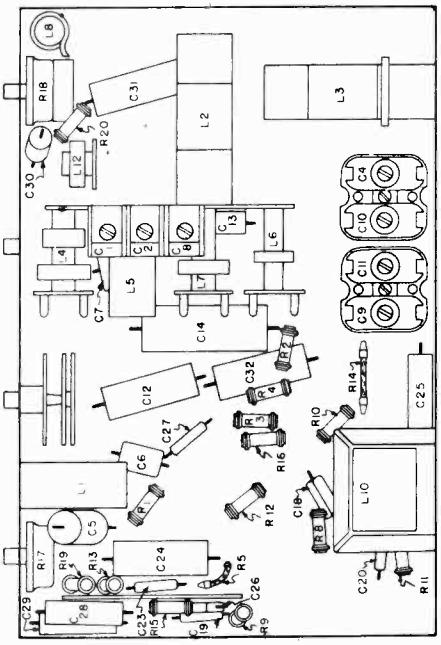
GENERAL INFORMATION

Two types of this model have been built. One uses conventional glass tubes. The other type uses octal base glass tubes.

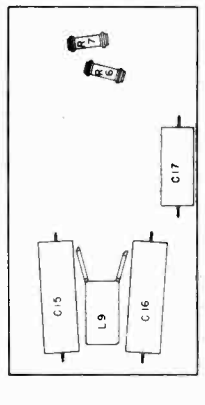
A plug-in type vibrator is used. It is non-synchronous, with an 84 or 6X5G tube serving as the rectifier. The vibrator and the rectifier tube are contained in a rectangular metal shield with removable top cover, mounted on top of the chassis.



TOP OF CHASSIS - MODEL 10419



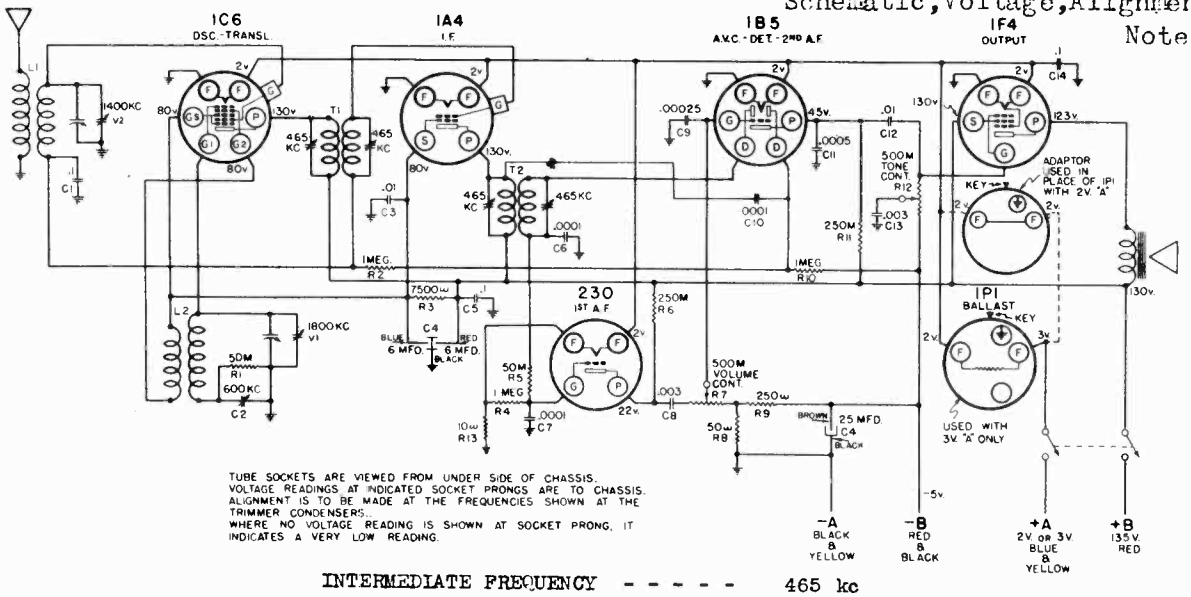
LOCATIONS OF PARTS UNDER CHASSIS - MODEL 10419



LOCATIONS OF PARTS UNDER POWER UNIT
MODEL 10419

SEARS-ROEBUCK & CO.

MODELS 4409,4413,4442,4443
4522,4523,4542,4543
Schematic,Voltage,Alignment
Notes



INTERMEDIATE FREQUENCY - - - - - 465 kc

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections - - - - - - - - 4000 ohm meter, in series with a .5 mfd. condenser, across speaker terminals.

Output meter reading to indicate 50 milliwatts - - - - - - - - - - - - - - - - - - 8.5 volts

Generator ground lead connection - Receiver chassis

Dummy antenna value to be in series with generator output - - - - - - - - See chart below

Connection of generator output lead - See chart below

Position of volume control - On full

GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED	POSITION OF VARIABLE
465 kc	.1 mfd.	1A4 Grid	T2	-
465 kc	.1 mfd.	1C6 Grid	T1	-
1800 kc	.0002 mfd.	Antenna Lead	V1	Completely open
1400 kc	.0002 mfd.	Antenna Lead	V2	1400 kc (rock)
600 kc	.0002 mfd.	Antenna Lead	C2	600 kc (rock)

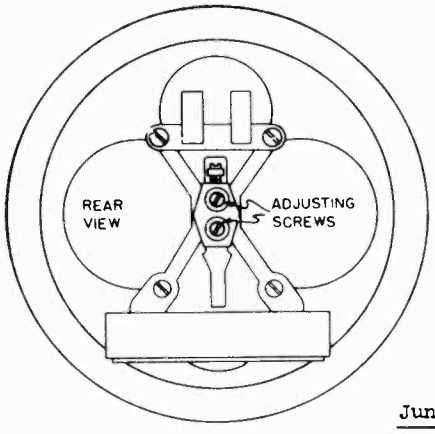
Parts may be secured direct from the Colonial Radio Corp,. 254 Rano Street, Buffalo, New York.

POWER SUPPLY:
"A" Battery, 3 volt - - - 1 - #5023P
"A" Battery, 2 volt storage 1 - #734
"B" Batteries - - - - - - 3 - #5503P
"A" Drain - - - - - - - - - .42 amperes
"B" Drain - - - - - - - - - - 18 ma

ALIGNMENT FREQUENCIES:
1800 kc - - - - (oscillator trimmer)
1400 kc - - - - (translator trimmer)
600 kc - - - - (oscillator padder)

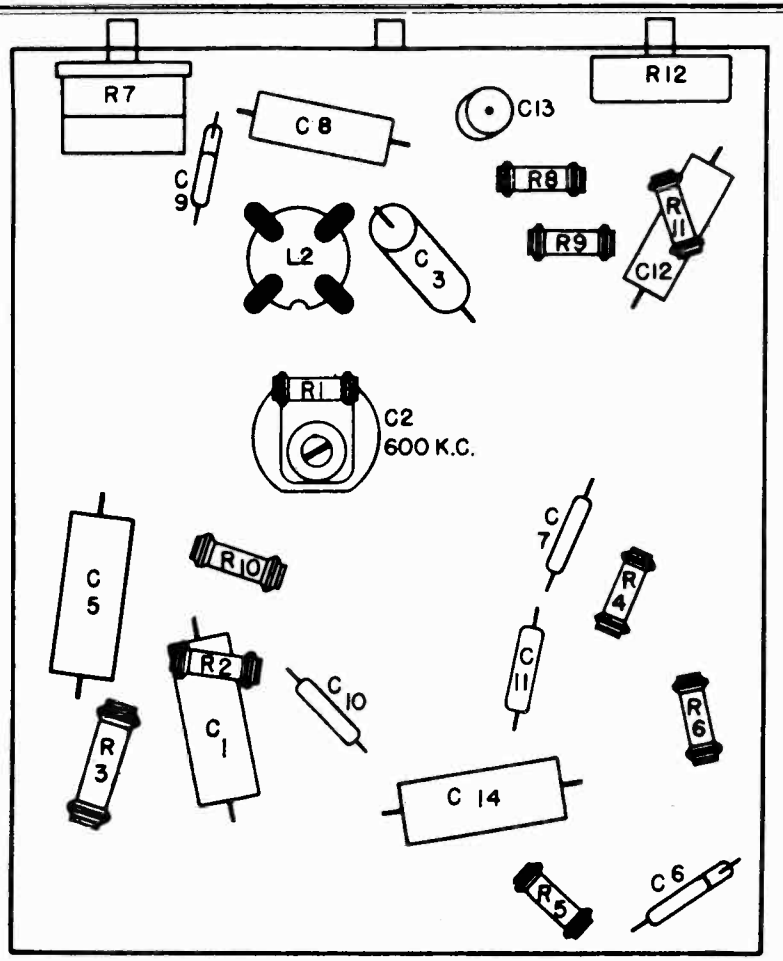
SPEAKER ADJUSTMENT

There are two adjusting screws at the rear of the speaker, as shown in the illustration. Speaker rattle can be corrected by turning these screws. Tighten one and loosen the other slightly until the rattle is eliminated.

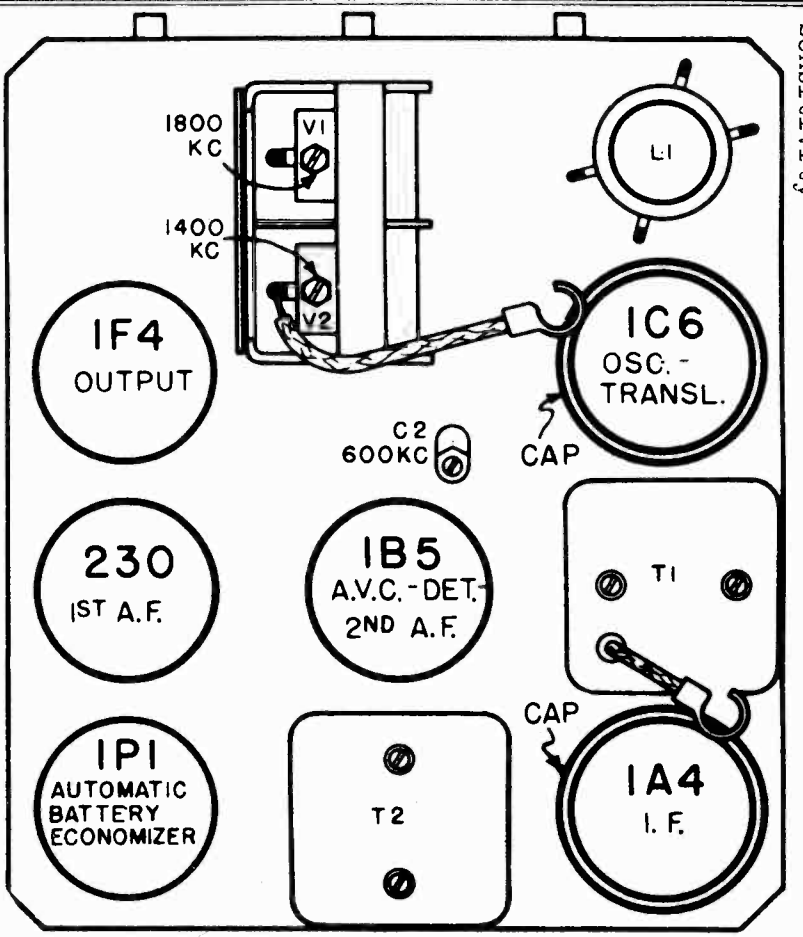


June 5, 1936

MODELS 4409,4413,4442,4443
4522,4523,4542,4543 SEARS-ROEBUCK & CO.
Chassis, Socket, Trimmers
Sensitivity



LOCATIONS OF PARTS UNDER CHASSIS



LOCATIONS OF PARTS ON TOP OF CHASSIS

SUBJECT: APPROXIMATE AVERAGE SENSITIVITY IN MICROVOLTS FOR 50 MILLIWATTS OUTPUT:

The generator connections and the receiver settings are to be as described in Service Instructions #57RL 9, for this model. The generator modulation is to be 30% at 400 cycles.

Frequency	Microvolts
600 kc	35
1000 kc	40
1400 kc	60

9000 microvolts, at IF grid, with variable closed and .1 mfd. dummy antenna.

125 microvolts, at translator grid, with variable closed and .1 mfd. dummy antenna.

LOUD SPEAKER:
Type - - - - - - - - - - - - Magnetic
Size - - - - - - - - - - - - - 6 inch
DC resistance - - - - - - - 1000 ohms

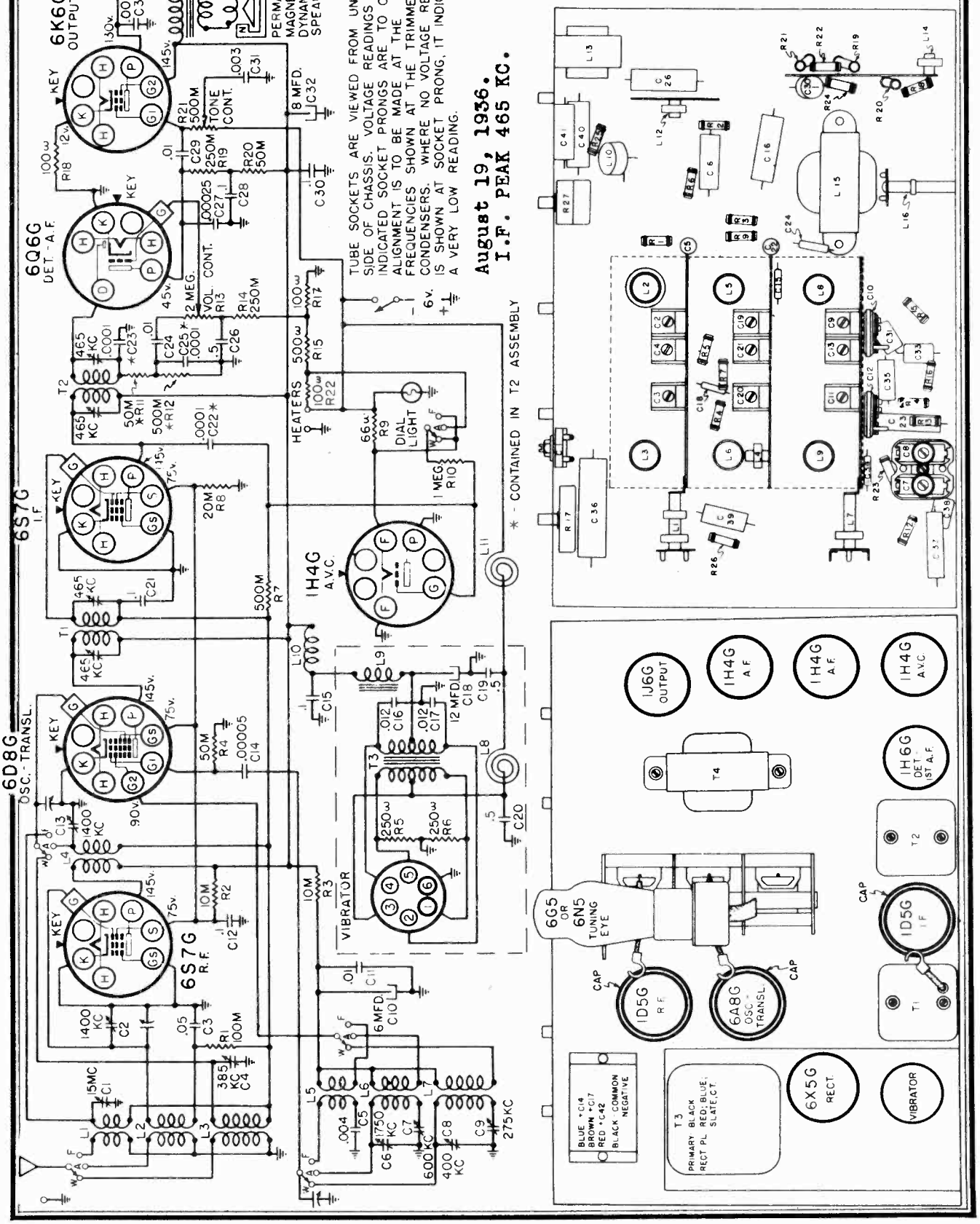
POWER OUTPUT:
Type - - - - - - - - - Single Pentode
Undistorted - - - - - - - - - .36 watts
Maximum - - - - - - - - - - - .9 watts

SEARS-ROEBUCK & CO.

MODELS 4428A, 4448A, 4528A, 4548A
Schematic, Socket, Trimmers
Voltage

Parts may be secured direct from the Colonial Radio Corp., 254 Rano Street, Buffalo, New York.

August 19, 1936.
I.F. PEAK 465 KC.



MODELS 4428A,4448A,4528A,4548A
Alignment,Data,Transformer

SEARS-ROEBUCK & CO.

ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (930 kc)of the 465 kc IF,and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc.

Align the IF at the new frequency and then realign the rest of the receiver as described under, "ALIGNMENT PROCEDURE".

POWER TRANSFORMER COLOR CODE

1,2,3 - Solid Conductor
4 - Red
5 - Slate
6 - Blue

LOCATIONS OF PARTS UNDER POWER SUPPLY UNIT

LOUD SPEAKER:
Type - - - - Permanent Magnet Dynamic
Size - - - - - - - - - - - - - - - - 6½" or 8"

POWER OUTPUT:
Type - - - - - - - - - - - - - - - - Single Pentode
Undistorted - - - - - - - - - - - - - .5 watts
Maximum - - - - - - - - - - - - - - - 1.6 watts

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection - Across speaker voice coil

Output meter reading to indicate 50 milliwatts - .45 volts

Approximate average sensitivity in microvolts for 50 milliwatts output - - See chart below

Generator ground lead connection - Receiver chassis

Dummy antenna value to be in series with generator output - - - - - - - - - - - - - - - See chart below

Connection of generator output lead - See chart below

Generator modulation - 30%, 400 cycles

Position of volume control - All the way on

Position of tone control - Fully clockwise

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	APPROXIMATE MICROVOLTS
"A"	Closed	465 kc	.1 mfd.	6D8G Grid	T2, T1	-
"A"	Fully open	1750 kc	.0002 mfd.	Antenna Lead	C6	25
"A"	1400 kc	1400 kc	.0002 mfd.	Antenna Lead	C2, C13	10
"A"	600 kc (rock)	600 kc	.0002 mfd.	Antenna Lead	C7	12
"W"	Fully open	400 kc	.0002 mfd.	Antenna Lead	C8	95
"W"	385 kc	385 kc	.0002 mfd.	Antenna Lead	C4	100
"W"	275 kc (rock)	275 kc	.0002 mfd.	Antenna Lead	C9	110
"P"	15 mc (rock)	15 mc	400 ohms	Antenna Lead	C1	18
"P"	6 mc	6 mc	400 ohms	Antenna Lead	-	75

IMPORTANT ALIGNMENT NOTES

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

Alignment must be made in the sequence indicated.

All of the adjustment should be repeated in their original order for greater accuracy. In particular, the band "W" adjustments should be gone over two or three times since one adjustment affects the others.

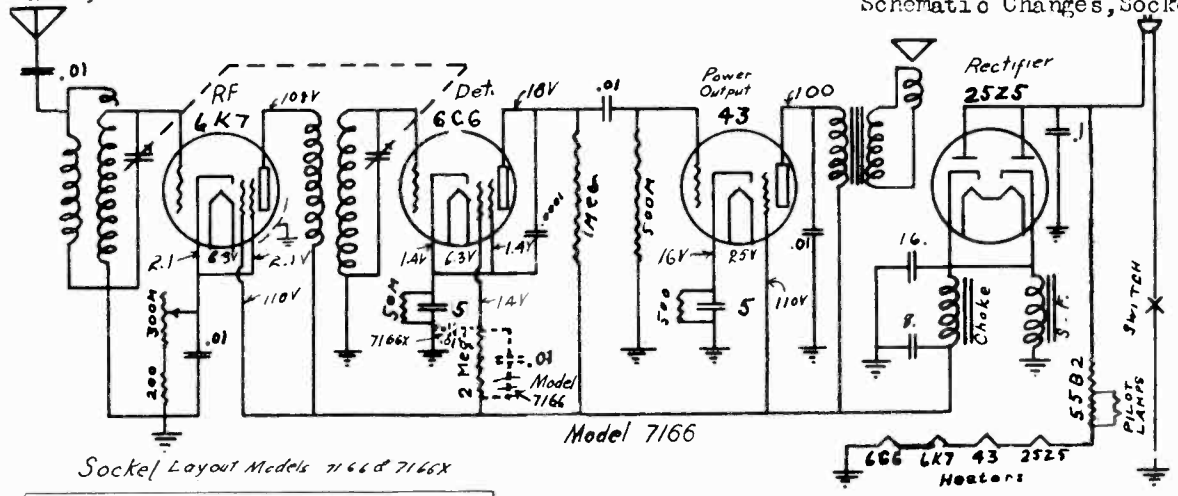
Always keep the output from the signal generator at its lowest possible value in order to make the AVC action of the receiver ineffective.

After the alignment procedure has been completed, tune in a signal at about 900 kc and, if necessary, shift the dial pointer to the station's indicated frequency on the dial.

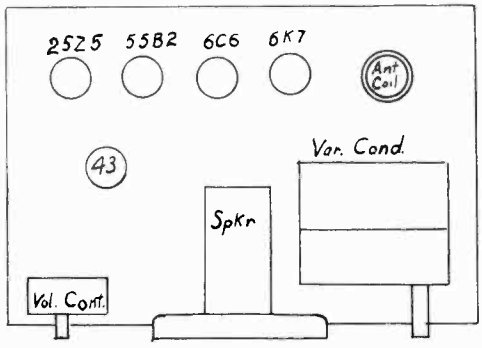
MODELS 7166,7166X
Schematic,Socket

SEARS-ROEBUCK & CO.

MODEL 7127,Early
MODELS 7127,Late,7133,7139
Schematic Changes,Socket



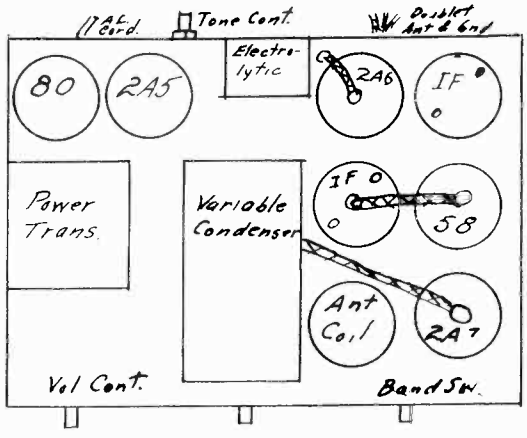
Socket Layout Models 7166 & 7166X



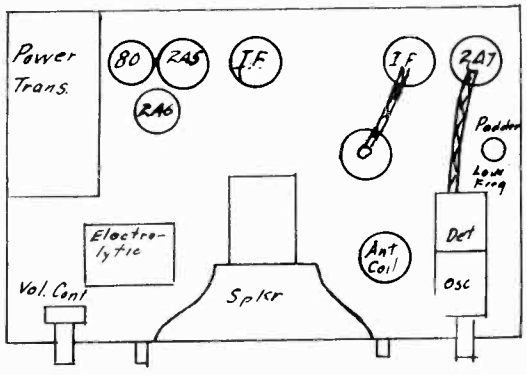
Model 7166X Changes from above schematic for 1766.

1. 6D6 Tube is used instead of 6K7
2. The .01 Mfd. Condenser in the screen circuit of the 6C6 is shown dotted and marked
3. The filter condensers are 1488
4. A .1 Mfd. is not connected from plates of rectifier to ground.

Rebalancing - to align receiver, proceed as follows:
1 - Remove chassis from its cabinet, open condenser all the way and adjust the trimmers on variable condenser, applying a 1712 KC note at the antenna.



Model 7139



Model 7127-7133

FOR SCHEMATIC SEE INDEX

Parts for this model may be ordered from Echophone Radio Corp., 2611 Indiana Avenue, Chicago, Ill.

EARLY MODEL 7127 is similar to Echophone 143 except for the following changes:

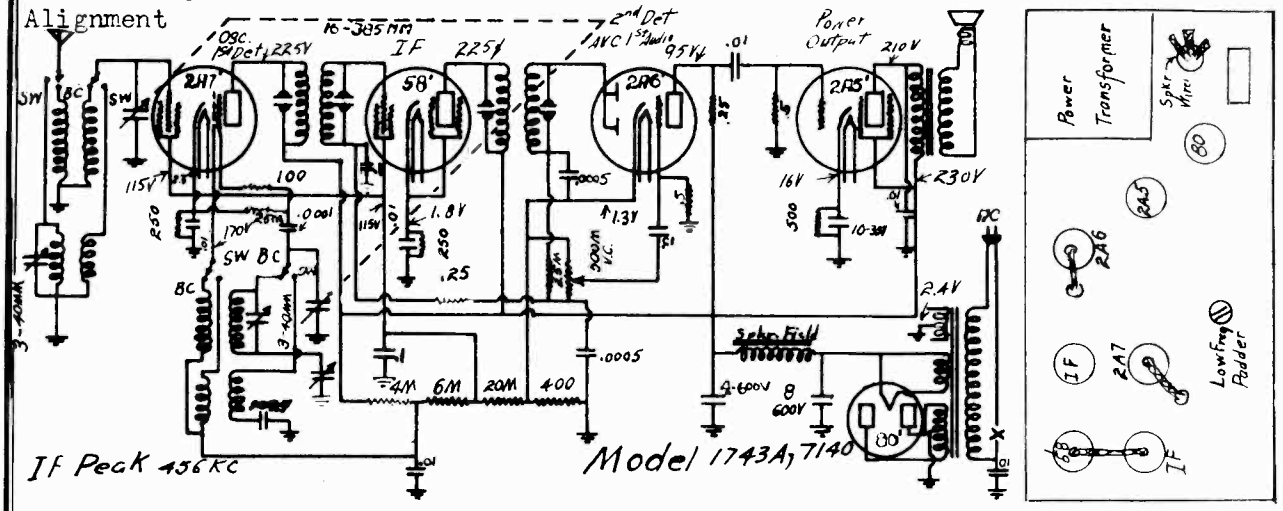
1. 25M resistor previously connected from cathode of 2A7 to screen now goes from cathode to negative end of 100 ohm resistor in screen circuit.
2. Tone control of 50M variable resistor in series with .05 condenser connected from plate of 2A5 to ground.
3. .01 mfd. condenser added on switch side of line to ground.
4. 420 mmfd. tuning condensers are now 16-385 mmfd.

7133, 7139, & Late 7127 are similar to Echophone 143 except for the following changes:

1. A Doublet antenna is used: 2- A .0018 mf cond. changed to .0027.
3. 16-385 mmf tuning cond. changed to 16-420 MMF.
4. 3-40 MMF S.W. ant. cond. changed to 3-50 MMF.

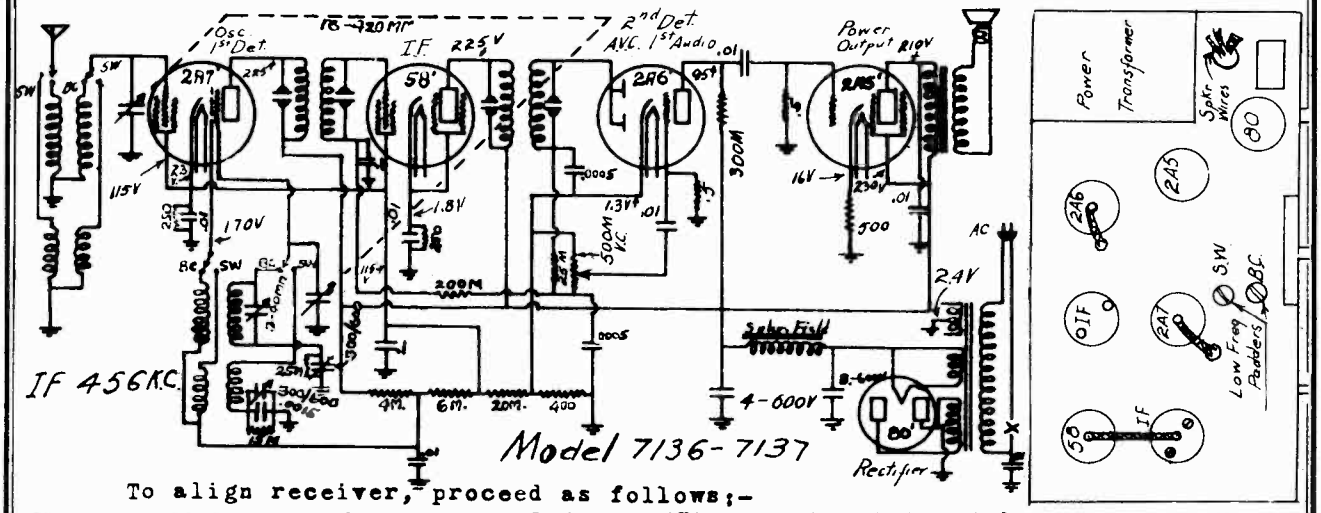
MODELS 7136, 7137
MODELS 1743A, 7140
Schematics, Socket
Alignment

SEARS-ROEBUCK & CO.



To align receiver, proceed as follows:

1 - Peak I.F. transformers, applying a 456 KC note at the 2A7 control grid.
2 - Turn variable condenser way open and apply a 1712 KC oscillator note at the antenna; set oscillator trimmer on oscillator coil first, then RF section on variable condenser.
3 - Adjust low frequency padder at 600 KC, rocking condenser back and forth across 600KC signal, and adjusting padder to maximum output.
4 - Go back and check at 1400 KC for alignment.
5 - Short Wave - adjust the small trimmer found underneath chassis on short wave antenna coil to maximum output. If short wave does not track with dial calibration, adjust trimmer on oscillator section of variable condenser until correct. Make all adjustments for short wave with variable tuned to center of 25 meter location on scale.



To align receiver, proceed as follows:-

1 - Peak I.F. transformers, applying a 456 KC note at the 2A7 control grid.
2 - Turn variable condenser all the way open, (minimum capacity) and apply a 1712 KC note at the antenna, set oscillator trimmer to peak output then the R F section of variable condenser, these two being found on the tuning condenser.
3 - Adjust low frequency padder marked B.C. at 600 KC, rocking condenser back and forth across 600 KC signal while adjusting padder to get maximum output.
4 - Short Wave - Short wave will not have to be adjusted except low frequency padder, this should be checked on noise level or some signal near 175 meters.

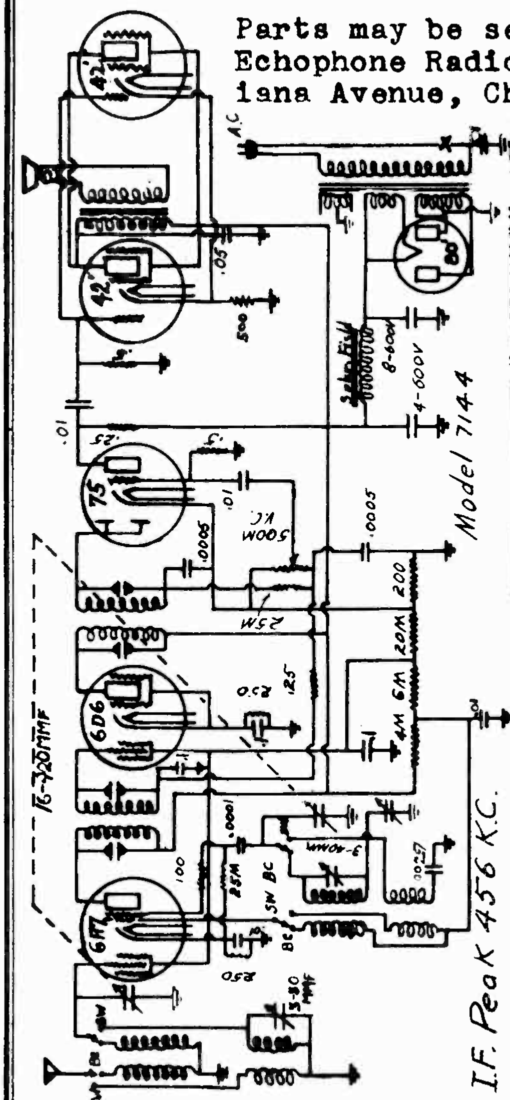
Parts may be secured from Echophone Radio Corp. 2611 Indiana Ave. Chicago Ill.

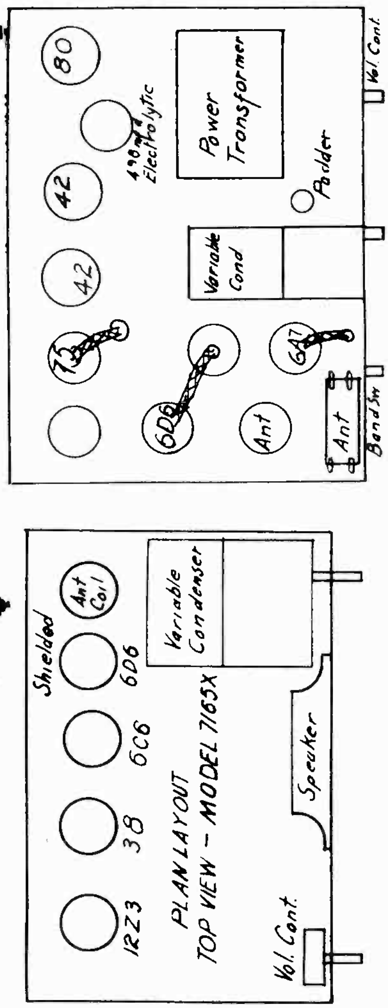
Schematic, Socket

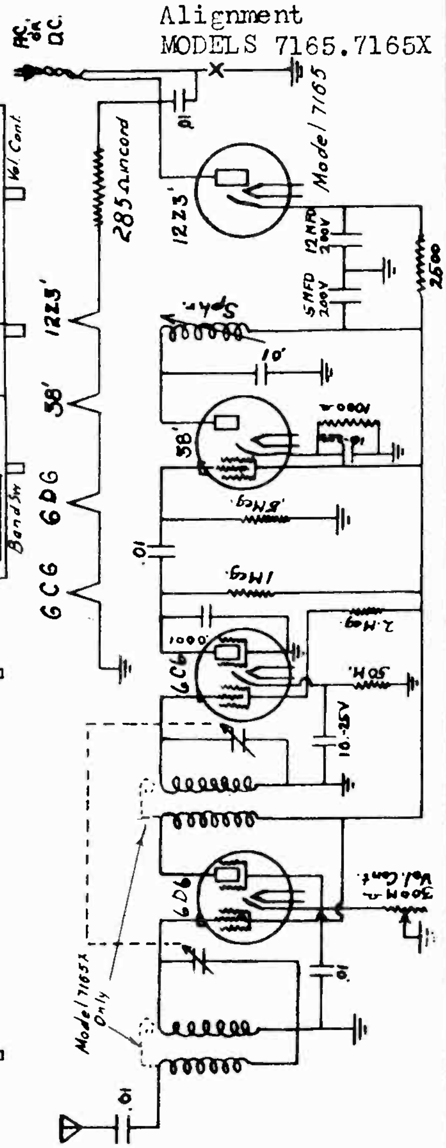
SEARS-ROEBUCK & CO.

MODEL 7144
Schematic, Socket
Alignment
MODELS 7165.7165X

Parts may be secured direct from Echophone Radio Corp., 2611 Indiana Avenue, Chicago, Illinois.





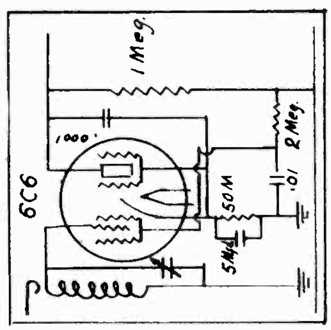


To Align receiver, proceed as follows;-

Model 7144

1 - Peak I.F. transformers, applying a 456 KC note from an oscillator to the 6A7 Control grid.
2 - Turn variable condenser all the way open and apply a 1720 Kc oscillator note at the antenna; set oscillator trimmers on oscillator coil to reach center of note, then adjust R.F. section of variable condenser to maximum output.
3 - Adjust low frequency padder at 600 KC, adjust padder while rocking condenser back and forth across 600 KC signal until maximum signal is obtained.
4 - Go back and check B.C. Band at 1400 KC, do not bend plates of Gang condenser.
5 - Short Wave. - Adjust the small trimmer (3 to 30 mmf) found beside S.W. Antenna Coil to maximum output. If short wave does not track with dial calibration, adjust trimmer on oscillator section of variable condenser until correct. Make all adjustments for short wave with variable tuned to center of 25 meter location on scale.

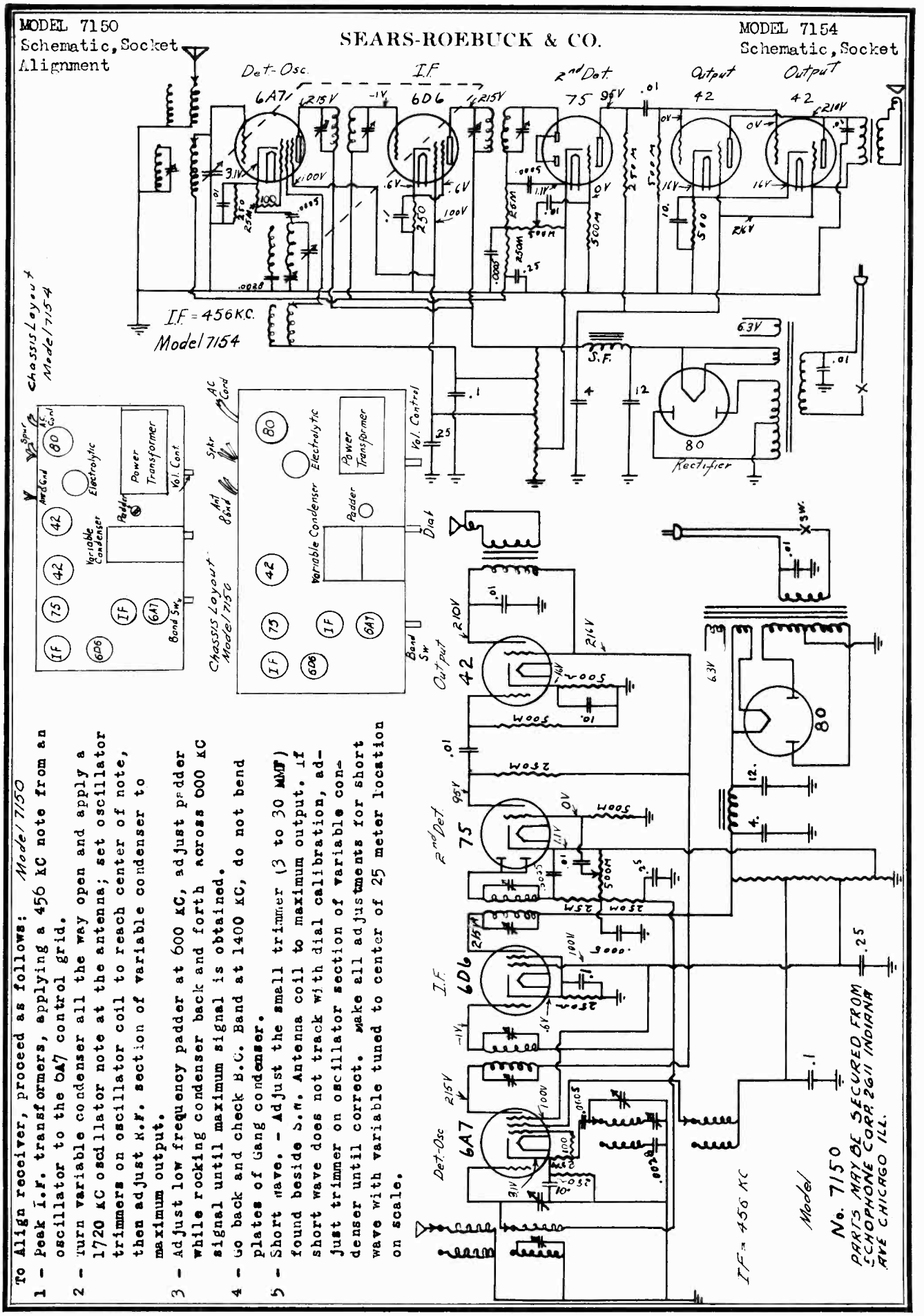
Model 7165X differs from 7165 by the changes shown to the left, the addition of Capacity turns to the ant. & R.F. coils, and the substitution of a 5 Mfd condenser in the grid bias of the 38 instead of a 10 Mfd



MODEL 7150
Schematic, Socket
Alignment

SEARS-ROEBUCK & CO.

MODEL 7154
Schematic, Socket



To Align receiver, proceed as follows: Model 7150

1 - Peak i.f. transformers, applying a 456 kC note from an oscillator to the 6A7 control grid.

2 - Turn variable condenser all the way open and apply a 1720 kC oscillator note at the antenna; set oscillator trimmers on oscillator coil to reach center of note, then adjust r.f. section of variable condenser to maximum output.

3 - Adjust low frequency padder at 600 kC, adjust padder while rocking condenser back and forth across 600 kC signal until maximum signal is obtained.

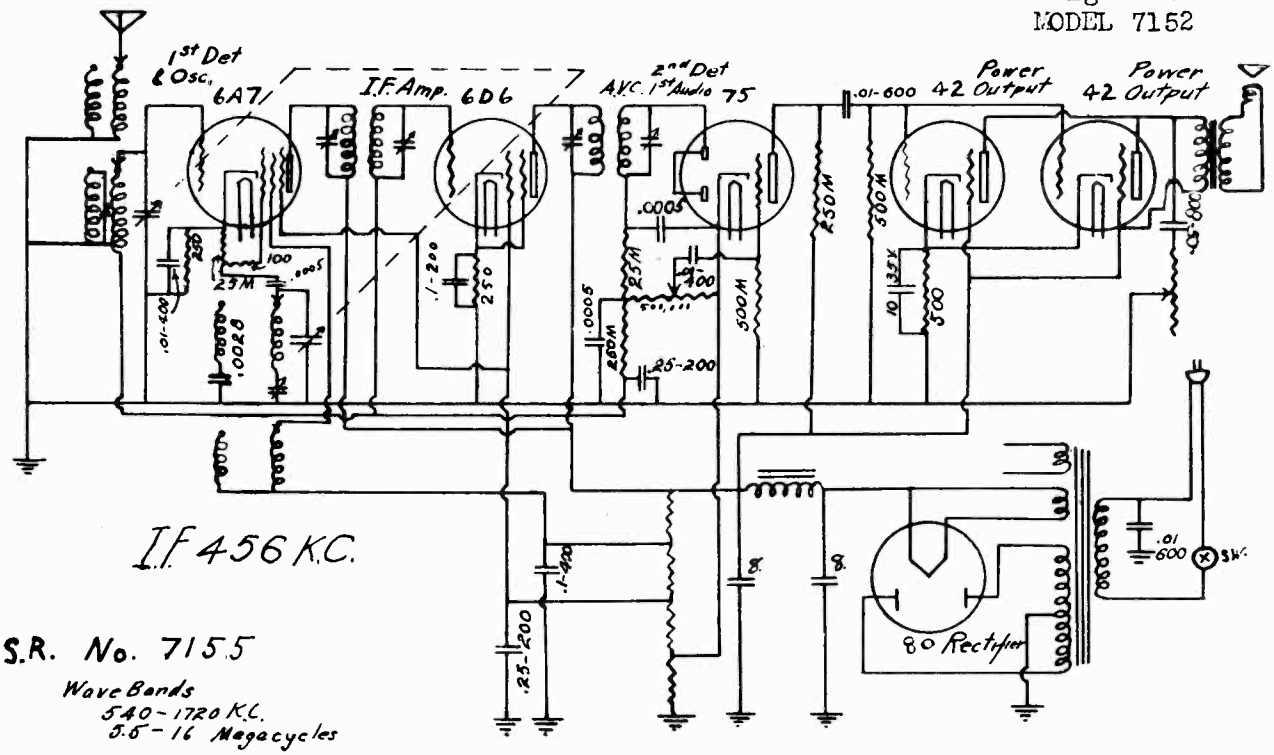
4 - Go back and check B.C. Band at 1400 kC, do not bend plates of Gang condenser.

5 - Short wave. - Adjust the small trimmer (3 to 30 MMF) found beside S.W. Antenna coil to maximum output. If short wave does not track with dial calibration, adjust trimmer on oscillator section of variable condenser until correct. Make all adjustments for short wave with variable tuned to center of 25 meter location on scale.

MODELS 1900,1910
Notes,Change

SEARS-ROEBUCK & CO.

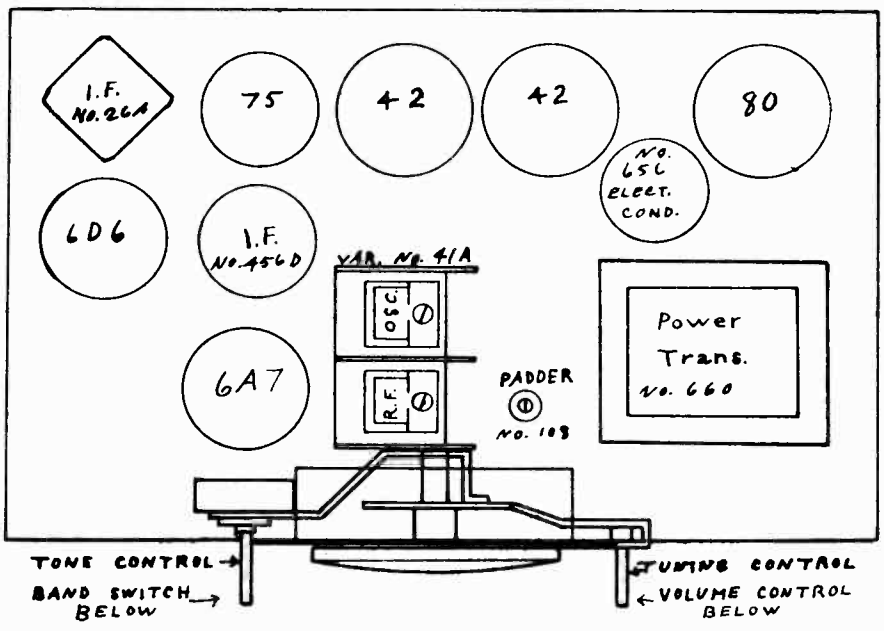
MODEL 7155
Schematic,Socket
Alignment
MODEL 7152



S.R. No. 7155

Wave Bands
540-1720 K.C.
5.5-16 Megacycles

Parts for this model may be ordered from Echophone Corp., 2611 Indiana Ave., Chicago, Ill.



Alignment

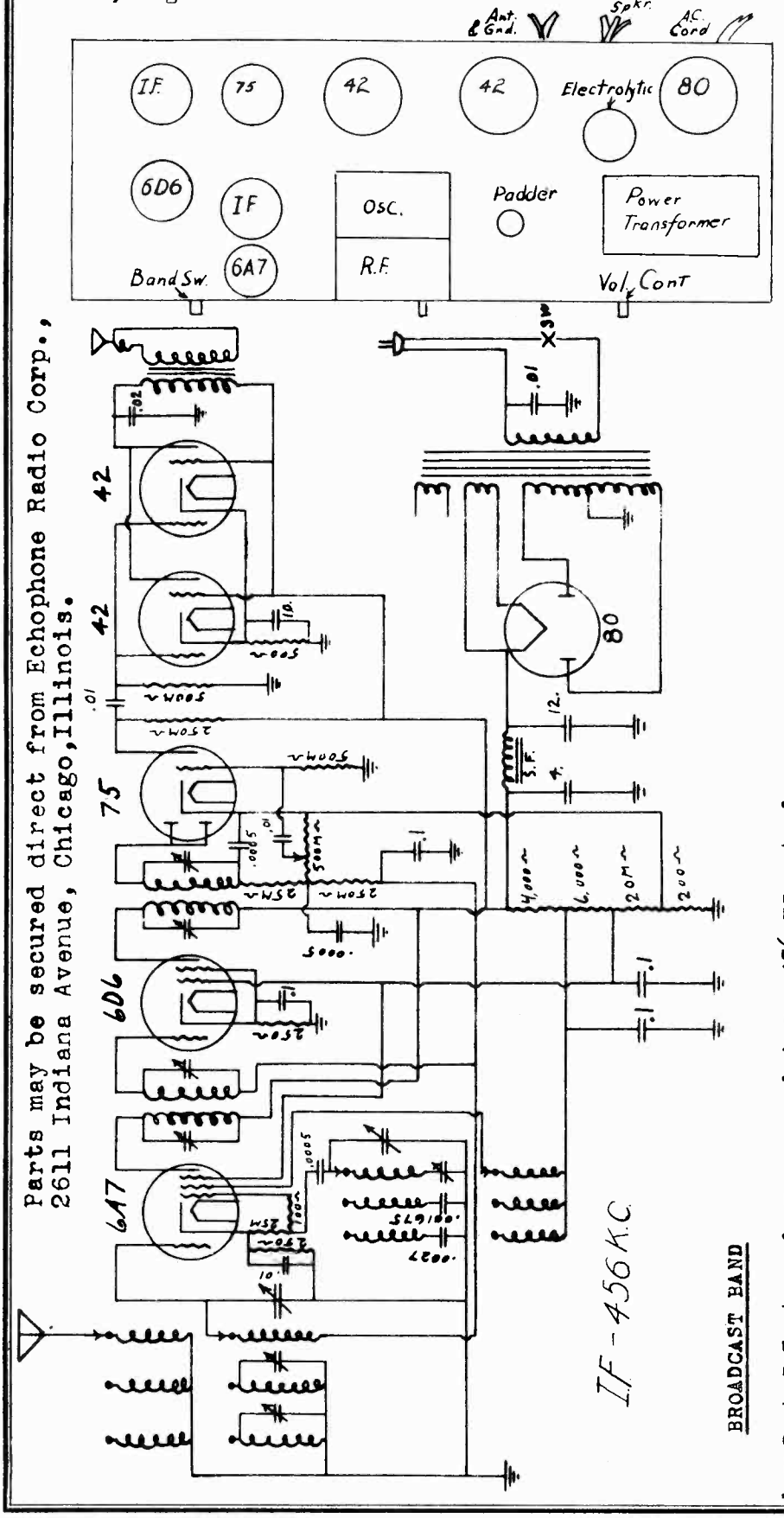
1. Apply 456 kc. signal to control grid of 6A7 and peak i-f trimmers for maximum signal.
2. Apply 1400 kc. signal to antenna input and ground and align trimmers for maximum gain.
3. Apply 600 kc. signal to input and adjust padder for maximum output, rocking the tuning condenser during the operation.
4. Check alignment at 1400 kc.
5. Check alignment on short waves at 12. megacycles.

Models 1900-1910 are similar to Echophone Model 139, 139C page 6-1
Error on drawing - Connect tone control on plate only.
Change - Tone control knob was shown on left front side of chassis instead of on rear of chassis.

Model 7152 is similar to Echophone Model 128 page 5-1.
Change - 5 MFD condenser across speaker field taken out.

MODEL 7158
Schematic, Trimmers
Socket, Alignment

SEARS-ROEBUCK & CO.



Parts may be secured direct from Echophone Radio Corp., 2611 Indiana Avenue, Chicago, Illinois.

BROADCAST BAND

1 - Peak I.F. transformers, applying a 456 KC note from a service oscillator to the grid of the 6A7 tube.

2 - Rotate condenser all the way open, apply a 1720 KC note to the antenna wire, then adjust oscillator trimmer on variable condenser to the signal and then peak the R.F. section of the variable.

3 - Apply a 600 KC note to antenna wire. Adjust padder for maximum gain while rocking the variable condenser back and forth across the 600 KC signal.

4 - Go back and check around 1400 KC for alignment. Do not bend plates.

SECOND BAND - S.W.

5 - Adjust trimmer, found on top of chassis next to ant coil, for maximum noise level at 4 megacycles.

THIRD BAND - S.W.

6 - Adjust trimmer, found underneath the chassis next to the antenna coil, for maximum noise level at 12 megacycles.

Schematic, Voltage Data
MODELS 1922, 1932, 1982, 1992
Notes, Changes

SEARS-ROEBUCK & CO.

MODEL 7166A
Schematic, Socket
MODEL 7168

Parts may be secured direct from Echophone Radio Corp., 2611 Indiana Avenue, Chicago, Illinois.

Models 1922, 1932, 1982, 1992 are similar to Colonial Model 659 page 5-45.

Changes: I 1A2 Ballast tube instead of similar 30 ballast tube.

II. IF Peak 175 KC instead of 480 KC.

III 8 M.F.D. screen filter condenser instead of 6 M.F.D.

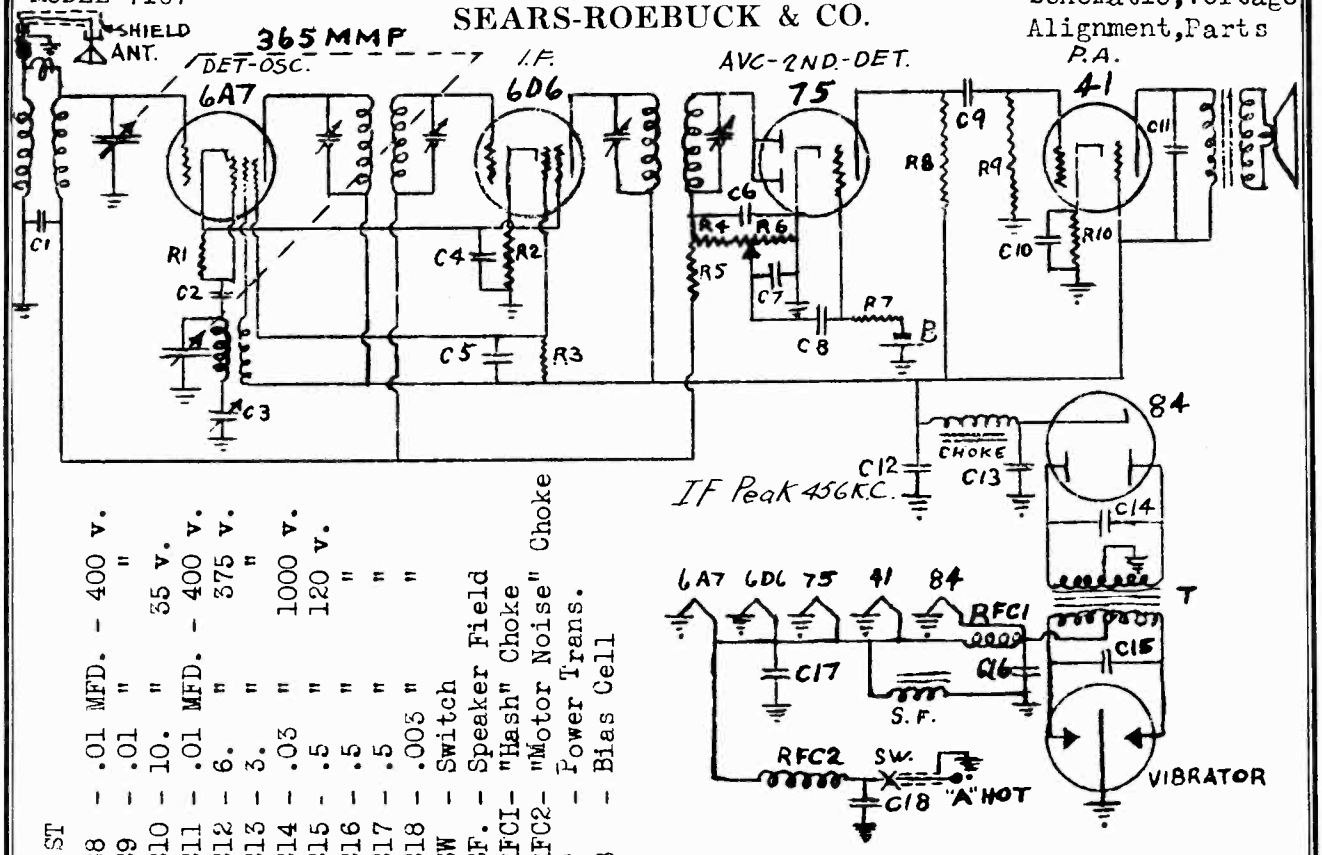
THE TWO TRIMMERS ON THE VARIABLE CONDENSER ARE ALIGNED AT 1400 KC.
WHEN THE VARIABLE IS AT FULL MAXIMUM CAPACITY (ALL THE WAY TO THE RIGHT) THE DIAL HAND SHOULD BE SET ABOVE THE HORIZONTAL DIVIDING LINE ABOUT 1/8" OR SO WHICH WOULD PLACE THE OPPOSITE END OF THE POINTER ON 1700KC. THE HAND IS ADJUSTED BY THE SET SCREW AND COLLAR ON THE VARIABLE CONDENSER SHAFT.

Parts may be secured direct from the Howard Radio Co., 1731 Belmont Avenue, Chicago, Illinois.

MODEL 7167

SEARS-ROEBUCK & CO.

Schematic, Voltage Alignment, Parts



PARTS LIST

R1	- 15,000 ohm 1/3 Watt	C8	- .01 MFD. - 400 v.	SF.	- Speaker Field
R2	- 100 " " "	C9	- .01 " "	RFC1	- "Hash" Choke
R3	- 25,000 " " "	C10	- 10. " 35 v.	RFC2	- "Motor Noise" Choke
R4	- 25,000 " " "	C11	- .01 MFD. - 400 v.	T	- Power Trans.
R5	- 1 Meg. " " Vol. Cont.	C12	- 6. " 375 v.	B	- Bias Cell
R6	- 500,000 " " 1/3 Watt	C13	- 3. " "		
R7	- 500,000 " " "	C14	- .03 " 1000 v.		
R8	- 250,000 " " "	C15	- .5 " 120 v.		
R9	- 500,000 " " "	C16	- .5 " "		
R10	- 500 " " "	C17	- .5 " "		
C1	- .05 MF - 200 v.	C18	- .005 " "		
C2	- .0001 MICA	SW	- Switch		
C3	- 300/600 MMF. Padder Cond.				
C4	- .1 MFD. 200 v.				
C5	- .01 " 400 v.				
C6	- .0005 MFD. Mica				
C7	- .0005 " "				

VOLTAGE READINGS ARE TAKEN ON A 1000 OHM PER VOLT METER

	6A7	606	75	41
FIL.	6V.	6V.	6V.	6V.
PLT.	225	225	90	205
G4	100	100	--	225
G3	225	---	--	---
CAT.	2.3	2.3	--	15

CAT. - CATHODE
FIL. - FILAMENT
PLTE - PLATE
G4 - SCREEN GRID
G3 - OSCILLATOR PLATE

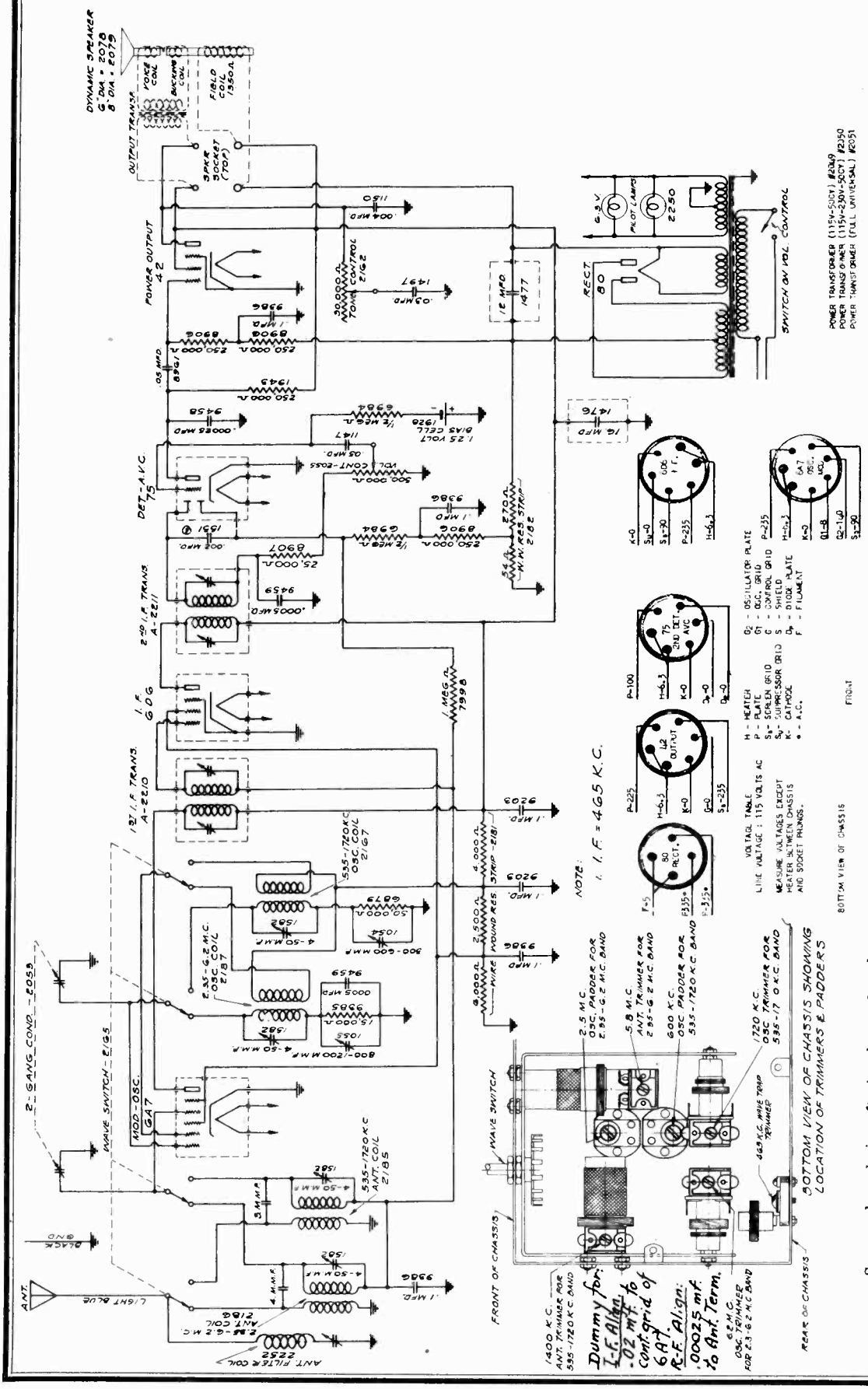
ALIGNMENT PROCEDURE

Apply a 456 kc note to grid of 6A7 tube and adjust IF transformers for maximum response noted on output meter.
Apply a 1400 kc note to antenna wire and adjust trimmers on variable condenser for greatest gain.
Apply a 600 kc note to antenna wire and adjust padder condenser, at end of chassis, for maximum gain, swinging the variable condenser back and forth across signal while adjusting.
Go back to 1400 kc and check for alignment.

Parts for this model may be ordered from Echophone Radio Corporation, 2611 Indiana Ave., Chicago, Ill.

SENTINEL RADIO CORP.

MODEL 20A
Schematic, Voltage
Trimmers, Alignment



Some code and aircraft signals are broadcast on a frequency the same or near the intermediate frequency of the receiver. To eliminate interference from these signals a 465 kilocycle antenna filter is incorporated in the set. To adjust, tune receiver dial to approximately 1000 kilocycles and set test oscillator frequency to EXACTLY 465 KILOCYCLES. Then adjust the 465 kilocycle wavetrap trimmer condenser for MINIMUM 465 KILOCYCLE SIGNAL RESPONSE.

MODEL 47A
Voltage
Alignment

SENTINEL RADIO CORP.

ALIGNING I. F. STAGE AT 465 KILOCYCLES:

(a) Attach the ground lead of the test oscillator to the chassis. Connect the other lead to the grid cap of the 6L7 tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.
(b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.
(c) Peak each of the second I. F. transformer trimmers.
(d) Peak each of the first I. F. transformer trimmers.

To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING 1800-540 KILOCYCLE BAND:

(a) Adjust band selector switch for operation on the 1800-540 kilocycle band, remove test oscillator lead from grid of 6L7 tube and connect to receiver antenna terminal through a .00025 Mfd. series condenser.
(b) Set test oscillator frequency and receiver dial to EXACTLY 1800 kilocycles, and bring in 1800 kilocycle test oscillator signal to maximum output by adjusting 1800 kilocycle oscillator trimmer.
(c) Tune receiver dial and set test oscillator frequency to EXACTLY 1500 kilocycles. Adjust 1500 K. C. R. F. and ant. trimmers for maximum sensivity.
(d) Set test oscillator frequency and receiver dial to approximately 600 kilocycles. Then while rocking gang condenser slightly to right and left, adjust 600 K. C. oscillator padder for maximum signal response.

ALIGNING 1.8-6.3 MEGACYCLE BAND:

(a) Replace .00025 Mfd. antenna series condenser with 400 ohm resistor, adjust band selector switch to 1.8-6.3 megacycles band, tune receiver dial and set test oscillator frequency to EXACTLY 6.3 megacycles. Bring in 6.3 megacycle test oscillator signal to maximum output by adjusting 6.3 M.C. oscillator trimmer.
(b) Tune receiver dial and set test oscillator frequency to EXACTLY 6 megacycles. Then adjust 6 M.C. ant. and R.F. trimmers for maximum sensitivity.

ALIGNING 6.1-21 MEGACYCLE BAND:

(a) Place band selector switch for operation on 6.1-21 megacycle band, tune receiver dial and set test oscillator frequency to EXACTLY 21 megacycles.
(b) Adjust 21 M. C. oscillator trimmer to bring in 21 megacycle test signal to maximum output.

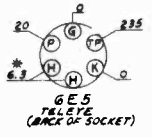
NOTE: When adjusting this trimmer two peaks, the fundamental and the image peak will be noticed. CARE MUST BE TAKEN THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 21 MEGACYCLES. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the first peak which is the fundamental and the proper one to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received, the incorrect image peak will be tuned in. After completing adjustment of the oscillator trimmer at 21 megacycles always check to see if the proper peak has been used. To do this leave test oscillator frequency at 21 megacycles, increase the output of the test oscillator and tune receiver dial to approximately 20 megacycles. Then vary the receiver dial slightly to the right and left of 20 megacycles, and if the fundamental peak was used in aligning at 21 megacycles the test oscillator signal will be heard at approximately 20 megacycles on the receiver dial.

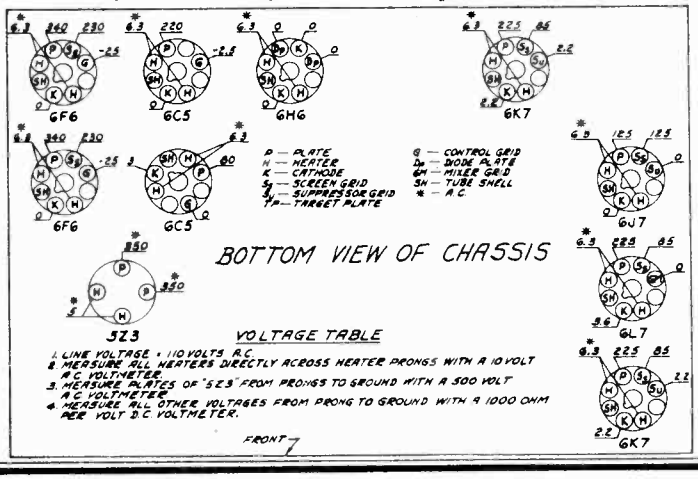
(c) Tune receiver dial and set test oscillator frequency to EXACTLY 18 megacycles.
(d) Adjust 18 M. C. antenna and R. F. trimmers for maximum 18 megacycle test signal response.

ALIGNING 390-140 KILOCYCLE BAND:

(a) Adjust band selector switch for operation on 390 to 140 kilocycle band, tune receiver dial and set test oscillator frequency to EXACTLY 390 kilocycles.

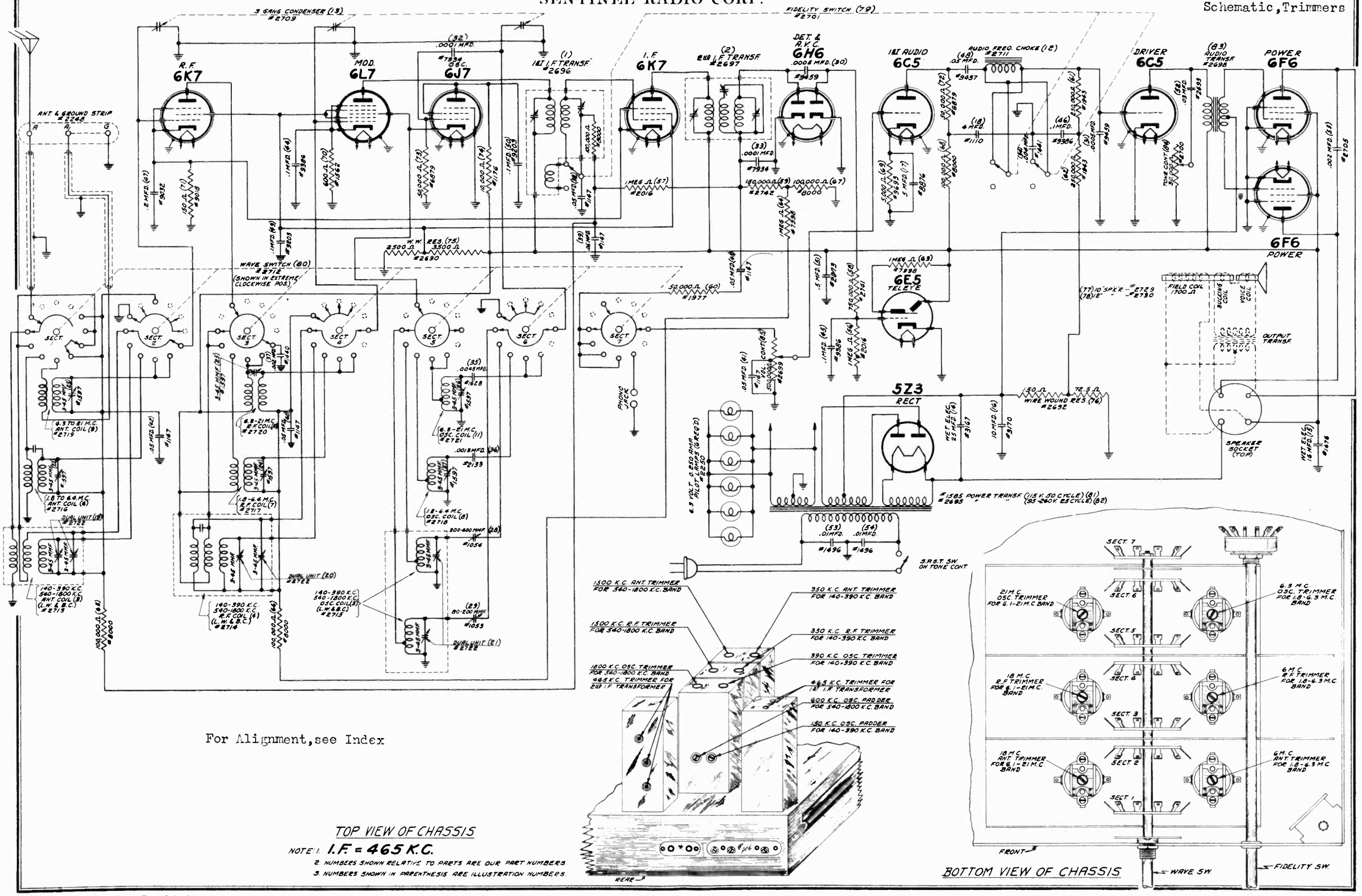
(b) Bring in 390 Kilocycle test signal to maximum output by adjusting 390 K. C. oscillator trimmer.
(c) Tune receiver dial and set test oscillator frequency to EXACTLY 350 kilocycles. Adjust 350 K. C. ant. and R. F. trimmers for maximum sensitivity.
(d) Tune receiver dial and set test oscillator frequency to approximately 150 kilocycles, then while rocking gang condenser slightly to right and left adjust 150 kilocycle oscillator padder for maximum sensitivity.





SENTINEL RADIO CORP.

MODEL 47A
Schematic, Trimmers



For Alignment, see Index

TOP VIEW OF CHASSIS

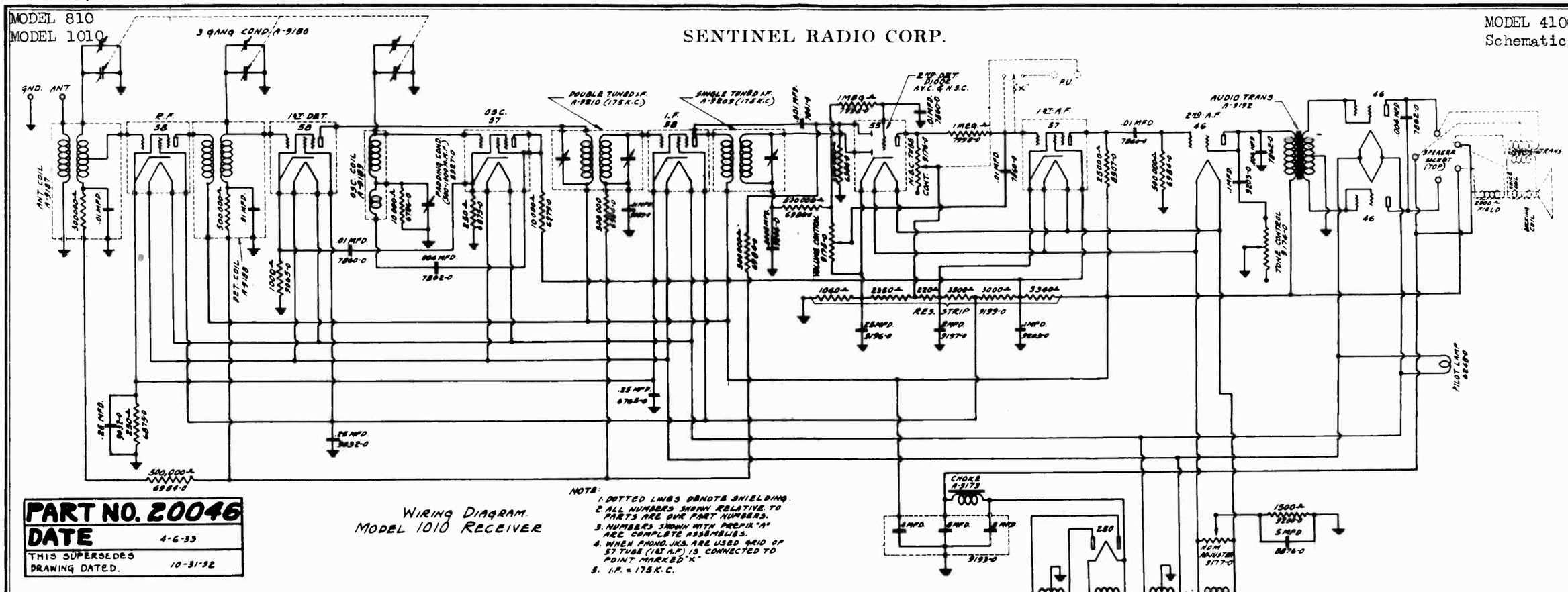
NOTE: 1. **I.F. = 465 K.C.**
2. NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

BOTTOM VIEW OF CHASSIS

MODEL 810
MODEL 1010

SENTINEL RADIO CORP.

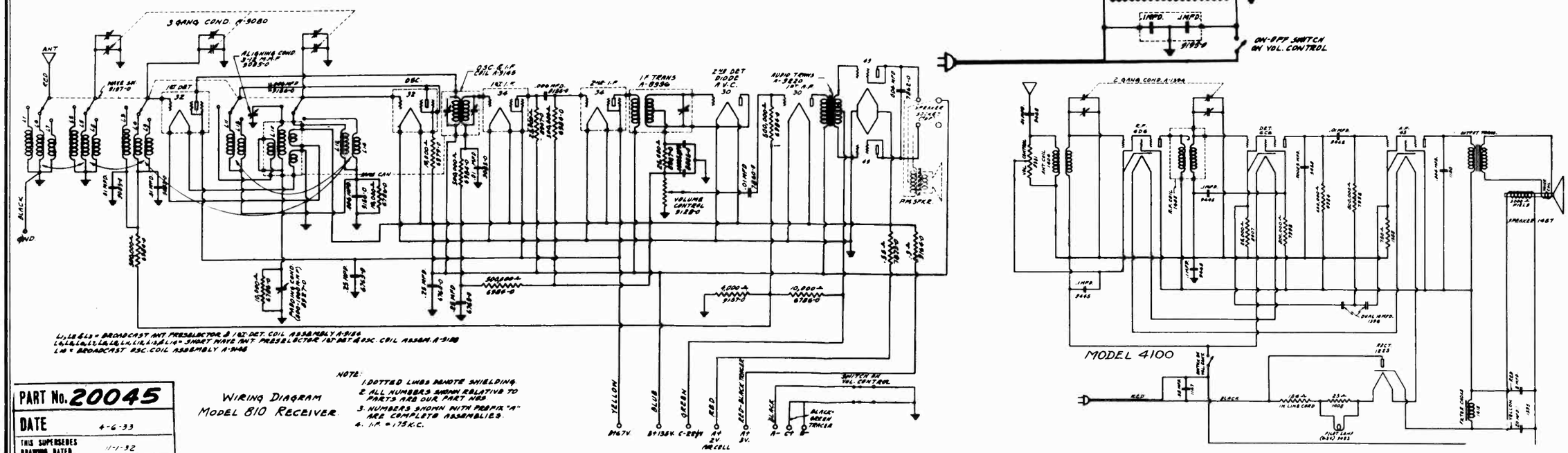
MODEL 4100
Schematics



PART NO. 20046	
DATE	4-6-33
THIS SUPERSEDES DRAWING DATED.	10-31-32

WIRING DIAGRAM
MODEL 1010 RECEIVER

NOTE:
1. DOTTED LINES DENOTE SHIELDING.
2. ALL NUMBERS SHOWN RELATIVE TO PARTS ARE SUPR PART NUMBERS.
3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.
4. WHEN PHONO JKS. ARE USED GRID OF 57 TUBE (1ST A.F.) IS CONNECTED TO POINT MARKED "X"
5. I.F. = 175 K.C.



L1, L2 & L3 = BROADCAST ANT. PRESELECTOR & 1ST. DET. COIL ASSEMBLY A-9145
L4, L5, L6, L7, L8, L9, L10, L11, L12, & L13 = SHORT WAVE ANT. PRESELECTOR 1ST DET & OSC. COIL ASSEM. A-9188
L14 = BROADCAST OSC. COIL ASSEMBLY A-9148

PART No. 20045	
DATE	4-6-33
THIS SUPERSEDES DRAWING DATED	11-1-32

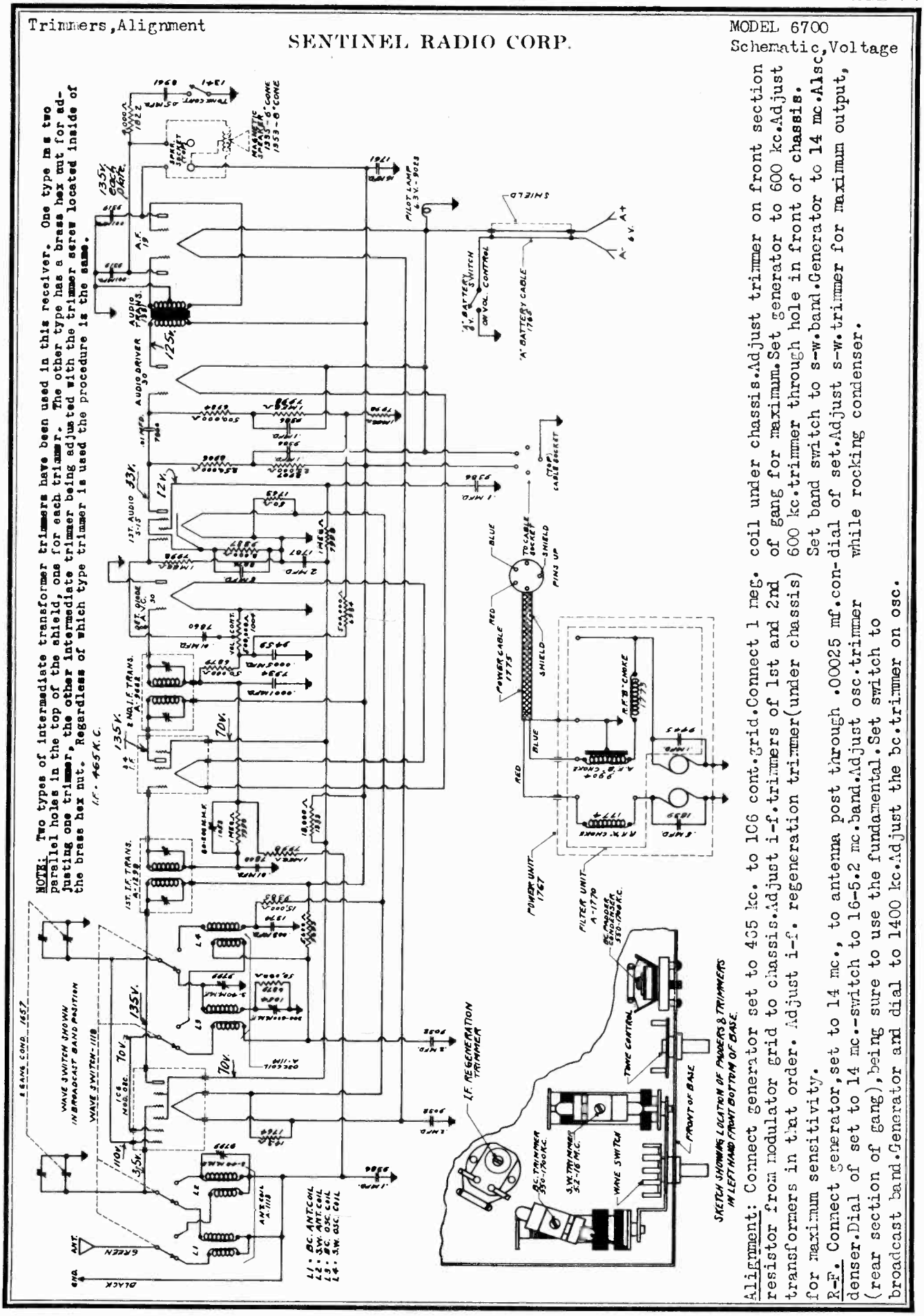
WIRING DIAGRAM
MODEL 810 RECEIVER

NOTE:
1. DOTTED LINES DENOTE SHIELDING.
2. ALL NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NOS.
3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.
4. I.F. = 175 K.C.

Trimmers, Alignment

SENTINEL RADIO CORP.

MODEL 6700
Schematic, Voltage



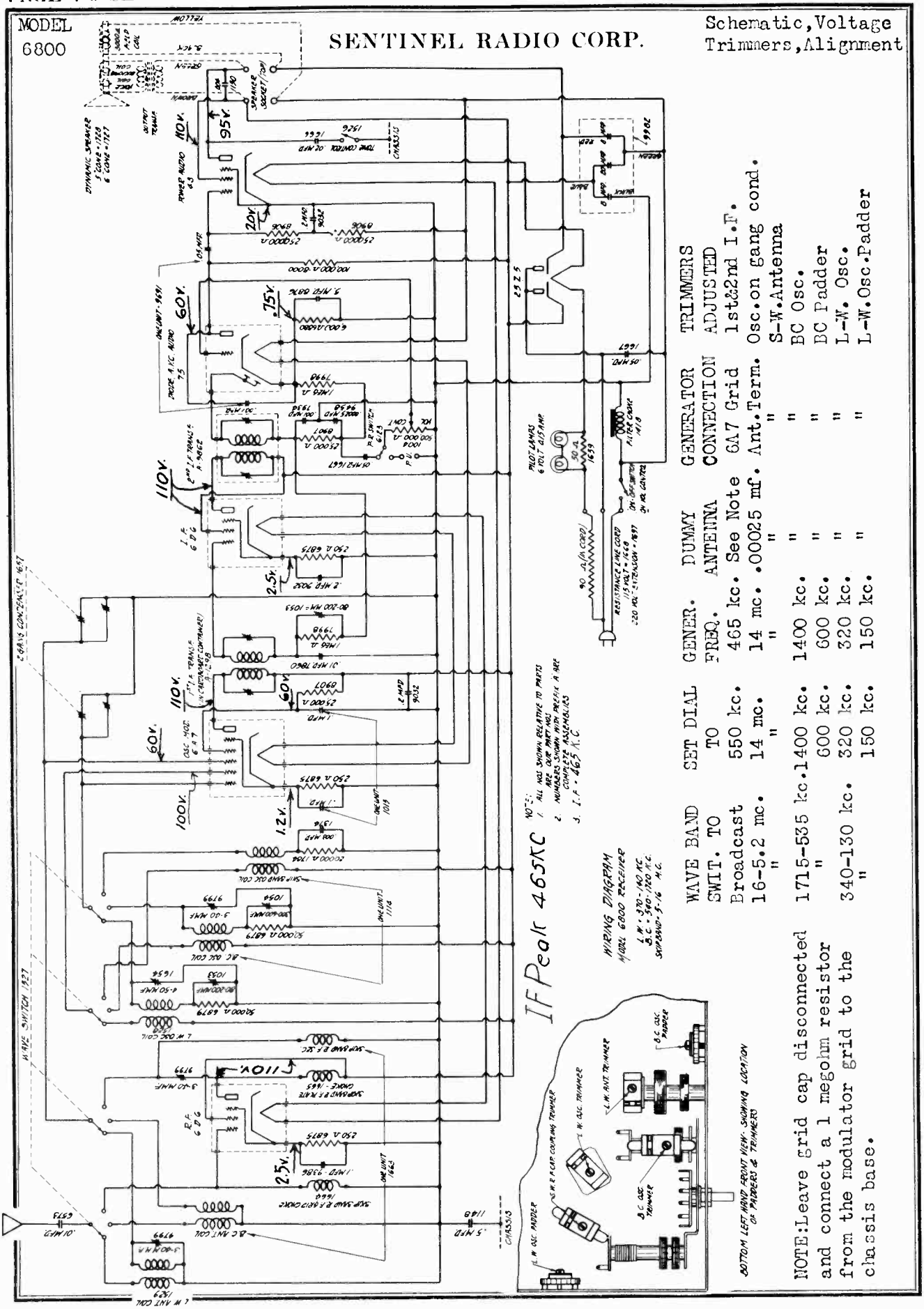
Alignment: Connect generator set to 465 kc. to 106 cont. grid. Connect 1 meg. resistor from modulator grid to chassis. Adjust i-f. trimmers of 1st and 2nd transformers in that order. Adjust i-f. regeneration trimmer (under chassis) for maximum sensitivity.

R-F. Connect generator, set to 14 mc., to antenna post through .00025 mf. condial of set. Adjust s-w. trimmer for maximum output, (rear section of gang), being sure to use the fundamental. Set switch to broadcast band. Generator and dial to 1400 kc. Adjust the bc. trimmer on osc. coil under chassis. Adjust trimmer on front section of gang for maximum. Set generator to 600 kc. Adjust 600 kc. trimmer through hole in front of chassis. Set band switch to s-w. band. Generator to 14 mc. Also, while rocking condenser.

MODEL 6800

SENTINEL RADIO CORP.

Schematic, Voltage Trimmers, Alignment

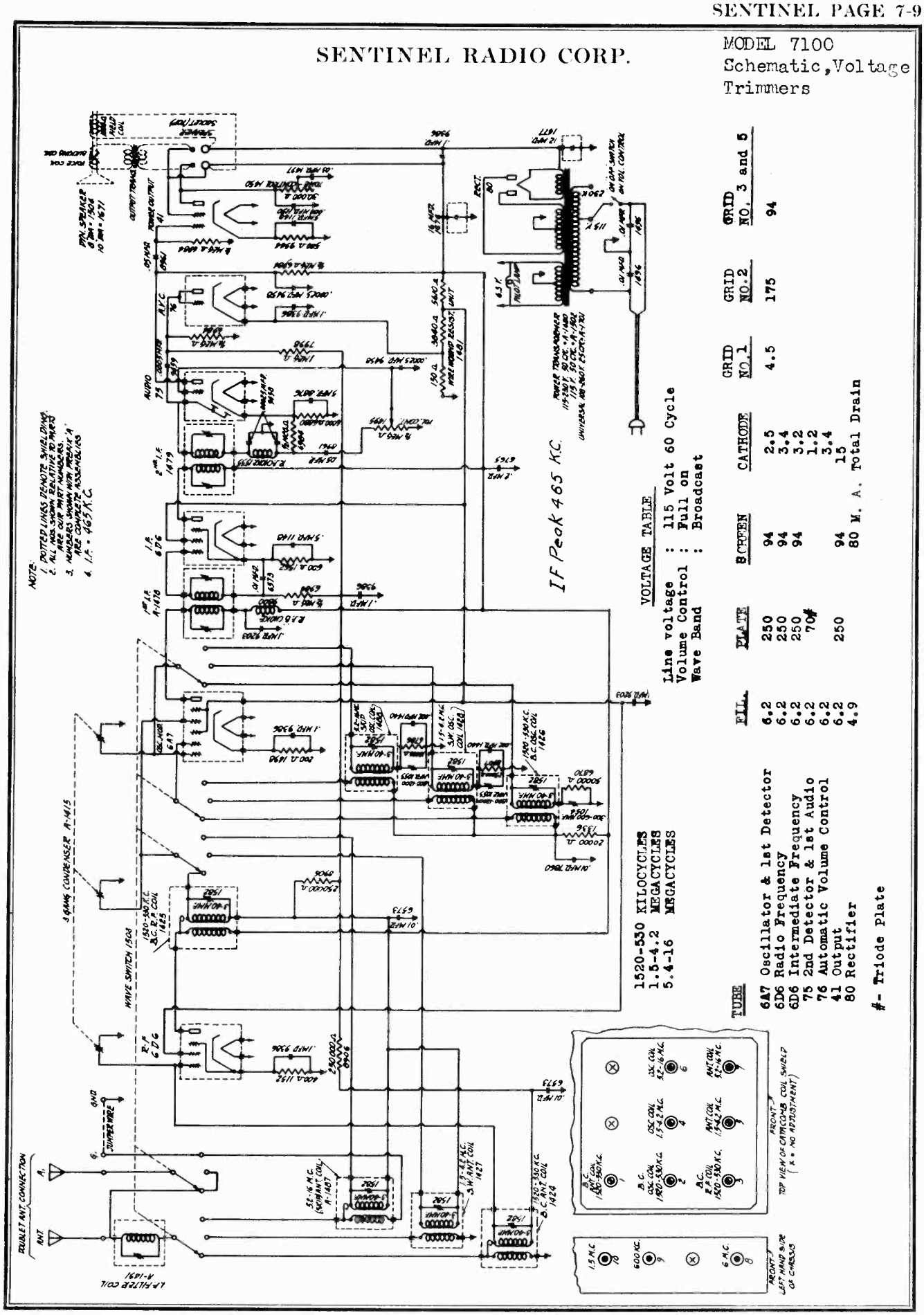


WAVE BAND SWIT. TO	SET DIAL TO	GENER. FREQ.	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED
Broadcast	550 kc.	465 kc.	See Note	6A7 Grid	1st&2nd I.F.
16-5.2 mc.	14 mc.	14 mc.	.00025 mf.	Ant.Term.	Osc.on gang cond.
"	"	"	"	"	S-W.Antenna
1715-535 kc.	1400 kc.	1400 kc.	"	"	BC Osc.
"	600 kc.	600 kc.	"	"	BC Padder
340-130 kc.	320 kc.	320 kc.	"	"	L-W. Osc.
"	150 kc.	150 kc.	"	"	L-W.Osc.Padder

NOTE: Leave grid cap disconnected and connect a 1 megohm resistor from the modulator grid to the chassis base.

SENTINEL RADIO CORP.

MODEL 7100
Schematic, Voltage
Trimmers



VOLTAGE TABLE

Line voltage : 115 Volt 60 Cycle
Volume Control : Full on
Wave Band : Broadcast

TUBE	FIL.	PLATE	SCREEN	CATHODE	GRID NO.1	GRID NO.2	GRID NO. 3 and 5
6A7 Oscillator & 1st Detector	6.2	250	94	2.5	4.5	175	94
6D6 Radio Frequency	6.2	250	94	3.4			
6D6 Intermediate Frequency	6.2	250	94	3.2			
75 2nd Detector & 1st Audio	6.2	70#		1.2			
76 Automatic Volume Control	6.2			3.4			
41 Output	6.2	250	94	15			
80 Rectifier	4.9		80 M. A. Total Drain				

#- Triode Plate

MODEL 7100
Alignment

SENTINEL RADIO CORP.

NOTE: NEVER LIFT THE RECEIVER BY GRASPING THE CATACOMB SHIELD, TO DO SO MAY MOVE THE SHIELD THEREBY DETUNING THE RECEIVER.

ALIGNMENT PROCEDURE:

It is important when aligning to carefully follow the procedure in the order given, otherwise the receiver will lack sensitivity and the dial calibration will be incorrect. IT IS IMPERATIVE THAT AN ACCURATELY CALIBRATED OSCILLATOR BE USED WITH SOME TYPE OF OUTPUT MEASURING DEVICE.

INTERMEDIATE ALIGNMENT:

1. Connect the high side of the oscillator output to the control grid of the 6A7 tube, leaving the grid cap disconnected. Connect the ground side of the oscillator to the receiver chassis.

2. Set the test oscillator frequency to 465 kilocycles. (This must be accurate).

3. Align the first intermediate transformer by turning one of the trimmer screws up and down (increasing and decreasing capacity) until maximum reading is obtained on the output meter, after which adjust the other trimmer screw of the same transformer for maximum sensitivity.

4. Adjust the other intermediate transformer in the same manner.

NOTE: Two type intermediate transformer trimmers have been used in this receiver. One type has two parallel holes in the top of the shield, one for each trimmer. The other type has a brass hex nut for adjusting one trimmer, the other intermediate trimmer being adjusted with the trimmer screw located inside of the brass hex nut. Regardless of which type trimmer is used, the procedure is the same.

TO ALIGN THE VARIABLE CONDENSER:

Adjustment of the trimmer condensers, located inside of and accessible through the holes found in the top of the catacomb shield (mounted on top and in the left hand front corner of the receiver) will be referred to by numbers as indicated on the circuit diagram showing the relative location of these trimmers.

1. Connect the high output side of the test oscillator to the receiver antenna post through a 250 MMFD (.00025 MFD) condenser and the ground to the set ground post.

2. Place the band selector switch for operation on the 1520 to 530 kilocycle (broadcast) band. Tune the receiver to exactly 1400 kilocycles on the dial and set the test oscillator frequency to exactly 1400 kilocycles. THEN BRING IN THE 1400 KILOCYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING THE TRIMMER MARKED NO. 2 ON CATACOMB DIAGRAM, after which adjust No. 1 and No. 3 trimmers in the order named for maximum sensitivity.

3. Leave the band selector switch for operation on the broadcast band (1520 to 530 kilocycles) and tune the receiver and set the oscillator to approximately 600 kilocycles. Then adjust the 600 kilocycle padding condenser No. 9 which is located on and accessible through the hole in the left hand side of the chassis for maximum sensitivity. As this adjustment is quite critical, it is necessary to rock the variable condenser slightly to the right and to the left to find the point of greatest sensitivity.

4. Recheck the alignment at 1400 kilocycles as the 600 kilocycle adjustment may have changed the alignment at 1400 kilocycles.

5. Place the band selector switch for operation on the 1.5 to 4.2 megacycle band and set the test oscillator frequency and tune the receiver dial to exactly 3.8 megacycles. THEN TUNE IN THIS 3.8 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING CATACOMB TRIMMER NO. 4, next adjust trimmer No. 5 for maximum sensitivity.

6. With the band selector switch in the same position (1.5 to 4.2 megacycle band) tune the receiver dial and set the oscillator frequency to approximately 1.7 megacycles and then while rocking the variable condenser slightly to the right and left, adjust the 1.7 megacycle trimmer No. 10 (located on the left hand side of the chassis) for maximum sensitivity.

7. Recheck 3.8 megacycle adjustments.

8. Adjust the band selector switch for operation on the 5.2 to 16 megacycle band and tune the receiver dial and set the oscillator frequency to exactly 15 megacycles. When adjusting catacomb trimmer No. 6 two peaks (the fundamental and the image peak) will be noticed. CARE MUST BE TAKEN SO THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 15 MEGACYCLES. First back off catacomb trimmer No. 6 to minimum capacity, next screw down the trimmer (add capacity) until the first peak which is the fundamental and the one you are to use is tuned in. If the trimmer is screwed down beyond the point where this first peak is received the incorrect image peak will be tuned in. When the first peak has been located adjust catacomb trimmer No. 6 to BRING IN THE 15 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT. After completing this adjustment always check to see if the proper peak has been used. To do this leave the test oscillator frequency at 15 megacycles and increase the output of the test oscillator, then tune the receiver dial to approximately 14 megacycles. Vary the receiver dial slightly to the right and left of 14 megacycles and if the fundamental peak was used in aligning at 15 megacycles the test oscillator signal will be heard at approximately 14 megacycles on the set dial. If it is not possible to receive the signal then the fundamental peak was not used and the 15 megacycle adjustment of trimmer No. 6 must be gone over and properly adjusted. After correctly completing catacomb trimmer No. 6 adjustment adjust catacomb trimmer No. 7 to maximum sensitivity. Should two peaks be noticed with this trimmer always adjust trimmer No. 7 to the one that requires the most capacity to tune in.

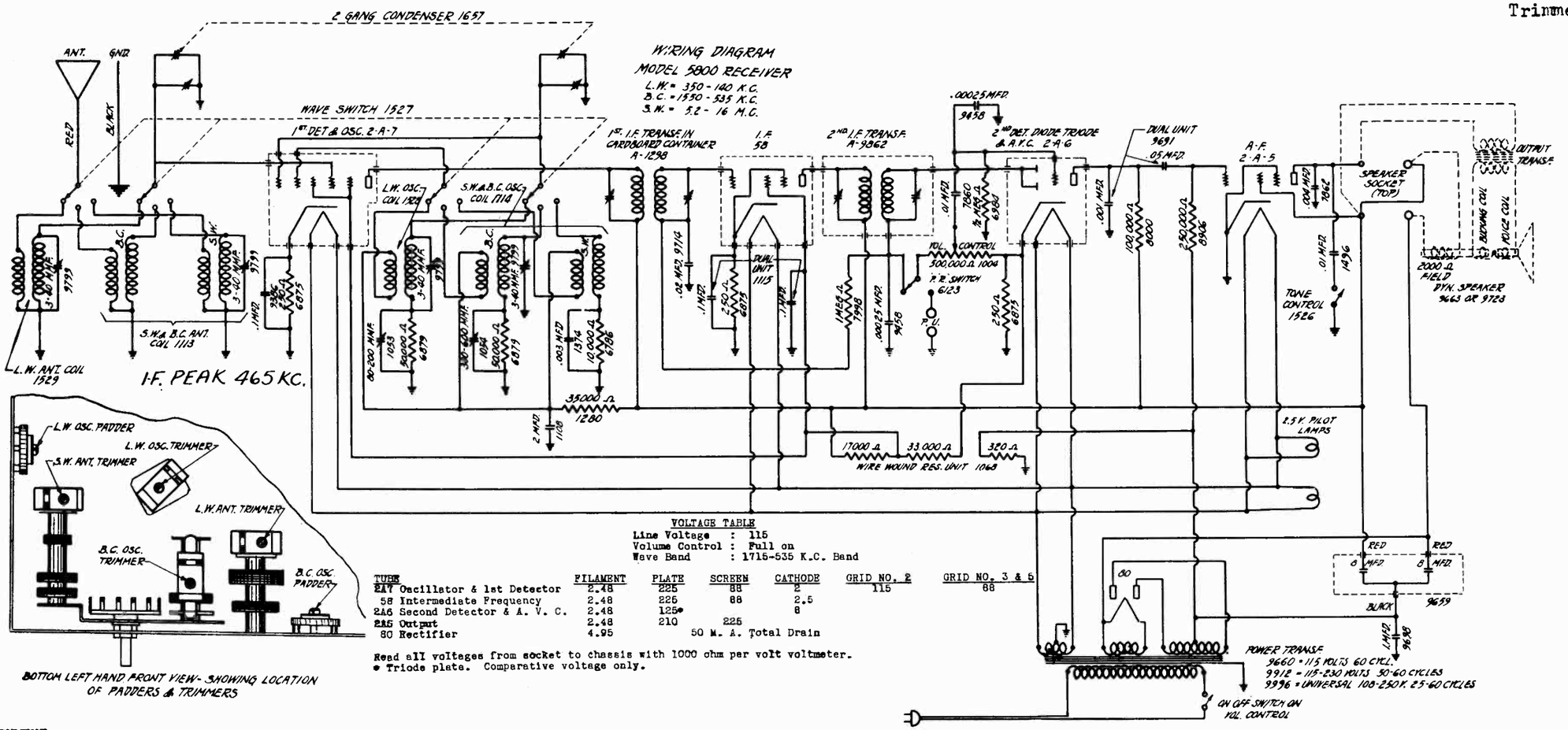
9. Leave the band selector switch for operation on 5.4 to 16 megacycle band, set the oscillator frequency and tune the receiver dial to approximately 6 megacycles. While rocking the variable condenser slightly to the right and left, adjust the 6 megacycle trimmer No. 8 (located on the left hand side of the chassis) for maximum sensitivity.

10. Recheck 15 megacycle adjustments.

11. Some code and aircraft signals are broadcast on a frequency exactly the same or near the IF frequency of the receiver. To eliminate interference from these signals a 465 kilocycle filter (mounted in the coil shield located underneath and towards the front of the chassis) is incorporated in the set. To adjust, set the oscillator frequency (with oscillator output connected to set antenna and ground) TO EXACTLY 465 KILOCYCLES turn the receiver on end and adjust the trimmer located on and accessible through the top of the filter shield for MINIMUM 465 KILOCYCLE SIGNAL.

MODEL 5800
Schematic, Voltage
Trimmers, Alignment

SENTINEL RADIO CORP.



VOLTAGE TABLE

Line Voltage : 115
Volume Control : Full on
Wave Band : 1715-535 K.C. Band

TUBE	FILAMENT	PLATE	SCREEN	CATHODE	GRID NO. 2	GRID NO. 3 & 5
2A7 Oscillator & 1st Detector	2.48	225	88	2	115	88
58 Intermediate Frequency	2.48	225	88	2.5		
2A6 Second Detector & A. V. C.	2.48	125*		8		
2A5 Output	2.48	210	225			
80 Rectifier	4.95	50 M. A. Total Drain				

Read all volteges from socket to chassis with 1000 ohm per volt voltmeter.
* Triode plate. Comparative voltage only.

INTERMEDIATE ALIGNMENT:

1. Connect the high side of the oscillator output to the control grid of the 2A7 tube. Leave the grid cap disconnected and connect a 1 meg ohm resistor from the modulator grid to the chassis base. Connect the ground side of the oscillator to the receiver ground post.

2. Set the test oscillator frequency to 465 kilocycles. (This must be accurate).

3. Align the first intermediate transformer by turning one of the trimmer screws up and down (increasing and decreasing capacity) until maximum reading is obtained on the output meter, after which adjust the other trimmer screw of the same transformer for maximum sensitivity.

4. Adjust the other intermediate transformers in the same manner.

TO ALIGN THE VARIABLE CONDENSER:

1. Connect the high output side of the test oscillator through a .00025 Mfd. condenser to the set antenna lead and the ground to the set ground.

2. Place the band selector switch for operation on the 16 to 5.2 megacycle band, tune the receiver to exactly 14 megacycles on the receiver dial, and set the test oscillator frequency to exactly 14 megacycles. THEN TUNE IN THE 1400 KILOCYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING THE TRIMMER CONDENSER LOCATED ON TOP OF THE OSCILLATOR SECTION OF THE GANG CONDENSER. Looking at the front of the receiver the first section of the gang condenser tunes the antenna coil and the second section the oscillator coil. When adjusting this trimmer two peaks (the fundamental and the image peak) will be noticed. CARE MUST BE TAKEN SO THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 14 MEGACYCLES. First back off the trimmer to minimum capacity, next screw down the trimmer (add capacity) until the first peak which is the fundamental and the one you are to use is tuned in. If the trimmer is screwed down beyond the point where this first peak is received the incorrect image peak will be tuned in. When the first peak has been located adjust the trimmer to BRING IN THE 14 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT. After completing this adjustment always check to see if the proper peak has been used. To do this leave the test oscillator frequency frequency at 14 megacycles and increase the output of the test oscillator and then tune the receiver dial to approximately 13 megacycles. Vary the receiver dial slightly to the right and left of 13 megacycles and if the fundamental peak was used in aligning at 14 megacycles the test oscillator signal will be heard at approximately 13 megacycles on the set dial. If it is not possible to receive the signal then the fundamental peak was not used and the 14 megacycle adjustment of the trimmer must be gone over and properly adjusted. AFTER CORRECTLY COMPLETING THE 14 MEGACYCLE ALIGNMENT TURN THE RECEIVER ON END AND WHILE ROCKING THE GANG CONDENSER SLIGHTLY TO THE RIGHT AND LEFT ADJUST THE TRIMMER CONDENSER MOUNTED ON THE SW (5.2-16 M.C. band) ANTENNA COIL LOCATED UNDERNEATH THE CHASSIS FOR MAXIMUM SENSITIVITY.

3. Adjust the band selector switch for operation on the 1715 to 535 kilocycle band and set the receiver dial and the test oscillator frequency to EXACTLY 1400 KILOCYCLES. Then turn the receiver chassis on end and bring in the 1400 kilocycle signal to maximum output by adjusting the trimmer condenser mounted on the B.C. (1715-535 K.C. band) oscillator coil. Next adjust the trimmer condenser mounted on top of the first section of the gang condenser for maximum 1400 kilocycle signal sensitivity.

4. Leave the band selector switch for operation on the 1715 to 535 kilocycle band and tune the receiver and set the test oscillator frequency to approximately 600 kilocycles. Then while rocking the condenser slightly to the right and left adjust the 600 kilocycle B. C. padding condenser, which is located on end accessible through the hole in the front of the chassis, for maximum sensitivity.

5. Recheck the 1400 kilocycle adjustment.

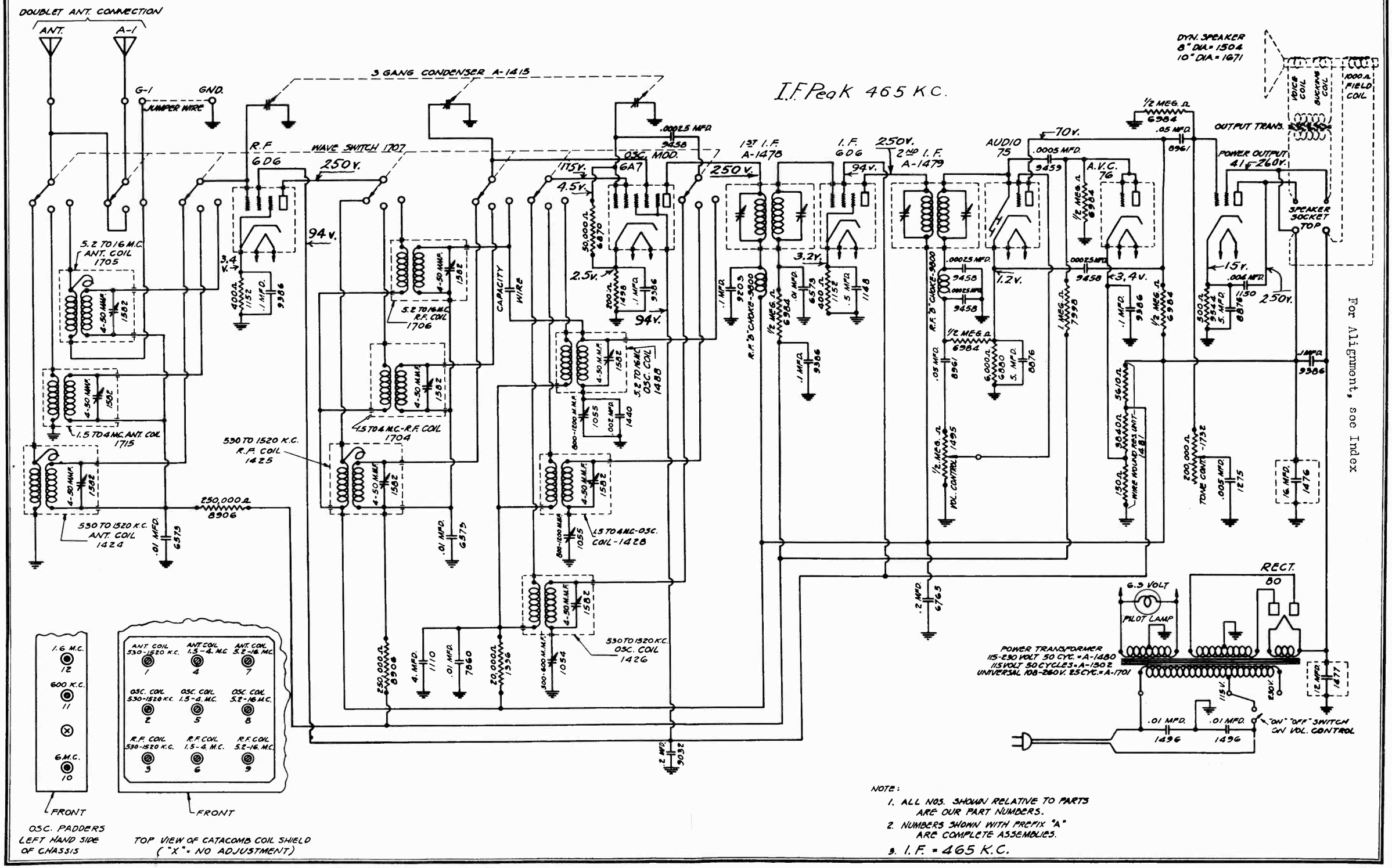
6. Recheck the 14 megacycle adjustment.

7. Place the band selector switch for operation on the 340 to 130 kilocycle band, and set the test oscillator frequency and the receiver dial to EXACTLY 320 KILOCYCLES. THEN BRING IN THIS 320 KILOCYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING THE TRIMMER CONDENSER LOCATED ON THE L. W. (340-130 K.C. band) oscillator coil located underneath the receiver chassis, after which adjust the trimmer condenser mounted on the L. W. (340-130 K.C. band) antenna coil also located underneath the chassis.

8. Leave the band selector switch for operation on the 340 to 130 kilocycle band and tune the receiver dial and set the test oscillator frequency to approximately 150 kilocycles. Then while rocking the variable condenser slightly to the right and left adjust the L. W. oscillator coil padding condenser, located on and accessible through the hole in the right hand side of the chassis, for maximum sensitivity.

MODEL 7100B
Schematic, Voltage
Trimmers

SENTINEL RADIO CORP.



NOTE:

1. ALL NOS. SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
2. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.
3. I. F. = 465 K.C.

For Alignment, see Index

SENTINEL RADIO CORP.

MODEL 7100B
Alignment

NOTE: NEVER LIFT THE RECEIVER BY GRASPING THE CATACOMB SHIELD, TO DO SO MAY MOVE THE SHIELD THEREBY DETUNING THE RECEIVER.

ALIGNMENT PROCEDURE:

It is important when aligning to carefully follow the procedure in the order given, otherwise the receiver will lack sensitivity and the dial calibration will be incorrect. IT IS IMPERATIVE THAT AN ACCURATELY CALIBRATED OSCILLATOR BE USED WITH SOME TYPE OF OUTPUT MEASURING DEVICE.

INTERMEDIATE ALIGNMENT:

1. Connect the high side of the oscillator output to the control grid of the 6A7 tube, leaving the grid cap disconnected. Connect the ground side of the oscillator to the receiver chassis.

2. Set the test oscillator frequency to 465 kilocycles. (This must be accurate).

3. Align the first intermediate transformer by turning one of the trimmer screws up and down (increasing and decreasing capacity) until maximum reading is obtained on the output meter, after which adjust the other trimmer screw of the same transformer for maximum sensitivity.

4. Adjust the other intermediate transformer in the same manner.

NOTE: Two type intermediate transformer trimmers have been used in this receiver. One type has two parallel holes in the top of the shield, one for each trimmer. The other type has a brass hex nut for adjusting one trimmer, the other intermediate trimmer being adjusted with the trimmer screw located inside of the brass hex nut. Regardless of which type trimmer is used, the procedure is the same.

TO ALIGN THE VARIABLE CONDENSER:

Adjustment of the trimmer condensers, located inside of and accessible through the holes found in the top of the catacomb shield (mounted on top and in the left hand front corner of the receiver) will be referred to by numbers as indicated on the circuit diagram showing the relative location of these trimmers.

1. Connect the high output side of the test oscillator to the receiver antenna post through a 250 MMFD. (.00025 Mfd.) condenser and the ground to the set ground post.

2. Place the band selector switch for operation on the 1520 to 530 kilocycle (broadcast) band. Tune the receiver to exactly 1400 kilocycles on the dial and set the test oscillator frequency to exactly 1400 kilocycles. THEN BRING IN THE 1400 KILOCYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING THE TRIMMER MARKED NO. 2 ON CATACOMB DIAGRAM, after which adjust No. 1 and No. 3 trimmers in the order named for maximum sensitivity.

3. Leave the band selector switch for operation on the broadcast band (1520 to 530 kilocycles) and tune the receiver and set the oscillator to approximately 600 kilocycles. Then adjust the 600 kilocycle padding condenser No. 11, which is located on and accessible through the hole in the left hand side of the chassis, for maximum sensitivity. As this adjustment is quite critical it is necessary to rock the variable condenser slightly to the right and to the left to find the point of greatest sensitivity.

4. Recheck the alignment at 1400 kilocycles as the 600 kilocycle adjustment may have changed the alignment at 1400 kilocycles.

5. Place the band selector switch for operation on the 1.5 to 4.2 megacycle band and set the test oscillator frequency and tune the receiver dial to exactly 3.8 megacycles. THEN TUNE IN THIS 3.8 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING CATACOMB TRIMMER NO. 5, next adjust trimmers No. 4 and 6 for maximum sensitivity.

6. With the band selector switch in the same position (1.5 to 4.2 megacycle band) tune the receiver dial and set the oscillator frequency to approximately 1.6 megacycles, and then while rocking the variable condenser slightly to the right and left adjust the 1.6 megacycle trimmer No. 12 (located on the left hand side of the chassis) for maximum sensitivity.

7. Recheck 3.8 megacycle adjustments.

8. Adjust the band selector switch for operation on the 5.2 to 16 megacycle band and tune the receiver dial and set the oscillator frequency to exactly 15 megacycles. When adjusting catacomb trimmer No. 8 two peaks (the fundamental and the image peak) will be noticed. CARE MUST BE TAKEN SO THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 15 MEGACYCLES. First back off catacomb trimmer No. 8 to minimum capacity, next screw down the trimmer (add capacity) until the first peak which is the fundamental and the one you are to use is tuned in. If the trimmer is screwed down beyond the point where this first peak is received the incorrect image peak will be tuned in. When the first peak has been located adjust catacomb trimmer No. 8 to BRING IN THE 15 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT. After completing this adjustment always check to see if the proper peak has been used. To do this leave the test oscillator frequency at 15 megacycles and increase the output of the test oscillator, then tune the receiver dial to approximately 14 megacycles. Vary the receiver dial slightly to the right and left of 14 megacycles and if the fundamental peak was used in aligning at 15 megacycles the test oscillator signal will be heard at approximately 14 megacycles on the set dial. If it is not possible to receive the signal then the fundamental peak was not used and the 15 megacycle adjustment of trimmer No. 8 must be gone over and properly adjusted. After correctly completing catacomb trimmer No. 8 adjustment, adjust catacomb trimmers No. 7 and 9 for maximum sensitivity.

9. Leave the band selector switch for operetion on 5.2 to 16 megacycle band, set the oscillator frequency and tune the receiver dial to approximately 6 megacycles. While rocking the variable condenser slightly to the right and left, adjust the 6 megacycle trimmer No. 10 (located on the left hand side of the chassis) for maximum sensitivity.

10. Recheck 15 megacycle adjustments.

MODEL 8100B
Alignment, Trimmers

SENTINEL RADIO CORP.

INTERMEDIATE ALIGNMENT:

1. Connect the high side of the oscillator output to the control grid of the 6A7 oscillator & modulator tube. Leave the grid cap disconnected and connect a 1 meg ohm resistor from the modulator grid to the chassis base.

2. Set the test oscillator frequency to 465 kilocycles. (This must be accurate).

3. Align the first intermediate transformer by turning one of the trimmer screws accessible through the holes in the top of the coil shield up and down (increasing and decreasing capacity) until maximum reading is obtained on the output meter, after which adjust the other trimmer screw of the same transformer for maximum sensitivity.

4. Adjust the other intermediate transformer in the same manner.

TO ALIGN THE VARIABLE CONDENSER: It is important when aligning the gang condensers, padder condensers, and trimmer condensers to follow the procedure carefully, otherwise the receiver will be insensitive and the dial calibration will be incorrect. The trimmer and padder condensers will be referred to by number as indicated on the diagram which shows their relative locations on the chassis.

1. Connect the high output side of the test oscillator through a .00025 Mfd. condenser to the set antenna post, and the ground to the set ground.

2. Place the band selector switch for operation on the 10 to 24 megacycle band, tune the receiver dial to EXACTLY 22 MEGACYCLES AND SET THE TEST OSCILLATOR FREQUENCY TO EXACTLY 22 MEGACYCLES. THEN TUNE IN THE 22 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING TRIMMER NO. 14. Next rock the gang condenser slightly to the right and left and adjust trimmers No. 13 and 15 for maximum 22 megacycle signal sensitivity. CARE MUST BE TAKEN SO THAT THE FUNDAMENTAL AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 22 MEGACYCLES. When adjusting trimmer No. 14 always back off the trimmer to minimum capacity and then screw down the trimmer (add capacity) until the first peak, which is the fundamental and the one you are to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received, the incorrect image peak will be tuned in. After completing adjustment of trimmers No. 14, 13, and 15 always check to see if the proper peak has been used. To do this leave the test oscillator frequency at 22 megacycles, increase the output of the test oscillator, and tune the receiver dial to approximately 21 megacycles. Vary the receiver dial slightly to the right and left of 21 megacycles, and if the fundamental peak was used in aligning at 22 megacycles the test oscillator signal will be heard at approximately 21 megacycles on the receiver dial. If it is not possible to receive the signal at approximately 21 megacycles, then the fundamental peak was not used and the 22 megacycle adjustment of trimmers No. 13, 14, and 15 must be gone over and properly adjusted.

3. Place the band selector switch for operation on the 4 to 11 megacycle band and set the receiver dial and the test oscillator frequency to EXACTLY 9.5 MEGACYCLES. When adjusting trimmer No. 10 the fundamental and the image peak will be noticed. CARE MUST BE TAKEN SO THAT THE FUNDAMENTAL AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 9.5 MEGACYCLES. First back off trimmer No. 10 to minimum capacity then screw down the trimmer (add capacity) until the first peak, which is the fundamental and the proper one to use is tuned in. When the first peak has been located adjust trimmer No. 10 TO BRING IN THE 9.5 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT. Next adjust trimmers No. 9 and 11 for maximum 9.5 megacycle sensitivity. After completing adjustment of trimmers No. 10, 11, and 9 always check to see if the proper peak has been used. To do this leave the test oscillator frequency at 9.5 megacycles and increase the test oscillator output. Vary the receiver dial slightly to the right and left of 8.5 megacycles and if the fundamental peak of trimmer No. 10 was used in aligning at 9.5 megacycles the test oscillator signal will be heard at approximately 8 megacycles on the receiver dial. If it is not possible to receive the signal, then the fundamental peak was not used and the 9.5 megacycle adjustment of trimmers No. 9, 10, and 11 must be gone over and properly adjusted.

4. Leave the band selector switch for operation on the 4 to 11 megacycle band and tune the receiver and set the test oscillator frequency to approximately 4.6 megacycles. Then while rocking the gang condenser slightly to the right and left adjust padder condenser No. 12 for maximum sensitivity.

5. Place the band selector switch for operation on the 1.5 to 4.2 megacycle band and tune the receiver dial and set the test oscillator frequency to EXACTLY 3.8 MEGACYCLES. THEN BRING IN THE 3.8 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING TRIMMER NO. 6, after which adjust trimmers No. 5 and 7 for maximum 3.8 megacycle signal sensitivity.

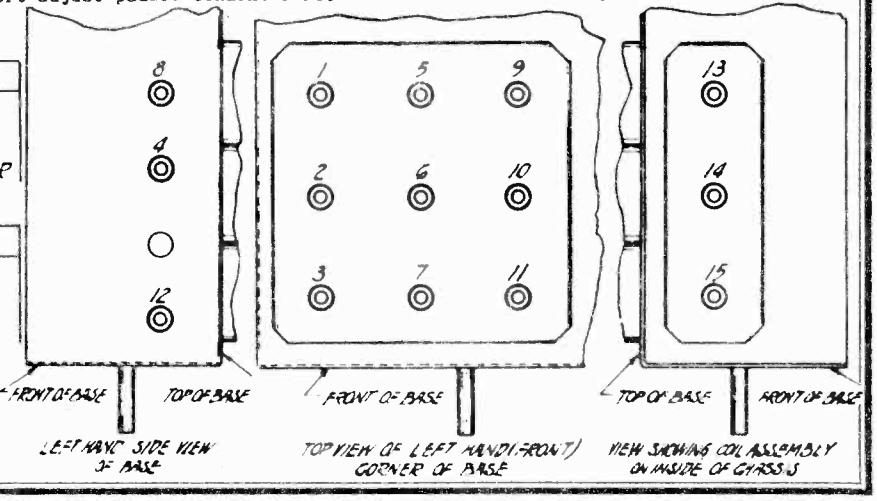
6. With the band selector switch in the same position (1.5 to 4.2 megacycle band) tune the receiver dial and set the test oscillator frequency to approximately 1.6 megacycles. Then while rocking the gang condenser slightly to the right and left, adjust padder condenser No. 8 for maximum 1.6 megacycle signal sensitivity.

7. Adjust the band selector switch for operation on the 1550 to 535 kilocycle band, tune the receiver dial and set the test oscillator frequency to EXACTLY 1400 KILOCYCLES. THEN BRING IN THE 1400 KILOCYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING TRIMMER NO. 2, after which adjust trimmers No. 1 and 3 for maximum sensitivity.

8. With the band selector switch set for operation on the 1550 to 535 kilocycle band tune the receiver dial and set the test oscillator frequency to approximately 600 kilocycles. Next while rocking the gang condenser slightly to the right and left adjust padder condenser No. 4 for maximum 600 kilocycle signal response.

535-1550 K.C. BAND	1.5-4.2 M.C. BAND
1 - ANT. TRIMMER	5 - ANT. TRIMMER
2 - OSC. " "	6 - OSC. " "
3 - R.F. " "	7 - R.F. " "
4 - 600 K.C. OSC. PADDER	8 - 1.6 M.C. OSC. PADDER

4.0-11 M.C. BAND	10-24 M.C. BAND
9 - ANT. TRIMMER	13 - ANT. TRIMMER
10 - OSC. " "	14 - OSC. " "
11 - R.F. " "	15 - R.F. " "
12 - 4.6 M.C. OSC. PADDER	



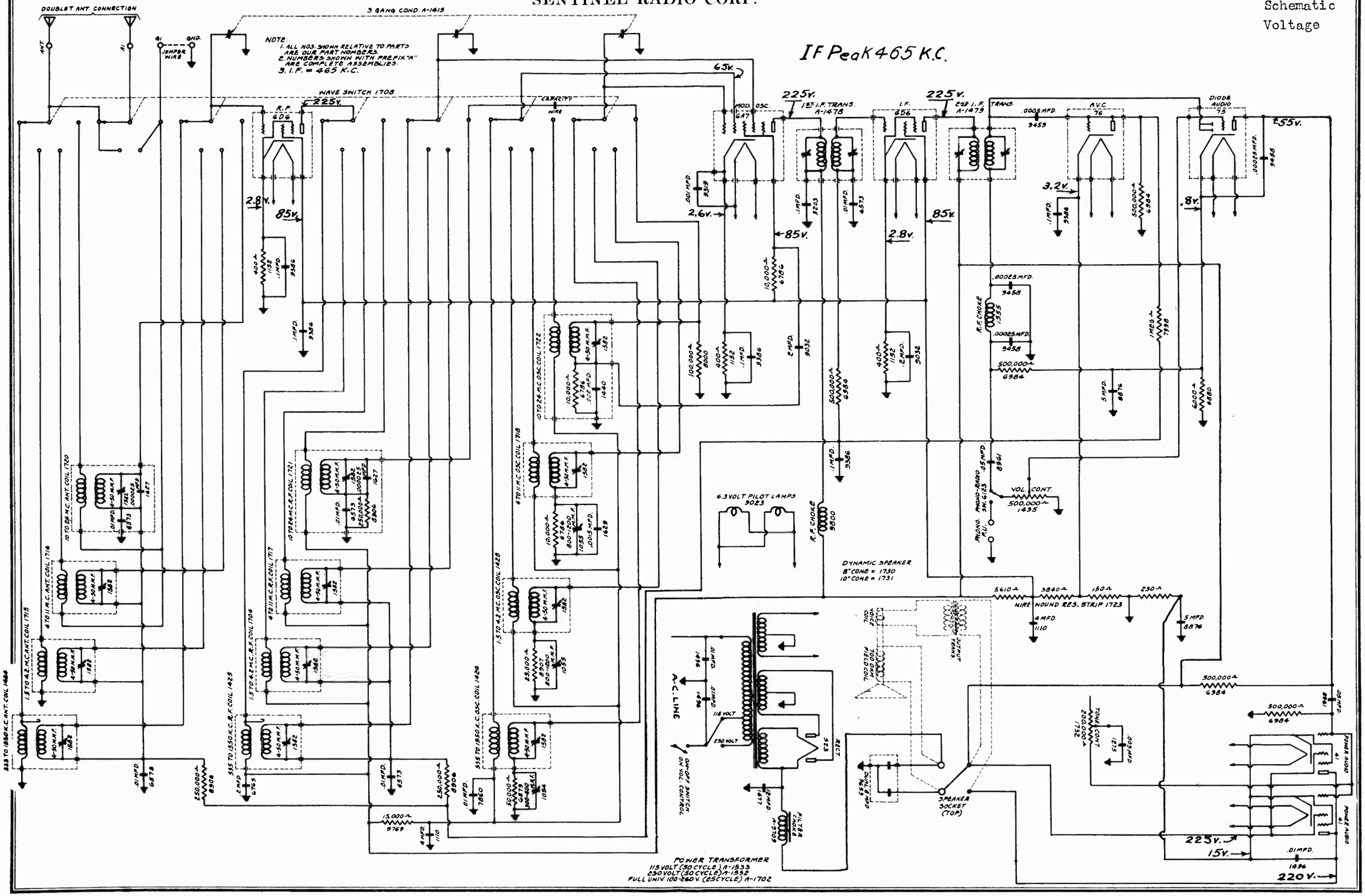
LEFT HAND SIDE VIEW OF BASE

TOP VIEW OF LEFT HAND (FRONT) CORNER OF BASE

VIEW SHOWING COIL ASSEMBLY ON INSIDE OF CHASSIS

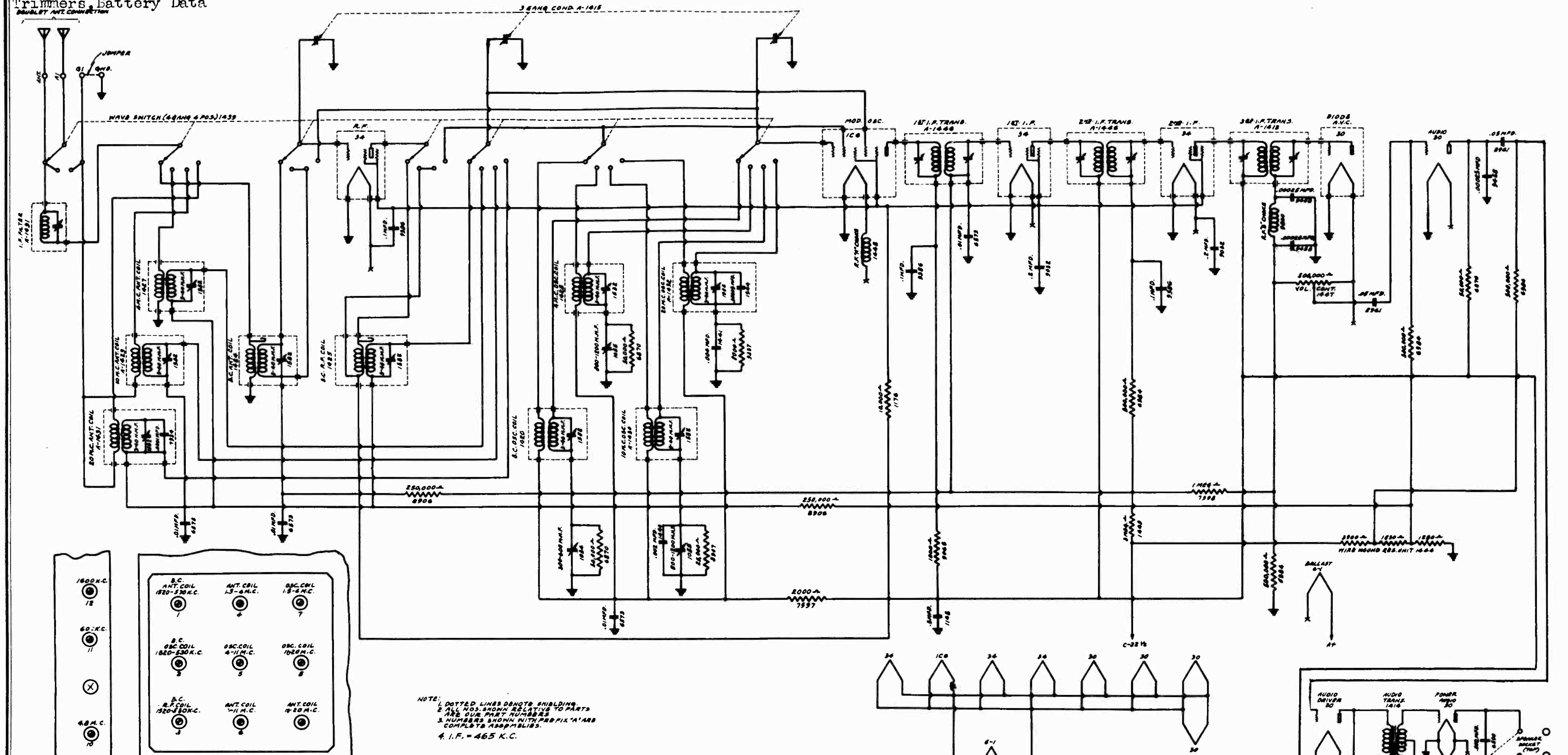
SENTINEL RADIO CORP.

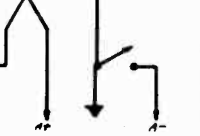
MODEL 8100B
Schematic
Voltage

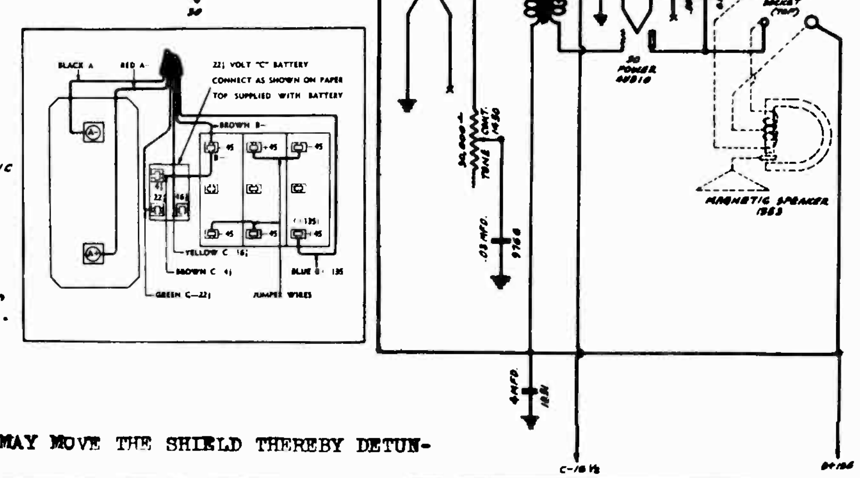


MODEL 9100
Schematic, Voltage
Trimmers, Battery Data

SENTINEL RADIO CORP.







VOLTAGE TABLE

"A" Battery - 3 Volt Dry Cell
"B" Battery - 3 45 Volt "B" Battery
"C" Battery - 1 22½ Volt "C" Battery

TUBE		FILAMENT	PLATE	SCREEN	GRID NO. 2	GRID NO. 3 & 5	CONTROL GRID
1C6	Oscillator & 1st Detector	1.9	135		135	75	3.5
34	Radio Freouency	1.9	135	75			
34	1st Intermediate Frequency	1.9	135	75			
34	2nd Intermediate Frequency	1.9	135	75			
30	2nd Detector & AVC	1.9					
30	1st Audio	1.9	60#				
30	Audio Driver	1.9	125				
30	Output	1.9	125				
30	Output	1.9	125				

(Total "A" Drain 600 M.A.)
(Total "B" Drain 23 M. A. with no signal)

IF Peak 465 K.C.

Comparative voltage only. Read all voltages from socket to chassis with 1,000 ohm per volt meter. When making voltage checks use batteries that deliver full voltage with the receiver turned on.

NOTE: NEVER LIFT THE RECEIVER BY GRASPING THE CATACOMB SHIELD, TO DO SO MAY MOVE THE SHIELD THEREBY DETUNING THE RECEIVER.

SENTINEL RADIO CORP.

INTERMEDIATE ALIGNMENT:

1. Connect the high side of the oscillator output to the control grid of the 1C6 tube, leaving the grid cap disconnected. Connect the ground side of the oscillator to the receiver ground post.

2. Set the test oscillator frequency to 465 kilocycles. (This must be accurate).

3. Align the first intermediate transformer by turning one of the trimmer screws up and down (increasing and decreasing capacity) until maximum reading is obtained on the output meter, after which adjust the other trimmer screw of the same transformer for maximum sensitivity.

4. Adjust the other intermediate transformers in the same manner.

TO ALIGN THE VARIABLE CONDENSER:

Adjustment of the trimmer condensers, located inside of and accessible through the holes found in the top of the catacomb (mounted on top and in the left hand front corner of the receiver) will be referred to by numbers as indicated on the circuit diagram showing the relative location of these trimmers.

1. Connect the high output side of the oscillator through a 250 mmfd. (.00025 Mfd.) to the receiver antenna post and the ground to the ground post.

2. Place the band selector switch for operation on the 1520 to 535 kilocycle band (broadcast), tune the receiver to exactly 1400 kilocycles on the dial and set the test oscillator frequency to exactly 1400 kilocycles. THEN BRING IN THE 1400 KILOCYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING TRIMMER MARKED No. 2 ON CATACOMB DIAGRAM, after which adjust No. 1 and No. 3 trimmers in the order named for maximum sensitivity.

3. Leave the band selector switch for operation on the broadcast band (1520-535 kilocycles) and tune the receiver and set the test oscillator to approximately 600 kilocycles. Then while rocking the condenser slightly to the right and left adjust the 600 kilocycle padding condenser No. 11, which is located on and accessible through the hole provided on the left hand side of the chassis, for maximum sensitivity.

4. Recheck the alignment at 1400 kilocycles as the 600 kilocycle adjustment may have changed the alignment at 1400 kilocycles.

5. Place the band selector switch for operation on the 1.5 to 4.2 megacycle band and set the test oscillator frequency and tune the receiver dial to EXACTLY 3.8 MEGACYCLES. THEN TUNE IN THIS 3.8 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING CATACOMB TRIMMER NO. 7. Next adjust catacomb trimmer No. 4 for maximum sensitivity.

6. With the band selector switch in the same position (1.5-4.2 megacycle band) tune the receiver dial and set the oscillator frequency to approximately 1600 kilocycles, and then while rocking the variable condenser slightly to the right and left adjust the 1600 kilocycle trimmer No. 12 located on the left hand side of the chassis for maximum sensitivity.

7. Recheck 3.8 megacycle adjustments.

8. Adjust the band selector switch for operation on the 4 to 11 megacycle band and tune the receiver dial and set the oscillator frequency to exactly 10.5 megacycles. When adjusting catacomb trimmer No. 5 two peaks (the fundamental and the image peak) will be noticed. CARE MUST BE TAKEN SO THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 10.5 MEGACYCLES. First back off catacomb trimmer No. 5 to minimum capacity, next screw down the trimmer (add capacity) until the first peak which is the fundamental and the one you areto use is tuned in. If the trimmer is screwed down beyond the point where this first peak is received the incorrect image peak will be tuned in. When the first peak has been located adjust catacomb trimmer No. 5 to BRING IN THE 10.5 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT. After completing this adjustment always check to see if the proper peak has been used. To do this leave the test oscillator frequency at 10.5 megacycles, increase its output, and tune the receiver dial to approximately 9.5 megacycles. Vary the receiver dial slightly to the right and left of 9.5 megacycles and if the fundamental peak was used in aligning at 10.5 megacycles the test oscillator signal will be heard at approximately 9.5 megacycles on set dial. If it is not possible to receive the signal then the fundamental peak was not used and the 10.5 megacycle adjustment of trimmer No. 5 must be gone over and properly adjusted. After correctly completing catacomb trimmer No. 5 adjustment adjust catacomb trimmer No. 6 for maximum sensitivity. Should two peaks be noticed with this trimmer always adjust trimmer No. 6 to the one that requires the most capacity.

9. With the band selector switch adjusted for operation on the same band (4-11 megacycles) set the test oscillator frequency and tune the receiver dial to approximately 4.8 megacycles. Then while rocking the variable condenser slightly to the right and left adjust the 4.8 megacycle trimmer No. 10, located on the left hand side of the chassis for maximum sensitivity.

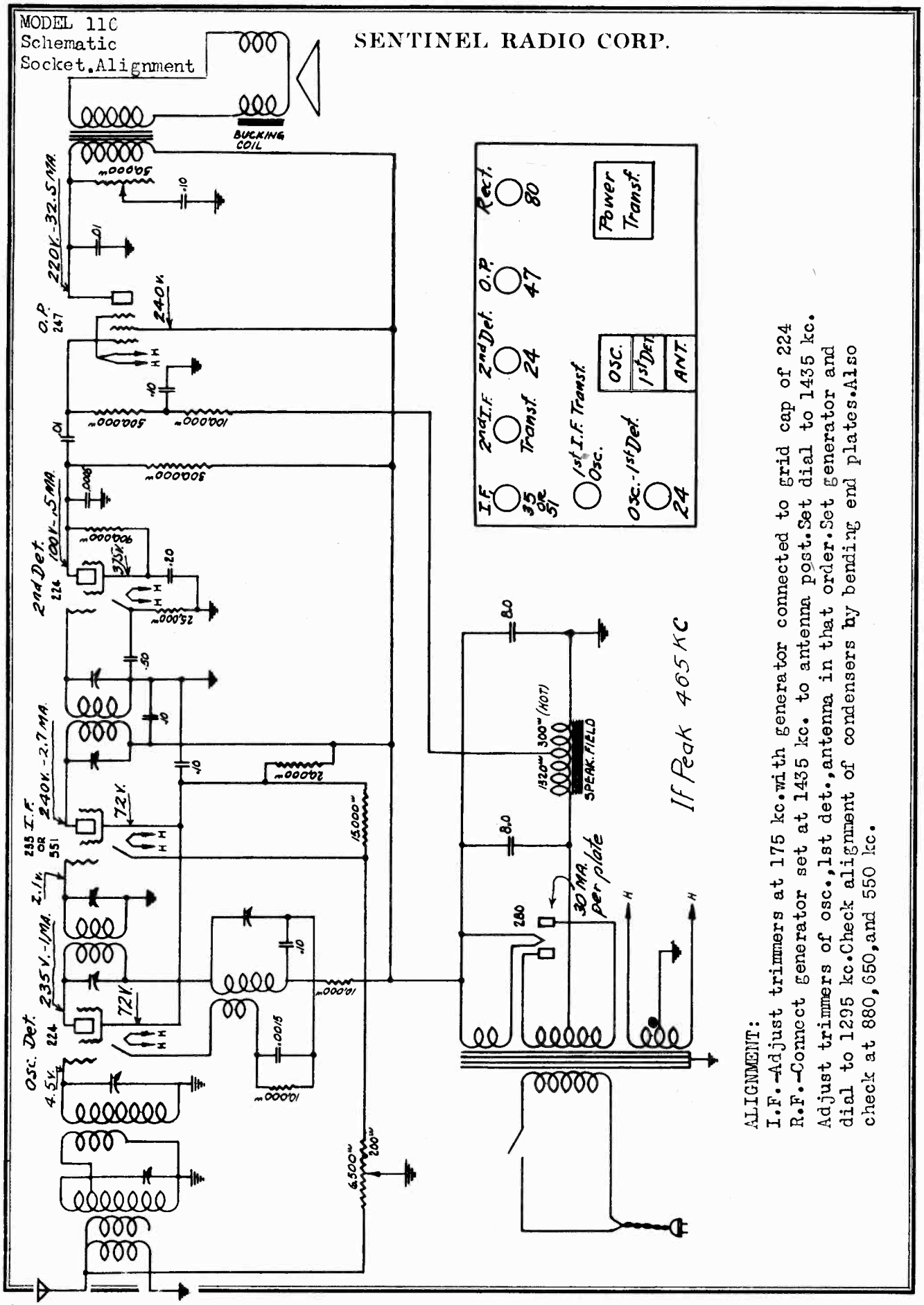
10. Recheck the 10.5 megacycle adjustment.

11. Adjust the band selector switch for operation on the 10 to 20 megacycle band, tune the receiver dial and set the oscillator frequency to exactly 19 megacycles. When adjusting catacomb trimmer No. 8 two peaks (the fundamental and the image peak) will be noticed. CARE MUST BE TAKEN SO THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 19 MEGACYCLES. First back off catacomb trimmer No. 8 to minimum capacity, next screw down the trimmer (add capacity) until the first peak which is the fundamental and the one you are to use is tuned in. If the trimmer is screwed down beyond the point where this first peak is received the incorrect image peak will be tuned in. When the first peak has been located adjust catacomb trimmer No. 8 to BRING IN THE 19 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT. After completing this adjustment always check to see if the proper peak has been used. To do this leave the test oscillator frequency at 19 megacycles, increase its output, and tune the receiver dial to approximately 18 megacycles. Vary the receiver dial slightly to the right and left of 18 megacycles and if the fundamental peak was used in aligning at 19 megacycles the test oscillator signal will be heard at approximately 18 megacycles on set dial. If it is not possible to receive the signal then the fundamental peak was used and the 19 megacycle adjustment of trimmer No. 8 must be gone over and properly adjusted. After correctly completing catacomb trimmer No. 8 adjustment adjust catacomb trimmer No. 9 for maximum sensitivity. Should two peaks be noticed with this trimmer always adjust trimmer No. 9 to the one that requires the most capacity.

12. Some code and aircraft signals are broadcast on a frequency exactly the same or near the IF frequency of the receiver. To eliminate interference from these signals a 465 kilocycle filter (mounted in the coil shield located underneath and towards the front of the chassis) is incorporated in the set. To adjust, set the oscillator frequency (with oscillator output connected to set antenna and ground) TO EXACTLY 465 KILOCYCLES, turn the receiver on end and adjust the trimmer located on and accessible through the top of the filter shield for MINIMUM 465 KILOCYCLE SIGNAL.

MODEL 11C
Schematic
Socket.Alignment

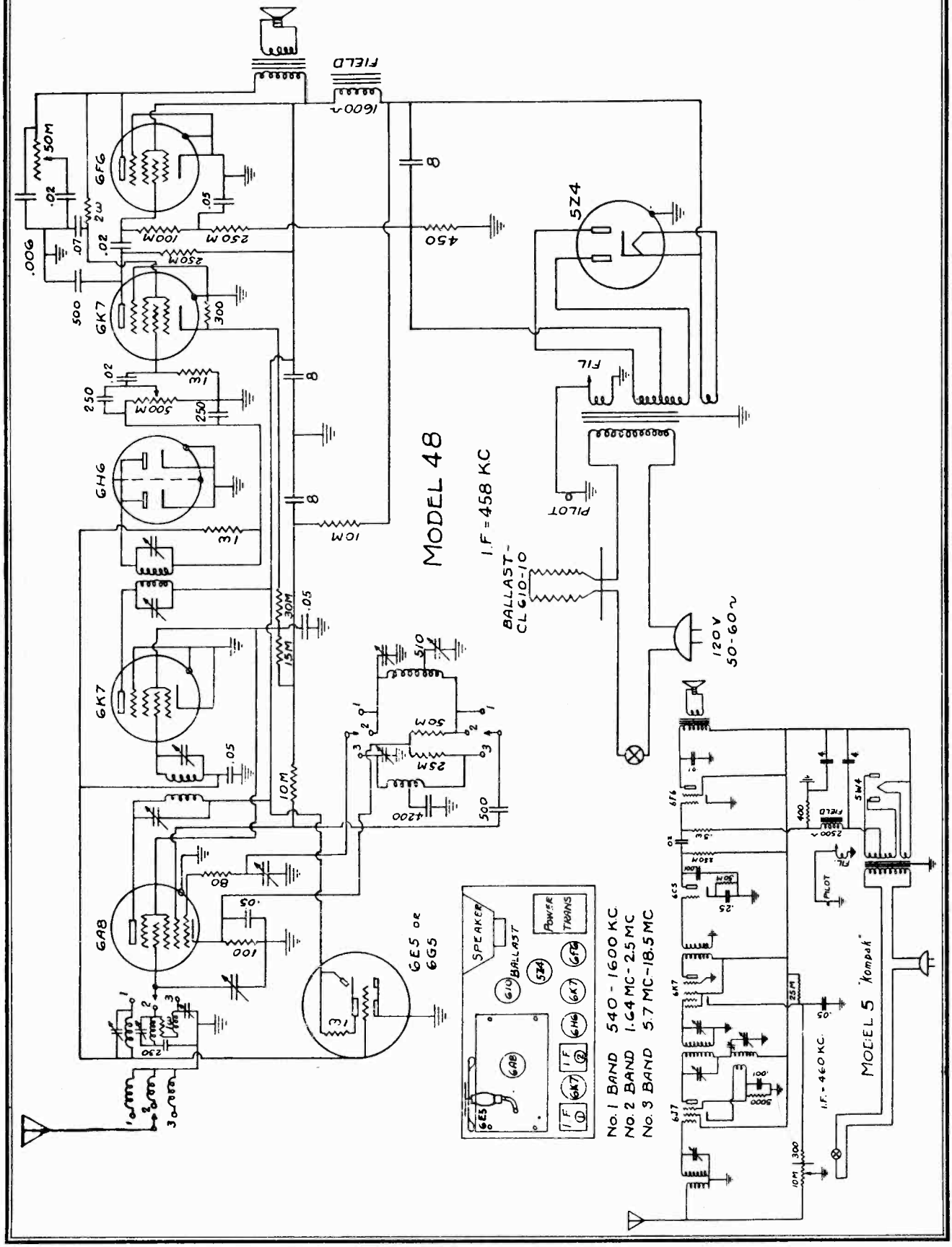
SENTINEL RADIO CORP.



ALIGNMENT:
I.F.—Adjust trimmers at 175 kc. with generator connected to grid cap of 224
R.F.—Connect generator set at 1435 kc. to antenna post. Set dial to 1435 kc.
Adjust trimmers of osc., 1st det., antenna in that order. Set generator and
dial to 1295 kc. Check alignment of condensers by bending end plates. Also
check at 880, 650, and 550 kc.

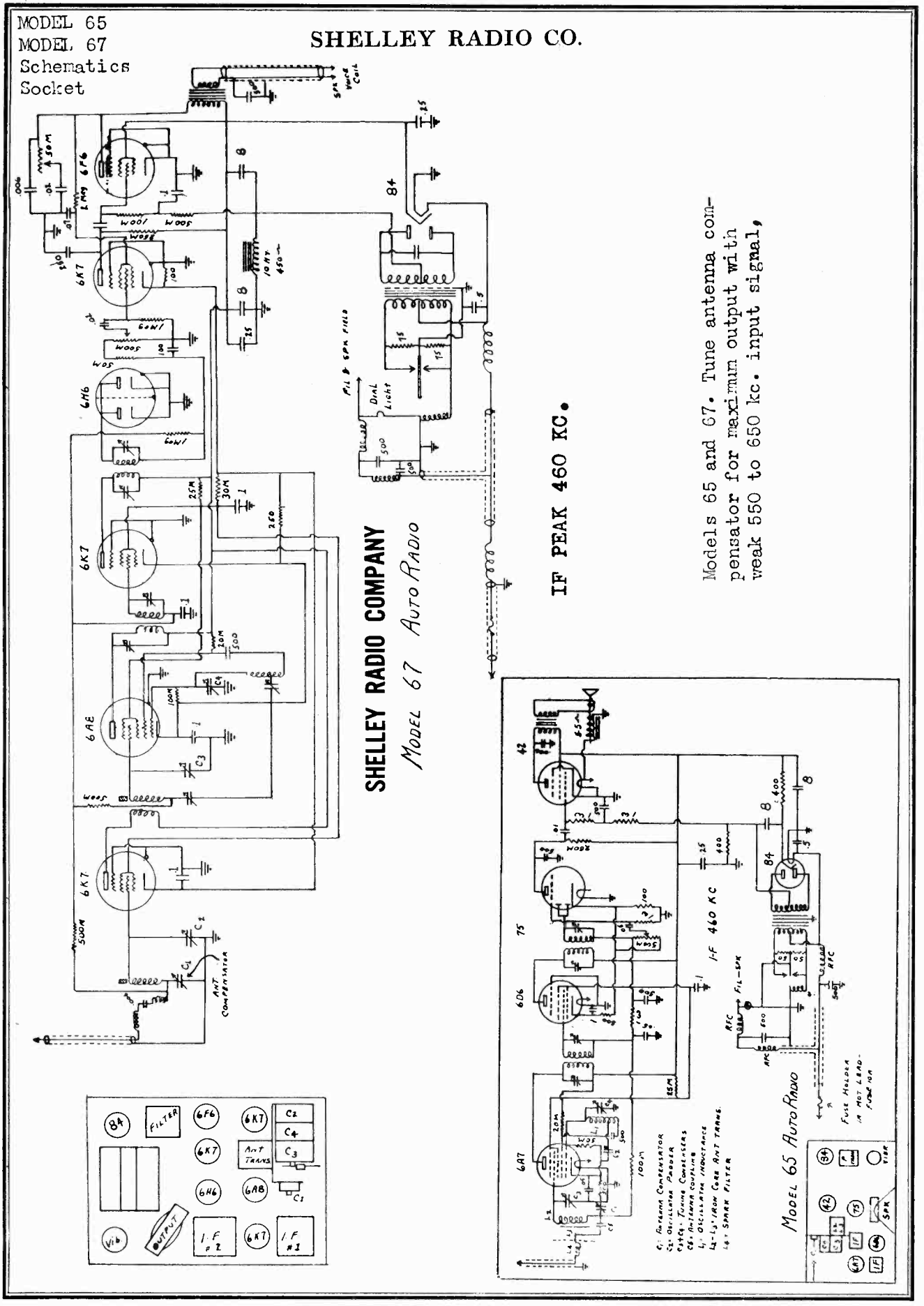
SHELLEY RADIO CO.

MODEL 5 Kompak
Schematic
MODEL 48
Schematic, Socket



MODEL 65
MODEL 67
Schematics
Socket

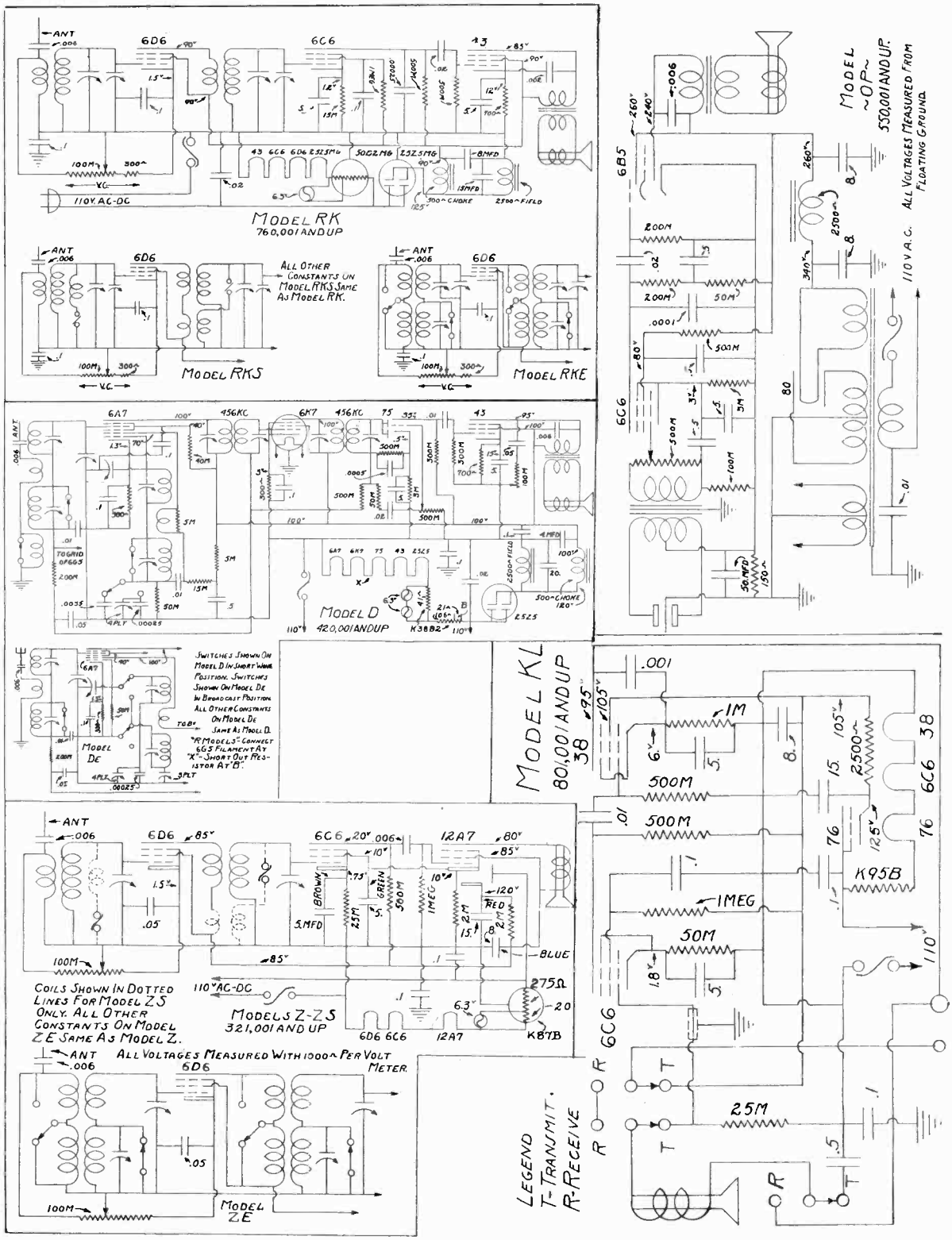
SHELLEY RADIO CO.



MODELS D, DE
MODEL KL
MODEL OP

SIMPLEX RADIO CO.

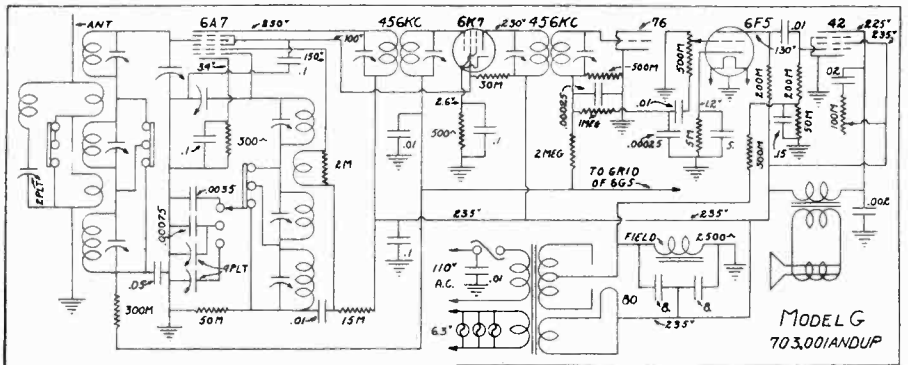
MODEL RK, RKE, RKS
MODELS Z, ZE
Schematics, Voltage

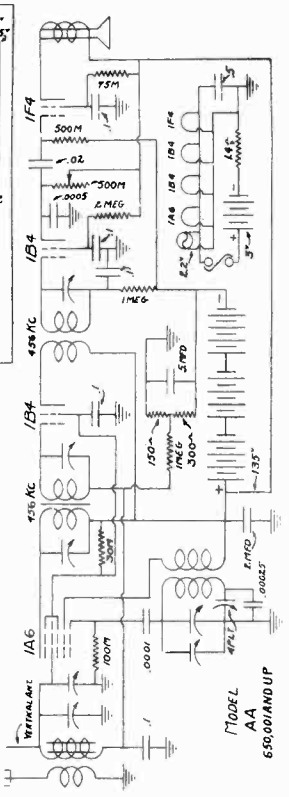


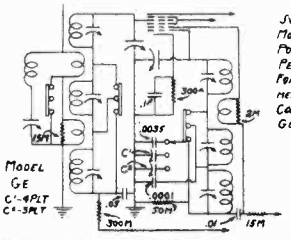
MODEL AA
MODELS G,GE
MODELS GB,GBE

SIMPLEX RADIO CO.

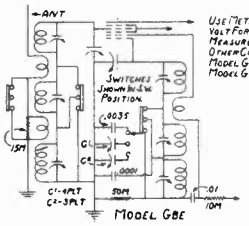
MODELS GH,GHE
MODEL Q
Schematics,Voltage



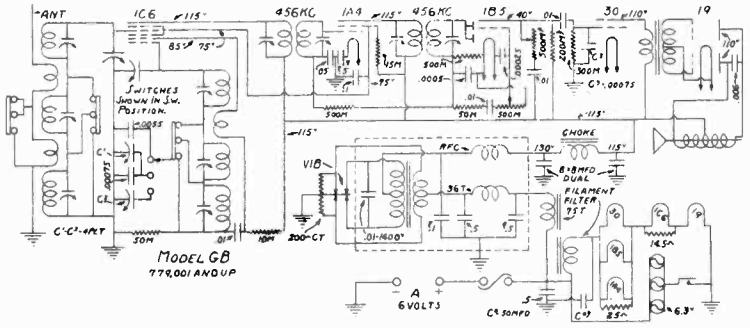


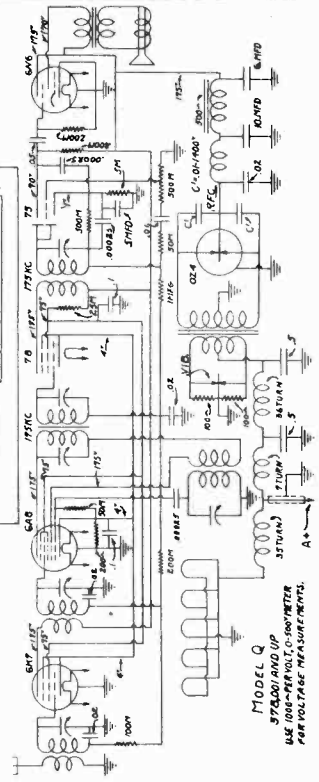


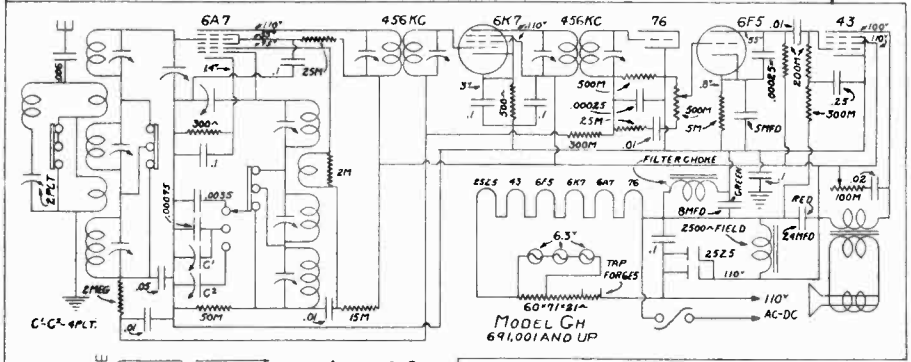
SWITCHES ON BOTH MODELS SHOWN IN SW. POSITION. USE 1000~ PER VOLT, 0-500~ METER FOR VOLTAGE MEASUREMENTS. ALL OTHER CONSTANTS ON MODEL GE SAME AS MODEL G.

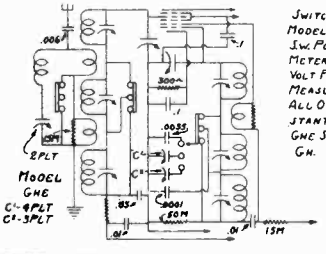


USE METER 1000~ PER VOLT FOR VOLTAGE MEASUREMENTS. ALL OTHER CONSTANTS ON MODEL GBE SAME AS MODEL GB.





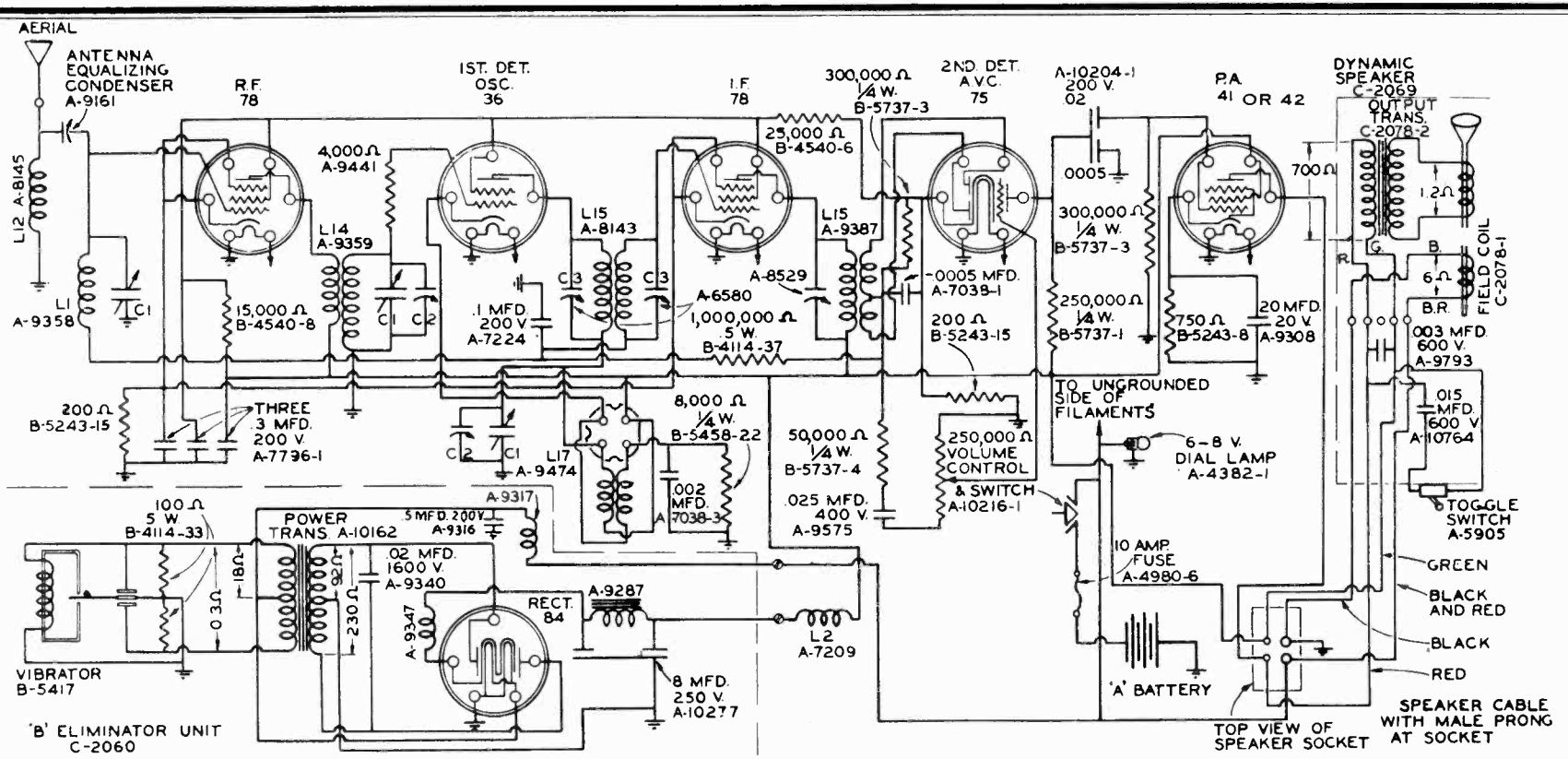




SWITCHES ON BOTH MODELS SHOWN IN SW. POSITION USE METER 1000~ PER VOLT FOR VOLTAGE MEASUREMENTS. ALL OTHER CONSTANTS ON MODEL GHE SAME AS MODEL GH.

