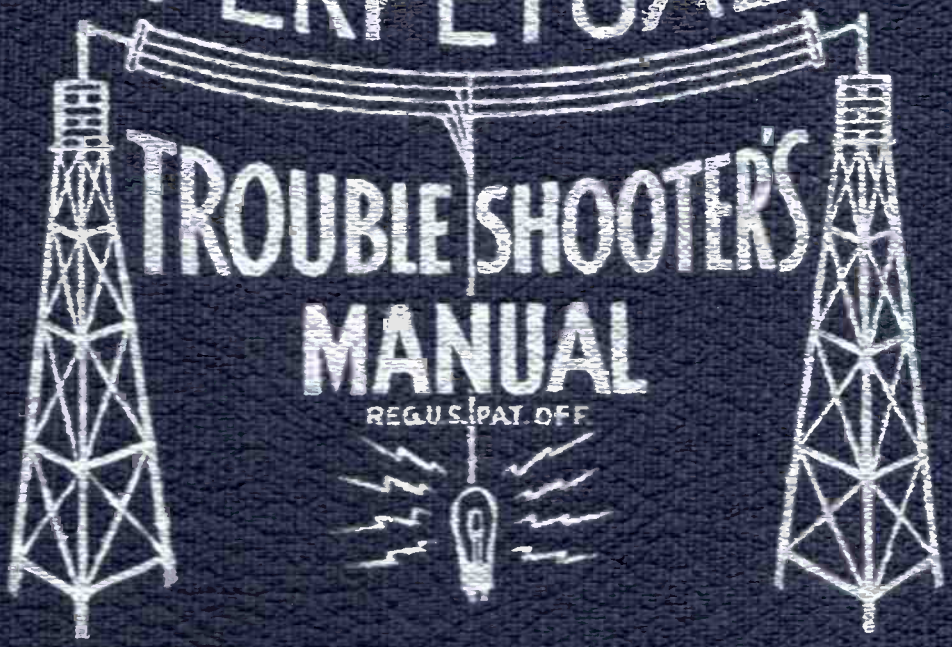
VOLUME XIV

PERPETUAL TROUBLE SHOOTER'S MANUAL



JOHN F. RIDER

E. H. SCOTT RADIO LABS., INC.

MODEL Phantom Deluxe

SCOTT FREQUENCY MODULATION DATA

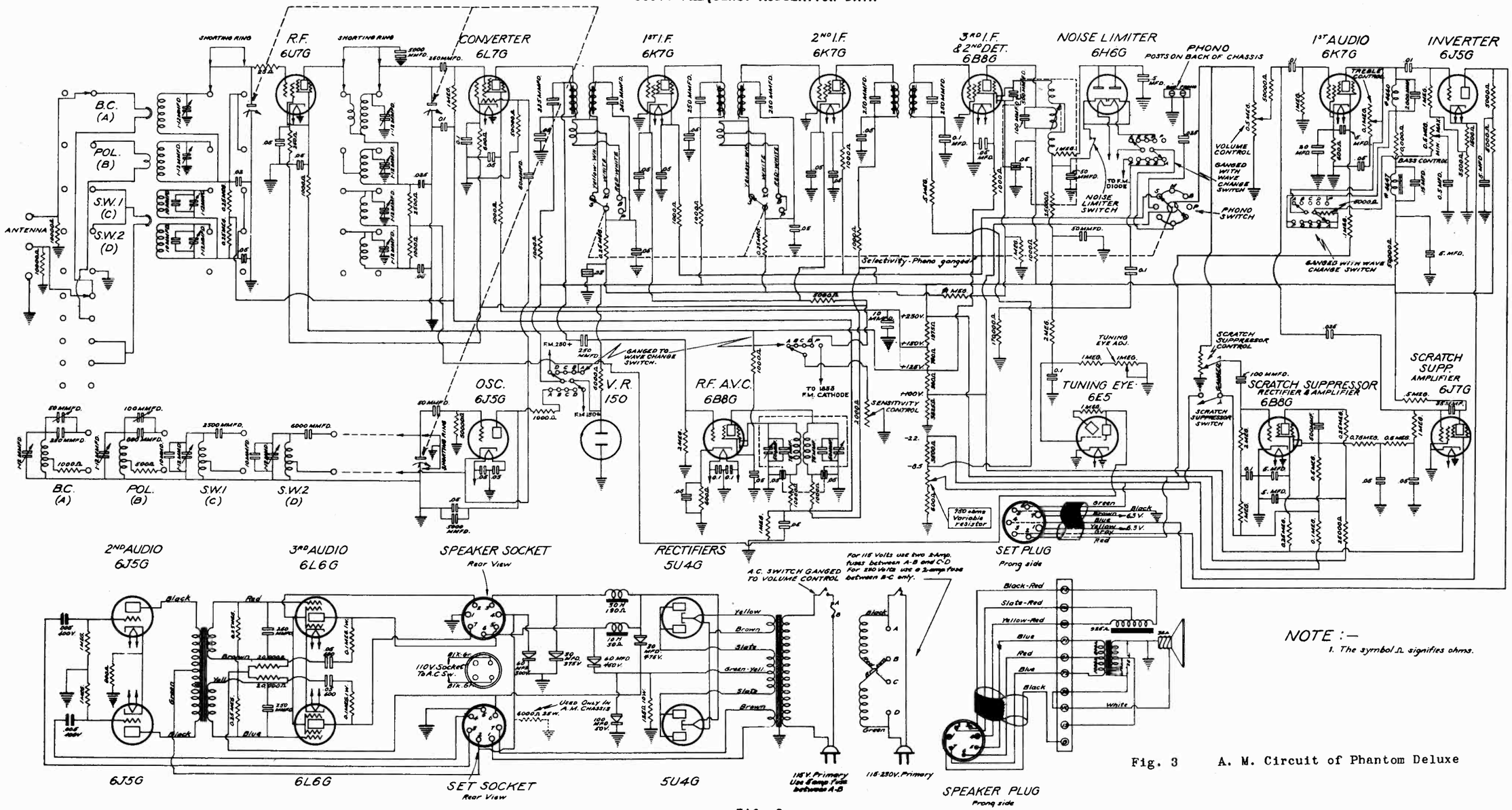


Fig. 3 A. M. Circuit of Phantom Deluxe

NOTE :—
1. The symbol Ω signifies ohms.

FIG. 3.

ANTENNA INPUT CIRCUIT

The coupling between the primary and secondary of the antenna transformer is such that a lead-in impedance of 75 to 100 ohms is suitably matched for optimum results. By disconnecting the jumper wire from one side of the primary winding to ground a floating dipole or doublet connection is provided to minimize capacitive coupling for noise picked up in the lead-in If a single wire horizontal or vertical antenna is used, the antenna input is connected to the terminal remote from ground and the one adjacent to ground is returned to that point by means of the jumper wire. However, the balanced dipole connection is recommended for maximum signal-to-noise ratio. In Figure 8 the details of a horizontal dipole are shown.

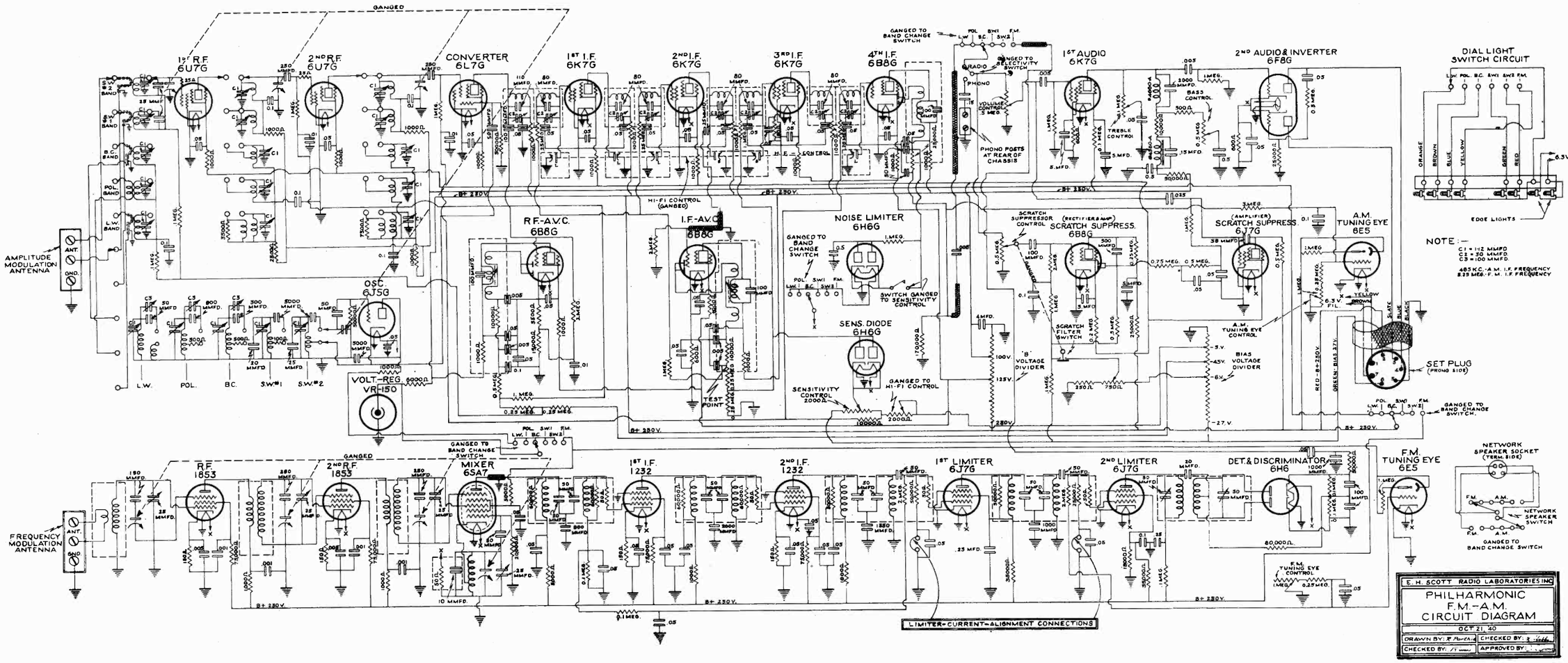
In the FM Tuner the input conductance of the 1853 r. f tube is neutralized to a certain extent by connecting the grid return condenser of the antenna transformer secondary to the cathode terminal of that tube. This circuit is not used in the combination receivers, because the leads required for it are too long to avoid regeneration in production sets. Input conductance neutralization increases the effective shunt resistance across the input circuit and allows it to function with higher gain and selectivity. The result is more sensitivity and a better image ratio.

THE R. F. STAGE

In all models an 1853 high Gm tube is used for r. f. amplification. Its output impedance operates into a bifilar winding tightly coupled to the secondary circuit feeding the mixer tube. The variable mu characteristic of the 1853 is employed to advantage in the control of the r. f. gain by a variable bias resistor. Ultra high frequency circuits are much broader for a given frequency deviation from resonance than low frequency circuits and strong signals are more likely to produce spurious responses. Hence, in the presence of strong FM signals it is advisable to reduce the r. f. gain to avoid repeat signals on the dial. This function is accomplished by the left hand control on the Tuner and the conventional sensitivity control on all of the FM-AM combinations, except the Philharmonic. In this receiver two r. f stages using 1853 tubes are employed and a somewhat higher attenuation of unwanted signals is present, with the result that spurious responses are not serious and an r. f. gain control is not necessary there.

MODEL Philharmonic Combination

E. H. SCOTT RADIO LABS., INC.



THE MIXER STAGE

A 6SA7 tube is used as a mixer because of its relatively good behavior in the ultra high frequency range Loading of the mixer input circuit is to be avoided as much as possible and in this respect the 6SA7 is good. A high conversion ratio obtained and a net overall stage gain is realized despite the high intermediate frequency.

THE OSCILLATOR

While some minor and insignificant benefit might be obtained with a separate oscillator, the internal triode section of the 6SA7 can be made to oscillate readily and with remarkable stability at 41 to 50 megacycles. By providing temperature compensation of an element of the oscillator circuit capacity a high degree of stability of the oscillator frequency with respect to time can be maintained. It is also important that the oscillator frequency shall not shift with variations in the strength of the received signal. The 6SA7 oscillator-mixer combination is excellent in this respect.

The oscillator frequency is below the frequency of the incoming signal in order to avoid image signals from television transmitters and also to maintain greater stability.

The oscillator plate voltage is supplied from a VR150 regulated source and stability with respect to line voltage is insured

THE I. F. AMPLIFIER

The intermediate frequency used in all Scott FM sets is 5.25 megacycles.

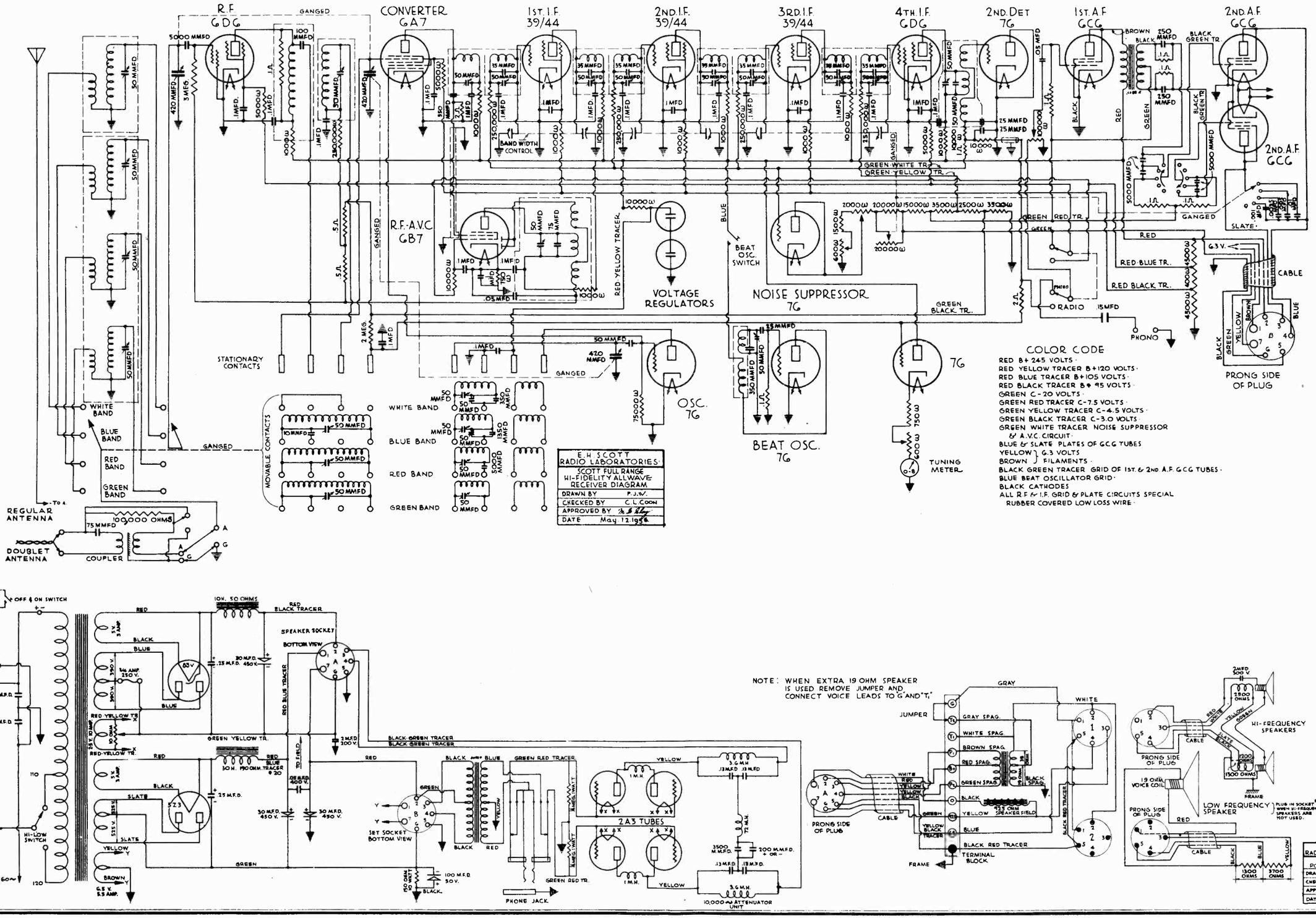
The first two i. f. stages employ high Gm 1232 type tubes and provide a large share of the gain and selectivity at this frequency. Each circuit is inductively tuned by low loss powdered iron cores and primary and secondary fixed silvercap tuning condensers are capacitively coupled by common fixed condensers to reduce the effects of tuning upon the coupling of each transformer. While there is a small amount of inductive coupling between the primary and secondary windings, the larger percentage of the coupling is derived from the common capacity between each grid and plate tuning condenser.

Each circuit is loaded with the correct amount of resistance to obtain the proper selectivity and to avoid transient distortion possible with a frequency modulated signal.

The third and fourth i. f. stages are somewhat similar to the first two, but differ by the fact that they act as limiting amplifiers thus performing a function peculiar only to frequency modulation receivers

E. H. SCOTT RADIO LABS., INC.

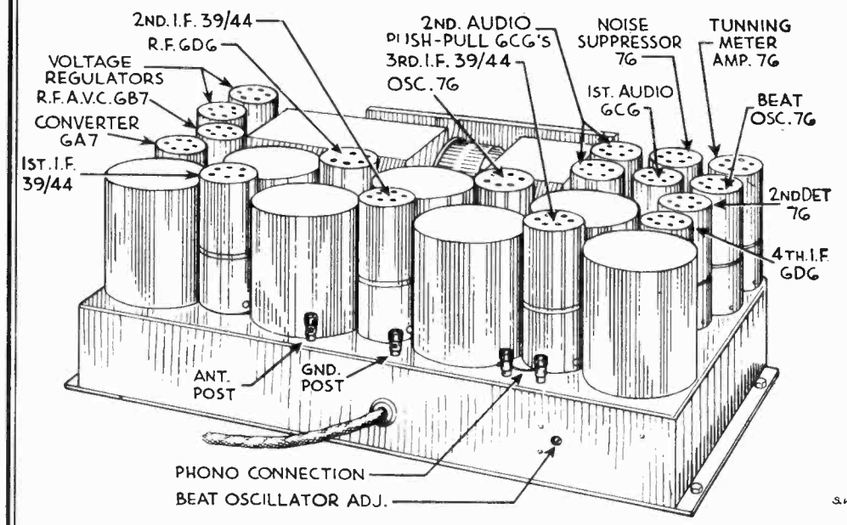
MODEL Hi-Fidelity All Wave



NOTE: WHEN EXTRA 19 OHM SPEAKER IS USED REMOVE JUMPER AND CONNECT VOICE LEADS TO G AND T,

E. H. SCOTT RADIO LABS., INC.

MODEL Hi-Fidelity
All Wave



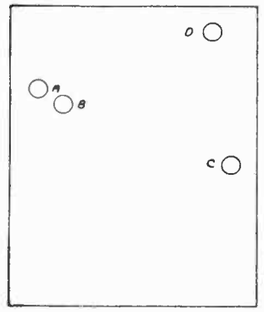


FIG. 7

FIG. 1 - TOP VIEW OF CHASSIS

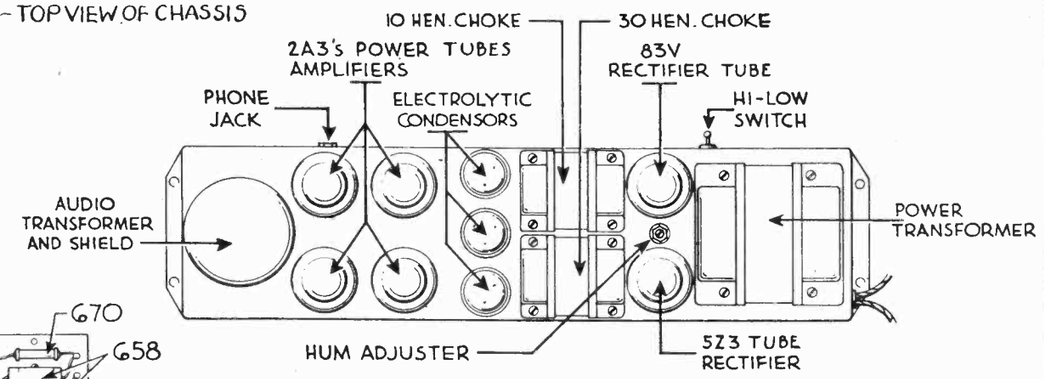
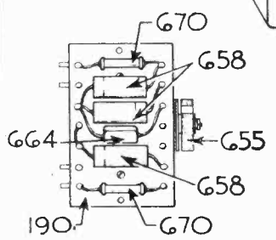


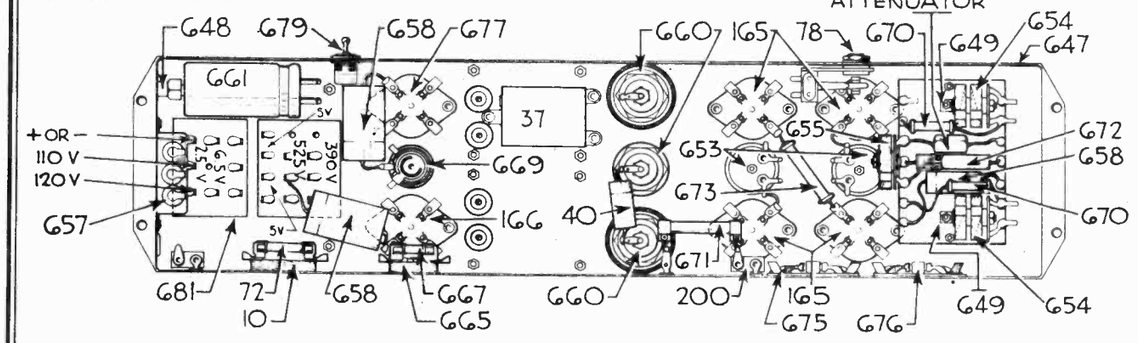
FIG. 2 - TOP VIEW OF AMPLIFIER



BOTTOM VIEW OF ATTENUATOR UNIT

FIG. 6

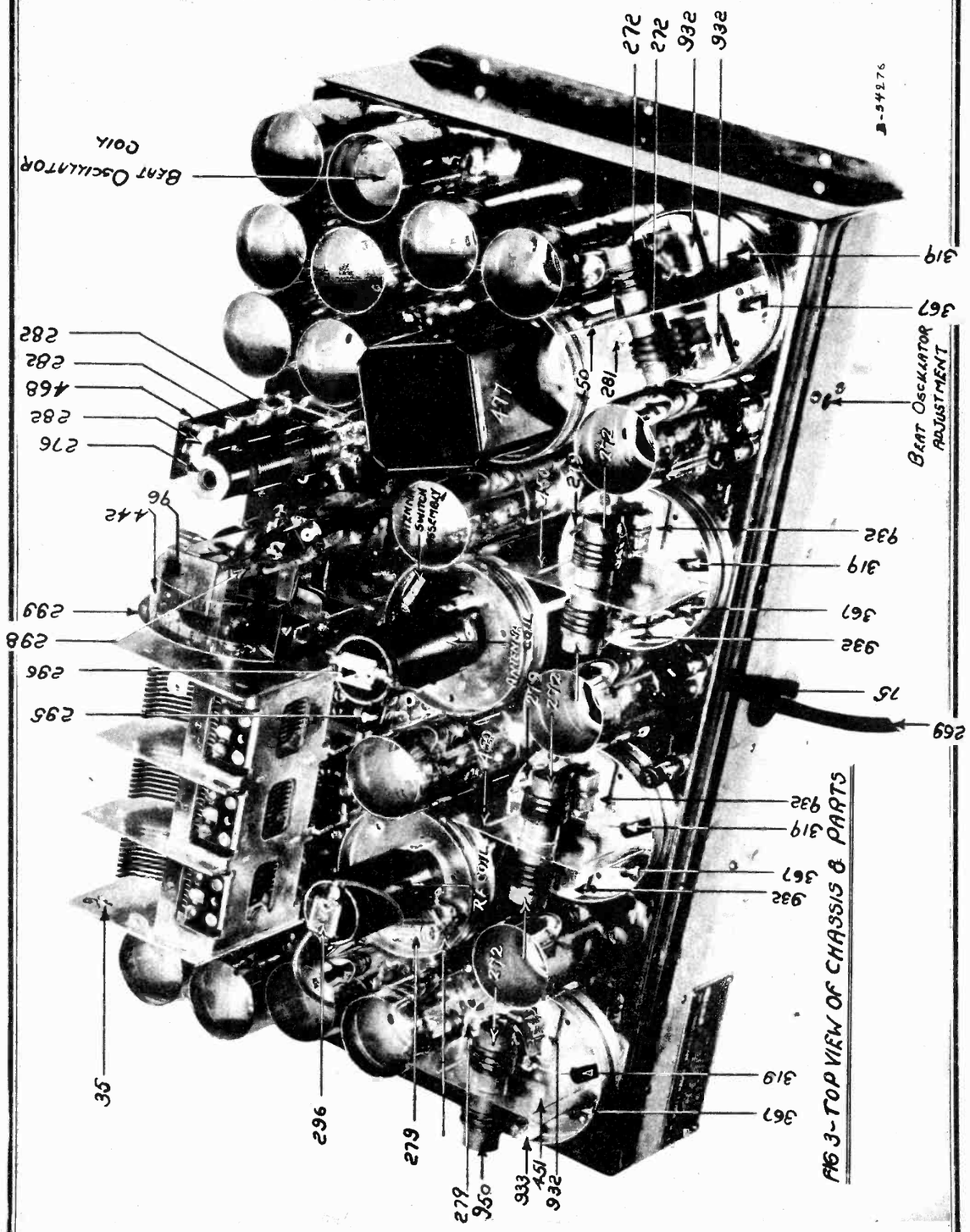
CONDENSOR OF REQUIRED VALUE TO TUNE ATTENUATOR



BOTTOM VIEW OF AMPLIFIER SHOWING PART NUMBERS

MODEL Hi-Fidelity
All Wave

E. H. SCOTT RADIO LABS., INC.



E. H. SCOTT RADIO LABS., INC.

MODEL Laureate

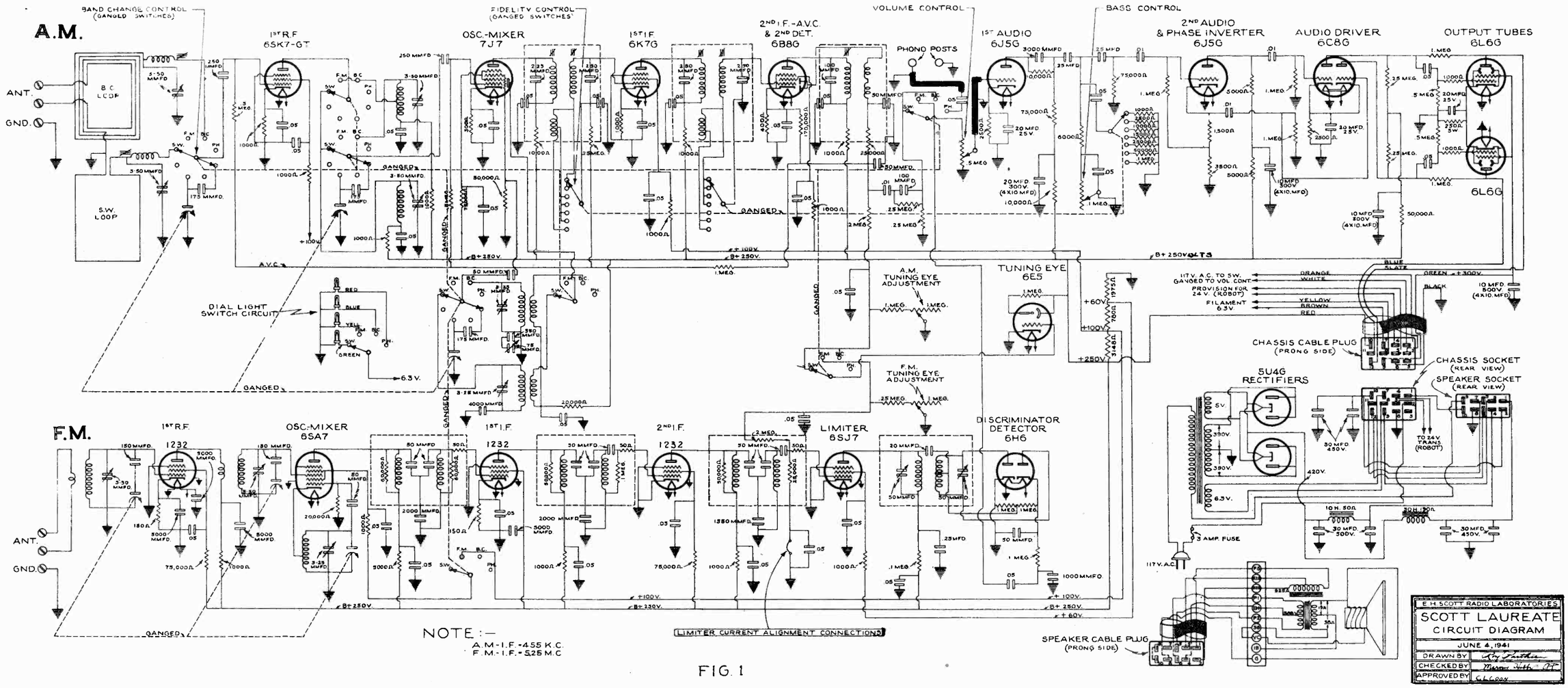


FIG. 1

ELECTRICAL SPECIFICATIONS

Voltage Rating . . . . 117 volts
Frequency Rating . . . 60 cycles

NOTE: Power transformers can be furnished for any special frequency or voltage rating.

TYPE CIRCUIT

AM - Superheterodyne with built-in duplex antenna - 1 r-f stage 2 tuning ranges - 2 i-f stages with variable selectivity.

FM - Superheterodyne covering 42 to 50 mc range, having 1 r-f stage - 3 stage high-gain 5.25-mc i-f amplifier, including 1 limiter stage - balanced diode detector - 4-stage a-f amplifier with bass and treble controls - phase inverter, inverse feedback - beam power output stage - RC tone compensation circuits.

AM AUDIO-FREQUENCY RANGE . . . . . 30 - 9000 cycles

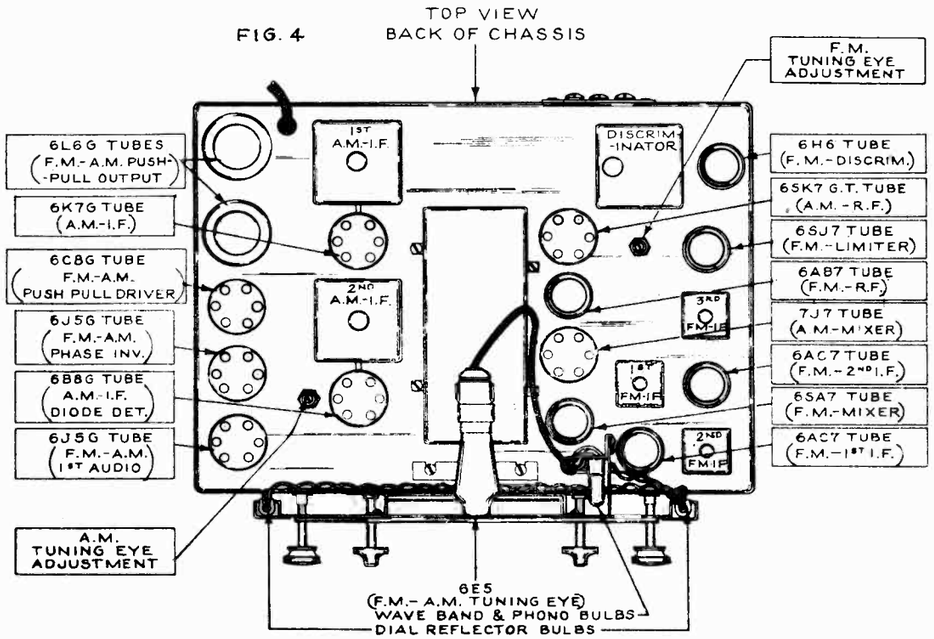
FM AND PHONE FREQUENCY RANGE . . . . . 30 - 15,000 cycles

RADIO-FREQUENCY COVERAGE . . . . . 540 - 1600 kc
9.2 - 15.6 mc
42 - 50 mc

E. H. SCOTT RADIO LABS., INC.

LAUREATE TUBE LAYOUT

FIG. 4



Line Voltage... 117 volts,60 cycles
Voltage... 265 volts

VOLTAGE MEASUREMENTS

SECTION	TUBE TYPE	FUNCTION	Ef	Ek	Eg	Esg	Eop	Ep
	6SK7GT	RF Amp.	6.1	7.5	+3.7	104	-	255
	7J7	Mixer-Osc.	6.1	3.0	+3.7	66	140	255
	6K7G	First IF Amp	6.1	6.3	+3.7	100	-	252
	6B8G	Second IF Amp AVC, Second Det.	6.1	3.7	0	100	-	252
FM SECTION	TUBE TYPE	FUNCTION	Ef	Ek	Eg	Esg	Ep	
	6AB7	RF Amp	6.1	1.3	-	110	252	
	6SA7	Mixer-Osc	6.1	0	0	100	250	
	6AC7	First IF Amp	6.1	3.0	0	146	255	
	6AC7	Second IF Amp.	6.1	0	0	76	250	
	6SJ7	Limiter	6.1	0	-	63	5	
	6H6	Frequency Det	6.1	0	0	0	-	
AUDIO SECTION	TUBE TYPE	FUNCTION	Ef	Ek	Eg	Esg	Ep	
	6J5G	First Audio	6.1	3.4	0	-	92	
	6J5G	Phase Inverter	6.1	6.7	15		210	
	6C8G	Push Pull Driver	6.1	3.0	0		102-102	
	6L6G	Push Pull Output	6.1	20.5	0	310	388	
	6L6G	" " "	6.1	20.5	0	310	388	
COMMON FUNC-TIONS	TUBE TYPE	FUNCTION	Ef	Ek	Ep			
	6E5	A-FM Tuning Ind	6.1	0	265			
	5U4G	Power Supply	4.9	420				
	5U4G	" "	4.9	420				

E. H. SCOTT RADIO LABS., INC.

LAUREATE TRIMMER & COIL ARRANGEMENT

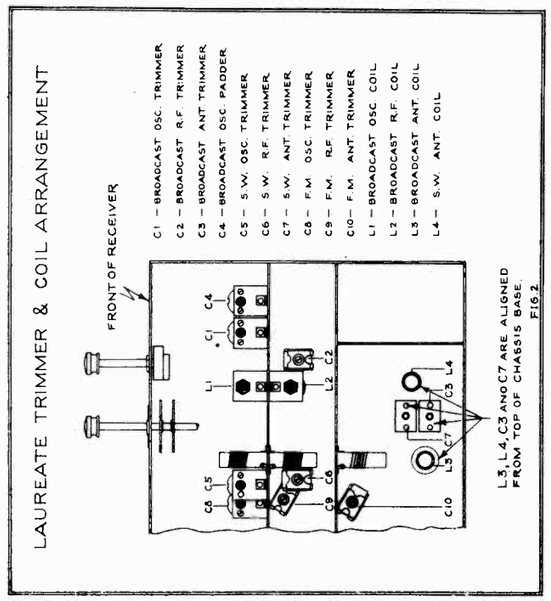


FIG. 2

ALIGNMENT OF AM SECTION

ALIGNMENT OF IF SECTION

Turn the wave band switch to the broadcast band and set dial pointer to high frequency end of the dial. Ground the AVC line by connecting a jumper wire from it to chassis. Set the selectivity-treble switch to the sharpest position (extreme counter-clockwise position). Open the 170,000 ohms diode load resistor at the point where it connects to the cathode of the 6B8G and insert a 0-30 or 0-50 microammeter in series with this resistor.

Connect the output of a good signal generator through a .05 mfd. condenser to the grid of the 6B8G second IF Amplifier. Apply an unmodulated 455KC signal of sufficient strength to produce a diode meter reading of 20 microamperes. Adjust the diode transformer alignment screw for maximum diode current, retarding the signal generator input so that the tuning meter reading is kept on scale.

Connect the signal generator to the grid of the 6K7G tube and align the primary and secondary adjustment screws of second IF transformer for maximum diode current.

Reduce the signal generator input so that the diode current is held close to 20 microamperes.

Now connect the signal generator output to the signal control grid of the 7J7 tube and adjust the primary and secondary alignment screws of the first IF transformer.

The selectivity characteristics of the receiver may be checked to a certain degree by rotating the treble control in a clockwise direction and detuning the signal generator above and below 455 Kc. The four degrees of selectivity are arranged in the following order: (1-2) sharp; (3-4) medium sharp; (5-6) medium broad and (7) broad. In the last two positions double peaks about the 455 kc. point should appear in the diode current as the generator is detuned.

ALIGNMENT OF RF SECTIONS

It will be noted that the antenna, RF and oscillator coils and trimmers are located in clusters around their respective wave change switch sections. This arrangement is most satisfactory from the standpoint of circuit efficiency and, although the application of a tuning wand to check alignment may not be particularly applicable, the broadcast band coils are equipped with moveable iron cores which allow their inductances to be varied readily. The short wave and FM coils can be adjusted only by sliding turns. However, little difficulty is likely to be encountered with this arrangement since suitably matched laboratory coils must be used for replacement purposes. The arrangement of R.F. trimmers and coils is shown in Fig. 2.

AM BROADCAST BAND ALIGNMENT

First turn the dial pointer completely to the low frequency end of the dial scale. In this position the pointer coincides with the heavy vertical mark which is located to the left of the marking "kilocycles" which is just above the regular dial calibration. Turn the wave band switch to the position in which the Blue dot on the dial, marked AM, lights; set the bass control at maximum, treble control to minimum and connect an output meter across the voice coil. Adjust oscillator trimmer C, until a 1400 kc signal as set on the dial is tuned in from the generator, whose output is being fed in at the 6SK7GT RF grid. Rotate the dial to 600 kc and tune in a 600 kc signal from the generator by adjusting the padding condenser C4. Check the dial at 1000 kc and if it tunes high in frequency turn the adjusting screw of L outward, to decrease it. If it is low in frequency turn the adjusting screw of L in to increase the inductance. Then readjust trimmer condenser C, and padder condenser C4, as before.

With the oscillator circuit correctly spotted, one can proceed to align the RF and Antenna circuits. With the signal generator input still connected to the RF grid, tune in a signal from the generator at 1400 kc and use the output meter to observe the alignment for maximum sensitivity. Have as weak a signal as possible and adjust C2 for maximum output. Turn the dial to 600 kc and check the alignment of the RF coil, by noting whether the sensitivity is normal. Decrease the inductance of L2 by the adjusting screw, where necessary, or increase it by means of the screw if more inductance is required. Readjust C2 for maximum at 1400 kc. Turn the dial to 1000 kc and check the alignment of the RF stage.

The alignment of the Loop Antenna Circuit is covered in a separate section at the end of this alignment procedure.

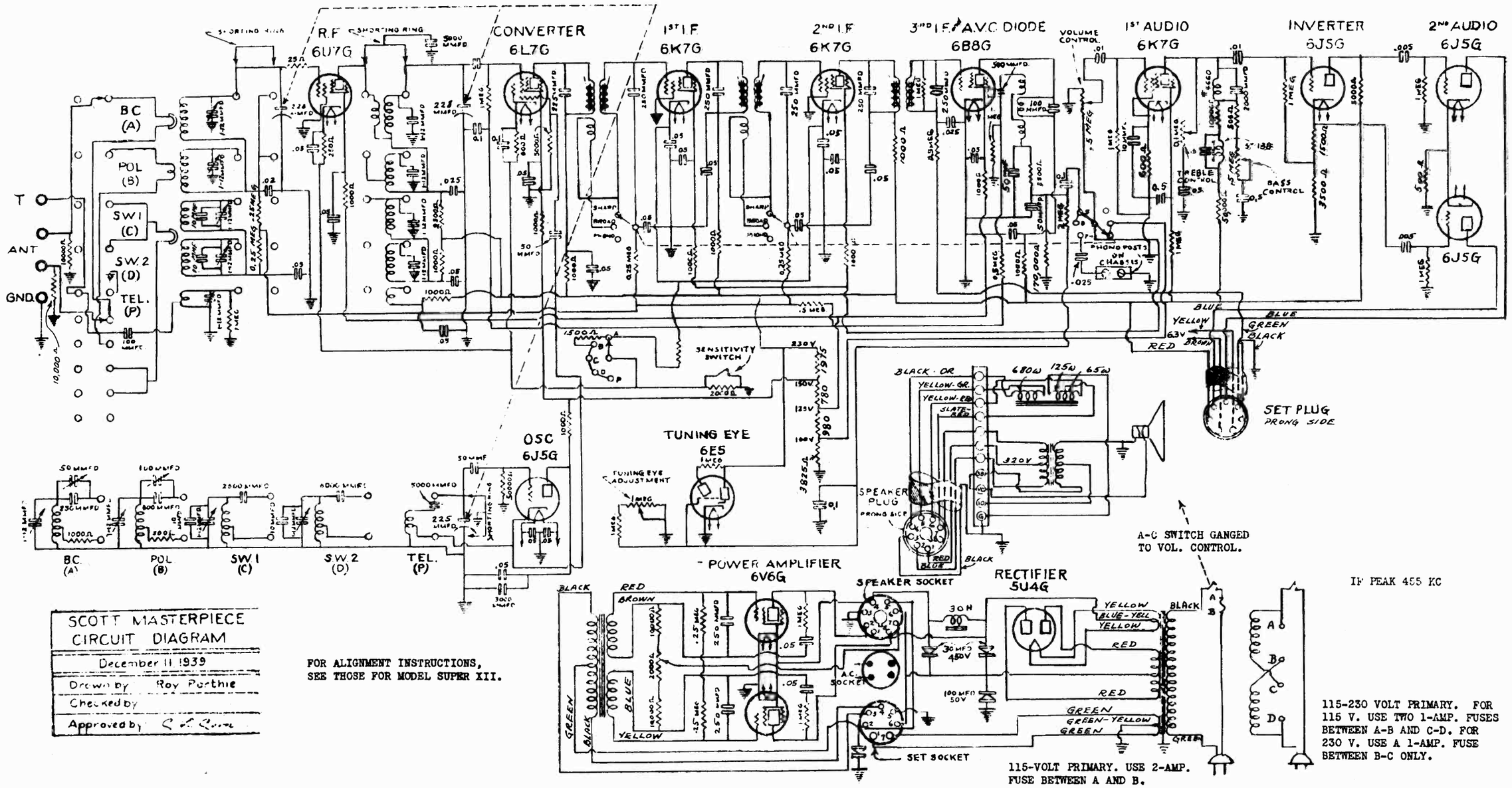
SHORT WAVE BAND ALIGNMENT

Set the wave change switch to the position in which the Green dot, marked SW, lights and turn the dial to 15 megacycles. Leave the signal generator connected to the RF grid, and adjust it to 15 megacycles. Tune the signal from generator by adjusting trimmer C5. Turn the dial to 10 megacycles and if necessary to correct the calibration do so by spreading or pushing turns on the coil. Readjust trimmer C5 at the 15 megacycles point and check the calibration at 12 megacycles.

With the oscillator correctly aligned tune in a signal at 15 megacycles and adjust trimmer C6 for maximum output. Check the alignment at 12 and 10 megacycles and make necessary corrections by pushing or spreading turns on the coils. Now readjust trimmer C6 at the 15 megacycle point.

MODEL Masterpiece

E. H. SCOTT RADIO LABS., INC.



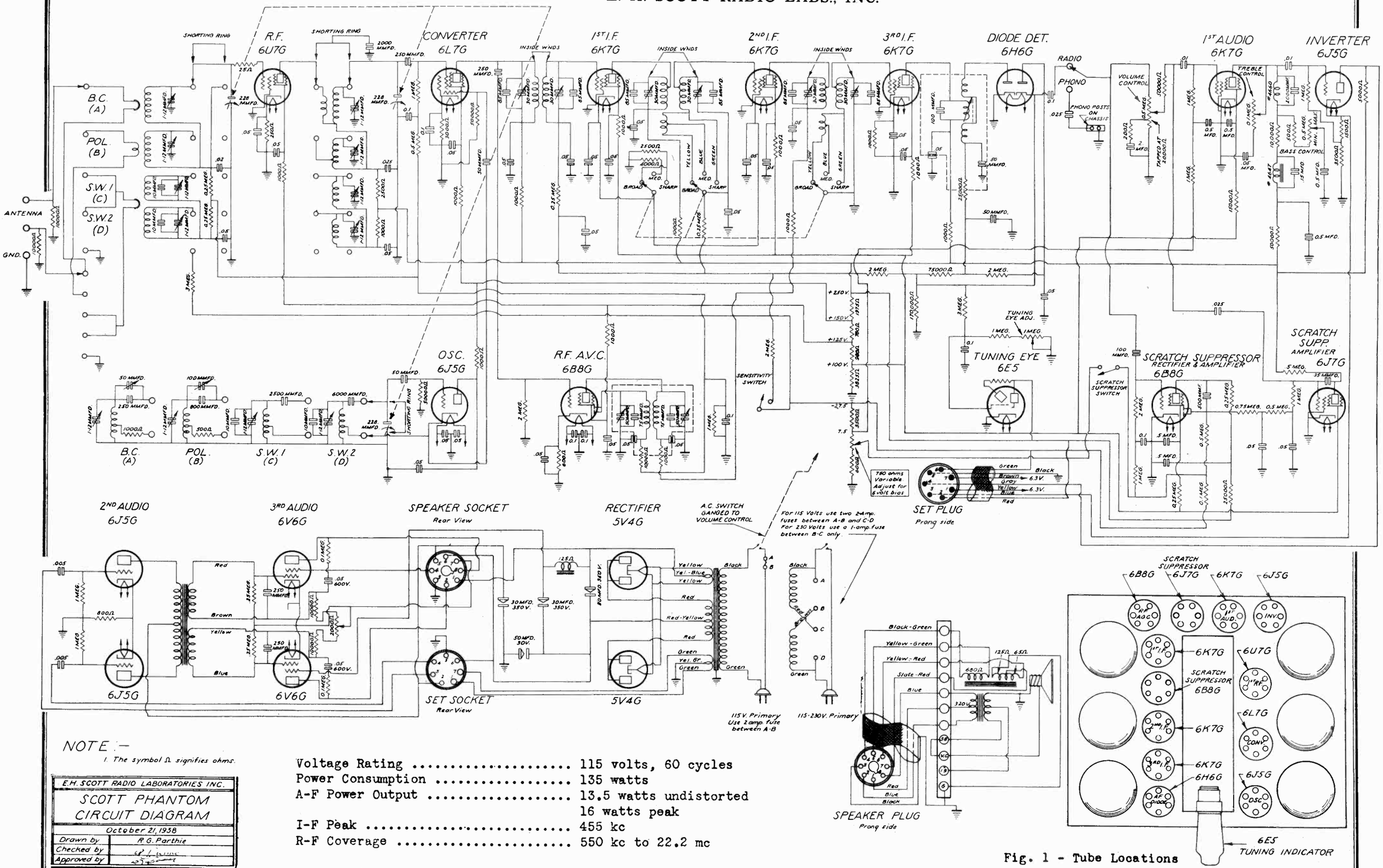
SCOTT MASTERPIECE
CIRCUIT DIAGRAM

December 11 1939	
Drawn by	Roy Porthie
Checked by	
Approved by	E. H. Scott

FOR ALIGNMENT INSTRUCTIONS, SEE THOSE FOR MODEL SUPER XII.

MODEL Phantom

E. H. SCOTT RADIO LABS., INC.



NOTE:—
1. The symbol Ω signifies ohms.

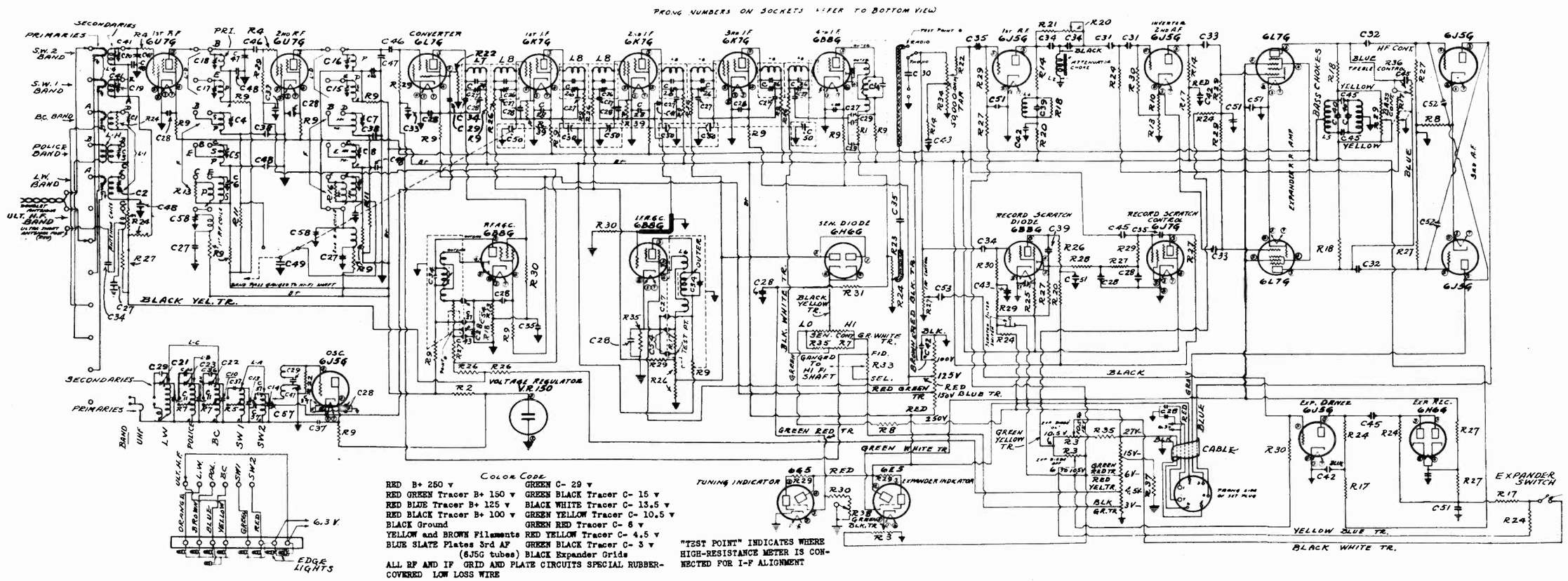
E.H. SCOTT RADIO LABORATORIES INC.	
SCOTT PHANTOM CIRCUIT DIAGRAM	
October 21, 1938	
Drawn by	R.G. Parthie
Checked by	
Approved by	

Voltage Rating	115 volts, 60 cycles
Power Consumption	135 watts
A-F Power Output	13.5 watts undistorted
	16 watts peak
I-F Peak	455 kc
R-F Coverage	550 kc to 22.2 mc

Fig. 1 - Tube Locations

E. H. SCOTT RADIO LABS., INC.

MODEL Philharmonic



Color Code

RED B+ 250 v	GREEN C- 29 v
RED GREEN Tracer B+ 150 v	GREEN BLACK Tracer C- 15 v
RED BLUE Tracer B+ 125 v	BLACK WHITE Tracer C- 13.5 v
RED BLACK Tracer B+ 100 v	GREEN YELLOW Tracer C- 10.5 v
BLACK Ground	GREEN RED Tracer C- 6 v
YELLOW and BROWN Filaments	RED YELLOW Tracer C- 4.5 v
BLUE SLATE Plates 3rd AF (6J5G tubes)	GREEN BLACK Tracer C- 3 v
	BLACK Expander Grids

ALL RF AND IF GRID AND PLATE CIRCUITS SPECIAL RUBBER-COVERED LOW LOSS WIRE

"TEST POINT" INDICATES WHERE HIGH-RESISTANCE METER IS CONNECTED FOR I-F ALIGNMENT

C1 to C20	1-12	C41	25 mmf mica	R1	125 ohms 10 w
C21 to C23	100 mmf air	C42	4 mf 300 v	R2	6500 ohms 2 w
C24	85 mmf and 30 mmf	C43	.1 mf 200 v	R3	300 ohms(variable)
C26	60 mmf air, 30 mmf air	C44	900 mmf mica	R4	25 ohms 1/4 w
C27	.05 mf 400 v	C45	.025 mf 400 v	R5	100 ohms 1/4 w
C28	.05 mf 200 v	C46	250 mmf mica	R6	150 ohms 1/4 w
C29	50 mmf mica	C47	320 mmf gang	R7	500 ohms 1/4 w
C30	.1 mf 600 v	C48	.1 mf 400 v	R8	800 ohms 1/4 w
C31	6000 mmf mica	C49	.15 mf 400 v	R9	1000 ohms 1/4 w
C32	2500 mmf mica	C50	HF Control	R10	1500 ohms 1/4 w
C33	.01 mf 400 v	C51	7 X .5 200v 400v	R11	2500 ohms 1/4 w
C34	100 mmf mica	C52	5 mmf mica	R12	3000 ohms 1/4 w
C35	.01 mf 200 v	C53	1000 mmf mica	R13	3500 ohms 1/4 w
C36	300 mmf mica	C54	2 X .005 mf 200 v	R14	5000 ohms 1/4 w
C37	5000 mmf mica	C55	35 mmf mica	R15	6000 ohms 1/4 w
C38	8000 mmf mica	C56	1 mf 200 v	R16	7500 ohms 1/4 w
C39	500 mmf mica	C57	20 mmf mica	R17	10,000 ohms 1/4 w
C40	.02 mf 400 v	C58	50 mmf mica	R18	15,000 ohms 1/4 w
				R19	20,000 ohms 1/4 w
				R20	25,000 ohms 1/4 w

R21	40,000 ohms 1/4 w	L-A	SW1 and SW2 Osc. coil
R22	50,000 ohms 1/4 w	L-B	Police Osc. coil
R23	75,000 ohms 1/4 w	L-C	LW and BC Osc. coil
R24	.1 megohm 1/4 w	L-G	SW1 and SW2 Ant. coil
R25	.2 megohm 1/4 w	L-H	Police Ant. coil
R26	.25 megohm 1/4 w	L-I	LW and BC Ant. coil
R27	.5 megohm 1/4 w	L-D	SW1 and SW2 RF1 and RF2 coils
R28	.75 megohm 1/4 w	F	LW and BC RF1 and RF2 coils
R29	1 megohm 1/4 w	E	Police RF1 and RF2 coils
R30	2 megohms 1/4 w	L1	1 henry choke
R31	3 megohms 1/4 w	L2	24 mh choke
R32	75,000 ohms 1 w	L3	.7 henry
R33	2000 ohms control	L4	175 henrys
R34	.5 megohm control	L5	Diode coil
R35	600 ohms	L6	.8 mh
R36	.1 megohm control	L7	1.2 mh
R37	300 ohms	L8	1.2 mh
R38	1 megohm variable		
R39	400 ohms 1/4 w		

Revised

E. H. SCOTT RADIO LABORATORIES INC.

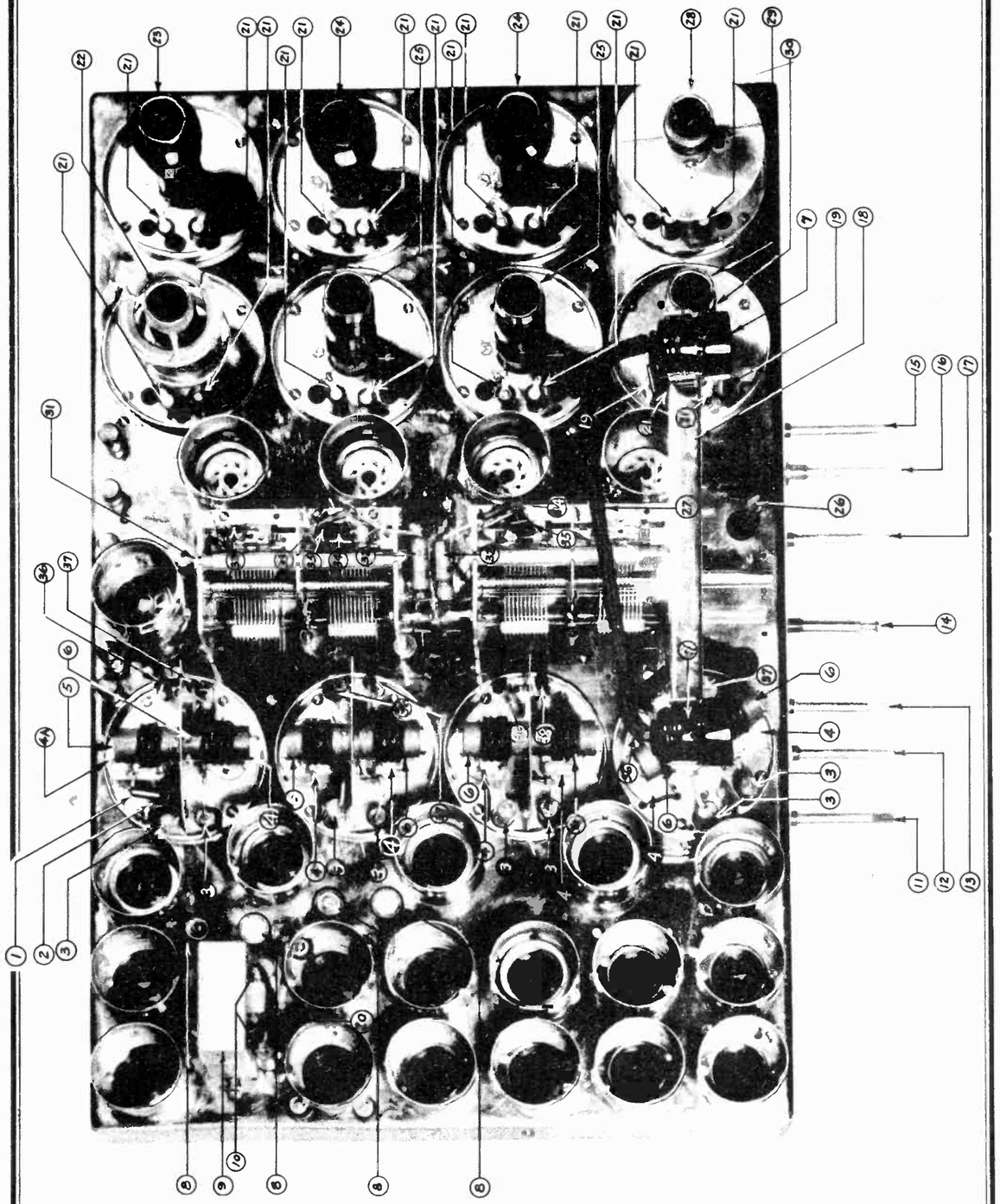
PHILHARMONIC RECEIVER DIAGRAM

DRAWN BY: R.E.S.
CHECKED BY:
APPROVED BY:
DATE April 4, 1939

Undistorted Output	40 Watts Class A
Audio Frequency Range	30 16,000 cycles.
Wave Length Range	3.75 to 2,000 meters.
Voltage Rating	100-130 volts
Frequency rating	60 cycles
NOTE. Designs are obtainable on special order for any commercial frequency or voltage	
Power Consumption	Average around 300 watts.

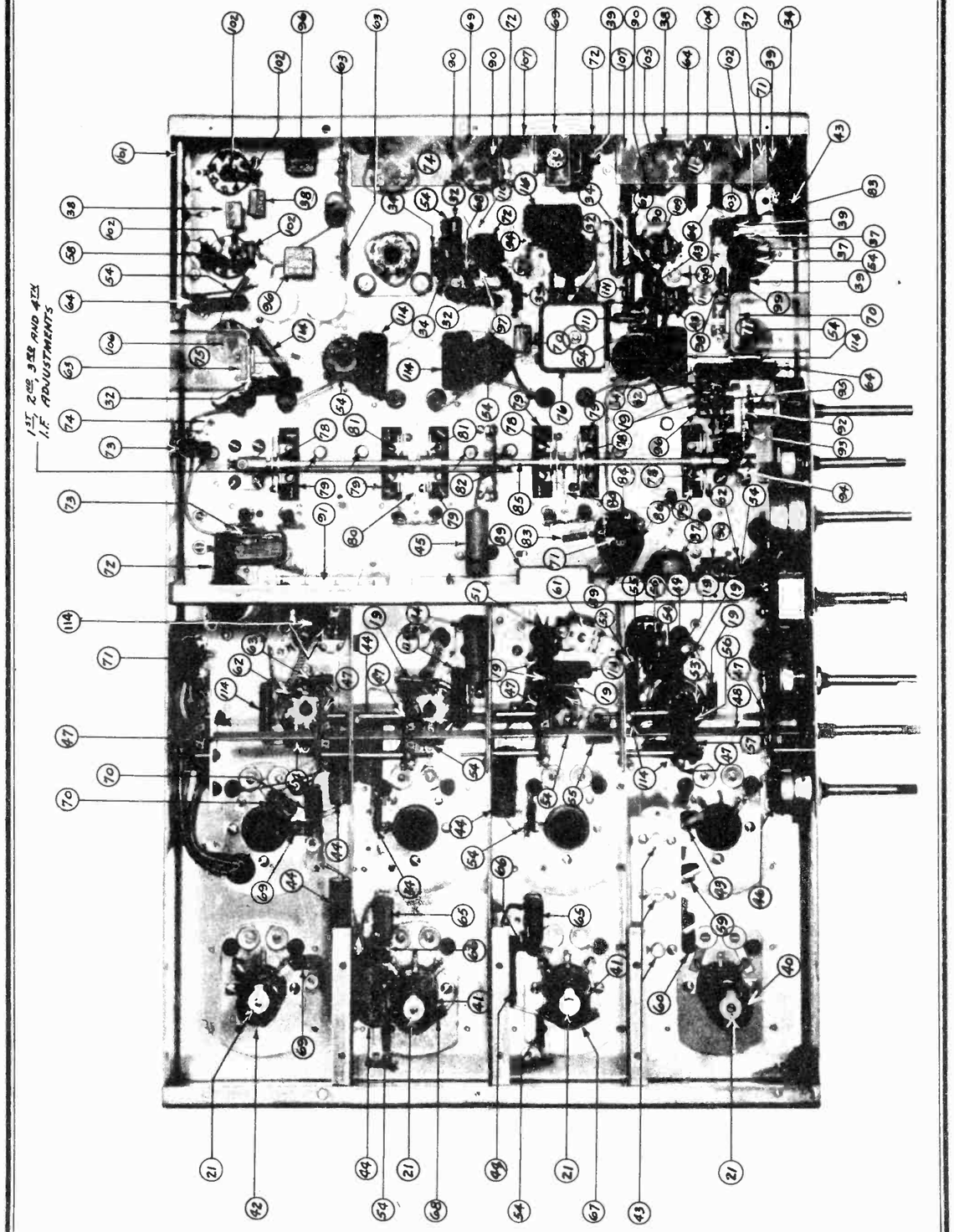
MODEL Philharmonic

E. H. SCOTT RADIO LABS., INC.



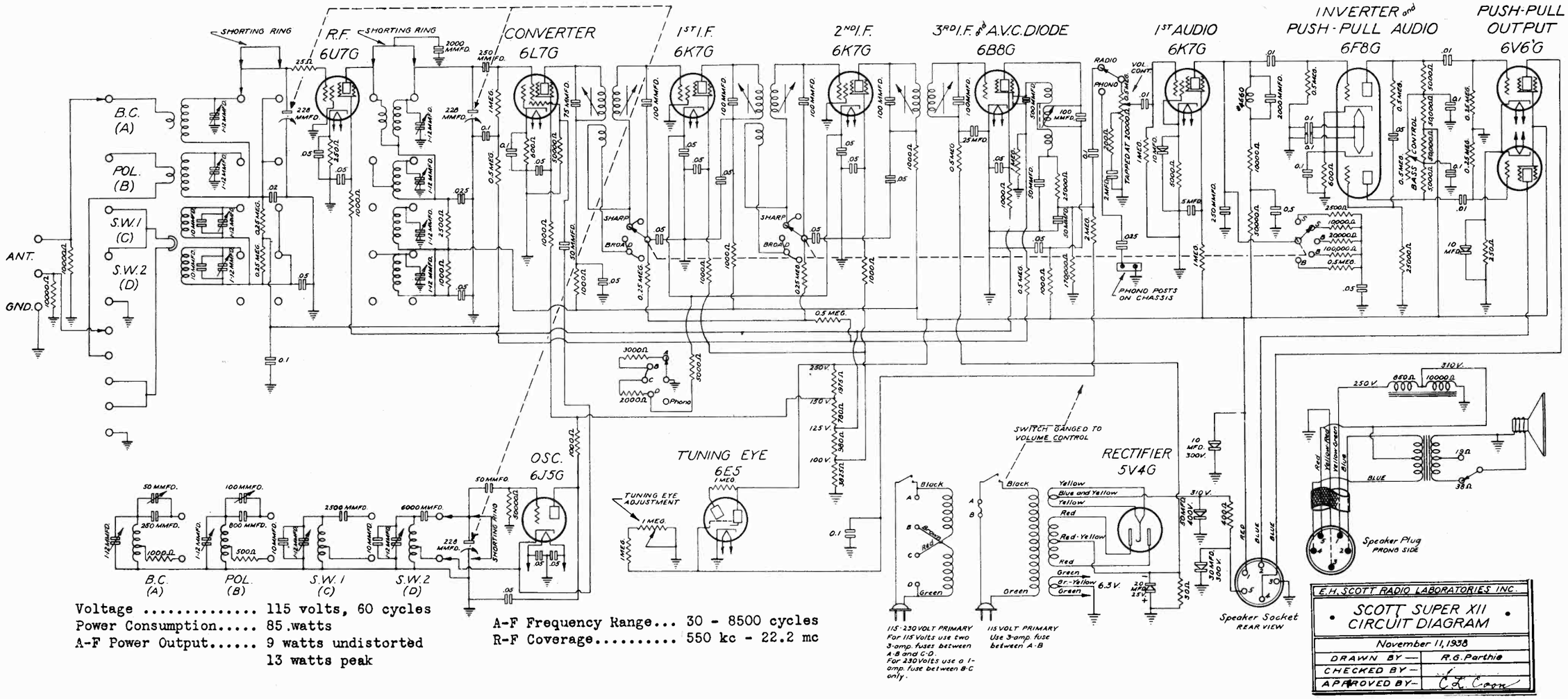
MODEL Philharmonic

E. H. SCOTT RADIO LABS., INC.



MODEL Super XII

E. H. SCOTT RADIO LABS., INC.



Voltage ..... 115 volts, 60 cycles
Power Consumption..... 85 watts
A-F Power Output..... 9 watts undistorted
13 watts peak

A-F Frequency Range... 30 - 8500 cycles
R-F Coverage..... 550 kc - 22.2 mc

Audio Amplifier

When the wave change switch is set to position "P" the input to the three stage audio system is automatically connected to the phonograph input terminals on the rear of the chassis. A volume control tapped for bass compensation is employed at the input circuit of the 6K7G first audio tube and in the plate circuit of this tube five position treble control circuits are connected. The bass circuit utilizes a special bass boost system giving about 6 db boost at 100 cycles, and is connected in the plates of the 6F8.

The first audio tube is followed by a 6F8 tube which has two functions, acting as a phase inverter and pushpull audio resistance coupled to pushpull 6V6's acting as pentode power tubes.

Power Supply

The power supply employs one of the new 5V4G heater type rectifier tubes. The primary of the power transformer is arranged for standard 115 volts on the domestic model. On the foreign model it is designed to accommodate either 115 volts or 230 volts AC by proper placement of the fuses. This is clearly shown on the schematic diagram. The rectified plate voltages are filtered by the use of two special high capacity electrolytics, the speaker field being employed as a filter choke. In addition, the bias voltage is further filtered by the use of a 20 mfd. condenser.

Loud Speaker

The loud speaker employed is arranged to provide connections for an external speaker. It is necessary only to remove the terminal cover, disconnect the jumper wire between terminals V.C. and 38, and connect it between V.C. and 19 instead. Now connect a 38 ohm speaker to the terminals marked 19 and G. "T" pads may be added by reference to the diagram showing these connections.

Adjust the I.F. diode trimmers for maximum meter reading, reducing the input, if necessary, to avoid exceeding the above figures.

Alignment of R.F. Sections

Before starting on this portion of the set, it is important to understand how the tuning wand tool works. One end of this device has a core of material such as Polyiron while the other end is brass. When the inductance of a coil is high, insertion of the brass end will decrease it to the proper resonant value; whereas, insertion of the other end will increase the effective inductance. This gives a very convenient means of determining whether or not it is necessary to add or remove turns from the coil. In the following instructions only a slight adjustment of trimmers and padders should be necessary where original coils are used. Full instructions, however, are given to cover the case where new coils are to be used.

Broadcast Band Alignment

First turn the dial pointer completely to the low frequency dial stop and center the pointer between the two heavy marks. Turn the wave band switch to the "Broadcast A" position, set the bass control to minimum, treble control to minimum and connect an output meter across the voice coil. Adjust oscillator trimmer C1, until a 1,400 Kc. signal as set on the dial is tuned in from the generator. Rotate the dial to 600 Kc. and tune in a 600 Kc. signal from the generator by adjusting the padding condenser C3. Check the dial at 950 Kc. and if it tunes high in frequency spread turns on the oscillator secondary. If it is low in frequency push the turns together and then readjust trimmer condenser C1, and padder condenser C3, as before.

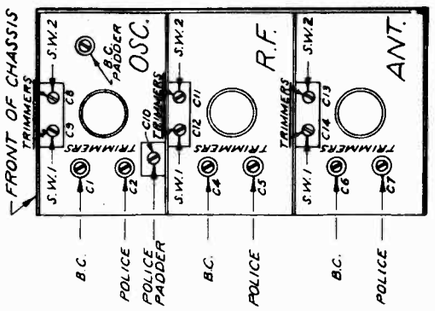


Fig. 2 - Location of Trimmers

With the oscillator circuit correctly spotted, tune in a signal from the generator at 1,400 Ko. and use the output meter as indicated.

Have as weak a signal as possible and adjust trimmers C4 and C6 for maximum output. Turn the dial to 600 Ko. and check the alignment of the R.F. and antenna stages with a tuning wand, spreading turns on the coil where less inductance is needed and pushing turns together if more inductance is required. Readjust the trimmer condenser C4 and C6 for maximum at 1,400 Ko. Turn the dial to 960 Ko. and check the alignment of the R.F. and antenna stages.

Police Band

Set the wave band switch to the Police "B" band position and turn the dial to 3.7 megacycles. Tune in a signal from the generator by adjusting trimmer C2, then turn the dial to 1.8 megacycles and tune in a signal from the generator by adjusting the padder C10. Check the alignment at 2.5 megacycles and if off, either push together or spread turns on the oscillator secondary as described under "Broadcast Band Alignment". Readjust trimmer C2 and padder C10 until correctly aligned. Tune in a signal at 3.7 megacycles and adjust trimmers C5 and C7 to maximum output. Now check the alignment on 1.8 megacycles with a tuning wand and make any necessary corrections by pushing or spreading turns on the coils and readjusting trimmers C5 and C7. Recheck the alignment at 2.5 megacycles.

HUM TESTS ON RECEIVER

The hum is very low in the Scott Super XII. Under normal conditions the hum cannot be read on an output meter. In case of bad hum, replace the 6Y6's, or it may be due to the 6F8 or 6K7. The 6K7 is the worst offender for causing hum.

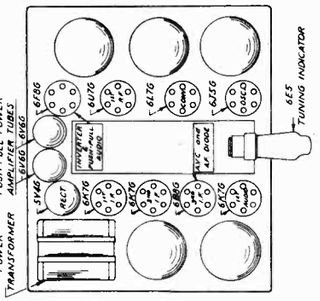


Fig. 1 - Location of Tubes

AUDIO GAIN TEST

With an audio input signal of 0.5 volt at 400 cycles an output reading of 11 volts should be obtained on the output meter which is connected across the voice coil. Make this test with volume full, bass control full, fidelity full and band switch in phono position. If the gain is low it may be due to defective tubes, wrong voltages, shorts or open circuits, either in the set or power amplifier. Both should be checked.

AUDIO FIDELITY TESTS

For correct high fidelity reproduction it is important that the electrical frequency response of the audio system for the phono posts to a 38 or 40 ohm dummy voice coil resistor be approximately 1 1/2 volts at 100 cycles and 4 volts at 6,000 cycles with the bass and fidelity controls on full, after the output has been carefully adjusted, by means of the volume control, to 1 volt at 400 cycles with an input of 0.1 volt at each frequency. Failure of the system to approximate this response (if you are certain that your meters are accurate and that no series meter condenser, which would "cut" low frequencies, is being used) should lead to analysis of the low or high frequency circuit involved to determine and eliminate the trouble.

Alignment of I.F. Section

Connect a good signal generator to the input of the I.F. system. Turn the wave band switch to the broadcast band; have selectivity switch to sharp position (to left); turn tuning dial pointer to Hi-Freq. end of dial.

Connect the negative terminal of a 20,000 ohm per volt DC voltmeter using the 25 volt scale, (or a sensitive microammeter with a 0.5 meg. resistor connected in series with its negative terminal) to the "I.F. Diode Output Point", and connect the positive terminal to the chassis.

Apply an unmodulated 455 Kc. signal of sufficient strength to produce a diode output voltage reading of approximately 10 v. (or 20 microamperes for the microammeter) and very carefully adjust the 1st, 2nd, 3rd, I.F. transformers by removing two buttons from two large round cans. The top adjustment is primary and the adjustment under chassis is secondary.

Foreign S.W. -C- (SW1)

Set the wave band switch to the "C" position and tune in a signal at 9 megacycles by adjusting trimmer condenser C9. Turn the dial to 5 megacycles and if necessary to correct the calibration do so by spreading or pushing turns on the coil and readjusting the trimmer condenser C9. Check the calibration at 6.0 megacycles.

With the oscillator calibrated, tune in a signal at 9 megacycles and adjust trimmer condensers C12 and C14 for maximum output. Check the alignment at 5 and 9 megacycles and make any necessary corrections by pushing or spreading turns on the coils and readjusting trimmers C12 and C14.

Foreign S.W. -D- (SW2)

Set the wave band switch to "D" position and tune in a signal at 20 megacycles by adjusting trimmer C8. Check and if necessary correct the calibration at 12 megacycles by pushing or spreading the turns on the oscillator coil. Check the calibration at 15 megacycles.