MODELS 33A, 33B
Schematic, Voltage
Resistance

June 1, 1936



VOLTAGE ANALYSIS AND CONTINUITY CHART

C1 VARIABLE CONDENSER
C2 EQUALIZING CONDENSER
C3 ADJUSTING CONDENSER

L1 TUNING COIL
L2 CATHODE CHOKE COIL
L12 ANTENNA CHOKE COIL

L14 R.F. TRANSFORMER
L15 I.F. TRANSFORMER
L17 OSCILLATOR COIL

I.F. PEAK - 172.5 K.C.

Condition of "A" Battery—Good

Position of Volume Control—Full with Antenna Disconnected

Tube	Location	PLATE		Screen Grid Volts	Control Grid Volts	Grid Res. to Preced. Plate (Ohms)	RESISTANCE TO GROUND			
		Volts	Ma.				Plate	Screen	C. Grid	Cathode
78	R-F Stage	200	6.	100	—2.5	—	40,000	25,000	1,300,000	200
36	1st Det.-Osc.	200	1.5	100	—12.	44,000	40,000	25,000	4,000	8,000
78	I-F Stage	200	6.	100	—2.5	1,340,000	40,000	25,000	1,300,000	200
75	Diode Det.-AVC	0	0	—	—	—	300,000	—	—	200
	A-F Triode	200	1.	—	—1.2	290,000	290,000	—	250,000	
41*	Power Stage	185	18.	200	—16.0	590,000	40,000	40,000	300,000	750
84	Rectifier	250	25.	—	—	—	92	—	—	40,000

NOTES: Allow 15% + or — on all measurements. All heater voltages: 6.3. "A" battery drain: 6.0 amperes.
* Chassis may be equipped with Type 41 or Type 42 tube.

MODELS 33A,33B
MODEL 36
MODELS 71,71B

SPARKS WITHINGTON CO.

MODELS 72
Trimmers,Alignment

A. ALIGNMENT OF THE I.F. EQUALIZING CONDENSERS.

1. Connect the aerial terminal of the oscillator to the control grid terminal (terminal on top of tube) of the first detector-oscillator tube, and the ground terminal to the ground connection of the receiver, and set oscillator for 172.5 kilocycles. (MODELS 71, 71-B - 456 K.C.)

2. Turn the volume control on full.

3. Turn the attenuator or volume control on the oscillator to the position where the oscillator is heard faintly. If the oscillator is not heard at all, even with the control full on, the condensers of the stage requiring adjustment should be manipulated until it is heard at the loudest. The control should then be reduced so that only a faint sound from the oscillator is audible.

4. All intermediate frequency adjustable condensers should be adjusted if the adjustment of one is necessary. When adjustment of the stage that requires such has been made, the other stages should be adjusted in rotation. Each pair of condensers should be adjusted before proceeding to the next.

5. Correct alignment is obtained when reduction of the oscillator output and readjustment of the condensers is continued until maximum deflection of the output meter is obtained with a minimum of oscillator input. The numerical value of the deflection on the output meter scale is of no consequence, for the object is to set the output of the oscillator at a certain value and adjust the condenser until maximum deflection is obtained. If the meter goes off scale or does not give a large enough reading, adjust the oscillator accordingly.

6. It may be necessary to repeat the entire adjustment once or twice, to be sure the adjustments are correct.

B. ALIGNMENT OF THE R.F. AND OSCILLATOR EQUALIZING CONDENSERS.

1. Connect the oscillator to the antenna and ground connections of the receiver, tune the oscillator to a frequency between 1400 and 1500 kilocycles.

NOTE - ON MODEL 72-PQ (POLICE SET) TUNE OSCILLATOR TO THE DESIRED FREQUENCY AND TURN DIAL UNTIL SIGNAL IS HEARD.

2. Turn condenser gang until this signal is heard.

3. Adjust oscillator end R.F. trimmers for maximum output.

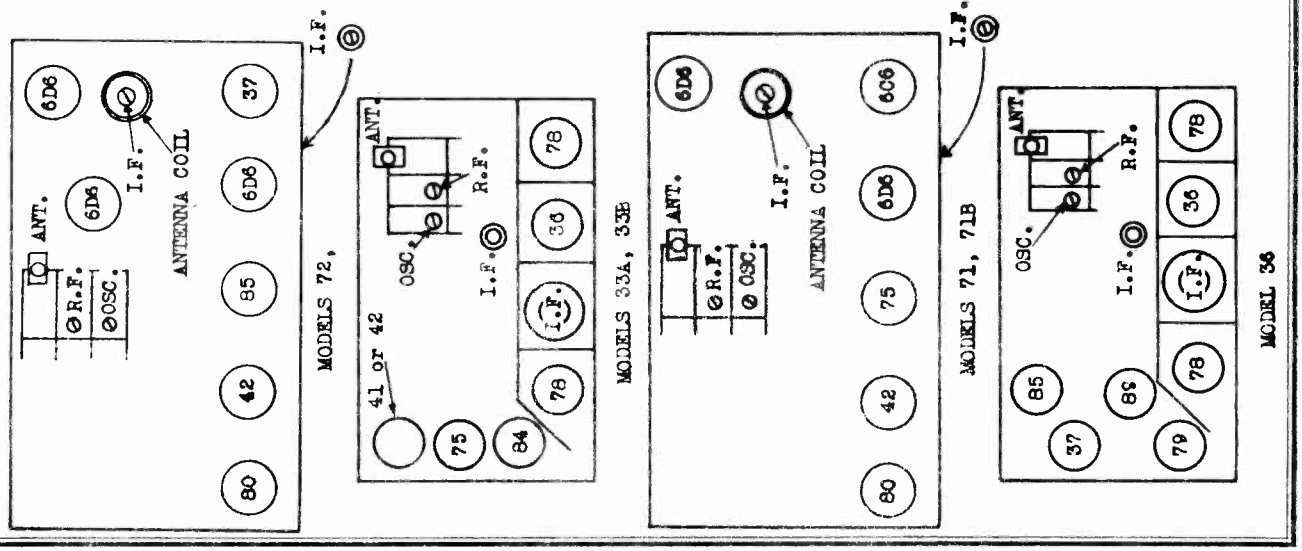
C. ALIGNMENT OF ANTENNA EQUALIZING CONDENSER.

The antenna equalizing condenser should always be adjusted when the receiver is installed and with the regular aerial and ground connected. It is the purpose of this condenser to resonate the first tuned circuit with the antenna system to which the receiver is connected, thereby providing a maximum transfer of energy. The procedure of adjustment is as follows:

1. Tune in a weak distant station or oscillator signal between 1300 and 1400 kilocycles, turn the volume control on full.

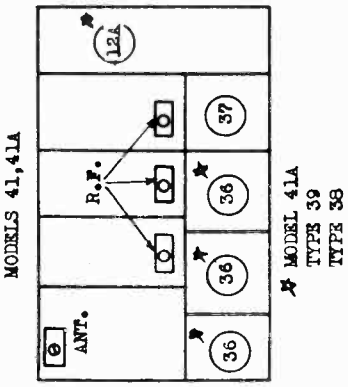
2. Turn the hex nut on the condenser or the screw in the condenser with an insulated handle screw driver to the position where the volume from the station "tuned-in" or the oscillator signal is the loudest. Once made, this adjustment need not be changed unless the antenna system is altered, the receiver is moved from one location to another, or the other condensers are re-adjusted.

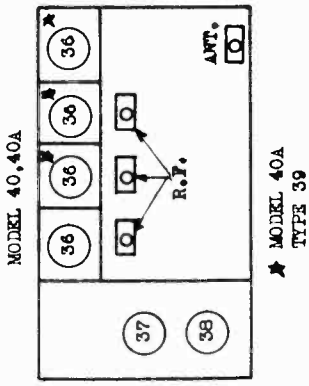
NOTE: When antenna equalizing condenser is adjusted on oscillator signal, adjustment will not hold true when receiver is connected to aerial; this condenser must be aligned to antenna system.

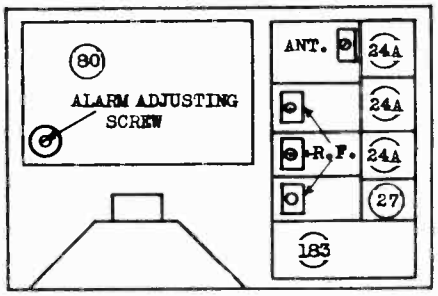


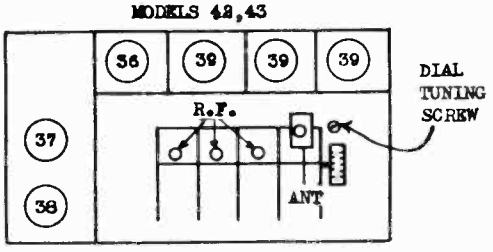
SPARKS WITHINGTON CO.

MODELS 40,40A
MODELS 41,41A,42,43
MODEL 55
Alignment,Trimmers









ALIGNMENT INSTRUCTIONS

MODELS 40,40A

1. Turn condenser gang to a dial setting between 1200 and 1400 kilocycles and turn volume control to full on position.

2. Connect oscillator to antenna terminal and adjust oscillator so that signal is heard at maximum volume.

3. Adjust R.F. trimmers for maximum signal response.

4. With the set installed and with antenna connected tune in a weak station between 1200 and 1400 kilocycles with volume control on full position.

5. Adjust antenna trimmer for maximum signal response.

MODEL 55

The procedure of adjustment is as follows: When a broadcast is being received, retard the volume control to a point where the signal is just audible and then adjust the R.F. and antenna equalizing condensers for maximum signal response. This adjustment should always be made when the Radio Receiving Set is installed and once made the adjustment should not be changed, unless the antenna system is altered, or the receiving set moved from one location to another.

ALARM CIRCUIT RELAY CONTROL

With the receiving set in operation and a broadcast being received, the Alarm Circuit should be adjusted so it will indicate when a broadcast is to be made. This adjustment is made by turning the slotted shaft visible through the small opening in the forward left hand corner of the power converter unit, to a position where static and interference will not operate the alarm, but the broadcast signal will give the proper indication.

If the Interference is particularly bad, the bell may be replaced by a .45 ampere 2.5, or six volt miniature lamp. This will eliminate any annoyance caused by tinkling of the bell.

While the light may glow at intervals from static impulses, the actual broadcast will be indicated by a steady illumination. When the signal-switch control knob is turned to the signal position the volume control is automatically disconnected, thus regardless of the position of the Volume Control, the alarm is always ready to operate at maximum volume.

MODELS 41, 41A, 42, 43

With the cover on the receiving unit turn the dial with a screw driver by means of the slotted shaft, to the frequency of the station to be received. Retard the volume control to a point where the station is just audible, then carefully retune the dial to the point where the station is heard the loudest. Again retard the volume control to a point where the station is just audible, then using a small wooden or insulated handle screw driver, turn the screw in the antenna compensating condenser to the right or the left until the maximum amount of volume has been obtained. Then again retard the volume control and with a hex-socket insulated adjusting wrench, adjust each R.F. equalizing condenser to a point where the volume from the station is the loudest.

This adjustment should always be made when the receiver is installed, and should not be changed unless the antenna system is altered, the receiver is moved from one location to another, or a different station is "tuned in". In each case the adjustment must then be repeated.

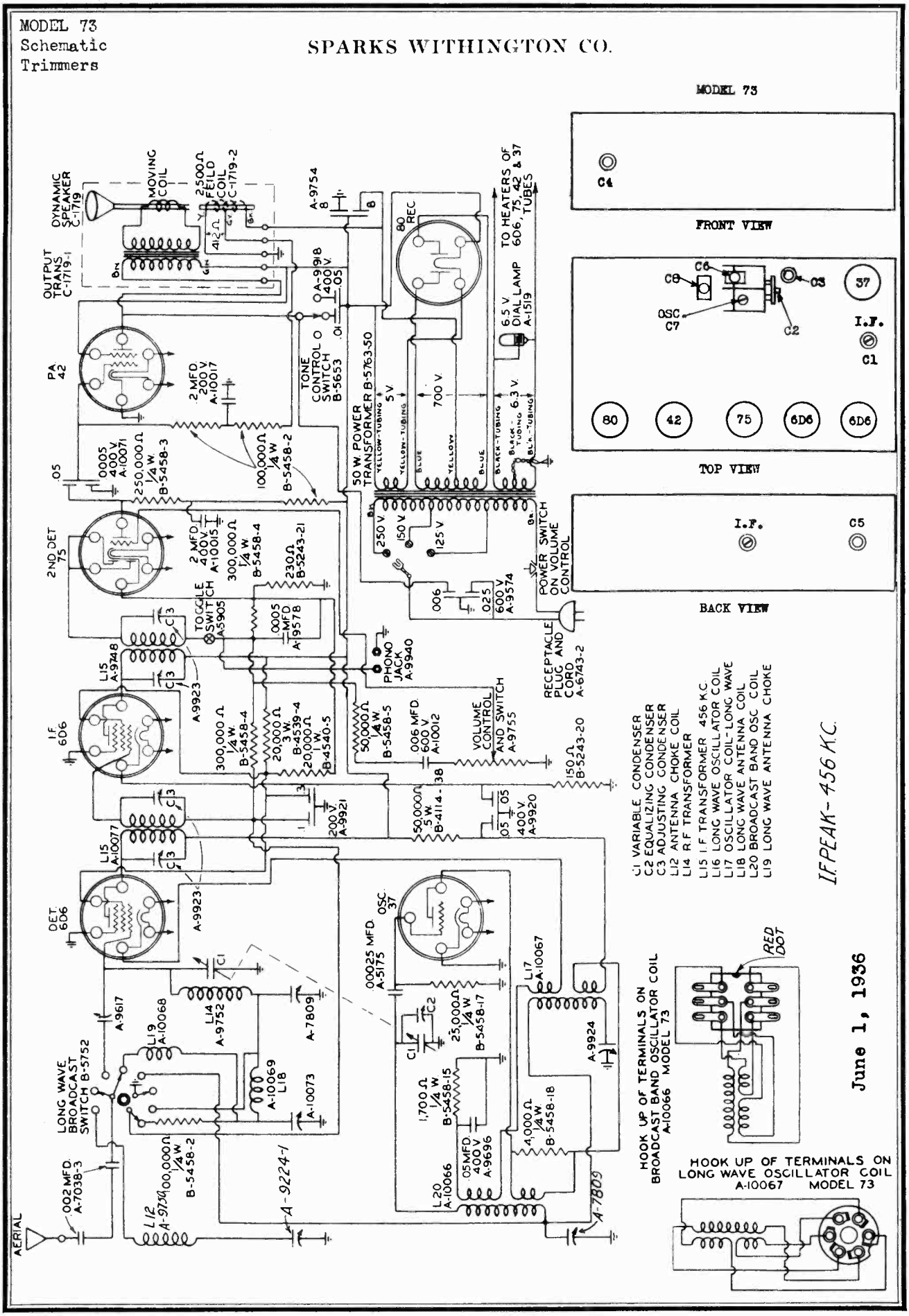
A more accurate adjustment of the compensating and equalizing condensers can be made by using a voltmeter as an indicator.

To do this proceed as follows:

Connect a 1,000 ohm per volt, 0-50 scale D.C. voltmeter from the cathode of the detector tube to the ground (plus of meter to cathode, minus to ground). Correct adjustment of the condenser is then obtained when the indicating needle on the voltmeter deflects to a maximum position.

MODEL 73
Schematic
Trimmers

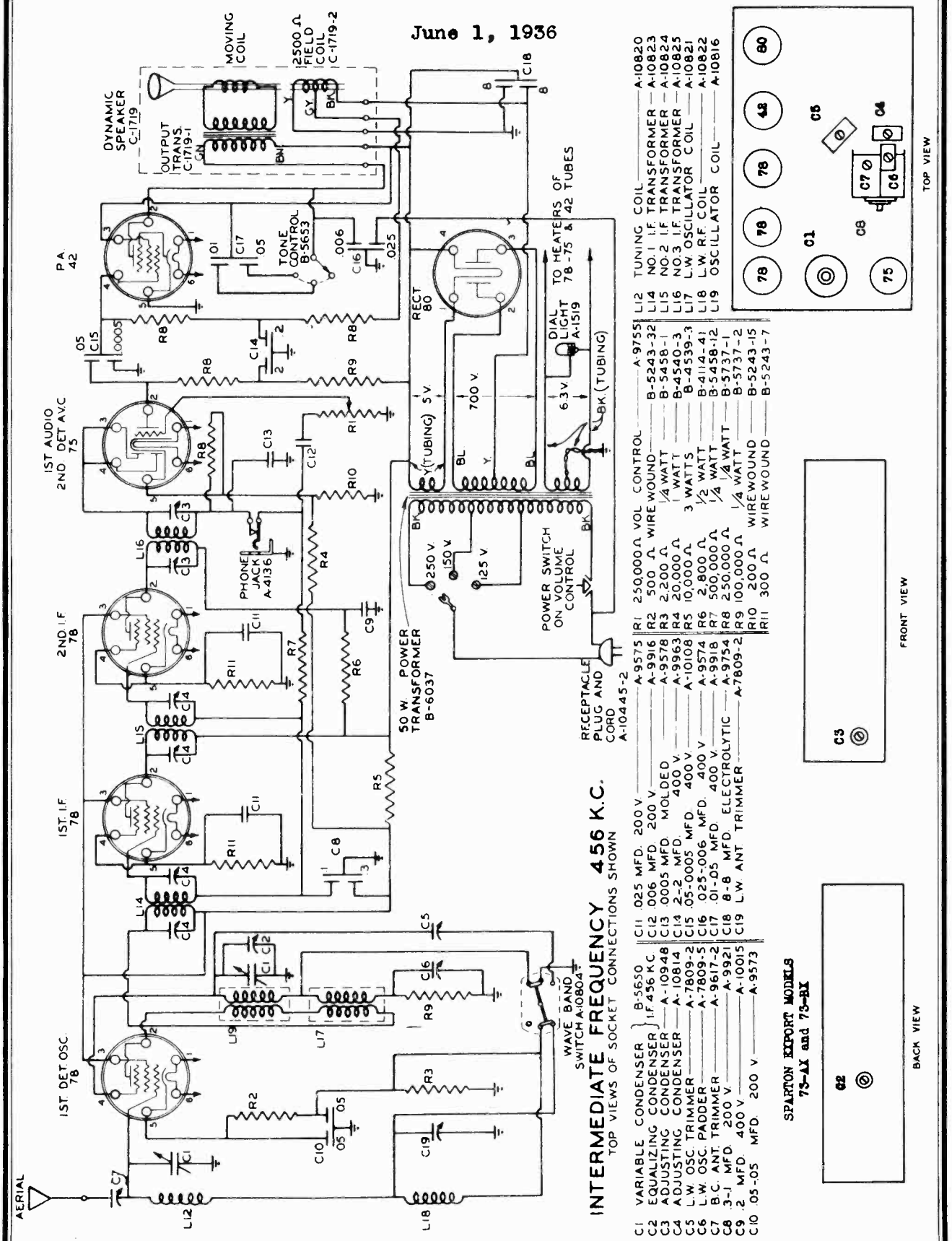
SPARKS WITHINGTON CO.



SPARKS WITHINGTON CO.

MODELS 73AX, 73BX
Schematic
Trimmers, Parts

June 1, 1936



SPARTON MODELS 73-AX, 73-BX.

Due to the fact that the ear cannot distinguish small changes in sound intensity, an output meter is essential to the proper adjustment of the various condensers.

Unless otherwise specified, the adjusting of any condenser consists of turning the adjusting screw or nut to the right or left until the output meter registers the greatest deflection.

1. STEP BY STEP PROCEDURE FOR COMPLETE ALIGNMENT OF MODELS.

NOTE: For proper alignment of these chassis the procedure should be followed in the same order as given.

A. ALIGNMENT OF INTERMEDIATE-FREQUENCY STAGES.

(1) Turn on receiver and test oscillator, and allow both to operate several minutes before attempting to align any condensers.

(2) Connect "antenna" of test oscillator to grid cap of Type 78 first detector-oscillator tube and "ground" of test oscillator to chassis frame of receiver.

(3) Turn the band selector switch to the "broadcast" position and adjust the tone control completely to the left so that the "brilliant" tone is obtained.

(4) Adjust condenser C_4 (see Fig.) so that the adjusting nut is screwed all the way down and then turned back one-quarter turn.

(5) Adjust condenser C_5 so that the nut is turned about one-half way down.

(6) The dial pointer should point to the last line on the scale past 550 meters when the variable condenser rotor plates are completely meshed with the stator plates. If the dial pointer reads incorrectly it may be reset by first loosening the set-screws on the hub of the dial scale, holding the rotor plates fully in mesh and moving the dial scale until the last line on the scale past 550 meters is opposite the pointer on the escutcheon.

(7) Turn the condenser rotor plates all the way out and with the test oscillator adjusted for generating a signal of 456 kilocycles (657.9 meters) adjust condensers C_1, C_2, and C_3.

B. ALIGNMENT OF BROADCAST BAND AND LONG-WAVE BAND.

(1) Disconnect "antenna" lead of test oscillator from grid cap of first detector-oscillator tube and connect to the antenna terminal of the chassis.

(2) Tune the test oscillator and receiver to a wave-length of 200 meters (1500 kilocycles) and adjust condensers C_6 and C_7.

CAUTION: Extreme care should be taken in the preceding step so that the condensers are not adjusted to any other signal except the 200 meter wave-length of the signal generator or test oscillator.

(3) Turn the band selector switch to the "long-wave" position.

(4) Tune the test oscillator and receiver to 1,000 meters (300 kilocycles) and adjust condenser C_4.

(5) Adjust condenser C_8 (mounted on the side of the variable condensers) for maximum deflection of the output meter with the test oscillator adjusted for 1,000 meters.

(6) Tune the test oscillator and receiver to 1740 meters (172.5 kilocycles) and adjust condenser C_5 for maximum deflection of the output meter regardless of the dial setting.

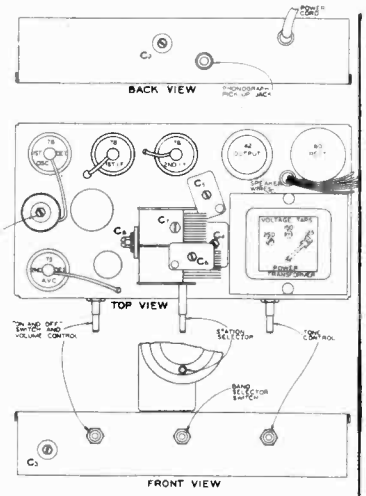
(7) Repeat steps 5 and 6 until the adjustment of condenser C_5 does not affect the adjustment made in Step 5 (1,000 meters).

(8) Tune test oscillator and receiver for a wave length of 2,000 meters (150 kilocycles) and check for operation of the receiver.

(9) Turn band selector switch back to "broadcast" position and tune test oscillator and receiver to 500 meters (600 kilocycles) and readjust condenser C_1 for maximum deflection of the output meter.

(10) Tune test oscillator and receiver to 200 meters (1500 kilocycles) and check for calibration and operation of the receiver. Repeat this procedure at 333 meters (900 kilocycles) and 500 meters (600 kilocycles.)

NOTE: Slight readjustments of the condenser C_8 will be required after the receiver is connected to the antenna with which it is to be used. This condenser should be adjusted by tuning in a weak distant station between 200 and 250 meters, and adjusting the condenser to a point of maximum volume. Once adjusted, it need not be changed unless the antenna system is altered. This adjustment ideally matches the receiver to operate on any antenna.



VOLTAGE-RESISTANCE CHART

Line Voltage — 117 Volts
Voltage Tap — 125 Volts
Position of Volume Control — Full with Antenna Disconnected
Position of Band Selector Switch — Broadcast

Tube	Function	Measurement	Voltage and Resistance of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram) Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Grid Cap
78	1st Detector-Oscillator	Volts	2.7	220	100	5.2	5.2	2.7	0
		Ohms	0	20,000	20,000	0	2,500	0	2,000
78	1st I-F Amplifier	Volts	2.7	100	100	.0	18	2.7	13
		Ohms	0	20,000	20,000	500	500	0	750,000
78	2nd I-F Amplifier	Volts	2.7	240	100	2.8	2.8	2.7	0
		Ohms	0	20,000	20,000	500	500	0	750,000
75	2nd Det.-A. V. C	Volts	2.7	85	*	*	1	2.7	0
		Ohms	0	500,000	250,000	250,000	200	0	500,000
42	Power Amplifier	Volts	2.7	235	240	*	0	2.7	—
		Ohms	0	20,000	20,000	500,000	0	0	—
80	Rectifier	Volts	240	130	130	240	—	—	—
		Ohms	2,500	2,500	2,500	2,500	—	—	—

NOTES: Voltage and resistance readings are for schematic diagram shown. Allow 15% + or — on all measurements. Always use meter which will give greatest deflection within scale limits. All measurements made with Weston Selective Analyzer No. 665, Type 1.
*Cannot be measured with Weston No. 665, Type 1.

SPARTON MODEL 73

The use of quality test equipment is highly recommended, and a good test oscillator becomes a virtual necessity when aligning the all-wave or short-wave type of receiver. Due to the fact that the ear cannot distinguish small changes in sound intensity, an output meter is essential to the proper adjustment of the various condensers.

Unless otherwise specified, the adjusting of any condenser consists of turning the adjusting screw or nut to the right or left until the output meter registers the greatest deflection.

1. EQUIPMENT REQUIRED.

A. Modulated test oscillator (crystal controlled or accurately calibrated) capable of generating signals with wave lengths from 200 to 2000 meters (100 to 1500 kilocycles).

NOTE: The above range is approximately that of the SPARTON Export Model 73. A good test oscillator or miniature signal generator is capable of generating signals from 12 to 3000 meters (100 to 25,000 kilocycles).

B. Output meter.

C. Sparton Part A-8737 and A-9631 adjusting wrenches.

2. STEP BY STEP PROCEDURE FOR COMPLETE ALIGNMENT OF MODELS.

IMPORTANT: An outdoor antenna fifty feet in length including lead-in and twenty-five to fifty feet in height will give good results. A longer aerial may be used to some advantage if not in the locality of a powerful local station. The yellow wire is the antenna terminal, and should be connected to the antenna lead-in wire. The joint should be taped so as to prevent grounding to the chassis body. Should an aerial of fifty feet or longer be used, the red and black lead adjacent to the antenna lead should be tied to the black or ground lead. With a short aerial, this red and black lead may be neglected. To determine the necessity of it, tune in some distant station about 500 meters in wave length and see if the connecting of this lead to ground improves the signal strength.

NOTE: For proper alignment of this chassis the procedure should be followed in the same order as given.

A. ALIGNMENT OF INTERMEDIATE-FREQUENCY STAGES.

(1) Turn on receiver and test oscillator, and allow both to operate several minutes before attempting to align any condensers.

(2) Connect "antenna" of test oscillator to grid cap of Type 6D6 first detector tube and "ground" of test oscillator to chassis frame of receiver.

NOTE: It is advisable to read carefully the operating instructions included with the test oscillator.

(3) Turn the band selector switch to the "broadcast" position and adjust the tone control completely to the left so that the "brilliant" tone is obtained. Connect the black lead and the black and red tracer lead to chassis.

(4) Adjust condenser C_4 so that the adjusting nut is screwed all the way down and then turned back one-quarter turn.

(5) Adjust condenser C_5 so that the nut is turned about one-half way down.

(6) The dial pointer should point to the last line on the scale past 550 meters when the variable condenser rotor plates are completely meshed with the stator plates. If the dial pointer reads incorrectly it may be reset by first loosening the set-screws on the hub of the dial scale, holding the rotor plates fully in mesh and moving the dial scale until the last line on the scale past 550 meters is opposite the pointer on the escutcheon.

(7) Turn the condenser rotor plates all the way out and with the test oscillator adjusted for generating a signal of 456 kilocycles (657.8 meters) adjust I.F. trimmers for maximum output.

B. ADJUSTING 456 KC REJECTOR CIRCUIT.

(1) Connect oscillator antenna lead to yellow wire (antenna) of set and ground of oscillator to chassis.

(2) Tune test oscillator to 456 KC.

(3) With volume control on full position adjust wave trap condenser C_2 for minimum output.

(1) Disconnect "antenna" lead of test oscillator from grid cap of first detector tube and connect to the antenna terminal of the chassis.

(2) Tune the test oscillator and receiver to a wave-length of 200 meters (1500 kilocycles) and adjust condensers C_6 and C_7.

CAUTION: Extreme care should be taken in the preceding step so that the condensers are not adjusted to any other signal except the 200 meter wave-length of the signal generator or test oscillator.

(3) Turn the band selector switch to the "long wave" position.

(4) Tune the test oscillator and receiver to 1,000 meters (300 kilocycles) and adjust condenser C_4.

(5) Adjust condenser C_8 and C_4 for maximum deflection of the output meter with the test oscillator adjusted for 1,000 meters.

(6) Tune the test oscillator and receiver to 1740 meters (172.5 kilocycles) and adjust condenser C_5 for maximum deflection of the output meter regardless of the dial setting.

(7) Repeat steps 5 and 6 until the adjustment of condenser C_5 does not affect the adjustment made in Step 5 (1,000 meters).

(8) Tune test oscillator and receiver for a wave length of 2,000 meters (150 kilocycles) and check for operation of the receiver.

(9) Turn band selector switch back to "broadcast" position and tune test oscillator and receiver to 500 meters (600 kilocycles) and readjust condenser C_1 for maximum deflection of the output meter.

(10) Tune test oscillator and receiver to 200 meters (1500 kilocycles) and check for calibration and operation of the receiver. Repeat this procedure at 333 meters (900 kilocycles) and 500 meters (600 kilocycles).

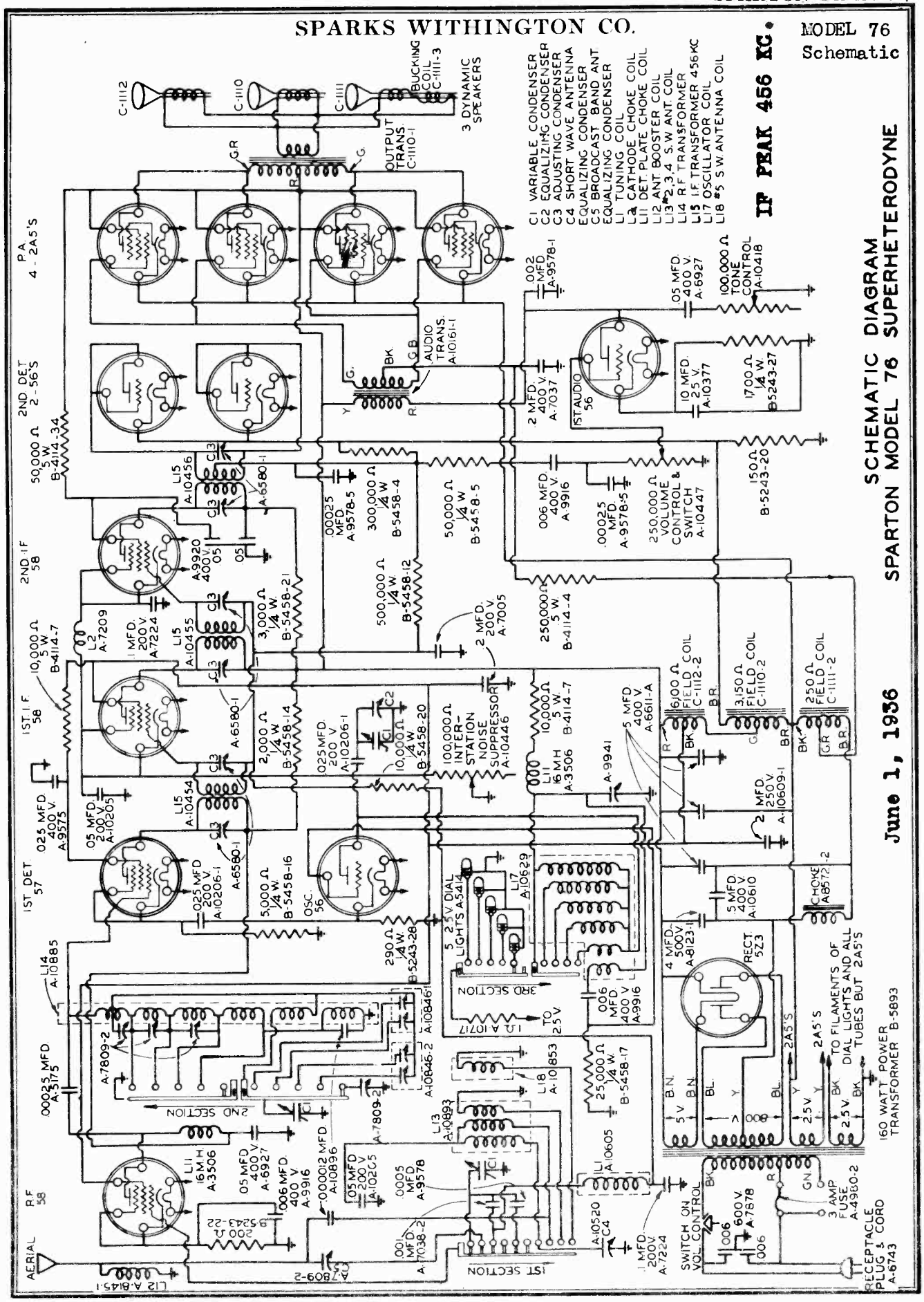
NOTE: Slight readjustments of the condenser C_8 will be required after the receiver is connected to the antenna with which it is to be used. This condenser should be adjusted by tuning in a weak distant station between 200 and 250 meters, and adjusting the condenser to a point of maximum volume. Once adjusted, it need not be changed unless the antenna system is altered. This adjustment ideally matches the receiver to operate on any antenna.

VOLTAGE ANALYSIS AND CONTINUITY CHART

Line Voltage 115
Position of Voltage Compensator—125
Position of Volume Control—Full with Antenna Disconnected
Position of Band Selector Switch—Broadcast

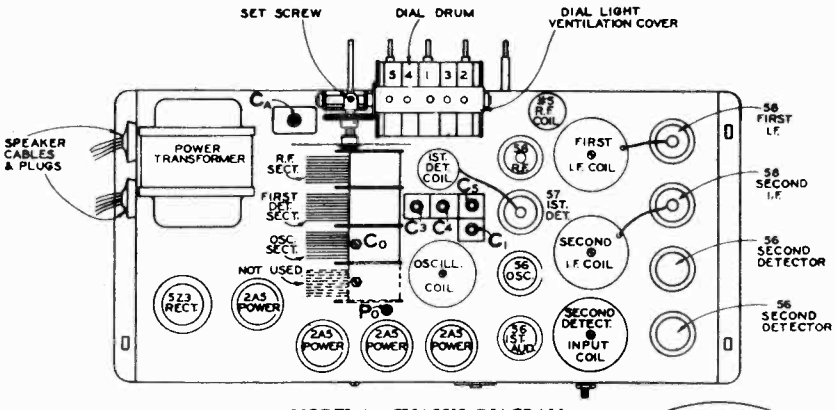
Tube	Location	PLATE Volts	PLATE Ma.	Screen Grid Volts	Control Grid Volts	Grid Res. to Preced. Plate (Ohms)	RESISTANCE TO GROUND (OHMS) Plate	Screen	C. Grid	Cathode
6D6	1st Det.	240	3.5	90	—6.5	—	40,000	20,000	600,000	1,700
37	Osc. Stage	90	3.	—	—	—	90,000	—	25,000	0
6D6	I-F Stage	240	8.	90	—1.5	640,000	40,000	20,000	600,000	150
75	Diode Det.-A.V.C.	—	—	—	—	—	300,000	—	—	230
	Triode A-F	75	0.5	—	—1.0	—	390,000	—	250 000	
42	Power Stage	235	20.	240	—20.*	590,000	40,000	40,000	200,000	0
80	Rectifier	340**	25†	—	—	—	—	—	—	—

NOTES Allow 15% + or — on all measurements
All heater voltages 6.3, except 80 Rectifier 5.0 volts.
* Actual. About —12. volts as read on Jewell 444 Analyzer.
** Filament to negative of field.
† Per plate

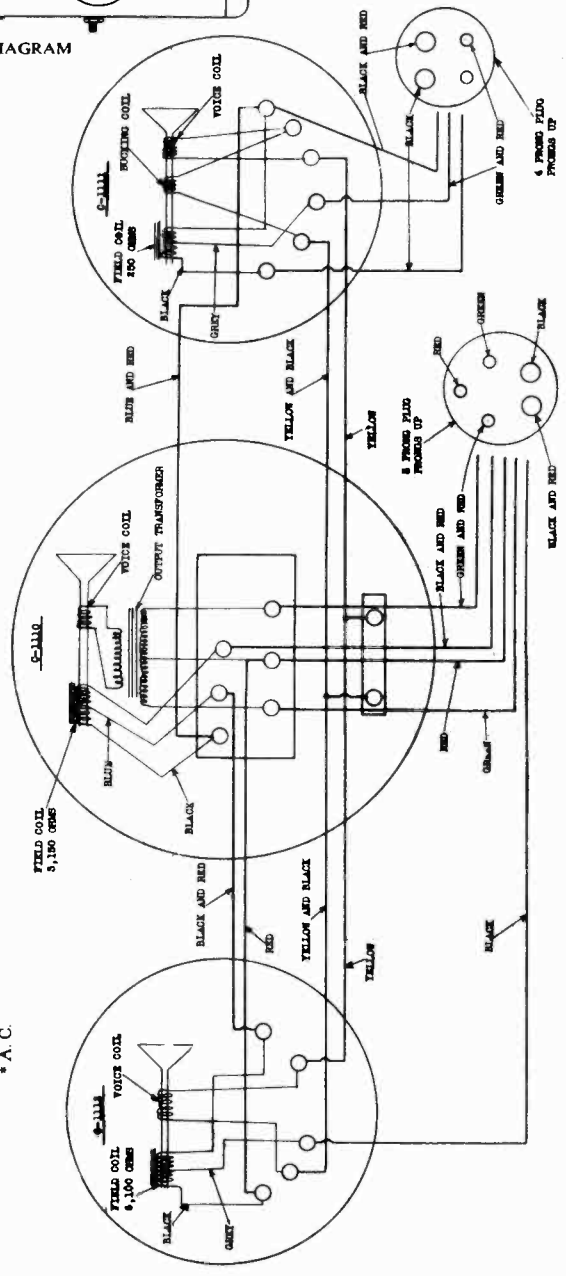


MODEL 76
Voltage, Resistance
Socket, Trimmers
Speaker Wiring

SPARKS WITHINGTON CO.



MODEL 76 CHASSIS DIAGRAM
(Top View)



VOLTAGE ANALYSIS AND CONTINUITY CHART

Line Voltage 115 — Position of Volume Control—Full with Antenna Disconnected
Position of Voltage Compensator 115-130 — Position of Band Selector Switch—Broadcast
Position of Inter-Station Noise Suppressor—Full — Position of Tone Control—Full

Tube	Location	PLATE		Scfen Grid Volts	Control Grid Volts	RESISTANCE TO GROUND (OHMS)			
		Volts	Ma.			Plate	Screen	C. Grid	Cathode
58	R-F Stage	150	2.9	76.	—	10,000	5,600	1,000,000	200
57	1st Detector	145	.8	64.	—5.0	10,000	15,000	2	5,000
56	Oscilator	90	6.5	—	—17.5	17,500	—	25,000	300
58	1st I-F Stage	165	2.6	95.	—	8,000	5,500	1,000,000	14
58	2nd I-F Stage	155	2.6	100.	—	11,000	57,500	1,000,000	20
56	2nd Det.-A.V.C.	—	—	—	—	250,000	—	250,000	150
56	2nd Det.-A.V.C.	—	—	—	—	250,000	—	250,000	150
56	1st A-F Stage	150	4.7	—	—	9,500	—	350,000	1,700
2A5	Power Stage	270	25.0	285.	—20.	8,000	7,500	275,000	3,200
2A5	Power Stage	270	25.0	285.	—20.	8,000	7,500	275,000	3,200
2A5	Power Stage	270	25.0	285.	—20.	8,000	7,500	275,000	3,200
2A5	Power Stage	270	25.0	285.	—20.	8,000	7,500	275,000	3,200
5Z3	Rectifier	430*	83.0	—	—	3,600	—	—	7,500

NOTES: Allow 15% + or — on all measurements.
All heater voltages: 2.5, except 5Z3 Rectifier: 5.0 volts.
All measurements made with Weston Selective Analyzer No. 665, Type 1.
* A.C.

SPARKS WITHINGTON CO.

MODELS 85X,105X,105XS,766XP
766XS,1166XP,1166XS
1176XP,1176XS
Phonograph Data,Part 1

FOREWORD.

The automatic record changer in the SPARTON Models 85-X and 105-X is carefully built and assembled, and will operate satisfactorily without attention other than the oiling of the motor. This bulletin describes the mechanism and will assist in making any minor adjustments.

1. OPERATING INSTRUCTIONS.

The "On and Off" switch (see Paragraph 5) must be turned "on" as for radio reception. Allow about 30 seconds for tubes to heat up.

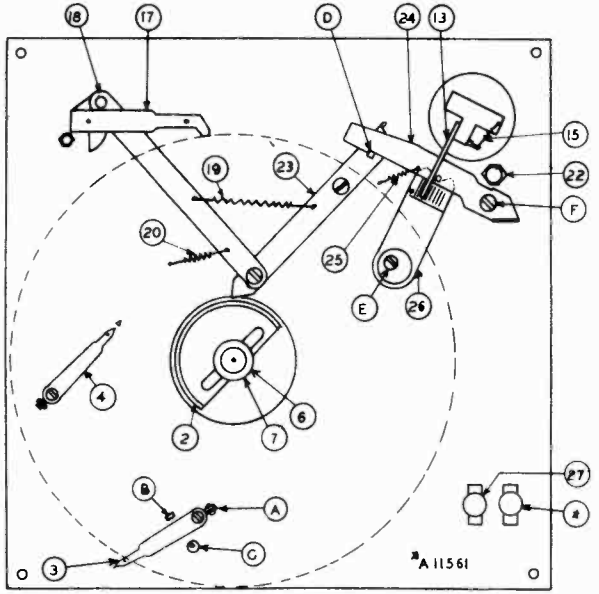
The toggle switch at the extreme right of the turntable is a master switch and must be snapped to the "on" position (away from the operator) for playing records and to the "off" position (towards operator) for operating the radio receiver.

Swing the tone arm and pickup to the right and lift it to the catch where it will remain clear from the turntable. If 10-inch records are to be played, move the thumb stop (on the right-hand side of the tone arm) back towards the tone arm pivot. If 12-inch records are to be played, move this stop forward.

Place one to eight records on the turntable.

Insert needle in pick-up and tighten firmly by means of the clamping screw in the end of the pick-up.

Snap the toggle switch at the left of the master switch to the "on" position (away from the operator). This starts the motor and turntable. CAUTION: Be sure the speed-change lever, located at the edge of the turntable at the front left-hand corner points to the No. 78.



JUNE 1, 1936 FIG-1

Start the pick-up needle in the first groove of the record. Adjust the radio volume control for satisfactory volume. NOTE: If it is desired to increase or decrease the record speed slightly, remove the turntable by lifting straight up and shift the lever located directly to the left of the turntable shaft to the letter "F" for increased speed and to the letter "S" for slower speed.

10-inch records will be rejected automatically. To reject 12-inch records when they have finished playing, or to reject either 10-inch or 12-inch records at any time in order to play the next record below, pull the reject lever forward. This lever is located on the base plate just below the thumb stop of the tone arm.

Any record may be repeated indefinitely by lifting the throw-off arm (located at the back left-hand corner) to an upright position.

The last record on the turntable is not rejected and will continue to repeat as long as the switches are left in the "on" position. CAUTION: Use only a good grade of needle and do not play them more times than recommended by the needle manufacturer. Satisfactory results are seldom obtained with scratched, worn-out, or warped records

To play the large slow-speed records of the transcription type, the speed change lever must be moved to the No. 33-1/3. The lever automatically changes the speed of the turntable from 78 r.p.m.

CAUTION: Use only the special needles designed for playing 33-1/3 r.p.m. records. The speed change lever must be moved back to the "78" position for playing the regular 10-inch and 12-inch records.

2. MOTOR AND SPEED REGULATOR MECHANISM.

The Motor installed in this Record Changer is governor-controlled with all gearing enclosed and leaves the factory lubricated for proper operation under ordinary weather conditions for considerable time.

The main bearings of the motor are fed with lubricating oil by means of wicks which are completely installed.

The governor disc engages with a complete ring of hard felt which is impregnated with lubricating solution sufficient for proper operation for approximately a year under normal weather conditions; however, if the motor has a tendency to "chatter" or "waver", a drop or two of very light lubricating oil should be placed on this felt ring.

Motor Speed. - To adjust the speed at 78.26 r.p.m., the speed adjustment lever (Figure 1, No. 5) should be set above the legend "78" as marked on the base plate, the speed being adjusted by means of a speed regulator lever (Figure 1, No. 4) which is mounted under the turntable and is indicated for direction of swing to fast or slow by the legends "F" and "S" on the base plate.

Speed Lever Adjustment. - To adjust the speed adjustment lever for 33-1/3 r.p.m., remove the turntable and loosen the screw (A) which fastens the lever on to the motor shaft which protrudes through the base plate, and which is provided with a screw driver slot in the top. Turn the shaft to the stop in a clockwise direction, which places the motor in 33-1/3 r.p.m. position. Then set the change lever against the lug (B) and opposite the 33-1/3 legend on the base plate, and tighten the clamp screw (A). Then loosen the screw which holds the eccentric bushing stop (C) and allow the lever to be swung to its farthest position in 78 r.p.m. Then turn the eccentric bushing around until it touches the side of the long lever and tighten the screw which holds the eccentric.

3. TRIP MECHANISM.

Care should be taken that the Notch (D) Figure 1, fits properly and latches when the latch bar (No. 23) over-travels against the latch spring (No. 25). This spring should have sufficient tension so that when the trip unlatches, the lift lever (No. 24) from the square pin, the point of the latch bar (No. 23) is properly swung in front of the operating cam (No. 2). A re-setting spring (No. 20) and a trip spring (No.19) both have loops on the ends to take care of the over-travel of the moving parts in re-setting the latch.

When latched, the engaging notch should be engaged approximately one-half its depth which is adjusted by means of the eccentric washer and lock screw (E). Care should be taken that these parts work freely in order that the mechanism will re-latch when the change cycle is completed.

The Record Changer is adjusted at the factory to trip on an eccentric trip groove record when the phonograph needle is 1-3/4" from the edge of the hole in the center. The eccentric trip is effected by means of the hardened steel pin pressed into the end of the tone arm lift crank (No. 15) riding on the serrated block located on the trip lever (No. 26). Care should be taken that there is a minimum of 1/32" clearance between the end of the pin and the block with a short phonograph needle in the pick-up and riding on top of one record on the turntable.

The oval head pivot screw (F) which serves as a pivot at the rear of the lift lever (No. 24) should be set at such a height to allow

the lift lever to be raised by the latch bar (No. 8) and the roller to pass under the end of the lever without binding but without additional play.

4. RECORD REJECT MECHANISM.

The Record Changer is intended to be operated without removing the first (bottom) record on the turntable in order to prevent the phonograph needle from damaging the covering on the turntable.

The height of the assembly should be so adjusted that the turntable with one record on it measures ONE INCH FROM THE BASE PLATE TO THE TOP OF THE FIRST RECORD.

The screw shown at (G) Figure 2, allows the adjustment to be made so that the unloading finger will separate the second record from the first or, in other words, barely rises over the top edge of the first record in removing the second record.

Care should be taken that this assembly works freely and that no binding occurs in pivots or bearings, and that in normal playing position the unloading arm assembly rests on the stop screw.

Care should be taken that the distance between the edge of the unloading finger (H) at the point at which it engages with the record and the unloading lever (I) is 3/32 inch.

FIGURE 3.

Lift Adjustment. - To adjust the lift of the unloading lever, the latch bar should be placed in a position at its farthest throw against the face of the cam mounted on the turntable spindle.

Place a record between the unloading finger ball on the underside of the unloading lever (I). In this position the record should clear the turntable spindle. This adjustment is made by means of the eccentric stud which is rotated to adjust the proper height and locked by means of a nut on the underside of the base plate at (J).

5. TONE ARM MECHANISM.

To Adjust Lift of Tone Arm. - To adjust for proper lift of the tone arm, rotate the motor to the position with the latch bar against the cam face with the tone arm lifted. In this position, and with the tone arm stopped against the hub of the dash pot at No. 4, the point of the phonograph needle should be suspended 1-3/4 inches from the top of the base plate. This adjustment is made at the factory but, if for any reason the lift lever (Figure 1, No. 24) becomes bent, it should be raised at the point where the lift crank roller rests in above-described position until this dimension is obtained.

To adjust for the proper lowering of the tone arm on the edge of the 10-inch record, a 10-inch record should be placed on the turntable and the screw (shown at "K") is provided for adjusting the tone arm in or out until the needle lowers approximately 3/32 of an inch from the edge of the record.

FIGURE 4.

In order to set the tone arm pivot bearing to take up the vertical play, two Jam nuts (shown at "L") are provided on the pivot sleeve in the bottom of the tone arm base as a means for taking up the play and also for locking in permanent position.

6. DASH POT MECHANISM.

The dash pot, located at the right and in front of the tone arm, is provided to allow the tone arm to come down slowly as shown in Figure 4.

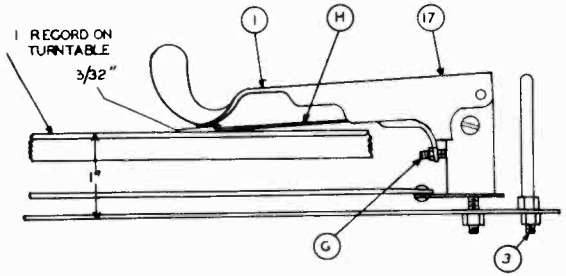


FIG. 2

With the tone arm of the Record Changer in the position as described under the tone arm adjustments, the dash pot should be adjusted for height by loosening the nut on top of the base plate as shown at (N), and should be raised or lowered until the tip of the dash pot shaft merely touches the lift shelf as shown at (O) WHILE IN 10-INCH RECORD-PLAYING POSITION.

IF TONE ARM FAILS TO TRIP WHEN A SPIRAL TYPE RECORD IS FINISHED PLAYING, check the latch mechanism (Figure 1, D) for depth of notch adjustment and determine whether the trip mechanism is binding anywhere; also check the pressure of springs (Figure 1, No. 19 and No. 20). Check the distance of the phonograph needle to the turntable spindle to make sure that the latch is disengaged at 1-3/4 inches. This may also be caused by a worn needle, worn record or a record without a trip groove.

IF TONE ARM FAILS TO TRIP AT THE END OF PLAYING AN ECCENTRIC GROOVE RECORD (VICTOR TYPE), check the lift crank assembly (Figure 3, No. 13) and determine whether it glides across the top of the cerrated block (Figure 3, M). Be sure that there is sufficient clearance between the end of the pin in the lift crank which should be approximately 1/32 inch with a short phonograph needle in the pick-up, resting on the top of one record on the turntable.

The pressure of the needle on the cerrated block as shown at Figure 3, M, is controlled by the pressure spring (Figure 3, No. 15), care being taken that this pressure is sufficient without binding to hold in the notches when the cerrated groove rocks the tone arm.

IF TONE ARM FAILS TO LOWER PROPERLY ON THE RECORD, it may be caused by the dash pot's being improperly adjusted for height, resulting in the tone arm's bouncing against the dash pot cap. This can be readily eliminated as explained in adjustments for the dash pot (Figure 4).

IF TONE ARM LOWERS TOO SLOWLY, it may be caused by the leather binding in the cylinder of the dash pot due to too much oil or the leather being expanded too tightly against the cylinder. Remove the leather and remove the surplus oil. The mechanism should allow the tone arm to "float" down slowly.

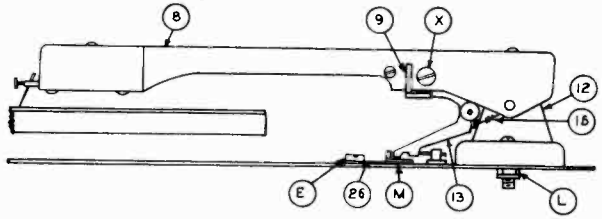


FIG. 3

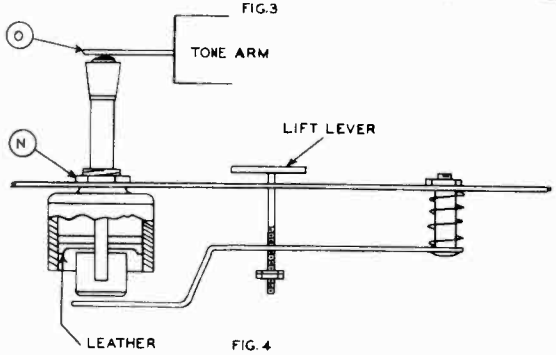
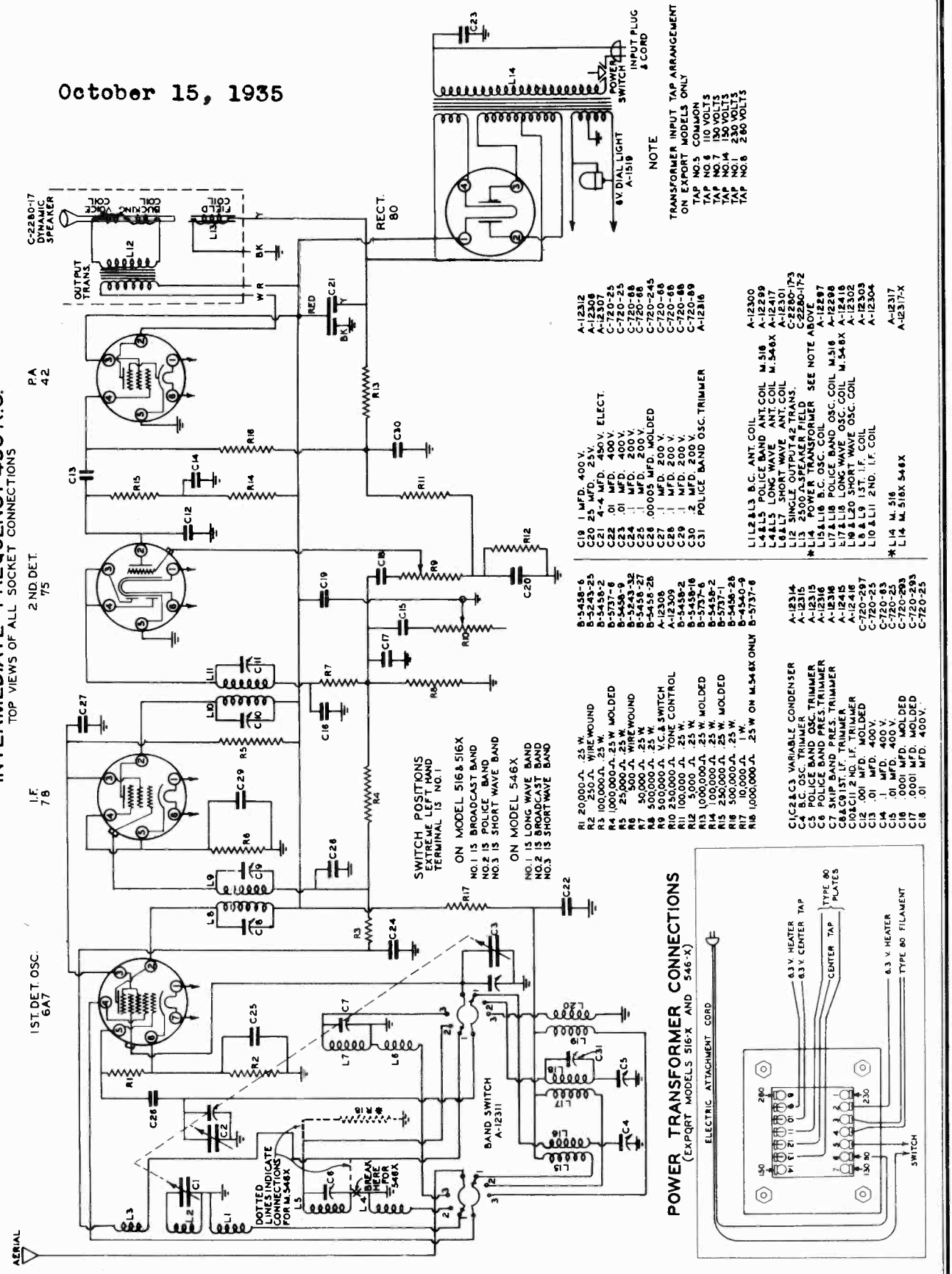


FIG. 4

SPARKS WITHINGTON CO.

MODELS 516, 516X, 546X
Schematic, Parts
Transformer

October 15, 1935



C19 1 MFD. 400 V.	A-12312	
C20 25 MFD. 25 V.	A-12308	
C21 4-4 MFD. 450 V. ELECT.	A-12307	
C22 .01 MFD. 400 V.	C-720-25	
C23 .01 MFD. 400 V.	C-720-25	
C24 .1 MFD. 200 V.	C-720-66	
C25 .00005 MFD. MOLDED	C-720-245	
C27 .1 MFD. 200 V.	C-720-66	
C28 .1 MFD. 200 V.	C-720-66	
C29 .2 MFD. 200 V.	C-720-89	
C30 POLICE BAND OSC. TRIMMER	A-12316	

L1 L2 & L3 B.C. ANT. COIL		A-12300
L4 & L5 POLICE BAND ANT. COIL M.516		A-12299
L4 & L5 LONG WAVE ANT. COIL M.546X		A-12417
L6 & L7 SHORT WAVE ANT. COIL		A-12301
L12 SINGLE OUTPUT 42 TRANS.		C-2280-173
L13 2300 Ω SPEAKER FIELD		C-2280-172
*L14 POWER TRANSFORMER SEE NOTE ABOVE		A-12297
L15 & L16 B.C. OSC. COIL		A-12298
L17 & L18 POLICE BAND OSC. COIL M.516		A-12298
L17 & L18 LONG WAVE OSC. COIL M.546X		A-12418
L19 & L20 SHORT WAVE OSC. COIL		A-12302
L9 & L9 1ST. I.F. COIL		A-12303
L10 & L11 2ND. I.F. COIL		A-12304
*L14 M. 516		A-12317
L14 M. 516X 546X		A-12317-X

R1 20,000 Ω .25 W.	B-5458-6	
R2 250 Ω WIREWOUND	B-5243-25	
R3 100,000 Ω .25 W.	B-5458-2	
R4 1,000,000 Ω .25 W. MOLDED	B-5737-6	
R5 25,000 Ω .25 W. WIREWOUND	B-5458-9	
R6 500 Ω WIREWOUND	B-5243-32	
R7 50,000 Ω .25 W.	B-5458-27	
R8 500,000 Ω .25 C.A. SWITCH	B-5458-28	
R9 500,000 Ω TONE CONTROL	A-12309	
R10 250,000 Ω .25 W.	B-5458-2	
R11 100,000 Ω .25 W.	B-5458-16	
R12 1,000,000 Ω .25 W. MOLDED	B-5737-6	
R13 1,000,000 Ω .25 W. MOLDED	B-5458-2	
R14 1,000,000 Ω .25 W. MOLDED	B-5737-1	
R15 250,000 Ω .25 W. MOLDED	B-5458-28	
R16 500,000 Ω .25 W.	B-4540-9	
R17 10,000 Ω 1 W.	B-5737-6	
R18 1,000,000 Ω .25 W ON M.546X ONLY		

C1, C2 & C3 VARIABLE CONDENSER	A-12314	
C4 B.C. OSC. TRIMMER	A-12315	
C5 POLICE BAND OSC. TRIMMER	A-12315	
C6 POLICE BAND PRES. TRIMMER	A-12316	
C7 SKIP BAND PRES. TRIMMER	A-12316	
C8 & C9 1ST. I.F. TRIMMER	A-12415	
C10 & C11 2 ND. I.F. TRIMMER	A-12416	
C12 .001 MFD. MOLDED	C-720-297	
C13 .01 MFD. 400 V.	C-720-25	
C14 .1 MFD. 400 V.	C-720-83	
C15 .01 MFD. 400 V.	C-720-25	
C16 .0001 MFD. MOLDED	C-720-293	
C17 .0001 MFD. MOLDED	C-720-293	
C18 .01 MFD. 400 V.	C-720-25	

MODELS 516,516X,546X
Voltage,Alignment
Socket,Trimmers
Resistance

SPARKS WITHINGTON CO.

The use of quality test equipment is highly recommended, and a good test oscillator becomes a virtual necessity when aligning a receiver of this type. Due to the fact that the ear cannot distinguish small changes in sound intensity, an output meter is essential to the proper adjustment of the various condensers.

Unless otherwise specified, the adjusting of any condenser consists of turning the adjusting screw or nut to the right or left until the output meter registers the greatest deflection.

1. EQUIPMENT REQUIRED

A. Modulated test oscillator (crystal controlled or accurately calibrated) capable of generating frequencies from 400 kc. to 20 mc.

B. Output meter.

C. SPARTON Part A-5732 Adjusting Wrench.

D. Dummy antennae consisting of a 600 ohm non-inductive, non-capacitive resistor.

2. STEP BY STEP PROCEDURE

For proper alignment of these receivers, the procedure should be followed in the same order as given.

A. Alignment of Intermediate-Frequency Stages.

(1) Turn on receiver and test oscillator and allow both to operate several minutes before attempting to align any condensers.

(2) Connect "antenna" of test oscillator to the grid cap of the type 6A7 first detector-oscillator tube, and "ground" of test oscillator to chassis frame of receiver. Connect output meter across the speaker input terminals.

NOTE: It is advisable to read carefully the operating instructions included with test oscillator.

(3) Tune test oscillator to obtain a signal of 456 kc.

(4) Turn the volume control of the receiver on full and short circuit the oscillator section of the variable condenser to ground.

(5) Adjust I-F condensers (C10 and C11). See Fig. 10.

NOTE: The condenser which is adjusted by means of the nut should first be brought to resonance; after which the condenser adjusted by the screw should be peaked.

(6) Adjust condensers C8 and C9 by first adjusting the grid circuit or nut adjustment and then adjusting the plate circuit or screw adjustment.

NOTE: As the gain of the receiver increases upon reaching resonance in the I-F circuit, the output of the signal generator should be constantly attenuated so that the indicating needle of the output meter is not thrown off scale or otherwise damaged.

Do not reduce the volume of the receiver to cut down the amount of output. This precaution will insure a type of peak not affected or broadened by the A.V.C. action.

(7) The above adjustment should be repeated with great care to insure accurate adjustment of the I-F condensers.

B. Alignment of Broadcast Band

The dial pointer should be exactly parallel with the horizontal lines of the kilocycle scale when the condenser plates are fully meshed. If the pointer does not read correctly, loosen the set screw which holds the dial disc to the condenser shaft, hold the rotor plates fully meshed with the stator plates and set the pointer so that it is parallel with the horizontal lines on the kilocycle scale, then tighten the set screw.

(1) Disconnect "antenna" lead of test oscillator from grid cap of first detector-oscillator tube and connect in series with the dummy antenna to the antenna binding post at the rear of the receiver.

(2) Turn the band selector switch to the extreme counter-clockwise position (broadcast band).

(3) Tune test oscillator and receiver to 1400 kc. and adjust trimming condensers C3,C2 and C1 in the order mentioned.

(4) Tune the receiver and the test oscillator to a frequency of 600 kc. and adjust condenser C4.

(5) Retune the receiver and the test oscillator to 1400 kc. and recheck the adjustments made on condensers C3, C2 and C1.

Sensitivity and calibration should be checked at 1000 kc., and if necessary, corrections may be made by bending the slotted plates of the variable condenser.

C. Alignment of Band No. 2 (MODELS 516 AND 516-X)

(1) Turn the band selector switch to the police band or central position for the knob.

(2) Tune test oscillator and receiver to a frequency of 3700 kc. and adjust condenser C31, which is reached from the front of the chassis.

(3) Tune test oscillator and receiver to a frequency of 1750 kc. and adjust condenser C5, also reached from the front of the chassis.

(4) Tune test oscillator and receiver to a frequency of 3700 kc. and adjust condenser C6.

C. Alignment of Band No. 2 (MODEL 546-X)

(1) Turn the band selector switch to the long wave or extreme left-hand position.

(2) Tune test oscillator and receiver to a frequency of 350 kc. and adjust condenser C31.

(3) Tune receiver and test oscillator to a frequency of 150 kc. and adjust condenser C5.

(4) Retune test oscillator and receiver to a frequency of 350 kc. and re-adjust condenser C31.

All adjustments made for long wave band should be carefully rechecked to assure accuracy and stability of adjustment.

D. Alignment of Band No. 3

(1) Turn the band selector switch to the short wave or extreme right-hand position.

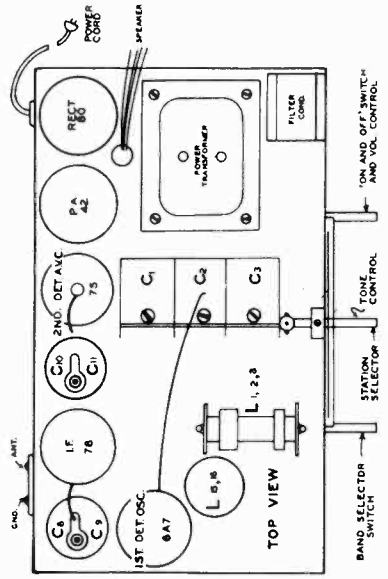
(2) Tune the test oscillator and receiver to a frequency of 14 mc. and adjust condenser C7.

While this adjustment is being made, the tuning control of the signal generator should be moved slowly back and forth across the resonance point of the receiver. This will assist in obtaining a proper adjustment of this condenser. There are no oscillator, trimming or padder condensers for the foreign short wave band.

If trouble is experienced in obtaining proper alignment of these receivers, it may be due to the condition of the Type 6A7 first detector-oscillator tube, in which case the receiver should be re-aligned at 1000 kc. as follows:

With the band selector switch set to the broadcast position, tune the test oscillator and receiver to 1000 kc.

Carefully adjust either the receiver or the test oscillator so that maximum deflection of the output meter is obtained. Then, adjust condensers C8 and C9 in the first intermediate frequency transformer.



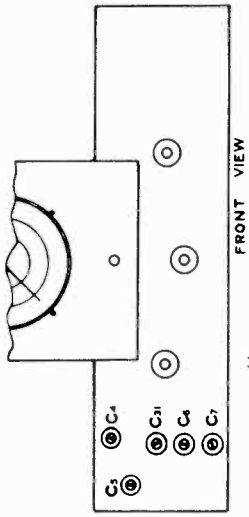


FIG. 17 CHASSIS DIAGRAM

VOLTAGE-RESISTANCE CHART

Position of Volume Control: Full with Antenna Disconnected

Line Voltage: 115 volts

Position of Band Selector Switch: Broadcast

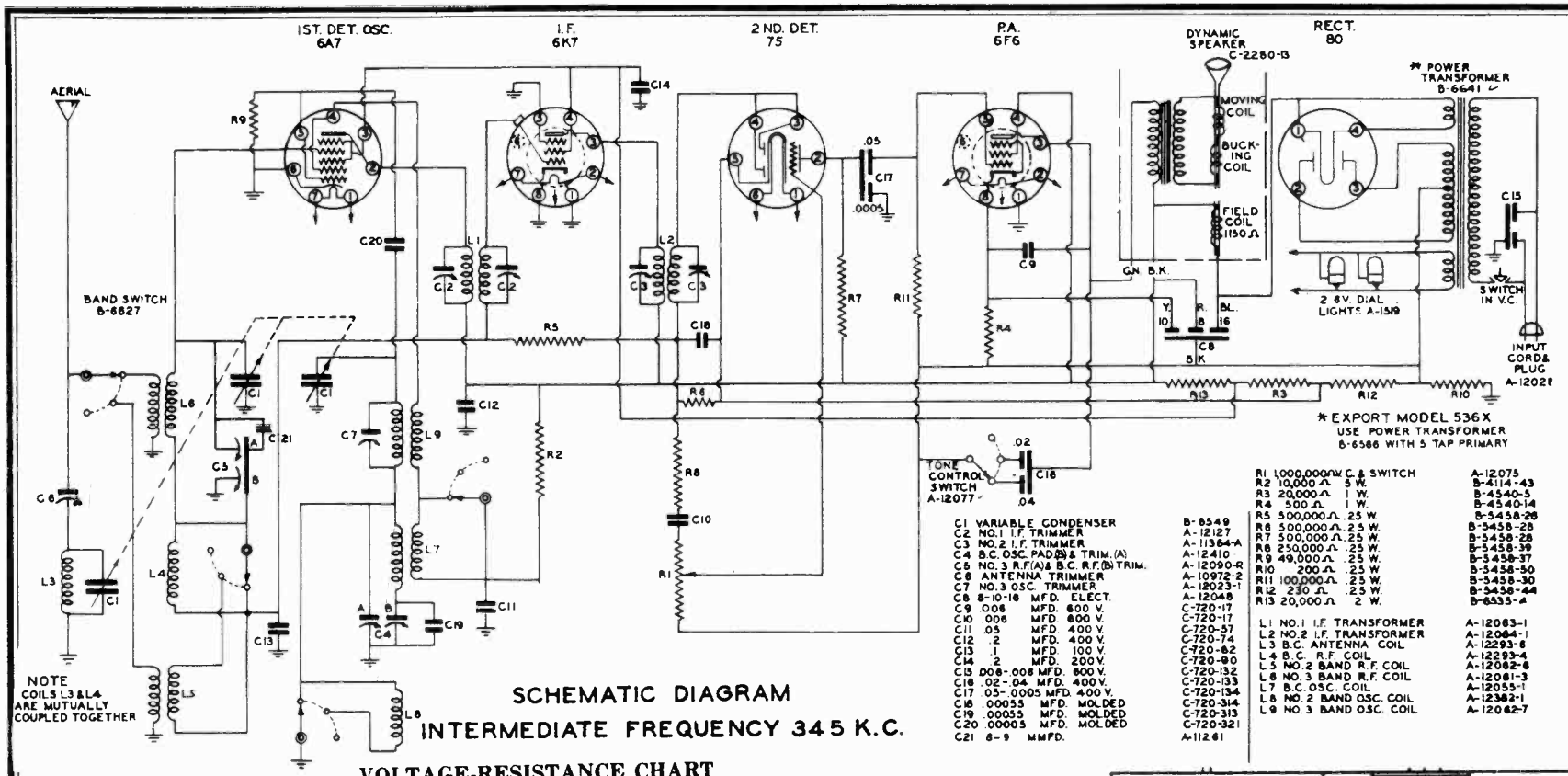
Tube	Function	Measurement	Values and Resistor of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram) Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Grid Cap
6A7	1st. Det-Oscillator	Volts	0	225	150	210	0	0	0	*
		Ohms	0	500000	500000	350000	20000	250	0	500000
78	I - F Amplifier	Volts	0	0	220	110	0	0	-	*
		Ohms	0	1750000	350000	0	500	0	-	500000
75	2nd. Det-A.V.C.-1st. Audio	Volts	0	90	0	0	0	0	-	*
		Ohms	0	*	500000	500000	0	0	-	500000
		Volts	0	310	315	0	0	0	-	-
42	Power Amplifier	Ohms	0	500000	500000	500000	0	0	-	-
		Volts	0	380	380	0	-	-	-	-
80	Rectifier	Ohms	500000	0	0	500000	-	-	-	-

NOTES: Voltage and resistance readings are for schematic diagram shown on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All measurements made with Weston Selective Analyzer No. 665, Type 1.
* Cannot be measured with Weston No. 665, Type 1.

SPARKS WITHINGTON CO.

December 1, 1935

MODELS 536, 536X
Schematic, Socket
Voltage, Resistance



SCHEMATIC DIAGRAM
INTERMEDIATE FREQUENCY 345 K.C.

C1	VARIABLE CONDENSER	B-6549
C2	NO.1 I.F. TRIMMER	A-12127
C3	NO.2 I.F. TRIMMER	A-11364-A
C4	B.C. OSC. PAD (B) & TRIM. (A)	A-12410
C5	NO. 3 R.F.(A) & B.C. R.F.(B) TRIM.	A-12090-R
C6	ANTENNA TRIMMER	A-10972-2
C7	NO. 3 OSC. TRIMMER	A-12023-1
C8	8-10-16 MFD. ELECT.	A-12048
C9	.006 MFD. 600 V.	C-720-17
C10	.006 MFD. 600 V.	C-720-17
C11	.05 MFD. 400 V.	C-720-57
C12	.2 MFD. 400 V.	C-720-74
C13	.1 MFD. 100 V.	C-720-62
C14	.2 MFD. 200 V.	C-720-90
C15	.006-.006 MFD. 600 V.	C-720-132
C16	.02-.04 MFD. 400 V.	C-720-133
C17	.05-.0005 MFD. 400 V.	C-720-134
C18	.00055 MFD. MOLDED	C-720-314
C19	.00055 MFD. MOLDED	C-720-313
C20	.00005 MFD. MOLDED	C-720-321
C21	8-9 MMFD.	A-11261

R1	1,000,000Ω C. & SWITCH	A-12075
R2	10,000Ω 5 W.	B-4114-43
R3	20,000Ω 1 W.	B-4540-5
R4	500Ω 1 W.	B-4540-14
R5	500,000Ω .25 W.	B-5458-26
R6	300,000Ω .25 W.	B-5458-28
R7	500,000Ω .25 W.	B-5458-28
R8	250,000Ω .25 W.	B-5458-39
R9	49,000Ω .25 W.	B-5458-37
R10	200Ω .25 W	B-5458-50
R11	100,000Ω .25 W.	B-5458-30
R12	230Ω .25 W.	B-5458-44
R13	20,000Ω 2 W.	B-6535-A

L1	NO.1 I.F. TRANSFORMER	A-12083-1
L2	NO.2 I.F. TRANSFORMER	A-12084-1
L3	B.C. ANTENNA COIL	A-12293-6
L4	B.C. R.F. COIL	A-12293-4
L5	NO.2 BAND R.F. COIL	A-12082-8
L6	NO.3 BAND R.F. COIL	A-12081-3
L7	B.C. OSC. COIL	A-12055-1
L8	NO.2 BAND OSC. COIL	A-12382-1
L9	NO.3 BAND OSC. COIL	A-12082-7

VOLTAGE-RESISTANCE CHART

* 6.2 or zero volts, depending on twist of filament hook-up wire

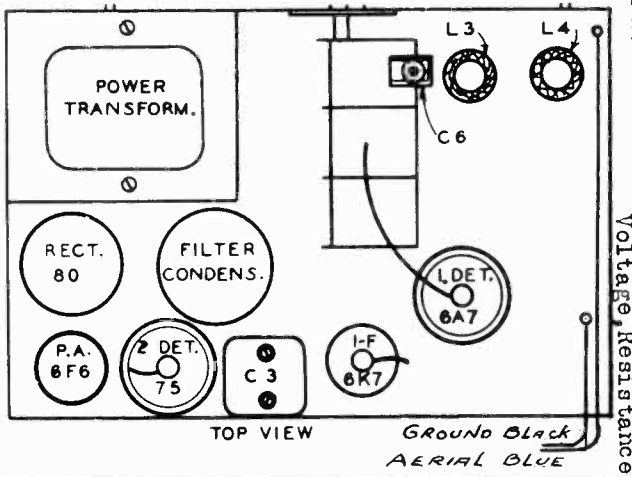
** Resistance too high to be measured with Weston Selective Analyzer No. 665, Type 2.

Line Voltage: 115 volts

Position of Volume Control: Full with Antenna Disconnected

Position of Band Selector Switch: Broadcast

Tube	Function	Voltage and Resistance of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram)									
		Measurement	Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8	Grid Cap
6A7	1st. Det-Oscillator	Volts	*	290	115	290	0	0	*	-	0
		Ohms	0	35000	16000	40000	40000	0	0	-	**
6K7	I-F Amplifier	Volts	0	*	290	120	0	-	*	0	0
		Ohms	0	0	40000	20000	0	-	0	0	750000
75	2nd. Det-A.V.C.	Volts	*	100	0	0	0	*	-	-	0
		Ohms	0	500000	500000	500000	0	0	-	-	750000
6F6	Power Amplifier	Volts	0	*	360	355	400	-	*	0	-
		Ohms	0	0	40000	40000	90000	-	0	600	-
80	Rectifier	Volts	0	350	350	5.2	-	-	-	-	-
		Ohms	40000	0	0	40000	-	-	-	-	-



Detailed Alignment Instructions for 536 and 536-X

The use of quality test equipment is highly recommended and a good test oscillator becomes a virtual necessity when aligning the all-wave or short-wave type of receiver. Due to the fact that the ear cannot distinguish small changes in sound intensity, an output meter is essential to the proper adjustment of the various condensers.

Unless otherwise specified, the adjusting of any condenser consists of turning the adjusting screw or nut to the right or left until the output meter registers the greatest deflection.

1. EQUIPMENT REQUIRED

A. Modulated test oscillator (crystal controlled or accurately calibrated) capable of generating frequencies from 345 to 15,000 kilocycles.

B. Output meter.

C. Part A-5732 adjusting wrench.

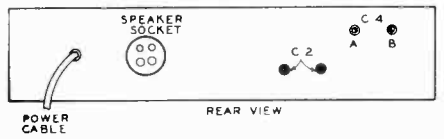
D. Dummy antennas, consisting of a 150 mmf. condenser and a 400 ohm non-inductive resistor.

2. STEP BY STEP PROCEDURE

Note: For proper alignment of these chassis, the procedure should be followed in the same order as given.

In the following procedure, the broadcast band will be termed Band No. 1; the first short-wave band (green section of the dial), Band No. 2; the second short wave band (blue section of the dial), Band No. 3.

The dial pointer should be exactly parallel with the horizontal line of the kilocycle scale when the condenser plates are fully meshed. If the pointer does not read correctly, loosen the set screws in the large brass collar directly between the dial lights, hold the rotor plates fully meshed with the stator plates and set the pointer so that it is parallel with the horizontal lines on the kilocycle scale, then tighten the set screws.



A. Alignment of Intermediate-Frequency Stages

(1) Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.

(2) Turn the band selector switch to the No. 1 (broadcast) position and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.

(3) Connect "antenna" of test oscillator to grid cap of Type 6A7 1st detector-oscillator tube and "ground" of test oscillator to chassis frame of receiver. Connect output meter "high tap" from plate of Type 6F6 tube to ground (See Fig. 1, Page 1, Bulletin No. 3-E). Note: It is advisable to read carefully the operating instructions included with the test oscillator.

(4) Tune test oscillator to obtain a signal of 345 kilocycles.

(5) Turn the volume control of receiver on full and adjust I.F. condensers C3 and C2. (See Fig. 10). Note: The intermediate frequency circuits are quite selective and care must be taken to insure proper adjustment.

B. Alignment of Broadcast Band

(1) Disconnect "antenna" lead of test oscillator from grid cap of first detector-oscillator tube and connect in series with a 150 mmf. condenser dummy antenna to the antenna terminal of the chassis.

(2) Tune test oscillator and receiver to a frequency of 1350 kilocycles, and without disturbing the setting of the test oscillator or the station selector, adjust condensers C4A, C5B and C6 in the order given.

(3) Tune test oscillator and receiver to 600 kilocycles and adjust condenser C4B.

(4) Retune test oscillator and receiver to 1350 kilocycles and check the adjustments of condensers C4A, C5B and C6.

(5) Calibration of the broadcast band should also be checked at 900 kilocycles and 600 kilocycles.

C. Alignment of Band No. 3

(1) Turn the band selector switch to the second short wave band (blue section of the dial).

(2) Remove the 150 mmf. condenser from "antenna" lead of test oscillator and replace with a 400 ohm non-inductive resistor dummy antenna.

(3) Tune test oscillator and receiver to 15 megacycles and adjust condensers C7 and C5A.

CAUTION: On this band care must be taken to adjust the various condensers to the fundamental of the signal and not to the image. The image signal is equal to the fundamental minus twice the intermediate frequency of the receiver.

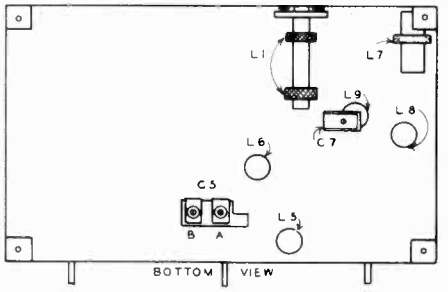
A set that is adjusted to the image frequency instead of to the fundamental may be detected by tuning over the band and checking the sensitivity at various points. If a dead spot appears near the center of the band, the adjustable condensers for that band have probably been adjusted to the image instead of the fundamental.

This type of mis-alignment may also be detected by tuning the test oscillator to a frequency of 15 megacycles and the station selector to approximately 15,700 kilocycles. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency for 15,000 kilocycles would be 15,000 kilocycles minus twice 345 kilocycles or approximately 14,300 kilocycles. Therefore a signal of this frequency may be found with the test oscillator generating a 15,000 kilocycle signal.

(4) Retune the test oscillator and receiver to 9 megacycles and check sensitivity and calibration. (There is no oscillator padder for this band.)

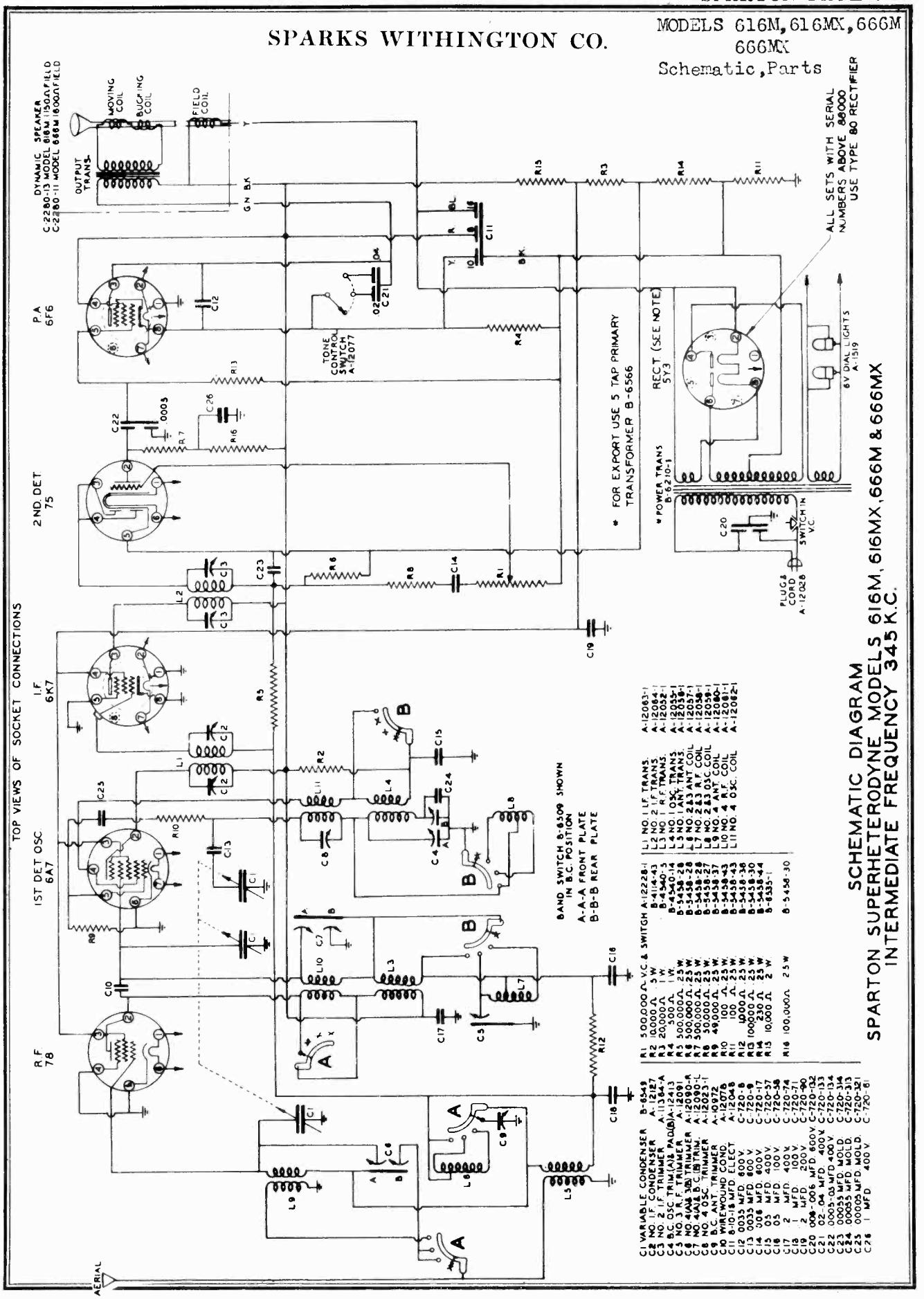
D. Alignment of Band No. 2

Note: There are no adjustable condensers for this band. However, it is advisable to check the calibration of the dial and the general operation of the receiver at both 1.7 megacycles and 3.6 megacycles. CAUTION: All adjustments should be rechecked to assure accuracy and stability of adjustment and calibration.



SPARKS WITHINGTON CO.

MODELS 616M, 616MX, 666M
666MX
Schematic, Parts



C1 VARIABLE CONDENSER B-6549
C2 NO. 1 I.F. CONDENSER A-12127
C3 NO. 2 I.F. TRIMMER A-11384-A
C4 B.C. OSC. TRIMMER A-12413
C5 NO. 3 A.F. TRIMMER A-12091-A
C6 NO. 4 A.F. TRIMMER A-12090-A
C7 NO. 4 A.F. (B) TRIMMER A-12090-L
C8 NO. 4 OSC. TRIMMER A-12023-1
C9 B.C. ANT. TRIMMER A-10972
C10 WIREWOUND COND. A-12078
C11 8-10-16 MFD ELECT A-12048
C12 .0035 MFD 600 V. C-720-8
C13 .0035 MFD 600 V. C-720-9
C14 .006 MFD 600 V. C-720-17
C15 .05 MFD 400 V. C-720-36
C16 .05 MFD 400 V. C-720-37
C17 .2 MFD 400 V. C-720-74
C18 .2 MFD 200 V. C-720-90
C19 .2 MFD 200 V. C-720-91
C20 .006-.006 MFD 600 V C-720-132
C21 .02-.04 MFD 400 V C-720-133
C22 .0005-.03 MFD 400 V C-720-134
C23 .00035 MFD MOLD C-720-314
C24 .00035 MFD MOLD C-720-315
C25 .00005 MFD MOLD C-720-321
C26 .1 MFD 400 V C-720-61

R1 500,000Δ V.C. & SWITCH A-12228-1
R2 10,000Δ 5W B-4114-43
R3 20,000Δ 1W B-4540-5
R4 500Δ 1W B-4540-14
R5 300,000Δ 2.5W B-5438-28
R6 500,000Δ 2.5W B-5438-29
R7 300,000Δ 2.5W B-5438-27
R8 30,000Δ 2.5W B-5438-37
R9 49,000Δ 2.5W B-5438-43
R10 100Δ 2.5W B-5438-43
R11 100Δ 2.5W B-5438-36
R12 1,000Δ 2.5W B-5438-30
R13 100,000Δ 2.5W B-5438-44
R14 230Δ 2W B-6335-1
R15 10,000Δ 2W
R16 100,000Δ 2.5W B-5438-30

L1 NO. 1 I.F. TRANS. A-12063-1
L2 NO. 2 I.F. TRANS. A-12064-1
L3 NO. 1 R.F. TRANS. A-12052-1
L4 NO. 1 OSC. TRANS. A-12035-1
L5 NO. 1 ANT. TRANS. A-12035-1
L6 NO. 2&3 ANT. COIL A-12037-1
L7 NO. 2&3 R.F. COIL A-12038-1
L8 NO. 2&3 OSC. COIL A-12038-1
L9 NO. 4 ANT. COIL A-12060-1
L10 NO. 4 R.F. COIL A-12061-1
L11 NO. 4 OSC. COIL A-12062-1

STEP BY STEP PROCEDURE

In the following procedure, the broadcast band will be termed Band No. 1; the first short wave band (green section of the dial), Band No. 2; the second short wave band (red section of the dial), Band No. 3; the third short wave band (blue section of the dial), Band No. 4. The dial pointer should be exactly parallel with the horizontal line of the kilocycle scale when the condenser plates are fully meshed. If the pointer does not read correctly, loosen the set screws in the large brass collar directly between the dial lights, hold the rotor plates fully meshed with the stator plates and set the pointer so that it is parallel with the horizontal lines on the kilocycle scale, then tighten the set screws.

A. Alignment of Intermediate-Frequency Stages

(1) Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.

(2) Turn the band selector switch to the No. 1 (broadcast) position and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.

(3) Connect "antenna" of test oscillator to grid cap of Type 6A7 1st detector-oscillator tube and "ground" of test oscillator to chassis frame of receiver. Connect output meter "high tap" from plate of Type 6F6 tube to ground.

NOTE: It is advisable to read carefully the operating instructions included with test oscillator.

(4) Tune test oscillator to obtain a signal of 345 kilocycles.

(5) Turn the volume control of receiver on full and adjust I.F. condensers C3 and C2. (See Fig. 13). Note: The intermediate frequency circuits are quite selective and care must be taken to insure proper adjustment.

B. Alignment of Broadcast Band

(1) Disconnect "antenna" lead of test oscillator from grid cap of first detector-oscillator tube and connect in series with a 150 mmf. condenser dummy antenna to the antenna terminal of the chassis.

(2) Tune test oscillator to obtain a signal of 1350 kilocycles.

(3) Turn the station selector of the receiver to 1350 kilocycles and without disturbing the setting of the test oscillator or the station selector, adjust condensers C4A, C7B and C9 in the order given.

(4) Tune test oscillator and receiver to 600 kilocycles and adjust condenser C4B at the same time the station selector knob is moved back and forth to obtain maximum deflection of the output meter.

(5) Retune test oscillator and receiver to 1350 kilocycles and check the adjustments of condensers C4A, C7B and C9.

(6) Calibration of the broadcast band should also be checked at 900 kilocycles and 600 kilocycles.

C. Alignment of Band No. 4

(1) Turn the band selector switch to the third short wave band (blue section of the dial).

(2) Disconnect "antenna" lead of test oscillator from antenna terminal, remove the 150 mmf. condenser and replace with a 400 ohm non-inductive resistor dummy antenna and connect to grid cap of Type 78 R.F. tube.

(3) Tune test oscillator and receiver to 18 megacycles and adjust condenser C8 and condenser C7A.

CAUTION: On this band care must be taken to adjust the various condensers to the fundamental of the signal and not to the image. The image signal is equal to the fundamental minus twice the intermediate frequency of the receiver. A set that is adjusted to the image frequency instead of to the fundamental may be detected by tuning over the band and checking the sensitivity at various points. If a dead spot appears near the center of the band, the adjustable condensers for that band have probably been adjusted to the image instead of the fundamental.

This type of mis-alignment may also be detected by tuning the test oscillator to a frequency of 15 megacycles and the station selector to approximately 15,700 kilocycles. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency for 15,000 kilocycles would be 15,000 kilocycles minus twice 345 kilocycles or approximately 14,300 kilocycles. Therefore a signal of this frequency may be found with the test oscillator generating a 15,000 kilocycle signal.

(4) Disconnect the "antenna" of the test oscillator from the grid cap of the Type 78 R.F. tube and, using the 400 ohm resistor in series, connect to the antenna terminal.

(5) Adjust condenser C6A. Note: Due to the inter-action between the various circuits, it is necessary to move the station selector knob slightly while adjusting these trimmers in order to realize the maximum possible gain.

(6) Retune the test oscillator and receiver to 9 megacycles and check sensitivity and calibration.

D. Alignment of Band No. 3

(1) Turn the band selector switch to the second short wave band (red section of the dial).

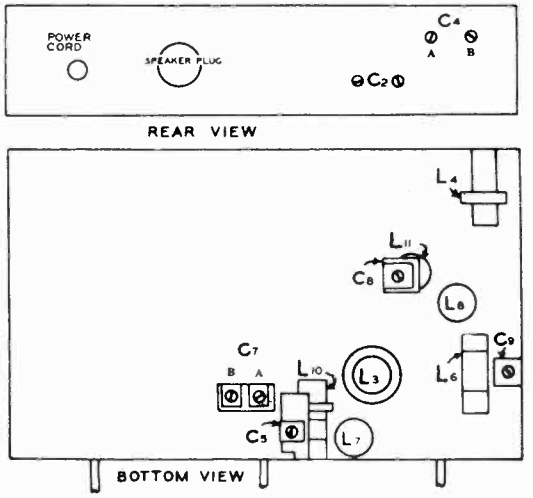
(2) Tune test oscillator and receiver to 7.2 megacycles.

(3) Adjust condensers C5 and C6B.

(4) Tune test oscillator and receiver to 3.6 megacycles and check calibration and sensitivity.

E. Alignment of Band No. 2

Note: There are no adjustable condensers for this band. However, it is advisable to check the calibration of the dial and the general operation of the receiver at both 1.7 megacycles and 3 megacycles. CAUTION: All adjustments should be rechecked to assure accuracy and stability of adjustment and calibration.



Socket, Voltage Resistance

SPARKS WITHINGTON CO.

VOLTAGE-RESISTANCE CHART

MODELS 616M, 616MX, 666M 666MX
MODELS 966, 966X

Line Voltage: 119 Models 616-M, 616-MX 666-M, 666-MX

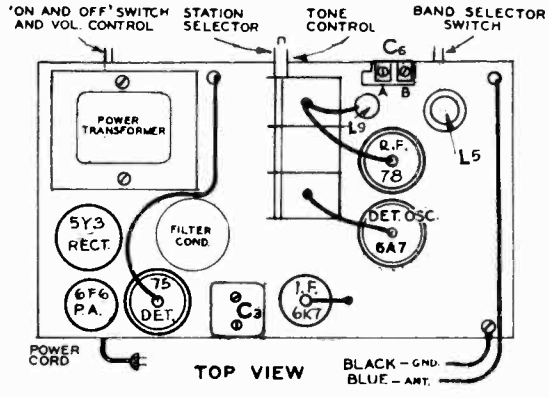
Position of Volume Control: Full with Antenna Disconnected
Position of Band Selector Switch: Broadcast

Tube	Function	Voltage and Resistance of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram)									
		Measurement	Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8	Grid Cap
78	R-F Amplifier	Volts	0	310	160	0	0	*	-	-	**
		Ohms	0	28000	18000	0	0	0	-	-	1 meg
6A7	1st. Det-Oscillator	Volts	*	300	160	235	7	0	*	-	**
		Ohms	0	28000	18000	38000	5000	0	0	-	1 meg
6K7	I-F Amplifier	Volts	0	*	295	160	0	0	*	0	**
		Ohms	0	0	28000	19000	0	0	0	0	1 meg
75	2nd. Det-A.V.C.	Volts	*	140	**	**	0	*	-	-	**
		Ohms	0	600000	600000	600000	350	0	-	-	1 meg
6F6	Power Amplifier	Volts	0	*	280	300	0	18	*	18	-
		Ohms	0	0	28000	28000	135000	600	0	600	-
5Y3	Rectifier	Volts	-	440	-	405	-	410	-	440	-
		Ohms	-	30000	-	250	-	250	-	30000	-

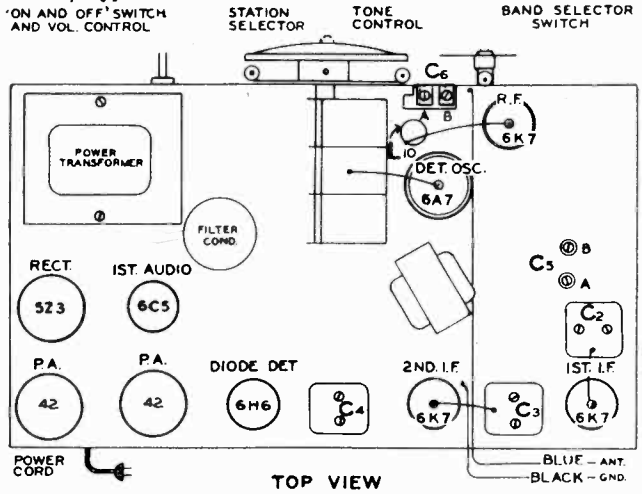
Notes: Voltage and resistance readings are for schematic diagram shown on back of sheet. Allow 15% + or - on all measurements. All measurements made with Weston Selective Analyzer No. 665, Type 1. Always use meter scale which will give greatest deflection within scale limits.

* Zero or 6 volts, depending on twist of filament (heater) hookup wire.
**Cannot be measured with Weston Selective Analyzer No. 665, Type 1.

Model 616-M, 616-MX
666-M, 666-MX



Model 966, 966-X



VOLTAGE-RESISTANCE CHART

Line Voltage: 115 volts Model 966, 966-X

Position of Volume Control: Full with Antenna Disconnected
Position of Band Selector Switch: Broadcast

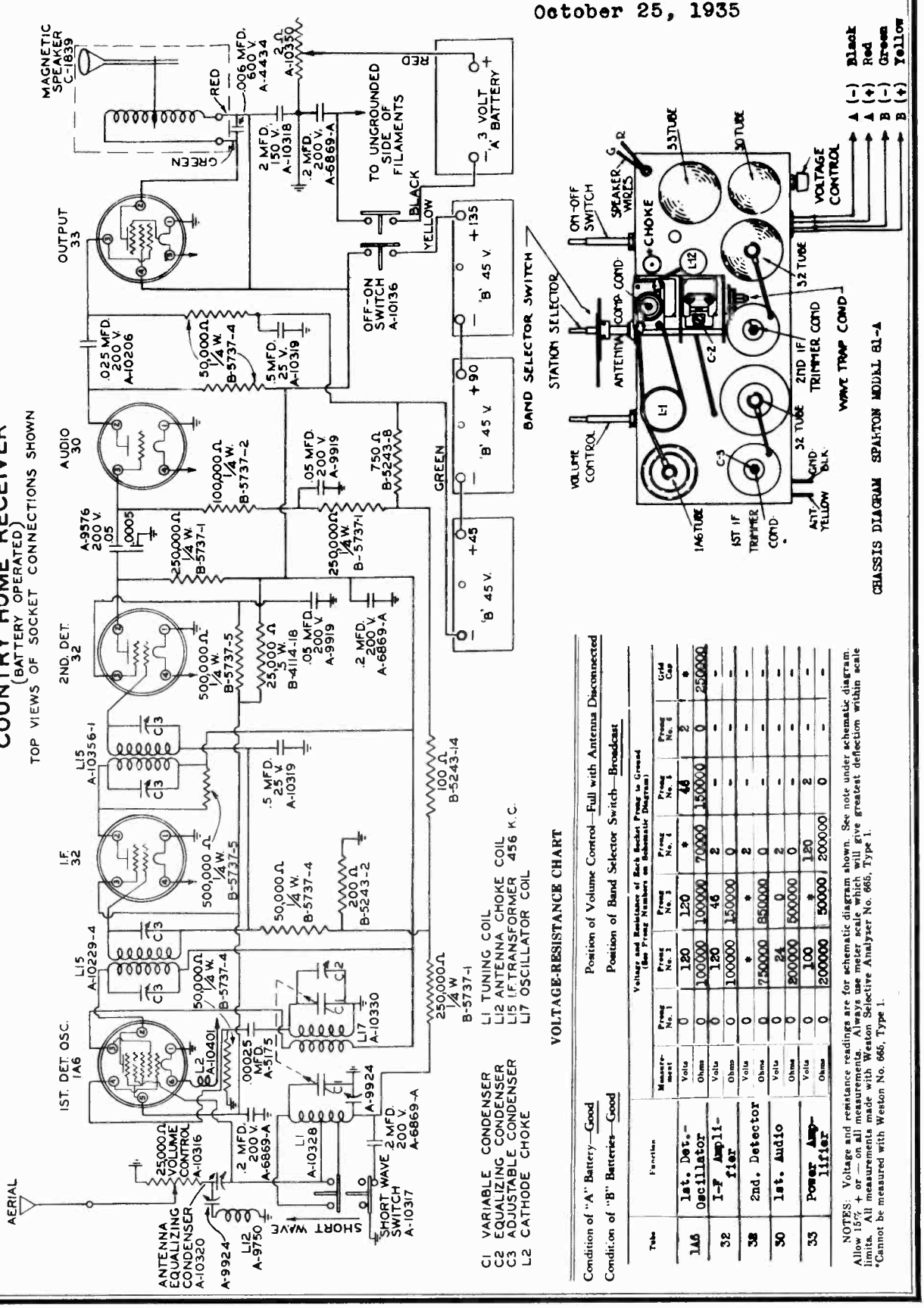
Tube	Function	Voltage and Resistance of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram)									
		Measurement	Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8	Grid Cap
6K7	R-F Amplifier	Volts	0	0	250	120	0	-	0	0	*
		Ohms	0	0	25000	20000	0	-	0	0	500000
6A7	1st. Det-Oscillator	Volts	0	250	120	240	0	0	0	-	*
		Ohms	0	25000	20000	38000	42000	0	0	-	500000
6K7	1st. I-F Amplifier	Volts	0	0	250	120	0	-	0	0	*
		Ohms	0	0	25000	20000	0	-	0	0	500000
6K7	2nd. I-F Amplifier	Volts	0	0	250	120	0	-	0	0	*
		Ohms	0	0	28000	20000	0	-	0	0	0
6H6	2nd. Det-A.V.C.	Volts	0	0	0	0	0	-	0	*	-
		Ohms	0	0	0	0	125000	-	0	100	-
6C5	1st. A-F Amplifier	Volts	0	0	210	-	0	-	0	8	-
		Ohms	0	0	90000	-	175000	-	0	5000	-
42	Power Amplifier	Volts	0	250	260	0	8	0	-	-	-
		Ohms	0	28000	28000	2000	0	0	-	-	-
42	Power Amplifier	Volts	0	250	260	0	8	0	-	-	-
		Ohms	0	28000	28000	2000	0	0	-	-	-
5Z3	Rectifier	Volts	0	325	325	0	-	-	-	-	-
		Ohms	28000	0	0	28000	-	-	-	-	-
6E5	Viso-Glo	Volts	0	*	0	250	0	0	-	-	-
		Ohms	0	1000000	250000	28000	0	0	-	-	-

MODEL 81A
Schematic, Socket
Voltage, Resistance

SPARKS WITHINGTON CO.

October 25, 1935

SCHEMATIC DIAGRAM
SPARTON MODEL 81-A SUPERHETERODYNE I.F. 456 K.C.
COUNTRY HOME RECEIVER
(BATTERY OPERATED)
TOP VIEWS OF SOCKET CONNECTIONS SHOWN



CHASSIS DIAGRAM SPARTON MODEL 81-A

C1 VARIABLE CONDENSER
C2 EQUALIZING CONDENSER
C3 ADJUSTABLE CONDENSER
L2 CATHODE CHOKE
L1 TUNING COIL
L12 ANTENNA CHOKE COIL
L15 I.F. TRANSFORMER 456 K.C.
L17 OSCILLATOR COIL

VOLTAGE-RESISTANCE CHART

Condition of "A" Battery—Good — Position of Volume Control—Full with Antenna Disconnected
Condition of "B" Batteries—Good — Position of Band Selector Switch—Broadcast

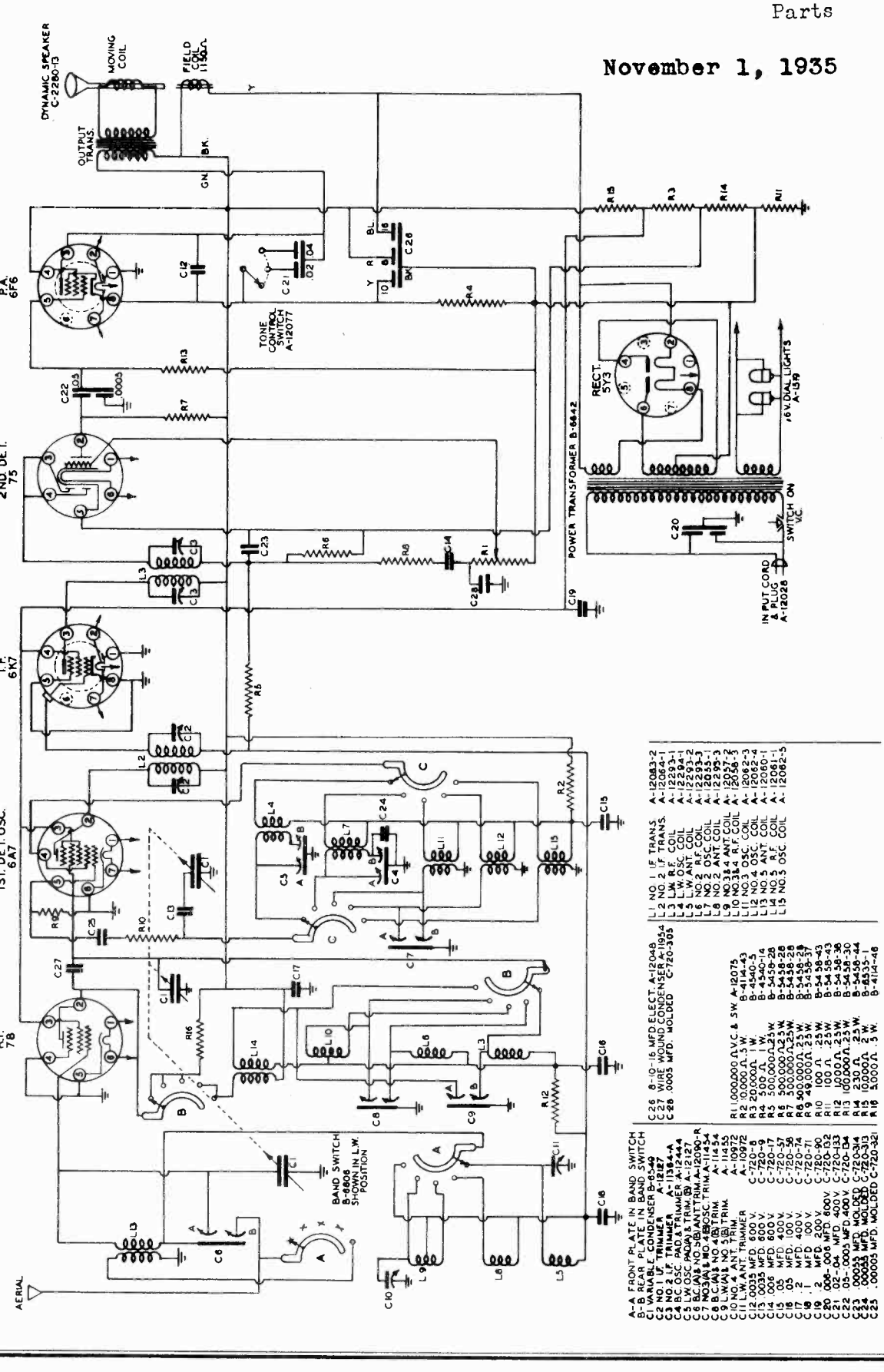
Tube	Function	Measurement	Voltage and Resistance of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram) Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Grid Cap
1A6	1st. Det.-Oscillator	Volts	0	120	120	*	45	2	*
		Ohms	0	100000	100000	70000	150000	0	2500000
32	I-F Amplifier	Volts	0	120	46	2	-	-	-
		Ohms	0	100000	150000	0	-	-	-
32	2nd. Detector	Volts	0	*	*	2	-	-	-
		Ohms	0	750000	850000	0	-	-	-
30	1st. Audio	Volts	0	24	0	2	-	-	-
		Ohms	0	200000	500000	0	-	-	-
33	Power Amplifier	Volts	0	100	*	120	2	-	-
		Ohms	0	200000	50000	200000	0	-	-

NOTES: Voltage and resistance readings are for schematic diagram shown. See note under schematic diagram. Allow 15% + or — on all measurements. Always use meter scale which will give greatest deflection within scale limits. All measurements made with Weston Selective Analyser No. 665, Type 1.
*Cannot be measured with Weston No. 665, Type 1.

SPARKS WITHINGTON CO.

MODEL 636MX
Schematic
Parts

November 1, 1935



MODEL 636MX
Voltage, Resistance
Socket, Trimmers
Alignment

SPARKS WITHINGTON CO.

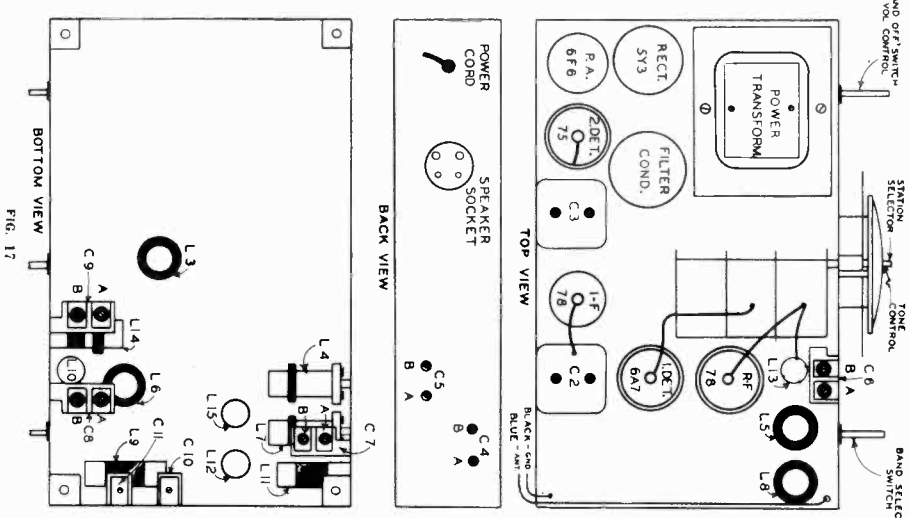


FIG. 17

Unless otherwise specified, the adjusting of any condenser consists of turning the adjusting screw or nut to the right or left until the output meter registers the greatest deflection.

1. EQUIPMENT REQUIRED

A. Modulated test oscillator (crystal controlled or accurately calibrated) capable of generating frequencies from 345 to 18,000 kilocycles (869.5 to 16.6 meters).

B. Output meter.

C. Part A-7813 adjusting screw driver.

D. Dummy antennas, consisting of a 150 mmf. condenser and a 400 ohm non-inductive resistor.

2. STEP BY STEP PROCEDURE

Note: For proper alignment of these chassis, the procedure should be followed in the same order as given.

In the following procedure, the long wave band will be termed Band No. 1; the broadcast band, Band No. 2; the first short-wave band, Band No. 3; the second short-wave band, Band No. 4; and the third short-wave band, Band No. 5. The dial pointer should be exactly parallel with the horizontal line of the kilocycle scale when the condenser plates are fully meshed. If the pointer does not read correctly, loosen the set screws in the large brass collar on the drive shaft, hold the rotor plates fully meshed with the stator plates and set the pointer so that it is parallel with the horizontal lines on the tuning scale, and then tighten the set screws.

A. Alignment of Intermediate-Frequency Stages.

(1) Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.

(2) Turn the band selector switch to the No. 2 (broadcast) position and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.

(3) Connect "antenna" of test oscillator to grid cap of Type 6A7 1st detector-oscillator tube and "ground" of test oscillator to chassis frame of receiver. Connect output meter "low tap" across voice coil of speaker (See Fig. 1, Page 1, Bulletin No. 3-E). Note: It is advisable to read carefully the operating instructions included with the test oscillator.

(4) Tune test oscillator to obtain a signal of 869.5 meters.

(5) Turn the volume control of receiver on full and adjust I.F. condensers C3 and C2 which are reached from the top of the chassis. (See Fig. 17.) Note: The intermediate frequency circuits are quite selective and extreme care must be taken to insure proper adjustment, otherwise the set will be weak on the high frequency bands.

B. Alignment of Broadcast Band

(1) Disconnect "antenna" lead of test oscillator from grid cap of 1st detector-oscillator tube and connect in series with a 150 mmf. condenser dummy antenna to the antenna terminal of the chassis.

(2) Tune the test oscillator and receiver to a wavelength of 222.1 meters and adjust condensers C4A, C8A and C6A.

(3) Tune test oscillator and receiver to 499.7 meters and adjust condenser C4B.

September 28, 1935

VOLTAGE-RESISTANCE CHART

Line Voltage : 115 volts — Position of Volume Control: Full with Antenna Disconnected

Voltage Tap : 95 to 115 volts — Position of Band Selector Switch: Broadcast

Tube	Function	Voltage and Resistance of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram)									
		Measurement	Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8	Grid Cap
78	R-F Amplifier	Volts	*	300	150	0	0	*	-	-	0
		Ohms	0	35000	22500	0	0	0	-	-	1000000
6A7	1st. Det-Oscillator	Volts	*	290	140	290	0	0	*	-	0
		Ohms	0	30000	22000	40000	45000	0	0	-	1000000
6K7	I-F Amplifier	Volts	0	*	300	150	0	-	*	0	0
		Ohms	0	0	30000	22000	0	-	0	0	1000000
75	2nd. Det-A.V.C.	Volts	*	100	0	0	0	*	-	-	0
		Ohms	0	500000	500000	500000	330	0	-	-	1000000
6F6	Power Amplifier	Volts	0	*	360	360	0	-	*	0	-
		Ohms	0	0	30000	30000	100000	-	0	600	-
5Y3	Rectifier	Volts	0	5	-	400	-	400	-	0	-
		Ohms	0	30000	-	0	-	0	-	30000	-

NOTES: Voltage and resistance readings are for schematic diagram shown on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All measurements made with Weston Selective Analyzer No. 665, Type 1.
* 6.2 or zero volts, depending on twist of filament hook-up wire.

(4) Retune the receiver and test oscillator to 222.1 meters and make any necessary adjustments on condensers C4A, C8A and C6A.

(5) Calibration and sensitivity of the broadcast band should also be checked at 333.1 meters and 499.7 meters.

C. Alignment of Band No.

(1) Turn the band selector switch to Band No. 1 (long wave band).

(2) Tune test oscillator and receiver to a wavelength of 999.4 meters and adjust condensers C5A, C9A and C11.

(3) Tune test oscillator and receiver to a wavelength of 1999 meters and adjust condenser C5B.

(4) Retune test oscillator and receiver to 999.4 meters and retrim condensers C5A, C9A and C11.

(5) Calibration of this band should also be checked at 1739 meters.

D. Alignment of Band No.

(1) Turn the band selector switch to the No. 5 band and replace the 150 mmf. condenser dummy antenna with a 400 ohm non-inductive resistor dummy antenna.

(2) Tune the test oscillator and receiver to a wavelength of 16.6 meters and adjust condensers C9B and C6B.

(3) Calibration and sensitivity of this band should also be checked at 33.3 meters.

E. Alignment of Band No. 4

(1) Turn the band selector switch to Band No. 4 (third short-wave band).

(2) Tune test oscillator and receiver to a wavelength of 41.6 meters and adjust condensers C7B, C8B and C10.

(3) Calibration and sensitivity of this band should also be checked at a frequency of 83.2 meters.

F. Alignment of Band No. 3

(1) Turn the band selector switch to the 1st short-wave band.

(2) Tune test oscillator and receiver to a wavelength of 99.9 meters and adjust condenser C9A.

This band has no adjustable condensers for the antenna or R.F. circuits and no padder condenser for the oscillator circuit.

Sensitivity and calibration of this band should be also checked at 176.4 meters.

All adjustments should be re-checked to assure accuracy and stability of adjustment and calibration.

Warning: Extreme care must be taken when adjusting any of the short-wave bands so that the condensers are not adjusted to the image of the signal rather than the fundamental. The image signal is equal to the fundamental minus twice the intermediate frequency of the receiver. A set that is adjusted to the image frequency instead of to the fundamental may be detected by tuning over the band and checking the sensitivity at various points. If a dead spot appears near the center of the band, the adjustable condensers for that band have probably been adjusted to the image instead of the fundamental.

This type of mis-alignment may also be detected by tuning the test oscillator to a wavelength of 19.9 meters and the station selector to approximately 19.1 meters. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency for 19.9 meters would be 19.9 meters (15,000 k.c.) minus twice 345 kilocycles or approximately 20.9 meters. Therefore, a signal of this frequency may be found with the test oscillator generating a 19.9 meter signal.

SPARKS WITHINGTON CO.

MODELS 716X, 766, 766XP
766XS
MODELS 966, 966X
Alignment, Trimmers

Foreword: Before attempting to realign the circuits of the above SPARTON Models, the serviceman should read carefully the information contained in Section 1 of Bulletin No. 3-E, pages 1 to 5 inclusive, especially the paragraphs pertaining to the use of a test oscillator, output meter, method of adjusting the various trimming and padding condensers and the bending of split condenser plate sections.

Unless otherwise specified, the adjusting of any condenser consists of turning the adjusting screw or nut to the right or left until the output meter registers the greatest deflection.

Alignment Instructions

1. EQUIPMENT REQUIRED

A. Modulated test oscillator (crystal controlled or accurately calibrated) capable of generating frequencies from 456 to 18,000 kilocycles.

B. Output meter.

C. Part A-5732 adjusting wrench.

D. Dummy antennas, consisting of a 150 mmf. condenser and a 400 ohm non-inductive resistor.

2. STEP BY STEP PROCEDURE

Note: For proper alignment of these chassis, the procedure should be followed in the same order as given.

In the following procedure, the broadcast band will be termed Band No. 1; the first short wave band (green section of the dial), Band No. 2; the second short wave band (red section of the dial), Band No. 3; the third short wave band (blue section of the dial), Band No. 4. The dial pointer should be exactly parallel with the horizontal line of the kilocycle scale when the condenser plates are fully meshed. If the pointer does not read correctly, loosen the set screws in the large brass collar directly between the dial lights, hold the rotor plates fully meshed with the stator plates and set the pointer so that it is parallel with the horizontal lines on the kilocycle scale, then tighten the set screws.

A. Alignment of Intermediate-Frequency Stages.

(1) Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.

(2) Turn the band selector switch to the No. 1 (broadcast) position and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.

(3) Connect "antenna" of test oscillator to grid cap of Type 6A7 1st detector-oscillator tube and "ground" of test oscillator to chassis frame of receiver. Connect output meter "low tap" across voice coil of speaker (See Fig.1)

Note: It is advisable to read carefully the operating instructions included with the test oscillator.

(4) Tune test oscillator to obtain a signal of 456 kilocycles.

(5) Turn the volume control of receiver on full and adjust I.F. condensers C4, C5 and C2 which are reached from the top of the chassis. (See Fig's.)

Note: The intermediate frequency circuits are quite selective and care must be taken to insure proper adjustment.

B. Alignment of Broadcast Band.

(1) Disconnect "antenna" lead of test oscillator from grid cap of first detector-oscillator tube and connect in series with a 150 mmf. condenser dummy antenna to the antenna terminal of the chassis.

(2) Tune test oscillator to obtain a signal of 1350 kilocycles.

(3) Turn the station selector of the receiver to 1350 kilocycles and without disturbing the setting of the test oscillator or the station selector, adjust condensers C5A, C7B and C9 in the order given.

(4) Tune test oscillator and receiver to 600 kilocycles and adjust condenser C5B, at the same time the station selector knob is moved back and forth to obtain maximum deflection of the output meter.

(5) Retune test oscillator and receiver to 1350 kilocycles and check the adjustments of condensers C5A, C7B and C9.

(6) Calibration of the broadcast band should also be checked at 900 kilocycles and 600 kilocycles.

C. Alignment of Band No. 4 (6.5 to 20 Megacycles).

(1) Turn the band selector switch to the third short wave band (blue section of the dial).

(2) Disconnect "antenna" lead of test oscillator from antenna terminal, remove the 150 mmf. condenser and replace with a 400 ohm non-inductive resistor dummy antenna and connect to grid cap of Type 78 (Type 6K7 in Model 966) R.F. tube.

(3) Tune test oscillator and receiver to 18 megacycles and adjust condenser C8 and condenser C7A.

CAUTION: On this band care must be taken to adjust the various condensers to the fundamental of the signal and not to the image. The image signal is equal to the fundamental minus twice the intermediate frequency of the receiver. A set that is adjusted to the image frequency instead of to the fundamental may be detected by tuning over the band and checking the sensitivity at various points. If a dead spot appears near the center of the band, the adjustable condensers for that band have probably been adjusted to the image instead of the fundamental.

This type of mis-alignment may also be detected by tuning the test oscillator to a frequency of 15 megacycles and the station selector to approximately 15,900 kilocycles. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency for 15,000 kilocycles would be 15,000 kilocycles minus twice 456 kilocycles or approximately 14,100 kilocycles. Therefore a signal of this frequency may be found with the test oscillator generating a 15,000 kilocycle signal.

(4) Disconnect the "antenna" of the test oscillator from the grid cap of the Type 78 (Type 6K7 in Model 966) R.F. tube and, using the 400 ohm resistor in series, connect to the antenna terminal.

(5) Adjust condenser C6A. Note: Due to the inter-action between the various circuits, it is necessary to move the station selector knob slightly while adjusting these trimmers in order to realize the maximum possible gain.

(6) Retune the test oscillator and receiver to 9 megacycles and check sensitivity and calibration.

D. Alignment of Band No. 3 (3.2 to 8.0 Megacycles).

(1) Turn the band selector switch to the second short wave band (red section of the dial).

(2) Tune test oscillator and receiver to 7.2 megacycles.

(3) Adjust condenser C11 and C6B.

(4) Tune test oscillator and receiver to 3.6 megacycles and check calibration and sensitivity.

E. Alignment of Band No. 2 (1.3 to 3.8 Megacycles).

Note: There are no adjustable condensers for this band. However, it is advisable to check the calibration of the dial and the general operation of the receiver at both 1.7 megacycles and 3 megacycles. CAUTION: All adjustments should be rechecked to assure accuracy and stability of adjustment and calibration.

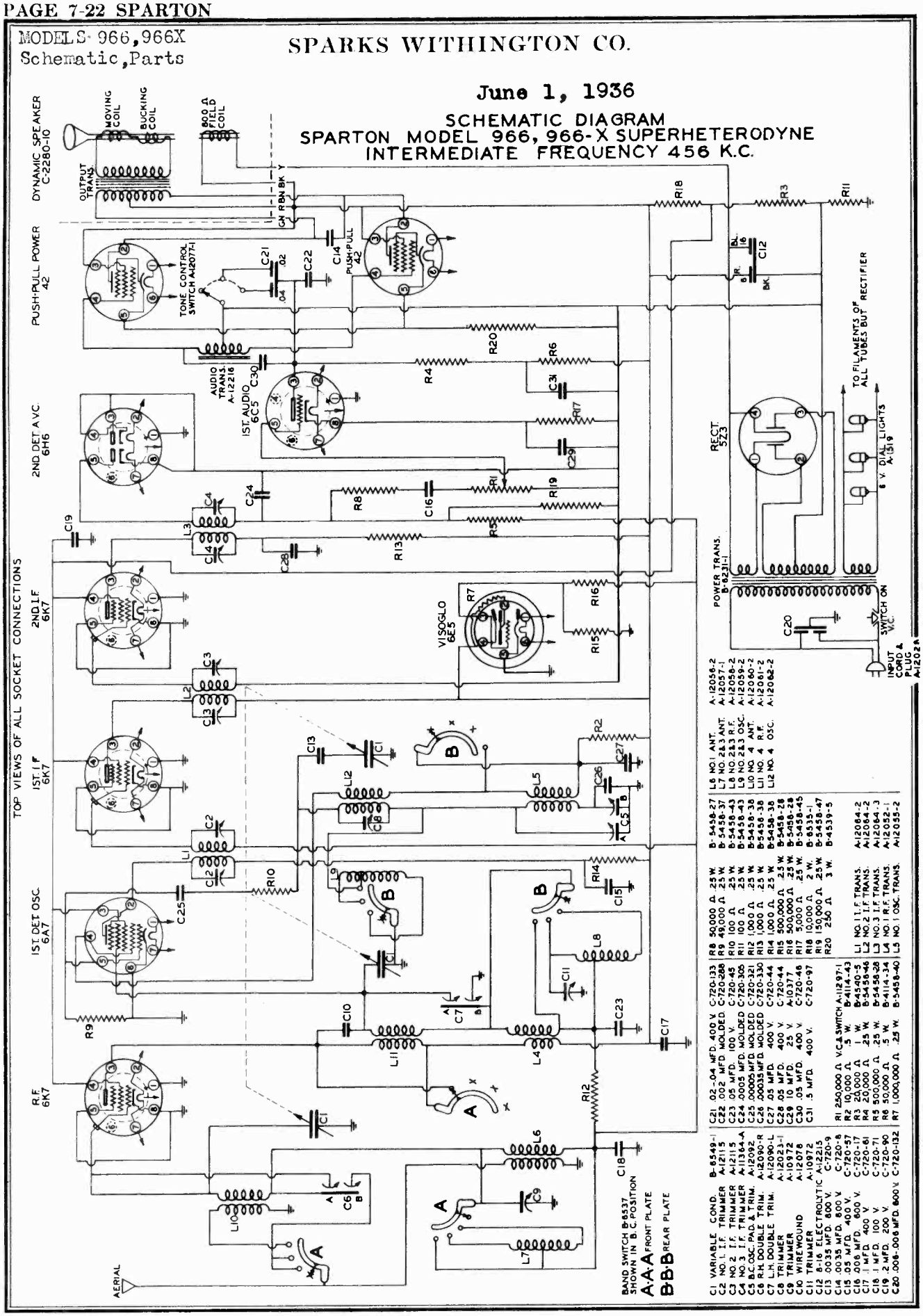
The use of quality test equipment is highly recommended and a good test oscillator becomes a virtual necessity when aligning the all-wave or short-wave type of receiver. Due to the fact that the ear cannot distinguish small changes in sound intensity, an output meter is essential to the proper adjustment of the various condensers.

MODELS 966, 966X
Schematic, Parts

SPARKS WITHINGTON CO.

June 1, 1936

SCHEMATIC DIAGRAM
SPARTON MODEL 966, 966-X SUPERHETERODYNE
INTERMEDIATE FREQUENCY 456 K.C.



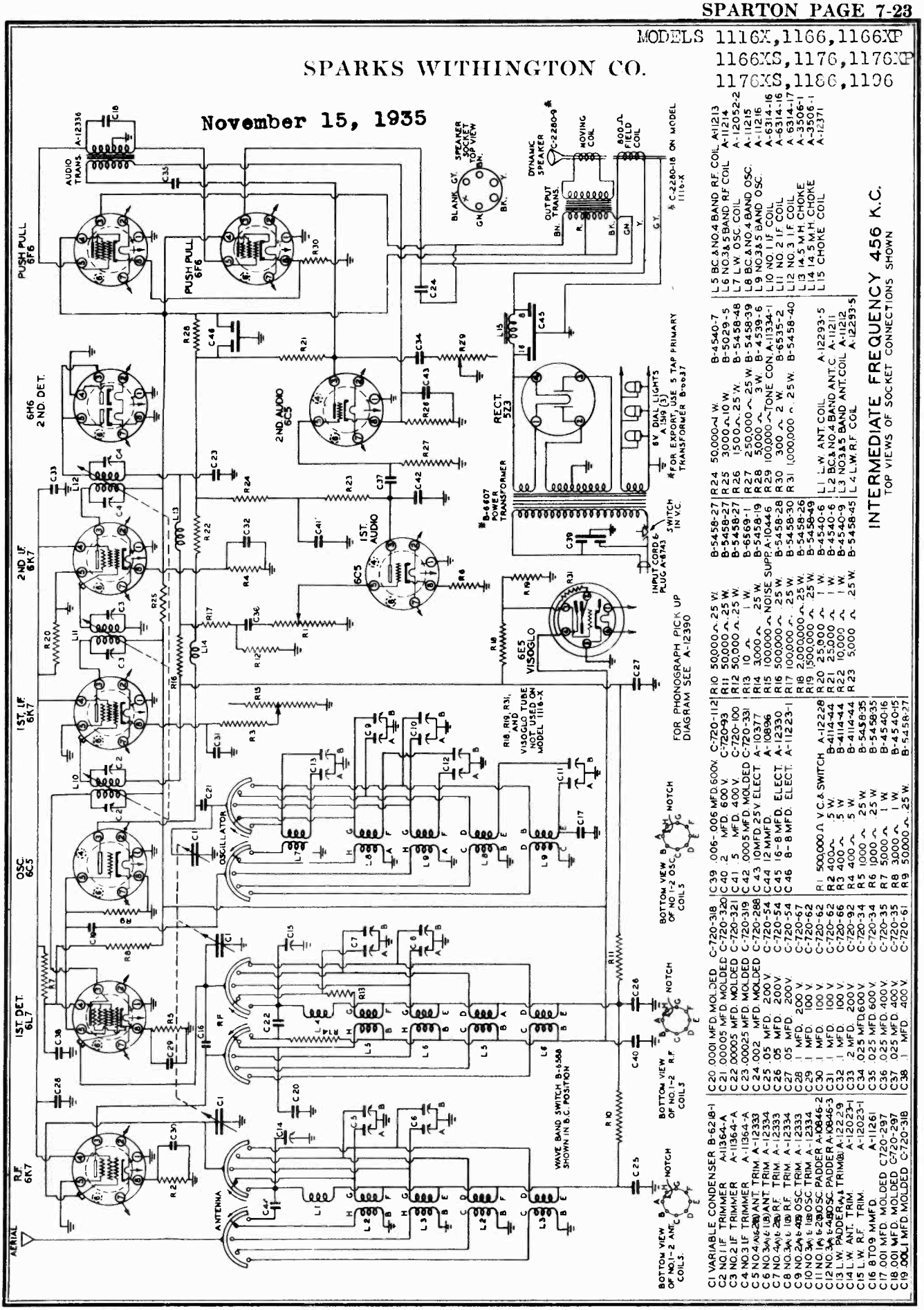
TOP VIEWS OF ALL SOCKET CONNECTIONS

C1 VARIABLE COND.	B-6549-1	C21 .02-.04 MFD. 400 V.	C-720-133	R8 50,000 Ω .25 W.	B-5458-27	L6 NO. 1 ANT.	A-12056-2
C2 NO. 1 I.F. TRIMMER	A-12115	C22 .002 MFD MOLDED	C-720-288	R9 49,000 Ω .25 W.	B-5458-37	L7 NO. 2 & 3 ANT.	A-12057-1
C3 NO. 2 I.F. TRIMMER	A-12115	C23 .05 MFD. 100 V.	C-720-45	R10 100 Ω .25 W.	B-5458-43	L8 NO. 2 & 3 R.F.	A-12058-2
C4 NO. 3 I.F. TRIMMER	A-11364-A	C24 .0005 MFD. MOLDED	C-720-305	R11 100 Ω .25 W.	B-5458-43	L9 NO. 2 & 3 OSC.	A-12059-2
C5 B.C. OSC. PAD. & TRIM.	A-12092	C25 .00005 MFD. MOLDED	C-720-321	R12 1,000 Ω .25 W.	B-5458-38	L10 NO. 4 ANT.	A-12060-2
C6 R.H. DOUBLE TRIM.	A-12090-R	C26 .00035 MFD. MOLDED	C-720-330	R13 1,000 Ω .25 W.	B-5458-38	L11 NO. 4 R.F.	A-12061-2
C7 L.H. DOUBLE TRIM.	A-12090-L	C27 .05 MFD. 400 V.	C-720-44	R14 1,000 Ω .25 W.	B-5458-38	L12 NO. 4 OSC.	A-12062-2
C8 TRIMMER	A-12023-1	C28 .05 MFD. 400 V.	C-720-44	R15 500,000 Ω .25 W.	B-5458-28		
C9 TRIMMER	A-10972	C29 .10 MFD. 25 V.	A-10377	R16 500,000 Ω .25 W.	B-5458-28		
C10 WIREWOUND	A-12078	C30 .05 MFD. 400 V.	C-720-46	R17 5,000 Ω .25 W.	B-5458-45		
C11 TRIMMER	A-10972	C31 .5 MFD. 400 V.	C-720-97	R18 10,000 Ω 2 W.	B-8535-1		
C12 8-16 ELECTROLYTIC	A-12215			R19 150,000 Ω .25 W.	B-5458-47		
C13 .0035 MFD. 800 V.	C-720-9			R20 250 Ω 3 W.	B-4539-5		
C14 .0035 MFD. 800 V.	C-720-8	R1 250,000 Ω V.C. & SWITCH	A-12297-1			L1 NO. 1 I.F. TRANS.	A-12064-2
C15 .05 MFD. 400 V.	C-720-57	R2 10,000 Ω .5 W.	B-4114-43			L2 NO. 2 I.F. TRANS.	A-12064-2
C16 .006 MFD. 600 V.	C-720-17	R3 20,000 Ω 1 W.	B-4540-5			L3 NO. 3 I.F. TRANS.	A-12064-3
C17 .1 MFD. 400 V.	C-720-61	R4 20,000 Ω .25 W.	B-5458-46			L4 NO. 1 R.F. TRANS.	A-12052-1
C18 .1 MFD. 100 V.	C-720-71	R5 500,000 Ω .25 W.	B-5458-28			L5 NO. 1 OSC. TRANS.	A-12055-2
C19 .2 MFD. 200 V.	C-720-90	R6 50,000 Ω .5 W.	B-4114-34				
C20 .006-.006 MFD. 600 V.	C-720-132	R7 1,000,000 Ω .25 W.	B-5458-40				

MODELS 1116X, 1166, 1166XP
1166XS, 1176, 1176XP
1176XS, 1186, 1196

SPARKS WITHINGTON CO.

November 15, 1935



C1 VARIABLE CONDENSER B-6218-1	C20 .0001 MFD. MOLDED C-720-318	C39 .006-.006 MFD. 600V. C-720-112	R10 50,000 Ω .25 W.	B-5458-27	R24 50,000 Ω W.	B-4540-7	L5 BC & NO. 4 BAND R.F. COIL A-11213
C2 NO. 1 I.F. TRIMMER A-11364-A	C21 .00005 MFD. MOLDED C-720-320	C40 .2 MFD. 600 V. C-720-93	R11 50,000 Ω .25 W.	B-5458-27	R25 3000 Ω .10 W.	B-5029-5	L6 NO. 3 & 5 BAND R.F. COIL A-11214
C3 NO. 2 I.F. TRIMMER A-11364-A	C22 .00005 MFD. MOLDED C-720-321	C41 .5 MFD. 400 V. C-720-100	R12 50,000 Ω .25 W.	B-5458-27	R26 1500 Ω .25 W.	B-5458-48	L7 L.W. OSC. COIL A-12052-2
C4 NO. 3 I.F. TRIMMER A-11364-A	C23 .00025 MFD. MOLDED C-720-319	C42 .0005 MFD. MOLDED C-720-331	R13 10 Ω 1 W.	B-6569-1	R27 250,000 Ω .25 W.	B-5458-39	L8 BC & NO. 4 BAND OSC. A-11215
C5 NO. 4 (A & B) ANT. TRIM A-12333	C24 .002 MFD. MOLDED C-720-288	C43 .1 0 MFD. 25 V ELECT A-10377	R14 3,000 Ω .25 W.	B-5458-19	R28 5,000 Ω 3 W.	B-4539-6	L9 NO. 3 & 5 BAND OSC. A-11216
C6 NO. 3 (A & B) ANT. TRIM A-12334	C25 .05 MFD. 200 V. C-720-54	C44 .12 MMFD. A-10896	R15 100,000 Ω NOISE SUPP. A-10446	B-5458-28	R29 100,000 Ω TONE CON. A-11334-1	L10 NO. 1 I.F. COIL A-6314-16
C7 NO. 4 (A & B) R.F. TRIM. A-12333	C26 .05 MFD. 200 V. C-720-54	C45 .16-8 MFD. ELECT. A-12330	R16 500,000 Ω .25 W.	B-5458-28	R30 300 Ω 2 W.	B-6535-2	L11 NO. 2 I.F. COIL A-6314-16
C8 NO. 3 (A & B) R.F. TRIM. A-12334	C27 .05 MFD. 200 V. C-720-54	C46 8-8 MFD. ELECT. A-11223-1	R17 100,000 Ω .25 W.	B-5458-30	R31 1,000,000 Ω .25 W.	B-5458-40	L12 NO. 3 I.F. COIL A-6314-17
C9 NO. 2 (A & B) OSC. TRIM A-12333	C28 .1 MFD. 200 V. C-720-67		R18 2,000,000 Ω .25 W.	B-5458-26			L13 14.5 M.H. CHOKE A-3506-1
C10 NO. 3 (A & B) OSC. TRIM A-12334	C29 .1 MFD. 100 V. C-720-62		R19 1,500,000 Ω .25 W.	B-5458-49			L14 14.5 M.H. CHOKE A-3506-1
C11 NO. 1 (A & B) OSC. PADDER A-10846-2	C30 .1 MFD. 100 V. C-720-62	R1 500,000 Ω V.C. & SWITCH A-12228	R20 25,000 Ω 1 W.	B-4540-6	L1 L.W. ANT. COIL A-12293-5	L15 CHOKE COIL A-12371
C12 NO. 3 (A & B) OSC. PADDER A-10846-3	C31 .1 MFD. 100 V. C-720-62	R2 400 Ω .5 W.	B-4114-44	R21 25,000 Ω 1 W.	B-4540-6	L2 BC & NO. 4 BAND ANT. C. A-11211	
C13 L.W. PADDER A-12229	C32 .1 MFD. 100 V. C-720-66	R3 400 Ω .5 W.	B-4114-44	R22 10,000 Ω 1 W.	B-4540-9	L3 NO. 3 & 5 BAND ANT. COIL A-11212	
C14 L.W. ANT. TRIM. A-12023-1	C33 .2 MFD. 200 V. C-720-92	R4 400 Ω .5 W.	B-4114-44	R23 5,000 Ω .25 W.	B-5458-45	L4 L.W. R.F. COIL A-12293-5	
C15 L.W. R.F. TRIM. A-12023-1	C34 .025 MFD. 600 V. C-720-34	R5 1000 Ω 25 W.	B-5458-35				
C16 8 TO 9 MMFD. A-11261	C35 .025 MFD. 600 V. C-720-34	R6 1000 Ω .25 W.	B-5458-35				
C17 .001 MFD. MOLDED C-720-297	C36 .025 MFD. 400 V. C-720-35	R7 5000 Ω 1 W.	B-4540-16				
C18 .001 MFD. MOLDED C-720-297	C37 .025 MFD. 400 V. C-720-35	R8 3000 Ω 1 W.	B-4540-15				
C19 .001 MFD. MOLDED C-720-318	C38 .1 MFD. 400 V. C-720-61	R9 50,000 Ω .25 W.	B-5458-27				

INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF SOCKET CONNECTIONS SHOWN

MODELS 1116X,1166,1166XP
1166XS,1176,1176XP
1176XS,1186,1196

SPARKS WITHINGTON CO.

VOLTAGE-RESISTANCE CHART

MODELS 1466,1476
Voltage,Resistance,Socket
Trimmers

Line Voltage: 110 volts
Position of Tone Control: High

Position of Volume Control: Full with Antenna Disconnected
Position of Band Selector Switch: Broadcast Band
Position of Inter-station Noise Suppressor: Full sensitivity

Tube	Function	Voltage and Resistance of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram)									
		Measurement	Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8	Grid Cap
6K7	R-F Amplifier	Volts	0	*	230	125	0	-	*	0	0
		Ohms	0	0	30000	24000	0	-	0	500	1 meg.
6L7	1st. Detector	Volts	0	*	225	190	0	-	*	0	0
		Ohms	0	0	30000	28000	55000	-	0	1000	1 meg.
6C5	Oscillator	Volts	0	*	240	-	150	-	*	0	-
		Ohms	0	0	50000	-	55000	-	0	0	-
6K7	1st. I-F Amplifier	Volts	0	*	200	110	0	-	*	0	0
		Ohms	0	0	30000	22500	0	-	0	0	1 meg.
6K7	2nd. I-F Amplifier	Volts	0	*	290	125	0	-	*	0	0
		Ohms	0	0	32000	22500	0	-	0	0	0
6H6	2nd. Detector, AVC.	Volts	0	*	0	0	0	-	*	0	-
		Ohms	0	0	150000	0	150000	-	0	0	-
6C5	1st. A-F Amplifier	Volts	0	*	210	-	0	-	*	0	-
		Ohms	0	0	95000	-	0	-	0	1000	-
6C5	2nd. A-F Amplifier	Volts	0	*	230	-	0	-	*	0	-
		Ohms	0	0	70000	-	500000	-	0	1500	-
(2) 6F6	Power Amplifiers	Volts	0	*	300	300	0	-	*	0	-
		Ohms	0	0	35000	34000	2000	-	0	300	-
5Z3	Rectifier	Volts	0	360	360	0	-	-	-	-	-
		Ohms	35000	0	0	35000	-	-	-	-	-
6E5	Viso-Glo	Volts	*	40	225	0	0	*	-	-	-
		Ohms	0	1 meg.	1 meg.	30000	0	0	-	-	-

SUPER-POWER AUDIO AMPLIFIER UNIT *ON MODELS 1466 & 1476 ONLY*

(2) 6A6	Power Amplifiers	Volts	0	340	0	0	0	350	0	-	-
		Ohms	0	6500	0	0	0	6500	0	-	-
5Z3	Rectifier	Volts	5	320	320	0	-	-	-	-	-
		Ohms	6500	0	0	6500	-	-	-	-	-

Notes: Voltage and resistance readings are for schemetic diagram shown on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All measurements made with Weston Selective Analyzer No. 665, Type 2.

* Reading will be 6.3 or zero volts, depending on twist of filament hook-up wire.

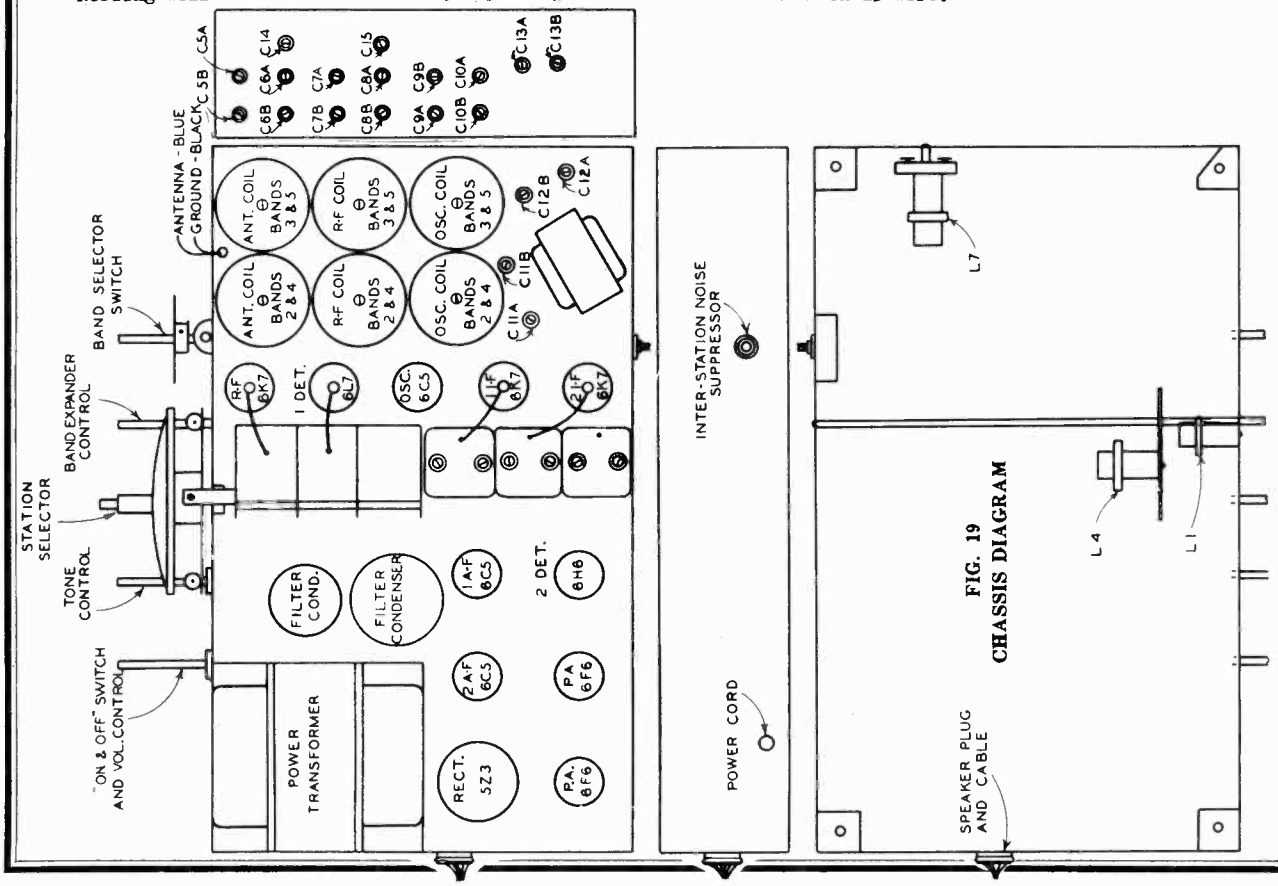


FIG. 19
CHASSIS DIAGRAM

SPARKS WITHINGTON CO.

MODELS 1116X, 1166, 1166XP
1166XS, 1176, 1176XP
1176XS, 1186, 1196
MODELS 1466, 1476
Alignment, Phonograph, Data

The use of quality test equipment is highly recommended and a good test oscillator becomes a virtual necessity when aligning the all-wave type of receiver. Due to the fact that the ear cannot distinguish small changes in sound intensity, an output meter is essential to the proper adjustment of the various condensers.

Unless otherwise specified, the adjusting of any condenser consists of turning the adjusting screw or nut to the right or left until the output meter registers the greatest deflection.

1. EQUIPMENT REQUIRED

A. Modulated test oscillator (crystal controlled or accurately calibrated) capable of generating frequencies from 456 to 18,000 kilocycles (18 megacycles).

B. Output meter.

C. Part A-7613 adjusting wrench.

D. Dummy antennas, consisting of a 150 mmf. condenser and a 400 ohm non-inductive resistor.

2. STEP BY STEP PROCEDURE

Note: For proper alignment of these chassis, the procedure should be followed in the same order as given.

In the following procedure, the long wave band (brown section of the dial) will be termed Band No. 1; the broadcast band (black section of the dial), Band No. 2; the first short wave band (green section of the dial), Band No. 3; the second short wave band (red section of the dial), Band No. 4; and the third short wave band (blue section of the dial), Band No. 5.

meshed with the stator plates and set the pointer so that it is parallel with the horizontal lines on the kilocycle scale, and then tighten the set screws.

A. Alignment of Intermediate-Frequency Stages.

(1) Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.

Note: It is advisable to read carefully the operating instructions which accompany the test oscillator before proceeding with any alignment work.

(2) Turn the band selector switch to the No. 2 (broadcast) position and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.

(3) Connect "antenna" of test oscillator to grid cap of the Type 6L7 1st detector tube and "ground" of test-oscillator to chassis frame of receiver. Connect output meter "high tap" from plate of Type 6F6 tube in 11-tube sets or from plate of Type 6A6 in 14-tube sets, to ground. (See Fig. 1, Page 1, Bulletin No. 3-S.)

(4) Tune test oscillator to obtain a signal of 456 kilocycles.

(5) Turn the volume control of the receiver on full and adjust I-F condensers C4, C3 and C2 in the order mentioned. (See Fig. 19). Note: The intermediate-frequency circuits are quite selective and extreme care must be taken to insure proper adjustment, otherwise the set will be weak on the high frequency bands.

Note: It is advisable to retard the inter-station noise suppressor so that the output of the receiver is reduced as the intermediate-frequency circuits are aligned, otherwise the set will be too sensitive to obtain an accurate reading on the output meter.

B. Alignment of Broadcast Band

(1) Disconnect "antenna" lead of oscillator from grid cap of Type 6L7 tube and connect in series with the 150 mmf. condenser dummy antenna to the antenna terminal of the chassis.

The dial pointer should be exactly parallel with the horizontal lines of the kilocycle scale when the condenser plates are fully meshed. If the pointer does not read correctly, loosen the set screws in the large brass collar on the drive shaft. Hold the rotor plates fully

(2) Tune the test oscillator and receiver to a frequency of 1350 kilocycles and adjust condensers C9B, C7A and C5A.

(3) Tune test oscillator and receiver to a frequency of 600 kilocycles and adjust condenser C12B.

(4) Retune the receiver and test oscillator to 1350 kilocycles and make any necessary adjustments on condensers C9B, C7A and C5A.

(5) Calibration and sensitivity of the broadcast band should also be checked at 600 kilocycles, 900 kilocycles and 1350 kilocycles.

C. Alignment of Band No. 1

(1) Turn the band selector switch to Band No. 1 (orange band).

(2) Tune test oscillator and receiver to a frequency of 345 kilocycles and adjust condensers C13B, C15 and C14.

(3) Tune test oscillator and receiver to a frequency of 150 kilocycles and adjust condenser C13A.

(4) Retune test oscillator and receiver to 345 kilocycles and retrim condensers C13B, C15 and C14.

(5) Calibration and sensitivity of this band should also be checked at 150 kilocycles, 172.5 kilocycles and 345 kilocycles.

D. Alignment of Band No. 3

(1) Replace the 150 mmf. condenser dummy antenna with a 400 ohm non-inductive resistor dummy antenna.

(2) Turn the band selector switch to the No. 3 Band position (green section of the dial).

(3) Tune test oscillator and receiver to a frequency of 3 megacycles (3000 kilocycles) and adjust condensers C10A, C8A and C6A.

(4) Tune test oscillator and receiver to a frequency of 1.7 megacycles (1700 kilocycles) and adjust condenser C12A.

(5) Retune test oscillator and receiver to 3 megacycles and check the adjustment of the condensers C10A, C8A and C6A.

(6) Calibration and sensitivity of this band should also be checked at 1.7 megacycles and 3 megacycles.

E. Alignment of Band No. 4

(1) Turn the band selector switch to the No. 4 Band position (red section of the dial).

(2) Tune test oscillator and receiver to a frequency of 7.2 megacycles and adjust condensers C9A, C7B and C5B.

(3) Tune test oscillator and receiver to a frequency of 3.6 megacycles and adjust condenser C11B.

(4) Retune test oscillator and receiver to 7.2 megacycles and re-adjust condensers C9A, C7B and C5B.

(5) Calibration and sensitivity of this band should also be checked at 7.2 megacycles, 6 megacycles and 3.6 megacycles.

Warning: Extreme care must be taken when adjusting condensar C11B in order that adjustment is not made to the image of the signal rather than the fundamental. The image signal is equal to the fundamental minus twice the intermediate-frequency of the receiver. A set that is adjusted to the image frequency instead of the fundamental may be detected by tuning over the band and checking the sensitivity at various points. If a dead spot appears near the center of the band, the adjustable condensers for that band have probably been adjusted to the image instead of the fundamental.

This type of mis-alignment may also be detected by tuning the test oscillator to a frequency of 6 megacycles and the station selector to approximately 6900 kilocycles. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency for 6000 kilocycles would be 6000 kilocycles minus twice 456 kilocycles or approximately 5100 kilocycles. Therefore, a signal of this frequency may be found with a test oscillator generating a 6000 kilocycle signal.

F. Alignment of Band No. 5

(1) Turn the band selector switch to the last short wave band (No. 5 Band position).

(2) Tune test oscillator and receiver to a frequency of 18 megacycles and adjust condensers C10B, C8B and C6B.

(3) Tune test oscillator and receiver to a frequency of 9 megacycles and adjust condenser C11A.

(4) Retune test oscillator and receiver to 18 megacycles and re-check the adjustment of condensers C10B, C8B and C6B.

(5) Calibration and sensitivity of this band should also be checked at 9 megacycles, 12 megacycles and 18 megacycles.

Warning: This band, like Band No. 4, may easily be aligned to the image frequency instead of the fundamental. This may be checked by tuning the test oscillator to a frequency of 15 megacycles and the station selector to approximately 15900 kilocycles. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal frequency for 15 megacycles would be 15,000 kilocycles minus twice 456 kilocycles or approximately 14,100 kilocycles. Therefore, the signal of this frequency may be found with a test oscillator generating a 15 megacycle signal.

WIRING DIAGRAM FOR PHONOGRAPH PICKUP

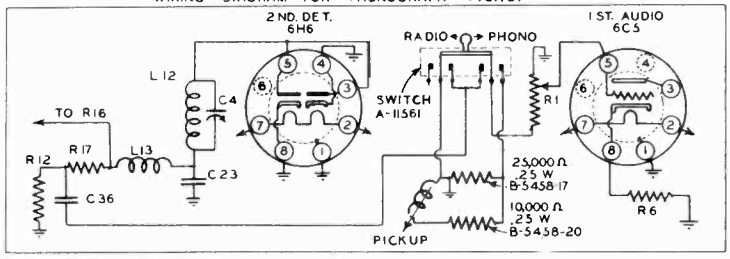
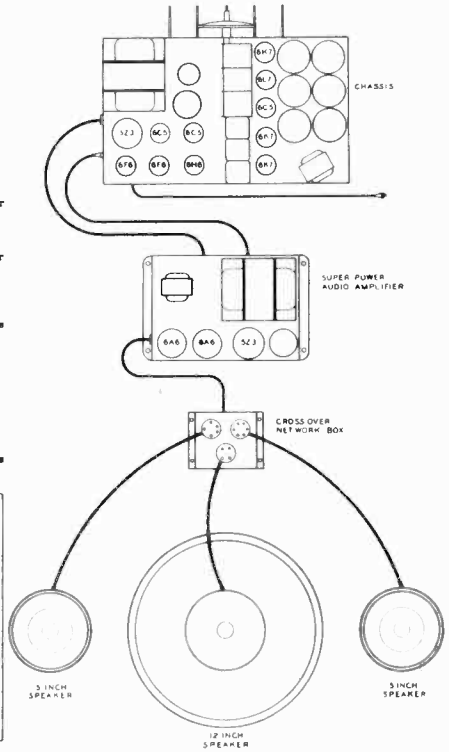


DIAGRAM OF CABLE CONNECTIONS
MODELS 1466 AND 1476



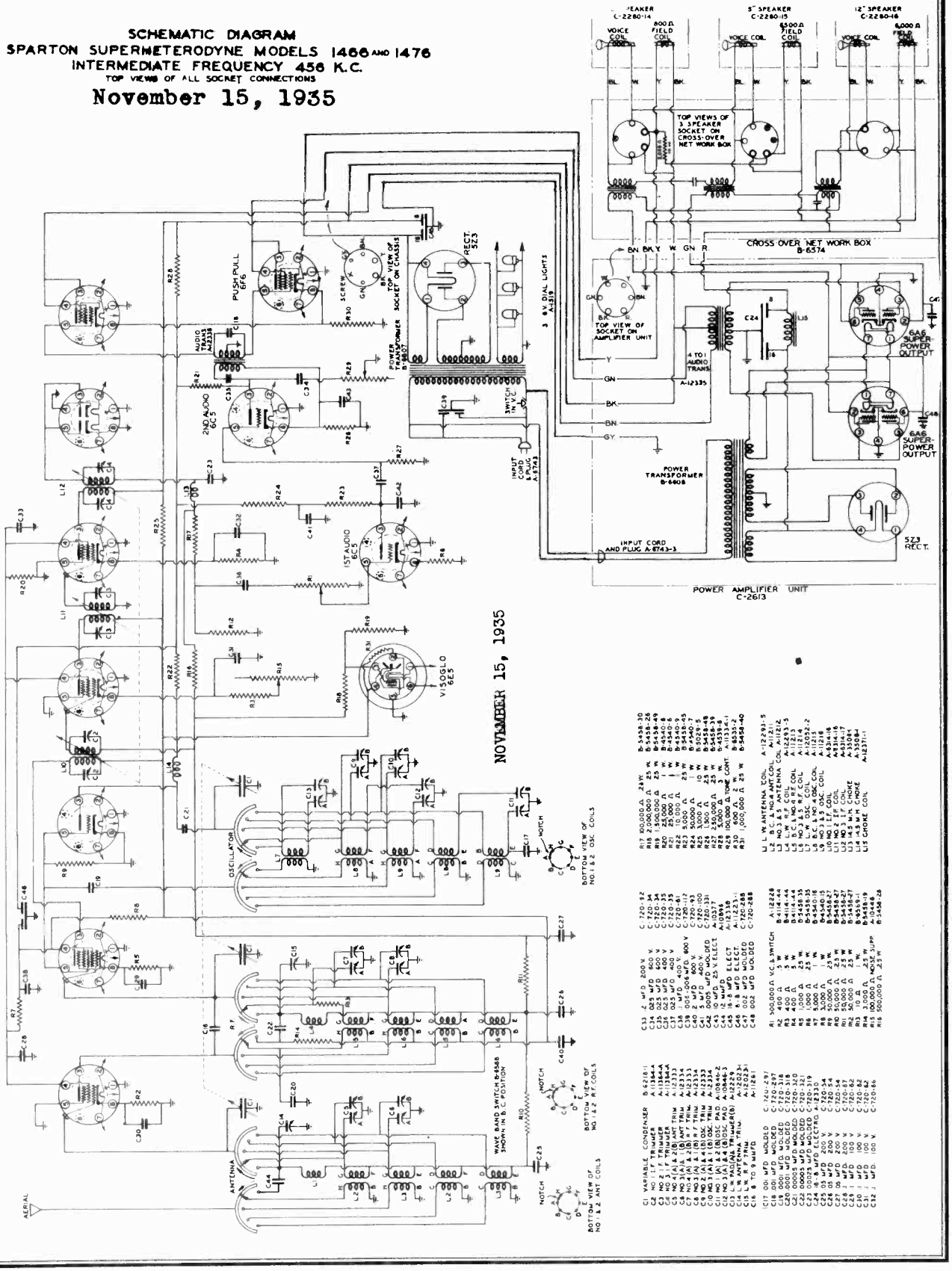
For Phonograph Mechanism of MODELS 1166-XP, 1166-XS, 1176-XS & 1176-XP, see MODELS 85-X, 105-X

MODELS 1466,1476
Schematic,Parts

SPARKS WITHINGTON CO.

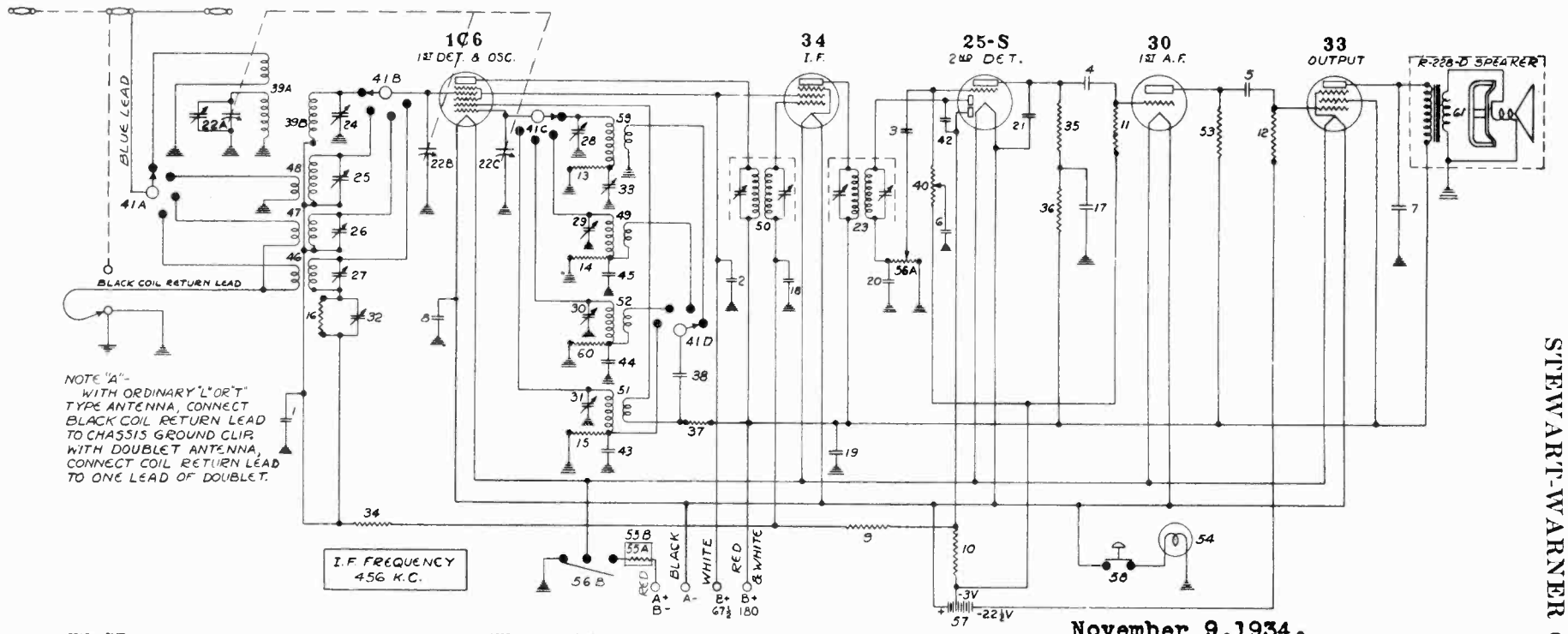
SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODELS 1466 AND 1476
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS

November 15, 1935



STEWART-WARNER CORP.

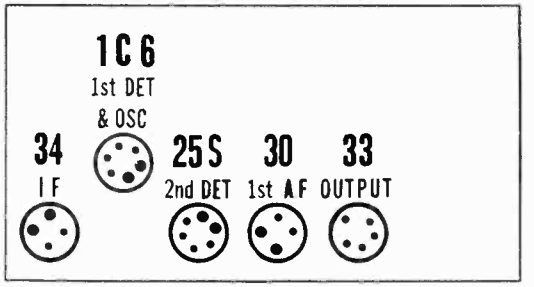
MODELS 1281D to 1289D
Chassis R-128D
Schematic, Socket
Parts



November 9,1934.

TUBE LOCATIONS

FRONT OF SET



DIAG. NO.	PART NO.	DESCRIPTION	LIST PRICE
33	84198	Padding Trimmer (300-600 mmfd.)	$ .50
34	84198	110,000 ohm, 1/4 watt carbon resistor.	.20
35	84198	110,000 ohm, 1/4 watt carbon resistor.	.20
36	84198	110,000 ohm, 1/4 watt carbon resistor.	.20
37	84199	16,000 ohm, 1/4 watt carbon resistor	.20
38	842J0	.004 mfd. molded mica condenser. 500 volt	.50
39A	84229	Broadcast Pre-Selector Coil Assembly	1.00
39B			
40	84368	300,000 ohm, variable Tone Control resistor.	.80
41A			
41B			
41C	84369	Range Switch	1.50
41D			
42	84370	.00011 mfd. molded mica condenser. 500 volt	.15
43	84371	.0004 mfd. molded mica condenser. 500 volt.	.20
44	84372	.006 mfd. molded mica condenser. 500 volt	.60
45	84373	.0015 mfd. molded mica condenser. 500 volt.	.25
46	84377	#4 band antenna coil	.90
47	84381	#3 band antenna coil (substitute #84734)	
48	84385	#2 band antenna coil	.55
49	84387	#2 band oscillator coil.	.55
50	84511	1st. I. F. Transformer	1.75
51	84512	#4 band oscillator coil.	1.00
52	84513	#3 band oscillator coil.	.85
53	84514	51,000 ohm 1/2 watt carbon resistor.	.20
54	84515	Dial light bulb (2.0 volts, .06 amp)	.25
55A	84527	Manganin Resistance wire 5-1/2"	.02
56A	84528	(600,000 ohm volume control) In one unit	1.25
56B		(on-off switch)	
57	84529	22-1/2 volt tapped C battery	
58	84532	Dial light push button switch.	1.00
59	84542	Broadcast oscillator coil.	.75
60	84553	26,000 ohm, 1/4 watt carbon resistor	.20
47	84734	#3 band antenna coil	.75
61	R-228-D	P.M. Speaker and Output Transformer.	12.00

DIAG. NO.	PART NO.	DESCRIPTION	LIST PRICE
55B	87035	Tubing for 84527. 4-3/8"	$ .06
1	81630	.1 mfd. 100 volt tubular paper condenser.	.30
2	81630	.1 mfd. 100 volt tubular paper condenser.	.30
3	83007	.02 mfd. 600 volt tubular paper condenser.	.35
4	83007	.02 mfd. 600 volt tubular paper condenser.	.35
5	83007	.02 mfd. 600 volt tubular paper condenser.	.35
	83011	.004 mfd. 600 volt tubular paper condenser.	.30
	83011	.004 mfd. 600 volt tubular paper condenser.	.30
8	83063	.5 mfd. 100 volt tubular paper condenser.	.45
9	83072	510,000 ohm, 1/4 watt carbon resistor.	.20
10	83072	510,000 ohm, 1/4 watt carbon resistor.	.20
11	83072	510,000 ohm, 1/4 watt carbon resistor.	.20
12	83072	510,000 ohm, 1/4 watt carbon resistor.	.20
13	83080	51,000 ohm, 1/4 watt carbon resistor.	.20
14	83080	51,000 ohm, 1/4 watt carbon resistor.	.20
15	83080	51,000 ohm, 1/4 watt carbon resistor.	.20
16	83082	260,000 ohm, 1/4 watt carbon resistor.	.20
17	83214	.25 mfd. 250 volt tubular paper condenser.	.30
18	83353	.05 mfd. 100 volt tubular paper condenser.	.30
19	83429	.5 mfd. 300 volt tubular paper condenser.	.55
20	83539	.00025 mfd. molded mica condenser. 500 volt.	.25
21	83539	.00025 mfd. molded mica condenser. 500 volt.	.25
22A			
22B	84174	3 gang variable condenser.	4.00
22C			
23	84188	2nd I. F. Transformer.	1.75
24	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
25	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
26	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
27	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
28	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
29	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
30	84194	R. F. Trimmer condenser (3 to 23mmfd.)	.15
31	84196	R. F. Trimmer condenser (3 to 23mmfd.)	.15
32	84195	Padding Trimmer (300-600 mmfd.)	.50

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

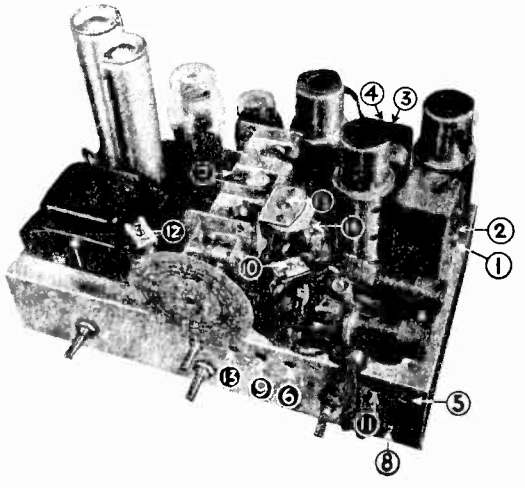
Form 6539 Printed in U.S.A.