With the oscillator correctly aligned tune in a signal at 20 megacycles and adjust trimmers C11 and C13 for maximum output. Check the alignment at 12 and 15 megacycles and make necessary corrections by pushing or spreading turns on the coils. Now, readjust trimmers C11 and C13.

CONNECTING EXTRA SPEAKER

The new type high-fidelity Scott permanent magnet 38-ohm voice coil speaker may be readily connected to a Scott receiver with the optional "T" pad inserted in the voice coil leads where separate control of the extension speaker volume is desired. In case the extension speaker is disconnected, the jumper might be changed to connect terminals "V.C." and "38" together.

ELECTROLYTIC CONDENSERS

The electrolytic condensers are special and in case a replacement is necessary, it must be purchased from the Scott Laboratories.

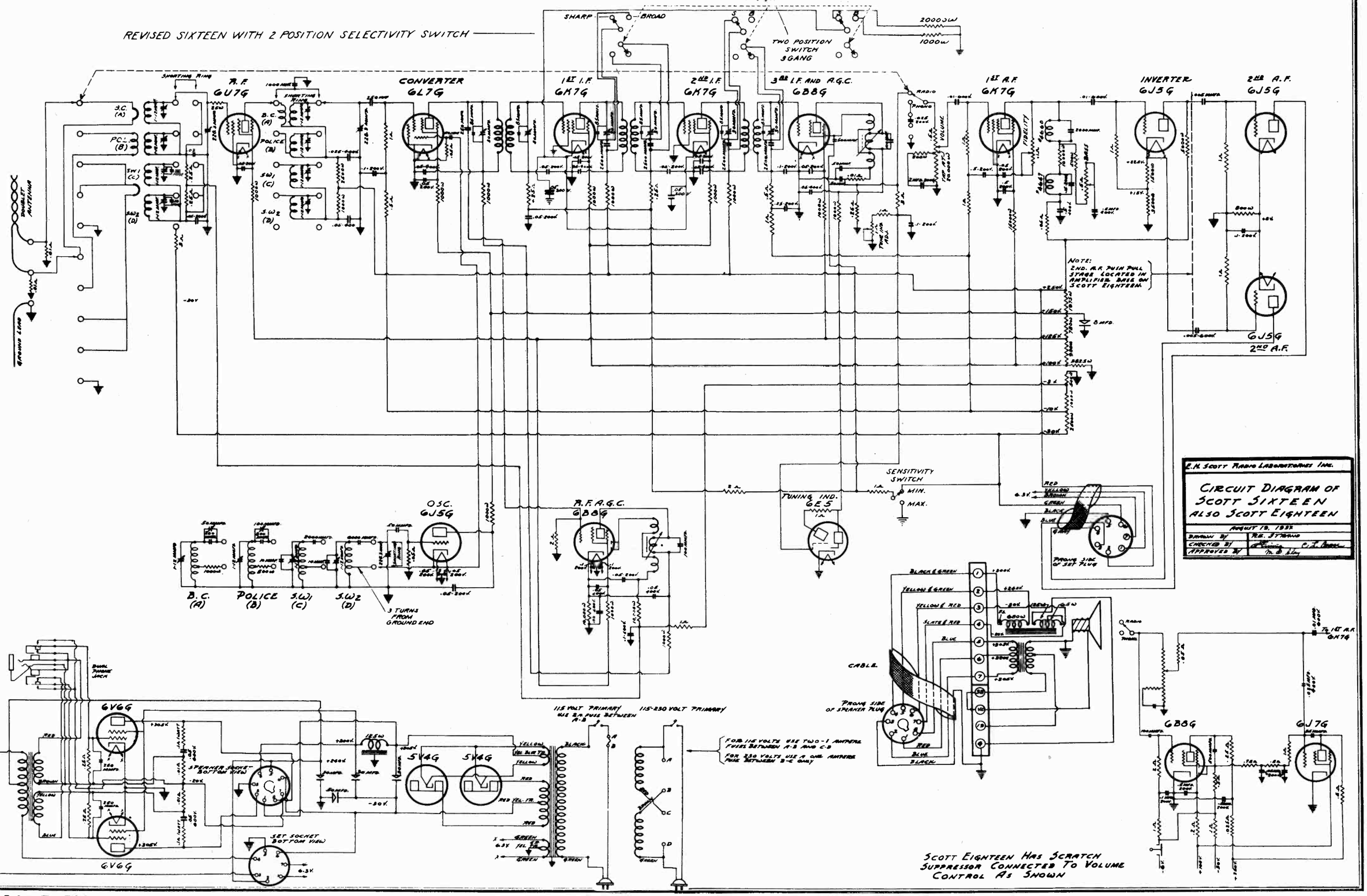
WAVE CHANGE SWITCH TROUBLE

Poor contact in the wave-change switch can generally be corrected by slightly bending the contacts involved. However, in case a switch section is accidentally damaged beyond repair, this section can be replaced by first removing the dial face, then removing the two screws which support the wave change detent plate and very carefully pulling out the wave change switch shaft. The damaged section can then be unsoldered, removed, and replaced with a new unit, which should be obtained from the Scott Laboratories in Chicago before the change is made in order to insure exact duplication of switch position and connections. Note particularly that the small notch near the center of the switch rotor must be in the same position in each switch section.

E. H. SCOTT RADIO LABS., INC.

MODELS 16,18

REVISED SIXTEEN WITH 2 POSITION SELECTIVITY SWITCH



E. H. Scott Radio Laboratories Inc.

CIRCUIT DIAGRAM OF SCOTT SIXTEEN ALSO SCOTT EIGHTEEN

August 19, 1938

Drawn By	W.E. Stroud
Checked By	C.J. Breen
Approved By	H.B. Wing

E. H. SCOTT RADIO LABS., INC.

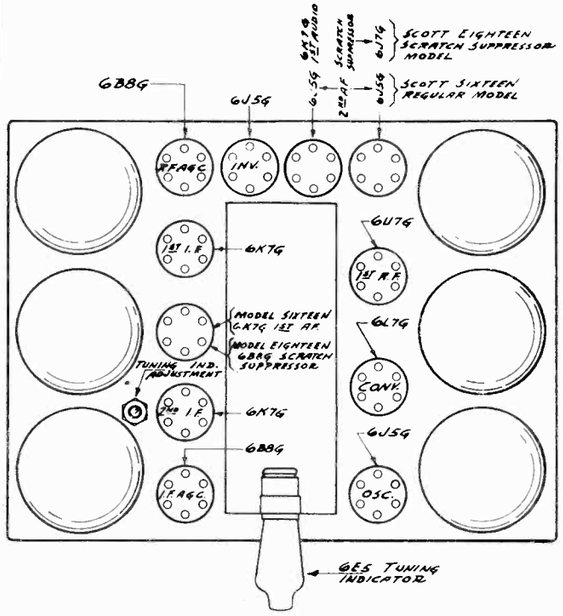


Fig. 1 Showing Tube Locations

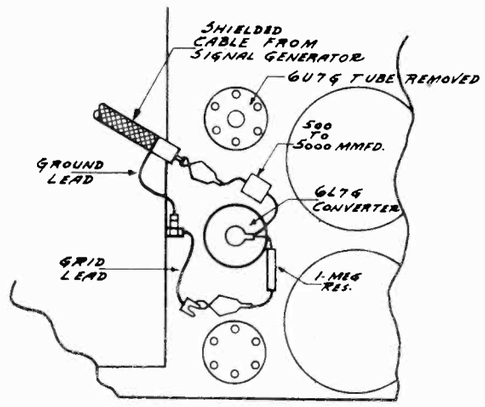


Fig. 2
Signal Generator Connection
For I.F. Alignment

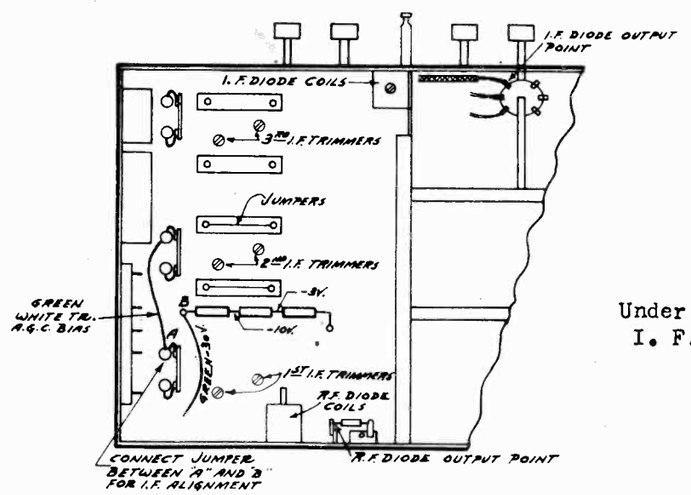


Fig. 3
Under Chassis View Showing
I. F. Adjustments, Etc.,

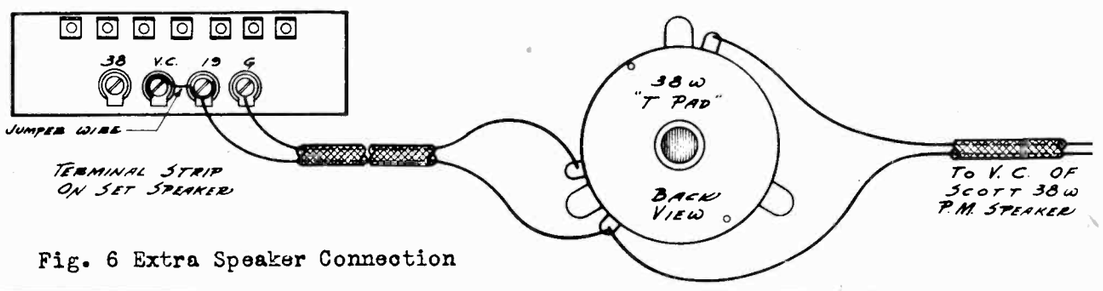


Fig. 6 Extra Speaker Connection

E. H. SCOTT RADIO LABS., INC.

HOW TO ADJUST THE AUTOMATIC RECORD SCRATCH SUPPRESSION CIRCUIT ON THE SPECIAL SCOTT EIGHTEEN

This test refers only to the 18 tube model and can be ignored when checking the Sixteen. See Fig. 1 for tube locations in Scott Eighteen.

Connect an output meter across the Voice coil circuit (V.C. to G.) Connect an audio oscillator and a sensitive output meter to the phono-posts, and turn the Wave Switch to position "p" (allway to right). With the Bass Control set to minimum, treble control full on, and Scratch Suppressor switch pushed in, apply 0.25 volt at 3500 cycles to the phono posts. Set the volume control so that 1 volt is obtained on the output meter across the voice coil. Pull out the suppressor switch and the 1 volt reading should just start to drop (say to .9V.) Now push the suppressor switch in (off position) and reduce the audio oscillator input to 0.05 volts, reset the volume control to obtain a 1 volt reading again on the voice coil output meter and now pull out the suppressor switch ("on" position). The 1 volt reading should now drop to a level of 0.2 of a volt or slightly under. This gives a reduction ratio of 5 to 1 and this is the proper ratio to maintain. If this 5 to 1 reduction is not obtained the 6 volt bias should be reduced slightly by shunting it to ground by a suitable resistor. The value of this resistor will lie somewhere between 800 and 5000 ohms. It will have to be determined by substitution of various resistors. If too much control is obtained, it may be due to an abnormal 6J7G.

The GB8G tube determines the level at which the circuit starts to cut high frequencies and the 6J7G tube determines the amount of this cut.

HOW TO ALIGN AND BAND PASS THE I. F. AMPLIFIER

While this operation is quite difficult in many receivers the Scott Sixteen and Eighteen incorporate a new development which greatly simplifies this adjustment if the following procedure is carefully followed. However, the I. F. adjustments should be changed only as a last resort on positive indication that the I. F. alignment has become impaired. A good signal generator should be connected to the input of the I. F. system at the grid of the 6L7G converter tube using the circuit shown in Fig. 2, in order to maintain normal operating bias. Turn the wave band switch to the Broadcast Band; turn the tuning pointer to the extreme high frequency end of the dial; push in the sensitivity switch; and remove the 6U7G R. F. tube.

Now referring to the underside view of the chassis, Fig. 2, connect a jumper wire between points "A" and "B". Remove the wire jumpers which shunt the terminals of the 2nd I. F. Transformer as shown in Fig. 3, leaving these terminals vacant, and connect two solid wire jumpers across the two terminal strips of the 3rd I. F. transformer. (In case resistors are found connected across any of the terminal strips their positions should be carefully noted on a piece of paper since they must be replaced exactly as found, when the operation is completed.) NOTE: Turn set off when changing jumpers to avoid shock from the plate voltage. Connect the negative terminal of a 20,000 ohm per volt D. C. voltmeter using the 25 volt scale, (or a sensitive microammeter with a 0.5 meg. resistor connected in series with its negative terminal) to the "I. F. Diode Output Point" shown in Fig. 3 and the positive terminal to the chassis.

Apply an unmodulated 465 K. C. signal of sufficient strength to produce a diode output voltage reading of approximately 10V (or 20 microamperes for the microammeter) and very carefully adjust the 1st, 2nd, 3rd I. F. and I. F. diode trimmers for maximum meter reading, reducing the input, if necessary, to avoid exceeding the above figures.

HUM TESTS ON RECEIVER

Make certain that there are no soldering irons near the chassis and that the power transformer end of the amplifier is as far away from the chassis as possible. Connect a good output meter, having a resistance of 3000 ohms or more to the 6V6G plates (No. 3 prong) and have a 1 to 2 mfd. condenser in series with one lead to the meter.

With bass full on - treble full - and volume off the hum should not exceed .2 of a volt. To make overall tests, remove the 2nd audio 6J5G tubes. The hum should now drop to less than 0.1 volt. If it does not the amount of hum read on the meter is the hum in the amplifier itself. Leave the tubes out and change the 6V6G tubes in the amplifier until the hum is reduced to a minimum. The phone jack may be defective or there may be filament shorts, check the circuit and connections and get the hum out of the amplifier before proceeding with the rest of the test.

NOTE: It is highly important, in minimizing hum to use the spiral heater type 6K7G and 6J5G tubes in the audio system since, while considerable bass boost is available, tubes are the sole source of hum, there being no hum pickup whatsoever in chokes, transformers, etc.

After a very few of the first receivers were shipped out, a 250 mmfd. mica condenser was added to the grid circuit of each 6V6G tube to eliminate high frequency parasitic oscillation which occurred with some tubes. If these two condensers are not present, they should be added, as shown on the circuit diagram, otherwise oscillation may occur when the 2nd A. F. 6J5G tubes are removed.

After the amplifier is found to be O. K. replace the 2nd audio tubes and remove the inverter and 1st audio, now substitute for the 2nd audio tubes until hum is reduced to a minimum, allowing sufficient time in each case for the tubes to heat up properly. Next try the inverter tube in the same manner and follow with the 1st audio 6K7G. It may be necessary to push the filament wires nearer the base and away from grid wiring on some of the tube sockets, also the dial light circuit may be shorted against the dial frame. All these points should be checked along with the trying of new tubes.

AUDIO GAIN TEST

With an Audio input signal of 0.1 volt at 400 cycles an output reading of between 2 and 3 volts should be obtained on the output meter which is connected across the voice coil. Make this test with Volume full, Bass control 1/2 on, Fidelity full and Band Switch in Phono position. If the gain is low it may be due to defective tubes, wrong voltages, shorts or open circuits, either in the set or power amplifier. Both should be checked.

AUDIO FIDELITY TESTS

For correct high fidelity reproduction it is important that the electrical frequency response of the audio system, from the phono posts to a 38 (or 40) ohm dummy voice coil resistor, approximate 5 volts at 75 cycles and 6 volts at 6250 cycles with the bass and fidelity controls on full, after the output has been carefully adjusted, by means of the volume control, to 1 volt at 400 cycles with an input of 0.1 volt at each frequency. Failure of the system to approximate this response (if you are certain that your meters are accurate and that no series meter condenser, which would "cut" low frequencies, is being used) should lead to analysis of the low or high frequency circuit involved to determine and eliminate the trouble.

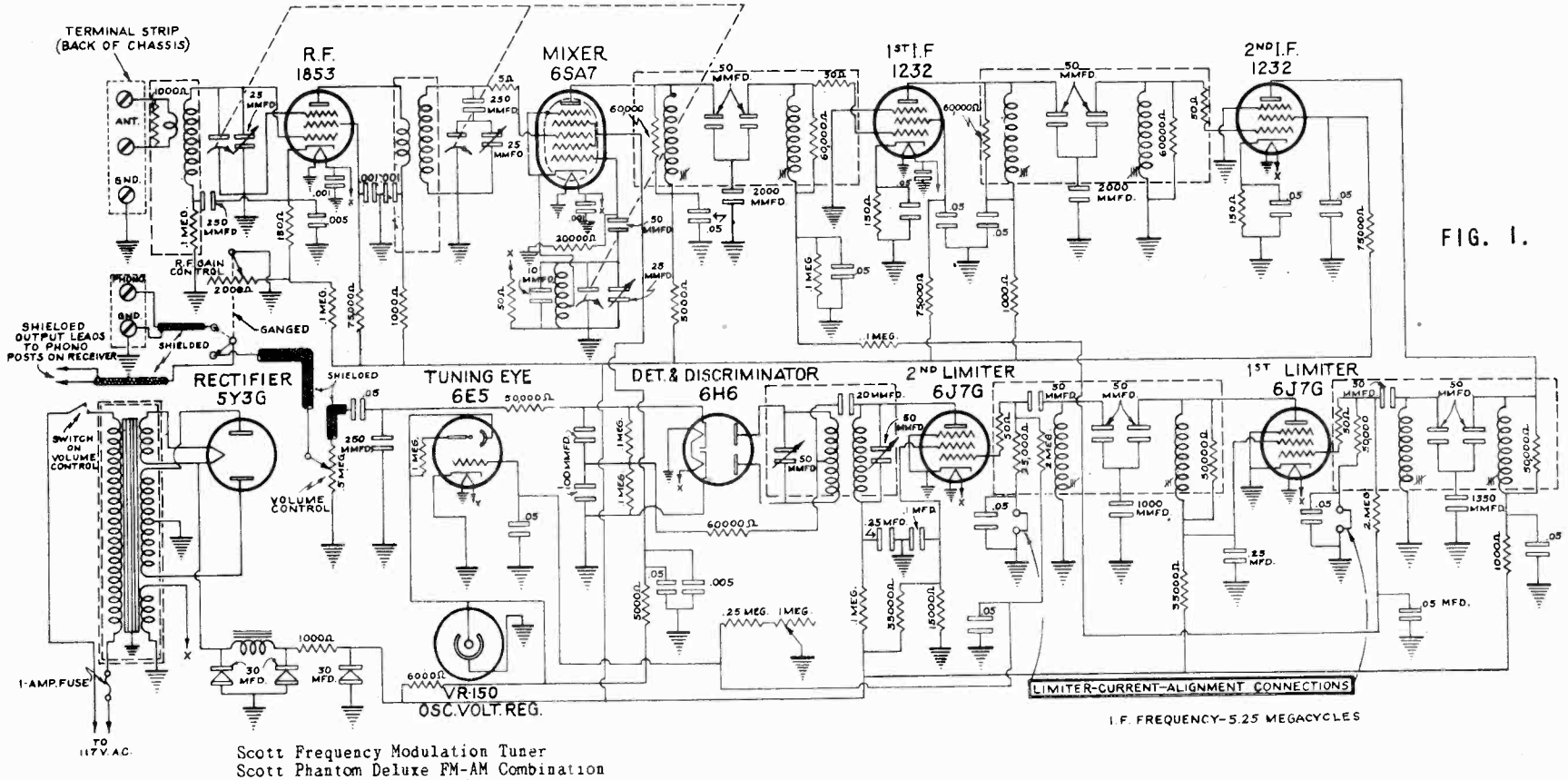


FIG. 1.

Scott Frequency Modulation Tuner
Scott Phantom Deluxe FM-AM Combination
Scott Philharmonic FM-AM Combination
Scott Masterpiece FM-AM Combination

It has been possible to combine the instructions for all of these receivers because of the fact that the same basic FM circuit is used in all models. Hence the alignment procedure and performance characteristics in the FM sections do not differ appreciably. Variations in circuit features of the different models are discussed in the section dealing with the description of electrical circuit features.

ELECTRICAL AND MECHANICAL DATA

VOLTAGES AND CURRENTS FOR F.M. TUNER

Tube Type	Function	E_f	E_k	E_{g1}	E_{gs}	E_p
	Function					
1853	1st R.F. Amplifier	5.9	1.2	105	0	230
6SA7	Mixer - Oscillator	5.9	0	102	-	225
1232	1st I.F. Amplifier	5.9	1.2	87	0	230
1232	2nd I.F. Amplifier	5.9	1.2	85	0	230
6J7G	1st Limiter	5.9	0	75	0	75
6J7G	2nd Limiter	5.9	0	60	0	45
6H6	Detector	5.9	0			

Power Consumption

F.M. Philharmonic	270 watts
F.M. Phantom	220 "
F.M. Masterpiece	150 "
F.M. Tuner	60 "

MODEL Phantom Deluxe

E. H. SCOTT RADIO LABS., INC.

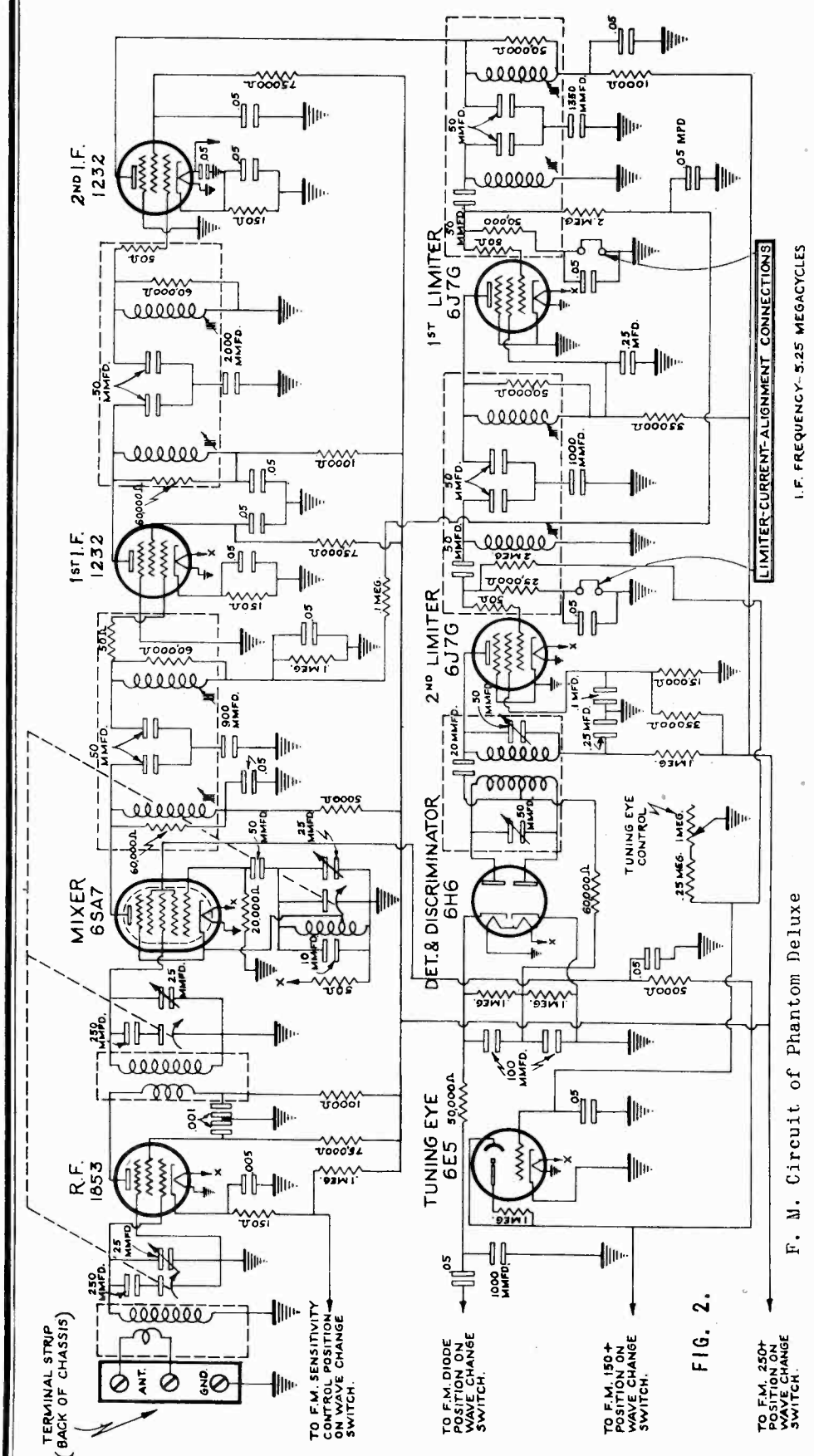


FIG. 2. F. M. Circuit of Phantom Deluxe

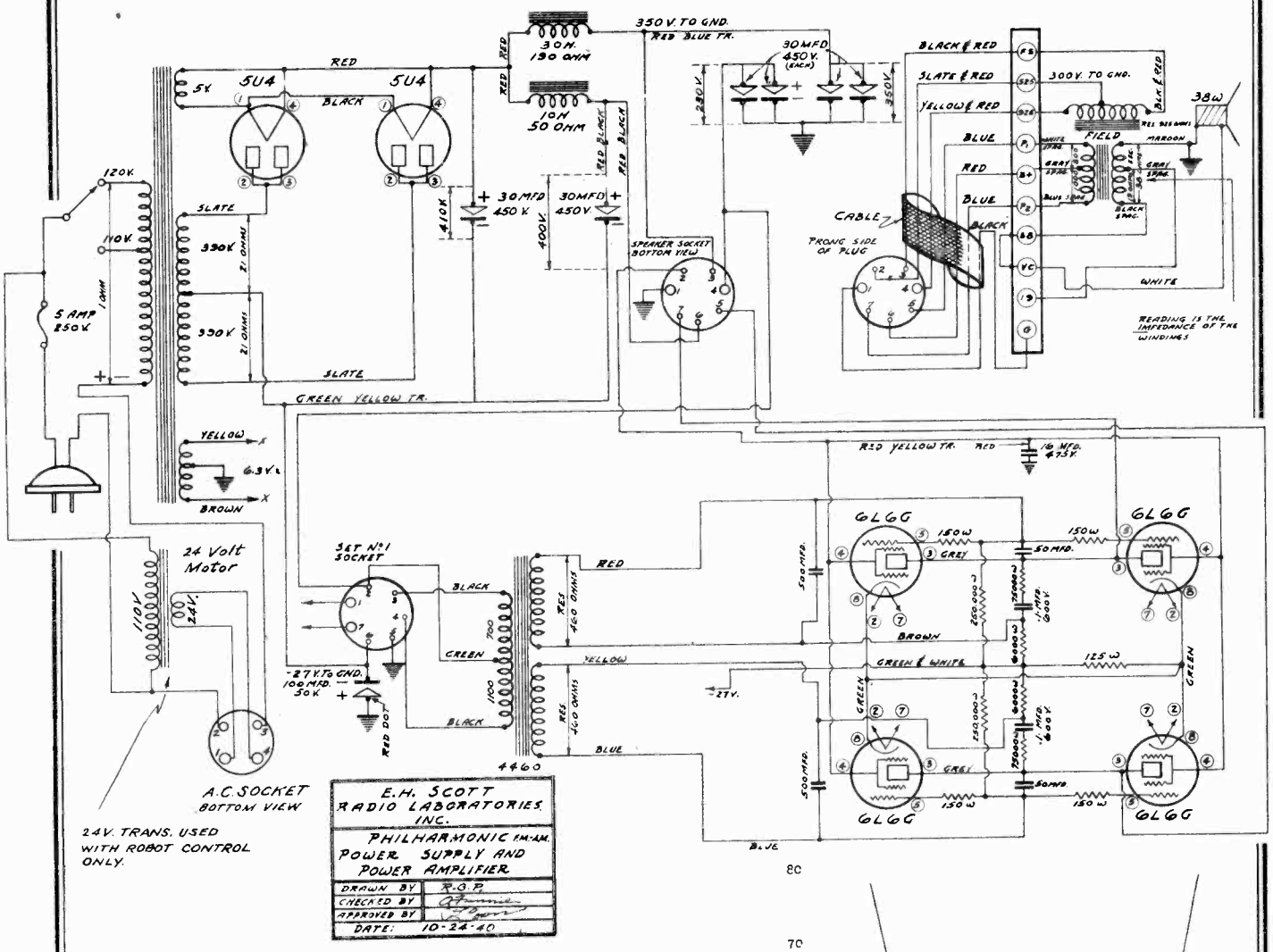
GENERAL

The Scott FM Tuner and Combinations are superheterodyne receivers covering a tuning range of 41 to 50 megacycles for wide band frequency modulation reception. A single high gain r. f. stage with an 1853 type high mutual conductance pentode is employed in all sets, except the Philharmonic where two stages of this type provide maximum signal-to-noise ratio and maximum image and spurious signal rejection. Dipole or doublet connections to the antenna primary may be made by removing the ground wire connected to one side of the winding.

Special FM circuit developments include a voltage and temperature stabilized oscillator system - high frequency i. f. for maximum image signal rejection ratio - high sensitivity level for weak signal limiting - cascaded limiting stages for maximum range of flat limiter action - cathode ray tuning indication - eight tuned circuits at the intermediate frequency for maximum adjacent channel selectivity - R. F. gain control to prevent overloading on high signal levels - air tuned discriminator circuit of high sensitivity

E. H. SCOTT RADIO LABS., INC.

MODEL Philharmonic Combination



E. H. SCOTT RADIO LABORATORIES INC.	
PHILHARMONIC FM-AM POWER SUPPLY AND POWER AMPLIFIER	
DRAWN BY	R.G.P.
CHECKED BY	
APPROVED BY	
DATE:	10-24-40

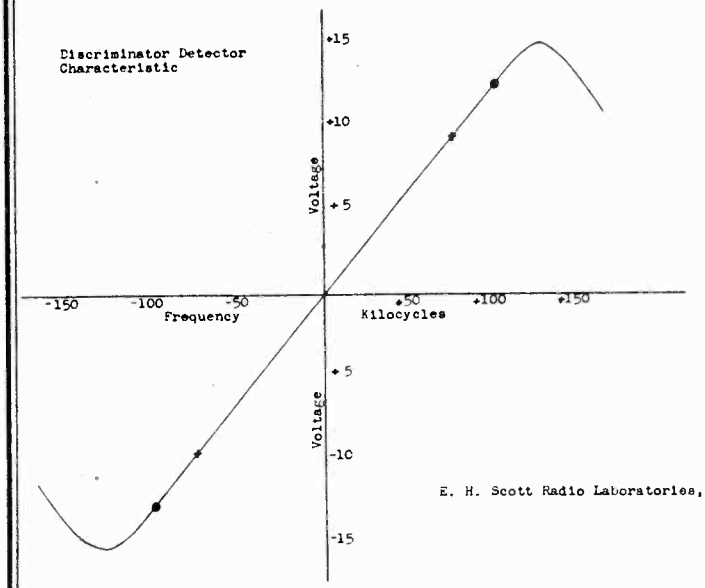


FIG. 5.

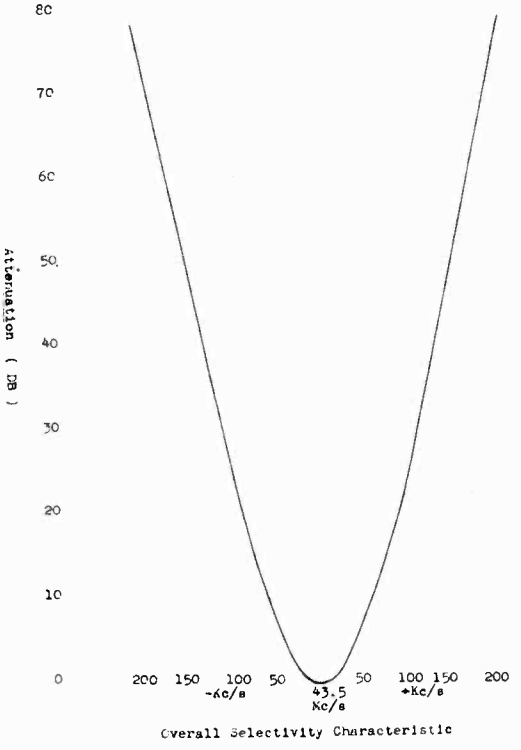


FIG. 6.

MODEL FM

E. H. SCOTT RADIO LABS., INC.

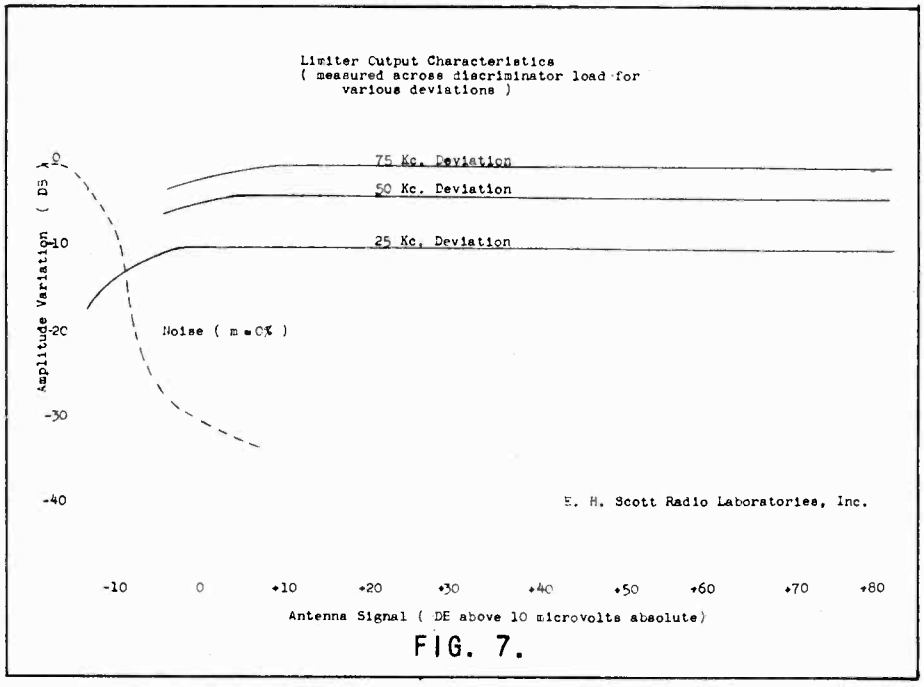


FIG. 7.

THE LIMITING STAGES

The third and fourth i. f. stages, or the first and second limiters respectively employ 6J7G tubes, whose characteristics are most suitable for providing a flat limiting action once the signal has reached sufficient amplitude to cause this characteristic to come into play. By using a cascade arrangement of these tubes, weak signals can produce limiting action at the second limiter and stronger signals cause both limiters to act on various impulse noises, such as ignition, arcs, etc

A factor of considerable importance in the limiting of ignition and other fast types of impulse noise is the time constant of the limiter grid leak-condenser combination. The first limiter has a grid circuit time constant of 2.5 microseconds and the second has a constant of 1.25 microseconds, thus insuring a fast action on noises possessing a steep wavefront.

A perfect degree of limiter flatness, once the action begins, is obtained by the proper choice of limiter plate and screen grid voltages.

THE DISCRIMINATOR-DETECTOR

A phase bridge type of frequency discriminator circuit is interposed between the plate of the second 6J7G limiter tube and the 6H6 diode detectors. Both the primary and secondary are tuned by means of air trimmers and are inductively coupled to a degree necessary for the proper discriminator peak separation, which is approximately 250 kc. Thus on either side of resonance the discriminator characteristic extends about 125 kc. before a peak is reached. Linearity up to $\pm$100 kc. is maintained so that a margin of safety for overmodulation beyond $\pm$ 75 kc. at the transmitter is possible without distortion.

The balanced detector action of the 6H6 diodes acts to cancel amplitude modulation present on weak signals and both diodes must be in proper condition to maintain the balance of discriminator symmetry. Conversion from frequency to amplitude modulation is achieved uniformly from 30 to 15000 cycles and the pre-emphasis of high audio frequencies at the transmitter is corrected by means of a resistance-capacity network directly following the diode load.

TUNING INDICATION

The control grid of a 6E5 "magic eye" tuning indicator is fed through a voltage divider and audio filter from the grid leak resistor of the 2nd limiter stage. The tuning indication provided by this arrangement is similar to that obtained from the indicator used in the amplitude modulation bands; that is, the correct tuning point occurs when the eye shadow is closed to the fullest extent. This method is based upon the fact that the peak of the i. f. selectivity curve coincides with the zero voltage point on the discriminator characteristic.

The adjustment of the shadow on this indicator is made in a similiar manner to that employed in the amplitude modulation bands. The control grid voltage on the 6E5 in this band is regulated by a potentiometer in the grid circuit of that tube. It should be adjusted so that the shadow eye is just closed for signals having a strength of approximately 100,000 microvolts.

In the combination receivers the operation of the tuning indicator in the AM bands is unchanged.

VOLTAGE REGULATION

A VR150 type tube supplies 150 volts to the plate of the 6E5 tuning indicator to prevent shifting of the zero setting of the shadow angle under varying voltage conditions, and 100 volts through a resistance-capacity filter to the oscillator section of the 6SA7 mixer.

AUDIO AMPLIFIERS (COMBINATION RECEIVERS)

In the Phantom and Philharmonic FM-AM models the basic features of the original amplifiers, with the exception of the high frequency compensation, have been retained. Owing to the fact that both the new single speaker and the three speaker combination provide a considerably better high frequency response than was obtainable previously, it was decided to eliminate the high boost choke and to replace it with a resistor. Thus, the electrical audio fidelity is substantially flat for F. M. reproduction and is somewhat better than was previously attainable with the old speakers in the AM positions.

Audio filters have been added to prevent the FM limiters from feeding noise voltages through the "B" supply.

In the Philharmonic FM-AM receiver the audio system has been rearranged and the volume range expander has been eliminated in order to make room for the FM components on the same chassis as used previously.

AUDIO TONE CONTROLS

In all of the combination receivers the tone controls operate as usual in the AM bands. In the FM position the treble control operates to attenuate the high audio frequencies much the same as with AM. However, the bass control in the FM band operates only to vary the amplitude of the low frequency compensation provided by the low boost choke. This action results in a variation of the bass response around 100 cycles and does not affect the low frequency response over as wide a range as is the case in the AM positions. This arrangement is used so that the electrical fidelity of the receiver is substantially flat when the bass control is fully retarded and the treble control is fully advanced. The cabinet or speaker system, of course, can alter the response from its true electrical fidelity characteristic.

POWER SUPPLIES

The power supply of the Scott FM Tuner is self contained, employing a 5Y3G rectifier and power transformer for 60 cycle operation. A combination choke and resistance filter is used for audio hum elimination in the B supply. To prevent the pickup of induction hum in the oscillator and mixer circuit a double magnetic shield is placed over the power transformer.

In the combination models the conventional power supply in its usual position furnishes voltage and current for both the AM and FM sections

THE WIDE RANGE LOUDSPEAKER SYSTEM

In order to reproduce audio frequencies above 8500 cycles with better fidelity a combination loudspeaker system, consisting of 1 - 12 inch low frequency unit and 2 - 5 inch tweeter type high frequency units has been introduced. To provide minimum distortion and maximum power handling capacity a constant resistance filter network is used to feed all frequencies below 2000 cycles to the L. F speaker and all frequencies above 2000 cycles to the H. F speakers. A wiring diagram and schematic circuit of the filter system is shown in Figure 9. This speaker system may be used on AM programs as well as FM programs with beneficial results

SERVICE PROCEDURE

In the AM and audio portions of the combination receivers the same service procedure as outlined in the service manuals should be applied to each of the respective AM sets.

ALIGNMENT PROCEDURE FOR FM TUNER AND FM SECTIONS OF COMBINATION RECEIVERS

To provide a better understanding of the performance characteristics to be attained when the FM section of a Scott receiver is properly aligned the following curves are shown:

Figure 5 Discriminator Characteristic
Figure 6 I. F. Selectivity Characteristic
Figure 7 Limiter Output Characteristic

These curves have been obtained with Scott receivers at the factory and alignment in service should produce substantially the same results, although slight variations in the selectivity of discriminator characteristic can be tolerated with no audible difference in performance. Reference to these curves should be helpful to the serviceman in familiarizing himself with the desirable FM characteristics.

DISCRIMINATOR ALIGNMENT

After removing the chassis bottom plate the discriminator alignment point can be readily located. It will be found on the 6H6 socket at terminal #4 or after the 50,000 ohms resistor in series with this point. A circuit diagram of the connections for this operation is shown in Figure 10. Connect the zero center microammeter with series resistor as shown and connect the output of the I. F. signal generator (tuned to 5 25 mc.) through a .05 mfd. condenser to the grid cap of the 2nd 6J7G limiter. If the generator has a high output impedance, the grid cap and lead of the 6J7G should be

removed and instead a 1 megohm grid leak should be inserted. Increase the output of the I. F. signal generator to the 2 or 3 volt level. Rotate the plate trimmer condenser at the top of the discriminator transformer shield can until the zero center microammeter swings to a maximum deflection in either direction from zero. Then rotate the secondary trimmer condenser at the bottom of the discriminator transformer until the meter indicator swings through zero with increasing or decreasing current depending upon the direction of rotation of the trimmer adjustment. Adjust for zero meter indication under these conditions.

Detune the signal generator back and forth about ±150 kc. If the discriminator circuit is operating properly the indicator meter will swing through a positive peak in one direction and through a negative peak in the other direction. However, these peaks may not be of equal amplitude. They can now be adjusted for equality by going back to the plate trimmer at the top of the discriminator transformer and making a slight readjustment. If the high frequency peak is of greater amplitude than the low frequency peak, the plate trimmer should be readjusted so that the amplitude of the former is reduced slightly. Then by detuning the generator back and forth the low frequency peak will be seen to have increased. By compromising between the two peak levels and going back over the plate trimmer adjustment the serviceman will soon find that it is relatively simple to attain peak equality in the discriminator circuit.

The peaks should be about 250 kc apart or ±125 kc. from the resonance frequency, which is 5.25 mc., and the variation of the zero center meter current should be linear on either side up to at least ±80 kc. The final goal of discriminator alignment is to attain this linearity over at least ±80 kc. and after obtaining peak linearity, the serviceman should finally readjust the plate trimmer slightly to obtain this result even at a sacrifice of peak equality. The linearity and equality of the ±80 kc. deviation characteristics are essential to distortionless audio reproduction for a wide band FM receiver. If it is found to be linear out to ±100 kc. when finally adjusted, it is so much the better to allow for overmodulation at the transmitter.

When the adjustment of the discriminator transformer is completed the zero center meter should indicate zero when the signal generator is tuned to 5.25 megacycles.

The general shape of the discriminator characteristic should resemble that shown in Figure 5.

I. F. AMPLIFIER ALIGNMENT

The 0-1 ma. milliammeter should be inserted in the ground side of the 25,000 ohms grid leak in the input circuit of the 2nd 6J7G limiter tube. A jumper connection and by-pass condenser have been provided under the chassis at this point in each receiver. In the FM Tuner it is located under the fourth i. f. transformer, near the socket of the 2nd 6J7G and the combination receivers it is under the FM extension section near the fourth i. f. transformer. The wire from the i. f. transformer is color-coded slate and white.

After the meter is inserted the i. f. signal generator (tuned to 5.25 mc.) should be connected through a .05 mfd. condenser to the grid cap of the 1st 6J7G limiter and the primary and secondary alignment screws of the fourth i. f. transformer should be adjusted for maximum limiter grid leak current. The output of the signal generator should be adjusted so that the limiter current is about .2 milliamperes while the tuning adjustments are being made. Since it is possible to align the i. f. coils with the cores either out or in, it is important to make sure that they are peaked with the adjustment screws in the outward position in order to insure proper coupling between the coils. The receivers in the field will be found to have their adjustments made in this manner.

The third, second and first i. f. transformers should be aligned in this order by moving the signal generator input progressively forward to the 2nd 1232, 1st 1232 and the 6SA7 grid. All of these connections are on the respective sockets, because of the single-ended construction of these tubes. Each transformer alignment screw should be adjusted for maximum 2nd limiter grid current, as the signal input is fed into the amplifying tube directly in front of it. After all of these adjustments have been made, the individual stages should not be realigned except by the above procedure, that is, the i. f. adjustments should be made individually for each stage by the point-to-point method and no overall readjustments should be made.

The overall i. f. selectivity characteristic may be checked by detuning the signal generator at least ±75 kc. or more from the 5.25 mc. point and observing the amount of attenuation. The characteristic should resemble the curve shown in Figure 6. However, a certain amount of dissymmetry can be tolerated as indicated in that figure, because of the limiting characteristic of the Scott receivers.

R. F. CIRCUIT ALIGNMENT

With the 0-1 ma. meter in the 2nd limiter grid leak circuit, connect the R. F. Signal Generator output through a .05 mfd. condenser to the grid terminal of the 6SA7 mixer tube. Observe whether the dial pointer stops at 41 mc. when it is turned fully to the end of the scale. If it does not, slide it along the drive cable until that condition exists when against the stop at that end. Then turn the tuning knob to rotate the pointer to 50 mc. and adjust the signal generator for a 50 mc. signal. With sufficient output from the generator to enable an easy location of the signal (1000 to 5000 microvolts) rotate the oscillator trimmer until a peak of limiter grid current is reached. The oscillator must be peaked on the low frequency side of the incoming signal and, while the capacity values in the oscillator circuit are such that it is difficult to align on the high frequency side, this condition might happen if some defective part should be present. Therefore, the best procedure is to make sure that the oscillator is on the low frequency side by observing that the image signal is on that side. This check can be made rather easily after a peak is reached by simply tuning the signal generator to approximately 39.5 mc. and noting that a repeat signal of about equal intensity comes in at that point. When this check shows the correct alignment, the oscillator is properly adjusted.

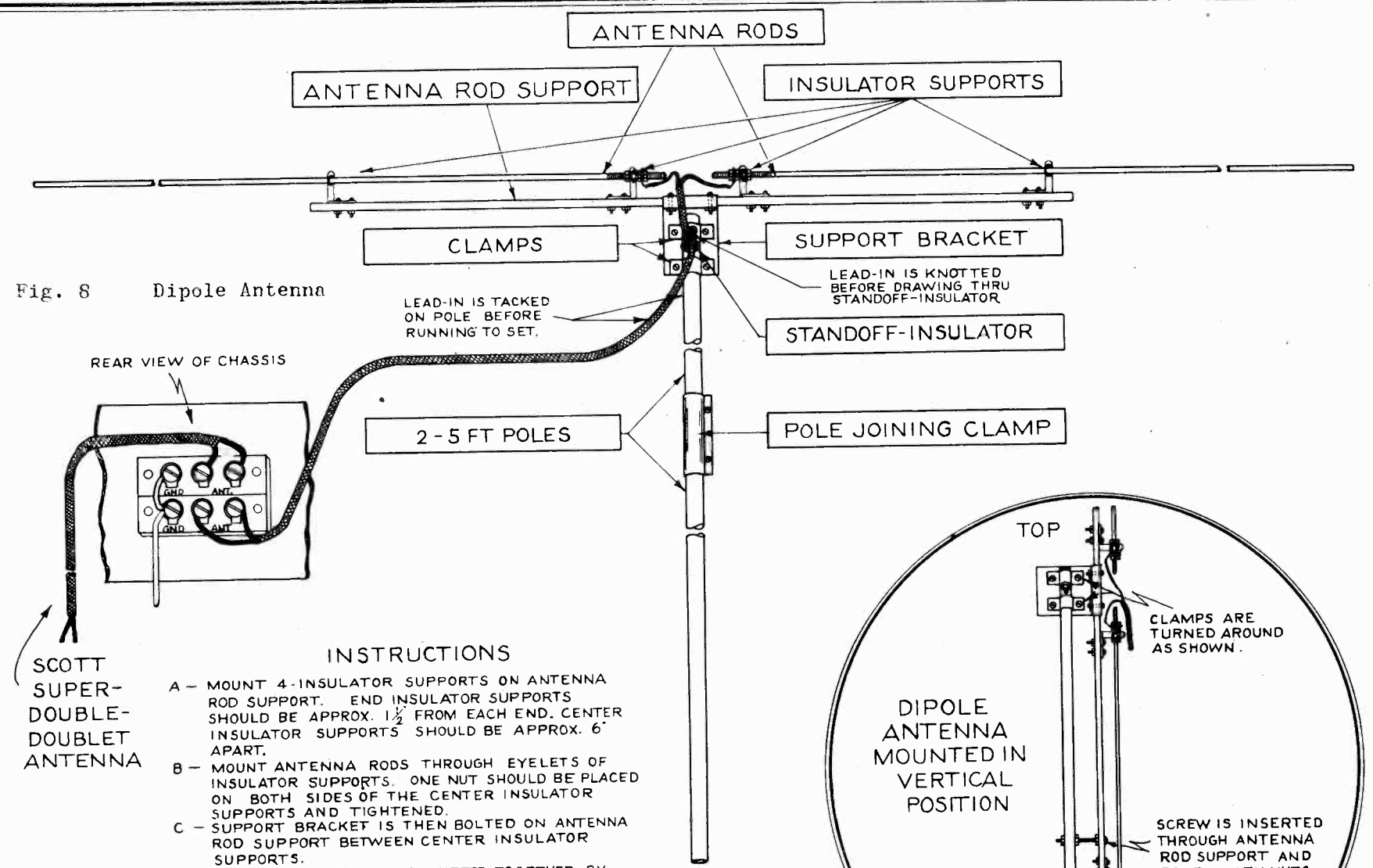


Fig. 8 Dipole Antenna

INSTRUCTIONS

A – MOUNT 4-INSULATOR SUPPORTS ON ANTENNA ROD SUPPORT. END INSULATOR SUPPORTS SHOULD BE APPROX. 1½ FROM EACH END. CENTER INSULATOR SUPPORTS SHOULD BE APPROX. 6" APART.

B – MOUNT ANTENNA RODS THROUGH EYELETS OF INSULATOR SUPPORTS. ONE NUT SHOULD BE PLACED ON BOTH SIDES OF THE CENTER INSULATOR SUPPORTS AND TIGHTENED.

C – SUPPORT BRACKET IS THEN BOLTED ON ANTENNA ROD SUPPORT BETWEEN CENTER INSULATOR SUPPORTS.

D – THE TWO 5-FT. POLES ARE FITTED TOGETHER BY THE POLE JOINING CLAMP AND THEN BOLTED ON THE SUPPORT BRACKET BY CLAMPS

E – FINALLY, FIT LEADS WITH TERMINALS ON ANTENNA RODS AND TIGHTEN WITH NUT.

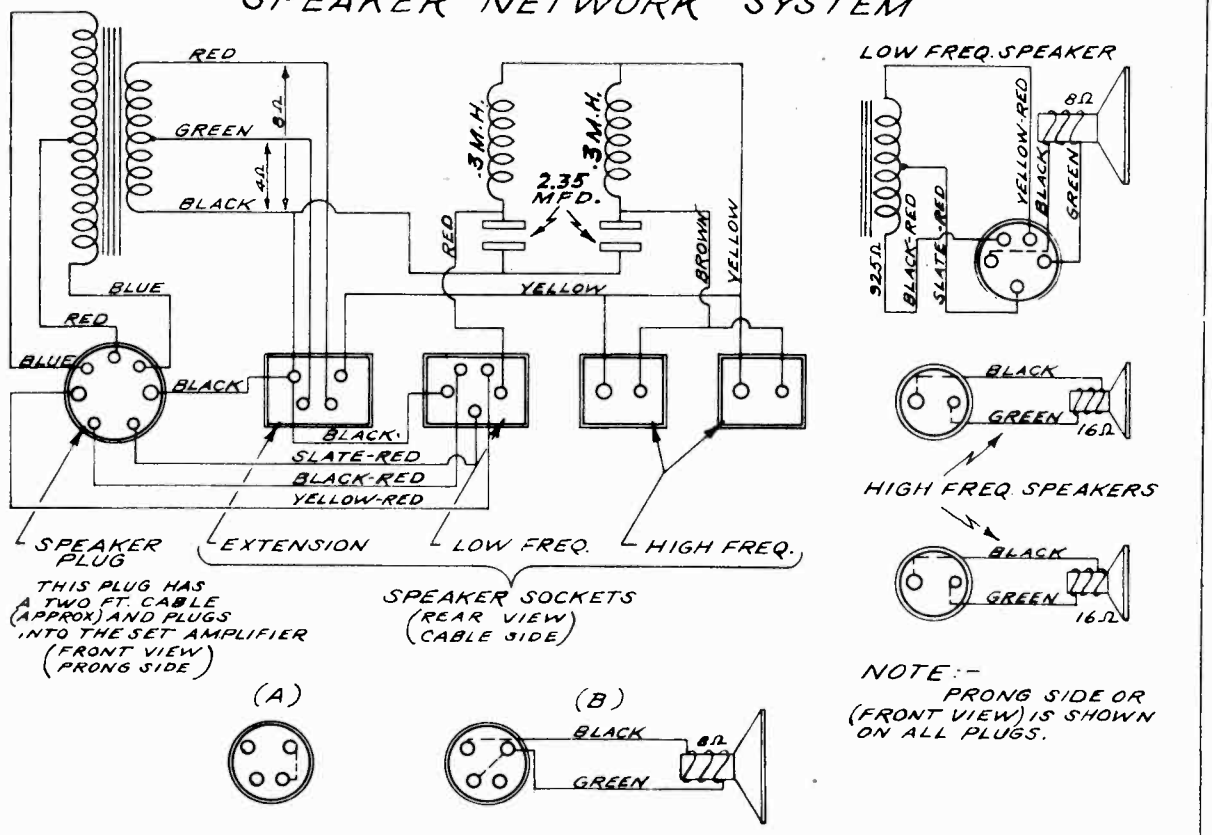
SCOTT

DIPOLE ANTENNA ASSEMBLY

MODEL FM

E. H. SCOTT RADIO LABS., INC.

SPEAKER NETWORK SYSTEM



EXTENSION SPEAKER

WHEN EXTENSION SPEAKER IS NOT USED PLUG IS WIRED AS SHOWN AT (A) AND LEFT IN EXTENSION SPEAKER SOCKET.

WHEN AN EXTENSION SPEAKER IS USED PLUG IS WIRED, AS SHOWN AT (B).

FILTER SYSTEM SHOWING VALUES FOR INDUCTANCE AND CAPACITY ARE FOR 6 K.C. AND SUPERCEDES THE VALUES FOR 2 K.C. WHICH WERE .9 M.H. FOR EACH INDUCTANCE & 7. MFD. FOR EACH CONDENSER.

FIG. 9.

ALIGNMENT CONNECTIONS FOR ALL F.M. RECEIVERS

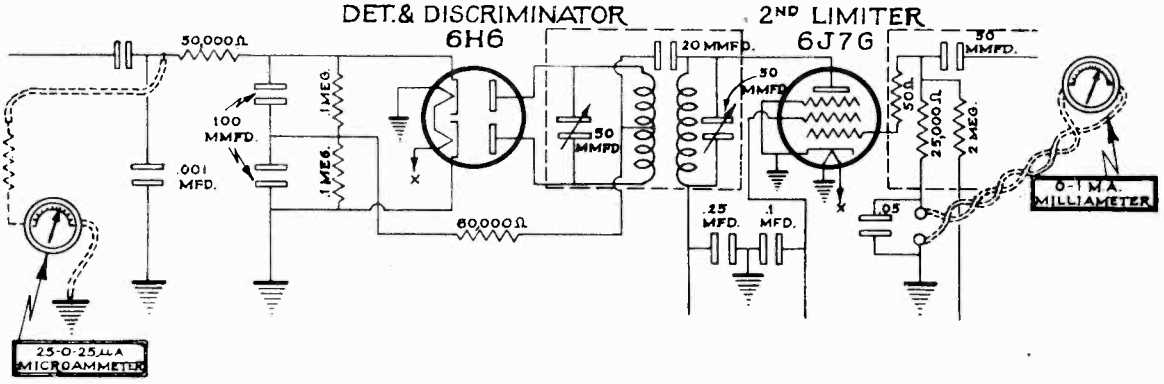


FIG. 10.

Connect the signal generator output to the grid of the 1853 r. f. tube and align the trimmer of the r. f. circuit following that tube for maximum output, that is, maximum limiter grid current; and proceed to the antenna terminals. In the Philharmonic connect the generator to the r. f. grids moving progressively toward the receiver input point and aligning each trimmer in that order.

The output of the signal generator should be fed to the antenna terminals through a 100 ohms resistor, provided the signal generator has a low internal impedance. If its internal impedance is high, the dummy resistor will have little effect; but a value of 100 ohms can still be used to avoid a complete short-circuit of the generator output If one side of the generator output is grounded, the receiver antenna terminal adjacent to the ground terminal should also be connected to ground by the jumper wire. With signal generator still tuned to 50 mc. the antenna shunt trimmer should be aligned for maximum limiter grid current.

After this alignment at the high frequency end of the band is completed the dial should be rotated to the low frequency end, about 43 mc., and the sensitivity level at that point should be compared with that which was noted at 50 mc. It should be substantially the same. Since fixed padding condensers are used in the antenna and r. f. circuits, a lack of sensitivity would indicate that the value of one of these might have changed or that the inductance of the coils might have shifted. An examination of these parts and the replacement of any defective ones should restore the sensitivity to normal. If the r. f. or antenna secondary inductance is slightly off, this may be remedied by pushing end turns slightly to obtain maximum sensitivity.

The r. f. signal generator output should be kept at a level which results in a 2nd limiter grid current of about .2 milliamperes during the alignment operations.

OBSERVATION OF LIMITER OPERATION

When the r. f. alignment is completed it is important to observe that the limiters are functioning properly The characteristic shown in Figure 7 indicates that a high degree of flatness of this characteristic can be expected. This action can be observed best by detuning the r. f. generator either +75 kc or - 75 kc with the zero center meter connected across the discriminator load as was done for the alignment of that circuit

Set the output of the r. f. signal generator to about 25 microvolts and observe the reading of the zero center meter. Then increase the output of the generator to the full 100,000 microvolts and observe the meter reading as this change is made. It should remain substantially constant. If it changes noticeably, the limiter tubes may be defective or their supply resistors may have become defective. Another cause for change in this reading is oscillator frequency shift due to a defective 6SA7. However, the latter defect will manifest itself in a different way and can be definitely isolated by tuning the signal generator to resonance which is indicated by zero discriminator voltage, and observing whether this zero point shifts when the signal level is varied from 25 to 100,000 microvolts If the oscillator frequency remains constant with varying signal input, the zero center point will not vary.

If the limiter characteristic is not flat, distortion will be noticed and the noise elimination will be somewhat less complete than normal

The following equipment is necessary for the accurate alignment of the FM sections of all Scott receivers:

1 - 0-1 ma d c. milliameter

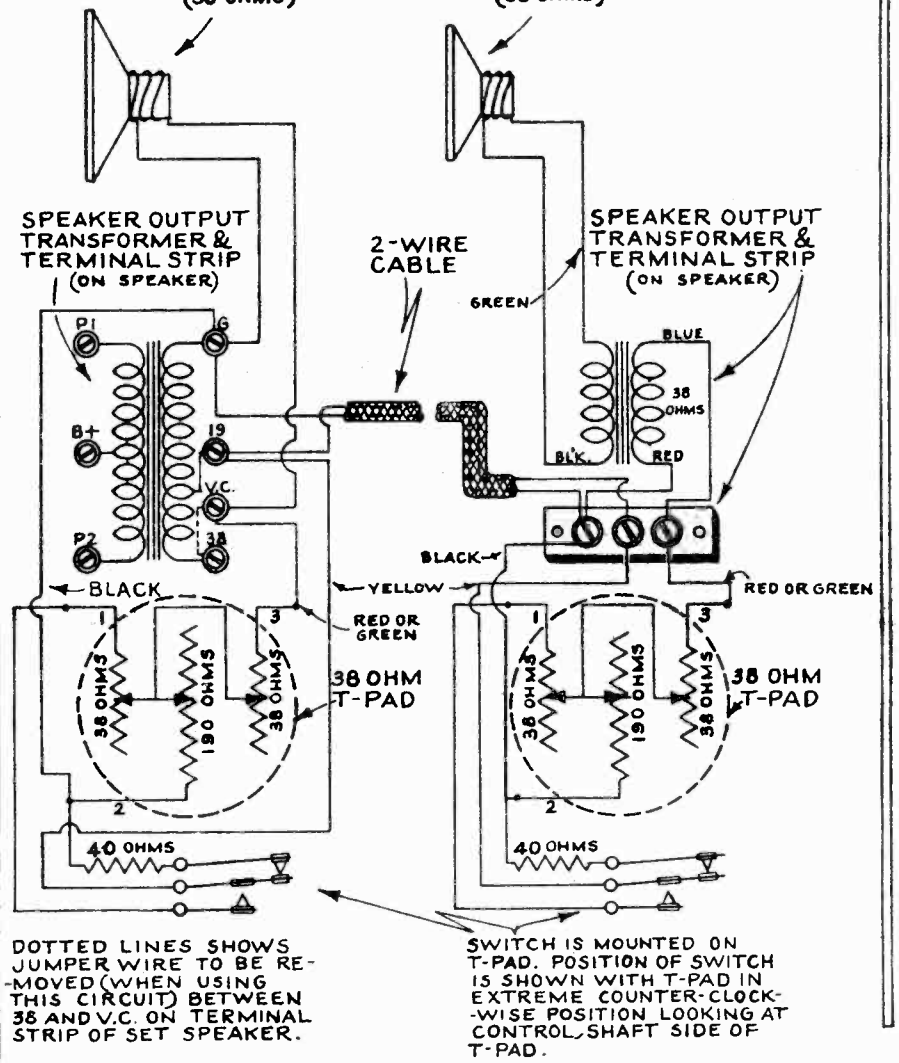
1 - 25-0-25 ma. d c microammeter with 500,000 ohms series resistor

1 - I. F. Signal Generator having a frequency range of at least 5 to 5.5 megacycles with maximum dial bandspread and 100 microvolts or less minimum to 2 or 3 volts maximum output voltage. Modulation unnecessary

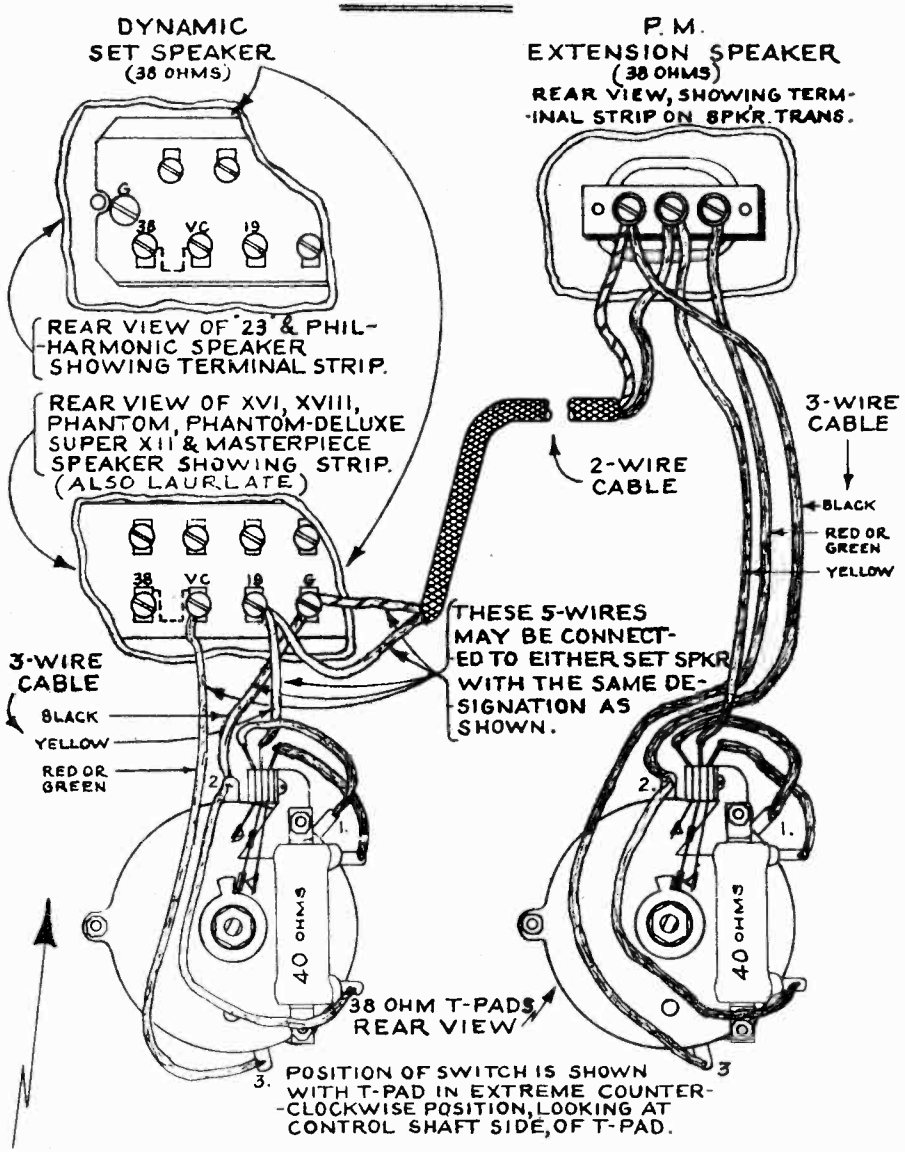
1 - R. F. Signal Generator having frequency range of 40 to 50 megacycles with r. f. output attenuator and output range of 1 microvolt to 100,000 microvolts. Modulation not essential, but variable frequency modulation is desirable.

SINGLE SPEAKER & EXTENSION SPEAKER WITH T-PADS

CIRCUIT



SKETCH



NOTE:—DOTTED LINES SHOW JUMPER WIRE BETWEEN 38 AND V.C. ON SET SPEAKER PLEASE REMOVE WHEN USING THIS CIRCUIT.

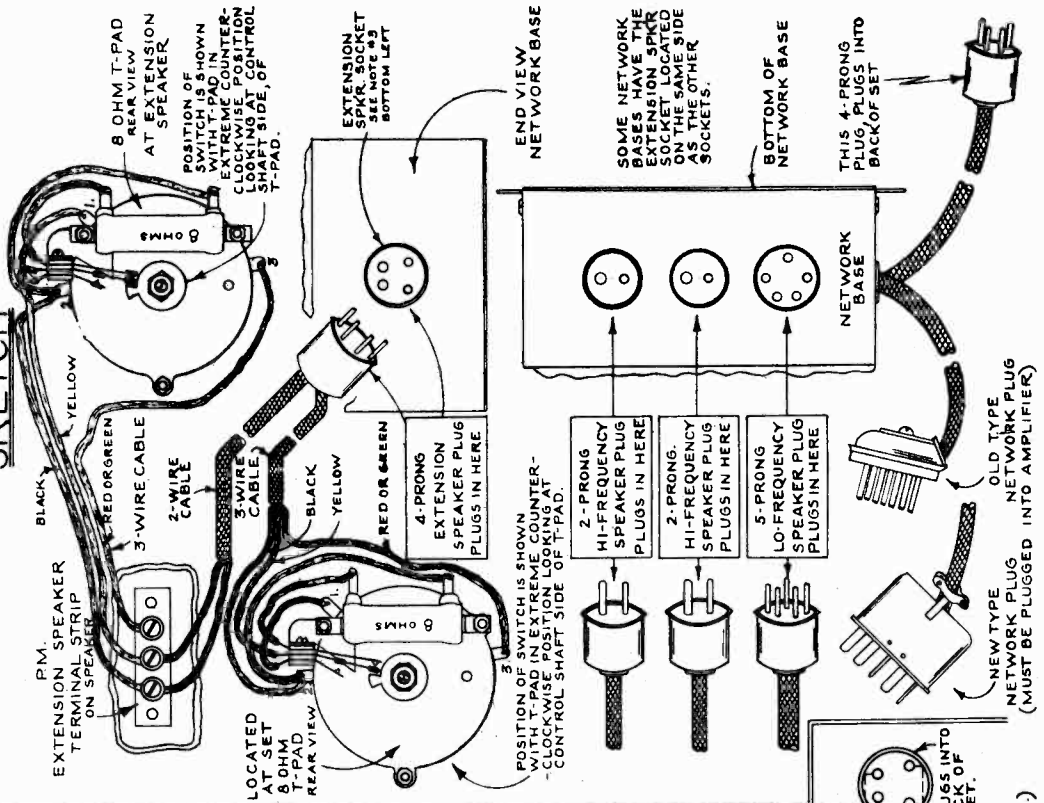
E. H. SCOTT RADIO LABS., INC.

MODEL FM

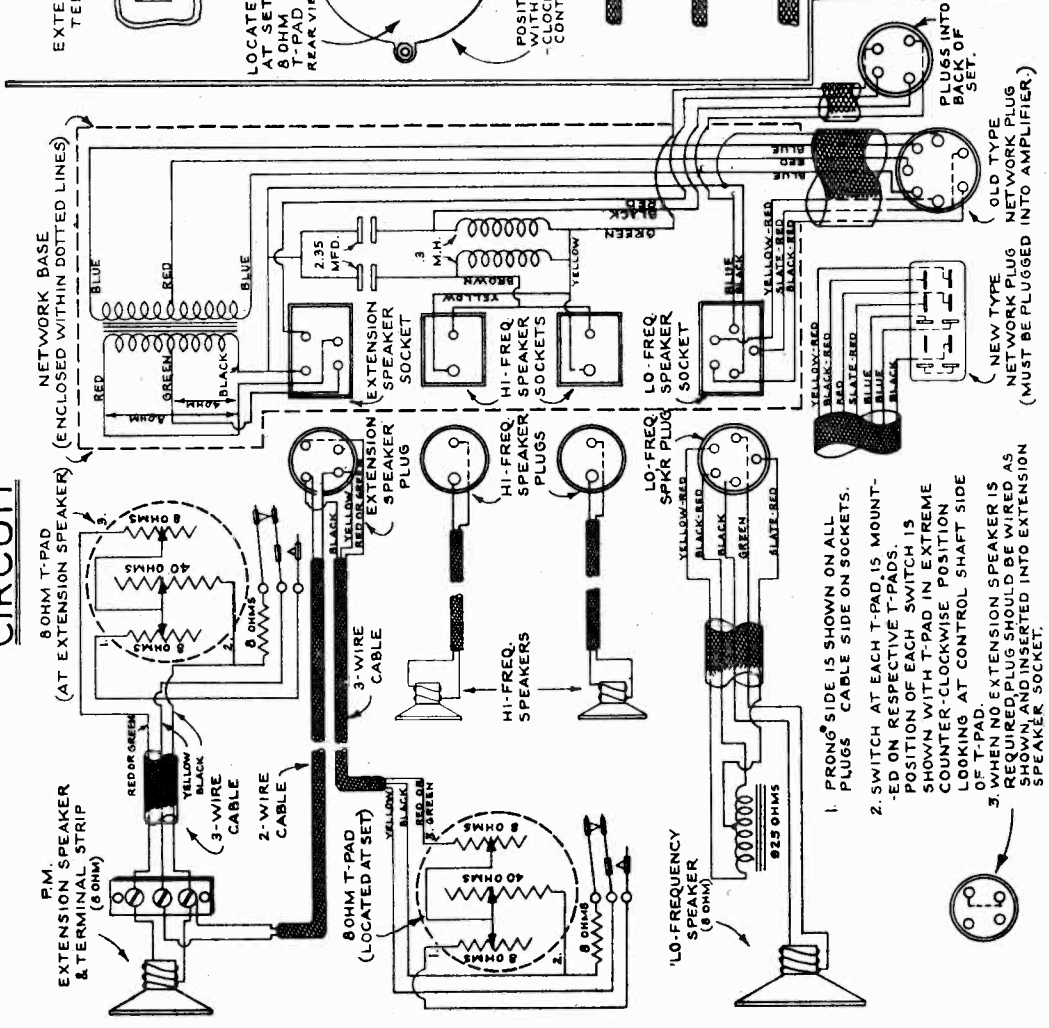
NETWORK SPEAKER SYSTEM & EXTENSION SPEAKER WITH T-PADS

E.H. SCOTT RADIO LABORATORIES INC. CHICAGO

SKETCH



CIRCUIT



MODEL Hi-Fidelity All Wave

E. H. SCOTT RADIO LABS., INC.

WHEN REPLACEMENTS ARE REQUIRED BE SURE TO ORDER BY STOCK NUMBERS SHOWN BELOW

Fig. 3

Stock No.	Part
35	Condenser No. 310
75	Grommet - 1/2" No. 430
96	Meter - 0-8
269	Cable - 7 wire, part No. 4
272	Coil - B. P. No. 298 1/25
276	Coil - Blue and red band primary
279	Condenser - .05 mfd. 200 volts
281	Condenser - .1 mfd. 400 V. Tubular new
282	Condenser - trimmer long spacers 11/32 - 50 mmf
295	Condenser - 5000 mmf reg Hole
296	Condenser - Trimmers, No. 8C-465
298	Dial Lights - 6.3 volts - No. 40
299	Drum Dial - for Imperial Model
319	Resistor - 250,000 ohms 1/4 watt
367	Resistor - 1000 ohms 1/4 watt
442	Dial Strips - Imperial
450	Shield - B. P. No. 295
451	Shield - B. P. No. 295-A
468	Strips - B. P. No. 291
477	Transformer - Audio 3088
932	Condenser - No. 858
933	Condenser - No. 878
950	Coil - M. H. 8