MODELS 1281D to 1289D
Chassis R-128D
Trimmers, Alignment

STEWART-WARNER CORP.

CONNECT SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL TUNED TO	RECEIVER WAVE BAND SWITCH AT	PADDER NO.	OUTPUT SIGNAL
1C6	456 KC	Broadcast	Broadcast	1	Max.
	"		"	2	Max.
	"		"	3	Max.
	"		"	4	Max.
		53'	"		
Antenna[2]	1400 KC	140	"	5	Max.
	"	"	"	6[3]	Max.
	"	"	"	7[3]	Max.
	600 KC	60	"	8	Max. (Rock)
	4000 KC	4.0 mc.	1st SW	9[4]	Max.
	"	3.1 mc.[5]	"		
	"	4.0 mc.	"	10	Max.[6]
	"	3.1 mc.[6]			
	12000 KC	12.0 mc.	2nd SW	11[7]	Max.
	"	11.1 mc.[8]			
	"	12.0 mc.		12	
	"	11.1 mc.[9]			
	20000 KC	20.0 mc.	3rd SW	13	Max.
	"	"	"	14	Max.
	12000 KC	12.0 mc.	"	15	Max. (rock)

1. This checks dial position. Mesh condenser fully. Push condenser rotar with fingers to full mesh. Dial should read 53.
2. Connect 400 ohm 1 Watt resistor in series with signal generator lead to antenna.
3. Retune receiver and again readjust trimmers.6 and 7.
4. If there are two peaks -- the correct one is with the trimmer farthest out.
5. This is image signal. If trimmer 9 is correctly adjusted image will be heard. If not heard, repeat 4000 kc. adjustment.
6. This is image signal test. If signal is as strong or stronger than previous 4.0 mc. signal, trimmer 10 is not correctly adjusted. 3.1 mc. signal should be much weaker than 4.0 mc. signal when adjusting trimmer #10.
7. Two peaks possible. Correctly setting is with trimmer farthest out.
8. Image signal test. See item 5 except that test applies to adjustment of trimmer 11.
9. This is test similar to item #6 -- except that trimmer is #12.



*NOTE: This cut shows the R-127 A.C. operated chassis. Trimmer condenser locations are the same on the R-128-D with the exception of the 1st.I.F. trimmers. In the R-128-D the 1st I. F. is contained in a cylindrical can with the trimmers at the top.

On the R-128-D there are no electrolytic condensers and the "C" battery is mounted in the approximate position of the R-127 power transformer.

STEWART-WARNER CORP.

MODELS 1341 to 1349
Chassis R-134
Final schematic note
Trimmers, Alignment

The temporary schematic is the same as the final, except that the fixed condenser that is shunted across the Broadcast Osc. coil (upper coil in No.38) has a value of 11 mmf. The resistance of the speaker field (#11) is 1300 ohms warm.

ALIGNING EQUIPMENT

For the proper alignment of this receiver, an output meter and a high grade modulated service oscillator are essential.

The oscillator should be capable of generating the frequencies of 456 KC., 600 KC., 1400 KC. and a short-wave range extending to 6000 KC. The test oscillator calibration should be checked, using broadcast station signals as standards.

In order that alignment may be carried out without actuating the A.V.C. of the receiver, it must be possible to reduce the output of the test oscillator to a very low value.

For trimmer adjustment, it is advisable to use an all-bakelite screw driver, although one with a small metal tip may be used.

ALIGNING PROCEDURE

The step by step routine given below should be carefully followed. The trimmer numbers referred to are shown in the illustration.

ALIGNING THE I. F. CIRCUIT

1. (a) Connect the output meter across the primary of the output transformer (red and yellow lead terminals on the speaker terminal strip.)
(b) Turn the receiver volume control to maximum volume position.
(Note: The volume control should be kept in this position throughout the entire alignment procedure.) Ground the antenna lead to the chassis.
(c) Adjust the test oscillator to exactly 456 KC. and connect its output to the modulator grid of the 6A7 tube and the chassis.
(d) Adjust all four I.F. trimmers (trimmer groups 1 and 2) for maximum output as indicated on the output meter. Adjust the test oscillator output to give about one half full-scale deflection on the output meter.
(e) Repeat all four adjustments since the changing of each I.F. trimmer affects the others to a certain extent, thus necessitating readjustment.

BROADCAST RANGE CALIBRATION

If the set should require calibration, proceed as follows:
2. (a) Turn the gang condenser to full mesh and check to see that the dial pointer indicates 540 KC. If not, remove the dial glass and turn the pointer to the correct position.
(b) Turn the range switch to the clockwise position.
(c) Connect a 400 or 500 ohm carbon resistor in series with the test oscillator output and the receiver antenna terminal, and connect the oscillator ground lead to the chassis.
(d) Adjust the test oscillator to 1400 KC.
(e) Turn the receiver dial pointer to indicate 1400 KC. on the dial.
(f) Adjust trimmer No. 3 (broadcast oscillator shunt trimmer) for maximum output without changing the setting of the main condenser. Maintain the level of the test oscillator output at a value which gives about one half full-scale deflection on the output meter.

BROADCAST RANGE ALIGNMENT

3. (a) Adjust the test oscillator to 1400 KC. and tune the receiver for maximum output.
(b) Adjust trimmers No. 4 and 5 (broadcast detector and antenna shunt trimmers respectively) for maximum output.
4. (a) Adjust the test oscillator to 600 KC. and tune the receiver to the signal.
(b) Adjust trimmer No. 6 (broadcast oscillator series padder) for maximum output.
(c) Retune the condenser gang to a peak and readjust trimmer No. 6 for maximum output.
(d) Continue to readjust trimmer No. 6 and retune until maximum output is obtained.

SHORT WAVE RANGE CALIBRATION

5. (a) Turn the receiver range switch to the counter-clockwise position.
(b) Adjust the test oscillator output to 6 MC.
(c) Turn the receiver dial pointer to indicate 6 MC. on the dial.
(d) Adjust trimmer No. 7 (short wave oscillator shunt trimmer) for maximum output.
(e) To check for possible adjustment of the receiver to the image frequency, turn the dial pointer to approximately 5.1 megacycles where a repeat signal should be heard. If no response is received here even with greatly increased test oscillator output, retune the dial pointer to 6 MC. and readjust trimmer No. 7 to a peak, with the trimmer screw farther out.

SHORT WAVE RANGE ALIGNMENT

1. Adjust the test oscillator to 6 MC. and carefully tune the receiver to the signal.
2. Adjust trimmers No. 8 and 9 (short wave detector and antenna shunt trimmers respectively) for maximum output.

Stewart Warner R-136 Chassis Alignment

Connect the output indicator across the primary of the output transformer (red and yellow wires on the speaker terminal strip) located under the speaker field cover.

I-f. Alignment:

Turn volume control to maximum and keep it there for entire alignment procedure. Set test oscillator to 456 kc., the i-f. peak, and connect to the 6A8 control grid and the chassis. Adjust the four i-f. trimmers (shown at 1 and 2 on the chassis layout on *page 6-18 of Rider's Volume VI*) for maximum output deflection. Recheck the adjustments.

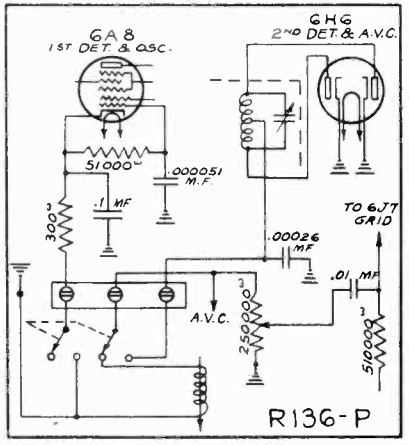
Broadcast Band Calibration:

Check position of dial pointer on shaft by turning the rotor plates to full mesh. The pointer should indicate 540 kc. Turn the range switch to extreme clockwise position. Connect the output of the test oscillator to the set's A and G terminals and ground both set and oscillator. Aqjust test oscillator and dial to 1400 kc. Adjust trimmer No. 3 for maximum output without changing the setting of the condenser gang.

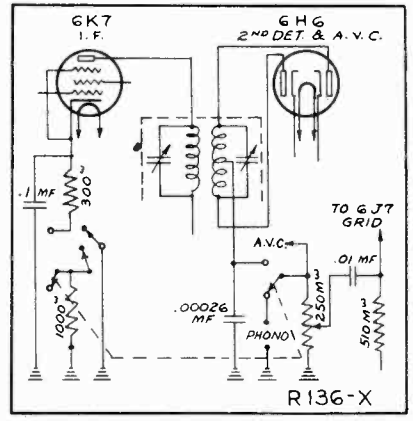
Broadcast Band Alignment:

Connect a 500-ohm carbon resistor in series with the test oscillator output and the set's antenna terminal and let it remain connected for the rest of the adjustments that are outlined below. Set oscillator at 1400 kc. and tune the receiver to the signal for maximum output. Adjust trimmers Nos. 4 and 5 for maximum output. Do not touch trimmer No. 3 as this will change calibration.

Adjust test oscillator to 600 kc. and tune set to this signal. Adjust trimmer No. 6 for maximum output. Retune gang condenser to a peak and readjust trimmer No. 6 for maximum output. Continue to do this until maximum output is obtained.



Schematic diagram of the Stewart Warner R-136-P chassis with phonograph pickup indicated.



The phonograph connections for the Stewart Warner chassis R-136-X.

First S-W. Band Calibration:

Turn range switch to center position. Adjust test oscillator to 5.5 mc. and set the set's dial to the same frequency. Adjust trimmer No. 7 for maximum output. If there are two peaks, the proper one is that with the trimmer screw farthest out.

First S-W. Band Alignment:

Set test oscillator to 5.5 mc. and tune receiver to maximum output. Adjust trimmers Nos. 8 and 9 for maximum output.

Second S-W. Band Calibration:

Be certain that the D to G connector on the receiver terminal strip is in place. Turn the range switch to the extreme counter-clockwise position. Adjust test oscillator to 16 mc. and the dial of the set to the same frequency.

Adjust trimmer No. 10 for maximum output. Check this by tuning the receiver to about 15.1 mc. If a repeat signal is not heard at this point, even with increased test oscillator output, retune the receiver to 16 mc. and adjust trimmer No. 10 to the proper peak with the screw farther out.

Second S-W. Band Alignment:

Adjust test oscillator to 16 mc. and tune set for maximum output. Adjust trimmers Nos. 11 and 12 for maximum output. Check to see if these trimmers are adjusted to the proper signal rather than the image, by tuning the set to approximately 15.1 mc. If the repeat signal is equal to or stronger than that at 16 mc., retune to 16 mc. and readjust Nos. 11 and 12 to the proper peak with the trimmer screws further in.

On *page 6-18 of Rider's Volume VI* appeared the temporary schematic of this chassis, which is used in Models 1361 to 1369 inclusive. The final diagram has now been released with the following changes:

Condenser No. 8, connected between the arm of the tone control and ground, was 0.015 mf. and is now 0.006 mf. The resistance of the tone control, No. 20, is 500,000 ohms.

Condenser No. 9, connected from the plate of the 6J7 to ground, has been changed from 0.00026 mf. to 0.00011 mf.

The left portion of tapped resistor No. 18 is 275 ohms and the right-hand part, that connected to ground, is 25 ohms.

The resistance of the volume control is 250,000 ohms. This is part No 19A.

The notation was omitted from the diagram of voltages that the grid bias on the 6J7 tube is—1.7 volts, measured across the 25-ohm portion of resistor No. 18.

The resistance of the speaker field is 1300 ohms with the coil warm.

Alignment
Chassis R137-P, R-137-X
Phonograph Circuits

STEWART-WARNER CORP.

MODELS 1371 to 1379
Chassis R-137
Final schematic note

The temporary schematic is the same as the final, except for the identification of the following condensers:
The fixed condenser shunting Osc.Coil 35 has a value of 0.000026 mf.
The fixed condenser shunting Osc.Coil 29 has a value of 0.000011 mf.
The resistance of the speaker field(#53) is 430 ohms, warm.

CALIBRATION AND ALIGNMENT

The following procedure on the proper adjustment of the various trimmers is divided into two classifications, calibration and alignment. Calibration is the adjustment of certain trimmers so that the radio signals can be received at the proper dial settings. Calibration of the R-137 is made at the high-frequency end of the dial. Alignment is the adjustment of trimmers so that the antenna and detector circuits are tuned to give maximum sensitivity and selectivity.

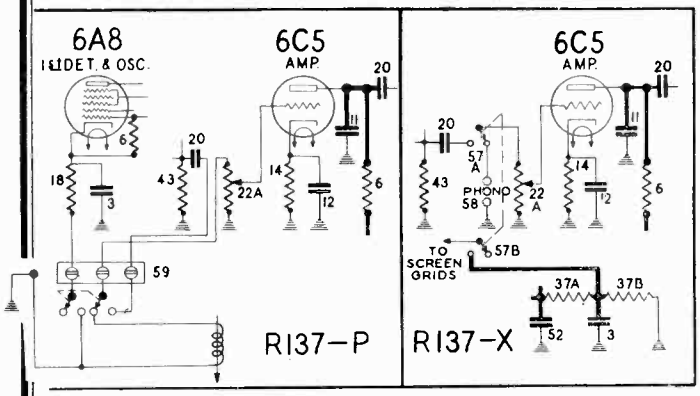
The R. F. calibration and alignment of each band is independent of all others, so that one band may be re-calibrated or re-aligned without affecting the trimmer adjustments on any of the other bands.

ALIGNMENT OF THE I. F. AMPLIFIER

1. (a) Turn the volume control to maximum volume position and keep it in this position throughout the entire alignment procedure.
(b) Connect the test oscillator output leads to the 6A8 control grid and the chassis, and set the test oscillator to exactly 456 KC. Adjust the output of the test oscillator to give about half of full scale deflection on the output meter.
(c) Adjust the four I. F. transformer trimmers (trimmer groups 1 and 2) for maximum output meter deflection.
(d) Repeat the four trimmer adjustments, since the adjustment of each trimmer has some effect on the others.

BAND NO. 1 (LONG WAVE) CALIBRATION

2. (a) Check the position of the dial pointer on its shaft by turning the rotor plates of the gang condenser to full mesh. The upper dial pointer should then coincide with the 540 KC. mark on the broadcast band scale. If it does not, hold the dial gear and turn the pointer to the correct position.
(b) Turn the range switch control to the extreme right position. (Clockwise)
(c) **Connect a 400 or 500 ohm carbon resistor in series with the test oscillator output and the receiver antenna terminal (Note: This resistor should remain connected for all subsequent adjustments).**
(d) Ground the receiver.
(e) Adjust the test oscillator to exactly 360 KC.
(f) Turn the receiver dial pointer to 360 KC. on the tuning dial.
(g) Adjust trimmer No. 3, for maximum output without changing the setting of the condenser gang.



PHONOGRAPH MODEL CIRCUITS

BAND NO. 1 (LONG WAVE) ALIGNMENT

3. (a) With the test oscillator set at 360 KC., tune the receiver to the signal for maximum output.
(b) Adjust trimmers No. 4 and No. 5 for maximum output. Do not touch trimmer No. 3 as this will change the calibration.
4. (a) Set the test oscillator to 180 KC. and tune the receiver to this signal.
(b) Adjust trimmer No. 6 for maximum output.
(c) Retune the set to get maximum output, and readjust trimmer No. 6 for maximum output. Continue to readjust trimmer No. 6 and retune until maximum output is obtained.

BAND NO. 2 (BROADCAST) CALIBRATION

5. (a) Turn the range switch control to the position second from the right.
(b) Adjust the test oscillator to exactly 1400 KC.
(c) Turn the receiver dial pointer to 1400 KC. on the tuning dial.
(d) Adjust trimmer No. 7 for maximum output without changing the setting of the condenser gang.

BAND NO. 2 (BROADCAST) ALIGNMENT

6. (a) With the test oscillator set at 1400 KC. tune the receiver to the signal for maximum output.
(b) Adjust trimmers No. 8 and 9 for maximum output.
Do not touch trimmer No. 7 as this will change the calibration.
7. (a) Adjust the test oscillator to 600 KC. and tune the receiver to this signal.
(b) Adjust trimmer No. 10 for maximum output.
(c) Retune the set and readjust trimmer No. 10 for maximum output. Continue to readjust trimmer No. 10 and retune until maximum output is obtained.

BAND NO. 3 CALIBRATION

8. (a) Turn the range switch control to the position third from the right.
(b) Adjust the test oscillator to 5.5 MC.
(c) Turn the receiver dial pointer to 5.5 MC. on the tuning dial.
(d) Adjust trimmer No. 11 for maximum output. If there are two peaks the proper one is that with the trimmer screw farthest out.

BAND NO. 3 ALIGNMENT

9. (a) With the test oscillator set at 5.5 megacycles, tune the receiver for maximum output.
(b) Adjust trimmers No. 12 and 13 for maximum output.

BAND NO. 4 CALIBRATION

10. (a) Be sure the D to G connector on the receiver terminal strip is in place.
(b) Turn the range switch control to the extreme left (counter-clockwise).
(c) Adjust the test oscillator to 16 MC.
(d) Turn the receiver dial pointer to 16 MC. on the tuning dial.
(e) Adjust trimmer No. 14 for maximum output. Check to see that it has been adjusted to the proper peak, by tuning the receiver to approximately 15.1 MC. If a repeat signal is not heard at this point, even with greatly increased oscillator output, retune the receiver to 16 MC. and adjust trimmer No. 14 to the proper peak with the trimmer screw farther out.

BAND NO. 4 ALIGNMENT

11. (a) Adjust the test oscillator to 16 MC.
(b) Tune the receiver for maximum output.
(c) Adjust trimmers No. 15 and 16 for maximum output.

R-137-X & R-137-P PARTS

57A & B	84404	Phonograph toggle switch (D.P.D.T.) (137-X only)	1.10
58	84407	Phonograph terminal strip (137-X only)	.12
59	84412	Three-lug terminal strip (137-P only)	.03
	85764	40 mfd. 100 volt electrolytic condenser	2.00
	85835	Power transformer (100 to 240 volts, 25 to 133 cycles)	12.50

MODELS 1381 to 1389
Chassis R-138
Final schematic note
Alignment

STEWART-WARNER CORP.

Chassis R-138P,R-138X
Phonograph Circuits

CALIBRATION AND ALIGNMENT

The following procedure on the proper adjustment of the various trimmers is divided into two classifications, calibration and alignment. Calibration is the adjustment of certain trimmers so that the radio signals can be received at the proper dial settings. Calibration of the R-138 is made at the high-frequency end of the dial. Alignment is the adjustment of trimmers so that the antenna and detector circuits are tuned to give maximum sensitivity and selectivity.

The R.F. calibration and alignment of each band is independent of all others, so that one band may be re-calibrated or re-aligned without affecting the trimmer adjustments on any of the other bands.

ALIGNMENT OF THE I. F. AMPLIFIER

1. (a) Turn the volume control to maximum volume position and keep it in this position throughout the entire alignment procedure.

(b) Connect the test oscillator output leads to the 6A8 control grid and the chassis, and set the test oscillator to exactly 456 KC. Adjust the output of the test oscillator to give about half of full scale deflection on the output meter.

(c) Adjust the six I. F. transformer trimmers (trimmer groups 1, 2 and 3) for maximum output meter deflection.

(d) Repeat the six trimmer adjustments, since the adjustment of each trimmer has some effect on the others.

BAND NO. 1 (LONG WAVE) CALIBRATION

2. (a) Check the position of the dial pointer on its shaft by turning the rotor plates of the gang condenser to full mesh. The upper dial pointer should then coincide with the 540 KC. mark on the broadcast band scale. If it does not, hold the dial gear and turn the pointer to the correct position.

(b) Turn the range switch control to the extreme right position. (Clockwise)

(c) Connect a 400 or 500 ohm carbon resistor in series with the test oscillator output and the receiver antenna terminal (Note: this resistor should remain connected for all subsequent adjustments).

(d) Ground the receiver.

(e) Adjust the test oscillator to exactly 360 KC.

(f) Turn the receiver dial pointer to 360 KC. on the tuning dial.

(g) Adjust trimmer No. 4 for maximum output without changing the setting of the condenser gang.

BAND NO. 1 (LONG WAVE) ALIGNMENT

3. (a) With the test oscillator set at 360 KC., tune the receiver to the signal for maximum output.

(b) Adjust trimmers No. 5 and No. 6 for maximum output. Do not touch trimmer No. 4 as this will change the calibration.

4. (a) Set the test oscillator to 180 KC. and tune the receiver to this signal.

(b) Adjust trimmer No. 7 for maximum output.

(c) Retune the set to get maximum output, and readjust trimmer No. 7 for maximum output. Continue to readjust trimmer No. 7 and retune until maximum output is obtained.

BAND NO. 2 (BROADCAST) CALIBRATION

5. (a) Turn the range switch control to the position second from the right.

(b) Adjust the test oscillator to exactly 1400 KC.

(c) Turn the receiver dial pointer to 1400 KC. on the tuning dial.

(d) Adjust trimmer No. 8 for maximum output without changing the setting of the condenser gang.

BAND NO. 2 (BROADCAST) ALIGNMENT

6. (a) With the test oscillator set at 1400 KC. tune the receiver to the signal for maximum output.

(b) Adjust trimmers No. 9 and 10 for maximum output. Do not touch trimmer No. 8 as this will change the calibration.

7. (a) Adjust the test oscillator to 600 KC. and tune the receiver to this signal.

(b) Adjust trimmer No. 11 for maximum output.

(c) Retune the set and readjust trimmer No. 11 for maximum output. Continue to readjust trimmer No. 11 and retune until maximum output is obtained.

BAND NO. 3 CALIBRATION

8. (a) Turn the range switch control to the position third from the right.

(b) Adjust the test oscillator to 5.5 MC.

(c) Turn the receiver dial pointer to 5.5 MC. on the tuning dial.

(d) Adjust trimmer No. 12 for maximum output. If there are two peaks the proper one is that with the trimmer screw farthest out.

BAND NO. 3 ALIGNMENT

9. (a) With the test oscillator set at 5.5 MC., tune the receiver for maximum output.

(b) Adjust trimmers No. 13 and 14 for maximum output.

BAND NO. 4 CALIBRATION

10. (a) Be sure the D to G connector on the antenna terminal strip is in place.

(b) Turn the range switch control to the extreme left (counter-clockwise).

(c) Adjust the test oscillator to 16 MC.

(d) Turn the receiver dial pointer to 16 MC. on the tuning dial.

(e) Adjust trimmer No. 15 for maximum output. Check to see that it has been adjusted to the proper peak, by tuning the receiver to approximately 15.1 MC. If a repeat signal is not heard at this point, even with greatly increased oscillator output, retune the receiver to 16 MC. and adjust trimmer No. 15 to the proper peak with the trimmer screw farther out.

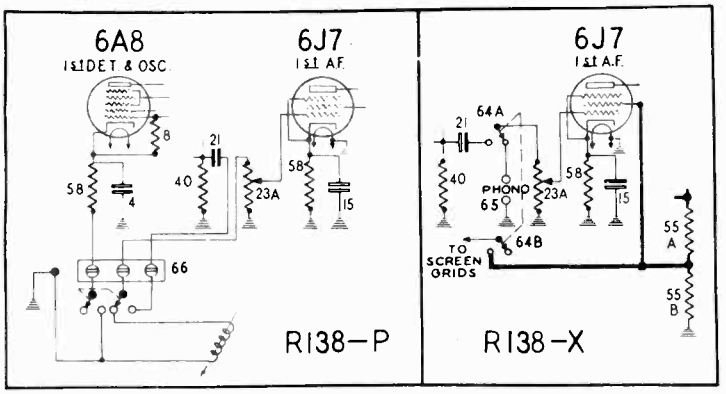
BAND NO. 4 ALIGNMENT

11. (a) Adjust the test oscillator to 16 MC.

(b) Tune the receiver for maximum output.

(c) Adjust trimmers No. 16 and 17 for maximum output.

The temporary schematic is the same as the final, except for the identification of the following condensers:
The fixed condenser shunting Osc.Coil 36 has a value of 0.000026 mf.
The fixed condenser shunting Osc.Coil 30 has a value of 0.000011 mf.
The resistance of the speaker field(50) is 430 ohms warm.



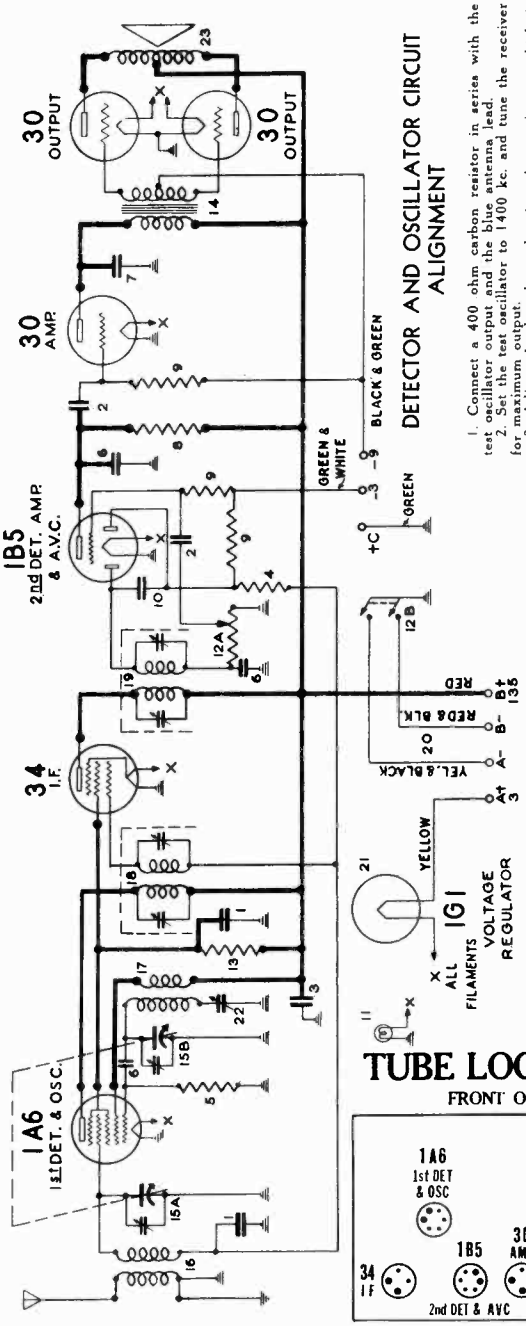
PHONOGRAPH MODEL CIRCUITS

R-138-X and R-138-P PARTS

64A&B	84404	Phonograph toggle switch (D.P.D.T.) (138X only)	1.10
65	84407	Phonograph terminal strip (138X only)	.12
66	84412	3 lug terminal strip (138P only)	.03
	85764	40 mfd. 100 volt electrolytic condenser	2.00
	85768	4 mfd. 150 volt electrolytic condenser	1.50
	85835	Power transformer (100 to 240 volts, 25 to 133 cycle)	12.50

STEWART WARNER CORP.

MODELS 1391D to 1399D
Chassis R-139D
Schematic, Socket, Data
Alignment, Parts



DETECTOR AND OSCILLATOR CIRCUIT ALIGNMENT

1. Connect a 400 ohm carbon resistor in series with the test oscillator output and the blue antenna lead.
2. Set the test oscillator to 1400 kc. and tune the receiver for maximum output.
3. Adjust the broadcast detector shunt trimmer which is located on the top of the section of the condenser gang second from the front, for maximum output.
4. Set the test oscillator to 600 kc. and tune the receiver to the signal.
5. Adjust the oscillator padding trimmer, which is located in the front lower right-hand corner of the chassis, for maximum output.
6. Retune the condenser gang to a peak and readjust the padding trimmer for maximum output.
7. Keep on readjusting the padding trimmer and retuning until maximum output is obtained.

ALIGNING THE I. F. CIRCUIT

1. Turn the receiver volume control to maximum position. (Note: The volume control should be kept in this position throughout the entire alignment procedure.) Ground the antenna lead to the chassis.
2. Adjust the test oscillator to 456 kc. and connect its output to the modulator grid of the 1A6 and the chassis.
3. Adjust all four I. F. trimmers located at the top of the I. F. transformers, for maximum output as indicated on the output meter. Adjust the test oscillator output to give about one half full scale deflection on the output meter. For trimmer adjustment, it is advisable to use an all-bakelite screw driver, although one with a small metal tip may be used.
No inward or sideward pressure should be applied to the alignment tool or the condenser may spring back to a different setting as soon as the tool is removed.
4. Go back and repeat all four adjustments since the changing of each I. F. trimmer affects the others to a certain extent, thus necessitating readjustment.

BATTERIES

Batteries required for operation consist of: 1. Either an Eveready air cell, a large 3 volt dry cell "A" pack, or a 2 volt storage battery. 2. Three 45 volt "B" batteries. 3. Two 4½ volt "C" batteries.

The function of the type 1G1 tube (No. 21 in the circuit diagram is to regulate the voltage applied to the filaments of the various tubes and to maintain it at the proper value throughout the life of the "A" battery. This tube is especially designed to meet the requirements of the receiver.

If an ordinary 2 volt lead storage cell is used for "A" supply, it is necessary that the regulator tube be removed and the two large socket contacts connected together with a short length of wire.

The two 4½ volt "C" batteries are essential to the proper operation of the receiver and for good "B" battery life.

If so desired, a combination "B" and "C" battery "plug in" pack, such as the Burgess G-90-D6, may be used with the R-139-D chassis. The "B" and "C" pack will fit into the console cabinet only, however.

To use the R-139-D chassis with the "B" and "C" pack, it is necessary that the regular battery cables be replaced with the special cables shown in the parts list and having the part numbers 85938 and 85939. These cables have the same color code as the regular cable and can be easily installed. When installing these cables, the green C+ lead is omitted since this connection is made inside the "B" and "C" unit.

NOTE: When a 2 volt storage cell is to be used for filament supply, remove the 1G1 voltage regulator and connect the large socket contacts with a short wire.

DIAL CALIBRATION

If the set should require calibration, proceed as follows:
1. Turn the gang condenser to full mesh and check to see that an indicator on a line directly above the control shaft indicates 540 kc. on the dial. If not, loosen the dial set screw and adjust the dial to the correct position.
2. Connect the test oscillator output to the receiver antenna lead and the chassis, and ground the chassis.
3. Adjust the test oscillator to 1400 kc.
4. Turn the receiver dial to 1400 kc.
5. Adjust the broadcast oscillator shunt trimmer located on the top of the gang condenser section closest to the front, for maximum output without changing the setting of the main condenser. Maintain the level of the test oscillator output at a value which gives about one half full scale deflection on the output meter.

CIRCUIT DESCRIPTION

The R-139-D Battery Receiver is a seven tube superheterodyne with a tuning range from 540 to 1750 KC. which covers the broadcast and first police bands.

The R. F. signal picked up by the antenna is tuned and applied to the modulator grid of the type 1A6 tube, where frequency conversion to 456 KC. takes place. The 456 KC. signal is amplified in the I F. stage which employs a type 34 tube and is then passed on to the 1B5/25S combination second detector, amplifier and A. V. C. tube.

For A. V. C. action, a portion of the I. F. signal is passed from the second I. F. transformer secondary to one of the diode plates through a condenser (No. 10 in the diagram). Rectification takes place in the diode section and a D. C. potential is developed across the diode load resistor (No. 9 on the circuit diagram). This potential is applied through a resistance-capacity filter to the grid returns of the 1A6 and 34 tubes. A slight delay bias is obtained for the A.V.C. action by use of the diode plate which is closest to the positive leg of the filament.

Rectification of the signal takes place in the other diode section of the 1B5 tube also, and results in a modulated D. C. potential which develops across the volume control resistor (No. 12A in the circuit diagram). Any desired portion of the audio component of this voltage may then be applied to the grid of the triode section of the 1B5 where it is still further amplified. The triode is resistance coupled to the type 30 driver tube, which in turn is transformer coupled to two type 30 tubes operating in push-pull Class A prime.

TUBE LOCATIONS

FRONT OF SET

I. F. FREQUENCY 456 KC.

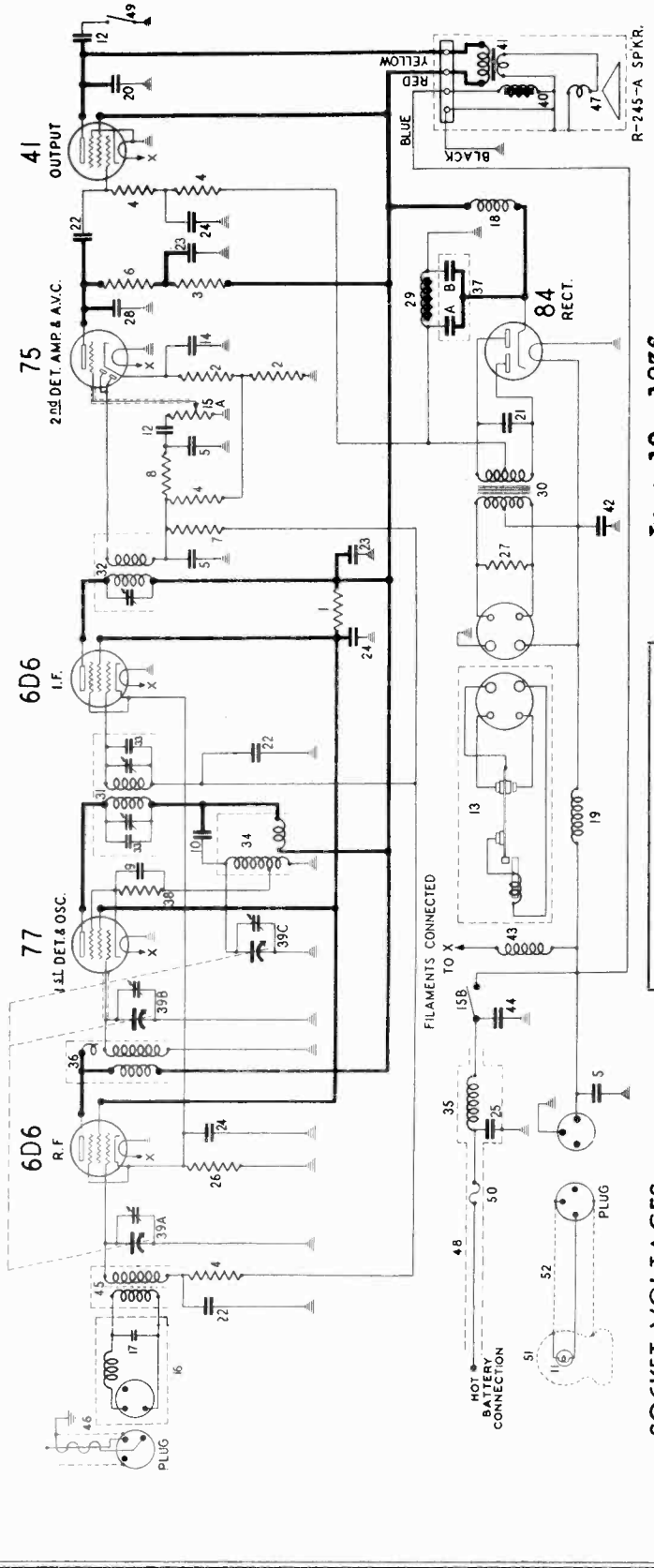
R-139-D PARTS LIST

Diag No.	Part No.	DESCRIPTION	List Price
1	81630	.1 mfd. 175 volt paper condenser	$0.30
2	83007	.02 mfd. 600 volt paper condenser	.35
3	83063	.5 mfd. 150 volt paper condenser	.45
4	83072	510,000 ohm ¼ W. carbon resistor	.15
5	83080	51,000 ohm ¼ W. carbon resistor	.20
6	83539	.00026 mfd. mica condenser	.25
7	83784	.0011 mfd. mica condenser	.22
8	84198	110,000 ohm ¼ W. carbon resistor	.30
9	84235	1.1 megohm ¼ W. carbon resistor	.20
10	84370	.00011 mfd. mica condenser	.15
11	84515	Dial lamp 2.0 volt .060 amp.	.25
12A, 12B	84528	Volume control, 500,000 ohm; Line switch	1.25
13	85116	25,000 ohm ¼ W. carbon resistor	.15
14	85404	Push-pull input transformer	2.50
15A, 15B	85405	Two gang variable condenser	$4.00
16	85406	Antenna coil assembly	1.00
17	85408	Osc. coil assembly	.75
18	85409	1st I.F. transformer	2.50
19	85410	2nd I.F. transformer	2.50
20	85416	Battery cable	.60
21	85420	Voltage regulator tube	1.10
22	85505	Padding trimmer	.50
23	R-234-D	6" magnetic spkr. used on 1391 D	5.75
	R-235-D	8" magnetic spkr. used on 1395 D	6.50
	85938	"A" battery cable 1395 D (special)	.30
	85939	"B" & "C" battery cable & plug 1395 D (special)	1.10

Prices subject to change without notice.

MODELS 1601 to 1609
Chassis R-160
Schematic, Voltage
Parts

STEWART-WARNER CORP.



I.F. FREQUENCY 177.5 KC.

June 10, 1936.

R-1601 PARTS LIST

Diag. No.	Part No.	DESCRIPTION	List Price
1	66023	60,000 ohm 1 watt carbon resistor	$0.25
2	67303	2,000 ohm ¼ watt carbon resistor	.25
3	83080	51,000 ohm ¼ watt carbon resistor	.20
4	83082	260,000 ohm ¼ watt carbon resistor	.20
5	83539	260 mmfd. mica condenser	.25
18	83777	Battery cable and fuse housing	.50
6	84199	110,000 ohm ¼ watt carbon resistor	.20
7	84235	1.1 megohm ¼ watt carbon resistor	.20
8	84238	11,000 ohm ¼ watt carbon resistor	.20
9	84282	.001 mfd. mica condenser	.25
10	84833	70 mmfd. mica condenser	.20
11	85296	Pilot lamp 6-8 volt (bayonet base)	.18
12	88026	.02 mfd. 400 volt paper condenser	.30
49	88031	Tone control switch	.30
13	88156	Vibrator	3.50
14	88170	10 mfd. 25 volt electrolytic condenser	.80
15A, 15B	88171	Volume control 500,000 ohm; Line switch	1.20
16	88172	Antenna Filter	1.20
17	88173	50 mmfd. mica condenser	.20
18	88181	R. F. choke coil	.40
19	88183	R. F. choke coil (to vibrator)	.25
20	88185	.006 mfd. 600 volt paper condenser	.35
21	88187	.01 mfd. 1500 volt paper condenser	.40
22	88189	.05 mfd. 200 volt paper condenser	.35
23	88191	.1 mfd. 300 volt paper condenser	.35
24	88193	.25 mfd. 150 volt paper condenser	.35
25	88195	.5 mfd. 150 volt paper condenser	.50
26	88203	600 ohm ¼ watt carbon resistor	.15
27	88204	210 ohm ½ watt carbon resistor	.15
28	88205	.0021 mfd. mica condenser	.35
29	88210	Filter choke	1.25
30	88213	Power transformer	3.50
31	88222	1st I.F. transformer	2.75
32	88223	2nd I.F. transformer	2.60
33	88233	110 mmfd. mica condenser	.25
34	88234	Oscillator coil and shield assembly	1.50
35	88239	"A" filter	1.00
36	88250	R.F. coil and shield assembly	1.50
37A	88256	{Electrolytic condenser 4 mfd. 350 volt	2.40
37B		{Electrolytic condenser 8 mfd. 350 volt	
38	88257	9,500 ohm ¾ watt carbon resistor	.15
39A to C	88258	Three gang variable condenser	6.00
40	88271	Field coil and housing (for R-245-A spkr.)	2.50
41	88276	Output transformer	2.00
42	88285	1.25 mfd. 150 volt paper condenser	.80
43	88289	R.F. choke (to filaments)	.20
44	88298	.25 mfd. 150 volt paper condenser (low reactance)	.40
45	88312	Antenna coil and shield assem. (iron core)	2.00
46	88327	Antenna cable and plug	1.10
47	88328	Diaphragm and shell assem. (R-245-A spkr.)	2.10
48	83777	Battery cable and fuse housing	.50
49	88054	Tone control switch	.30
50	88365	Fuse, 10 amperes	.05
51	88730	Control head less shafts	4.75
52	88738	Pilot light cable with plug, 31"	.90

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SOCKET VOLTAGES

BOTTOM VIEW

1F — 1st DET. & OSC. — R.F.

	1F	1st DET. & OSC.	R.F.
H	0	5.7	5.7
K	7	see note A	0
SUP	7	0	240
S.G.	110	110	110
P	240	240	SUP 7

RECT. — THESE VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS — CONTROL END

RECT.		
P	240 A.C.	
K	240	
H	5.7	
H	0	
P	240 A.C.	

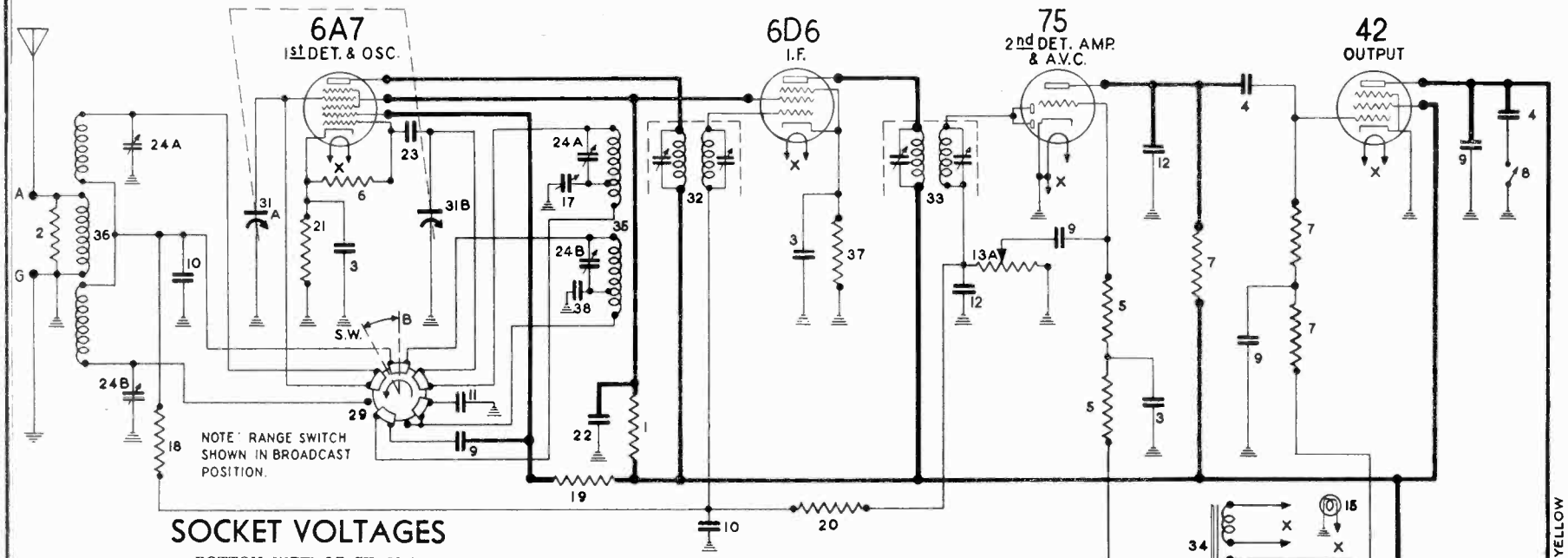
BATTERY VOLTAGE 6.0

ABBREVIATIONS					
D. DIODE	K	15	H	5.7	
G GRID	D	0	H	0	
H HEATER	D	0	P	234	
K CATHODE	P	120	S.G.	240	
P PLATE	H	0	G	see note B	
S.G. SCREEN GRID	H	5.7	K	0	
SUP SUPPRESSOR GRID	2nd DET. AMP & A.V.C.		OUTPUT		

IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. Make allowances for battery voltage variation.
NOTE A: The cathode voltage of the 77 varies from 6 to 10 volts, depending on the gang condenser setting.
NOTE B: The grid bias on the 41 output tube is —18 volts, measured from the chassis to the ungrounded filter choke terminal.

STEWART WARNER CORP.

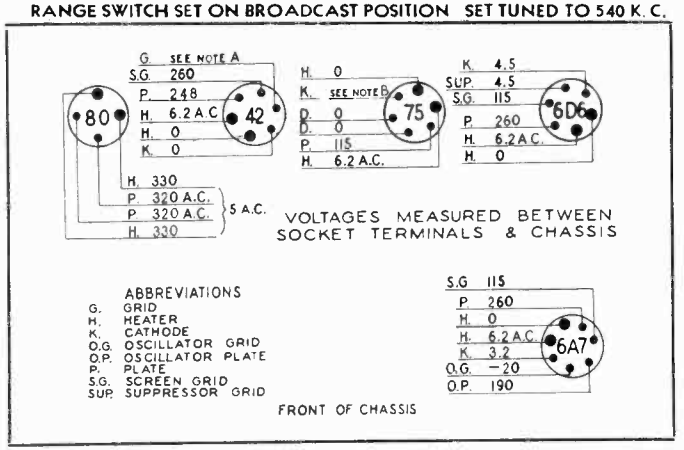
MODELS 1401 to 1409
Chassis R-140
Schematic, Voltage
Socket, Trimmers



SOCKET VOLTAGES

BOTTOM VIEW OF CHASSIS

LINE VOLTAGE 115 VOLTS Volume Control on Full ANTENNA GROUNDED
RANGE SWITCH SET ON BROADCAST POSITION SET TUNED TO 540 K.C.



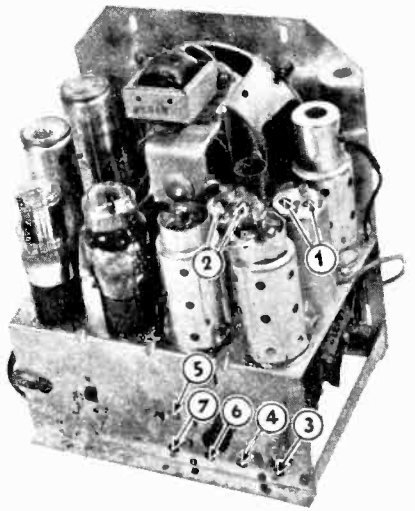
IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. Readings will vary depending upon voltage range of meter, being higher for higher range instruments. This variation is most marked for second detector plate voltage.

Voltage across speaker field with coil warm is 70 volts D. C.

NOTE A: The bias on the 42 output tube is —17.5 volts measured across the metal-clad bias resistor 28A and 28B.

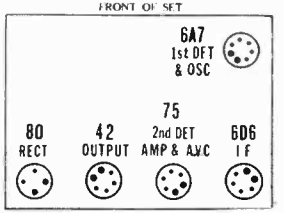
NOTE B: The grid bias on the 75 second detector is —1.5 volts measured across the bias resistor 28A.

Nov. 21, 1935



I.F. FREQUENCY 456 KC.

TUBE LOCATIONS
FRONT OF SET



MODELS 1401 to 1409
Chassis R-140

STEWART WARNER CORP.

ALIGNING EQUIPMENT

For the proper alignment of this receiver, an output meter and a high grade modulated service oscillator are essential.

The oscillator should be capable of generating the frequencies of 456 KC., 600 KC., 1400 KC. and a short wave range extending to 4000 KC. The test oscillator calibration should be checked, using broadcast station signals as standards.

In order that alignment may be carried out without actuating the A.V.C. of the receiver, it must be possible to reduce the output of the test oscillator to a very low value.

ALIGNING PROCEDURE

The step by step routine given below should be carefully followed. The trimmer numbers referred to are shown in the illustration.

ALIGNING THE I. F. CIRCUIT

1. Connect the output meter between the plate of the 42 tube and the chassis through a .25 mfd. condenser or across the voice coil, depending on its type.
2. Turn the receiver volume control to maximum position. (Note: The volume control should be kept in this position throughout the entire alignment procedure.) Ground the antenna lead to the chassis.
3. Adjust the test oscillator to 456 KC. and connect its output to the modulator grid of the 6A7 tube and the chassis.
4. Adjust all four I.F. trimmers shown at 1 and 2, for maximum output as indicated on the output meter. Adjust the test oscillator output to give about one half full scale deflection on the output meter. For trimmer adjustment, it is advisable to use an all-bakelite screw driver, although one with a small metal tip may be used.

No inward or sideward pressure should be applied to the alignment tool or the condenser may spring back to a different setting as soon as the tool is removed.

5. Go back and repeat all four adjustments since the changing of each I. F. trimmer affects the others to a certain extent, thus necessitating readjustment.

BROADCAST RANGE CALIBRATION

If the set should require calibration, proceed as follows:

1. Turn the gang condenser to full mesh and check to see that the dial indicates 540 KC. If not, loosen the dial set screw and adjust the dial to the correct position.
2. Turn the range switch to the clockwise position.
3. Connect the test oscillator output to the receiver antenna lead and the chassis, and ground the chassis.
4. Adjust the test oscillator to 1400 KC.
5. Turn the receiver dial to 1400 KC.
6. Adjust trimmer No. 3 (broadcast oscillator shunt trimmer) for maximum output without changing the setting of the main condenser. Maintain the level of the test oscillator output at a value which gives about one half full scale deflection on the output meter.

BROADCAST RANGE ALIGNMENT

1. Connect a 500 ohm carbon resistor in series with the test oscillator output and the blue antenna lead.
2. Set the test oscillator to 1400 KC. and tune the receiver for maximum output.
3. Adjust trimmer No. 4 (broadcast detector shunt trimmer) for maximum output.
4. Set the test oscillator to 600 KC and tune the receiver to the signal.
5. Adjust trimmer No. 5 (broadcast oscillator series padder) for maximum output.
6. Retune the condenser gang to a peak and readjust trimmer No. 5 for maximum output.
7. Keep on readjusting trimmer No. 5 and retuning until maximum output is obtained.

SHORT WAVE RANGE CALIBRATION

1. Turn the receiver range switch to the counterclockwise position.
2. Adjust the test oscillator output to 4000 KC.
3. Set the receiver dial to 4000 KC.
4. Adjust trimmer No. 6 (short wave oscillator shunt trimmer) for maximum output.
5. To check for possible adjustment of the receiver to the image frequency, tune the dial to approximately 3.1 megacycles where a repeat signal should be heard. If no response is received here even with greatly increased test oscillator output, retune the dial to 4000 KC. and readjust trimmer No. 6 to a peak with the trimmer screw **farther out.**

SHORT WAVE RANGE ALIGNMENT

1. Connect a 500 ohm carbon resistor in series with the test oscillator output and the blue antenna lead.
2. Set the test oscillator for 4000 KC. and carefully tune the receiver to the signal.
3. Adjust trimmer No. 7 (short wave detector shunt trimmer) for maximum output.

Diag. No.	Part No.	DESCRIPTION	List Price
1	62183	30,000 ohm 1 watt carbon resistor	$0.20
2	67303	2000 ohm ¼ watt carbon resistor	.25
3	81630	.1 mfd. 175 volt paper condenser	.30
4	83007	.02 mfd. 600 volt paper condenser	.35
5	83072	510,000 ohm ¼ watt carbon resistor	.15
6	83080	51,000 ohm ¼ watt carbon resistor	.20
7	83082	260,000 ohm ¼ watt carbon resistor	.20
8	83179	Tone control switch	.30
9	83219	.01 mfd. 600 volt paper condenser	.30
10	83353	.05 mfd. 100 volt paper condenser	.30
11	83436	.002 mfd. 1000 volt paper condenser	.25
12	83539	.00026 mfd. mica condenser	.25
13A, 13B	83551	Volume control, 500,000 ohm; Line switch	1.25
14	83976	.012 mfd. 1000 volt paper condenser	.35
15	84058	Pilot lamp 6 volt	.15
16	84193	16 mfd. 350 volt electrolytic condenser	1.50
17	84195	Padding trimmer	.50
18	84198	110,000 ohm ¼ watt carbon resistor	.30
19	84199	16,000 ohm ¼ watt carbon resistor	.20
20	84235	1.1 megohm ¼ watt carbon resistor	.20
21	84888	300 ohm ½ watt wire wound resistor	.15
22	85059	.05 mfd. 300 volt condenser	.35
23	85061	.000051 mfd. mica condenser	.15
24A & B	85087	Dual trimmer condenser	.35
25	85112	16 mfd. 300 volt electrolytic condenser	1.50
26	85843	Output transformer (242-A Speaker)	2.00
27	85846	Field coil and housing (R 242A Spkr.)	3.00
28A, 28B	85849	25 ohm bias resistor; 275 ohm bias resistor	.35
29	85850	Range switch	1.00
30	85852	Diaphragm and shell assembly (R 242A Spkr.)	2.25
31A & B	85853	Two gang variable condenser	3.00
32	85856	1st I.F. Transformer	2.50
33	85857	2nd I.F. Transformer	2.50
34	85865	Power Transformer (R-140-A)	6.00
35	85867	Oscillator coil assembly	1.25
36	85868	Antenna coil assembly	1.50
37	85881	600 ohm ½ watt W.W. resistor	.15
38	85882	.001 mfd. mica condenser	.25
	85963	Power Transformer (R-140-B) 25 cycle	7.50
	85968	Power Transformer (R-140-X) (100-240 volts, 50 cycle)	8.00

Prices subject to change without notice.

MISCELLANEOUS PARTS

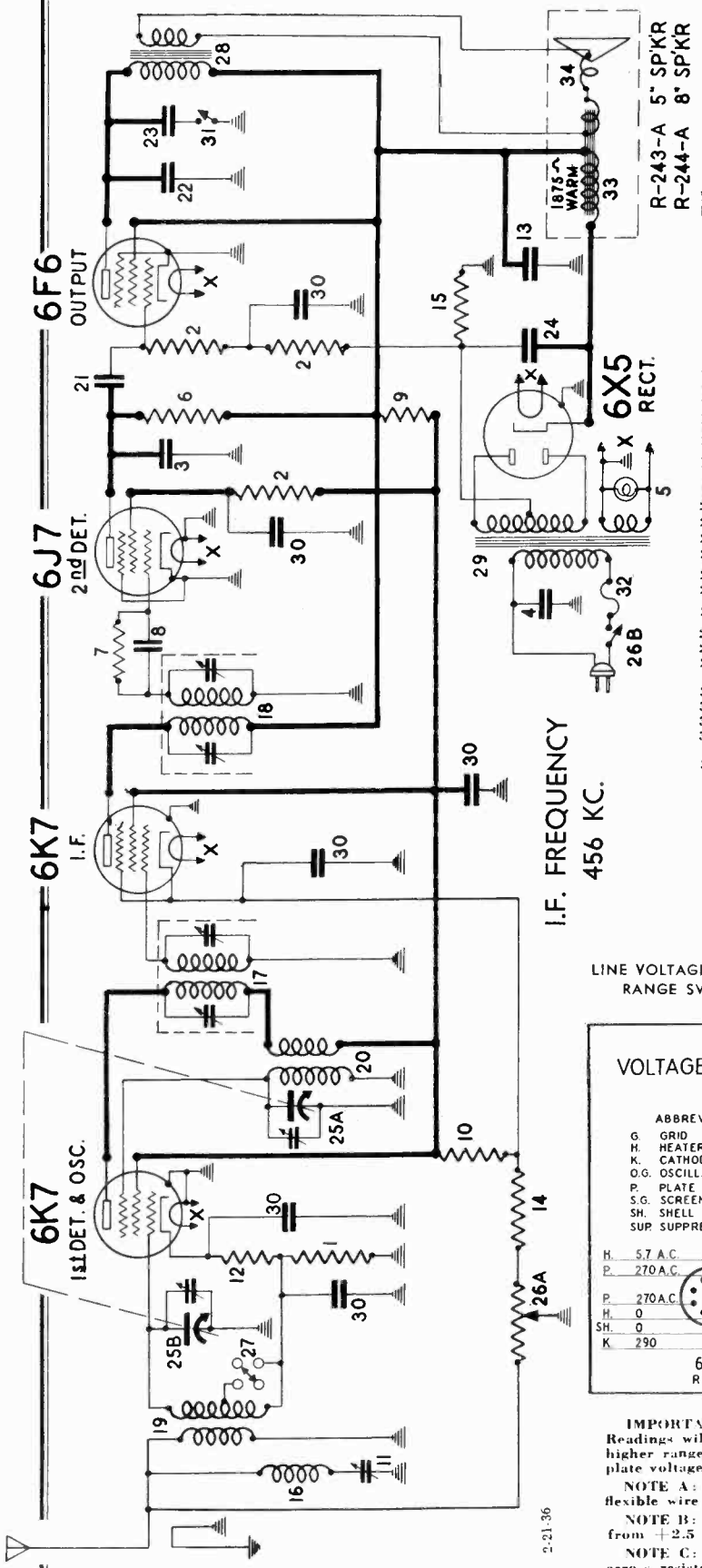
NOT SHOWN ON CIRCUIT DIAGRAM

Part No.	DESCRIPTION	List Price
83560	Tube shield	$0.15
83584	Mounting bushing (rubber)	.03
83587	No. 8 - 32x1¼ inch special mtg. screw	.01
84234	Tube shield cap	.05
85876	Knob	.15

Prices Subject to Change Without Notice

STEWART WARNER CORP.

MODELS 1421 to 1429
Chassis R-142A, R-142AS
Schematic, Voltage, Parts



Diag. No.	Part. No.	DESCRIPTION	List Price
1	71657	3000 Ohm ¼ watt Carbon Resistor	$0.25
2	83082	260,000 Ohm ¼ watt Carbon Resistor	.20
3	83539	260 mmfd. Mica Condenser	.25
4	83976	.012 mfd. 1000 volt Paper Condenser	.35
5	84058	Dial Lamp, 6-8 volt	.15
6	84198	110,000 ohm ¼ watt Carbon Resistor	.30
7	84235	1.1 megohm ¼ watt Carbon Resistor	.20
8	85061	51 mmfd. Mica Condenser	.15
9	85064	10,000 ohm 1 watt Carbon Resistor	.20
10	85266	70,000 ohm ¼ watt Carbon Resistor	.20
11	85285	456 KC. Wave Trap Trimmer	.40
12	85691	500 ohm ½ watt Wire Wound Resistor	.20
13	88007	8 mfd. 250 volt Electrolytic Condenser	1.00
14	88009	200 ohm ½ watt Wire Wound Resistor	.15
15	88010	320 ohm 1½ watt Wire Wound Resistor	.15
16	88014	456 KC. Wave Trap Coil	.50
17	88016	1st I.F. Transformer	2.00
18	88017	2nd I.F. Transformer	2.00
19	88018	Antenna Coil	1.00
20	88019	Oscillator Coil	.70
21	88026	.02 mfd. 400 volt Paper Condenser	.30
22	88029	.004 mfd. 400 volt Paper Condenser	.30
23	88030	.01 mfd. 400 volt Paper Condenser	.30
24	88033	8 mfd. 350 volt Electrolytic Condenser	$1.10
25A & B	88035	2 Gang Variable Condenser	2.75
26 A	88036	Volume Control, 22,000 ohm	1.25
26 B	88036	Line Switch	
27	88037	Range Switch	.60
28	88040	Output Transformer	1.50
29	88044	Power Transformer 115 volt 60 cycle (See 88138 for 115 volt 25 cycle)	4.20
30	88046	.1 mfd. 150 volt Paper Condenser	.30
31	88054	Tone Control Switch	.30
32	88055	¾ Amp. Fuse	.12
33	88085	Field Coil Shell & Brkt. (R-243-A - 5" Spkr.) (See 88120 for R-244-A - 8" Spkr.)	3.75
34	88100	Diaphragm and voice coil (R-243-A - 5" Spkr.) (See 88133 for R-244-A - 8" Spkr.)	1.50
	88120	Field Coil and Housing (R-244A - 8" Spkr.)	3.60
	88133	Diaphragm & Shell Assembly (R-244-A - 8" Spkr.)	2.00
	88138	Power Transformer, 115 volt, 25 cycle	5.50
	R-243A	5" Speaker (on chassis)	4.50
	R-244A	8" Speaker	5.70

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

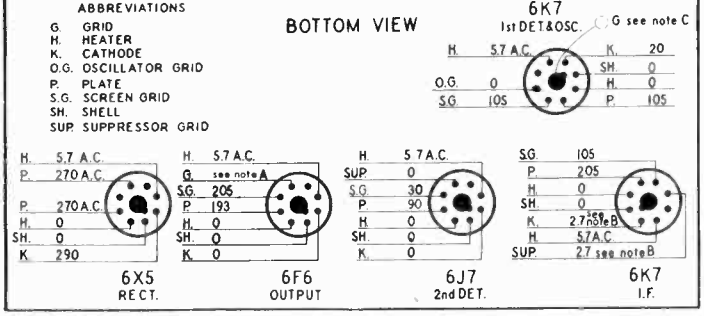
LINE VOLTAGE 115 VOLTS. VOLUME CONTROL ON FULL. ANTENNA GROUNDED
RANGE SWITCH SET ON BROADCAST POSITION. SET TUNED TO 530 KC.

REAR OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS

ABBREVIATIONS
G. GRID
H. HEATER
K. CATHODE
O.G. OSCILLATOR GRID
P. PLATE
S.G. SCREEN GRID
SH. SHELL
SUP. SUPPRESSOR GRID

BOTTOM VIEW



IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. Readings will vary depending upon voltage range of meter, being higher for higher range instruments. This variation is most marked for second detector plate voltage.

NOTE A: The bias on the 6F6 output is —14 volts measured across the flexible wire wound resistor No. 15 in the circuit diagram.

NOTE B: The cathode voltage varies with the setting of the volume control, from +2.5 volts for maximum volume to +30 volts for minimum volume.

NOTE C: Grid voltage for the 6K7 first detector is +17 volts measured across resistor No. 1 in the cathode circuit. Grid bias is —3 volts measured across resistor No. 12.

MODELS 1421 to 1429
Chassis R-142A, R-142AS
Circuit Data, Alignment
Trimmers, Parts

STEWART WARNER CORP.

MISCELLANEOUS PARTS NOT SHOWN ON CIRCUIT DIAGRAM

Part No.	DESCRIPTION	List Price
67590	Flat washer for chassis mtg.	$0.01
81090	Escutcheon mounting screw #1 x ¼ oval head W.S.	.60 per C
83552	Chassis mounting screw #10 x ¾	.03
85427	Tube socket (8 prong)	.15
88053	Dial scale	.30
88056	Fuse holder	.16
88057	Fuse cover	.06
88104	Dial pointer	.04
88105	Dial glass	.50
88106	Dial gasket	.01
88108	Dial escutcheon	.50
88115	Knob (push-on)	.20
88116	Knob (with set screw)	.16

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CIRCUIT DESCRIPTION

The Stewart-Warner chassis Models 142A and 142AS differ only in that the 142AS chassis includes a speaker that is mounted directly on the chassis.

These receivers use a superheterodyne circuit which employs five metal tubes. The intermediate frequency is 456 KC. The tuning range of these chassis includes, in addition to the standard broadcast band, the two police radio bands.

The signal picked up by the antenna is impressed on the primary of the antenna transformer, which has connected across it a wave trap for the purpose of eliminating 456 KC. interference. The signal is then tuned and impressed on the control grid of the 6K7 oscillator and first detector. The suppressor, or No. 3 grid of the 6K7, is used as the oscillator grid. The 456 KC. output of the first detector is amplified in the I. F. stage, using a 6K7 tube.

The second detector is of the grid leak-grid condenser type, and uses a 6J7 tube. The 6J7 is resistance coupled to the 6F6 pentode power amplifier. Bias for the output tube is obtained by grid return connection to the negative end of a resistor connected between the center tap of the power transformer high-voltage winding and ground. The bias potential so obtained is filtered by a resistance-capacity filter.

The volume control is double acting. It simultaneously changes the antenna signal input and the I. F. stage bias. Because of the sensitivity of this receiver, and due to the fact that it does not have A.V.C., it requires an antenna that is shorter than usual. The short antenna is particularly necessary where interference from powerful local stations is encountered, and where difficulty is experienced in properly controlling the volume.

When tuning on the short wave band, local broadcast stations can be heard in the background at their regular positions on the dial. This is a normal condition, and is due to the tapped coil method of tuning the antenna coil secondary to the short wave band. No aligning adjustments are required on the short wave band.

ALIGNING THE I.F. CIRCUIT

1. Connect the output meter in series with a .25 mfd. condenser between the plate of the 6F6 tube and ground, or across the voice coil, depending on the type of meter.
2. Turn the volume control to the maximum volume position. (Note: The volume control should be kept in this position throughout the entire alignment procedure.) Ground the antenna lead to the chassis.
3. Turn the range switch to the right (clockwise) to the broadcast position.
4. Adjust the test oscillator to exactly 456 KC. and connect its output to the control grid of the 6K7 first detector tube and the chassis.
5. Align I. F. trimmers No. 1, 2, 3 and 4 for maximum output as indicated on the output meter. No inward or sideward pressure should be applied to the alignment tool or the condenser may spring back to a different setting as soon as the tool is removed.
6. Repeat all I. F. trimmer adjustments since the changing of each trimmer will affect the others to a certain extent.

456 KC. WAVE TRAP ADJUSTMENT

1. Disconnect the antenna lead from ground.
2. Connect the test oscillator output in series with a 400 ohm carbon resistor to the receiver antenna lead, and connect the test oscillator ground lead to the receiver chassis. Ground the chassis.
3. Without changing the test oscillator from the frequency setting used in aligning the I. F. stage, adjust trimmer No. 5 for **MINIMUM** output. Increase the test oscillator output as a minimum is reached, in order to obtain a clearly defined setting of the trimmer. **NOTE:** If code interference is troublesome on a frequency in the neighborhood of 456 KC., the wave trap should be adjusted for **MINIMUM** output with the test oscillator set to the same frequency as the signal that is causing interference.

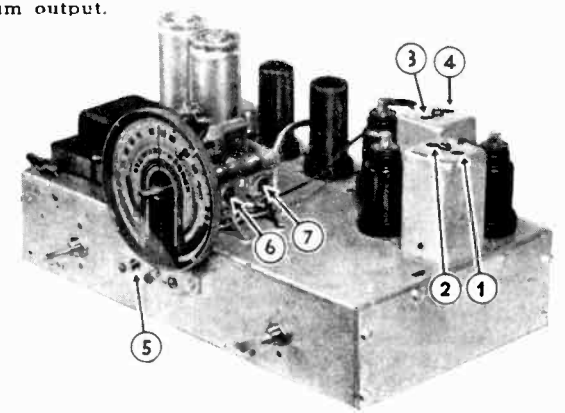
DIAL CALIBRATION

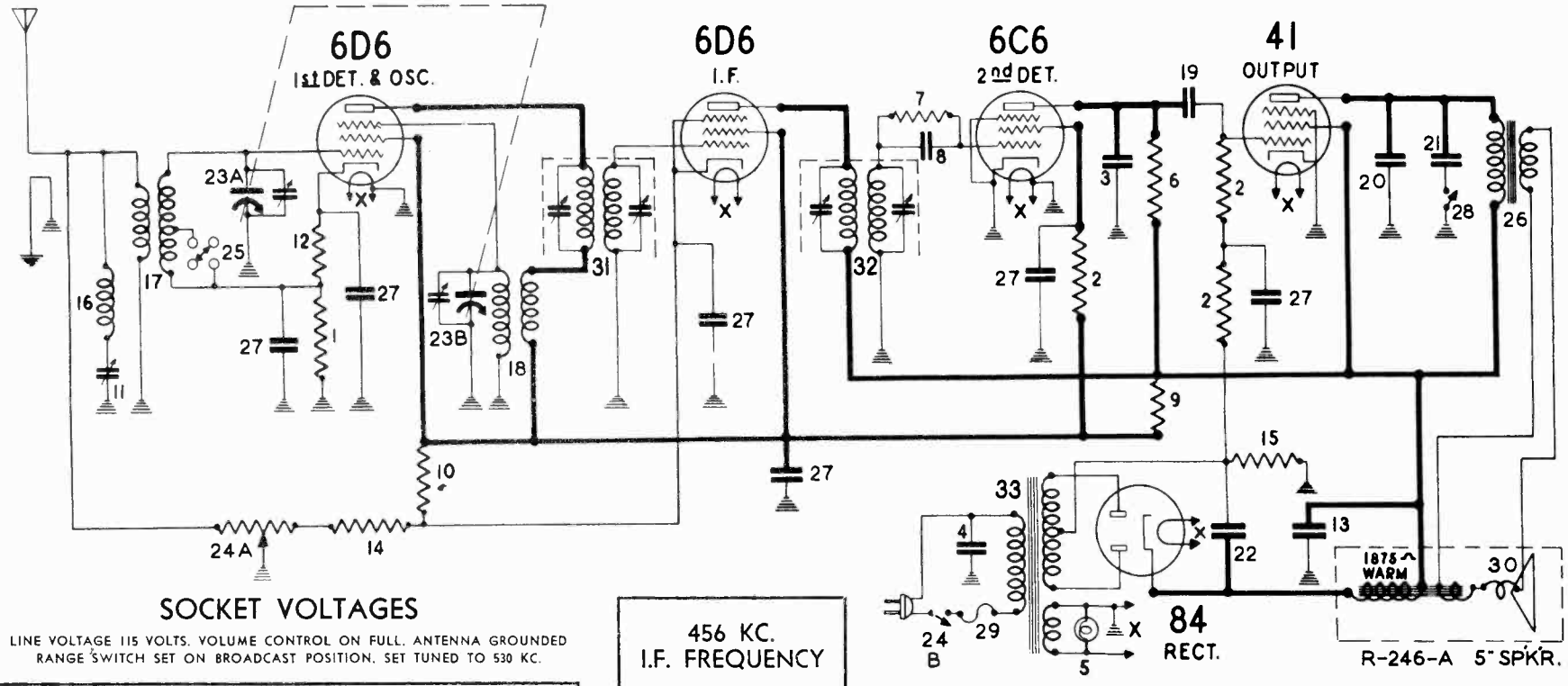
If the receiver should require calibration, proceed as follows:

1. Turn the gang condenser to full mesh and check to see that the dial pointer indicates 530 KC. If it does not, remove the dial knob and turn the pointer to the correct position by means of a sharp tool inserted in the pointer slots which may be reached through the dial glass. Replace the dial knob.
2. Adjust the test oscillator to 1400 KC.
3. Turn the condenser gang until the dial pointer indicates 1400 KC.
4. Adjust trimmer No. 6 (oscillator shunt trimmer) for maximum output without changing the setting of the gang condenser.

R. F. ALIGNMENT

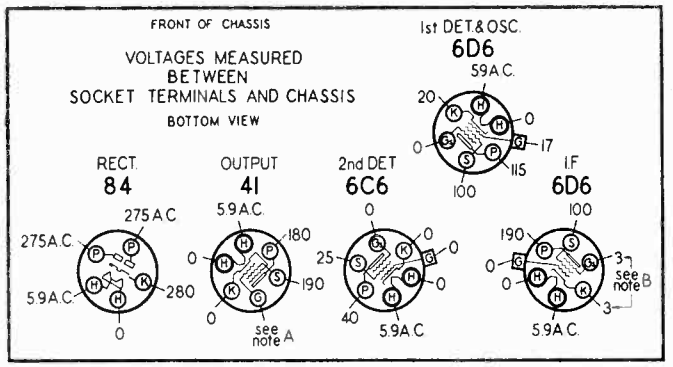
1. Set the test oscillator to 1400 KC. and apply the signal to the receiver antenna lead through a 400 ohm carbon resistor.
2. Tune the receiver to the signal for maximum output.
3. Adjust trimmer No. 7 (detector shunt trimmer) for maximum output.





SOCKET VOLTAGES

LINE VOLTAGE 115 VOLTS. VOLUME CONTROL ON FULL. ANTENNA GROUNDED
RANGE SWITCH SET ON BROADCAST POSITION. SET TUNED TO 530 KC.



IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. Readings will vary depending upon voltage range of meter, being higher for higher range instruments. This variation is most marked for second detector plate voltage.

NOTE A: The bias on the 6F6 output is —14 volts measured across the flexible wire wound resistor No. 15 in the circuit diagram.

NOTE B: The cathode voltage varies with the setting of the volume control, from +3 volts for maximum volume to +30 volts for minimum volume.

August 5, 1936.

R-144AS PARTS LIST

Diag. No.	Part No.	DESCRIPTION	List Price
1	71657	3000 Ohm ¼ watt Carbon Resistor	$0.25
2	83082	260,000 Ohm ¼ watt Carbon Resistor	.20
3	83539	260 mmfd. Mica Condenser	.25
4	83976	.012 mfd. 1000 volt Paper Condenser	.35
5	84058	Dial Lamp, 6-8 volt	.15
6	84198	110,000 ohm ¼ watt Carbon Resistor	.30
7	84235	1.1 megohm ¼ watt Carbon Resistor	.20
8	85061	51 mmfd. Mica Condenser	.15
9	85064	10,000 ohm 1 watt Carbon Resistor	.20
10	85266	70,000 ohm ¼ watt Carbon Resistor	.20
11	85285	456 KC. Wave Trap Trimmer	.40
12	85691	500 ohm ½ watt Wire Wound Resistor	.20
13	88007	8 mfd. 250 volt Electrolytic Condenser	1.00
14	88009	200 ohm ½ watt Wire Wound Resistor	.15
15	88010	320 ohm 1½ watt Wire Wound Resistor	.15
16	88014	456 KC. Wave Trap Coil	.50
17	88018	Antenna Coil	1.00
18	88019	Oscillator Coil	.70
19	88026	.02 mfd. 400 volt Paper Condenser	$0.30
20	88029	.004 mfd. 400 volt Paper Condenser	.30
21	88030	.01 mfd. 400 volt Paper Condenser	.30
22	88033	8 mfd. 350 volt Electrolytic Condenser	1.10
23A & B	88035	.2 Gang Variable Condenser	2.75
24 A	88036	Volume Control, 22,000 ohm	1.25
24 B		Line Switch	
25	88037	Range Switch	.60
26	88040	Output Transformer	1.50
27	88046	.1 mfd. 150 volt Paper Condenser	.30
28	88054	Tone Control Switch	.30
29	88055	¾ Amp. Fuse	.12
30	88100	Diaphragm and voice coil	1.50
31	88389	1st I. F. Transformer	2.00
32	88390	2nd I. F. Transformer	2.00
33	88393	Power Transformer, 115 V-60 cycle	4.20
	R-246-A	Speaker—5 inch	4.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 1441 to 1449
Chassis R-144AS
Trimmers, Alignment
Circuit Data, Parts

STEWART-WARNER CORP.

MODEL R-144AS CHASSIS (Receiver Models 1441 to 1449)

CIRCUIT DESCRIPTION

The Stewart-Warner chassis Model 144 includes a speaker that is mounted directly on the chassis.

This receiver uses a superheterodyne circuit which employs five tubes. The intermediate frequency is 456 KC. The tuning range of this chassis includes, in addition to the standard broadcast band, the two police radio bands.

The signal picked up by the antenna is impressed on the primary of the antenna transformer, which has connected across it a wave trap for the purpose of eliminating 456 KC. interference. The signal is then tuned and impressed on the control grid of the 6D6 oscillator and first detector. The suppressor, or No. 3 grid of the 6D6, is used as the oscillator grid. The 456 KC. output of the first detector is amplified in the I. F. stage, using a 6D6 tube.

The second detector is of the grid leak-grid condenser type, and uses a 6C6 tube. The 6C6 is resistance coupled to the 41 pentode power amplifier. Bias for the output tube is obtained by grid return connection to the negative end of a resistor connected between the center tap of the power transformer high-voltage winding and ground. The bias potential so obtained is filtered by a resistance-capacity filter.

The volume control is double acting. It simultaneously changes the antenna signal input and the I. F. stage bias. Because of the sensitivity of this receiver, and due to the fact that it does not have A.V.C., it requires an antenna that is shorter than usual. The short antenna is particularly necessary where interference from powerful local stations is encountered, and where difficulty is experienced in properly controlling the volume.

When tuning on the short wave band, local broadcast stations can be heard in the background at their regular positions on the dial. This is a normal condition, and is due to the tapped coil method of tuning the antenna coil secondary to the short wave band. No aligning adjustments are required on the short wave band.

ALIGNING EQUIPMENT

For proper alignment of this receiver, an output meter and a high grade modulated service oscillator are essential. The oscillator should be capable of generating the frequencies of 456 KC., 600 KC. and 1400 KC. The test oscillator calibration should be checked, using broadcast station signals as standards. For trimmer adjustment, it is advisable to use an all bakelite screwdriver, although one with a small metal tip may be used.

ALIGNING PROCEDURE

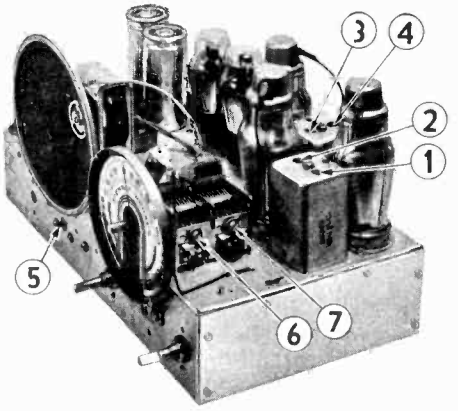
The step by step routine given below should be carefully followed. The trimmer numbers referred to are shown in the illustration.

ALIGNING THE I.F. CIRCUIT

1. Connect the output meter in series with a .25 mfd. condenser between the plate of the 41 tube and ground, or across the voice coil, depending on the type of meter.
2. Turn the volume control to the maximum volume position. (Note: The volume control should be kept in this position throughout the entire alignment procedure.) Ground the antenna lead to the chassis.
3. Turn the range switch to the right (clockwise) to the broadcast position.
4. Adjust the test oscillator to exactly 456 KC. and connect its output in series with a .1 mfd. condenser to the control grid of the 6D6 first detector tube and the chassis.
5. Align I. F. trimmers No. 1, 2, 3 and 4 for maximum output as indicated on the output meter. No inward or sideward pressure should be applied to the alignment tool, or the condenser may spring back to a different setting as soon as the tool is removed.
6. Repeat all I. F. trimmer adjustments since the changing of each trimmer will affect the others to a certain extent.

456 KC. WAVE TRAP ADJUSTMENT

1. Disconnect the antenna lead from ground.
2. Connect the test oscillator output in series with a .00025 mfd. condenser to the antenna lead, and connect the test oscillator ground lead to the receiver chassis. Ground the chassis.
3. Without changing the test oscillator from the frequency setting used in aligning the I. F. stage, adjust trimmer No. 5 for **MINIMUM** output. Increase the test oscillator output as a minimum is reached, in order to obtain a clearly defined setting of the trimmer. **NOTE:** If code interference transmitted on a frequency in the neighborhood of 456 KC. is troublesome, the wave trap should be adjusted for **MINIMUM** output with the test oscillator set to the same frequency as the signal that is causing interference.



DIAL CALIBRATION

If the receiver should require calibration, proceed as follows:

1. Turn the gang condenser to full mesh and check to see that the dial pointer indicates 530 KC. If it does not, remove the dial knob and turn the pointer to the correct position by means of a sharp tool inserted in the pointer slots which may be reached through the dial glass. Replace the dial knob.
2. Adjust the test oscillator to 1400 KC.
3. Turn the condenser gang until the dial pointer indicates 1400 KC.
4. Adjust trimmer No. 6 (oscillator shunt trimmer) for maximum output without changing the setting of the gang condenser.

R. F. ALIGNMENT

1. Set the test oscillator to 1400 KC. and apply the signal to the receiver antenna lead through a .00025 mfd. condenser.
2. Tune the receiver to the signal for maximum output.
3. Adjust trimmer No. 7 (detector shunt trimmer) for maximum output.

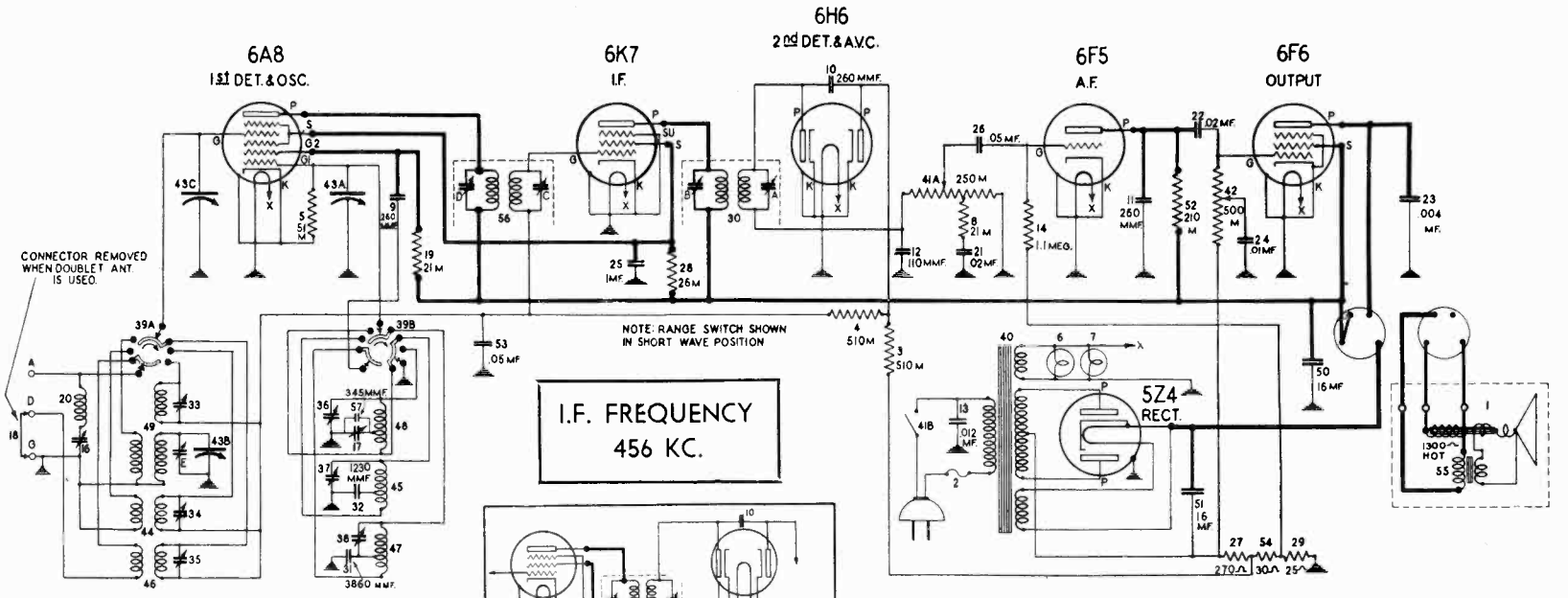
MISCELLANEOUS PARTS NOT SHOWN ON CIRCUIT DIAGRAM

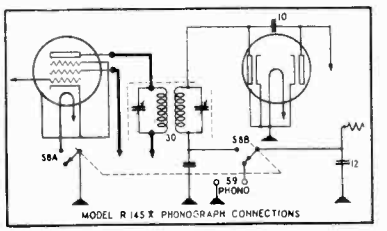
Part No.	DESCRIPTION	List Price
67590	Flat washer for chassis mtg.	$0.01
81090	Escutcheon mounting screw #1 x ¼ oval head W.S.	.60 per C
83552	Chassis mounting screw #10 x ⅜	.03
88403	Dial scale	.30
88056	Fuse holder	.16
88057	Fuse cover	.06
88104	Dial pointer	.04
88105	Dial glass	.50
88106	Dial gasket	.01
88108	Dial escutcheon	.50
88115	Knob (push-on)	.20
88116	Knob (with set screw)	.16
88162	Tube shield	.08
88164	Tube shield cap	.06

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Form 7666 Printed in U.S.A. 7-20-36

MODEL R-145 CHASSIS (RECEIVER MODELS 1451 to 1459)





MODEL R-145 PARTS LIST

Diag. No.	Part No.	Description	List Price
1	{R-247-A R-248-A	8" Dynamic Speaker 12" Dynamic Speaker	$ 9.00 11.50
2	38841	Fuse, 1 ampere	.10
3-4	83072	510,000 ohm ¼ watt carbon resistor	.15
5	83080	51,000 ohm ¼ watt carbon resistor	.20
6-7	83278	Pilot lamp, 6-8 volt	.15
8	83286	21,000 ohm ¼ watt carbon resistor	.20
9-10-11	83539	260 mmfd. mica condenser	.15
12	83783	110 mmfd. mica condenser	.16
13	83976	.012 mfd. 1000 v. shielded condenser	.35
14	84235	1.1 megohm ¼ watt carbon resistor	.20
16	85285	Wave trap trimmer	.40
17	85285	Padding trimmer	.40
18	85321	Ground connector	.01
19	85442	21,000 ohm ½ watt carbon resistor	.20
20	88014	Wave trap coil	.50
21-22	88026	.02 mfd. 400 v. paper condenser	.30
23	88029	.004 mfd. 400 v. paper condenser	.30
24	88030	.01 mfd. 400 v. paper condenser	.30
25	88046	.1 mfd. 150 v. paper condenser	.30
26	88189	.05 mfd. 200 v. paper condenser	.35
27	88463	270 ohm 1 watt carbon resistor	.15
28	88464	26,000 ohm ¼ watt carbon resistor	.15
29	88465	25 ohm ½ watt wire wound resistor	.12
30	88468	2nd I.F. transformer	2.40
31	88472	3860 mmfd. mica condenser	.35
32	88473	1230 mmfd. mica condenser	.25
33-34-35	88477	Trimmer condenser	.12
36-37-38	88477	Trimmer condenser	.12
39A&B	88480	Range switch	1.90
40	88481	Power transformer, 115 v. 60 cycle	5.00
41-A 41-B	88487	{Volume control (250,000 ohm)} {A. C. line switch}	1.25
42	88488	Tone control (500,000 ohm)	$ .80
43A to C	88493	Three gang condenser	5.40
44	88499	Antenna coil (Police)	.85
45	88501	Oscillator coil (Police)	.65
46	88502	Antenna coil (S.W.)	.80
47	88504	Oscillator coil (S.W.)	.80
48	88506	Oscillator coil (B.C.)	.55
49	88507	Antenna coil (B.C.)	1.60
50	88511	16 mfd. 300 v. electrolytic condenser	1.10
51	88512	16 mfd. 400 v. electrolytic condenser	1.10
52	88532	210,000 ohm ¼ watt carbon resistor	.12
53	88534	.05 mfd. 150 v. condenser (low loss)	.25
54	88613	30 ohm ½ watt wire wound resistor	.15
55	88529	Output transformer (on 247 speaker)	2.00
55	88796	Output transformer (on 248 speaker)	2.50
56	88466	1st I.F. transformer	2.40
57	89564	345 mmfd. mica condenser	.25

MODEL 145-X PARTS

58	84404	Phonograph Toggle Switch D.P. D.T.	$ 1.10
59	84407	Phonograph terminal strip	.12
	89216	Power transformer (100 to 240 volts, 25 to 133 cycles) Model R145X only	11.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

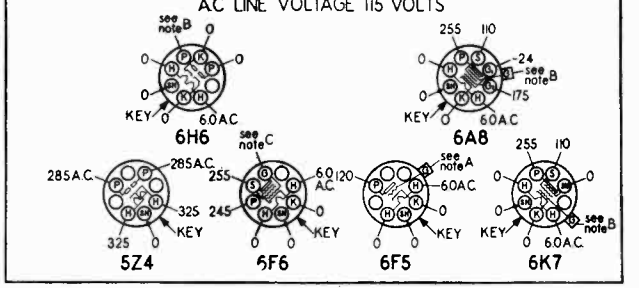
August 15, 1936.

SOCKET VOLTAGES

VOLUME CONTROL ON FULL
RANGE SWITCH SET ON BROADCAST POSITION

ANTENNA GROUNDED
DIAL TUNED TO 525 KC.

BOTTOM VIEW OF CHASSIS
VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS
AC LINE VOLTAGE 115 VOLTS



REAR OF CHASSIS

IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt.

NOTE A: The grid bias for the 6F5 is—1.5 volts measured across resistor 29.

NOTE B: The grid bias for the 6A8, 6A7, and the anode voltage of the A.V.C. section of the 6H6 is—3.5 volts measured across resistors 29 and 54.

NOTE C: The grid bias for the 6F6 output tube is—19.5 volts measured across resistors 29, 54 and 27.

MODELS 1451 to 1459
Chassis R-145
Socket, Trimmers

STEWART-WARNER CORP.

Alignment, Parts

MODEL R-145 CHASSIS (Receiver Models 1451 to 1459)

CALIBRATION AND ALIGNMENT

ALIGNING EQUIPMENT: For proper alignment, an output meter and an accurately calibrated oscillator with a tuning range from 456 KC. to 16 MC. are required.

Connect the output meter from the plate of the output tube to chassis. A convenient point to make the plate connection is to the yellow wire on speaker socket.

ALIGNING THE I. F. AMPLIFIER: Turn the volume control to maximum volume position and keep it in this position throughout the entire alignment procedure. Turn the range switch to the broadcast position (fully clockwise).

Connect the test oscillator output leads to the 6A8 control grid and chassis with a **.1 mfd. condenser in series with the oscillator output.** Set the oscillator to exactly 456 KC. Set the receiver dial at any point where it has no tuning effect on the oscillator signal.

Adjust the four I.F. trimmers, Nos. 1, 2, 3 and 4, for maximum output meter deflection, then repeat the trimmer adjustment.

BROADCAST BAND CALIBRATION AND ALIGNMENT: With the gang condenser in full mesh, the dial pointer should be on the white horizontal line below 530 KC. on the dial scale.

Turn the range switch to the extreme clockwise position and connect the test oscillator output to the A and G terminals of the receiver with a 400 ohm carbon resistor in series with the A terminal and the oscillator output.

Adjust the test oscillator to exactly 1500 KC. and turn the receiver dial pointer to 1500 KC. on the tuning dial. To calibrate the dial, adjust trimmer No. 5 for maximum output.

Carefully tune the receiver to the signal and adjust trimmers Nos. 6 and 7 for maximum output.

Adjust the test oscillator to 600 KC. and tune the receiver to the signal. Adjust trimmer No. 8 for maximum output. Then try to increase the output meter reading by detuning No. 8 slightly and retuning the receiver dial. If the output goes down, detune the trimmer in the opposite direction. Continue detuning the trimmer and retuning the receiver dial until maximum output meter deflection is secured. This operation is commonly known as "rocking" and when performed as described will give maximum selectivity and sensitivity even though the dial may be slightly off calibration at 600 KC.

WAVE-TRAP ADJUSTMENT: (included only in chassis stamped "S"). The wave-trap adjusting trimmer, No. 13, is located on the back of the chassis. Leave the test oscillator connected to the A and G terminals through a 400 ohm resistor and set the oscillator at 456 KC. Then adjust the wave-trap trimmer No. 13 for **minimum** output. If some particular station with a frequency near 456 KC. causes code interference, it may be desirable to adjust the wave-trap on the actual frequency of the interfering station.

Check the adjustment of trimmers 5, 6, and 7 at 1500 KC.

BAND NO. 2 CALIBRATION AND ALIGNMENT: Turn the range switch to the center position.

Adjust the test oscillator to exactly 5.0 MC. and turn the receiver dial pointer to exactly 5.0 MC. on the tuning dial.

To calibrate the dial, adjust trimmer No. 9 for maximum output. If two peaks are found, the proper one is that with the trimmer screw farthest **out.**

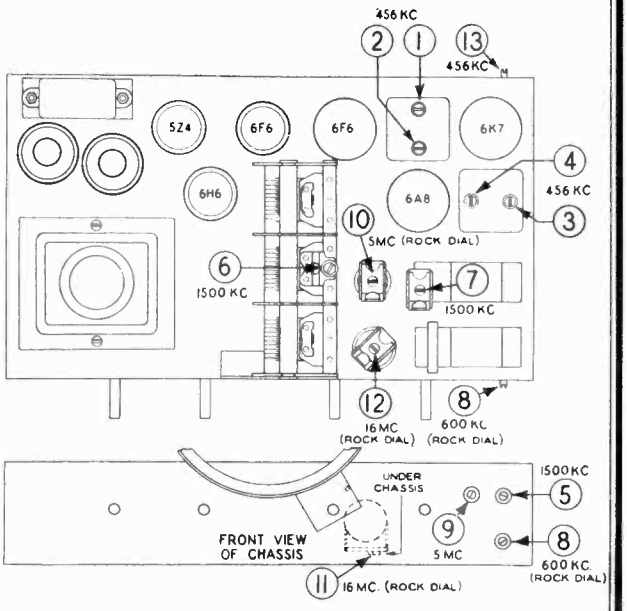
Carefully tune the receiver to the signal and adjust trimmer No. 10 for maximum output. Then try to increase the output by detuning No. 10 slightly and retuning the receiver dial. Continue detuning No. 10 and retuning the dial until the output meter deflection is a maximum.

BAND NO. 3 CALIBRATION AND ALIGNMENT: Turn the range switch to the extreme counter-clockwise position. Be sure the D and G terminals on the antenna terminal strip are connected together.

Set the test oscillator to 16 MC. and turn the receiver dial pointer to exactly 16 MC. on the tuning dial.

To calibrate the dial, adjust trimmer No. 11 for maximum output. Check to see that it has been adjusted to the proper peak by tuning the receiver to approximately 15.1 MC. A repeat signal should be heard at this point. If none is present, even with greatly increased oscillator output, retune the receiver to 16 MC. and adjust trimmer No. 11 to the proper peak with the trimmer screw farther **out.**

Carefully tune the receiver to the signal and adjust trimmer No. 12 to a peak. Then try to increase the output by detuning the trimmer slightly and retuning the dial until a maximum output meter deflection is secured. Check the adjustment by tuning the receiver to the image at about 15.1 MC. The image should be much weaker than the 16 MC. signal. If the signal at 15.1 MC. dial setting is equal to or stronger than the 16 MC. signal, trimmer No. 12 is not set to the proper peak. Turn the trimmer in a turn or so, then readjust as above.



TRIMMER LOCATIONS

Trimmer Number		Alignment Frequency
1.	2nd I.F. transformer trimmer	456 KC.
2.	2nd I.F. transformer trimmer	456 KC.
3.	1st I.F. transformer trimmer	456 KC.
4.	1st I.F. transformer trimmer	456 KC.
5.	Broadcast oscillator shunt trimmer	1500 KC.
6.	Broadcast antenna shunt trimmer	1500 KC.
7.	Broadcast detector shunt trimmer	1500 KC.
8.	Broadcast oscillator series padder	600 KC.
9.	Police oscillator shunt trimmer	5 MC.
10.	Police antenna shunt trimmer	5 MC.
11.	Short wave oscillator shunt trimmer	16 MC.
12.	Short wave antenna shunt trimmer	16 MC.
13.	Wave-trap trimmer	456 KC.

MISCELLANEOUS PARTS NOT SHOWN ON CIRCUIT DIAGRAM

Part No.	Description	List Price
67590	Flat steel mtg. washer	$ .01
84428	Rubber chassis mtg. bushing	.03
84493	No. 10 x 1¼ chassis mtg. screw	.03
85066	G.D.A. terminal strip	.20
85321	Ground connector for G.D.A. strip	.01
88056	Fuse mounting	.16
88057	Fuse cover	.06
88675	Speaker socket	.12
88956	Escutcheon with glass	1.65
88983	Knob; tuning, volume and tone	.15
88984	Knob; range switch	.20

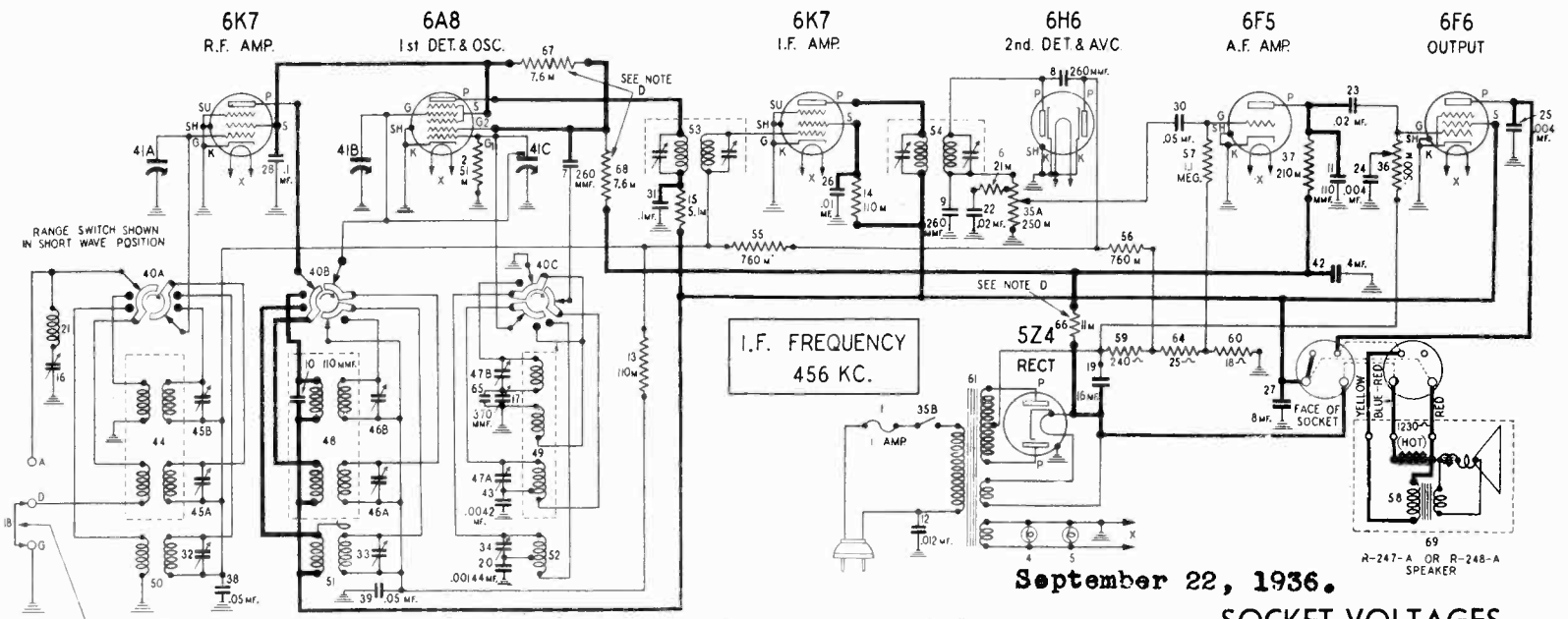
TUNING DRIVE AND DIAL PARTS

Part No.	Description	List Price
83278	Dial lamp	$ .15
88500	Dial scale (for rear lighting)	1.80
88561	Pointer and stud assembly	.12
88713	Dial drive shaft	.15
88741	Dial drive shaft retainer spring	.05
88745	Dial ring and bracket assembly (for edge lighting)	.90
88748	Dial disc and bushing assembly	.30
89283	Pilot lamp socket	.10
89284	Dial scale (for edge lighting)	1.80
89284	Pilot lamp shield	.02
89486	Dial ring and bracket assembly (for rear lighting)	.90

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

FORM 7794—7-30-36—PRINTED IN U.S.A.

STEWART-WARNER CORP.
Chassis R-146
Schematic, Voltage
Parts



September 22, 1936.

NOTE D: In receivers having serial numbers below 332,599, resistor 67 is omitted, and the screen grids of the 6K7, R.F. amplifier and the 6A8 receive their current through a 31,000 ohm, 1 watt carbon resistor which is connected to the screen grid of the 6F6. In addition, resistor 66 has a rating of 30,000 ohms, 1 watt and resistor 68 has a rating of 16,000 ohms, ¼ watt.

MODEL R-147 PARTS LIST

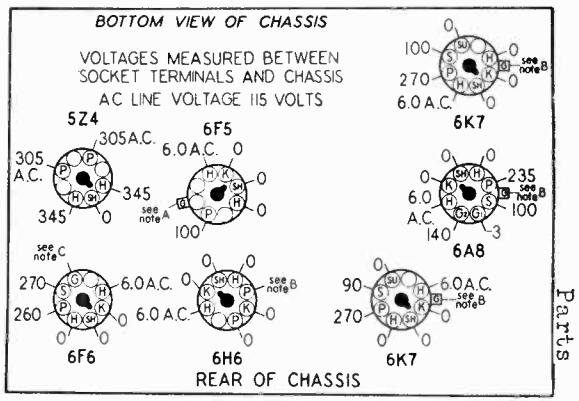
Diagram Number	Part Number	Description	List Price
1	38841	Fuse, 1 amp.	$ .10
2	83080	51,000 ohm, ¼ watt carbon resistor	.20
4-5	83278	Pilot lamp	.15
6	83286	21,000 ohm, ¼ watt carbon resistor	.20
7-8-9	83539	260 mmfd. mica condenser	.15
10-11	83783	110 mmfd. mica condenser	.16
12	83976	.012 mfd. 1000 v. shielded condenser	.35
13-14	84198	110,000 ohm ¼ watt carbon resistor	.30
57	84235	1.1 megohm ¼ watt carbon resistor	.20
15	84720	5,100 ohm ¼ watt carbon resistor	.12
16	85285	Wave Trap Condenser	.40
17	85285	Padding Trimmer	.40
18	85321	Ground Connector for G.D.A. strip	.01
19	85431	16 mfd. 400 v. electrolytic condenser	1.25
20	85562	.00144 mfd. mica condenser	.30
61	85782	Power transformer 115 V. 60 cycles	5.20
22-23	88026	.02 mfd. 400 V. paper condenser	.30
24-25	88029	.004 mfd. 400 V. paper condenser	.30
26	88030	.01 mfd. 400 V. paper condenser	.30
27	88033	.8 mfd. 350 V. electrolytic condenser	1.10
28	88046	.1 mfd. 150 V. paper condenser	.30
30	88189	.05 mfd. 200 V. paper condenser	.35
31	88191	.1 mfd. 300 V. paper condenser	.35
64	88465	.25 ohm ½ watt wire wound resistor	.12
32-33-34	88477	Trimmer condenser	.12
35-A, 35-B	88487	Volume Control (250,000 ohms) A.C. line switch	1.25
36	88488	Tone control 500,000 ohms	.80
58	88529	Output transformer on R-247-A speaker	2.00
37	88532	210,000 ohm ¼ watt carbon resistor	.12
38-39	88534	.05 mfd. 150 V. condenser (low loss)	.24
40A to C	88573	Range switch	2.50

Diagram Number	Part Number	Description	List Price
41A to C	88574	Three gang condenser	5.00
42	88576	4 mfd. 250 V. electrolytic condenser	.80
60	88584	18 ohm ½ watt wire wound resistor	.15
43	88587	.0042 mfd. mica condenser	.32
44	88592	Antenna coil & shield assem. (B.C.&S.W.) with trimmer	2.20
45A-45B, 46A-46B, 47A-47B	88596	Trimmer Condenser	.25
48	88597	R.F. coil & shield assem. (B.C. & S.W.) with trimmer	2.40
49	88599	Oscillator coil & shield assem. (B.C.&S.W.) with trimmer	2.20
50	88602	Antenna coil assem. (Police) with trimmer	.85
51	88604	R.F. coil assem. (Police) with trimmer	1.00
52	88605	Oscillator coil (Police) with trimmer	.70
53	88606	1st I.F. transformer	2.50
54	88607	2nd I.F. transformer	2.50
55-56	88854	760,000 ohm ¼ watt carbon resistor	.12
57	84235	1.1 megohm ¼ watt carbon resistor	.20
58	88796	Output transformer on R-248 spkr.	2.50
	88529	Output transformer on R-247 spkr.	2.00
59	89439	240 ohm 2 watt wire wound resistor	.12
60	88584	18 ohm ½ watt wire wound resistor	.15
61	85782	Power transformer, 115 V. 60 cycles	5.20
64	88465	.25 ohm ½ watt wire wound resistor	.12
65	89525	370 mmfd. mica condenser	.40
66	89751	11,000 ohm 1 watt carbon resistor	.12
67	89752	7,600 ohm ½ watt carbon resistor	.12
68	89754	7,600 ohm 1 watt carbon resistor	.12
69	R-247-A	Dynamic speaker, 8"	9.00
	R-248-A	Dynamic speaker, 12"	11.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SOCKET VOLTAGES

RANGE SWITCH ON BROADCAST POSITION — DIAL TUNED TO 530 KC.
VOLUME CONTROL ON FULL — ANTENNA GROUNDED



IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt.

NOTE A: The grid bias for the 6F5 is −1.3 volts measured across resistor 60.

NOTE B: The grid bias for the 6A8, 6K7's, and the anode voltage of the A.V.C. section of the 6H6 is −3.0 volts measured across resistors 60 and 64.

NOTE C: The grid bias for the 6F6 output tube is −19.0 volts measured across resistor 59, 64 and 60.

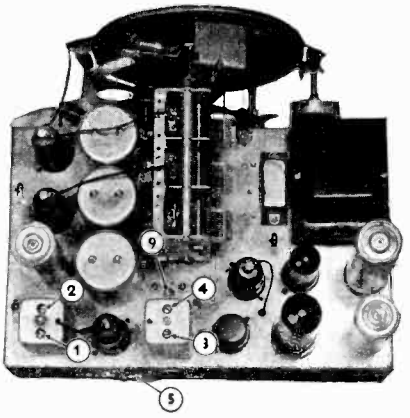
MODELS 1461 to 1469
Chassis R-146

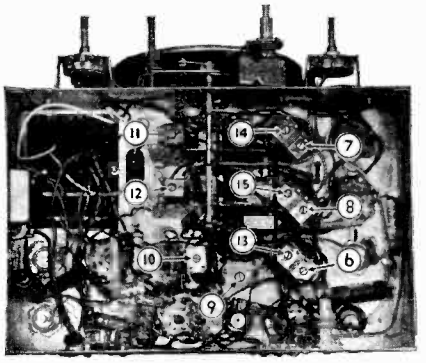
STEWART-WARNER CORP.

Trimmers, Alignment Parts

MODEL R-146 CHASSIS (Receiver Models 1461 to 1469)

CALIBRATION AND ALIGNMENT





ALIGNING EQUIPMENT: For proper alignment, an output meter and an accurately calibrated oscillator with a tuning range from 456 KC. to 16 MC. are required.

Connect the output meter from the plate of the output tube to chassis. A convenient point to make the plate connection is to the yellow wire on speaker socket.

ALIGNING THE I. F. AMPLIFIER: Turn the volume control to maximum volume position and keep it in this position throughout the entire alignment procedure. Turn the range switch to the broadcast position (fully clockwise).

Connect the test oscillator output leads to the 6A8 control grid and chassis with a **.1 mfd. condenser in series with the oscillator output.** Set the oscillator to exactly 456 KC. Set the receiver dial at any point where it has no tuning effect on the oscillator signal.

Adjust the four I.F. trimmers, Nos. 1, 2, 3 and 4, for maximum output meter deflection, then repeat the trimmer adjustment.

WAVE-TRAP ADJUSTMENT: The wave-trap adjusting trimmer, No. 5, is located on the back of the chassis. Leave the test oscillator at 456 KC. Connect the oscillator output to the A and G terminals with a 400 ohm resistor in series with the A terminal and oscillator output. Then adjust the wave-trap trimmer No. 5 for minimum output. If some particular station with a frequency near 456 KC. causes code interference, it may be desirable to adjust the wave-trap on the actual frequency of the interfering station.

BROADCAST BAND CALIBRATION AND ALIGNMENT: With the gang condenser in full mesh, the dial pointer should be on the white horizontal line below 530 KC. on the dial scale. Leave the range switch in the extreme clockwise position, and leave the test oscillator connected to the A and G terminals of the receiver through a 400 ohm resistor.

Adjust the test oscillator to exactly 1500 KC. and turn the receiver dial pointer to 1500 KC. on the tuning dial. To calibrate the dial, adjust trimmer No. 6 for maximum output.

Carefully tune the receiver to the signal and adjust trimmers Nos. 7 and 8 for maximum output.

Adjust the test oscillator to 600 KC. and tune the receiver to the signal. Adjust trimmer No. 9 for maximum output. Then try to increase the output meter reading by detuning No. 9 slightly and retuning the receiver dial. If the output goes down, detune the trimmer in the opposite direction. Continue detuning the trimmer and retuning the receiver dial until maximum output meter deflection is secured. This operation is commonly known as "rocking" and when performed as described will give maximum selectivity and sensitivity even though the dial may be slightly off calibration at 600 KC.

BAND NO. 2 CALIBRATION AND ALIGNMENT: Turn the range switch to the center position.

Adjust the test oscillator to exactly 5.0 MC. and turn the receiver dial pointer to exactly 5.0 MC. on the tuning dial.

To calibrate the dial, adjust trimmer No. 10 for maximum output. If two peaks are found, the proper one is that with the trimmer screw farthest **out.**

Carefully tune the receiver to the signal and adjust trimmers Nos. 11 and 12 for maximum output. Then try to increase the output by detuning No. 12 slightly and retuning the receiver dial. Continue detuning No. 12 and retuning the dial until the output meter deflection is a maximum. Then readjust No. 11 for maximum output.

BAND NO. 3 CALIBRATION AND ALIGNMENT: Turn the range switch to the extreme counter-clockwise position. Be sure the D and G terminals on the antenna terminal strip are connected together.

Set the test oscillator to 16 MC. and turn the receiver dial pointer to exactly 16 MC. on the tuning dial.

To calibrate the dial, adjust trimmer No. 13 for maximum output. Check to see that it has been adjusted to the proper peak by tuning the receiver to approximately 15.1 MC. A repeat signal should be heard at this point. If none is present, even with greatly increased oscillator output, retune the receiver to 16 MC. and adjust trimmer No. 13 to the proper peak with the trimmer screw farther **out.**

Carefully tune the receiver to the signal and adjust trimmers Nos. 14 and 15 for a peak. Then try to increase the output by detuning No. 15 slightly and retuning the dial until a maximum output meter deflection is secured. Then readjust No. 14 for maximum output. Check the adjustment by tuning the receiver to the image at about 15.1 MC. The image should be much weaker than the 16 MC. signal. If the signal at 15.1 MC. dial setting is equal to or stronger than the 16 MC. signal, trimmer No. 15 is not set to the proper peak. Turn the trimmer in a turn or so, then readjust as above.

TRIMMER LOCATIONS

Trimmer Number		Alignment Frequency
1	1st I.F. transformer trimmer	456 KC.
2	1st I.F. transformer trimmer	456 KC.
3	2nd I.F. tranformer trimmer	456 KC.
4	2nd I.F. tranformer trimmer	456 KC.
5	Wave trap trimmer	456 KC.
6	Broadcast oscillator shunt trimmer	1500 KC.
7	Broadcast antenna shunt trimmer	1500 KC.
8	Broadcast detector shunt trimmer	1500 KC.
9	Broadcast oscillator series padder	600 KC.
10	Police oscillator shunt trimmer	5 MC.
11	Police antenna shunt trimmer	5 MC.
12	Police detector shunt trimmer	5 MC.
13	Short wave oscillator shunt trimmer	16 MC.
14	Short wave antenna shunt trimmer	16 MC.
15	Short wave detector shunt trimmer	16 MC.

MISCELLANEOUS PARTS

Part No.	Description	List Price
67977	No. 14x1¼ mtg. screw	$ .03
77381	Flat steel washer	.01
84428	Rubber chassis mtg. bushing	.03
85066	G.D.A. terminal strip	.20
85321	Ground connector for G.D.A. strip	.01
88056	Fuse mounting	.16
88057	Fuse cover	.06
88675	Speaker socket	.12
88825	Link and lever assembly	.14
88831	Bracket for range selector knob shaft	.02
88832	Shaft, range selector knob	.10
88985	Tuning knob, front section	.20
88986	Tuning knob, rear section	.25
88987	Knob, range switch	.20
89038	Knob, tone and volume control	.20

DIAL PARTS

83278	Pilot lamp No. 40, 6-8 volts	.15
85902	Dual ratio planetary dial drive	.90
88835	Idler gear and pinion assembly	.25
88839	Tension spring (for idler gear)	.10
88840	Dial disc and bushing assem.	.40
88844	Dial ring, bracket and shaft assem. (for edge lighting)	1.00
88956	Escutcheon with glass	1.65
88958	No. 2 x 3/8 round head wood screw (each)	.01
88998	Second pointer	.05
89000	Dial scale (for rear lighting)	2.00
89001	Main pointer and stud assem.	.10
89027	Spring washer (for planetary drive)	.01
89144	Tension spring (for idler gear)	.10
89283	Pilot lamp socket	.10
89284	Pilot lamp shield	.02
89285	Dial background (with edge lighting)	.12
89286	Dial scale (for edge lighting)	1.80
89484	Dial ring, bracket and shaft assembly (for rear lighting)	1.60
89799	Dial scale retaining clip	.02

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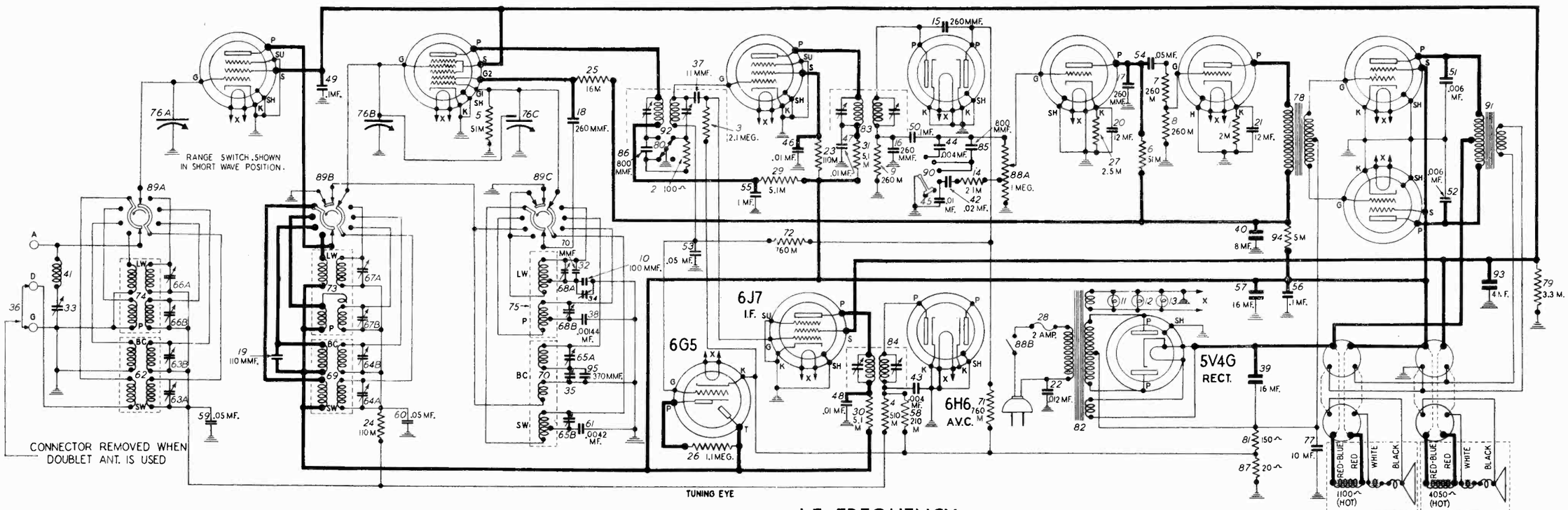
FORM 7844 9-12-36 PRINTED IN U. S. A.

Chassis R-149X
Phonograph Circuit

STEWART-WARNER CORP.

MODELS 1491 to 1499
Chassis R-149
Schematic, Voltage
Parts



VOLUME CONTROL ON FULL
RANGE SWITCH SET ON BROADCAST POSITION

ANTENNA GROUNDED
SET TUNED TO 530 K. C.

IMPORTANT: Use a high resistance voltmeter of 1,000 ohms per volt.

NOTE A: —2.6 volts measured across resistor 87.

Diagram Number	Part Number	DESCRIPTION	List Price
1	67303	2000 ohm ¼ watt carbon resistor	$0.15
2	67786	100 ohm ½ watt carbon resistor	.12
3	81644	2.1 megohm ¼ watt carbon resistor	.12
4	83072	510,000 ohm ¼ watt carbon resistor	.12
5-6	83080	51,000 ohm ¼ watt carbon resistor	.12
7-8-9	83082	260,000 ohm ¼ watt carbon resistor	.12
10	83109	100 mmfd. mica condenser	.20
11-12-13	83278	Pilot lamp No. 40 6-8 volts	.15
14	83286	21,000 ohm ¼ watt carbon resistor	.12
15-16 / 17-18	83539	260 mmfd. mica condenser	.20
19	83783	110 mmfd. mica condenser	.20
20-21	83803	12 mfd. 15 V. electrolytic condenser	.80
22	83976	.012 mfd. 1000 V. shielded condenser	.40
23-24	84198	110,000 ohm ¼ watt carbon resistor	.12
25	84199	16,000 ohm ¼ watt carbon resistor	.12
26	84235	1.1 meghom ¼ watt carbon resistor	.12
27	84236	2,500 ohm ¼ watt carbon resistor	.12
28	84672	Fuse, 2 amperes	.10
29-30-31	84720	5,100 ohm ¼ watt carbon resistor	.12
32	84833	70 mmfd. mica condenser	.20
33	85285	Antenna trap condenser	.40
34-35	85285	Padding trimmer	.40
36	85321	Ground connector	.01
37	85454	11 mmfd. mica condenser	.15
38	85562	.00144 mfd. mica condenser	.25
39	85583	16 mfd. 450 V. electrolytic condenser	2.50
40	88007	8 mfd. 250 V. electrolytic condenser	1.00
41	88014	Antenna trap coil	.50
42	88026	.02 mfd. 400 Volt paper condenser	.25
43-44	88029	.004 mfd. 400 Volt paper condenser	.25
45-46 / 47-48	88030	.01 mfd. 400 Volt paper condenser	.25
49-50	88046	.1 mfd. 150 Volt paper condenser	.25
51-52	88185	.006 mfd. 600 Volt paper condenser	.25
53-54	88189	.05 mfd. 200 Volt paper condenser	.25
55-56	88191	.1 mfd. 300 Volt paper condenser	.25
57	88511	16 mfd. 300 Volt electrolytic condenser	1.10
58	88532	210,000 ohm ¼ watt carbon resistor	.12
59-60	88534	.05 mfd. 150 Volt condenser (low loss)	.25
61	88587	.0042 mfd. mica condenser	.35
62	88592	Antenna coil and shield (B.C. & S.W.) with trimmers	2.70
63A-63B, 64A-64B, 65A-65B, 66A-66B, 67A-67B, 68A-68B	88596	Trimmer condenser	.30

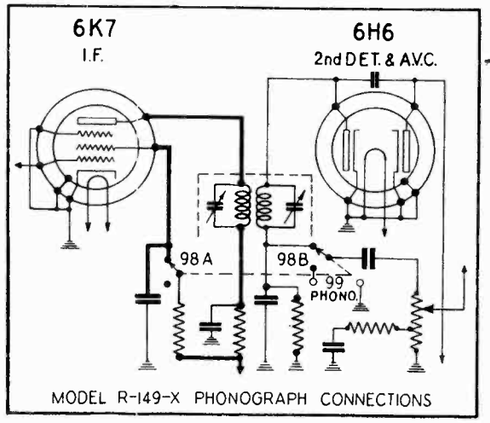
Diagram Number	Part Number	DESCRIPTION	List Price
69	88597	R.F. coil and shield (B.C. & S.W.) with trimmers	$3.10
70	88599	Osc. coil and shield (B.C. & S.W.) with trimmers	2.50
71-72	88854	760,000 ohm ¼ watt carbon resistor	.12
73	88925	R.F. coil and shield (Police & L.W.) with trimmers	2.50
74	88930	Antenna coil and shield (Police & L.W.) with trimmers	2.65
75	88932	Osc. coil and shield (Police & L.W.) with trimmers	2.10
76A to C	89044	Variable gang condenser	5.20
77	89053	10 mfd. 25 V. electrolytic condenser	.92
78	89062	Push-pull input transformer	3.00
79	89096	3300 ohm 3 watt wire wound resistor	.40
80	89103	Selectivity switch	.85
81	89105	150 ohm 3 watt wire wound resistor	.50
82	89106	Power transformer (115 volts—60 cycles) (See Part No. 89537 for other voltages, etc.)	9.00
83	89111	2nd I. F. transformer	2.50
84	89112	I. F. transformer (A.V.C.)	2.10
85-86	89114	800 mmfd. mica condenser	.20
87	89116	20 ohm ½ watt wire wound resistor	.12
88A / 88B	89118	Vol. cont. (1 megohm) tap 200,000 ohm from gr'nd & A.C. line switch	1.25
89A to C	89124	Range switch	2.50
90	89128	Tone control switch	1.10
91	89139	Output transformer	3.00
92	89180	1st I. F. transformer	3.40
93	89186	4 mfd. 150 V. electrolytic condenser	1.00
94	89255	5000 ohm 1 watt carbon resistor	.15
95	89525	370 mmfd. mica condenser	.40
96	R-255-A	12" Dynamic speaker	10.50
97	R-256-A	10" Dynamic speaker	9.50

R-149-X PARTS

Diagram Number	Part Number	DESCRIPTION	List Price
98A-98B	84404	Phonograph toggle switch D.P.D.T.	1.10
	89537	Power transformer 100 to 240V—25 to 133 cycles	13.25
99	89709	Phonograph terminal strip	.15

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

I.F. FREQUENCY
456 KC.

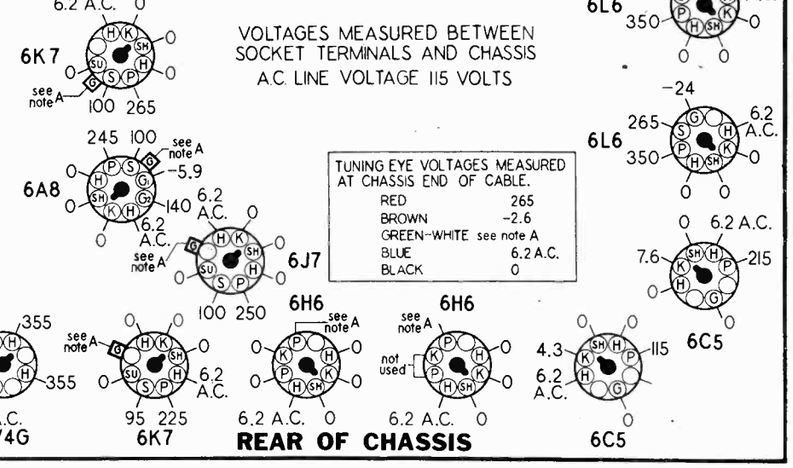


MODEL R-149-X PHONOGRAPH CONNECTIONS

MODEL R-149 CHASSIS
MODELS 1491 to 1499

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS
A.C. LINE VOLTAGE 115 VOLTS



TUNING EYE VOLTAGES MEASURED AT CHASSIS END OF CABLE.	
RED	265
BROWN	-2.6
GREEN-WHITE	see note A
BLUE	6.2 A.C.
BLACK	0

REAR OF CHASSIS

MODELS 1491 to 1499
Chassis R-149
Socket, Trimmers
Alignment, Notes
Parts

STEWART-WARNER CORP

MODEL R-149 CHASSIS (Receiver Models 1491 to 1499)

CIRCUIT DESCRIPTION

The Stewart-Warner model R-149 chassis is a 12 tube, all-wave superheterodyne with an intermediate frequency of 456 kc. It has four tuning ranges which are 140 to 400 kc., 527 to 1750 kc., 1720 to 5600 kc., and 5.5 to 18.0 mc. Individual coils and trimmer condensers are provided for each band so that each circuit can be adjusted to give maximum efficiency on every frequency range.

The antenna coils are designed to give efficient reception with either a standard or doublet type antenna without the use of any additional coupling transformer. A small connector is provided on the antenna terminal strip to short the D and G terminals when a standard antenna is used. If a doublet antenna is used, the connector should be turned or removed to open the connection between the D and G terminals.

SELECTIVITY—SENSITIVITY SWITCH

Two degrees of selectivity are obtainable by means of the selectivity-sensitivity control operating on the first I. F. transformer. When the control is in the sharp position (counter-clockwise) the first I. F. transformer functions as a typical transformer with sharply tuned primary and secondary circuits. When it is in the broad position (clockwise) the resonant frequency of the primary is decreased and that of the secondary circuit increased. At the same time the selectivity curve of the secondary is broadened and the amplification reduced. The combined effect gives a broad flat top to the intermediate frequency amplifier selectivity curve.

AUTOMATIC VOLUME CONTROL

This chassis uses an amplified and dual A. V. C. action to keep the second detector signal more constant and still have sharp tuning. The diode of the 6H6 second detector tube which is capacity coupled to the second I. F. transformer, produces the A. V. C. voltage for the I. F. tube and the tuning eye only. The A. V. C. voltage for the R. F. and first detector tubes is secured by means of the 6J7 A. V. C. amplifier tube and the second 6H6 tube. The control grid of the 6J7 tube is capacity coupled to the control grid of the 6K7 first I. F. tube.

FIVE POINT TONE CONTROL

This control permits the following combinations of treble and bass response. No. 1 is with the switch in the extreme counter-clockwise position.

1. Minimum treble and emphasized bass.
2. Medium treble and emphasized bass.
3. Medium treble and normal bass.
4. Maximum treble and normal bass.
5. Maximum treble and emphasized bass.

CALIBRATION AND ALIGNMENT

Experience has definitely shown that a selective chassis such as the Stewart-Warner Model R-149 cannot be properly aligned by ear or "on the air." A high grade modulated service oscillator and an output meter are absolutely essential.

The oscillator should cover a frequency range extending from 175 KC. to 16,000 KC. It should have a wide range of signal output with a continuously variable output control. A very weak signal is needed for proper alignment without actuating the A. V. C. and a very strong one to align the A. V. C. channel and for use when the receiver is badly out of alignment.

PRECAUTIONS

During calibration and alignment, keep the receiver volume control in the maximum volume position if noise is not too great, and adjust the oscillator output so that the output meter reads near the center of its scale.

Use the lowest output meter scale that will provide a steady reading. For making trimmer adjustments, use a bakelite aligning tool which has only a small metal screwdriver tip.

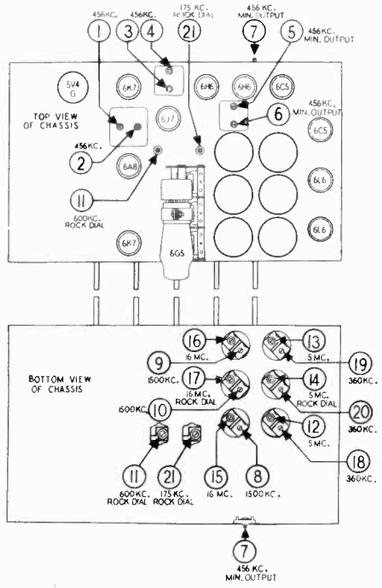
PRELIMINARY STEPS

Connect the output meter across the two plates of the two 6L6 power output tubes. **Important:** Do not connect from one 6L6 plate to chassis since this would unbalance the circuit and cause hum.

CALIBRATION AND ALIGNMENT

The following procedure on the proper adjustment of the various trimmers is divided into two classifications, calibration and alignment. Calibration is the adjustment of certain trimmers so that the radio signals can be received at the proper dial settings. Calibration of the R-149 is made at the high-frequency end of the dial. Alignment is the adjustment of trimmers so that the antenna and detector circuits are tuned to give maximum sensitivity and selectivity.

The R. F. calibration and alignment of each band is independent of all others, so that one band may be re-calibrated or re-aligned without affecting the trimmer adjustments on any of the other bands.



ALIGNMENT OF THE I. F. AMPLIFIER

1. (a) Turn the volume control to maximum volume position and turn the sensitivity-selectivity control to the sharp position (counter-clockwise).

(b) Turn the range switch to the broadcast position (second from the right) and set the tuning dial to any point where there is no tuning effect on the oscillator signal.

(c) Connect the test oscillator output leads to the 6A8 control grid and the chassis with a **.1 or .25 mfd. condenser in series with the lead to the 6A8 grid. DO NOT OMIT THIS CONDENSER OR ALIGNMENT WILL BE INCORRECT.**

(d) Set the test oscillator to exactly 456 KC. Adjust the output of the test oscillator to give about half scale deflection on the output meter.

(e) Adjust the four I. F. transformer trimmers (trimmers No. 1, 2, 3 and 4) for maximum output meter deflection.

ALIGNMENT OF THE A. V. C. AMPLIFIER

2. (a) Leave the test oscillator set at 456 KC. and connected to the 6A8 control grid through a condenser.

(b) Turn the volume control down to protect the output meter and turn the output control of the oscillator up to give enough signal so that the tuning eye closes more than half way. If your oscillator cannot give this much 456 KC. output, the A. V. C. amplifier can be aligned immediately after completing the Broadcast Alignment by means of a 1500 KC. signal fed into the antenna terminal, with the receiver tuned to the signal.

(c) Readjust the volume control so that the output meter shows about half scale deflection.

(d) Adjust the two A. V. C. amplifier trimmers No. 5 and 6 for **minimum output meter deflection.** Readjust the volume control or oscillator output to the point necessary to obtain a clearly defined point of minimum output when adjusting the trimmers.

(e) Reduce the oscillator output to normal and turn the volume control full on and repeat the adjustment of the I. F. trimmers as explained in 1 (a) to (e).

ADJUSTMENT OF WAVE TRAP

3. (a) Leave the test oscillator at 456 KC. but connect the oscillator output to the A and G terminals of the receiver with a 400 or 500 ohm carbon resistor in series with the oscillator output and the A terminal.

(b) Adjust the wave trap trimmer No. 7 for **minimum** output. Increase the oscillator output as necessary to obtain a clearly defined point of minimum output. If some particular station with a frequency slightly different than 456 KC. causes code interference, it may be advisable to adjust trimmer No. 7 on the actual frequency of the interfering station.

BROADCAST BAND CALIBRATION

4. (a) Check the position of the dial pointer on its shaft by turning the tuning knob until the rotor plates of the gang condenser are in full mesh. The slow-moving dial pointer should then coincide with the low frequency end of the dial scale. If it does not, hold the dial gear and turn the pointer to the correct position.

(b) Turn the range switch control to the broadcast position (second from the right).

(c) Connect a 400 or 500 ohm carbon resistor in series with the test oscillator output and the receiver antenna terminal. Note: This resistor should remain connected for all subsequent adjustments.

(d) Ground the receiver.

(e) Adjust the test oscillator to exactly 1500 KC.

(f) Tune in the 1500 KC. oscillator signal or a station above 1300 KC. on the dial and determine whether the dial calibration is correct at the high frequency end of the dial. If the calibration is correct, do not adjust the broadcast oscillator shunt trimmer No. 8. If the calibration is incorrect, adjust trimmer No. 8 to give proper calibration.

BROADCAST BAND ALIGNMENT

5. (a) With the test oscillator set at 1500 KC. tune the receiver to the signal for maximum output and adjust the broadcast antenna and detector shunt trimmers No. 9 and 10 for maximum output. Do not touch the oscillator shunt trimmer No. 8 as this will change the calibration.

(b) Adjust the test oscillator to exactly 600 KC. and tune the receiver to the signal. Adjust the broadcast oscillator series padder No. 11 for maximum output. Then try to increase the output by detuning the padder and retuning the receiver dial. If this reduces the output, detune the padder on the opposite direction. Continue detuning the padder and retuning the dial until a maximum output meter deflection is secured. This operation is commonly known as "rocking." The object of this adjustment is to find the combination of padder adjustment and tuning condenser position which gives the maximum output. This adjustment should not be changed regardless of whether the dial reads exactly 600 KC. or slightly off 600 KC. for maximum output.

(c) Check the adjustment of trimmers No. 8, 9 and 10 at 1500 KC.

POLICE BAND CALIBRATION

6. (a) Turn the range switch to the Band No. 3 (green) position (second from the left).

(b) Adjust the test oscillator to exactly 5.0 megacycles.

(c) Tune in the 5 MC. oscillator signal at or near 5 MC. on the receiver dial to determine whether the receiver dial calibration is correct at 5 MC. If it is, do not adjust police band oscillator shunt trimmer No. 12. If the calibration is incorrect, set the dial pointer to 5 MC. on the dial, and adjust the oscillator shunt trimmer No. 12 until the oscillator signal comes in at this point. If there are two peaks, the proper one is that with the trimmer screw farthest out.

POLICE BAND ALIGNMENT

7. (a) With the test oscillator set at 5.0 MC. tune the receiver for maximum output.

(b) Adjust the police band antenna and detector trimmers No. 13 and 14 for maximum output. After this is done try to increase the output meter reading by detuning the detector trimmer No. 14 slightly and retuning the receiver dial. If the output goes down, detune the trimmer in the opposite direction. Continue detuning No. 14 and retuning the set until maximum output meter deflection is secured. Then readjust No. 13.

SHORT WAVE BAND CALIBRATION

8. (a) Turn the range switch to the extreme left (counter-clockwise).

(b) Be sure that the D and G terminals on the antenna terminal strip are connected together.

(c) Adjust the test oscillator to exactly 16 megacycles.

(d) Tune in the 16 MC. oscillator signal at or near 16 MC. on the receiver dial to determine whether the receiver dial calibration is correct at 16 MC. If it is, do not adjust the short wave band oscillator shunt trimmer No. 15. If the calibration is incorrect, set the receiver dial pointer exactly at 16 MC. and adjust the oscillator shunt trimmer No. 15 until the oscillator signal comes in at this point.

(e) Check to see that trimmer No. 15 is adjusted to the proper peak by tuning the receiver to approximately 15.1 MC. If a repeat signal is not heard at this point, even with greatly increased oscillator output, retune the receiver to 16.0 MC. and adjust trimmer No. 15 to the proper peak with the trimmer screw farther out.

SHORT WAVE BAND ALIGNMENT

9. (a) With the test oscillator set at 16 MC. tune the receiver for maximum output.

(b) Adjust the short wave antenna and detector trimmers No. 16 and 17 for maximum output. After this is done, try to increase the output meter deflection by detuning the detector trimmer No. 17 slightly and retuning the receiver dial. If this causes the output to drop, detune the trimmer in the opposite direction. Continue detuning No. 17 and retuning the set until the output is at a maximum. Then readjust No. 16.

(c) Check the adjustment of No. 17 by tuning the receiver to the image at 15.1 MC. and noting if the image is much weaker than the 16 MC. signal. If the signal at 15.1 MC. dial setting is equal to or stronger than the 16 MC. signal, trimmer No. 17 is not set to the proper peak. Turn the trimmer in a turn or so, then readjust as in 9 (b).

LONG WAVE BAND CALIBRATION

10. (a) Turn the range switch to the extreme right position (clockwise).

(b) Adjust the test oscillator to exactly 350 KC.

(c) Turn the receiver dial pointer to 350 KC. on the tuning dial and adjust the long wave band oscillator shunt trimmer No. 18 for maximum output.

LONG WAVE BAND ALIGNMENT

11. (a) With the test oscillator set at 350 KC., tune the receiver to the signal for maximum output.

(b) Adjust the antenna and detector trimmers No. 19 and 20 for maximum output. Do not touch the oscillator trimmer No. 18 as this will change the calibration.

(c) Adjust the test oscillator to exactly 175 KC. and tune the receiver to the signal. Adjust the long wave oscillator series padder No. 21 for maximum output, then try to increase the output by detuning the padder No. 21 and retuning the receiver dial.

(d) Repeat adjustments of trimmers No. 18, 19 and 20 a 350 KC.

MISCELLANEOUS PARTS

Part Number	DESCRIPTION	List Price
67667	Flat steel mtg. washer	$ .01
67977	No. 14 x 1¼ chassis mtg. screw	.02
85066	G.D.A. terminal strip	.20
85578	Rubber chassis mtg. washer	.04
88056	Fuse mounting	.15
88057	Fuse cover	.08
88985	Tuning knob, front section	.20
88986	Tuning knob, rear section	.25
89038	Knob, volume control	.20
89051	Knob, range switch	.20
89119	Tuning indicator cable and plug	1.50
89267	Knob, selectivity control	.20
89268	Knob, tone control	.20

TUNING DRIVE AND DIAL PARTS

Part Number	DESCRIPTION	List Price
85902	Dual ratio planetary dial drive	$1.00
88839	Gear tension spring	.10
88958	No. 2 x ¾ R.H.W. screw for escutcheon (each)	.01
88982	Compression spring for band indicator	.01
89027	Spring washer for planetary	.01
89072	Dial ring bracket and shaft assembly (for edge lighting)	2.50
89073	Split second shaft (hand spread ratio 10 to 1) See part No. 89721	.20
89075	Main pointer gear and shaft assembly	.30
89078	Idler gear and pinion (hand spread ratio 10 to 1) See part No. 89721	.25
89081	Driven disc and bushing	.65
89086	Compression spring for driven disc gear	.01
89092	Second pointer	.04
89093	Main pointer and stud	.10
89095	Spring washer (for pointer shaft)	.01
89100	Dial scale for rear lighting	2.20
89120	Band indicator and link assembly	.60
89132	Escutcheon and glass assembly	2.25
89283	Pilot lamp socket	.10
89284	Pilot lamp shield	.02
89308	Bracket and light bracket assem. (for idler gear)	.15
89311	Dial background (for edge lighting dials)	.12
89313	Dial scale for edge lighting	2.00
89485	Dial ring bracket and shaft assembly (for rear lighting)	2.50
89721	Idler gear and pinion (hand spread ratio 12 to 1)	.45
89721	Split second shaft (hand spread ratio 12 to 1)	.18
89799	Dial scale retaining clip	.02

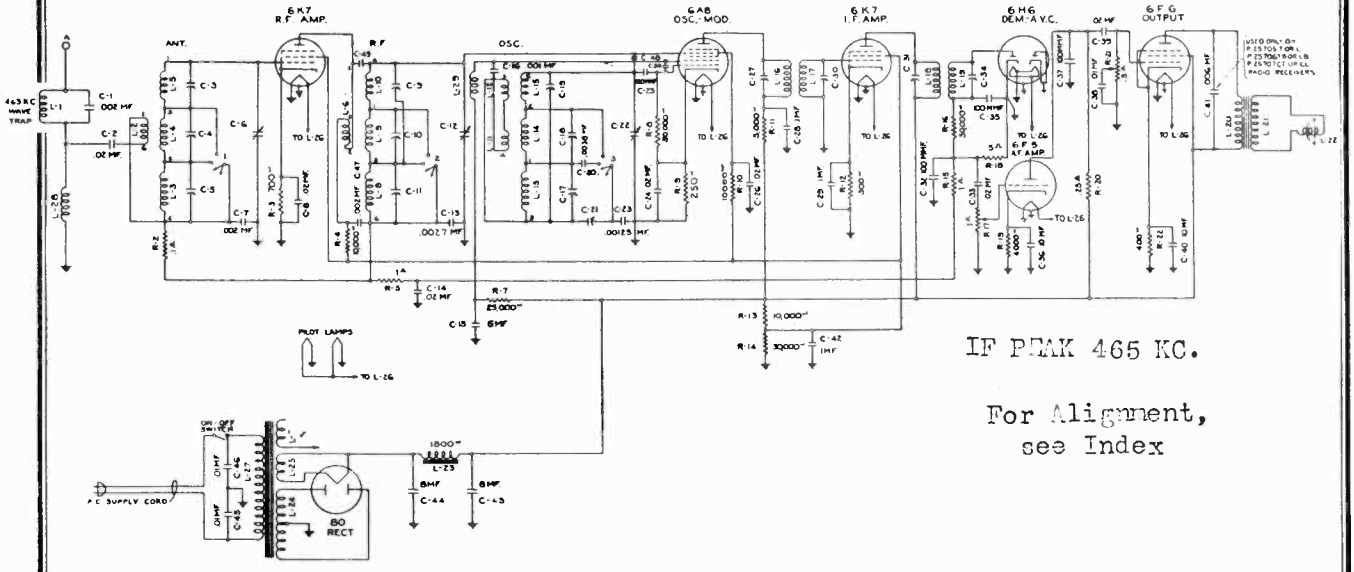
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

F6000 7840 PRINTED IN U. S. A. 9-14-35

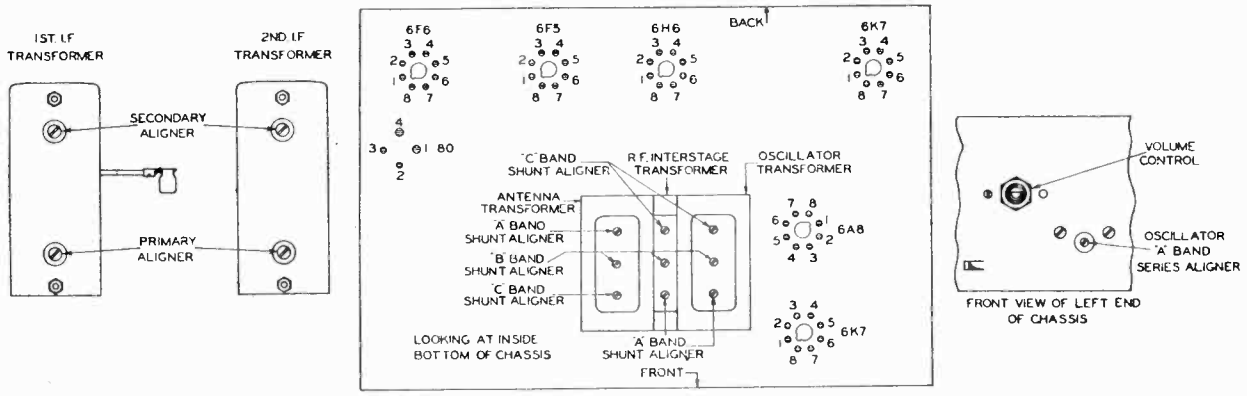
MODELS 61T, 61TB, 61L
61LB, 61W, 61WB

Schematic, Socket
Trimmers, Voltage

STROMBERG-CARLSON TEL. MFG. CO.



Schematic Circuit of Receiver.



Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

Tube	*Circuit*	*Cap.*	*Terminals of Sockets* 1	2	3	4	5	6	7	8	*Heater Voltages Between Terminals Nos. at 120 Volts*
6K7	R. F. Amp.	0	0	0	+ 50	+100	+ 4.5	—	0	+ 4.5	2-7, *6.3* Volts
6A8	Osc.-Mod.	0	0	0	+220	+ 72	— 6	+160	0	+ 1.8	2-7, *6.3* Volts
6K7	I. F. Amp.	0	0	0	+235	+100	+ 3	—	0	+ 3	2-7, *6.3* Volts
6H6	Dem.—A.V.C.	—	0	0	0	0	— .5	—	0	0	2-7, *6.3* Volts
6F5	A. F. Amp.	0	0	0	—	+ 58	—	—	0	+ 1.2	2-7, *6.3* Volts
6F6	Output	—	0	0	+220	+235	0	—	0	+14	2-7, *6.3* Volts
80	Rectifier	—	+355	*335*	*335*	+355	—	—	—	—	1-4, *4.8* Volts

Set tuned to 1000 kc., no signal. A. C. voltages are indicated by italics.

APPARATUS SPECIFICATIONS

No. 61-T	50-60 Cycles	P-25705 Chassis; P-25464 Loud Speaker
No. 61-TB	25-60 Cycles	P-25706 Chassis; P-25464 Loud Speaker
No. 61-L	50-60 Cycles	P-25705 Chassis; P-25464 Loud Speaker
No. 61-LB	25-60 Cycles	P-25706 Chassis; P-25464 Loud Speaker
No. 61-W	50-60 Cycles	P-25795 Chassis; P-25601 Loud Speaker
No. 61-WB	25-60 Cycles	P-25796 Chassis; P-25601 Loud Speaker

MODELS 61T, 61TB, 61L
61LB, 61W, 61WB

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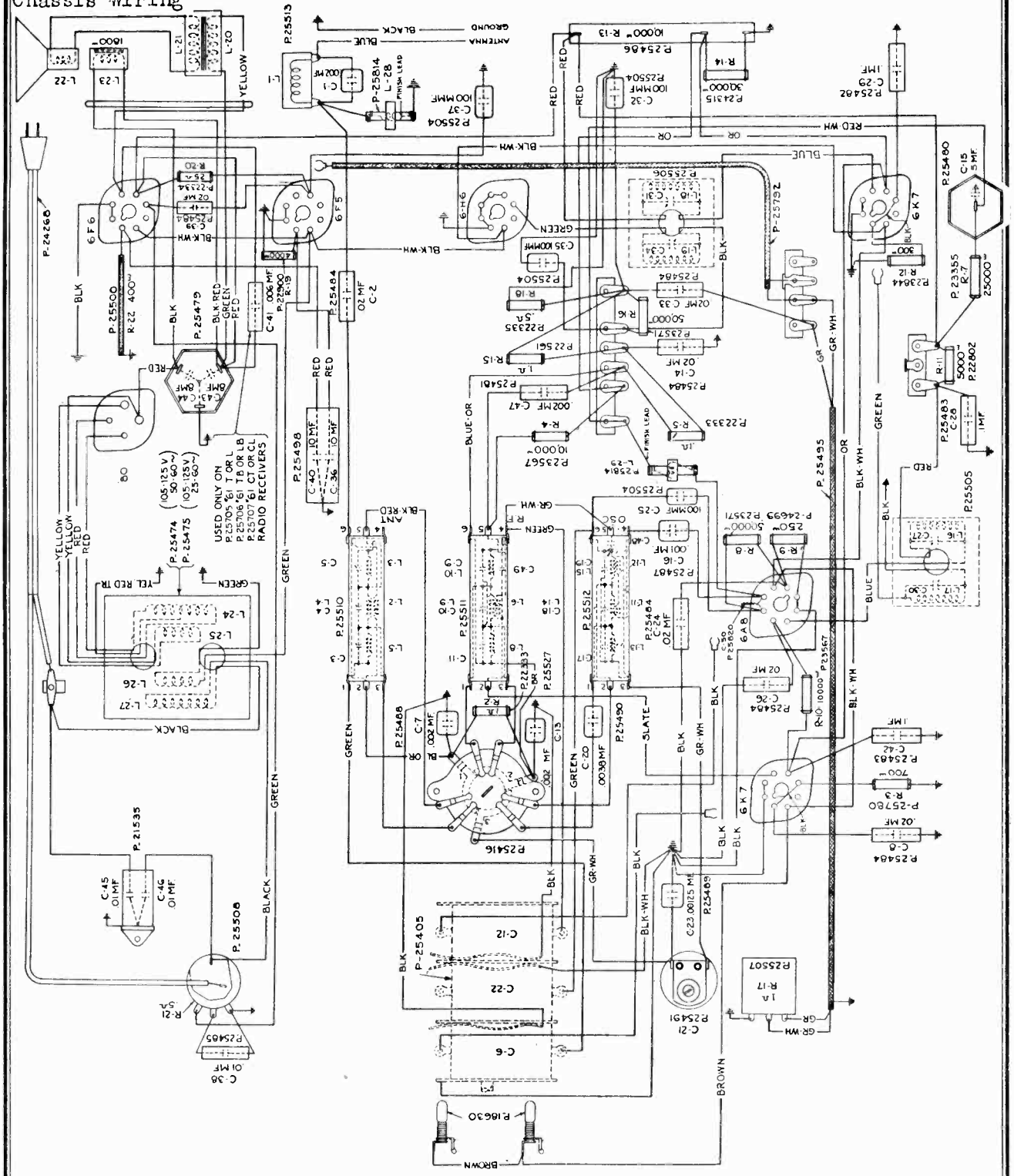
Chassis Wiring

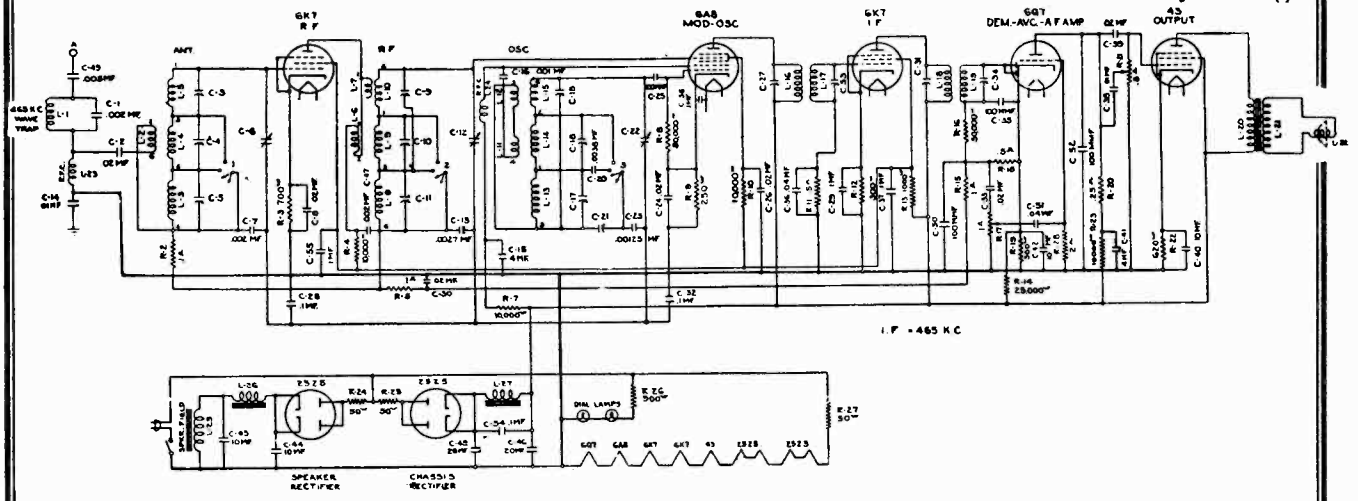


Type of Circuit	Superheterodyne
Tuning Ranges	A—540 to 1500 kc.; B—1450 to 3500 kc.; C—5600 to 18,000 kc.
Number and Type of Tubes	2 No. 6K7, 1 No. 6A8, 1 No. 6H6, 1 No. 6F5, 1 No. 6F6, 1 No. 80
Voltage Rating	105 to 125 Volts
Frequency Rating	25-60 Cycles and 50-60 Cycles
Wattage Rating	60 Watts
Intermediate Frequency	465 Kc.

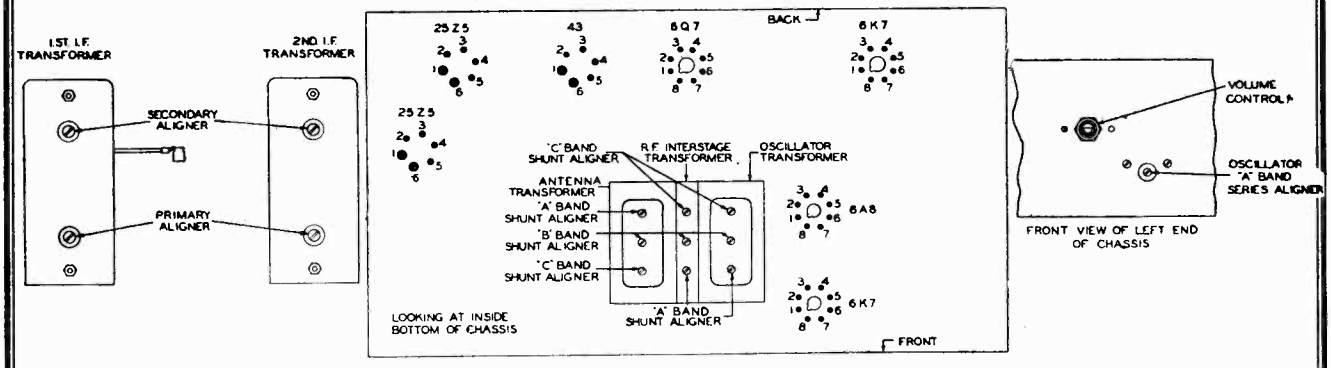
MODELS 61Y, 61Z

STROMBERG-CARLSON TEL. MFG. CO.

Schematic, Socket Trimmers, Voltage



Schematic Circuit of Receiver.



For Alignment see Index

Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

TUBE	CIRCUIT	CAP.	TERMINALS OF SOCKETS 1	2	3	4	5	6	7	8	Heater Voltages Between Heater Terminals: Terminal Nos.	Volts
6K7	R. F. Amp.	0	0	*19*	+ 45	+110	+ 5	0	+13	+5	2-7	*6.0*
6A8	Mod.—Osc.	0	0	*6*	+117	+ 52	— 4	+90	+13	+2	2-7	*6.0*
6K7	I. F. Amp.	0	0	*26*	+120	+110	+ 3	—	*19*	+3	2-7	*6.0*
6Q7	Dem.—A. V. C. —Audio	0	0	0	30	0	0	0	*6*	+1	2-7	*6.0*
43	Output	—	*26*	+112	+120	0	+14	*51*	—	—	1-6	*26*
25Z5	Chassis Rectifier	—	*76*	*115*	+135	+135	*115*	51	—	—	1-6	*26*
25Z5	Speaker Rectifier	—	*76*	*114*	+117	+117	*114*	*101*	—	—	1-6	*26*

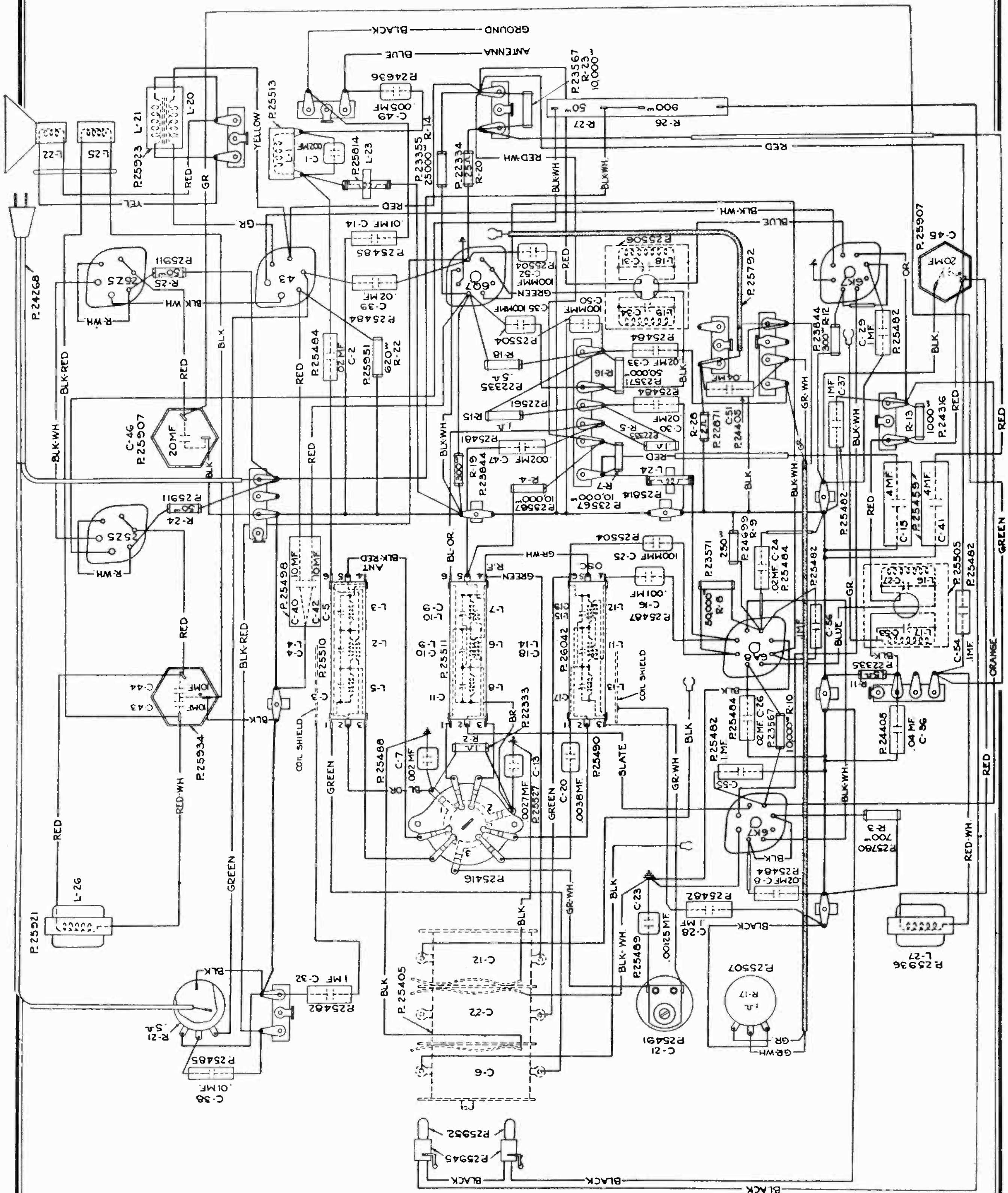
Voltage across pilot lamps—*27* volts

APPARATUS SPECIFICATIONS

61-Y	50-60 Cycles (For AC Operation)	P-25919 Chassis; P-25896 Loud Speaker
61-Z	50-60 Cycles (For AC Operation)	P-25919 Chassis; P-25896 Loud Speaker

MODELS 61Y, 61Z
Chassis Wiring

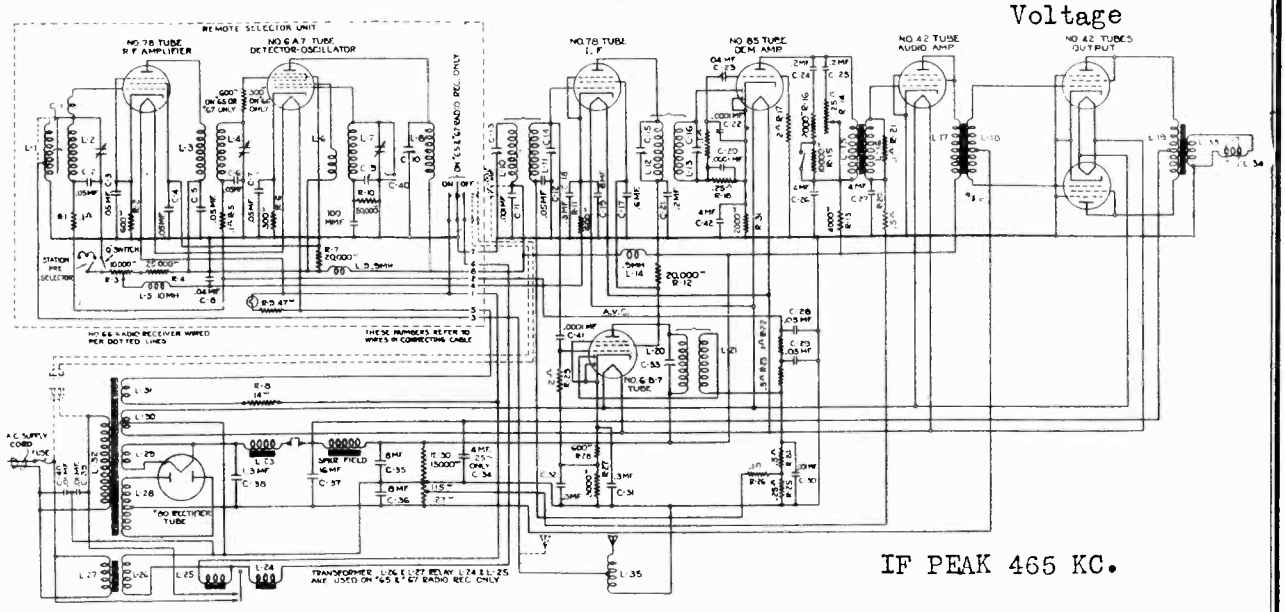
STROMBERG-CARLSON TEL. MFG. CO.



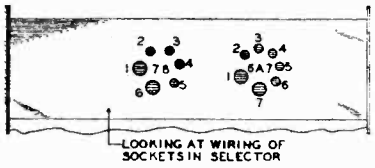
Type of Circuit	Superheterodyne
Tuning Ranges	A—540 to 1500 kc.; B—1450 to 3500 kc.; C—5600 to 18,000 kc.
Number and Types of Tubes	2 No. 6K7, 1 No. 6A8, 1 No. 6Q7, 1 No. 43, 2 No. 25Z5
Voltage Rating	105 to 125 Volts, AC or DC
Frequency Rating (For AC Operation)	50-60 Cycles
Wattage Rating	65 Watts
Intermediate Frequency	465 Kilocycles

STROMBERG-CARLSON TEL. MFG. CO

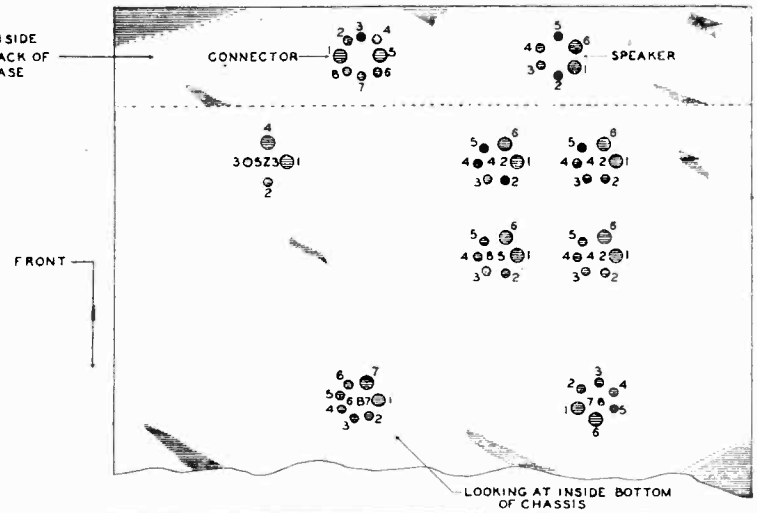
MODELS 65,66,67
Schematic, Socket Voltage



Schematic Circuit of Receiver.



Terminal Layout of Sockets for Voltage test.

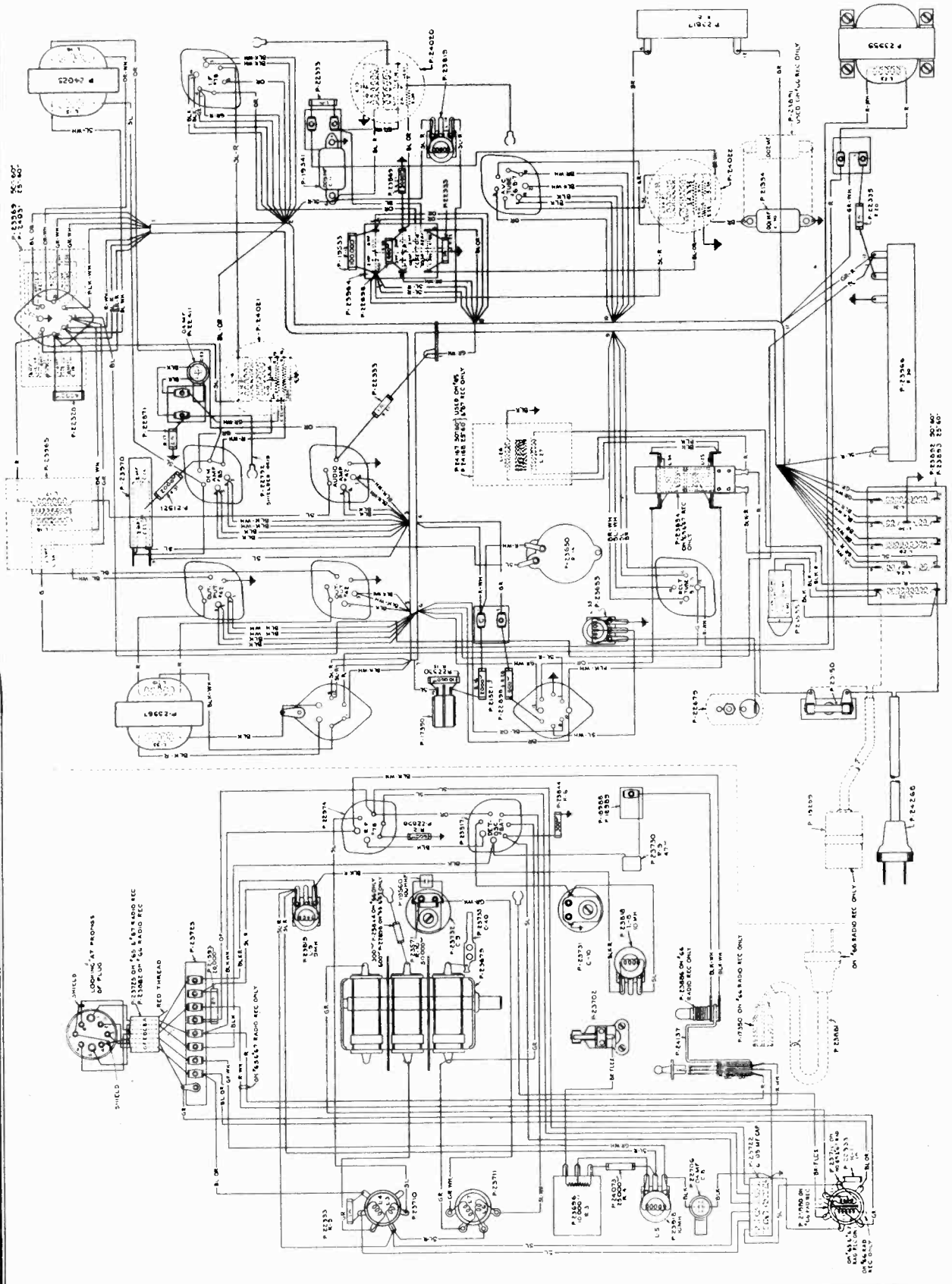


Tube	Circuit	Cap.	Terminals of Sockets 1	2	3	4	5	6	7	A. C. Meter for Heater Voltages Between Terminal Nos.
78	R. F. Amp.	0		+200	+100	+ 3	+ 3			1–6—*6.5* volts
6A7	Mixer-Osc.			+200	+100	+200	— 11	+ 3		1–7—*6.5* volts
78	I. F.			+180	+ 75	+ 2	+ 2			1–6—*6.5* volts
6B7	I. F. Dem.			+180	+ 75	0	+ 12	+ 12		1–7—*6.5* volts
85	1st Audio			+180	0	+ 13	+ 13			1–6—*6.5* volts
42	2nd Audio			+170	+170	— 16	0			1–6—*6.5* volts
42's	Outputs			+345	+345	— 32	0			1–6—*6.5* volts
5Z3	Rectifier		A. C. voltage between plate terminals and chassis base	*500*	*500*					1–4—*4.8* volts
Speaker Socket			0	+193	+350	+350	+350	0		

A. C. voltages are indicated by italics. Additional voltages may be measured directly across the proper terminals.

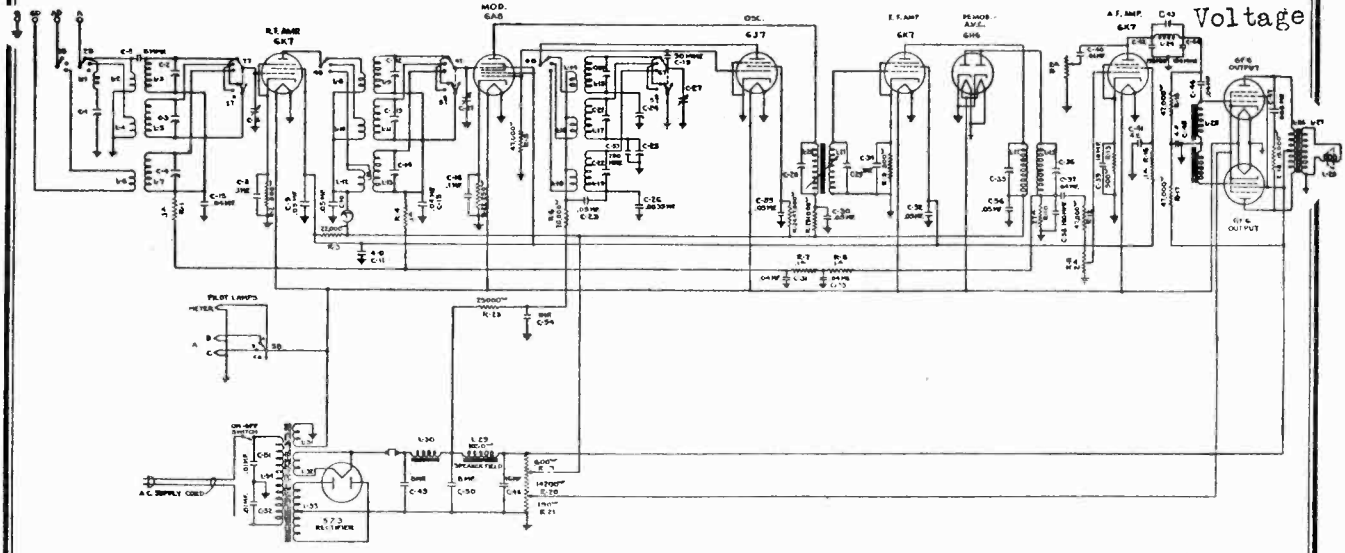
MODELS 65,66,67
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.



STROMBERG-CARLSON TEL. MFG. CO.

MODEL 80
Schematic, Voltage



Schematic Circuit of Receiver.

Tube	Circuit	Cap	Terminals of Sockets 1	2	3	4	5	6	7	8	Heater Voltages Between Terminal Nos. at 120 Volts
6K7	R. F. Amp.	0	0	—	+242	+ 96	+3.4	—	—	+ 3.4	2-7, *6.3* Volts
6A8	Mod.	0	0	—	+245	+ 96	— 13	+ 96	—	+ 1.6	2-7, *6.3* Volts
6J7	Osc.	0	0	—	+165	+125	0	—	—	—	2-7, *6.3* Volts
6K7	I. F. Amp.	0	0	—	+244	+ 95	+3.2	—	—	—	2-7, *6.3* Volts
6H6	Dem.—A.V. C.	—	0	—	0	0	0	0	—	—	2-7, *6.3* Volts
6K7	A. F. Amp.	0	0	—	+ 35	+ 25	+1.5	—	—	+ 1.5	2-7, *6.3* Volts
6F6	Output	—	0	—	+260	+270	—	—	0	+16	2-7, *6.3* Volts
5Z3	Rectifier	—	+426	*405*	*405*	+426					1-4, *4.8* Volts
Speaker Socket			+260	+403	+425	+425	+265	+260			

Set tuned to 1000 kc., no signal. A. C. voltages are indicated by italics.

Type of Circuit ..... Superheterodyne
Tuning Ranges ..... A—.54 to 1.7 megacycles; B—1.7 to 5.4 megacycles; C—5.4 to 18 megacycles
Number and Types of Tubes ..... 3 No. 6K7, 1 No. 6A8, 1 No. 6J7, 1 No. 6H6, 2 No. 6F6, 1 No. 5Z3
Voltage Rating ..... 105 to 125 Volts
Frequency Rating ..... 50-60 Cycles
Wattage Rating ..... 105 Watts
Intermediate Frequency ..... 465 Kc.

APPARATUS SPECIFICATIONS

No. 80 Receiver ..... 50-60 Cycles ..... P-25908 Chassis; P-25687 Loud Speaker

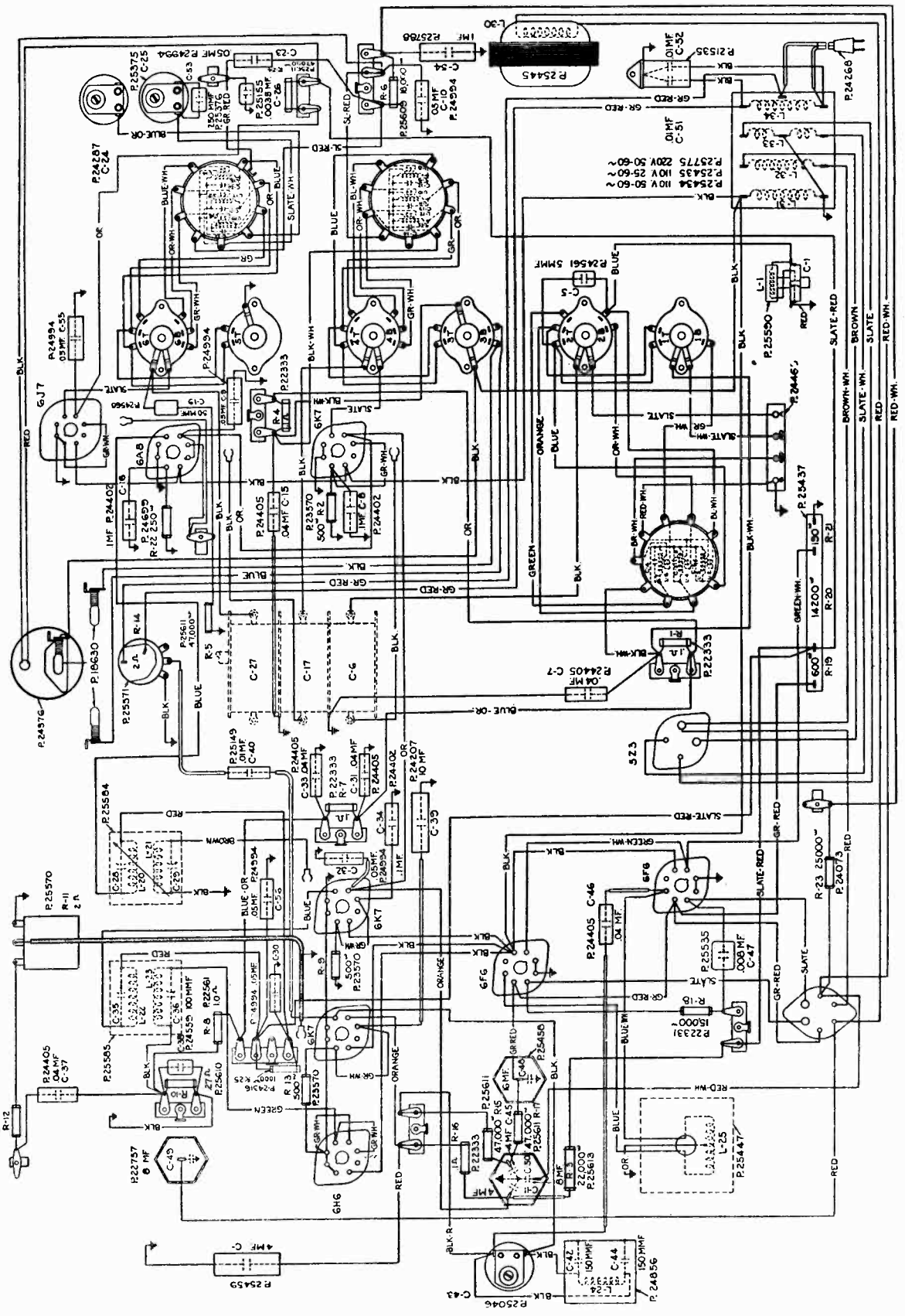
CIRCUIT DESCRIPTION

Nine tubes, A. C. operated, Superheterodyne receiver employing metal tubes and having three tuning ranges. These three tuning ranges cover all the important broadcasts and special service bands of both American and Foreign stations. These receivers are also equipped with a high fidelity control providing high fidelity reception by means of a special band widener device and a Carpinchoe high fidelity speaker. See P-25924 Installation and Operating Instructions, for properly installing and operating the No. 80 Receiver.

The various tubes in this receiver are used as follows: One of the No. 6K7 tubes functions as an R. F. Amplifier, another No. 6K7 tube is used in the I. F. Amplifier Stage, and the other No. 6K7 tube operates as an Audio Driver tube. The No. 6A8 tube is used as a Modulator. The No. 6J7 tube is used as the Oscillator tube. The No. 6H6 tube is used as a Demodulator-Automatic Volume Control tube. The audio power output stage uses the two No. 6F6 tubes, and the No. 5Z3 tube is used as the rectifier in the power supply unit.

MODEL 80
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.



Parts List

MODEL 80

STROMBERG-CARLSON TEL. MFG. CO.

Socket, Trimmers

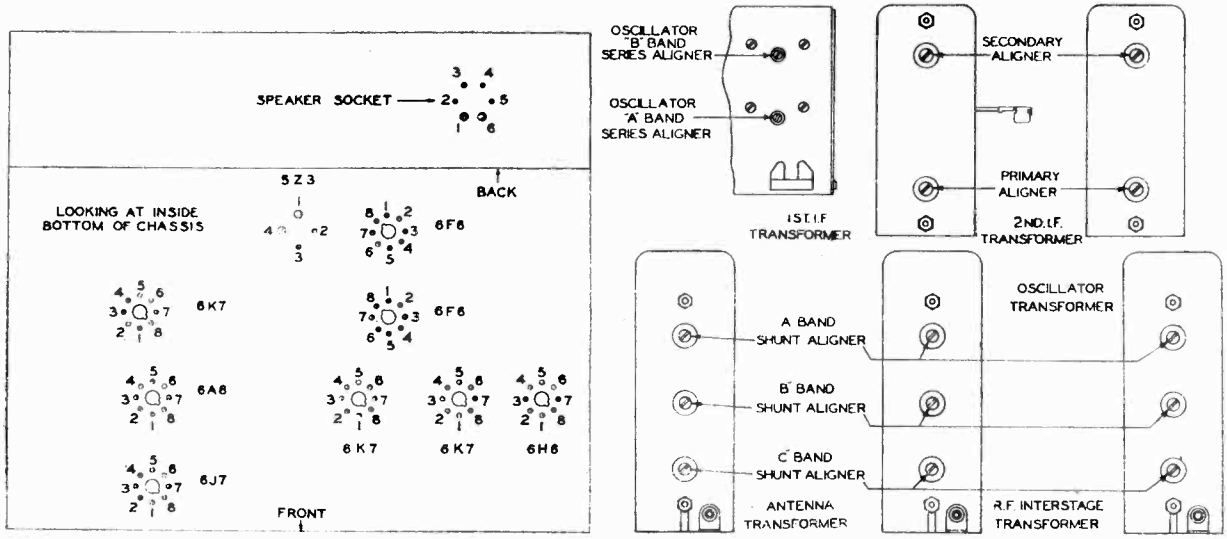


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors. CAUTION—Never Attempt to Align Receiver with Fidelity Control Set At Any Position Other Than the Maximum Counter-Clockwise Position.

REPLACEMENT PARTS

Piece Number	Part	Description	Required Per Receiver
P-24465	Binding Post	Antenna and Ground	1
P-25746	Bracket	Fidelity Control	1
P-25454	Capacitor	Aligning	1
P-25819	Capacitor	Aligning	1
P-24287	Capacitor	Aligning	1
P-25375	Capacitor	Aligning	1
P-25046	Capacitor	Aligning	1
P-22752	Capacitor	Aligning	1
P-22757	Capacitor	Electrolytic	1
P-25457	Capacitor	Electrolytic	1
P-25458	Capacitor	Electrolytic	1
P-25459	Capacitor	Electrolytic	1
P-24207	Capacitor	Electrolytic	1
P-25788	Capacitor	Electrolytic	1
P-21533	Capacitor	Two, .01 MF.	1
P-24402	Capacitor	.1 MF.	3
P-24405	Capacitor	.04 MF.	6
P-24994	Capacitor	.05 MF.	8
P-25149	Capacitor	.01 MF.	1
P-25155	Capacitor	.0035 MF.	1
P-25535	Capacitor	.008 MF.	1
P-24561	Capacitor	5 MMF.	1
P-24560	Capacitor	50 MMF.	1
P-24559	Capacitor	100 MMF.	1
P-25376	Capacitor	250 MMF.	1
P-25054	Capacitor	150 MMF.	2
P-25785	Coil	2.3 MH.	1
P-25909	Coil	Antenna	1
P-25910	Coil	R. F.	1
P-25939	Coil	Oscillator	
P-25915	Coil	.5 MH.	1
P-25445	Coil	Choke	1
P-24268	Cord	A.C.	1
P-25582	Dial and Drive		1
P-24856	Filter Assembly	Audio Cut-Off Filter	1
P-25590	Filter Assembly	Antenna Wave Trap	1
P-24416	Knob	Large	
P-22391	Knob	Small	
P-18620	Lamp	Pilot	
P-25747	Lever	Fidelity Control	1
P-24376	Meter	Visual Tuning	1
P-25570	Potentiometer	Volume Control	1
P-25571	Potentiometer	Tone Control and "On-Off" Switch	1
P-25609	Resistor	18,000 ohms Type C	1
P-22333	Resistor	.1 megohm Type D	4
P-25610	Resistor	.27 megohm Type D	1
P-23570	Resistor	500 ohms Type D	3
P-25611	Resistor	47 000 ohms Type D	6
P-25561	Resistor	1 megohm Type D	1
P-22331	Resistor	15 000 ohms Type C	1
P-25613	Resistor	22 000 ohms Type F	1
P-24316	Resistor	1,000 ohms Type D	1
P-24699	Resistor	250 ohms Type D	1
P-24073	Resistor	25,000 ohms Type B	1
P-25437	Resistor	"B" Voltage Divider	1
P-25687	Speaker Assembly	High Fidelity Loud Speaker	1
P-25539	Socket	Tube—8 Prong	8
P-23040	Socket	Tube—6 Prong	1
P-22988	Socket	Tube—4 Prong	1
P-25748	Shaft Assembly	Fidelity Control	1
P-25745	Shoulder Screw	Fidelity Control	1
P-21808	Shoulder Screw	Fidelity Control	1
P-25472	Switch Assembly	Frequency Range	1
P-25434	Transformer	Power, 50-60 Cycles, 110 Volts	1
P-25447	Transformer	Audio Power	1
P-25688	Transformer	Audio Power Output	1
P-25584	Transformer	Audio 1st I. F.	1
P-25585	Transformer	Audio 2nd I. F.	1

Two dummy antennas are necessary. For most practical cases a 250-mmf. condenser connected in series with the high side of the signal generator can be used for the standard broadcast band. A suitable dummy antenna for the short-wave bands may consist of a small non-inductive carbon resistor of 400 ohms value; this latter dummy antenna replaces the former when making short-wave adjustments.

The locations of the various trimmers of the sets mentioned above will be found in the servicing data in Rider's Volume VI. *The i-f peak of each receiver is 465 kc.*

Always align either the r-f. or i-f. circuits (on those sets which are equipped with high-fidelity circuits and controls) with the high-fidelity control set at maximum counter-clockwise position (normal fidelity), unless the alignment is being checked at the high-fidelity setting as specified in the following instructions:

(The use of a cathode-ray oscillograph is recommended for alignment purposes by the manufacturer, although the instructions can be followed when a meter or glow type indicator is used.

Before proceeding with the alignment, connect the "high" terminal of the output indicator to the output of the demodulator circuit.

In Models 58 and 61, this connection should be made at the junction of R-15, R-18, and C-33.

In Models 62 and 63, this connection should be made at the junction of R-10, L-29, and C-37.

In Models 82 and 83, this connection should be made at the junction of R-12, L-29, and C-46.

In Model 84, this connection should be made at the junction of R-14, L-30, and C-47.

Connect the chassis to the other terminal of the indicator. Connect a 0.001-mf. condenser in series with the high side of the signal generator and the control grid of the 6K7 i-f. amplifier tube. Connect the other terminal of the signal generator to the chassis. Set the range switch of the set to the "A" band position and tune the set to highest frequency setting shown on the dial for this band. Tune the signal generator to 465 kc., the i-f. peak, and keep its output as low as consistent with proper output indications on either the oscillograph or meter.

Adjust the trimmers across the secondary and primary windings of the second i-f. transformer, in the order given, until maximum deflection is obtained on the output indicator.

Feed a frequency modulated signal to the same grid as stated above and adjust the trimmers for maximum output.

Change the input lead from the grid of the 6K7 tube to the control grid of the 6A8 modulator tube. Adjust the trimmers of the primary and secondary coils of the first i-f. transformer, adjusting the latter first for maximum output. Check the alignment of the second transformer and then recheck that of the first.

Check the alignment of the i-f. circuits with the fidelity control set at the maximum high fidelity position (maximum clockwise).

R-f. Circuits Alignment:

Have the On-Off switch set to "Off." (This switch is located in the rear of those chassis which have a "Q" circuit). On receivers equipped with a high-fidelity control, make sure that this is set for normal fidelity (maximum counter-clockwise). See that the tone control is at normal and that the volume control is set at maximum (maximum clockwise).

"A" Band Alignment:

Set range switch on chassis to "A" position. Set the receiver and the signal generator to the particular high-frequency setting called for in the table below, for this band, of the receiver being aligned. Adjust the shunt aligning condensers of the oscillator, r-f. amplifier, and antenna transformers in the order given until maximum output is obtained.

Set the receiver and signal generator to the particular low frequency called for in the table, and align only the oscillator by means of the oscillator series padder. *Align only the oscillator at this frequency.*

Recheck the adjustments of the shunt, trimmers of the oscillator, r-f. amplifier and antenna transformers.

"B" Band Alignment:

Operate the range switch on the chassis to the "B" position and align the oscillator, r-f. amplifier, and antenna transformers in the same manner as was done in the "A" band, using the frequencies listed in the table below under the "B" band.

"C" and "D" Bands Alignment:

Operate the range switch to the "C" band and follow the same procedure as in the "B" band. After this is completed, then change to the "D" band and follow the same procedure, using in each case the frequencies as set forth in the table below for the respective bands.

Models 58 and 61:

Band	*High-Frequency Aligning Point*	*Aligning Frequency for Oscillator Series Padder*
"A"	1400 kc.	600 kc.
"B"	3000 kc.	No Aligner
"C"	16 mc.	No Aligner

Align the bands in the following order: "C," "B" and then "A."

Models 62 and 63:

Band	*High-Frequency Aligning Point*	*Aligning Frequency for Oscillator Series Padder*
"A"	1500 kc.	600 kc.
"B"	5000 kc.	1800 kc.
"C"	16 mc.	No Aligner

Align the bands in the following order: "A, "B," and then "C."

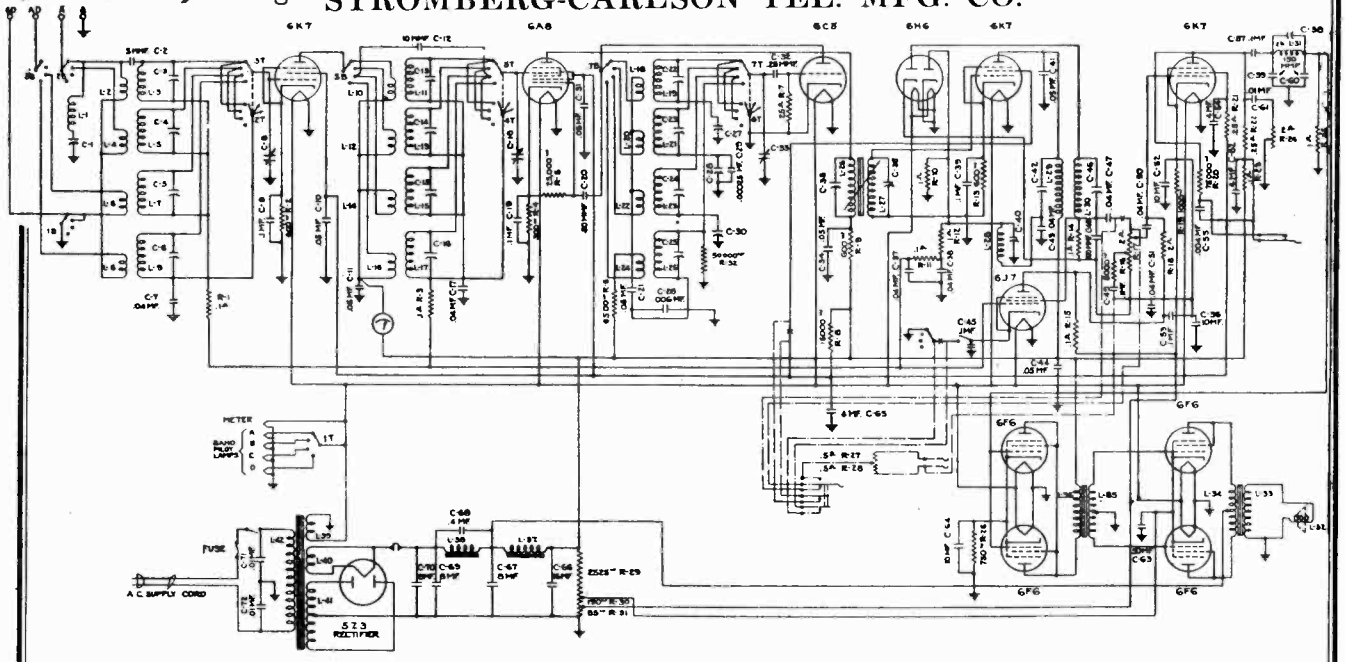
Models 82, 83, and 84:

Band	*High-Frequency Aligning Point*	*Aligning Frequency for Oscillator Series Padder*
"A"	1500 kc.	600 kc.
"B"	4000 kc.	1500 kc.
"C"	10 mc.	4 mc.
"D"	19.8 mc.	No Aligner

Align the bands in the following order: "A," "B," "C," and "D."

MODELS 84, 84-B
Schematic, Voltage

STROMBERG-CARLSON TEL. MFG. CO.



Schematic Circuit of Receiver.

For Alignment, see Index

Tube	Circuit	Cap.	Terminals of Sockets 1	2	3	4	5	6	7	8	Heater Voltages Between Terminals Nos. at 120 Volts
6K7	R. F. Amp.	0	0	—	+240	+ 90	+ 3.5	0	—	+ 3.5	2-7, *6.3* Volts
6A8	Mod.	0	0	—	+240	+ 85	—	+ 85	—	+ 2	2-7, *6.3* Volts
6C5	Osc.	—	0	—	+195	—	—	—	—	—	2-7, *6.3* Volts
6K7	I. F. Amp.	0	0	—	+230	+ 85	+ 3.5	—	—	+ 3.5	2-7, *6.3* Volts
6H6	Dem.—A.V. C.	—	0	—	—	—	—	—	—	—	2-7, *6.3* Volts
6K7	1st Audio	0	0	—	+100	+ 35	+ 10	—	—	+10	2-7, *6.3* Volts
6J7	"Q"	0	0	—	—	—	—	—	—	—	2-7, *6.3* Volts
6F6	2nd Audio	—	0	—	+220	+220	0	—	—	+20	2-7, *6.3* Volts
6F6	Output	—	0	—	+390	+390	0	—	—	+30	2-7, *6.3* Volts
5Z3	Rectifier	—	+410	*395*	*395*	+410					1-4, *4.75* Volts
Speaker Socket			0	+250	+410	+410	+ 395	0			

Set tuned to 1000 kc., no signal: A. C. voltages are indicated by italics.

ELECTRICAL SPECIFICATIONS

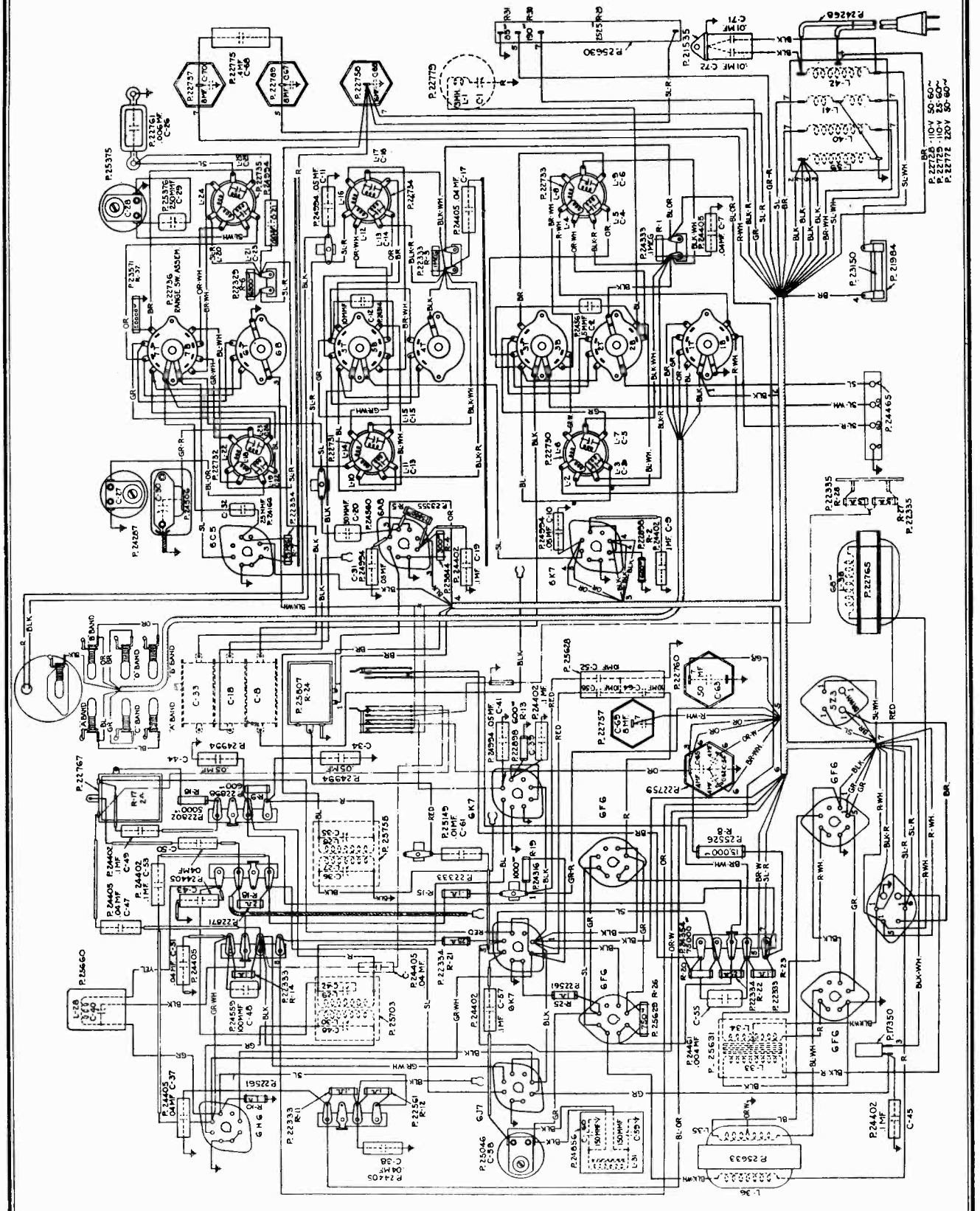
Type of Circuit ..... Superheterodyne
Tuning Ranges ..... A—520 to 1600 kc.; B—1500 to 4200 kc.; C—3.7 to 10 mcgacycles; D—8.5 to 23 megacycles
Number and Type of Tubes ..... 3 No. 6K7, 1 No. 6A8, 1 No. 6C5, 1 No. 6H6, 1 No. 6J7, 4 No. 6F6, 1 No. 5Z3
Voltage Rating ..... 105 to 125 Volts
Frequency Rating ..... 25-60 Cycles and 50-60 Cycles
Wattage Rating ..... 150 Watts
Intermediate Frequency ..... 465 Kc.

APPARATUS SPECIFICATIONS

No. 84 Receiver ..... 50-60 Cycles ..... P-22725 Chassis; P-25683 Loud Speaker
No. 84-B Receiver ..... 25-60 Cycles ..... P-22726 Chassis; P-25683 Loud Speaker

MODELS 84, 84-B
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.

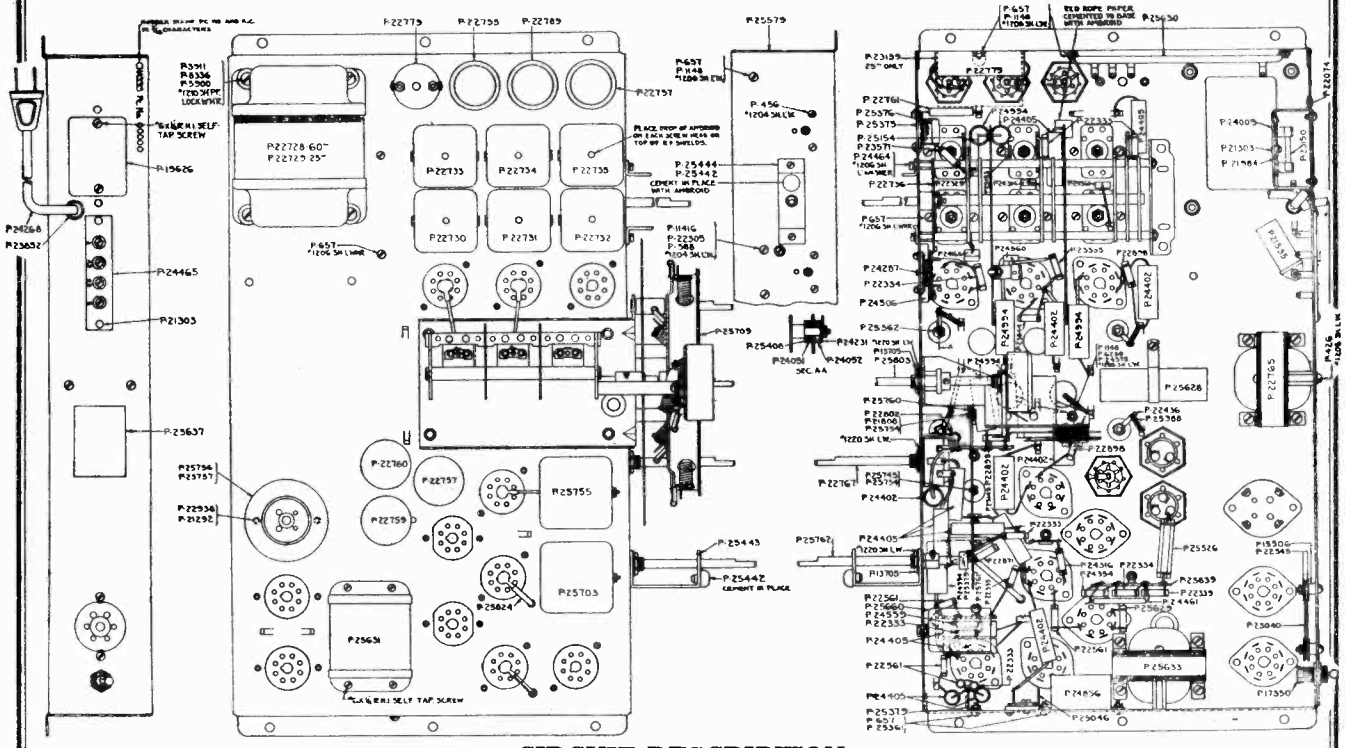


Chassis Assembly.

Circuit Data
Trimmers

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 84,84-B
Chassis Views



CIRCUIT DESCRIPTION

Twelve tubes, A. C. operated, Deluxe High Fidelity, Superheterodyne receiver employing metal tubes and having four tuning ranges. These four tuning ranges cover all the important broadcasts and special service bands of both American and Foreign stations. High fidelity is obtained in this receiver by its design as a complete high quality reproducing system including the receiver chassis which has a special band widener device; a Carpinchoe high fidelity speaker and treatment of the enclosing cabinet by means of the new revolutionary Stromberg-Carlson development for a sound reproducing system. This new device, the Acoustical Labyrinth (patent applied for) extends the bass response, provides reproduction only from the front of the cabinet and eliminates all cabinet resonance. Audio reproduction is further improved by employing sound diffusing vanes in front of the loud speaker opening which breaks up the directional high frequencies, thereby providing excellent reproduction in all parts of the room by spreading out these directional frequencies. See P-25826 Installation and Operating Instructions, for properly installing and operating this receiver.

The tubes used in this receiver are as follows: One No. 6K7 tube functions as an R. F. Amplifier, another No. 6K7 tube is used in the I. F. Amplifier Stage and the other No. 6K7 tube operates in the First Audio Stage. The No. 6A8 tube is used as the Modulator tube. The No. 6C5 tube is used as the Oscillator tube. The No. 6H6 tube is used as a Demodulator-Automatic Volume Control tube. The No. 6J7 tube is used in the Interstation Noise Suppressing (Q) Circuit. Two of the No. 6F6 tubes are connected in parallel and operate as the Audio Drive tubes. The other two No. 6F6 tubes operate in push-pull in the audio power output stage. The No. 5Z3 tube is the rectifier tube of the power supply unit.

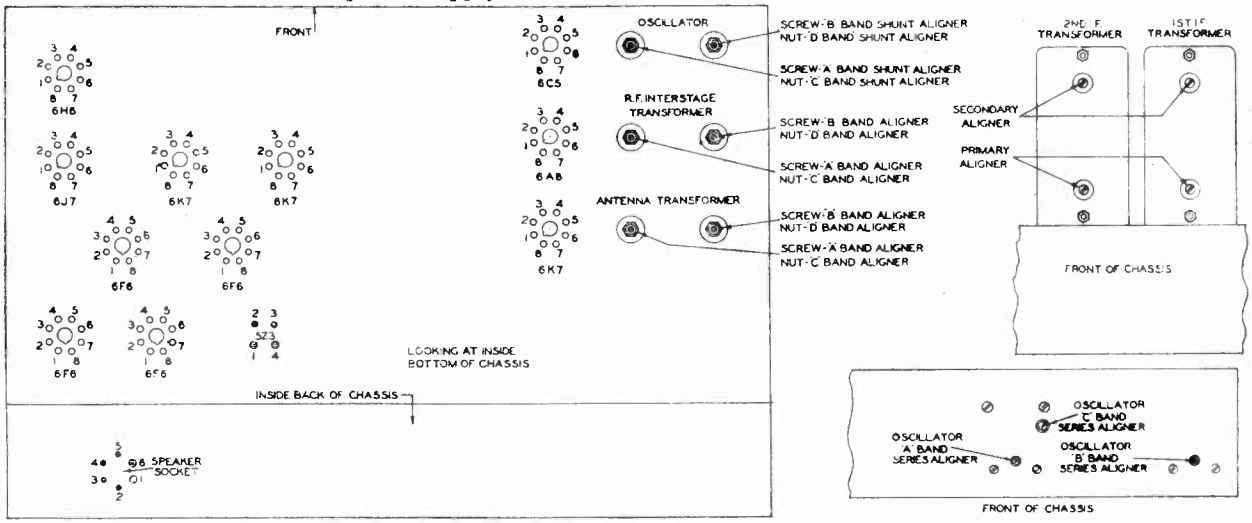
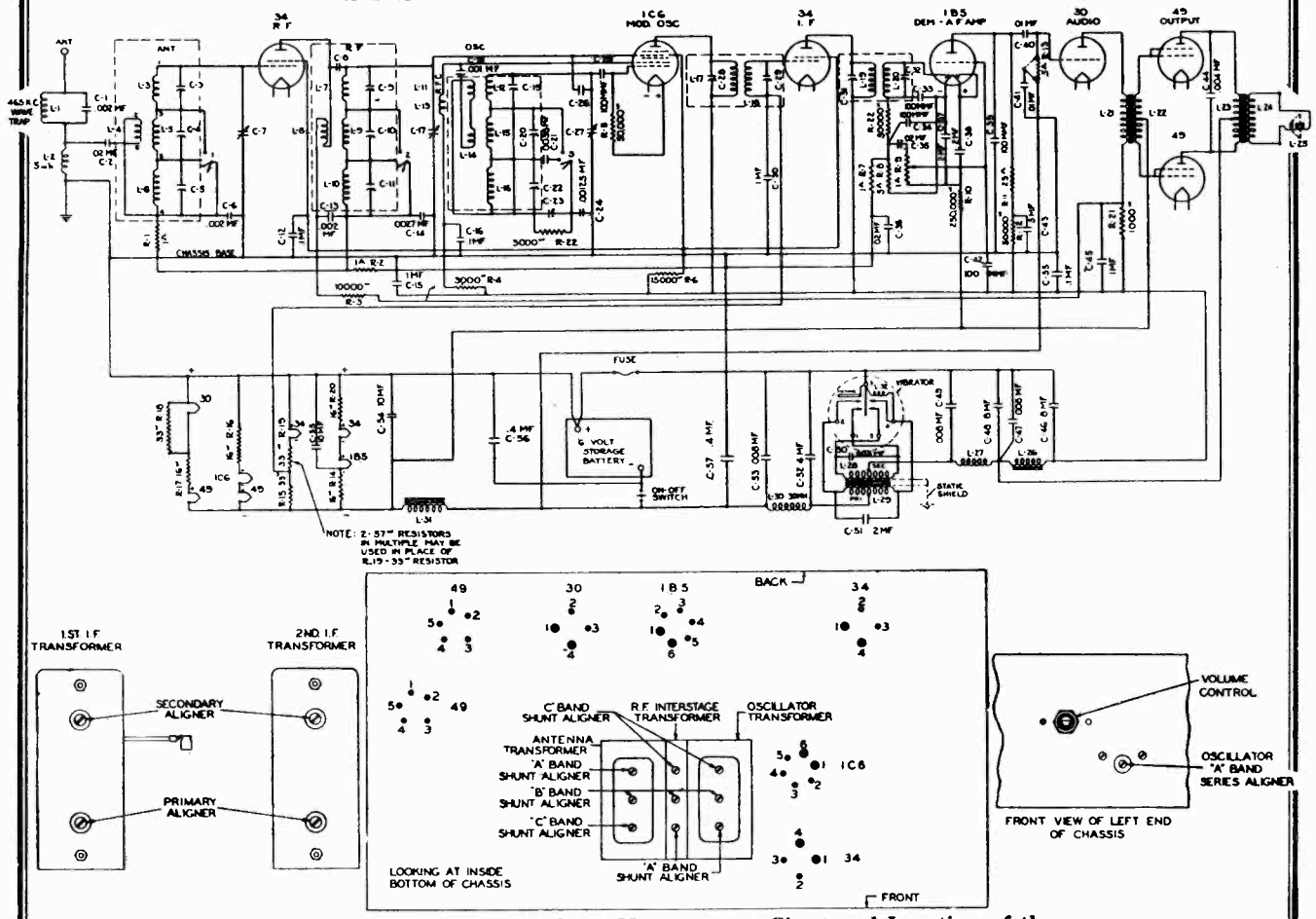


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors. CAUTION—Never Attempt to Align Receiver With Fidelity Control Set At Any Position Other Than the Maximum Counter-Clockwise Position.

MODEL 115
Schematic, Socket

STROMBERG-CARLSON TEL. MFG. CO.

Trimmers, Voltage



Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

APPARATUS SPECIFICATIONS

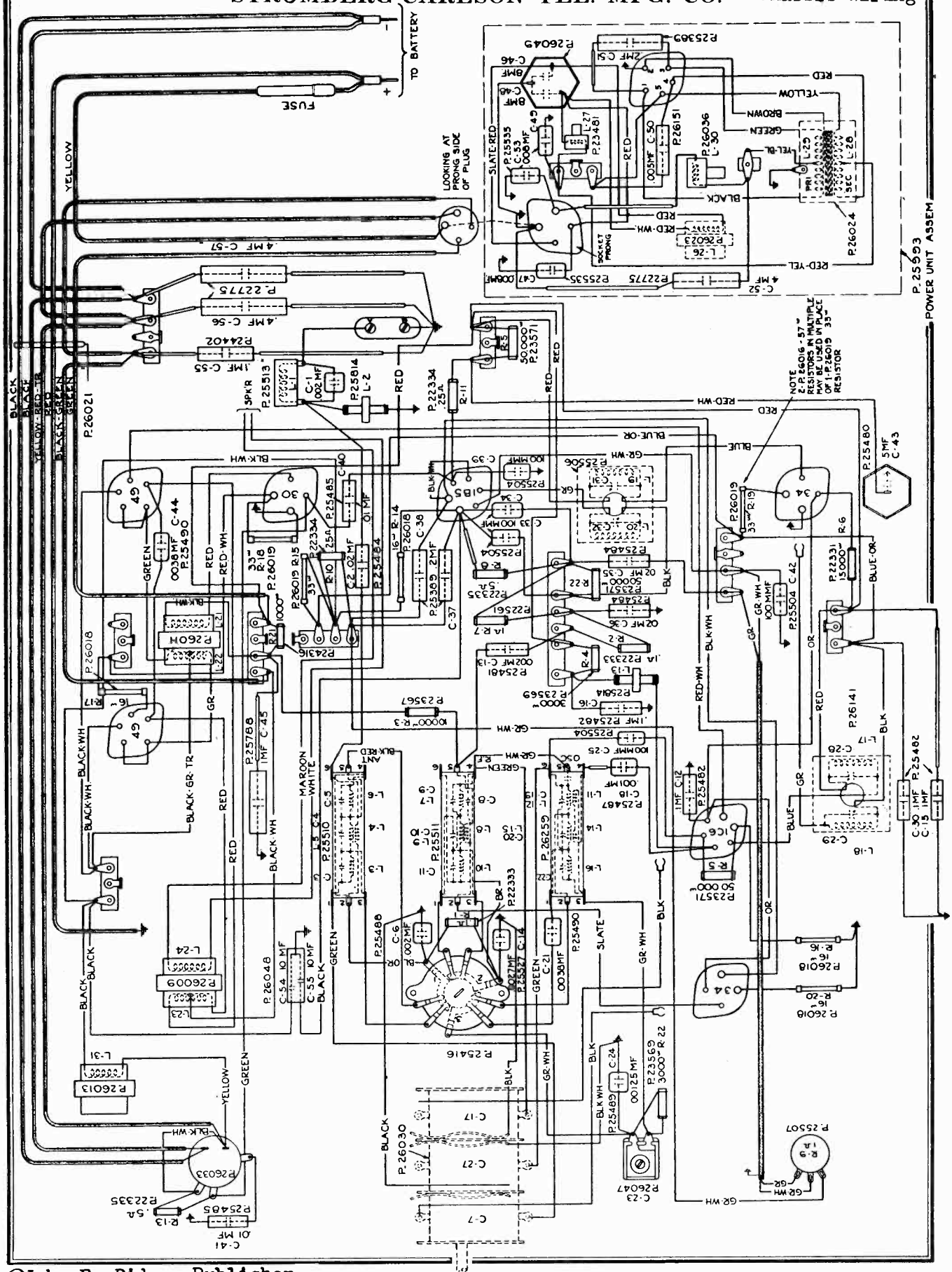
Chassis	P-25992
Loud Speaker	P-25994
Vibrator "B" Power Unit	P-25993
Type of Circuit	Superheterodyne
Tuning Ranges	A—540 to 1500 kc.; B—1450 to 3500 kc.; C—5600 to 18,000 kc.
Number and Types of Tubes	2 No. 34, 1 No. 1C6, 1 No. 1B5, 1 No. 30, 2 No. 49
Voltage Rating	5.7 to 6.8 Volts
Normal Current Consumption	7.8 Watts at 6 Volts Input
Intermediate Frequency	465 Kc.

TUBE	*CIRCUIT*	*CAP.*	*TERMINALS OF SOCKETS* 1	2	3	4	5	6	*Filament Voltages Between Filament Terminals* *Terminal Nos.*	*Volts*
34	R. F. Amp.	—.15	—0.9	+ 86	+ 62	—2.8	—	—	1-4	1.8
1C6	Mod.-Osc.	—.37	—1.9	+132	+117	—6.4	+ 62	—3.8	1-6	1.95
34	I. F. Amp.	—3.6	—1.8	+130	+ 63	0	—	—	1-4	1.85
1B5	Demod.-A. V. C. —Audio	—	—2.7	+ 30	—2.7	—1.3	—1.6	—4.7	1-6	2.0
30	Audio	—	—1.9	+117	—.05	0	—	—	1-4	1.88
49	Power Output	—	—3.8	+145	—5.6	—5.6	—5.8	—	1-5	2.0

Receiver tuned to 1000 kc., no signal, volume control set at minimum.

MODEL 115
Chassis Wiring

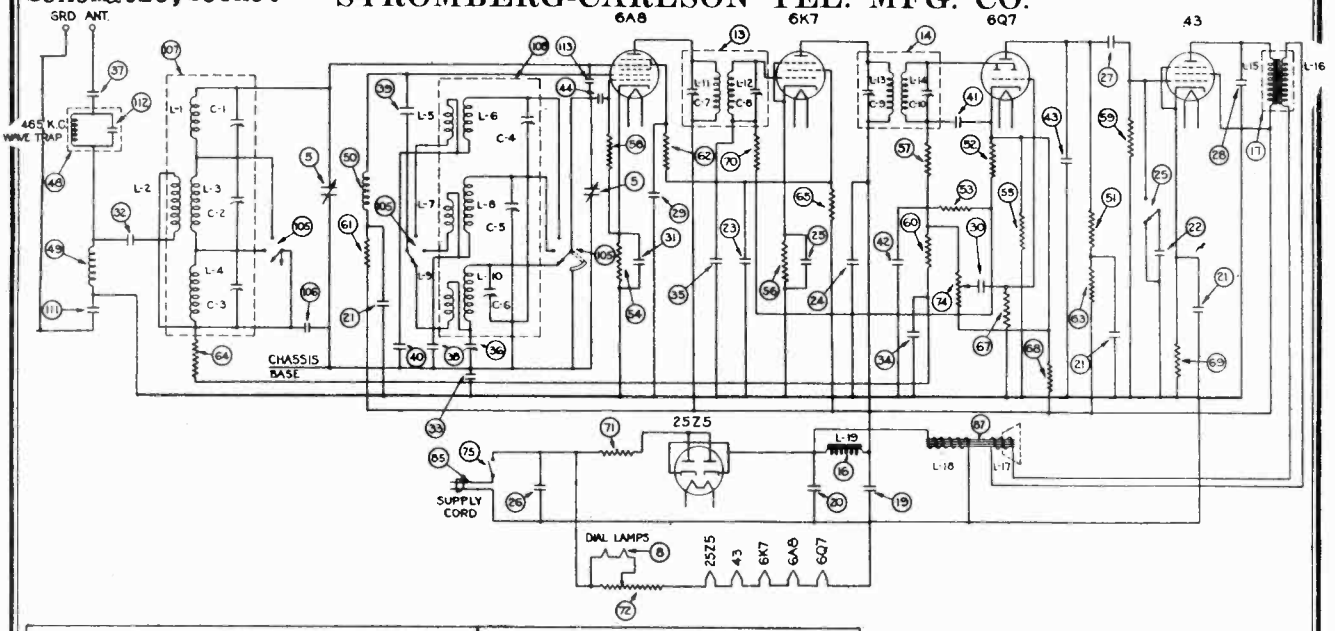
STROMBERG-CARLSON TEL. MFG. CO.

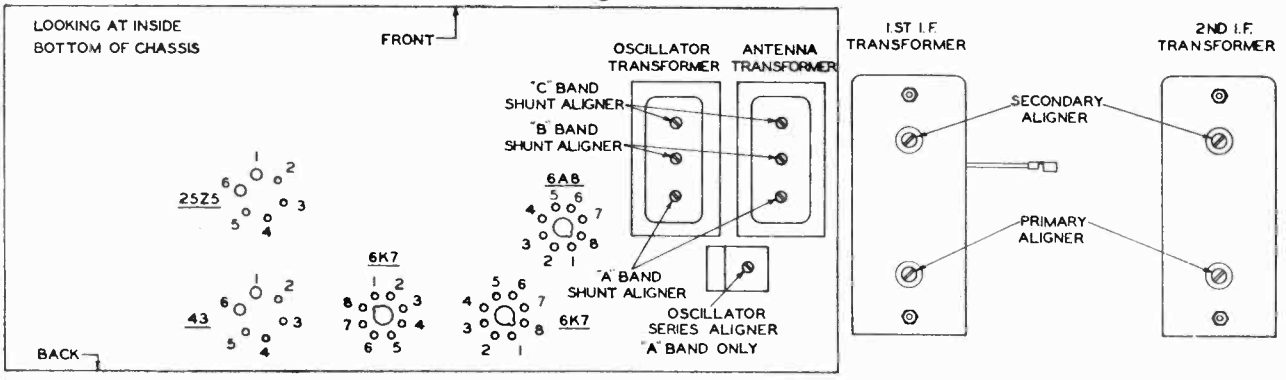


MODEL 125 AC-DC
Schematic, Socket

STROMBERG-CARLSON TEL. MFG. CO.

Trimmers, Voltage





Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

Tube	Circuit	Cap.	Terminals of Sockets 1	2	3	4	5	6	7	8	Heater Voltages Between Heater Terminals: Terminal Numbers	Volts
6A8	Mod.—Osc.	—.02	*125*	0	+ 97	+ 60	— 7	+73	*6.3*	+1.3	2-7	*6.3*
6K7	I. F. Amp.	0	*125*	0	+ 97	+ 91	+ 3	—	*18*	+3	2-7	*6.3*
6Q7	Dem.—A.V.C. —Audio	0	0	0	+55*	0	0	—	*6.2*	+1	2-7	*6.3*
43	Audio Output	—	*43*	+ 90	+ 96	0	+ 12	*18*	—	—	1-6	*24*
25Z5	Rectifier	—	*65*	*112*	+102	+102	*112*	*43*	—	—	1-6	*22*

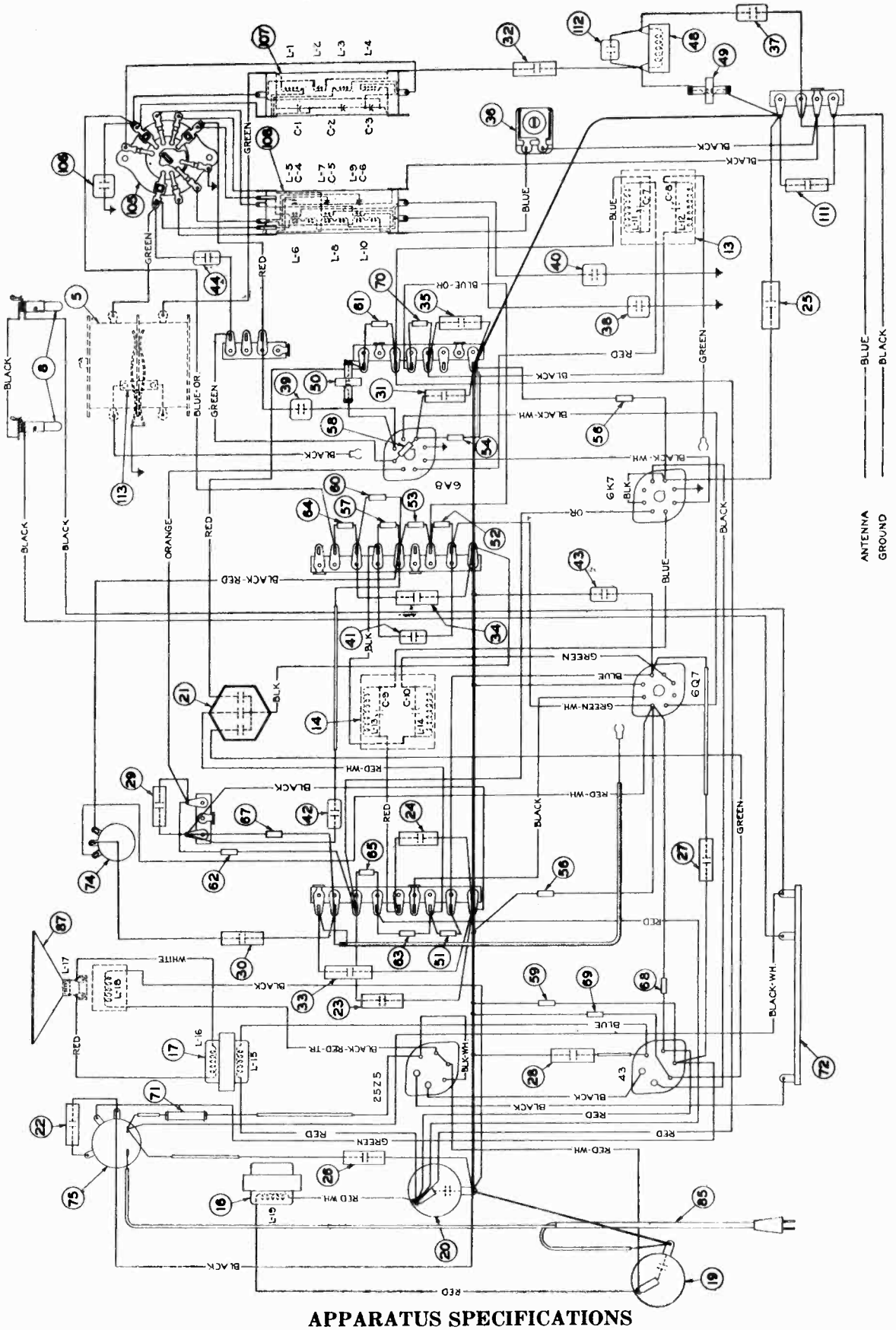
Voltage across pilot lamps—*8.2* volts

A.C. voltages are indicated by italics; when the receiver is operated from a D.C. power supply, D.C voltages will be obtained in place of the A.C. voltages.
Receiver tuned to 1000 kc., no signal.

Type of Circuit ..... Superheterodyne
Tuning Ranges ..... A—540 to 1500 Kc.; B—1450 to 3500 Kc.; C—5600 to 18,000 Kc.
Number and Types of Tubes ..... 1 No. 6A8, 1 No. 6K7, 1 No. 6Q7, 1 No. 43, 1 No. 25Z5
Voltage Rating ..... 105 to 125 Volts
Power Frequency (For AC Operation) ..... 50-60 Cycles
Input Power Rating ..... 45 Watts
Intermediate Frequency ..... 465 Kilocycles

MODEL 125 AC-DC
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.



Wiring Diagram of Chassis.

APPARATUS SPECIFICATIONS

No. 125 ..... 50 to 60 Cycles (For AC Operation) ..... P-26052 Chassis Assembly

MODEL 125 AC-DC
Chassis Views
Alignment, Parts

STROMBERG-CARLSON TEL. MFG. CO.

CIRCUIT DESCRIPTION

This triple range, superheterodyne receiver has five tubes and may be operated on a power supply circuit of either alternating or direct current at the voltages and frequency (for A. C. operation) specified above.

The various tubes are used in this receiver as follows: One No. 6A8 tube functions as both Oscillator and Modulator; one No. 6K7 tube is used in the I. F. Amplifier; the No. 6Q7 tube is used as the Demodulator, A. V. C. and Audio Amplifier tube. The No. 43 tube is used in the Audio Power Output stage, and the No. 25Z5 tube is used as the Rectifier tube for the receiver "B" voltage supply.

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, this alignment procedure should be carefully followed.

In making any alignment adjustments always adjust the signal generator's output to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal.

Figure 1 shows the location of all the aligning capacitors used in this receiver.

Intermediate Frequency Adjustments

The intermediate frequency used in these receivers is 465 kilocycles. In making these I. F. circuit adjustments always align in the following order:

1. Secondary of 2nd I. F. Transformer (Capacitor C-10).
2. Primary of 2nd I. F. Transformer (Capacitor C-9).
3. Secondary of 1st I. F. Transformer (Capacitor C-8).
4. Primary of 1st I. F. Transformer (Capacitor C-7).

Radio Frequency Adjustments

The adjustments of the aligning capacitors used in the radio frequency circuits in this receiver should be very carefully made in the following order and at the frequencies specified below:

1. Oscillator's "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-4).
2. Antenna "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-1).
3. Oscillator's "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-5).
4. Antenna "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-2).
5. Oscillator's "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-6).
6. Antenna "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-3).
7. Oscillator's "A" Band Series Aligner at 600 Kilocycles (Capacitor 36).
8. Oscillator's "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-6).
9. Antenna "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-3).

REPLACEMENT PARTS

Item Number	Piece Number	Part
2	25998	Bracket Assembly
5	28057	Gang Tuning Condenser
6	26143	Dial Assembly
8	26597	Dial Lamp
13	26121	1st I. F. Transformer
14	25506	2nd I. F. Transformer
16	26133	Choke Assembly
17	26135	Transformer, Output
19	26162	Capacitor, Electrolytic 85 Mf.
20	26165	Capacitor, Electrolytic 40 Mf.
21	26164	Capacitor, Electrolytic 4-4-12 Mf.
22	25461	Capacitor .002 Mf.
23	25483	Capacitor .1 Mf.
24	25483	Capacitor .1 Mf.
25	25483	Capacitor .02 Mf.
26	25150	Capacitor .02 Mf.
27	25150	Capacitor .02 Mf.
28	25150	Capacitor .02 Mf.
30	25150	Capacitor .02 Mf.
31	25150	Capacitor .02 Mf.
32	25150	Capacitor .02 Mf.
33	25389	Capacitor Assembly .2 Mf.
34	24405	Capacitor Assembly .04 Mf.
35	24405	Capacitor Assembly .04 Mf.
36	26747	Capacitor Altimer
37	26778	Capacitor .005 Mf.
38	25487	Capacitor .001 Mf.
39	25487	Capacitor .001 Mf.
40	25489	Capacitor 100 Mmf.
41	25504	Capacitor 100 Mmf.
42	25504	Capacitor 100 Mmf.
43	25504	Capacitor 100 Mmf.
44	24559	Capacitor 100 Mmf.
48	26513	Coil Assembly, Wave Trap
49	25814	Coil Assembly, Choke
50	25814	Coil Assembly, Choke
51	26582	Resistor Type "E" .27 Megohms
52	26582	Resistor Type "E" .27 Megohms
53	26582	Resistor Type "E" .27 Megohms
54	26396	Resistor Type "E" 270 Ohms
55	26827	Resistor Type "E" 330 Ohms
56	26327	Resistor Type "E" 330 Ohms
57	26353	Resistor Type "E" 47,000 Ohms
58	26353	Resistor Type "E" 47,000 Ohms
59	26390	Resistor Type "E" 1 Megohm
60	26390	Resistor Type "E" 1 Megohm
61	26345	Resistor Type "E" 18,000 Ohms
62	26345	Resistor Type "E" 10,000 Ohms
63	26345	Resistor Type "E" 10,000 Ohms
64	26367	Resistor Type "E" .1 Megohm
65	26333	Resistor Type "E" 1,000 Ohms
67	26373	Resistor Type "E" 2.2 Megohms
68	26408	Resistor Type "C" 27,000 Ohms
69	26330	Resistor Type "E" 560 Ohms
70	26365	Resistor Type "E" .47 Megohms
71	25911	Resistor Type "H" 50 Ohms
72	26127	Resistor, "B" Voltage Divider
73	26252	Insulation (For Tone Control)
74	26114	Potentiometer (Volume Control)
75	26061	Off-On Switch—Tone Control
77	25559	Tube Socket, 8 Prong
78	25974	Tube Socket, 6 Prong
85	24268	Cord, Power Supply
86	25594	Grid Clip Assembly
87	26053	Speaker Assembly
105	26172	Range Switch
106	25488	Capacitor .002 Mf.
107	26113	Coil Assembly, Antenna
108	26157	Coil Assembly, Oscillator
109	26424	Dial Lamp Socket Assembly
111	26149	Capacitor Assembly, .01 Mf.
112	25488	Capacitor .002 Mf.
113	26417	Capacitor (Gimmick)

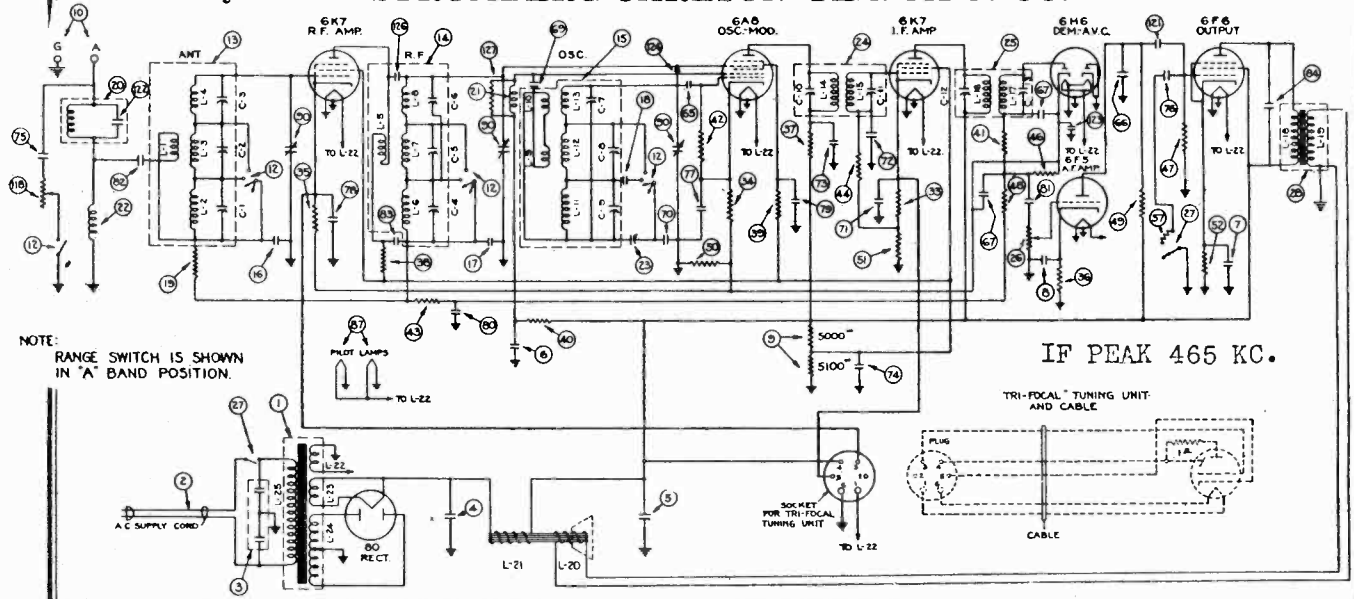
MISCELLANEOUS PARTS

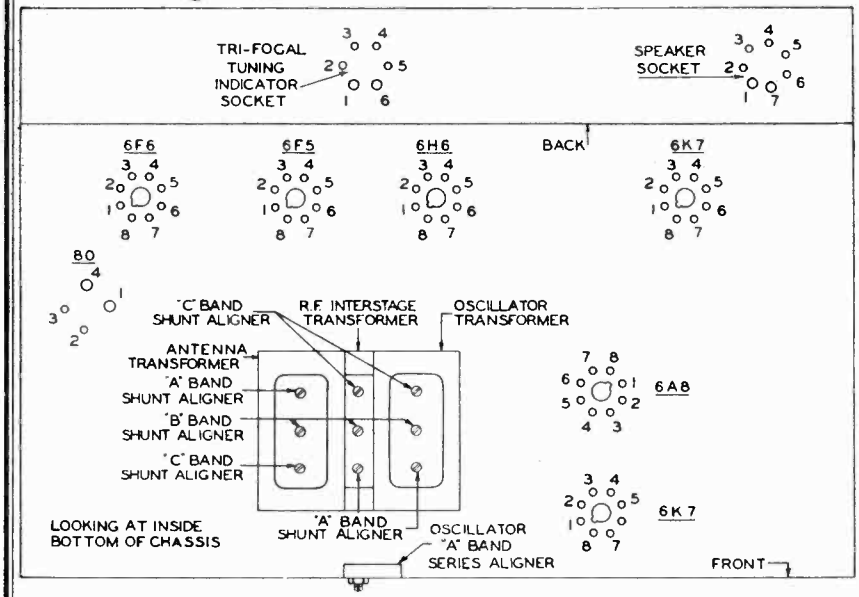
Piece Number	Part
26090	Cone Assembly (For 12-Inch Speaker)
26396	Knob (Used on Volume, "Off-on-Tone" and Station Selector Controls) 3 Required for Each Receiver
26297	Knob (For Range Switch) 1 Required

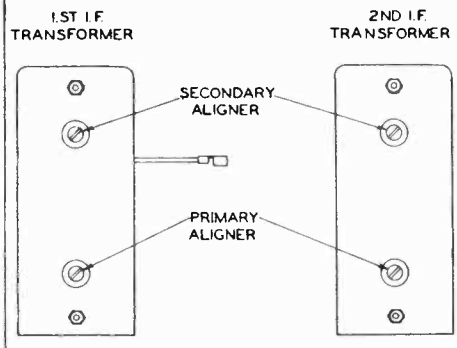
Schematic, Socket, Trimmers
Sensitivity Control

MODEL 130 Series

STROMBERG-CARLSON TEL. MFG. CO.







Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

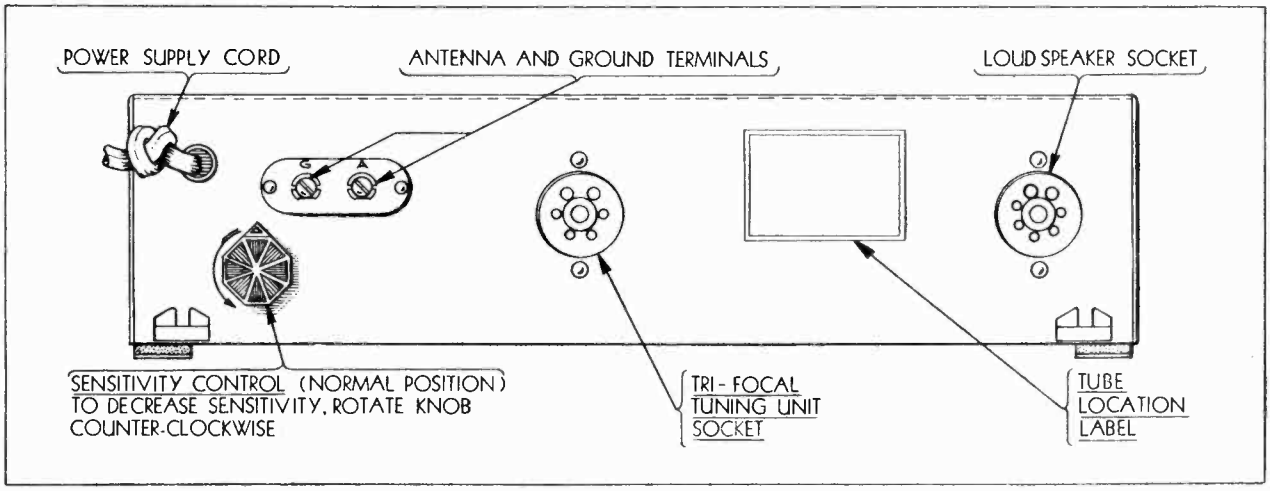
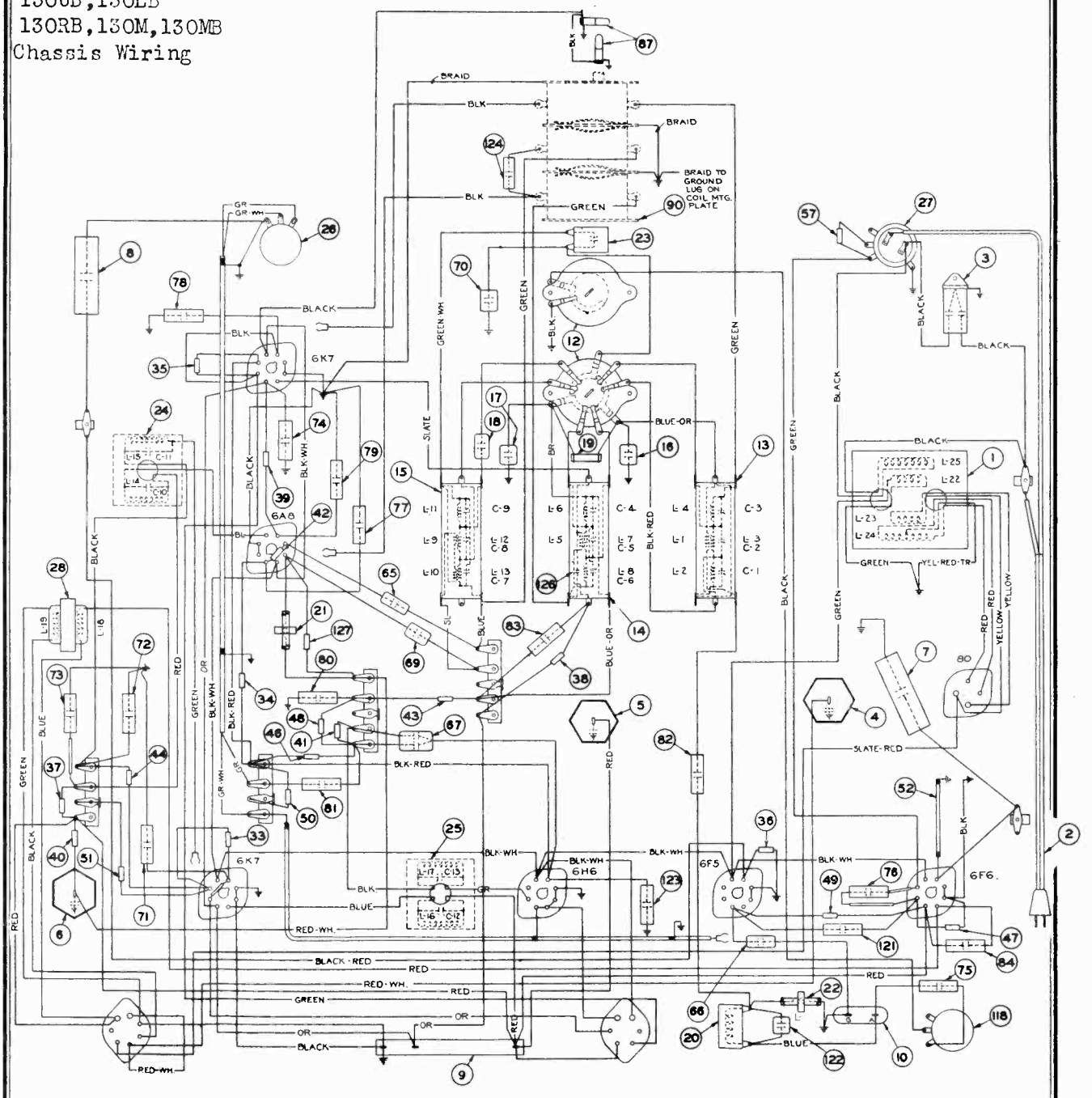


Fig. 1. Location and Operation of Sensitivity Control.

MODELS 130H,130U,130L
130R,130HB,
130UB,130LB
130RB,130M,130MB
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.



Type of Circuit	Superheterodyne
Tuning Ranges	A—540 to 1500 Kc.; B—1450 to 3500 Kc.; C—5600 to 18,000 Kc.
Number and Types of Tubes:	
Nos. 130-H, 130-U, and 130-L Receivers	2 No. 6K7, 1 No. 6A8, 1 No. 6H6, 1 No. 6F5, 1 No. 6F6, 1 No. 80
Nos. 130-M and 130-R Receivers	2 No. 6K7, 1 No. 6A8, 1 No. 6H6, 1 No. 6F5, 1 No. 6F6, 1 No. 80, 1 No. 6E5
Power Supply Voltage	105 to 125 Volts
Power Supply Frequency	25 to 60 Cycles and 50 to 60 Cycles
Input Power Rating	70 Watts
Frequency of Intermediate Amplifier	465 Kilocycles

APPARATUS SPECIFICATIONS

Nos. 130-H, 130-U, 130-L, 130-R	50 to 60 Cycles	P-26246 Chassis; P-26171 Loud Speaker
Nos. 130-HB, 130-UB, 130-LB, 130-RB	25 to 60 Cycles	P-26247 Chassis; P-26171 Loud Speaker
No. 130-M	50 to 60 Cycles	P-26246 Chassis; P-26170 Loud Speaker
No. 130-MB	25 to 60 Cycles	P-26247 Chassis; P-26170 Loud Speaker

STROMBERG-CARLSON TEL. MFG. CO

MODELS 130H,130U
130L,130R,130HB,
130UB,130LB,130RB
130M,130MB
Voltage,Alignment

Tube	Circuit	Cap.	Terminals of Sockets 1	2	3	4	5	6	7	8	Heater Voltages Between Heater Terminals: Socket Terminal Numbers	Volts
6K7	R. F. Amp.	0	0	0	+ 54	+ 96	+7.6	+4.5	*6.3*	+7.6	2-7	*6.3*
6A8	Osc.-Mod.	0	0	0	+222	+ 72	—1.0	+143	*6.3*	+6.1	2-7	*6.3*
6K7	I. F. Amp.	0	0	0	+240	+ 96	+7.4	+4.5	*6.3*	+7.4	2-7	*6.3*
6H6	Dem.—A.V.C.	—	0	0	0	0	0	—	*6.3*	+4.5	2-7	*6.3*
6F5	Audio Amp.	0	0	0	—	+122*	—	—	*6.3*	+.75	2-7	*6.3*
6F6	Audio Output	—	0	0	+226	+237	0	0	*6.3*	+ 15	2-7	*6.3*
80	Rectifier	—	+330	*325*	*325*	+330	—	—	—	—	1-4	*4.8*
Tri-Focal Tuning Indicator Plug's Socket When Tri-Focal Tuning Unit Is Used			*6.3*	0	+7.6	+235	+7.8	0	—	—	1-6	*6.3*
Tri-Focal Tuning Indicator Plug's Socket When Tri-Focal Tuning Unit Is Not Used			*6.3*	0	+7.6	+237	+7.3	0	—	—	1-6	*6.3*
Speaker Socket			+327	0	0	+327	+327	0	+237	—	—	—

Receiver tuned to 1000 Kc., no signal. A. C. voltages are indicated by italics.

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, this alignment procedure should be carefully followed.

In making any alignment adjustments always adjust the signal generator's output to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal.

Figure 2 shows the location of all the aligning capacitors used in this receiver.

Intermediate Frequency Amplifier Adjustments

The intermediate frequency used in these receivers is 465 kilocycles. In making these I. F. circuit adjustments always align in the following order:

1. Secondary of 2nd I. F. Transformer (Capacitor C-13).
2. Primary of 2nd I. F. Transformer (Capacitor C-12).
3. Secondary of 1st I. F. Transformer (Capacitor C-11).
4. Primary of 1st I. F. Transformer (Capacitor C-10).

Radio Frequency Adjustments

The adjustments of the aligning capacitors used in the radio frequency circuits in this receiver should be very carefully made in the following order and at the frequencies specified below:

1. Oscillator's "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-7).
2. R. F. Interstage "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-6).
3. Antenna "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-3).
4. Oscillator's "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-8).
5. R. F. Interstage "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-5).
6. Antenna "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-2).
7. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-9).
8. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
9. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).
10. Oscillator's "A" Band Series Aligner at 0.6 Megacycles (Capacitor (23)).
11. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-9).
12. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
13. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).

MODELS 130H, 130U, 130L, 130R, 130HB 130UB, 130LB, 130RB

STROMBERG-CARLSON TEL. MFG. CO.

130M, 130MB Circuit Data Socket, Trimmers, Parts

CIRCUIT DESCRIPTION

The No. 130 Series of Radio Receivers are divided into two groups; the Nos. 130-U, 130-H, and 130-L are seven tube receivers and are not equipped with the "Tri-Focal Tuning System". The Nos. 130-M and 130-R are eight tube receivers and are equipped with the exclusive Stromberg-Carlson "Tri-Focal Tuning System." A socket is provided on the rear of the chassis for making connections between the tuning indicator and receiver circuits. The chassis used in these different models of No. 130 Receivers are identical.

These No. 130 Receivers are composed of a seven tube chassis employing metal tubes, and have three tuning ranges. In order to obtain maximum performance from these receivers, a sensitivity control is provided for use on the standard broadcast band only. Its control knob is located on the rear of the chassis base. When either the "B" or "C" ranges are in operation, this sensitivity control is automatically cut out of the circuit so that the receiver will function at its maximum sensitivity on these two ranges. In some localities it will be found that without the use of this control, it will be impossible to eliminate adjacent channel interference. When this condition is obtained, the receiver should be tuned accurately to the desired station, and this sensitivity control adjusted so that minimum interference is obtained from the interfering station. See Figure 1.

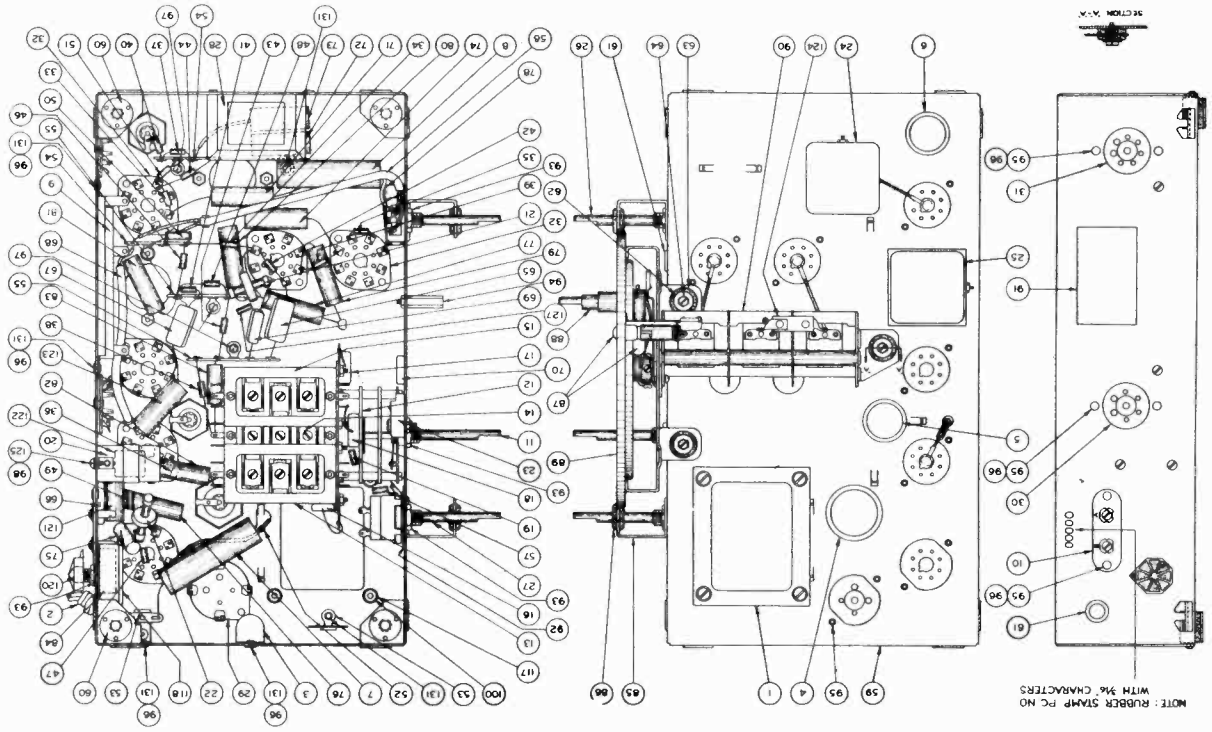
The various tubes are used in these receivers as follows: One No. 6K7 tube is used in the R. F. Amplifier, and the other No. 6K7 is used in the I. F. Amplifier. The No. 6A8 tube functions as both Oscillator and Modulator tube. The No. 6H6 tube is used as a Demodulator and Automatic Volume Control tube. The No. 6F5 tube is used in the Audio Frequency Amplifier Stage (Driver), and the No. 6F6 tube is used in the Audio Power Output Stage. The No. 80 tube is the Rectifier tube of the power supply unit. In the Nos. 130-M and 130-R Receivers the No. 6E5 tube is used as the indicator of the Tri-Focal Tuning System.

REPLACEMENT PARTS

Item Number	Piece Number	Part
1	26248	Power Transformer (50 to 60 Cycles)
1	26249	Power Transformer (25 to 60 Cycles)
2	24268	Cord, A. C. Supply
3	21535	Capacitor Assembly (2-.01 Mf. Capacitors)
4	26403	Capacitor, Electrolytic, 25 Mf.
5	25408	Capacitor, Electrolytic, 16 Mf.
6	25458	Capacitor, Electrolytic, 16 Mf.
7	24207	Capacitor, Electrolytic, 10 Mf., 25 Volts
8	24207	Capacitor, Electrolytic, 10 Mf., 25 Volts
9	26405	Resistor, "B" Voltage Divider
12	26402	Range Switch
13	25510	Coil Assembly, Antenna
14	25511	Coil Assembly, R. F.
15	25512	Coil Assembly, Oscillator
16	25488	Capacitor, .002 Mf.
17	25527	Capacitor, .0027 Mf.
18	25490	Capacitor, .0038 Mf.
19	26283	Resistor, Type "E1", .1 Megohm
20	25513	Coil Assembly, Wave Trap
21	25514	Coil Assembly, R. F. Choke
22	25514	Coil Assembly, R. F. Choke
23	26047	Capacitor, Osc. Series Aligner
24	26406	1st I. F. Transformer
25	25506	2nd I. F. Transformer
26	26114	Potentiometer, Volume Control
27	26271	Switch, "Off-On-Tone"
28	26411	Transformer, Audio Output
29	22988	Socket, 4 Prong
30	22974	Socket, 6 Prong
31	23517	Socket, 7 Prong
32	25539	Socket, 8 Prong
33	26327	Resistor, Type "E", 330 Ohms
34	26326	Resistor, Type "E", 270 Ohms
35	26331	Resistor, Type "E", 680 Ohms
36	26340	Resistor, Type "E", 3900 Ohms
37	26341	Resistor, Type "E", 47,000 Ohms
38	26345	Resistor, Type "E", 10,000 Ohms
39	26345	Resistor, Type "E", 10,000 Ohms
40	26350	Resistor, Type "E", 27,000 Ohms
41	26353	Resistor, Type "E", 47,000 Ohms
42	26353	Resistor, Type "E", 47,000 Ohms
43	26357	Resistor, Type "E", .1 Megohm
44	26357	Resistor, Type "E", .1 Megohm
46	26365	Resistor, Type "E", .47 Megohm
47	26365	Resistor, Type "E", .47 Megohm
48	26360	Resistor, Type "E", 1 Megohm
49	26362	Resistor, Type "E", .27 Megohm
50	26328	Resistor, Type "E", 390 Ohms
51	26330	Resistor, Type "E", 560 Ohms
52	25500	Resistor, 400 Ohms, 1 Watt
57	26353	Resistor, Type "E", 47,000 Ohms
60	25998	Bracket Assembly
65	25504	Capacitor, 100 Mmf.
66	25504	Capacitor, 100 Mmf.
67	26512	Capacitor Assembly, 5—100 Mmf.
69	25497	Capacitor, .001 Mf.
70	25489	Capacitor, .00125 Mf.
71	24402	Capacitor Assembly, .1 Mf.
72	24402	Capacitor Assembly, .1 Mf.
73	25483	Capacitor Assembly, .1 Mf., 400 Volts
74	25483	Capacitor Assembly, .1 Mf., 400 Volts
75	25149	Capacitor Assembly, .01 Mf.
76	25149	Capacitor Assembly, .01 Mf.
77	25150	Capacitor Assembly, .02 Mf.
78	25150	Capacitor Assembly, .02 Mf.
79	25150	Capacitor Assembly, .02 Mf.
80	25150	Capacitor Assembly, .02 Mf.
81	25150	Capacitor Assembly, .02 Mf.
82	25150	Capacitor Assembly, .02 Mf.
83	25481	Capacitor Assembly, .002 Mf.
84	25533	Capacitor Assembly, .006 Mf.
87	26247	Pilot Lamp
89	26285	Dial Assembly
90	26414	Gang Tuning Capacitor
121	25149	Capacitor Assembly, .01 Mf.
122	25488	Capacitor, .002 Mf.
123	24402	Capacitor Assembly, .1 Mf.
124	26417	Capacitor, Gimmick
127	26350	Resistor, Type "E", 27,000 Ohms

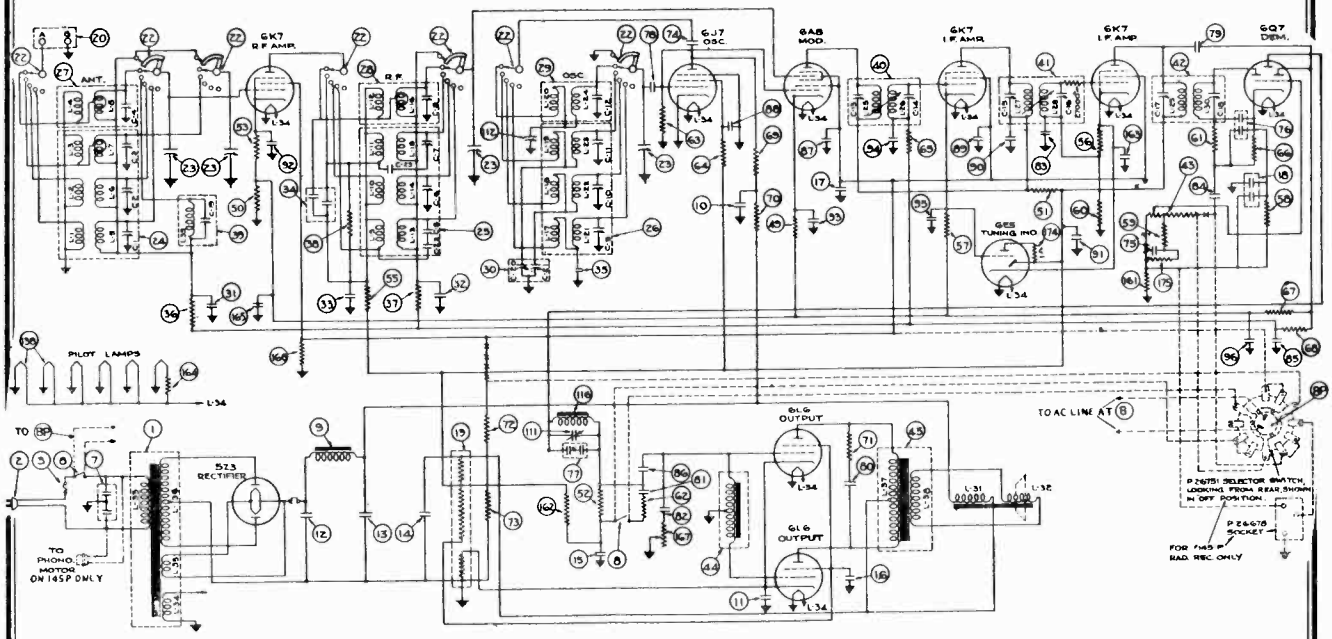
MISCELLANEOUS PARTS

Piece Number	Part
26250	Cone Assembly (For P-26170 Speaker)
25492	Cone Assembly (For P-26171 Speaker)
26043	Plug (For Loud Speaker Cable)
26491	Plug (For Tri-Focal Tuning Unit Cable)
26369	Resistor, Type "E", 1 Megohm (Used at Socket of No. 6E5 Tube)
26147	Pilot Lamp Socket
25502	Knob (For Volume Control. Used on the Nos. 130-H, 130-U, 130-L, 130-M Receivers)
26303	Knob (For Volume Control. Used only on the No. 130-R Receivers)
26385	Knob (For Range Switch. Used on Nos. 130-H, 130-U, 130-L, 130-M Receivers)
26304	Knob (For Range Switch. Used only on the No. 130-R Receivers
26384	Knob (For Off-On-Tone Control. Used on Nos. 130-H, 130-U, 130-L, 130-M Receivers)
26298	Knob (For Off-On-Tone Control. Used only on the No. 130-R Receiver)
26306	Knob (For Large Portion of Tuning Shaft. Used on the Nos. 130-H, 130-U, 130-L, 130-M Receivers)
26307	Knob (For Large Portion of Tuning Shaft. Used only on the No. 130-R Receivers)
26306	Knob (For Vernier Portion of Tuning Shaft. Used on the Nos. 130-H, 130-U, 130-L, 130-M Receivers
26308	Knob (For Vernier Portion of Tuning Shaft. Used only on the No. 130-R Receivers)



MODELS 145L, 145LB
145P, 145PB
Schematic, Socket
Trimmers

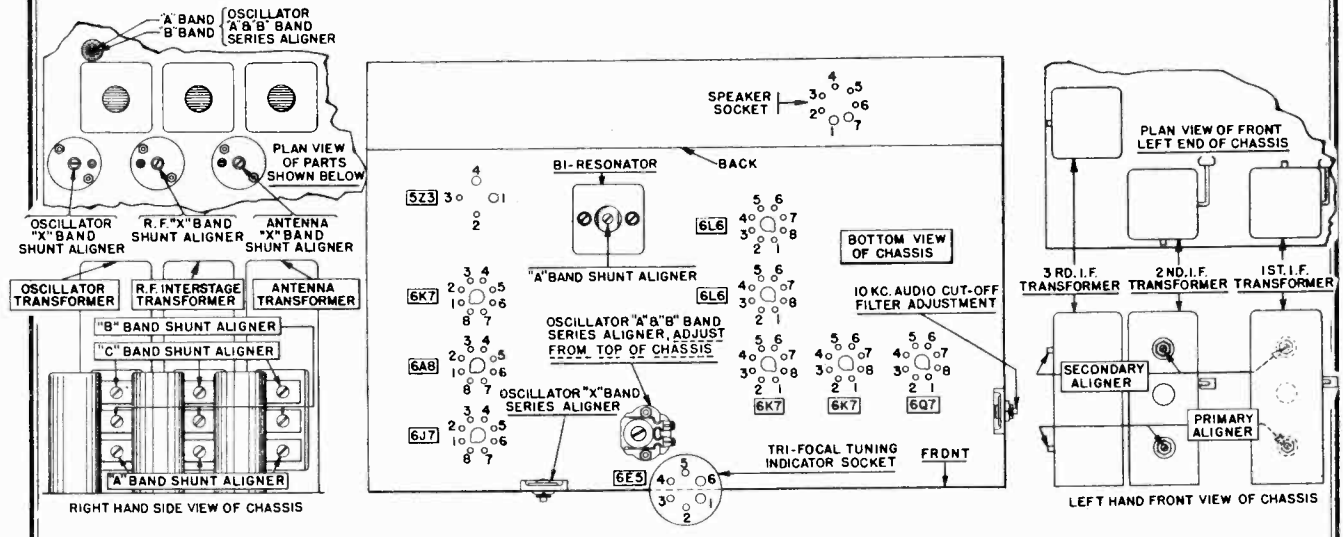
STROMBERG-CARLSON TEL. MFG. CO.



Type of Circuit	Superheterodyne
Tuning Ranges	X—145 to 370 Kc.; A—530 to 1700 Kc.; B—1700 to 5600 Kc.; C—5600 to 18,000 Kc.
Number and Type of Tubes	3 No. 6K7, 1 No. 6A8, 1 No. 6J7, 1 No. 6Q7, 2 No. 6L6, 1 No. 6E5, 1 No. 5Z3
Power Supply Voltage	105 to 125 Volts
Power Supply Frequency	25 to 60 Cycles and 50 to 60 Cycles
Input Power Rating—	
No. 145-L	118 Watts
No. 145-P	162 Watts
Frequency of Intermediate Amplifier	465 Kilocycles

APPARATUS SPECIFICATIONS

No. 145-L	50 to 60 Cycles; P-26288 Chassis; P-26170 Loud Speaker
No. 145-LB	25 to 60 Cycles; P-26289 Chassis; P-26170 Loud Speaker
No. 145-P	60 Cycles Only; P-26458 Chassis; P-26170 Loud Speaker; P-26728 Phonograph Unit
No. 145-PB	25 Cycles Only; P-26459 Chassis; P-26170 Loud Speaker; P-26729 Phonograph Unit

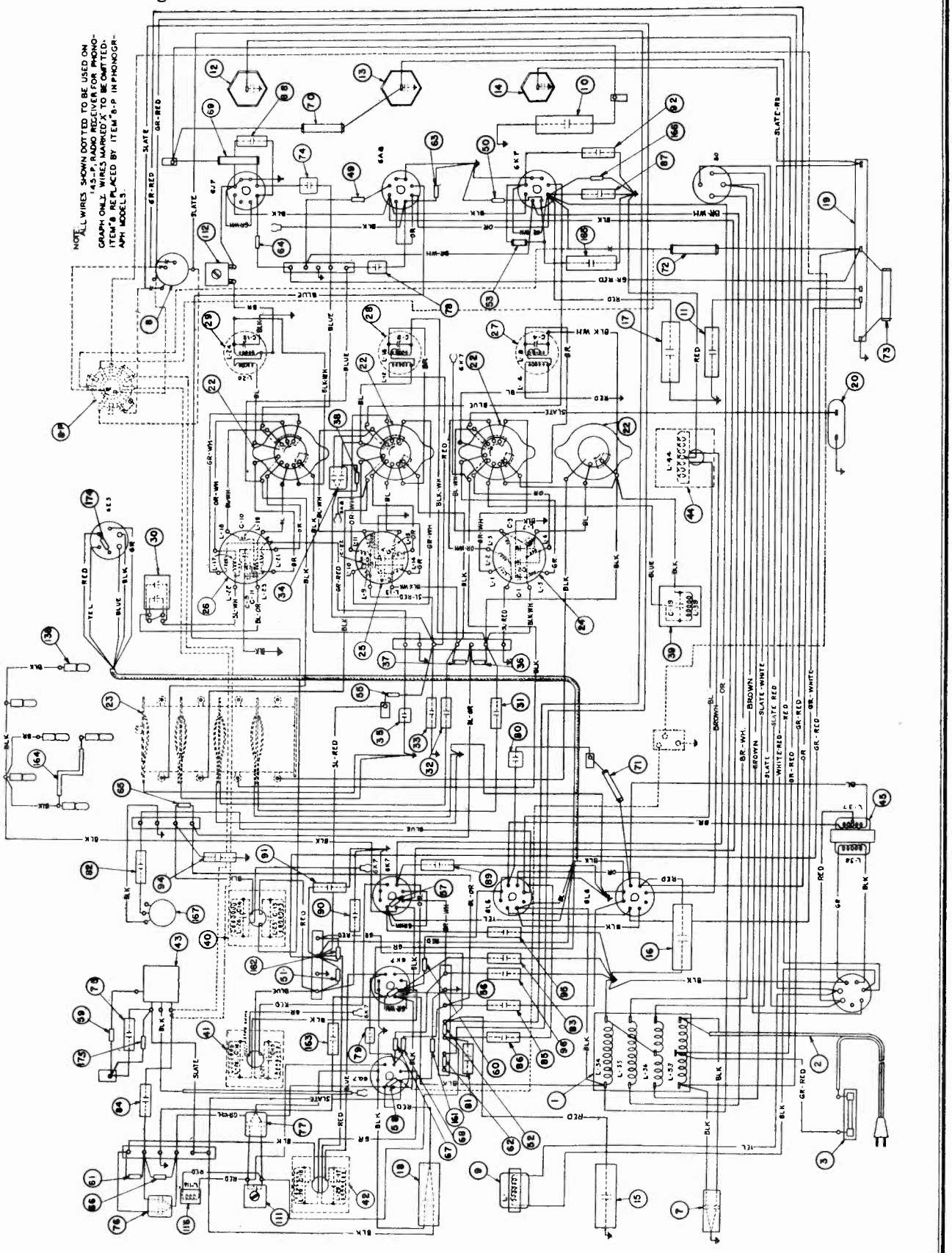


Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

MODELS 145L,145B
145P,145PB

STROMBERG-CARLSON TEL. MFG. CO.

Chassis Wiring



CIRCUIT DESCRIPTION

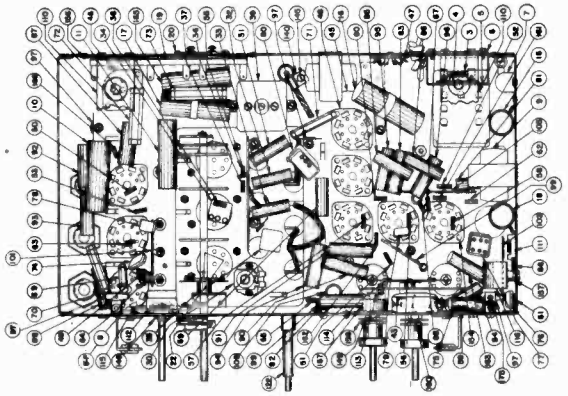
The No. 145 Radio Receiver is a ten tube, "Adjustable High Fidelity" receiver employing metal tubes including the new "Beam" power tubes. This receiver uses a Carpinchoe high fidelity dynamic speaker, and has incorporated in it the exclusive "Patent Applied For", Stromberg-Carlson "Tri-Focal" tuning system and the exclusive Stromberg-Carlson Acoustical Laboratories' revolutionary new development, the "Acoustical Labyrinth". This new device extends the bass response, provides reproduction only from the front of the cabinet, and eliminates all cabinet resonance. Audio reproduction is further improved in this receiver by employing sound diffusing vanes in front of the loud speaker opening which distribute the higher pitched tones, thereby providing excellent reproduction in all parts of the room by spreading out these directional frequencies.

Maximum selectivity between adjacent stations located in the standard broadcast band is obtained by the use of an additional tuned radio frequency ("Bi-resonator") circuit. When either the "X", "B", or "C" ranges are in operation, this additional tuned radio frequency circuit is automatically cut out of the receiver circuit. Adjustable high fidelity is obtained from this receiver by means of the variable band width, intermediate frequency transformers which are used in the two intermediate amplifier stages.

The various tubes are used in this receiver as follows: One No. 6K7 tube is used in the R. F. Amplifier, and the other two No. 6K7 tubes are used in the First and and Second I. F. Amplifier Stages. The No. 6A8 tube is used as the Modulator tube, and the No. 6J7 tube is used as the Oscillator tube. The No. 6Q7 tube is used as the Demodulator, Automatic Volume Control, and Audio Amplifier tube. The two No. 6L6 tubes are used in the Audio Power Output Stage. The No. 6E5 tube is used as the Indicator of the "Tri-Focal Tuning System", and the No. 5Z3 tube is the Rectifier tube of the Power Supply Unit.

			Terminals of Sockets								*Heater Voltages Between Heater Terminals*	
Tube	*Circuit*	*Cap*	1	2	3	4	5	6	7	8	*Socket Terminal Numbers*	*Volts*
6K7	R. F. Amp.	0	0	0	+245	+102	+6.8	+3.5	*6.3*	+6.8	2-7	*6.3*
6A8	Mod.	0	0	0	+247	+102	— 25	+102	*6.3*	+5.2	2-7	*6.3*
6J7	Osc.	— 25	0	0	+180	+145	0	—	*6.3*	0	2-7	*6.3*
6K7	I. F. Amp.	0	0	0	+240	+ 96	+7.6	+3.2	*6.3*	+7.6	2-7	*6.3*
6K7	I. F. Amp.	+.25	0	0	+242	+ 96	+6.9	+3.8	*6.3*	+6.9	2-7	*6.3*
6Q7	Dem.	0	0	0	+150*	0	+.15	+4.2	*6.3*	+7.5	2-7	*6.3*
6L6	Output	—	0	0	+260	+190	0	—	*6.3*	+ 12	2-7	*6.3*
6E5	Tuning Ind.	—	*6.3*	+.5	+7.5	+238	+ 9	0	—	—	1-6	*6.3*
5Z3	Rectifier	—	+442	*400*	*400*	+442	—	—	—	—	1-4	*4.8*
Speaker		—	+425	0	0	+442	+442	—	+262	—		

Voltage across vernier dial pilot lamp—*6.3* volts
Receiver tuned to 1000 Kc., no signal. A. C. voltages are indicated by italics.



ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on this receiver, and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, this alignment procedure should be carefully followed.

In making any alignment adjustments always adjust the signal generator's output to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal.

Figure 1 shows the location of all the aligning capacitors used in this receiver.

Intermediate Frequency Amplifier Adjustments

Because of the necessity of obtaining the proper shape of resonance curve of these stages in a high fidelity receiver, it is recommended that unless it is absolutely essential, these I. F. adjustments be untouched. In the factory these adjustments are made using a visual system which allows the operator to see the exact shape of the resonance curve. For this reason it is best to have these adjustments made at the factory. However, in the case where this cannot be done, the following procedure should be followed.

Operate the range switch of the receiver to the "A" range position. Set the tuning dial at its extreme low frequency position, and operate the "Tone-Fidelity" control knob so that the receiver is adjusted for the standard fidelity position as indicated by the fidelity indicator located on the front panel of the receiver. **Never attempt to align the I. F. circuits of this receiver with the "Tone-Fidelity" control set at any position other than the standard fidelity.** The I. F. circuits may then be checked for alignment by adjusting the aligning capacitors in the exact order as follows:

1. Secondary of 3rd I. F. Transformer (Capacitor C-18).
2. Primary of 3rd I. F. Transformer (Capacitor C-17).
3. Secondary of 2nd I. F. Transformer (Capacitor C-16).
4. Primary of 2nd I. F. Transformer (Capacitor C-15).
5. Secondary of 1st I. F. Transformer (Capacitor C-14).
6. Primary of 1st I. F. Transformer (Capacitor C-13).

Radio Frequency Adjustments

The alignment of the radio frequency circuits for the various ranges in this receiver should be very carefully made in the order and at the frequencies specified.

It will be noted that no instructions are given for aligning the receiver at other than two frequencies for any range. Each receiver is given an ex. ting check for "tracking" at various frequencies in each range before leaving the factory. It is felt by the manufacturers that should any receiver through accident require a check on the "tracking", it should be returned to the factory, where this may be easily and accurately done.

Alignment of Long-Wave-Weather Range (Also Referred to as "X" Band) Circuits

1. Oscillator's "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-12).
2. R. F. Interstage "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-8).
3. Antenna "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-4).
4. Oscillator "X" Band Series Aligning Capacitor at 150 Kilocycles (Capacitor Item 112). When operation No. 4 has been completed repeat operations 1, 2, and 3 again and in the exact order given.

Alignment of Standard Broadcast Range (Also Referred to as "A" Band) Circuits

1. Oscillator's "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-11).
2. R. F. Interstage "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-7).
3. "A" Band, R. F. Bi-resonator Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-19).
4. Antenna "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-3).
5. Oscillator "A" Band Series Aligning Capacitor at 600 Kilocycles (Capacitor C-20). When operation No. 4 has been completed repeat operations 1, 2, and 3 again and in the exact order given.

Alignment of Amateur, Police, and Aircraft Range (Also Referred to as "B" Band) Circuits

1. Oscillator's "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-10).
2. R. F. Interstage "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-6).
3. Antenna "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-2).
4. Oscillator "B" Band Series Aligning Capacitor at 1.8 Megacycles (Capacitor C-21). When operation No. 4 has been completed repeat operations 1, 2, and 3 again and in the exact order given.

Alignment of Short-Wave-Foreign Range (Also Referred to as "C" Band) Circuits

1. Oscillator's "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-9).
2. R. F. Interstage "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-5).
3. Antenna "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-1).

MODELS 145L, 145LB
145P, 145PB STROMBERG-CARLSON TEL. MFG. CO.
Parts List

REPLACEMENT PARTS

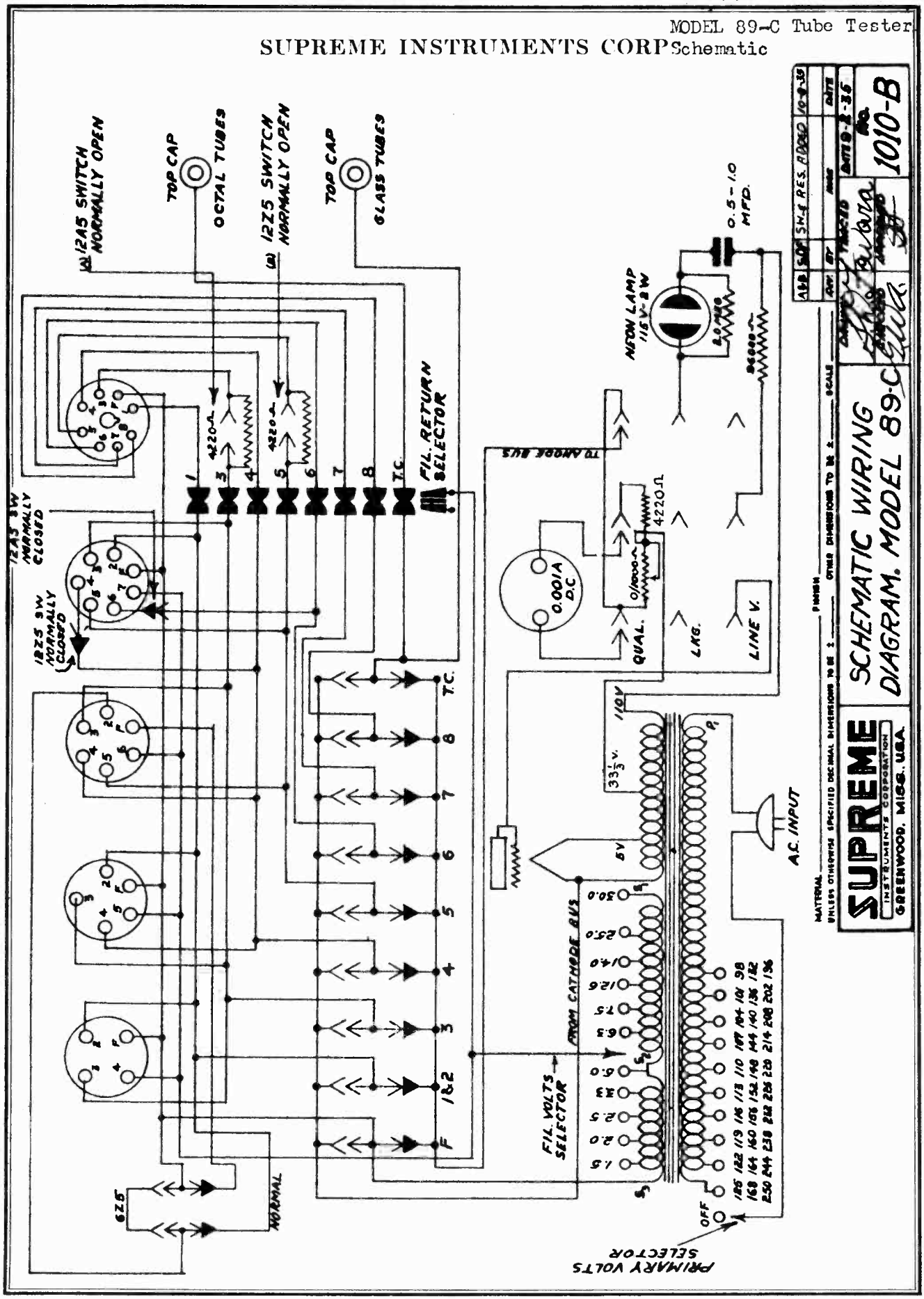
Item Number	Piece Number	Part
1	26440	Power Transformer (50 to 60 Cycles Chassis)
1	26441	Power Transformer (25 to 60 Cycles Chassis)
2	24268	Cord (A. C. Power Supply)
3	23150	Fuse (2 Amperes)
4	21984	Fuse Block Assembly
7	21535	Capacitor Assembly (2—.01 Mf. Capacitors)
8	26061	Switch ("Off-On" and Tone Control)
9	26260	Choke Coil Assembly (Filter of Rectifier)
10	25788	Electrolytic Capacitor, 1 Mf., 450 Volts
11	24207	Electrolytic Capacitor, 12 Mf., 25 Volts
12	22757	Electrolytic Capacitor (50 to 60 Cycles Chassis)
12	26510	Electrolytic Capacitor (25 to 60 Cycles Chassis)
13	22789	Electrolytic Capacitor (50 to 60 Cycles Chassis)
13	26511	Electrolytic Capacitor (25 to 60 Cycles Chassis)
14	25458	Electrolytic Capacitor, 16 Mf.
15	26693	Electrolytic Capacitor, 4 Mf., 350 Volts
16	26693	Electrolytic Capacitor, 4 Mf., 350 Volts
17	26693	Electrolytic Capacitor, 4 Mf., 350 Volts
18	26048	Capacitor, Dual, 10 Mf.
19	26442	Resistor "B" Voltage Divider
22	26443	Range Switch Assembly
23	26444	Gang Tuning Capacitor Assembly
24	26446	Coil Assembly, Antenna ("A", "B" and "C" Ranges)
25	26447	Coil Assembly, R. F. ("A", "B" and "C" Ranges)
26	26448	Coil Assembly, Oscillator ("A", "B" and "C" Ranges)
27	26507	Coil Assembly, Antenna ("X" Range)
28	26508	Coil Assembly, R. F. ("X" Range)
29	26509	Coil Assembly, Oscillator ("X" Range)
30	26564	Capacitor Assembly, Series Aligner ("A" and "B" Ranges)
31	24405	Capacitor Assembly, .04 Mf.
32	24405	Capacitor Assembly, .04 Mf.
33	24994	Capacitor Assembly, .05 Mf.
34	26513	Capacitor, Double, 200 Mmf.
35	25155	Capacitor, .0035 Mf.
36	26357	Resistor, Type "E", .1 Megohm
37	26357	Resistor, Type "E", .1 Megohm
38	26353	Resistor, Type "E", 47,000 Ohms
39	26474	Coil Assembly (Bi-Resonator)
40	26481	1st I. F. Transformer
41	26482	2nd I. F. Transformer
42	26243	3rd I. F. Transformer
43	26077	Potentiometer (Volume Control)
44	26272	Transformer Assembly, Audio Input
45	26469	Transformer Assembly, Audio Output
46	22988	Socket, 4 Prong
47	23517	Socket, 7 Prong
48	25539	Socket, 8 Prong
49	26326	Resistor, Type "E", 270 Ohms
50	26324	Resistor, Type "E", 180 Ohms
51	26330	Resistor, Type "E", 560 Ohms
52	26357	Resistor, Type "E", .1 Megohm
53	26329	Resistor, Type "E", 470 Ohms
55	26330	Resistor, Type "E", 560 Ohms
56	26330	Resistor, Type "E", 560 Ohms
57	26333	Resistor, Type "E", 1000 Ohms
58	26340	Resistor, Type "E", 3900 Ohms
59	26341	Resistor, Type "E", 4700 Ohms
60	26331	Resistor, Type "E", 680 Ohms
61	26345	Resistor, Type "E", 10,000 Ohms
62	26349	Resistor, Type "E", 22,000 Ohms
63	26353	Resistor, Type "E", 47,000 Ohms
64	26353	Resistor, Type "E", 47,000 Ohms
65	26357	Resistor, Type "E", .1 Megohm
66	26362	Resistor, Type "E", .27 Megohm
67	26369	Resistor, Type "E", 1 Megohm
68	26369	Resistor, Type "E", 1 Megohm
69	18696	Resistor, Type "B", 10,000 Ohms
70	24073	Resistor, Type "B", 25,000 Ohms
71	18696	Resistor, Type "B", 10,000 Ohms
72	25526	Resistor, Type "F", 15,000 Ohms
73	26567	Resistor, Type "F", 30,000 Ohms
74	25487	Capacitor, Type "W", .001 Mf.
75	24994	Capacitor Assembly, .05 Mf.
76	26512	Capacitor, Double, 100 Mmf.
77	26512	Capacitor, Double, 100 Mmf.
78	24560	Capacitor, 50 Mmf.
79	24560	Capacitor, 50 Mmf.
80	25487	Capacitor, Type "W", .001 Mf.
81	25149	Capacitor Assembly, .01 Mf.
82	25149	Capacitor Assembly, .01 Mf.
83	24405	Capacitor Assembly, .04 Mf.
84	24405	Capacitor Assembly, .04 Mf.
85	24405	Capacitor Assembly, .04 Mf.
86	24405	Capacitor Assembly, .04 Mf.
87	24994	Capacitor Assembly, .05 Mf.
88	24994	Capacitor Assembly, .05 Mf.
89	24994	Capacitor Assembly, .05 Mf.
90	24994	Capacitor Assembly, .05 Mf.
91	24994	Capacitor Assembly, .05 Mf.
92	24402	Capacitor Assembly, .1 Mf.
93	24402	Capacitor Assembly, .1 Mf.
94	24402	Capacitor Assembly, .1 Mf.
95	24402	Capacitor Assembly, .1 Mf.
96	24402	Capacitor Assembly, .1 Mf.
111	26568	Adjustable Capacitor (High Frequency Cut-off Filter)
112	26569	Capacitor (Oscillator Series Aligner, "X" Range)
113	26485	Potentiometer and Bracket Assembly (Tone Control and High Fidelity)
116	26515	Coil Assembly (High Frequency Cut-off Filter)
122	26220	Drive Shaft Assembly
123	26520	Dial Assembly
124	26533	Dial Assembly (Main)
125	26672	Drive Cord Assembly, R. T. Disc
126	26673	Drive Cord Assembly, L. T. Disc
127	26683	Cord Assembly (Dial Elevator)
128	26226	Spring
132	26682	Reel Assembly (Range Switch)
133	26667	Reel Assembly (Tone Control)
134	26666	Reel Assembly (Volume Control)
136	26147	Dial Lamp Socket
137	26257	Lamp Shades (For Dial Lamps)
138	26287	Pilot Lamp
141	26497	Cable Assembly, Tri-Focal Indicator
161	26353	Resistor, Type "E", 47,000 Ohms
162	26353	Resistor, Type "E", 47,000 Ohms
163	24402	Capacitor Assembly, .1 Mf.
164	26780	Resistor, 3.5 Ohms, (Pilot Lamp)
165	24207	Electrolytic Capacitor, 12 Mf., 25 Volts
166	26353	Resistor, Type "E", 47,000 Ohms
167	26439	Potentiometer (Tone Control)
174	26369	Resistor, Type "E", .1 Megohm

MISCELLANEOUS PARTS

Piece Number	Part
26250	Cone Assembly (For P-26170 Speaker)
26043	Plug (For Loud Speaker Cable)
26369	Resistor, Type "E", 1 Megohm (Used at Socket of No. 6E5 Tube)
26302	Knob (For "Volume" Control)
26299	Knob (For "Tone-Fidelity" Control)
26305	Knob (For "Stations" Selector Control Shaft)
26306	Knob (For "Vernier" Stations Selector Control Shaft)
26301	Knob (For "Ranges" Switch)
26300	Knob (For "Off-On-Bass" Control)
26391	Knob (For "Off-On-Bass-Phono" Control. Used only on No. 145-P Receivers)

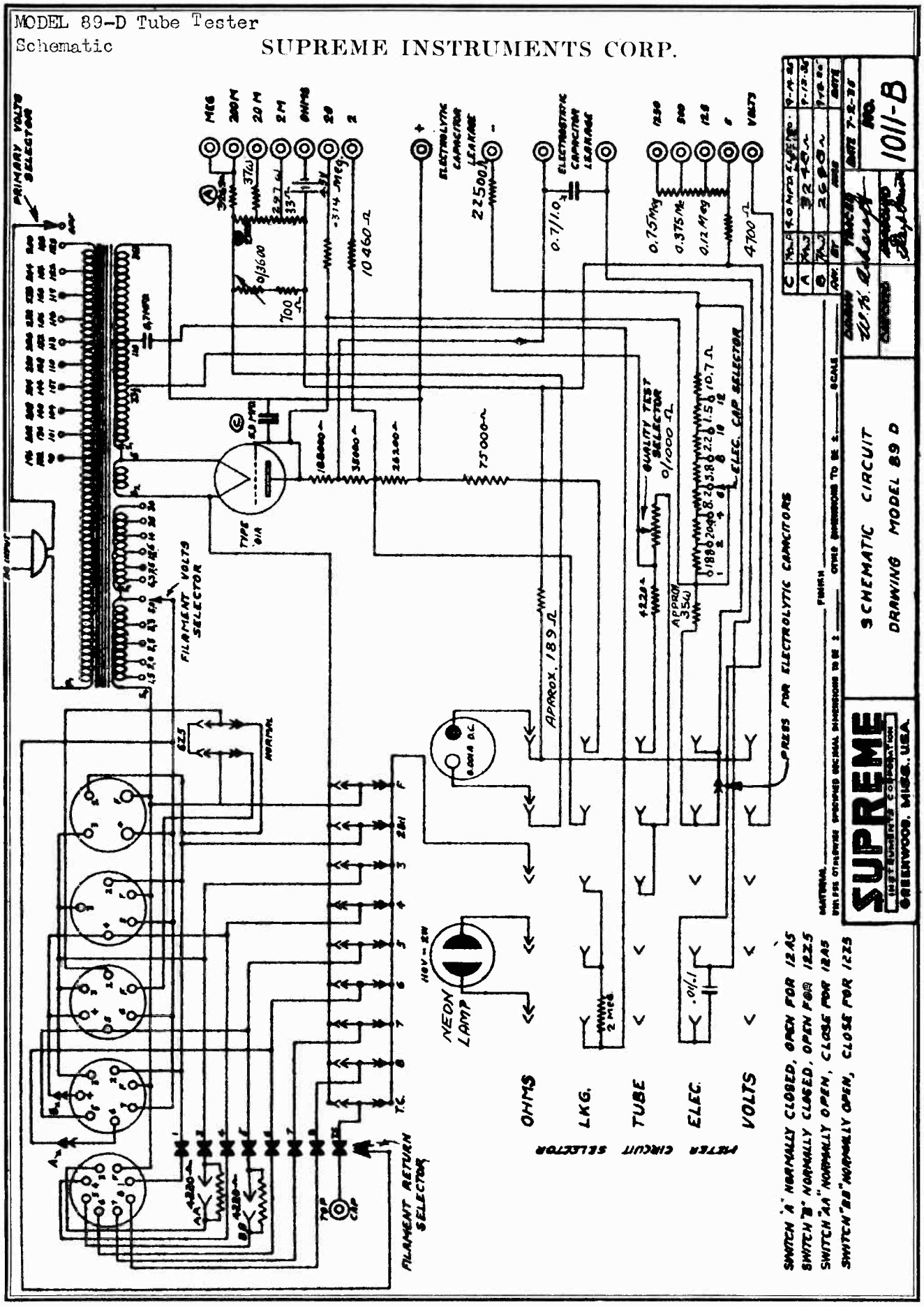
MODEL 89-C Tube Tester

SUPREME INSTRUMENTS CORP Schematic



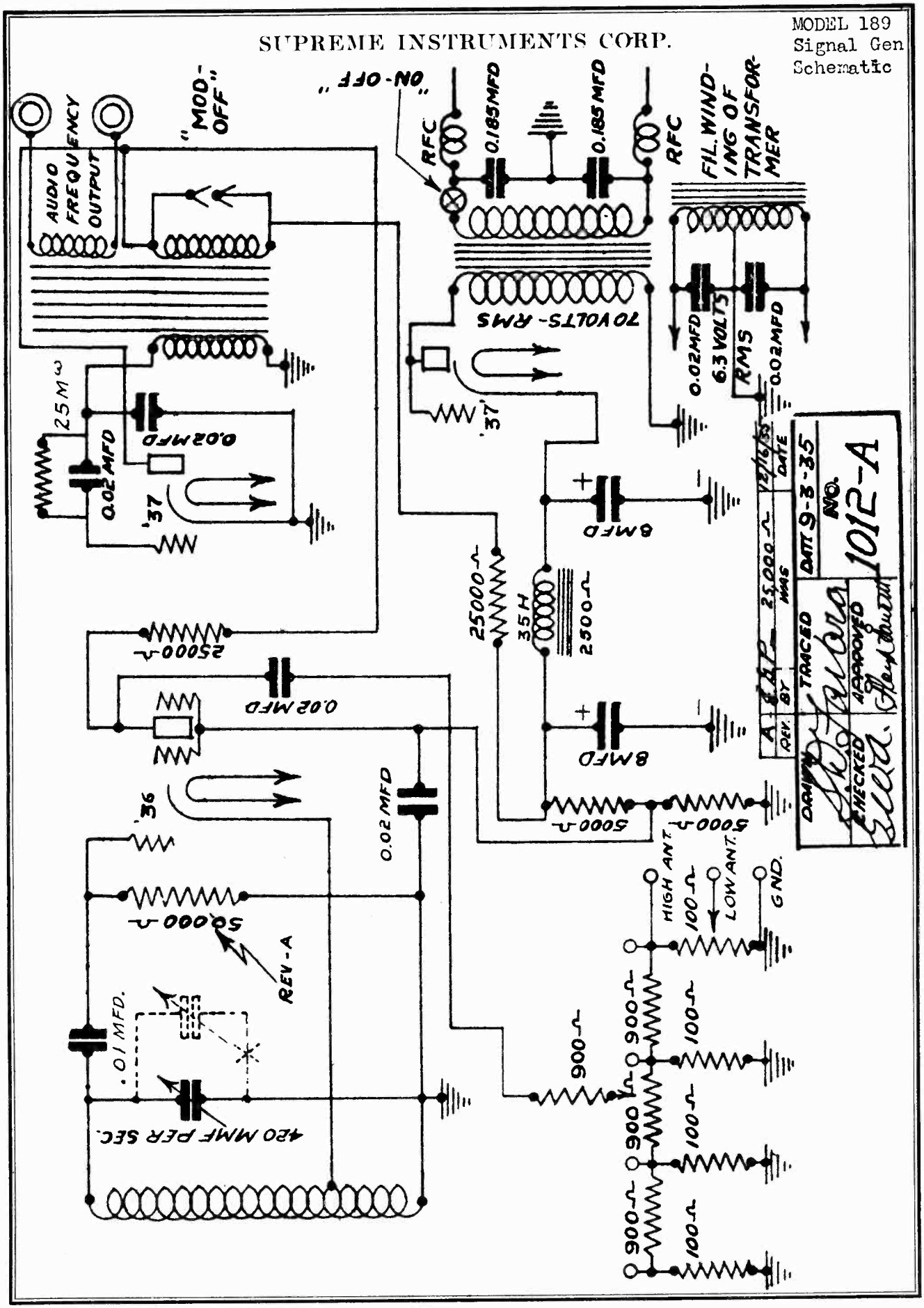
MODEL 89-D Tube Tester
Schematic

SUPREME INSTRUMENTS CORP.



SUPREME INSTRUMENTS CORP.

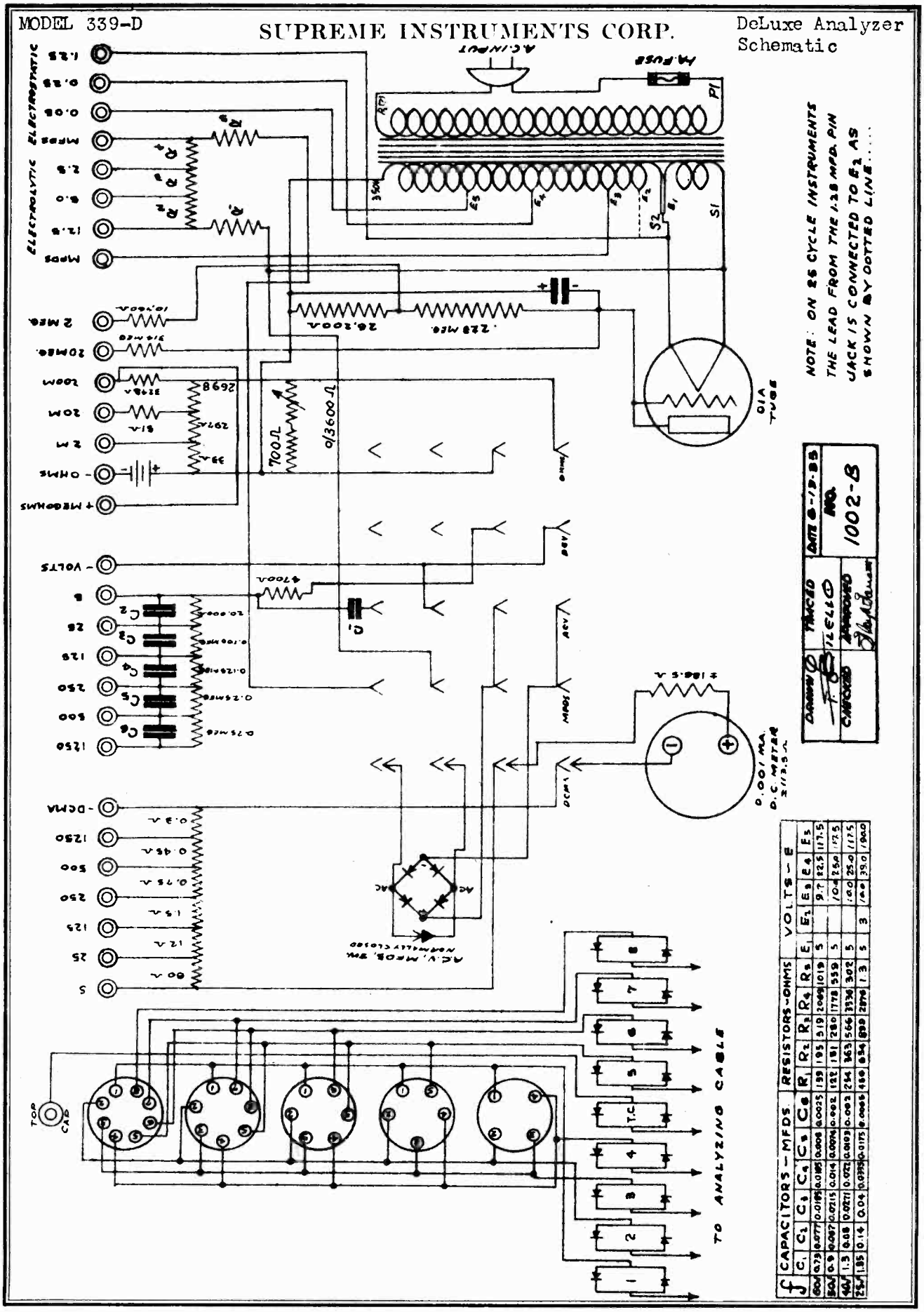
MODEL 189
Signal Gen
Schematic



MODEL 339-D

SUPREME INSTRUMENTS CORP.

DeLuxe Analyzer Schematic



ƒ	C1	C2	C3	C4	C5	C6	R	R1	R2	R3	R4	R5	E1	E2	E3	E4	E5
60	0.73	0.077	0.0195	0.0195	0.005	0.0025	139	1.95	3.19	209	1019	5			9.7	12.5	117.5
120	0.9	0.047	0.0215	0.014	0.0074	0.002	132	1.81	2.80	178	559	5			10.4	25.0	117.5
400	1.3	0.08	0.0211	0.022	0.0093	0.003	254	3.63	5.66	334	302	5			10.0	25.0	117.5
2500	1.85	0.14	0.04	0.0335	0.0175	0.005	480	6.54	8.99	296	1.3	5	3		10.0	39.0	1900

Alignment, Parts

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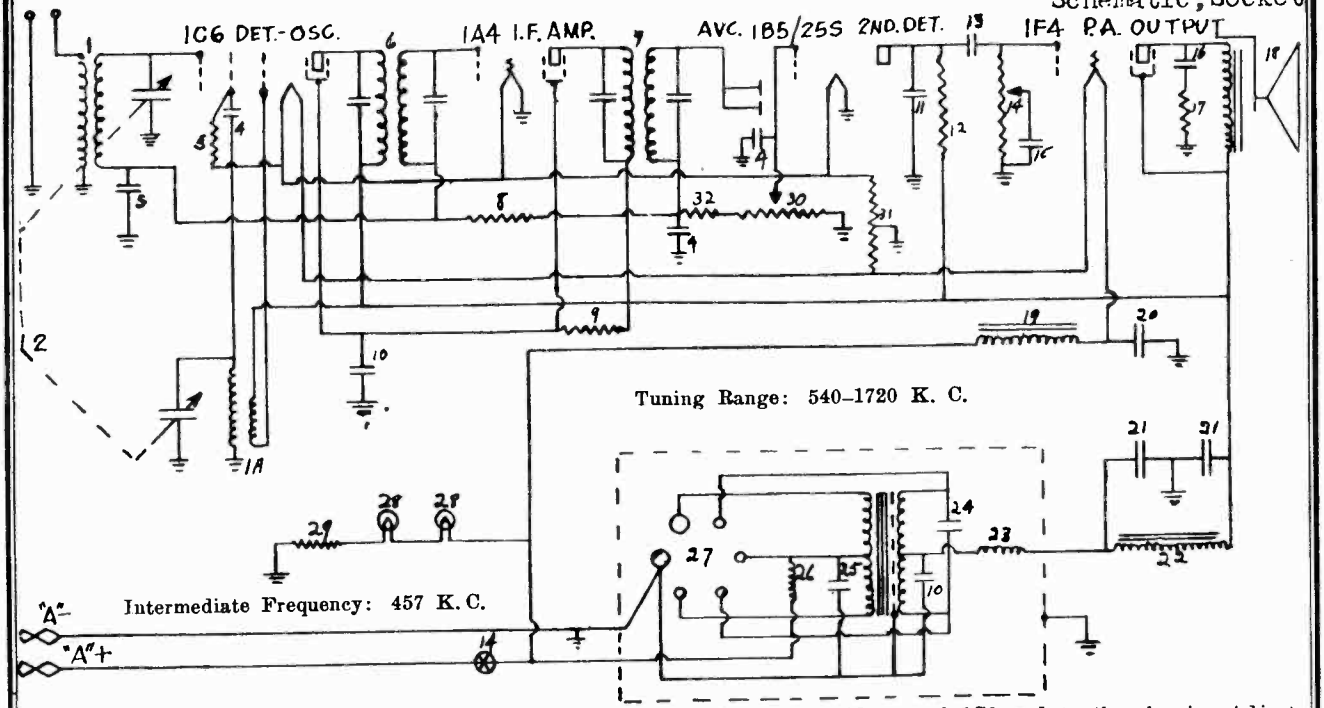
MODEL EN6-4
Schematic, Socket



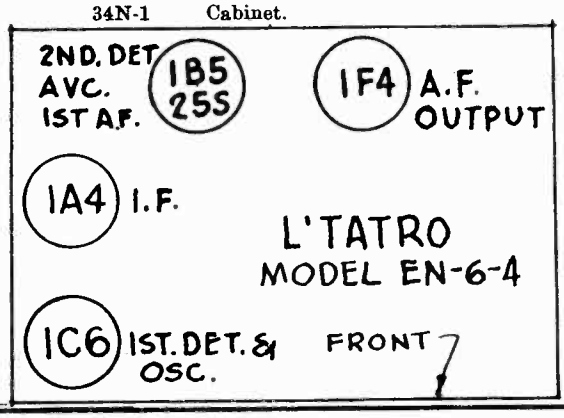
I. F. Adjustments—A. Connect test oscillator output leads to control grid cap of 1C6 and to the chassis. Adjust oscillator to 457 K. C. and turn the receiver to a point where no interference is received from the heterodyne oscillator or from a local station. B. Adjust trimmers in top of I. F. coil shield cans for maximum output from the receiver as shown by an output meter.

R. F. Adjustments—Check dial calibration of dial scale by turning the variable condenser to the "full-in" position and make sure that the dial pointer registers the end of the scale. Then tune to 1400 K. C. on the dial, adjust test oscillator to 1400 K. C. and adjust trimmers on top of tuning condenser for maximum output as shown by an output meter.

Vibrator Unit—The vibrator power unit supplies the proper B and C voltages for the set's operation. It contains a plug-in vibrator, step-up transformer, and filter system. No adjustments should be undertaken on the vibrator unit, as it has been properly adjusted with precision equipment for a long service life.

Voltages—Proper voltage in 1F4 Screen and R. F. and I. F. tube plates on a fully charged battery is 125 to 130 volts. R. F. and I. F. Screen voltage is 55 to 60 volts.

Diagram Number	Part Number	Name
1.—1A	10N-1	Antenna Osc. Coil.
2.	9N-1	Variable Condenser.
3.	5N-1	.05 Mf. 400 V. Condenser.
4.	7N-1	.0001 Mf. Mica Condenser.
5.	4N-1	50 M. Ohm Resistor.
6.	11N-1	Input I. F. Coil.
7.	11N-2	Output I. F. Coil.
8.	4N-2	1 Megohm Resistor.
9.	4N-3	25 M. Ohm.
10.	5N-2	.1 Mf. 400 V. Condenser.
11.	5N-3	.00025 Mf. 600 V. Condenser
12.	4N-4	250 M. Ohm Resistor.
13.	5N-4	.01 Mf. 400 V. Condenser.
14.	16N-1	.5 Megohm Potentiometer and Switch.
15.	5N-5	.005 Mf. 600 V. Condenser.
16.	5N-6	.0015 Mf. 600 V. Condenser.
17.	4N-5	38 M. Ohm Resistor.
18.	35N-1	Loud Speaker.
19.	14N-1	Filament Choke.
20.	6N-1	10 Mf. 6 V. Electrolytic Condenser.
21.	6N-2	8 Mf. 6 V. Electrolytic Condenser.
22.	14N-2	Filter Choke.
23.	12N-1	Secondary R. F. Choke.
24.	5N-7	.005 Mf. 1600 V. Buffer Condenser.
25.	5N-8	.5 Mf. 160 V. Condenser.
26.	12N-2	Primary R. F. Choke.
27.		Vibrator (Socket Connections).
28.	32N-1	Dial Light Bulbs, 6 V- .06 Amp.
29.	3N-1	33 Ohm Wire Wound Resistor.
30.	16N-2	.5 Megohm Volume Control.
31.	3N-2	400 Ohm Wire Wound Center Tapped Resistor.
32	4N-5	38 M. Ohm Resistor.
	17N-1	Dial Unit Complete.
	34N-1	Cabinet.



MODEL IN-25
Schematic. Socket.

Alignment, Parts

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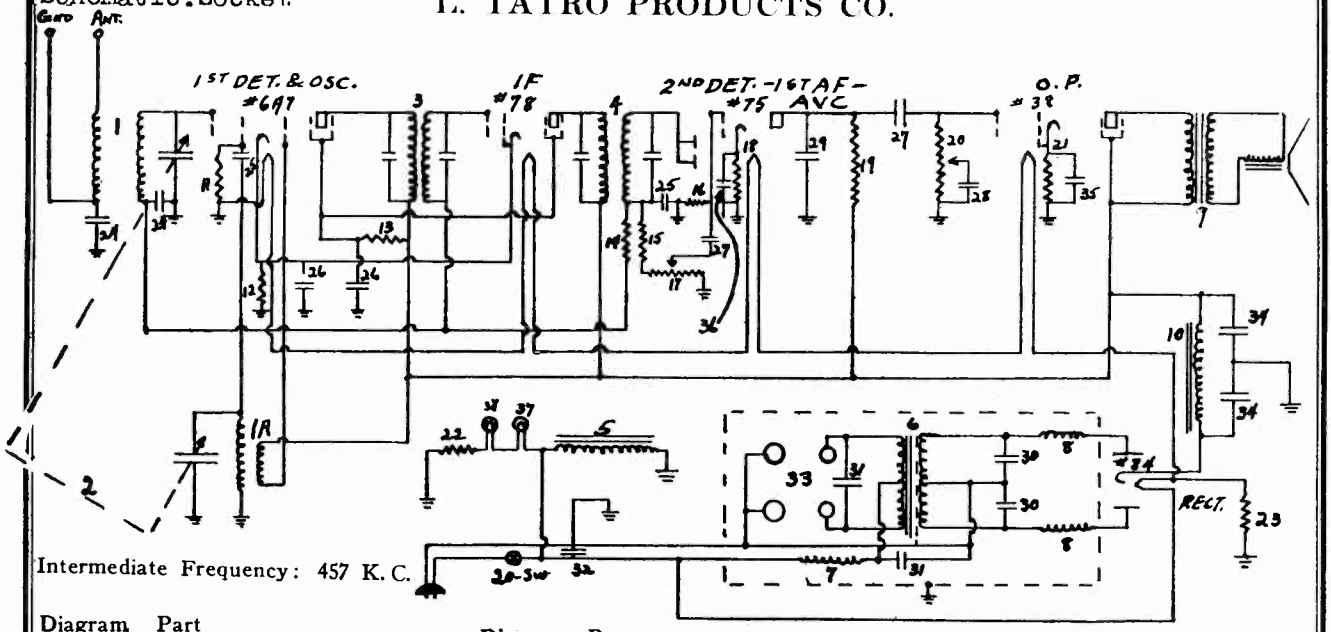
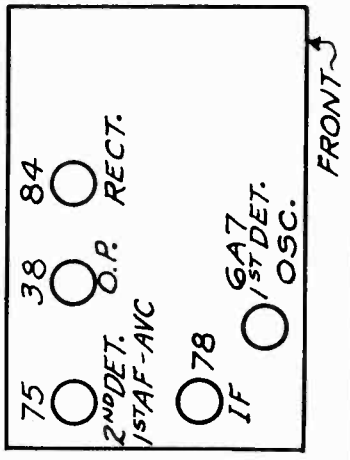


Intermediate Frequency: 457 K. C.

Diagram No.	Part No.	Description
1.—1A	10N-1	Antenna Osc. Coil.
2.	9N-1	Variable Condenser.
3.	11N-1	Input I. F. Coil.
4.	11N-2	Output I. F. Coil.
5.		Speaker Field.
6.	13N-3	Power Transformer.
7.	12N-1	Primary R. F. Choke.
8.	12N-1	Secondary R. F. Choke
9.	35N-3	Speaker.
10.	14N-4	Filter Choke.
11.	4N-1	50 M. Ohm Resistor.
12.	4N-10	500 Ohm Resistor.
13.	4N-5	38 M. Ohm Resistor.
14.	4N-2	1 Meg Ohm Resistor.
15.	4N-5	38 M. Ohm Resistor.
16.	4N-8	500 M. Ohm Resistor.
17.	16N-2	½ Meg. Volume Control
18.	4N-11	1500 Ohm Resistor.
19.	4N-4	250 M. Ohm Resistor.
20.	16N-1	½ Meg. Tone Control.

Diagram No.	Part No.	Description
21.	4N-11	1500 Ohm Resistor.
22.	3N-3	150 Ohm Wire Wound Res
23.	3N-4	125 Ohm Wire Wound Res
24.	5N-1	.05 Mf. 400 Volt Cond
25.	7N-1	.0001 Mf. Mica Cond
26.	5N-2	.1 Mf. 400 Volt Cond
27.	5N-5	.005 Mf. 600 Volt Cond
28.	5N-10	.0025 Mf. 600 Volt Cond
29.	5N-3	.00025 Mf. 600 Volt Cond
30.	5N-11	.02 Mf. 800 Volt Cond
31.	5N-8	.5 Mf. 160 Volt Cond
32.	5N-9	.25 Mf. 200 Volt Cond
33.		Vibrator Socket Conn
34.	6N-4	8 Mf. 350 Electrolytic Cond
35.	6N-5	10 Mf. 25 Electrolytic Cond
36.	6N-1	10 Mf. 6 Electrolytic Cond
37	32N-1	.06A, 2 Volt Dial Lights.
	17N-1	Dial Assembly Complete.
	34N-1	Cabinet.



Power Source: 28 V to 36 V D. C.

Power Output: Undistorted 1.75 Watt, Maximum 2.25 Watts.

I. F. Adjustments—

(A) Connect test oscillator output leads to the control grid of 6A7 tube and chassis. Adjust oscillator to 457 K. C. and tune the receiver to a point where no interference is encountered from the heterodyne oscillator or from a local station.

(B) Adjust Trimmer Condensers in top of I. F. cans for maximum output as shown by an output meter.

R. F. Adjustments—

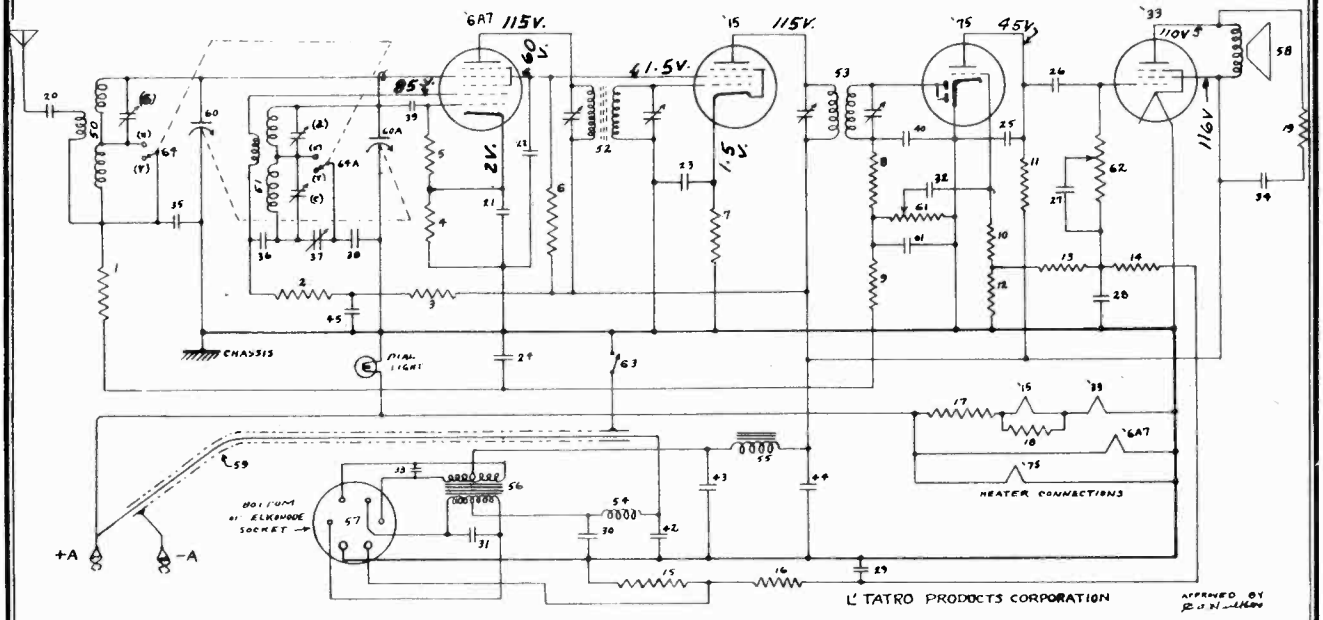
Check dial calibration by turning the variable condenser to the full-in position, and make sure that the dial pointer registers the end of the scale. Then tune to 1400 K. C. on the dial, adjust test oscillator to 1400 K. C. and adjust trimmer condensers on top of tuning condensers for maximum output as shown by an output meter.

Voltages—

Proper voltages at the rectifier cathode on a 33-volt line is from 190 to 210 volts.

MODELS O-4626, P-4626
Schematic, Parts

L. TATRO PRODUCTS CO.



I.F. Peak 456 K.C.

ITEM NO.	PART NO.	DESCRIPTION
1	2L-44	100M ohms 1/4 watt
2	2L-26	7500 ohms 1/4 watt
3	2L-27	10M ohms 1/4 watt
4	2L-14	450 ohms 1/4 watt
5	2L-37	50M ohms 1/4 watt
6	2L-75	25M ohms 1/4 watt
7	2L-17	800 ohms 1/4 watt
8	2L-37	50M ohms 1/4 watt
9	2L-57	1 MEG ohms 1/4 watt
10	2L-57	1 MEG ohms 1/4 watt
11	2L-49	250M ohms 1/4 watt
12	2L-44	100M ohms 1/4 watt
13	2L-57	1 MEG ohm 1/4 watt
14	2L-44	100M ohms 1/4 watt
15	2L-17A	800 ohms 1/2 watt
16	2L-44	100M ohms 1/4 watt
17	1L-1E	10 ohms 5 watt w.w.
18	2L-4A	53 ohms 1/2 watt
19	2L-31	20M ohms 1/4 watt
20	3L-16	.02 MFD 400 V. paper
21	3L-18	.10 MFD 400 V. paper
22	3L-18	.10 MFD 400 V. paper
23	3L-18	.10 MFD 400 V. paper
24	3L-16	.02 MFD 400 V. paper
25	3L-23	.0005 MFD 600 V. paper
26	3L-16	.02 MFD 400 V. paper
27	3L-40	.005 MFD 600 V. paper
28	3L-9H	.25 MFD 200 V. paper
29	3L-9H	.25 MFD 200 V. paper
30	3L-44H	.50 MFD 160 V. paper
31	3L-44H	.50 MFD 160 V. paper
32	3L-16	.02 MFD 400 V. paper
33	3L-42H	.005 MFD 1600 V. paper
34	3L-25	.01 MFD 600 V. paper
35	5L-13	.0025 MFD MICA
36	5L-10	.0015 MFD MICA
37	6L-1	Adjustable MICA
38	5L-10	.0015 MFD MICA
39	5L-2	.0001 MICA
40	5L-2	.0001 MICA
41	5L-2	.0001 MICA
42	3L-59S	.5 MFD 120 V. paper
43	4L-1	8 MFD 250 V. electrolytic
44	4L-1	8 MFD 250 V. electrolytic
45	4L-1	8 MFD 250 V. electrolytic
46		
47		
48		
49		
50	8L-15	Antenna coil
51	8L-16	Oscillator coil
52	8L-12	I.F. transformer 456 K.C.
53	8L-3	i.f. transformer 456 K.C.
54	8L-4	choke
55	9L-11	Filter Choke
56	9L-1	Power Transformer
57	25L-25	Elkonode Socket Assembly
58	18L-9	Orthovox Speaker
59	25L-33	Shielded Battery Cable
60	7L-4	Variable Condenser
60A		Part of Item 60
61	10L-1	Volume Control
62	10L-11	Tone Control
63		Part of Item 62
64	16L-3	Selector Switch
64A		Part of Item 64

MODELS Q-5636, R-5636, S-5636
Schematic, Parts

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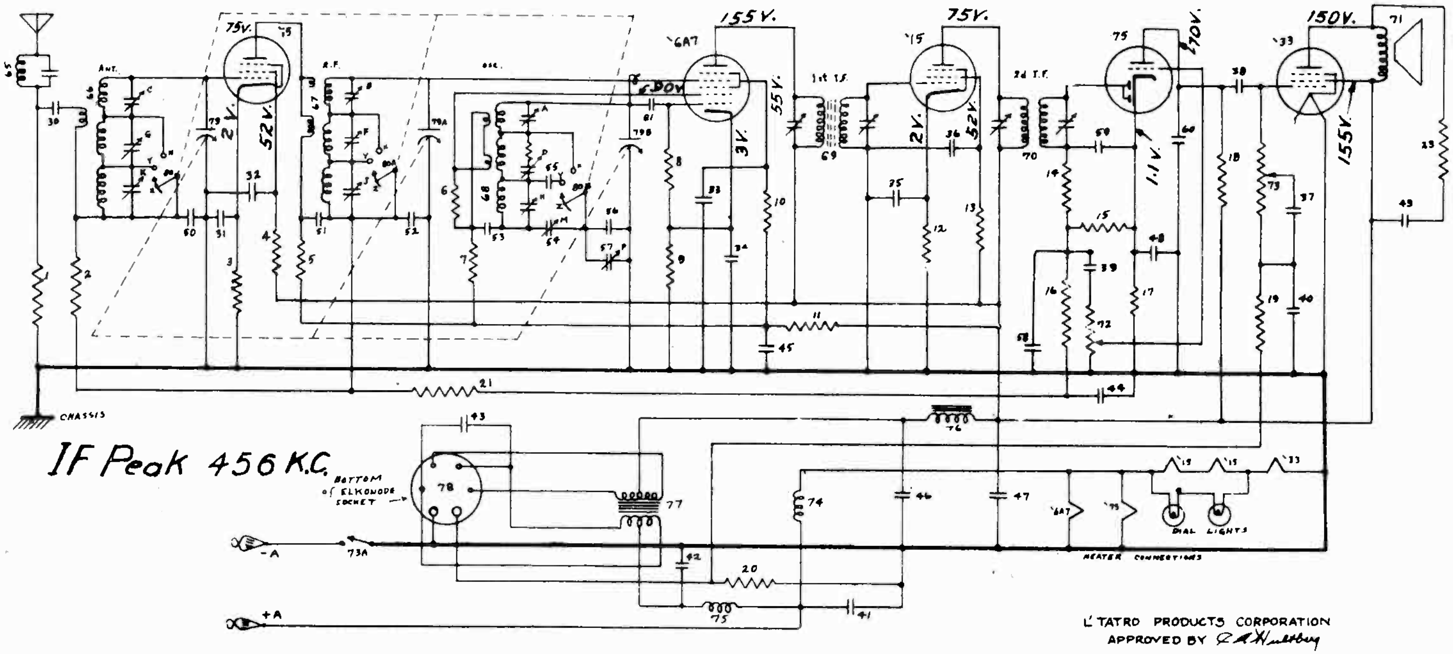

L. TATRO PRODUCTS CORPORATION
APPROVED BY

Item No.	Part No.	Description
1	2L-27	10M ohms 1/4 watt
2	2L-44	100M ohms 1/4 watt
3	2L-17	800 ohms 1/4 watt
4	2L-49	250M ohms 1/4 watt
5	2L-25	15M ohms 1/4 watt
6	2L-31	20M ohms 1/4 watt
7	2L-27	10M ohms 1/4 watt
8	2L-37	50M ohms 1/4 watt
9	2L-16	600 ohms 1/4 watt
10	2L-33	30M ohms 1/4 watt
11	2L-26	7500 ohms 1/4 watt
12	2L-15	500 ohms 1/4 watt
13	2L-44	100M ohms 1/4 watt
14	2L-37	50M ohms 1/4 watt
15	2L-53	500M ohms 1/4 watt
16	2L-57	1 Meg ohm 1/4 watt
17	2L-24	5000 ohms 1/4 watt
18	2L-49	250M ohms 1/4 watt
19	2L-53	500M ohms 1/4 watt
20	2L-178	800 ohms 1 watt
21		
22		
23	2L-31A	20M ohms 1/2 watt
24		
25		
26		
27		
28		
29		
30	3L-16	.02 Mfd. 400 V.Paper
31	3L-17	.05 Mfd. 400 V.Paper
32	3L-17	.05 Mfd. 400 V.Paper
33	3L-16	.02 Mfd. 400 V.Paper
34	3L-17	.05 Mfd. 400 V.Paper
35	3L-18	.10 Mfd. 400 V.Paper
36	3L-18	.10 Mfd. 400 V.Paper
37	3L-40	.005 Mfd.600 V.Paper
38	3L-16	.02 Mfd. 400 V.Paper
39	3L-16	.02 Mfd. 400 V.Paper
40	3L-50	1.0 Mfd. 200 V.Paper
41	3L-595	0.5 Mfd. 120 V.Paper
42	3L-595	0.5 Mfd. 120 V.Paper
43	3L-44H	0.5 Mfd. 160 V. Paper
44		
45	4L-1	8.0 Mfd. 250 V. Electrolytic
46	4L-1	8.0 Mfd. 250 V. Electrolytic
47	4L-1	8.0 Mfd. 250 V. Electrolytic
48	4L-6	20.0 Mfd. 6 V. Electrolytic
49	3L-25	.01 Mfd. 600 V. Paper
50	5L-12	.002 Mfd. Mica
51	5L-12	.002 Mfd. Mica
52	5L-13	.0025 Mfd. Mica
53	5L-7	.001 Mfd. Mica
54	6L-8	6 plate variable (Mica)
55	5L-19	.0096 Mfd. Mica
56	5L-26	.0009 Mfd. Mica
57	6L-7	4 plate variable (Mica)
58	5L-2	.0001 Mfd. Mica
59	5L-2	.0001 Mfd. Mica
60	5L-2	.0001 Mfd. Mica
61	5L-2	.0001 Mfd. Mica
62		
63		
64		
65	8L-22	456 K.C. IF Trap
66	8L-37	Antenna Trans.
67	8L-38	R.F. Trans.
68	8L-39	Osc. Trans.
69	8L-24	IF Trans. 456 K.C.
70	8L-26	IF Trans. 456 K.C.
71	18L-9	Speaker
72	10L-5	Volume Control
73	10L-15	Tone Control
73A		Part of Item 73
74	8L-21	R. F. Choke
75	8L-4	R. F. Choke
76	9L-11	Filter Choke
77	9L-4	Power Trans.
78	25L-25	Elkonode Socket
79	7L-3	Variable Condenser
79A		Part of Item 79
79B		Part of Item 79
80	16L-2	Selector Switch
80A & B		Parts of Item 80

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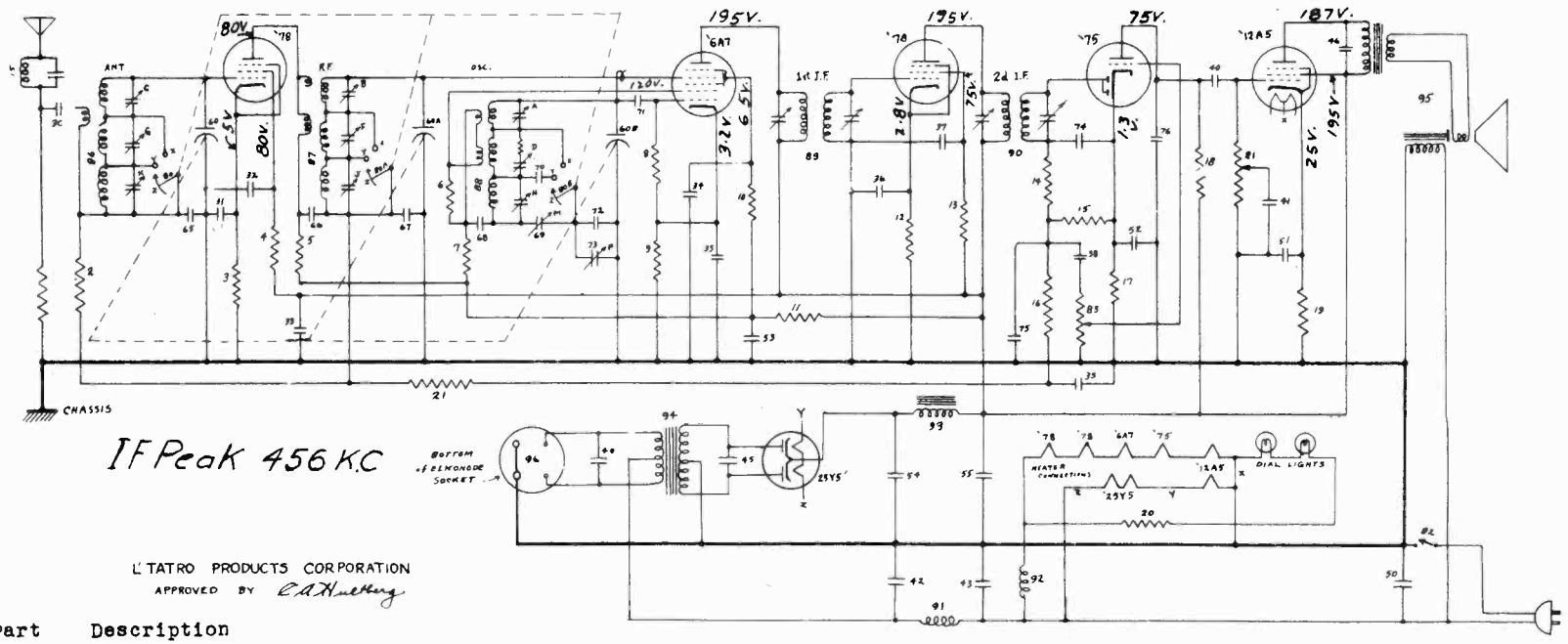
MODELS W-6236, X-6236
Y-6236



L. TATRO PRODUCTS CORPORATION
APPROVED BY C.A. Hellberg

Item No.	Part No.	Description
1	2L-27	10M ohms 1/4 watt
2	2L-44	100M ohms 1/4 watt
3	2L-18	1000 ohms 1/4 watt
4	2L-44	100M ohms 1/4 watt
5	2L-29	15M ohms 1/4 watt
6	2L-31	20M ohms 1/4 watt
7	2L-27	10M ohms 1/4 watt
8	2L-37	50M ohms 1/4 watt
9	2L-16	600 ohms 1/4 watt
10	2L-35	38M ohms 1/4 watt
11	2L-26	7500 ohms 1/4 watt
12	2L-15	500 ohms 1/4 watt
13	2L-44	100M ohms 1/4 watt
14	2L-37	50M ohms 1/4 watt
15	2L-53	500M ohms 1/4 watt
16	2L-57	1 Meg ohm 1/4 watt
17	2L-24	5000 ohms 1/4 watt
18	2L-49	250M ohms 1/4 watt
19	1L-20C	750 ohms 2 watt
20	1L-17F	160 ohms 10 watt
21	2L-44	100M ohms 1/4 watt
22		
23		
24		
30	3L-16	.02 Mfd. 400 V.
31	3L-17	.05 Mfd. 400 V.
32	3L-17	.05 Mfd. 400 V.
33	3L-17	.05 Mfd. 400 V.
34	3L-16	.02 Mfd. 400 V.
35	3L-17	.05 Mfd. 400 V.
36	3L-18	.10 Mfd. 400 V.
37	3L-18	.10 Mfd. 400 V.
38	3L-16	.02 Mfd. 400 V.
39	3L-16	.02 Mfd. 400 V.
40	3L-16	.02 Mfd. 400 V.
41	3L-40	.005 Mfd. 600 V.
42	3L-59S	.5 Mfd. 120 V.
43	3L-59S	.5 Mfd. 120 V.
44	3L-44H	.5 Mfd. 160 V.
45	3L-42H	.005 Mfd.1600 V.
46	3L-26	.02 Mfd. 600 V.
47		
48		
49		
50	4L-15	20 Mfd. 40 V. NP Electro
51	4L-11	10 Mfd. 25 V. Electrolyt
52	4L-6	20 Mfd. 6 V. Electrolyt
53	4L-1	8 Mfd. 250 V. Electrolyt
54	4L-3	8 Mfd. 450 V. Electrolyt
55	4L-3	8 Mfd. 450 V. Electrolyt
56		
57		
59		
60	7L-3	Variable Condenser
60A		Part of Item 60
60B		Part of Item 60
65	5L-12	.002 Mfd. Mica
66	5L-12	.002 Mfd. Mica
67	5L-13	.0025 Mfd. Mica
68	5L-7	.001 Mfd. Mica
69	6L-8	6 plate variable Mica
70	5L-19	.0096 Mfd. Mica
71	5L-2	.0001 Mfd. Mica
72	5L-26	.0009 Mfd. Mica
73	6L-7	4 plate variable Mica
74	5L-2	.0001 Mfd. Mica
75	5L-2	.0001 Mfd. Mica
76	5L-2	.0001 Mfd. Mica
80	16L-2	Selector Switch
80A		Part of Item 80
80B		Part of Item 80
81	10L-15	Tone Control
82		Part of Item 81
83	10L-5	Volume Control
84		
85	8L-22	456 K. C. IF Trap
86	8L-37	Antenna Trans.
87	8L-38	R. F. Transformer
88	8L-39	Oscillator Trans.
89	8L-25	I.F. Trans. 456 K.C.
90	8L-26	I.F. Trans. 456 K. C
91	8L-23	R.F. Choke
92	8L-20	R.F. Choke
93	9L-11	Filter Choke
94	9L-2	Power Transformer
95	18L-8	Dynamic Speaker
96	25L-26	Elkonode Socket

GENERAL NOTES & ALIGNMENT PROCEDURE FOR
L'TATRO MODELS Q-5636, R-5636, S-5636, W-6236, X-6236, Y-6236

The R.F. and I.F. circuits of these chassis are identical with the exception of the tube complements. Due to the combination of inductive and capacitive coupling employed in the antenna stage very uniform gain results in all three bands. IT IS TO BE NOTED HOWEVER THAT THIS COMBINATION REQUIRES SPECIAL CARE WHEN USING A SIGNAL GENERATOR FOR ALIGNMENT PURPOSES. The .002 MFD. mica condenser which provides the capacity coupling is also a part of the tuned grid circuit. If a signal generator is connected from the antenna lead to chassis without inserting the proper dummy antenna the .002 MFD. condenser will be short circuited, and will cause the R.F. input circuit to resonate at frequencies much lower than the dial reading.

For the high frequency band alignment (both H.F. bands) ALWAYS USE A 400 OHM CARBON RESISTOR BETWEEN THE SIGNAL GENERATOR AND THE ANTENNA LEAD. When aligning the BROADCAST BAND ALWAYS USE A .0002 MFD. CONDENSER BETWEEN THE SIGNAL GENERATOR AND THE ANTENNA LEAD.

DO NOT ATTEMPT TO ALIGN THESE RECEIVERS WITHOUT THE USE OF A CORRECTLY CALIBRATED SIGNAL GENERATOR OF RELIABLE MAKE HAVING GOOD ATTENUATOR CONSTRUCTION. On all models connect a high resistance output meter across the plate and screen terminals of the output tube, using a larger condenser in series with the meter to prevent D.C. plate current from flowing through the meter. KEEP THE SIGNAL GENERATOR INPUT LOW. It is preferable that the output of the receiver should not be allowed to exceed 200 milliwatts during the "peaking" operation on any trimmer. The volume and tone control knobs should be advanced to the full open position during alignment. Failure to observe this precaution will usually result in misalignment due to frequency shift caused by A.V.C. or due to overload of the I.F. amplifier tube.

I.F. ALIGNMENT - 456 K.C.