15

Fig. 4

15	Brackets - Resistor
45	Condenser - 50 mmfd type S reg
46	Condenser - 100 mmfd type S Regular Bakelite
47	Condenser - 250 mmfd type S Regular Bakelite
49	Condenser - 350 mmfd type S regular Bakelite
76	Grommet - 3/8" - No. 240
108	Resistor - 600 ohms 17058
120	Resistor - 100,000 ohms 1/4 watt
123	Resistor - 500,000 ohms 1/4 watt
124	Resistor - 1,000,000 ohms 1/4 watt
194	Switch - 2 blade with push button ST213
279	Condenser - .05 mfd 200 volt Tubular new
280	Condenser - .1 " " " " "
281	Condenser - .1 " 400 " " "
285	Condenser - 25 mmfd regular bakelite S
295	Condenser - 5000 mmfd regular new type W
319	Resistor - 250,000 ohms 1/4 watt
321	Resistor - 2,000,000 ohms 1/4 watt
364	Potentiometer - Type P 35-2000
366	Resistor - 750 ohms 1/4 watt
367	Resistor - 1000 ohms 1/4 watt
368	Resistor - 1500 ohms 1/4 watt
369	Resistor - 2500 ohms 1/4 watt
370	Resistor - 3500 ohms 1/4 watt
371	Resistor - 5000 ohms 1/4 watt
373	Resistor - 10,000 ohms 1/4 watt
374	Resistor - 15,000 ohms 1/4 watt
386	Resistor - 3,000,000 ohms 1/4 watt
389	Rotor plate - 292 Assembly L
398	Rotor plate - 292A Assembly S
391	Rotor Shaft - Bearing B. P. No. 310
449	Shield - B. P. No. 293
460	Socket - 18 P Special
469	Switch B. P. No. 325
470	Switch E. Spec. 14
492	Volume Control - 7075 - F Spec. 13 - Imperial
498	Shield - No. 5 AF
491	Voltage Divider - X349
897	Potentiometer - 20,000 ohms wire wound type

Fig. 5

49	Condenser
97	Mounting
192	Support
216	Tubing
282	Trimmer Long
283	Trimmer Short
293	Condenser
295	Condenser
437	Condenser
	Broadcast Band Oscillator Coil
	Blue band oscillator coil
	Blue band R. F. coil
	Red band oscillator coil
	Red band R. F. coil
	Green band oscillator coil
	Green band R. F. coil

Fig. 5A

45	Condenser - 50 mmfd. type S. reg.
88	Lugs - No. 1465
270	Can - 2x2x2 No. 01806
273	Coil - B. P. No. 299 Diode
274	Coil - 8 Millihenry
280	Condenser - .1 mfd 200 V
281	Condenser - .1 400 V. Tubular new
283	Condenser - 50 mmfd. V810 new type shor
285	Condenser - 25 mmfd. regular bakelite S
288	Condenser - 75 mmfd. regular bakelite S
367	Resistor - 1000 ohms 1/4 watt
373	Resistor - 10,000 ohms 1/4 watt

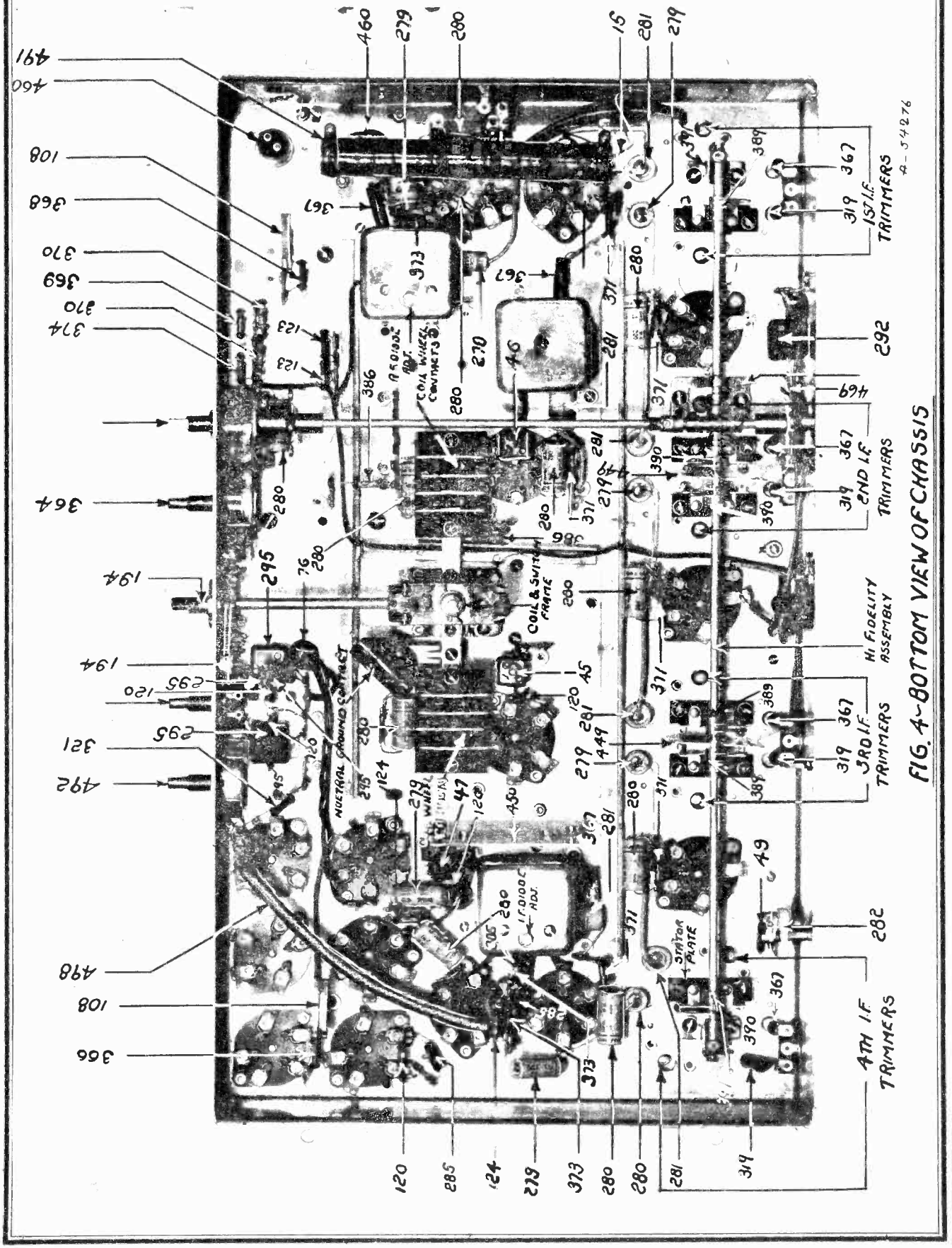
LIST OF PARTS FOR AMPLIFIER

Fig. 6

10	Fuse Base - 4 amp
37	Condenser - 2 mfd 200 volt
40	Condenser - 656 - .05 400 volt
72	Fuse - 4 amp
78	Phone Jack
165	Sockets - 2A3
166	Sockets - 5Z3
190	Attenuator Strip
200	Terminal - 1 lug
648	Condenser Bracket
649	Attenuator Bracket - B. P. No. 322
651	Choke - 30 Henry
652	Choke - 10 Henry
654	Choke coil - 3.6 M. H.
655	Choke coil - 72 M. H.
657	Condenser - .1.1 mfd 400 volt
658	Condenser - A.13 mfd 300 volt
660	Condenser - Electrolytic
661	Condenser - Electrolytic - 100 mfd.
665	Fuse - 3/4 Amp.
667	Fuse Base - 3/4
669	Hum Control - 10 ohm
670	Resistor - 10 ohms 1/2 watt
671	Resistor - 150 ohms 10 watt
672	Resistor - 500 ohms 10 watt
675	Socket - Speaker connecting
676	Socket - Set connecting
677	Socket - 83 V
679	Switch - Hi-Low
680	Transformer - Audio
681	Transformer - 110 volt 60 cycles
682	Transformer - 220 volt
683	Transformer - 110 volt 25 cycle
949	Condenser - .25 - .25 1250 volt

E. H. SCOTT RADIO LABS., INC.

MODEL Hi-Fidelity
All Wave



MODEL Hi-Fidelity
All Wave

E. H. SCOTT RADIO LABS., INC.

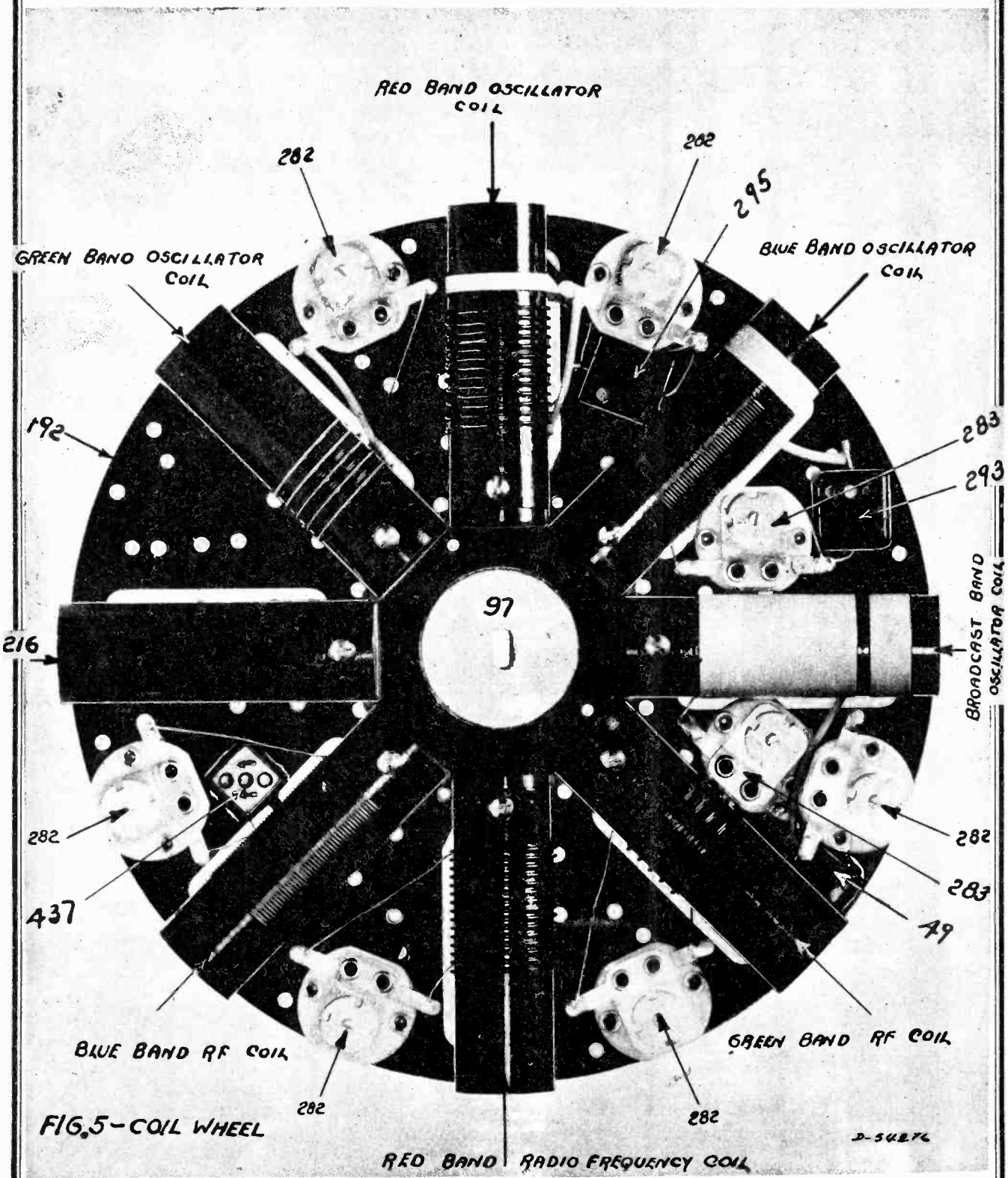


FIG. 5 - COIL WHEEL

E. H. SCOTT RADIO LABS., INC.

MODEL Hi-Fidelity
All Wave

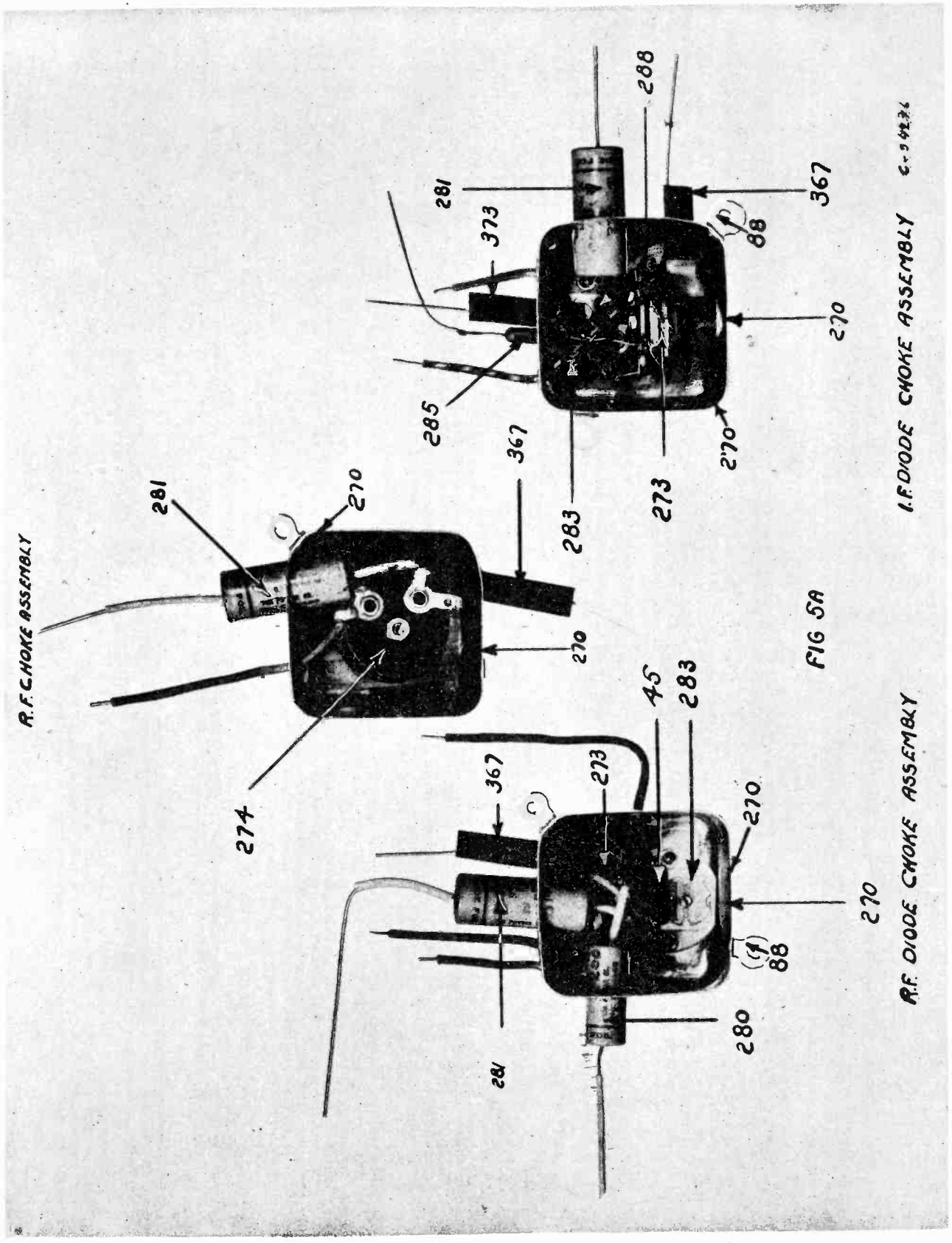


FIG 5A

CALIBRATION OF DIAL IS NOT CORRECT

If the tracking is not correct stations will not come in at the correct dial point. The calibration of the oscillator dial should not be off more than 5 kc. on the broadcast band nor more then 1/2 of one percent on any of the short wave bands.

The dial strip should first be checked to see if it has slipped off its support. If the dial settings are off on all stations by the same amount, the dial has probably slipped on the shaft and will have to be re-set. The method of checking this is to turn the dial to the low frequency end, the marker should be approximately at the bottom of the words KIL-MEG. If it has moved considerably either way, loosen the 2 screws that hold the dial to the shaft and re-set the dial. If this does not remedy the difficulty it may be due to the fact that the inter-electrode capacity in the oscillator tube has changed, or if a new tube has been used, it is different from the one used when the set was calibrated. If this appears to be the case other oscillator tubes should be tried.

If the above suggestions do not clear up the trouble further tests should be abandoned and the I. F. Amplifier should be aligned before attempting to track.

HOW TO ADJUST THE INTERMEDIATE FREQUENCY

Due to pronounced AVC action in the Scott Full Range Receiver the ordinary method of using an output meter to indicate alignment and tracking is not entirely satisfactory and if possible a 0-30 D.C. Microameter such as the Weston Model 600 should be used. It should be shunted by a 10,000 ohm resistor and a 500,000 ohm resistor placed in series with the side. An oscillator for generating a frequency of 465 Kc. is also required. The Microameter is connected to the terminal that the 10,000 ohm resistor and lead going to the volume control is soldered. The positive side of the microameter is connected to ground (chassis base).

The signal should be fed to the Control Grid of the 6A7 tube with an .025 condenser in series with the oscillator lead to prevent shorting out of the bias of this tube. Put all tube shields on the set and ground chassis.

Refer to the figure showing underside of chassis and location of I. F. transformers. Now with a strong signal of 100 M.V. or over, begin adjusting the I. F. Diode trimmer for Maximum reading on Microameter of output meter. Now do the same for the 4th I. F., 3rd I. F., 2nd I. F. and first I. F. transformer. Make certain that the Selectivity Control is in Maximum selectivity position, Wave Change Switch in broadcast position, Bass Control in minimum position, and Sensitivity Control set to Maximum. Now measure the bias from the cathode of the noise suppressor tube and set this bias to 9.5 Volts by the small adjustable 600 ohm resistor.

CALIBRATING DIAL FOR BROADCAST BAND

With the marker now set so that it is at the bottom of the Kil-Meg mark the actual calibration may now be undertaken. Reference to Fig. 7 will indicate the order of adjustments.

NOTE: It is unlikely that the following procedure will need to be carried out in full for coils that have been previously adjusted, but is given for use where new coils are to be used. Otherwise only trimmers need be adjusted.

It is unnecessary to remove the cover from the three gang condenser. DO NOT BEND THE PLATES OF THE 3 GANG CONDENSER as these are adjusted at the factory and should never have to be touched. We strongly urge the use of a tuning wand for doing this work accurately. One end of this device has a core such as Polyiron and the other brass. When the inductance of a coil is high, insertion of the brass end will decrease it to the proper resonant value; whereas, insertion of the other end will increase it to the correct resonant value.

Have the wave change switch set to the broadcast position. Sensitivity Control in Minimum position, selectivity control in Maximum selective position, or in extreme counter clockwise position, and bass control in minimum position to left. Remove the shield cans from the antenna and R. F. Coils and substitute similar ones having holes in the top for access to trimmers. Set these trimmers to minimum capacity and connect oscillator into Antenna post thru the correct "dummy".

Set the signal generator and receiver dial to 1400 kc. then adjust the oscillator trimmer at B until the signal is loudest, set signal generator and receiver to 600 kc. and adjust the padder at A until signal becomes maximum. Made certain that all shields are in place while making these adjustments. Trim the R. F. and antenna coils at 1400 kc. Turn back to 600 kc. and see if the adjustment still holds by checking the antenna and R. F. coils with a tuning wand. If insertion of the brass end increases the signal the inductance is too high and turns will have to be removed. If insertion of the other end raises the signal then turns must be added, but if either end causes the signal to drop the coil inductance is correct. Now set the selectivity control to the maximum selective position (all the way to the left). Turn the receiver tuning dial back to 1400 kc. and check the adjustment of the antenna and R. F. trimmer condensers. The output meter should show maximum output under these conditions. If it does not, readjust the antenna and R. F. trimmer and recheck at 600 kc. as outlined above. It will be found that the trimmer condensers will be almost at a minmum when the set is correctly aligned.

ADJUSTING THE BLUE BAND

The antenna tuner cover should be removed by taking out three screws from the bottom of the chassis base. The coil wheel shield plate should now be replaced. Throw the Wave Change switch to the blue band, sensitivity control to Maximum position, selectivity control to maximum selectivity and bass control to minimum bass. Set the signal generator and the main dial to 4 megacycles and adjust trimmer at B until the oscillator signal is heard. Adjust the R. F. trimmer at C and antenna trimmer at E to maximum output on the output meter.

> NOTE: When adjusting the short wave bands and using a strong signal, there will be an "image" signal removed from the fundamental frequency by 930 kilocycles. Be careful to select the right peak, which is obtained when the oscillator is tuned 465 kc. above (not below) the signal frequency.

The low frequency end is adjusted at 2 Megacycles by adjusting the inductance of the oscillator and R. F. coils. If the signal tune is high in frequency the inductance is decreased by spreading the turns at the ends of the coils. If low in frequency the inductance is increased by pushing the turns together.

To check the proper inductance of the antenna and R. F. coil, the tuning wand is used as decribed previously.

ADJUSTING THE RED BAND

The wave change switch is now set to the red band position. All other controls are left as described previously.

Set the signal generator and the main dial to 10 Megacycles. Adjust the trimmer at A until the signal is heard. Now adjust the R. F. trimmer at C and antenna trimmer at F to Maximum output.

The low frequency end is adjusted at 6 Megacycles and is accomplished in the same manner as described previously.

ADJUSTING THE GREEN BAND

Set the wave change switch to the green band. All other controls are left as described previously. Set the signal generator and the main dial to 20 Megacycles and carefully adjust the trimmer at A until the generator signal is heard. Adjust the R. F. trimmer at C and the antenna trimmer at G until maximum output is obtained.

The low frequency end is adjusted at 12 Megacycles by changing the inductance of the coils as previously described.

In the latest Scott Allwave High Fidelity receiver air tuned condensers are used in the I. F. amplifier. These condensers maintain their capacity settings and are more stable than the older type. It is especially desirable to use them in humid climates. Where the I. F. Amplifier seems weak and has low sensitivity it may be advisabe to change the trimmer type and use the air tuned condensers. The following instructions should be carefully followed:

INSTRUCTIONS FOR INSTALLING AIR CONDENSERS IN THE SCOTT FULL RANGE HIGH FIDELITY RECEIVER

1. Remove the bottom plates from the receiver.

2. Remove the large round cans from the I. F. Coils. Be very careful in removing these cans so as not to damage the I. F. Coils in any way.

3. Unsolder all wires from the trimmer condensers. Be very careful so as not to burn or otherwise damage I. F. coils for if one strand of wire is broken the coil is ruined and must be replaced. The resistance of each coil is 11 ohms. If one strand or more of the wire is broken the resistance will be less.

4. Loosen the two screws holding the trimmer to the chassis base which can be gotten at from the underside. After the trimmers are loosened, remove them and replace with the air condensers. You will notice that seven of these air condensers are alike. That is, two plates are missing from the fixed section and one of the condensers has the full number of plates. This condenser mounts in the First I. F. stage in the plate circuit of the converter. This means that the I. F. coil for this circuit also has to be changed. We will send a coil with the proper inductance which is 8 Milihenry inductance. We wish to caution you again to be very careful in making changes so as not to damage the I. F. coils. Now replace all wires and make certain that the same connections are made.

5. Now replace the I. F. cans, and be careful in removing the grid caps from the wire so that the same grid leads can be used.

6. Remove the two condensers and resistors which are in series with the grid leads of the audio transformers.

7. Turn the terminal holding the .05 audio coupling condenser so that there will be room to mount the shield plate 5 5/8" from the left hand end of the chassis and 4" from the front. This plate should be mounted parallel to the end of the chassis and is used to shield the oscillator coil from the diode and audio frequency circuits. If this shield is not used, the set will oscillate violently at the lower frequency end of the broadcast band. It will be noticed that there are two mounting holes on this shield. After the shield is in place as described, mark the chassis base for these two holes drilling them with a No. 31 drill and tapping for 6/32 screws. Be very careful in drilling these holes so as not to go thru too far, thereby damaging the audio transformer. Be sure to mount this shield so that the end having the shortest flange from the mounting hole is toward the front of chassis.

8. The series audio condensers and resistors that were removed are mounted on this shield on the opposite side of the oscillator coil very near to the bottom of the shield.

9. Mount the 1/2 Meg. 1/4 watt resistor across the Primary of the 4th I. F. coil. The best position for this is from the resistor end in insulated sleeve to the air trimmer terminal.

10. Remove the old antenna leads from the antenna coil and ant. binding post to the 4 point switch and replace with the shielded leads furnished. Ground shield to chassis.

11. Remove the .025 mfd. condenser from the audio Compensator switch and move all the other condensers one contact point forward or "down" on the switch when chassis is underside up. The required parts for the change are:-

1 - 1/2 Meg. 1/4 watt resistor	1 - Air Condenser No. 878 - 933
1 - I. F. shield part No. 450	8 - Brackets for mounting air condensers Part No. 947
1 - Ant. shield wire 11 1/2" No. 937	
1 - Ant. shield wire 10 3/4" No. 936	2 - 1/8 x 6/32 R.H.N.P. Screws No. 393
1 - .8 M. H. I. F. Coil, No. 950	1 - 1/2 x 6/32 R.H.N.P. Screws No. 142
7 - Air Condensers No. 858 - 932	1 - Nut 6/32 N.P. No. 99

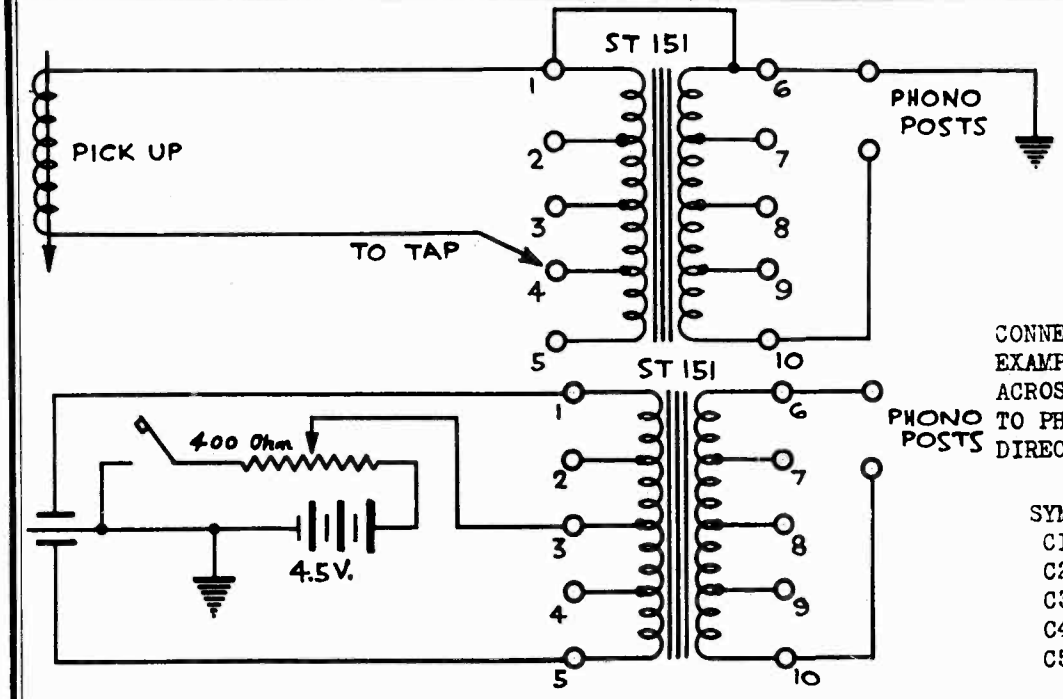
Also in the power amplifier of early design it has been found that the two 1/4 mfd. tubular condensers across the 5Z3 and 83-V choke inputs occasionally give trouble, and these should be replaced by a dual unit incased in a can. This is part No. 952. It is only necessary to remove the tubular condenser. Mount this unit in the amplifier opposite the 2 mfd. unit in the block can be drilling three holes, and wire in place of the tubular condensers. With the amplifier underside up and the condenser mounted, the two top lugs are the terminals of one condenser and the bottom lugs are the terminals of the other condenser. Check the continuity meter if there is doubt.

On sets used in Europe, the attenuator coils and condensers have different values than for American use, since it is designed for 9-kc attenuation.
It will be noticed on the schematic that the output transformer secondary is tapped and designated as 19 and 30 ohms. This refers to the impedance of the load or voice coil that these windings are to match and not their ohmic resistance. All other chokes and resistances are marked with their ohmic resistance. The input and output transformers have winding resistances as shown below.

	PRIMARY RES.	SECONDARY RES.
Input transformer No.3088 (6C6 to PP 6C6)	1800	..... 3000 to C.T.
Input transformer No.3078 (PP 6C6 to PP 2A3)...	180 to C.T.	... 700-0-1000
Output transformer in speaker	50-0-48	..... (G-T2) - 2 ohms (G-T1) - 3 ohms
Voice coil resistance	15 ohms	

Some of the earlier sets have the tubular type 1000-volt, 0.25-mf condensers across the 5Z3 and 83V choke input circuits. Later sets use a dual 1250-volt unit mounted in a can.

An improvement has recently been made in the oscillator circuit for eliminating weak spots in the green band. Refer to the sketch showing these new oscillator connections. It consists in directly grounding the cathode of the oscillator by a lug riveted to the chassis. This is shown in the sketch.

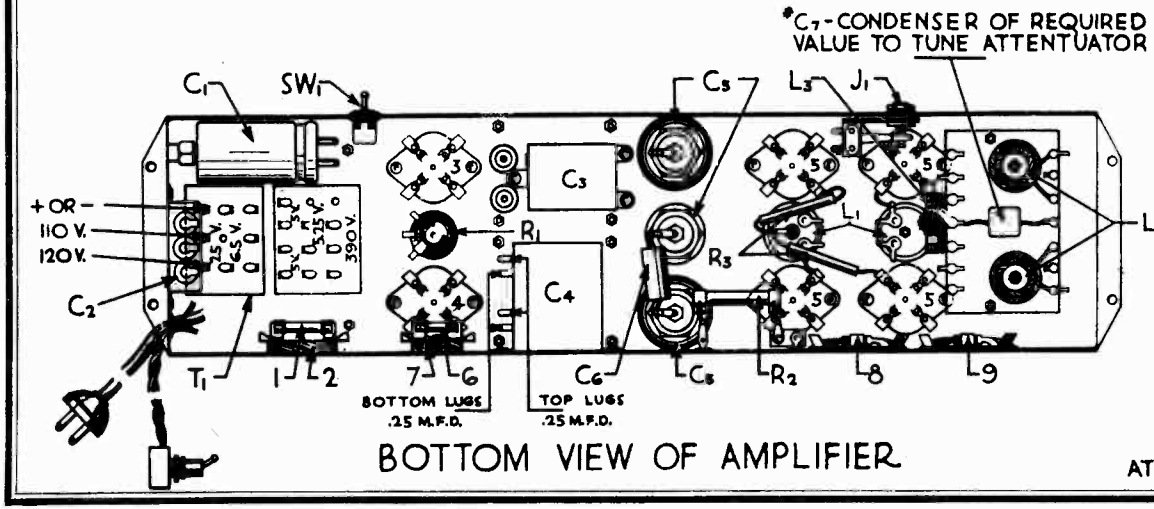


CONNECTIONS WHEN USING CARBON MIKE

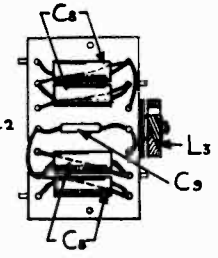
PRIMARY		SECONDARY	
TAP	IMPEDANCE	TAP	IMPEDANCE
2 - 3	12.5	6-7	1560
3 - 4	25	6-8	6250
4 - 5	50	6-9	25000
1 - 2	75	6-10	100000
1 - 3	150		
1 - 4	300		
1 - 5	600		

CONNECT PICKUP ACROSS TAPS WHICH MATCH ITS IMPEDANCE EXAMPLE: FOR PICKUP OF 2000 OHMS; CONNECT PICKUP ACROSS SECONDARY TERMINALS 6-7; TERMINALS 6 AND 10 TO PHONO POSTS. PICKUPS OVER 4000 OHMS CONNECT DIRECTLY TO PHONO POSTS.

PHONOGRAPH CONNECTIONS TO SCOTT XXIII



BOTTOM VIEW OF AMPLIFIER



BOTTOM VIEW OF ATTENUATOR UNIT

SYMBOL	VALUE	STOCK NO.
C1	100 mf,50 v	661
C2	.1-.1, 300 v	657
C3	2 mf,200 v	37
C4	2×.25 mf,1250v	949
C5	30 mf,475 v	660
R1	10 ohms	669
R2	150 "	671
R3	.25 meg	673
T1	Pwr.Trans	681
1	Fuse- 4amp	961
2	Fuse Base	10
3	83V Socket	677
4	5Z3 "	166
5	2A3 "	165
6	Fuse-.75 amp	665
7	Fuse Base	667
8	Socket set	676
9	" Speaker	675

SYMBOL	VALUE	STOCK
C6	.05 mf,400v	656
C7*	(See below)	
C8	.13 mf	658
C9	3500 mf	664
R1	10 ohms	669
L1	1 mh	653
L2	3.5 mh	654
L3	72 mh	655
J1	Phone jack	78
SW1	Hi-Low Switch	679
	Attenuator strip	190
	Switch Off-On	193
	A-F Transformer	680
	Choke 30 h.	651
	" 30 h.	652
	A-C Cable	21
	EXPORT SET VALUES	
C8	.15 mf	799
L2	3.7 mh	707
L3	84 mh	708
T1	Pwr.Trans-25 ~	683
T1	" 220-volt	682

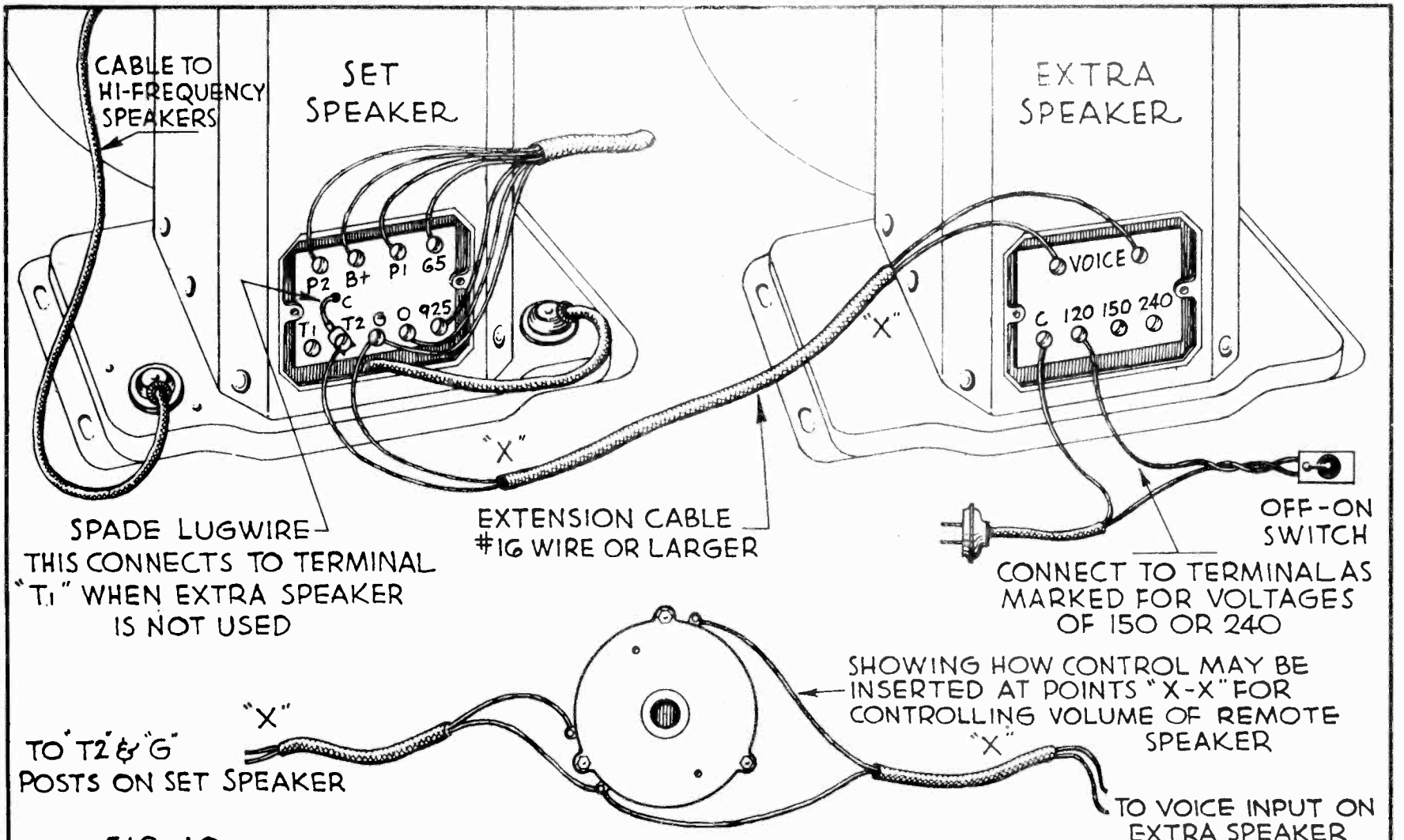


FIG. 10 BACK VIEW OF CONSTANT IMPEDANCE VOLUME CONTROL

• EXTRA SPEAKER INSTALLATION FOR SCOTT FULL RANGE • • HI-FIDELITY ALLWAVE RECEIVER •

MODEL Hi-Fidelity
All Wave

E. H. SCOTT RADIO LABS., INC.

A AMPLIFIER VOLTAGE READINGS

TEST NO.	TEST POINT Line Voltage 112 volts	CORRECT VOLTAGE READING	PROBABLE CASE OF INCORRECT READING
1.	C. T. of 83-V Hi Voltage Wndg. to plates of 2A3's (2A3 Plate V.)	310	Defective 83-V shorted filter condenser Line voltage low, Shorted. 25 mfd. input Condenser. Defective 10 HEN. Choke shorted attenuator. Open M. H. coils. Open Primary on output transformer. Defective 2A3 tubes.
2.	C. T. 83-V Hi-Voltage Wndg. to Gnd. (2A3 - BIAS V)	63	3/4 Amp. fuse open. Bias filter condenser shorted. Open connections to fields in Hi-Frequency speaker, or to field resistor in low-frequency unit if used. Hi-frequency field open. Field resistor open. Defective 5Z3. Shorted 2 mfd. condenser.
3.	C. T. Pri. P.P. 2A3 Input Transformer to Gnd.	250	Defective 5Z3. Shorted .25 mfd. input condenser. Shorted filter condensers open or shorted fields. Defective 30 HEN. choke. Defective B-Stick in set Chassis. Shorted or grounded by-pass condensers or resistors in set.
4.	C. T. 5Z3 Hi Volt Wndg. to gnd. (Noise Suppression Bias)	20	Defective 5Z3. Shorted 100 mfd. dry electrolytic. Open or shorted 150 ohm resistor. Short in chassis divider network.
5.	Across 925 ohm speaker field.	135	Shorted .05 condenser across field Shorted or open field.
6.	Filaments	2.5 For 2A3 6.5 For set 5 on Rectifiers	Shorted wiring or windings. Defective hum control.