In order not to disturb the normal bias voltage applied to the tubes during alignment, it is advisable that the grid clips be left on the tubes, and that the signal be applied to the grid clips through a .005 MFD. condenser connected to the high side of the signal generator, and return the ground side of the signal generator to the receiver chassis. During alignment of 32 volt receivers it is advisable that a .5 MFD. condenser be connected between the ground side of the generator and the receiver chassis to allow the signal generator to be well grounded.

With the input connected to the I.F. tube grid, adjust the trimmer condenser on the second I.F. transformer for maximum output. Reduce the signal input and connect the signal source to the 6A7 grid and adjust the trimmers on the first I.F. transformer for maximum response.

H.F. BAND ALIGNMENT - USE 400 OHM DUMMY ANTENNA

Always use short leads from the dummy antenna (400 ohm resistor) to the generator and receiver. Also a short heavy lead (or .5 MFD. condenser with heavy leads) from the ground side of generator to receiver chassis.

Set the signal generator frequency at 16.0 megacycles. With the selector switch on point X-(clockwise position) and the receiver dial at 16 M.C. Adjust trimmer A in both directions. Two points should be found which will allow 16 M. C. signals to come through. Always set A at the lower capacity setting that gives 16 M.C. response. The center coil is the oscillator coil and the trimmer furthest from the selector switch is trimmer A.

Next vary the generator (or reciever dial) frequency very slowly back and forth and adjust trimmer B for maximum response on the output meter. The R. F. coil is the coil with the open side exposing the trimmer screws. Trimmer B is the trimmer furthest from the selector switch.

Next adjust the trimmer C, which is on the antenna coil and is the trimmer nearest to the selector switch, to give the greatest response on the output meter.

Now set the receiver dial and signal generator at 6.0 MEGACYCLES. Slowly tune the receiver dial both ways from 6 M.C. and slowly adjust trimmer "F" which is mounted on the receiver chassis. The setting giving greatest output is the desired setting. If considerable change from the original setting is required, peak the trimmer and realign at 16 and 6 M. C.

POLICE BAND ALIGNMENT: USE 400 OHM DUMMY ANTENNA

Set the selector switch in the center position (point Y), turn the dial to 3.0 megacycles and set the signal generator at 3.0 megacycles. Adjust the center oscillator trimmer D to bring in signal. Then adjust F & G, the center trimmers on the R. F. and antenna coils for maximum response.

BROADCAST BAND ALIGNMENT USE .0002 MFD. DUMMY ANTENNA

Set the selector switch on point Z-(Counter-clockwise position). Set the receiver dial at 1400 K.C. and feed a 1400 K.C. signal through the .0002 condenser to the antenna lead. Adjust trimmer H (oscillator trimmer nearest to the selector switch) to bring in signal. Adjust trimmer J (R.F. coil trimmer nearest to selector switch) for maximum response. Then adjust trimmer K (antenna coil trimmer furthest from selector switch) for maximum output.

Set receiver dial at 600 K. C. and tune signal generator to same frequency. Slowly turn tuning control back and forth and adjust trimmer M (mounted on the coil assembly plate) in both directions until the maximum response point is reached. If a large readjustment is required from the original adjustment, repeat BC band alignment.

If trouble is occasioned during alignment procedure due to broadcast signals interfering with the operation, the alignment may be made on the adjacent channel, that is 10 K.C. from the usual alignment frequency. For example if a strong station causes 600 K.C. interference set the dial and signal generator at either 590 or 610 K.C. The same applies to 1400 K.C. No appreciable error will result from aligning the trimmers at a point 10 K.C. from the recommended frequency.

The complete receiver after above procedure should be in correct adjustment, and may be checked on the air. Under normal conditions a single wire antenna 100 feet long with lead in at one end is recommended.

GENERAL NOTES AND ALIGNMENT PROCEDURE
MODELS O4626, P4626

The R.F. and I.F. circuits on these receivers are identical with the exception of tube complements. Due to the combination inductive and capacitive coupling used in the antenna stage, very uniform gain results. IT IS TO BE NOTED HOWEVER THAT THIS COMBINATION REQUIRES SPECIAL CARE WHEN USING A SIGNAL GENERATOR FOR ALIGNMENT PURPOSES. The .0025 mica condenser which provides the capacity coupling is also a part of the tuned grid circuit. If a signal generator is connected from antenna to chassis without inserting the proper dummy antenna the .0025 MFD condenser will be short circuited and will cause the grid circuit of the 6A7 tube to resonate at a much too low frequency.

For the BROADCAST BAND ALIGNMENT ALWAYS USE A .0002 MFD CONDENSER BETWEEN THE SIGNAL GENERATOR AND THE ANTENNA LEAD. For the HIGH FREQUENCY BAND ALIGNMENT ALWAYS USE A 400 OHM CARBON RESISTOR BETWEEN THE SIGNAL GENERATOR AND THE ANTENNA LEAD.

DO NOT ATTEMPT TO ALIGN THESE RECEIVERS WITHOUT THE USE OF A CORRECTLY CALIBRATED SIGNAL GENERATOR OF RELIABLE MAKE. On all models connect a high resistance output meter across the plate and screen of the output tube, using a large condenser in series with the meter to prevent D.C. plate current from flowing through the meter. KEEP THE SIGNAL GENERATOR INPUT LOW and leave the volume control and tone control wide open to avoid misalignment which will result if high input is used (due to frequency shift with AVC or due to overload of the I.F. tube).

I.F. ALIGNMENT 456 K.C:
Connect signal generator through a .005 MFD condenser to the I.F. tube grid cap, and the ground side of the generator to the chassis. Adjust the trimmers on item 53 for maximum output. If high output or double peaks occur, reduce the input from the signal generator and readjust. Next reduce the input and connect the .005 MFD condenser to the grid cap of the 6A7 and adjust the trimmer condensers on ITEM 52 for maximum output. SLIGHTLY GREATER OUTPUT MAY BE OBTAINED BY READJUSTING THE TRIMMERS ON ITEM 53. THIS SHOULD NOT BE DONE UNLESS ABSOLUTELY NECESSARY AS IT INTRODUCES SOME REGENERATION AND MAY CAUSE EXCESSIVE HISS WHEN A CARRIER IS TUNED IN.

H.F. BAND ALIGNMENT: USE 400 OHM DUMMY ANTENNA.
First set signal generator and receiver dial at 16 MEGACYCLES, and receiver selector switch ON POINT (x). Turn trimmer (a) in and out--two points will be found that will allow 16 MC signals to come through. Always set (a) at the lower capacity setting that gives 16 MC response. (The H.F. trimmers (a) and (b) are color coded red for easy identification).

Next vary the generator frequency back and forth slowly and adjust trimmer (b) for maximum signal output, when this is obteined the H.F. band is properly aligned.

B.C. BAND ALIGNMENT: USE .0002 MFD DUMMY ANTENNA.
Set signal generator at 1400 K.C. Set selecter switch on point (Y) and receiver dial to 1400 K.C. Adjust trimmer C to bring in signal.

Set generator near 600 K.C. (right on 600 K.C. if no local signal interfers), tune radio set to signal generator. "Rock" tuning condenser back and forth slowly and adjust item 37 simultaneously until maximum response is obtained. If considerable change from the original value of 37 adjustment is required--repeat the B.C. band alignment procedure.

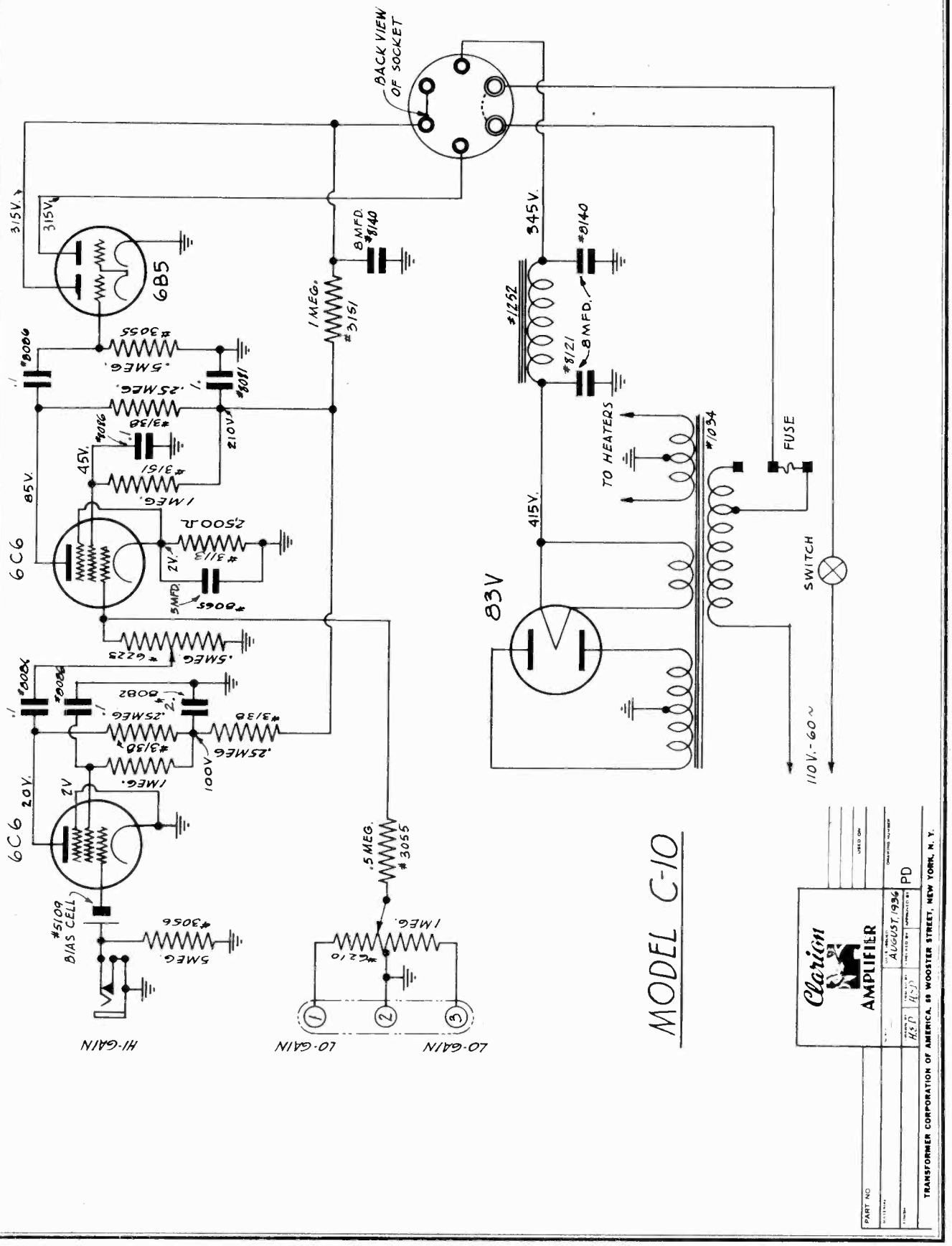
The complete receiver should now be in correct adjustment, and may be checked on the air. Under normal conditions a single wire antenna 100 ft. long with lead in at one end is recommended.

If A.C. hum is experienced during alignment operations, try grounding the signal generator or the receiver chassis to a good ground.

If in a particular locality hum comes in with each station tuned in, this may be remedied by connecting a 10,000 ohm carbon resistor from the antenna side of item 20 to chassis. If hum still persists the antenna should be strung in a different direction so as not to pick up hum from power lines, etc.

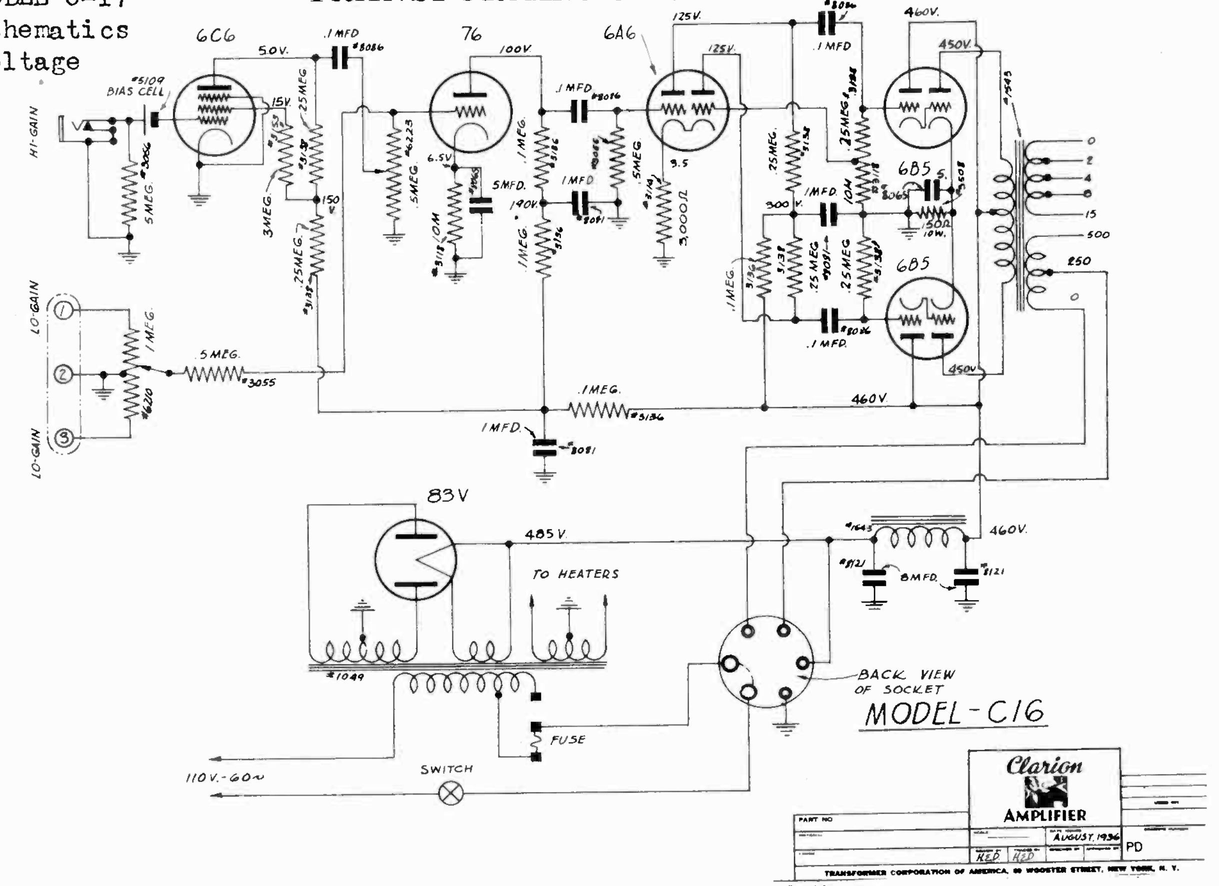
TRANSFORMER CORP. OF AMER.

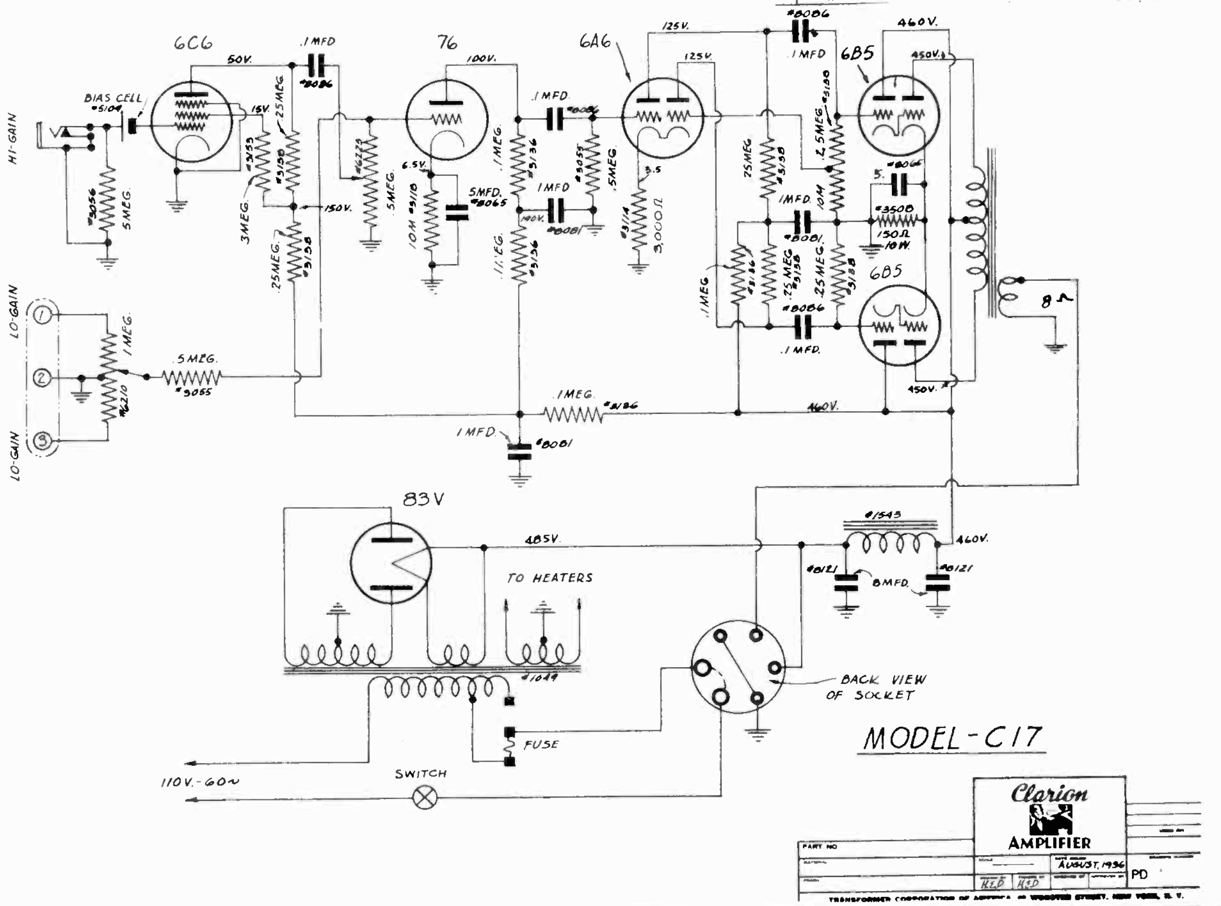
MODEL C-10
Schematic
Voltage



MODEL C-16
MODEL C-17
Schematics
Voltage

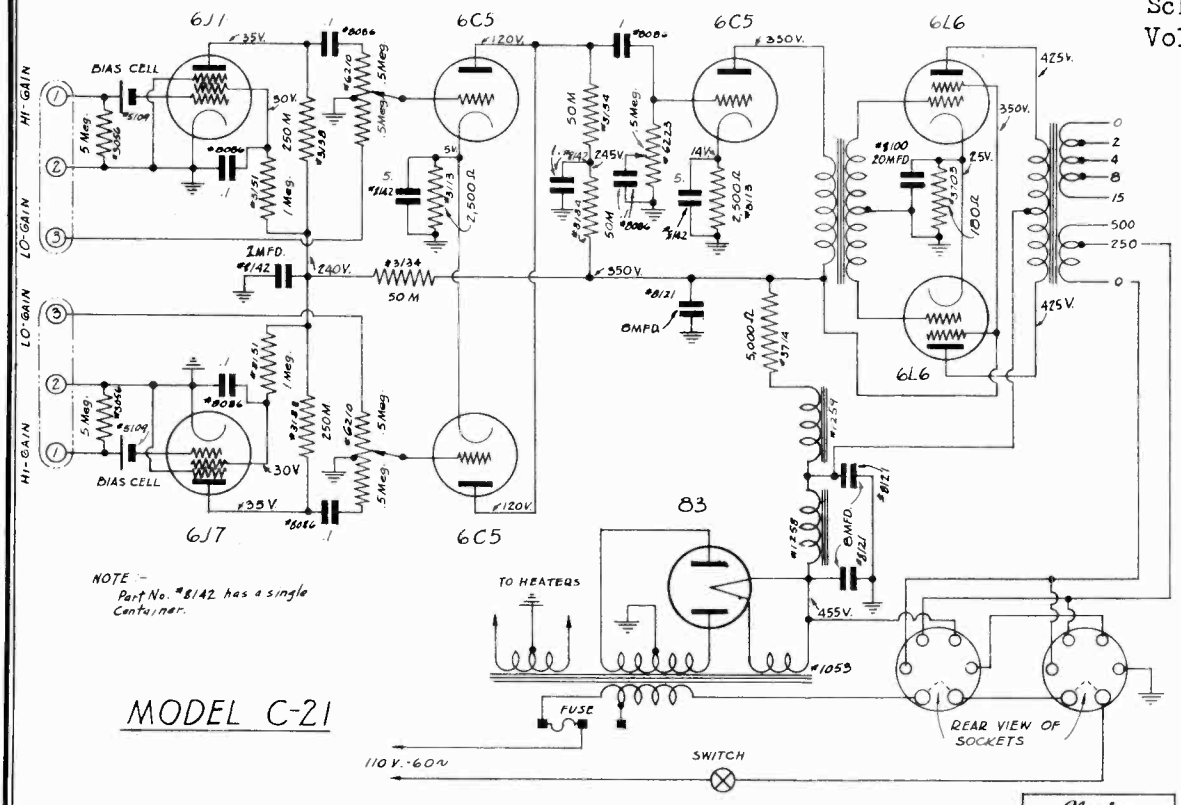
TRANSFORMER CORP. OF AMER.





TRANSFORMER CORP. OF AMER.

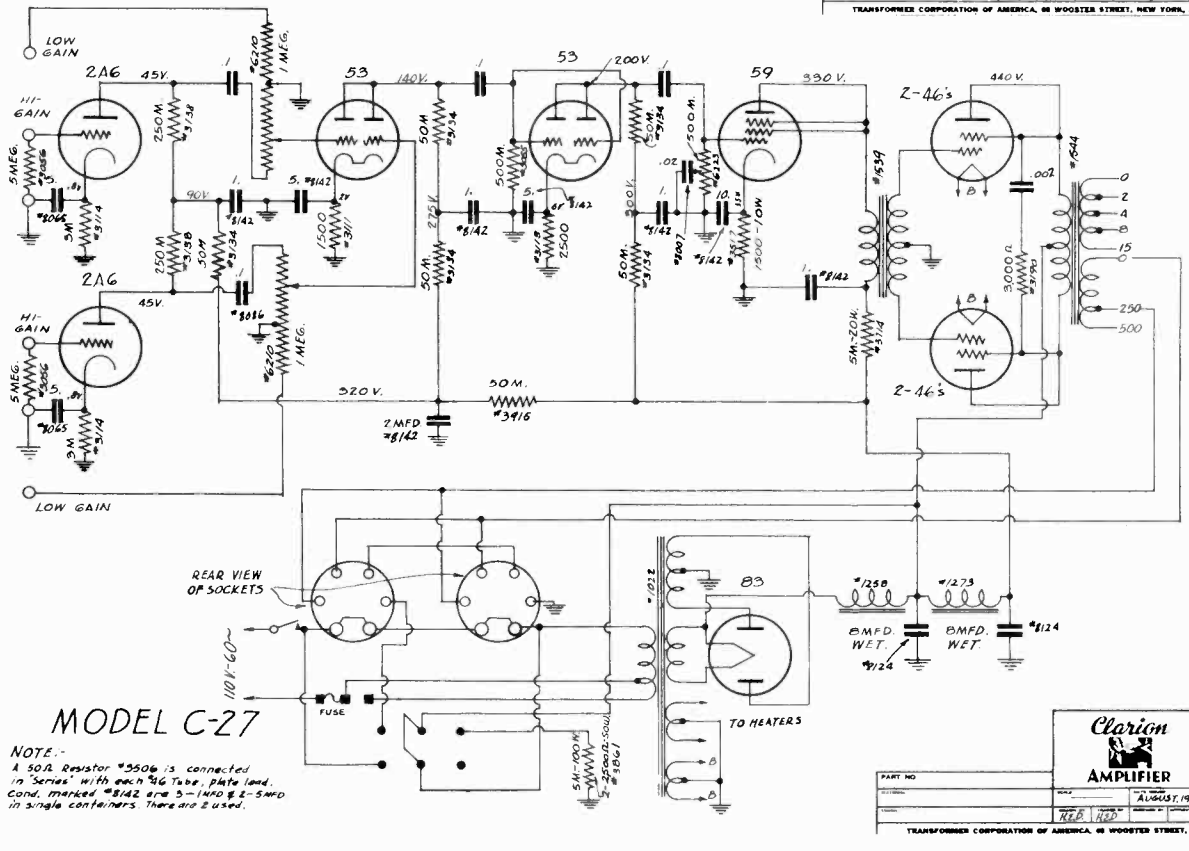
MODEL C-21
MODEL C-27
Schematics
Voltage



NOTE :-
Part No. #8142 has a single Container.

MODEL C-21

Clarion AMPLIFIER
AUGUST, 1936
TRANSFORMER CORPORATION OF AMERICA, 69 WOOSTER STREET, NEW YORK, N. Y.



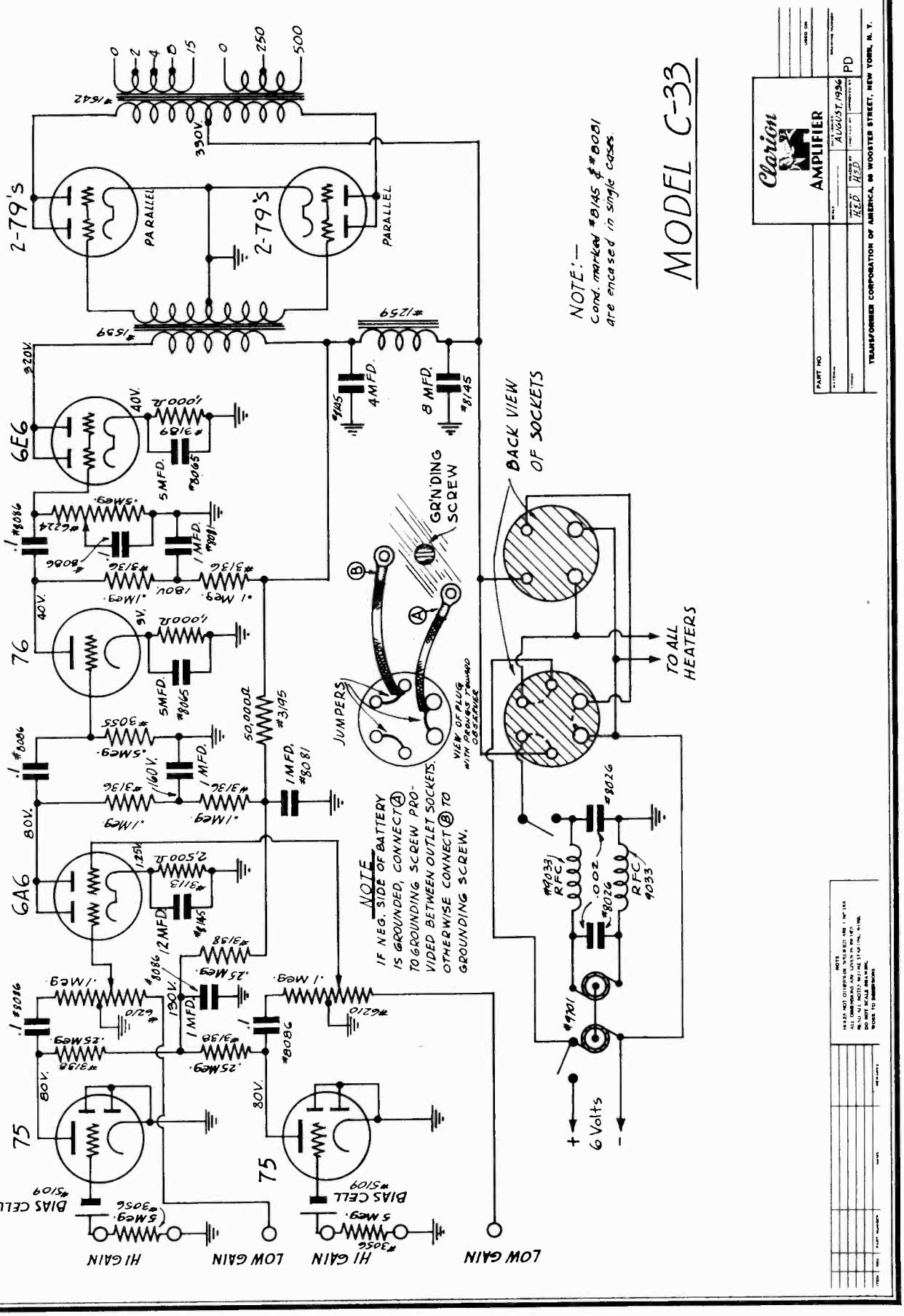
MODEL C-27

NOTE.-
A 50Ω Resistor #5506 is connected in "Series" with each 46 Tube, plate load. Cond. marked #8142 are 3-1MFD & 2-5MFD in single containers. There are 2 used.

Clarion AMPLIFIER
AUGUST, 1936
TRANSFORMER CORPORATION OF AMERICA, 69 WOOSTER STREET, NEW YORK, N. Y.

MODEL C-33
Schematic
Voltage

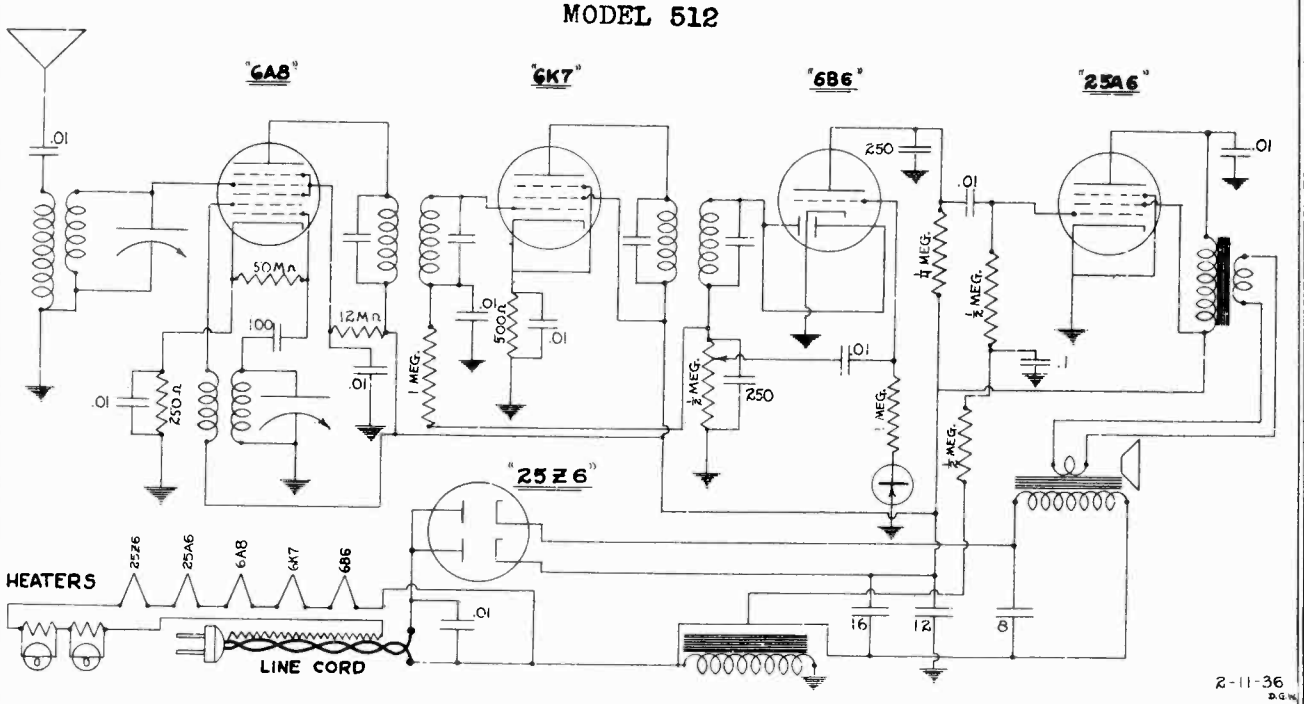
TRANSFORMER CORP. OF AMER.



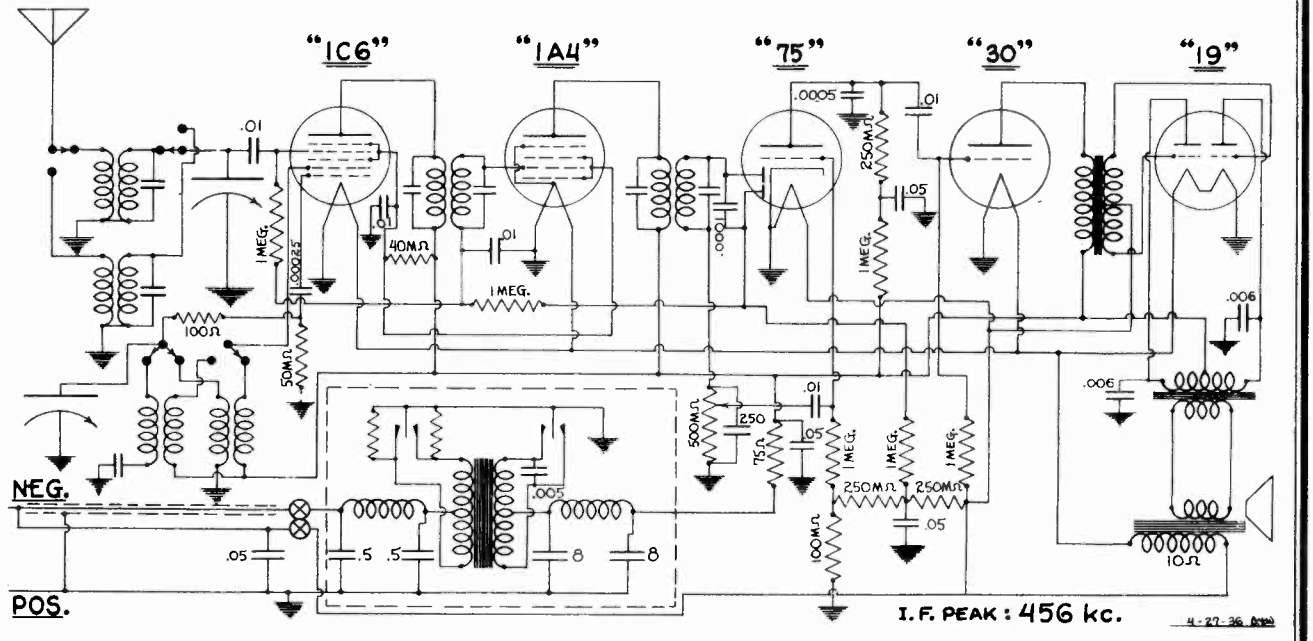
TRAV-LER RADIO & TELEV. CORP.

MODEL 512
MODEL 525, 6v. DC
Schematics

MODEL 512



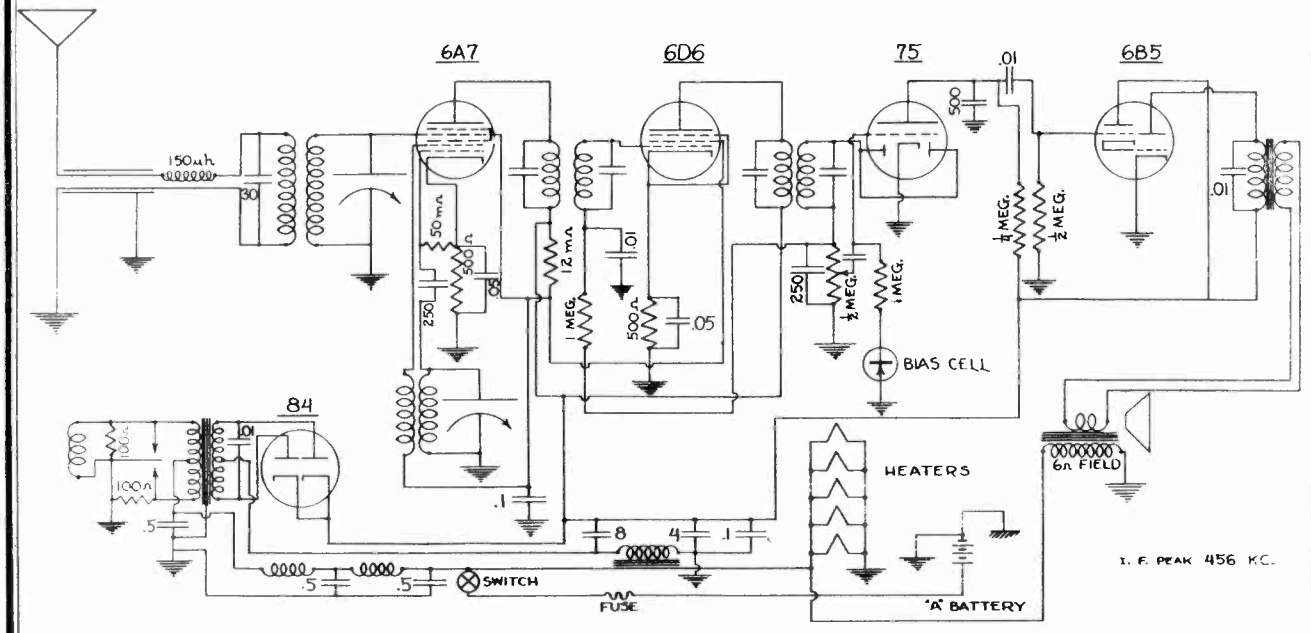
MODEL 525, 6v. DC.



MODELS 173,733
MODEL 542
Schematics

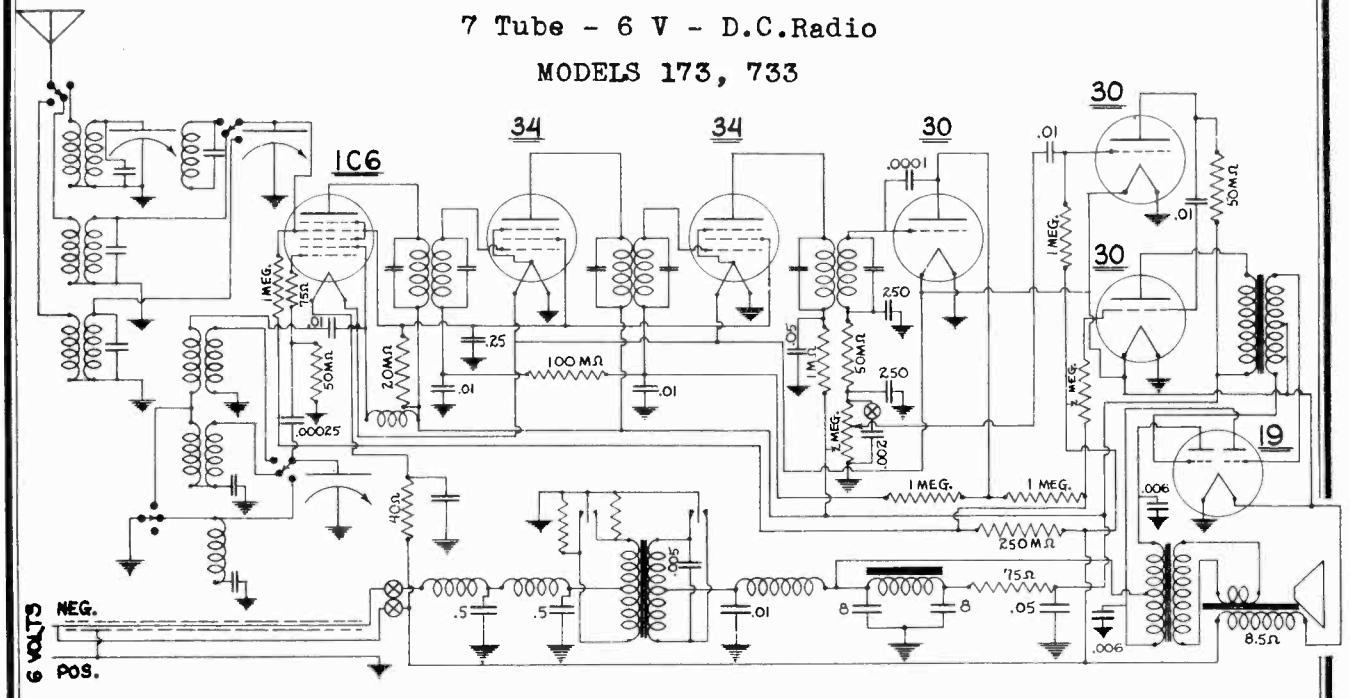
TRAV-LER RADIO & TELEV. CORP.

MODEL 542



7 Tube - 6 V - D.C.Radio

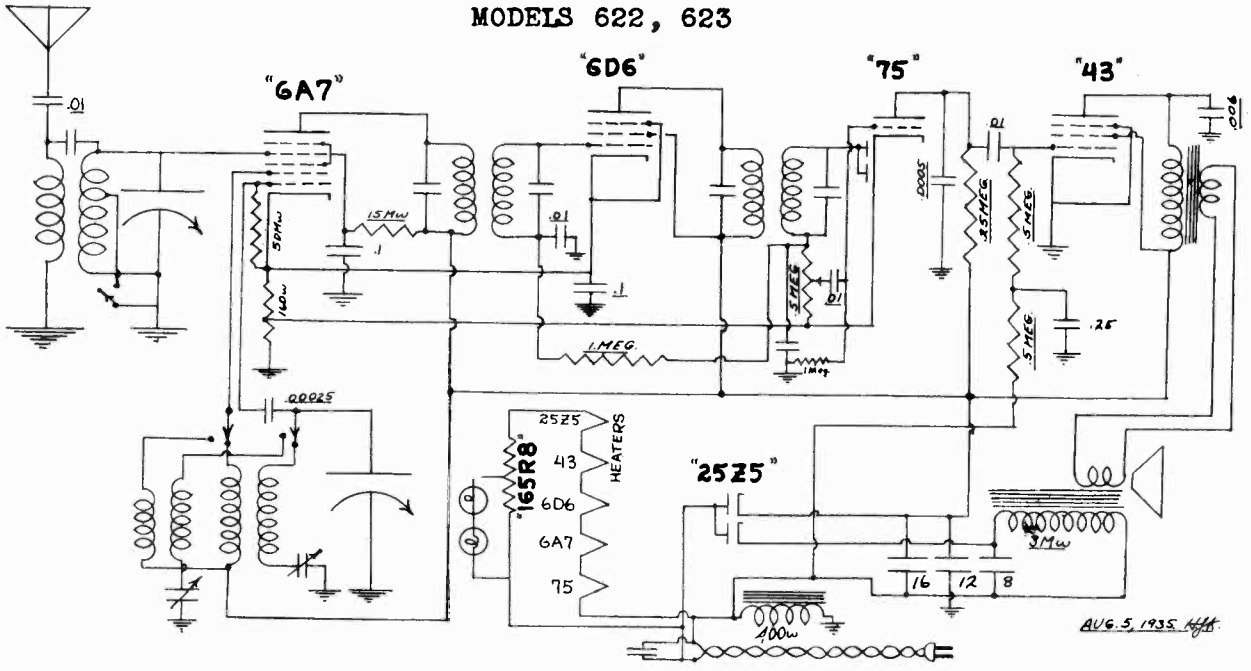
MODELS 173, 733



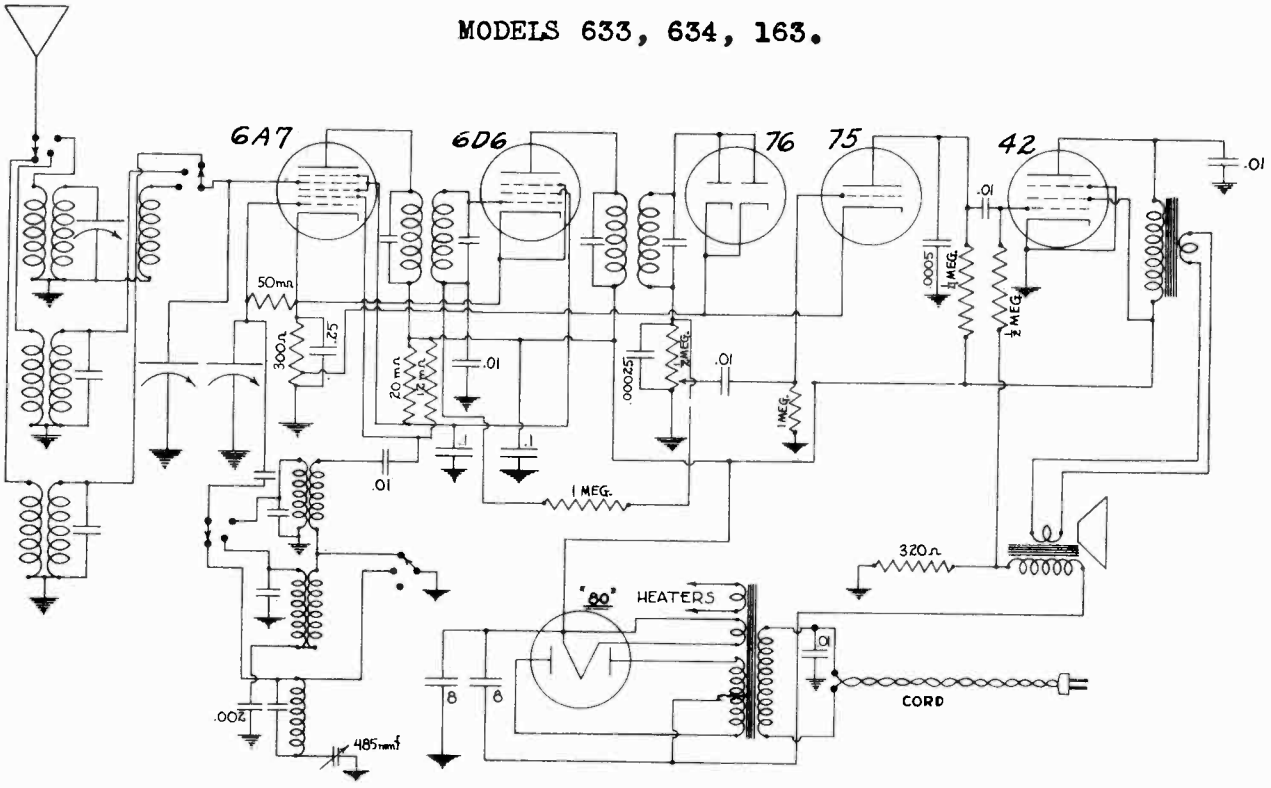
TRAV-LER RADIO & TELEV. CORP.

MODELS 622,623
MODELS 633,634,163
Schematics

MODELS 622, 623

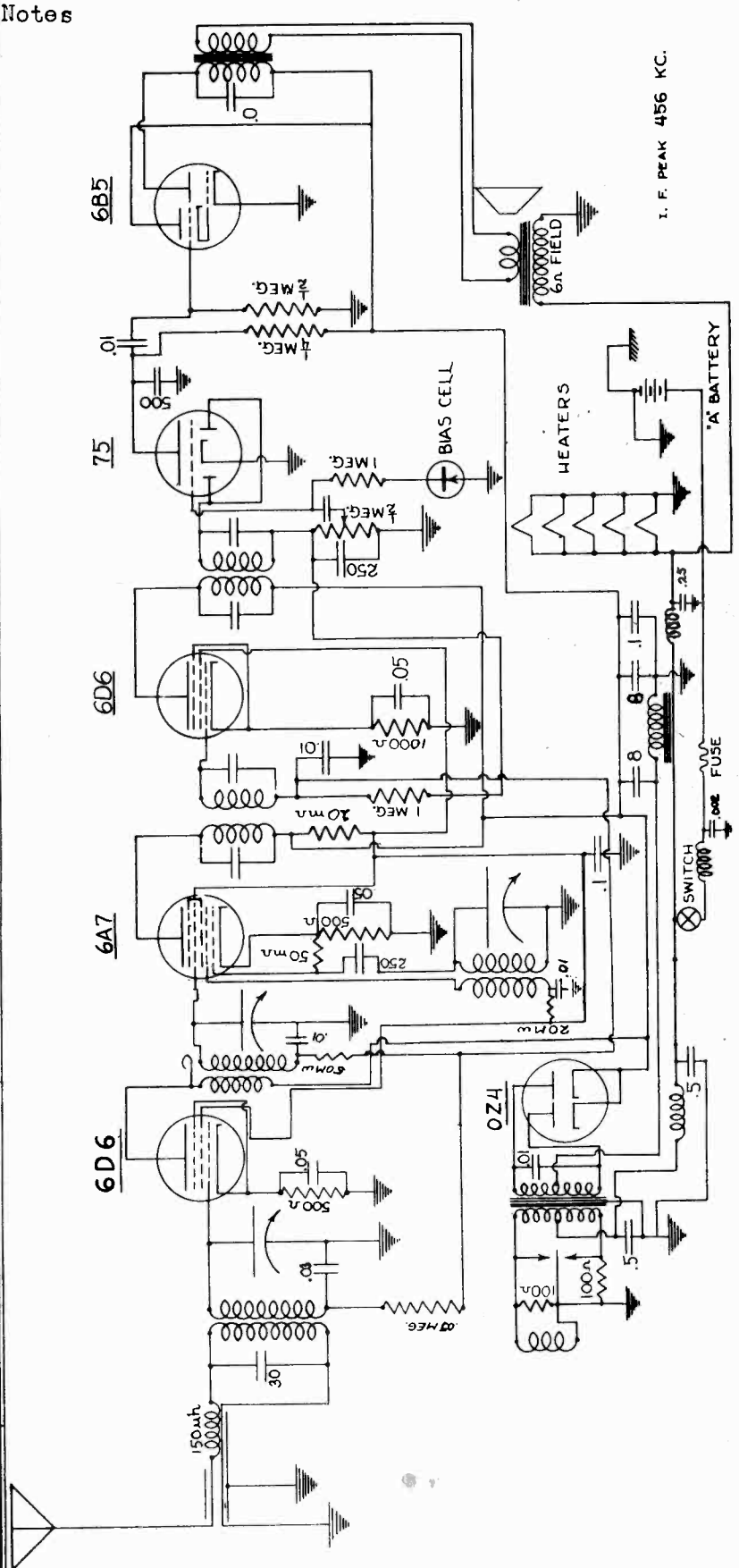


MODELS 633, 634, 163.



MODEL 642
Schematic
Notes

TRAV-LER RADIO & TELEV. CORP.



MODEL 642

ASSEMBLY AND MOUNTING:

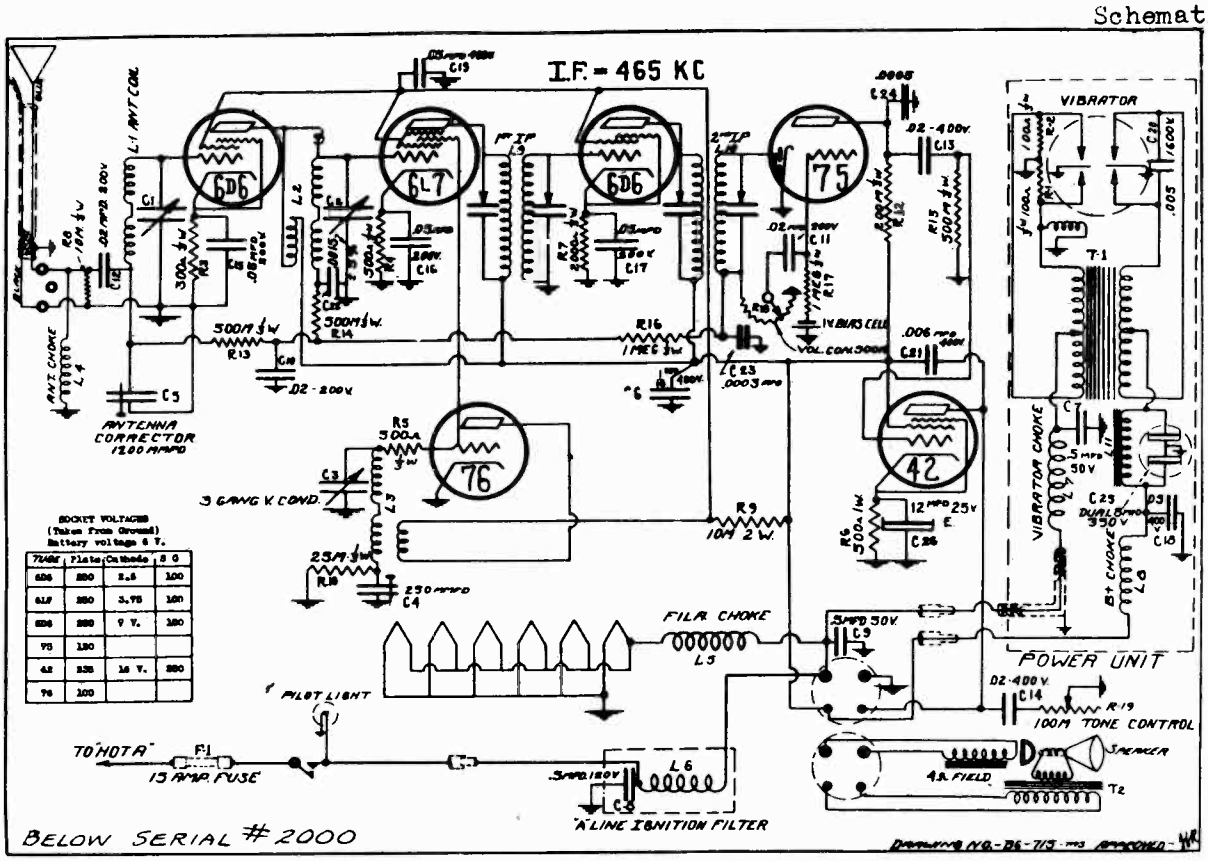
The set is mounted by means of a 3/8 inch machine bolt placed through a hole in the center of a space to clear 8¾ x 7¾ inches, and having no obstruction within 7¾ inches from its surface which will then clear the auto chassis, and so located as to allow the insertion of the shafts without sharp bends. The rear of the set can then be joined to the head of this bolt, and the nut attached to the bolt and tightened against the opposite side of the partition, leaving the set in a rigid mounting.

The control unit is supplied with individual escutcheon plates to match your particular car. It is also possible to secure means for mounting the unit under the dash or on the steering column if the car is not equipped for dash mounting. Instructions for mounting the control unit in the dash of your car are enclosed with the proper escutcheon.

Parts List

TRIANGLE ELECTRIC CO.

MODEL 6P
Imperial
Schematic



REPLACEMENT PARTS LIST

WHEN ORDERING, USE PART NO. AND DESCRIPTION SHOWN ON THIS LIST REGARDLESS OF NUMBER PRINTED ON PART ITSELF.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Part No.	Schematic Location	Description	List Price
7601		Bias Cell - 1 Volt	.20
5600		Cable - Flexible drive with fittings	.85
5632		Cable - Antenna	.50
5630A		Cable - "A" Battery with fuse holder	.50
5533		Cable - Battery and B + lead (inside set)	.32
5631		Short "A" lead (extending from set)	.25
5634		Long "A" lead (extending from drive head)	.60
4302	L11	Choke - filter (power unit)	.92
8523	L1	Coil - Antenna, complete assembly	.85
8524	L2	Coil - Mixer, complete assembly	.85
8525	L3	Coil - Oscillator, complete assembly	.85
8526	L4	Coil - Antenna input choke	.85
8527	L5	Coil - Filament choke	.85
8528	L6	Coil - Ignition choke	.85
8529	L7	Coil - Vibrator primary choke	.85
8530	L8	Coil - B + Choke	.85
8531	L9	Coil - 1st. I.F. Assembly	1.30
8532	L10	Coil - 2nd. I.F. Assembly	1.30
8121	C1 C2 C3	Condenser - variable tuning	3.50
8223	C4	Condenser - Padding 2 stud mounting	.28
8224	C5	Condenser - Padding, single mounting	.28
	C6	Condenser - .1 Mfd - 400 volt	.20
	C7	Condenser - .5 Mfd - 50 volt (power unit)	.40
	C8	Condenser - .5 Mfd - 120 volt	.40
	C9	Condenser - .5 Mfd - 50 volt	.36
	C10 C11 C12	Condenser - .02 Mfd - 200 volt	.16
	C13 C14	Condenser - .02 Mfd - 400 volt	.20
	C15 C16 C17	Condenser - .05 Mfd - 200 volt	.16
	C18 C19	Condenser - .05 Mfd - 400 volt	.20
	C20	Condenser - .005 Mfd - 1600 volt	.36
	C21	Condenser - .006 Mfd - 400 volt	.20
	C22	Condenser - .0015 Mica	.16
	C23	Condenser - .0003 Mica	.16
	C24	Condenser - .0005 Mica	.12
8825	C25	Condenser - Dual 8 Mfd. - 350 volt	1.80
8823	C26	Condenser - 12 Mfd. - 25 volt	.60
		Condenser - .5 Mfd. - 200 volt (can Type for Generator)	.40
6226	R18	Control - volume	.90
6225	R19	Control - tone	.75
4668		Coupling - insacup on vari. cond.	.12
6103		Coupling - male for wire leads	.20
6102		Coupling - female for wire leads	.20
		Dial Card - calibrated	.28
5717		Dial Plate	1.15
3415	F1	Fuse - 15 ampere	.30

Part No.	Schematic Location	Description	List Price
7904		Fuse - insulating tube	.04
460		Grid cap - large	.04
6012		Grid cap - metal tube	.04
7809		Grommet - Large rubber - 1/2" ID	.04
7109		Knob - volume control & switch	.60
7110		Knob - large control	.80
4106		Lamp - 6 volt pilor - bayonet type	.12
6420		Mounting Studs for Mtg. plate	.12
9006		Nuts for above	.12
758		Nut - thumb, round, knurled (power unit)	.04
6521		#8 P.K. Screw - hex head 1/4" long	.04
742		#8 P.K. Screw - hex head 3/8" long	.04
882		#6 P.K. Screw - hex head 1/4" long	.04
855		6-32 Headless set screw 1/8" long (couplings)	.04
6418		Cover Screw (Power Unit)	.12
4666		Cable anchor bushing (var. condenser)	.08
4669		Cable anchor bushing (volume control)	.08
820		#8 Washer 1/2" OD	.04
6421		Wing screw - 5/16 - 18 x 3/8" long	.08
7054		Wing screw Washer	.06
	R1 R2	Resistor - 100 ohm 1/3 Watt - Moulded bakelite	.12
	R3	Resistor - 300 ohm 1/3 Watt - Moulded bakelite	.12
	R4 R5	Resistor - 500 ohm 1/3 Watt - Moulded bakelite	.12
3365	R6	Resistor - 500 ohm 1/2 Watt - Wirewound	.15
	R7	Resistor - 2000 ohm 1/3 Watt - Moulded bakelite	.12
	R8	Resistor - 10M ohm 1/3 Watt - Moulded bakelite	.12
	R9	Resistor - 10M ohm 1 Watt - Moulded bakelite	.16
	R10	Resistor - 25M ohm 1/3 Watt - Moulded bakelite	.12
	R12	Resistor - 300M ohm 1/3 Watt - Moulded bakelite	.12
	R13 R14 R15	Resistor - 500M ohm 1/3 Watt - Moulded bakelite	.12
	R16 R17	Resistor - 1 megohm 1/3 Watt - Moulded bakelite	.12
		Resistor - 15M ohm (Distributor suppressor)	.25
4182		Remote control head (for under-dash mounting)	6.50
4018		Worm drive - replacement unit (var. cond.)	1.40
2746		Socket - 6 prong	.14
6008		Socket - 8 prong	.16
2745		Socket - 5 prong	.14
2744A		Socket - 4 prong - phenolic	.25
6003		Socket - 3 prong - antenna	.08
6014		Socket - vibrator	.12
8917		Speaker - 6 inch.	4.50
4321	T2	Speaker transformer - Specify if Jensen or Rola	1.80
4202	T1	Transformer - power	2.50
6331		Tube Shield assembly	.25
6832		Tube Shield ground clip	.16
9600		Vibrator - (synchronous)	3.30
3980		Main Mounting Plate	2.50

MODEL 6P
Imperial
Alignment
Socket, Trimmers

TRIANGLE ELECTRIC CO.

ALIGNMENT PROCEDURE

PRELIMINARY

Output Meter Connections (Copper Oxide Type Meter) . . Across voice coil
Output Meter reading to indicate 1 Watt output . . . . . 1.73 Volts
Average sensitivity in microvolts for 1 Watt output . . See chart below

Generator ground lead connection . . . . . Receiver Chassis
Dummy antenna value in series with generator output lead See chart below
Connection of generator output lead . . . . . See chart below

Position of volume control . . . . . Full on
Position of tone control . . . . . OFF (or treble position)
Position of dial card at Maximum Capacity . . . . . Max. Setting line

BAND RANGE	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (in order shown)	MICRO-VOLTS
I.F.Stages	540 KC	465 KC	.1 Mfd.	Trans Grid	C31 C32 C33 C34	1000
Regular	1400 KC	1400 KC	.0002	Ant. Lead	C35 C36 C37	2
Regular	600 KC	600 KC	.0002	Ant. Lead	C4 C5	2

IMPORTANT ALIGNMENT NOTES

1. After adjusting the C4 oscillator padding condenser at 600 KC rotate dial back to 1400 KC and recheck the settings made on C35, C36, C37.

2. It will not be necessary to bend the plates of the variable condenser for alignment on other points on the dial.

3. It should be noted that after the receiver is installed in a car that it is not necessary, when preparing to align the set, to remove the control head and cables from the dash. There is a dial card on the variable condenser that will indicate the alignment frequencies and settings.

GENERAL INFORMATION

To examine this receiver for any reason first remove the two screws holding the cover. The speaker which is mounted on this cover will be removed at the same time allowing further inspection of the tubes and radio. The radio, being designed in two parts, having a pair of wire connectors from the chassis itself to the self contained power unit, can be removed from the case by first taking out the power unit.

The power unit has been very carefully designed to avoid any vibrator "Hash" from being picked up. Due to the exceptional sensitivity of the radio this interference must be kept at a minimum and it is advisable that the cover on the power unit be making good contact to the box. Tighten the cover by bending the flanges inward slightly. Also be sure that the .005 Mfd. 1600 Volt condenser across the vibrator is not open.

It is important that the chassis and power unit make contact to the inside of the receiver case. In addition it is advisable that the paint be removed from under the various bolt heads on the outside of the case that are holding power unit.

Harmonics of the I.F. may be noticed when the chassis is being serviced outside its case. This is a normal condition and will not be present when the set is in actual use.

NOTES ON THE ELIMINATION OF UNUSUAL NOISE CONDITIONS OCCURRING IN THE INSTALLATION IN CERTAIN CARS ARE GIVEN IN SECTION IX OF THE INSTRUCTIONS THAT WERE SENT WITH THE RECEIVER.

Car interference can be fed into the receiver through the flexible control cables, and it is suggested that these cables be bonded. Also see page 6 to this instruction book regarding the use of a shield bracket mounted over the tuning shaft coupling on the set.

In some types of installations (Usually inverted mountings) some receivers may experience extreme loss of sensitivity. If the 2nd I.F. transformer (#8532 as shown on can) does not respond to alignment, it should be replaced with a new type. This condition in the I.F. transformer is caused by the position of the iron core being affected by heat generated within the chassis, and is usually indicated by the softening of the wax within the transformer. The new type I.F. transformer (Part #8542) eliminates this difficulty.

WHEN REPLACING THE 2ND.I.F. UNIT FOR THE REASON AS DESCRIBED ABOVE, IT IS OF COURSE NECESSARY TO READJUST THE TRIMMERS TO 465 KC. WHEN MAKING THE ADJUSTMENT ON THIS UNIT AND LIKEWISE WHEN RE-TRIMMING THE 1ST. I.F. STAGE BE SURE NOT TO PULL THE PLATES TOGETHER TOO TIGHT AS THIS MAY BEND THE PLATES PERMANENTLY OUT OF SHAPE AND THEY WILL NOT SPRING BACK WHEN THE SCREW IS TURNED IN THE OTHER DIRECTION. IN THIS EVENT PEAKING OF THE TRIMMERS WOULD NOT BE OBTAINED AND THE UNIT WOULD HAVE TO BE REPLACED.

ADDITION OF NEW SPECIAL TUNING CABLE SHIELD (3132) TO ELIMINATE EXCESSIVE IGNITION INTERFERENCE. IN MODEL HA6 SERIES 1.

In Ford 1936 V-8 and other automobiles where an excessive amount of ignition noise is present, the bracket described should be used in conjunction with a new type of shield (No. 3132). Both the bracket described and the new type shield described here are necessary for best noise elimination. The bracket and shield need not be ordered for models number above 5000 (series 2).

The new tuning cable shield (3132) will be supplied "No Charge" together with a screw used to fasten it over the tuning cable opening.

SERVICE FIRST AID
EVERY GOOD SERVICEMAN CHECKS TUBES AND THE ANTENNA SYSTEM FIRST.

DEFECT	GENERALLY CAUSED BY	REMEDY
QUALITY POOR	After Checking Voltage, Tubes and Vibrator; Check .02 Condenser in the plate circuit of the 76 tube which may be open	Change if necessary
	Speaker Cone off center	Adjust or change speaker
DEAD RECEIVER	Blown Fuse, Defective Off-On Switch, Open Voice Coil or Speaker Transformer	Check
	Defective Vibrator, Blown Condenser, Open Coil Winding	Check "B" Voltage
LOW VOLUME INSENSITIVE	Poor Antenna System, Receiver not aligned, Speaker Field Coil shorted	Check
	2nd. I.F. Transformer having lost its gain due to the softening of the wax and the shifting of the iron core coupling	Change to new type I.F. (# 8542 on can)
AUDIO OSCILLATION OR HOWL	Possible open .006 in place circuit of 42	Change if necessary
	Variable Condenser not floating freely in its rubber mountings	Free Condenser
RADIO FREQUENCY OSCILLATION	Open C6 bypass condenser .1 Mfd. 400 volt in B - Circuit	Change
	The grid lead between the mixer tube 6L7 and the variable condenser may be too close to the Antenna Stage of the variable condenser (Top Section)	Push lead away
OFF CALIBRATION	Set not properly aligned	Check
	Dial hand not set to maximum line when condenser is at full capacity	Reset screw on back of drive head
SET NOT SELECTIVE	Check Alignment, especially the I.F. stages.	
SLIPPING OF THE VOLUME CONTROL SHAFT	Cable may not be meshed with slot in control shaft due to cable not being far enough in the coupling, or volume control bracket may be bending back at an angle which does not allow the control to meet the shaft slot.	Correct as described

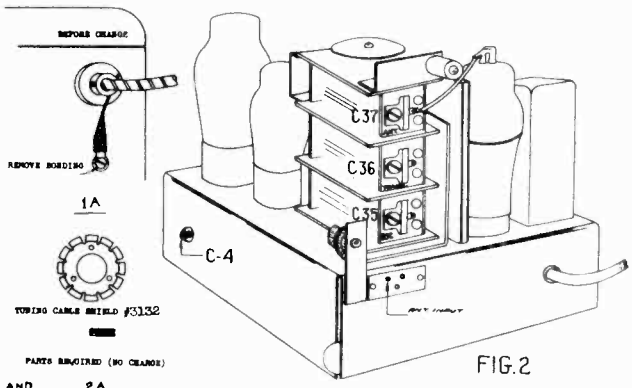


FIG.2

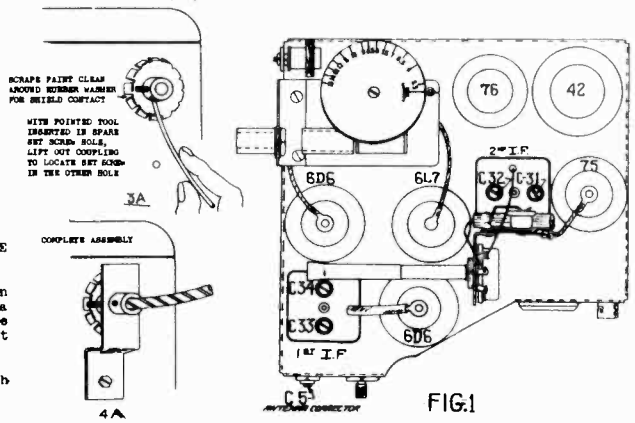
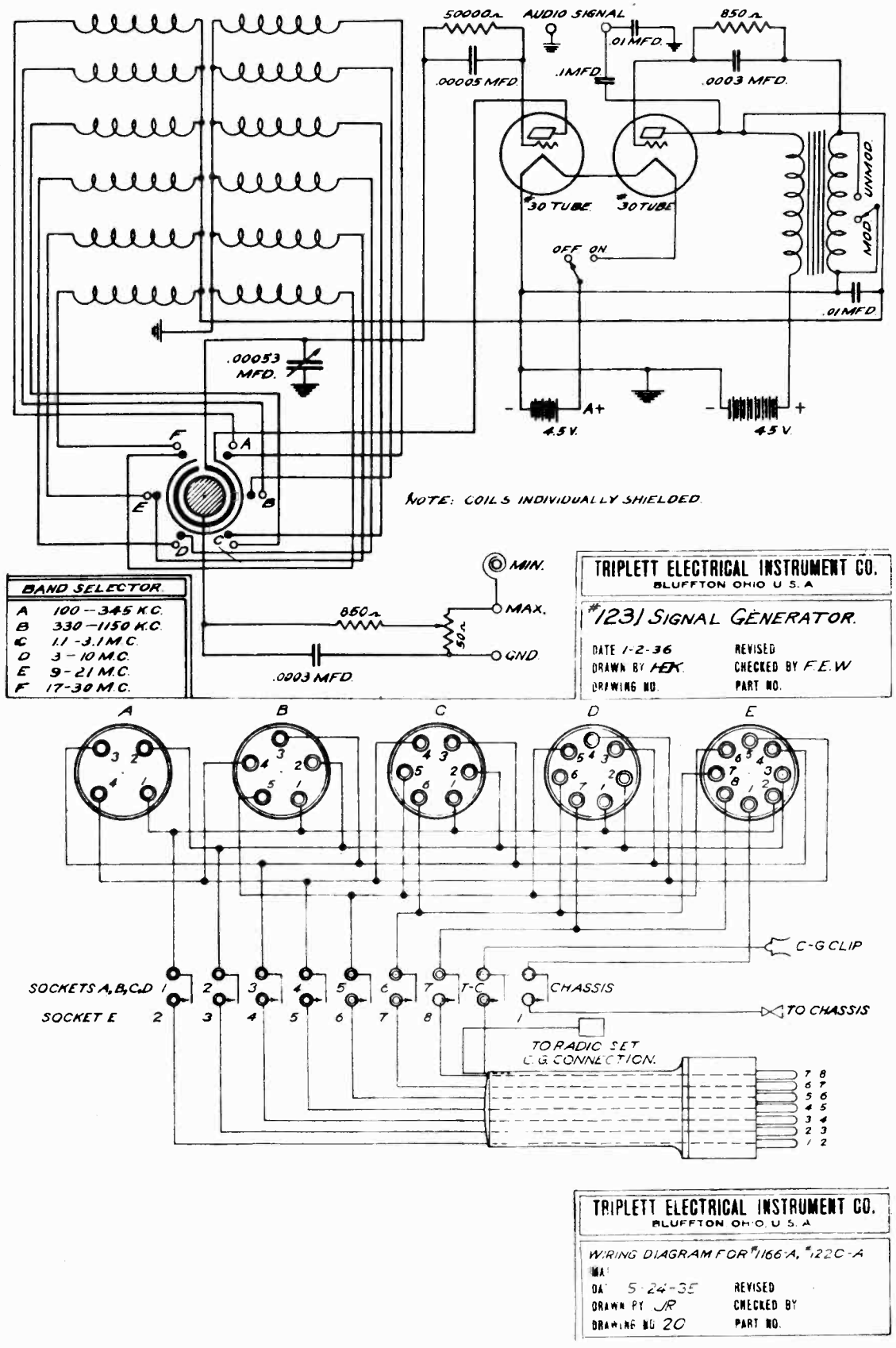


FIG.1

TRIPLETT ELECTRICAL INSTRUMENT CO.

MODEL 1231 Sign.Gen.
MODELS 1166A, 1220A
Schematics



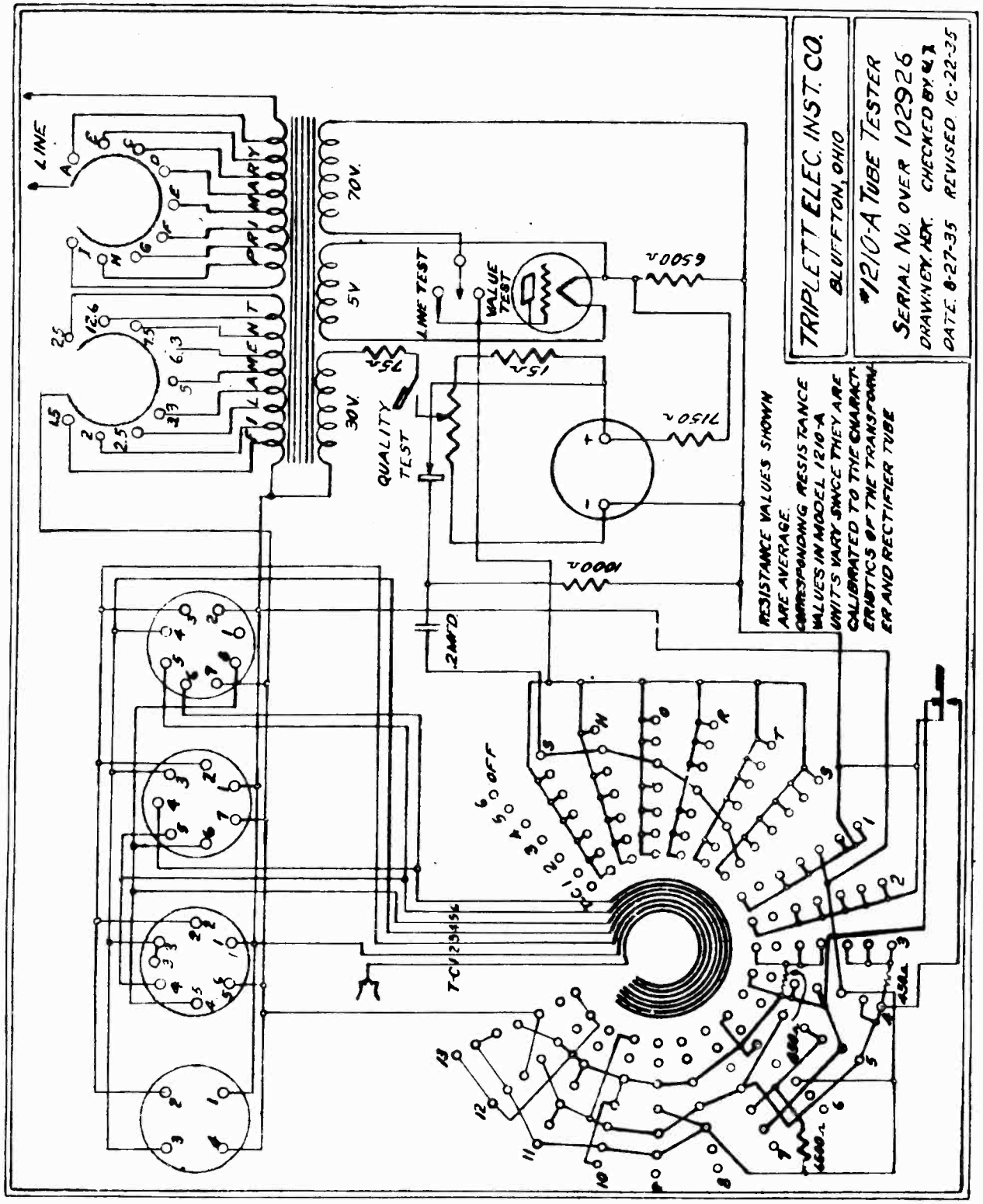
TRIPLETT ELECTRICAL INSTRUMENT CO.
BLUFFTON OHIO U.S.A.

WIRING DIAGRAM FOR #1166-A, #122C-A

MA
DA 5-24-35 REVISED
DRAWN BY JR CHECKED BY
DRAWING NO 20 PART NO.

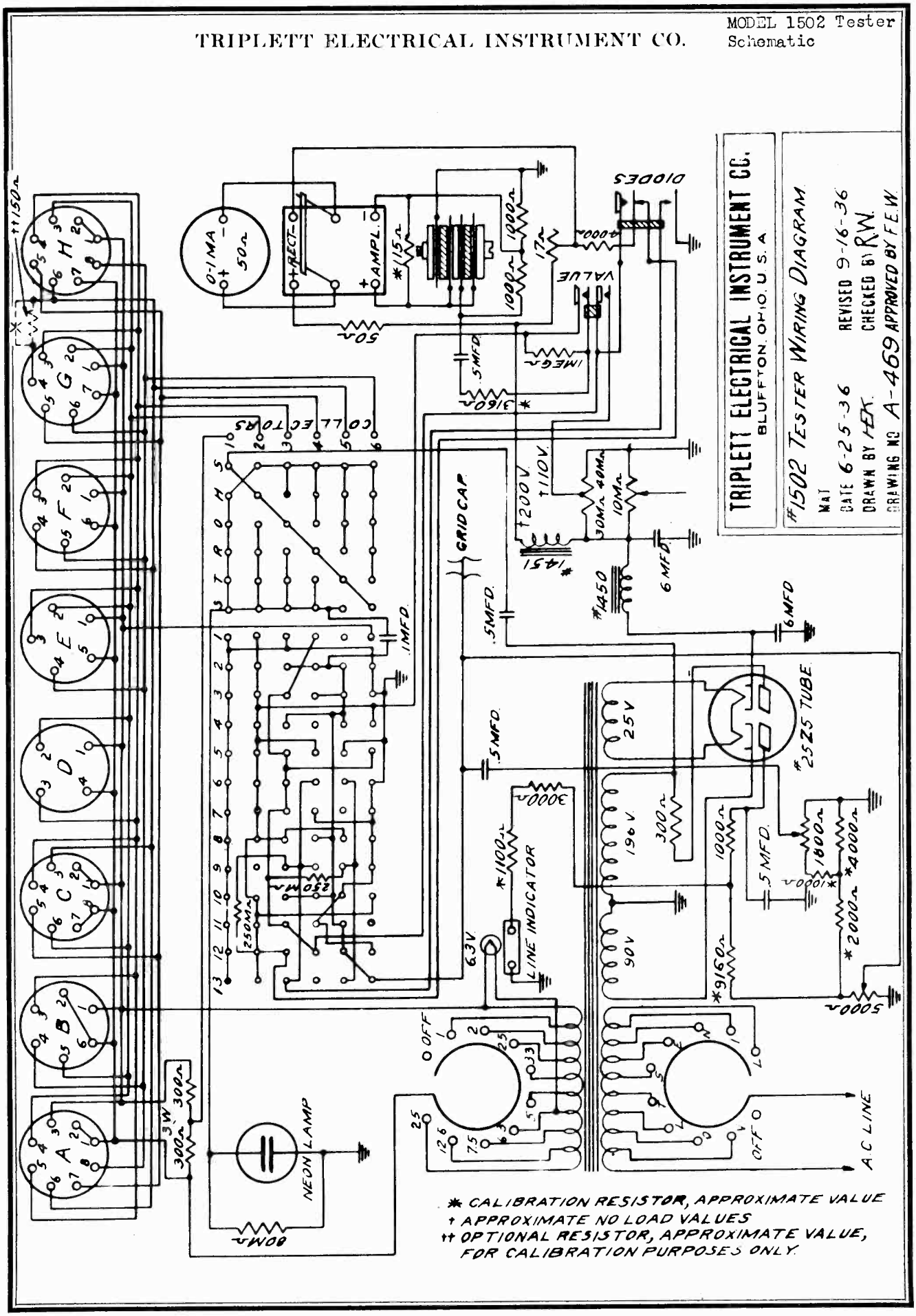
MODEL 1210A Tube Tester
Schematic

TRIPLETT ELECTRICAL INSTRUMENT CO.



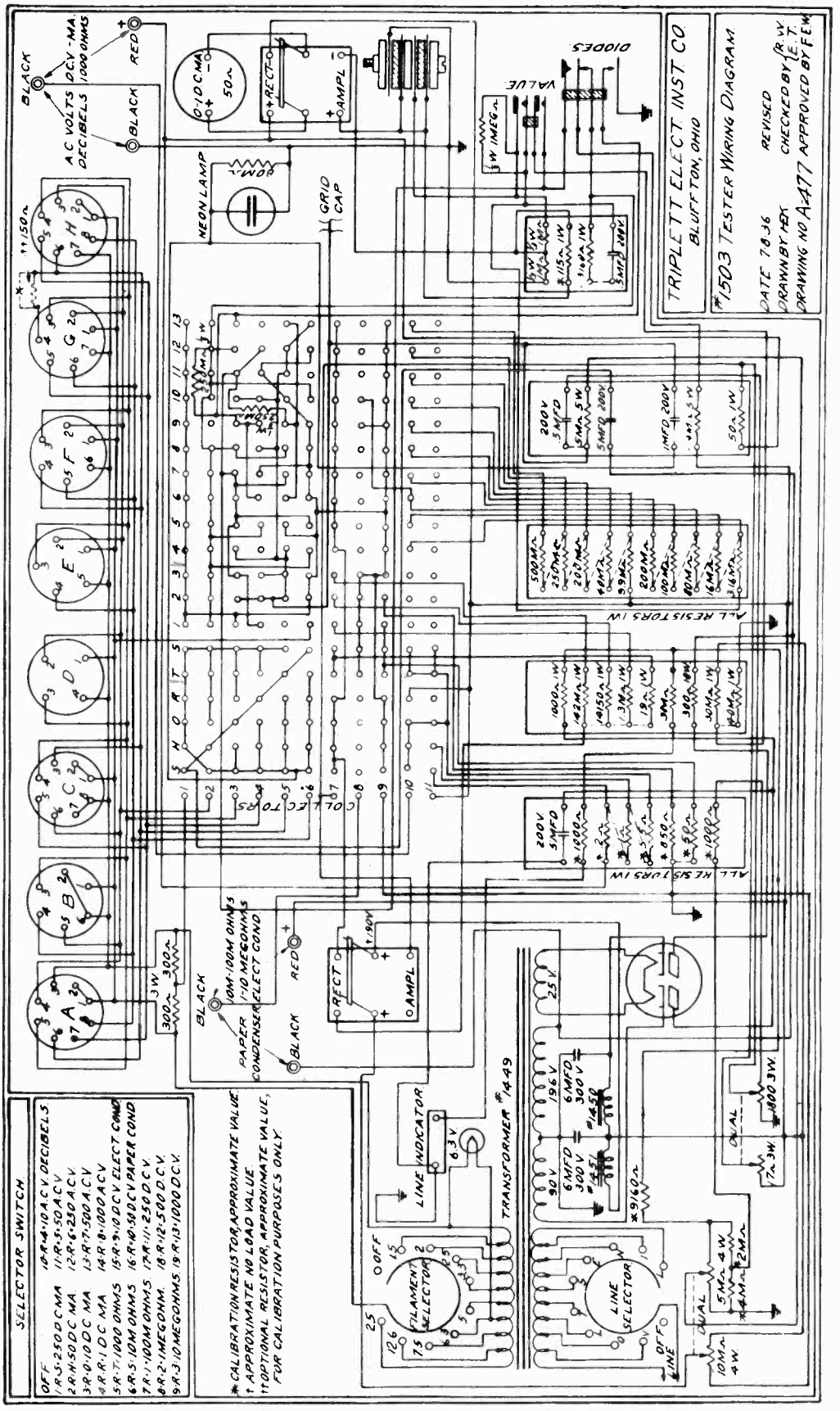
TRIPLETT ELECTRICAL INSTRUMENT CO.

MODEL 1502 Tester
Schematic



MODEL 1503 Tester
Schematic

TRIPLETT ELECTRICAL INSTRUMENT CO.

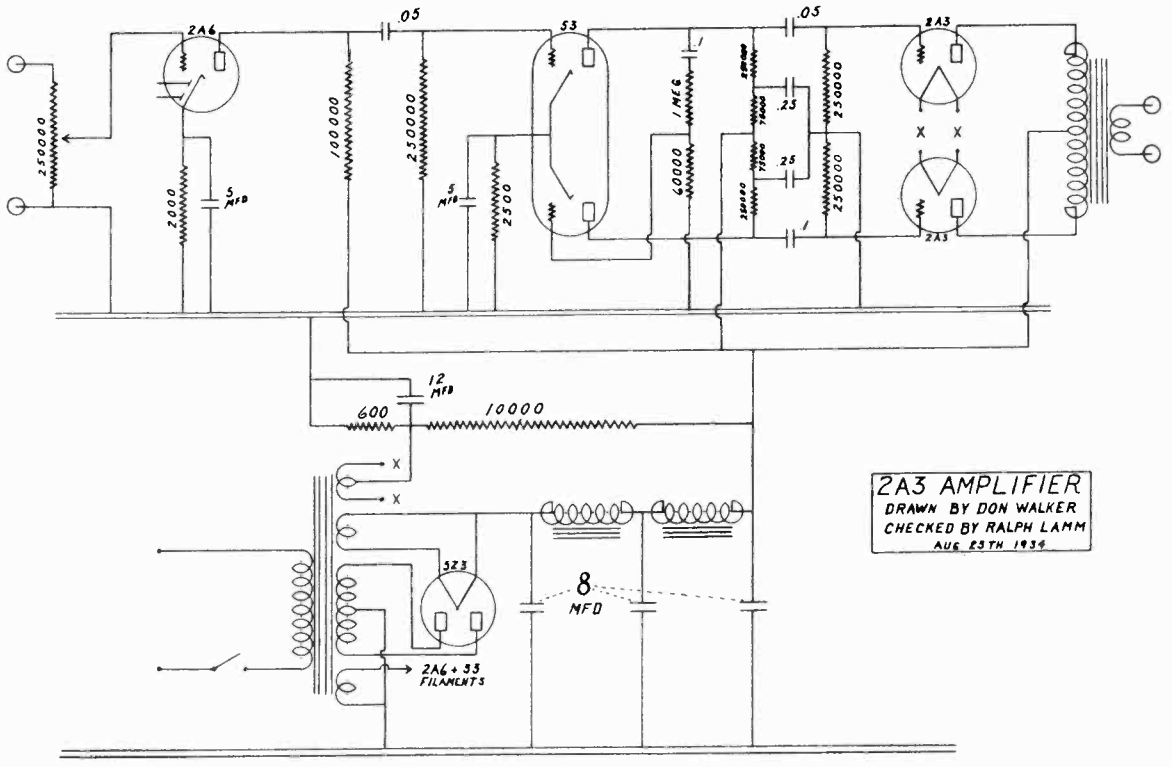


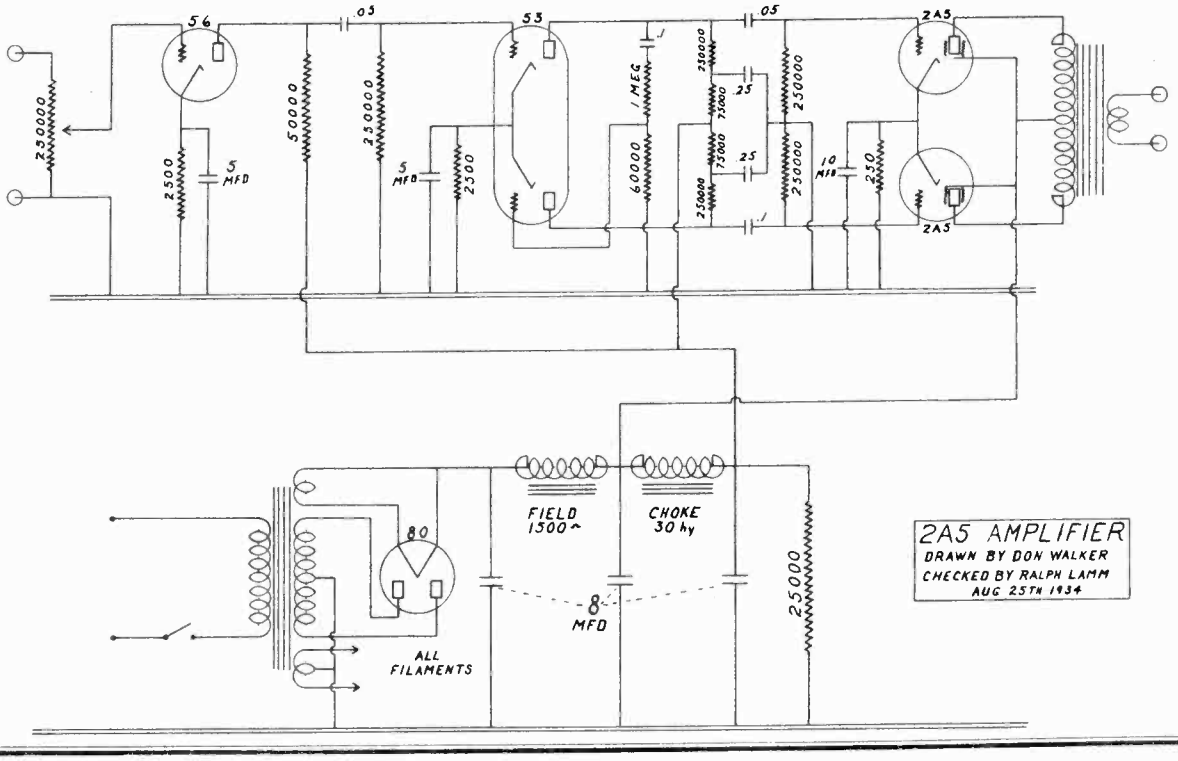
TROY RADIO MFG. CO.

MODEL 2A3 Amplifier
MODEL 2A5 Amplifier
Schematics

POWER AMPLIFIERS

(Phase Inverted)



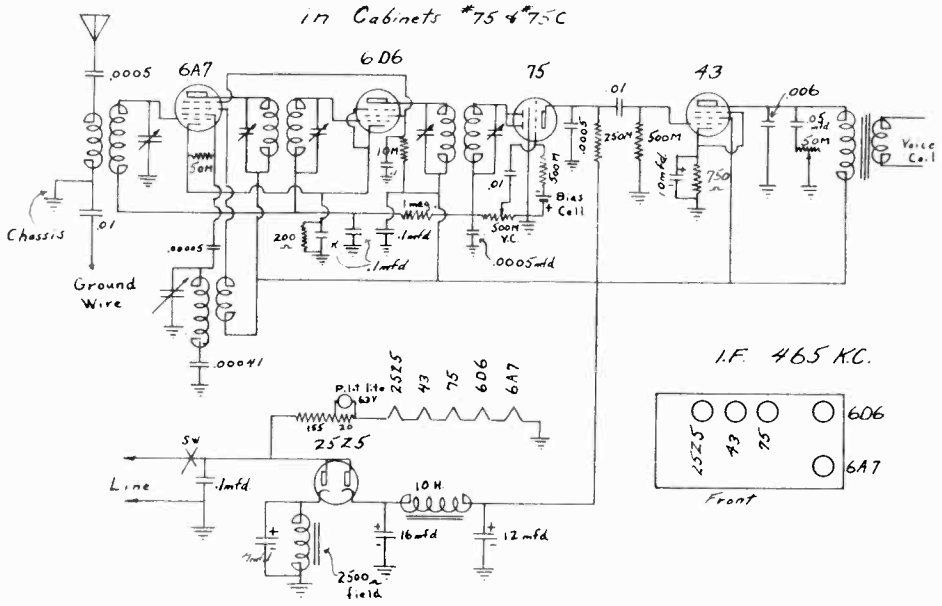


MODELS TR4,TR4CH
MODEL TR68 Auto
MODELS 75,75C,175 AC-DC
Schematics,Socket

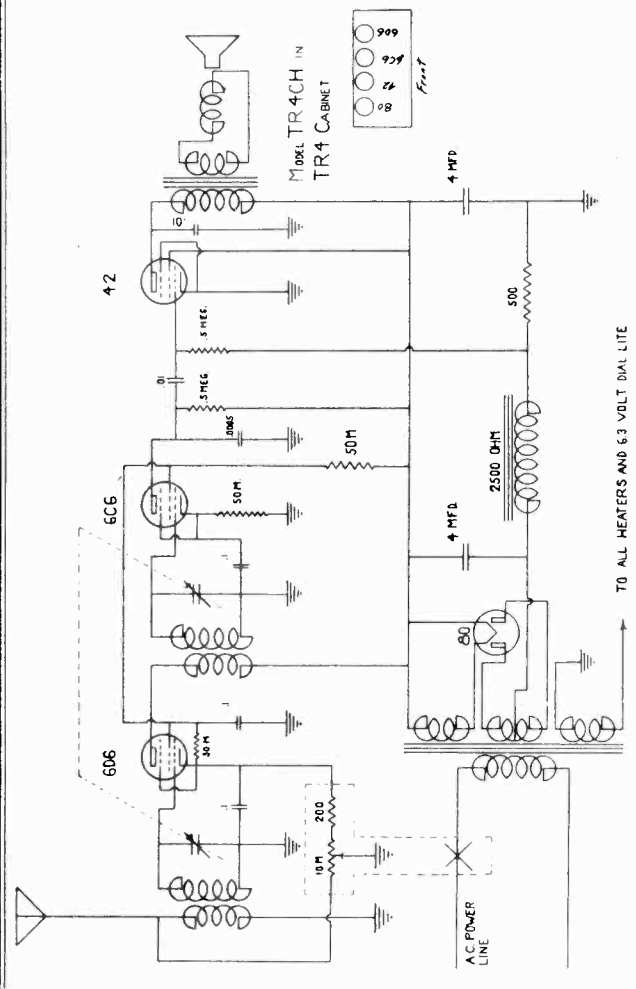
TROY RADIO MFG. CO.

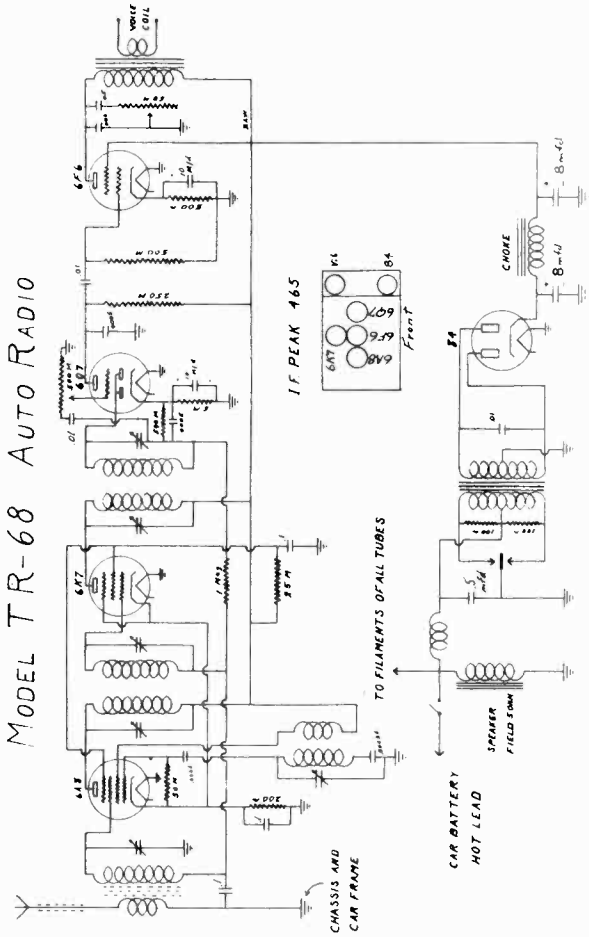
TROY #175 AC-DC

In Cabinets #75 & #75C



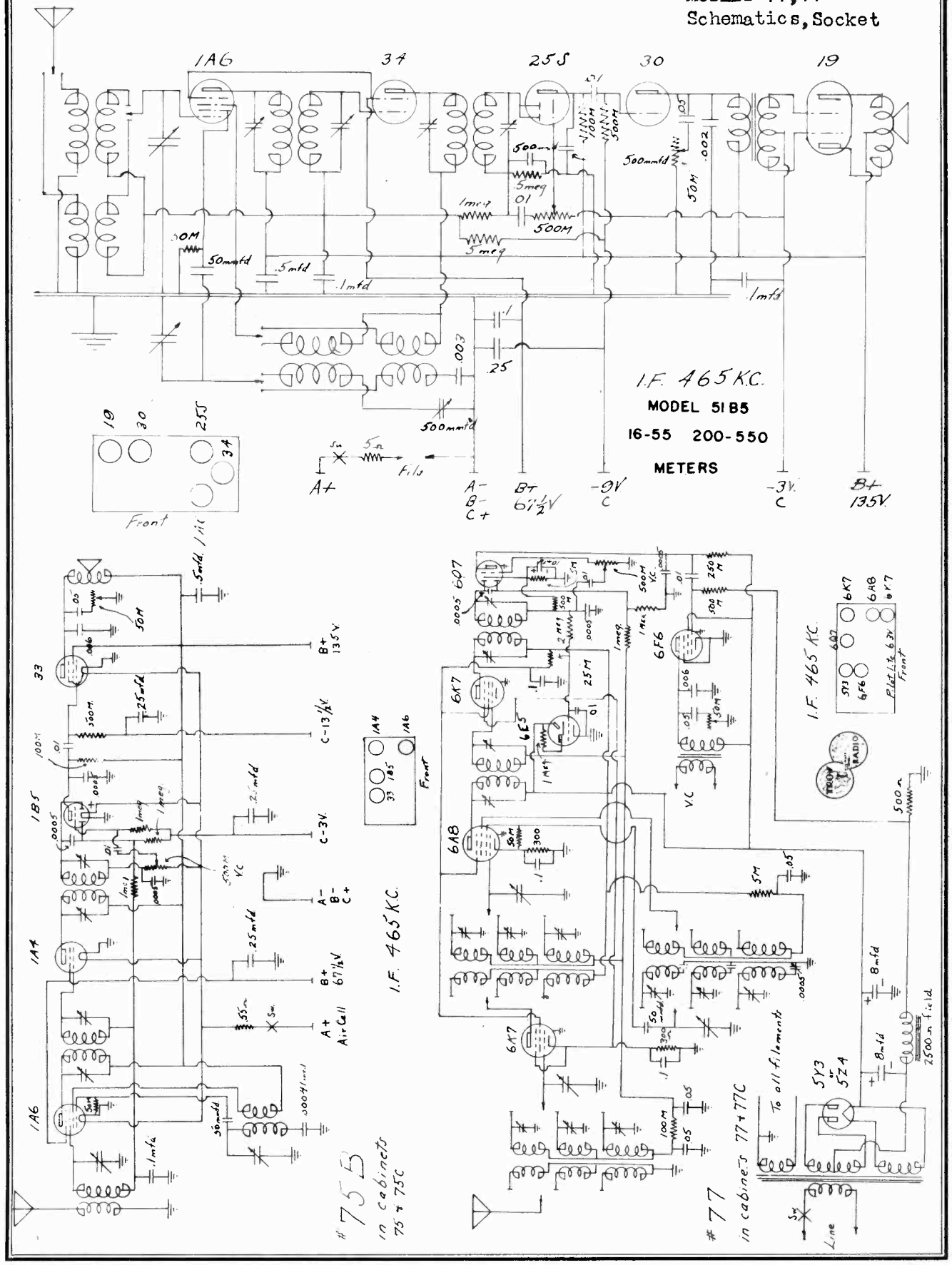
I.F. 465 K.C.





TROY RADIO MFG. CO.

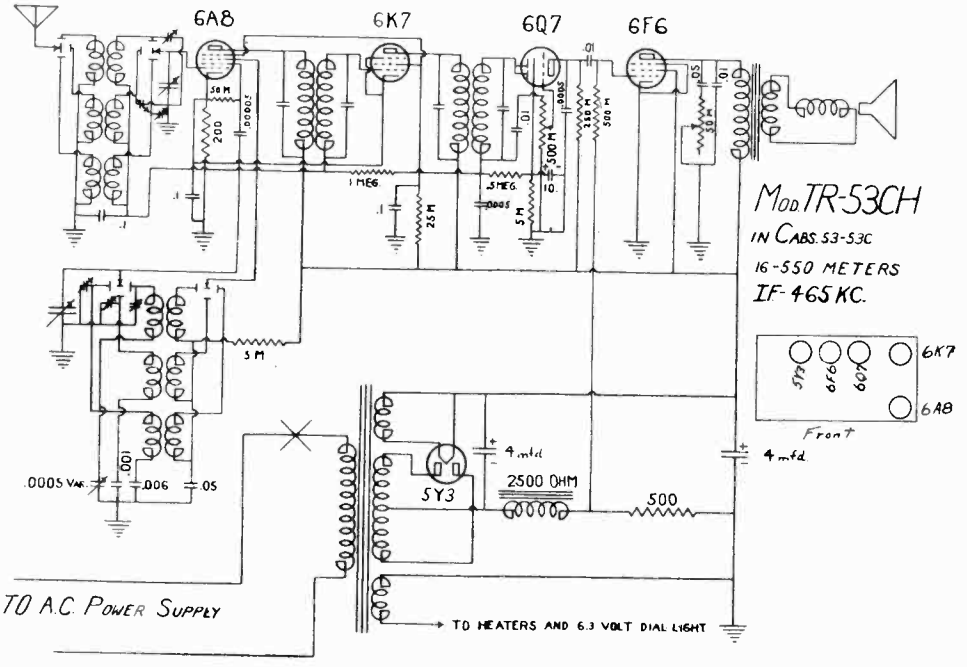
MODEL 51B5
MODEL 75,75B,75C Batt.
MODELS 77,77C
Schematics, Socket

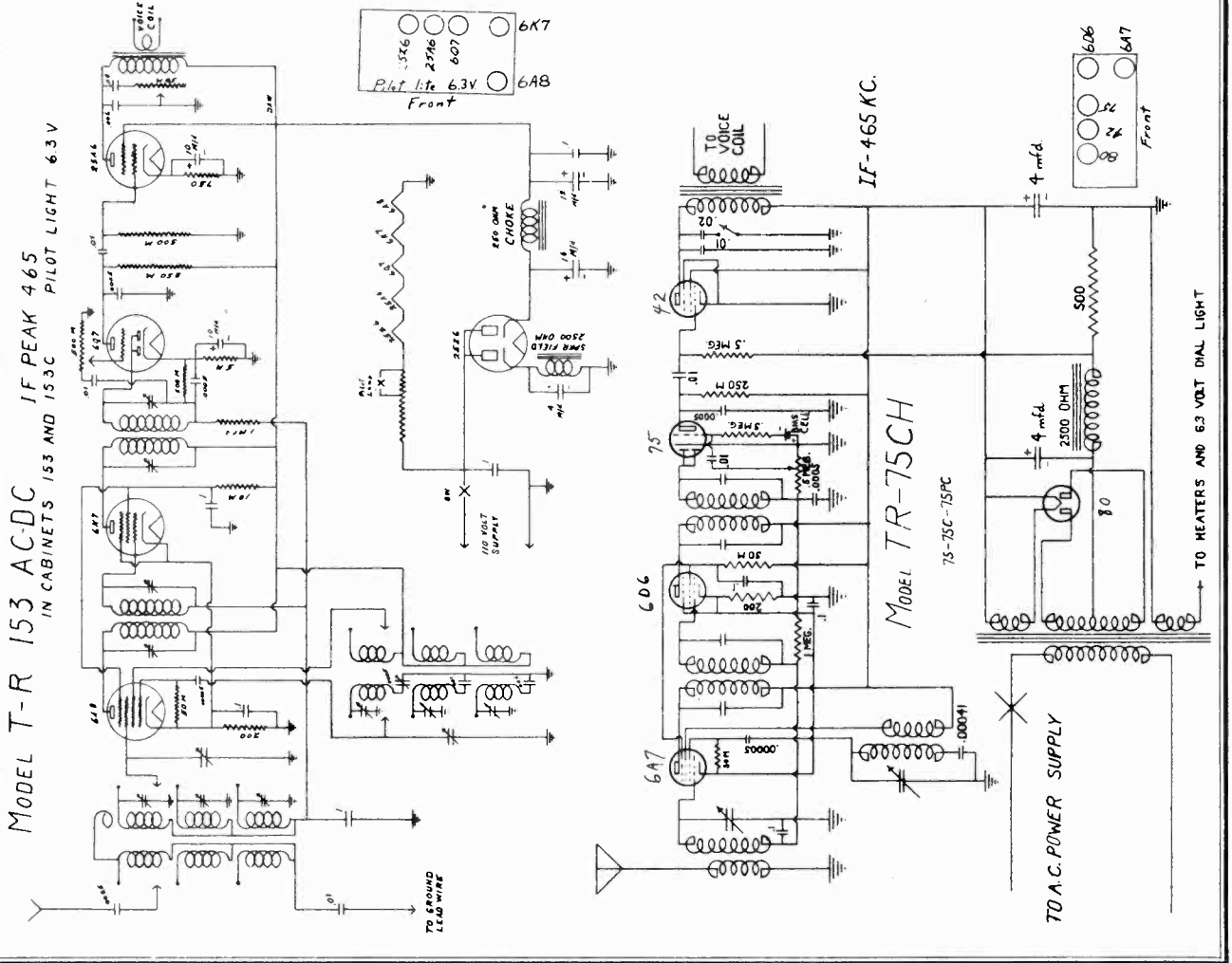


MODELS TR53, TR53C, TR53CH
MODELS 75, 75C, 75CH, 75PH AC
MODELS TR153, 153C AC-DC

TROY RADIO MFG. CO.

Schematics, Socket





UNITED AMERICAN BOSCH CORP.

MODELS 242, 243
MODELS 250, 251
Socket, Alignment

GENERAL DESCRIPTION

The Model 242 is an eight-tube superheterodyne receiver whose circuits comprise a first detector, an oscillator, two stages of intermediate frequency amplification, a combined second detector--automatic volume control, a stage of audic frequency amplification, an output stage and a rectifier.

This model is designed to operate over the standard broadcast band covering the frequencies from 550 to 1500 K.C.

LINE-UP CAPACITOR ADJUSTMENTS

To align the 242 chassis, it is essential to use a high grade modulated test oscillator and a sensitive output meter. The R.F. signal fed into the receiver must be very weak or it will cause the A.V.C. to function, making correct alignment difficult. 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. A top view of the chassis is shown in Fig. #1 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (175 K.C.)

1. Set the volume control to maximum position.

2. Connect output meter across terminals of speaker voice coil.

3. Set the test oscillator to 175 K.C., and apply test signal to the grid of the second I.F. tube through a .25 mfd. blocking condenser.

4. Adjust alignment condenser "A" for maximum output.

5. Apply the test signal to the grid of the first detector tube.

NOTE: In the alignment of the 1st I.F. stage of this receiver it is necessary to use a "losser" so as to flatten out the top of the selectivity curve to give better tone quality. The "losser" consists merely of a .05 mfd. condenser and 1000 ohm resistor connected in series.

6. With the "losser" on the plate of the first detector tube to ground, adjust "B" (top) alignment condenser to maximum output.

7. With the "losser" on the grid of the 1st I.F. tube adjust "C" (bottom) alignment condenser to maximum output.

8. Do not recheck the first I.F. transformer without the "losser".

ADJUSTMENT OF OSCILLATOR AND R.F.

1. Set the test oscillator and pointer on scale to 1400 K.C.

2. Adjust the oscillator trimmer condenser "D" until the signal is received.

NOTE: When adjusting the oscillator trimmer condenser, the signal will be received at two different settings. Use the signal received with the alignment screws turned farthest out.

3. Apply the test signal to the antenna lead of the receiver through a .0002 mfd. series condenser and adjust the preselector alignment condenser "E" and antenna alignment condensers for maximum output.

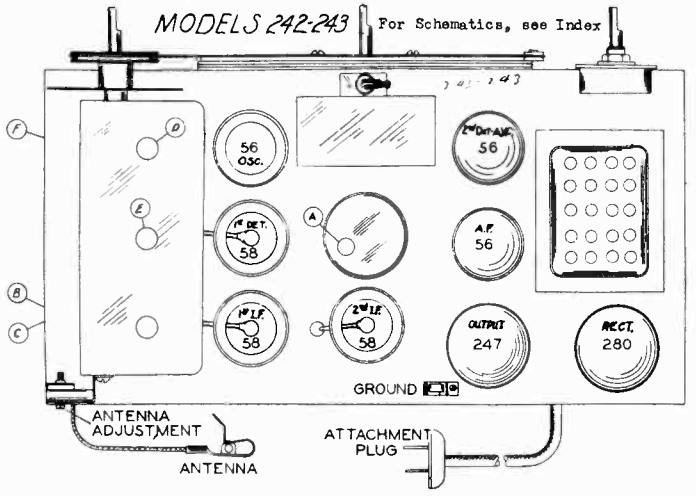
4. Set the test oscillator and receiver to 600 K.C.

5. Adjust the oscillator lagging condenser "F" until the signal is received.

6. Return both the test oscillator and receiver to 1400 K.C.

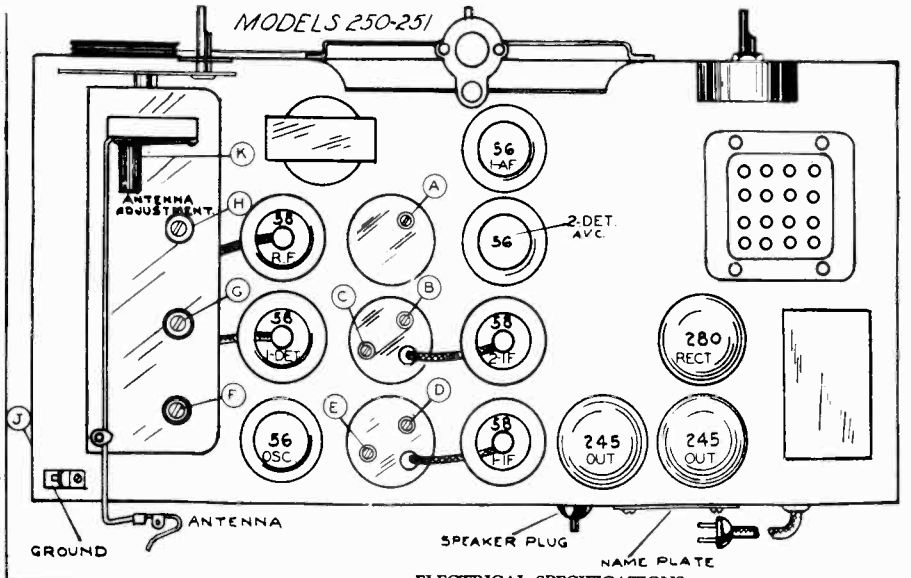
7. Recheck the oscillator, preselector and antenna trimmer condensers.

8. Check calibration and sensitivity over scale.



ELECTRICAL SPECIFICATIONS

Type and Number of Tubes	3 #58, 3 #56, 1 #47, 1 #80 - Total 8
Power Supply	(Model 242 105 to 125 volt, 50 to 60 cycle A.C.
	(Model 243 105 to 125 volt, 25 to 50 cycle A.C.
Power Consumption	70 Watts
Maximum Undistorted Output	2.5 Watts
Tuning Range	550 to 1500 K.C.
Line-Up Frequencies	I.F. 175 K.C., 1400 K.C., 600 K.C.



ELECTRICAL SPECIFICATIONS

Type and Number of Tubes	4 #58, 3 #56, 2 #45, 1 #80 - Total 10
Power Supply	(Model 250 - 105 to 125 volts, 50 to 60 cycles AC
	(Model 251 - 105 to 125 volts, 25 cycles AC
Power Consumption	120 Watts
Maximum Undistorted Output	4 Watts
Maximum Output	6 Watts
Tuning Range	550 to 1500 K.C.
Line-Up Frequencies	I.F. 175 K.C., 1400 K.C., 600 K.C.

GENERAL DESCRIPTION 250-251

This model is a ten-tube superheterodyne receiver whose circuit employs a type 58 tube as an R.F. amplifier, a type 58 tube as a first detector, a type 56 tube as an oscillator, two type 58 tubes as I.F. amplifiers, a type 56 as a combined second detector - A.V.C., a type 56 tube as a first A.F. amplifier, two type 45 tubes in a push-pull output stage, and a type 80 rectifier tube.

This receiver is designed to operate over the standard broadcast band on frequencies from 550 to 1500 K.C.

LINE-UP CAPACITOR ADJUSTMENTS

To align the Model 250 chassis, it is essential to use a high grade modulated test oscillator and a sensitive output meter. The R.F. signal fed into the receiver must be relatively weak or it will cause the A.V.C. to function, making correct alignment difficult. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low signal.

Before attempting to align a receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. A top view of the chassis is shown in Figure #1 and should be carefully studied before the actual work is started.

ALIGNMENT OF I.F. (175 K.C.)

1. Connect the output meter across the terminals of the voice coil.
2. Turn the volume control to maximum position.
3. Set the test oscillator to 175 K.C. and apply signal to the grid of the type 58 second I.F. tube and adjust trimmer condenser "A" to maximum output.
4. Apply test signal to grid of type 56 first I.F. tube and adjust trimmers "B" and "C" to maximum output.
5. Apply test signal to grid of type 58 first detector tube and adjust trimmer condensers "D" and "E" to maximum output.

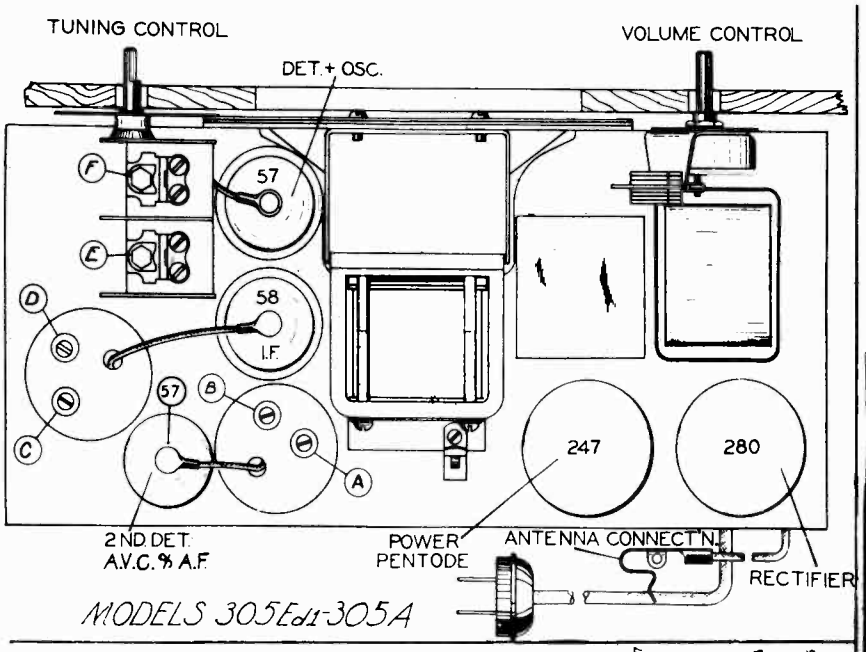
ALIGNMENT OF OSCILLATOR AND R.F.

1. Set test oscillator and dial indicator to 1400 K.C. and adjust alignment condenser "F" until the signal is received.
2. Set test oscillator and dial indicator to 600 K.C. and adjust alignment condenser "J" until the signal is received.
3. Set test oscillator and dial indicator to 1400 K.C. and apply signal to antenna lead of receiver.
4. Adjust trimmer condensers "G", "H" and "K" to maximum output.
5. Check sensitivity at several points over the scale.

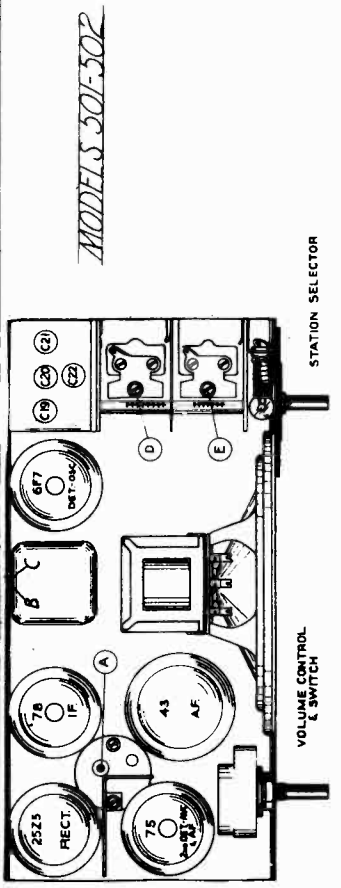
MODELS 501, 502
Socket, Trimmers
Alignment

UNITED AMERICAN BOSCH

MODELS 305, Ed. 1, 305A
MODELS 480, 481, 484
Socket, Chassis

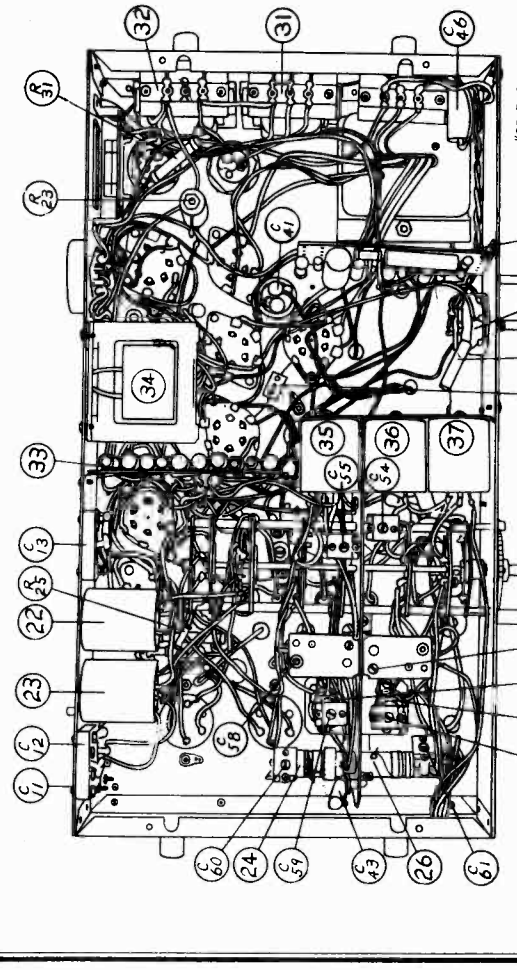


MODELS 305Ed1-305A



MODELS 501-502

MODELS 480, 481, 484



#22 Red band oscillator coil #107483
#23 Purple band oscillator coil #107484
#24 G.B. R.F. coil #107491
#25 Tuning Ind. #107608
#26 G.B. antenna coil #107486
#27 R.B. antenna coil #107487
#28 R.B. R.F. coil #107492
#29 Tone control and switch #107684
#30 Resistor strips #107609
#31 Filter choke #108864
#32 Filter choke #107804
#33 Resistor strip #107608
#34 Input transformer #107684
#35 R.B. R.F. coil #107490
#36 R.B. selector coil C107489
C37 B.B. antenna coil #107485

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ..... 1 #6P7, 1 #78, 1 #75, 1 #43, 1 #2525 - Total 5
Power Supply Characteristics ..... 105 to 125 volt D.C. or 60-cycle A.C.
Power Consumption ..... 45 Watts
Tuning Range ..... 540 to 1750 K.C.
Maximum Undistorted Output ..... 1 Watt
Line-Up Frequencies ..... 456 K.C., 1500 K.C.

GENERAL DESCRIPTION

The Models 501 and 502 are five-tube, A.C. D.C. superheterodyne Receivers whose circuits consist of a combined detector-oscillator-a stage of intermediate frequency amplification, a combined second detector - automatic volume control - audio amplifier, a power output stage and a rectifier.

The Models 501 and 502 are designed to operate on frequencies from 540 to 1750 K.C. The Model 502 differs from the Model 501 in the cabinet only.

LINE-UP CAPACITOR ADJUSTMENTS

To align the Models 501 and 502 chassis, it is essential to use a high grade modulated oscillator and sensitive output meter. The R.F. signal fed into the receiver must be very weak in order to allow the A.V.C. to function, making correct alignment impossible. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low signal.

Before attempting to align a receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. A top view of the chassis is shown in Fig. #1 and #2 and should be carefully studied before the actual work is started.

I.F. ADJUSTMENT (456 K.C.)

NOTE: The signal generator or alignment oscillator should have no external ground connection. The low potential side of its output should be connected to the power line, and the low potential output terminal may be connected to the frame of the receiver. An external ground of the receiver frame will result in a loud hum making alignment impossible.

1. Connect output meter across the voice coil of speaker (speaker impedance is 4.5 ohms).
2. Set volume control at maximum.
3. Set the test oscillator to 456 K.C. and apply test signal to the grid of the 78 I.F. tube.
4. Adjust second I.F. alignment condenser "A" to maximum output.
5. Apply the test signal to the grid of the 6P7 first detector-oscillator tube, "G".
6. Adjust alignment condensers "F" and "G" to maximum output.

OSCILLATOR AND R.F. ADJUSTMENT

1. Set dial scale to maximum mark beyond the 540 K.C. point with the gang condenser entirely closed.
2. Set the test oscillator and dial scale to 1500 K.C. and apply test signal to the antenna of the receiver.
3. Adjust the oscillator and antenna alignment condensers "F" and "E" to maximum output.
4. Check sensitivity over scale.

MODELS 305, Ed. 2, 405
Schematic, Voltage
Parts

UNITED AMERICAN BOSCH CORP.

MODELS 305 Ed. 2-405

Five-Tube, Superheterodyne Receivers

SOCKET VOLTAGES

Stage	Tube	Filament	Plate	Screen	Cathode	Grid
Det. & Osc.	57	2.47	245	85	7	0
2nd Det.	2A6	2.48	75	--	.7	0
I.F.	58	2.47	248	85	3.	0
Output	47	2.5	235	248	0	18
Rect.	80	5	360	--	-	-

NOTE: These values are readings of a high resistance voltmeter from each socket terminal to ground. The filament voltages are, of course, an exception. Cathode readings are given for those tubes having the grid at ground. The values are only approximate and will vary with the line voltage and the type of meter employed.

SERVICE PARTS LIST MODELS 305 Ed. 2-405

Dia.#	Part #	Description
R 1	SA 104897	500,000 ohm vol. control
R 2	SA 101181	300 ohm, 1/2 W. resistor
R 3	SA 100197	25,000 ohm, 1/2 W. res.
R 4	SA 101722	30,000 ohm, 1 W. res.
R 5	SA 104824	7,500 ohm, 1/2 W. res.
R 6	SA 100823	2,000 ohm, 1/2 W. res.
R 7	SA 100824	5,000 ohm, 1/2 W. res.
R 8	SA 100195	1/4 meg., 1/2 W. res.
R 9	SA 100194	1/2 meg., 1/2 W. res.
R10	SA 100196	2 meg., 1/2 W. resistor
R11	SA 99412	5 ohm midtap resistor
R12	SA 103062	400 ohm, 1 W. resistor
R13	SA 100194	1/2 meg., 1/2 W. res.
C 1)	SA 104820	Variable tuning cond.
C 2)		
C 3	SA 100198	.002 mfd., mica cond.
C 4		70 to 140 mmf. cond. - part of SA 104901
C 5		.05 mfd., 200 V. cond. - part of SA 104834
C 6		.25 mfd., 200 V. cond. - part of SA 104834
C 7		.01 mfd., 400 V. cond. - part of SA 104834
C 8		70 to 140 mmf. cond. - part of SA 104901
C 9		70 to 80 mmf. condenser - part of SA 104899
C10		70 to 80 mmf. condenser - part of SA 104899
C11	SA 103852	.002 mfd., 600 V. cond.
C12		.5 mfd., 200 V. cond. - part of SA 104834
C13		.005 mfd., 400 V. cond. - part of SA 104834
C14		.05 mfd., 200 V. cond. - part of SA 104834
C15		.005 mfd., 400 V. cond. - part of SA 104834
C16)		
C17)	SA 105237	8 mfd., filter condenser
C18)		4 mfd., filter condenser
C19	SA 102500	20 mfd., filter cond.
C20	SA 101143	.01 mfd., 400 V. cond.
C21	SA 104886	.0001 mfd., mica cond.
C22	SA 103695	.00025 mfd., mica cond.
C23	SA 102493	.01 mfd., 200 V. cond.

R 15, C 23 and C 11 to be used on Model 405 only.

Part #	Description
	MAIN ASSEMBLIES
SA 104905	Chassis assy. - Model 305 Ed. 2
SA 105153	Chassis assy. - Model 405
SA 102280	Speaker - Model 305 Ed. 2
SA 105130	Speaker - Model 405
RK 104856	Cabinet - Model 305 Ed. 2
RK 105175	Cabinet - Model 405
	COILS
SA 101858	Speaker field coil
SA 104828	Antenna coil
SA 104889	I.F. coil
SA 104901	Detector-osc. coil assembly
	TRANSFORMERS
SA 102551	Output transformer
SA 104555	Power transformer
	MISCELLANEOUS
SA 104816	Dial scale assembly
SA 106282	Diaphragm & voice coil assy.
SA 101869	Felt foot for cabinet
SA 99401	Knob
SA 98713	Dial lamp

MODELS 305,Ed.2,405
Socket,Trimmers
Alignment

AMERICAN-BOSCH RADIO MODELS 305 Ed. 2-405

Five-Tube, Superheterodyne Receivers

SERVICE NOTES

GENERAL DESCRIPTION

The Models 305 Ed. 2 and 405 are five-tube superheterodyne receivers whose circuits comprise a combined first detector-oscillator, an intermediate frequency amplifier, a combined second detector-automatic volume control - first audio amplifier, an output stage and a rectifier.

The receiver is designed to operate over the broadcast band covering the frequencies from 550 to 1720 K.C.

The Model 305 Ed. 2 is a personal model with the speaker mounted on the chassis.

The Model 405 is a console model with a separate speaker.

LINE-UP CAPACITOR ADJUSTMENTS

To align the Model 305 Ed. 2 or 405 chassis, it is essential to use a high grade modulated oscillator and sensitive output meter. The R.F. signal fed into the receiver must be very weak or it will cause the A.V.C to function, making correct alignment impossible. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low signal.

Before attempting to align a receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. A top view of the chassis is shown in Fig. #1 and should be carefully studied before the actual work is started.

I.F. ADJUSTMENT 456 K.C.

1. Connect output voltmeter to speaker.
2. Set volume control at maximum position.
3. Set signal generator at 456 K.C., and connect generator output lead to grid of I.F. tube.
4. Adjust condensers A & B on coil nearest back of set for maximum output as indicated on output voltmeter. Sensitivity at this point should be 300 microvolts.
5. Connect signal generator output lead to grid of first detector. Adjust condensers C & D on front coil to maximum output as indicated on output voltmeter.

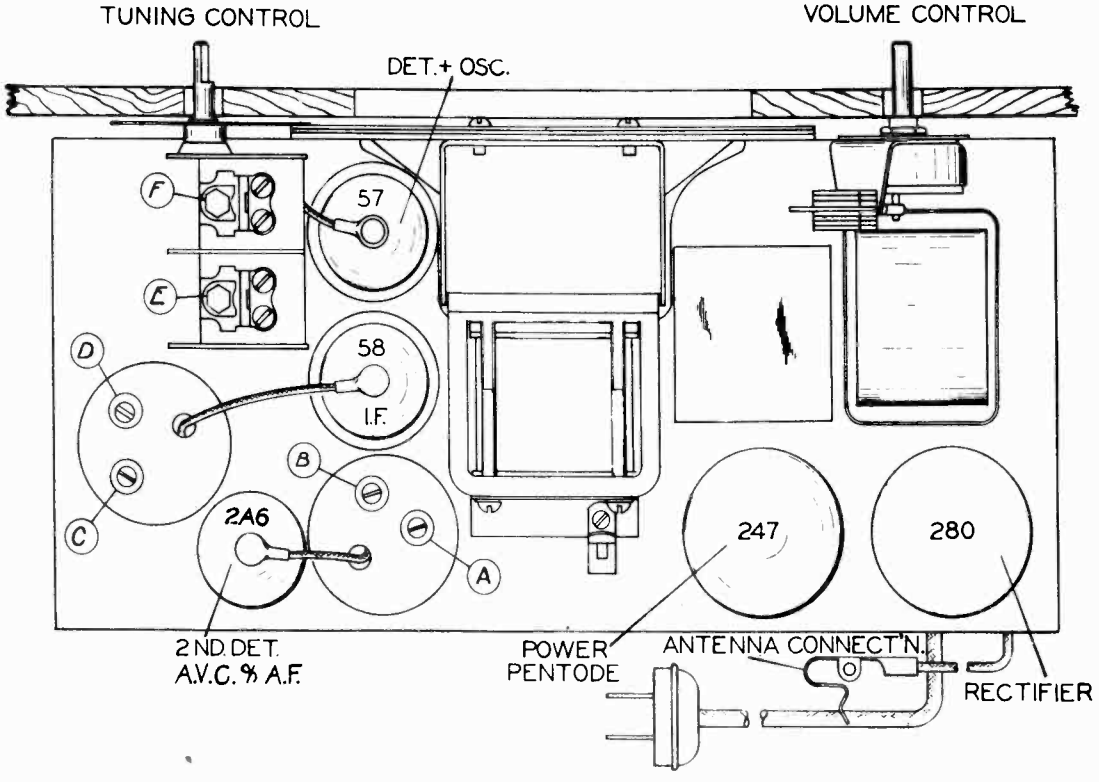
OSCILLATOR ALIGNMENT

1. Switch generator to R.F. and set at 1400 K.C.
2. Connect generator lead to antenna.
3. Set scale to 100 with gang closed tightly.
4. Adjust condenser gang to a scale reading of 21 and peak oscillator trim condenser. (This condenser is the back alignment screw on gang condenser.)
5. To check I.F. alignment, connect I.F. signal generator to antenna; second harmonic should be at 912 K.C., third at 1368 K.C.
6. Adjust preselector trimmer condenser (on front section of gang condenser) to maximum output.

NOTE: If it is necessary to improve sensitivity at 600 or 1000 K.C., adjust plates until the set reaches the sensitivity limits. If bending plates does not help, change tubes. Oscillator condenser end plates should be bent out at 1700 K.C. end of condenser.

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ..... 1 #57, 1 #58, 1 #2A6, 1 #47, 1 #80 - Total 5
Power Supply Characteristics ..... 105 to 125 volt, 60 cycle A.C.
Power Consumption ..... 55 Watts
Tuning Range ..... 550 to 1720 K.C.
Total Power Output ..... 2.5 Watts
Line-Up Frequencies ..... I.F. 456 K.C., 1400 K.C.



Schematic, Data

UNITED AMERICAN BOSCH CORP.

MODELS 360(Late)
361.364

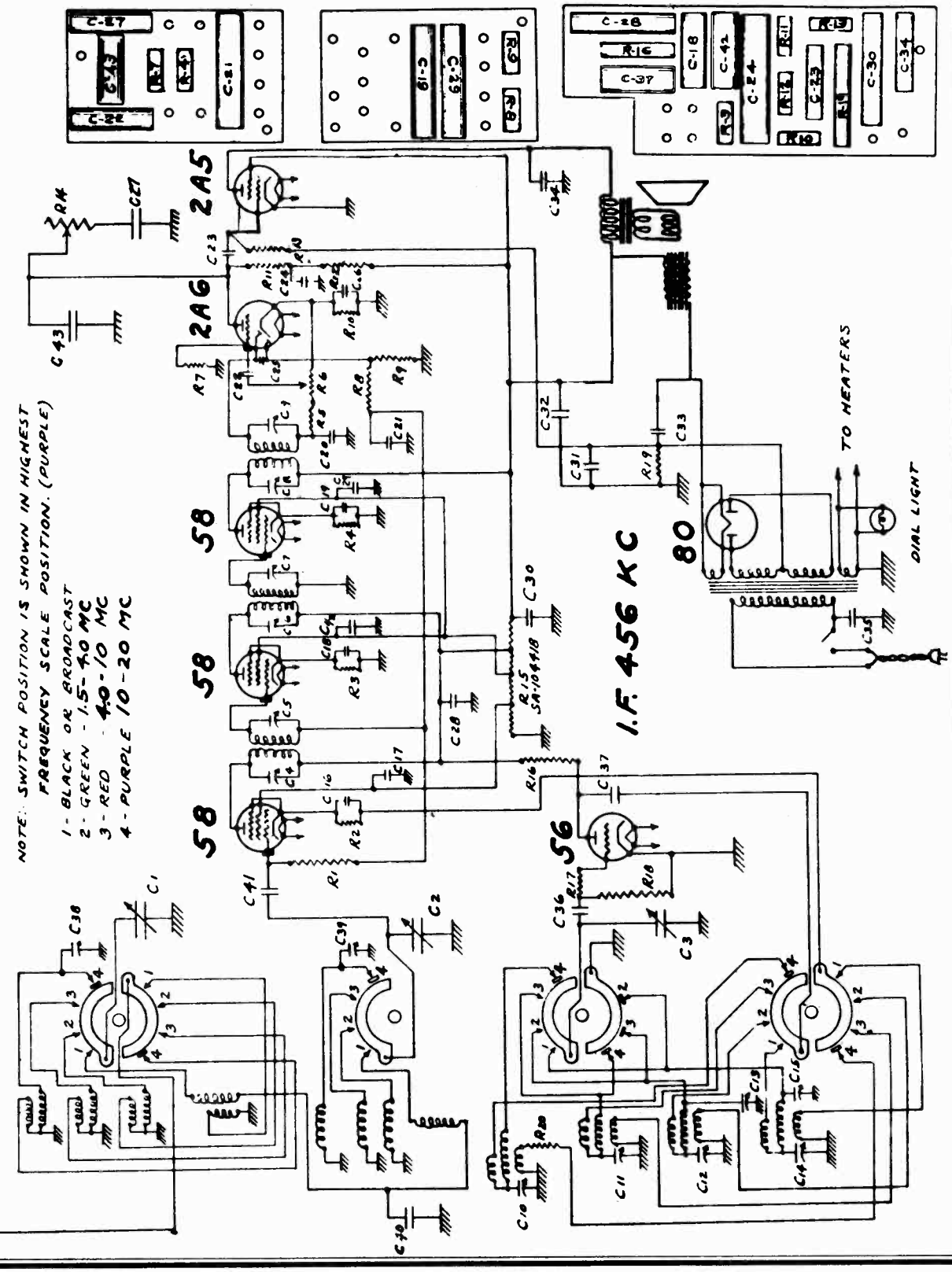
Power Supply Characteristics (Model 360 ---------- 105 to 125 volts, 50 to 60 cycles
(Model 361 ---------- 105 to 125 volts, 25 to 50 cycles
(Model 364 ---------- 90 to 250 volts, 50 to 60 cycles

Power Consumption ---------- 60 Watts

Maximum Undistorted Output ---------- 3 Watts

Tuning Range ---------- 550 to 20,000 K.C.

Line-Up Frequencies --------- I.F. 456 K.C., 600 K.C., 1400 K.C., 1600 K.C.. 3600 K.C., 4000 K.C., 8000 K.C., 10,000 K.C., 15,000 K.C.



MODELS 360(Late) 361,364 Socket,Trimmers

UNITED AMERICAN BOSCH CORP.

Alignment,Parts Voltage

LINE-UP CAPACITOR ADJUSTMENTS

To properly align the Model 360 chassis, it is essential to use a high grade modulated oscillator and a sensitive output meter. The R.F. signal fed into the receiver must be relatively weak or it will cause the A.V.C. to function making correct alignment impossible. The sensitivity of the output meter mustbe sufficient to give satisfactory reading with a low signal.

Before attempting to align a receiver, the service man shouldfamiliarize himself with the general layout of the chassis, the location of the tubes and the various alignment condensers. A top view of the chassis is shown in Fig.#1 and should be carefully studied before the actual work is started.

A- ADJUSTMENT OF I.F. (456 K.C.)

1. Set test oscillator to 456 K.C.
2. Apply test signal to grid of second I.F. tube #5 and adjust #14 and #15 to maximum output, reducing test oscillator as required.
3. Apply test signal to grid of first I.F. amplifier #6 and adjust #16 and #17 to maximum output.
4. Apply test signal to grid of first detector #11 and adjust #18 and #19 to maximum output.
5. Recheck the above four operations for accuracy.

B- ADJUSTMENT OF BLACK BAND & R.F.

1. Set test oscillator to 1500 K.C. and apply signal to grid of first detector tube #11. Place pointer of radio to 1.5 mark on dial. Adjust #20 until signal is tuned in. This adjusting screw is usually designated by a Red color dot. Having obtained tune at this point, set test oscillator to 600 K.C. and tune station selector to .6 mark on dial. Adjust #21 until the signal is tuned in.
2. Now return to 1500 K.C. point with set and test oscillator and make the resetting of #20 to obtain accurate adjustment to scale reading.
3. Apply test signal to antenna lead, making sure the equivalent (200 mmf.) is in the circuit and with test oscillator and dial indicator still set at 1500 kilocycles, adjust trimmer #22 and #23 for maximum output. Check sensitivity and calibration at several points on dial.
4. Set should come correctly to kilocycle settings of important broadcasting stations.

C- ADJUSTMENT OF GREEN BAND

1. Set test oscillator to 3600 K.C. and indicator of radio at 3.6 mark on dial.
2. Adjust trimmer#24 until signal is tuned in. This trim condenser is usually marked with a Red color dot.
3. Set test oscillator at 1600 K.C. and tune set to 1.6 mark. Adjust #25 to maximum output.
4. Return to 3600 K.C. and repeat adjustment. In adjusting the 3600 K.C. point it is possible to obtain two settings for different position of the trim condenser. This denotes merely the plus and minus frequency between oscillator and test oscillator which will give the correct I.F. frequency. The correct setting of the trim condenser is the one wherein the screw is turned furthest out. In any event, an incorrect setting will always be denoted by lack of sensitivity and calibration when the set and test oscillator are tuned to 2500 K.C. (mid-band).

D- ADJUSTMENT OF RED BAND

1. Set test oscillator to 8000 K.C.marking and tune receiver in region of 8.0 on dial scale. Note when signal is received. Next set test oscillator to 4000 K.C. setting and tune set to 4.0 on dial scale. Adjust #26 on right side of chassis until signal is heard.
2. Retune set and test oscillator to 8000 K.C. and observe pointer setting and sensitivity. Slight deviations from calibration can be compensated by manipulating the stiff wires connecting the oscillator coil to switch.

E- ALIGNING THE PURPLE BAND

1. Set test oscillator to 20,000 K.C. or if this is not available, then adjust to highest possible frequency, which preferably should be at least 15,000 K.C. Tune set to this frequency and note where set oscillator is received on dial scale. Then place test oscillator on 10,000 K.C. and adjust #27 on right of chassis until test oscillator is tuned at 10 on dial scale.
2. Now return both test oscillator and radio set to high frequency. Located underneath the base and adjacent to the switch and high frequency selector coils are two trim condensers #28 & #29 which are used for correct adjustment at this high frequency. Increase setting of test oscillator until signal generator can be tuned in at two points on dial (say 20 and 19). Then with pointer of set at 20 adjust #28 & #29 for maximum output decreasing test signal as signal becomes better tuned. At correct adjustment a very loud signal will be obtained at 20 on dial while a feeble signal or none at all is observed at 19.

The adjustment instructions just given apply to the Model 360 receiver which is in reasonable operating condition, but in some manner has been thrown out of adjustment. Obviously, before the radio service man can go through with the adjustments given here, he must assure himself that defective tubes, injured parts, such as punctured condensers, shorted variable condensers, open resistors, scratched high frequency coils, etc., are not such as to cause the set to be inoperative on one or more bands of frequencies.

SERVICE DATA

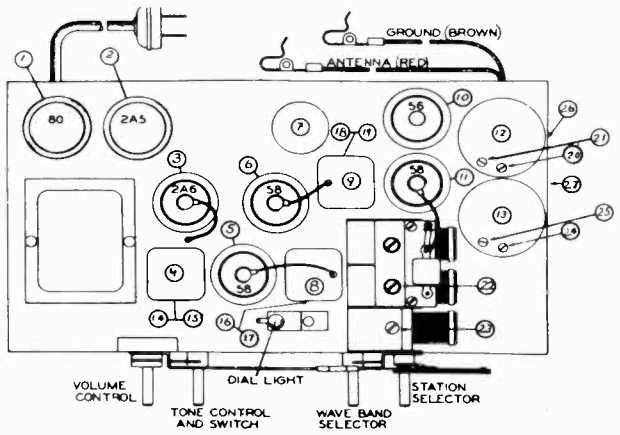
Noises when chassis is jarred, or sudden breaking into oscillations and whistling, are caused by poor contact between the bases of the tube shields and chassis. These bases are riveted to the chassis, but should oxide form on the aluminum it will cause poor contact.

This can be corrected by drilling small holes through the shield bases near the rivets and bolting the bases tightly to the chassis with Parker Kalon self-tapping screws.

GENERAL DESCRIPTION

The Model 360 is a seven tube, four band, all-wave, superheterodyne receiver whose circuits comprise an oscillator, a first detector, two stages of intermediate frequency amplification, a combined second detector, automatic volume control and first audio amplifier, an output stage and a rectifier.

This receiver has four bands with the following frequency coverage: On the broadcast band, printed in black, 540 to 1500 K.C. On the green band, 1500 to 4000 K.C. On the red band, 3500 to 9000 K.C. On the purple band, 8000 to 20,000 K.C.



MODEL 361

All parts the same as for Model 360 except for the following:

MAIN ASSEMBLIES

SA 106445	Chassis assembly (Models 361W, 361X, 361Y)	

MISCELLANEOUS

SA 106098	Power transformer assembly	

MODEL 364

The Model 364 has been designed to operate on power line voltage of from 90 to 250 volts, 50 to 60 cycles. In cases where the line voltage fluxuates considerably, it is recommended that the 80 rectifier tube be replaced with an 83 V. rectifier. This requires no change in the power transformer but a 400 ohm 8 watt resistor (part #SA 102177) should be connected in series with the B-plus lead at the rectifier socket.

All parts are the same as the Model 360 except:

MAIN ASSEMBLIES

SA 106442	Chassis assembly (Models 364W, 364X, 364Y)	

PARTS LIST

SPEAKER, PARTS (SA 105575)

SA 102819	Diaphragm & voice coil assy.	
SA 102551	Output transformer	
SA 101858	Field coil	
FP 102270	Plate over core & frame assy.	
SA 101733	Core and frame assembly	

BRACKETS & CLAMPS

FP 79381	Clamp for speaker cable	
FP 106819	Clamp for speaker (Model 360W	
SA 105654	Dial scale bracket	
SA 105655	Dial scale bracket	

CABLES & CABLE ASSEMBLIES

SA 101711	Line cable assembly	
KL 102064	Speaker cable	

COILS

SA 105684	Oscillator coil (Black Band)	
SA 105683	Oscillator coil (Green Band)	
SA 105689	Oscillator coil (Red Band)	
SA 105687	Oscillator coil (Blue Band)	
SA 105690	Preselector coil (Black Band)	
SA 105691	Preselector coil (Black Band)	
SA 105685	Preselector coil (Green Band)	
SA 105686	Preselector coil (Red Band)	
SA 105688	Preselector coil (Blue Band)	
SA 105696	Intermediate coil (1st & 2nd I.F.)	
SA 105696	Intermediate coil (Diode)	

SOCKET VOLTAGES

Tube	Stage	Fil.	Plate	Screen	Cathode	Grid
58	1st Det.	2.65	220	40	2.8	
58	1st I.F.	2.65	220	95	2.0	
58	2nd I.F.	2.65	240	95	2.7	
56	Oscillator	2.65	75	-	0	25
2A6	2nd Det.	2.65	90	-	1.4	
2A5	Output	2.65	235	240	0	
80	Rectifier	4.8	-	-	-	

Bias on 2A5 (across 400 ohms) - 22 volts
Output of rectifier ----------360 volts

Line volts ---------- 115
Power ---------- 60 watts

NOTE: These values are readings of a high resistance voltmeter from each socket terminal to ground, with the exception of the filament voltages. The values are only approximate and will vary with the line voltage and the type of meter employed.

MODEL 360

Dia #	Part #	Description
R 11	SA 105279	1/4 meg., 1/4 W. res.
R 12	SA 105276	50,000 ohm, 1/4 W. res.
R 13	SA 105279	1/4 meg., 1/4 W. res.
R 14	SA 105561	Tone control (1/2 meg.)
R 15	SA 104418	Multiple resistance
R 16	SA 100197	25,000 ohm, 1/2 W. res.
R 17	SA 100814	50 ohm, 1/2 W. res.
R 18	SA 105274	20,000 ohm, 1/4 W. res.
R 19	SA 103062	400 ohm, 1 W. resistor
R 20	SA 105256	200 ohm, 1/4 W. res.

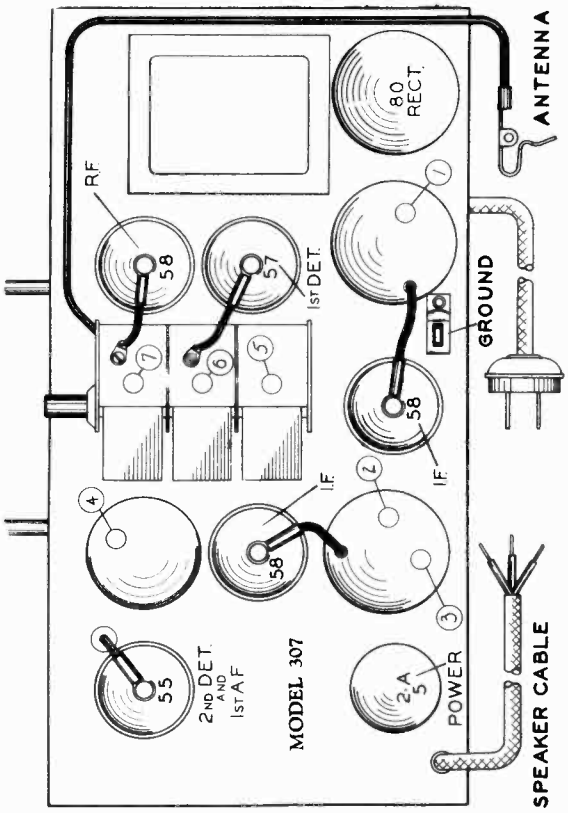
Part #	Description
	MAIN ASSEMBLIES
SA 105720	Chassis assembly (Models 360E, 360M, 360S, 360T)
SA 106460	Chassis assembly (Models 360W, 360X, 360Y)
RK 105752	Cabinet assembly (Model 360E)
RK 105629	Cabinet assembly (Model 360L)
RK 105768	Cabinet assembly (Model 360S)
RK 105622	Cabinet assembly (Model 360T)
RK 106304	Cabinet assembly (Model 360W)
RK 106305	Cabinet assembly (Model 360X)
RK 106306	Cabinet assembly (Model 360Y)
SA 105750	Speaker assembly (Models 360E, 360M, 360S, 360X, 360Y)
SA 106575	Speaker assembly (Models 360T, 360W)

C 1)		Variable tuning cond.
C 2)	SA 106352	Variable tuning cond.
C 3)		Variable tuning cond.
C 4		I.F. trimmer cond. - part of SA 105695
C 5		I.F. trimmer cond. - part of SA 105695
C 6		I.F. trimmer cond. - part of SA 105695
C 7		I.F. trimmer cond. - part of SA 105695
C 8		I.F. trimmer cond. - part of SA 105696
C 9		I.F. trimmer cond. - part of SA 105696
C 10	SA 103800	2000 mmf. alignment condenser
C 11	SA 103800	2000 mmf. alignment condenser
C 12		1200 mmf. align. cond. - part of SA 105683
C 13		7-70 mmf. align. cond. - part of SA 105683
C 14		300 mmf. align. cond. - part of SA 105684
C 15		7-70 mmf. align. cond. - part of SA 105684
C 16	SA 102493	.05 mfd., 200 V. cond.
C 17	SA 102493	.05 mfd., 200 V. cond.
C 18	SA 102493	.05 mfd., 200 V. cond.
C 19	SA 102493	.05 mfd., 200 V. cond.
C 20	SA 101143	100 mmf. mica condenser
C 21	SA 102493	.05 mfd., 200 V. cond.
C 22	SA 103659	.005 mfd., 400 V. cond.
C 23	SA 103659	.005 mfd., 400 V. cond.
C 24	SA 102494	.1 mfd., 400 V. cond.
C 25	SA 101143	100 mmf. mica condenser
C 26	SA 102499	.5 mfd., 200 V. cond.
C 27	SA 106277	.01 mfd., 400 V. cond.
C 28	SA 102494	.05 mfd., 400 V. cond.
C 29	SA 102493	.05 mfd., 200 V. cond.
C 30	SA 102492	.05 mfd., 400 V. cond.
C 31)		20 mfd. elec. condenser
C 32)	CE 954	4 mfd. elec. condenser
C 33)		8 mfd. elec. condenser
C 34	SA 103659	.005 mfd., 400 V. cond.
C 35	SA 105931	.01 mfd., 600 V. cond.
C 36	SA 101143	100 mmf. mica condenser
C 37	SA 102493	.05 mfd., 200 V. cond.
C 38	SA 105705	Trimmer cond.purple band
C 39	SA 105705	Trimmer cond.purple band
C 40	SA 102493	.05 mfd., 200 V. cond.
C 41	SA 101143	100 mmf. mica condenser
C 42	SA 102493	.05 mfd., 200 V. cond.
C 43	SA 106403	.001 mfd., 600 V. cond.
R 1	SA 105246	1/2 meg., 1/4 W. res.
R 2	SA 105245	2000 ohm, 1/4 W. res.
R 3	SA 105267	1000 ohm, 1/4 W. res.
R 4	SA 105267	1000 ohm, 1/4 W. res.
R 5	SA 105275	50,000 ohm, 1/4 W. res.
R 6	SA 105562	Volume control(1/2 meg.)
R 7	SA 105281	1 meg., 1/4 W. res.
R 9	SA 105281	1 meg., 1/4 W. res.
R 10	SA 105249	5000 ohm, 1/4 W. res.

MODELS 310,310A
Socket,Trimmers
Alignment

UNITED AMERICAN BOSCH CORP.

MODEL 307
Socket,Trimmers
Voltage,Alignment



AMERICAN-BOSCH RADIO MODEL 307

Seven-Tube, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ---------- 3 #58, 1 #57, 1 #55, 1 #2A5, 1 #80 - Total 7
Power Supply Characteristics ---------- 105 to 125 volts, 50 to 60 cycle, A.C.
Power Consumption ---------- 65 Watts
Tuning Range ---------- 540 to 1600 K.C.
Maximum Undistorted Output ---------- 3 Watts
Line-Up Frequencies ---------- 175 K.C., 1400 K.C., 600 K.C.

GENERAL DESCRIPTION

The Model 307 is a seven-tube superheterodyne receiver whose circuits comprise a stage of radio frequency amplification, a combined first detector-oscillator, two stages of intermediate frequency amplification, a combined second detector-automatic volume control and first audio amplifier, an audio output stage and a rectifier.

The Model 307 is designed to operate on the broadcast band extending from 540 to 1600 kilocycles.

LINE-UP CAPACITOR ADJUSTMENTS

To align the Model 307 chassis, it is essential to use a high grade modulated oscillator and sensitive output meter. The R.F. signal fed into the receiver must be very weak or it will cause the A.V.C. to function, making correct alignment difficult. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low signal.

Before attempting to align a receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. A top view of the chassis is shown in Fig. #1 and should be carefully studied before the actual work is started.

I.F. ADJUSTMENT (175 K.C.)

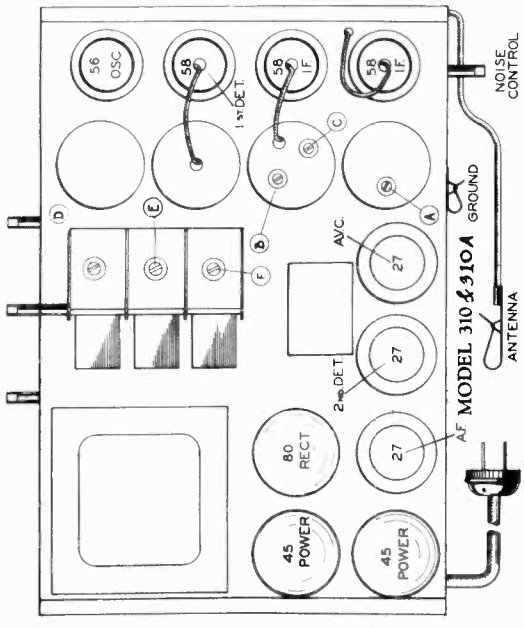
1. Set the volume control on maximum.
2. Set the test oscillator on 175 K.C. and connect to the grid of the second I.F. tube.
3. Adjust alignment condenser #4 on top of third I.F. coil for maximum output.
4. Connect the test oscillator to the grid of the first I.F. tube and adjust the alignment condensers #2 and #3 on top of the second I.F. coil.
5. Connect the test oscillator to the grid of the first detector tube and adjust the alignment condenser #1 on top of the first I.F. coil for maximum output. With the tuning condenser closed, adjust the pointer 1/8" past the second line from the left.

ADJUSTMENT OF OSCILLATOR AND R.F.

1. Set the test oscillator and pointer to 1400 kilocycles.
2. Adjust the oscillator trimmer condenser #5 on the second signal heard when turning the alignment screw out.
3. Connect the test oscillator to the antenna lead of the receiver through a 200 mmfd. condenser.
4. Adjust the antenna and R.F. alignment condensers #6 and #7 for maximum output.
5. Check the receiver over scale for sensitivity and calibration.
6. If the oscillator does not track at 600 kilocycles bend the oscillator tuning condenser plates (rear section of tuning condenser) until the receiver reaches its maximum sensitivity.

SOCKET VOLTAGES

Stage	Tube	Plate	Screen	Cathode	Fil.
R.F.	58	175	95	6.5	2.5
1 Det.	57	175	95	4.0	2.5
1 I.F.	58	175	45	6.5	2.5
2 I.F.	58	175	45	6.5	2.5
2 Det.	55	26	-	0	2.5
Output	2A5	235	245	-	2.5
Rectifier	80	-	-	-	5.0



AMERICAN-BOSCH RADIO MODEL 310 & 310A

Ten-Tube, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ..... 3 #58, 1 #56, 3 #27, 2 #45, 1 #80 - Total 10
Power Supply ..... 105 to 125 volts, 50 to 60 cycles A.C.
Power Consumption ..... 110 Watts
Maximum Undistorted Output ..... 4 Watts
Maximum Output ..... 6 Watts
Tuning Range ..... 550 to 1500 K.C.
Line-Up Frequencies ..... 175 K.C., 1400 K.C.

GENERAL DESCRIPTION

This model is a ten-tube superheterodyne receiver designed to operate over the broadcast band on frequencies from 550 K.C. to 1500 K.C.

The circuit employs a type 58 tube as a first detector, a type 56 tube as an oscillator, two type 58 tubes as intermediate frequency amplifiers, a type 27 as a second detector, a type 27 as an automatic volume control tube, a type 27 as a first audio amplifier, two type 45 tubes in push pull output and a type 80 tube as a rectifier.

LINE-UP CAPACITOR ADJUSTMENTS

To properly align the chassis, it is essential to use a high grade modulated test oscillator and a sensitive output meter. The R.F. signal fed into the receiver must be very weak or it will cause the A.V.C. to function making correct alignment difficult. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low signal.

Before attempting to align the chassis, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and the various alignment condensers. A top view of the chassis is shown in Fig. #1 and should be carefully studied before the actual work is started.

ALIGNMENT OF I.F. (175 K.C.)

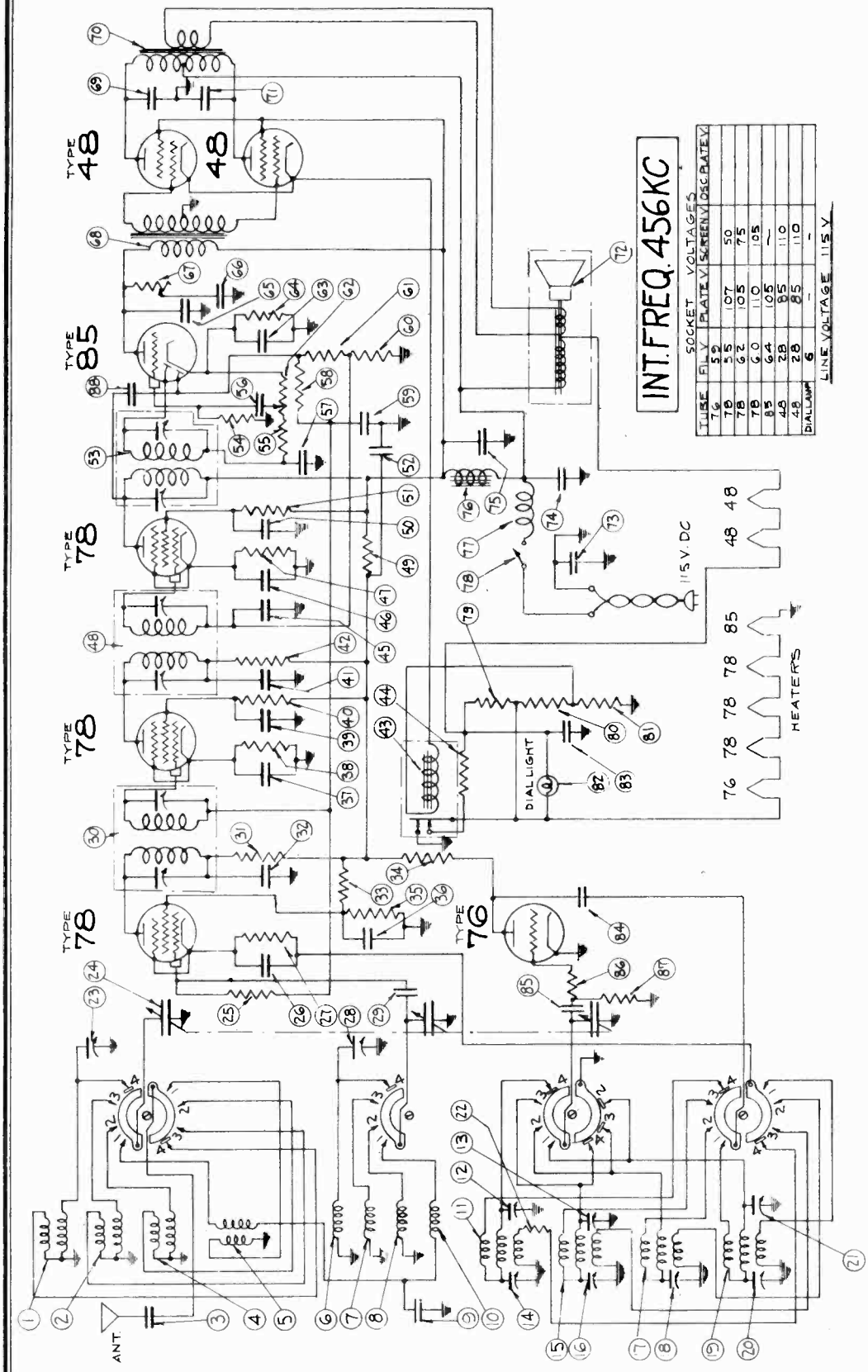
1. Set the volume control and noise delay to maximum position, and tone control to treble position.
2. Set the test oscillator to 175 K.C. and apply test signal to grid of the type 58 second I.F. tube.
3. Adjust trimmer "a" to maximum output.
4. Apply test signal to grid of type 58 first detector tube and adjust trimmers "g" and "f" to maximum output.

ALIGNMENT OF OSCILLATOR AND PRESELECTOR

1. Set dial scale and test oscillator to 1400 K.C.
2. Adjust trimmer "n" to maximum output.
3. Apply test signal to antenna lead through a .0002 mfd. condenser
4. Adjust trimmers "E" and "p" to maximum output.
5. Check sensitivity at various points on the dial scale.

MODELS 462A, 462Y
Schematic, Voltage

UNITED AMERICAN BOSCH CORP.



The Model 462 is a seven-tube superheterodyne receiver for operation on direct current of from 105 to 125 volts. The circuit comprises a first detector, an oscillator, two stages of I. F. amplification, a combined double diode second detector and first audio amplifier, and a stage of push-pull audio amplification.

MODELS 462A, 462Y
Socket, Trimmers
Chassis

UNITED AMERICAN BOSCH CORP.

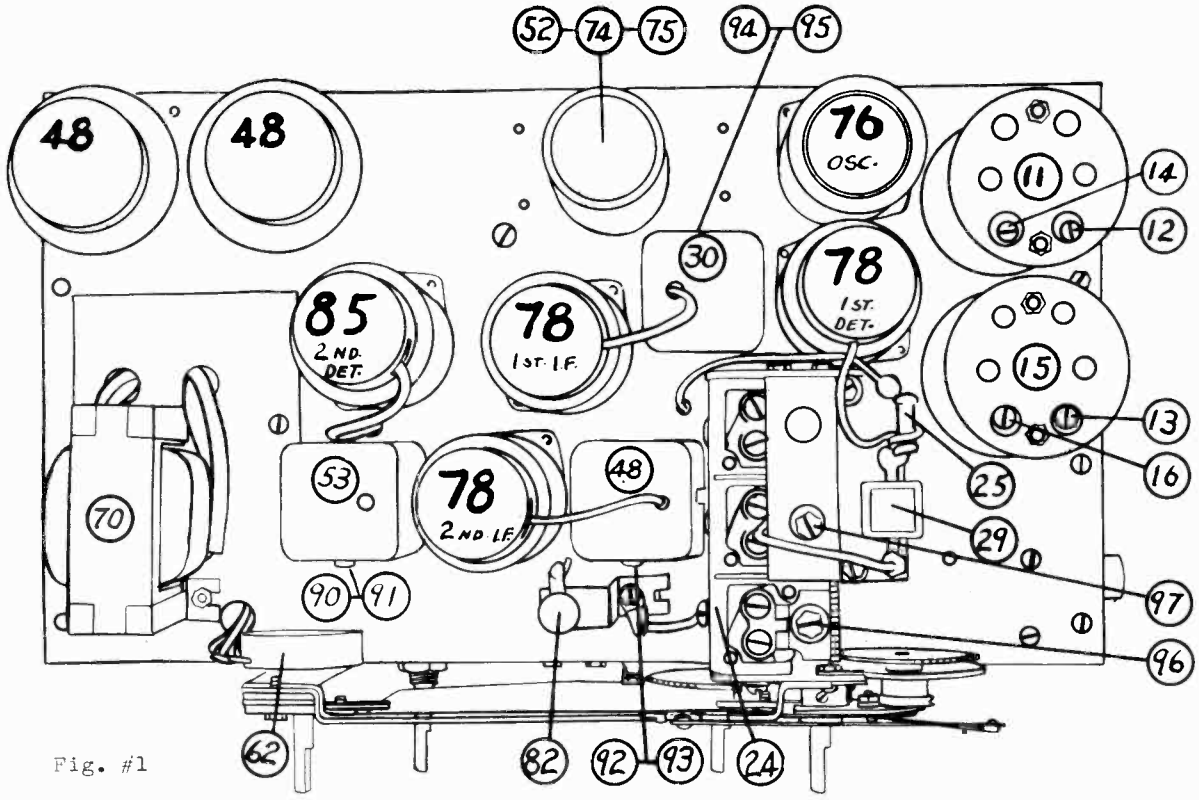


Fig. #1

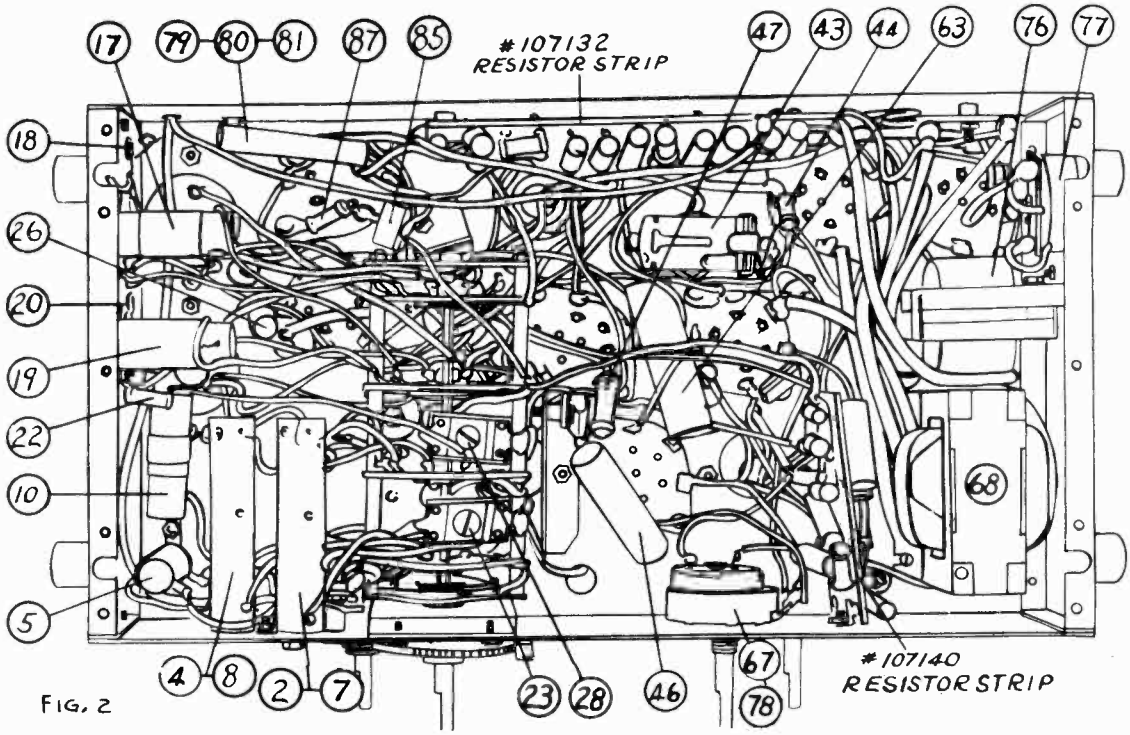


FIG. 2

ALIGNMENT NOMENCLATURE

#11 Broadcast oscillator coil
#12 Broadcast oscillator trimmer
#13 Green band oscillator trimmer
#14 Broadcast oscillator lag condenser
#15 Green band oscillator coil
#16 Green band oscillator lag. condenser
#18 Red band lag condenser (see Fig. #2)
#20 Purple band lag cond. (see Fig. #2)
#23-28 Purple band trimmers (see Fig. #2)
#90-91 Third I.F. trimmers
#92-93 Second I.F. trimmers
#94-95 First I.F. trimmers
#96 Broadcast antenna trimmer
#97 Broadcast preselector trimmer

SERVICE PARTS LIST

Model 462A - Table Model Model 462Y - DeLuxe Console

(110 Volt D. C. 7-tube All Wave Receiver)

Part #	Dia. #	Description of Parts
105688	1	Antenna coil (blue)
105686	2	Antenna coil (red)
103659	3	.005 mf. 350 V. condenser
105685	4	Antenna coil (green)
105690	5	Antenna coil (black)
	6	Ant. coil - part of 105688
	7	Ant. coil - part of 105686
	8	Ant. coil - part of 105685
102493	9	.05 mf. 200 V. condenser
105691	10	Antenna coil (black)
105684	11	Oscillator coil (black)
	12	7-70 mmf. condenser - part of 105684
	13	7-70 mmf. condenser - part of 105683
	14	300 mmf. variable condenser part of 105684
105683	15	Oscillator coil (green)
	16	1200 mmf. variable cond. - part of 105683
105689	17	Oscillator coil (red)
103800	18	2000 mmf. variable cond.
105687	19	Oscillator coil (blue)
103800	20	2000 mmf. var. condenser
105705	21	Trimmer condenser
105258	22	200 ohms ½ W. resistor
105705	23	Trimmer condenser
106352	24	Variable condenser
105246	25	.5 meg. ½ W. resistor
106386	26	.05 mf. 200 V. condenser
105267	27	1000 ohms ½ W. resistor
105705	28	Trimmer condenser
101143	29	.0001 mica condenser
105695	30	I.F. transformer
105267	31	1000 ohms ½ W. resistor
106386	32	.05 mf. 200 V. resistor
105254	33	15000 ohms ½ W. resistor
105272	34	10,000 ohms ½ W. resistor
105254	35	15,000 ohms ½ W. resistor
106386	36	.05 mf. 200 V. condenser
102495	37	.1 mf. 200 V. condenser
105263	38	600 ohms ½ W. resistor
106386	39	.05 mf. 200 V. condenser
105275	40	25,000 ohms ½ W. resistor
106386	41	.05 mf. 200 V. condenser
105267	42	1000 ohms ½ W. resistor
107129	43	Relay
107142	44	12 ohms ½ W. resistor
106386	45	.05 mf. 200 V. condenser
106386	46	.05 mf. 200 V. condenser
105262	47	450 ohms ½ W. resistor
105695	48	I.F. transformer
105267	49	1000 ohms ½ W. resistor
106386	50	.05 mf. 200 V. condenser
105245	51	2000 ohms ½ W. resistor
	52	4 mf. 125 V. condenser - part of 106968
107050	53	Diode transformer
105281	54	1 meg. ½ W. resistor
105276	55	50,000 ohms ½ W. resistor

Part #	Dia. #	Description of Parts
103659	56	.005 mf. 350 V. condenser
106417	57	.0001 mica condenser
105246	58	.5 meg. ½ W. resistor
106386	59	.05 mf. 200 V. condenser
105281	60	1 meg. ½ W. resistor
105281	61	1 meg. ½ W. resistor
105562	62	Volume control
102499	63	.5 mf. 200 V. condenser
105249	64	5000 ohms ½ W. resistor
106403	65	.001 500 V. condenser
102504	66	.02 mf. 350 V. condenser
105561	67	Tone control
100759	68	Input transformer
103659	69	.005 mf. 350 V. condenser
107190	70	Output transformer
103659	71	.005 mf. 350 V. condenser
107102	72	Speaker
102493	73	.05 mf. 200 V. condenser
	74	4 mf. 125 V. condenser - part of 106968
	75	8 mf. 125 V. condenser - part of 106968
104116	76	Choke coil
99947	77	Choke coil
	78	Switch - part of 105561
107130	79	26 ohms resistor
	80	160 ohms resistor
	81	80 ohms resistor
104916	82	Pilot light
102493	83	.05 mf. 200 V. condenser
102498	84	.05 mf. 200 V. condenser
101143	85	.0001 mica condenser
100814	86	50 ohms ½ W. resistor
105278	87	.1 meg. ½ W. resistor
106417	88	.0001 mica condenser

MAIN ASSEMBLIES

107078	Chassis assembly - Mdls 462A & Y
107721	Cabinet - Model 462A
106304	Cabinet - Model 462Y
107102	Speaker assembly - Model 462A
107942	Speaker assembly - Model 462Y

BRACKETS, CLIPS & CLAMPS

107113	Chassis mounting bracket- Mdl 462A
79381	Speaker cable clamp
105703	Insulation strip bracket on variable condenser
106358	Bracket with bearing on variable condenser assembly
105655	Dial scale indicator bracket
107321	Dial lamp bracket assembly
101783	Bracket for iron cored filter choke
106369	Dial scale clip
103601	Speaker diaphragm bracket

A - ALIGNING THE I.F. (456 K.C.)

1. Set test oscillator to 456 K.C.
2. Connect test oscillator to grid of 2nd I. F. tube and adjust #90 and #91 to maximum output, reducing test oscillator output as required.
3. Connect test oscillator to grid of 1st I. F. tube and adjust #92 and #93 to maximum output.
4. Connect test oscillator to grid of 1st detector and adjust #94 and #95 to maximum output.

B - R.F. ADJUSTMENT BROADCAST BAND

1. Set test oscillator to 1500 K.C. and connect to grid of first detector.
2. Set station indicator to 1.5 on dial scale.
3. Adjust #12 until signal is tuned in. This adjustment screw is usually color coded. Having obtained tune at this point, set test oscillator to 600 K.C. and tune station selector to .6 mark on dial.
4. Adjust #14 until signal is tuned in.
5. Return to 1500 K. C. setting with set and test oscillator, and readjust #12 to obtain accurate adjustment to scale reading.
6. Connect test oscillator to antenna lead of the chassis making sure that the equivalent (200 mmf.) is in the circuit.
7. Continue setting of 1500 K.C.
8. Adjust #96 and #97 for maximum output. Check sensitivity and calibration at several points on dial. Set should come correctly to kilocycle settings of important broadcast stations.

C - ALIGNING THE GREEN BAND

1. Set test oscillator to 3600 K.C. and station indicator to 3.6, and dial.
2. Adjust #13 until signal is tuned in. This adjustment screw is usually color coded.
3. Set test oscillator to 1600 K.C. and station inuicator to 1.6 on dial.
4. Adjust #16 until signal is tuned in.
5. Return to 3600 K. C. setting and repeat adjustment of #13. In adjusting #13, it is possible to obtain two peaks. This denotes merely the plus and minus frequency between oscillator and test oscillator which will give the correct I.F. frequency. The correct setting of the trim condenser is the one wherein the screw is turned farthest out. In any event, an incorrect setting will always be denoted by lack of sensitivity when the set and test oscillator are tuned to 2500 K.C. (mid-band).

D - ALIGNING THE RED BAND

1. Set test oscillator to 8000 K. C. and tune receiver in region of 8.0 on dial. Note where signal is received.
2. Next, set test oscillator to 4000 K.C. and tune set to 4.0 on dial.
3. Adjust #18 on right side of chassis (see Figure #2) until signal is tuned in.
4. Retune set and test oscillator to 8000 K.C. and observe pointer setting and sensitivity. Slight deviations from calibration can be compensated by manipulating the stiff wires connecting the oscillator coil to switch.

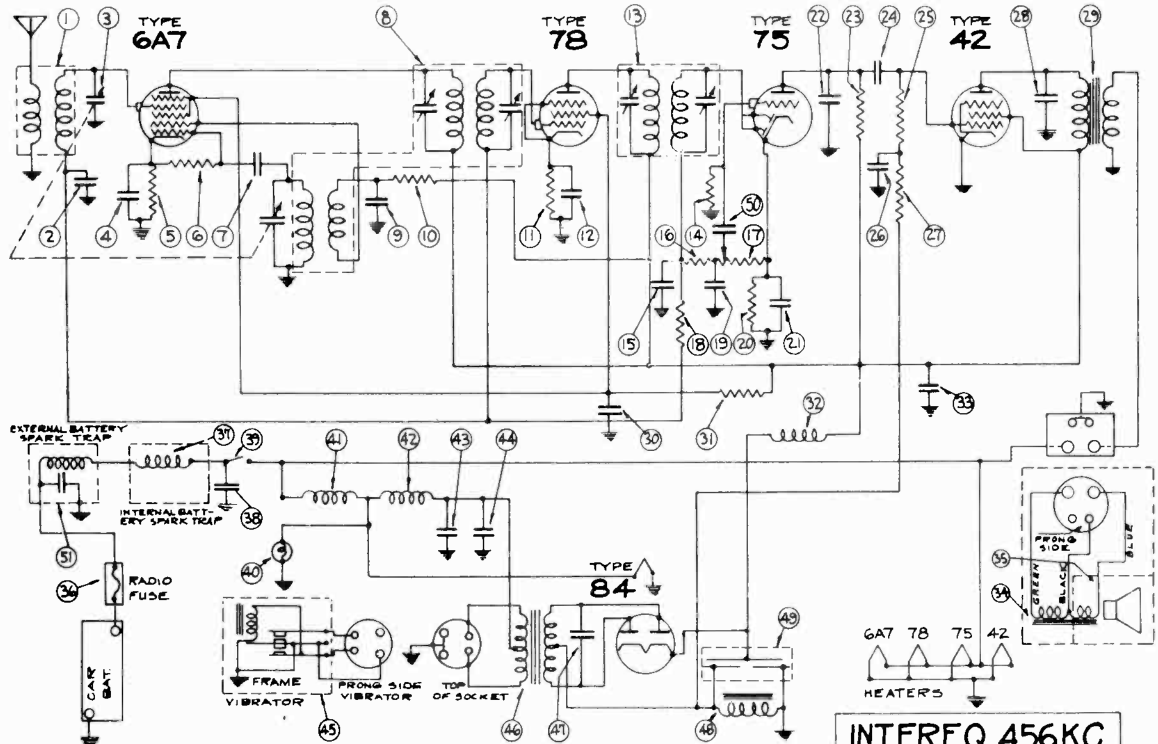
E - ALIGNING THE PURPLE BAND

1. Set test oscillator to 20,000 K. C. or if this is not available, then adjust to highest possible frequency, which should at least be 15,000 K.C. Tune set to this frequency and note where signal is received on dial.
2. Then set test oscillator to 10,000 K.C. and station indicator to 10. on dial. Adjust #20 on right side of chassis (Fig. #2) until signal is tuned in at 10. or dial scale.
3. Now retune both test oscillator and set to highest frequency. Located underneath the chassis and mounted on the wave change switch are two trim condensers (see Figure #2) which are used for correct adjustment at this high frequency.
4. Increase output of test oscillator until signal can be tuned in at two points on dial (say 19. and 20.). Then with pointer set at 20., adjust #23 and #28 for maximum output, decreasing test signal as signal becomes better tuned. At correct adjustment a very loud signal will be obtained at 20. on the dial while a feeble signal or none at all will be observed at 19. This is a practical illustration of the effectiveness of preselection as outlined in the first part of this description.

The adjustment instructions just given apply to a Model 462 which is in reasonable operating condition, but in some manner has been thrown out of adjustment. Before the radio service man can go through with the adjustment just given here, he must assure himself that defective tubes, injured parts; such as punctured condensers, shorted variable condensers, open resistors, open by-pass condensers, scratched high frequency coils, etc., are not such as to cause the set to be inoperative on one or more bands of frequencies.

MODEL 536
Schematic
Parts List

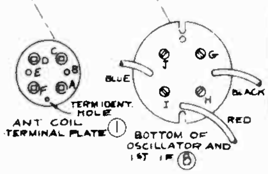
UNITED AMERICAN BOSCH CORP.



* REFER TO SKETCHES

WINDING RESISTANCE

PART	FUNCTION	PRIMARY RESIST.	PRIMARY IDENT *	SECONDARY RESIST.	SECONDARY IDENT *
(1)	ANT. COIL	2 Ω	C TO D	4 Ω	A TO F
(8)	OSCILLATOR	3 Ω	G TO I	4 Ω	H TO J
(8)	1ST I.F.	13 Ω	RED TO BLUE	13.5 Ω	GREEN TO BLACK
(13)	2ND I.F.	14 Ω	RED TO BLUE	13.5 Ω	GREEN TO BLACK
(29)	OUTPUT	560 Ω	GREEN TO BROWN		
(46)	POWER	0.5 Ω	BLACK TO GREEN	8.0 Ω	RED TO BLUE
(48)	CHOKE	350 Ω	BLACK TO GND		



SOCKET VOLTAGE

TUBE	STAGE	FIL.	PLATE	CATH.	SCREEN	TRIODE	OUTPUT GRID BIAS MEASURED ACROSS POWER PACK CHOKE (48)
6A7	DET OSC	6.0	235	3.2	97.0	175	
78	I.F.	6.0	240.5	2.5	98.0		
75	2ND DET	6.0	146.5	1.5			
84	RECTIFIER	6.0					
42	POWER	6.0	227.5		243		-16.5

NOTE ALL VOLTAGE READINGS WITH A VOLTMETER HAVING A RESISTANCE OF 1000 Ω PER VOLT

SERVICE PARTS LIST MODEL 536

Dia. #	Part #	Description
1	RC 9525	Antenna coil assembly
2	SA 106386	.05 mfd. 200 V. cond.
3	CG 953	Condenser gang assy.
4	SA 106386	.05 mfd. 200 V. cond.
5	SA 105260	300 ohms ¼ W. resistor
6	SA 105276	50,000 ohms ¼ W. res.
7	CM 9513	.0001 mfd. mica cond.
8	RC 9526	Composite coil assy.
9	SA 102500	.01 mfd. 400 V. cond.
10	SA 105272	10,000 ohms ¼ W. res.
11	SA 105258	200 ohms, ¼ W. res.
12	CW 951	.1 mfd. 200 V. cond.
13	IC 955	2nd I.F. coil assy.
14	SA 105281	1 meg. ¼ W. resistor
15	CM 9513	.0001 mfd. mica cond.
16	SA 105276	50,000 ohms ¼ W. res.
17	VR 951	Volume control - 50,000 ohms
18	SA 105246	.5 meg. ¼ W. resistor
19	CM 9513	.0001 mfd. mica cond.
20	SA 105249	5,000 ohms ¼ W. res.
21	SA 102497	.25 mfd. 200 V. cond.
22	SA 103852	.002 mfd. 600 V. cond.
23	SA 105278	100,000 ohms ¼ W. res.
24	SA 103659	.005 mfd. 400 V. cond.
25	SA 105279	.25 meg. ¼ W. resistor
26	CW 951	.1 mfd. 200 V. cond.
27	SA 105279	.25 meg. ¼ W. resistor
28	CW 952	.005 mfd. 600 V. cond.
29	TR 952	Output transformer
30	SA 102492	.05 mfd. 400 V. cond.
31	SA 101471	18,000 ohms ½ W. res.
32	RC 9527	Choke coil
33	SA 102496	.25 mfd. 400 V. cond.
34	SK 951	Speaker
35	DM 951	Diaphragm & voice coil assembly
36	FU 951	Fuse - 20 ampere
37	RC 9512	Filter choke
38	CM 953	.00005 mfd. mica cond.
39		Switch - part of VR 951
40	LP 956	Dial light
41	SA 105452	Filter choke
42	SA 105452	Filter choke
43	CW 958	.5 mfd. 200 V. cond.
44	CW 958	.5 mfd. 200 V. cond.
45	VI 951	Vibrator
46	TR 953	Power transformer
47	SA 106804	.008 mfd. 1600 V. cond.
48	TR 951	B choke
49	CE 951	6-10 mfd. electrolytic condenser
50	SA 103659	.005 mfd. 400 V. cond.
51	CC 953	Spark trap

Part #	Description
	MAIN ASSEMBLIES
CH 954	Chassis assembly
CU 956	Control unit-less shafts
SK 951	Speaker assembly
	CABLE ASSEMBLIES
CB 951	Battery cable assembly
CB 958	Antenna cable assembly
	TUBE SOCKETS & TUBE SHIELDS
CW 954	Tube shield
SA 104617	Tube socket - 6 prong
SA 104616	Tube socket - 5 prong
SO 953	Tube socket - 4 prong
SA 105461	Tube socket - 7 prong
SA 107257	Speaker socket
	NUTS
NT 952	Thumb nut - assy. to drive shaft
NT 104935	Mounting nut
FP 106639	Thumb nut - cables to housing
NT 103039	Nut for volume control
	WASHERS, BUSHINGS & SPACERS
WA 104936	Mounting washer
WA 41033	Mounting lock washer
SR 953	Bushing spacer for mounting variable condenser
FP 104086	Spacer for speaker & spark trap
IS 1002	Variable cond. rubber mounting bushing
	SCREWS & STUDS
FP 104892	Cover-to-housing fastening thumb screw
FP 106571	Mounting stud
SC 1026CA	Self-tapping screw #6 x 1" long
SC 101700	Self-tapping screw #7 x ¼" long

Part #	Description
	SPEAKER PARTS
DM 951	Diaphragm assembly - complete
SC 106677	Diaphragm housing-to-frame fastening screw
CL 9513	Speaker field coil
SA 106492	Core-and-frame assembly
FP 106496	Plate for core & frame assy.
CB 9528	Speaker cable with 4 prong plug assembly
FA 958	Speaker silk grill
	MISCELLANEOUS
IF 954	Paper template
SH 951	Drive shafts - 2 used
KT 956	Spark plug suppressor kit
DS 9518	Dial scale
FP 107470	Control unit dial scale indicator
KN 958	Knob - volume control
KN 959	Knob - tuning
IS 105430	Insulation for battery cable fuse
SA 106754	Ignition-coil suppressor
SA 107182	Spark plug suppressor
SA 105300	Suppressor condenser
CV 95172	Cover-and-speaker assembly
HG 9590	Housing-and-chassis assy.
WN 952	Window-control head
RG 952	Dial glass rim
BK 955	Control unit mounting bracket
HP 951	Control unit mounting strap
SF 9510	Variable condenser shaft-and-pinion assembly
FP 79381	Battery & antenna cable to housing mounting clamp

KITS

The following kits are available for adapting the control head furnished with this set to panel mounting:

Part #	Description
KT 951	Under-dash mounting
KT 952	1934 Plymouth, Chrysler, Dodge
KT 953	1934 Ford
KT 954	1935 Plymouth, Chrysler, Dodge, Hupmobile
KT 955	1935 Ford

Type and Number of Tubes -------- 1 #6A7, 1 #78, 1 #75, 1 #42, 1 #84 - Total 5
Battery Current (6.3 Volt Battery) -------- 6.5 Amperes
Tuning Range -------- 540 to 1500 K.C.
Maximum Undistorted Output -------- 3.0 Watts
Maximum Output -------- 4.0 Watts
Line-up Frequencies -------- I.F. 456 K.C., 1400 K.C., 1500 K.C.

MODEL 536
Socket, Trimmers
Chassis, Alignment
Vibrator Data, Notes

UNITED AMERICAN BOSCH CORP.

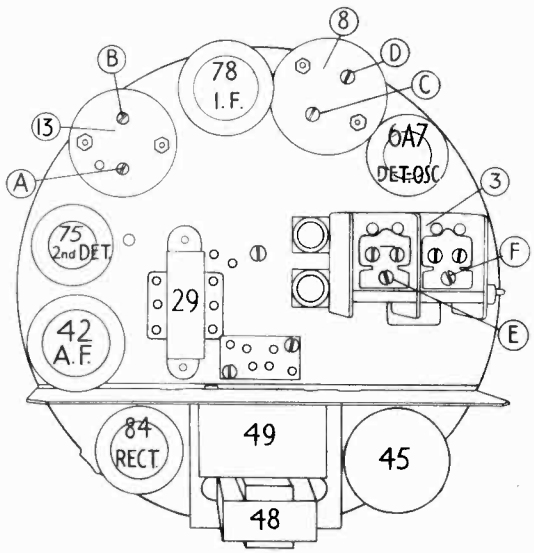


Figure No. 2

GENERAL DESCRIPTION

The Model 536 Car Radio has been designed, manufactured and tested with special regard for the requirements of automobile radio. The electrical, mechanical and acoustical features of the set have been decided upon after extensive tests in automobiles to determine the proper requirements for satisfaction. This Car Radio is a single unit compact radio chassis, power pack, and speaker with a separate remote control. The set is contained in a cylindrical housing and is provided with many features which result in improved tone quality, attractive appearance, mechanical stability and desirable service features.

CIRCUIT DESCRIPTION

The circuit is of the superheterodyne type employing five tubes as follows: A type 6A7 as a combined first detector-oscillator, a type 78 as an intermediate frequency amplifier, a type 75 as a combination second detector-A.V.C.-and first audio amplifier, a type 42 as an output tube and a type 84 as a rectifier in the power supply.

As the Model 536 is equipped with both an external spark trap (connected in the battery cable) and an internal, tuned spark trap, the use of spark-plug suppressors is unnecessary in many installations.

SERVICE DATA

COMMON TROUBLES THAT CAN BE EASILY LOCATED AND REMEDIED WITHOUT REMOVING RECEIVER FROM CAR OR FROM ITS HOUSING

DIAL LIGHT DOES NOT LIGHT

Dial light may be loose in socket, broken or burned out.

Socket on end of lead in rear of control head pulls straight out.

SET INOPERATIVE AND TUBES DO NOT LIGHT

Check fuse in container on receiver ammeter lead. Remove speaker cover and disconnect speaker plug. Remove vibrator, all tubes and disconnect dial-light cable from set. Check with ohmmeter from "Hot A" side of battery cable (male bayonet connector inside the fuse-container housing) to ground. Should ohmmeter show an open circuit when line switch is closed, obviously a tube or the vibrator is shorted and these parts can be checked separately to determine which is defective. On the other hand, if ohmmeter shows a short circuit, the chassis should be removed from its housing and checked.

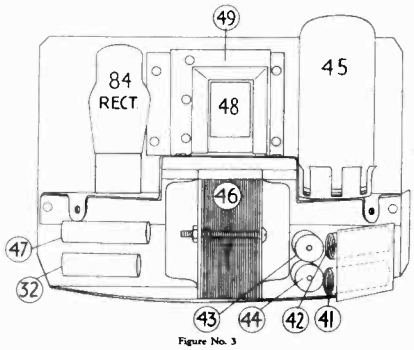


Figure No. 3

INSENSITIVE OR WEAK

Check car antenna for poor connections and grounds. Also check tubes and the receiver alignment.

INTERMITTENT RECEPTION

This is usually caused by a poor connection from the set antenna lead to the car antenna lead-in, and this point should always be checked when intermittent reception occurs.

MICROPHONIC OR INTERMITTENT

Tap each tube lightly with a small piece of wood or an insulated screw driver handle. The offending tube, when tapped, will usually howl very loudly if microphonic, or will give intermittent results if defective.

LOW POWER OUTPUT

Check tubes and vibrator. Usually caused by the latter.

RECEPTION CUTS OFF AT CERTAIN SETTINGS OF DIAL-SCALE POINTER

Usually caused by some foreign metallic substance shorting a section of the condenser gang. These particles are often too small to be seen but can be removed by blowing them out with an air pressure hose or an ordinary hand pump. Great care must be exercised not to destroy the thin mica insulators assembled under the trimmers on top of condenser gang.

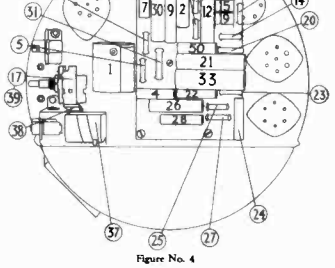


Figure No. 4

POOR TONE QUALITY

Foreign material is apt to become lodged between the speaker voice coil and the field core. This hampers the movement of the speaker diaphragm. As the rear of the speaker diaphragm is open, this space can be blown out clean with an air hose.

BUZZING SOUND IN SPEAKER

This can be remedied in many cases by the method described above. It can also be caused by a loose winding on the voice coil, in which case the turns of this winding should be pushed together, and a thin coat of collodion or coil cement should be applied to hold the windings in place.

RATTLES

Check receiver for loose cover thumb screws, tube shield, and housing screws. Rattles, seemingly in the radio receiver, are often traced to loose parts on the bulkhead or dashboard of the car.

SET INOPERATIVE
TUBES LIGHT AND VIBRATOR BUZZES

A. Check B voltage (approximately 240 volts) from middle terminal of electrolytic filter condenser #40 to ground. This point is easily reached with the speaker cover removed. If no voltage or low voltage is obtained, test the vibrator and 84 tube. If voltage is still incorrect, the receiver should be removed from its housing for further checking.

B. With the speaker plugged in, remove the clip from the grid of the 75 tube and touch the clip to the grid cap of the tube several times in succession. A clicking noise should be heard in the speaker. This is a practical test for the audio amplifier and speaker. If this clicking noise is not heard, the 75 and 42 tubes should be tested and the voltages checked at the plates of these tubes. The speaker should be also checked with an ohmmeter by testing across the prongs of the speaker plug for continuity. While making this test, the cable should be moved back and forth to show up any possible intermittent open circuit in the speaker cable. Check the voice coil and the field coil for continuity.

If the audio and speaker are still dead, the chassis should be removed from its housing.

If the audio and speaker are working correctly, test the remaining tubes and check the voltages at each socket.

In the event that the chassis has to be removed from the car for repairs, this can easily be done as follows:

Disconnect all chassis cables and the flexible control shafts from the receiver. Remove the speaker cover and pull out the speaker plug. Remove the screws around the outside of the housing and pull the chassis straight out. The chassis can be removed in many cars in this manner without unbolting the chassis housing from the car.

LOCATING TROUBLE IN CHASSIS

To locate a shorted, open, or defective unit, causing low or no B voltage, disconnect the power pack from the receiver section by unsoldering the red lead (coming from coil #32, Fig. 5) from the terminal at the end of resistor #23, Fig. 4. Check the voltage at the free end of this Red lead (should be approximately 250 volts.) If the voltage is incorrect, the trouble is definitely in the power pack and all component parts should then be checked.

Conversely, if the voltage reading proves to be correct, the trouble is in the receiver section and all parts should be checked. In locating a short or open in the filament circuit, the power pack can be disconnected from the filament supply of the receiver section by removing the red wire on the top terminal of the "off" and "on" switch which is connected to the 42 tube. This will connect only the power pack in the filament circuit; and if the short or open is corrected, it will prove that the trouble is in the receiver section.

WEAK OR INSENSITIVE AFTER REALIGNMENT

Check coils and associated circuits in the deficient "stage" of the set for proper resistance values.

LOW POWER OUTPUT WITH B VOLTAGE CORRECT

Check speaker field coil, voice coil and associated audio circuit for resistance continuity and defective condensers. All riveted component parts can be removed by merely punching out the rivets with a small diameter straight side punch. Replacement parts can be secured with small machine screws and nuts.

In changing the power transformer, it is necessary only to remove the four drive screws, two located directly over the resistor and condenser strip, and the other two in back of the condenser gang on the power pack shield. In replacing the power transformer be sure to tighten the screws securely and replace the shield braid bond or vibrator noise will be present.

INSTRUCTIONS FOR ADJUSTING VIBRATOR

After the vibrator has been in use for some time, it may refuse to start operating. This is an indication of "worn" tungsten contact points; but, as a reserve supply of tungsten has been provided, a simple adjustment can be made to prolong the life of the vibrator.

1. Remove the vibrator unit from its housing by removing the tension spring with a pair of round-nose pliers.

2. Remove the rubber sock, being careful not to bend the wires at the soldered connection.

3. Lay the vibrator on a piece of white paper so that when viewed from above it appears exactly as shown in Fig. 1.

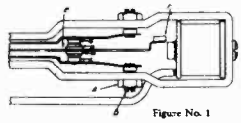


Figure No. 1

4. Loosen lock nut A and turn screw B clockwise until .005" of light can be seen between contacts C and D. If the contact points are somewhat roughened, light cannot be seen across their entire diameter, even though they are correctly re-spaced, that is, within .005" of touching each other.

5. A simple check on the correctness of the spacing adjustment is obtained by pressing lightly against the center of the reed with a small nail in the direction and location shown by arrow E. When the reed is thus moved so as to close contacts C and D, the weight F on the free end of the reed should move 1/64" from its "at rest" position. This check should be made after lock nut A has been firmly retightened.

6. Do not readjust the spacing between contacts G and H unless the tungsten is nearly all worn away. In this case, readjustment may be made in the same manner as for contacts C and D.

7. In re-inserting the vibrator into its rubber sock, be very careful to turn the "flats" of the sock hole so that they are parallel to the flat side of the vibrator frame. This provides ample space in the sock for the free movement of the reed. Make certain that the slot in the prong terminal plate engages the small projection on the inside edge of the housing. Then replace the tension spring. THESE INSTRUCTIONS DO NOT APPLY TO ANY OTHER TYPES OF VIBRATORS.

LINE-UP CAPACITOR ADJUSTMENTS

All the adjustable capacitors, commonly called trimmer condensers, are very accurately adjusted at the factory and will not need any further adjustment unless a coil or I.F. transformer is changed or the adjustments tampered with in the field. Therefore, DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary and a high grade modulated oscillator is available. In such a case, proceed as follows, referring to Fig. #2:

1. Set test oscillator to 466 K.C.

2. Set condenser gang to approximately 600 K.C. This will be at a point where the condenser plates are nearly all in mesh.

3. Connect output meter across voice coil of speaker. This may be done by connecting one lead of the output meter to the blue lead of the speaker terminal strip and the other lead to any metal part of the chassis. (The impedance of the voice coil is 3.0 ohms.)

4. Apply test signal to grid of 78 I.F. tube through a .5 mfd. blocking condenser and adjust trimmers A and B to maximum output reducing output of test oscillator as required.

5. Apply test signal to grid of 6A7 detector-oscillator tube and adjust trimmers C and D to maximum output.

6. Set test oscillator to 1500 K.C. and turn condenser gang until the rotor plates are wide open. Then place a piece of thin paper (approximately .015 thick) between the rotor and stator at the bottom of the gang, and then close the rotor down to this spacing. This is the exact setting of the condenser gang for the receiver oscillator at 1500 K.C. and should be carefully set as the resultant alignment of the receiver is directly dependent upon it.

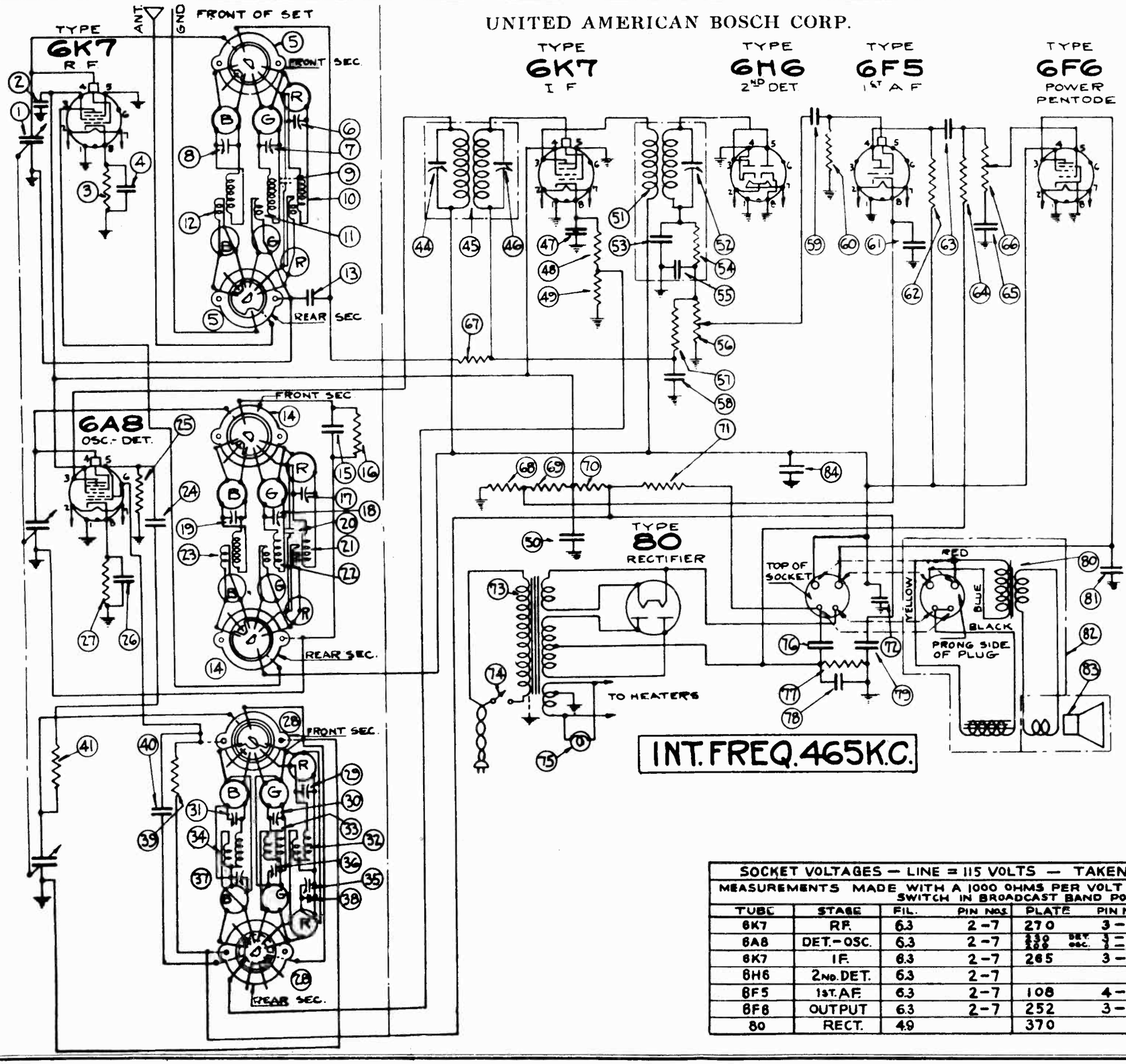
7. Adjust trimmer E to maximum output and then remove the paper gauge.

8. Set test oscillator and concenser gang to 1400 K.C.

9. Apply test signal to antenna lead through a .0002 mfd. condenser and adjust trimmer F to maximum output. This completes the adjustment of the receiver.

MODELS 575F, 575Q
Schematic, Voltage
Coil Data

UNITED AMERICAN BOSCH CORP.



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	3.2 "	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. 220 OSC.	3-1 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
6F8	OUTPUT	6.3	2-7	252	3-1	270	4-1	18.5 ACROSS 77 RES.	
80	RECT.	4.9		370					

MODELS 575F, 575Q
Socket, Trimmers
Alignment

UNITED AMERICAN BOSCH CORP.

AMERICAN-BOSCH Centr-O-matic RADIO MODEL 575

Seven-Tube. Three Band, 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 ---------- 3.5 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.& 6000 K.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 "Centr-O-matic" unit. 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 CENTR-O-MATIC UNIT

If a component part located underneath the switch and coil assemblies of the "Centr-O-matic" unit 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 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 "Centr-O-matic" unit and are indicated by X,Y and Z in figure #3. Remove the corresponding screws.
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 one 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 "Centr-O-matic" unit. 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 contact, this will also prevent the shields from rattling.

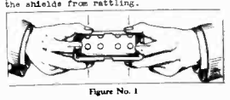


Figure No. 1

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 a satisfactory reading with a low input signal. Before attempting to align the receiver, the service man should familarize 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 through a .5 mfd. blocking condenser.
4. Adjust trimmer #52 for maximum output, reducing output of test oscillator as required.
5. Apply test signal to grid of 6A8 detector-oscillator and adjust #44 and #46 for 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 through a .0002 mfd. series condenser and adjust #31, #19 and #8 for maximum output.
4. Set test oscillator and dial indicator to 570 K.C. and adjust #37 for 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 for maximum output.
3. Set test oscillator and dial indicator to 1900 K.C. and adjust #36 for maximum output.
4. Return to 5500 K.C. setting and make readjustment of #30, #18 and #7.

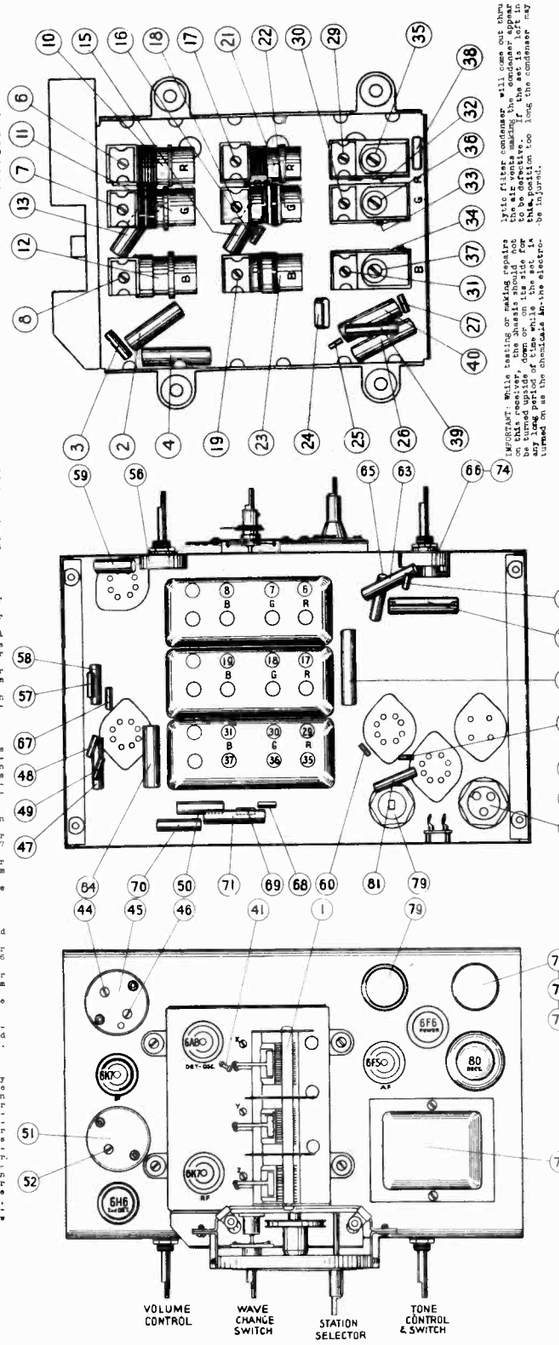
ADJUSTMENT OF RED BAND

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 for maximum output.
3. Set test oscillator and dial indicator to 6000 K.C. and adjust #35 for 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 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 lagging condenser are changed. While this procedure may appear to be difficult, facility can easily be acquired by practice and the operation requires only a few minutes.



MODELS 575F, 575Q
Parts List

UNITED AMERICAN BOSCH CORP.

SERVICE PARTS LIST MODEL 575F

DIA.#	PART#	DESCRIPTION	DIA.#	PART#	DESCRIPTION
1	CG 9527	Variable gang condenser	35		800 to 1600 mfd. osc. lag condenser-part of CS 9520 (Red Band)
2	SA 106386	.05 mfd. 200 V. condenser			
3	RE 9529	300 ohm ½ W. resistor	36		800 to 1600 mfd. osc. lag condenser-part of CS 9520 (Green Band)
4	SA 106386	.05 mfd.200 V. condenser			
5	SW 9527	Ant. section of "Centr-O-matic" unit complete with coils,switch and trimmers	37		300 to 600 mfd. oscillator lag condenser-part of CS 9517 (Broadcast Band)
6	CS 9511	4 to 25 mmf. antenna trimmer (Red Band)	38	CM 959	.002 mfd. mica condenser
7	CS 9511	4 to 25 mmf. antenna trimmer (Green Band)	39	CW 9513	5000 ohm 1 W. resistor
8	CS 9511	4 to 25 mmf. antenna trimmer(Broadcast Band)	40	CW 9513	.05 mfd. 200 V. condenser
9		Twisted pair of wire-part of RC 9571	41	RE 9537	50 ohm ½ W. resistor
10	RC 9571	Antenna coil assembly (Red Band)	44		30 to 100 mmf. trim condenser-part of IC 9527
11	RC 9574	Antenna coil assembly (Green Band)	45	IC 9527	1st I.F. transformer assembly
12	RC 9577	Antenna coil assembly (Broadcast Band)	46		30 to 100 mmf. trim condenser-part of IC 9527
13	CW 9513	.05 mfd. 200 V. condenser	47	SA 102493	.05 mfd. 200 V. condenser
14	SW 9528	R.F. section of "Centr-O-matic" unit complete with coils,switch and trimmers	48	SA 105267	1000 ohm ½ W. resistor
			49	SA 105267	1000 ohm ½ W. resistor
			50	SA 102497	.25 mfd. 200 V. condenser
15	CW 9513	.05 mfd. 200 V. condenser	51	IC 9537	2nd I.F. transformer assembly
16	RE 9527	5000 ohm ½ W. resistor	52		30 to 100 mmf. trim condenser-part of IC 9537
17	CS 9511	4 to 25 mmf. R.F. trimmer condenser (Red Band)	53		50 mmf. mica condenser - part of IC 9537
18	CS 3512	1.5 to 10. mmf. R.F. trimmer condenser (Green Band)	54		50,000 ohm ½ W. resistor-part of IC 9537
19	CS 9512	1.5 to 10. mmf. R.F. trimmer condenser (Broadcast Band)	55		100 mmf. mica condenser-part of IC 9537
20	CM 9512	6 mmf. mica condenser	56	VR 959	Volume control (½ meg.)
21	RC 9572	R.F. coil assembly (Red Band)	57	RE 9530	1 meg. ½ W. resistor
22	RC 9575	R.F. coil assembly (Green Band)	58	SA 106386	.05 mfd. 200 V. condenser
23	RC 9578	R.F. coil assembly (Broadcast Band)	59	CW 9512	.02 mfd. 400 V. condenser
24	SA 106417	.0001 mfd. condenser	60	RE 9530	1 meg. ½ W. resistor
25	RE 9524	50,000 ohm ½ W. resistor	61	CE 9515	12. mfd. 25 V. condenser
26	SA 106386	.05 mfd. 200 V. condenser	62	SA 105279	250,000 ohm ½ W. resistor
27	RE 9529	300 ohm ½ W. resistor	63	SW 9512	250,000 ohm 1 W. resistor
28	SW 9529	Oscillator section of "Centr-O-matic" unit complete with coils,switch, trim and lag condensers, 3 to 15 mmf. oscillator trim condenser-part of CS 9520 (Red Band)	64	SA 106403	.001 mfd. 600 V. condenser
			65	RE 9512	2000 ohm 1 W. resistor
			66	VR 9512	Tone control (1 meg.)
			67	SA 105278	100,000 ohm 1 W. resistor
			68	SA 105280	300,000 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. Power transformer
30	CW 9513	3 to 15 mmf. oscillator trim condenser-part of CS 9520 (Green Band)	73	TR 959	Core and frame assembly
			74		Line switch-part of VR9512
			75	SA 106609	Dial lights 6 V. (3 used)
			76		8. mfd. 475 V. elect. condenser-part of CE 954
31		5 to 25 mmf. oscillator trim condenser-part of CS 9517 (Broadcast Band)	77	RE 9523	300 ohm resistor
			78		20. mfd. 25 V. elect. condenser-part of CE 954
32	RC 95109	Oscillator coil assembly (Red Band)	79	CE 9511	8. mfd. 300 V. elect. condenser
33	RC 9576	Oscillator coil assembly (Green Band)	80	TR 9515	Speaker output transformer
34	RC 9579	Oscillator coil assembly (Broadcast Band)	81	SA 103559	.005 mfd. 400 V. condenser
			82	SK 9511	Speaker

DIA.#	PART#	DESCRIPTION
	IS 9590	Insulation assembly on side of chassis
	SH 9524	Varnier drive and plate assy.
	PU 9513	Dial drive pulley assembly
	SI 9526	Wave band indicator assembly
	SH 9527	Wave change switch shaft and plate assembly
	SA 104822	Dial lamp socket - 2 used
	SO 955	Dial lamp socket (Band indicator)
	BK 95120	Dial scale mounting bracket
	FP 103164	Spring for dial cable
	DS 9534	Dial scale
	CV 95100	Cover for dial scale
	SI 9512	Dial scale indicator
	FP 102133	Speaker cardboard ring
	FP 97803	Spacer for speaker socket
	FP 65772	Spring ring used with GE 956
	IS 95103	Shield for dial lamps
	GE 956	Celluloid gear and pinion assembly (second hand)
	GE 955	Small pinion gear(second hand)
	SI 9533	Indicator (second hand)

MODEL 575Q

Service parts list for Model 575Q are the same as for Model 575F except for the following parts:

DIA.#	PART#	DESCRIPTION
82	SK 9513	Speaker
83	SA 102283	Diaphragm and voice coil assembly

MAIN ASSEMBLIES

PART #	DESCRIPTION
SK 9513	Speaker
KA 9520	Cabinet

SPEAKER PARTS

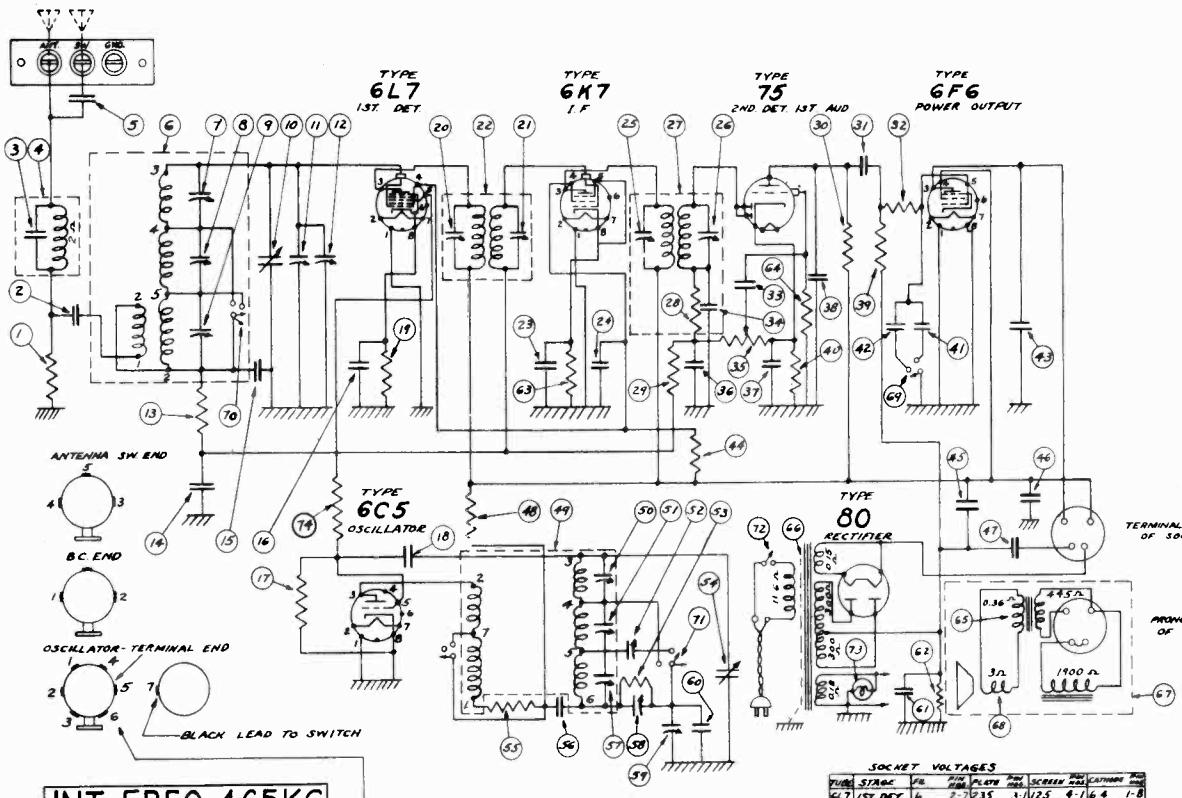
SA 102283	Diaphragm and coil assembly
FP 102279	Steel plate
FP 101742	Speaker washer
CL 9537	Speaker field coil
SA 101733	Core and frame assembly
SC 102133	Core and frame fastenirg screw
FP 79351	Cable clamp
SC 101865	Diaphragm fastening screw
TR 9515	Speaker output transformer fastening screw
SC 101864	Speaker output transformer fastening screw
SA 107278	Speaker plug
SA 107279	Speaker plug cover
FP 101740	Copper ring

MISCELLANEOUS

FP 102133	Cardboard speaker baffle ring
SC 101788	Chassis mounting screws

UNITED AMERICAN BOSCH CORP.

MODELS 565K, 565W
Schematic, Voltage
Parts List



REFER TO SKETCHES

PNO	FUNCTION	WINDING PRIMARY RESIST	IDENT #	SECONDARY RESIST	IDENT #
6	ANT COIL	0.5Ω	1 TO 2	3.7Ω 5.7Ω 10.5Ω	3 TO 5 3 TO 5 3 TO 5
49	OSC COIL	0.8Ω 1.9Ω 2.8Ω	2 TO 7 7 TO 1 2 TO 1	6.4Ω 12.8Ω 17.2Ω 30.5Ω	3 TO 6 4 TO 5 5 TO 6 3 TO 6
22	1ST I.F. TRANS. 1ST	12.5Ω		12.5Ω	
27	I.F. TRANS. OUTPUT	9Ω		9Ω	
65	I.F. TRANS. OUTPUT	465Ω		0.36Ω	

SOCKET VOLTAGES

TUBE	STAGE	PIN NO.	PLATE	PIN NO.	SCREEN	PIN NO.	CATHODE	PIN NO.
6L7	1ST. DET.	6	235	3-1	125	4-1	64	1-8
6K7	I.F.	6	235	3-1	125	4-1	58	1-8
75	2nd DET. 1st AUD.	6	180				09	
6F6	OUTPUT	6	235	3-1	235	4-1	20	
6C5	OSCILLATOR	6	130	3-1				
80	RECTIFIER	#7	350					

NOTE - ALL VOLTAGES MEASURED TO FRAME WITH 1000 OHMS PER VOLT METER
LINE VOLTAGE - 115 V

SERVICE PARTS LIST MODEL 565W

Dia. #	Part #	Description
1	RE 9549	10,000 ohm, ½ watt res.
2	CW 9512	.02 mfd., 400 V. cond.
3		.002 mfd. mica condenser - part of RC 95102
4	RC 95102	Trap coil assembly
5	SA 106417	.0001 mfd. mica cond.
6	RC 9563	Antenna coil assembly
7		3-30 mmf. trimmer cond. - part of RC 9563 A
8		3-30 mmf. trimmer cond. - part of RC 9563 A
9		3-30 mmf. trimmer cond. - part of RC 9563 A
10		Variable condenser - part of CG 9520
11		Trimmer condenser - part of CG 9520
12		Trimmer condenser - part of CG 9520
13	RE 9534	100,000 ohm, ½ watt res.
14	SA 106386	.05 mfd., 200 V. cond.
15	SA 107801	.0025 mfd. mica cond.
16	SA 106386	.05 mfd., 200 V. cond.
17	RE 9536	20,000 ohm, ½ watt res.
18	SA 106417	.0001 mfd. mica cond.
19	RE 9551	750 ohm, ½ watt resistor
20		30-100 mmf. trimmer cond. - part of IC 9546
21		30-100 mmf. trimmer cond. - part of IC 9546
22	IC 9546	1st I.F. coil assembly
23	SA 106386	.05 mfd., 200 V. cond.
24	SA 102495	.1 mfd., 200 V. cond.
25		(35-100 mmf. trimmer cond.
26	IC 9547	(35-100 mmf. trimmer cond.
27		(2nd I.F. coil assembly
28		50,000 ohm, ½ watt res. - part of IC 9547
29	RE 9530	1 megohm, ½ watt res.
30	RE 9531	250,000 ohm, ½ watt res.
31	CW 9512	.02 mfd., 400 V. cond.
32	RE 9531	250,000 ohm, ½ watt res.
33	SA 106386	.05 mfd., 200 V. cond.
34		.0001 mfd. mica cond. - part of IC 9547
35	VR 9516	Volume control & switch (500,000 ohms)
36	SA 106417	.0001 mfd. mica cond.
37	SA 102499	.5 mfd., 200 V. cond.
38	SA 106417	.0001 mfd. mica cond.
39	RE 9531	250,000 ohm, ½ watt res.
40	RE 9527	5000 ohm resistor
41	SA 106403	.001 mfd. 600 V. cond.
42	CW 954	.0005 mfd. mica cond.
43	CW 952	.005 mfd., 600 V. cond.
44	SA 101404	15,000 ohm, 1 watt res.
45	CE 9511	8 mfd., 300 V. electrolytic condenser
46	SA 102494	.1 mfd., 400 V. cond.
47	CE 9512	12 mfd., 450 V. electrolytic condenser
48	SA 101404	15,000 ohm, 1 watt res.
49	RC 9570	Oscillator coil assembly
50		3-30 mmf. trimmer cond. - part of RC 9570
51		3-30 mmf. trimmer cond. - part of RC 9570
52	CS 9513	750-1750 mmf. trimmer condenser
53	RE 9550	2000 ohm ½ watt resistor
54		Variable condenser - part of CG 9520
55	RE 9529	300 ohm, ½ watt resistor
56	CW 9512	.02 mfd., 400 V. cond.
57		3-30 mmf. trimmer cond. - part of RC 9570
58		300-600 mmf. trimmer condenser - part of SA 108001
59		1100-2000 mmf. trimmer condenser - part of SA 108001
60	SA 103775	.001 mfd. mica condenser
61	CE 958	10 mfd., 25 V. electrolytic condenser
62	SA 102564	350 ohm, 1 watt resistor
63	RE 9539	500 ohm, ½ watt resistor
64	RE 9530	1 megohm, ½ watt res.
65	SA 108025	Speaker output transformer
66	TR 9512	Power transformer
67	SA 108024	Speaker assy. complete
68	SA 106617	Diaphragm & voice coil assembly
69	SW 9515	Tone control switch
70		Wave change switch - part of SW 9514
71		Wave change switch - part of SW 9514
72		On-Off switch - part of VR 9516
73	SA 106809	Dial lights (6.3 volts) - 3 used
74	RE 9539	500 ohm, ½ watt res.

Part #	Description
	MAIN ASSEMBLIES
CH 9531	Chassis assembly
SA 108024	Speaker assembly, complete
KA 9533	Cabinet
	CABLES & CABLE ASSEMBLIES
CB 9512	Line cable with plug assembly
PR 98511	Cable dial drive (9 inches)
	SPEAKER PARTS
SA 106617	Diaphragm and voice coil assy.
SA 108025	Speaker output transformer
FP 106496	Steel plate
SA 107163	Speaker field coil
SA 107359	Core and frame assembly
SA 101856	Insulation plate assembly
SA 107273	Copper ring assembly
SC 106677	Diaphragm housing to core plate fastening screw
SA 107279	Cover for speaker plug
SA 107278	Speaker plug

MODEL 565K

Service parts for the Model 565-K are the same as those for the Model 565-W, except for the following parts:

Dia. #	Part #	Description
65	TR 9515	Speaker output transformer
67	SK 9513	Speaker assy. complete
68	SA 102283	Diaphragm and voice coil assembly

Part #	Description
	MAIN ASSEMBLIES
SK 9513	Speaker assembly complete
KA 9537	Cabinet assembly
	SPEAKER PARTS
SA 102283	Diaphragm and voice coil assy.
FP 102270	Steel plate
FP 101742	Cardboard washer
CL 9537	Speaker field coil
SA 101733	Core and frame assembly
SC 102132	Core and frame fastening screw
TR 9515	Speaker output transformer
SA 107278	Speaker plug
SA 107279	Speaker plug cover
FP 101740	Copper ring
FP 102133	Cardboard baffle ring

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes	1 #6L7, 1 #6K7, 1 #75, 1 #6F6, 1 #80 - Total 6
Power Supply	105 to 125 volts, 50 to 60 cycles
Power Consumption	55 Watts
Maximum Undistorted Output	2.5 Watts
Maximum Output	3.5 Watts
Tuning Ranges	White Band 540 to 1540 K.C.
	Green Band 1540 to 5200 K.C.
	Red Band 5900 to 18,200 K.C.
Line-Up Frequencies	I.F. 465 K.C., 16,000 K.C., 6000 K.C., 4000 K.C., 1800 K.C., 1400 K.C., 560 K.C.

MODELS 565K, 565W
Socket, Trimmers
Chassis, Alignment

UNITED AMERICAN BOSCH CORP.

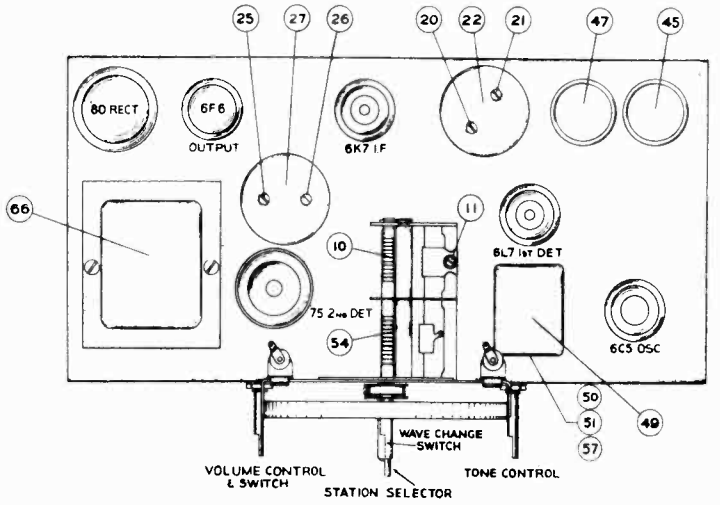


Figure No. 1

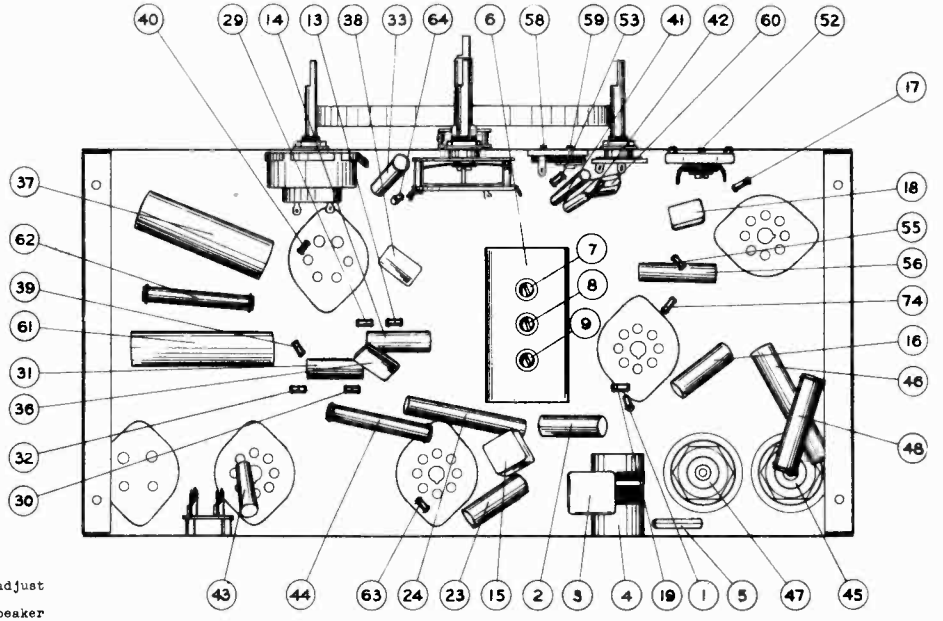


Figure No. 2

GENERAL DESCRIPTION

The Model 565 is a six-tube, three-band superheterodyne receiver, designed for world-wide reception and employing the new all-metal tubes.

The circuit of the chassis employs a type 6L7 as a first detector, a type 6C5 as a separate oscillator or mixer tube, a type 6K7 as an intermediate frequency amplifier, a type 75 as a combination second detector, A.V.C. and first audio amplifier, a type 6F6 pentode power amplifier and a type 80 rectifier with its associated filter system.

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 and reduced sufficiently to prevent the action of the A.V.C. of the receiver from occuring when the individual circuits 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 correctly aligned. The sensitivity of this 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, location of the tubes and various alignment condensers. Top and bottom views are shown in Figures #1 and #2 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 adjust tone control to center position.
2. Connect output meter across speaker voice coil terminals.
3. Set test oscillator to 465 K.C. and adjust its output to produce a measurable reading on the output meter when the test signal is applied to the grid of the 6K7 I.F. tube thru a .5 mfd. blocking condenser.
4. Adjust trimmers #25 and #26 to maximum output.
5. Apply test signal to grid of 6L7 first detector tube and adjust trimmers #20 and #21 to maximum output.

ADJUSTMENT OF RED BAND

NOTE: Before proceeding with the following adjustments, it is important that trimmer #11 located on top of the condenser gang, be carefully adjusted. This trimmer has been correctly adjusted prior to its shipment at the factory and no further adjustment should be necessary, unless it has been tampered with. In this event, turn the adjustment screw of this trimmer to maximum capacity (screw turned to extreme clockwise position—all the way in), then turn screw about a half-turn in a counter-clockwise direction.

1. Set wave change switch to the red-band position (lower center control turned to its extreme left-hand setting).
2. Set dial indicator and test oscillator to 16,000 K.C. and apply test signal to the "A" and "G" terminals of the chassis thru a .0002 mfd. condenser and a 400 ohm resistor in series. This condenser-resistor combination is the approximate equivalent of a short-wave antenna.
3. Adjust trimmer #50 to maximum output.

NOTE: When adjusting the oscillator trimming condensers, it is possible to obtain two different peaks. Correct adjustment is obtained by trimming to the second peak from maximum capacity of the trim condenser. Adjustment to the wrong peak will result in a lack of sensitivity and poor calibration at mid-band positions.

4. Adjust trimmer #7 by the "max-max" method. This is accomplished as follows: With dial indicator and test oscillator still set at 16,000 K.C., adjust trimmer #7 to maximum output and note reading of the output meter. Then, change the setting of #7 trimmer slightly in either direction and then without changing trimmer screw, tune receiver by means of tuning knob thru a maximum and note reading of output meter. If second reading is lower, reverse the direction of the adjustment of #7 trimmer. Proceed with this adjustment in progressive steps, each time tuning receiver thru a maximum, until no further improvement can be obtained by tuning receiver, the #7 trimmer screw, or both together. Although this proceedure may at first appear a bit complicated, facility is easily acquired with practice; and after a few trials the operation can be completed in a few minutes.
5. Set dial indicator and test oscillator to 6000 K.C. and "max-max" the lagging condenser #59 to maximum output.

ADJUSTMENT OF GREEN BAND

1. Set wave-change switch to the green-band position (middle setting).
2. Set dial indicator and test oscillator to 4000 K.C. and adjust trimmers #51 and #8 to maximum output.
3. Set dial indicator and test oscillator to 1800 K.C. and "max-max" lagging condenser #52 to maximum output.

ADJUSTMENT OF WHITE BAND

1. Set wave-change switch to the white or broadcast-band position (right-hand setting).
2. Set dial indicator and test oscillator to 1400 K.C. and adjust trimmers #57 and #9 to maximum output.
3. Set dial indicator and test oscillator to 560 K.C. and "max-max" lagging condenser #58 to maximum output.

MODEL 600
Preliminary
Schematic
Voltage, Parts

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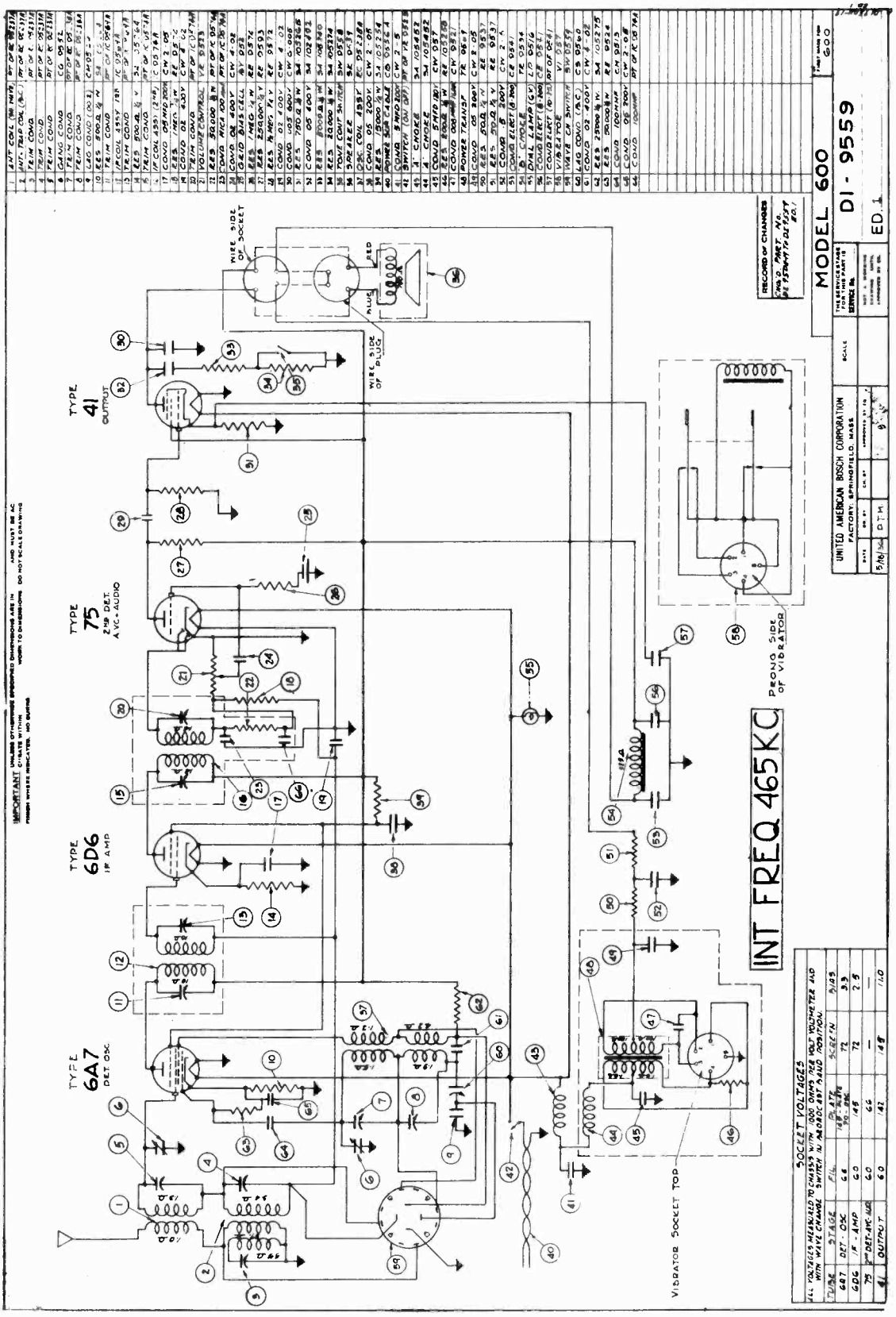

MODEL 601
Preliminary
Schematic
Voltage, Parts

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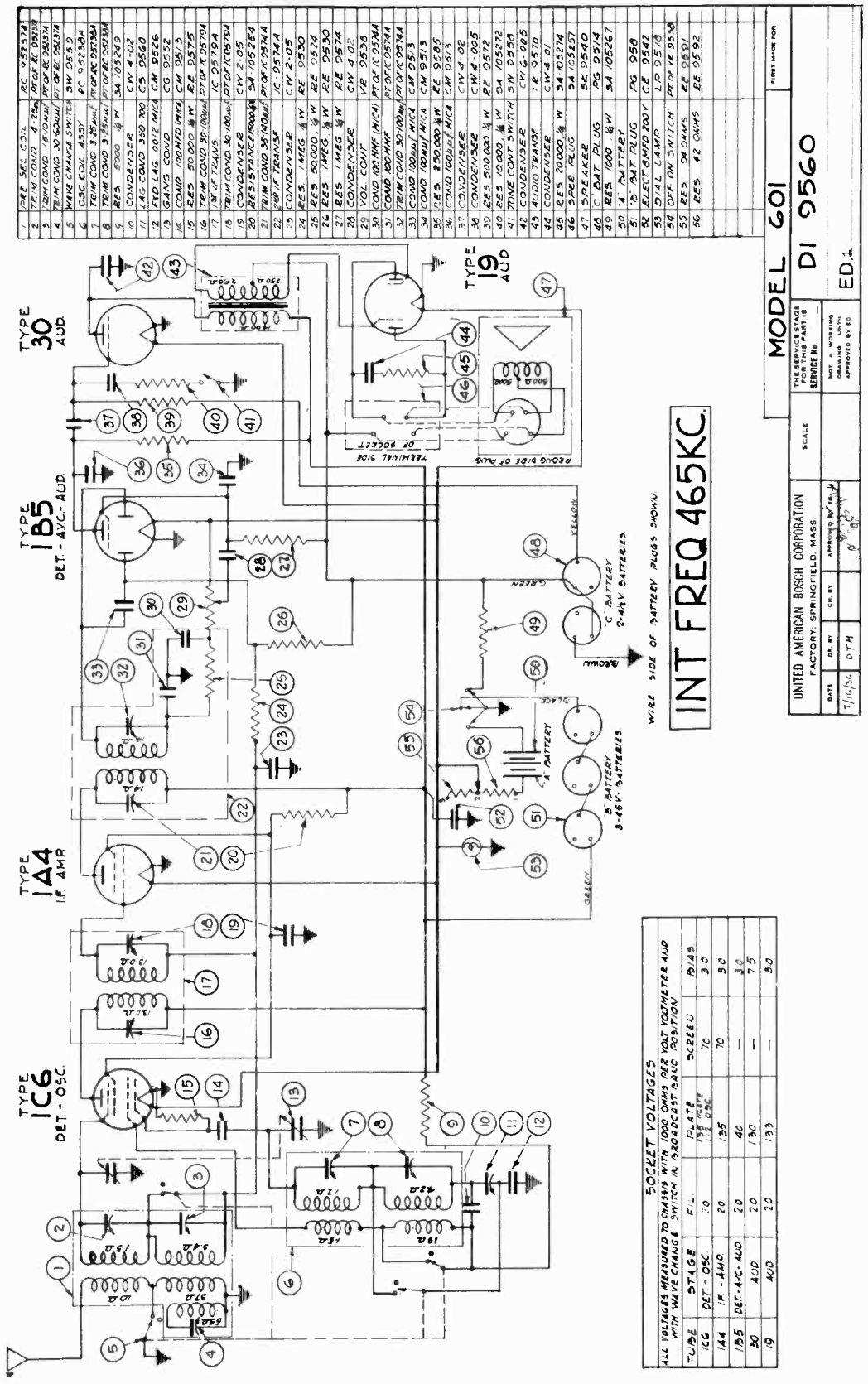

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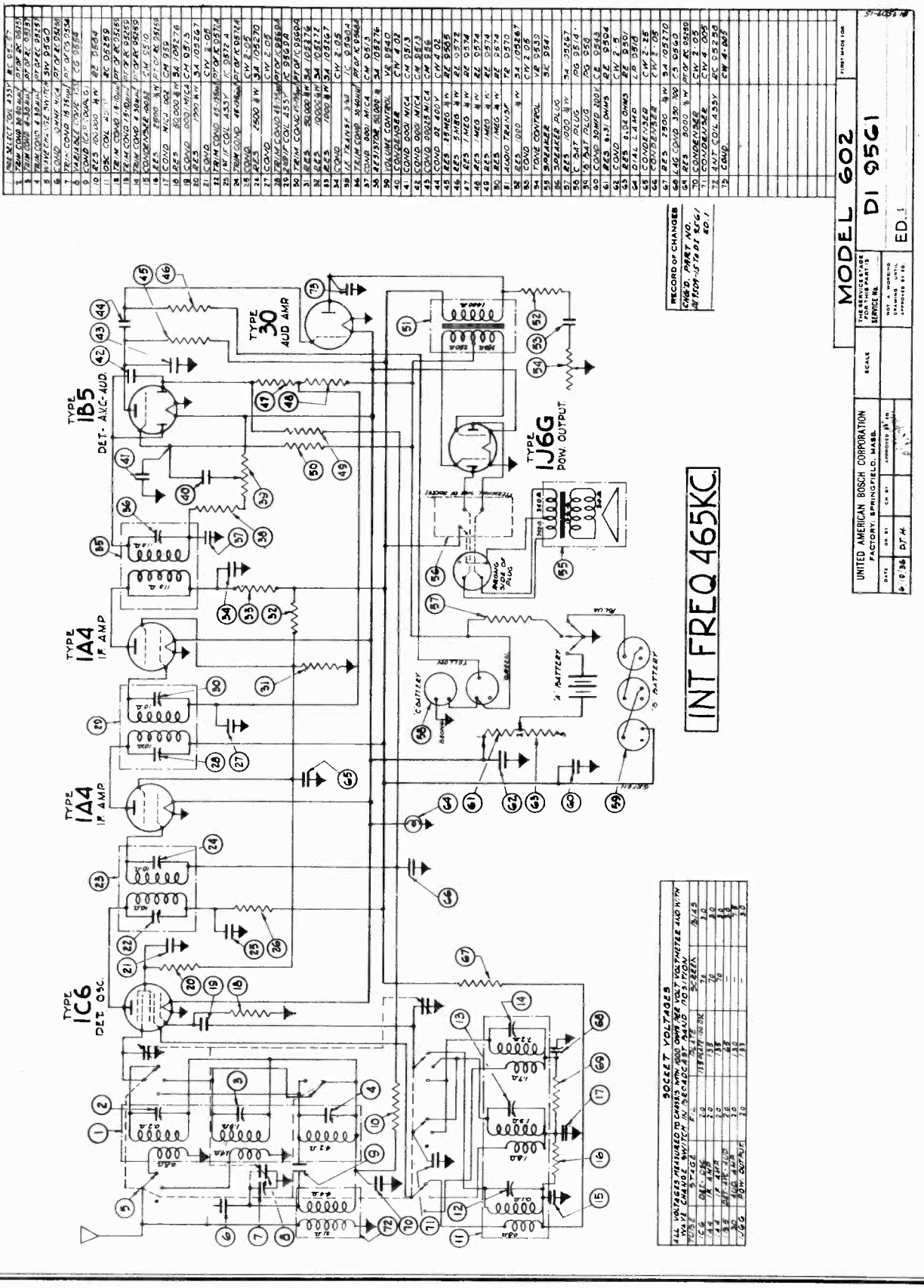
MODEL 602
Preliminary
Schematic
Voltage, Parts



MODEL 350
MODELS 355,357
Socket,Trimmers
Voltage,Alignment

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MODELS 355 & 357

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ---------- 1 #6A7, 1 #78, 1 #75, 1 #43, 1 #25Z5 - Total 5
Power Supply Characteristics ---------- 105 to 125 volts D.C. or A.C. 50 to 60 cycles
Power Consumption ---------- 45 Watts
Tuning Range ---------- 540 to 4200 K.C.
Maximum Undistorted Power ---------- 3 Watts
Line-Up Frequencies ---------- 175 K.C., 1400 K.C., 600 K.C., 1800 K.C.

GENERAL DESCRIPTION

The Model 357 is a five tube, two band, A.C.- D.C., superheterodyne receiver whose circuits consist of a combined first detector - oscillator, and intermediate frequency amplifier stage, a combined second detector-automatic volume control and first audio amplifier, an output stage and a rectifier.

The receiver is of the two band type and is designed to work on the following frequencies:

On the Black band from 540 to 1600 kilocycles and on the Red band from 1600 to 4200 kilocycles.

LINE-UP CAPACITOR ADJUSTMENTS

To align the 357 chassis, it is essential to use a high grade modulated oscillator and sensitive output meter. The R.F. signal fed into the receiver must be weak or it will cause the A.V.C. to function, making correct alignment difficult. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low signal.

Before attempting to align a receiver, the serviceman should familiarize himself with the general layout of the chassis, the location of the tubes and various alignment condensers. A top view of the chassis is shown in Figure #1 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (175 K.C.)

1. Set volume control on full.
2. Tone control should be on bass position.
3. Connect output meter across voice coil of loud speaker (speaker impedance is 3.5 ohms).
4. Set test oscillator to 175 K.C. and adjust its output to produce measurable reading on output meter when test oscillator is connected between frame of the chassis and the grid of 78 I.F. tube #4.
5. Adjust #6 and #9 to maximum output, reducing signal oscillator outputas stage is brought into resonance.
6. Connect test oscillator to grid of 6A7 (#5) and adjust #10 and #11 to maximum output.

ADJUSTMENT OF B.C., OSC. & R.F.

1. Set wave change switch to broadcast or BLACK scale position.
2. Connect test oscillatorto grid of first detector tube 6A7 (#5) and adjust test oscillator to 1400 K.C.
3. Check dial scale by observing maximum mark beyond 550 K.C. calibration point when gang is entirely closed.
4. Set scale at 1400 K.C. and adjust #12 to maximum output. NOTE: Two peaks will be heard as trimmer condenser is tuned. The second peak from maximum capacity of trim condenser should be used.
5. Connect test oscillator to antenna through 100. mmf. condenser and with scale still setat 1400 K.C. adjust condensers#12, 13 and 14 to maximum output.
6. Set scale and test oscillator to 600 K.C. and adjust #16 simultaneously changing this adjustment and the tuning control of chassis for maximum output. This type of adjustment is known as "max-max"and is obtained in the following manner:

Tune receiver with left hand by means of tuning knob and adjust #16 in either direction, and then without changing it, tune the receiver through a maximum, noting the value of output meter reading. Change #16 further in same direction, retune receiver and note reading. If output drops with second adjustment, reverse direction of the adjustment of #16, continue this type of trial and error adjustment until no further improvement can be made when either tuning control or #16 are changed. While this procedure may appear difficult, facility can be easily acquiredby practice and the operation requires only a few moments.

7. With test oscillator and scale set at 1400 K.C. readjust #12,13 and 14, since previous operation may have altered oscillator trimmer setting.
8. Check sensitivity across band.

ADJUSTMENT OF S.W. OSCILLATOR

1. Set wave change switch to short wave or RED band position.
2. Set test oscillator to 1800 K.C. and adjust #15 and tuning control to a "max-max" as per instructions given under Broadcast Band Alignment.
3. Check sensitivity across band.

SOCKET VOLTAGES

A.C. MEASUREMENT

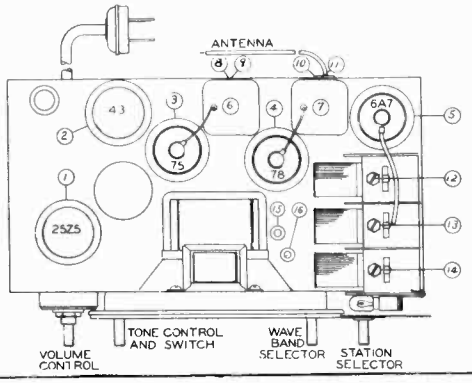
Stage	Tube	Fil.	Plate	Screen	Cathode
Det.) Osc.)	6A7	5.1	118 97	46	1.4
I.F.	78	5.1	118	118	3.0
2 Det.	76	5.3	50		0.7
Pent.	43	22.3	108	118	18
Rect.	25Z5	24	128		

Volts drop across series fil. resistor- 44
Dynamic field excitation - 115 volts
Line - 115 volts A.C. --- Power - 45 watts
Current - .43 amps.

D.C. MEASUREMENT

Stage	Tube	Fil.	Plate	Screen	Cathode
Det.) Osc.)	6A7	5.6	105 85	40	1.1
I.F.	78	5.5	105	105	2.4
2 Det.	76	5.8	47		0.6
Pent.	43	28	97	105	18
Rect.	25Z5	30	113		

Volts drop across series fil. resistor- 52
Dynamic field exitation - 113 volts
Line - 115 volts D.C.



MODEL 350

ELECTRICAL SPECIFICATIONS

Type and Number of tubes ---------- 1 #2A7, 1 #58, 1 #2A6, 1 #2A5, 1 #80 - Total 5
Power Supply Characteristics ---------- 105 to 125 volt, 50 to 60 cycle
Power Consumption ---------- 50 Watts
Tuning Ranges ---------- 540 to 4200 K.C.
Maximum Undistorted Output ---------- 3 Watts
Line-Up Frequencies ---------- 175 K.C., 1400 K.C., 600 K.C., 1800 K.C.

GENERAL DESCRIPTION

The Model 350 is a five tube, two band, superheterodyne receiver. Its circuit comprises a combined first detector-oscillator, a stage of intermediate frequency amplification, a combined second detector-automatic volume control and first audio amplifier, a power output amplifier and a rectifier.

This receiver is designed to work over two bands; the broadcast band (black band) extending from 540 to 1600 kilocycles and the red band extending from 1600 to 4200 kilocycles.

LINE UP CAPACITOR ADJUSTMENTS

To properly align the Model 350 chassis, it is essential to use a high grade modulated oscillator and a sensitive output meter. The R.F. signal fed into the receiver must be very weak or it will cause the A.V.C. to function making correct alignment impossible. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low signal.

Before attempting to align a receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and the various alignment condensers. A top view of the chassis is shown in Fig. #2 and should be carefully studied before the actual work is started.

1. Set volume control on full.
2. Tone control should be on bass position.
3. Short circuit antenna and ground leads to prevent local stations from interfering with subsequent alignment operations.
4. Connect output meter across voice coil of loud speaker (speaker impedence is 3.5 ohms).
5. Set test oscillator to 175 K.C. and adjust its output to produce measurable readings on output meter when test oscillator is connected between frame of the chassis and the grid of 58 I.F. tube #6.
6. Adjust #4 and #5 to maximum output, reducing signal oscillator output as stage is brought into resonance.
7. Connect test oscillator to grid of 2A7 (#9) and adjust #7 and #8 to maximum output.

ADJUSTMENT OF B.C. OSC. & R.F.

1. Set wave change switch to broadcast or BLACK scale position.
2. Connect test oscillator to grid of first detector tube 2A7 (#9) and adjust test oscillator to 1400 K.C.
3. Set dial scale to maximum mark beyond 550 K.C. calibration point when gang is entirely closed.
4. Set scale at 1400 K.C. and adjust #10 to maximum output. NOTE: Two peaks will be heard as trimmer condenser is tuned. The second peak from maximum capacity should be used.
5. Connect test oscillator to antenna through 100. mmf. condenser and with scale still set at 1400 K.C. adjust condensers #10, 11 and 12 to maximum output.
6. Set scale and test oscillator to 600 K.C. and adjust #14 simultaneously changing this adjustment and the tuning control of chassis for maximum output. This type of adjustment is known as "max-max" and is obtained in the following manner:

Tune receiver with left hand by means of tuning knob and adjust #14 in either direction and then without changing it, tune the receiver through a maximum, noting the value of output meter reading. Change #14 further in same direction, retune receiver and note reading. If output drops with second adjustment, reverse direction of the adjustment of #14, continue this type of trial and error adjustment until no further improvement can be made when either tuning control or #14 are changed. While this procedure may appear difficult, facility can be easily acquired by practice and the operation requires only a few moments.

7. With test oscillator and scale set at 1400 K.C. readjust #10,11 and 12, since previous operation may have altered oscillator trimmer setting.
8. Check sensitivity across band.

ADJUSTMENT OF S.W. OSC.

1. Set wave change switch to short wave on RED band position.
2. Set test oscillator to 1800 K.C. and adjust #13 and tuning control to a "max-max" as per instructions given under Broadcast Band Alignment.
3. Check sensitivity across band.

TROUBLE NOTES

INTERMITTENT RECEPTION

Intermittent reception occurring in the early Model 350 is caused by variations in characteristics in the 2A7 tube. The following circuit changes will stabilize the action of the 2A7 oscillator tube.

1. Replace R3 and R4 (2A7 and 58 bias resistors) with 750 ohm resistors.
2. Remove #18 which is connected between the 2A7 oscillator plate terminal and R6.
3. Connect a 20,000 ohm resistor to the 2A7 oscillator plate terminal and the 250 volt terminal of the electrolytic condenser.

NOTE: This 250 volt terminal may be located by turning chassis upside down and looking at the chassis from the back. The 250 volt point is the upper right hand terminal of the electrolytic condenser.

4. Replace C26 (2A5 bypass condenser) with a .01-600 volt condenser. Parts required for above changes:

2 SA 105265 - 750 ohm resistors
1 SA 105274 - 20,000 ohm resistor
1 SA 103695 - .01 mfd. 600 V. condenser

Should a loud hum develop in the Model 350, it is probably caused by a poor ground between the riveted connection from the filament of the 2A6 socket to ground. This can be corrected by soldering a short lead from the filament lug on the socket to the body of the chassis.

TUBE	STAGE	FIL.	PLATE	SCREEN	CATHODE	GRID	
2A7	1ST. DET.	2.4	75	30	0.8		LINE VOLTAGE 115
	OSC.		80				POWER IN WATTS 50
58	I. F.	2.4	250	75	2.0		BIAS 2A5 ACROSS
2A6	2 ND. DET.	2.4	95		1.5		RESISTOR 15 VOLTS
2A5	PENTODE	2.5	235	250	0	7.5	
80	RECTIFIER	4.7					

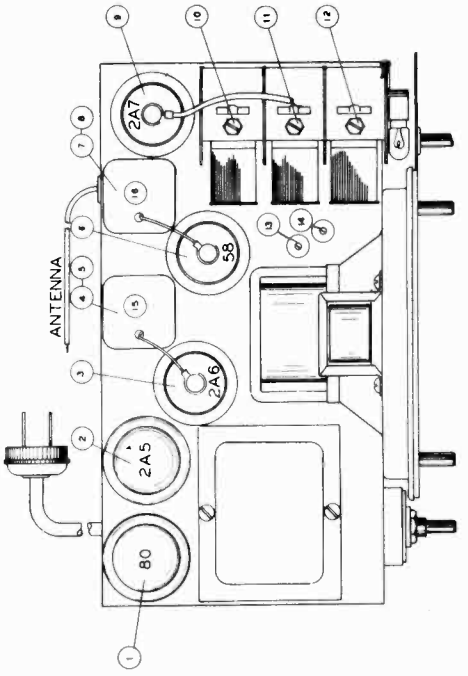


Figure No. 2

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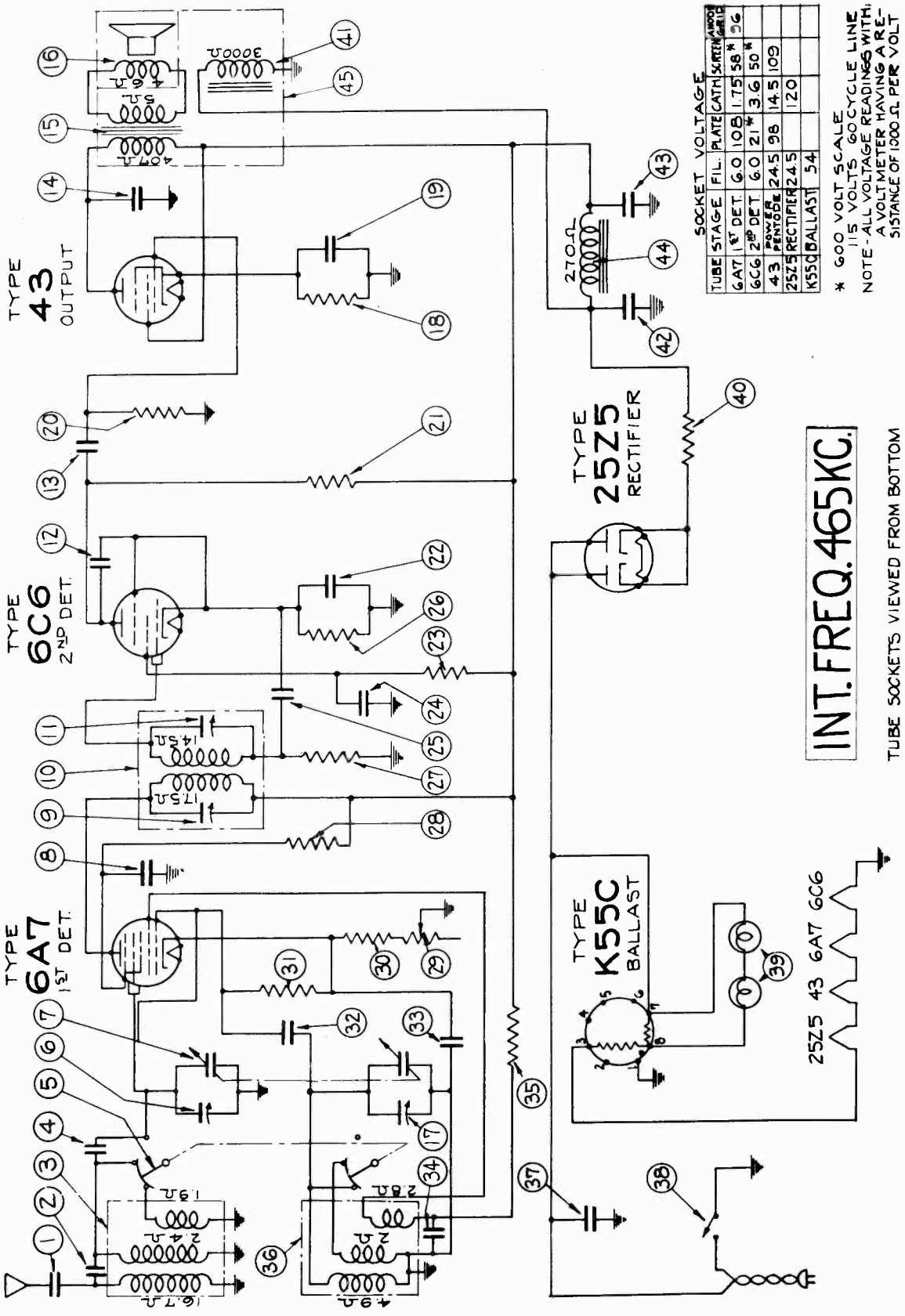
MODEL 604
Preliminary
Schematic
Voltage



MODEL 604
Socket, Trimmers
Chassis, Parts
Alignment

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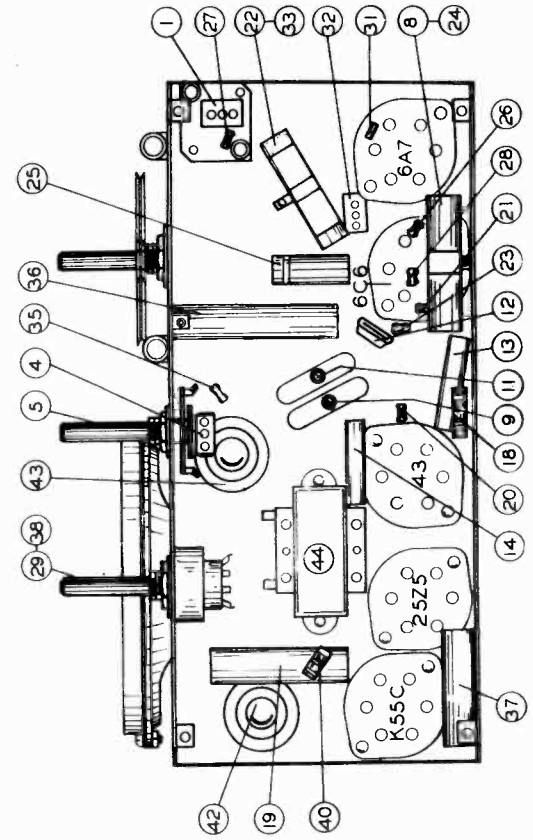

Figure No. 2

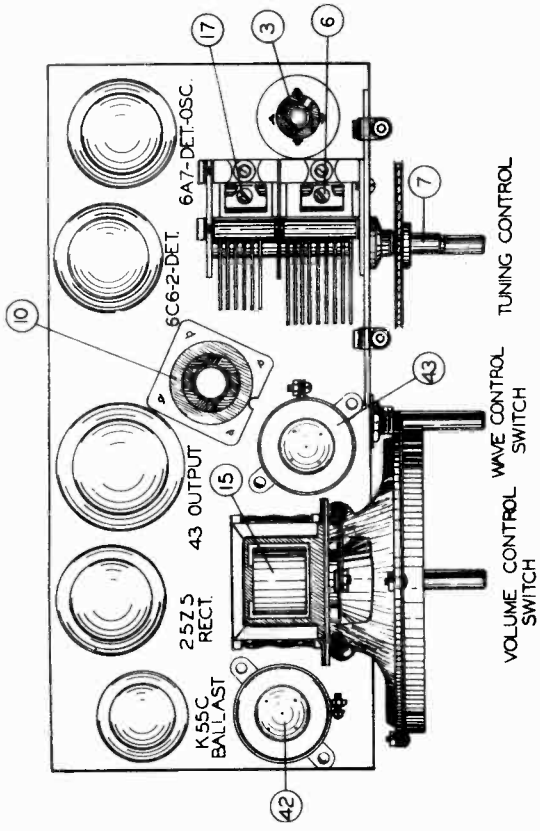

Figure No. 1

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes .. 1 #6A7, 1 #6C6, 1 #43, 1 #25Z5, 1 #K55C (Ballast) - Total 5
Power Supply Characteristics .... 105-125 volts D.C. or 105-125 volts, 50-60 cycle A.C.
Power Consumption ..... 44 Watts
Total Power Output ..... 1.10 Watts
Undistorted Power Output ..... 0.75 Watts
Tuning Ranges ..... (Broadcast Band 530 to 1525 K.C.
(Shortwave Band 1500 to 3000 K.C.
Line-Up Frequencies ..... I.F. 465 K.C., 1400 K.C.

GENERAL DESCRIPTION

This model is a four-tube (plus a ballast tube), two-band superheterodyne receiver, designed to operate over the standard broadcast band extending from 530 to 1525 K.C., and a short-wave band extending from 1500 to 3000 K.C.

The receiver uses a type 6A7 tube as a first detector-oscillator, a type 6C6 as a second detector, a type 43 as a power output tube, a type 25Z5 as a rectifier and a type k55C as a ballast tube.

LINE-UP CAPACITOR ADJUSTMENTS

To properly 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 and reduced sufficiently to prevent overload as the individual circuits of the receiver are brought into alignment. A conventional output meter should be connected across the terminals of the speaker voice coil to indicate when the individual circuits are correctly aligned. The sensitivity of this meter must be sufficient to give satisfactory readings with low input signals.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, location of the various tubes and alignment condensers. Top and bottom views of the chassis are shown in Figures #1 and #2 and should be carefully studied before actual work is started.

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

1. Set the volume control to maximum position and wave change switch to standard broadcast band.
2. Connect the output meter across the voice coil terminals of the speaker.
3. Set the test oscillator to 465 K.C. and adjust its output to produce a measureable reading on the output meter when the test signal is applied to the grid of the type 6A7 first detector-oscillator tube through a 0.5 mfd. blocking condenser.
4. Adjust trimmers #9 and #11 to maximum output.

ALIGNMENT OF OSCILLATOR AND R. F.

1. Check the pointer setting to be sure that is is exactly horizontal when the tuning condenser is completely closed.
2. Set the test oscillator and dial indicator to 1400 K.C. and adjust the oscillator trimmer condenser #17 to maximum output.
3. Apply the test signal to the antenna of the receiver through a .0001 mfd. blocking condenser and adjust trimmer condenser #6 to maximum output.
4. Check sensitivity over the band.
5. Turn wave change switch to the shortwave band and check the sensitivity over scale.

Dia. #	Part #	Description of Parts
1	CM 9519	.0005 mfd., mica condenser
2	CS 9546	5 mmf., mica condenser
3	RC 95197	Antenna coil assembly
4	CM 9522	.00048 mfd., mica condenser
5	SW 9545	Wave change switch
6		Trimmer condenser - part of CG 9547
7	CG 9547	Tuning condenser
8		.05 mfd., 200 V. condenser - part of SA 105327
9		Trimmer condenser - part of IC 9566
10	IC 9566	I.F. coil
11		Trimmer condenser - part of IC 9566
12	CM 9519	.0005 mfd., mica condenser
13	CW 4-01	.01 mfd., 400 V. condenser
14	CW 4-01	.01 mfd., 400 V. condenser
15	TR 9560	Output transformer
16	DM 9512	Diaphragm and voice coil assembly
17		Trimmer condenser - part of CG 9547
18	RE 9567	600 ohm, 1/2 W. resistor
19	CE 9515	12 mfd., 25 V. electrolytic condenser
20	RE 9545	1/2 meg., 1/4 W. resistor
21	RE 9545	1/2 meg., 1/4 W. resistor
22		.05 mfd., 200 V. condenser - part of SA 105327
23	RE 9545	1/2 meg., 1/4 W. resistor
24		.05 mfd., 200 V. condenser - part of SA 105327
25	CW 2-10	.1 mfd., 200 V. condenser
26	RE 9568	25,000 ohm, 1/4 W. resistor
27	RE 9530	1 meg., 1/4 W. resistor
28	RE 9569	30,000 ohm, 1/4 W. resistor
29	VR 9531	Volume control
30		300 ohm resistor - part of VR 9531
31	RE 9524	50,000 ohm, 1/4 W. resistor
32	CK 9513	.0001 mfd., mica condenser
33		.05 mfd., 200 V. condenser - part of SA 105327
34	CW 4-005	.005 mfd., 400 V. condenser
35	RE 9527	5,000 ohm, 1/4 W. resistor
36	RC 95166	Oscillator coil assembly
37	CW 2-10	.1 mfd., 200 V. condenser
38		Switch (On-Off) - part of VR 9531
39	LP 9515	Dial lamp - 6.3 V.
40	RE 9566	25 ohm, 1/2 W. resistor
41		Speaker field coil - part of SK 9531
42	CE 9533	12 mfd., 150 V. electrolytic condenser
43	CE 9534	16 mfd., 150 V. electrolytic condenser
44	SA 105311	Choke coil assembly

Part #	Description of Parts
MAIN ASSEMBLIES	
CH 95100	Chassis assembly
KA 9545	Cabinet
SK 9531	Speaker
TUBE SOCKETS	
SO 956	Tube socket - 8 prong
SA 105461	Tube socket - 7 prong
SA 104617	Tube socket - 6 prong
MISCELLANEOUS	
DS 9550	Dial scale
KH 9553	Knobs
SI 9545	Dial indicator
FP 101869	Felt feet
SC 952	Screw for dial indicator
CV 95189	Cover - front of speaker
PU 9517	Large pulley on tuning condenser
SH 9539	Dial drive shaft
PU 9516	Small dial drive pulley
BK 95193	Dial lamp bracket
SO 9518	Dial lamp socket
PP 105427	Dial lamp contact spring
SP 9539	Spring on dial drive cord
BK 95182	Electrolytic condenser mounting bracket
BG 9523	Dial drive shaft bearing
PR 97160	Dial drive cord

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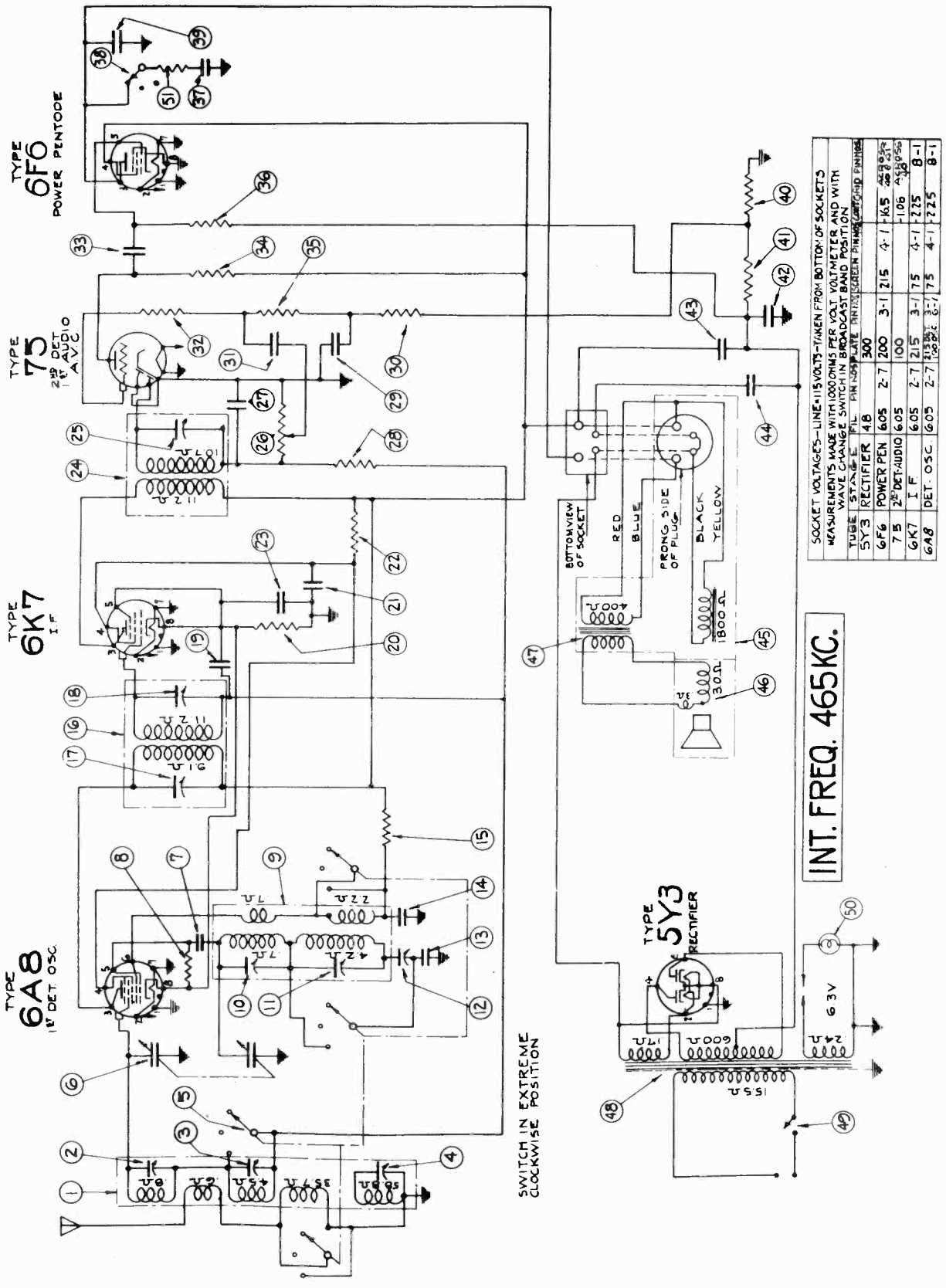
MODELS 605, 605C
Preliminary
Schematic. Voltage



MODELS 605,605C
Preliminary
Socket,Trimmers
Parts List

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Dia. #	Part #	Description of Parts
1	RC 95200	Antenna coil
2		4-25 mmf. trimmer condenser - part of RC 95200
3		1.5-10 mmf. trimmer condenser - part of RC 95200
4		30-60 mmf. trimmer condenser - part of RC 95200
5	SW 9546	Switch assembly
6	CG 9548	Variable tuning condenser
7	CN 9513	.0001 mfd. mica condenser
8	RE 9524	50,000 ohm, 1/4 W. resistor
9	RC 95199	Oscillator coil
10		10-45 mmf. trimmer condenser - part of RC 95199
11		4-25 mmf. trimmer condenser - part of RC 95199
12	CS 9545	Oscillator series condenser
13	CL 9523	.003 mfd. mica condenser
14	SW 4-005	.005 mfd., 400 V. condenser
15	SA 105249	5000 ohm, 1/4 W. resistor
16	IC 9569	1st I.F. coil
17		45-135 mmf. trimmer condenser - part of IC 9569
18		45-135 mmf. trimmer condenser - part of IC 9569
19	CW 2-05	.05 mfd., 200 V. condenser
20	RE 9570	180 ohm, 1/4 W. resistor
21	CW 2-05	.05 mfd., 200 V. condenser
22	RE 9524	50,000 ohm, 1/4 W. resistor
23	CW 2-10	.1 mfd., 200 V. condenser
24	IC 9568	2nd I.F. coil
25		30-60 mmf. trimmer condenser - part of IC 9568
26	VR 9532	Volume control (.5 megohm)
27	CN 9519	.0005 mfd. mica condenser
28	RE 9530	1 meg., 1/4 W. resistor
29	CW 2-05	.05 mfd., 200 V. condenser
30	RE 9524	50,000 ohm, 1/4 W. resistor
31	CW 4-02	.02 mfd., 400 V. condenser
32	RE 9534	100,000 ohm, 1/4 W. resistor
33	CW 4-02	.02 mfd., 400 V. condenser
34	RE 9531	1/4 meg., 1/4 W. resistor
35	RE 9530	1 meg., 1/4 W. resistor
36	RE 9531	1/4 meg., 1/4 W. resistor
37	CW 4-05	.05 mfd., 400 V. condenser
38		Tone control switch - part of SW 9546
39	CW 4-01	.01 mfd., 400 V. condenser
40	RE 9556	25 ohm, 1/4 W. resistor
41	SA 102564	350 ohm, 1 W. resistor
42	CE 9515	12 mfd., 25 V. electrolytic condenser
43	CE 9535	16 mfd., 300 V. electrolytic condenser
44	CE 9536	12 mfd., 450 V. electrolytic condenser
45	SK 9525	Speaker assembly
46	DM 9510	Diaphragm and voice coil assembly
47	TR 9559	Output transformer
48	TR 9555	Power transformer
49		On-Off switch - part of VR 9532
50	LP 9510	Dial light
51	RE 9579	2000 ohm, 1/4 W. resistor

Part #	Description of Parts
MAIN ASSEMBLIES	
CH 95101	Chassis assembly
SK 9525	Speaker
KA 9546	Cabinet
BRACKETS	
BK 95182	Filter condenser mounting bracket
TUBE SOCKETS & TUBE SHIELDS	
BE 956	Tube shield base
CV 954	Tube shield
SA 104617	Tube socket - 6 prong
SA 107257	Speaker socket
SO 956	Tube socket - 8 prong

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ..... 1 #6A8 ,1 #6K7 ,1 #75, 1 #6P6 ,1 #5Y3 - Total 5
Power Supply Characteristics ..... 105 to 125 volts, 50 to 60 cycle A.C.
Power Consumption ..... 46 Watts
Power Output ..... 3.0 Watts
Undistorted Power Output ..... 1.5 Watts
Tuning Range ..... 545 to 1725 KC., and 2100 to 7200 KC.
Line-Up Frequencies ..... 465 KC., 1700 KC., 600 KC., 6000 KC.

GENERAL DESCRIPTION

These models are five-tube, two-band superheterodyne receivers employing a type 6A8 tube as a combination first detector-oscillator, a type 6K7 tube as a first I.F. amplifier, a type 75 tube as a combination second detector - A.V.C. - first audio amplifier, a type 6P6 tube as an output amplifier and a type 5Y3 tube as a rectifier.

These models are designed to operate over two bands on frequencies from 545 to 1725 KC. and 2100 to 7200 KC.

The model 605 is a table model while the model 605C is a console model using a larger speaker.

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 Figs. #1 and #2 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 KC.)

1. Connect the output meter to the terminals of the speaker voice coil.
2. Set the volume control to maximum position and tone control to treble.
3. Apply the test signal to the grid of the type 6K7 I.F. tube through a .1 mfd. blocking condenser.
4. Adjust trimmer condenser #25 to maximum output.
5. Apply the test signal to the grid of the type 6A8 first detector-oscillator tube and adjust trimmer condensers #17 and #18 to maximum output.

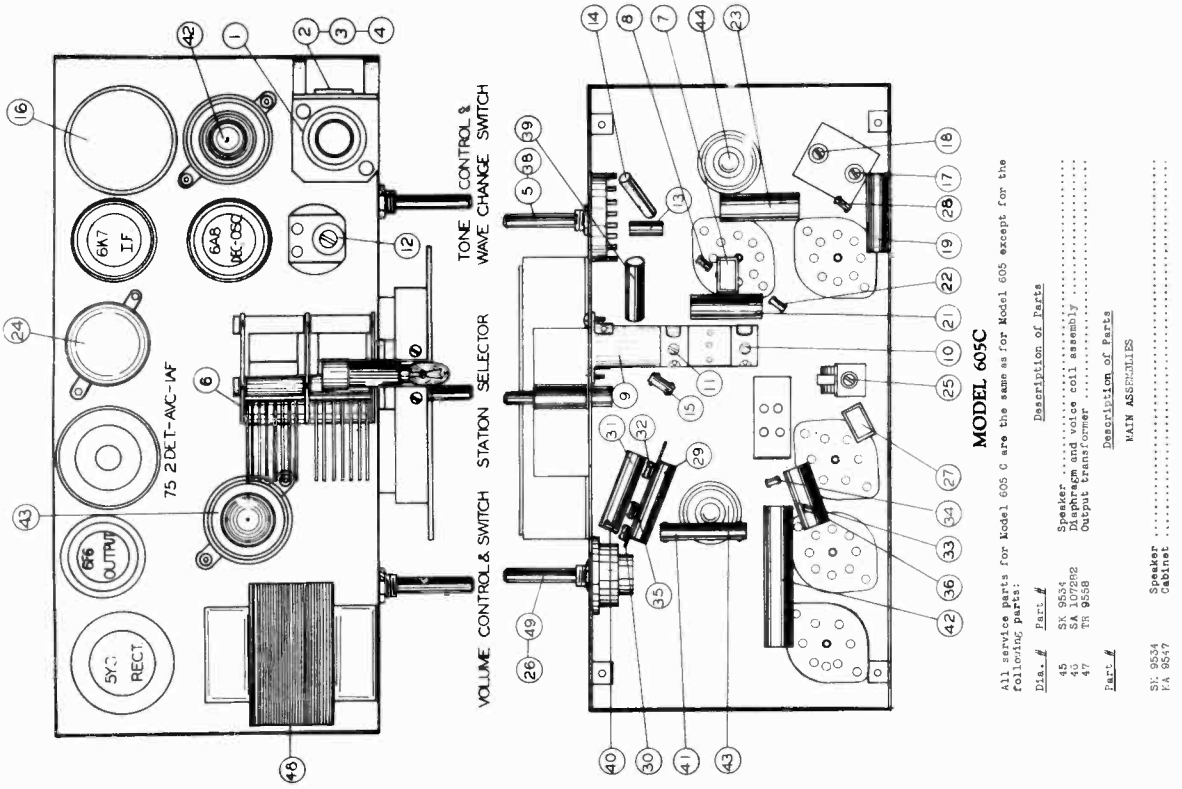
ADJUSTMENT OF BROADCAST BAND

1. Apply test signal to antenna lead and with a strong input signal adjust wave trap trimmer condenser #4 to minimum output.
2. Apply test signal to the antenna lead through a .0002 mfd. condenser.
3. Set test oscillator and dial indicator to 1700 KC. and adjust oscillator trimmer condenser #11 until the signal is received.
4. Adjust preselector trimmer #3 to maximum output.
5. Set test oscillator and dial indicator to 600 KC. and adjust oscillator series condenser #12 to maximum output.
6. Return both test oscillator and dial indicator to 1700 KC. and check adjustment of oscillator and preselector trimmer condensers.

ADJUSTMENT OF S. W. BAND

1. Turn the wave change switch to the short-wave position.
2. Set the test oscillator and dial indicator to 6000 KC. and adjust oscillator trimmer condenser #10 until the signal is received.
3. Adjust the preselector trimmer condenser #2 to maximum output.
4. Check the receiver over scale for sensitivity and calibration.

	MISCELLANEOUS
KK 9538	Knobs
GA 9510	Dial gasket
DS 9551	Dial scale
PL 9561	Plate to support dial
SO 9519	Dial lamp socket
CO 9512	Line cable
SP 9540	Spring clip on dial
SI 9545	Dial indicator
SH 9539	Dial drive shaft
PU 9516	Dial drive pulley
PU 9518	Dial pulley - on condenser shaft
SP 9539	Spring on dial drive belt
DR 97160	Dial drive belt
BB 9503	Dial drive shaft bearing



MODEL 605C

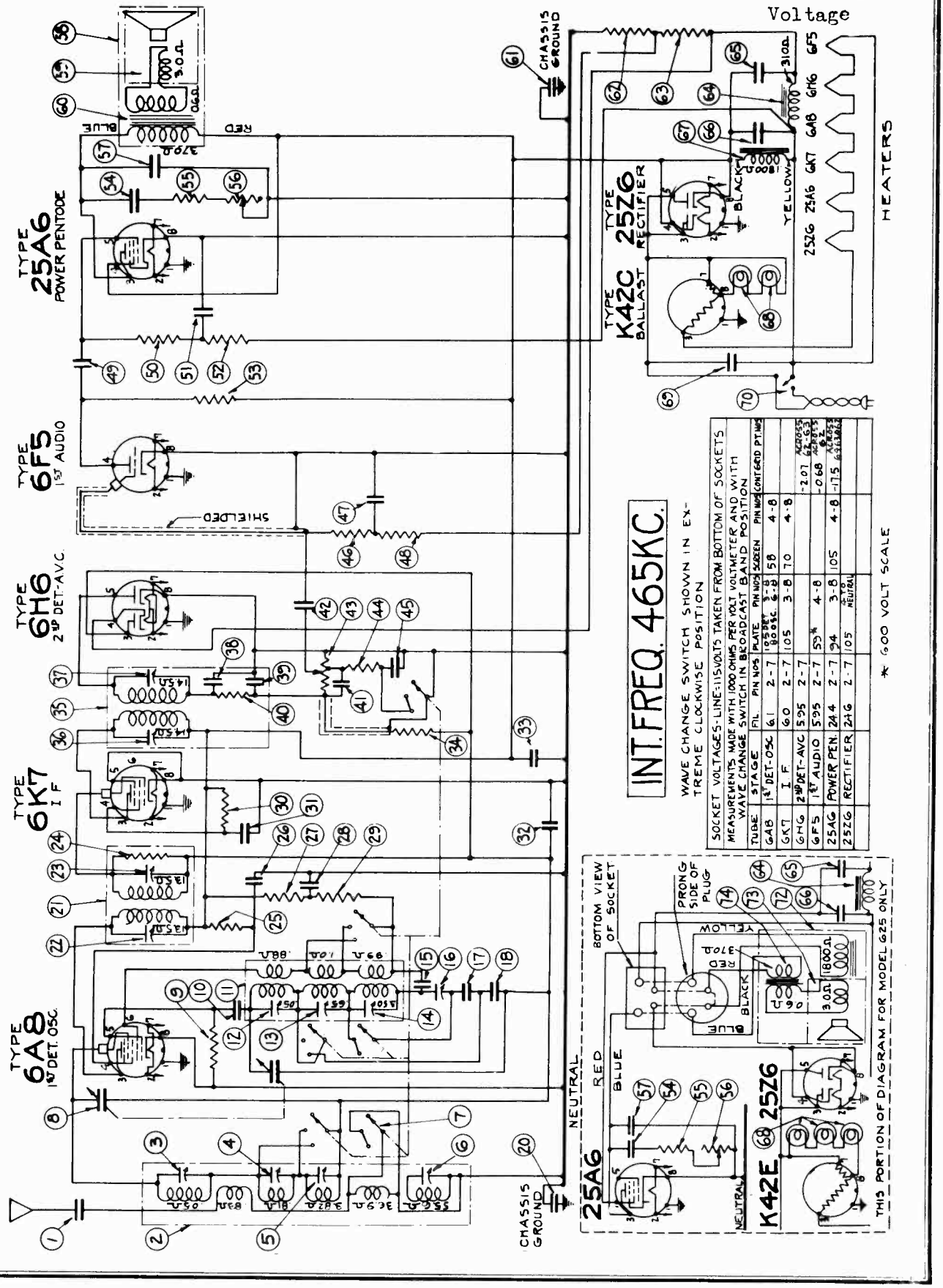
All service parts for Model 605 C are the same as for Model 605 except for the following parts:

Dia. #	Part #	Description of Parts
45	SK 9534	Speaker
46	SA 107282	Diaphragm and voice coil assembly
47	TR 9558	Output transformer

Part #	Description of Parts
MAIN ASSEMBLIES	
SK 9534	Speaker
KA 9547	Cabinet

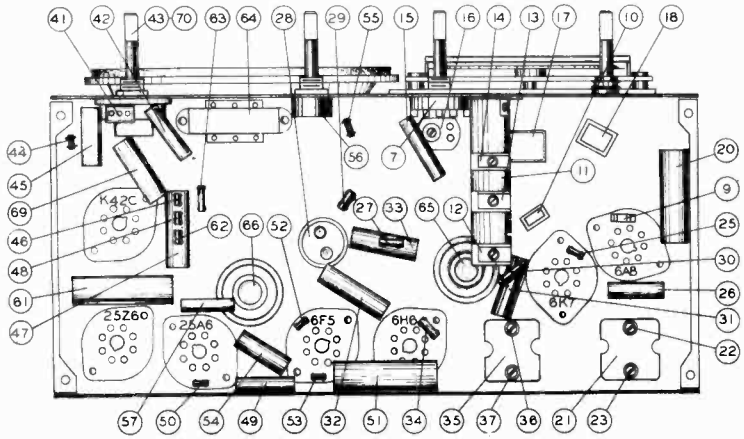
MODELS 620, 625
Preliminary
Schematic
Voltage

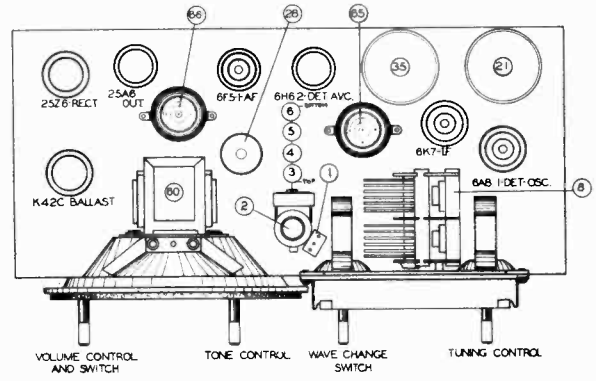
UNITED AMERICAN BOSCH CORP



SOCKET VOLTAGES - LINE: 115 VOLTS TAKEN FROM BOTTOM OF SOCKETS
MEASUREMENTS MADE WITH 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.	CONTGRID	PIN NOS.
GA8	1ST DET-OSC.	6.1	2-7	185 OSC. 105	1-8 5-8	58	4-8		
GK7	I F	6.0	2-7	105	3-8	70	4-8	-2.01	ACROSS 62 OHMS
GH6	2ND DET-AVC	5.95	2-7	55	4-8			-0.68	ACROSS 62 OHMS
6F5	1ST AUDIO	5.95	2-7	55	4-8			-1.15	ACROSS 62 OHMS
25A6	POWER PEN.	24.4	2-7	234	3-8	105	4-8		
25Z6	RECTIFIER	24.6	2-7	105	*1-6 NEUTRAL				





Dia. #	Part #	Description of Parts
1	SA 103775	.001 mfd. mica condenser
2	RC 95202	Preselector coil
3		4-25 mmf. trimmer condenser - part of RC 95202
4		1.5-10 mmf. trimmer condenser - part of RC 95202
5		1.5-10 mmf. trimmer condenser - part of RC 95202
6		30-60 mmf. trimmer condenser - part of RC 95202
7	SW 9548	Wave change switch
8	CG 9549	Variable condenser
9	RE 9581	50,000 ohm, 1/4 W. resistor
10	SA 106417	.0001 mfd. mica condenser
11	RC 95203	Oscillator coil assembly
12		4-25 mmf. trimmer condenser - part of RC 95203
13		1.8-10 mmf. trimmer condenser - part of RC 95203
14		1.5-10 mmf. trimmer condenser - part of RC 95203
15	CW 4-005	.005 mfd., 400 V. condenser
16	CS 9545	300-600 mmf. oscillator series condenser
17	CM 9525	.0027 mmf. mica condenser
18	CM 9524	.0034 mmf. mica condenser
20	CW 6-10	.1 mfd., 600 V. condenser
21	IC 9573	1st I.F. coil
22		30-100 mmf. trimmer condenser - part of IC 9573
23		30-100 mmf. trimmer condenser - part of IC 9573
24		500,000 ohm, 1/4 W. resistor - part of IC 9573
25	RK 9536	20,000 ohm, 1/4 W. resistor
26	CW 2-05	.05 mfd., 200 V. condenser
27	SA 105249	5000 ohm, 1/4 W. resistor
28	CK 9540	4 mfd., 150 V. condenser
29	SA 105249	5000 ohm, 1/4 W. resistor
30	RE 9568	25,000 ohm, 1/4 W. resistor
31	CW 2-05	.05 mfd., 200 V. condenser
32	CW 2-10	.1 mfd., 200 V. condenser
33	CW 2-10	.1 mfd., 200 V. condenser
34	RE 9577	2 meg., 1/2 W. resistor
35	IC 9574	Second I.F. coil
36		30-100 mmf. trimmer condenser - part of IC 9574
37		30-100 mmf. trimmer condenser - part of IC 9574
38		.0001 mfd. mica condenser - part of IC 9574
39		.0001 mfd. mica condenser - part of IC 9574
40		50,000 ohm, 1/4 W. resistor - part of IC 9574
41	CM 9519	.0008 mfd. mica condenser
42	CW 4-005	.005 mfd., 400 V. condenser
43	VR 9533	1/2 meg. volume control
44	RE 9568	25,000 ohm, 1/4 W. resistor
45	CW 4-01	.01 mfd., 400 V. condenser
46	RE 9572	500,000 ohm, 1/4 W. resistor
47	CW 2-10	.1 mfd., 200 V. condenser
48	RE 9572	500,000 ohm, 1/4 W. resistor
49	CW 4-01	.01 mfd., 400 V. condenser
50	RE 9572	500,000 ohm, 1/4 W. resistor
51	CW 9525	1 mfd., 100 V. condenser
52	RE 9534	100,000 ohm, 1/4 W. resistor
53	RE 9531	250,000 ohm, 1/4 W. resistor
54	CW 2-05	.05 mfd., 200 V. condenser
55	RE 9550	2000 ohm, 1/4 W. resistor
56	VR 9534	Tone control
57	CW 4-01	.01 mfd., 400 V. condenser
58	SK 9532	Speaker
59	SA 106617	Diaphragm and voice coil
60	TR 9554	Output transformer
61	CW 6-10	.1 mfd., 600 V. condenser

MODEL 625

All service parts for Model 625 are the same as for Model 620 except for the

Dia. #	Part #	Description of Parts
43	VR 9535	1/2 meg. volume control
44	RE 9527	5000 ohm, 1/4 W. resistor
45	CW 2-05	.05 mfd., 200 V. condenser
70		On-Off switch - part of VR 9535
72	SK 9535	Speaker assembly
73	SA 102916	Diaphragm and voice coil assembly
74	TR 9556	Output transformer

Part #	Description of Parts
	MAIN ASSEMBLIES
CH 95102	Chassis assembly
KA 9541	Cabinet
SK 9535	Speaker assembly
	MISCELLANEOUS
GA 9512	Dial gasket
WA 106339	Chassis mounting washers
SC 19-16 CA	Chassis mounting screws
SI 9549	Dial indicator assembly
DS 9560	Dial scale
PL 9562	Masking plate
BK 95203 CA	Bracket over dial scale
SC 99005	Speaker centralizer screw
SA 107278	Speaker plug
SA 107279	Speaker plug cover
SA 101740	Copper ring
SA 107257	Speaker socket

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ..... 1 #6AB, 1 #6K7, 1 #6H6, 1 #6F5, 1 #25A6, 1 #25Z6, 1 #K42C (Ballast) in Model 620, 1 #K42E (Ballast) in Model 625 - Total 7

Power Supply Characteristics .... 105-125 volts D.C. or 105-125 volts, 50-60 cycle A.C.

Power Consumption ..... 52 Watts

Maximum Output ..... 1.0 Watts

Maximum Undistorted Output ..... 0.75 Watts

Tuning Ranges ..... (Black Band - 540 to 1550 K.C.
(Green Band - 1500 to 4500 K.C.
(Red Band - - 5500 to 16500 K.C.

Line-Up Frequencies ..... I.F. 465 K.C., 1400 K.C., 600 K.C., 4000 K.C., 15000 K.C.

GENERAL DESCRIPTION

These models are seven-tube, three-band, A.C.-D.C. superheterodyne receivers whose circuits employ all metal tubes. A type 6AB tube is used as a combined first detector-oscillator, a type 6K7 tube as an intermediate frequency amplifier, a type 6H6 tube as a second detector and automatic volume control, a type 6F5 as a first audio frequency amplifier, a type 25A6 as an output amplifier, a type 25Z6 as a rectifier, and a type K42C as a ballast tube in the Model 620 or a type K42E in the Model 625.

The Model 620 is a personal model with the speaker mounted on the chassis while the Model 625 is a console model using a larger separate speaker.

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 Figs. #1 and #2 and should be carefully studied before the actual work is started.

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

1. Set the volume control to maximum position and tone control to treble position.
2. Connect the output meter to the terminals of the voice coil.
3. Set the test oscillator to 465 K.C. and apply the test signal to the grid of the type 6K7 I.F. tube through a .1 mfd. blocking condenser.
4. Adjust trimmer condensers #36 and #37 to maximum output.
5. Apply the test signal to the grid of the type 6AB first detector-oscillator tube and adjust trimmer condensers #22 and #23 to maximum output.
6. Connect the test oscillator to the antenna of the receiver and with a strong input signal adjust wave trap trimmer condenser #6 to minimum output.

BROADCAST BAND ADJUSTMENT

1. Set the test oscillator and dial indicator to 1400 K.C.
2. Apply the test signal to the antenna of the receiver through a .0002 mfd. condenser.
3. Adjust oscillator trimmer condenser #14 until the signal is received.
4. Adjust the preselector trimmer condenser #5 to maximum output.
5. Set test oscillator and dial indicator to 600 K.C. and adjust the oscillator series condenser #16 until the signal is received. Tune the receiver to a slightly lower frequency and readjust trimmer #16 to maximum output. If the sensitivity increases, continue this procedure in the same direction until maximum sensitivity is reached. If the sensitivity decreases, try this procedure at slightly higher frequencies until maximum sensitivity is reached.
6. Return test oscillator and dial indicator to 1400 K.C. and check adjustment of the oscillator and preselector trimmer condensers.

ADJUSTMENT OF GREEN BAND

1. Set the wave change switch to the green band position.
2. Set the test oscillator and dial indicator to 4000 K.C. and adjust the oscillator trimmer condenser #13 until the signal is received.
3. Adjust the preselector trimmer condenser #4 to maximum output.
4. Check the sensitivity and calibration over scale.

ADJUSTMENT OF RED BAND

1. Set the wave change switch to the red band position.
2. Set the test oscillator and dial indicator to 15000 K.C. and adjust the oscillator trimmer condenser #12 until the signal is received. Two positions may be found at which the signal may be tuned in. Use the position with the lower capacity trimmer setting or with the alignment screw turned farther out.
3. Adjust the preselector trimmer #3 to maximum output.
4. Check the receiver over scale for calibration and sensitivity.

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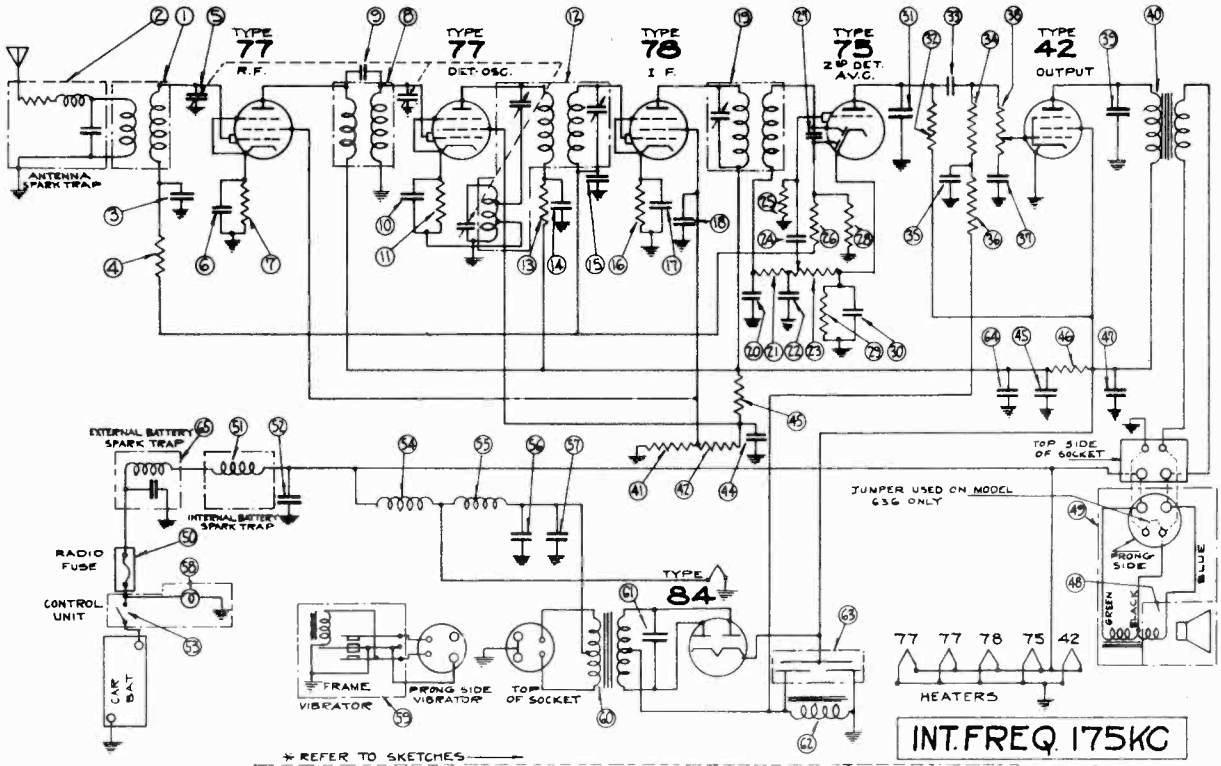
MODELS 636,637
Schematic,Voltage
Coil Data,Parts



* REFER TO SKETCHES

WINDING RESISTANCE

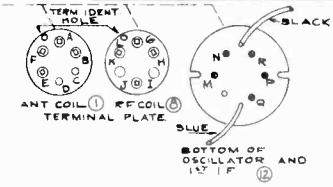
PART	FUNCTION	PRIMARY RESIST.	PRIMARY IDENT *	SECONDARY RESIST.	SECONDARY IDENT *
(1)	ANT COIL	21 Ω	A To B	2.5 Ω	E To F
(8)	RF COIL	72 Ω	L To G	4 Ω	H To J
(12)	OSCILLATOR	6 Ω	M To P		
(17)	1ST I F	70 Ω	R To BLUE	67 Ω	BLACK To GREEN
(19)	2ND I F	90 Ω	RED To BLUE	86 Ω	GREEN To BLACK
(40)	OUTPUT	550 Ω	GREEN To BROWN		
(64)	CHOKE	325 Ω	BLACK To GND		
(60)	POWER	3 Ω	BLACK To GREEN	860 Ω	RED To BLUE

SOCKET VOLTAGE

TUBE	STAGE	FIL.	PLATE	CATH.	SCREEN	OUTPUT GRID BIAS MEASURED ACROSS (62) CHOKE
77	RF	6.0	186	1.8	84	
77	DET-OSC	6.0	185	9	135	
78	I F	6.0	190	6.5	84	
75	2ND DET	6.0	117	1.5		
42	OUTPUT	6.0	226	0	242	-15
84	RECTIFIER	6.0				

NOTE ALL VOLTAGE READINGS WITH A VOLT METER HAVING A RESISTANCE OF 1000 Ω PER VOLT

TERM IDENT HOLE



SERVICE PARTS LIST MODEL 636

Dia. #	Part #	Description
1	RC 95128	Antenna coil
2	CC 958	Antenna spark trap
3	SA 106386	.05 mfd. 200 V. cond.
4	SA 105278	100,000 ohm ½ W. res.
5	CQ 9542	3 gang condenser
6	SA 106386	.05 mfd. 200 V. cond.
7	SA 105264	500 ohm ½ W. resistor
8	RC 95130	R.F. coil
9		Twisted wire
10	SA 103852	.002 mfd. 600 V. cond.
11	SA 105247	7500 ohm ½ W. resistor
12	RC 95132	Composite coil
13	SA 105245	2000 ohm ½ W. resistor
14	SA 102492	.05 mfd. 400 V. cond.
15	SA 106386	.05 mfd. 200 V. cond.
16	SA 105270	2500 ohm ½ W. resistor
17	SA 102497	.25 mfd. 200 V. cond.
18	CW 951	.1 mfd. 200 V. cond.
19	IC 951	I.F. coil
20	CM 9513	.0001 mfd. mica cond.
21	SA 105276	50,000 ohm ½ W. res.
22	CM 9513	.0001 mfd. mica cond.
23	VR 9524	Volume control
24	SA 103659	.006 mfd. 400 V. cond.
25	SA 105281	1 meg. ½ W. resistor
26	SA 105246	½ meg. ½ W. resistor
27	CM 9513	.0001 mfd. mica cond.
28	SA 105246	½ meg. ½ W. resistor
29	SA 105249	5000 ohm ½ W. res.
30	SA 102497	.25 mfd. 200 V. cond.
31	SA 103852	.002 mfd. 600 V. cond.
32	SA 105278	100,000 ohm ½ W. res.
33	SA 103659	.006 mfd. 400 V. cond.
34	SA 105279	½ meg. ½ W. resistor
35	CW 951	.1 mfd. 200 V. cond.
36	SA 105279	½ meg. ½ W. resistor
37	SA 106403	.001 mfd. 600 V. cond.
38	VR 9525	Tone control
39	CW 952	.005 mfd. 600 V. cond.
40	TR 952	Output transformer
41	SA 105277	75,000 ohm ½ W. res.
42	SA 105274	20,000 ohm ½ W. res.
43	SA 105274	20,000 ohm ½ W. res.
44	SA 102492	.05 mfd. 400 V. cond.
45	SA 102496	.25 mfd. 400 V. cond.
46	SA 107572	5000 ohm 1 W. res.
47	CM 951	.001 mfd. mica cond.
48	DM 951	Speaker diaphragm
49	SK 955	Speaker
50	FU 951	Fuse (20 amperes)
51	RC 9512	Filter choke
52	CM 953	.00005 mfd. mica cond.
53	SW 9539	Switch assembly complete less cables
54	SA 105452	Filter choke
55	SA 105452	Filter choke
56	CW 958	.5 mfd. 200 V. cond.
57	CW 958	.5 mfd. 200 V. cond.
58	LP 956	Pilot light - 6 V.- .20 amperes)
59	VI 951	Vibrator
60	TR 953	Power transformer
61	SA 106804	.008 mfd. 1600 V. cond.
62	TR 951	"B" choke
63	CE 951	6 & 10 mfd. electrolytic condenser
64	CW 951	.001 mfd. mica cond.
65	CC 959	Spark trap

Part #	Description
	MAIN ASSEMBLIES
CH 9582	Chassis assembly
CU 9517	Tuning unit (less shafts)
SK 955	Speaker
	NUTS
FP 106639	Thumb nut for ant. & bat. cable
NT 104935	Nut for mounting studs
	SCREWS AND STUDS
FP 104892	Thumb screws on housing cover
FP 106571	Mounting studs
SC 1026CA	Self-tapping screw (#6 x 1" long)
SC 101700	Self-tapping screw (#7 x ¼" long)
	TUBE SOCKETS & TUBE SHIELDS
SA 104617	Tube socket - 6 prong
SA 104616	Tube socket - 5 prong
SO 953	Tube socket - 4 prong
BE 956	Base for tube shield
CV 954	Tube shield - long
CV 9516	Tube shield - short

Part #	Description
	WASHERS, BUSHINGS & SPACERS
WA 2-12 CA	Mounting washer
WA 7-10	Mounting lock washer
IS 1002	Rubber bushing for variable condenser
FP 104086	Spacer for speaker plug
SR 953	Spacer for variable condenser rubber bushing
	SPEAKER PARTS (SK 955)
CL 9513	Speaker field coil
DM 951	Diaphragm & voice coil assy.
FA 958	Silk speaker grill cloth
CB 9528	Speaker cable with 4 prong plug
SA 107279	Cover for speaker plug
SA 107278	Speaker plug
	MISCELLANEOUS
SH 9537	Variable condenser shaft with pinion
KT 956	Spark plug suppressor kit
DS 956	Dial indicator disc
DS 9547	Glass dial scale
SP 9537	Spring for dial glass
GA 959	Gasket for dial glass
SW 9541	Switch assembly complete with cables

MODEL 637

All parts for Model 637 same as for Model 636 except for the following parts:

Dia. #	Part #	Description
49	SK 9522	Header speaker
		MAIN ASSEMBLIES
	SK 9522	Header speaker
		MISCELLANEOUS
	CB 9576	Speaker cable
	CB 956	Internal speaker cable

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes	2 #77, 1 #78, 1 #75, 1 #42, 1 #84 - Total 6
Battery Current (6.3 Volt Battery)	0.6 Amperes
Tuning Range	540 to 1500 K.C.
Maximum Undistorted Output	4.0 Watts
Maximum Output	4.0 Watts
Line-up Frequencies	I.F. 175 K.C., 1400 K.C., 1500 K.C.

MODELS 636, 637
Socket, Trimmers
Chassis, Alignment
Vibrator Adjustment

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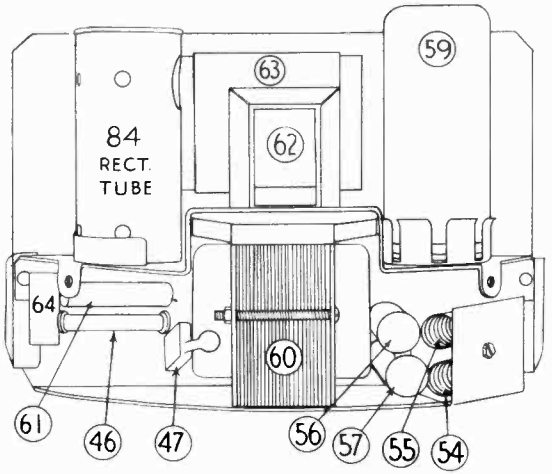
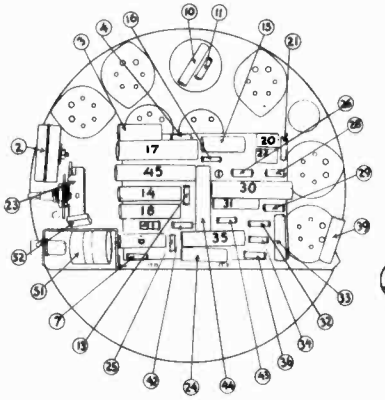




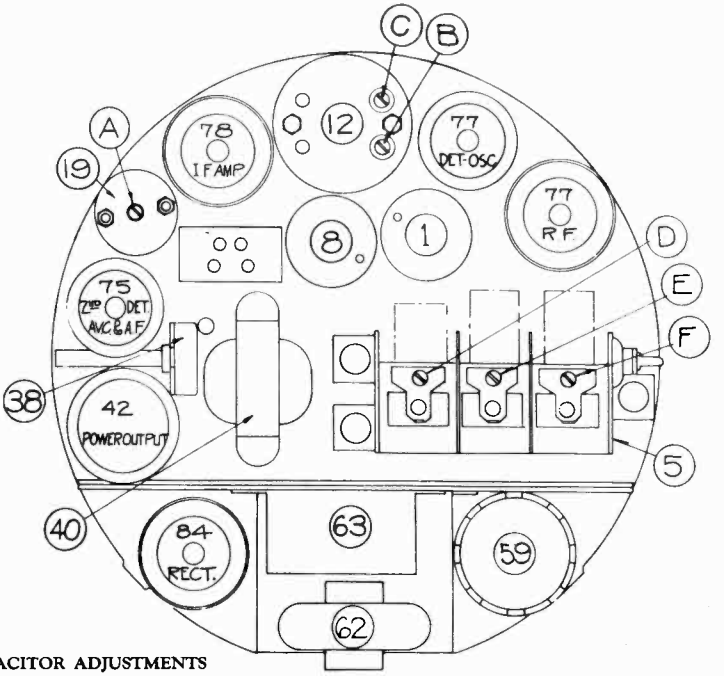


Figure No. 3

INSTRUCTIONS FOR ADJUSTING VIBRATOR

After the vibrator has been in use for some time, it may refuse to start operating. This indicates worn tungsten contact points. Since a reserve supply of tungsten is available, a simple adjustment can be made to prolong the life of the vibrator.

1. Remove the vibrator unit from its housing by removing the tension spring with a pair of round nosed pliers.

2. Remove the rubber sock, being careful not to bend the wires at the soldered connections.

3. Lay the vibrator on a piece of white paper so that when viewed from above it appears exactly as shown in Fig. 1.

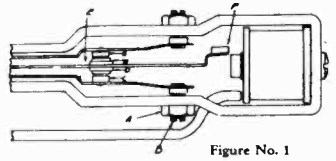


Figure No. 1

4. Loosen lock nut "A" and turn screw "B" clockwise until .005" of light can be seen between contacts "C" and "D". If the contact points are somewhat roughened, light cannot be seen across their entire diameter, even though they are correctly replaced, that is within .005" of touching each other.

5. A simple check on the correctness of the spacing adjustment is obtained by pressing lightly against the center of the reed with a small nail in the direction and location shown by arrow "E". When the reed is thus moved so as to close contacts "C" and "D", the weight "F" on the free end of the reed should move 1/64" from its "at rest" position. This check should be made after lock nut "A" has been firmly retightened.

6. Do not readjust the spacing between contacts "G" and "H" unless the tungsten is nearly all worn away. In this case, re-adjustment may be made the same as for contacts "C" and "D".

7. In re-inserting the vibrator into its rubber sock, be very careful to turn the "flats" of the sock hole so that they are parallel to the flat side of the vibrator frame. This provides ample space in the sock for the free movement of the reed. Make certain that the slot in the prong terminal plate engages the small projection on the inside edge of the housing. Then replace the tension spring. THESE INSTRUCTIONS DO NOT APPLY TO ANY OTHER TYPES OF VIBRATORS.

LINE-UP CAPACITOR ADJUSTMENTS

All the adjustable capacitors, commonly called trimmer condensers, are very accurately adjusted at the factory and will not need any further adjustment unless a coil or I.F. transformer is changed or the adjustments are tampered within the field. Therefore, DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary, and a high grade modulated test oscillator is available. In such a case, proceed as follows, referring to Fig. #2.

1. Set test oscillator to 175 K.C.

2. Set condenser gang to approximately 600 K.C. This will be at a point where the condenser plates are nearly all in mesh.

3. Connect output meter across voice coil of speaker. This may be done by connecting one lead of the output meter to the blue lead of the speaker terminal strip and the other lead to the frame of the chassis. The impedance of the voice coil is 3. ohms.

4. Apply test signal to grid of 78 K.F. tube thru a .5 mfd. blocking condenser and adjust trimmer "A" to maximum output reducing output of test oscillator as required.

Figure No. 2

5. Apply test signal to grid of 77 first detector-oscillator and adjust trimmers "B" and "C" to maximum output.

6. Set test oscillator to 1500 K.C. and rotate condenser gang until the plates are wide open. Place a piece of paper (approx. .015 thick) between the rotor and stator plates at the bottom of the gang and close the rotor down to this spacing. This is the exact setting of the condenser gang for the receiver oscillator at 1500 K.C. and should be carefully set as the resultant alignment of the receiver is directly dependent upon it.

7. Adjust trimmer "D" to maximum output and then remove the paper gauge.

8. Set test oscillator and condenser gang to 1400 K.C.

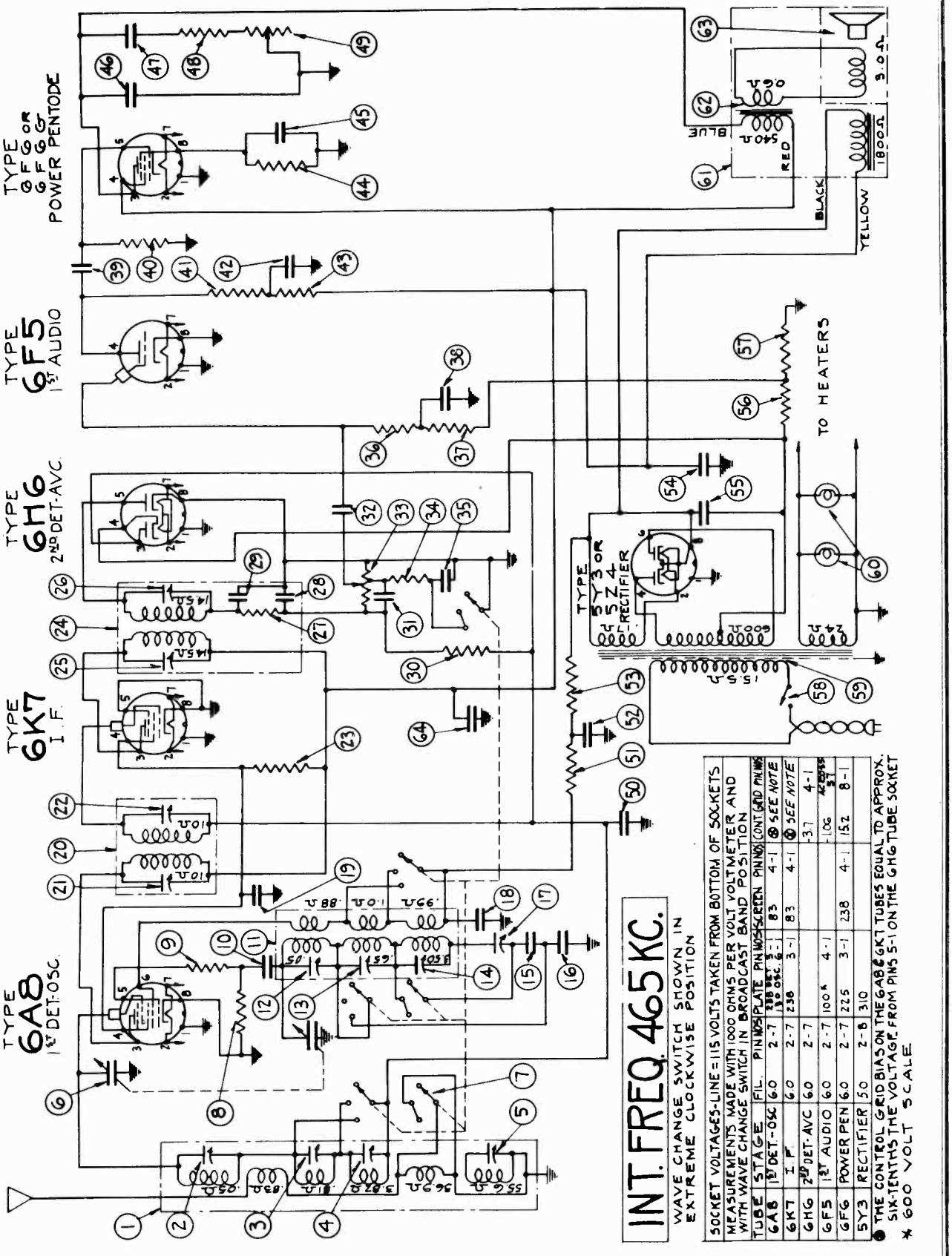
9. Apply test signal to grid of 77 R.F. tube and adjust trimmer "E" to maximum output.

10. Apply test signal to antenna lead thru a .0002 mfd. condenser and adjust trimmer "F" to maximum output.

11. Check sensitivity at several points.

MODEL 640
Preliminary
Schematic
Voltage

UNITED AMERICAN BOSCH CORP.



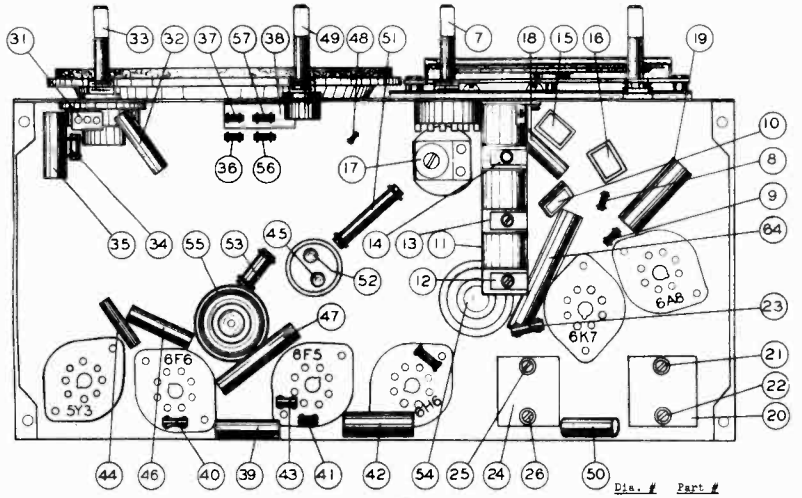
SOCKET VOLTAGES-LINE=115 VOLTS TAKEN FROM BOTTOM OF SOCKETS
MEASUREMENTS MADE WITH 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL.	PIN NO'S	PLATE	PIN NO	SCREEN	PIN NO	CONT. GRID	PIN NO
6A8	1ST DET-OSC	6.0	2-7	180 ● 250 OSC.	5-1	83	4-1	● SEE NOTE	
6K7	I F	6.0	2-7	230	3-1	83	4-1	● SEE NOTE	
6H6	2ND DET-AVC	6.0	2-7					-3.7	4-1
6F5	1ST AUDIO	6.0	2-7	100 *	4-1			-.06	ACROSS #1
6F6	POWER PEN	6.0	2-7	225	3-1	238	4-1	-15.2	8-1
5Y3	RECTIFIER	5.0	2-8	310					

● THE CONTROL GRID BIAS ON THE 6A8 & 6K7 TUBES EQUAL TO APPROX. SIX-TENTHS THE VOLTAGE FROM PINS 5-1 ON THE 6H6 TUBE SOCKET
* 600 VOLT SCALE

MODEL 640
Preliminary
Socket, Trimmers
Alignment, Parts

UNITED AMERICAN BOSCH CORP.



ADJUSTMENT OF BROADCAST BAND
(540 to 1550 K.C.)

1. Set wave change switch to standard broadcast band position.
2. Set test oscillator and dial indicator to 1400 K.C.
3. Apply the test signal to the antenna of the receiver through a .0002 mfd. blocking condenser and adjust the oscillator trimmer condenser #14 until the signal is received.
4. Adjust the preselector trimmer #4 to maximum output.
5. Set the test oscillator and dial indicator to 600 K.C. and adjust the oscillator series condenser #1 until the signal is received. Tune the variable condenser to a slightly lower frequency and readjust trimmer #17 to maximum output. If the sensitivity increases, continue this trial and error method in the same direction until no further improvement in sensitivity can be made. If the sensitivity decreases, try this adjustment at slightly higher frequencies.

ADJUSTMENT OF GREEN BAND

1. Set the wave change switch to the green band position.
2. Set the test oscillator and dial indicator to 4000 K.C. and adjust the oscillator trimmer condenser #13 until the signal is tuned in.
3. Adjust the preselector trimmer condenser #3 to maximum output.
4. Check the sensitivity and calibration over scale.

ADJUSTMENT OF RED BAND

1. Set the wave change switch to the red band position.
2. Set the test oscillator and dial indicator to 15000 K.C. and adjust the oscillator trimmer condenser #12 until the signal is received. Two positions may be found at which the signal may be tuned in. Use the position with the lower capacity trimmer setting or with the alignment screw turned farther out.
3. Adjust the preselector trimmer #2 to maximum output.
4. Check the receiver over scale for calibration and sensitivity.

GENERAL DESCRIPTION

This model is a six-tube, three-band, superheterodyne receiver whose circuits employ all-metal tubes. The circuit employs a type 6A8 tube as a combined first detector-oscillator, a type 6K7 tube as an intermediate frequency amplifier, a type 6H6 tube as a second detector and automatic volume control, a type 6F5 tube as a first audio frequency amplifier, a type 6F6 as an output amplifier, and a type 5Y3 tube as a rectifier.

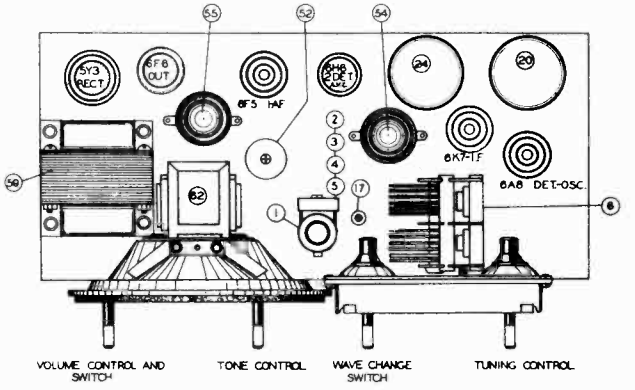
LINE-UP CAPACITOR ADJUSTMENTS

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 should 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 #1 and #2 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (456 K.C.)

1. Set volume control to maximum position.
2. Connect output meter across voice coil of speaker.
3. Set test oscillator to 465 K.C., and apply signal to grid of 6K7 I.F. tube through a 0.5 mfd. blocking condenser.
4. Adjust trimmers #25 and #26 to maximum output, reducing output of test oscillator as required.
5. Apply test signal to grid of 6A8 first detector-oscillator tube and adjust trimmers #21 and #22 to maximum output.
6. Apply test signal to antenna of receiver.
7. Adjust trap coil trimmer #5 to minimum output.



PARTS LIST
MODEL 640

Type and Number of Tubes ..... 1 #6A8, 1 #6K7, 1 #6H6, 1 #6F5, 1 #6F6, 1 #5Y3 - Total 6
Power Supply Characteristics ..... 105-125 volts, 50-60 cycle A.C.
Power Consumption ..... 47 Watts
Maximum Output ..... 3 Watts
Maximum Undistorted Output ..... 2.4 Watts

Tuning Ranges ..... (Black Band - 540 to 1550 K.C.
(Green Band - 1500 to 4500 K.C.
(Red Band - - 5500 to 16500 K.C.

Line-Up Frequencies ..... I.F. 465 K.C., 1400 K.C., 600 K.C., 4000 K.C.

Dia. #	Part #	Description of Parts
1	RC 95202	Preselector coil assembly
2		Trimmer condenser - 4-25 mmf. - part of RC 95202
3		Trimmer condenser - 1.5-10 mmf. - part of RC 95202
4		Trimmer condenser - 1.5-10 mmf. - part of RC 95202
5		Trimmer condenser - 30-80 mmf. - part of RC 95202
6	CG 9549	Variable tuning condenser
7	SW 9548	Wave change switch
8	RE 9575	50,000 ohm, 1/4 W. resistor
9	RE 9582	200 ohm, 1/4 W. resistor
10	SA 106417	.0001 mfd. mica condenser
11	RC 95203	Oscillator coil assembly
12		Trimmer condenser - 4-25 mmf. - part of RC 95203
13		Trimmer condenser - 1.5-10 mmf. - part of RC 95203
14		Trimmer condenser - 1.5-10 mmf. - part of RC 95203
15	CM 9525	.0027 mfd. mica condenser
16	CM 9524	.0034 mfd. mica condenser
17	CS 9545	300-600 mmf. lag condenser
18	CW 4-005	.005 mfd., 400 V. condenser
19	CW 2-10	.1 mfd., 200 V. condenser
20	IC 9572	First I.F. coil assembly
21		Trimmer condenser - 45-135 mmf. - part of IC 9572
22		Trimmer condenser - 45-135 mmf. - part of IC 9572
23	SA 105251	40,000 ohm, 1/4 W. resistor
24	IC 9574	Second I.F. coil assembly
25		Trimmer condenser - 30-100 mmf. - part of IC 9574
26		Trimmer condenser - 30-100 mmf. - part of IC 9574
27		50,000 ohm, 1/4 W. resistor - part of IC 9574
28		.0001 mfd. mica condenser - part of IC 9574
29		.0001 mfd. mica condenser - part of IC 9574
30	RE 9577	2 meg., 1/2 W. resistor
31	CM 9519	.0005 mfd. mica condenser
32	CW 4-02	.02 mfd., 400 V. condenser
33	VR 9533	Volume control .5 meg.
34	RE 9568	25,000 ohm, 1/4 W. resistor
35	CW 4-01	.01 mfd., 400 V. condenser
36	RE 9574	1 meg., 1/4 W. resistor
37	RE 9575	50,000 ohm, 1/4 W. resistor
38	CW 2-05	.05 mfd., 200 V. condenser
39	CW 4-02	.02 mfd., 400 V. condenser
40	RE 9572	.5 meg., 1/4 W. resistor
41	RE 9531	250,000 ohm, 1/4 W. resistor
42	CW 2-10	.1 mfd., 200 V. condenser
43	RE 9581	50,000 ohm, 1/4 W. resistor
44	SA 107391	500 ohm, 1 W. resistor
45		10 mfd., 25 V. condenser - part of CE 9537
46	CW 4-005	.005 mfd., 400 V. condenser
47	CW 4-05	.05 mfd., 400 V. condenser
48	RE 9550	2000 ohm, 1/4 W. resistor
49	VR 9534	Tone control, 20,000 ohm
50	CW 2-05	.05 mfd., 200 V. condenser
51	SA 101722	30,000 ohm, 1 W. resistor
52		4 mfd., 450 V. electrolytic condenser - part of CE 9537
53	SA 100826	10,000 ohm, 1/2 W. resistor
54	CE 9535	16 mfd., 500 V. electrolytic condenser
55	CE 9536	12 mfd., 450 V. electrolytic condenser
56	RE 9589	65 ohm, 1/4 W. resistor
57	RE 9556	25 ohm, 1/4 W. resistor
58		On-Off switch - part of VR 9533
59	TR 9555	Power transformer

Dia. #	Part #	Description of Parts
60	LP 961	Dial lamp
61	SK 9536	Speaker assembly
62	SA 107357	Output transformer
63	SA 106617	Diaphragm and voice coil assembly
64	CW 4-10	.1 mfd., 400 V. condenser

Part #	Description of Parts
	MAIN ASSEMBLIES
CH 95104	Chassis assembly
KA 9540	Cabinet
SK 9536	Speaker
	BRACKETS, CLIPS AND CLAMPS
BK 95201	Dial mounting bracket on variable condenser
BK 95202	Bracket over dial scale
BK 95182	Large electrolytic condenser mounting bracket
BK 95195	Small electrolytic condenser mounting bracket
	CABLES AND CABLE ASSEMBLY
CB 9541	Antenna and ground cables
CB 9512	Line cable assembly
PR 106282	Copper braid
PR 97160	Dial drive belt
	SCREWS AND NUTS
SC 953	Felt foot and chassis mounting screw
SC 97081	Dial indicator set screw
SC 102441	Set screw for pulley
	WASHERS, BUSHINGS AND SPACERS
WA 106339	Chassis mounting washers
SR 953	Spacer for variable condenser mounting
SR 9519 CA	Spacer for vernier drive mounting
	MISCELLANEOUS
GA 9511	Dial gasket
KN 9561	Knob - spring type
KN 9563	Knob - set screw type
SO 9520	Dial lamp socket
DS 9564	Dial scale
PL 9563	Masking plate
SI 9548	Dial indicator assembly
PU 9519	Pulley - dial driven
SE 9540	Vernier drive assembly
SP 9540	Spring for dial scale
IS 1002	Rubber bushing - condenser mounting
SO 956	Tube socket - 8 prong
SA 107273	Copper washer assembly

MODEL 650
Preliminary
Schematic
Voltage

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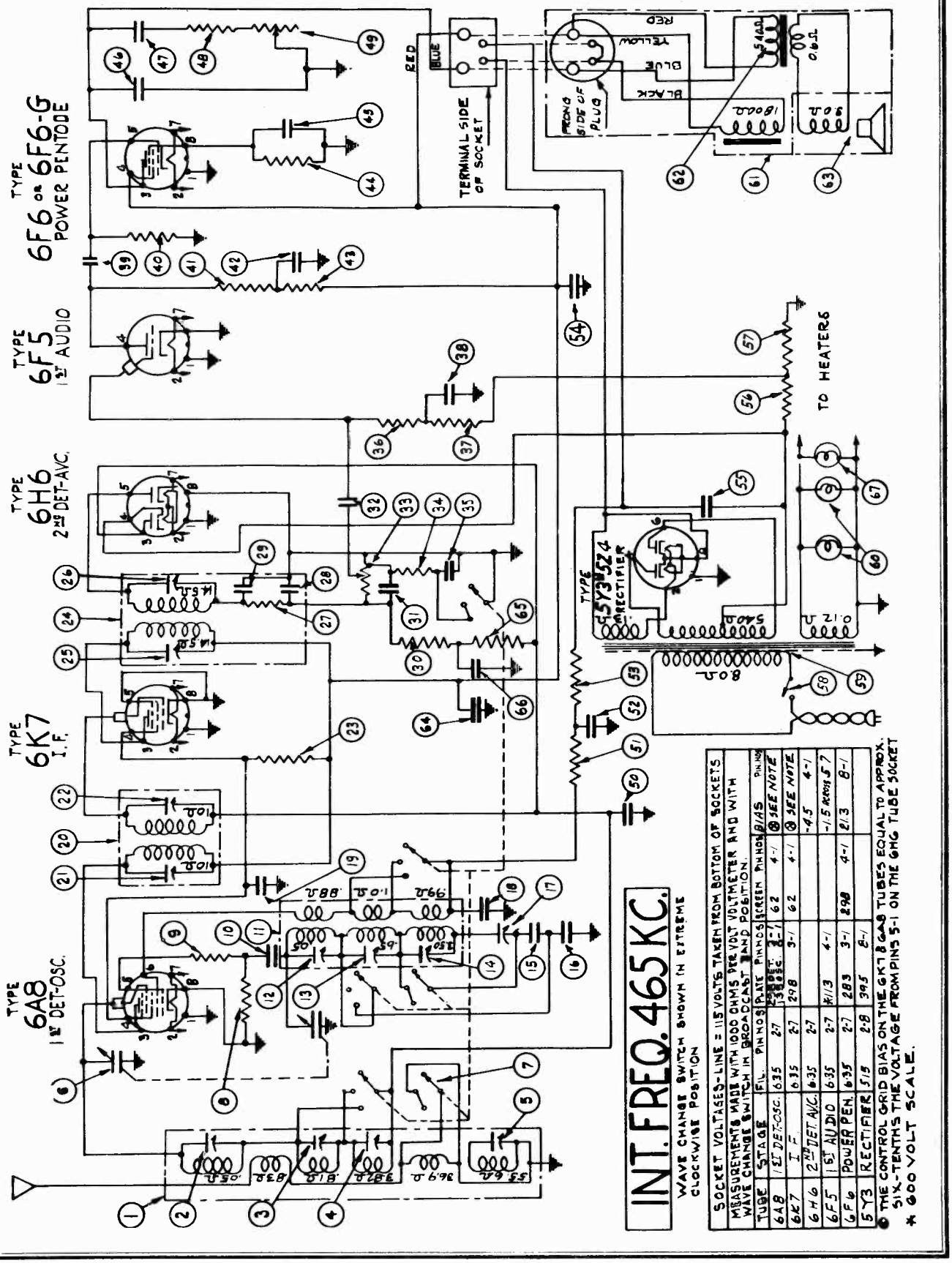


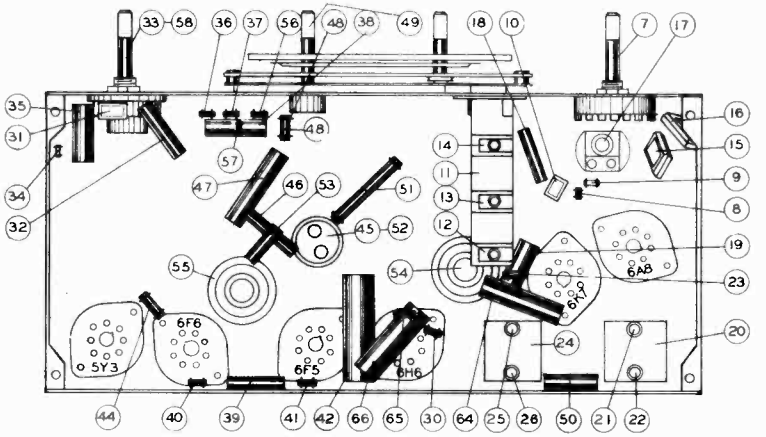
SOCKET VOLTAGES—LINE = 115 VOLTS TAKEN FROM BOTTOM OF SOCKETS
MEASUREMENTS MADE WITH 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE CHANGE SWITCH IN BROADCAST BAND POSITION.