SET CHASSIS VOLTAGE READINGS

Volume control - Minimum; Sensitivity Control - Maximum; Fidelity Control - Minimum - Line Voltage 112 volts.

7.	Plates 6C6 Audio to Gnd.	235	Open Pri. on P.P. Input Trans. Same Tests as in No. 3.
8.	Plates 6C6 1st Audio	230	Open Pri. on 1st Audio Trans.
9.	2nd Stage Audio Bias & 1st stage audio Bias. Measure from CT Secondary of 1st Audio Trans. to GND.	7 1/2	Defective Bias resistors. Defective 6C6 tubes. Shorted contacts on Condensers or open resistors in bass control. Open Audio Trans. winding.
10.	Plates 4th, 3rd, 2nd, 1st I. F. Tubes	235	Open plate resistors or open I.F. primary coils.
	3rd, 2nd, 1st, I. F. Screen	90	Open Screen Resistors. Shorted by-pass condenser.
11.	Cathode of Noise Suppressor to Gnd.	9 1/2	Open Resistors
12.	Tuning Meter Amplifier Plate V.	238	Same test as No. 3. Open cathode resistor or wrong 600 ohm resistor adjustment.
	Cathode to Gnd.	9 1/2	
13.	Oscillator Plate	118	Shorted by-pass condenser. Open coil or 10,000 ohm resistor.
14.	4th IF Bias, measure from outside 1/4 meg. Grid coil Resistor.	4 1/2	Defective resistor, 6D6 tubes or shorted by-pass.
	4th IF Screen	95	Open screen Resistor
15.	Converter Plate	230	Open plate resistors or I.F. Primary Test as in No. 3.
	Converter Screen Converter Bias at Resistance Network	70 3	Defective Resistor, divider or by-pass
16.	RF (AVC) Plate	230	Open Coil of Resistor Test as in 3
	Screen	100	Open Resistor in Plate
	Bias (Cathode to Gnd.)	6	Defective Resistors or by-pass.
17.	R. F. Plate	225	Open Plate Primary Resistor
	R. F. Screen	92	Open Resistor, shorted .1 mfd.
	Bias	3	
	Measure at network		
18.	Beat oscillator Plate	225	Open coil - Poor Switch Contact
19.	Neon, Oscillator Side to ground	120	Open 10,000 ohm resistor
	per tube	60	

ALIGNMENT OF FM SECTION

DISCRIMINATOR ALIGNMENT

A circuit diagram of the connections for this operation is shown in Fig. 3. Connect the zero center microammeter with series resistor as shown and connect the output of the model 12 generator (tuned to 5.25 Mc) through a .05 mfd. condenser to the grid terminal of the 6SJ7 limiter. Increase output of the model 12 signal generator to its maximum output level. Rotate the plate trimmer condenser at the top of the discriminator transformer shield can until the zero center microammeter swings to a maximum deflection in either direction from zero. Then rotate the secondary trimmer condenser at the bottom of the discriminator transformer until the meter indicator swings through zero with increasing or decreasing current depending upon the direction of rotation of the trimmer adjustment. Adjust for zero meter indication under these conditions.

Detune the signal generator back and forth about + 200 kc. If the discriminator circuit will swing through a positive peak in one direction and through a negative peak in the other direction. However, these peaks may not be of equal amplitude at this stage of the alignment procedure. They can now be adjusted for equality by going back over the plate trimmer adjustment the serviceman will soon find that it is relatively simple to attain peak equality in the discriminator circuit.

The peaks should be about 300 kc apart or + 150 kc. from the resonance frequency, which is 5.25 Mc, and the variation of the zero center meter current should be linear on either side up to at least + 80 kc. The final goal of discriminator alignment is to attain this linearity over at least + 80 kc. and after obtaining linearity, the serviceman should finally readjust the plate trimmer slightly to obtain this result even at a sacrifice of peak equality. The linearity and equality of the + 80 kc. deviation characteristics are essential to distortionalists audio reproduction for a wide-band FM receiver. If the characteristics is found to be linear out to + 100 kc. then finally adjusted, it is so much the better to allow for overmodulation at the transmitter.

When the adjustment of the discriminator transformer is completed, the zero center meter should indicate zero when the signal generator is tuned to 5.25 mc.

The diagram of the general shape of the discriminator characteristics will be found in Fig. 5 under model Philharmonic.

FM IF AMPLIFIER ALIGNMENT

The 0-1 ma. milliammeter should be inserted in the ground side of the 25,000 ohms grid leak in the input circuit of the 6SJ7 limiter tube. A jumper connection and bypass condenser have been provided under the chassis at this point in the receiver. The wire from the IF transformer is color-coded slate and white and is connected to a terminal strip near the 6SJ7.

After the meter is inserted the IF signal generator (tuned to 5.25 Mc) should be connected through a .05 mf. condenser to the grid terminal on the socket of the second 6AC7 IF amplifier and the primary and secondary alignment screws of the third IF transformer should be adjusted for maximum limiter grid leak current. The output of the signal generator should be adjusted so that the limiter current is about .2 milliamperes while the tuning adjustments are being made. Since it is possible to align the IF coils with cores either out or in, it is important to make sure that they are peaked with the adjustment screws in the outward position in order to insure proper coupling between the coils.

The second and first IF transformer should be aligned in this order by moving the signal generator input progressively forward to the first 6AC7 and the 6SA7 grid. All of these connections are on the respective sockets, because of the single ended construction of these tubes. Each transformer alignment screw should be adjusted for maximum limiter grid current, as the signal input is fed into the amplifying tube directly in front of it. After all of these adjustments have been made, the individual stages

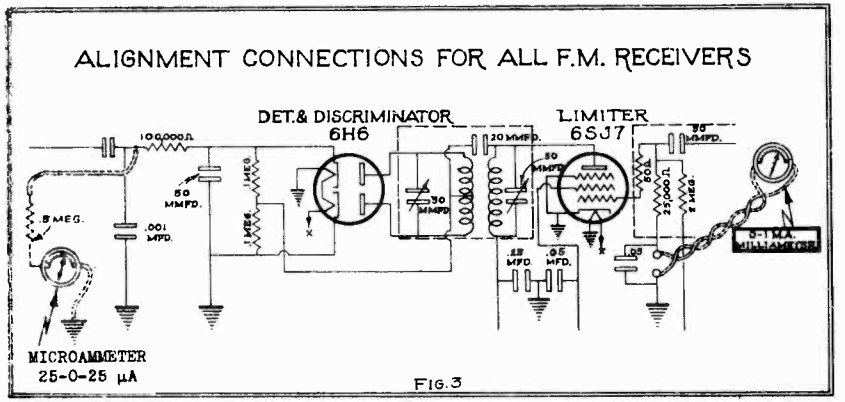


FIG.3

shoudl not be realigned except by the above procedure; that is, the IF adjustments should be made individually for each stage by the point-to-point method and no overall re-adjustments should be made.

Because of the high gain in each IF stage of the Scott Laureate it may be found when the IF alignment is completed that the overall selectivity peak does not occur at exactly 5.25 MC, where the signal generator was set during the procedure. If this is the case, the signal generator should be tuned to the point where maximum output occurs, and the tester should go back to the secondary trimmer of the discriminator transformer and readjust it slightly so that the zero current point coincides exactly with the peak of limiter grid current. The IF signal should then be fed into the grid of the limiter and discriminator linearity shoudl be rechecked and adjusted to equality by the primary tuning condenser if necessary. This readjustment of the discriminator to align its characteristic exactly with the wave shape of the IF selectivity curve is essential for optimum results and minimum distortion. However, in no case should the required readjustments be more than slight. If the discriminator zero and the selectivity peak are too far removed excessive regeneration is indicated.

The overall IF selectivity characteristic may be checked by detuning the signal at least + 75 kc or more from the frequency of maximum output and by observing the amount of attenuation. The characteristic should resemble that shown in Fig. 6 of the Scott Frequency Modulation Data Manual. As pointed out there, a small amount of dissymmetry can be tolerated, because of the limiter characteristic.

FM RF CIRCUIT ALIGNMENT

With the 0-1 Mc. meter in the limiter grid leak circuit, connect the Model 12 signal generator output through a .05 mfd. condenser to the grid terminal of the 6SA7 mixer tube.

Observe that the dial pointer still travels exactly to the low frequency end stop used for AM alignment. Turn the tuning knob to rotate the pointer to 50 Mc. and adjust the signal generator for a 50 Mc signal. With sufficient output from the generator to enable an easy location of the signal, rotate the oscillator trimmer C8 until a peak of limiter grid current is reached. Since the oscillator must be peaked on the low frequency side of the incoming signal, it should be observed that the trimmer C8 is set a about 50% of its total capacity.

Connect the signal generator output to the grid of the 6AB7 RF tube and align the trimmer C9 of the RF circuit for maximum limiter grid current.

Proceeding to the antenna terminals the output of the signal generator should be fed through a 100 ohms resistor. The receiver antenna terminal adjacent to the groun

terminal should be connected to that point by a jumper wire. With the signal generator still set at 50 Mc., the antenna shunt trimmer C10 should be aligned for maximum limiter grid current.

After this alignment at the high frequency end of the band is completed the dial should be rotated to the low frequency end, about 43 Mc., and the sensitivity level at that point should be compared with that which was noted at 50 Mc. It should be substantially the same.

Since fixed padding condensers are used in the antenna and RF circuits, a lack of sensitivity would indicate that the value of one of these might have changed or that the inductance of the coils might have shifted. An examination of these parts and the replacements of any defective ones should restore the sensitivity to normal. If the RF or antenna secondary inductance is slightly off, this may be remedied by spreading or pushing end turns slightly to obtain maximum sensitivity.

BUILT-IN ANTENNA ALIGNMENT

The use of a built-in loop antenna introduces a new alignment problem in the AM broadcast and short wave ranges. In checking a receiver on the bench it will be desirable to remove the loop from the cabinet and perform alignment operations on this circuit under conditions which may be slightly different than those in the cabinet. Also whenever a receiver is installed in the cabinet after servicing, it will be desirable to make the necessary slight readjustments to assure that the loop circuits are in resonance.

When alignments are made on the bench precautions should be taken to insure that the loop is remote from metal objects which may seriously affect its inductance. Also the signal pickup is quite high on the broadcast band loop and usually a large number of stations will be tuned in unless the receiver and the antenna are placed inside a screened room, from which all aerial lead-in wires are completely removed. However, it is possible to obtain satisfactory alignment even in the presence of considerable outside signal pickup, if the signal generator is set at such frequencies that its signal does not coincide with that of some of the local broadcast stations.

Connect the signal generator input through a 100 ohm resistor to the antenna terminals on the loop terminal board. The antenna terminal nearest to the ground terminal should be connected to that point. In the AM broadcast band align C3 for maximum tuning eye closure at a frequency around 1,400 kc. and adjust L3 for maximum closure at a frequency around 600 kc. In the short wave band align C7 for maximum closure at 15 megacycles and L4 for maximum closure at 10 megacycles. Correct alignment can also be detected by listening to inter-station noise provided the local noise level is not too high. If tuning eye indication is used, the eye can be snapped out of its holder and allowed to hang down in the rear of the chassis where it can be seen.

CONNECTING EXTRA SPEAKER

Provision is made for connecting an extra speaker to either the single 15" speaker system or the co-axial high fidelity speaker. In the case of the former the extra speaker must either have a voice coil impedance of 38 ohms or must be matched to that value by a suitable transformer. In the latter case provision is made for plugging an extra speaker having an 8 ohm voice coil impedance into the dividing network.

In case the extension speaker is disconnected from the single speaker system the jumper must be changed to connect terminals "VC" and "38" together. In the case of the co-axial system a small plug which is furnished with the dividing network must be reinserted when the extra speaker plug is removed.

WAVE CHANGE SWITCH TROUBLE

Poor contact in the wave change switch can generally be corrected by slightly bending the contacts involved. However, in case a switch section is accidentally damaged beyond repair, this section can be replaced by removing the two screws which support the wave change detent plate and very carefully pulling out the wave change switch shaft. The damaged section can then be unsoldered, removed and replaced with a new unit which should be obtained from the Scott Laboratories in Chicago before the change is made in order to assure exact duplication of switch position and connections. Note particularly that the small notch near the center of the switch rotor must be in the same position in each switch section.

SYMPTOMS OF TROUBLE

If the set is tuned to a strong local station and the tuning meter moves back and forth as the sensitivity control is varied, this indicates that the I-F amplifier is weak or out of adjustment. The antenna should be disconnected and with volume and sensitivity full on and fidelity control one-third to the right, there should be a rushing noise over the whole of each band. If this does not happen, the I-F adjustment is off and this should be corrected as outlined.

If the sensitivity appears to drop off rapidly as selectivity is increased, it is also an indication of poor I-F adjustment or incorrect bias. This bias will vary from 3 volts for max. fidelity and selectivity to 9.5 for min. fidelity and max. sensitivity. Do not loosen any of the band-spread condensers on the common shaft, as the spacing of the plates has been set.

HUM

If the set appears to have undue hum, it is probably due to an unbalanced condition of the 2A3 tubes. Adjust the hum control for min. output on an output meter and try all possible combinations of the 2A3's in their different sockets. Carefully avoid any possibility of inductive or stray pickup from cables, phonograph leads, and wiring. Tubes should also be checked.

PHONOGRAPH OPERATION

On the older type 23-tube receivers, the phono input was of the low-impedance type and was connected in the cathode circuit. On the newer receivers, the input is of the grid injection type or high-impedance input. On the new receivers, pickups from 4000 ohms inpedance and up may be directly connected to the phono posts, while on the older receivers, matching transformers are required in most cases.

OPERATION OF EXTRA SPEAKERS

The output transformer normally matches a 10-ohm voice coil, but it is arranged so that another 19-ohm voice coil may be connected in series with the set speaker and the total load connected to T1 with correct loading. T pads may be used for individual controls and a suggested arrangement is shown in Fig. 10. (Note the terminal C is not ground on this speaker, but is the ungrounded side of voice coil.)

The earlier type loud speaker was arranged with an output transformer with the following output impedances: 38 ohms; terminal G to T1, for one single Scott speaker (38-ohm voice coil) --- 19 ohms; terminal G to T2 for two Scott speakers (38-ohm voice coils) --- 4 ohms; terminals T1 to T2 for single low-impedance speaker. One side of the voice coil in the speaker is connected to the frame of the speaker, the other side is brought out to a spade lug so that it may be connected to either of two terminals. For a single speaker the flexible lead marked C is normally connected to T2. When an extra speaker is desired, the flexible wire with the spade lug is connected to T1. The voice coil leads of the extra speaker are then connected to terminals marked G to T2. This provides operation of two 30-ohm impedance voice coils in parallel.

CAUTION

Never remove the 5Z3 tube from the amplifier when the set is on, as it will blow the fuses and may damage the receiver.

TUNING METER

If the tuning meter cannot be made to respond by tapping it, it should be tested for continuity and, if found defective, should be replaced. Its removal will not affect general operation.

ADJUSTING THE BLUE BAND OR LONG-WAVE BAND ON EXPORT RECEIVERS

Remove the antenna tuner cover and replace the coil wheel shield plate. Throw the wave-change switch lever to the long-wave band, sensitivity control to one-half max., selectivity to max., and bass control to min. Set the signal generator and the main dial to 170 kc and adjust the padder at A until the oscillator signal is heard. Repeat at 350 kc and trim at B. With less generator input, spot 170 again and align. Repeat at 350 kc and adjust the R-F trimmer at C and antenna trimmer at E to max. output on the diode or output meter. This must all be done after the BC band has been aligned.

The Scott Phantom covers all frequencies from 550 Kc. to 22.2 Megacycles in four bands, taking full advantage of a high gain R.F. stage on all bands. The perfected Scott Supershield Antenna Coupling System is employed to provide effective antenna lead-in noise reduction on the important shortwave bands, and broadcast band. In addition, a new and advanced type of noise-reducing double-doublet is employed on all bands.

Other circuit developments include a means for providing control of bass and treble frequencies - a highly stabilized electron coupled oscillator - silent tuning between stations - separate R.F. and I.F. AVC control systems - self-balancing phase inverter - cathode ray tuning indication - phonograph input - beam power output stage with inverse feed-back - noise limiter circuit - automatic scratch suppression and an I.F. amplifier having variable selectivity.

ELECTRICAL DESCRIPTION OF THE CIRCUIT

R. F. Section

The antenna input circuit is arranged so that when operating on the two shortwave bands and broadcast band, the signal picked up on the flat top portion of the doublet antenna is transferred to the R.F. tube grid by means of the special shielded ring coupling system, achieving a high degree of noise reduction. Noise reduction is also achieved on all bands due to the use of a special filter at the antenna. On the police band the signal is fed directly into the primary coil shorted out to minimize circuit loss. The first tuned circuit resonates and amplifies the desired signal. On shortwave and police the second tuned circuit operates directly from the plate of the R.F. tube and feeds directly into the converter grid reducing losses to a minimum. A 6U7G tube, having high mutual conductance is used in the R.F. stage which gives high sensitivity on all bands.

Converter Section

The amplified signal from the R.F. amplifier is applied to the 6L7G converter control grid and the oscillator output is coupled to grid No. 3. These two input signals now both modulate the converter cathode emission and the result will be a difference in frequency component in the plate circuit of the converter which represents the I.F. frequency.

Oscillator Section

The proper combination of series padders, shunt trimmers, and coils in the oscillator circuit provide a signal frequency 455 Kc. higher than that to which the R.F. section is tuned. The efficient 6J5G type oscillator tube is used in an electron coupled circuit. Oscillator potentials are carefully by-passed and filtered, and the circuit is made extremely stable by the use of Silver Cap condensers and a special metalized grid resistor.

I.F. Section

The I.F. amplifier consists of three stages employing three 6K7G tubes. The I.F. transformers are wound in single pi sections in both primary and secondary coils, and are permanently tuned by a combination fixed and adjustable air condenser. In addition, each stage is arranged with resistance capacity filters for each circuit. The I.F. system is arranged for three degrees of selectivity by means of a small tapped coil connected to the grid return of the I.F. secondary and closely coupled to the primary in the 2nd and 3rd stage. The degree of coupling is then controlled by varying the selectivity switch. The signal developed in the converter plate circuit is highly amplified in the I.F. amplifier at 455 Kc. and is passed to the second detector.

R.F. and I.F. AVC Systems

The Scott Phantom employs two separate AVC systems. In the R.F. AVC circuit the control grid of the 6B8G tube is capacitatively coupled to the plate of the 6L7G converter tube. I.F. and signal frequency are amplified and rectified by this tube and applied as control on the 1st R.F. grid and converter tube. This prevents overload in the R.F. stage and helps to reduce the effects of noise and distortion when tuned to powerful locals and also protects the first tube from these effects when the set is tuned to a weak distant station that is near in frequency to a powerful local. This AVC action operates only when the input signal exceeds about 1,000 microvolts.

In the I.F. AVC circuit the 6H6G tube acting as part of the noise limiter circuit and diode detector supplies AVC voltage for control on the 1st and 2nd I.F. tube grids and prevents overload and distortion in this part of the circuit.

Just below the volume control is the sensitivity switch which will decrease the maximum sensitivity of the receiver, when to the extreme left, by increasing the minimum bias of the I.F. AVC to approximately 30 volts. This provides silent tuning between stations but in no way affects the normal AVC action on the stations which are well above the noise level.

Detector

As mentioned above, the 6H6G tube acts as a second detector in addition to its other functions, and handles high percentage modulation signals with a minimum of distortion.

Record Scratch Suppression

The Scott Phantom employs the feature of automatic scratch suppression using a 6B8G and a 6J7G in a special circuit which attenuates the higher audio frequencies (corresponding to record scratch) when they are very weak, but passes unattenuated the stronger high frequencies (corresponding to useful high fidelity reproduction).

The 6B8G tube operates as an amplifier and diode to supply rectified bias voltages, (proportional to input signal amplitude for frequencies above 1,500 cycles) to the control grid of a 6J7G tube. The circuit is arranged so that the effective capacity of a 35 mmf. condenser, amplified to a maximum of approximately 3,000 mmf. by the gain of the 6J7G tube, is in shunt with the first A.F. 6K7G tube grid at audio frequencies.

When the higher audio frequencies are weak no rectified bias is developed by the 6B8G tube allowing the 6J7G tube to operate at maximum gain, shunting a high capacity from the grid of the first AF tube to ground, thus practically eliminating record scratch. However, when the higher audio frequencies are strong, considerable rectified bias is developed in the 6B8G tube and applied to greatly reduce the gain of the 6J7G tube, thus reducing the effective capacity, shunting the input to the first A.F. tube and allowing all frequencies to pass unattenuated.

Audio Amplifier

When the wave change switch is set to position "P" the input to the three stage audio system is automatically connected to the phonograph input terminals on the rear of the chassis. A volume control tapped for bass compensation is employed at the input circuit of the 6K7G first audio tube and in the plate circuit of this tube the variable bass and treble control circuits are connected. The bass circuit utilizes a high "Q" resonator choke system and provides a boost of about 15 db at 75 cycles in the maximum position.

The first audio tube is followed by the 6J5G phase inverter tube. This circuit is self-balancing and couples into the grids of the 6J5G pushpull 2nd audio

tubes which operate into the balanced primary of a special driver transformer, the secondaries of which in turn apply the signal to the 6V6G beam power output stage.

The power output stage incorporates inverse feed-back which helps to flatten loudspeaker response and improves reproduction.

Noise Limiter Circuit

Part of the diode detector is utilized as a noise limiter device so that peaks of local electrical interference may be "chopped" off resulting in some reduction of noise when the receiver is tuned to a weak signal, particularly on shortwaves.

Power Supply

The power supply used is of the heavy duty type employing two of the new 5V4G heater type rectifier tubes. The primary of the power transformer is arranged for standard 115 volts on the domestic model. On the foreign model it is designed to accommodate either 115 volts or 230 volts AC by proper placement of the fuses. This is clearly shown on the schematic diagram. The rectified plate voltages are filtered by the use of three high capacity electrolytics, a choke and the speaker field employed as another choke. In addition, the bias voltage is further filtered by the use of a 50 mfd. condenser.

Loud Speaker

The loud speaker employed is arranged to provide connections for an external speaker. It is necessary only to remove the terminal cover, disconnect the jumper wire between terminals V.C. and 38, and connect it between V.C. and 19 instead. Now connect a 38 ohm speaker to the terminals marked 19 and G. "T" pads may be added by reference to the diagram showing these connections.

HUM TESTS ON RECEIVER

Make certain that there are no soldering irons near the chassis and that the power transformer end of the amplifier is as far away from the chassis as possible. Connect a good output meter, having a resistance of 3,000 ohms or more to the 6V6G plates (No. 3 prong) and have a 1 to 2 mfd. condenser in series with one lead to the meter.

With bass full on, treble full, and volume off, the hum should not exceed .2 of a volt. To make overall tests, remove the 2nd audio 6J5G tubes. The hum should now drop to less than 0.1 volt. If it does not, the amount of hum read on the meter is the hum in the amplifier itself. Leave the tubes just removed out and change the 6V6G tubes in the amplifier, at the same time adjusting the hum control on the amplifier until the hum is reduced to a minimum. There may be filament shorts also. Check the circuit and connections to get the hum out of the amplifier before proceeding with the rest of the test.

NOTE: It is highly important, in minimizing hum, to use the spiral heater type 6K7G and 6J5G tubes in the audio system since while considerable bass boost is available, tubes are the sole source of hum, there being no hum pickup whatsoever in chokes, transformers, etc.

After the amplifier is found to be OK replace the 2nd audio tubes and remove the inverter and 1st audio, substituting a new tube for the 2nd audio tube until the hum is reduced to a minimum, allowing sufficient time in each case for the tubes to heat up properly. Next try the inverter tube in the same manner and follow with the 1st audio 6K7G. It may be necessary to push the filament wires nearer the base and away from the grid wiring on some of the tube sockets; also, the dial light circuit may be shorted against the dial frame. All these points should be checked along with the trying of new tubes.

AUDIO GAIN TEST

With an audio input signal of 0.5 volt at 400 cycles an output reading of between 18-20 volts should be obtained on the output meter which is connected across the voice coil. Make this test with volume full, bass control full, fidelity full and band switch in phono position. If the gain is low it may be due to defective tubes, wrong voltages, shorts or open circuits, either in the set or power amplifier. Both should be checked.

AUDIO FIDELITY TESTS

For correct high fidelity reproduction it is important that the electrical frequency response of the audio system, from the phono posts to a 38 or 40 ohm dummy voice coil resistor approximate 5 volts at 75 cycles and 6 volts at 6,250 cycles with the bass and fidelity controls on full, after the output has been carefully adjusted, by means of the volume control, to 1 volt at 400 cycles with an input of 0.1 volt at each frequency. Failure of the system to approximate this response (if you are certain that your meters are accurate and that no series meter condenser, which would "cut" low frequencies, is being used) should lead to analysis of the low or high frequency circuit involved to determine and eliminate the trouble.

HOW TO ADJUST THE AUTOMATIC RECORD SCRATCH SUPPRESSION CIRCUIT ON THE SCOTT PHANTOM

Connect an output meter across the voice coil circuit (V.C. to G.). Connect an audio oscillator and a sensitive output meter to the phono posts, and turn the wave switch to position "P" (all way to right). With the bass control set to minimum, treble control full on, and scratch suppressor switch off, (to left) apply 0.25 volt at 3,500 cycles to the phono posts. The scratch suppressor switch is on the back of the set. Set the volume control so that 1 volt is obtained on the output meter across the voice coil. Turn on (to right) the suppressor switch and the 1 volt reading should just start to drop (say to .9 v.). Now turn the suppressor switch off and reduce the audio oscillator input to 0.05 volts, reset the volume control to obtain a 1 volt reading again on the voice coil output meter and now turn on the suppressor switch. The 1 volt reading should now drop to a level of 0.2 of a volt or slightly under. This gives a reduction ratio of 5 to 1 and this is the proper ratio to maintain. If this 5 to 1 reduction is not obtained the 6 volt bias should be reduced slightly by varying the small slider arm in the C divider network, until the hiss is reduced slightly. It will have to be determined by substitution of various resistors. If too much control is obtained, the 6 volt bias may be raised by adjusting the slider arm.

The 6B8G tube determines the level at which the circuit starts to cut high frequencies and the 6J7G tube determines the amount of this cut.

Alignment of I.F. Section

Connect a good signal generator to the input of the I.F. system. Turn the wave band switch to the broadcast band; have sensitivity switch to maximum position (to right); turn tuning dial pointer to Hi-Freq. end of dial. Ground the I.F. AVC line by connecting a jumper wire from it to Gnd. Now set the selectivity switch in the sharp position (all the way to left).

Connect the negative terminal of a 20,000 ohm per volt DC voltmeter using the 25 volt scale, (or a sensitive microammeter with a 0.5 meg. resistor connected in series with its negative terminal) to the "I.F. Diode Output Point", and connect the positive terminal to the chassis.

Apply an unmodulated 455 Kc. signal of sufficient strength to produce a diode output voltage reading of approximately 10 v. (or 20 microamperes for the microammeter) and very carefully adjust the 1st, 2nd, 3rd, I.F. transformers and I.F.

diode trimmers for maximum meter reading, reducing the input, if necessary, to avoid exceeding the above figures.

Adjust the R.F. diode transformer for maximum output after the I.F. stages are aligned. Remove the 1 meg resistor from ground that is connected to the R.F. diode output point (10,000 ohm) and put the high resistance DC meter in series with the 1 meg resistor to ground, the positive side of the meter going to ground. If there is sufficient signal from the generator it will be OK to merely connect the negative terminal of the microammeter to the R.F. diode output point. Put in a strong signal until a variation is noted and adjust the R.F. diode for maximum output. Adjust the diode trimmers very carefully. Also shunt out the coil you are not adjusting, with a 10,000 ohm resistor while trimming the other circuit; namely, put 10,000 ohms from B+ to the 6B8G plate then trim the secondary. Shift the resistor to diode plates and 10,000 ohm diode output point and trim the primary.

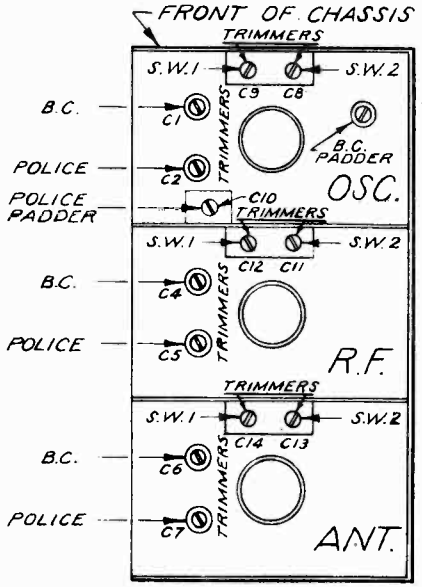


Fig. 2 - Location of Trimmers

Alignment of R.F. Sections

Before starting on this portion of the set, it is important to understand how the tuning wand tool works. One end of this device has a core of material such as Polyiron while the other end is brass. When the inductance of a coil is high, insertion of the brass end will decrease it to the proper resonant value; whereas, insertion of the other end will increase the effective inductance. This gives a very convenient means of determining whether or not it is necessary to add or remove turns from the coil. In the following instructions only a slight adjustment of trimmers and padders should be necessary where original coils are used. Full instructions, however, are given to cover the case where new coils are to be used.

Broadcast Band Alignment

First turn the dial pointer completely to the low frequency dial stop and see that the pointer reaches 1/16" beyond the lowest frequency mark. Turn the wave band switch to the "Broadcast A" position, set the bass control to minimum, treble control to maximum and sensitivity switch to minimum and connect an output meter across the voice coil. Adjust oscillator trimmer C1, until a 1,400 Kc. signal as set on the dial is tuned in from the generator. Rotate the dial to 600 Kc. and tune in a 600 Kc. signal from the generator by adjusting the padding condenser C3. Check the dial at 950 Kc. and if it tunes high in frequency spread turns on the oscillator secondary, If it is low in frequency push the turns together and then readjust trimmer condenser C1, and padder condenser C3, as before.

With the oscillator circuit correctly spotted, tune in a signal from the generator at 1,400 Kc. and use the output meter as indicated.

Have as weak a signal as possible and adjust trimmers C4 and C6 for maximum output. Turn the dial to 600 Kc. and check the alignment of the R.F. antenna and pre-selector stages with a tuning wand, spreading turns on the coil where less inductance is needed and pushing turns together if more inductance is required.

Readjust the trimmer condenser C4 and C6 for maximum at 1,400 Kc. Turn the dial to 950 Kc. and check the alignment of the R.F. and antenna stages.

Police Band

Set the wave band switch to the Police "B" band position and turn the dial to 3.7 megacycles. Tune in a signal from the generator by adjusting trimmer C2, then turn the dial to 1.8 megacycles and tune in a signal from the generator by adjusting the padder C10. Check the alignment at 2.5 megacycles and if off, either push together or spread turns on the oscillator secondary as described under "Broadcast Band Alignment". Readjust trimmer C2 and padder C10 until correctly aligned. Tune in a signal at 3.7 megacycles and adjust trimmers C5 and C7 to maximum output. Now check the alignment on 1.8 megacycles with a tuning wand and make any necessary corrections by pushing or spreading turns on the coils and readjusting trimmers C5 and C7. Recheck the alignment at 2.5 megacycles.

Foreign S.W. -C- (SW 1)

Set the wave band switch to the "C" position and tune in a signal at 9 megacycles by adjusting trimmer condenser C9. Turn the dial to 5 megacycles and if necessary to correct the calibration do so by spreading or pushing turns on the coil and readjusting the trimmer condenser C9. Check the calibration at 6.0 megacycles.

With the oscillator calibrated, tune in a signal at 9 megacycles and adjust trimmer condensers C12 and C14 for maximum output. Check the alignment at 5 and 9 megacycles and make any necessary corrections by pushing or spreading turns on the coils and readjusting trimmers C12 and C14.

Foreign S.W. -D- (SW 2)

Set the wave band switch to "D" position and tune in a signal at 20 megacycles by adjusting trimmer C8. Check and if necessary correct the calibration at 12 megacycles by pushing or spreading the turns on the oscillator coil. Check the calibration at 15 megacycles.

With the oscillator correctly aligned tune in a signal at 20 megacycles and adjust trimmers C11 and C13 for maximum output. Check the alignment at 12 and 15 megacycles and make necessary corrections by pushing or spreading turns on the coils. Now, readjust trimmers C11 and C13.

CONNECTING EXTRA SPEAKER

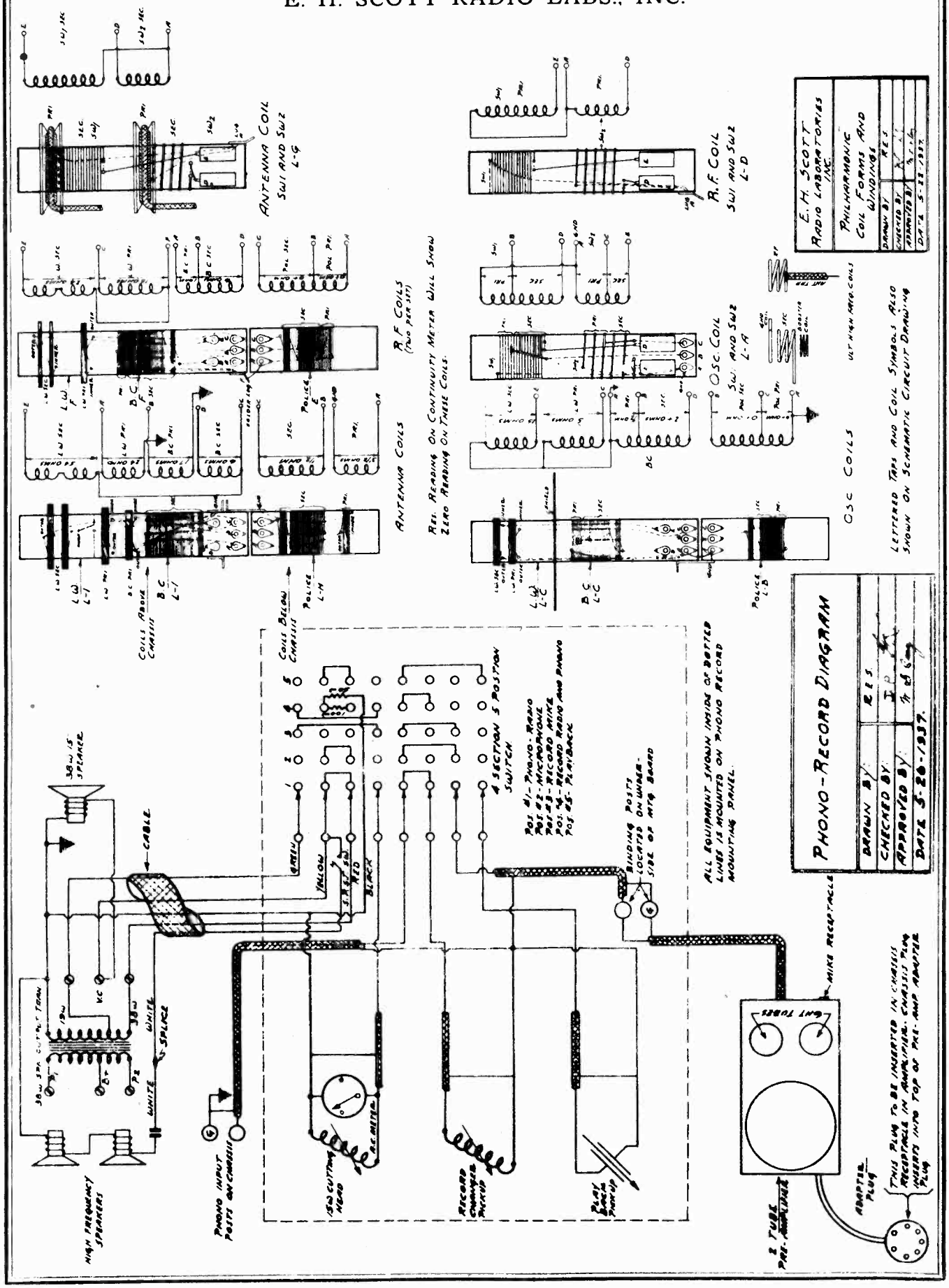
The new type High Fidelity Scott permanent magnet 38 ohm voice coil speaker may be readily connected to a Scott receiver with the optional "T" pad inserted in the voice coil leads where separate control of the extension speaker volume is desired. In case the extension speaker is disconnected the jumper might be changed to connect terminals "V.C." and "38" together.

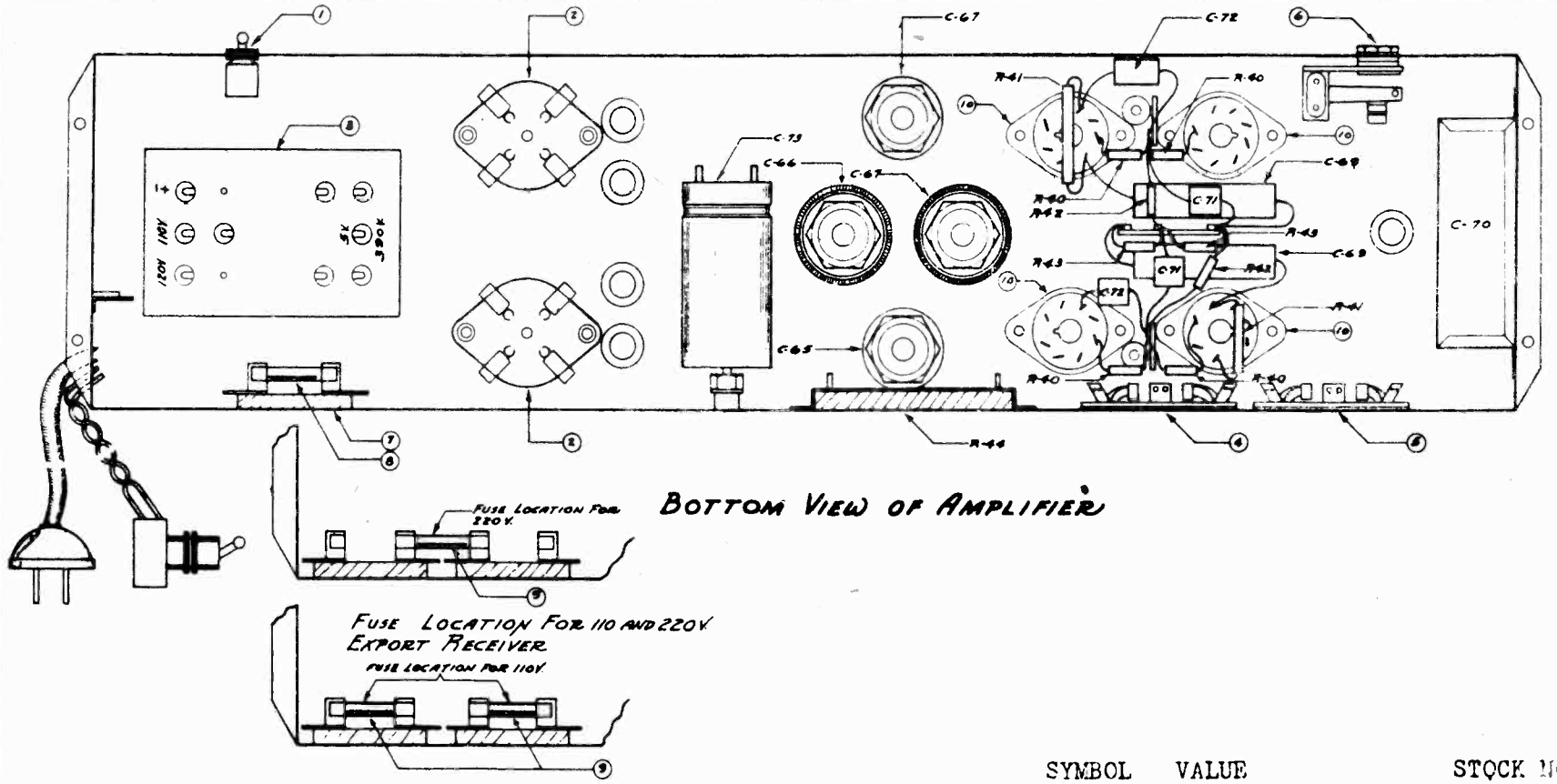
WAVE CHANGE SWITCH TROUBLE

Poor contact in the wave change switch can generally be corrected by slightly bending the contacts involved. However, in case a switch section is accidentally damaged beyond repair, this section can be replaced by first removing the dial face, then removing the two screws which support the wave change detent plate and very carefully pulling out the wave change switch shaft. The damaged section can then be unsoldered, removed, and replaced with a new unit which should be obtained from the Scott Laboratories in Chicago before the change is made in order to assure exact duplication of switch position and connections. Note particularly that the small notch near the center of the switch rotor must be in the same position in each switch section.

MODEL Philharmonic

E. H. SCOTT RADIO LABS., INC.



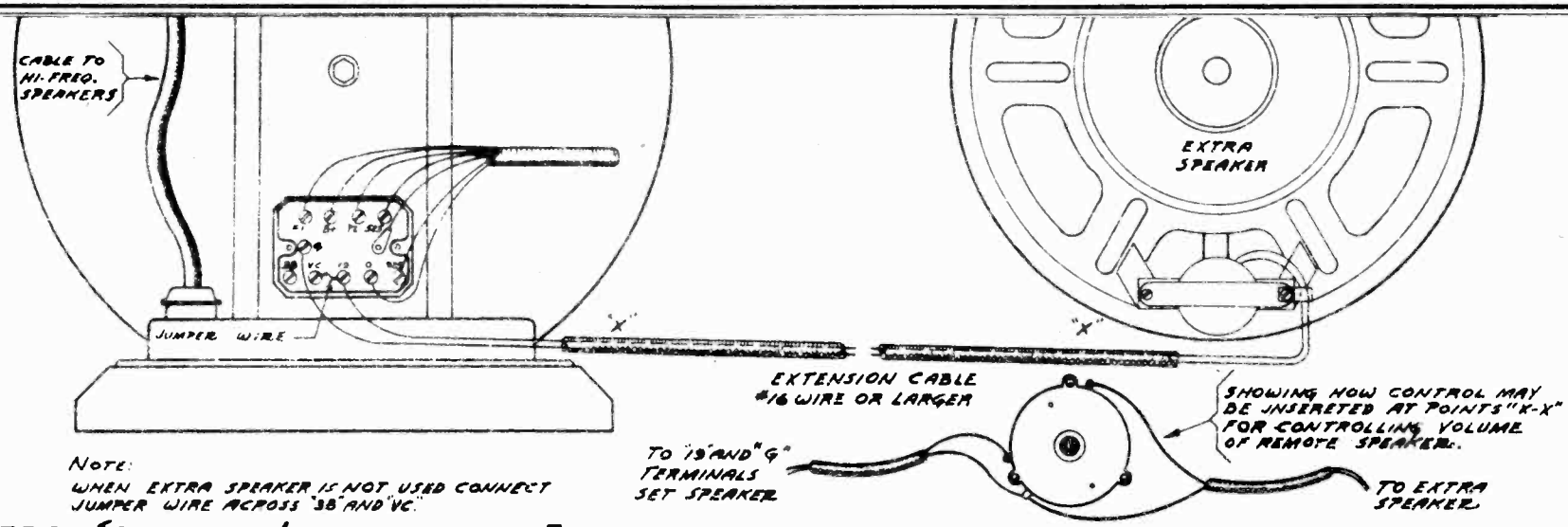


BOTTOM VIEW OF AMPLIFIER

SYMBOL	VALUE	STOCK NO.
1	Hi-Lo Switch	679
2	83V Tube socket	677
3	Power transformer	377
4	Socket, speaker	1329
5	Socket, set	676
6	Phone jack	1361
7	Fuse base	10
8	Fuse, 5 amp, 250 v.	1353
9	Fuse, 3 amp (220 v. amp)	72
10	6L6G tube socket	1163

PART	STOCK NO.
Switch "Off-On"	193
Choke 30 h.	651
Choke 10 h.	652
A-C Cable	21
Transformer, audio	376

SYMBOL	VALUE	STOCK NO.
R-40	150 ohms, 1/4 watt	427
R-41	75,000 ohms, 1 w.	564
R-42	.25 meg, 1/4 w.	319
R-43	6000 ohms, 1/4 w.	438
R-44	125 ohms, 10 w.	544
C-65	60 mf, 300 v.	803
C-66	40 mf, 450 v.	802
C-67	30 mf, 475 v.	660
C-68	60 mf, 300 v.	803
C-69	.1 mf, 600 v.	1157
C-70	16 mf, 475 v.	1244
C-71	500 mf,	526
C-72	50 mf,	45
C-73	100 mf, 50 v.	661



BACK VIEW OF CONSTANT IMPEDANCE VOLUME CONTROL

EXTRA SPEAKER INSTALLATION FOR SCOTT PHILHARMONIC RECEIVER

AMPLIFIER VOLTAGE READINGS

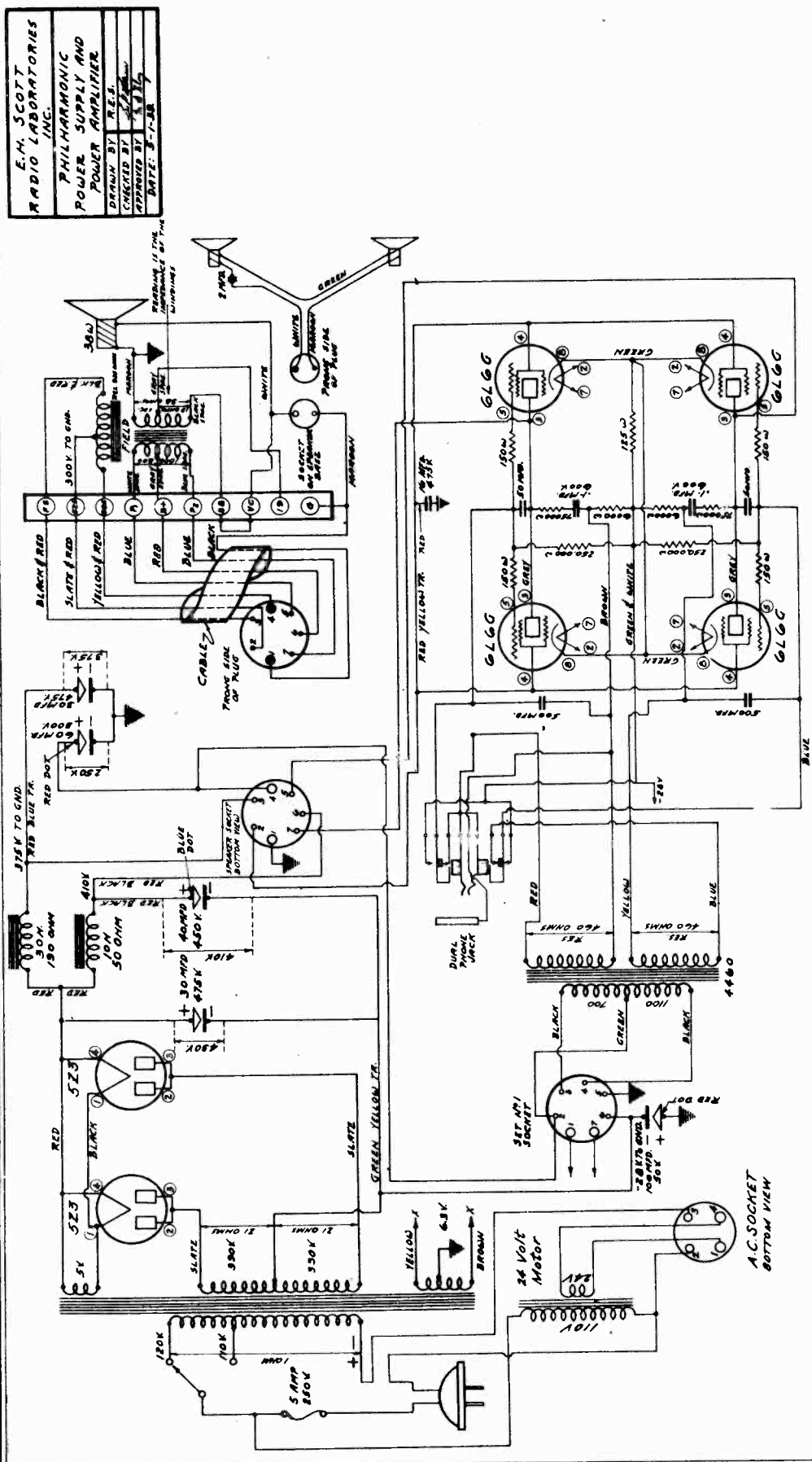
Line Volts 110
Hi-Lo Switch Down

TEST NO.	VOLTAGE MEASURED, TEST POINTS	CORRECT VOLTAGE	POSSIBLE CAUSE OF WRONG READING
1	Rectifier d-c output voltage: C.T. 83-V high-voltage winding to FIL. prong of 83-V	450	Defective rect.tubes; shorted high-voltage sec. winding; shorted 1st filter condenser
2	6L6 Plate voltage: C.T. 83-V Hi-voltage winding to 6L6G plates	410	Defective filter condensers; open primary on output transf.; shorted 50-mmf neutralizing condensers; open 10-henry choke
3	Input spkr.field voltage: Output lead of 30-henry choke (red blue tr) to ground	375	Shorted filter cond.; open 30-h. choke
4	B voltage to set: C.T. (green wire) 6L6G input transf. to ground	250	Shorted filter condensers; Pri. of 6L6 input transf. grounded; spkr. field open or shorted; B-divider shorted in set.
5	Speaker field volts drop 0 to 925 terminals on speaker	125	Shorted or open field

(CONTINUED ON NEXT PAGE)

MODEL Philharmonic

E. H. SCOTT RADIO LABS., INC.



AMPLIFIER VOLTAGE READINGS (Continued)

TEST NO.	VOLTAGE MEASURED, TEST POINTS	CORRECT VOLTAGE	POSSIBLE CAUSE OF WRONG READING
6	Bias voltage supply C.T. high-volt.winding to ground	-28	Shorted 100-mf electrolytic; shorted C-divider in set
7	Cathode 6L6G(Prong 8) to gnd.....	-3	Shorted 125-ohm cath. resistor
8	Screens 6L6 (Prong 4)	300	Open field tap
9	Filaments: 83-V (Prongs 1-4).....	5	Shorted wiring or windings
	To set(Yellow and brown)6.3		

MODEL Philharmonic

E. H. SCOTT RADIO LABS., INC.

GENERAL

The Scott Philharmonic XXX is an advanced type of superheterodyne incorporating rather elaborate special features such as. Separate tuned R. F. stages for each band using two stages on all except the ultra high frequency section, separate 6J5G oscillator operated in a special electron coupled oscillator circuit arranged with an auxiliary VR150 voltage regulator tube for stabilizing the oscillator tube voltage; noise reducing shielded antenna input system for the wave lengths between 12 3 and 76 meters; continuously variable selectivity operating in conjunction with an R. F. band-pass system for high fidelity reception; four stage I. F. amplifier having electrostatic shield partitions between transformer primary and secondary coils; separate automatic gain control systems on the R. F. and I. F. amplifiers; continuously variable sensitivity control - dual bass boost and bass compensation for low volume - needle point 10,000 cycle attenuation system, push-pull expansion circuit; automatic phonograph needle scratch suppression circuit; 4 stage high gain audio amplifier with parallel push pull output stage; dual acoustical channel having one high fidelity 15" speaker and two high frequency units for extended range.

ELECTRICAL DESCRIPTION OF THE CIRCUIT

The circuit of the Philharmonic XXX will appear rather complicated, however, it can be easily understood when "broken down" section by section. It is recommended that the circuit be carefully followed as its operation is explained in the following paragraphs

R. F. SECTION

The antenna input circuit is arranged so that a switch connects the antenna as a regular L - type to the primaries of the long wave, police, broadcast and ultra H. F. bands and as a doublet when on the shortwave 1 and shortwave 2 bands. When on the ultra H. F. band the signal is fed into its own R. F. circuit and the regular antenna and R. F. stage are not in the circuit. In SW_1 and SW_2 bands the signal picked up on the flat top portion of the antenna is transferred to the grid of the 1st R. F. tube by means of the shielded antenna coupling system giving a high efficiency of signal transfer and a high degree of noise reduction. On the other bands the signal is passed to the 1st R. F. grid in the usual manner and the band switch is so arranged that all coils not in use are shorted out, thus avoiding dead spots. When on the regular bands, the first tuned circuit resonates and amplifies the desired signal. The second and third tuned circuits operate in the plate output of the R. F. tubes rather than in the usual grid circuits and thus provide maximum R. F. gain. 6U7G type tubes, having a high mutual conductance are used in the R. F. stages and this factor makes for still higher gain on the higher frequencies.

A switch is ganged to the Fidelity Control so that as the I. F. System is band-passed to a certain point, the switch shunts a .15 condenser across a smaller value of condenser in the primary R. F. tuned circuit and thus broadens or band-passes this circuit for higher fidelity reception.

CONVERTER SECTION

The emission from the 6L7-G converter cathode is modulated by the voltage from the 6J5-G oscillator tube, the output of which is connected to #3 grid of the converter. The amplified signal from the R. F. amplifier is applied to the control grid of the converter. This latter signal also modulates the converter cathode emission and the plate current of the tube will carry the difference frequency component which will be the I. F. frequency

OSCILLATOR SECTION

The 6J5-G oscillator tube is arranged (thru the use of series padder shunt trimmer condensers and correct coils) to operate at a frequency which is 465 kc higher than the frequency of the R. F. section. The oscillator circuit has been carefully arranged for the best stability and its filament circuit is adequately by-passed; in addition the plate voltage supplied to the tube is kept constant by means of a special voltage regulator tube the VR-150. This latter tube is connected to B + 250 V. through a series resistor of 6,500 ohms.

I. F. SECTION

The I. F. system comprises 4 stages having 4 double tuned I. F. transformers plus a single tuned closely coupled diode transformer. Three 6K7G tubes are used in the first three stages and one dual purpose 6B8G in the fourth I. F. stage. This latter tube acts as a driver for the low impedance diode circuit. Both primary and secondary coils in each I F transformer, except the first I. F. primary, are wound in 4 pi sections on special low loss bakelite forms, and tuned by air condensers. The first I. F. coil is a 3 pi section coil. Electrostatic shields are provided between the primary and secondary coils of each I F transformer, to eliminate capacity coupling and in addition each stage is arranged with resistance capacity filters for each circuit. The design of this I. F. amplifier assures high gain and provides a large degree of usable sensitivity. Six of the double tuned transformer circuits are provived with small variable condensers which, operating in opposite directions as the control knob is turned, serve to vary the band width as desired. The remaining three tuned circuits maintain the sensitivity mid-band and thus avoid the usual center dip at full band width. Three other controls are ganged to the selectivity hi-fidelity control. One of these is a variable which controls the bias on the I. F. amplifier tubes and keeps the sensitivity of the receiver nearly constant as the fidelity is varied, another control switch is an audio tone control and it cuts the audio response at about the same frequency as that at which the I F band width is set, this is useful on phonograph reproduction and certain types of shortwave reception. The other switch control band passes the R. F when the fidelity control is opened sufficiently.

R. F AND I F A. G. C. SYSTEMS

Two separate automatic gain control systems are employed in the Philharmonic XXX, the first controlling the R F amplifier, using a 6B8G tube and the second system controlling the I. F. amplifier, using one 6B8G tube. In the R. F. A. G. C. circuit the control grid of the 6B8G tube is capacitively coupled to the plate of the converter tube. I. F. and signal frequency are amplified in this tube and rectified in its diode circuit and applied as control on all bands, on the first R. F. tube. This arrangement prevents overload in the R. F. and converter tubes and further helps to eliminate noise and distortion, when tuned to a powerful local, or adjacent channel "slop over" from locals, when tuned to a distant station.

In the I. F. A. G. C. circuit the 6B8G control grid is capacitively coupled to the 2nd I F. plate by means of a 25 mmf. condenser. The rectified diode out-put is applied as control on the first three stages of I. F. and is proportioned so that practically constant signal level is maintained at all times. In addition this system gives satisfactory tuning indication even when operated at high fidelity.

E. H. SCOTT RADIO LABS., INC.

MODEL Philharmonic

VARIABLE SENSITIVITY CIRCUIT

With the efficient AGC circuit of the XXX this means that when tuning between stations the AGC circuit will open up the full sensitivity of the receiver and bring up interstation noise if the location is not "quiet". With the variable sensitivity control, however, the degree of sensitivity may be set to any pre-determined level and thus "throttle" the A.G.C. voltage so that it does not drop below a set level. This action is accomplished in one half of the sensitivity diode 6H6G tube, the other half of this tube is used in a noise "limiter" circuit for reducing some types of noise and interference. This circuit is not shown on the diagram but it is very unlikely that any tronble will ever arise in it.

AUDIO AMPLIFIER

Four stages of class A audio amplification are used giving adequate gain and over 40 watts output with less than 1% harmonic distortion. The first audio stage uses a 6J5G, the second uses another 6J5G as an inverter, the third stage uses two 6J5G tubes in push-pull to drive the 4th audio 6L6G power output stage. The output stage comprises four 6L6G beam power output tubes utilizing the inverse feed-back principle

Audio frequency voltage may be produced across the volume control either by diode rectification, when the radio phono switch is in the "radio" position, or, it may be introduced in the phono-posts by a microphone or phono-pickup and may be amplified in the four stages as outlined above. The volume control has a tap at 20,000 ohms from its ground end and this point is connected to ground through a choke, condenser and resistor combination, which provides balanced bass compensation at low volume. A special 10,000 cycle attenuator system is connected in the plate circuit of the first audio tube. It consists of a variable resistance, two fixed condensers and a choke having a movable core. This arrangement provides for infinite attenuation of the undesired 10,000 cycle adjacent channel whistle without affecting frequencies below 8,500 or above 11,000 cycles. The inverter stage out-put connects into the control grids of the 6L7G P.P expander tubes and while they are primarily for the purpose of expansion, they also serve as a coupling stage between the 2nd and 3rd audio. The dual bass circuit is connected in the plate circuit of the 6L7G tubes and consists of two 175 henry chokes tuned by 0.02 mfd. shunting condensers and coupled by means of .025 mfd. condensers. Bass control is obtained by means of a dual potentiometer control, the one megohm section of which is shunted across the choke circuit and the 10,000 ohm section is connected back to the inverter grid input through a 100,000 ohm fixed resistor. This system provides a wide degree of bass variation and also gives a high boost "peak" at 70 and 45 cycles, but a decided dip at 60 cycles and it also falls rapidly at 120 cycles This feature reduces 60 cycle power line hum and station hum that is often picked up.

RECORD SCRATCH SUPPRESSION

The automatic Record Scratch Suppression System utilizes a 6B8G, the control grid of which is connected to the input to the main audio circuit through a 100 mmf. condenser. This tube operates as a diode to supply rectified voltage to another tube, a 6J7G, operating as a variable mu device so that its gain is a function of the applied bias, and this latter tube causes an effect upon the input to the first audio as though a variable condenser to ground were shunting it. This "condenser" effect at any instant will be determined by the level of signal acting upon the 6B8G grid. Any signal above 1500 cycles which causes 80 V. or more to be applied to the 6J5G grid will cause the tube to be "cut off" and no high frequencies will be lost. Lower level signals, however, in the scratch frequency range will cause the "condenser shunting" effect and therefore, eliminate undesirable needle scratch at low volume but will have no effect on full reproduction of the higher frequencies at normal or high volume.

VOLUME RANGE EXPANSION

This circuit is connected to the audio input circuit by a 1000 mmf. condenser and a suitable means of control is provided. It consists of a 6J5G driver circuit, a 6H6 rectifier and a push-pull amplifier stage. The diode output of the 6H6 is connected to grid #8 of the 6L7-G tubes and this circuit is arranged with the necessary variable adjustments so that a very flexible system is thus provided. This circuit enables the volume as cut by the recording or monitoring engineer to be restored to the original volume range at which the program was played.

POWER SUPPLY

The power supply is of the heavy duty type, the primary of the power transformer being tapped and the circuit is arranged with a hi-lo switch so that it may be operated on line voltages between 100-130 V. The secondary high voltage winding utilizes two 83V tubes in a full wave rectifier circuit. This circuit works into a condenser input filter and additional sections provide a high degree of filteration. Over 260 mfd. of capacity is used in this amplifier and any ripple voltage is smoothed out to a minimum. The field of the speaker is utilized as a filter choke and this also supplies field excitation for the speaker. Tapped bleeder resistors are mounted in the chassis and serve to divide the C and B voltages, to the desired values.

LOUD SPEAKER SYSTEM

The power output transformer located in the base of the loud speaker is arranged to provide the following output impedance: 38 ohms from terminal marked 38 to G (ground) and 19 ohms from terminal marked 19 to G. When it is desired to use an extra speaker it must have a 38 ohm voice coil, then it is only necessary to change the jumper wire so that it is connected between terminals VC and 19 and the extra unit's voice coil is now connected in parallel with the main speaker from G to 19. We can supply output transformers on special order having the necessary taps or windings for any combination or arrangement of extra speakers. (See diagram)

TUNING INDICATOR AND EXPANDER EYE

An amplifying type 6G5 cathode ray tube is used to indicate tuning resonance and its grid is tied to a suitable point at the audio diode output. The expander indicator grid is connected to grid #3 of the expander 6L7G tubes and serves to indicate the amount of expansion. The 6E5 amplifying type cathode ray tube is used to indicate exactly the amount of expansion on phonograph or radio reproduction.

HEADPHONE JACK

A special jack is provided so that headphones may be plugged in to the first notch, and both speaker and phones will operate, while if pushed in all the way only the headphones will operate.*

PHONOGRAPH, MICROPHONE OPERATION AND RECORDING

The phono-input will take any type of high impedance phono-pickup device from 4000 ohms and upward. Matching transformers and arrangements for low impedance types are illustrated in the drawings relating to this. Any type microphone may be used but we recommend the new crystal type, and a pre-amplifier. A recording arrangement is available and a schematic diagram is shown.

* The head phone jack is optional and is not supplied as standard equipment.

MODEL Philharmonic

E. H. SCOTT RADIO LABS., INC.

SET CHASSIS VOLTAGE READINGS

VOLUME CONTROL MIN. Sensitivity Control off - Record Scratch off - Expander off
Fidelity 3/4 on Wave change switch in B C position.
Line Volts at 110 V - Hi Lo Switch down

TEST NO.	Voltage Being Measured & Test Pts. to Ground	Correct Voltage	Possible Cause of Incorrect Reading
1	3rd Audio P. P. 6J5G:		
	Plates #3 prong	240	Audio transformer open
	Bias #8 prong	8	800 ohm bias resistor open or shorted.
2	P. P. Expander Amp., 6L7-G		
	Plates #3	205	(Plate resistors defective. (Bass boost chokes shorted or open.
	Screen #4*	100	Open or shorted screen circ.
	Grid #1 Bias (green yellow wire @ 1 Meg.)	-10.5	Expander adjustments shorted.
	Grid #3 Bias		
	Expander-OFF adjustment C. T.	-(8-10)	" "
	Expander-ON adjustment C. T.	-(11-14)	" "
3	Exp. Driver, 6J5-G		
	Plate #3	120	Open or shorted plate resis
	Grid bias, bias side 2 meg. grid res.	-6	Grid circuit open.
4	Inverter 6J5-G.		
	Plate #3	175	Defective Plate Resistor or plate filter condensers.
	Cathode #8	+17	Open or shorted cathode.
	Outside end 2 meg. grid resistors.	+10	
5	1st Audio, 6J5-G:		
	Plate #3	150	Defective plate resistors, plate filter condenser, or Hi Boost choke.
	Bias @ .5 Meg. end grid filter	-6	Defective components in grid circuit.
6	Record Scratch Control Tube 6J7-G:		
	Plate #3	75	Plate feed resistor defective.
	Screen #4	100	Shorted Screen.
7	Record Scratch Diode, 6B8-G.		
	Plate #3	110	Shorted plate filter condens. or resistors.
	Screen #6	55	Open or shorted screen.
	Bias:		
	R. S. off (outside end 1 meg going to Record Scratch Switch)	-28	Defective control switch or short circuit.
	R. S. on (inside end 1 meg. going to Record Scratch switch	-6	Shorted bias.
8	RF A. G. C. Tube 6B8-G:		
	Plate #3	235	Shorted on open diode coil pri. or plate circuit resistor.
	Screen #6	150	Open screen.
	Grid Bias		Short in cathode or grid circ.
	Junction of 3000 and 1500 ohm Cathode resistors.	+32	
	Cathode #8	+44	
	1st RF Min. Bias: Outside end 1 meg. res. to RF. A. G. C. Line	4½	
	Developed Diode V. depends on signal		
9	I. F. A. G. C. 6B7-G:		
	Plate #3	235	Same Test as #8
	Screen #6	125	
	Bias, bias end 2 meg. grid resis tor. Diode V depends on signal	4½	
10	1st - 2nd - 3rd I. F. 6K7G:		
	Plates #3	235	I. F. coils shorted to shield tube
	Screen #4, 1st and 2nd I. F.	100	turned wrong in sockets.
	Screen #4, 3rd I. F.	125	I. F. trimmers grounding to shield
	A. V. C. line voltage determined by signal.		Fidelity condensers shorting.

*#4 E T C., refers to socket pin number except where reference is made to grid #1, Grid #3, etc.

(Continued on next page)

MODEL Philharmonic

E. H. SCOTT RADIO LABS., INC.

TEST NO.	Voltage Being Measured & Test Pts. To Ground	Correct Voltage	Possible Cause of Incorrect Reading
11	4th I.F. Audio Diode 6B8G:		
	Plate #8.....	235	As test #10 Diode Plate winding open or shorted to shield can.
	Screen #4.....	125	Screen circuit open or shorted.
	Bias - measured at junction of 5 meg. and .05 meg. resistors shunting sensitivity control.....	-7	Defective grid circuit compon nt
12	Sensitivity Diode 6H6G: Cathode #8		
	Sensitivity Min.	28	Defective sensitivity control or defe tive resistors shunting it.
	Sensitivity Max.	7	
13	Oscillator 6J5-G:		
	Plate #3	140	Plate voltage dropping resistors defective.
14	Converter, 6L7-G:		
	Plate #3	235	Open I.F. Pri. coil, shorted .05 filter cond. or defective 1000 ohm res. to I.F. Pri.
	Screen #4	150	Open screens.
	Bias..... (Measure at Hi-end sensitivity control)	-9	Shorted bias circuits.
15	1st and 2nd R.F. 6U7-G:		
	Plate #3	235	Shorted R.F. coil trimmer open primary coils or plate circuit resistors shorted plate filter condenser. Open or shorted secondaries or filter circuits.
	Screen #4	100	Screen open.
	Bias (2nd RF) Bias end 1 meg. grid res. (1st RF) See test #8	-6	Bias circuit shorted or open.
16	Oscillator voltage regulator VR 150		
	Pin #2	150	Grounded plate circuit. Open or shorted 6500 ohm resistor.

RESISTANCE MEASUREMENT IN POWER AMPLIFIER

TEST NO	Points Where Resistance is Measured in Circuit	Resistance ohms	Possible Reason for incorrect reading.
1	Primary of power transformer (across	1	Open, shorted turns
2	Power transformer High V. secondary CT to 390 each side	21	Shorted or open.
3	Audio interstage transformer Primary:		
	C.T. to outside	(1100 (700	Shorted or open Pri.
	Secondary Junction of 150 ohm 6L6-G Grid resistor on 1 Pr. of tubes to brown sec. lead.....	475	Phone Jack not making contact Open or shorted winding
	Same measurement on other pair of tubes to yellow wire	475	
4	Chokes-		
	Red lead to red with blue tracer...	190	Open or shorted
	" " " " " black " ...	50	
5	Output transformer:		
	B+ to P1	1000	Shorts or open circuits.
	B+ to P2	800	
	Secondary: -		
	38 to G	1.5	
	38 to 19	5	
	19 to G	1	
6	Voice Coil: -		
	VC to G	26	Open voice coil
7	Field -		
	O - 925	910	Open winding
	O - tap	525	

MODEL Philharmonic

E. H. SCOTT RADIO LABS., INC.

RESISTANCE TEST MEASUREMENTS OF CIRCUITS IN SCOTT PHILHARMONIC XXX

TEST NO.	Points Where Resistance is Measured in Circuit	Resistance Ohms	Possible reason for incorrect reading
1	B + 250 V. tap on B-divider to ground	4250*	I.F. Pri-Coils shorted to shield. R.F. trimmers shorting. Wave band switch contacts shorting.
	*Later divider	4750	
	150 V. tap on B-divider to ground...	3050	R.F. - A.G.C. or converter screens shorted
	125 V. tap on B-divider to ground...	2630	I.F. - A.G.C. 3rd or 4th IF screens shorted.
	100 V. tap on B-divider to ground...	2200	Screen circuits shorted.
2	Expander and tuning eye adjustments approximately.		
	Exp. Diode - OFF adj. C.T. to ground	200	
	Exp. Diode - ON adj. " " "	175	Cases of adjustments shorted to ground
	Exp. Eye " " " "	85	
	Tuning Eye " " " "	100	
3	C-Bias Divider to ground		
	20 Volt tap	260	
	15 " "	148	
	6 " "	60	Shorted wiring and as in Test #2
	4½ " "	50	
	3 " "	40	
4	Bass Boost choke B + to outside: (Bass full on)	2000) 2500)	Shorted choke or associated wiring and coupling condens.
5	Compensated bass choke - (across)	10	Shorted or open
6	Hi-Boost choke (across)	1100	As in 5
7	10,000 cycle adjustable choke (across)	250	As in 5
8	I.F. Coil circuits Primaries: Plates of Conv-1st IF -- 2nd and 3rd IF to B +	1100	Coils shorted to shield can. IF trimmers shorted. 1000 ohm resistors to pri. coils open or shorted.
	Secondaries: Grids of 1st and 2nd IF to AVC line	250,000	Resistors to secondaries open or shorted. Secondaries open.
	Grid of 3rd IF to outside end of grid resistor	1 meg.	Open or, shorted coil or resistor
	Grid of 4th IF to Junction point of .5 and .05 megohm resistor across sensitivity control	250,000	Resistor to coil open or shorted.
9	Diode coil circuits; - Outside end 10,000 ohm diode coil resistor to diode plates #4 and 5 on IF. A.G.C. RF-AGC, and 4th IF.	10,000	Open diode coil, open or shorted. 10,000 ohm resistor.
	B + 250 V to plate on IF-AGC-RF-AGC; and 4th IF	1100	Open plate coil winding
10	Antenna coil circuits: - Primaries- Measure at outside ANT. post to GND.		
	Position of Wave-Switch		
	UH	Open	Open coils or circuit shorts
	LW	57	
	POL	4	
	BC	20	
	SW1 and SW2	0	
	SECONDARIES: - 1st RF Grid to common Secondary terminal of SW ANT coil (A) SW1 and SW2 Pos. of Wave Switch	25	

E. H. SCOTT RADIO LABS., INC.

MODEL Philharmonic

TEST NO	Points Where Resistance is Measured in Circuit	Resistance Ohms	Possible reason for incorrect reading
	1st RF Grid to common of LW-BC-POL		Open ,coils or shorts
	ANT (E)		
	Switch position		
	BC	35	
	POL	27	
	LW	50	
	UH	0	
11	RF1 and RF2 circuits		
	Primaries		
	SW - Position and coil		
	BC ....RF tube plate to Point A	1	
	POL. RF Tube Plate to Point A	0	
	LW...RF tube Plate to Point F	75	
	UH.. " " " " " "	0	
	SECONDARIES:		
	SW POSITION and COIL		
	BC... Tuning Condenser Stator to A	7	
	POL.. " " " " "	0	
	LW.. " " " " F	20	
12	Oscillator Coil Circuits		
	Switch Position for Primary Coils		
	SW2 ....Gnd to Osc. Catho.	0	
	SW1 .... " " " "	100	
	BC .... " " " "	500	
	POL .... " " " "	500	
	LW .... " " " "	5	
	Sec. coils: Measure at coil points		Open coils, open resistors or shorts
	SW2 ....Gnd. (A) to point E	0	
	SW1 .... " " " " D	0	
	BC .... " " " " D	3	
	POL .... " " " " B	0	
	LW .... " " " " E	15	
	UH Spread out Grid 6J5 Osc. to 30 mmf. on stator	0	

INSTRUCTIONS FOR ADJUSTMENTS OF THE AUDIO CIRCUITS

With receiver cable not plugged into amplifier socket, test filaments to ground with the continuity meter. Turn Expander and eye adjustments near center and the resistance from center to ground should be above 75 ohms if not shorted. Connect the receiver to the a-c line through a voltage control device, such as the Variac and adjust the voltage to 112 volts with the Hi-Lo switch up. Where no such arrangement is available, allowance must be made for line voltage variation. Begin test by measuring voltages existing at the C and B dividers.

B - DIVIDER

	Volts	Res.to Gnd.*
Red	245	4250
Red green tr	150	3050
Red blue tr	125	2630
Red green tr	100	2200
Green	28	260
Green black tr	15	148
Green red tr	6	60
Red yellow tr	4.5	50
Black green tr	3	40

* With set plug not in amplifier

The set has the proper divider network in it, but if a new B-divider is installed, the C bias should be checked. Where the C bias is over 28 volts, it will be necessary to connect a resistor of about 2000 ohms from the 28-volt tap to ground. Use a decade resistance box to determine the correct resistor. Where the B voltage is much below 250 look for shorts in the plate circuits of the tubes.