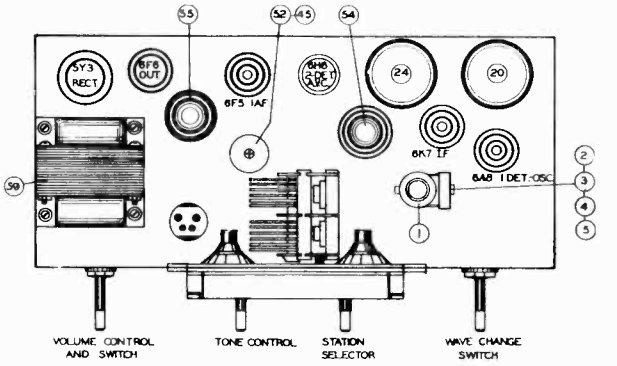
TUBE	STAGE	FIL.	PIN NOS.	PLATE	PIN NOS.	SCREEN	PIN NOS.	BIAS	PIN NOS.
6A8	1ST DET-OSC.	6.35	2-7	250 SEE NOTE	3-1	62	4-1	⊛ SEE NOTE	
6K7	I.F.	6.35	2-7	298	3-1	62	4-1	⊛ SEE NOTE	4-1
6H6	2ND DET. AVC.	6.35	2-7					-4.5	4-1
6F5	1ST AUDIO	6.35	2-7	#1/3	4-1			-1.5 APPROX.	4-7
6F6	POWER PEN.	6.35	2-7	283	3-1	298	4-1	21.3	8-1
5Y3	RECTIFIER	5.15	2-8	395	8-1				

⊛ THE CONTROL GRID BIAS ON THE 6K7 & 6A8 TUBES EQUAL TO APPROX. SIX-TENTHS THE VOLTAGE FROM PINS 5-1 ON THE 6H6 TUBE SOCKET
* 600 VOLT SCALE.

MODEL 650
Preliminary
Socket, Trimmers
Alignment, Parts

UNITED AMERICAN BOSCH CORP.





AMERICAN-BOSCH RADIO MODEL 650

Six-Tube, Three-Band, Superheterodyne Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes	1 #6A8, 1 #6K7, 1 #6H6, 1 #6F5, 1 #6F6, 1 #5Y3 - Total 6
Power Supply Characteristics	105-125 volts, 50-60 cycle A.C.
Power Consumption	62 Watts
Maximum Output	3.5 Watts
Maximum Undistorted Output	2.6 Watts
Tuning Ranges	(Black Band - 540 to 1550 K.C. (Green Band - 1500 to 4500 K.C. (Red Band - - 5500 to 16500 K.C.
Line-Up Frequencies	I.F. 465 K.C., 1400 K.C., 600 K.C., 4000 K.C.

GENERAL DESCRIPTION

This model is a six-tube, three-band, superheterodyne receiver whose circuits employ all-metal tubes. The circuit employs a type 6A8 tube as a combined first detector-oscillator, a type 6K7 tube as an intermediate frequency amplifier, a type 6H6 tube as a second detector and automatic volume control, a type 6F5 tube as a first audio frequency amplifier, a type 6F6 as an output amplifier, and a type 5Y3 tube as a rectifier.

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 should 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 #1 and #2 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (456 K.C.)

1. Set volume control to maximum position.
2. Connect output meter across voice coil of speaker.
3. Set test oscillator to 465 K.C., and apply signal to grid of 6K7 I.F. tube through a 0.2 mfd. blocking condenser.
4. Adjust trimmers #25 and #26 to maximum output, reducing output of test oscillator as required.
5. Apply test signal to grid of 6A8 first detector-oscillator tube and adjust trimmers #21 and #22 to maximum output.
6. Apply test signal to antenna of receiver.
7. Adjust trap coil trimmer #5 to minimum output.

ADJUSTMENT OF BROADCAST BAND
(540 to 1550 K.C.)

1. Set wave change switch to standard broadcast band position.
2. Set test oscillator and dial indicator to 1400 K.C.
3. Apply the test signal to the antenna of the receiver through a .0002 mfd. blocking condenser and adjust the oscillator trimmer condenser #14 until the signal is received.
4. Adjust the preselector trimmer #4 to maximum output.
5. Set the test oscillator and dial indicator to 600 K.C. and adjust the oscillator series condenser #17 until the signal is received. Tune the variable condenser to a slightly lower frequency and readjust trimmer #17 to maximum output. If the sensitivity increases, continue this trial and error method in the same direction until no further improvement in sensitivity can be made. If the sensitivity decreases, try this adjustment at slightly higher frequencies.

ADJUSTMENT OF GREEN BAND

1. Set the wave change switch to the green band position.
2. Set the test oscillator and dial indicator to 4000 K.C. and adjust the oscillator trimmer condenser #13 until the signal is tuned in.
3. Adjust the preselector trimmer condenser #3 to maximum output.
4. Check the sensitivity and calibration over scale.

ADJUSTMENT OF RED BAND

1. Set the wave change switch to the red band position.
2. Set the test oscillator and dial indicator to 15000 K.C. and adjust the oscillator trimmer condenser #12 until the signal is received. Two positions may be found at which the signal may be tuned in. Use the position with the lower capacity trimmer setting or with the alignment screw turned farther out.
3. Adjust the preselector trimmer #2 to maximum output.
4. Check the receiver over scale for calibration and sensitivity.

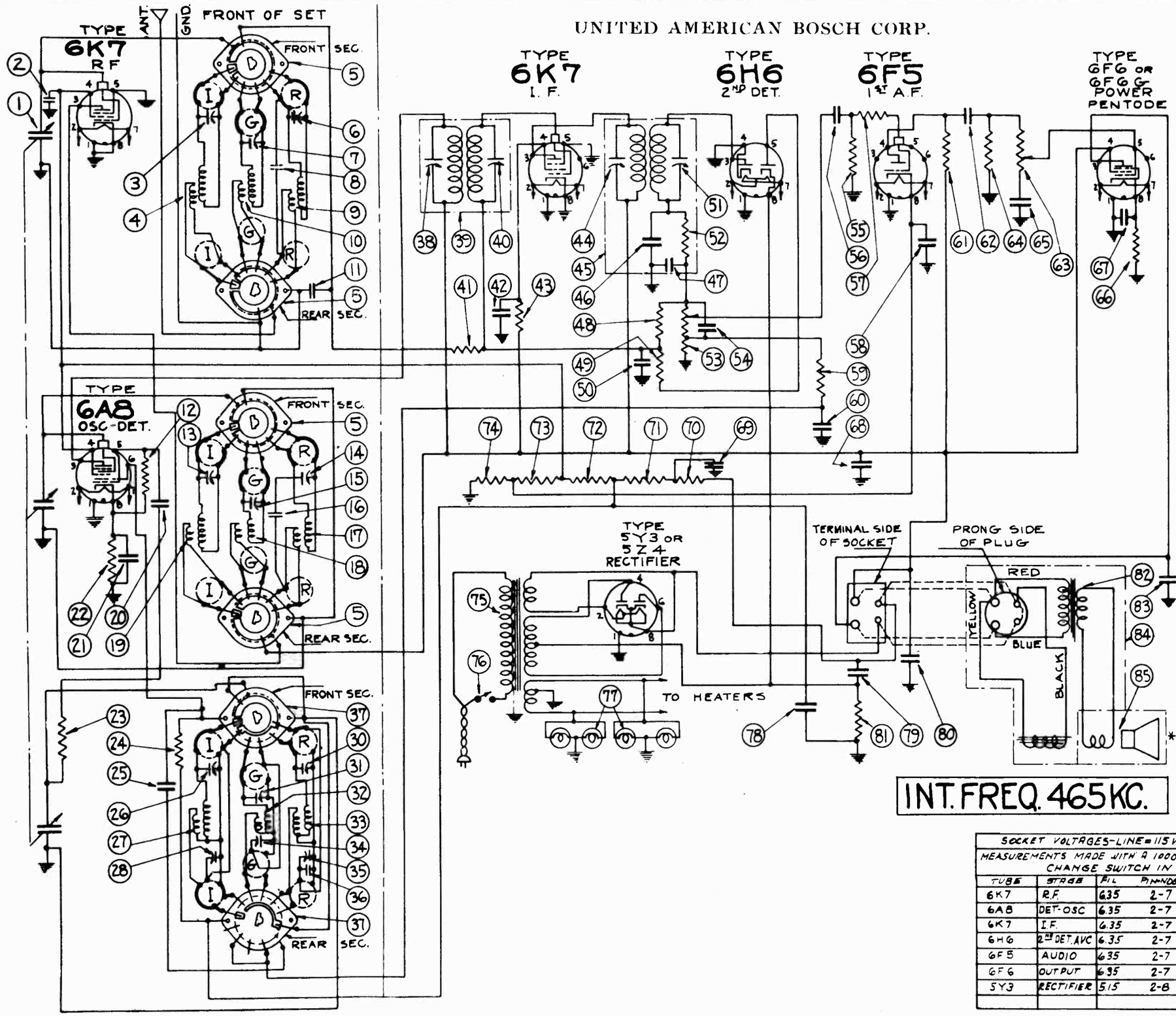
SERVICE PARTS LIST MODEL 650

Dia. #	Part #	Description of Parts
1	RC 95202	Preselector coil assembly
2		4-25 mmf. trimmer condenser - part of RC 95202
3		1.5-10 mmf. trimmer condenser - part of RC 95202
4		1.5-10 mmf. trimmer condenser - part of RC 95202
5		30-60 mmf. trimmer condenser - part of RC 95202
6	CG 9549	Variable condenser
7	SW 9546	Wave change switch
8	RE 9575	50,000 ohm, 1/4 W. resistor
9	RR 9582	200 ohm, 1/4 W. resistor
10	SA 106417	.0001 mfd. mica condenser
11	RC 95203	Oscillator coil assembly
12		4-25 mmf. trimmer condenser - part of RC 95203
13		1.5-10 mmf. trimmer condenser - part of RC 95203
14		1.5-10 mmf. trimmer condenser - part of RC 95203
15	CM 9525	.0027 mfd. mica condenser
16	CM 9524	.0034 mfd. mica condenser
17	CS 9545	300-600 mmf. lag condenser
18	CW -005	.005 mfd., 400 V. condenser
19	CW 2-10	.1 mfd., 200 V. condenser
20	IC 9572	I.F. coil assembly (First)
21		45-135 mmf. trimmer condenser - part of IC 9572
22		45-135 mmf. trimmer condenser - part of IC 9572
23	SA 105251	400,000 ohm, 1/4 W. resistor
24	IC 9574	I.F. coil assembly (Second)
25		30-100 mmf. trimmer condenser - part of IC 9574
26		30-100 mmf. trimmer condenser - part of IC 9574
27		50,000 ohm, 1/4 W. resistor - part of IC 9574
28		.0001 mfd. mica condenser - part of IC 9574
29		.0001 mfd. mica condenser - part of IC 9574
30	RE 9574	1 meg., 1/4 W. resistor
31	CM 9519	.0005 mfd. mica condenser
32	CW 4-02	.02 mfd., 400 V. condenser
33	VR 9535	.5 meg. volume control
34	RE 9527	5,000 ohm, 1/4 W. resistor
35	CW 2-05	.05 mfd., 200 V. condenser
36	RE 9574	1 meg., 1/4 W. resistor
37	RE 9575	50,000 ohm, 1/4 W. resistor
38	CW 2-05	.05 mfd., 200 V. condenser
39	CW 4-02	.02 mfd., 400 V. condenser
40	RE 9572	.5 meg., 1/4 W. resistor
41	RE 9531	.25 meg., 1/4 W. resistor
42	CW 2-10	.1 mfd., 200 V. condenser
43	RR 9581	50,000 ohm, 1/4 W. resistor
44	SA 107391	500 ohm, 1 W. resistor
45		10 mfd. electrolytic condenser - part of CE 9537
46	CW 4-005	.005 mfd., 400 V. condenser
47	CW 4-05	.05 mfd., 400 V. condenser
48	RE 9550	2000 ohm, 1/4 W. resistor
49	VR 9534	20,000 ohm, tone control
50	CW 2-05	.05 mfd., 200 V. condenser
51	SA 101722	30,000 ohm, 1 W. resistor
52		4 mfd. electrolytic condenser - part of CE 9537
53	SA 100825	10,000 ohm, 1/2 W. resistor
54		16 mfd., 300 V. electrolytic condenser - part of CE 9535
55		12 mfd., 450 V. electrolytic condenser - part of CE 9536
56	RE 9598	65 ohm, 1/4 W. resistor
57	RE 9556	25 ohm, 1/4 W. resistor
58		On & Off switch - part of VR 9533
59	TR 9557	Power transformer
60	LP 951	Dial light (6-8V)
61	SK 9613	Speaker assembly
62	TR 9515	Output transformer
63	SA 102916	Diaphragm and voice coil assembly
64	CW 4-10	.1 mfd., 400 V. condenser
65	RE 9574	1 meg., 1/4 W. resistor
66	CW 2-10	.1 mfd., 200 V. condenser
67	LP 9510	Dial light (6.3 V.)

Part #	Description of Parts
MAIN ASSEMBLIES	
CH 95103	Chassis assembly
SK 9513	Speaker assembly
KA 9531	Cabinet
BRACKETS, CLIPS AND CLAMPS	
BK 95203 CA	Bracket over dial scale
BK 95204	Dial lamp bracket
BK 95201	Dial scale bracket on variable condenser
BK 95182	Bracket for mounting large electrolytic condenser
BK 95195	Bracket for mounting small electrolytic condenser
CABLES AND CABLE ASSEMBLY	
CB 9541	Antenna and ground cables
CB 9512	Line cable assembly
PR 106282	Copper braid
PR 97160	Dial drive cable
SCREWS AND NUTS	
SC 19-16 CA	Chassis mounting screw
SC 97061	Set screw for dial indicator
SC 102441	Set screw for pulley
WASHERS, BUSHINGS AND SPACERS	
WA 106339	Chassis mounting washer
IS 1002	Rubber bushing for variable condenser mounting
SR 953	Spacer for variable condenser mounting
SR 9519 CA	Spacer - Vernier drive mounting
FP 101742	Cardboard washer for speaker
MISCELLANEOUS	
KN 9561	Knob - spring type
GA 9512	Dial gasket
KN 9563	Knob - set screw type
SI 9549	Dial indicator assembly
DS 9560	Dial scale
PL 9562	Masking plate
SO 9519	Dial lamp socket
SO 9520	Dial lamp socket - side
DS 9554	Dial scale
PL 9563	Masking plate
SI 9548	Dial indicator assembly
PU 9519	Pulley--dial driven
SH 954C	Vernier drive assemb
SP 9540	Springs for dial scale
SP 9539	Spring for dial drive cable
SO 956	Tube socket - 8 prong
SA 107257	Speaker socket
FP 101740	Copper ring for speaker
SA 107278	Speaker plug
SA 107279	Speaker plug cover

MODELS 660T, 660C
Preliminary
Schematic, Voltage
Coil Resistances

UNITED AMERICAN BOSCH CORP.



*THE CONTROL GRID BIAS ON THE 6K7 TUBES EQUAL TO APPROXIMATE SIX-TENTHS THE VOLTAGE FROM PINS 5-1 ON THE 6H6 TUBE SOCKET.

DC RESISTANCE MEASURED WITH WAVE-CHANGE SWITCH IN CORRESPONDING BAND POSITION			
COIL	DIA. No	PRIM	SEC.
I-ANT	4	18.5Ω	3.8Ω
I-RF	.9	0.8	10.7
I-OSC	2.7	1.4	3.3
G-ANT	10	2.1	1.0
G-RF	18	1.8	1.0
G-OSC	32	0.5	0.9
R-ANT	9	0.7	0.03
R-RF	17	2.0	0.03
R-OSC	33	0.5	0.05
1ST IF	39	8.6	8.6
2ND IF	45	8.6	8.6
OUTPUT TRANS	82	450	0.5
SPKR FIELD		1900	
VOICE COIL	85	3	

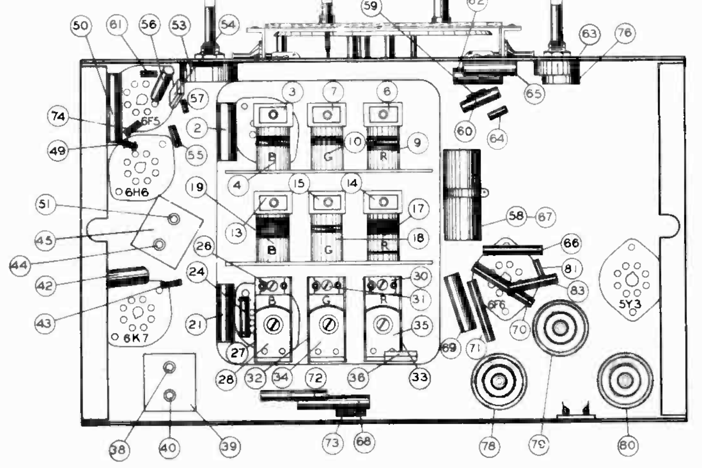
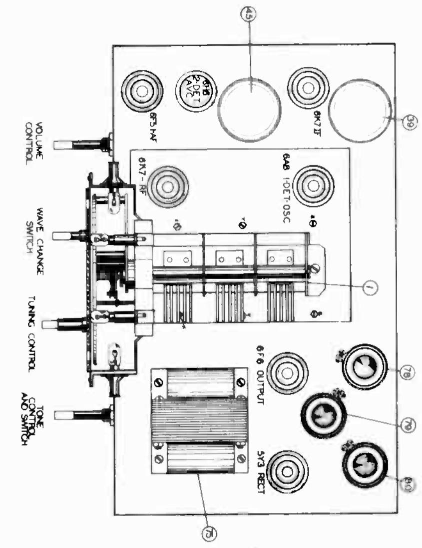
SOCKET VOLTAGES-LINE = 115 VOLTS TAKEN FROM BOTTOM OF SOCKETS
MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER S.W. WITH WAVE CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL	PINNOS	PLATE	PINNOS	SCREEN	PINNOS	BIAS	PINNOS
6K7	R.F.	6.35	2-7	263	3-1	94	4-1	* SEE NOTE	
6A8	DET-OSC	6.35	2-7	263 BAT / 267 AVC	3-1 / 6-1	94	4-1	2.7	8-1
6K7	I.F.	6.35	2-7	263	3-1	103	4-1	* SEE NOTE	
6H6	2ND DET. AVC	6.35	2-7					-5.5	8-1
6F5	AUDIO	6.35	2-7	111	4-1			1.1	8-1
6F6	OUTPUT	6.35	2-7	247	3-1	263	4-1	17.5	8-1
5Y3	RECTIFIER	5.15	2-8	380	8-1				

Circuit Data, Parts Alignment

UNITED AMERICAN BOSCH CORP.

MODELS 660T, 660C
Preliminary
Socket, Trimmers

AMERICAN-BOSCH CentrOmatic RADIO MODELS 660T-660C

Seven-Tube, Three-Band, Superheterodyne Receivers

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ..... 2 #6K7, 1 #6A8, 1 #6H6, 1 #6F5, 1 #6F6, 1 #5Y3 - 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 .... (White Band - 525 to 1800 KC. (Green Band - 1750 to 6000 KC. (Red Band - - 5800 to 18500 KC.
Line-Up Frequencies . I.F.465 KC.,1600 KC.,570 KC.,5500 KC.,1900 KC.,17000 KC.,&6000 KC.

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 "CentrOmatic" unit. 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 5Y3 rectifier supplies the direct current for energizing the tubes.

REMOVING INDIVIDUAL COIL AND SWITCH SECTIONS OF CENTROMATIC UNIT

If a component part located underneath the switch and coil assemblies of the "CentrOmatic" unit 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 two screws which fasten the mounting plate of the wave change switch shaft to the chassis. Pull switch shaft out straight.
2. Unsolder the stator and rotor leads from the gang condenser.
3. The fastening screws for the switch sections are located on top of the "CentrOmatic" unit and are indicated by X, Y and Z in Figure #1. Remove the corresponding screws.
4. 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 and the yellow plate supply lead to the switch will have to be unsoldered from the switch.

5. 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 "CentrOmatic" unit. This is IMPORTANT as the switch shaft cannot be inserted if the switch brackets do not line up.
6. Replace the section fastening screws.
7. Resolder the stator and rotor leads on the gang condenser.
8. 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.

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 #1 and #2 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 KC.)

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 KC. 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 through a .5 mfd. blocking condenser.
4. Adjust trimmers #44 and #51 to maximum output, reducing output of test oscillator as required.
5. Apply test signal to grid of 6A8 detector-oscillator and adjust #38 and #40 to maximum output.

ADJUSTMENT OF BROADCAST BAND

1. Set wave change switch to the White or Broadcast Band position.
2. Set test oscillator and dial indicator to 1600 KC.
3. Apply test signal to antenna terminal of chassis through a .0002 mfd. series condenser and adjust #26, #13 and #3 to maximum output.
4. Set test oscillator and dial indicator to 570 KC. and adjust #28 to maximum output, at the same time rocking the variable tuning condenser.
5. Return to 1600 KC. setting with both test oscillator and dial indicator and readjust #26, #13 and #3 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 KC. and adjust #31, #15 and #7 to maximum output.
3. Set test oscillator and dial indicator to 1900 KC. and adjust #34 to maximum output, at the same time rocking the variable tuning condenser.
4. Return to 5500 KC. setting and make readjustment of #31, #15 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 KC. and adjust #30, #14 and #6 to maximum output.
3. Set test oscillator and dial indicator to 6000 KC. and adjust #35 to maximum output, at the same time rocking the variable tuning condenser.
4. Return to 17000 KC. setting and make readjustment of #30, #14 and #6.

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 through the air vents making the condenser appear to be defective. If left in this position too long the condenser may be injured.

MODEL 660C

All service parts for Model 660C are the same as for Model 660T except for the following parts:

Dia. #	Part #	Description of Parts
84	SK 9513	Speaker assembly
85	SA 102916	Diaphragm and voice coil assembly

Part #	Description of Parts
	MAIN ASSEMBLIES
SK 9513	Speaker assembly
KA 9543	Cabinet
SC 101788	Chassis mounting screw

SERVICE PARTS LIST MODEL 660T

These prices supersede all previous prices and are subject to change without notice. U.S.A. Sales Tax included in prices of taxable parts.

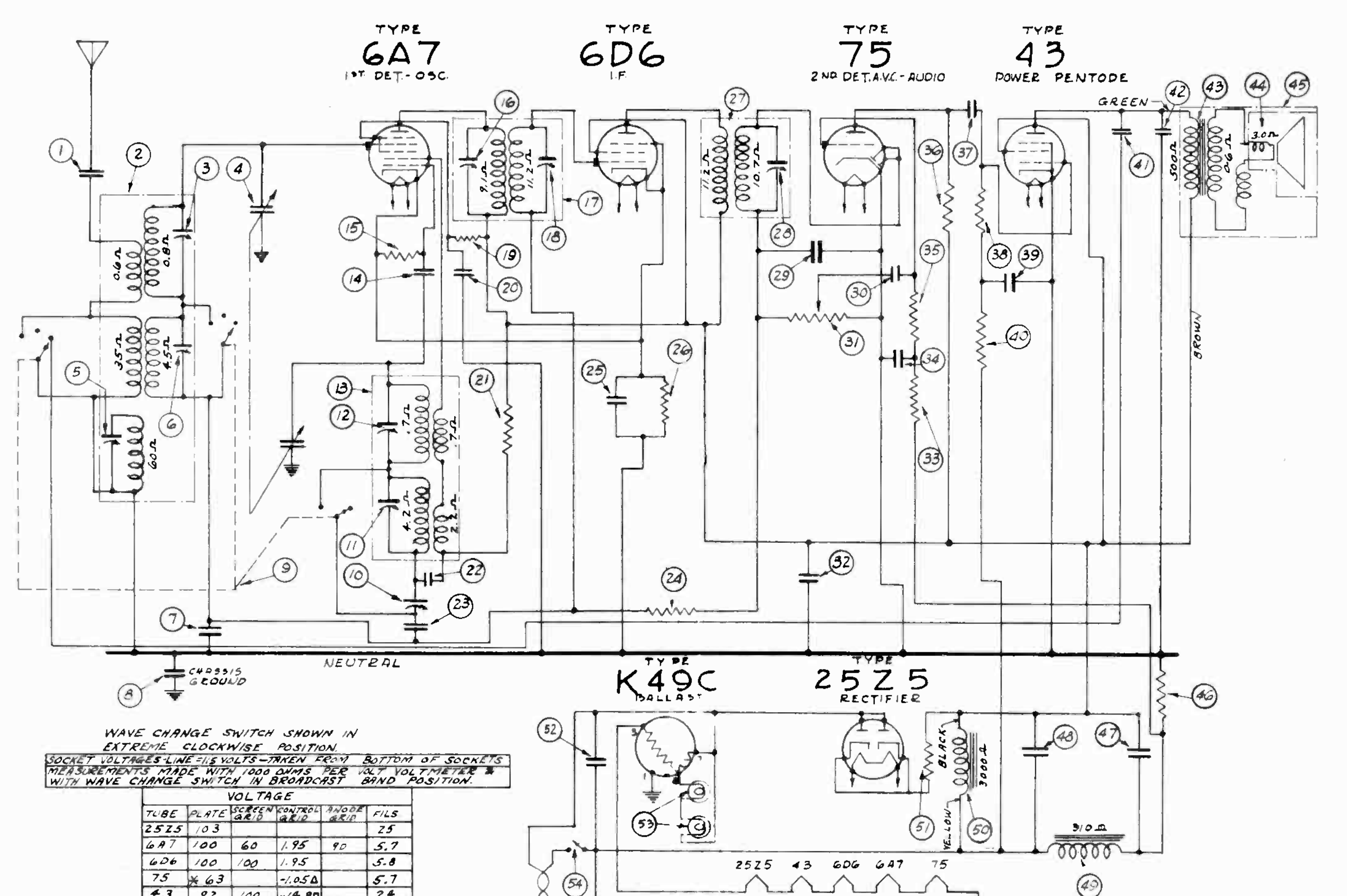
Consult Price Section Page R12 for Supplements and Changes.

Dia. #	Part #	Description of Parts
1	CG 9550	Variable condenser
2	CW 2-10	.1 mfd., 200 V. condenser
3	CS 9554	4-30 mmf., trimmer condenser
4	RC 95209	Antenna coil (broadcast)
5	SW 9553	Switch and bracket assembly - Antenna & R.F. Sections.
6	CS 9554	4-30 mmf. trimmer condenser
7	CS 9554	4-30 mmf. trimmer condenser
8		Twisted wire - part of RC 95206
9	RC 95206	Antenna coil - red band
10	RC 95212	Antenna coil - green band
11	CW 9513	.05 mfd., 200 V. condenser
12	RE 9563	50,000 ohm, 1/4 W. resistor
13	CS 9554	4-30 mmf., trimmer condenser
14	CS 9554	4-30 mmf., trimmer condenser
15	CS 9553	1.5-10 mmf., trimmer condenser
16	CM 9512	6 mmf., mica condenser
17	RC 95207	R.F. coil assembly - red
18	RC 95214	R.F. coil assembly - green
19	RC 95210	R.F. coil assembly (broadcast)
20	CM 9511	.000065 mfd., mica condenser
21	CW 2-05	.05 mfd., 200 V. condenser
22	RE 9529	300 ohm, 1/4 W. resistor
23	RE 9537	50 ohm, 1/4 W. resistor
24	RE 9526	5,000 ohm, 1 W. resistor
25	CW 9513	.05 mfd., 200 V. condenser
26		5-25 mmf., trimmer condenser - part of CS 9540
27	RC 95211	Oscillator coil (broadcast)
28		300-600 mmf., oscillator series cond. - part of CS 9540
30		3-15 mmf., trimmer condenser - part of CS 9520
31		3-15 mmf., trimmer condenser - part of CS 9520
32	RC 95213	Oscillator coil - green
33	RC 95208	Oscillator coil - red
34		800-1600 mmf., lag condenser - part of CS 9520
35		800-1600 mmf., lag condenser - part of CS 9520
36	CM 959	.002 mfd., mica condenser
37	SW 9553	Switch & bracket assembly - oscillator section
38		80-200 mmf. trimmer condenser - part of IC 9576
39	IC 9576	First I.F. coil assembly
40		80-200 mmf. trimmer condenser - part of IC 9576
41	RE 9573	.25 meg., 1/4 W. resistor
42	CW 2-05	.05 mfd., 200 V. condenser
43	SA 105277	75,000 ohm, 1/4 W. resistor
44		80-200 mmf., trimmer condenser - part of IC 9577
45	IC 9577	Second I.F. coil assembly
46		100 mmf., mica condenser - part of IC 9577
47		100 mmf., mica condenser - part of IC 9577
48	SA 105281	1 meg., 1/4 W. resistor
49	SA 105281	1 meg., 1/4 W. resistor
50	CW 2-05	.05 mfd., 200 V. condenser
51		80-200 mmf. trimmer condenser - part of IC 9577
52		50,000 ohm, 1/4 W. resistor - part of IC 9577
53	VR 9536	Volume control - .5 meg.
54	CM 9519	.0005 mfd., mica condenser
55	SA 105281	1 meg., 1/4 W. resistor
56	CW 2-02	.02 mfd., 200 V. condenser
57	RE 9584	.1 meg., 1/4 W. resistor
58	CE 9526	12 mfd., 25 V. condenser
59	SA 105249	5,000 ohm, 1/4 W. resistor
60	CW 2-05	.05 mfd., 200 V. condenser
61	RE 9573	.25 meg., 1/4 W. resistor
62	CW 4-02	.02 mfd., 400 V. condenser
63	VR 9512	Tone control - .5 meg.
64	RE 9585	.25 meg., 1/4 W. resistor
65	CW 2-001	.001 mfd., 200 V. condenser
66	SA 107391	500 ohm, 1 W. resistor
67		12 mfd., 25 V. condenser - part of CE 9526
68	CW 4-10	.1 mfd., 400 V. condenser
69	CW 4-10	.1 mfd., 400 V. condenser
70	SA 103835	10,000 ohm, 2 W. resistor
71	SA 107572	5,000 ohm, 2 W. resistor
72	SA 101401	15,000 ohm, 1 W. resistor
73	SA 104966	30,000 ohm, 1/2 W. resistor
74	SA 105260	300 ohm, 1/4 W. resistor
75	TR 9557	Power transformer
76		Switch (On & Off) - part of VR 9512
77	LP 9515	Dial lamp - 3.2 V.
78	CE 9528	8 mfd., 450 V. electrolytic condenser
79	CE 9536	12 mfd., 450 V. electrolytic condenser
80	CE 9535	16 mfd., 300 V. electrolytic condenser
81	RE 9583	75 ohm, 1/4 W. resistor
82	TR 9515	Output transformer
83	CW 4-005	.005 mfd., 400 V. condenser
84	SK 9511	Speaker
85	SA 107282	Diaphragm

Part #	Description of Parts
	MAIN ASSEMBLIES
CH 95107	Chassis assembly
SK 9511	Speaker assembly
KA 9542	Cabinet
	BRACKETS, CLIPS AND CLAMPS
BK 95209	Bracket assembly for idler pulley
BK 95206	Dial mounting bracket
BK 95211	Bracket assembly for top dial lamp socket
	CABLE AND CABLE ASSEMBLY
CB 9512	Line cable assembly
BT 951	Dial drive belt

MODEL 610
Preliminary
Schematic
Voltage, Parts

UNITED AMERICAN BOSCH CORP.



WAVE CHANGE SWITCH SHOWN IN EXTREME CLOCKWISE POSITION.

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

VOLTAGE					
TUBE	PLATE	SCREEN GRID	CONTROL GRID	ANODE GRID	FILS
25Z5	103				25
6A7	100	60	1.95	90	5.7
6D6	100	100	1.95		5.8
75	* 63		-1.05 Δ		5.7
43	92	100	-14.8 □		24
DROP ACROSS BALLAST					49

* 600 VOLT SCALE
Δ ACROSS POSITION 46
□ ACROSS POSITIONS 46 & 49

INT FREQ 465 K.C.

1	COND. .0005 MFD MICA	CM 9519	1
2	PRESELECTOR COIL	RC 95262A	1
3	TRIM COND (4-25)	PT OF RC 95262A	3
4	VARIABLE COND	CG 9548	3
5	TRIM COND (30-60)	PT OF RC 95262A	3
6	TRIM COND (1.5-10)	" " "	3
7	COND .1 200V	CW 2-10	
8	COND .1 600V	CW 6-10	
9	SWITCH (WAVE CHG)	SW 9562	2
10	LAG COND	CS 9545	1
11	TRIM COND (4-25)	PT OF RC 95199A	2
12	TRIM COND	" " "	2
13	OSC COIL ASSY	RC 95199A	2
14	COND .0001 MFD MICA	SA-106417	1
15	RES 50,000 Ω 1/4 W	RE 9561	1
16	TRIM COND (35-135)	PT OF IC 9586	3
17	1ST IF COIL ASSY	IC 9586	3
18	TRIM COND (35-135)	PT OF IC 9586	3
19	RES 20,000 Ω 1/4 W	RE 9536	1
20	COND .1 200V	CW 2-10	
21	RES 5,000 Ω 1/4 W	SA-105249	1
22	COND .1 200V	CW 2-10	
23	COND .00274 MFD MICA	CM 9525	1
24	RES. 500,000 Ω 1/4 W	RE 9572	1
25	COND .1 200V	CW 2-10	
26	RES. 150 Ω 1/4 W	SA 105257	1
27	2ND IF COIL ASSY	IC 9595	2
28	TRIM COND (30-60)	PT OF IC 9595	2
29	COND .0005 MFD MICA	CM 9519	1
30	COND .005 400V	CW4-005	
31	VOLUME CONTROL	VR 957	2
32	COND .1 200V	CW 2-10	
33	RES. 500,000 Ω 1/4 W	RE 9572	1
34	COND. .1 200V	CW 2-10	
35	RES. 500,000 Ω 1/4 W	RE 9572	1
36	RES 250,000 Ω 1/4 W	SA-105279	1
37	COND .005 400V	CW 4-005	
38	RES 500,000 Ω 1/4 W	RE 9572	1
39	COND. 1.0 100V.	CW 9525	1
40	RES. 500,000 Ω 1/4 W	RE 9572	1
41	COND. .05 200V.	CW 2-05	
42	COND .005 400V	CW 4-005	
43	OUTPUT TRANS.	TR 9583	
44	DIAPHRAGM & COIL ASSY	DM 9514	
45	SPEAKER	SK 9544	4
46	RES 25 Ω 1/2 W.	RE 9566	1
47	COND	CE 9546	2
48	COND	CE 9545	2
49	CHOKE COIL ASSY.	SA-105311	2
50	FIELD COIL	PT OF SK 9544	4
51	RES 25 Ω 1/2 W	RE 9564	1
52	COND. .1 200V.	CW 2-10	
53	DIAL LAMP 6.3V .15A	LP 9516	1
54	ON-OFF SWITCH	PT OF VR 957	2
55	LINE CABLE	CB 9512	2

MODEL 610

UNITED AMERICAN BOSCH CORPORATION
FACTORY: SPRINGFIELD, MASS.

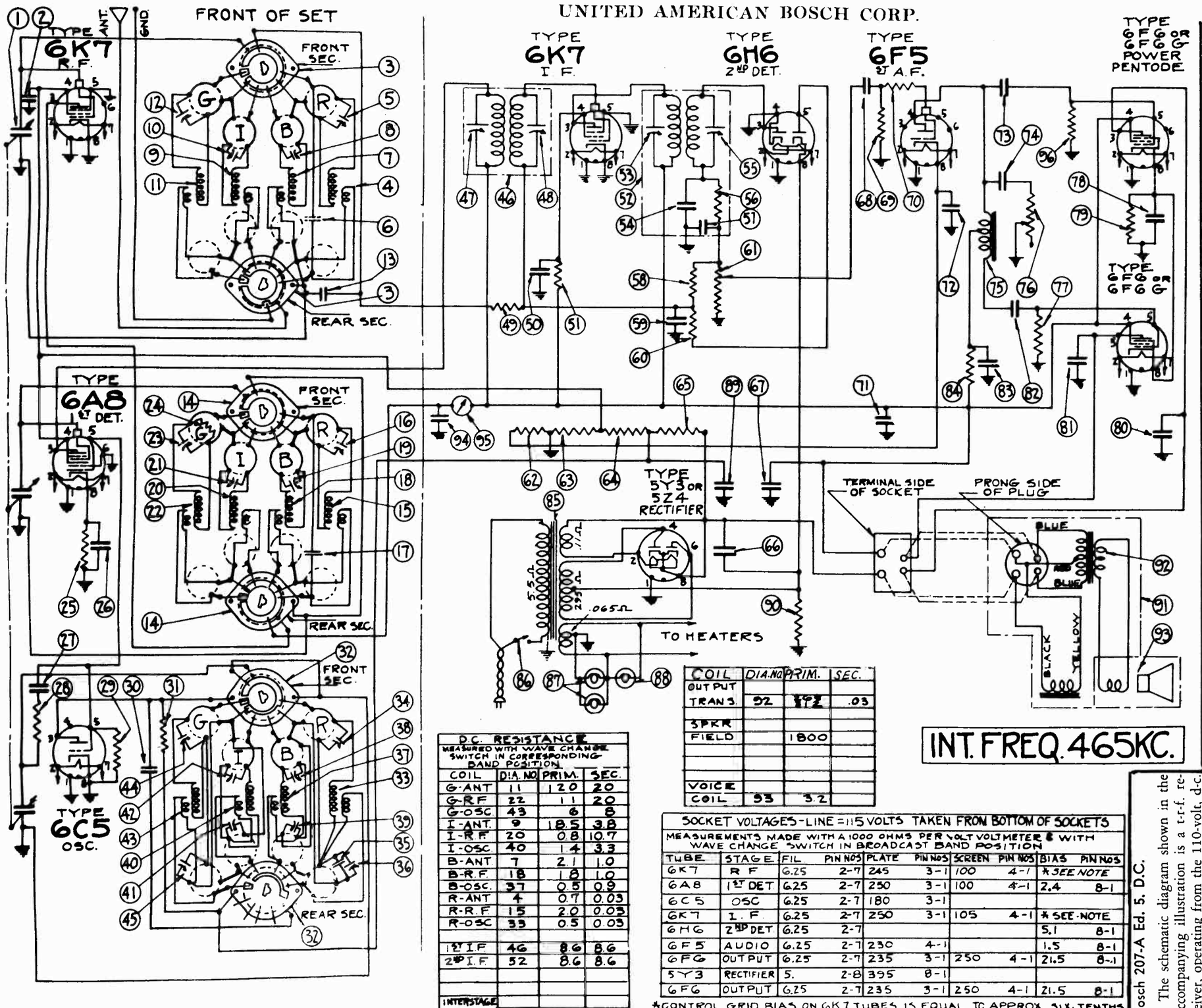
DI 9565

ED. 1

7/15/36 T.K.

MODEL 207A, Ed. 5
Schematic, Changes
MODELS 670S, 670C
Schematic, Voltage
Coil Resistances

UNITED AMERICAN BOSCH CORP.



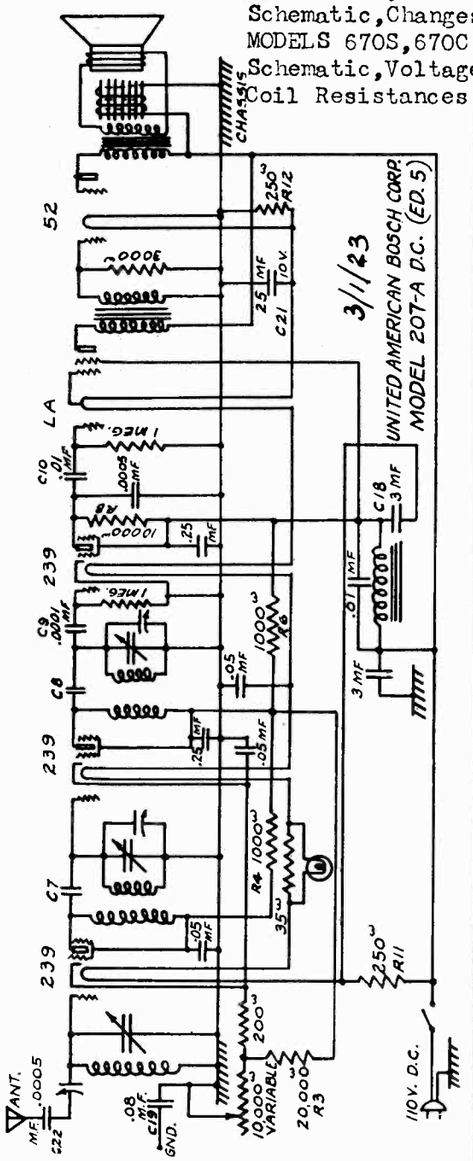
COIL	DIA. NO	PRIM.	SEC.
OUTPUT TRANS.	92	892	.03
SPKR FIELD		1800	
VOICE COIL	93	3.2	

D.C. RESISTANCE MEASURED WITH WAVE CHANGE SWITCH IN CORRESPONDING BAND POSITION			
COIL	DIA. NO	PRIM.	SEC.
G-ANT	11	120	20
G-RF	22	11	20
G-OSC	43	6	8
I-ANT.	9	18.5	3.8
I-RF	20	0.8	10.7
I-OSC	40	1.4	3.3
B-ANT	7	2.1	1.0
B-RF	18	1.8	1.0
B-OSC.	37	0.5	0.9
R-ANT	4	0.7	0.03
R-RF	15	2.0	0.03
R-OSC	33	0.5	0.03
1ST I.F.	46	8.6	8.6
2ND I.F.	52	8.6	8.6
INTERSTAGE TRANS.	75	4200	9000

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

TUBE	STAGE	FIL	PIN NOS	PLATE	PIN NOS	SCREEN	PIN NOS	BIAS	PIN NOS
6K7	R F	6.25	2-7	245	3-1	100	4-1	*SEE NOTE	
6A8	1ST DET	6.25	2-7	250	3-1	100	4-1	2.4	8-1
6C5	OSC	6.25	2-7	180	3-1				
6K7	I. F.	6.25	2-7	250	3-1	105	4-1	* SEE NOTE	
6H6	2ND DET	6.25	2-7					5.1	8-1
6F5	AUDIO	6.25	2-7	230	4-1			1.5	8-1
6F6	OUTPUT	6.25	2-7	235	3-1	250	4-1	21.5	8-1
5Y3	RECTIFIER	5.	2-8	395	8-1				
6F6	OUTPUT	6.25	2-7	235	3-1	250	4-1	21.5	8-1

*CONTROL GRID BIAS ON 6K7 TUBES IS EQUAL TO APPROX. SIX-TENTHS THE VOLTAGE FROM PINS 5-1 ON THE 6H6 TUBE SOCKET.



Bosch 207-A Ed. 5. D.C.

The schematic diagram shown in the accompanying illustration is a t-r-f. receiver, operating from the 110-volt, d-c. line. The diagram shown has incorporated in it all the changes that were made in production runs, but in case you should have to repair an early type, we are giving below the changes as they have been made.

Edition 2. C-21 was changed from 8 mf., 200 volts, to 25 mf., 10 volts, Part No. SA-104487.

Edition 3. C-18 was connected to ground and changed to one end of R-11. R-3 was formerly connected to the junction of R-6 and R-8. This was changed to the junction of R-4 and R-6. C-19 was changed from 0.1 mf. to 0.08 mf.

Edition 4. R-12, Part No. 99864, and C-22, Part No. SA-100880, were added. C-7 and C-8 were also added, Part No. SA-102243.

UNITED AMERICAN BOSCH CORP.

SERVICE PARTS LIST MODELS 670S-670C

These prices supersede all prevous prices and are subject to change without notice.
U.S.A. Sales Tax included in prices of taxable parts.

Consult Price Section Page R12 for Supplements and Changes.

Dia. #	Part #	Description of Parts
1	CG 9551	Variable condenser
2	CW 2-10	.1 mfd., 200 V. condenser
3	SW 9555	Switch and bracket assembly - antenna section
4	RC 95220	Antenna coil (Red)
5	CS 9554	4-30 mmf. trimmer condenser
6		Twisted wire - part of RC 95220
7	RC 95212	Antenna coil (Blue)
8	CS 9554	4-30 mmf. trimmer condenser
9	RC 95218	Antenna coil (White)
10	CS 9554	4-30 mmf. trimmer condenser
11	RC 95219	Antenna coil (Green)
12	CS 9554	4-30 mmf., trimmer condenser
13	CW 9513	.05 mfd., 200 V. condenser
14	SW 9556	Switch and bracket assembly - R.F. section
15	RC 95217	R.F. coil (Red)
16	CS 9554	4-30 mmf. trimmer condenser
17	CM 9512	6 mmf. mica condenser
18	RC 95214	R.F. coil (Blue)
19	CS 9553	1.5-10 mmf. trimmer condenser
20	RC 95215	R.F. coil (White)
21	CS 9554	4-30 mmf. trimmer condenser
22	RC 95216	R.F. coil (Green)
23	CS 9553	1.5-10 mmf. trimmer condenser
24		.1 meg., 1/4 W. resistor - part of RC 95216
25	RE 9529	300 ohm, 1/4 W. resistor
26	CW 2-05	.05 mfd., 200 V. condenser
27	CM 9511	.000065 mfd. mica condenser
28	RE 9537	50 ohm, 1/4 W. resistor
29	RE 9524	50,000 ohm, 1/4 W. resistor
30	CW 9513	.05 mfd., 200 V. condenser
31	RE 9526	5,000 ohm, 1/4 W. resistor
32	SW 9557	Switch and bracket assembly - oscillator section
33	RC 95223	Oscillator coil (Red)
34		3-15 mmf., trimmer condenser - part of CS 9557
35	CM 959	.002 mfd., mica condenser
36		800-1600 mmf., oscillator series cond. - part of CS 9557
37	RC 95213	Oscillator coil (Blue)
38		3-15 mmf. trimmer condenser - part of CS 9520
39		800-1600 mmf. osc. series condenser - part of CS 9520
40	RC 95221	Oscillator coil (White)
41		300-600 mmf. osc. series condenser - part of CS 9517
42		5-25 mmf. trimmer condenser - part of CS 9517
43	RC 95222	Oscillator coil (Green)
44		50-100 mmf. trimmer condenser - part of CS 9558
45		60-150 mmf. osc. series condenser - part of CS 9558
46	IC 9576	First I.F. coil assembly
47		80-200 mmf. trimmer condenser - part of IC 9576
48		80-200 mmf. trimmer condenser - part of IC 9576
49	RE 9585	.25 meg., 1/4 W. resistor
50	CW 2-05	.05 mfd., 200 V. condenser
51	SA 105277	75,000 ohm, 1/4 W. resistor
52	IC 9577	Second I.F. coil assembly
53		80-200 mmf. trimmer condenser - part of IC 9577
54		100 mmf. mica condenser - part of IC 9577
55		80-200 mmf. trimmer condenser - part of IC 9577
56		50,000 ohm, 1/4 W. resistor - part of IC 9577
57		100 mmf. mica condenser - part of IC 9577
58	SA 105281	1 meg., 1/4 W. resistor
59	CW 2-05	.05 mfd., 200 V. condenser
60	SA 105281	1 meg., 1/4 W. resistor
61	VR 959	Volume control - .5 meg.
63	SA 104966	30,000 ohm, 1/2 W. resistor
64	SA 101404	15,000 ohm, 1 W. resistor
65	SA 103835	10,000 ohm, 2 W. resistor
66	CE 9536	12 mfd., 450 V. electrolytic condenser
67	CE 9535	16 mfd., 300 V. electrolytic condenser
68	CW 4-02	.02 mfd., 400 V. condenser
69	SA 105281	1 meg., 1/4 W. resistor
70	RE 9581	.1 meg., 1/4 W. resistor
71	CW 4-10	.1 mfd., 400 V. condenser
72	CE 9526	12 mfd., 400 V. electrolytic condenser
73	CW 4-02	.02 mfd., 400 V. condenser
74	CW 4-02	.02 mfd., 400 V. condenser
75	TR 9563	Interstage transformer
76	VR 9536	Tone control - .1 meg., 5,000 ohm min.
77	RE 9585	.25 meg., 1/4 W. resistor
78		12 mfd., electrolytic condenser - part of CE 9526
79	RE 9587	500 ohm resistor
80	CW 4-005	.005 mfd., 400 V. condenser
81	CW 4-005	.005 mfd., 400 V. condenser
82	CW 4-02	.02 mfd., 400 V. condenser
83	CW 9526	1 mfd., 400 V. condenser
84	SA 105272	10,000 ohm, 1/4 W. resistor
85	TR 9562	Power transformer
86		On & Off switch - part of VR 9537
87	LP 9515	Dial lamp - 3.5 V.
89	CE 9528	8 mfd., 450 V. electrolytic condenser
90	RE 9588	70 ohm, 1/4 W. resistor
91	SK 959	Speaker
92	TR 9513	Output transformer
93	DM 956	Diaphragm & voice coil assembly
94	CW 4-05	.05 mfd., 400 V. condenser
95	SI 9561	Tuning indicator
96	RE 9585	.25 meg., 1/4 W. resistor

Part #	Description of Parts
	MAIN ASSEMBLIES
CH 95109	Chassis assembly
KA 9558	Cabinet - Model 670S
KA 9544	Cabinet - Model 670C
SK 959	Speaker
	BRACKETS
BK 95217	Bracket assembly - dial support - top
BK 95220	Variable condenser to dial - support bracket
BK 95219	Bracket for dial - top
BK 95182	Electrolytic condenser mounting bracket
	CABLE ASSEMBLIES
CB 9512	Line cable assembly
CB 9595	Cable assembly for band indicator - long
CB 9596	Cable assembly for band indicator - short
	GEARS
GE 9520	Pinion gear assembly for second hand
GE 9516	Variable condenser drive gear assembly
GE 9514	Gear assembly - between drive and second hand gears
	KNOBS
KN 9561	Volume and tone control knobs
KN 9566	Wave change switch knob
KN 9565	Tuning control knob - large
KN 9560	Tuning control knob - small
	MISCELLANEOUS
SC 101788	Chassis mounting screw
IS 95123	Rubber bushings for mounting tuning unit
SI 9561	Tuning meter
SH 9542	Wave change switch shaft & plate
SH 9543	Vernier drive assembly
SI 9562	Wave band indicator assembly
PL 9575	Plate - dial glass support
SO 9520	Dial lamp socket assembly
PU 9524	Idler pulley
PU 9525	Pulley - band indicator drive
BT 952	Dial drive belt
WN 953	Glass window over dial scale
DS 9564	Glass dial scale
SI 9559	Dial indicator - second hand
SI 9560	Dial indicator
SO 956	Tube socket - 8 prong
SA 107257	Speaker socket
	SPRINGS
FP 103164	Spring for band indicator cable
SP 9540	Spring clip for holding dial scale & cover
SP 9541	Spring for idler pulley
	SPEAKER PARTS
DM 956	Diaphragm & voice coil assembly
FP 101740	Copper ring
CL 9537	Speaker field coil
TR 9513	Output transformer
SA 107278	Speaker plug - 4 prong
SA 107279	Speaker plug cover

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ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ... 2 #6K7,1 #6A8,1 #6C5,1 #6H6,1 #6F5,2 #6F6,1 #5Y3 - Total 9
Power Supply .... 105 to 125 volts, 50 to 60 cycles
Power Consumption .... 80 Watts
Maximum Undistorted Output .... 4.5 Watts
Maximum Output .... 6.5 Watts
Tuning Ranges .... Green Band - 150 to 390 KC.; White Band - 525 to 1800 KC.; Blue Band - 1750 to 5000 KC.; Red Band - 5800 to 18500 KC.
Line-Up Frequencies .. I.F. 465 KC.,350 KC.,130 KC.,1600 KC.,570 KC.,5500 KC.,1900 KC., 17000 KC., and 6000 KC.

AMERICAN-BOSCH CentrOmatic RADIO MODELS 670S-670C

Nine-Tube, Four-Band, Superheterodyne Receivers

GENERAL DESCRIPTION

This model is a nine-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 "CentrOmatic" unit. From the high frequency assembly the energy passes through 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 push-pull output stage employing two type 6F6 tubes. A type 5Y3 rectifier supplies the direct current for energizing the tubes.

REMOVING INDIVIDUAL COIL AND SWITCH SECTIONS OF CENTROMATIC UNIT

If a component part located underneath the switch and coil assemblies of the "CentrOmatic" unit 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 two screws which fasten the mounting plate of the wave change switch shaft to the chassis frame. Pull switch shaft straight out.
2. Unsolder the stator and rotor leads from the gang condenser.
3. The fastening screws for the switch sections are located on top of the "CentrOmatic" unit and are indicated by X, Y, and Z in Figure #1. Remove the corresponding screws.
4. 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 to the 6C5 socket and the plate supply lead will have to be unsoldered from the switch terminal before the section can be removed.

5. 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 "CentrOmatic" unit. This is IMPORTANT as the switch shaft cannot be inserted if the switch brackets do not line up.
6. Replace the section fastening screws.
7. Resolder the stator and rotor leads on gang condenser.
8. 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.

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 contiguously 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 #1 and #2 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. (465 KC.)

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 KC. 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 through a .5 mfd. blocking condenser.
4. Adjust trimmers #53 and #55 for maximum output reducing output of test oscillator as required.
5. Apply test signal to grid of 6A8 first detector and adjust #47 and #48 for maximum output.

ADJUSTMENT OF GREEN BAND

1. Set wave change switch to Green Band position.
2. Set test oscillator and dial indicator to 350 KC.
3. Apply test signal to antenna terminal of the chassis through a .0002 mfd. series condenser and adjust #44, #23, and #12 for maximum output.
4. Set test oscillator and dial indicator to 130 KC. and adjust #45 for maximum output, at the same time rocking the variable tuning condenser.
5. Return to 350 KC. setting with both test oscillator and dial indicator and repeat adjustment of #44, #23 and #12 for accuracy.

ADJUSTMENT OF BROADCAST BAND

1. Set wave change switch to the White or Broadcast Band position.
2. Set test oscillator and dial indicator to 1600 KC. and adjust #42, #21 and #10 for maximum output.
3. Set test oscillator and dial indicator to 570 KC., and adjust #41 for maximum output, at the same time rocking the variable tuning condenser.
4. Return to 1600 KC. setting and make readjustment of #42, #21 and #10.

ADJUSTMENT OF BLUE BAND

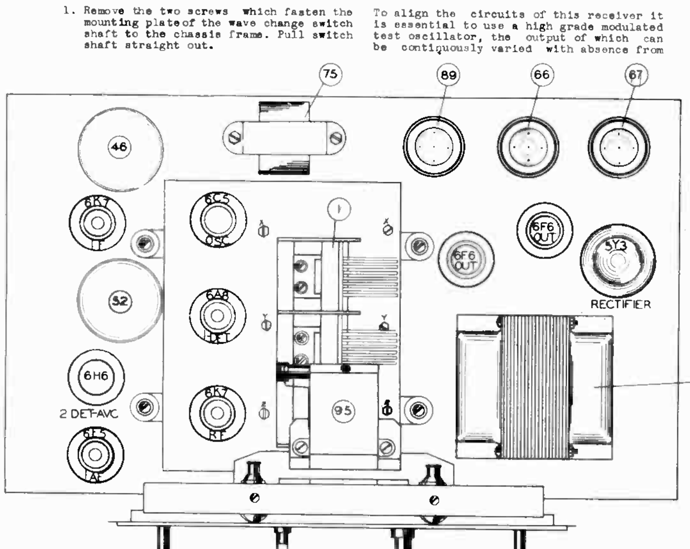
NOTE: In adjusting the Blue and Red Bands, a .0002 mfd. condenser and a 400 ohm resistor connected in series should be inserted in the high side of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short-wave antenna.

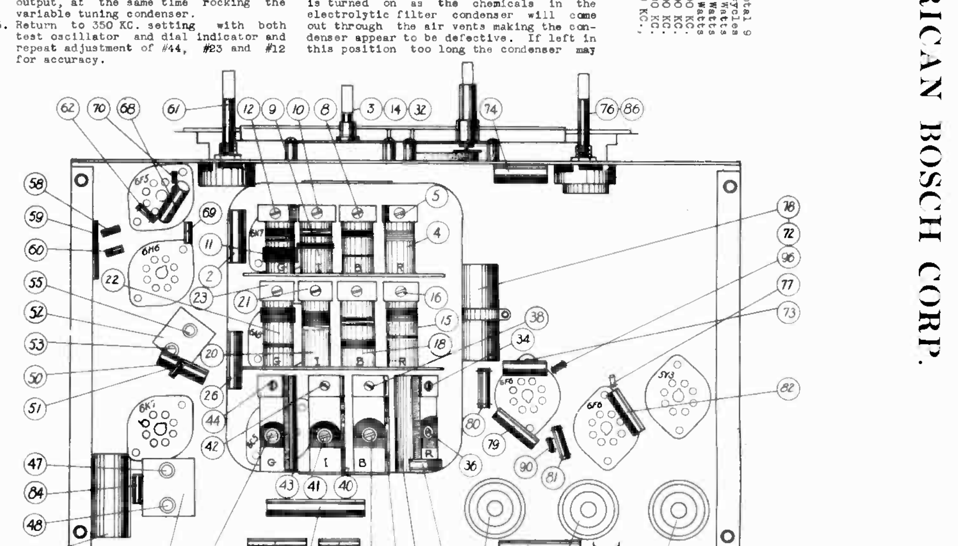
1. Set wave change switch to Blue Band position.
2. Set test oscillator and dial indicator to 5500 KC. and adjust #38, #19 and #8 for maximum output.
3. Set test oscillator and dial indicator to 1900 KC. and adjust #39 for maximum output, at the same time rocking the variable tuning condenser.

ADJUSTMENT OF RED BAND

1. Set wave change switch to Red Band position.
2. Set test oscillator and dial indicator to 17000 KC. and adjust #34, #16 and #5 for maximum output.
3. Set test oscillator and dial indicator to 6000 KC. and adjust #36 for maximum output, at the same time rocking the variable tuning condenser.
4. Return to 17000 KC. setting and make readjustment of #34, #16 and #5.

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 through the air vents making the condenser appear to be defective. If left in this position too long the condenser may





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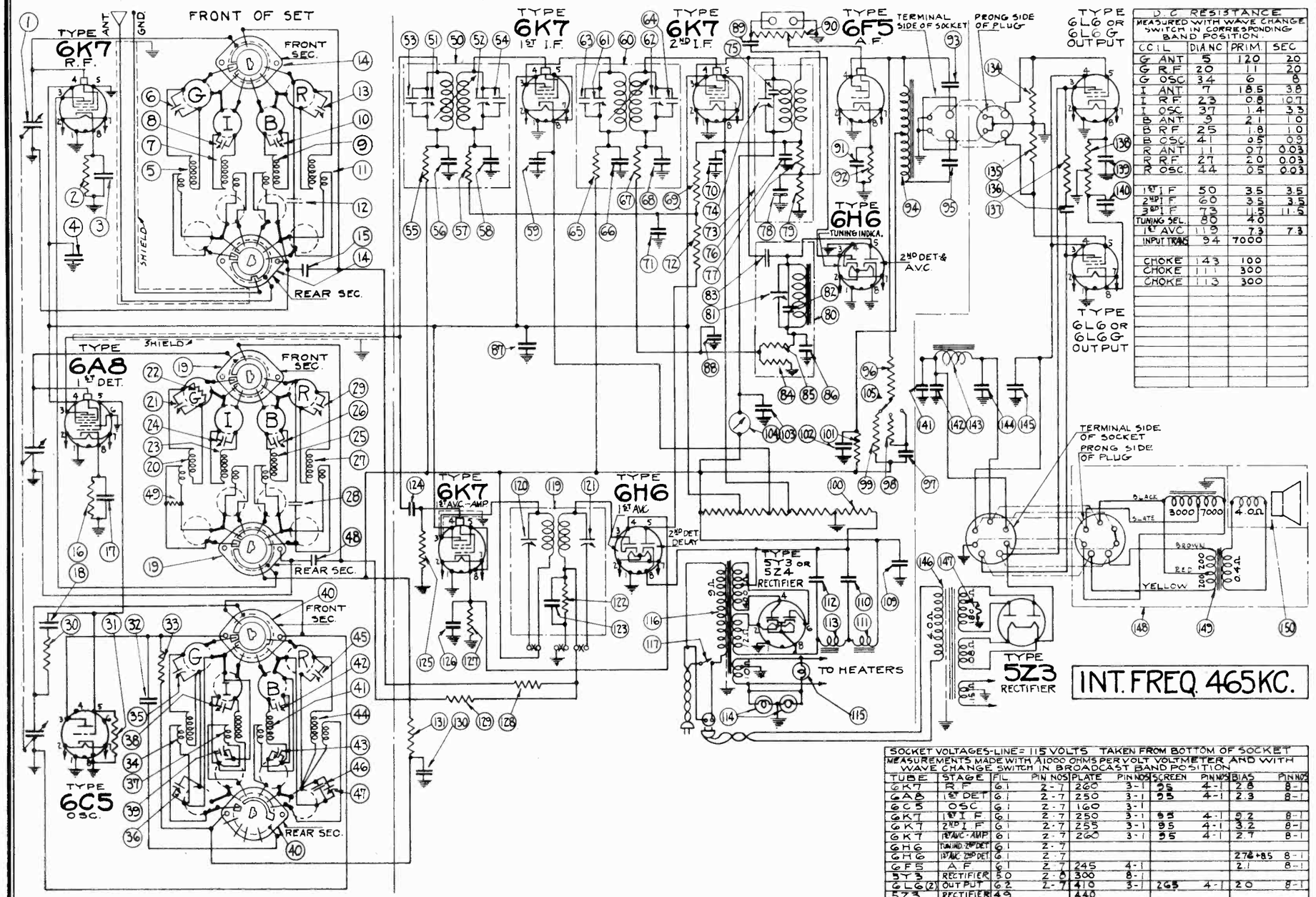
MODEL 680
Preliminary
Schematic, Voltage
Parts List



D.C. RESISTANCE
MEASURED WITH WAVE CHANGE SWITCH IN CORRESPONDING BAND POSITION.

COIL	DIA. NC	PRIM.	SEC
G ANT	5	120	20
G R.F	20	11	20
G OSC	34	6	8
I ANT	7	18.5	3.8
I R.F.	23	0.8	10.7
I OSC	37	1.4	3.3
B ANT	3	2.1	1.0
B R.F	25	1.8	1.0
B OSC	41	0.5	0.3
R ANT	11	0.7	0.03
R R.F.	27	2.0	0.03
R OSC.	44	0.5	0.03
1ST I.F	50	3.5	3.5
2ND I.F	60	3.5	3.5
3RD I.F	73	11.5	11.5
TUNING SEL.	80	40	
1ST AVC	119	7.3	7.3
INPUT TRANS	94	7000	
CHOKE	143	100	
CHOKE	111	300	
CHOKE	113	300	

SOCKET VOLTAGES-LINE = 115 VOLTS TAKEN FROM BOTTOM OF SOCKET
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	BIAS	PIN NOS
6K7	R F	6.1	2-7	260	3-1	95	4-1	2.8	8-1
6A8	1ST DET	6.1	2-7	250	3-1	95	4-1	2.3	8-1
6C5	OSC	6.1	2-7	160	3-1				
6K7	1ST I F	6.1	2-7	250	3-1	95	4-1	3.2	8-1
6K7	2ND I F	6.1	2-7	255	3-1	95	4-1	3.2	8-1
6K7	1ST AVC-AMP	6.1	2-7	260	3-1	95	4-1	2.7	8-1
6H6	TUNING IND. 2ND DET	6.1	2-7						
6H6	1ST AVC 2ND DET	6.1	2-7					27&85	8-1
6F5	A F	6.1	2-7	245	4-1			2.1	8-1
5T3	RECTIFIER	5.0	2-6	300	8-1				
6L6(2)	OUT PUT	6.2	2-7	410	3-1	265	4-1	20	8-1
5Z3	RECTIFIER	4.9		440					

72	RES 1MEG ½W	5A 105281	1	1	VARI. COND (3GANG) CG 9551 P
73	I.F COIL ASST (PIDE)	IC 9594 A	3	2	RES 300Ω ¼W RE 9523
74	TRIM COND 25-30MMF	CS 9522	2	3	COND .05MF 200V CW 2-05
75	COND .002 5MF	CM 955	1	4	COND .1MF 200V CW 2-10
76	COND .5MMF MICA	CM 953	1	5	ANT. COIL (GREEN) RC 95219 A 2
77	RES 100,000Ω ½W	RE 9535	1	6	TRIM COND 4-30 MMF CS 9554 1
78	COND .100 MMF MICA	5A 10641.7	1	7	ANT. COIL (IVORY) RC 95218 A 2
79	RES .25 MEG ½W	RE 9531	1	8	TRIM COND 4-30 MMF CS 9554 1
80	TUNING SEL ASST (PUSH)	IC 9592 A	3	9	ANT. COIL (BLUE) RC 95212 A 2
81	TRIM COND 25-100 MMF	CS 9522	2	10	TRIM COND 4-30 MMF CS 9554 1
82	COND .00075 MFD	CM 9518	1	11	ANT. COIL (RED) RC 95220 A 2
83	COND 1.2 MMF	CM 9527	1	12	TWISTED WIRE 15 MMF PT OF RC 95220 A 2
84	RES 1 MEG ½W	RE 9530	1	13	TRIM COND 4-31 MMF CS 9554 1
85	RES 1 MEG ¼W	RE 9536	1	14	SWITCH & BRT ASSY. SW 9553
86	COND 500 MMF MICA	CM 9519	1	15	COND .05 MF 200V CW 9513 1
87	COND .1 MF 200V	CW 2-10		16	RES 300Ω ½W RE 9529 1
88	COND .05 MF 200V	CW 2-05		17	COND .05 MF 200V CW 2-05
89	COND .002 MF 400V	CW 4-02		18	COND .0005 MICA CM 9511 1
90	VOL CONT. 1 MEG	VC 9510	2	19	SWITCH & BRT ASSY. SW 9556
91	COND (ELECT) 25MF 25V	CE 9550	2	20	RF COIL (GREEN) RC 95216 A 2
92	RES 2200Ω ½W	RE 9550	1	21	TRIM COND (SILVER) CS 9553 1
93	COND .02 MF 400V	CW 4-02		22	RES 18,000Ω ½W PT OF RC 95216 A 2
94	INPUT TRANS	TR 9574	2	23	RF COIL (IVORY) RC 95215 A 2
95	COND .02 400V	CW 4-02		24	TRIM COND 4-31 MMF CS 9554 1
96	RES 20,000Ω ¼W	RE 9536	1	25	RF COIL (BLUE) RC 95214 A 2
97	COND .02 MF 400V	CW 4-02		26	TRIM COND 5-10 MMF CS 9553 1
98	RES 2.0 MEG ½W	RE 9536	1	27	RF COIL (RED) RC 95217 A 2
99	RES 750Ω ½W	SA 105277	1	28	COND 6 MMF CM 9512
100	RES 7500Ω 1W	RE 9593	1	29	TRIM COND 4-31 MMF CS 9554 1
101	RES 3000Ω 1W	SA 105249	1	30	RES 50Ω ¼W RE 9537 1
102	COND .02 MF 400V	CW 4-02		31	RES 50,000Ω ½W (WW) RE 9563 1
103	COND .25 MF 400V	CW 4-25		32	COND .05 MF 200V CW 9513 1
104	TUNING INDICATOR	ST 9561	2	33	RES 500Ω 1W RE 9526
105	TONE CONTROL	VR 9541	4	34	OSC COIL (GREEN) RC 95222 A 2
106				35	TRIM COND 50-80 MMF PT OF CS 9558 1
107				36	LAG COND 60-150 MMF " " " 1
101				37	OSC. COIL (IVORY) RC 95221 A 2
109	COND (ELECT) 8MF 350V	CE 9548	2	38	TRIM COND 5-25 MMF PT OF CS 9557 1
110	COND " 1MF 400V	CE 9536	2	39	LAG COND 540-1400 MMF PT OF CS 9557 1
111	CHOKE COIL ASST	SA 107033	2	40	SWITCH & BRT ASSY SW 9557
112	CONDENSER 8MF 450V	CE 9548	2	41	OSC. COIL (BLUE) RC 95213 A 2
113	CHOKE COIL ASST	SA 107033	2	42	TRIM COND 3-15 MMF PT OF CS 9520 1
114	DIAL LAMP 6.3V 0.3A	LP 9515	1	43	LAG COND 840-1600 PT OF CS 9520 1
115	TUNING IND LAMP	PT OF CS 9561		44	OSC COIL (RED) RC 95223 A 2
116	POWER TRANS	TR 9571	3	45	TRIM COND 3-15 MMF PT OF CS 9557 1
117	ON-OFF SWITCH	PT OF VR 9541	2	46	COND .002 MF MICA CM 953 1
118				47	LAG COND 540-1600 PT OF CS 9557 1
119	1ST AVC TRANS ASSY	IC 9593 A	3	48	COND .05 MF 200V CW 9513 1
120	TRIM COND 80-200 MMF	PT OF CS 9552	2	49	RES 1000Ω ½W RE 9528 1
121	TRIM COND 80-200 MMF	PT OF CS 9552	2	50	1ST I.F COIL ASSY IC 9588A 2
122	RES 500,000Ω 1W	RE 9545	1	51	TRIM COND 250-350 MMF PT OF CS 9552 1
123	COND 5 MMF MICA	CM 953	1	52	TRIM COND " " " PT OF CS 9557 1
124	COND 50 MMF MICA	CM 953	1	53	COND 100 MMF MICA SA 10641.7 1
125	RES .1 MEG ½W	SA 105276	1	54	COND 100 MMF MICA SA 10641.7 1
126	COND .05 MF 200V	CW 2-05		55	RES 5000Ω ½W RE 9527 1
127	RES 1,000Ω ½W	SA 100825	1	56	COND .005 MF 400V CW 4-005
128				57	RES 10,000Ω ½W RE 9534 1
129				58	COND .05 MF 200V CW 2-05
130	RES 250,000Ω ½W	RE 9535	1	59	COND .05 MF 200V CW 2-05
131	RES 250,000Ω ½W	RE 9535	1	60	2ND I.F COIL ASST IC 9587 A 2
132	COND " 400V	CW 4-01		61	TRIM COND 250-350 MMF PT OF CS 9552 1
133	RES 10,000Ω 2W	SA 103835	1	62	TRIM COND " " "
134	RES (TAP) 400-40Ω 2W	RE 9535	1	63	COND 100 MMF MICA SA 10641.7 1
135	COND (ELEC) 10MF 150V	CE 9547	2	64	COND 100 MMF MICA SA 10641.7 1
136	COND (ELEC) 10MF 150V	CE 9547	2	65	RES 5000Ω ¼W RE 9527
137	COND (ELEC) 8MF 350V	CE 9549	2	66	COND .005 MF 400V CW 4-005
138	CHOKE COIL ASST	T2 9553	2	67	RES 100,000Ω ½W RE 9534 1
139	CONDENSER 8MF 350V	CE 9549	2	68	COND .05 MF 200V CW 2-05
140	COND " 1MF 350V	CE 9548	2	69	RES 1 MEG Ω ½W SA 105281 1
141	POWER TRANS	TR 9572	3	70	COND .05 MF 200V CW 2-05
142	PILOT LAMP 6.3V 0.3A	LP 9515	1	71	COND .005 MF 400V CW 2-05
143	SPEAKER ASSY	SK 9545	4		
144	OUTPUT TRANS				
145	PHASE COIL ASST				

MODEL 680
DI 9558
ED 1
UNITED AMERICAN BOSCH CORPORATION
FACTORY SPRINGFIELD MASS

DATE	DR BY	CH BY	APPROVED BY E.G.
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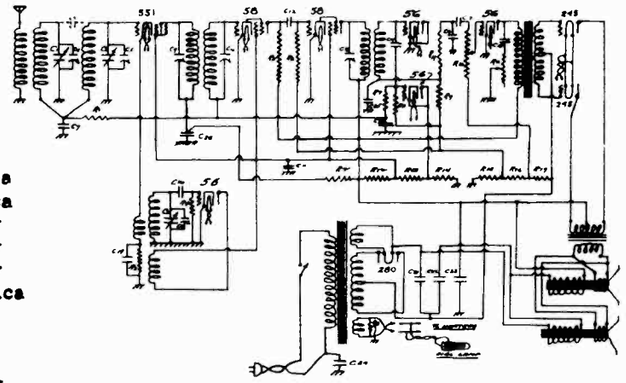
UNITED AMERICAN BOSCH CORP.

MODEL 812
Schematic
Parts, Voltage
Alignment

R1- 100,000 ohms
R2- 1000 ohms
R3- 2000 ohms
R4- 100,000 ohms
R5- 20,000 ohms
R6- 100,000 ohms
R7- 500,000 ohms
R8- 1 megohm
C1 - Cond. Gang
C2 - Cond. Gang
C3 - Cond. Gang
C4 - Cond. Gang
C5 - Cond. Gang
C6 - Cond. Gang
C7 - .04 mfd. 3 ply
C8 - .05 mfd. 3 ply
C9 - 7 to 70 mmf.
C10- 7 to 70 mmf.
C11- .5 mfd.
C12- .0005 mfd.
C13- 7 to 70 mmf.
C14- .05 mfd. 2 ply

R12- 12,000 ohms
R13- 8000 ohms
R14- 6000 ohms
R15- 30 ohms
R15- 200 ohms
R17- 300 ohms
R18- Center Tap
R19- 20,000 ohms
R9- 500,000 ohms
R10- 500,000 ohms
R11- 500,000 ohms
C15- .0001 mfd mica
C16- .0001 mfd mica
C17- .05 mfd 2 ply
C18- .05 mfd 3 ply
C19- .05 mfd 2 ply
C20- .0001 mfd. mica
C21- 8 mfd.
C22- 8 mfd.
C23- 4 mfd.
C24- .01 mfd 4 ply
C25- .0001 mica
C26- .1 mfd 3 ply



Schematic Wiring Diagram - Model 812 Receiver

Socket Voltage Readings - Model 812 Receiver

	Osc. 56	1st Det. 551	1st I.F. 58	2nd IF 58	AVC 56	2nd Det. 56	AF 56	AF 245	Rect. 280
Filament	2.5	2.2	2.2	2.2	2.3	2.3	2.3	2.3	4.5
Plate	85	228	105	232	36	-	225	225	-
Screen	-	85	85	85	-	-	-	-	-
Bias	7	2.6	2.6	-	-	-	19	45	-

ALIGNMENT INSTRUCTIONS FOR MODEL 812

I. F. ADJUSTMENT

1. Connect the five leads to the loud speaker.
2. Set volume control at maximu, tone control on base, and fround antenna lead.
3. Connect the 175 KC oscillator to the grid of the 2nd I. F. tube.
   a) Align the second I. F. transformer, for max. sensitivity. 20,000 u.v.
4. Connect the 175 KC oscillator to the grid of the 1st I.F. tube.
   a) Align the first and second I.F. coils for max. sens. Limit: 500 u.v.
5. Check the I. F. stability.

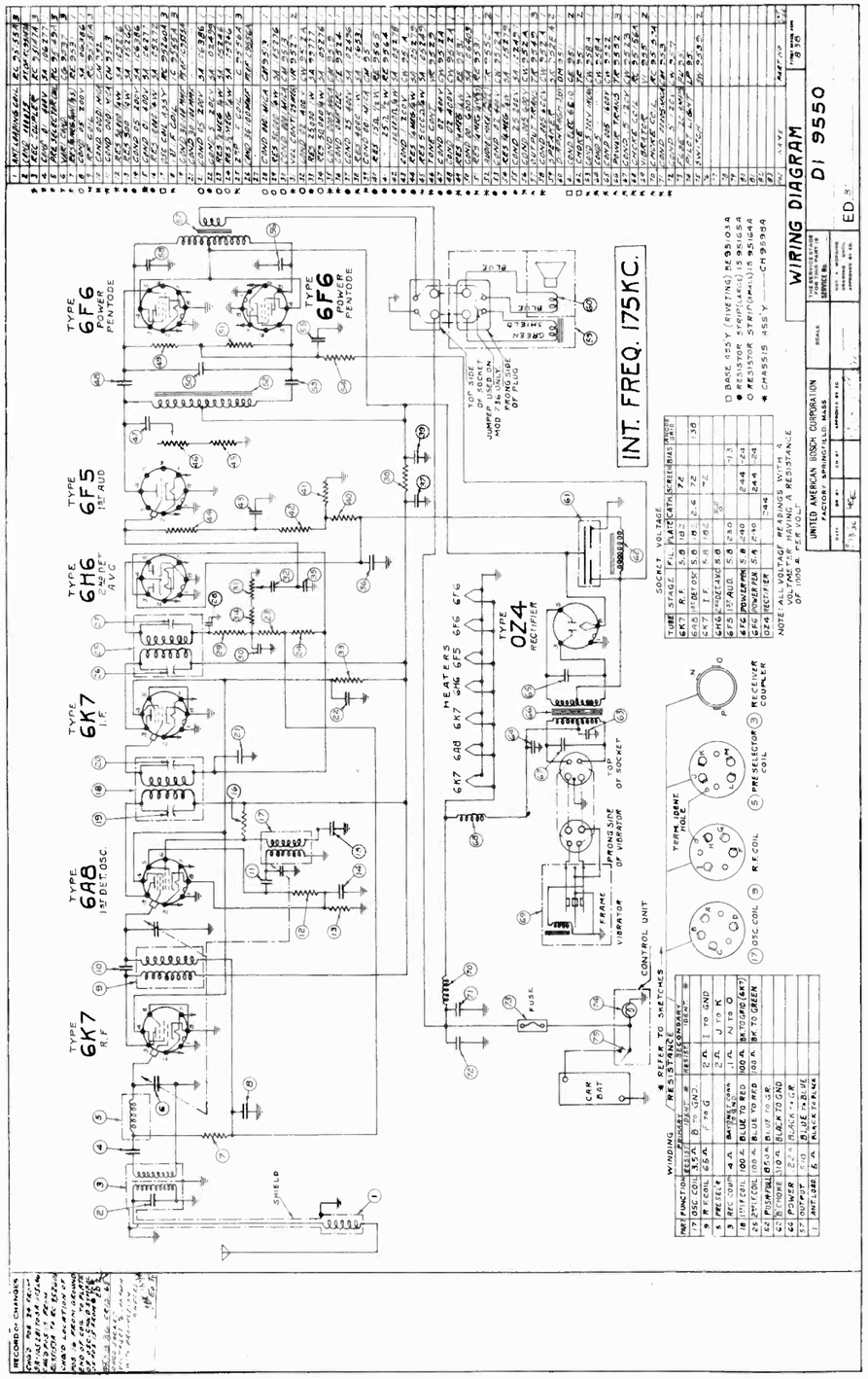
OSCILLATOR ADJUSTMENT

1. Adjust scale so that the indicator will be on the second line from the left, when the gang is entirely closed.
2. Connect ant. lead of the R. F. Oscillator to the grid of the 1st Detector.
3. Set the oscillator and set scale at 1400 Kilocycles.
   a) Peak the oscillator condenser on the second signal heard, when turning the condenser out. The osc. condenser is the front align. cond. on the variable condenser gang.
4. Connect ant. lead of the R. F. oscillator to the antennae lead of the set.
   a) Without touching the oscillator condenser, align the R. F. and ant. alignment condensers to the 1400 Kilocycle signal, until maximum sensitivity is obtained.
5. Check sensitivity at 1400 Kilocycles.
   Check sensitivity at 1000 Kilocycles.
   Check sensitivity at 550 Kilocycles.
6. If set lacks sensitivity at 600 or 550, the plates of the condenser gang should be adjusted until the set will reach the sensitivity limits.

7. If set does not track at 600, readjust plates of osc. section of gang condenser.

MODEL 838
Preliminary
Schematic
Voltage, Parts
Coil Resistances

UNITED AMERICAN BOSCH CORP.



UNITED AMERICAN BOSCH CORP.

MODELS 736A2, 737A2, 738A2
Schematic, Voltage
Coil Resistances
Parts List

PART #	FUNCTION	PRIMARY WINDING	PRIMARY TO	PRIMARY RESISTANCE	SECONDARY WINDING	SECONDARY TO	SECONDARY RESISTANCE
17	OSC. COIL	3.8Ω	B TO GND.				
9	R.F. COIL	68Ω	P TO G		2Ω	I TO GND.	
5	PRE-SEL. COIL				2Ω	J TO K	
3	REC. COUP.	4Ω			.1Ω	N TO O	
8	1ST I.F. COIL	100Ω	BLUE TO RED	100Ω	BK. TO GRD. (6K7)		
28	2ND I.F. COIL	100Ω	BLUE TO RED	100Ω	BK. TO GREEN		
52	OUTPUT	520Ω	GR. TO BROWN				
69	R CHOKE	300Ω	BLACK TO GRD.				
63	POWER TRANS.	24Ω	BLACK TO GR.	2.4Ω	RED TO BLUE		
-	HEATERS	6Ω	BLACK TO BLACK				

SOCKET VOLTAGE

TUBE	STAGE	FIL.	PLATE	CATH.	SCREEN	BIAS	ANODE GRID
6K7	R.F.	6.8	182		83		
6A8	1ST DET. OSC.	5.8	188	4.4	83		138
6K7	I.F.	5.8	182		83		
6H6	2ND DET. A.V.C.	6.8		11.0			
6F5	1ST AUD.	5.8	79			-8	
6F6	POWER PEN.	5.8	228		244	-17	
0Z4	RECTIFIER	5.8		244			

NOTE: ALL VOLTAGE READINGS WITH A VOLTMETER HAVING A RESISTANCE OF 1000 Ω PER VOLT.

SERVICE PARTS LIST MODEL 736A2

Dia. #	Part #	Description
1		Antenna loading coil - part of RC 95155
2		.000075 mfd. condenser - part of RC 95147
3	RC 95147	Receiver coupler
4	SA 106277	.01 mfd. 400 V. cond.
5	RC 95149	Preselector coil assembly
6	CO 95153	Oscillator coil assembly
7	RE 9534	100,000 ohm, 1/4 W. res.
8	SA 106386	.05 mfd., 200 V. cond.
9	RC 95151	R.F. coil
10	CM 952	.00001 mfd. mica cond.
11	CM 9513	.0001 mfd. mica cond.
12	SA 105276	50,000 ohm, 1/4 W. res.
13	SA 105246	1/2 meg., 1/4 W. res.
14	SA 106277	.01 mfd., 400 V. cond.
15	SA 105272	10,000 ohm, 1/4 W. res.
16	RC 95153	Oscillator coil assy.
17	IC 9555	1st I.F. coil
18		30-100 mmf. condenser - part of IC 9555
19		30-100 mmf. condenser - part of IC 9556
20		.05 mfd. 200 V. cond. - part of IC 9556
21	SA 106386	.05 mfd., 200 V. cond.
22	CM 951	.1 mfd., 200 V. cond.
23	SA 105246	1/2 meg., 1/4 W. res.
24	SA 105281	1 meg., 1/4 W. res.
25	IC 9556	2nd I.F. coil
26		30-100 mmf. condenser - part of IC 9555
27		30-100 mmf. condenser - part of IC 9556
28	CM 9513	.0001 mfd. mica cond.
29	SA 105276	50,000 ohm, 1/4 W. res.
30	CM 9513	.0001 mfd. mica cond.
31	VR 9527	.25 meg. volume control
32	SA 103659	.006 mfd., 400 V. cond.
33	SA 106312	25,000 ohm, 1/2 W. res.
34	CM 958	.05 mfd., 200 V. cond.
35	SA 105246	1/2 meg., 1/4 W. res.
36	SA 102496	.25 mfd., 400 V. cond.
37	SA 106531	4000 ohm, 1 W. res.
38	CM 951	.001 mfd. mica cond.
39	BT 952	Grid bias cell
40	SA 105281	1 meg., 1/4 W. res.
41	CM 9519	.0005 mfd. mica cond.
42	SA 106403	.001 mfd., 600 V. cond.
43	SA 105279	250,000 ohm, 1/4 W. res.
44	SA 102497	.25 mfd., 200 V. cond.
45	SA 105279	250,000 ohm, 1/4 W. res.
46	SA 106403	.001 mfd., 600 V. cond.
47	CM 9524	.008 mfd., 600 V. cond.
48	SA 105279	250,000 ohm, 1/4 W. res.
49	VR 9525	250,000 ohm tone control
50	CM 9524	.008 mfd., 600 V. cond.
51	TR 9543	Output transformer
52	CM 967	.5 mfd. 120 V. cond.
53	CM 963	.00005 mfd. mica cond.
54	RC 95157	Choke coil
55	FU 951	20 ampere fuse
56	FH 9533	Fuse holder
57	SW 9539	On-Off switch assembly
58	VI 955	Vibrator

MODEL 737A2

All parts are the same as for Model 736 A2 except for the following parts:

Dia. #	Part #	Description
70	SK 9622	Header speaker assembly

MAIN ASSEMBLIES

CH 9576	Chassis assembly	
SK 9622	Header speaker assembly	

MISCELLANEOUS

HP 9515	Speaker mounting clamp	
CB 9576	Speaker cable	

Part #	Description
CW 958	.5 mfd., 200 V. cond.
RC 95156	Choke coil
CW 9523	.5 mfd., 120 V. cond.
TR 9547	Power transformer
CW 9522	.005 mfd., 1600 V. cond
SA 105272	10,000 ohm, 1/4 W. res.
SA 105284	10,000 ohm, 1/2 W. res.
SA 106284	30,000 ohm, 1/4 W. res.
CE 951	6 & 10 mfd. elec. cond.
TR 951	"P" choke
SK 955	Speaker assembly
DM 951	Diaphragm assembly - Model 736 only

Part #	Description

MAIN ASSEMBLIES

CH 9575	Chassis assembly
SK 955	Speaker
CO 9517	Control unit - less shafts

BRACKETS & CLAMPS

PP 79381	Clamp (battery, antenna & speaker cables)
BK 95175	Bracket for loading coil

CABLES & CABLE ASSEMBLIES

CB 9570	Battery cable assembly
TU 1014	Shielded loom

SOCKETS

SO 958	Speaker socket
SO 953	Tube socket (4 prong)
SO 9511	Tube socket (metal tube)

WASHERS, BUSHINGS & SPACERS

WA 1048	Washers for mounting studs
WA 8-8 CA	Lock washer for mtg. studs
SR 953	Spacer for variable cond.
IS 1002	Rubber bushing for variable condenser mounting
WA 7-10 CA	Washer for loading-coil mtg.

SCREWS & STUDS

SD 957	Mounting studs
PP 104692	Thumb screw

MISCELLANEOUS

NT 103475	Mtg. nuts for loading coil
SH 9533	Flexible drive shaft (2 used)
SW 9540	Switch (complete)
SA 106754	Suppressor (ignition coil)
SA 105300	Suppressor condenser
RC 95156	Ant. loading coil & cable assy.
RC 95152	Rubber mounting insulators
KN 9531	Tone control knob (rubber)
IS 95159	Mtg. assy. for grid bias cell
PA 957	Grill cloth

MODEL 738A2

All parts are the same as for Model 736 A2 except for the following parts:

Dia. #	Part #	Description
70	SK 9627	Bulkhead speaker

MAIN ASSEMBLIES

CH 9576	Chassis assembly
SK 9627	Bulkhead speaker assy.

MISCELLANEOUS

CB 9576	Speaker cable

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ------- 1 #6A8, 2 #6K7, 1 #6H6, 1 #6F5, 1 #6F6, 1 #0Z4, Total 7
Battery Current (6.5-volt Battery) ---------- 6.5 Amperes
Range ---------- 540 to 1600 K.C.
Image Rejection ---------- 3.0 Watts
Undistorted Output ---------- 4.0 Watts
Intermediate Frequency ---------- I.F. 175 K.C., 1400 K.C.

MODELS 736A2, 737A2, 738A2

Socket, Trimmers
Circuit Data, Changes
Alignment, Notes

UNITED AMERICAN BOSCH CORP.

LOCATING TROUBLE IN CHASSIS

To locate a short, open or defective unit in the "B" circuit, disconnect the power pack from the receiver section by disconnecting the two red leads at each end of the 4000 ohm resistor #30 in the power pack that pass into the receiver section. Check the voltage at the input side of the resistor, which should be approximately 250 volts. If the voltage is incorrect, the trouble is definitely in the power pack and all component parts should be checked.

Conversely, if the voltage reading proves to be correct, the trouble is in the receiver section and all its parts should be checked.

In locating a "short" or "open" in the filament circuit, the power pack can be disconnected from the filament supply of the receiver section by removing the red wire from the lower terminal of the RF battery choke #56. This will connect only the power pack in the filament circuit, and if the short or open is corrected, it will prove that the trouble is in the receiver section.

WEAK OR INSENSITIVE AFTER REALIGNMENT

Check coils and associated circuits in the different "stages" of the receiver for proper resistance values.

LOW POWER OUTPUT WITH "B" VOLTAGE CORRECT

Check the speaker field coil, voice coil and associated audio circuit for resistance continuity and defective 6F6 plate by-pass condenser.

All riveted component parts can be removed merely by punching out the rivets with a small-diameter straight side punch. Replacement parts can be secured with small machine screws and nuts.

In changing the power transformer, it is necessary only to remove the four machine screws. When replacing the power transformer, be sure to tighten these screws securely.

GENERAL DESCRIPTION

The Models 736, 737 and 738 American-Bosch All-Metal Car-Radios are standard manufactured and tested with special consideration for the requirements of automobile radio. The electrical, mechanical and acoustical features of these sets have been developed only after extensive tests in automobiles to determine the proper requirements for greatest satisfaction.

The Models 736, 737 and 738 are seven-tube superheterodyne car-radios, differing only in the type of sound speaker used. In the Model 736, a permanent magnet dynamic speaker, with thin receiver housing is incorporated. The Model 736 uses a separate header-type speaker, for mounting on the header bar directly above the windshield. A separate bulkhead-mounted speaker is used with the Model 738 receiver.

The Models 736, 737 and 738 are equipped with three spark traps: an internal, tuned spark trap in the battery circuit to assist in the suppression of ignition interference; an external spark trap connected in series with the battery cable; and an antenna spark trap provided in the antenna circuit. The use of these spark traps makes the installation of additional suppression equipment unnecessary in most cars.

LINE-UP CAPACITOR ADJUSTMENTS

All the adjustable capacitors, commonly called trimmer condensers, are very carefully adjusted at the factory, and will not need any further adjustment unless a coil or I.F. transformer is changed or the adjustments tampered with in the field. Therefore, DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary, and a high grade modulated test oscillator and an output meter are available. Then proceed as follows, referring to Figs. 1 and 2:

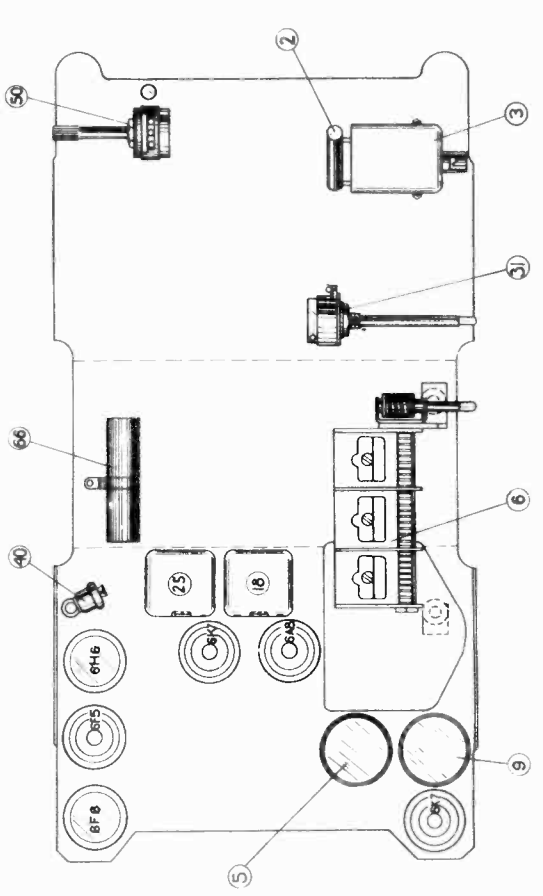
NOTE: Before aligning the gang-condenser trimmers on the bottom of the gang condenser, it will be necessary to remove the three rubber plugs from the bottom of the receiver housing. The setting of the trimmer on the TOP of the condenser gang should UNDER NO CIRCUMSTANCES BE DISTURBED.

1. Set test oscillator to 175 K.C.
2. Set condenser gang to approximately 600 K.C. This will be at a point where the condenser plates are almost all meshed.
3. Connect output meter across voice coil of speaker. This may be done by connecting one lead of the output meter to the blue lead of the speaker terminal strip and the other lead to the frame of the chassis. The impedance of the voice coil is 3.0 ohms.
4. Apply test signal to grid cap of 6K7 I.F. tube through a .5 mfd. blocking condenser and adjust trimmers #26 and #27 to maximum output reducing output of test oscillator as required.
5. Apply test signal to grid cap of 6A8 first detector-oscillator and adjust first detector-oscillator trimmer #25 to maximum output.
6. Set test oscillator to 1600 K.C. and rotate condenser gang until the plates are wide open. Place a piece of paper (approximately .015" thick) between the rotor and stator plates at the top of the gang and close the rotor down to this spacing. This is the exact setting of the condenser gang for the receiver oscillator at 1600 K.C. and should be carefully set as the resultant alignment of the receiver is dependent upon it.
7. Adjust trimmer #24 to maximum output and then remove the paper gauge.
8. Set test oscillator and condenser gang to 1400 K.C.
9. Apply test signal to grid cap of 6K7 R.F. tube and adjust trimmer "B" to maximum output.
10. Apply test signal to antenna lead thru a .0002 mfd. condenser and adjust trimmer "C" to maximum output.
11. Check sensitivity at several points.

ENGINEERING CHANGES

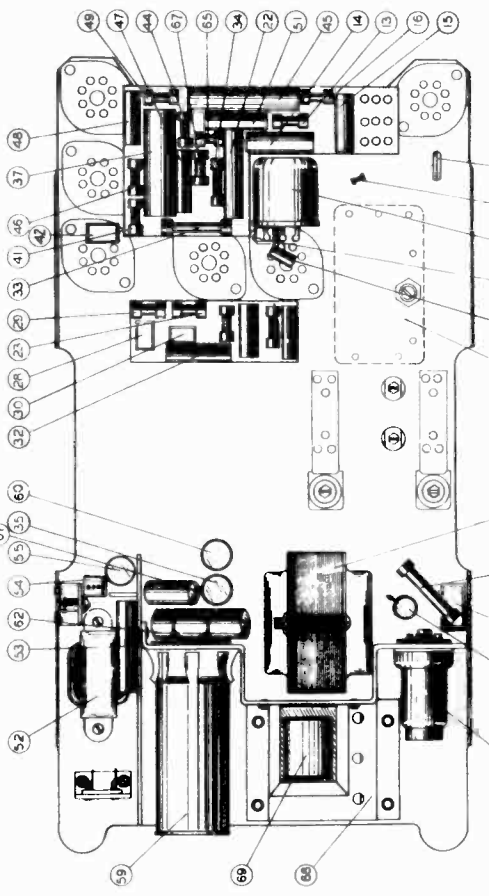
On early Models 736, 737 and 738 the following changes were made to make these Models 736 A2, 737 A2 and 738 A2:

1. The type 6J7 R.F. tube was changed to a type 6K7.
2. The .005 mfd., 600 volt condenser (CW 982) from the plate of the type 6F6 output tube to ground was changed to a .006 mfd., 600 volt condenser (CW 9519).
3. A .0002 mfd. condenser (CW 9524) was added from the grid of the type 6F5 audio tube to ground.
4. The type 6A8 detector-oscillator tube was placed on A.V.C. This change was made by removing the jumper from terminal on R.F. coil to ground and connecting this terminal by a jumper to the terminal on the antenna coil to which the red and yellow lead and the 100,000 ohm resistor are connected.



INSIDE VIEW SHOWN WITH DOUBLE-WINGS OF CHASSIS OPENED OUT.

Figure No. 1



OUTSIDE VIEW SHOW. WITH DOUBLE-WINGS OF CHASSIS OPENED OUT.

Figure No. 2

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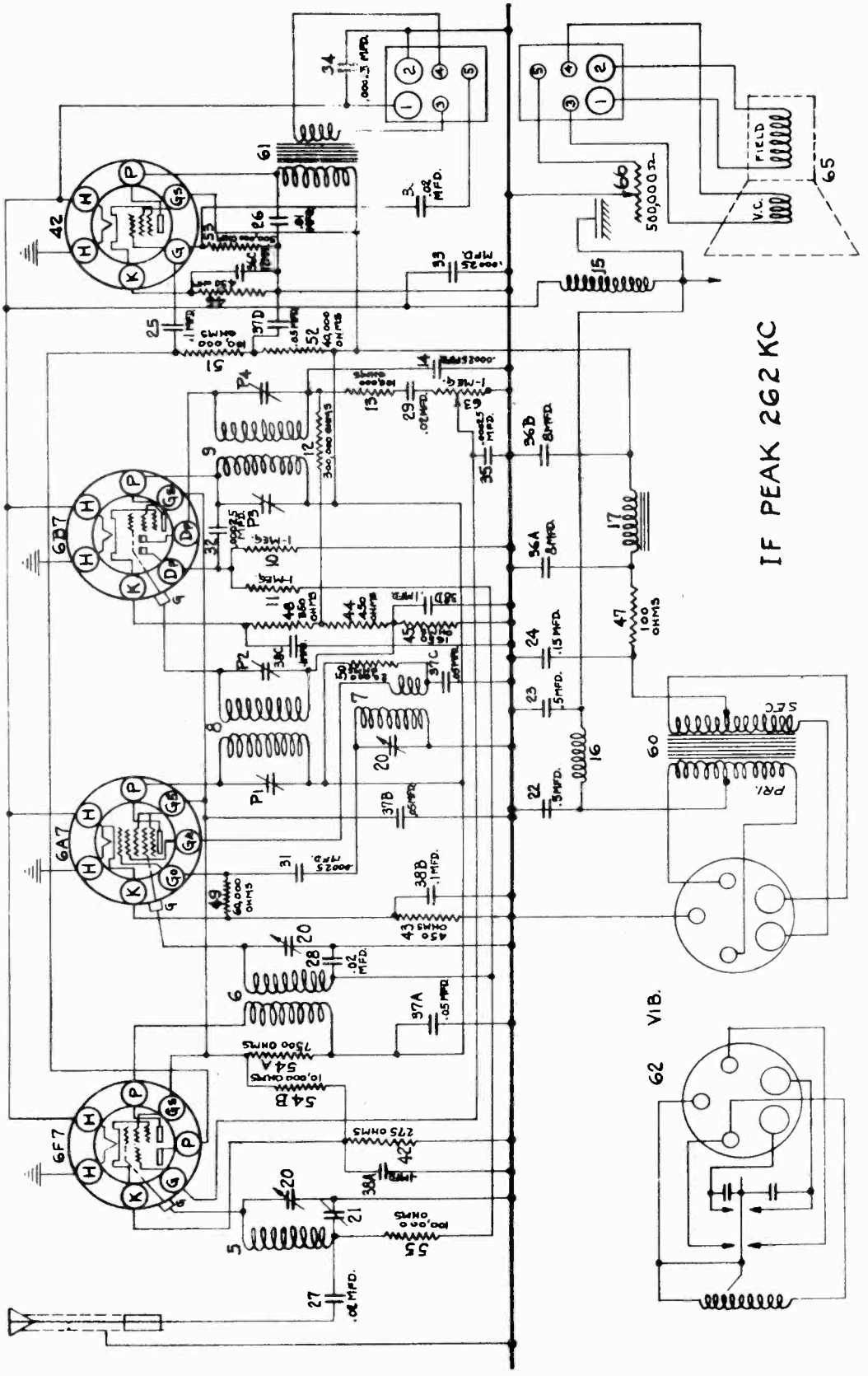
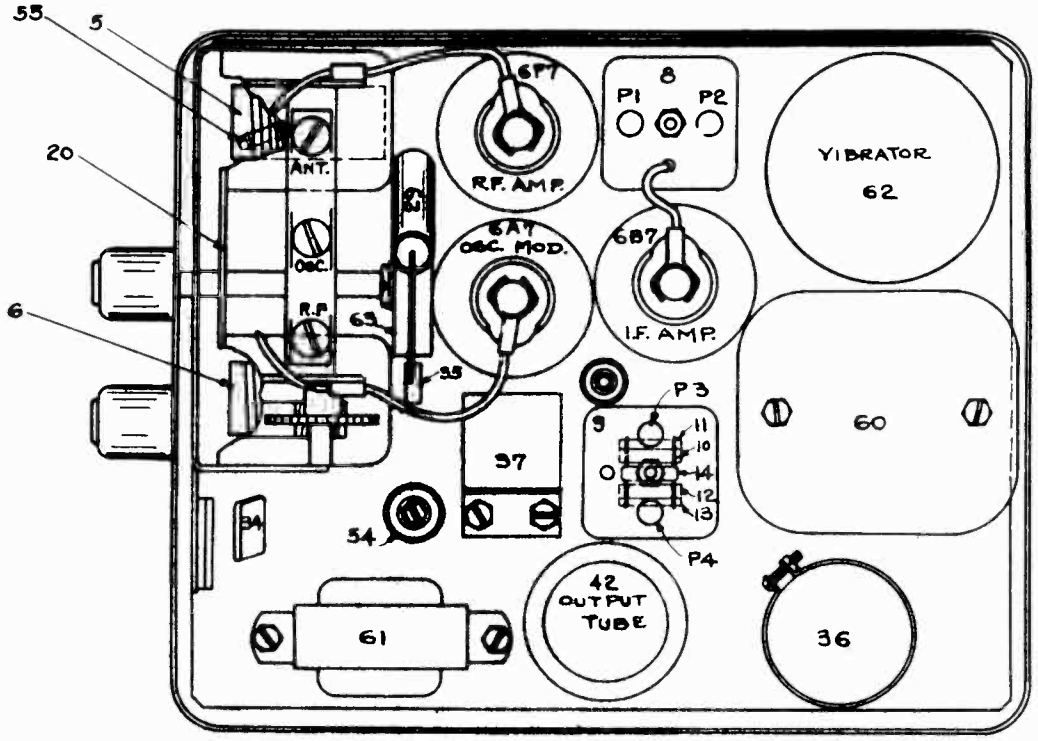
MODEL 601662 Chevrolet
Schematic

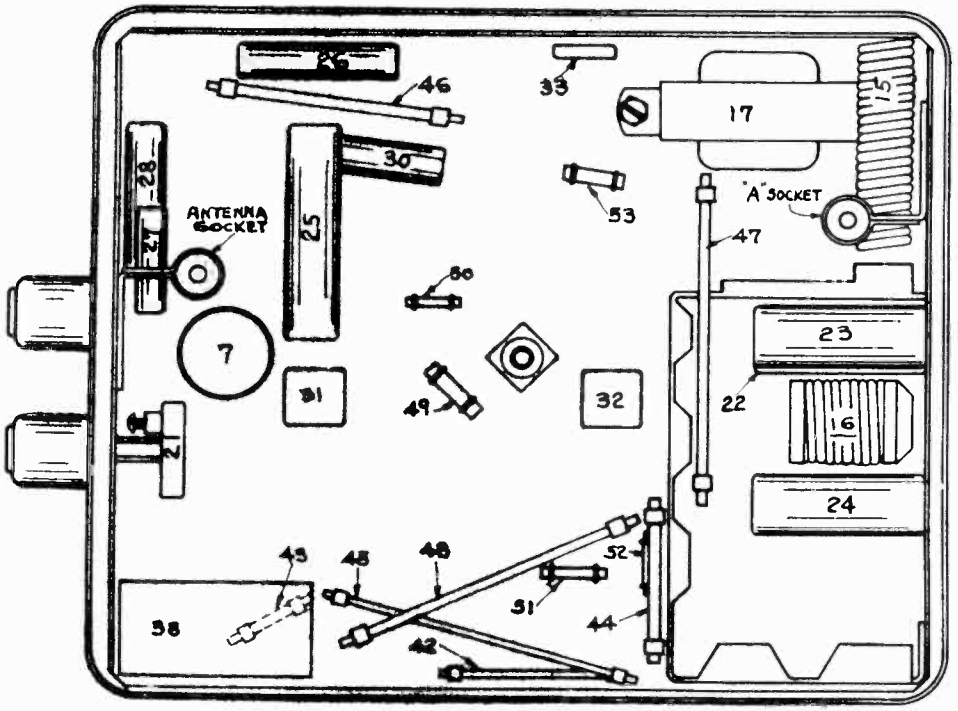


MODEL 601662 Chevrolet
Socket, Trimmers
Chassis

UNITED MOTORS SERVICE



Top View



Bottom View

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MODEL 601662 Chevrolet Alignment, Voltage

GENERAL: The Chevrolet Model 601662 is a four tube, superheterodyne auto radio with a header speaker. It is designed specifically for the 1935 Model Chevrolet automobiles and can be installed on either the "Standard" or "Master" Models. Two types of tuning controls are used. One type mounts on the bottom flange of the instrument panel of "Standard" Chevrolets and the other mounts in the instrument panel of "Master" Chevrolets.

TUBE COMPLEMENT

Type	Function
6F7	R.F.--1st Audio Amplifier
6A7	Detector--Oscillator
6B7	I.F. Amplifier--2nd Det.--A.V.C.
42	Power Output

CIRCUIT DESCRIPTION

This receiver requires the use of four tubes, three of which are the dual purpose type. The circuit is the conventional superheterodyne type that does not involve the use of any regeneration which might affect its stability.

The antenna circuit of this receiver is an improved type designed for use with undercar antenna systems. An exceptionally high gain is obtained in this circuit by resonating it with the car antenna. This results in higher sensitivity and a lower station hiss level. A separate adjustment is provided on the receiver to permit accurate alignment of this circuit to the car antenna.

The output transformer is mounted on the receiver chassis because of the space limitation in the Header type speaker.

PEAKING PROCEDURE

The only way the circuits of this receiver can be peaked properly is with the use of a calibrated oscillator and an output meter. The circuits are very carefully adjusted at the factory and do not need any further adjustment unless tampered with in the field or a coil has been replaced. It is, therefore, advisable not to attempt any adjustments unless it is definitely known that an adjustment is necessary.

Connecting Output Meter

Connect the output meter leads to the chassis frame and to the plate prong of the type 42 output tube. The plate prong can be located by looking at the bottom of the tube with the filament prongs toward you. The first prong to the right of the filaments is the plate prong. Make sure that the meter is protected with a series D.C. blocking condenser.

IMPORTANT

ue to the high sensitivity of these receivers, the receiver chassis must be in its case before making any adjustments. This is necessary in order to obtain accurate adjustments and to prevent oscillation due to lack of the shielding effect of the receiver case.

Peaking I.F. Stages at 262 K.C.

(a) Connect the ground lead of the test oscillator to the chassis frame. Connect a .5 mfd. condenser in series with the other lead and connect this lead to the grid cap of the 6A7 tube, leaving the tube's grid clip in place.

(b) Set the test oscillator on 262 kilocycles.

(c) Turn the volume control of the receiver on full.

(d) Peak the I.F. trimmers P-4 and P-3 on the 2nd I.F. coil, Illus. #9 on Fig. 2.

(e) Then peak each of the trimmers P-2 and P-1 on the 1st I.F. coil, Illus. #8 on Fig. 2.

NOTE: In order to insure accurate settings of the I.F. trimmers the above adjustments should be repeated using the lowest oscillator output that will give a reasonable output meter scale deflection. Make all adjustments for maximum output.

Peaking Gang Condenser at 1530 K.C.

(a) Connect the output of the test oscillator to the antenna connection of the receiver and to the chassis ground. (Do not use the .5 mfd. condenser that was required in aligning the I.F. stages.)

(b) Turn the rotor plates of the gang condenser until they are COMPLETELY OUT OF MESH.

(c) Set the test oscillator on 1530 kilocycles.

(d) Adjust the trimmer for the oscillator section of the gang condenser (middle section) CAREFULLY for maximum output. Then adjust the trimmers for the "R.F." and "ANT." sections of the gang condenser also for maximum output.

Peaking Gang Condenser at 1400 K.C. and Compensating Condenser at 600 K.C.

(a) Set the test oscillator at 1400 kilocycles.

(b) Turn the condenser rotor plates until the 1400 K.C. signal from the test oscillator is tuned in with maximum output.

(c) Readjust the parallel trimmers for the "R.F." and "ANT." sections of the gang condenser (shown on Fig. 2) for maximum output. DO NOT DISTURB the setting of the "OSC." section of the gang condenser as this is adjusted at 1530 K.C. only, and any further adjustments at this point will affect both the tuning range of the receiver and the tracking of its circuits.

(d) Set the test oscillator on 600 kilocycles.

(e) Turn the condenser rotor plates until the 600 K.C. signal from the test oscillator is tuned in with maximum output.

(f) Peak the antenna compensating condenser (Illus. #21 on Fig. 3) for maximum output. Re-tune the condenser plates for maximum output. Repeat these operations alternately until no further improvement in output can be noted.

(g) Reset the test oscillator on 1400 kilocycles.

(h) Turn the condenser rotor plates until the 1400 K.C. signal is tuned in with the maximum output.

(i) Readjust the trimmer for the "ANT." section of the gang condenser CAREFULLY for maximum output.

Adjusting the Compensating Condenser to Car Antenna

After the "ANT." trimmer of the gang condenser has been correctly set according to preceding information, it will require no further adjustment. It will be necessary, however, to reset the "antenna compensating condenser" (Illus. #21 on Fig. 3) to the car antenna when installing the receiver in a car in order to compensate for the wide range of antenna capacities being used. This is done in the following manner:

(a) Tune the receiver to a weak broadcast station between 570 to 640 K.C.

(b) Peak the "antenna compensating condenser" for maximum output, rocking the receiver dial and adjusting the compensating condenser alternately until no further improvement in output can be obtained.

CAUTION: Do not touch the adjustment of the parallel trimmer for the "ANT." section of the gang condenser after the receiver is installed on a car.

VOLTAGE CHART

The voltages shown below are average readings taken from the tube socket contacts to the chassis frame, and will vary ± 10% when the set is tested on a 6 volt battery due to differences in characteristics of vibrators and tubes. All readings were taken with a 1000 ohm per volt meter.

TUBE BASE DIAGRAM SYMBOLS*

Type	Function	H	P	Pt	Gs	Ga	Go	Gt	K
6F7	R.F.--1st Aud.	6	220	60	100	-	-	0	3.0
6A7	Det.--Osc.	6	220	-	100	140	0	-	3.0
6B7	I.F. Amp.--Det.	6	220	-	100	-	-	-	12.0
42	Output	6	210	-	220	-	-	-	15.0

NOTE: Ampere drain 6.2 amperes at 6 volts.
Milliampere drain from B supply is 55 M.A.

CODE FOR SYMBOLS

(These symbols also appear on the Circuit Diagram)

H--Heater
P--Plate (Pentode)
Pt--Plate (Triode)
Gs--Screen grid
Ga--Oscillator Plate
Go--Oscillator grid
Gt--Grid (Triode)
K--Cathode

MODEL 627 Delco
Schematic

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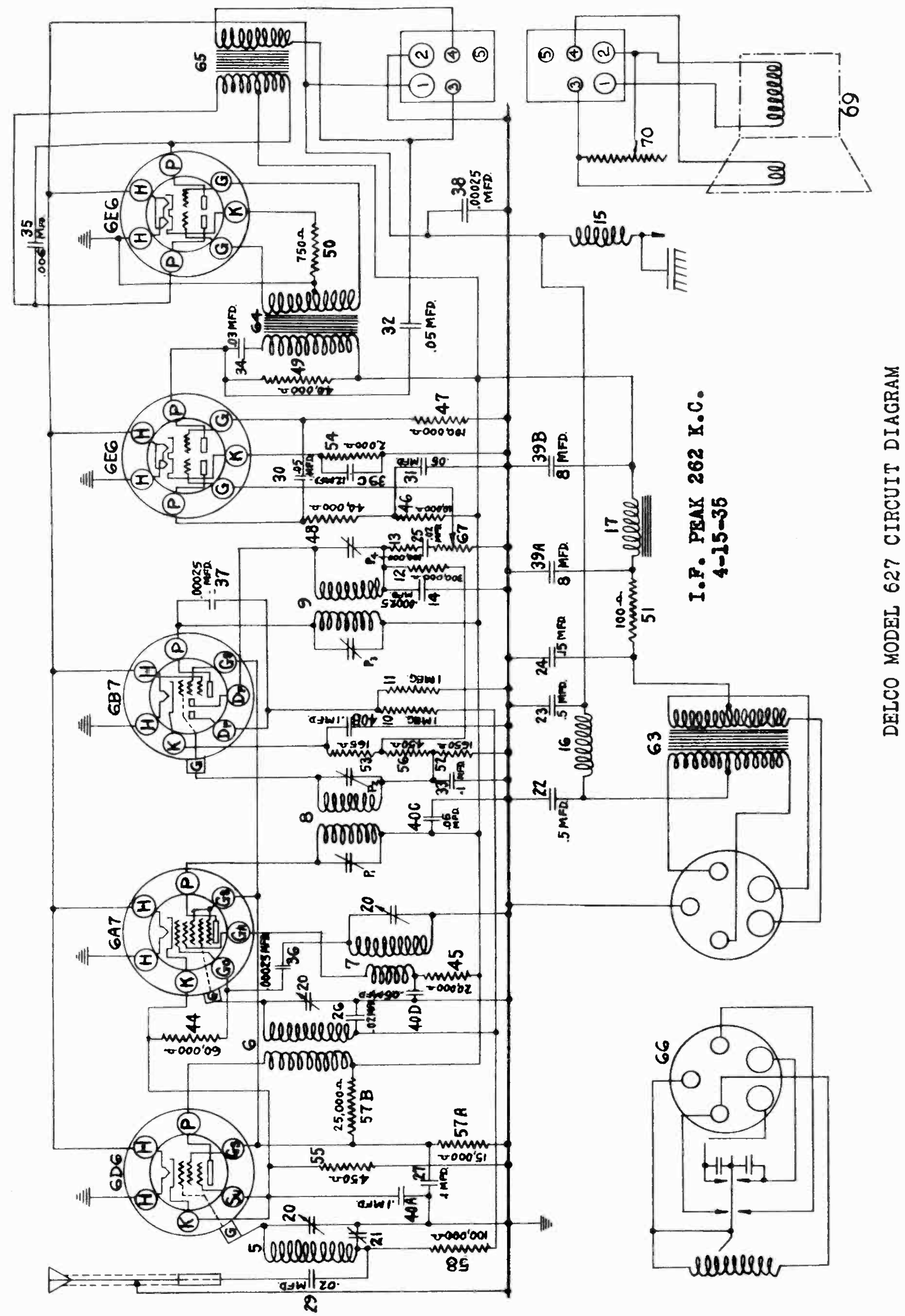

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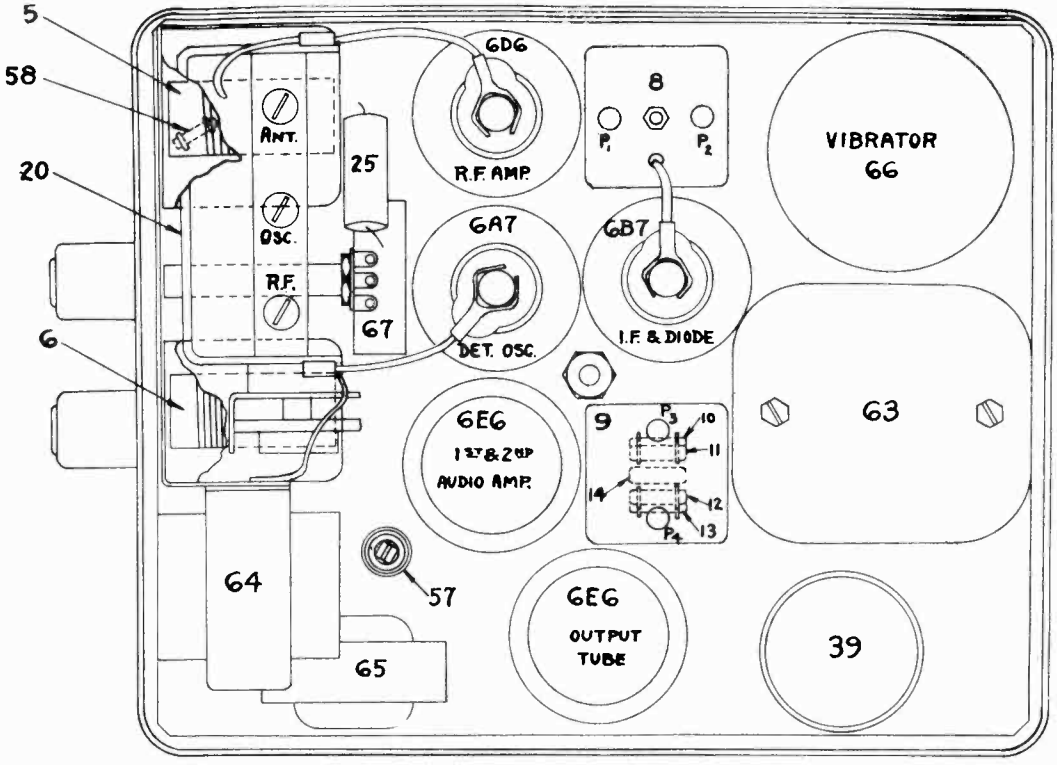
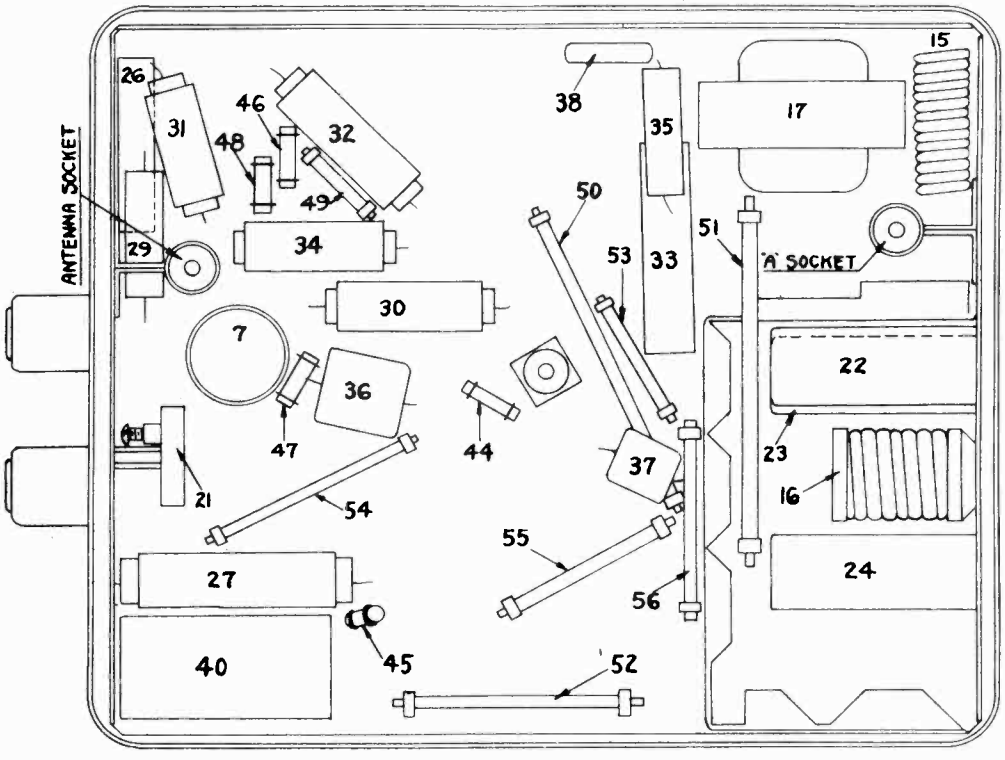
MODEL 627 Delco
Socket, Trimmers
Chassis



PARTS LAYOUT--Top View



PARTS LAYOUT--Bottom View

MODEL 627 Delco
Alignment
Voltage

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*TUBE BASE DIAGRAM SYMBOLS

Type	Function	H	P	P1	P2	Gs	Ga	GO	G	Su	K
6D6	R.F. Amp.	6	230	-	-	95	-	-	0	5.6	5.6
6A7	Det.-Osc.	6	230	-	-	95	145	-	0	-	5.6
6B7	I.F. Amp.-Det.	6	230	-	-	95	-	-	8	-	11
6E6	1st & 2nd Aud.	6	-	100	110	-	-	-	0	-	15
6E6	Output	6	-	230	230	-	-	-	0	1	21

NOTE: Ampere drain of set at 6 volts is 6 amperes.
Milliampere drain from B supply is 55 M.A.

VOLTAGE CHART

The voltages shown below are average readings taken from the tube socket contacts to the chassis frame, and may vary plus or minus 10% when the set is tested on a 6 volt battery. This is due to variations in characteristics of vibrators and tubes. All readings taken with a 1000 ohm per volt meter.

3. Tracking "Syncro-Tuning" Circuit

(a) Set the test oscillator on 1400 kilocycles. (Leave test oscillator connected to ant. and gnd. of receiver.)

(b) Turn the condenser rotor plates until the 1400 K.C. signal from the test oscillator is tuned in with maximum output.

(c) Readjust the parallel trimmers for the "ANT." and "R.F." sections of the gang condenser (shown on Fig. 2) for maximum output. DO NOT DISTURB the setting of the oscillator trimmer as this is adjusted at 1540 K.C. only and any adjustment at this point will affect both the tuning range of the receiver and the tracking of its circuits.

NOTE: In order to accurately set the "ANT." trimmer of the condenser gang at 1400 K.C. it will be necessary to make a preliminary adjustment of the "antenna compensating condenser" (Illus. #21 on Fig. 3) before installing the receiver on a car.

(d) Set the test oscillator on 600 kilocycles.

(e) Turn the condenser rotor plates until the 600 K.C. signal from the test oscillator is tuned in with maximum output.

(f) Peak the antenna compensating condenser (Illus. #21 on Fig. 3) for maximum output. Re-tune the gang condenser for maximum output. Repeat these operations alternately until no further improvement in output can be obtained.

(g) Reset the test oscillator on 1400 kilocycles.

(h) Turn the condenser rotor plates until the 1400 K.C. signal is tuned in with maximum output.

(i) Readjust the trimmer for the "ANT." section of the gang condenser CAREFULLY for maximum output.

Adjusting Compensating Condenser to Car Antenna

4. After the "ANT." trimmer of the gang condenser has been correctly set according to preceding information, it will require no further adjustment. It will be necessary, however, to reset the "antenna capacity compensating condenser" (Illus. #21 on Fig. 3) to the car antenna when installing the receiver in a car in order to compensate for the wide range of antenna capacities being used. This is done in the following manner:

(a) Tune the receiver to a weak broadcast station between 570 to 640 K.C.

(b) Peak the "antenna capacity compensating condenser" for maximum output, rocking the receiver dial and adjusting the compensating condenser alternately until no further improvement in output can be obtained.

CAUTION: Do not touch the adjustment of the parallel trimmer for the "ANT." section of the gang condenser after the receiver is installed on a car.

PEAKING PROCEDURE

Connecting Output Meter

Connect the terminals of the output meter to the two plate prongs of the type 6E6 output tube which can be determined by looking at the bottom of the tube with the filament prongs toward you. The prongs located on each side of the filaments are the plate prongs--make sure that the meter is protected with a series condenser.

IMPORTANT

Due to the high sensitivity of these receivers, the receiver chassis must be in its case before making any adjustments. This is necessary in order to obtain accurate adjustments and to prevent oscillation due to lack of the shielding effect of the receiver case. Also, the following procedure should be followed closely if the "Syncro-Tuning" Circuit is to function properly.

1. Peaking I.F. Stages at 262 K.C.

(a) Connect the ground lead of the test oscillator to the chassis frame. Connect a .5 mfd. condenser in series with the other lead and connect this lead to the grid cap of the 6A7 tube, leaving the tube's grid clip in place. (The .5 mfd. condenser is necessary to prevent the oscillator circuit of the receiver from affecting the I.F. adjustments.)

(b) Set the test oscillator on 262 kilocycles.

(c) Turn the volume control of the receiver on full.

(d) Peak each of the I.F. trimmers P3 and P4 on the 2nd I.F. coil, (Illus. #9 on Fig. 3).

(e) Then peak each of the trimmers P1 and P2 on the 1st I.F. coil, (Illus. #8 on Fig. 3).

(f) In order to insure accurate settings of the I.F. trimmers, the above adjustments should be repeated using the lowest oscillator output that will give a reasonable output meter scale deflection. Make all adjustments for maximum output.

2. Peaking Oscillator Section of Gang Condenser at 1540 K.C.

(a) Connect the output of the test oscillator to the antenna connection of the receiver and to the chassis ground. (Do not use the .5 mfd. condenser that was required in aligning the I.F. stages.)

(b) Turn the rotor plates of the gang condenser until they are COMPLETELY OUT OF MESH.

(c) Set the test oscillator on exactly 1540 kilocycles.

(d) Adjust the parallel trimmer for the "OSC". section (middle section) CAREFULLY for maximum output. Then adjust the trimmers for the other two sections of the gang condenser, also for maximum output.

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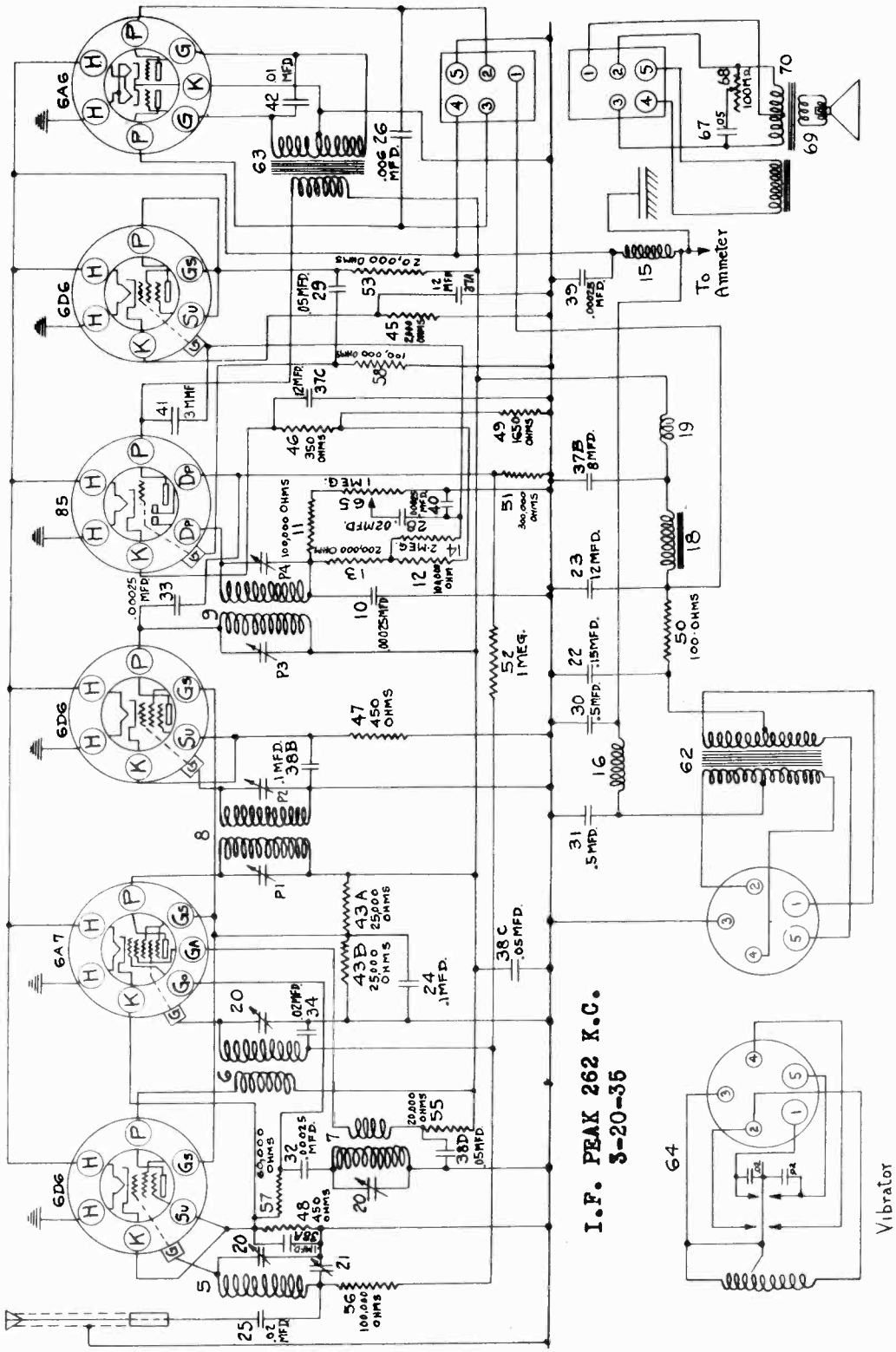
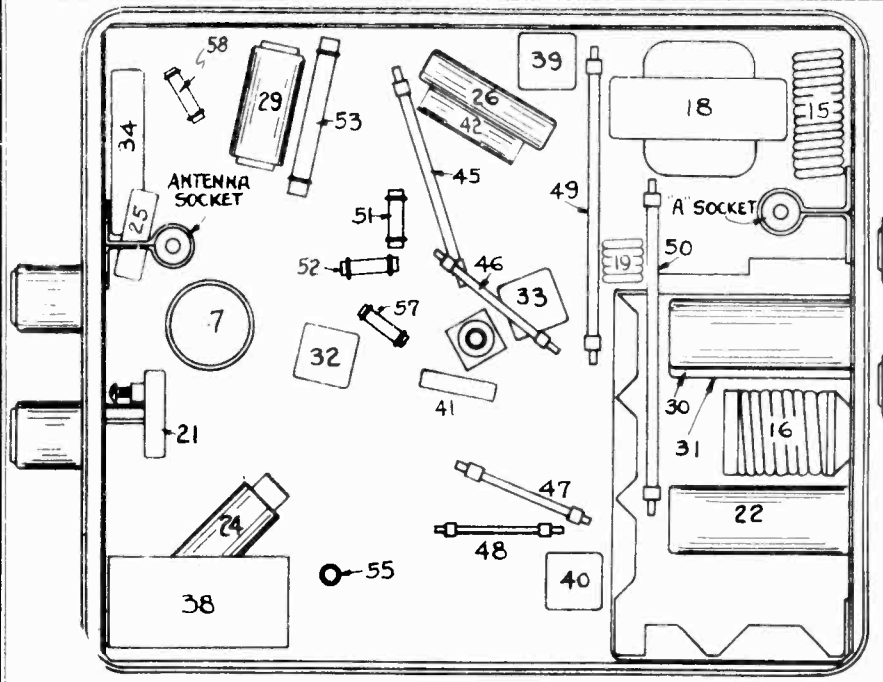
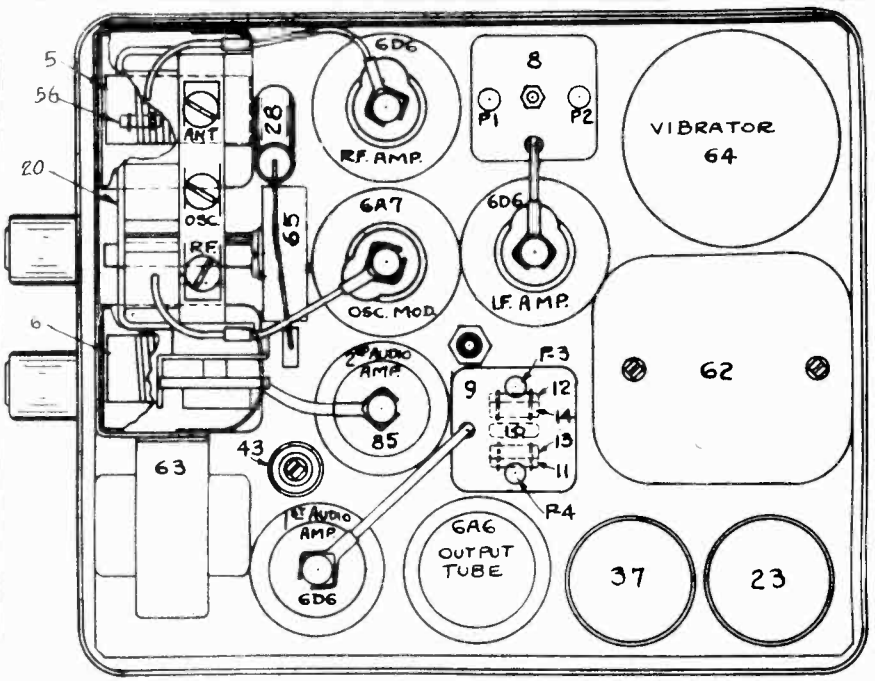
MODEL 628 Delco
Schematic





PARTS LAYOUT (Bottom View)



PARTS LAYOUT (Top View)

VOLTAGE CHART

The voltages shown below are average readings taken from the tube socket contacts to the chassis frame, and may vary plus or minus 10% when the set is tested on a 6 volt battery. This is due to variations in characteristics of vibrators and tubes. All readings taken with a 1000 ohm per volt meter.
NOTE: Ampere drain of set at 6 volts is 6.8 amperes. Milliampere drain from B supply is 60 M.A.

*TUBE BASE DIAGRAM SYMBOLS

Type	Function	H	P	Gs	Ga	Go	Su	K
6D6	R.F. Amp.	6	210	70	-	-	4	4
6A7	Det.-Osc.	6	210	70	150	0	-	4
6D6	I.F. Amp.	6	210	70	-	-	4	4
85	Det.-2nd A.F.	6	200	-	-	-	-	13
6D6	1st A.F. Amp.	6	90	90	-	-	90	13
6A6	Output	6	200	-	-	-	-	0

PEAKING PROCEDURE

Connecting Output Meter

Connect the terminals of the output meter to the two plate prongs of the type 6A6 output tube which can be determined by looking at the bottom of the tube with the filament prongs toward you. The prongs located on each side of the filaments are the plate prongs--make sure that the meter is protected with a series condenser.

IMPORTANT

Due to the high sensitivity of these receivers, the receiver chassis must be in its case before making any adjustments. This is necessary in order to obtain accurate adjustments and to prevent oscillation due to lack of the shielding effect of the receiver case. Also, the following procedure should be followed closely if the "Snycro-Tuning" circuit is to function properly.

1. Peaking I.F. Stages at 262 K.C.

   (a) Connect the ground lead of the test oscillator to the chassis frame. Connect a .5 mfd. condenser in series with the other lead and connect this lead to the grid cap of the 6A7 tube, leaving the tube's grid clip in place. (The .5 mfd. condenser is necessary to prevent the oscillator circuit of the receiver from affecting the I.F. adjustments.)

   (b) Set the test oscillator on 262 kilocycles.

   (c) Turn the volume control of the receiver on full.

   (d) Peak each of the I.F. trimmers on the 2nd I.F. coil, Illustration #9 on Fig. 3.

   (e) Then peak each of the trimmers on the 1st I.F. coil, Illustration #8 on Fig. 3.

   (f) In order to insure accurate settings of the I.F. trimmers the above adjustments should be repeated using the lowest oscillator output that will give a reasonable output meter scale deflection. Make all adjustments for maximum output.

   Peaking Oscillator Section of Gang Condenser at 1540 K.C.

   (a) Connect the output of the test oscillator to the antenna connection of the receiver and to the chassis ground. (Do not use the .5 mfd. condenser that was required in aligning the I.F. stages.)

   (b) Turn the rotor plates of the gang condenser until they are COMPLETELY OUT OF MESH.

   (c) Set the test oscillator on exactly 1540 kilocycles.

   (d) Adjust the parallel trimmer for the "OSC." section (middle section) CAREFULLY for maximum output. Then adjust the trimmers for the other two sections of the gang condenser, also for maximum output.

3. Tracking "Syncro-Tuning" Circuit

   (a) Set the test oscillator on 1400 kilocycles. (Leave test osicllator connected to ant. and gnd. of receiver.)

   (b) Turn the condenser rotor plates until the 1400 K.C. signal from the test oscillator is tuned in with maximum output.

   (c) Readjust the parallel trimmers for the "ANT." and "R.F." sections of the gang condenser (shown on Fig. 2) for maximum output. DO NOT DISTURB the setting of the oscillator trimmer as this is adjusted at 1540 K.C. only and any adjustment at this point will affect both the tuning range of the receiver and the tracking of its circuits.

      NOTE: In order to accurately set the "ANT." trimmer of the condenser gang at 1400 K.C. it will be necessary to make a preliminary adjustment of the "antenna compensating condenser" (Illustration #21 on Fig. 3) before installing the receiver on a car.

   (d) Set the test oscillator on 600 kilocycles.

   (e) Turn the condenser rotor plates until the 600 K.C. signal from the test oscilaltor is tuned in with maximum output.

   (f) Peak the "antenna compensating condenser," (Illustration #21 on Fig. 3) for maximum output, rocking the rotor plates of the condenser gang back and forth and adjusting the "antenna compensating condenser" alternately until no further improvement in output can be obtained. (This trimmer is not critical in its adjustment, however, it should be adjusted carefully using a very low test osc. output.)

   (g) Reset the test oscillator on 1400 kilocycles.

   (h) Turn the condenser rotor plates until the 1400 K.C. signal is tuned in with maximum output.

   (i) Readjust the trimmer for the "ANT." section of the gang condenser CAREFULLY for maximum output.

4. Adjusting Compensating Condenser to Car Antenna

   After the "ANT." trimmer of the gang condenser has been correctly set according to preceding information, it will require no further adjustment. It will be necessary, however, to reset the "antenna capacity compensating condenser" (Illus. #21 on Fig. 3) to the car antenna when installing the receiver in a car in order to compensate for the wide range of antenna capacities being used. This is done in the following manner:

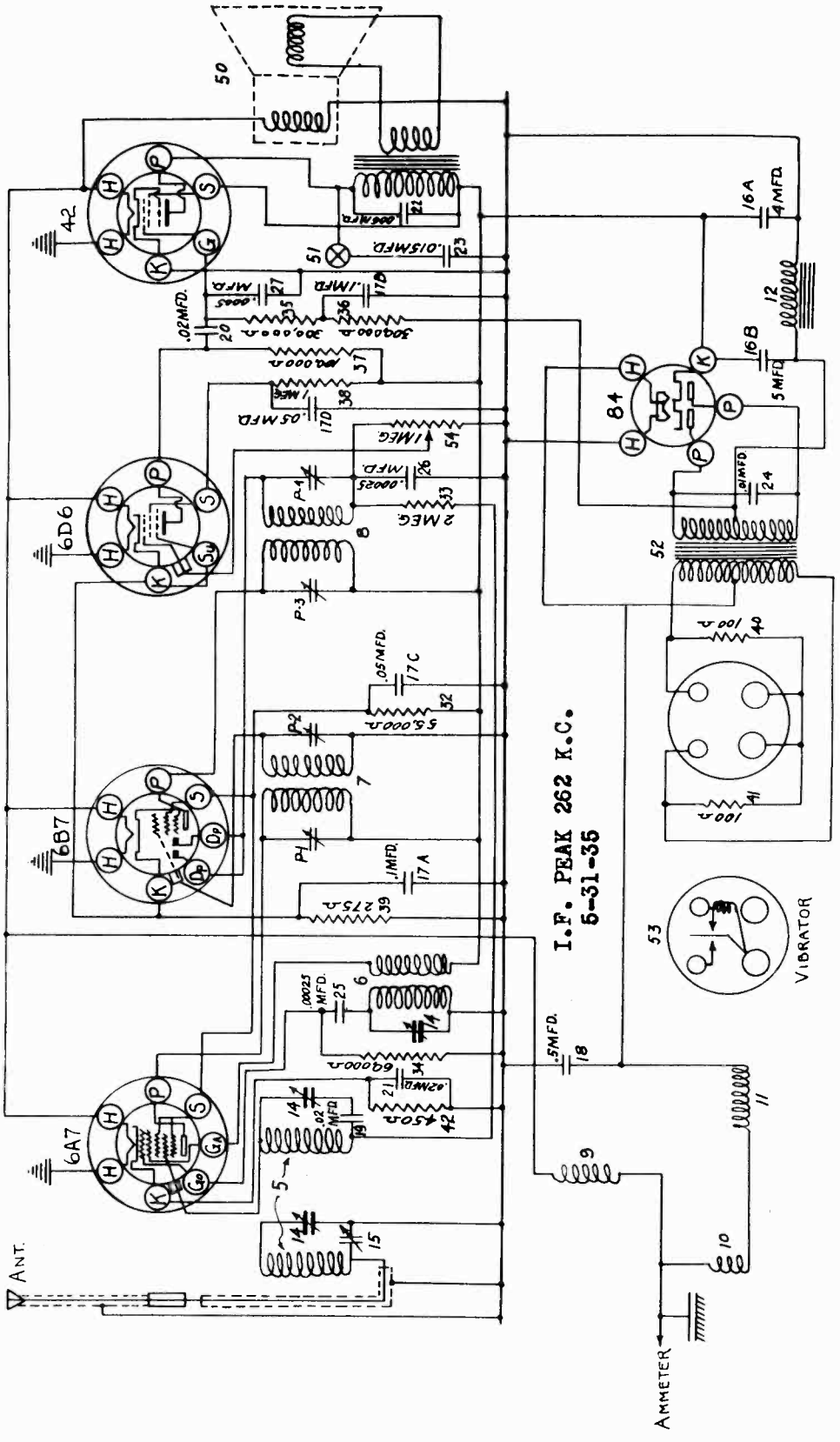
   (a) Tune the receiver to a weak broadcast station between 570 to 640 K.C.

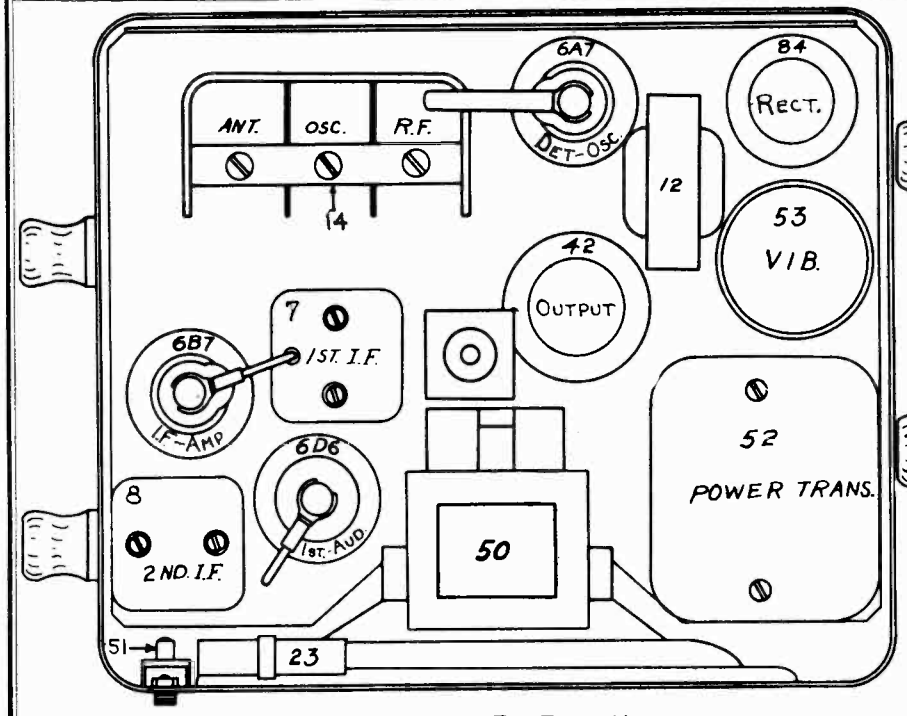
   (b) Peak the "antenna capacity compensating condenser" for maximum output, rocking the receiver dial and adjusting the compensating condenser alternately until no further improvement in output can be obtained.

      CAUTION: Do not touch the adjustment of the parallel trimmer for the "ANT." section of the gang condenser after the receiver is installed on a car.

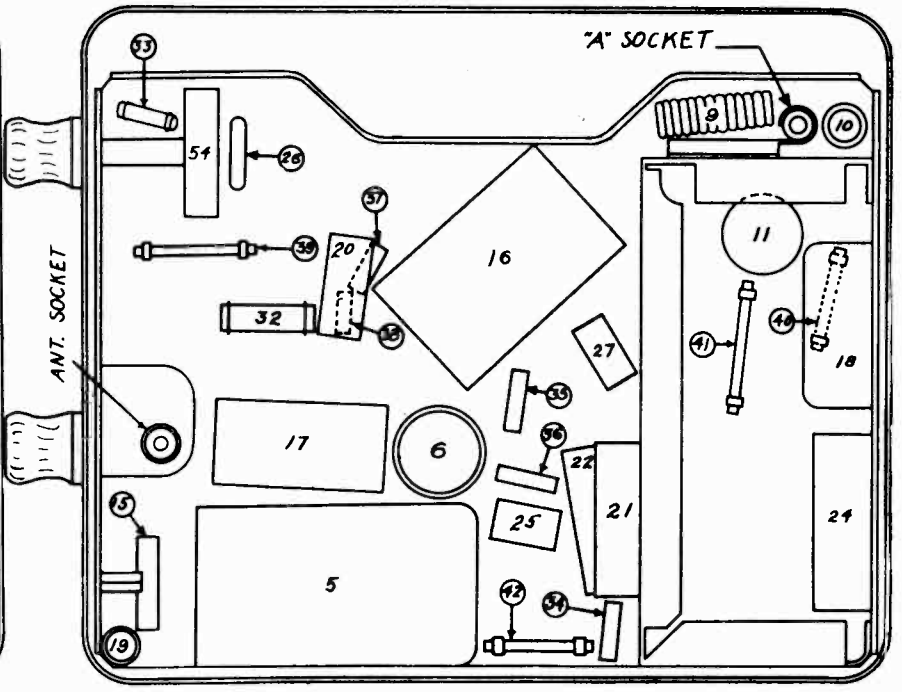
MODEL 630 Delco
Schematic

UNITED MOTORS SERVICE





PARTS LAYOUT--Top View



PARTS LAYOUT--Bottom View

VOLTAGE CHART

The voltages shown below are average readings taken from the tube socket contacts to the chassis frame, and may vary plus or minus 10% when the set is tested on a 6 volt battery. This is due to variations in characteristics of vibrators and tubes. All readings taken with a 1000 ohm per volt meter.

*TUBE BASE DIAGRAM SYMBOLS

Type	Function	H	P	Gs	Ga	Go	Su	K
6A7	Det.-Osc.	6	230	100	230	0	-	6.0
6B7	I.F. Amp.	6	230	100	-	-	-	3.0
6D6	1st Audio	6	55	20	-	-	-	3.0
42	Output	6	230	230	-	-	0	0
84	Rectifier	6	230	-	-	-	-	2.45

NOTE: Ampere drain of set at 6 volts is 7 amperes. Milliampere drain from B supply is 45 M.A.

PEAKING PROCEDURE

The only way the circuits of this receiver can be peaked properly is with the use of a calibrated test oscillator and an output meter. The circuits are very carefully adjusted at the factory and do not need any further adjustment unless tampered with in the field or a defective coil has been replaced. It is, therefore, advisable not to attempt any adjustments unless it is definitely known that an adjustment is necessary. This is especially important in connection with the "Syncro-Tuning" circuit.

Connecting Output Meter

Connect one of the output meter leads to the plate prong of the type 42 output tube. (The plate prong is the first prong to the left of the filament when looking at the bottom of the tube with the filament prongs toward you.) Connect the other lead to the receiver chassis, making sure that the output meter is protected with a D.C. blocking condenser connected in series to prevent damage to the meter.

IMPORTANT

Due to the high sensitivity of these receivers, the receiver chassis must be in its case before making any adjustments. This is necessary in order to obtain accurate adjustments and to prevent oscillation due to lack of the shielding effect of the receiver case. Also, DO NOT DISTURB the placement of the capacity wire located on top of the gang condenser. This wire should lay flat across the top of the condenser gang, extending from the "OSC." section to the "R.F." section.

1. Peaking I.F. Stages at 262 K.C.

(a) Connect the ground lead of the test oscillator to the chassis frame. Connect a .5 mfd. condenser in series with the other lead and connect this lead to the grid cap of the 6B7 tube, leaving the tube's grid clip in place. (The .5 mfd. condenser is necessary to prevent the oscillator circuit of the receiver from affecting the I.F. adjustments.)

(b) Set the test oscillator on 262 kilocycles.

(c) Turn the volume control of the receiver on full.

(d) Peak each of the I.F. trimmers on the 2nd I.F. coil, Illus. #8 on Fig. 3.

(e) Remove the test oscillator lead from the grid clip of the 6B7 tube and connect it to the grid clip of the 6A7 tube, leaving the tube's grid clip in place.

(f) Then peak each of the trimmers on the 1st I.F. coil, Illus. #7, Fig. 3.

(g) In order to insure accurate settings of the I.F. trimmers the above adjustments should be repeated using the lowest oscillator output that will give a reasonable output meter scale deflection. Make all adjustments for maximum output.

2. Peaking Oscillator Section of Gang Condenser at 1540 K.C.

(a) Connect the output of the test oscillator to the antenna connection of the receiver and to the chassis ground. (Do not use the .5 mfd. condenser that was required in aligning the I.F. stages.)

(b) Turn the rotor plates of the gang condenser until they are COMPLETELY OUT OF MESH.

(c) Set the test oscillator on exactly 1540 kilocycles.

(d) Adjust the parallel trimmer for the "OSC." section (middle section) CAREFULLY for maximum output. Then adjust the trimmers for the other two sections of the gang condenser also for maximum output.

Tracking "Syncro-Tuning" Circuit

(a) Set the test oscillator on 1400 kilocycles. (Leave test oscillator connected to ant. and gnd. of receiver.)

(b) Turn the condenser rotor plates until the 1400 K.C. signal from the test oscillator is tuned in with maximum output.

(c) Readjust the parallel trimmers for the "ANT." and "R.F." sections of the gang condenser (shown on Fig. 2) for maximum output. DO NOT DISTURB the setting of the oscillator trimmer as this is adjusted at the 1540 K.C. only and adjustment at this point will affect both the tuning range of the receiver and the tracking of its circuits.

NOTE: In order to accurately set the "ANT." trimmer of the condenser gang at 1400 K.C. it will be necessary to make a preliminary adjustment of the "antenna compensating condenser" (Illus. #15 on Fig. 3) before installing the receiver on a car.

(d) Then set the test oscillator on 600 kilocycles.

(e) Turn the condenser rotor plates until the 600 K.C. signal from the test oscillator is tuned in with maximum output.

(f) Peak the antenna compensating condenser (Illus. #15 on Fig. 3) for maximum output. Re-tune the gang condenser for maximum output. Repeat this operation alternately until no further improvement in output can be obtained.

(g) Reset the test oscillator on 1400 kilocycles.

(h) Turn the condenser rotor plates until the 1400 K.C. signal is tuned in with maximum output.

(i) Adjust the trimmer for the "ANT." section of the gang condenser CAREFULLY for maximum output.

4. Adjusting Compensating Condenser to Car Antenna

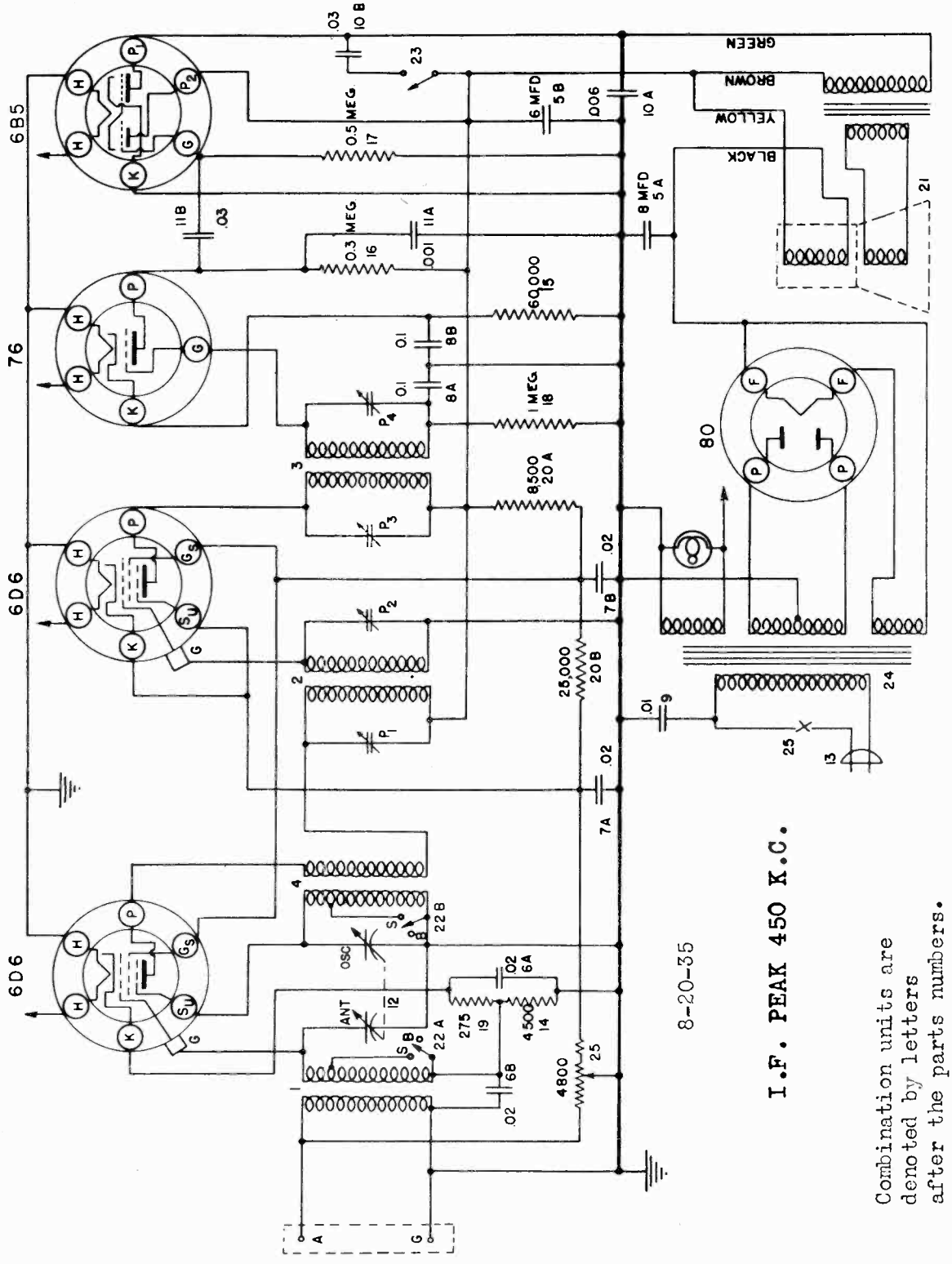
After the "ANT." trimmer of the gang condenser has been correctly set according to the preceding information, it will require no further adjustment. It will be necessary, however, to reset the antenna capacity compensating condenser (Bottom View of chassis) to the car antenna when installing the receiver in a car in order to compensate for the wide range of antenna capacities being used. This is done in the following manner:

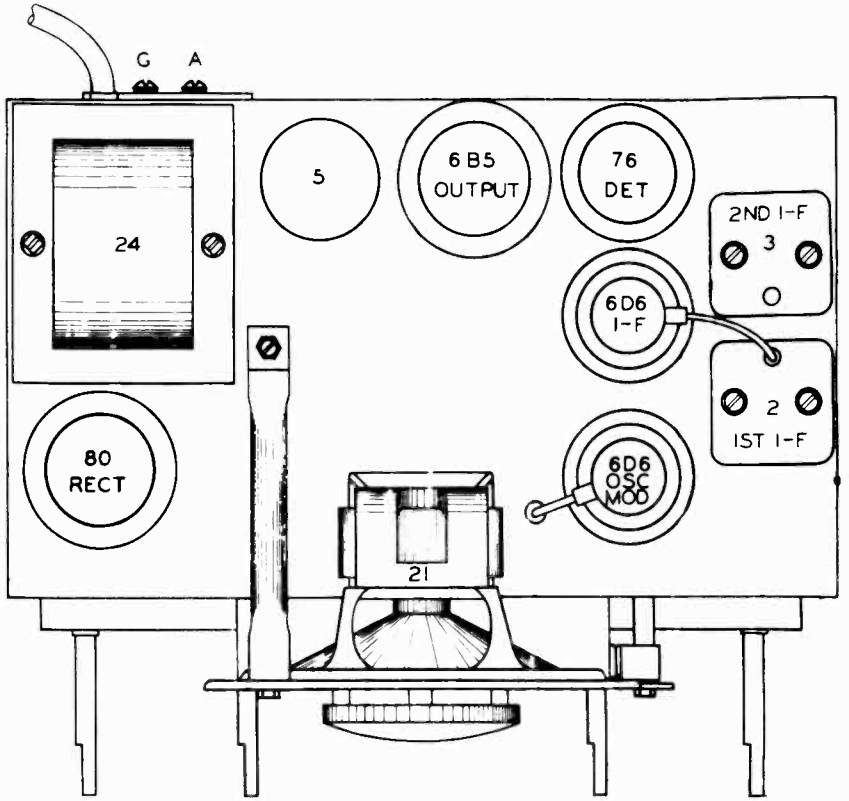
(a) Tune the receiver to a weak broadcast station between 570 to 640 K.C.

(b) Peak the compensating condenser for maximum output, rocking the receiver dial and adjusting the comp
sating condenser alternately until no further improvement in output can be obtained.
CAUTION: Do not touch the adjustment of the parallel trimmer for the "ANT" section of the gang cond-
nser after the receiver is installed on a car.

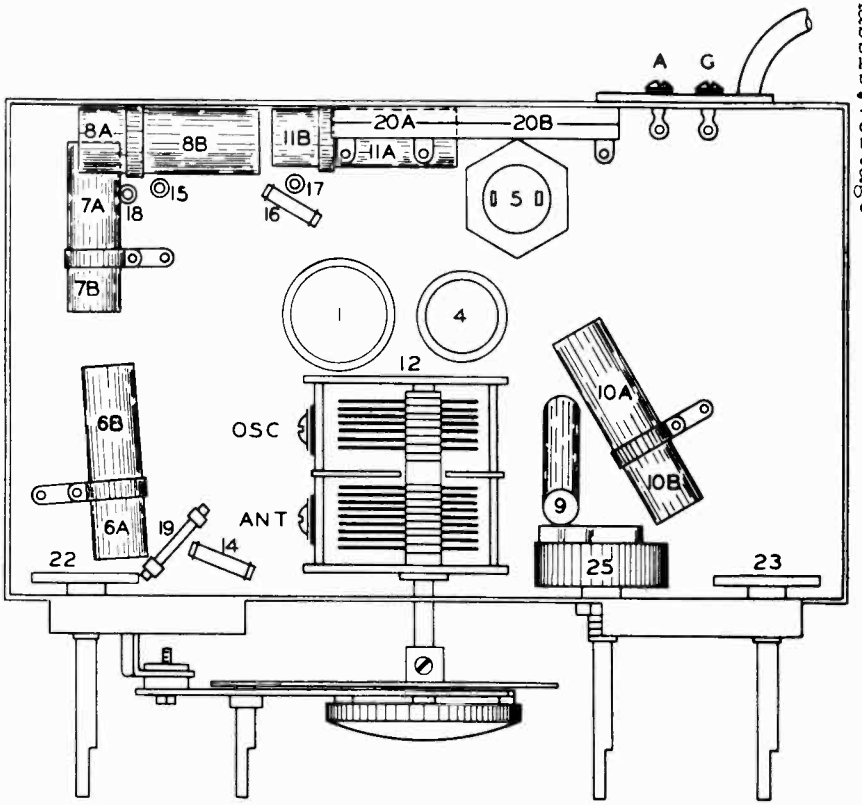
UNITED MOTORS SERVICE

MODEL 1105 Delco
Schematic





PARTS LAYOUT--Top View



PARTS LAYOUT--Bottom View

TUBE SOCKET VOLTAGES

Type	Function	H	P	Gs	Su	G	P2	K
6D6	Osc.-Mod.	6.3	210	120	0	28	-	31
6D6	I-F Amp.	6.3	210	120	3	0	-	3
76	Detector	6.3	86	-	-	0	-	8.5
6B5	Output	6.3	200	-	-	0	210	0
80	Rectifier	4.9	280	-	-	-	-	-

All readings (except filaments) taken on 115 volt line with 1000 ohms per volt meter from tube socket contacts to chassis using the 250 volt scale. Filament readings were taken with a low range A-C voltmeter.

MODEL 1105 Delco
Alignment

UNITED MOTORS SERVICE

GENERAL: The Delco Model 1105 is a five tube, two band, A.C., receiver. The tubes used are: 6D6 Oscillator-Modulator, 6D6 I-F Amplifier, 76 Detector, 6B5 Output and type 80 Rectifier.

The frequency range is from 540 to 1570 kilocycles on the Broadcast Band and from 1570 to 4000 kilocycles on the short wave band (Police and Amateur).

CIRCUIT ALIGNMENT

All of the adjustable condensers are very accurately adjusted at the factory and should need no further adjustment unless tampered with in the field or a defective coil has been replaced. If realignment is found necessary the circuits can be properly adjusted only with the use of a calibrated test oscillator and an output meter.

1. Peaking I-F Stages at 450 Kilocycles

   (a) Connect the output of the test oscillator through a .02 mfd. series condenser to the top cap of the 6D6 Osc.-Mod. tube. DO NOT REMOVE THE GRID CLIP.

   (b) Connect the ground lead of the test oscillator to the chassis frame or ground terminal of the receiver.

   (c) Set the test oscillator to 450 kilocycles.

   (d) Rotate the receiver tuning condenser until the rotor plates are completely out of mesh.

   (e) Turn the band selector switch to the right hand position. (Short Wave Band)

   (f) Turn the volume control of the receiver on full.

   (g) With the test oscillator set to the lowest usable output level adjust the I-F trimmer condensers located on top of the I-F coils, Fig. 2, for maximum output.

   NOTE: Make the adjustments very carefully, going over them several times to insure that the final setting is at resonant frequency. Also, an insulated screw driver should be used to insure accurate adjustments.

2. Aligning R-F Circuits

   (a) Turn the band selector switch to the left hand position. (Broadcast Band)

   (b) Leave the receiver tuning condenser rotor plates completely out of mesh.

   (c) Connect the output lead from the test oscillator through a .00025 mfd., series condenser to the antenna terminal of the receiver.

   (d) Set the test oscillator to exactly 1570 kilocycles.

   (e) Adjust the trimmer on the "Osc." section of the tuning condenser gang for maximum output. (Fig. 3)

   (f) Set the test oscillator to 1400 kilocycles.

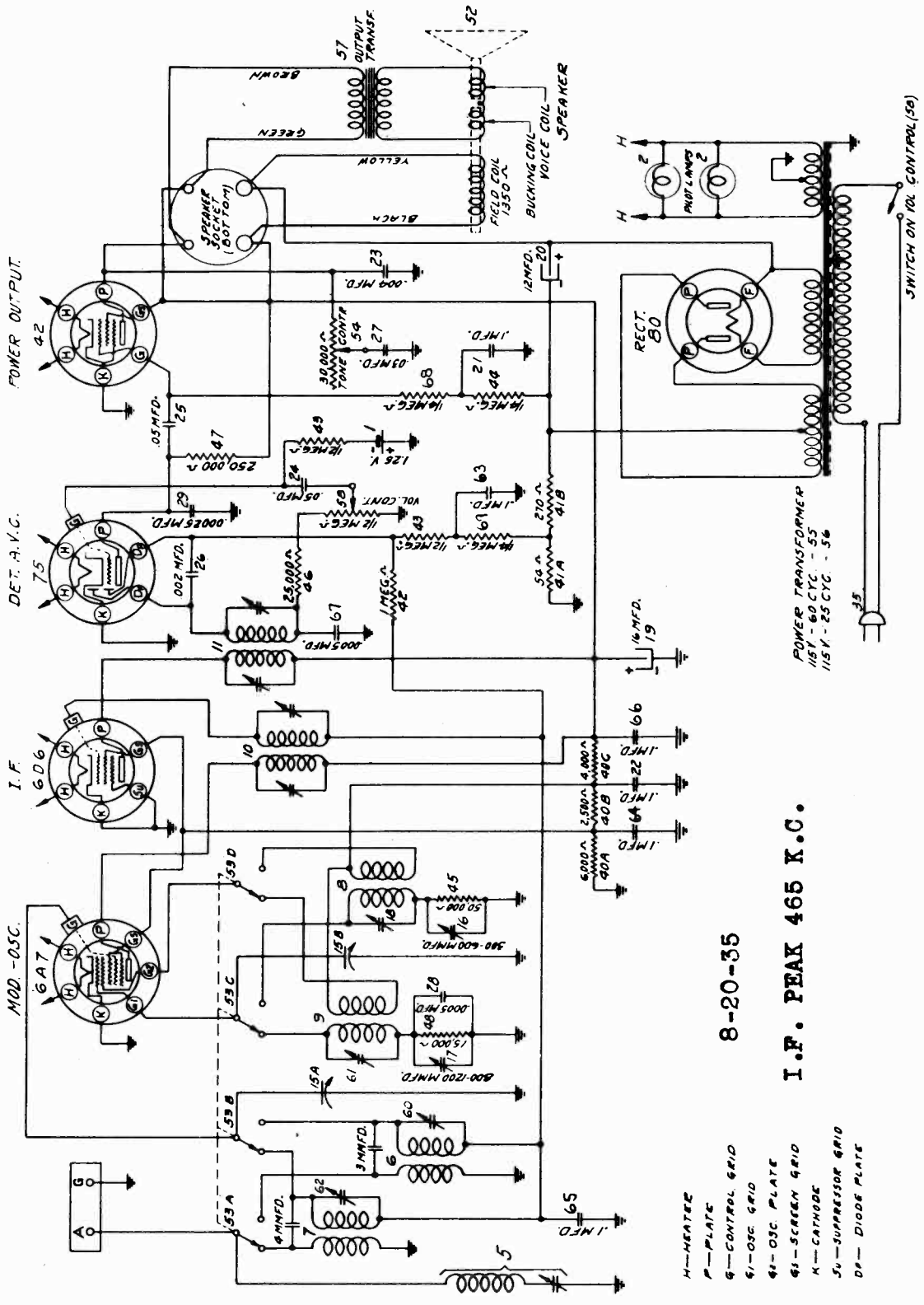
   (g) Tune in the 1400 kilocycle signal with the station selector for maximum output.
   Note: Do not disturb the setting of the "Osc." trimmer as this is adjusted at 1570 kilocycles only and any further adjustment at this point would affect both the tuning range of the receiver and the tracking of its circuits.

   (h) Adjust the trimmer on the "Ant" section of the tuning condenser gang for maximum output.

NOTE: There are no adjustments on this receiver for the Police Band.

MODEL 1106 Delco
Schematic

UNITED MOTORS SERVICE



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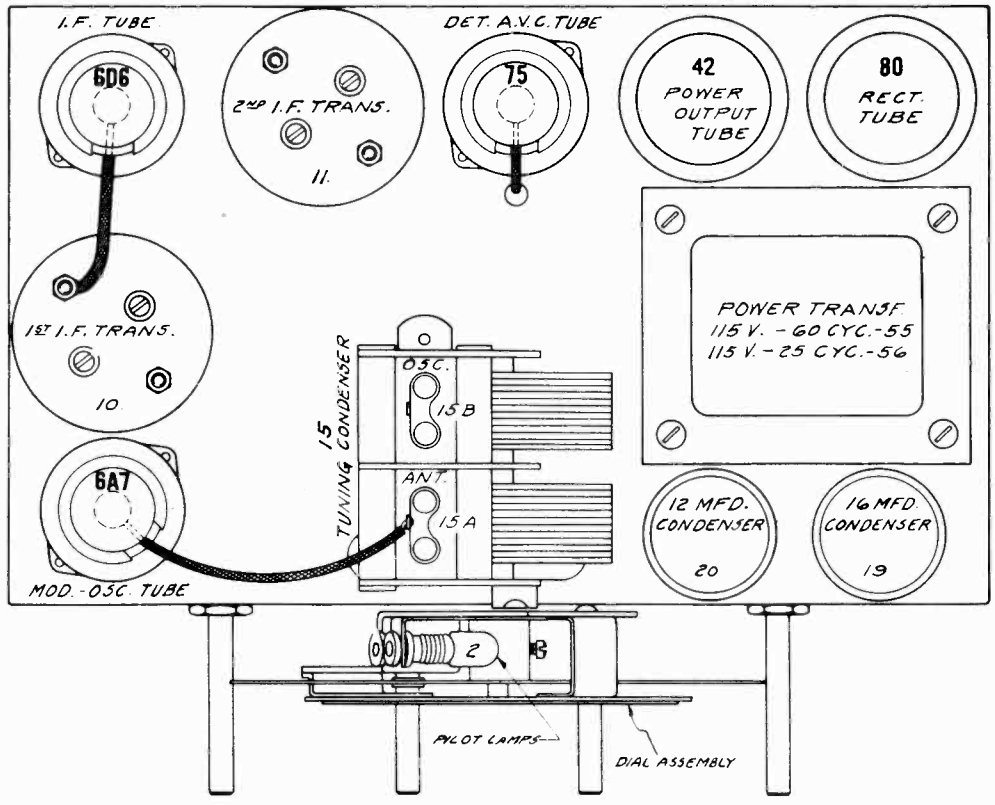
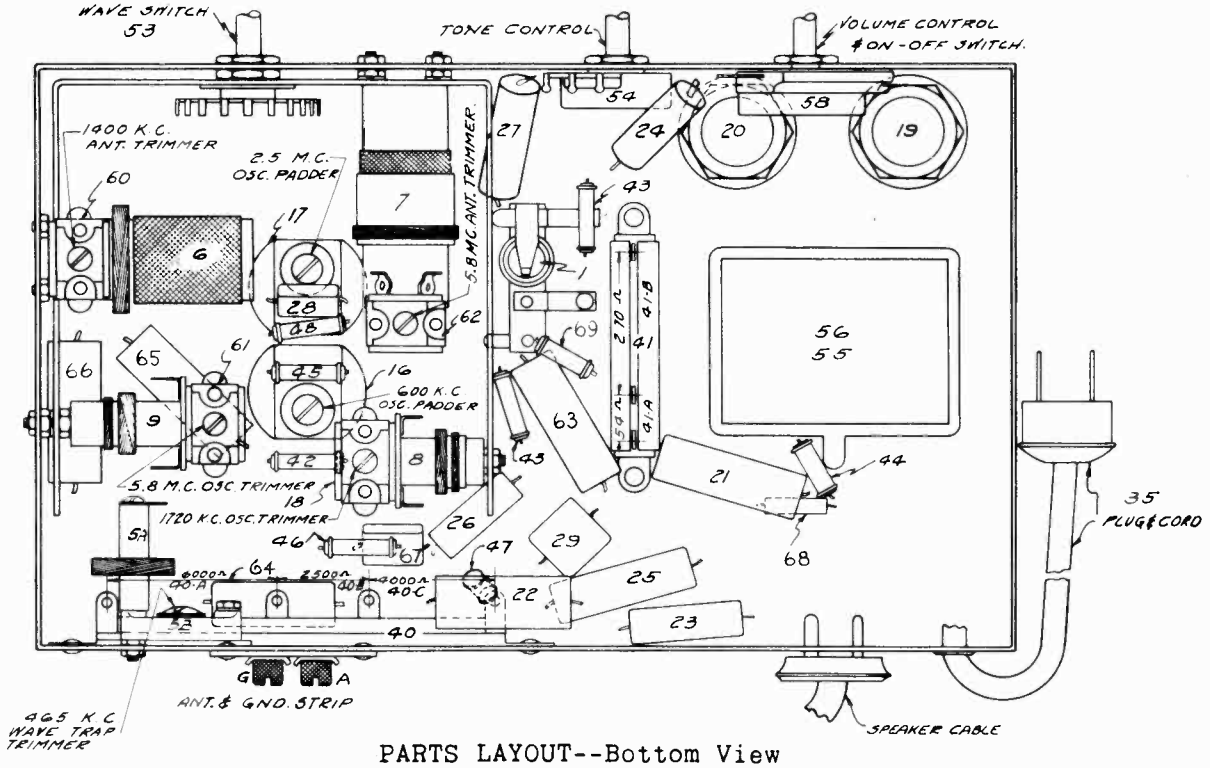
MODEL 1106 Delco
Socket, Trimmers
Chassis



PARTS LAYOUT--Top View



PARTS LAYOUT--Bottom View

GENERAL: The Delco Model 1106 is a 5 tube, 110 volt, 60 cycle operated, two band receiver with A.V.C. The type tubes used are: 6A7 Oscillator-Modulator, 6D6 I-F Amplifier, 75 Detector, A.V.C., and 1st Audio Amplifier, 42 Power Output and an 80 Rectifier.

The frequency range is from 540 to 1720 kilocycles on the Broadcast Band and from 2300 to 6200 kilocycles on the Short Wave Band.

CIRCUIT ALIGNMENT

All of the adjustable condensers are very accurately adjusted at the factory and should need no further adjustment unless tampered with in the field or a defective coil has been replaced. If realignment is found necessary, the circuits can be properly adjusted only with the use of a calibrated test oscillator or signal generator and an output meter.

1. Peaking I-F Stages at 465 Kilocycles

   (a) Connect the ground lead of the test oscillator to the chassis frame. Connect the other lead to the grid cap of the 6A7 tube through a .02 mfd. series condenser. DO NOT REMOVE THE GRID CLIP.

   (b) Set the test oscillator to exactly 465 kilocycles.

   (c) Turn the volume control of the receiver on full.

   (d) Peak each of the trimmers on the 2nd I-F coil., Illus. #11 on Fig. 2.

   (e) Peak each of the trimmers on the 1st I-F coil., Illus. #10 on Fig. 2.

   (f) In order to insure accurate settings of the I-F trimmers, the above adjustments should be repeated using the lowest test oscillator output that will give a reasonable output meter scale deflection.

2. Aligning R-F Circuits -- Broadcast Band (540-1720 K.C.)

   (a) Remove the test oscillator lead from the grid of the 6A7 tube and connect it to the receiver antenna terminal through a .00025 mfd. series condenser.

   (b) Check to see the tuning diel has not slipped on the condenser gang shaft by turning the rotor plates of the condenser gang until they are completely out of mesh, at which point the dial pointer should be at the high frequency end of the dial calibration.

   (c) Turn the band selector switch to the right for operation on the Broadcast Band (540-1720 K.C.)

   (d) Set the test oscillator frequency to exactly 1720 K.C.

   (e) Turn the gang condenser until the plates are completely out of mesh.

   (f) Adjust the broadcast padding condenser for the oscillator section of the condenser gang, shown as Illus. #18 on Fig. 3, to bring in the 1720 kilocycle signal from the test oscillator with maximum output.

   (g) Set the test oscillator frequency and the receiver dial to exactly 1400 kilocycles.

   (h) Adjust the broadcast padding condenser, Illus. #60 Fig. 3, for the antenna section of the condenser gang for maximum output.

   (i) Set test oscillator on 600 kilocycles.

2. Aligning R-F Circuits--Broadcast Band (540-1720 K.C.)--Cont'd.

   (j) Set receiver dial at approximately 600 kilocycles, leaving the test oscillator connected to the ANT and GND terminal of the receiver and the band change switch in the Broadcast position.

   (k) Adjust the oscillator tracking condenser Illus. #16 Fig. 3, rocking the tuning condenser gang back and forth until no further increase in output can be obtained.

3. Aligning R-F Circuits--Short Wave Band (2.3 to 6.2 meg.)

   (a) Leave test oscillator connected to ANT and GND of receiver and turn the band selector switch to the left for operation on the Short Wave Band.

   (b) Set test oscillator frequency and receiver dial to exactly 5.8 megacycles.

   (c) Adjust the short wave padding condenser, Illus. #61 Fig. 3, for the oscillator section of the condenser gang until the 5.8 megacycle signal from the test oscillator is tuned in with maximum output.

   (d) Adjust the short wave padding condenser, Illus. #62. Fig. 3 for maximum output.

   (e) Turn the receiver dial and set test oscillator to approximately 2.5 megacycles.

   (f) Adjust the Oscillator tracking condenser, Illus. #17 Fig. 3, rocking the tuning condenser gang back and forth until no further improvement in output can be obtained.

4. Adjustment of 465 K.C. Wave Trap

Some code and aircraft signals are broadcast on a frequency exactly the same or near the I.F. frequency of the receiver. To eliminate interference from these signals, a 465 K.C. antenna filter is incorporated in the set. To adjust:

(a) Leave test oscillator output leads connected to the set ANT and GND.

(b) Set the test oscillator frequency to exactly 465 K.C. and adjust the 465 K.C. wave trap trimmer, Illus. #5, Fig. 3 for MINIMUM 465 K.C. SIGNAL RESPONSE.

*TUBE SOCKET VOLTAGES

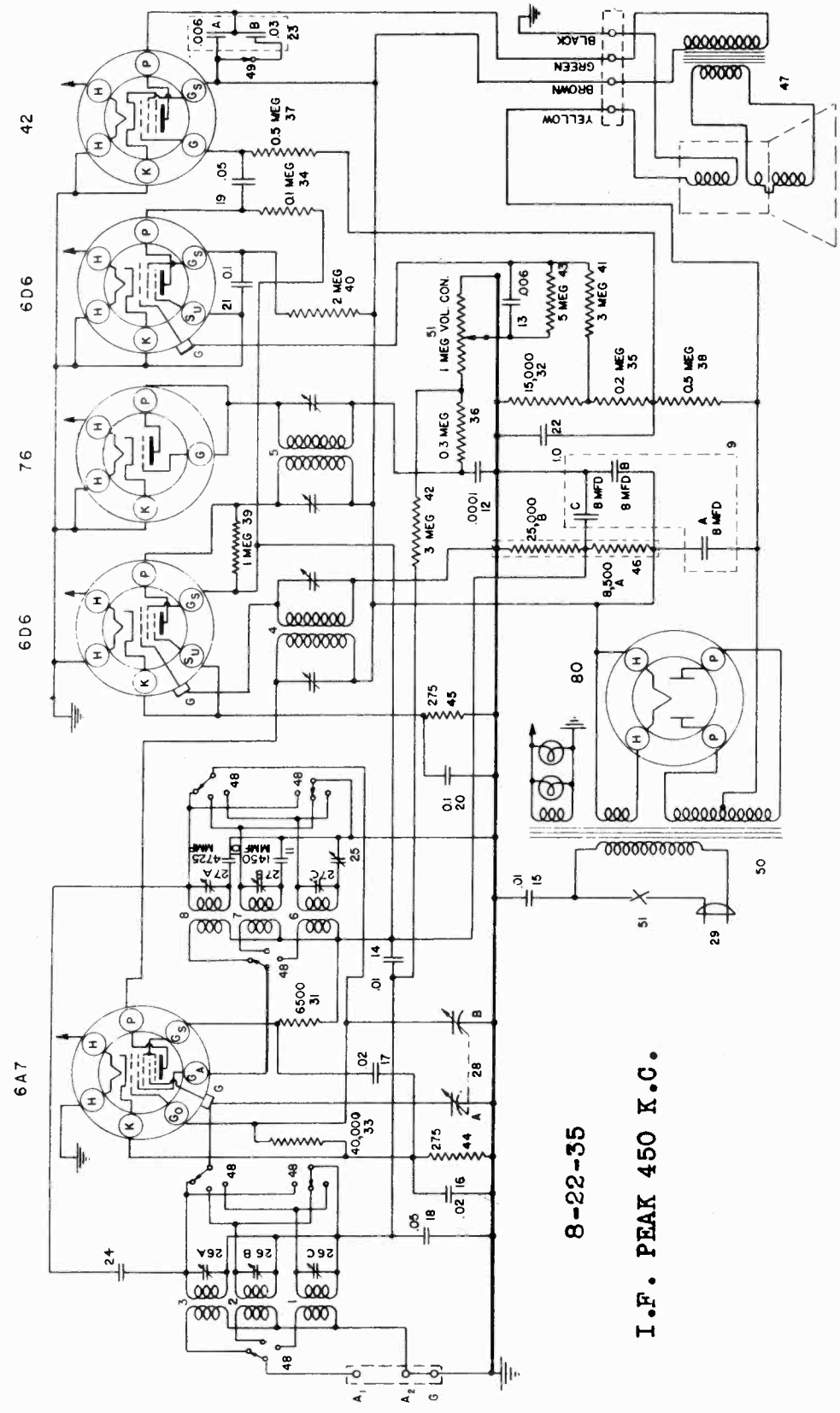
Tube	Function	H	P	Gs	Su	G1	G2	K
6A7	Osc.-Mod.	6.3	235	90	-	-	140	0
6D6	I-F Amp.	6.3	235	90	0	-	-	0
75	Det. A-F Amp.	6.3	100	-	-	-	-	0
42	Output	6.3	225	235	-	-	-	0
80	Rectifier	5.0	-	-	-	-	-	-

*Readings taken from tube socket contacts to ground (except heaters) with a meter having a resistance of a 1000 ohms per volt using a line voltage of 115 volts A.C.

CAUTION: Do not under any condition remove the speaker plug with the receiver power on as serious damage will result to the electrolytic condensers.

MODEL 1107 Delco
Schematic

UNITED MOTORS SERVICE



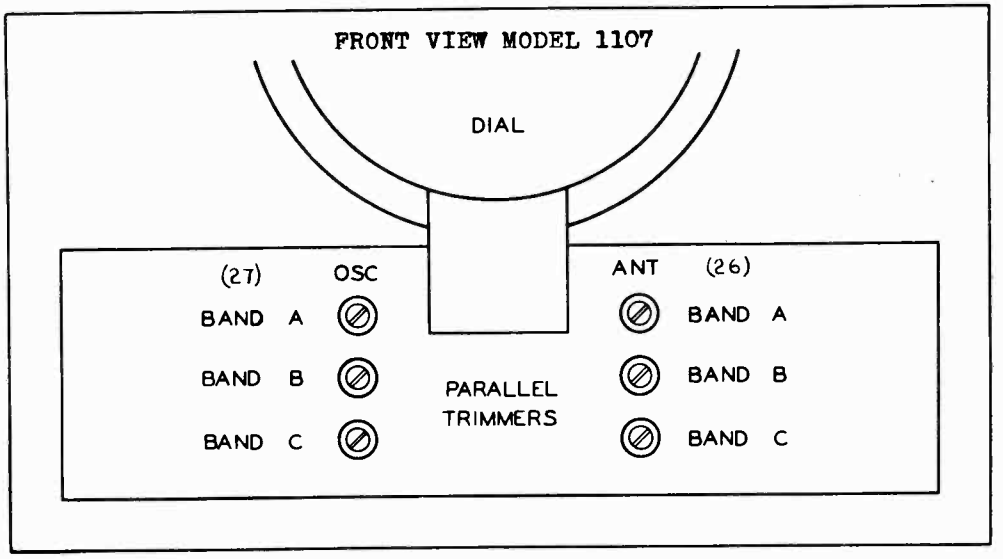
DELCO MODEL 1107 CIRCUIT DIAGRAM

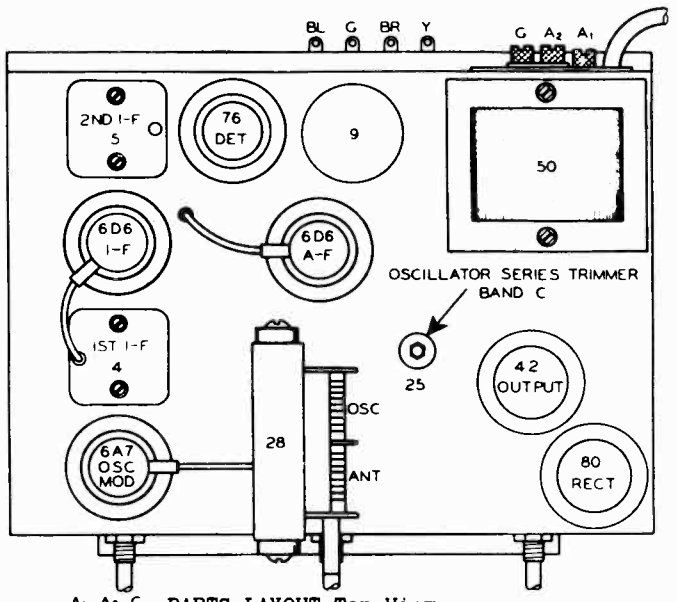
*TUBE SOCKET VOLTAGES

Type	Function	H	P	Gs	Su	G	Go	Ga	K
6A7	Osc.-Mod.	6.3	220	80	3.3	0	-4-10	105	2.5
6D6	I-F Amp.	6.3	220	105	3.3	0	-	-	3.3
76	Diode	6.3	-	-	-	-	-	-	0
6D6	A-F Amp.	6.3	20	20	0	1.0	-	-	0
42	Output	6.3	210	220	-	8	-	-	0
80	Rectifier	4.9	220	-	-	-	-	-	-

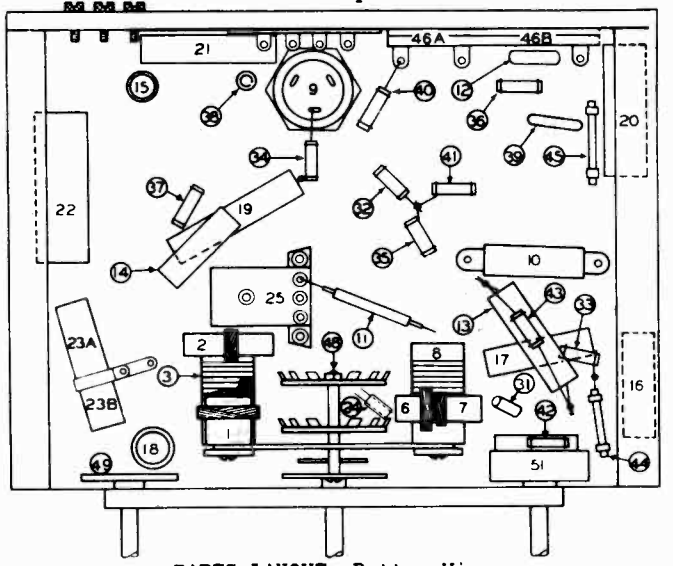
*Readings taken from the tube socket contacts to ground (except heaters) with a meter having a resistance of 1000 ohms per volt using a 250 volt scale and a line voltage of 115 volts A.C.

NOTE: On the wave band switch Illus. #48 there is a small eyelet soldered to one of the switch connecting lugs. This eyelet, Illus. #24 is used as a small condenser the capacity of which is formed by inserting an insulated wire into the sleeve of the eyelet. In replacing any defective wave band switches, care should be taken to see that the "capacity wire" is inserted in the sleeve of the eyelet. This insulated wire should be passed through the eyelet and a slight hook made in the end to prevent it from pulling out.





PARTS LAYOUT-Top View



PARTS LAYOUT--Bottom View

GENERAL: The Delco Model 1107 is a 6 tube, 110 volt A.C., three band receiver with A.V.C. The tubes used are a 6A7 Oscillator-Modulator, 6D6 I-F Amplifier, 76 Detector and A.V.C., 6D6 A-F Amplifier, 42 Output and type 80 Rectifier.

The frequency ranges on bands covered are: American Broadcast Band (C) 540 to 1700 kilocycles, Police and Amateur Band (B) 1700 to 5000 kilocycles and the Foreign Short Wave Band (A) 5.4 to 15 megacycles.

ALIGNMENT PROCEDURE

1. Peaking I-F Stages at 450 Kilocycles

   (a) Connect the output of the test oscillator through a .02 mfd. condenser to the grid cap of the 6A7 tube, leaving the tube's grid clip in place. Connect the ground lead from the test oscillator to the receiver chassis.

   (b) Turn the tuning condenser rotor plates until they are completely meshed. (540 K.C. end)

   (c) Turn the band selector switch to Band A (extreme left hand position).

   (d) Set the test oscillator to 450 kilocycles.

   (e) Adjust both trimmers located on top of the 2nd. I-F coil for maximum output. (Illus. #5, Fig. 3)

   (f) Adjust both trimmers located on top of the 1st. I-F coil for maximum output. (Illus. #4, Fig. 3)

   (g) Using the lowest test oscillator output that will give a reasonable scale deflection on the output meter repeat operations (e) and (f) as many times as necessary to obtain the maximum output.

2. Peaking R-F Circuits--Band "C" (540 to 1700 K.C.)

   (a) Connect the output of the test oscillator through a .00025 mfd. condenser to the "Ant" terminal of the receiver.

   (b) Turn the tuning condenser rotor plates until they are COMPLETELY OUT OF MESH.

   (c) Turn the band selector switch to Band C (extreme right hand position).

   (d) Set the test oscillator to 1720 kilocycles.

   (e) Peak the Band "C" oscillator parallel trimmer shown on Fig. 1.

   (f) Set the test oscillator to 1400 kilocycles.

   (g) Tune-in the 1400 kilocycle signal with the station selector.

   (h) Peak the Band "C" antenna parallel trimmer shown on Fig. 1.

   (i) Using the lowest test oscillator output that will give a reasonable output meter reading, repeat operations (g) and (h) until no further increase in output can be obtained.

   (j) Set the test oscillator to 600 kilocycles.

   (k) Tune-in the 600 kilocycle signal with the station selector in the region of 60 on the dial, for maximum reading on the output meter.

   (l) Adjust the oscillator series trimmer, (Illus. #25, Fig. 4) while rocking the condenser gang plates back and forth slightly, until no further increase in output can be obtained.

   (m) Repeat operations (g) and (h) for more accurate adjustments.

3. Peaking R-F Circuits--Band "B" (1700 to 5000 K.C.)

   (a) Turn the band selector switch to Band "B" (Middle position).

   (b) Set the test oscillator to 5000 kilocycles. (5.0 megacycles)

   (c) Turn the station selector to 5 on Band "B".

   (d) Peak the Band "B" oscillator parallel trimmer shown on Fig. 1.

   (e) Peak the Band "B" antenna parallel trimmer (Fig. 1).

4. Peaking R-F Circuits--Band "A" (5.4 to 15 Meg.)

   (a) Replace the .00025 mfd. condenser which is being used in series with the output lead of the test oscillator with a 400 ohm carbon resistor.

   (b) Turn the band selector switch to Band "A".

   (c) Set the test oscillator to 15 megacycles.

   (d) Close the Band "A" Oscillator parallel trimmer (Fig. 1) and then open three turns.

   (e) Close the Band "A" Antenna parallel trimmer (Fig. 1) and then open 1/2 turn.

   (f) Turn the station selector to 15 on the dial (Band "A").

   (g) Peak the Band "A" oscillator parallel trimmer (Fig. 1) on the FIRST test oscillator signal heard when closing the condenser. In making this adjustment care should be taken not to use too much output from the test oscillator to avoid setting the oscillator circuit on the wrong frequency.

   NOTE: Check on the adjustment of the Band "A" oscillator parallel trimmer as follows:

   1. Increase the test oscillator output not more than ten times.
   2. Try to tune-in the 15 megacycle test oscillator signal with the station selector at approximately 14 on the dial.
   3. If the 15 megacycle signal can be heard at approximately 14 and 15 both on the dial the oscillator parallel trimmer has been aligned on the correct frequency. It should be noted, however, that the signal tuned in at 15 on the dial should be much stronger than the signal heard at 14. If this condition is not found it will be necessary to repeat the operation (g).

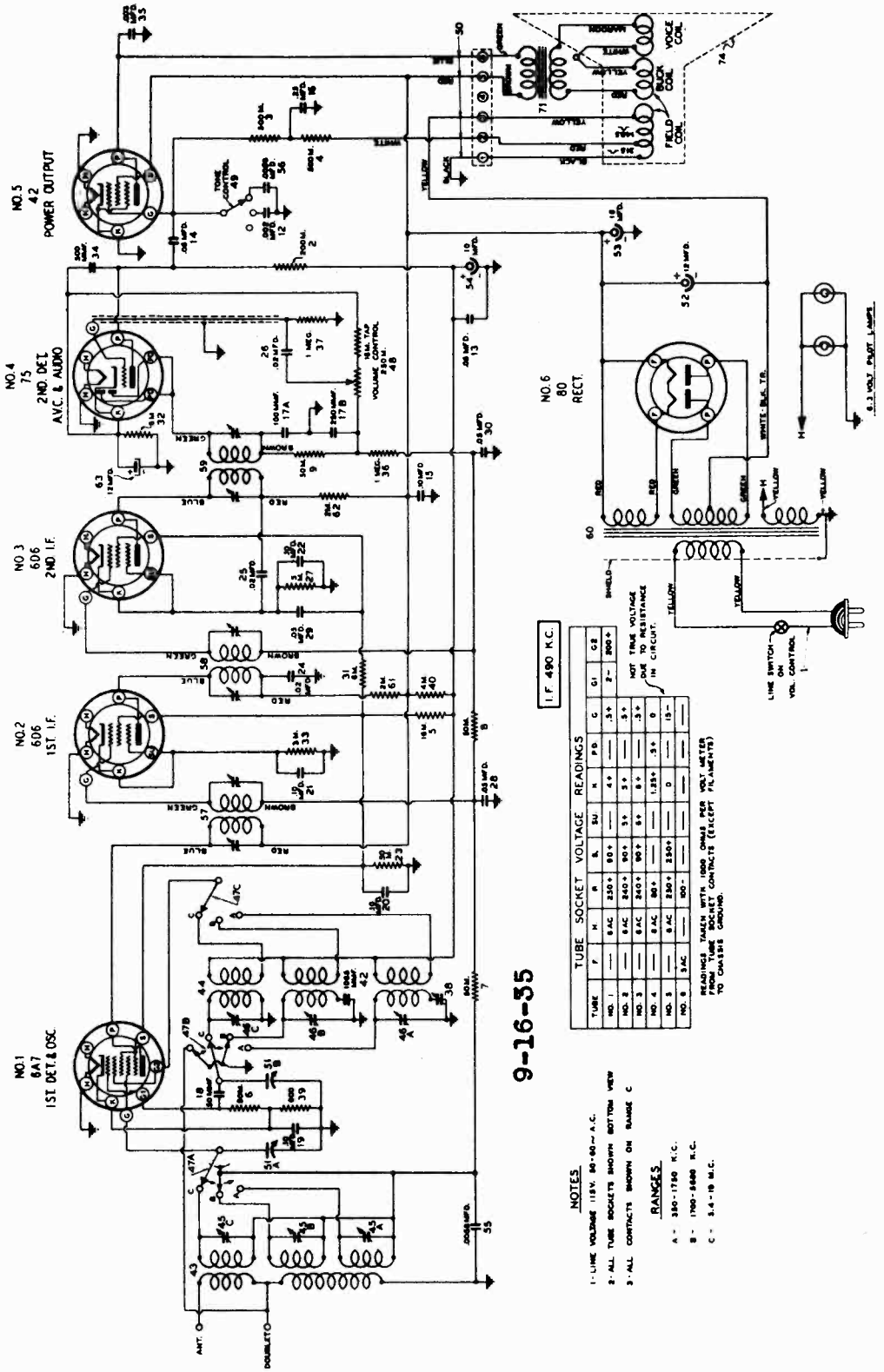
   (h) Reduce the output of the test oscillator to the previous output and re-tune the station selector to 15 megacycles at 15 on the dial.

   (i) Peak the Band "A" antenna parallel trimmer (Fig. 1) for maximum output, then re-tune the station selector for maximum output.

   (j) Repeat the two operations in (i) as many times as necessary to obtain the maximum output.

MODEL 1108 Delco
Glass Tubes
Schematic, Voltage

UNITED MOTORS SERVICE



TUBE SOCKET VOLTAGE READINGS

TUBE	F	H	P	SL	SU	K	PG	G	G1	G2
NO. 1	—	6 AC	230+	80+	—	4+	—	-5+	2-	200+
NO. 2	—	6 AC	240+	90+	3+	3+	—	-5+		
NO. 3	—	6 AC	240+	90+	6+	6+	—	-5+		
NO. 4	—	6 AC	80+	—	—	1.25+	-3+	0		
NO. 5	—	6 AC	230+	250+	—	0	—	15-		
NO. 6	3 AC	—	90-	—	—	—	—	—		

HOT TRUE VOLTAGE DUE TO RESISTANCE IN CIRCUIT.

READINGS TAKEN WITH 1000 OHMS PER VOLT METER FROM TUBE SOCKET CONTACTS (EXCEPT FILAMENTS) TO CHASSIS GROUND.

NOTES
1 - LINE VOLTAGE 115 V. 50-60 ~ A.C.
2 - ALL TUBE SOCKETS SHOWN BOTTOM VIEW
3 - ALL CONTACTS SHOWN ON RANGE C

RANGES
A - 380-1750 K.C.
B - 1700-6600 K.C.
C - 5.4-18 M.C.

DELCO MODEL 1108 CIRCUIT DIAGRAM

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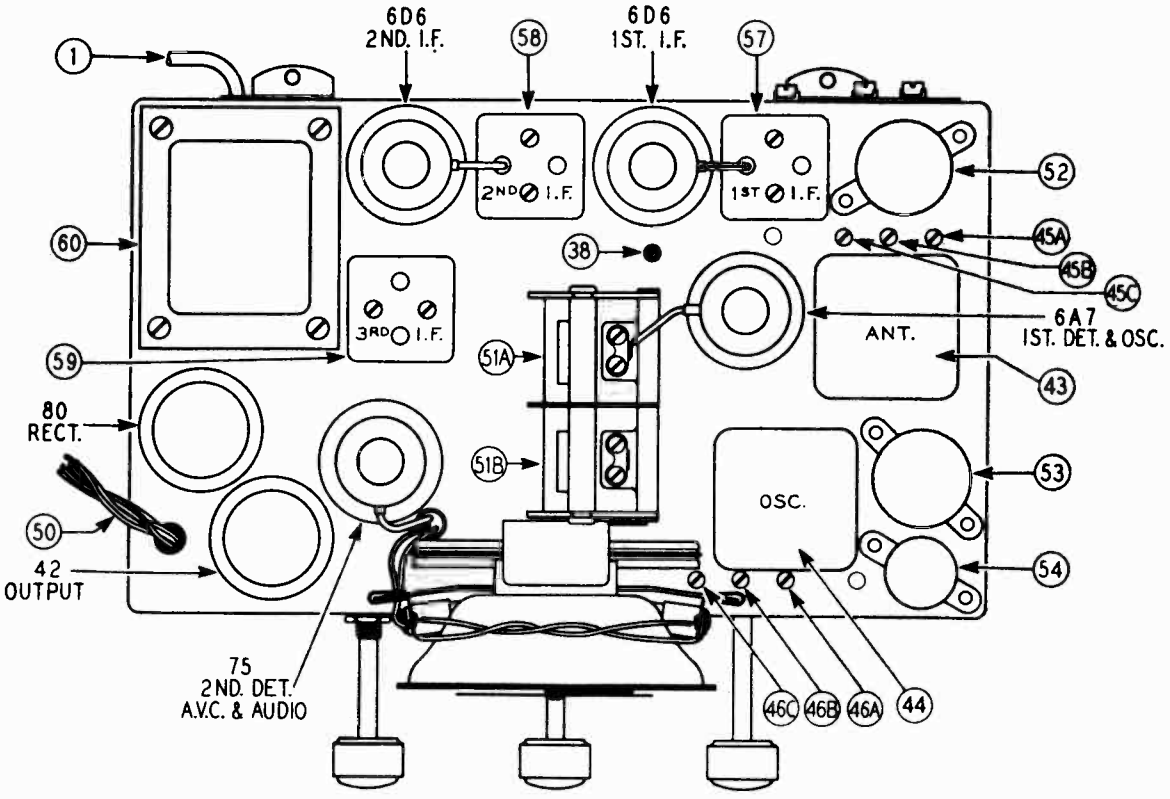
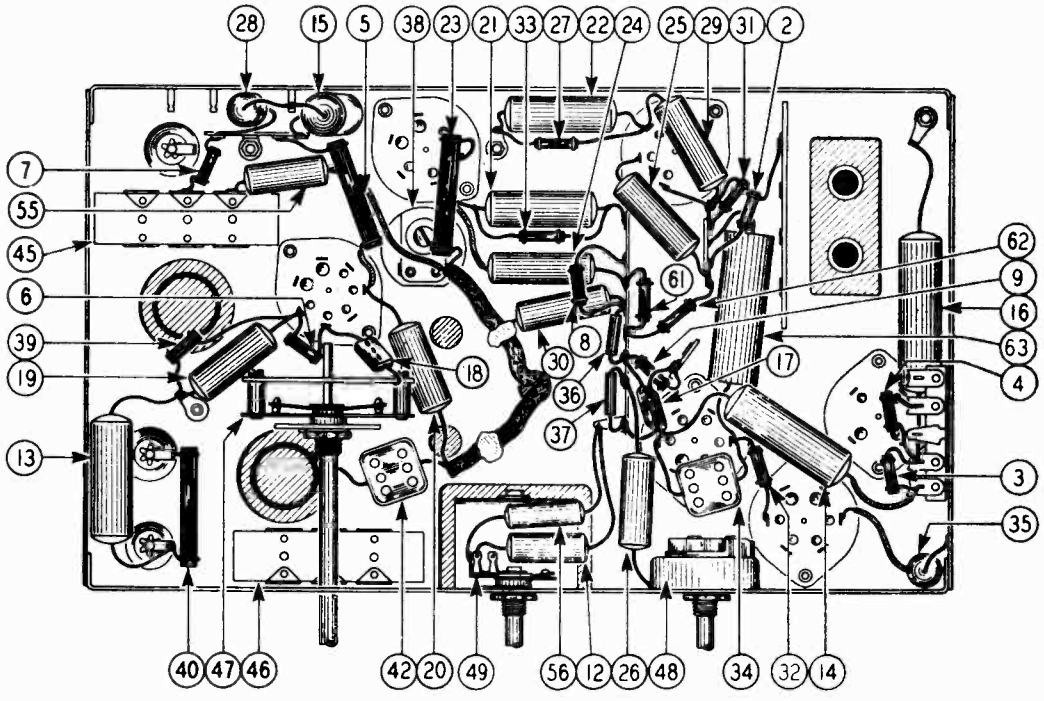
MODEL 1108 Delco
Glass Tubes
Socket, Trimmers
Chassis



PARTS LAYOUT--Top View



PARTS LAYOUT--Bottom View

GENERAL: The Delco Models 1108 is a six tube, 115 volt, 50-60 cycles A.C., three band receiver with A.V.C., Tone Control and a "Band Spread" dial. The tubes used are 6A7 Detector-Oscillator, 6D6 1st I-F Amplifier, 6D6 2nd I-F Amplifier, 75 Detector, A.V.C. and 1st Audio amplifier, 42 Power Output and an 80 Rectifier tube.

The frequency ranges on bands covered are: American Broadcast Band (A) 550 to 1750 kilocycles, Police and Amateur Band (B) 1700 to 5680 kilocycles and the Foreign Short Wave Band (C) 5.4 to 18 megacycles.

CIRCUIT ALIGNMENT

All of the adjustable condensers are very accurately adjusted at the factory and should need no further adjustment unless tampered with in the field or a defective coil has been replaced. If realignment is found necessary the circuits can be properly adjusted only with the use of a calibrated test oscillator and an output meter.

The receiver should be aligned in a location free from local interference (interference caused by motors, flashers, automobile ignition, etc.) as high frequency disturbances will cause difficulties when adjusting the short wave circuits.

1. Peaking I-F Stages at 490 Kilocycles

   (a) Connect the signal lead of the test oscillator to the grid cap of the 6A7 tube through a .25 mfd. condenser. DO NOT REMOVE THE GRID CLIP FROM THE TUBE.

   (b) Connect the ground lead of the test oscillator to the receiver chassis.

   (c) Set receiver dial pointer to 1400 K.C. and band change switch on position "A".

   (d) Place test oscillator in operation at 490 K.C.

   (e) Turn receiver volume control to the maximum position.

   (f) Adjust the six I-F trimmers located on top of the I-F coils, (Fig. 2) until maximum output is obtained. During alignment, maintain as low a value of signal from the test oscillator as is consistant with obtaining a readable indication on the output meter.

Aligning at 1400 Kilocycles

   (a) Connect the signal lead of the test oscillator to the antenna binding post through a .00025 mfd. condenser. (Leave test oscillator ground lead connected to the chassis ground.)

   (b) Turn dial knob until condensers are fully MESHED. The dial pointer (hour hand) should be on the horizontal line of the dial, pointing to 9 and 3 o'clock. The minute hand should be at 12 o'clock or in the vertical position.

   (c) Set test oscillator to 1400 K.C.

   (d) Turn dial pointer 1400 K.C. and leave band change switch on position "A" (extreme left hand position).

   (e) Adjust the Band "A" oscillator parallel trimmer, Illus. 46A (Fig. 2) to maximum output.

   (f) Adjust the Band "A" R-F parallel trimmer, Illus. 45A (Fig. 2) to maximum output.

3. Aligning at 600 K.C.

   (a) Set the test oscillator to 600 Kilocycles.

   (b) Tune in the 600 K.C. signal with the receiver dial in the region of 600 K.C. for maximum output. (This point does not have to be exactly at the 600 K.C. dial setting.)

   (c) Adjust the Band "A" oscillator tracking condenser, Illus. #38 (Fig. 2) while rocking the tuning condenser back and forth through resonance until no further increase in output can be obtained.

   (d) Repeat operations (c), (d), (e) and (f) under "Aligning at 1400 K.C." for accurate adjustments.

4. Aligning at 5 Megacycles (5000 K.C.)

   (a) Turn band change switch to Band "B" (middle position)

   (b) Set the test oscillator to 5 megacycles.

   (c) Turn receiver dial pointer to 5 megacycles.

   (d) Adjust the Band "B" oscillator parallel trimmer Illus. #46B (Fig.2) to maximum output.

   (e) Adjust the Band "B" R-F parallel trimmer, Illus. #45B (Fig. 2) to maximum output.

   (f) Check dial setting at 1800 K.C.

5. Aligning at 18 Megacycles (18,000 K.C.)

   (a) Replace the .00025 mfd. series condenser in the signal lead from the test oscillator with a 400 ohm carbon resistor.

   (b) Turn the band change switch to Band "C" (extreme right hand position).

   (c) Turn receiver dial pointer to 18 megacycles.

   (d) Set the test oscillator to 18 megacycles.

   (e) Adjust the Band "C" oscillator parallel trimmer, Illus. #46C (Fig. 2) to maximum output.

NOTE: On the 18 Megacycle Alignment of trimmer Illus. #46C, it will be noted that there are two settings at which the signal will be received. Use the signal received with oscillator parallel trimmer setting having the most capacity or the point at which the trimmer screw is farthest in.

   (f) Adjust the Band "D" R-F parallel trimmer, Illus. 45C (Fig. 2) to maximum output.

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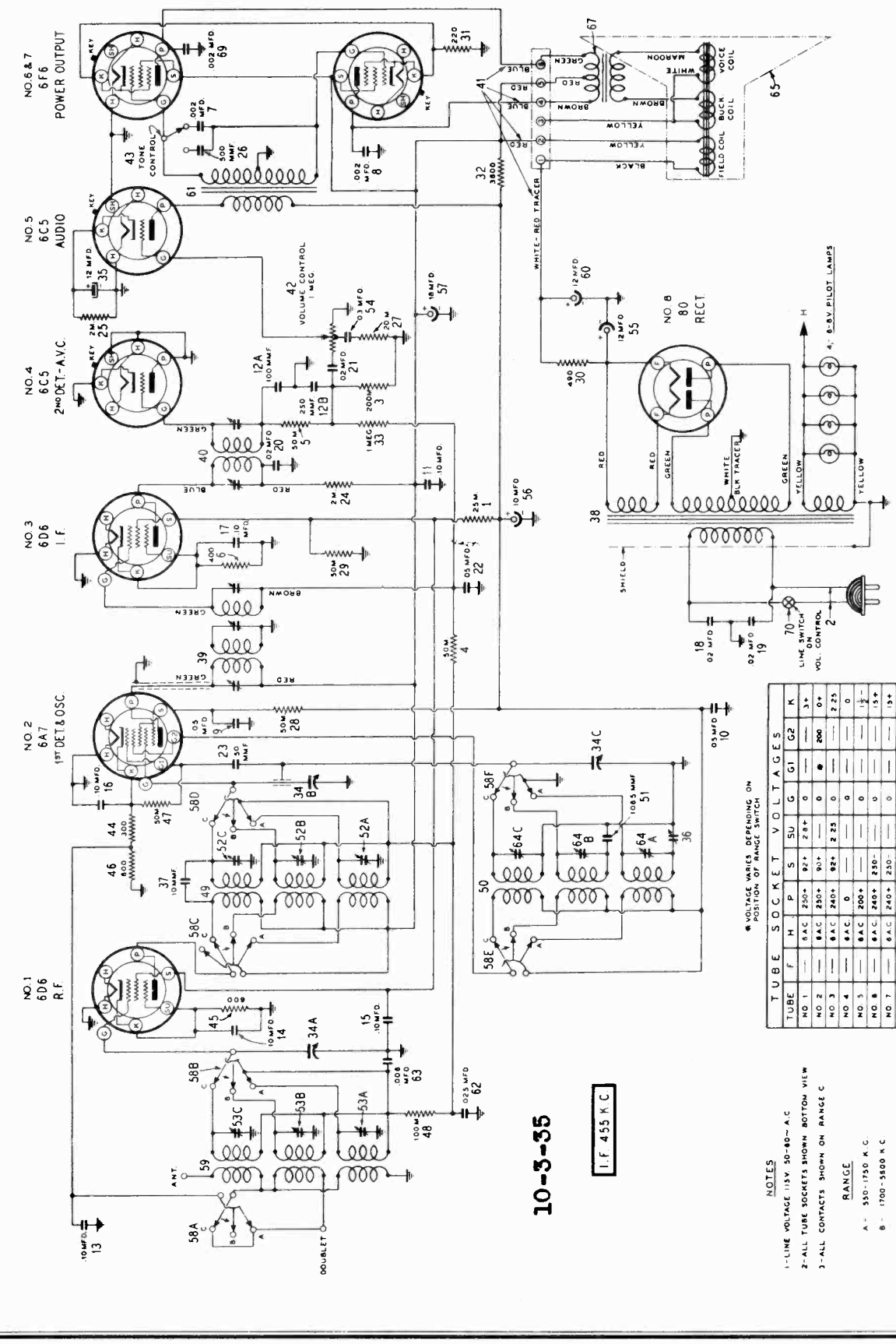
MODEL 1109 Delco
Schematic
Voltage



DELCO MODEL 1109 CIRCUIT DIAGRAM

TUBE SOCKET VOLTAGES									
TUBE	F	H	P	S	SU	G	G1	G2	K
NO 1	—	6 A.C	250+	82+	28+	0	—	—	3+
NO 2	—	6 A.C	230+	90+	—	0	*	200	0+
NO 3	—	6 A.C	240+	92+	2 25	0	—	—	2 25
NO 4	—	6 A.C.	0	—	—	0	—	—	0
NO 5	—	6 A.C	200+	—	—	0	—	—	1/2+
NO 6	—	6 A.C	240+	230-	—	0	—	—	15+
NO 7	—	6 A.C	240+	230-	—	0	—	—	13+
NO 8	5 A.C	—	300 A.C	300 A.C	—	—	—	—	—

* VOLTAGE VARIES DEPENDING ON POSITION OF RANGE SWITCH

READINGS TAKEN WITH 1000 OHMS PER VOLT VOLTMETER FROM TUBE SOCKET CONTACTS TO CHASSIS GROUND EXCEPT FILAMENTS

NOTES

1 - LINE VOLTAGE 115 V 50-60~ A.C
2 - ALL TUBE SOCKETS SHOWN BOTTOM VIEW
3 - ALL CONTACTS SHOWN ON RANGE C

RANGE

A - 550-1750 K.C.
B - 1700-5800 K.C.
C - 5.4-18 M.C.

MODEL 1109 Delco
Socket,Trimmers
Chassis,Dial Parts

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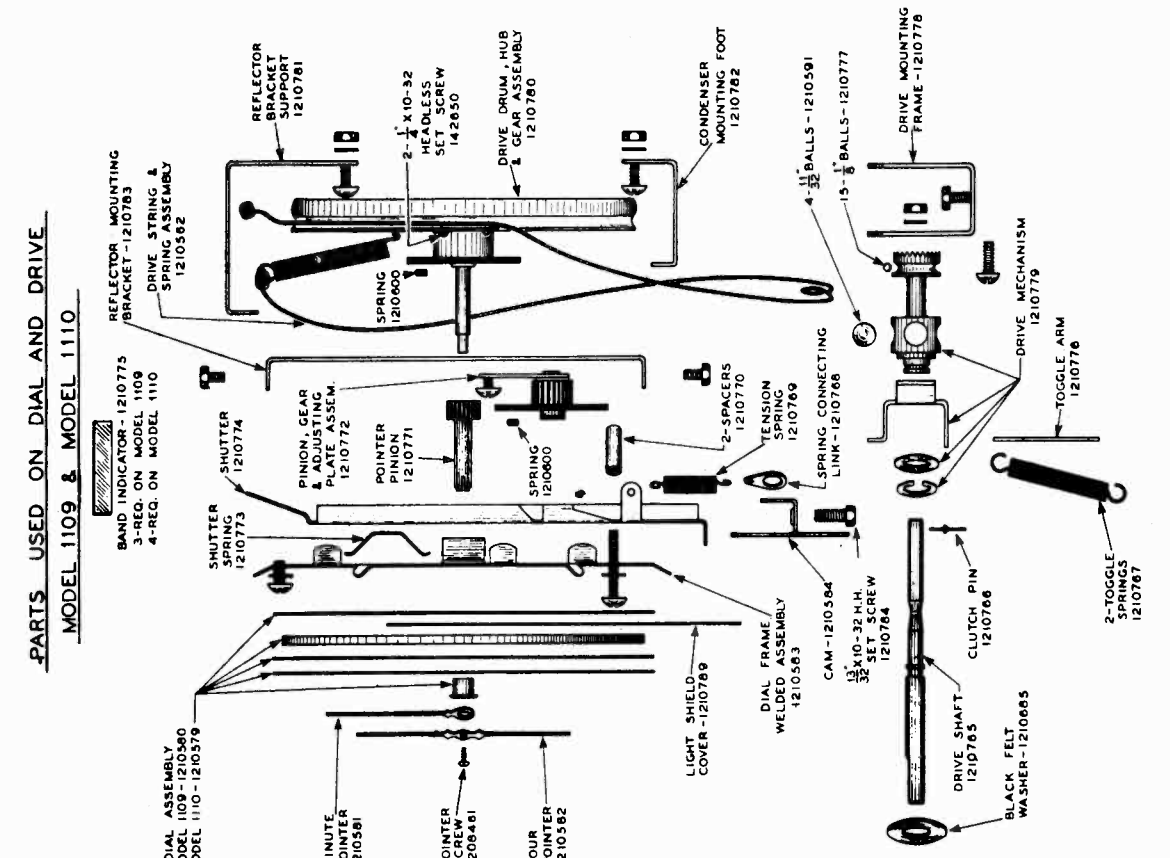
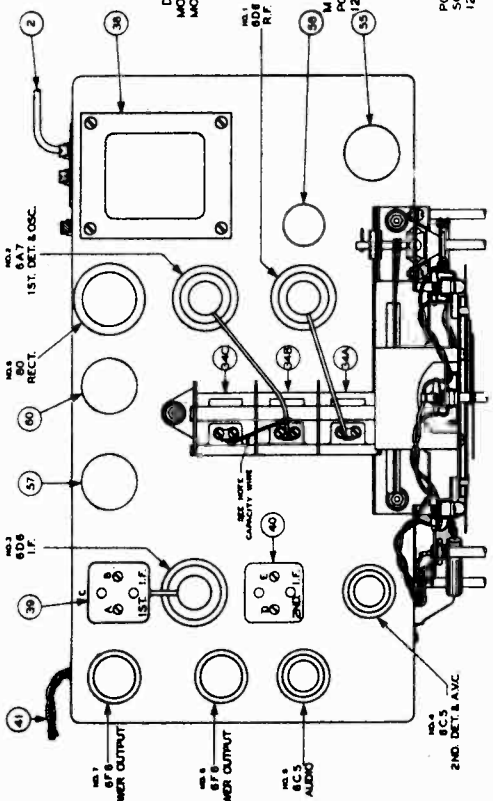
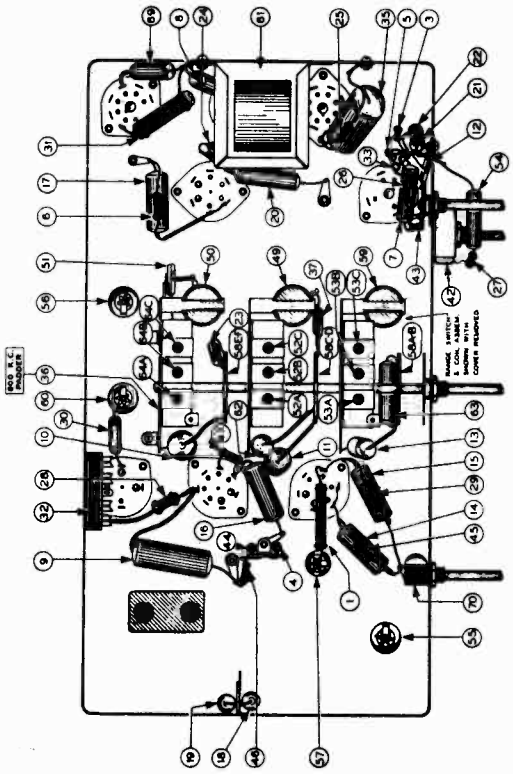




PARTS LAYOUT--Top View



PARTS LAYOUT--Bottom View

GENERAL: The Delco Model 1109 is an eight tube, 110 volt A.C., 50-60 cycle, three band receiver with A.V.C., Tone Control, "Band Spread" dial, and a full 10" dynamic speaker. This receiver has incorporated in its chassis, four of the new metal type tubes. The complete tube complement is as follows: 6D6 R-F Amplifier, 6A7 Detector-Oscillator, 6D6 I-F Amplifier, 6C5 (Metal) 2nd Detector - A.V.C., 6C5 (Metal) 1st A-F Amplifier, two type 6F6 (Metal) tubes in the output stage, connected for push-pull operation and an 80 type Rectifier.

The frequency ranges on the three bands covered are: American Broadcast Band (A) 540 to 1800 K.C., Police and Amateur Band (B) 1800 to 5600 K.C., and the Foreign Short Wave Band (C) 5.6 to 18 Megacycles.

CIRCUIT ALIGNMENT

All of the adjustable trimmer condensers are very accurately adjusted at the factory and should need no further adjustment unless tampered with in the field or a defective coil has been replaced. If realignment is found necessary the circuits can be properly adjusted only with the use of a calibrated test oscillator and an output meter.

The receiver should be aligned in a location free from local interference (interference caused by motors, flashers, automobile ignition, etc.) as high frequency disturbances will cause difficulties when adjusting the short wave circuits.

1. Peaking I-F Stages at 455 Kilocycles

   (a) Connect the signal lead of the test oscillator to the grid cap of the 6A7 tube through a .25 mfd. condenser. DO NOT REMOVE THE GRID CLIP FROM THE TUBE.

   (b) Connect the ground lead of the test oscillator to the receiver chassis.

   (c) Set receiver dial pointer to 1400 K.C. and band change switch on position "A".

   (d) Place test oscillator in operation at 455 K.C.

   (e) Turn receiver volume control to the maximum position.

   (f) Adjust the five I-F trimmers on the two I-F coils (Illus. 39 & 40) carefully for maximum output in the following sequence -- A-B-C-D-E. During alignment, maintain as low a signal output from the test oscillator as is consistant with obtaining a readable indication on the output meter.

2. Aligning at 1400 Kilocycles

   (a) Connect the signal lead of the test oscillator to the antenna binding post through a .0002 mfd. condenser. (Leave test oscillator ground lead connected to the chassis ground).

   (b) Turn dial knob until condensers are fully MESHED. The dial pointer (hour hand) should be on the horizontal line of the dial, pointing to 9 and 3 o'clock. The minute hand should be at 12 o'clock or in the vertical position.

   (c) Set test oscillator to 1400 K.C.

   (d) Turn dial pointer 1400 K.C. and leave band change switch on position "A" (extreme left hand position).

   (e) Adjust the Band "A" oscillator parallel trimmer, Illus. 64A (Fig. 3) to maximum output.

   (f) Adjust the Band "A" R-F parallel trimmer, Illus. 52A (Fig. 3) to maximum output.

   (g) Adjust the Band "A" Antenna parallel trimmer, Illus. 53A to maximum output.

3. Aligning at 600 K.C.

   (a) Set the test oscillator to 600 Kilocycles.

   (b) Tune in the 600 K.C. signal with the receiver dial in the region of 600 K.C. for maximum output. (This point does not have to be exactly at the 600 K.C. dial setting.)

   (c) Adjust the Band "A" oscillator padding condenser, Illus. #36 (Fig. 3) while rocking the tuning condenser back and forth through resonance until no further increase in output can be obtained.

   (d) Repeat operations (c), (d), (e), (f), and (g) under "Aligning at 1400 K.C." for accurate adjustments.

4. Aligning at 5 Megacycles (5000 K.C.)

   (a) Turn band change switch to Band "B" (middle position).

   (b) Set the test oscillator to 5 megacycles.

   (c) Turn receiver dial pointer to 5 megacycles.

   (d) Adjust the Band "B" oscillator parallel trimmer, Illus. #64B (Fig. 3) to maximum output.

   (e) Adjust the Band "B" R-F parallel trimmer, Illus. #52B (Fig. 3) to maximum output.

   (f) Adjust the Band "B" Antenna parallel trimmer, Illus. 53B (Fig. 3) to maximum output.

   (g) Check dial setting at 1800 K.C.

5. Aligning at 18 Megacycles (18,000 K.C.)

   (a) Replace the .0002 mfd. series condenser in the signal lead from the test oscillator with a 400 ohm carbon resistor.

   (b) Turn the band change switch to Band "C" (extreme right hand position).

   (c) Turn receiver dial pointer to 18 megacycles.

   (d) Set the test oscillator to 18 megacycles.

   (e) Adjust the Band "C" oscillator parallel trimmer, Illus. #64C (Fig. 3) to maximum output.

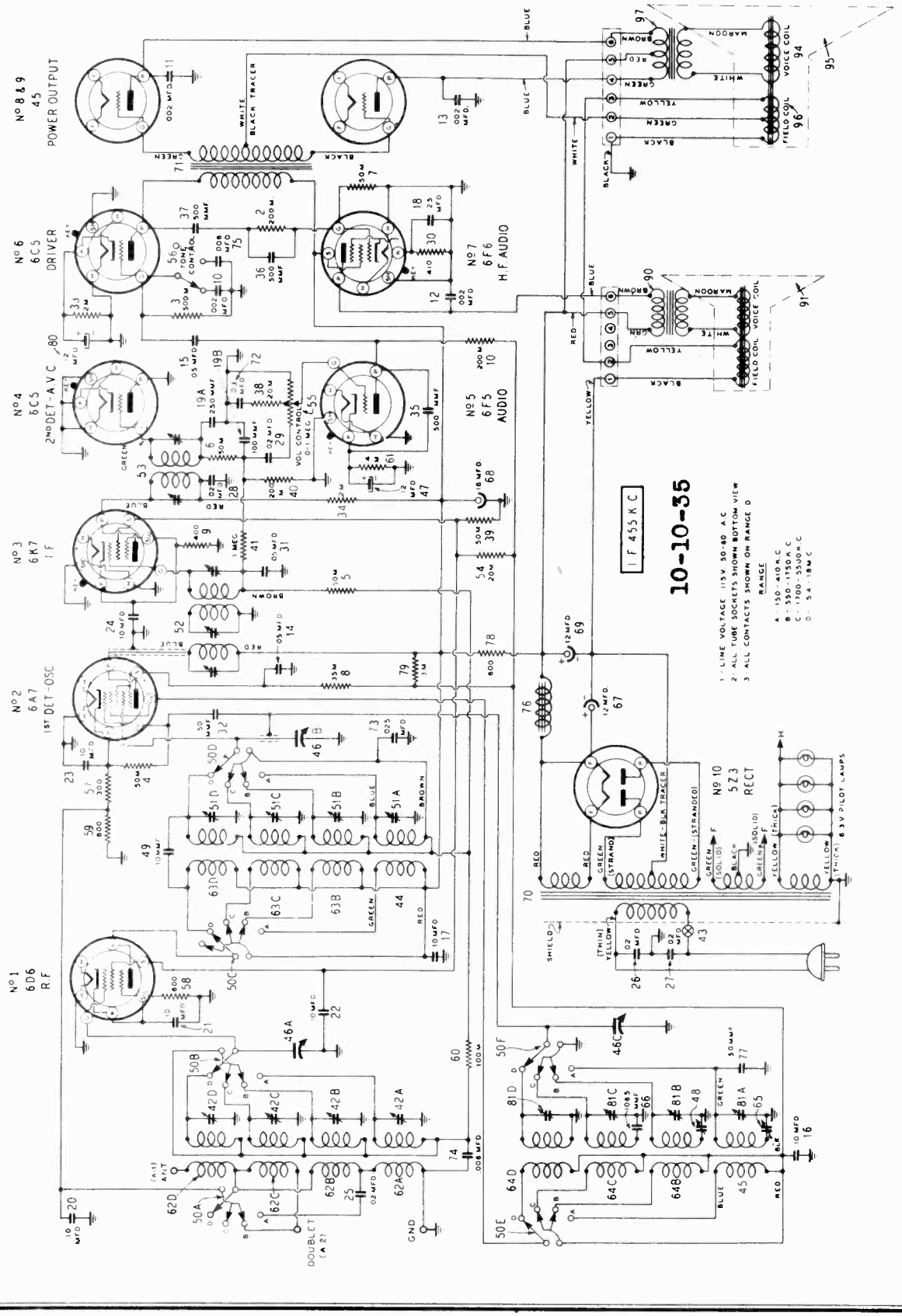
NOTE: On the 18 Megacycle Alignment of trimmer Illus. #64C, it will be noted that there are two settings at which the signal will be received. Use the signal received with oscillator parallel trimmer setting having the most capacity or the point at which the trimmer screw is farthest in.

   (f) Adjust the Band "C" R-F parallel trimmer, Illus. 52C (Fig. 3) to maximum output.

   (g) Adjust the Band "C" Antenna parallel trimmer, Illus. 53C (Fig. 3) to maximum output.

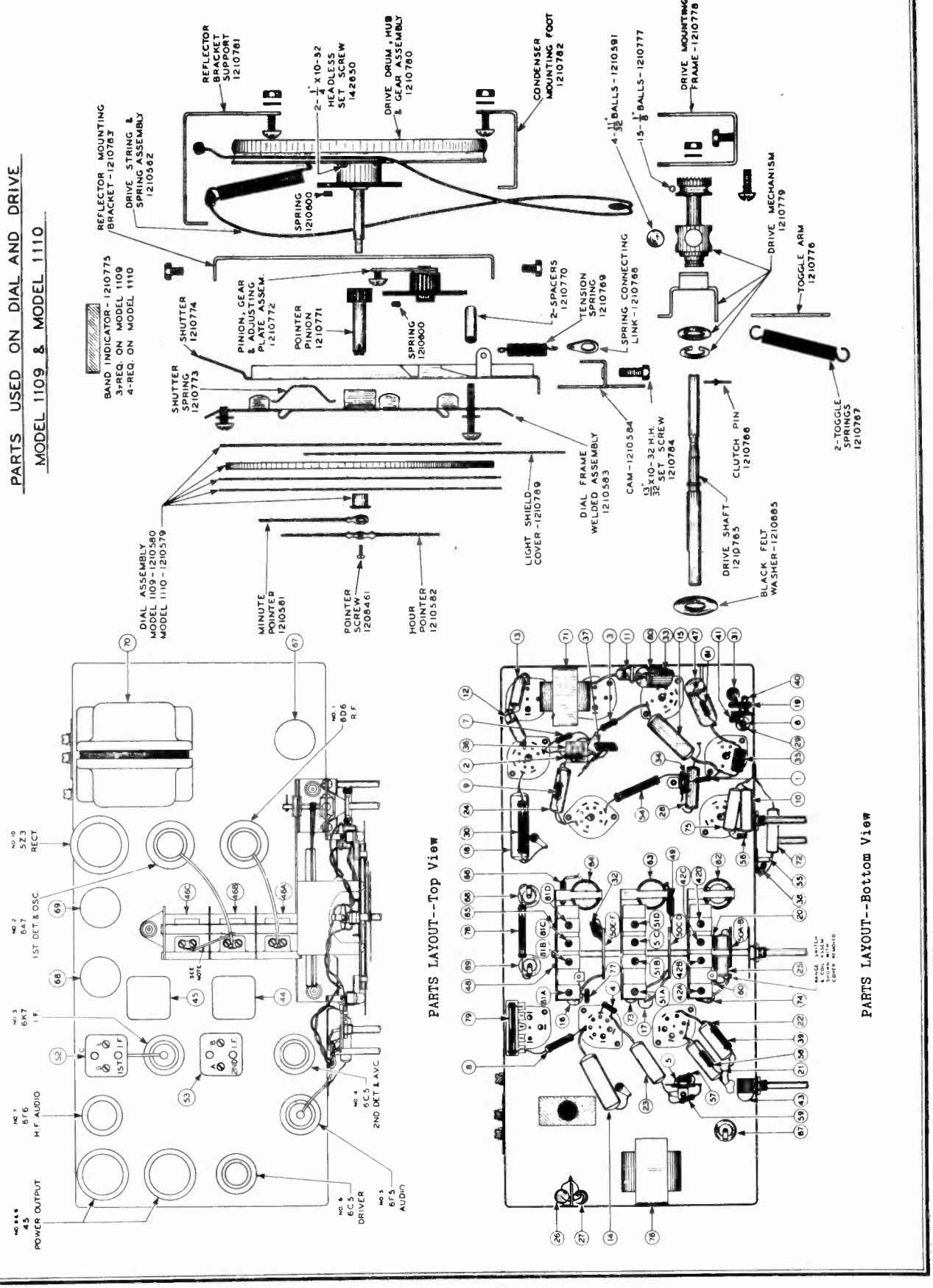
MODEL 1110 Delco
Schematic

UNITED MOTORS SERVICE



UNITED MOTORS SERVICE

MODEL 1110 Delco
Socket, Trimmers
Chassis, Dial Parts



MODEL 1110 Delco
Alignment

UNITED MOTORS SERVICE

GENERAL: The Delco Model 1110 is a ten tube, 110 volt AC, 50-60 cycle, four band receiver with A.V.C., Tone Control, "Band Spread" dial and equipped with two dynamic speakers. This receiver has incorporated in its chassis five of the new metal type tubes. The complete tube complement is as follows: 6D6 R-F Amplifier, 6A7 Detector-Oscillator, 6K7 (Metal) I-F Amplifier, 6C5 (Metal) 2nd Detector-A.V.C., 6F5 (Metal) Driver, 6F5 High Frequency A-F Amplifier, two type 45 tubes in the Output Stage, and a type 5Z3 Rectifier.

The frequency ranges on the four bands covered are: Weather Band (A) 150 to 410 K.C. American Broadcast Band (B) 530 to 1750 K.C., Police and Amateur Band (C) 1700 to 5500 K.C., and the Foreign Short Wave Band (D) 5.4 to 18 Megacycles.

AUDIO SYSTEM

A two channel audio system is used in the Delco Model 1110 receiver--one channel, comprising a 6F5 tube coupled into a small speaker reproduces the high notes of the musical range and the other channel comprising two type 45 tubes connected in push-pull reproduces the low and middle register of the musical range. From a service viewpoint this audio system should be considered as dual audio amplifier. Care should be taken when changing any part of the speaker system, to see that the polarity of all transformers and voice coils remain as originally connected in order that the speakers will be in "phase." If this is not done, one speaker will have a tendency to cancel out certain frequency responses of the other. Particular attention should be given to the wire colors shown on the Circuit Diagram in replacing any parts. To determine whether the speakers are in phase--short out the voice coil on the large speaker to see that the small speaker is reproducing the "highs" and then reverse the voice coil leads on the large speaker, leaving them in the position of the strongest and best reception.

CIRCUIT ALIGNMENT

All of the adjustable condensers are very accurately adjusted at the factory and should need no further adjustment unless tampered with in the field or a defective coil has been replaced. If realignment is found necessary the circuits can be properly adjusted only with the use of a calibrated test oscillator and an output meter.

The receiver should be aligned in a location free from local interference (interference ceased by motors, flashers, automobile ignition, etc.) as high frequency disturbances will cause difficulties when adjusting the short wave circuits.

DIAL SETTING CHECK: Turn dial knob until rotor plates of condenser gang are fully meshed. The "hour" hand should be on the horizontal line of the dial pointer to 9 and 3 o'clock. The "minute" hand should be in a vertical position or at 12 o'clock. This check should be made before attempting any adjustments.

CAUTION: Do not attempt to make any adjustments of the trimmer condensers with the band change switch over removed.

1. Peaking I-F Stages at 455 Kilocycles

(a) Connect the signal lead of the test oscillator to the grid cap of the 6A7 tube through a .25 mfd. condenser. DO NOT REMOVE THE GRID CLIP FROM THE TUBE.

(b) Connect the ground lead of the test oscillator to the receiver chassis.

(c) Set receiver dial pointer to 1400 K.C. and band change switch on position "B".

(d) Place test oscillator in operation at 455 K.C.

(e) Turn receiver volume control to the maximum position.

(f) Adjust the five I-F trimmers on the two I-F coils Illus. 52 & 53 (Fig. 2) carefully for maximum output in the following sequence--A-B-C-D-E. During alignment, maintain as low a signal output from the test oscillator as is consistant with obtaining a readable indication on the output meter.

2. Aligning at 175 Kilocycles (Band "A")

(a) Connect the signal lead of the test oscillator to the antenna binding post on the chassis through at .0002 mfd. condenser. Leave test oscillator ground lead connected to the receiver chassis.

(b) Place test oscillator in operation at 175 K.C.

(c) Turn band change switch to Band "A" (extreme left).

(d) Tune in the 175 K.C. signal from the test oscillator with the receiver dial for maximum output. (This point does not have to be exactly at the 175 K.C. dial setting).

(e) Adjust the Band "A" oscillator tracking condenser, Illus. #55 (Fig. 3) while rocking the tuning condenser plates back and forth through resonance until no further increase in output can be obtained.

3. Aligning at 350 Kilocycles (Band "A")

(a) Place test oscillator in operation at 350 K.C., leaving the leads connected the same as before.

(b) Turn dial pointer to 350 K.C.

(c) Adjust the Band "A" oscillator parallel condenser, Illus. 81A (Fig. 3) to maximum output.

(d) Adjust the Band "A" R-F parallel trimmer, Illus. 51A (Fig. 3) to maximum output.

(e) Adjust the Band "A" Antenna parallel trimmer, Illus. 42A (Fig. 3) to maximum output.

(f) Repeat operations under paragraph #2 "Aligning at 175 Kilocycles" for accurate adjustments.

4. Aligning at 1400 Kilocycles (Band "B")

(a) Place test oscillator in operation at 1400 K.C.

(b) Turn dial pointer to 1400 K.C. setting and band change switch to Band "B".

(c) Adjust the Band "B" oscillator parallel condenser, Illus. 81B (Fig. 3) to maximum output.

(d) Adjust the Band "B" R-F parallel trimmer, Illus. 51B (Fig. 3) to maximum output.

(e) Adjust the Band "B" Antenna parallel trimmer Illus. 42B (Fig. 3) to maximum output.

5. Aligning at 600 Kilocycles (Band "B")

(a) Place test oscillator in operation at 600 K.C.

(b) Tune in the 600 K.C. test oscillator signal with the receiver dial for maximum output. (This point does not have to be exactly at the 600 K.C. dial setting).

(c) Adjust the Band "B" oscillator tracking condenser, Illus. 48 while rocking the tuning condenser plates back and forth through resonance until no further increase in output can be obtained.

(d) Repeat operations under paragraph #4 "Aligning at 1400 Kilocycles" for accurate adjustments.

6. Aligning at 5 Megacycles (5000 K.C. Band "C")

(a) Place test oscillator in operation at 5 megacycles.

(b) Turn dial pointer to 5 megacycles and band change switch to Band "C".

(c) Adjust the Band "C" oscillator parallel trimmer, Illus. #61C to maximum output.

(d) Adjust the Band "C" R-F Parallel trimmer Illus. #51C to maximum output.

(e) Adjust the Band "C" Antenna parallel trimmer Illus. #42C (Fig. 3) to maximum output.

7. Aligning at 18 Megacycles (18,000 K.C. Band "D")

(a) Replace the .0002 mfd. condenser in the signal lead from the test oscillator with a 400 ohm carbon resistor, leaving the test oscillator leads connected the same as before.

(b) Turn the band change switch to Band "D" (extreme right hand position).

(c) Turn the receiver dial pointer to 18 Megacycles.

(d) Place test oscillator in operation at 18 Megacycles.

(e) Adjust the Band "D" oscillator parallel trimmer, Illus. 61D (Fig. 3) to maximum output.

NOTE: On the 18 Megacycle Alignment of trimmer Illus. 61D, it will be noted that there are two settings at which the signal will be received. Use the signal received with the trimmer setting having the most capacity or the point at which the trimmer screw is the farthest in.

(f) Adjust the Band "D" R-F parallel trimmer Illus. 51D to maximum output.

(g) Adjust the Band "D" Antenna parallel trimmer, Illus. 42D to maximum output.

TUBE SOCKET VOLTAGES

Tube	No.	*H	P	S	Su	G1	G2	G	K
6D6	1	6.0	240	90	3.25			0	3.25
6A7	2	6.0	240	85		1.0	200	0	7.75
6K7	3	6.0	225	90	3.0			0	0
6C5	4	6.0	0					0	0
6F5	5	6.0	72					0	0
6C5	6	6.0	225						7.5
6F5	7	6.0	240	230				0	12.5
45	8	2.5	250					55	
45	9	2.5	250					55	
5Z3	10	6.0	*400						

*A.C. voltage readings.

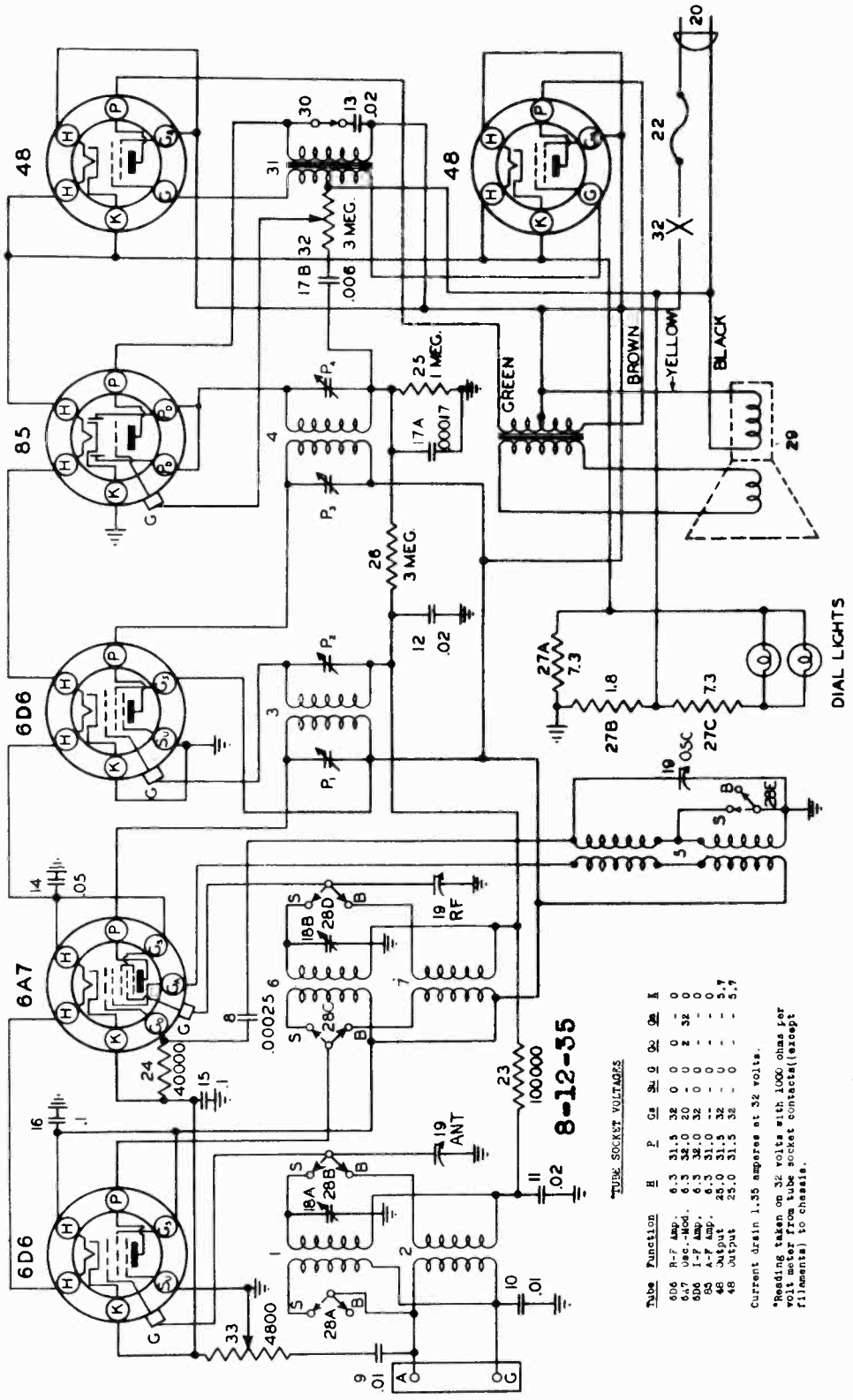
Above readings taken from tube socket contacts to ground (except filaments) using a line voltage of 115 volts A.C. and a meter having a resistance of 1000 ohms per volt.

NOTE

A neutralizing capacity is used in this receiver, in the form of a small wire soldered to the stator of the oscillator section of the condenser gang, (see Fig. 2) and capacity coupled to the 6A7 tube grid lead.

MODEL 3205 Delco
Schematic
Voltage

UNITED MOTORS SERVICE



INTERMEDIATE FREQUENCY 450 K.C.

DELCO MODEL 3205 CIRCUIT DIAGRAM

*TUBE SOCKET VOLTAGES

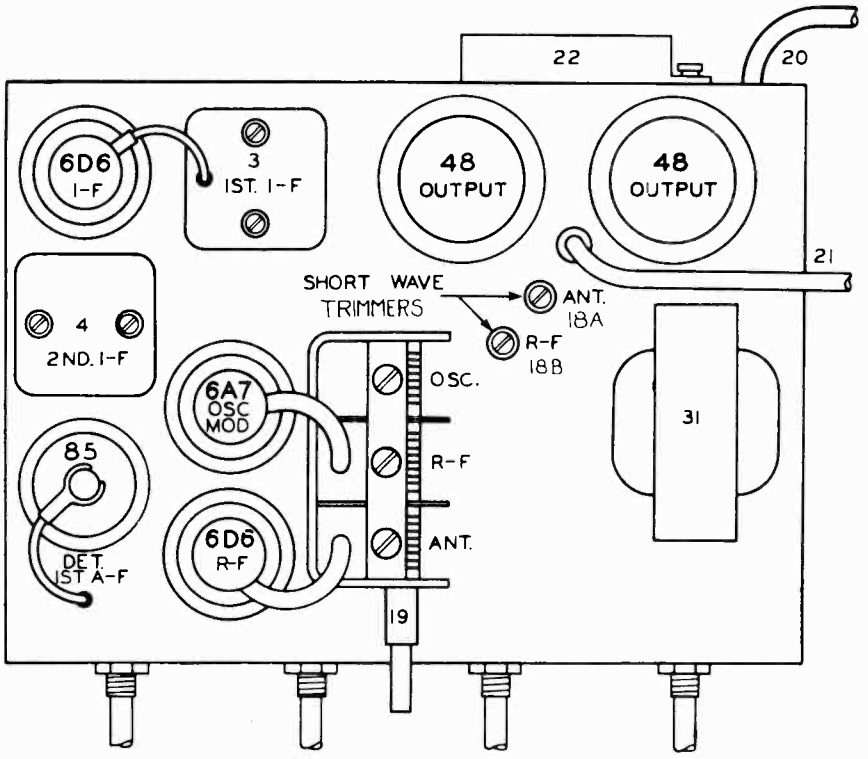
Tube	Function	H	P	Ga	Sg	G	G2	Ga	K
6D6	R-F Amp.	6.3	31.5	32	0	0	0	-	0
6A7	Osc.-Mod.	6.3	32.0	20	0	0	2	32	0
6D6	I-F Amp.	6.3	32.0	32	0	0	-	-	0
85	A-F Amp.	6.3	31.0	12	-	0	-	-	5.7
6A7	Output	6.3	31.5	32	-	0	-	-	5.7
48	Output	25.0	31.5	32	-	0	-	-	5.7

Current drain 1.35 amperes at 32 volts.

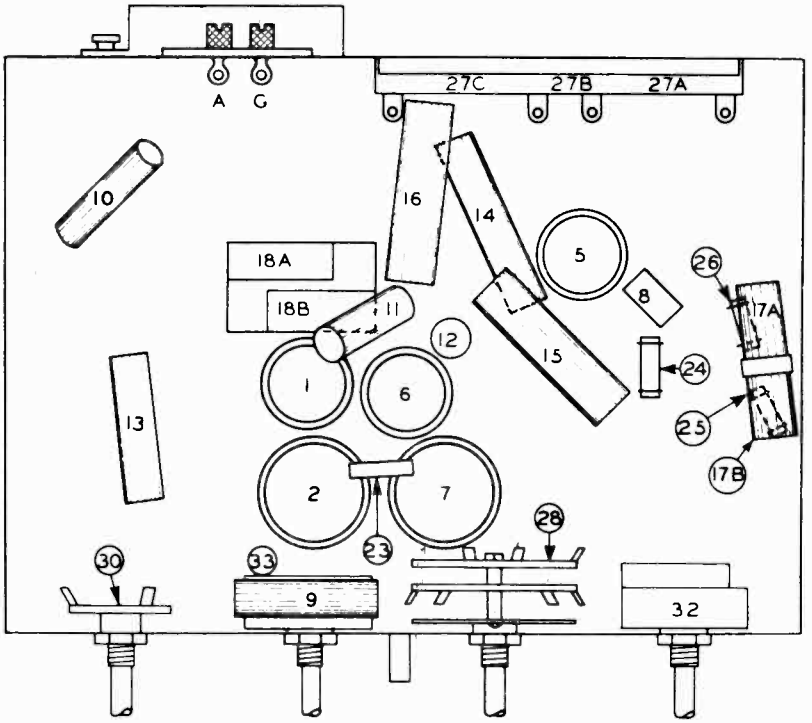
*Reading taken on 32 volts with 1000 ohms per volt meter from tube socket contacts(except filamental to chassis.

MODEL 3205 Delco
Socket, Trimmers
Chassis

UNITED MOTORS SERVICE



PARTS LAYOUT--Top View



PARTS LAYOUT--Bottom View

GENERAL: The Delco Model 3205 is a six tube, 32 volt, two band receiver with A.V.C. and sensitivity control. The tubes used are; 6D6 R-F Amplifier, 6A7 Oscillator-Modulator, 6D6 I-F Amplifier, 85 Detector and 1st Audio Amplifier and two type 48 Output Tubes.

The frequency range is from 540 to 1570 kilocycles on the Broadcast Band and from 1570 to 4000 kilocycles on the Short Wave Band.

SENSITIVITY CONTROL

The sensitivity control is a low resistance potentiometer, (Illus. #33) One end is connected to the antenna lead and the other end is connected to the cathodes of the R-F and Osc.-Mod. tubes. The moving arm is connected to the chassis. When the knob is turned toward the left (counter-clockwise) it simultaneously decreases the resistance across the primary of the antenna coil and increases the grid bias on the R-F and Osc.-Mod. tubes. This has the effect of decreasing the sensitivity of the receiver and increasing the selectivity. Since the sensitivity of the R-F and I-F amplifiers is simultaneously decreased, it serves as a control of overall oscillations which sometimes develop with abnormally high line voltage.

GROUND CIRCUIT

DO NOT ground the chassis except through the use of the "GND" terminal on the terminal strip located on the rear of the chassis. This terminal connects to the chassis frame through a series condenser in order to prevent a short circuit when operating the receiver on a 32 volt system with the positive side grounded.

CIRCUIT ALIGNMENT

All of the adjustable condensers are very accurately adjusted at the factory and should need no further adjustment unless tampered with in the field or a defective coil has been replaced. If realignment is found necessary, the circuits can be properly adjusted only with the use of a test oscillator and an output meter.

1. Peaking I-F Stages at 450 Kilocycles

   (a) Connect the antenna of the signal generator to the control grid connection on top of the 6A7 tube through a .02 mfd. series condenser. DO NOT REMOVE THE GRID CLIP.

   (b) Connect the ground terminal of the signal generator to the ground terminal of the receiver.

   (c) Set the signal generator to exactly 450 kilocycles.

   (d) Rotate the receiver tuning condenser until the rotor plates are completely meshed.

   (e) Turn the band selector switch to the left. (Short Wave)

   (f) Adjust the line voltage to 32 volts.

   (g) Turn the volume control and the sensitivity control all the way to the right.

   (h) With the signal generator set to the lowest usable output level adjust the I-F trimmer condensers for maximum signal output.

   NOTE: The I-F trimmers are located on top of the I-F coils, Fig. 2 and may be adjusted with an insulated screw driver. Always make the adjustments very carefully, going over them several times to insure that the final setting is at resonant frequency.

2. Aligning R-F Circuits--Broadcast Band (540-1570 K.C.)

   (a) Turn the band selector switch to the right hand position. (Broadcast Band)

   (b) Rotate the tuning condenser until the rotor plates are completely out of mesh.

   (c) Connect the antenna terminal of the signal generator to the receiver antenna terminal through a .00025 mfd., mica, series condenser.

   (d) Connect the ground terminal of the signal generator to the ground terminal of the receiver.

   (e) Set the signal generator to exactly 1575 kilocycles.

   (f) Adjust the "Osc." section (rear section) of the tuning condenser gang for maximum signal output.

   (g) Set the signal generator to 1400 kilocycles.

   NOTE: If electrical interference causes an excessive reading on the output meter, making alignment difficult, it can be reduced by connecting a 5 to 10 mfd., paper, condenser between the ground terminal of the receiver and the chassis frame.

   (h) Tune in the 1400 kilocycle signal with tuning condenser for maximum output.

   NOTE: Do not disturb the setting of the oscillator trimmer (rear section) as this is adjusted at 1575 kilocycles only and any further adjustment at this point would affect both the tuning range of the receiver and the tracking of its circuits.

   (i) Adjust the "R-F" parallel trimmer of the condenser gang for maximum output.

   (j) Adjust the "Ant." parallel trimmer of the condenser gang for maximum output.

   (k) Repeat operations (h), (i) and (j) until no further improvement in output can be made.

3. Aligning R-F Circuits--Short Wave (1570-4000 K.C.)

   (a) Set the signal generator to 2500 kilocycles.

   (b) Turn the band selector switch to the left. (Short Wave)

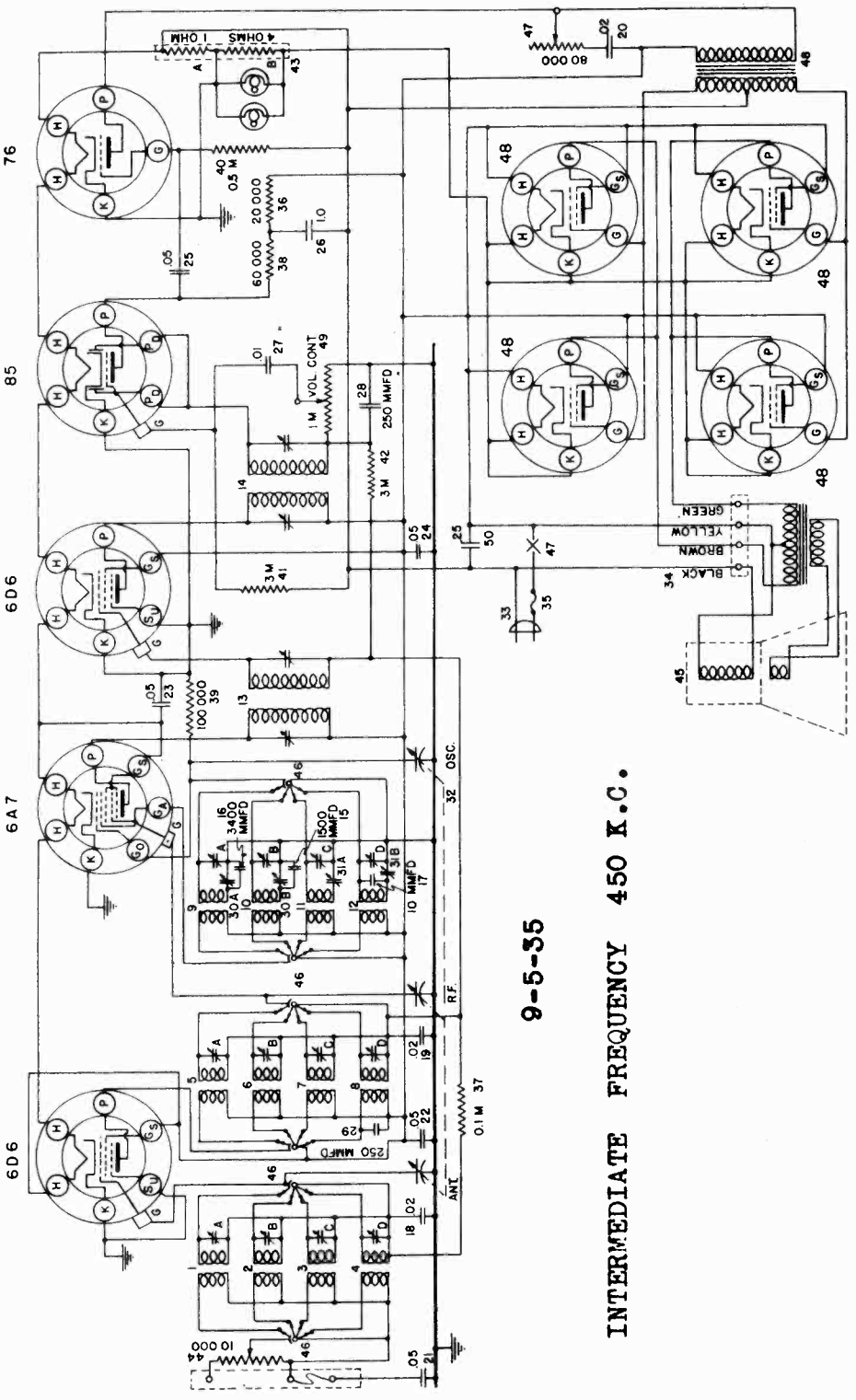
   (c) Tune in the 2500 kilocycle signal with the tuning condenser for maximum output.

   (d) Adjust the R-F short wave padding condenser, Illus. #18B for maximum output.

   (e) Adjust the Ant. short wave padding condenser, Illus. #18A for maximum output.

MODELS 3206,3207 Delco
Schematic

UNITED MOTORS SERVICE



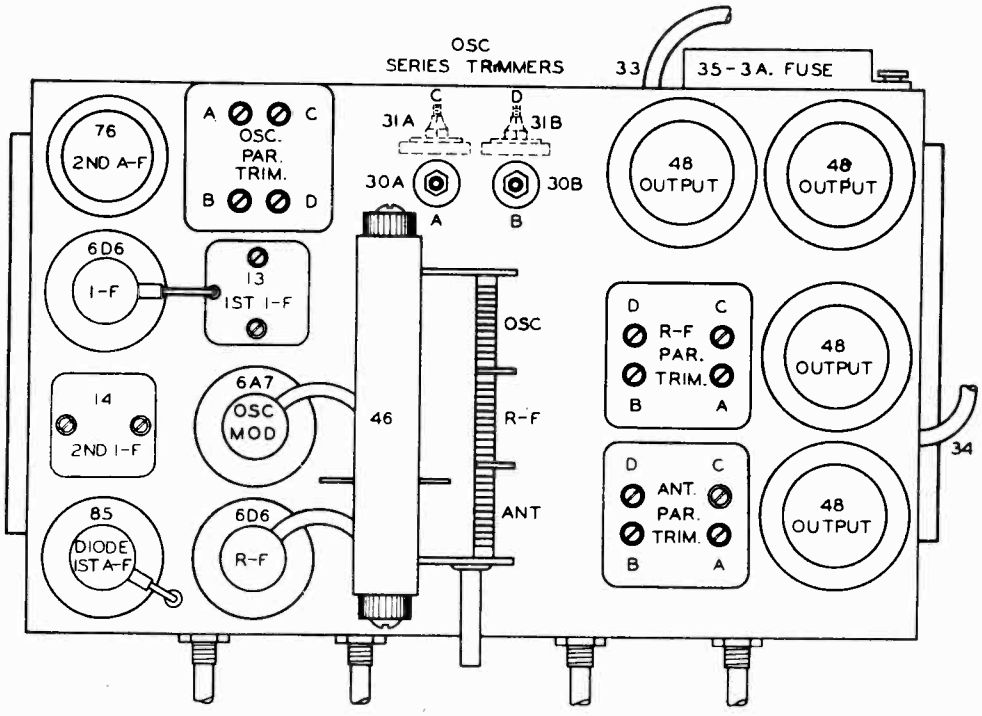
9-5-35

INTERMEDIATE FREQUENCY 450 K.C.

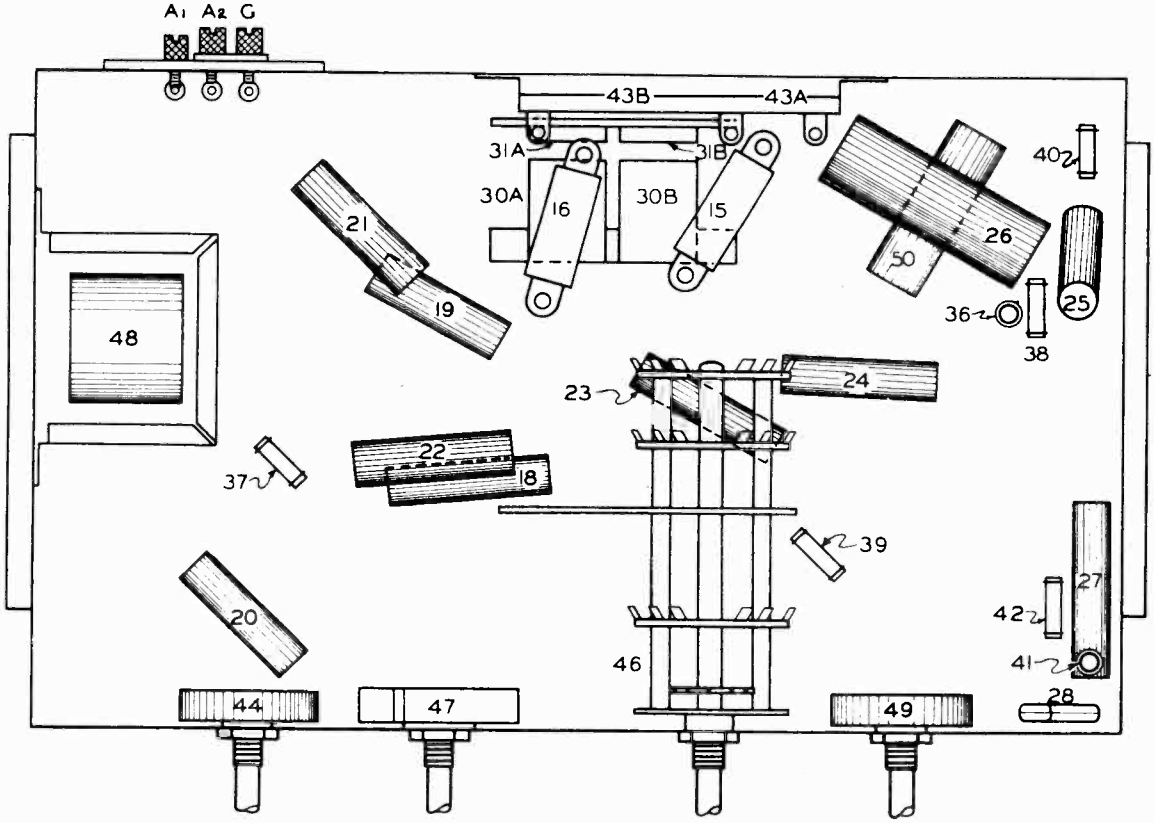
DELCO MODEL 3206 and 3207 CIRCUIT DIAGRAM

UNITED MOTORS SERVICE

MODELS 3206,3207 Delco
Socket,Trimmers
Chassis



PARTS LAYOUT--Top View



PARTS LAYOUT--Bottom View

MODELS 3206,3207 Delco
Alignment,Voltage

UNITED MOTORS SERVICE

GENERAL: The Delco Models 3206 (table model) and 3207 (console model) employ the same chassis which is a nine tube, 32 volt, four band receiver. The tubes used are 6D6 R-F amplifier, 6A7 Oscillator-Modulator, 6D6 I-F Amplifier, 85 Detector and A-F Amplifier and four type 46 output tubes in push-pull parallel.

The frequency ranges on the four bands covered are: Foreign Short Wave Band (A) 5.9 to 15.3 megacycles, Police and Amateur Band (B) 1690 to 4500 Kilocycles, American Broadcast Band (C) 540 to 1600 Kilocycles and the Weather Band (D) 148 to 400 Kilocycles.

SENSITIVITY CONTROL

The sensitivity control is a potentiometer connected across the A1 and A2 terminals on the terminal strip on the rear of the chassis. The movable arm is connected to the antenna coil. It is used to vary the strength of the signal in order to prevent overloading the R-F amplifier because of the low plate voltage used.

GROUND CIRCUIT

DO NOT ground the chassis except through the use of the "GND" terminal on the terminal strip located on the rear of the chassis. This terminal connects to the chassis frame through a series condenser in order to prevent a short circuit when operating the receiver on a 32 volt system with the positive side grounded.

CIRCUIT ALIGNMENT

All of the condensers are very accurately adjusted at the factory and should need no further adjustment unless tampered with in the field or a defective coil has been replaced. If realignment is found necessary, the circuits can be properly adjusted only with the use of a signal generator and an output meter.

1. Peaking I-F Stages at 450 Kilocycles

(a) Connect the antenna of the signal generator to the control grid connection on top of the 6A7 tube through a .02 mfd. series condenser. DO NOT REMOVE THE GRID CLIP.

(b) Connect the ground terminal of the signal generator to the ground terminal of the receiver.

(c) Set the signal generator to exactly 450 Kilocycles.

(d) Rotate the receiver tuning condenser until the rotor plates are completely out of mesh.

(e) Turn the band selector switch to Band A. (First position on left)

(f) Adjust the line voltage to 32 volts.

(g) Turn the volume control and sensitivity control knobs all the way to the right.

(h) With the signal generator set to the lowest usable output level, adjust the I-F trimmer condensers for maximum signal output.

NOTE: The I-F trimmers are located on top of the I-F coils, Fig. 2, and may be adjusted with an insulated screw driver. Always make the adjustments very carefully, going over them several times to insure that the final setting is at resonant frequency.

2. Aligning R-F Circuits Band "D" (148-400 K.C.)

(a) Turn the band selector switch to the first position on the right. (Band D)

(b) Rotate the receiver tuning condenser until the rotor plates are completely IN MESH and adjust the dial pointer, if necessary, so that it is exactly horizontal.

(c) Connect the antenna terminal of the signal generator to terminal "A1" on the rear of the receiver through a .00025 mfd. mica series condenser.

(d) Set the signal generator to 400 Kilocycles.

(e) Rotate the station selector until the rotor plates are completely OUT OF MESH.

(f) Adjust the Band D "Osc." parallel trimmer (Fig. 2), for maximum output.

NOTE: If electrical interference causes an excessive reading on the output meter, making alignment difficult, it can be reduced by connecting a 5 to 10 mfd. paper condenser between the ground terminal of the receiver and the chassis frame.

(g) Adjust the Band D "R-F" parallel trimmer, (Fig. 2), for maximum output.

(h) Adjust the Band D "Ant" parallel trimmer, (Fig. 2), for maximum output.

(i) Repeat operations (f), (g) and (h) until no further improvement in output can be obtained.

(j) Set the signal generator to 150 Kilocycles.

(k) Tune-in the 150 kilocycle signal with the station selector in the region of 15 on the dial (Band D), for maximum reading on the output meter.

(l) Adjust the Band D oscillator series trimmer, (Illus. #31B, Fig. 2) while rocking the condenser gang plates back and forth slightly, until no further increase in output can be obtained.

(m) Repeat operations (f), (g) and (h) for more accurate adjustments.

3. Aligning R-F Circuits - Band C (540-1600 K.C.)

(a) Turn the band selector switch to the second position from the right. (Band C)

(b) Set the signal generator to 1400 kilocycles.

(c) Rotate the station selector until the pointer points to 140. (Band C)

(d) Adjust the Band C "Osc." parallel trimmer (Fig. 2), for maximum signal output.

(e) Adjust the Band C "R-F" parallel trimmer, (Fig. 2), for maximum signal output.

(f) Adjust the Band C "Ant" parallel trimmer (Fig. 2), for maximum signal output.

(g) Repeat operations (d), (e) and (f).

(h) Set the signal generator to 600 kilocycles.

(i) Tune-in the 600 Kilocycle signal with the station selector in the region of 60 on the dial (Band C), for maximum reading on the output meter.

(j) Adjust the Band C oscillator series trimmer, (Illus. #31A, Fig. 2) while rocking the condenser gang plates back and forth slightly, until no further increase in output can be obtained.

(k) Repeat operations (d), (e) and (f) for more accurate adjustments.

4. Aligning R-F Circuits - Band B (1690-4500 K.C.)

(a) Turn the band selector switch to the second position from the left. (Band B)

(b) Set the signal generator to 4000 Kilocycles.

(c) Rotate the station selector until the pointer points to 4.0. (Band B)

(d) Adjust the Band B "Osc." parallel trimmer, (Fig. 2), for maximum signal output.

(e) Adjust the Band B "R-F" parallel trimmer, (Fig. 2), for maximum signal output.

(f) Adjust the Band B "Ant." parallel trimmer,(Fig. 2),for maximum signal output.

(g) Repeat operations (d), (e) and (f).

(h) Set the signal generator to 1700 Kilocycles.

(i) Tune-in the 1700 Kilocycle signal with the station selector in the region of 1.7 on the dial (Band B), for maximum reading on the output meter.

(j) Adjust the Band B oscillator series trimmer (Illus. #30B, Fig. 2) while rocking the condenser gang plates back and forth slightly, until no further increase in output can be obtained.

(k) Repeat operations (d), (e) and (f) for more accurate adjustments.

5. Aligning R-F Circuits - Band A (5,900-15,300 K.C.)

(a) Replace the .00025 series condenser in the output lead from the signal generator with a 400 ohm, carbon resistor.

(b) Turn the band selector switch to the first position on the left. (Band A)

(c) Set the signal generator to 15 megacycles. (15,000 K.C.)

(d) Rotate the station selector until the pointer points to 15. (Band A)

(e) Adjust the Band A "Osc." parallel trimmer, (Fig. 2), for maximum signal output.

(f) Adjust the Band A "R-F" parallel trimmer, (Fig. 2), for maximum signal output.

(g) Adjust the Band A "Ant." parallel trimmer, (Fig. 2), for maximum signal output.

(h) Repeat operations (e), (f) and (g).

(i) Set the signal generator to 6 megacycles. (6000 K.C.)

(j) Tune-in the 6 megacycle signal with the station selector in the region of 6.0 on the dial (Band A) for maximum reading on the output meter.

(k) Adjust the Band A oscillator series trimmer (Illus. #30A, Fig. 2) while rocking the condenser gang plates back and forth slightly, until no further increase in output can be obtained.

(l) Repeat operations (e), (f) and (g) for more accurate adjustments.

*TUBE SOCKET VOLTAGES

Tube	Function	H	P	Go	Su	G	Go	Ga	B
6D6	R-F Amplifier	6.4	30.5	30.5	- - -	0			
6A7	Osc-Mod	6.4	30.5	17.6		0	0		0
6D6	I-F Amplifier	6.4	30.5	30.5		0	0		0
85	Det. & 1st A-F	6.4	9.0	- - -					
76	A-F Amplifier	6.4	30.0	- - -					
46	(4) Output	25.2	30.0	30.5	- - -	0	0	30.5	0
						1.6	- - -	- - -	5.2

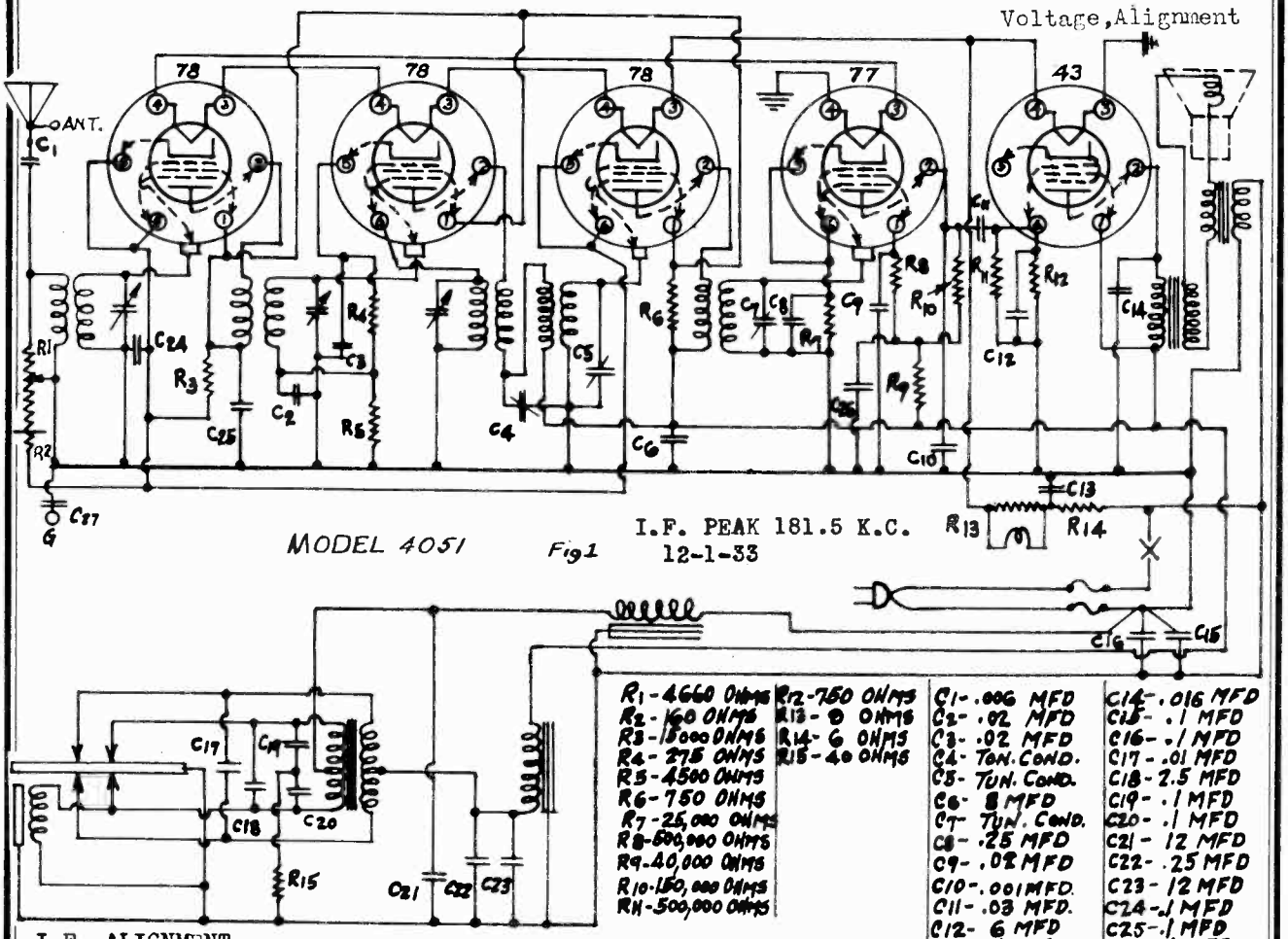
Current drain 2.0 amperes at 32 volts.

**Oscillator grid (Go) voltage varies from - 1 at the low frequency end of the dial to - 3 at the high frequency end of the dial.

* Readings taken on 32 volt power supply with 1000 ohms per volt voltmeter from tube socket contacts (except filaments) to chassis.

UNITED MOTORS SERVICE

MODEL 4051, 32 volts
Schematic
Voltage, Alignment



MODEL 4051 Fig 1 I.F. PEAK 181.5 K.C. 12-1-33

R1 - 4660 OHMS	R12 - 750 OHMS	C1 - .006 MFD	C14 - .016 MFD
R2 - 160 OHMS	R13 - 2 OHMS	C2 - .02 MFD	C15 - .1 MFD
R3 - 15000 OHMS	R14 - 6 OHMS	C3 - .02 MFD	C16 - .1 MFD
R4 - 275 OHMS	R15 - 40 OHMS	C4 - TUN. COND.	C17 - .01 MFD
R5 - 4500 OHMS		C5 - TUN. COND.	C18 - 2.5 MFD
R6 - 750 OHMS		C6 - 8 MFD	C19 - .1 MFD
R7 - 25,000 OHMS		C7 - TUN. COND.	C20 - .1 MFD
R8 - 500,000 OHMS		C8 - .25 MFD	C21 - 12 MFD
R9 - 40,000 OHMS		C9 - .02 MFD	C22 - .25 MFD
R10 - 150,000 OHMS		C10 - .001 MFD	C23 - 12 MFD
R11 - 500,000 OHMS		C11 - .03 MFD	C24 - .1 MFD
		C12 - 6 MFD	C25 - .1 MFD
		C13 - .1 MFD	C26 - .1 MFD
			C27 - .1 MFD

I.F. ALIGNMENT.

1. Connect the Oscillator to the grid cap of the 1st. Detector (78 Tube)
2. Set the Oscillator for 181.5 K.C.
3. Peak the I.F. trimmer condensers, peaking the secondary of the second I.F. Transformer first and working forward to the primary of the first I.F. Transformer.

R.F. ALIGNMENT.

1. Connect the Oscillator to the antenna and ground posts of the receiver.
2. Tune the receiver to 1400 K.C.; operate the Oscillator at 1400 K.C.
3. Peak the parallel trimmers on the tuning condenser; peak the oscillator section (small plates) first.

CAUTION.

Do NOT connect the chassis of the receiver to the chassis of the vibrator as they are 32 Volts apart electrically. Connecting the two chassis together will cause the fuses to blow.

VOLTAGE CHART

TUBE	Tube prong numbers. #1	#2	#3 & #4 Filament	#5	#6
78	135	135	6.4	5.0	5.0
78	135	154	6.4	35.0	.0
78	135	154	6.4	5.0	5.0
77	50	77	6.4	5.5	5.5
43	154	148	25.0	22.5	

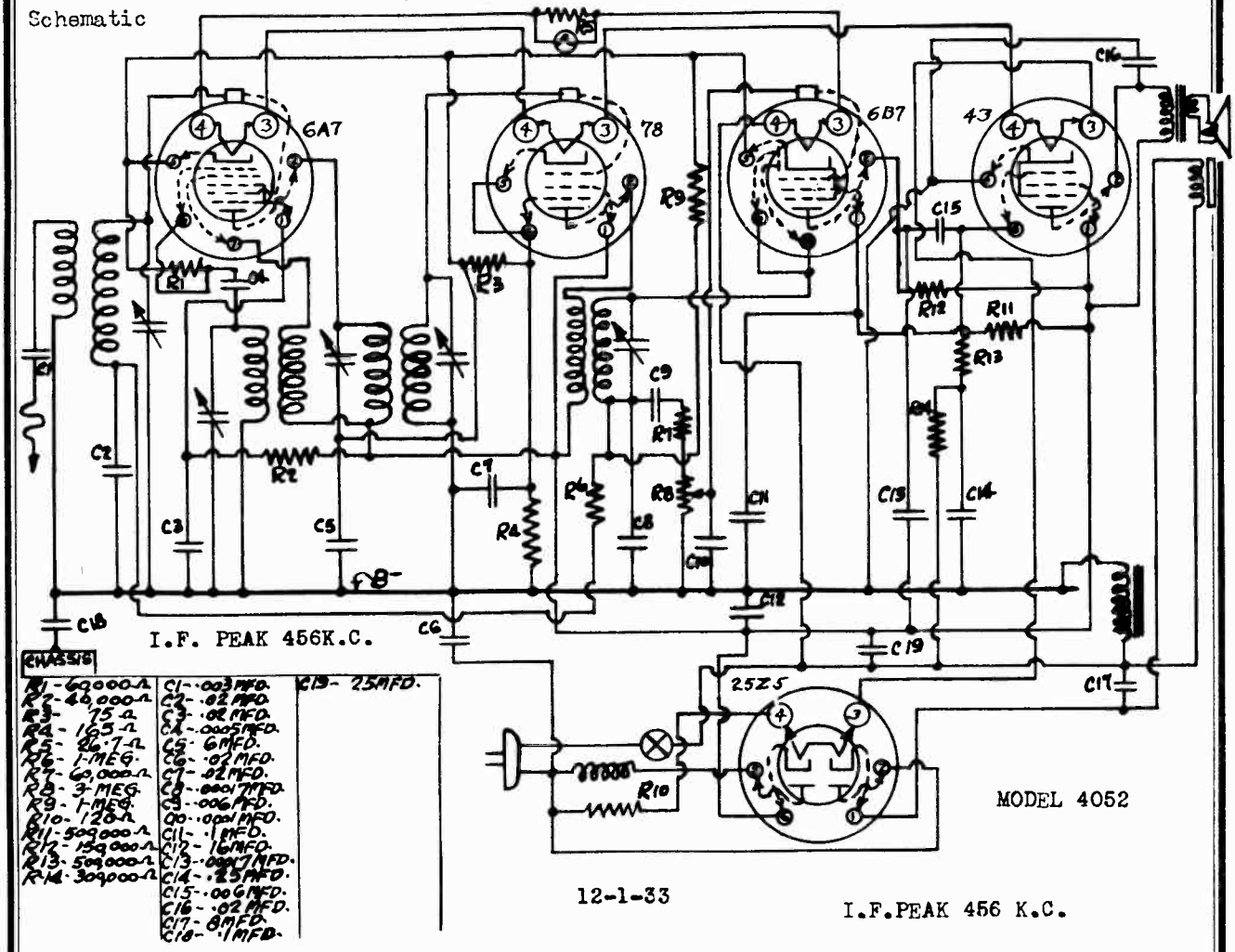
NOTE:

All readings are taken from indicated tube socket prong to frame except filament voltages. Volume Control on full. Supply Voltage at 32 Volts. Any increase or decrease in the power supply will vary these readings proportionately.

MODEL 4052 AC-DC
Schematic

UNITED MOTORS SERVICE

Voltage, Alignment



I.F. ALIGNMENT.
Peak the I.F. circuits of this receiver at 456 K.C. Use a fibre wrench for aligning the I.F. circuits, DO NOT attempt to use a metal wrench for this purpose.

R.F. & OSCILLATOR ALIGNMENT.
Peak the trimmer condensers on the tuning condenser at exactly 1400 K.C. Variation of this frequency will prevent tuning in both 550 and 1712 K.C. satisfactoily.

*NOTE:
The I.F. frequency of this receiver falls in the Government Coast Guard communications band. In certain locations code may be heard between stations over the entire dial as a nearby Coast Guard station may ride through on the I.F. circuits are repeaked at a slightly lower , or a slightly higher, frequency the code signal will be rejected by the I.F. circuits.

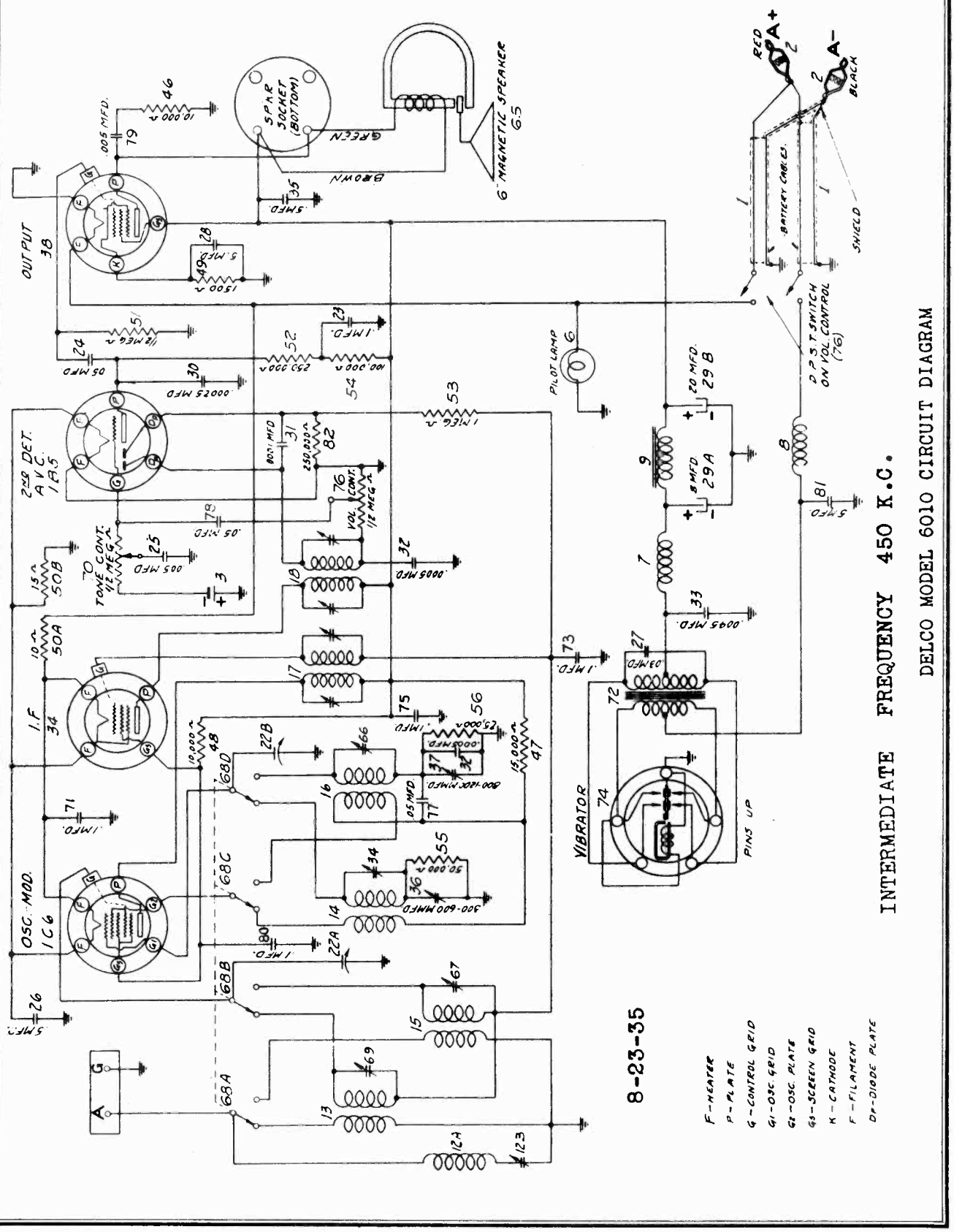
VOLTAGE CHART

"B" MINUS for this receiver will be found on the tuning condenser frame. All D.C. Voltages are measured between the indicated tube prong and the frame of the tuning condenser. The A.C. Voltages of the tube filaments are measured directly across the tube filament prongs with an A.C. meter.

TUBE	TUBE PRONG NUMBERS					
	#1	#2	#3 & #4(Fil)	#5	#6	#7
6A7	46	100	6.3	2.5	-.8	100
78	100	100	6.3	2.2	2.2	
6B7	12.5	13.5	6.3	1.0	.0	.0
43	100	92.5	25.0		-5.	
25Z5	-20	25.	-20.	100.		

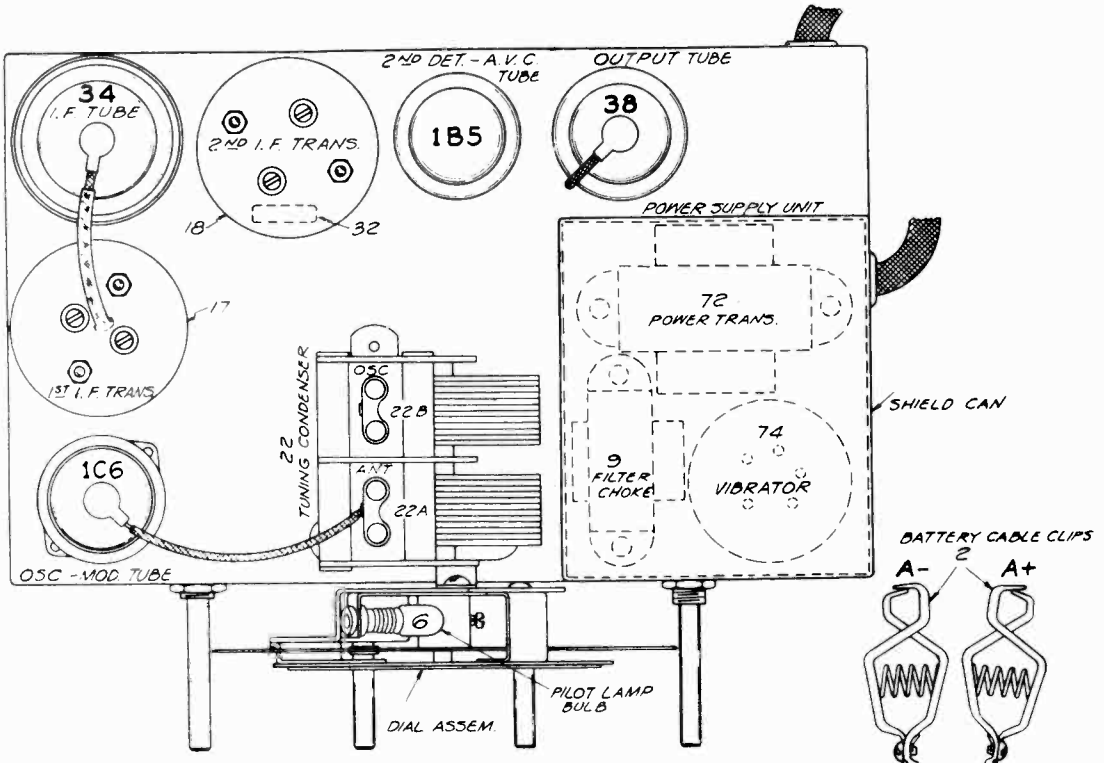
MODEL 6010 Delco
Schematic

UNITED MOTORS SERVICE

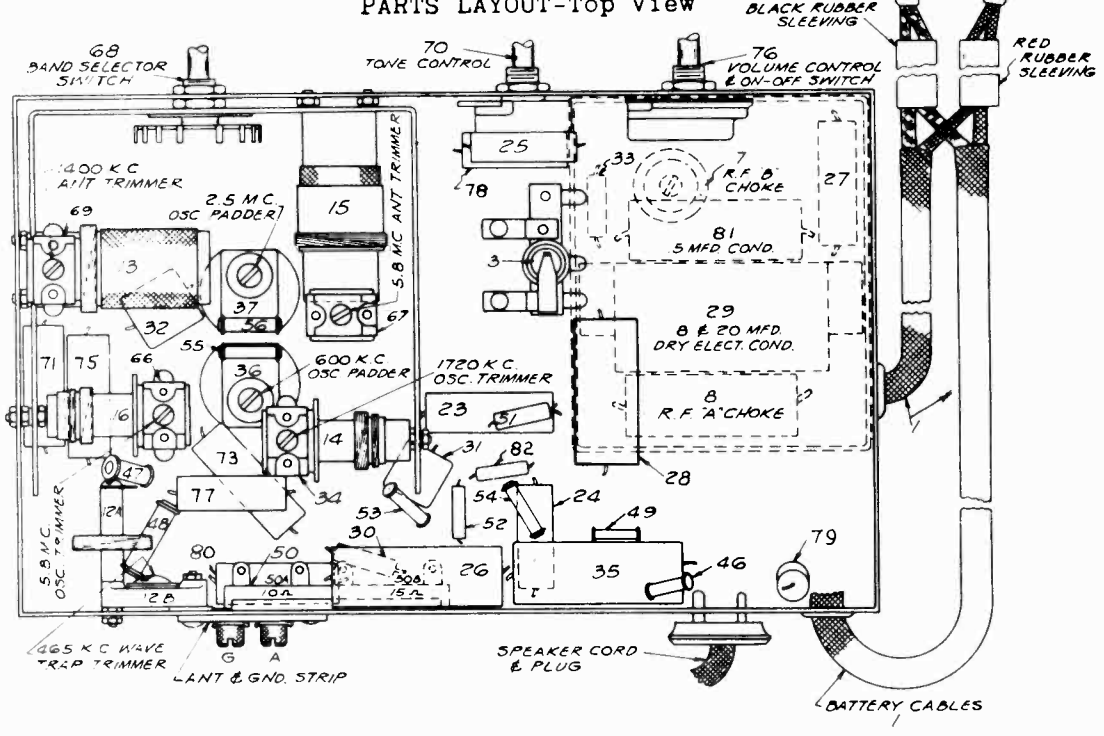


MODEL 6010 Delco
Socket, Trimmers
Chassis

UNITED MOTORS SERVICE



PARTS LAYOUT-Top View



PARTS LAYOUT--Bottom View

GENERAL: The Delco Model 6010 is a 5 tube, 6 volt battery operated receiver with A.V.C. The type tubes used are: 1C6 Oscillator-Modulator, 34 I-F Amplifier, 1B5 Detector, A.V.C., and 1st A-F Amplifier and a type 38 Output tube.

The frequency range is from 540 to 1720 kilocycles on the Broadcast Band and from 2300 to 6200 kilocycles on the Short Wave Band.

CIRCUIT ALIGNMENT

All of the adjustable condensers are very accurately adjusted at the factory and should need no further adjustment unless tampered with in the field or a defective coil has been replaced. If realignment is found necessary, the circuits can be properly adjusted only with the use of a calibrated test oscillator or signal generator and an output meter.

1. Peaking I-F Stages at 465 Kilocycles

(a) Connect the ground lead of the test oscillator to the chassis frame. Connect the other lead to the grid cap of the 1C6 tube through a .02 mfd. series condenser. DO NOT REMOVE THE GRID CLIP.

(b) Set the test oscillator to exactly 465 kilocycles.

(c) Turn the volume control of the receiver on full.

(d) Peak each of the trimmers on the 2nd I-F coil., Illus. #18 on Fig. 2.

(e) Peak each of the trimmers on the 1st I-F coil., Illus. #17 on Fig. 2.

(f) In order to insure accurate settings of the I-F trimmers, the above adjustments should be repeated using the lowest test oscillator output that will give a reasonable output meter scale deflection.

2. Aligning R-F Circuits -- Broadcast Band (540-1720 K.C.)

(a) Remove the test oscillator lead from the grid of the 1C6 tube and connect it to the receiver antenna terminal through a .00025 mfd. series condenser.

(b) Check to see the tuning dial has not slipped on the condenser gang shaft by turning the rotor plates of the condenser gang until they are completely out of mesh, at which point the dial pointer should be at the high frequency end of the dial calibration.

(c) Turn the band selector switch to the right for operation on the Broadcast Band (540-1720 K.C.)

(d) Set the test oscillator frequency to exactly 1720 K.C.

(e) Turn the gang condenser until the plates are completely out of mesh.

(f) Adjust the broadcast padding condenser for the oscillator section of the condenser gang, shown as Illus. #34 on Fig. 3, to bring in the 1720 kilocycle signal from the test oscillator with maximum output.

(g) Set the test oscillator frequency and the receiver dial to exactly 1400 kilocycles.

(h) Adjust the broadcast padding condenser, Illus. #69 Fig. 3, for the antenna section of the condenser gang for maximum output.

(i) Set test oscillator on 600 kilocycles.

2. Aligning R-F Circuits--Broadcast Band (540-1720 K.C.)--Cont'd.

(j) Set receiver dial at approximately 600 kilocycles, leaving the test oscillator connected to the ANT and GND terminal of the receiver and the band change switch in the Broadcast position.

(k) Adjust the oscillator tracking condenser Illus. #36 Fig. 3, rocking the tuning condenser gang back and forth until no further increase in output can be obtained.

3. Aligning R-F Circuits--Short Wave Band (2.3 to 6.2 meg.)

(a) Leave test oscillator connected to ANT and GND of receiver and turn the band selector switch to the left for operation on the Short Wave Band.

(b) Set test oscillator frequency and receiver dial to exactly 5.8 megacycles.

(c) Adjust the short wave padding condenser, Illus. #66 Fig. 3, for the oscillator section of the condenser gang until the 5.8 megacycle signal from the test oscillator is tuned in with maximum output.

(d) Adjust the short wave padding condenser, Illus. #67 Fig. 3 for maximum output.

(e) Turn the receiver dial and set test oscillator to approximately 2.5 megacycles.

(f) Adjust the Oscillator tracking condenser, Illus. #37 Fig. 3, rocking the tuning condenser gang back and forth until no further improvement in output can be obtained.

4. Adjustment of 465 K.C. Wave Trap

Some code and aircraft signals are broadcast on a frequency exactly the same or near the I.F. frequency of the receiver. To eliminate interference from these signals, a 465 K.C. antenna filter is incorporated in the set. To adjust:

(a) Leave test oscillator output leads connected to the set ANT and GND.

(b) Set the test oscillator frequency to exactly 465 K.C. and adjust the 465 K.C. wave trap trimmer, Illus. #12B Fig. 3 for MINIMUM 465 K.C. SIGNAL RESPONSE.

*TUBE SOCKET VOLTAGES

Tube	Function	F	P	Gs	G2	G1	K
1C6	Osc.-Mod.	2.1	135	85	-2.8	100	-
34	I-F Amp.	2.1	135	85	-	-	-
1B5	Det.,1st A-F	2.1	50	-	-	--	-
38	Output	6.0	130	135	-	-	13

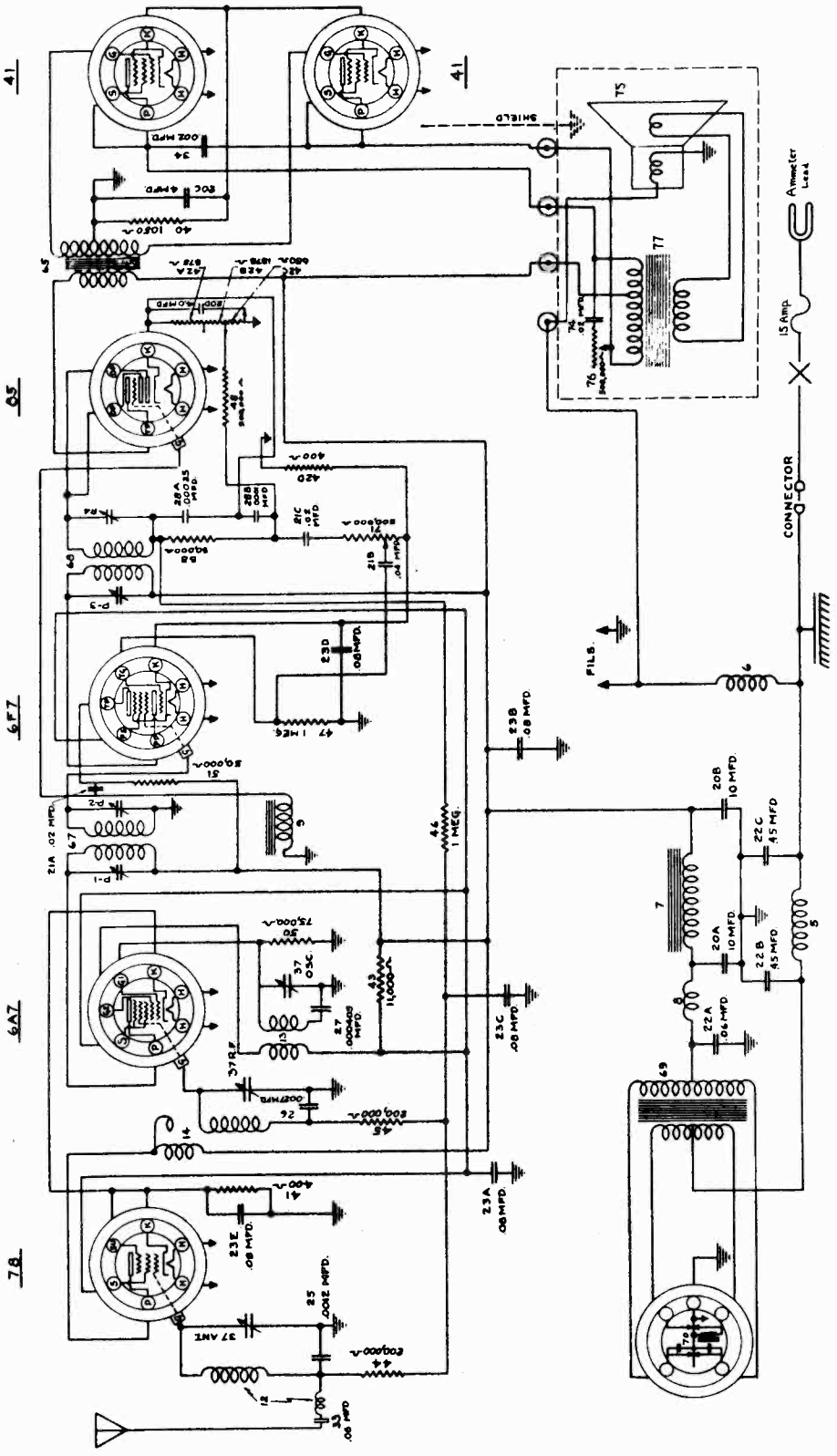
*Readings taken from tube socket contacts to ground (except filaments) with a meter having a resistance of 1000 ohms per volt.

●

MODEL 405046 Oldsmobile
544268 Pontiac

UNITED MOTORS SERVICE

Schematic

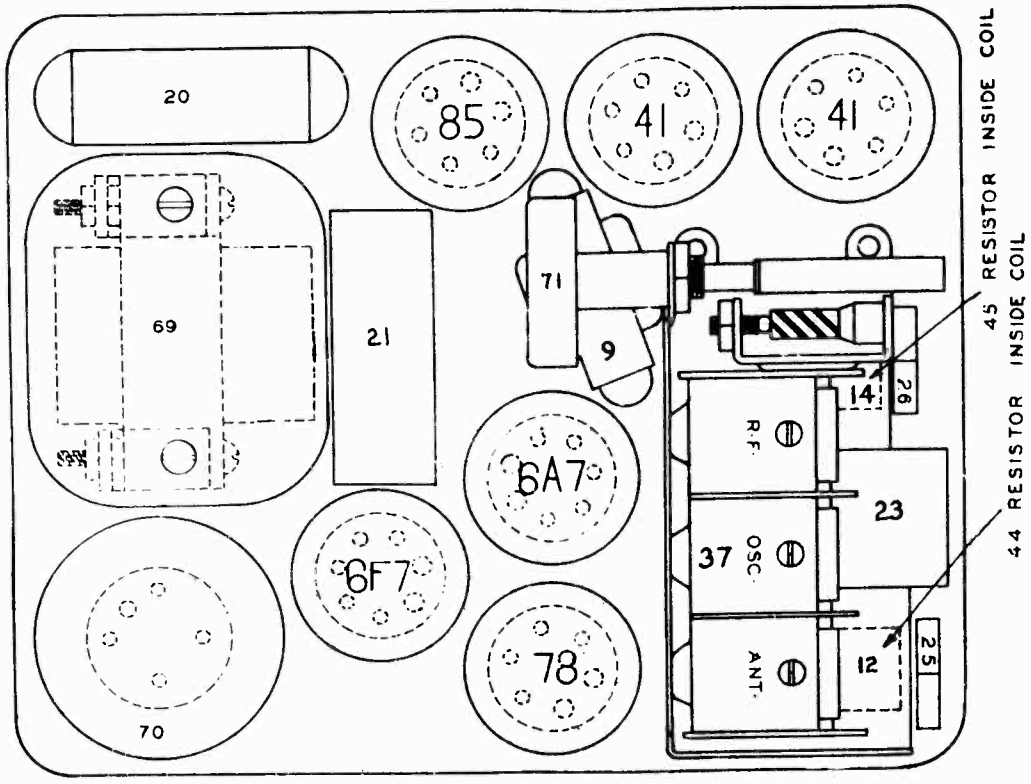


CIRCUIT DIAGRAM--Pontiac Model #544268, Olds Model 405045
Note: These receivers are all above Serial #1791090.

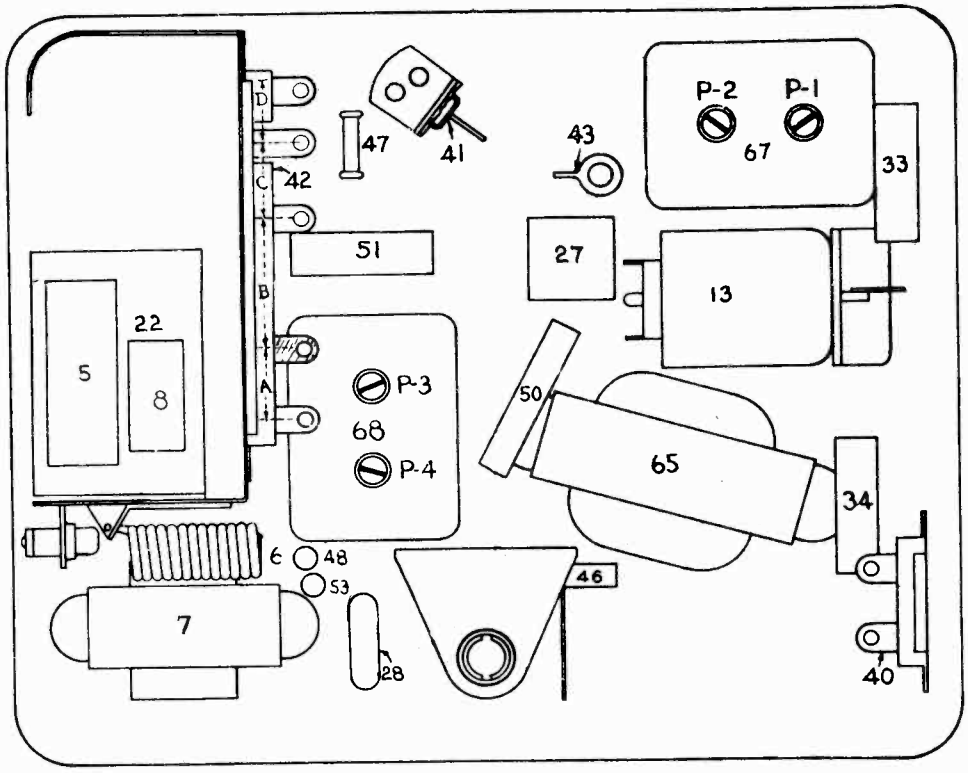
MODEL 405046 Oldsmobile
544268 Pontiac

UNITED MOTORS SERVICE

Socket, Trimmers, Chassis



PARTS LAYOUT--Top View



PARTS LAYOUT--Bottom view

PEAKING PROCEDURE

Peaking I.F. Stages at 262 K.C.

(a) Connect the ground lead of the test oscillator to the chassis frame. Connect a .5 mfd. condenser in series with the other lead and connect this lead to the grid cap of the 6A7 tube, leaving the grid clip in place. The .5 mfd. condenser is necessary to prevent the oscillator circuit of the receiver from affecting the I.F. adjustments.

(b) Set the test oscillator on 262 kilocycles.

(c) Turn the volume control of the receiver on full.

(d) Peak the I.F. trimmer P-4 and P-3 located on the 2nd I.F. coil shown on Figure 3.

(e) Then peak trimmers P-2 and P-1 located on the first I.F. coil also shown on Figure 3.

(f) In order to insure accurate settings of the I.F. trimmers the above adjustments should be repeated using the lowest oscillator output that will give a reasonable deflection of the output meter pointer. Make all adjustments for maximum output.

Peaking Gang Condenser at 1530 and 1400 K.C.

(a) Connect the output of the test oscillator to the antenna connection of the receiver and to the chassis ground. Do not use the .5 mfd. condenser that was required in aligning the I.F. stages.

(b) Turn the rotor plates of the gang condenser until they are COMPLETELY OUT OF MESH.

(c) Set the test oscillator on 1530 kilocycles.

(d) Adjust the trimmer condenser for the oscillator section (middle section) of the gang condenser CAREFULLY for maximum output. Then adjust the trimmers for the "R.F." and "ANT" sections of the gang condenser. (See Fig. 2)

(e) Set the test oscillator on 1400 kilocycles.

(f) Turn the condenser rotor plates until the 1400 K.C. signal from the test oscillator is tuned in with maximum output. (No calibration blocks should be used as the oscillator circuit is adjusted at 1530 K.C. on this set.)

Peaking Gang Condenser at 1530 and 1400 K.C.--Cont'd.

(g) Readjust the parallel trimmers for the "R.F." and "ANT" sections of the gang condenser for maximum output. DO NOT disturb the oscillator trimmer (middle section) as this is adjusted at 1530 K.C. only, and any further adjustments at this point will affect both the tuning range of the receiver and the tracking of its circuits.

(h) The capacity of the output circuit of the test oscillator may be slightly different than that of the under car antenna the receiver is to be used on. Therefore, it is advisable to readjust the "ANT" trimmer to the car antenna when reinstalling the receiver. This may be done by tuning the receiver to a broadcast station around 1400 K.C. and adjusting for maximum volume.

CIRCUIT CHANGES

A number of .05 mfd. tubular condensers were used at the factory in place of the .06 mfd. condenser part #1209213 condenser shown on figure 2 as illustration #33. For Service Replacement purposes of any defective .05 mfd. condensers--use part #1209213 condenser.

VOLTAGE CHART

The voltages shown below are average readings taken from the tube socket contacts to the chassis frame, and will vary ±10% when the set is tested on a 6 volt battery due to differences in characteristics of vibrators and tubes.

TUBE BASE DIAGRAM SYMBOLS*

Type	Function	H	Pp	S	Tp	Gt	G	G1	G2	K
78	R.F.	6	240	130	-	-	0	-	-	8.0
6A7	Det-Osc.	6	240	130	-	-	0	0	130	8.0
6F7	I.F.-A.F.	6	240	130	115	0	0	-	-	4.5
85	Det-2nd AF	6	-	-	235	0	0	-	-	16.5
41	Output	6	240	235	-	-	-	-	-	23.0
41	Output	6	240	235	-	-	-	-	-	23.0

NOTE: Ampere drain of set at 6 volts is 6.7 amperes
Milliampere drain from "B" supply is approximately 57 M.A

MODEL 600153 Chevrolet

UNITED MOTORS SERVICE Schematic

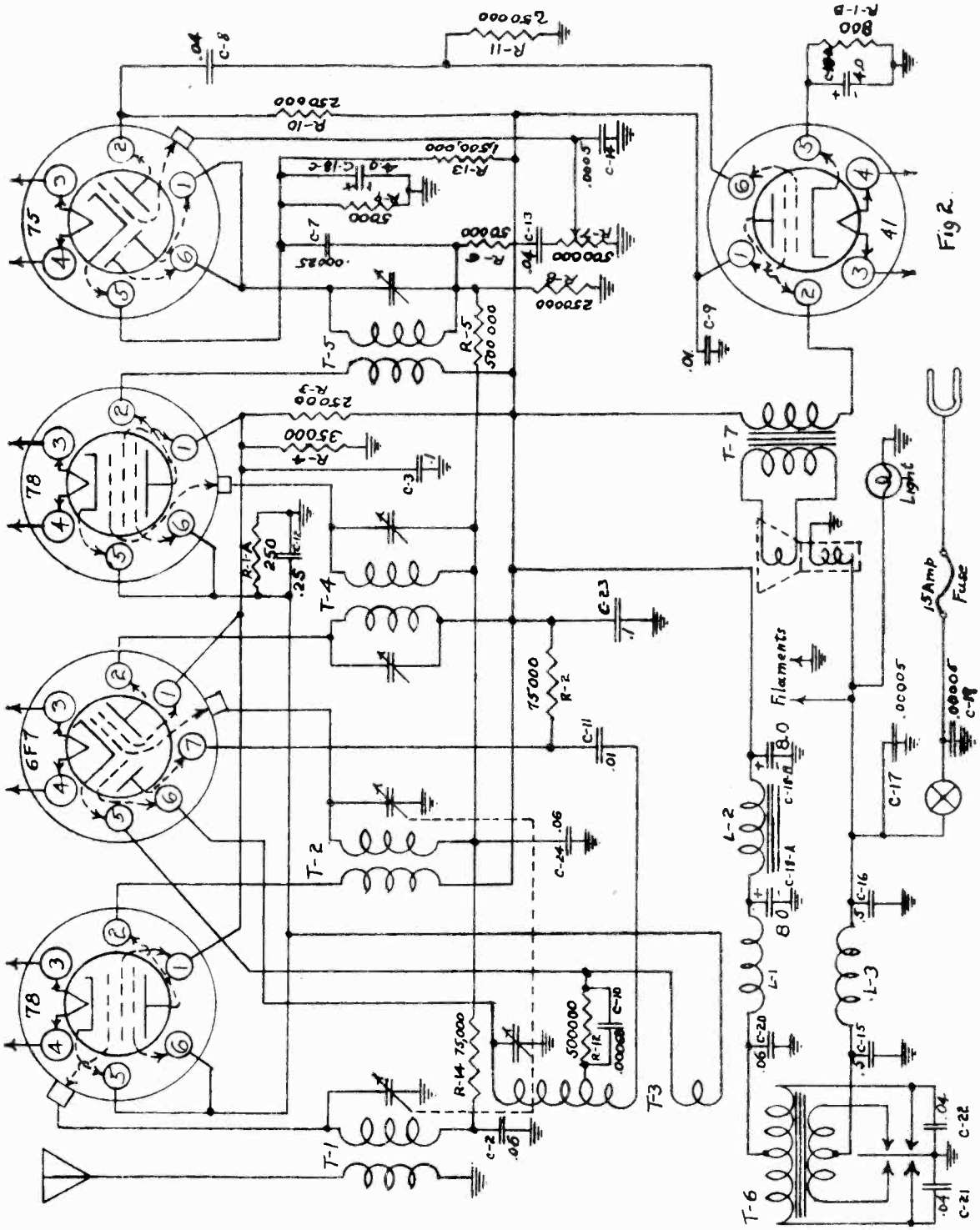


Fig. 2 CHEV. 600153 CIRCUIT DIAGRAM

VOLTAGE CHART

Note: All readings taken from indicated tube prong to chassis frame. Volume control on full.

Tube	#1 Screen	#2 Plate	#3 Fil	#4 Fil	#5 Cathode	#6 Grid	#7 Triode Plate
78 R.F.	88	215	6	0	3.4	3.4	
6F7 (Det							
(Osc.	88	215	0	6	3.4	-.8	88
78 I.F.	88	215	6	0	3.4	3.4	
75 (2nd Det.							
(AVC	0	90	0	6	1.5	0	
41 A.F.	215	210	6	0	16.3	0	

PEAKING

All of the adjustable condensers, commonly called "trimmer" condensers, are very accurately adjusted at the factory and will not need any further adjustment unless a coil or I.F. transformer is changed or the adjustments are tampered with in the field.
DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that the adjustment is necessary. If re-alignment is found necessary a test oscillator, fibre screw driver and output meter will be necessary to accurately align the circuits.

PEAKING I.F. STAGES AT 262 K.C.

The only way the I.F. stages can be peaked properly is with the use of an oscillator and output meter. Connect the output meter to the plate prong of the 41 output tube and to the chassis frame. Make sure that the output meter is protected with a series condenser internally, if not, connect a 1/10 mfd. condenser in series with the ground lead to the chassis. The Dayrad #875 Universal Test Meter and Series #51 Volt-Ohmeter have this protective condenser included in them.

(a) Connect the output of the oscillator to the grid cap of the 6F7 tube (leave grid cap in place) and to the chassis ground.

(b) Turn the condenser gang until the plates are entirely out of mesh.

(c) Set the oscillator on 262 K.C. and feed this signal through the I.F. stages of the set.

(d) Peak the I.F. trimmer which is in the I.F. coil having only one adjusting screw first. Then peak the two condensers of the 2nd I.F. coil.

(e) Set the oscillator output at the lowest level that will give a reasonable scale deflection on the output meter. This should be less than half the maximum output available.

(f) Make all trimmer adjustments for maximum deflection on the output meter scale.

PEAKING GANG CONDENSER AT 1400 K.C.

(a) Connect the output of the oscillator to the antenna connection of the set and to the chassis ground.

(b) In order that the position of the condenser plates for 1400 K.C. may be accurately determined, a wood calibration block (painted red, part number 1208073) should be used. This block may be used also in peaking all of the U.M.S., B-O-P, and Chevrolet radios that use the "tubeless rectifier".

(c) Insert the RED block under the middle section of the gang condenser, so that the largest flat side rests on the chassis base and the square notch stops solidly against the stationary plate support bracket.

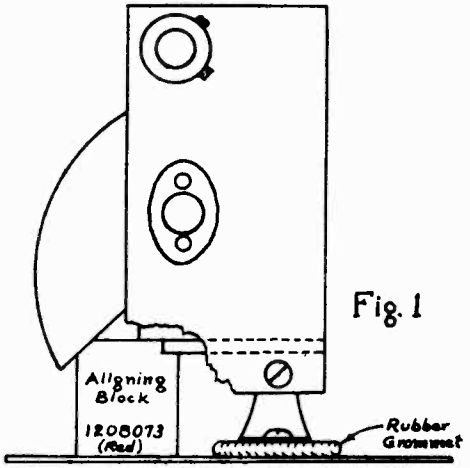


Fig. 1

(d) Open the condenser plates until they stop solidly against the beveled edge of the block as shown in Fig. (1).

(e) Peak the parallel trimmers on top of the condenser gang, the oscillator section first at 1400 K.C. for maximum deflection on the output meter.

(f) To insure sharp peaking of all trimmers reduce the oscillator output to the lowest level that will give a reasonable deflection on the output meter scale.

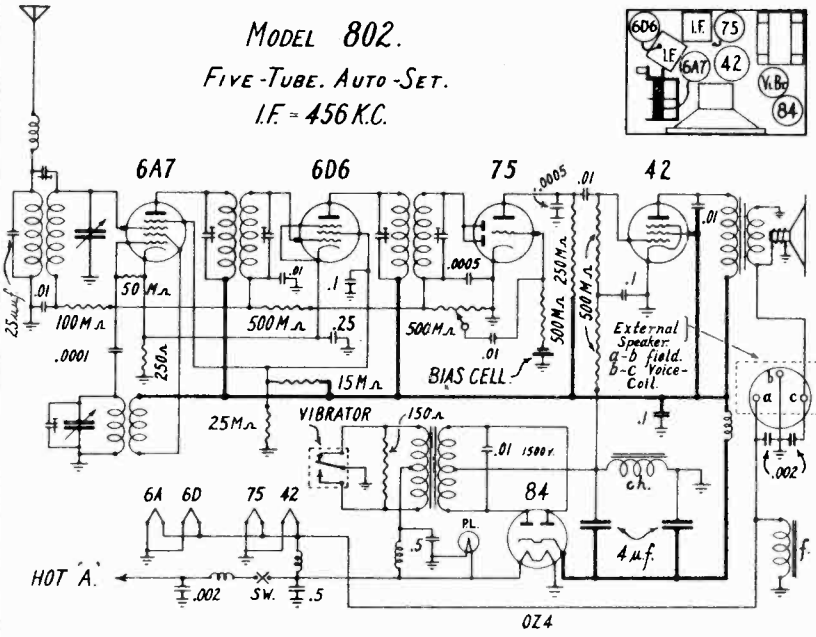
NOTE: Always use the red calibration block when aligning the parallel trimmers on the gang condenser. Do not rely on the logging of the dial to determine the 1400 K.C. setting. When the aligning procedure is completed, the logging of the dial may be slightly off and should be re-set.

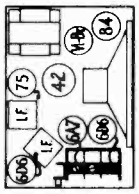
UNIVERSAL BATTERY CO.

MODEL 802
MODEL 803
MODEL 5010
MODEL 5032
Schematics
Socket

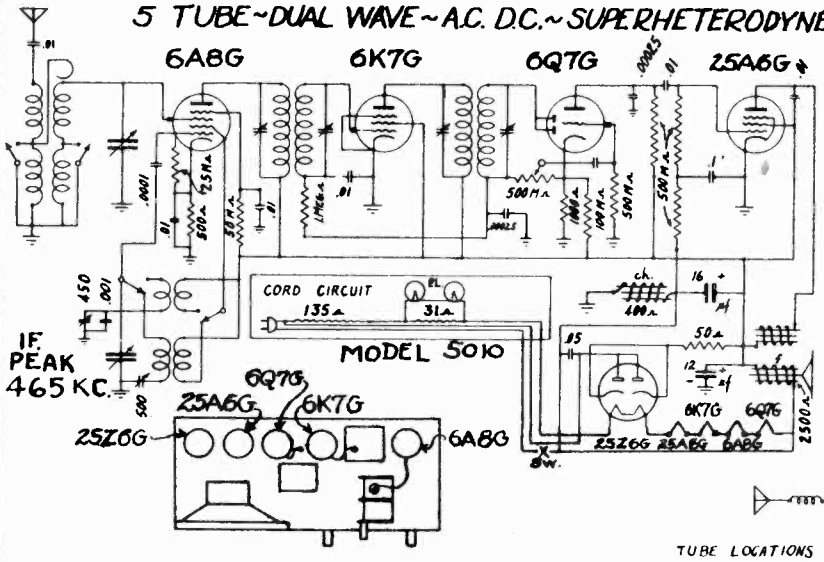
MODEL 802.

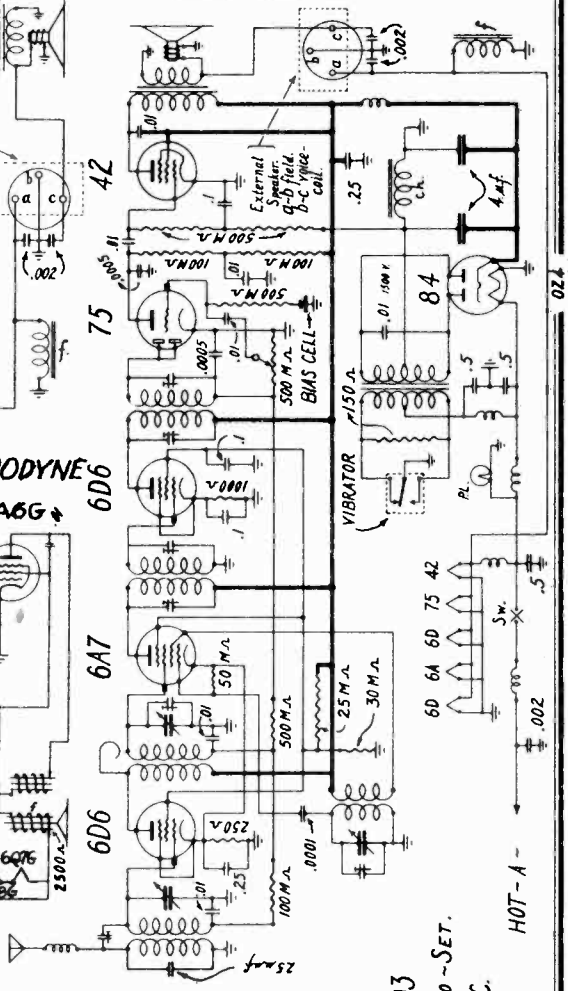
FIVE-TUBE. AUTO-SET.
I.F. = 456 K.C.





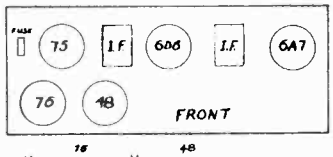
5 TUBE~DUAL WAVE~A.C. D.C.~SUPERHETERODYNE



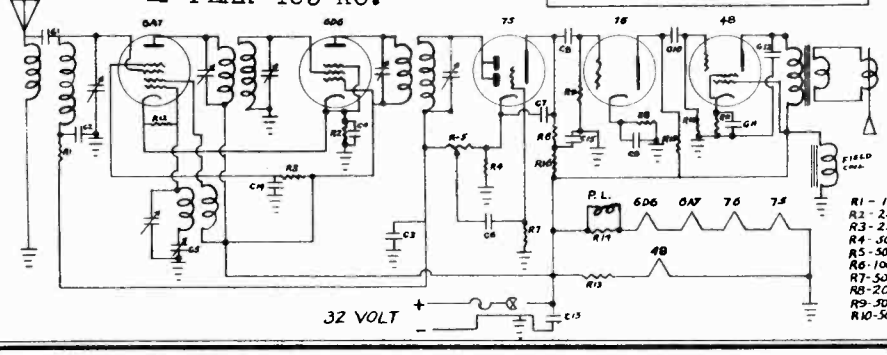


MODEL 803
SIX-TUBE. AUTO-SET.
I.F. = 456 K.C.

TUBE LOCATIONS



Model 5032
IF PEAK 465 KC.

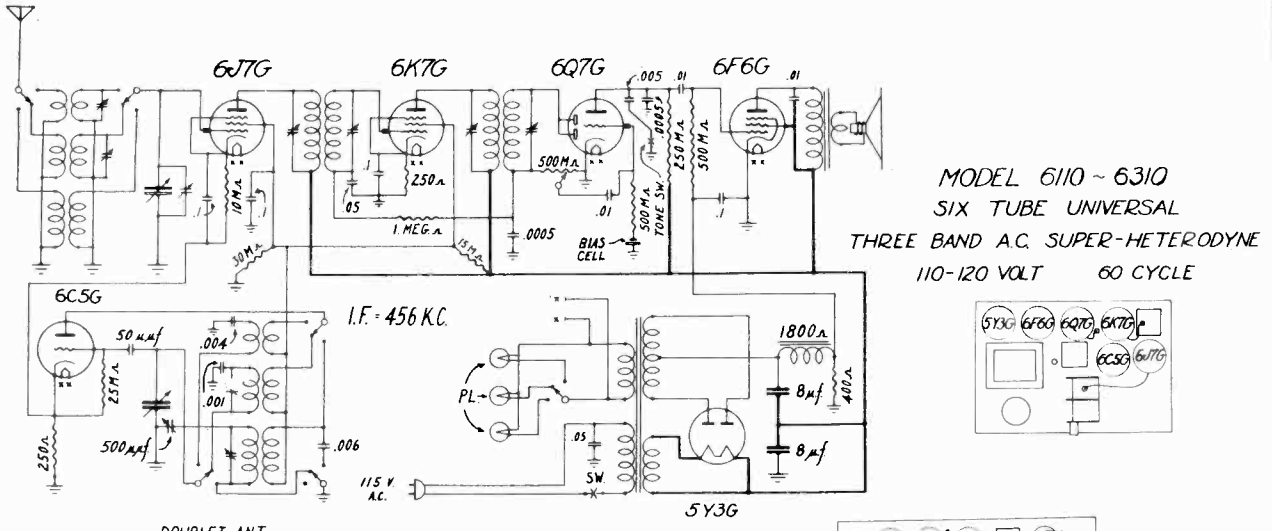


PARTS LIST

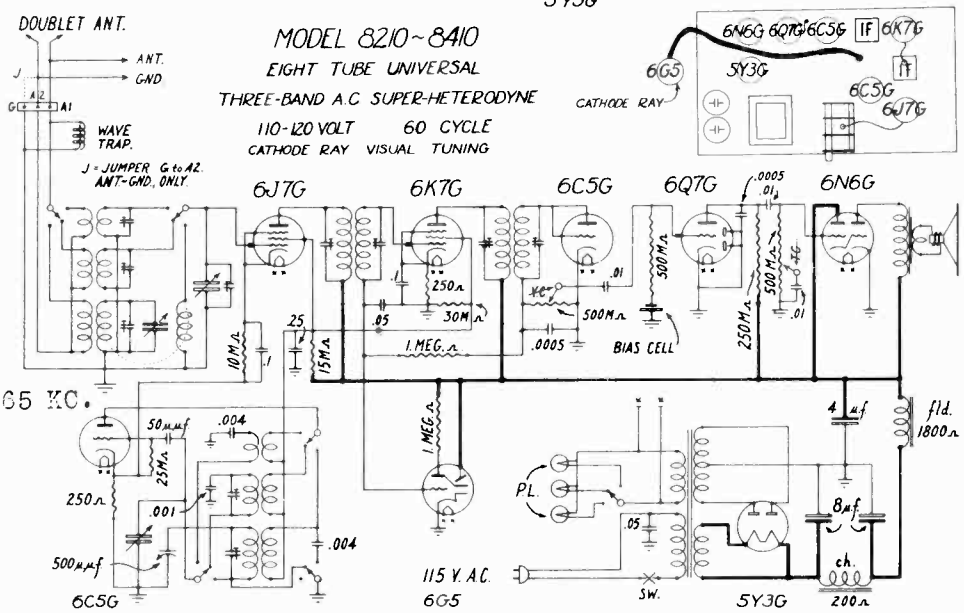
R1 - 1 MEG. RESISTOR	R11 - 400Ω RESISTOR	C6 - .01 - 200V. COND.
R2 - 250Ω "	R12 - 50MΩ "	C7 - .001 - MICA "
R3 - 25MΩ "	R13 - 15Ω - 2½ WATT	C8 - .01 - 200V. "
R4 - 500Ω "	R14 - 90Ω "	C9 - 10MFD. 25V. "
R5 - 500MΩ VOL. CONT	R15 - 250M	C10 - .01 - 200V.
R6 - 100MΩ RESISTOR	C1 - GIMMICK COND.	C11 - 10MFD. 25V. "
R7 - 500MΩ "	C2 - .01 - 200 V. "	C12 - .02 - 200V. "
R8 - 20M "	C3 - .001 - MICA "	C13 - .25 - 200V. "
R9 - 500M "	C4 - .1 - 200 V. "	C14 - .05 - 200V. "
R10 - 500MΩ "	C5 - 300MMF PADDER	C15 - .1 - 200 V. "
	R16 - 100MΩ RESISTOR	

MODELS 6110,6310
MODEL 7332
MODELS 8210,8410
Schematics,Socket

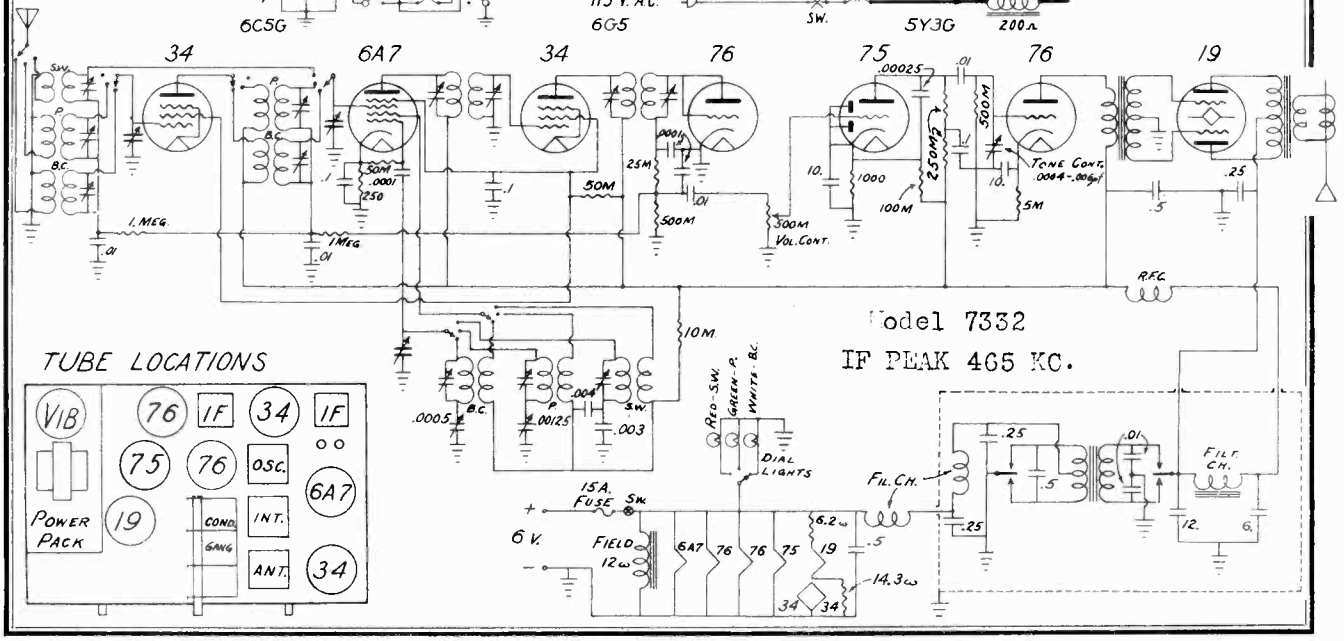
UNIVERSAL BATTERY CO.



MODEL 6110 ~ 6310
SIX TUBE UNIVERSAL
THREE BAND A.C. SUPER-HETERODYNE
110-120 VOLT 60 CYCLE



MODEL 8210~8410
EIGHT TUBE UNIVERSAL
THREE-BAND A.C. SUPER-HETERODYNE
110-120 VOLT 60 CYCLE
CATHODE RAY VISUAL TUNING



Model 7332
IF PEAK 465 KC.

TUBE LOCATIONS