MODEL Philharmonic

E. H. SCOTT RADIO LABS., INC.

EXPANDER ADJUSTMENT

With Fidelity Control 3/4 of the way on, Volume Off, expansion off, Bass minimum, and in phono position, connect an audio oscillator to the phono posts with suitable rectifier type A.C. meters across the input directly, and across a 40 ohm dummy voice resistor or voice coil itself if desired, (GND. to 38) Feed 1 volt into phono-posts, and turn volume control until 1 volt is read at the output. Turn the Expander control just on and the output reading should drop to .4 of a volt, if it does not, vary the exp. diode - on adjustment on top of chassis. These adjustment controls are between tube shields near expander tubes. The Exp-on adjustment is nearest front of chassis. Turn the Expansion control knob to full and it should read 1.25 V. on the output meter. If it is too high or too low, turn the control knob to "off" position and set the Exp. diode-off control, (the one next to Exp-diode adjustment) for a new level, reset the Volume Control for 1 volt reading and repeat as before until the correct results are obtained. Change tubes if necessary

With the Expander adjusted, and a 1 volt signal into phono, turn the Expansion Control knob to "just on" and adjust the Expander eye until it closes, by means of the adjustment screw nearest back of chassis. The eye should open full when the Expansion knob is all the way on, and a strong signal is being received.

RECORD SCRATCH SUPPRESSOR ADJUSTMENT

With expansion off and controls as above, feed 0 25 volts at 3500 cycles into the phono posts and adjust volume control for 1 volt output. Pull the Scratch Suppressor Switch "out" and the output reading should just start to drop. Now with Suppressor switch off, reduce the input to 0.05 volts, reset the volume control to obtain 1 volt again and turn the suppressor switch on. The output reading should drop to 0.2 giving a ratio of 5 to 1. If a 5 to 1 reduction ratio is not obtained the 6 volt bias applied to the 6B8G Record Scratch diode tube should be reduced by shunting this point to ground by a suitable resistor, using the decade resistance box method, or substituting various resistors until the correct results are obtained. If too much control is obtained it may be due to an abnormal 6J7G or the condenser across its grid and plate may be too high in value

BASS CIRCUIT CHECK

Connect a jumper wire from the tap point on the volume control to ground. Have bass control on full and other controls as before. Feed a signal in the phono posts at 400 cycles and adjust the output voltage for 1 volt across the dummy load resistor. Maintain the input constant as the frequency is varied over the lower range. There should be a peak reading of about 6 volts at 70 cycles, a dip-reading of 2 volts at 60 cycles, and another peak of around 4 volts at 40 cycles. Remember to leave the volume control set as it was at 400 cycles and keep the input constant at some convenient reading, say 1 volt. Sixty cycles may be determined by noting the "beat". If there is a peak at points other than those mentioned, it indicates that the bass chokes are shunted by too high a value of condenser, these condensers should be .02 mfd. If the bass "peaks" are low in output voltage reading, it indicates that the gain is low and this should be checked.

* Later divider measures 4750 ohms to ground on this tap, other taps remain as before.

AUDIO GAIN TEST

With an audio input signal of 0.1 volt at 400 cycles an output of between 10 to 15 volts will be obtained across the dummy voice load. Make this test at full volume, minimum bass, fidelity 3/4 on, Expander and Record Scratch off. If an output of around 20 to 30 volts is obtained look for trouble in the 6J5 PP stage grid circuit. If the gain is low it may be due to tubes, wrong voltages, shorts or open circuits, either in the set or power amplifier. Both should be checked.

10,000 CYCLE ATTENUATOR ADJUSTMENT

Feed an accurately known frequency of 10,000 cycles into the phono-posts and obtain an output reading of about 2 volts in full fidelity position Move the adjustable core on the attenuator choke until a dip in the output reading is obtained Turn the small midget variable control, which is mounted over the 1st audio socket, until the dip point is lowest, now feed in more signal and repeat operations more carefully until a condition is obtained so that the output meter needle is just moving down to its minimum point. The needle should be moving down rather than at the minimum, and the core may now be sealed with coil "dope". In case it is necessary to push the core to the top of the choke, (gap end) the inductance is now minimum, which means that the two 100 mmf condensers are too high in value and will have to be replaced with condensers having closer tolerance. If it is necessary to push the core all the way to the bottom, the inductance will now be greater and it means that the condensers are below 100 mmf. and the higher values are required.

For 9,000 cycles the two condensers should have a value of 125 mmf each and a 9 kc source of signal will be required, otherwise the same data applies

HUM TESTS

Make certain that there are no soldering irons near the chassis and that the power transformer end of the amplifier is as far away from chassis as possible. Connect the output meter to the 6L6 plates. (Blue wires on P_1 and P_2 speaker terminal plate) having a 0 5 to 1 mfd condenser in series with one lead to the meter. With bass control full on, volume off and fidelity 3/4 open, note hum. It should not be over 0.3 of a volt, overall, at full bass To make overall tests, remove 3rd audio 6J5G tubes. The hum should be zero, and if not, it is in the amplifier Leave the 3rd audio out and replace 6L6G tubes in the power amplifier until the hum is zero. Now replace the 3rd audio tubes and remove expander 6L7G tubes. The hum should not exceed 0.2 volts. Try new tubes if necessary and try pushing filament wires closer to base and away from grids Now remove the 6J5G inverter and 1st audio tubes and insert one of the expander tubes. The hum should not rise above its previous value, if it goes up appreciably try another tube. After selecting one 6L7G leave it in the socket and match it up with another that does not raise the hum above that of the single tube. Next put in the inverter tube and select one that has minimum hum. The 1st audio tube may now be replaced, and this may require a trial of several tubes, if it appears impossible to get the overall hum down to 0.3 volts select other expander tubes and repeat as before. The set filament wiring should also be checked. See that the filament wire on the 3rd audio tubes, 6J5G, is pushed down closely to the base, also the filament wires from the "eyes" and dial lights should be clear of the hi-boost and bass compensator chokes. If it has slipped out of place, push it away from the chokes and over to the corner of the 4th Hi-Fidelity shield can.

E. H. SCOTT RADIO LABS., INC.

HOW TO ADJUST INTERMEDIATE FREQUENCIES IN THE SCOTT PHILHARMONIC XXX

To satisfactorily align the I F and R F circuits in Scott Receivers, a modern signal generator is a necessity We recommend the use of an instrument such as the model 12 Monarch The ordinary method of using an output meter for indicating alignment is not satisfactory We recommend the use of a sensitive meter such as the Weston model 600 D C Microammeter The meter should be shunted by a 10,000 ohm resistor and a 500,000 ohm resistor should be connected in series with the positive side. Set the controls so that the selectivity fidelity control is in the selective position, bass control minimum, sensitivity control maximum, expander control off, and volume just on. The signal generator output lead should be connected to the control grid of the 6L7 converter tube through a 5,000 mmf condenser. The control grid should also be connected through a 1 megohm resistor to the grid lead which formerly connected to its grid cap so that it will be properly biased.

Connect the positive side of the microammeter to chassis ground and the negative terminal to the diode output celanese lead connected to the switch on the selectivity control It is well to have a small 22 1/2 volt C Battery with a number of taps Connect the positive side of the C Battery to chassis ground and either the 10 or 15 volt tap to the A V C line on the I F A G C diode and the -6 volt tap on the R F A G C diode output These two points are at the end of the 10,000 ohm diode resistor which projects through the diode shield can Use the voltage taps on the C Divider if a C battery is not available

Feed a 465 kc signal * from the generator sufficient to show indication on the microammeter and begin adjusting the first I F trimmers Next adjust the 2nd, 3rd and 4th primary and secondary I F trimmers in turn, meanwhile reducing the signal generator input voltage Repeat the above operations more carefully making certain that each I F stage has a double peak as indicated by rotating each trimmer until this is shown Next adjust the audio diode adjustment for maximum output Remove the negative 15 volts from the I F A G C diode output point and replace it on the 2nd I F A V C line Connect the negative terminal of the microammeter to the output point of the I F A G C diode Increase the signal generator input to the converter until the microammeter reads about mid scale Then adjust the variable control on the I F A G C diode for maximum output Put in more signal if necessary

* I F. frequency is 465 kc. in most cases but may be 456, 472 5 or 475 for some special locations. In some cases it may be better to start at the 4th I F. and work back to the 1st, especially if one of the stages is defective or weak. Also it may be desirable to "beat" generator with a signal at 930 kc. to determine if the generator calibration is correct

Remove the -6 volt lead from the R.F. - A.G.C. diode output point and connect the negative terminal of the microammeter to this point. Put sufficient signal into the converter to get an indication on the meter and adjust the R.F. - A.G.C. diode for maximum output. It may be necessary to over-load this circuit in order to get sufficient indication. The system should now be correctly aligned.

Remove all tie down biases and with the microammeter connected to the celanese lead on the switch on back of sensitivity control, feed a signal of 2,000 microvolts into the converter grid. The microammeter should read between 16 and 18 volts which corresponds to the standards at our Laboratory. There should be no wide deviation from this standard. The I.F. sensitivity of the set is dependent upon the I.F. coil position, the bias voltage, or screen voltage. The coils are mounted on the brass shield partitions so that in the 1st, 3rd and 4th I.F. stage the distance from the top of the shield to the coil form is 3/16 inch, while in the 2nd stage it is 3/8 of an inch. More sensitivity can of course, be gained by decreasing the distance, however, it should never be necessary to resort to this but the distance should be measured as a "check".

Another way to increase the sensitivity if found necessary, is to decrease the 28 volt bias voltage to about -27 volts by the shunting of the 28 volt tap on the divider, to ground by a suitable resistor. This assumes of course, a line voltage of 112 volts, sensitivity control full, fidelity control in the minimum position, and the hi-lo switch on the amplifier should be in the "up" position.

R F ALIGNMENT ON PHILHARMONIC LONG WAVE BAND

In the following adjustments it should only be necessary to vary the trimmers and padders for the average case, however, full instructions are included to cover the case where new coils have been installed.

1. Check carefully and make sure that the horizontal line on the left side of the dial cuts through the tuning indicator spot. Connect a jumper wire from center Ant. Post to Gnd. and connect a signal generator to the outside Ant. post An output meter may be used.

2. Turn the wave change switch to the long wave position and adjust the dial to the reading of 170 kc. Now with the signal generator set to 170 kc adjust the long wave padding condenser C_{21} until proper resonance is indicated. Now turn the dial to the settling of 370 kc. and adjust the long wave oscillator trimmer condenser C_{12} until the 370 kc signal from the generator is tuned in. Next turn the dial back to 170 kc. rechecking the adjustment and making any necessary changes in the setting on padding condenser C_{21}. Check the tracking in the center position at 250 kc. and if any correction is necessary at this setting, it will be necessary to add turns to the oscillator secondary to lower the frequency or on the other hand turns will have to be taken off to raise the frequency as well as to readjust padder condenser C_{21} and trimmer condenser C_{12}.

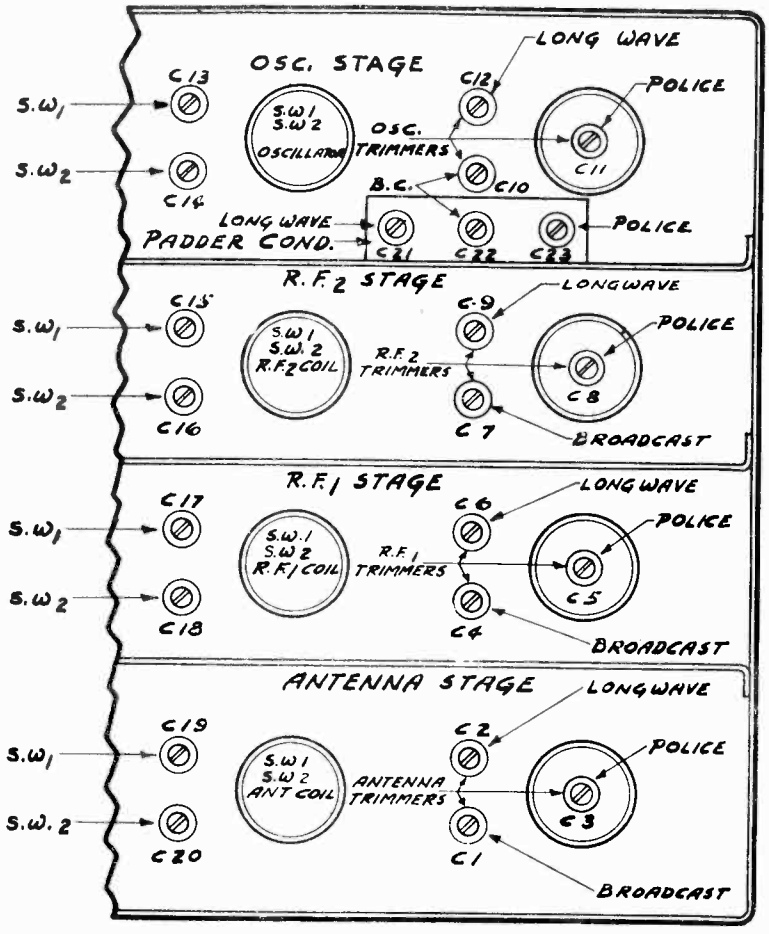
3. With the oscillator stage properly aligned turn the tuning dial to 370 kc. and tune in a signal from the signal generator and adjust trimmers C_2 C_6 C_9 to give maximum output. Next turn the dial to 170 kc. and check the alignment by means of a tuning wand. We strongly urge the use of a tuning wand for proper alignment of the receiver One end of this device is a core such as a polyiron and the other brass. When the inductance of the coil is high the insertion of the brass end will decrease it to the proper resonant value, whereas, insertion of the other end will increase it to the correct resonant value. This is a quick method of determining whether or not turns will have to be added or taken off. Add turns if the inductance is low and on the other hand remove turns if the inductance is high at the same time adjusting trimmer condensers C_2-C_6-C_9 at 370 kc. Then recheck the alignment at 250 kc. which should be very close if the dial setting is correct.

ALIGNMENT OF POLICE BAND

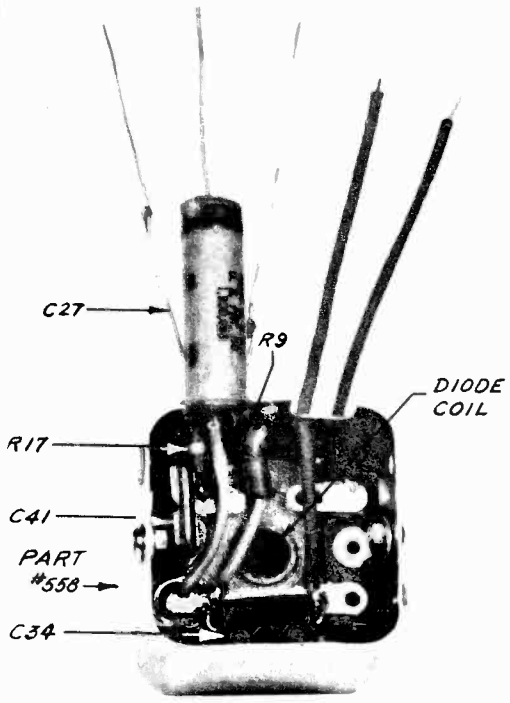
Turn the wave change switch to the police band making certain that the coil shield plate is securely fastened to the chassis and set the tuning dial to 1.8 meg. With the signal generator set at a

MODEL Philharmonic

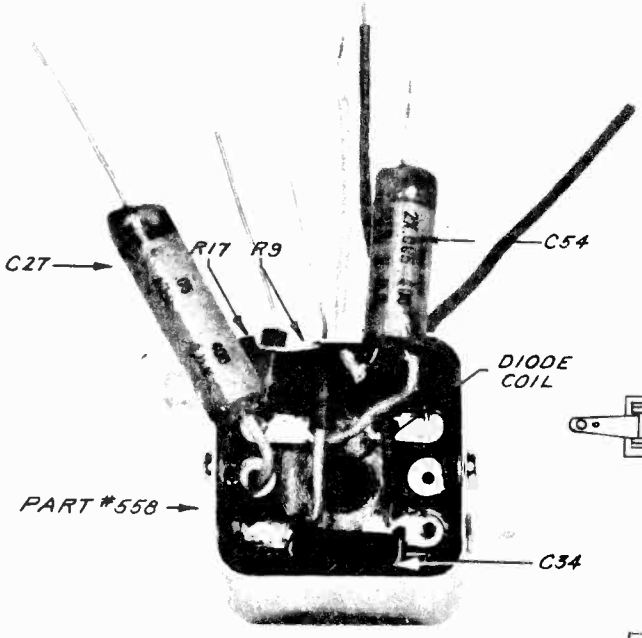
E. H. SCOTT RADIO LABS., INC.



POSITION OF TRIMMER AND PADDER COND.



AUDIO DIODE



I.F. A.G.C. DIODE
R.F. A.G.C. DIODE

PHILHARMONIC

FOR
110 VOLT OPERATION
2-4 AMP. FUSES

FOR
220 VOLT OPERATION
1-2 AMP. FUSE

frequency of 1.8 meg. adjust padder condenser C_{23} until resonance is indicated. Now adjust the tuning dial to 3.7 meg. and tune in generator signal by adjusting trimmer condenser C_{11}. Turn the dial back to 1.8 meg. and readjust padding condenser C_{23} if necessary. The middle tracking should be checked at 2.6 meg. making any necessary changes in calibration at this point, by pushing together or spreading the turns on the coil and then, of course, readjust the padding and trimming condensers.

2. After the oscillator stage has been correctly aligned set the tuning dial at 3.7 meg. and adjust the trimming condensers C_2, C_5, and C_8 to give maximum response. Check the alignment at 1.8 meg. making any required changes in inductance by pushing or spreading the turns on the coils and readjusting the trimmer condensers C_3, C_5, and C_8 at 3.7 meg. Finally check the alignment at 2.6 meg.

ALIGNMENT ON BROADCAST BAND

1. For alignment on the broadcast band turn the wave change switch to the broadcast position and employ exactly the same procedure as you did for the police band. Padding condenser C_{22} should be adjusted at 650 kc. and trimming condenser C_{10} at 1420 kc. The middle tracking is checked at 970 kc. with any adjustment in inductance made by pushing together or spreading apart the turns on the coils and realigning the padder and trimmer condensers

2. After proper alignment has been made on the oscillator stage adjust trimming condensers C_1 - C_4 - and C_7 at 1420 kc. and check alignment with the tuning wand at 650 kc. and 970 kc.

ALIGNMENT OF SHORTWAVE BAND NO. 1

1. First turn the wave change switch to shortwave band No. 1 and turn the tuning dial to 9 meg. By adjusting trimming condenser C_{12} tune in a signal from a signal from the signal generator. Check the alignment at 5 meg. and adjust the calibration by pushing together or spreading apart the turns on the coil. Middle tracking should be checked at 6.5 meg. and if it is necessary to adjust the calibration at this point either spread or push together the turns on the oscillator coil and change the fixed pad on the oscillator coil to correct the calibration at 5 meg.

2. With the oscillator stage properly aligned set the tuning dial to 9 meg. and adjust trimming condensers C_{15}, C_{17} and C_{19} to maximum output. Alignment at 5 meg. should be checked with the tuning wand and any adjustments necessary made by pushing together or spreading turns on the coil. Then check the middle tracking point at 6.5 meg.

ALIGNMENT OF SHORTWAVE BAND NO. 2

1. Place the wave change switch on shortwave band No. 2 and adjust the tuning dial at 22 meg. Tune in the signal from the generator by adjusting trimmer condenser C_{14}. Turn the tuning dial to 12 meg. and adjust the calibration by either pushing together or spreading apart the turns on the oscillator coil. The middle tracking point is checked at 16 meg. and if it is necessary to readjust the calibration at this point either push together or spread apart the turns on the oscillator coil and change the fixed padding condenser on the oscillator coil to correct the alignment at 12 meg

2. When the oscillator stage has been properly aligned set the dial at 22 meg and adjust trimmer condensers C_{16}, C_{18}, and C_{20} to give maximum output. Check the alignment at 12 meg. by means of a tuning wand and make any required adjustments by either pushing together or spreading apart the turns on the coils. Check the middle tracking point alignment at 16 meg

ALIGNMENT OF THE ULTRA SHORTWAVE BAND

1. Set the tuning dial at 30 meg with the high fidelity control advanced about 1/4 of the way on. Tune in the signal from the generator using a harmonic of 15 meg and adjust the calibration by spreading or pushing together the turns on the ultra high frequency oscillator coil. Be sure to keep the small booster coil at the bottom of the oscillator coil closely coupled. Next adjust the dial to 60 meg. leaving the generator set at 15 meg and check the calibration.

2. With the oscillator properly aligned and the receiver tuned to the generator signal at 60 meg. adjust the trimmer condenser on the ultra high frequency R F coil to maximum slowly rocking the tuning dial back and forth while making this adjustment. Check the alignment at 30 meg and adjust to maximum by spreading or pushing together the turns on the R F coil and readjusting the trimmer at 60 meg

CONCLUSION

It will be recognized that it would be quite impossible to enumerate every symptom and its required remedy in a circuit and mechanism as elaborate and advanced as the Scott Philharmonic XXX. For this reason a rather detailed description of the functions and operation of practically all parts has been given. This information together with the circuit diagram should enable the experienced service engineer to remedy any trouble, however, there may be cases that are particularly baffling and in such events the Scott Radio Laboratories may always be relied upon to cooperate in every way possible.

WHEN REPLACEMENTS ARE REQUIRED
BE SURE TO ORDER BY STOCK NUMBERS SHOWN BELOW

Symbol	Part	Stock Number
1	100 mmfd. Cond.	46
2	2 meg. 1/4 watt Res.	321
3	.05-400 V Cond.	1284
	(60 mmfd. Air Cond. Fixed	
	(30 mmfd. Air Cond. Variable	932
	(85 mmfd. Air Cond. Fixed	
4A	(30 mmfd. Air Cond. Variable	933
5	3 pi I. F. Coil	948
6	4 pi I. F. Coil	272
7	6E5 Socket	1220
8	300 ohm variable (eyes and Exp. adj.)	1155
9	4370 Choke (Bass)	1371
10	.025-400 V Cond.	1283
11	Selectiwity Fidelity Control (2,000 ohms)	1315
12	Volume Control (500M)	1343
13	Bass Control (Dual)	1333
14	Scratch Suppressor Switch	1341
15	Expander Control (500 M)	1342
16	Wave Change Switch	
17	Sensitivity Control and Phono Switch (2000 ohms	700
18	Indicator Eye Tube Bracket	1326
19	5000 mmfd. Mica Cond.	295
20	.02 mfd. 400 V Cond.	1335
21	1-12 Variable	1184
22	SW_1 and SW_2 Ant. Coils (L-G)	1399
23	L. W. and B. C. Ant. Coils (L - 1)	1400
24	L. W. and B. C. R. F. Coils (F)	1403
25	SW_1 and SW_2 R. F. Coils (L-D)	1402
26	Dial Light Cable	1354
27	Tuning and Exp. Eye Cable	
28	L. W. and B. C. Osc. Coil (L-C)	1398
29	SW_1 and SW_2 Osc. Coil (L-A)	1396
30	20 mmfd. Cond.	522
31	2-2 section gang Cond. (front and rear)	534
32	.01-400 V Cond.	1281
33	25 ohms 1/4 watt Res.	285
34	1 meg. 1/4 watt res.	124
35	250 mmfd. Cond.	47
36	1000 ohm 1/4 watt Res.	367
37	1/4 meg. 1/4 watt Res.	319
38	5 mmfd. Cond.	1363
39	2 meg. 1/4 watt Res.	321
40	Police Osc. Coil (L-B)	1397
41	Police R.F. Coil (E)	1404
42	Police Ant. Coil (L-H)	1400
43	100 mmfd. Cond.	46
44	.1 mfd. 400 V.	281
45	.15 mfd. 400 V.	799
46	1000 mmfd.	52
47	Wave Switch Section	1278
48	Wave Switch Shaft	1276
49	Ult. High Freq. Gnd. Coil	1392
50	" " " Sec. Coil	1334
51	" " " R F. Coil	1391
52	" " " Booster Coil	1405
53	20,000 ohm 1/4 watt Res.	841
54	1000 ohm 1/4 watt Res.	367
55	50 mmfd. Cond.	45
56	100 ohm 1/4 watt Res.	414
57	500 ohm 1/4 watt Res.	768
58	800 ohm 1/4 watt Res.	1216
59	300 mmfd. Cond.	48
60	900 mmfd. Cond.	51
61	50 mmfd. Cond. (Trimmer)	296
62	50,000 ohm 1/4 watt	318
63	15,000 ohm 1/4 watt	374
64	.05 mfd. cond. 400 V.	1284
65	.008 mfd. Cond.	1368
66	2500 ohms 1/4 watt Res.	369
67	7,500 ohms 1/4 watt Res.	1322
68	3,500 ohms 1/4 watt Res.	370
69	100,000 1/4 watt Res.	120
70	25 mmfd. Cond.	285
71	500 mmfd. Cond.	526
72	10,000 ohms 1/4 watt	317
73	1 mfd. Cond.	281
74	7 x .5 200 V. 400 V.	1321

SYMBOL	PART	STOCK NUMBER
75	R. F. - A.G.C Diode (assembly)	
76	I.F. - A.G.C. Diode "	
77	Audio Diode "	
78	2 Blade Hi-Fi Cond. (L)	389
79	Stator Plate	462
80	Brass Shield	449
81	2 Blade Hi-Fi Cond. (S)	390
82	Band Pass Switch	1314
83	25,000 ohm 1/4 watt Res.	650
84	15,000 ohm 1/4 watt Res.	374
85	Hi-Fi Shaft	1298
86	.7 Henry High Boost Choke (L4) 4443	1370
87	Bass Comp. Choke 24 M.H. (L-3) 4442	1372
88	1 mfd. Cond. 200 V.	968
89	150 ohm 1/4 Res.	427
90	500,000 ohm 1/4 watt Res.	123
91	"C" bias Divider	524
92	Gear #1	
93	Gear #2	
94	Gear #3	
95	Hi-Fi Control Switch	
96	2500 mmfd. Cond.	310
97	1,500 ohms 1/4 watt Res.	368
98	3 meg. 1/4 watt res.	386
99	75,000 ohm 1/4 watt Res.	563
100	Attenuator Choke 4446	1373
101	"B" Voltage Divider	523
102	1/2 meg 1/4 watt Res.	123
103	750,000 ohm 1/4 watt Res.	1045
104	200,000 ohm 1/4 watt Res.	1246
105	35 mmfd. Cond.	286
106	3,000 ohm 1/4 watt Res.	840
107	.025 mfd. 400 V Cond.	1283
108	25,000 ohm (Attenuator variable)	1337
109	40,000 ohm 1/4 watt Res.	1048
110	5,000 ohm 1/4 watt Res.	371
111	.006 mfd. Cond.	1275
112	4 x 4 mfd. 300 V.	1259
113	175 Henry Choke	1371
114	.05 mfd. Cond. 100 V.	1284

During the early part of 1939 several improvements and changes were made in the Philharmonic receiver. These changes results in a number of parts being removed from the receiver and other parts added. These changes are not shown on the top and bottom view diagrams but are shown on the circuit diagram. These changes are as follows.

.5 meg ohm 1/4 Watt Resistors	123	.01 400 volt tubular condenser	361
Compensator switch	1312	.05 " " " "	656
300 ohm variable resistor	1155	.25 " " " "	876
Volume Control	1343	.025 " " " "	875
Expander Control	1342	.05 200 " " "	279
Scratch Suppressor Switch	1341	Volume Control (topped at 40,000 R) new	413
50000 mmf. mica condenser	295	Expander control (linear taper) new	409
100,000 ohm 1/4 watt resistors	120	1 meg. ohm midget control	1472
.15 400 volt tubular condenser	799	100,000 ohm midget control - new	
1 mfd. 200 volt condenser in can	968	S. S. Switch midget type (stackpole) new	707
150 ohm 1/4 watt resistor	427	50 mmf. trimmer condensers (teleradio)	296
Volume compensation choke # 1442	1372	Binding post (Marked U.S.) new	410
50,000 ohm 1/4 watt resistor	318	Antenna ring	1197
Switch Section	1278	Switch section	1279
2500 mmf. mica condenser	310	Escutcheon (fidelity) new	
.01 400 volt condenser	361	Escutcheon (scratch suppressor) new	
25 mmf. mica condenser	285	Knobs small	1340
10,000 ohm 1/4 watt resistor	317	Ultra S.W. Coils - new	
100 mmf. mica condenser	46	50 mmf. mica condensers	45
900 mmf. mica condenser	51	25,000 ohm 1/4 watt resistor	841
400 ohm 1/4 watt resistors	1270	900 mmf. Silvercap condenser (new) Cornell	453
600 " " " "	1686	100 mmf. Silvercap condenser (new) Cornell	121
800 " " " "	1216		
15,000 ohm 1/4 watt resistors	374		
500 " " " "	768		
6,000 " " " "	438		
5,000 " " " "	371		
1,000 " " " "	367		
250,000 " " " "	319		

E. H. SCOTT RADIO LABS., INC.

The wire jumpers may now be removed from the 3rd I. F. transformer terminals and the wire jumpers (or the original resistors, if they were used) connected to the 2nd I. F. transformer terminals. The bias jumper may now be removed from points "A" and "B" leaving the I. F. terminals connected as originally found and completing the alignment.

Alignment of R. F. sections:

Before starting on this portion of the set, it is important to understand how the tuning wand tool works. One end of this device has a core of material such as Polyiron while the other end is brass. When the inductance of a coil is high, insertion of the brass end will decrease it to the proper resonant value; whereas, insertion of the other end will increase the effective inductance. This gives a very convenient means of determining whether or not it is necessary to add or remove turns from the coil. In the following instructions only a slight adjustment of trimmers and padders should be necessary where original coils are used. Full instructions however, are given to cover the case where new coils are to be used.

Broadcast Band alignment:

First turn the dial pointer completely to the low frequency dial stop and center the pointer exactly between the two heavy horizontal lines which separate the "Broadcast A" position, set the Bass Control to minimum, Treble control to maximum and sensitivity switch to minimum (pulled out), and connect an output meter across the voice coil. Refer to Fig. 5, and adjust oscillator trimmer C1, until a

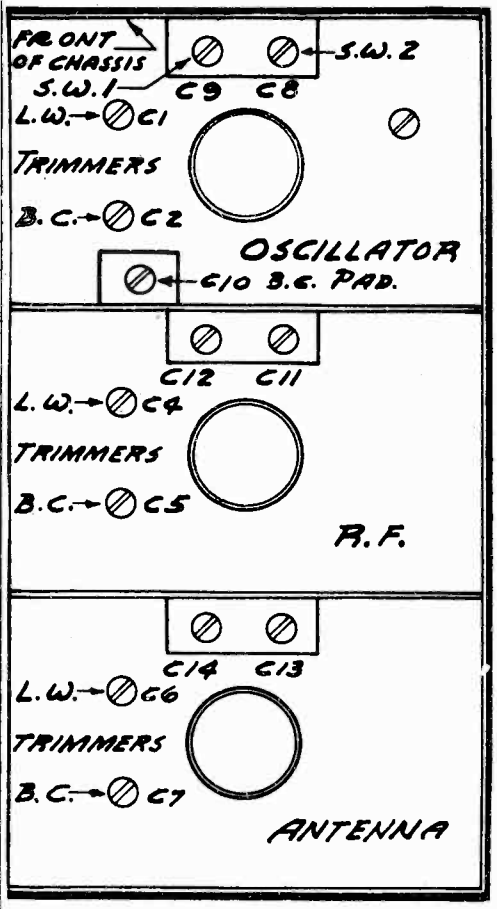


Fig. 4 Location of R.F. Trimmers and padders (Export Model.)

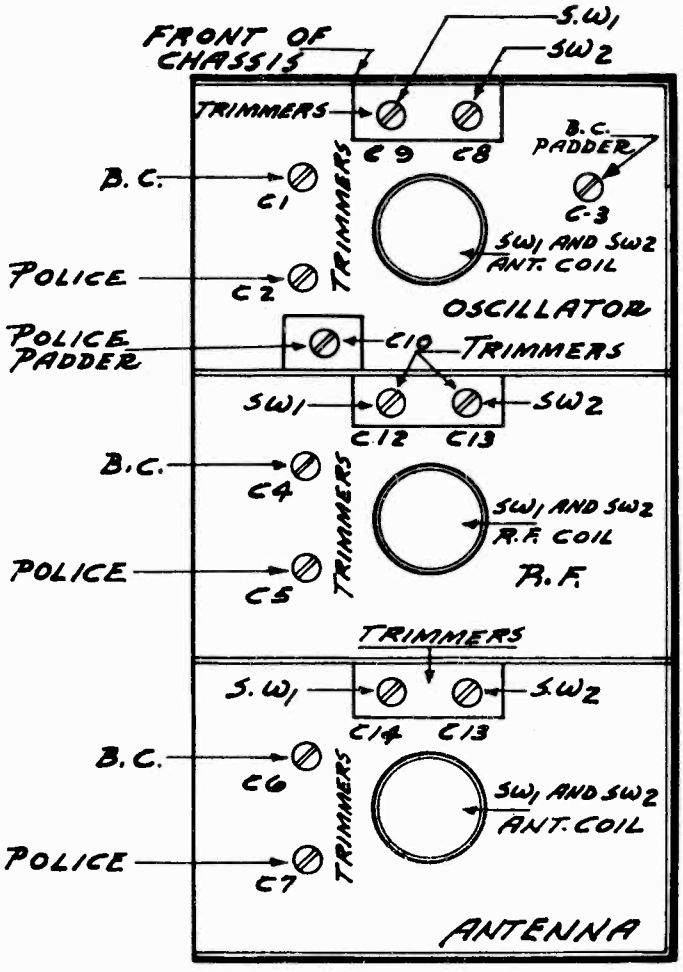


Fig. 5 Location of R.F. Trimmers and padders for Domestic Model.

1400 KC signal as set on the dial is tuned in from the generator. Rotate the dial to 650 KC and tune in a 650 KC signal from the generator by adjusting the padding condenser C3. Check the dial at 970 KC and if it tunes high in frequency spread turns on the oscillator secondary, if it is low in frequency push the turns together and then readjust trimmer condenser C1, and Padder condenser C3, as before.

With the oscillator circuit correctly spotted tune in a signal from the generator at 1400 KC and use the output meter as indication. Have as weak a signal as possible and adjust trimmer C4 and C6 for maximum output. Turn the dial to 650 KC and check the alignment of the R. F. and antenna stages with a tuning wand, spreading turns on the coil where less inductance is needed and pushing turns together if more inductance is required. Readjust the trimmer condenser C4 and C6 for maximum at 1400 KC. Turn the dial to 970 KC and check the alignment of the R. F. and antenna stages.

Police Band:

Set the wave Band switch to the Police "B" Band, position and turn the dial to 3.7 megacycles. Tune in a signal from the generator by adjusting the Padder C10. Check the alignment at 2.6 megacycles, if off, either push together or spread turns on the oscillator secondary as described under "Broadcast Band Alignment". Readjust trimmer C2 and padder C10 until correctly aligned. Tune in a signal at 3.7 megacycles and adjust trimmers C1 and C3 to maximum output, now check the alignment of 1.8 megacycles with a tuning wand and make any necessary corrections by pushing or spreading turns on the coils and readjusting trimmers C5 and C7. Recheck the alignment at 2.6 megacycles.

Long Wave Band on Export Model.

On the Export model the Long Wave Band replaces the Police Band. To align this model set the wave change switch to L. W. position A and rotate the tuning dial on the set to 370 KC. Tune in a signal from the generator by adjusting trimmer condenser C1. Now turn the set dial to 170 KC and tune in a 170 KC signal from the generator by adjusting the oscillator padding condenser C3. Return to 370 KC and retrim condenser C1. Check the calibration at 250 KC. Add or remove turns from the oscillator coil as required for perfect dial calibration at these three frequencies. Now turn the dial to 370 KC and tune in a weak signal from the generator and adjust trimmers C4 and C6 until maximum output is shown on the output meter. Now turn the dial to 170 KC and check the R. F. and Ant. alignment with a tuning wand. Make any necessary corrections on the coils (where new) by adding or removing turns. Then repeak the trimmers C4 and C6. Check the alignment at 250 KC.

Foreign S. W. - C - (SW1)

Set the wave band switch to the "C" position and tune in a signal at 9 megacycles by adjusting trimmer condenser C9. Turn the dial to 4.5 megacycles and if necessary to correct the calibration do so by spreading or pushing turns on the coil and readjusting the trimmer condenser C9. Check the calibration at 6.5 megacycles.

With the oscillator calibrated tune in a signal at 9 megacycles and adjust trimmer condensers C12 and C14 for maximum output. Check the alignment at 4.5 and 8.6 megacycles and make any necessary corrections by pushing or spreading turns on the coils and readjusting trimmers C12 and C14.

Foreign S. W. - D - (SW2)

Set the Wave Band Switch to D position and tune in a signal at 20 megacycles by adjusting trimmer C8, check and if necessary correct the calibration at 12 megacycles by pushing or spreading the turns on the oscillator coil. Check the calibration at 15 megacycles.

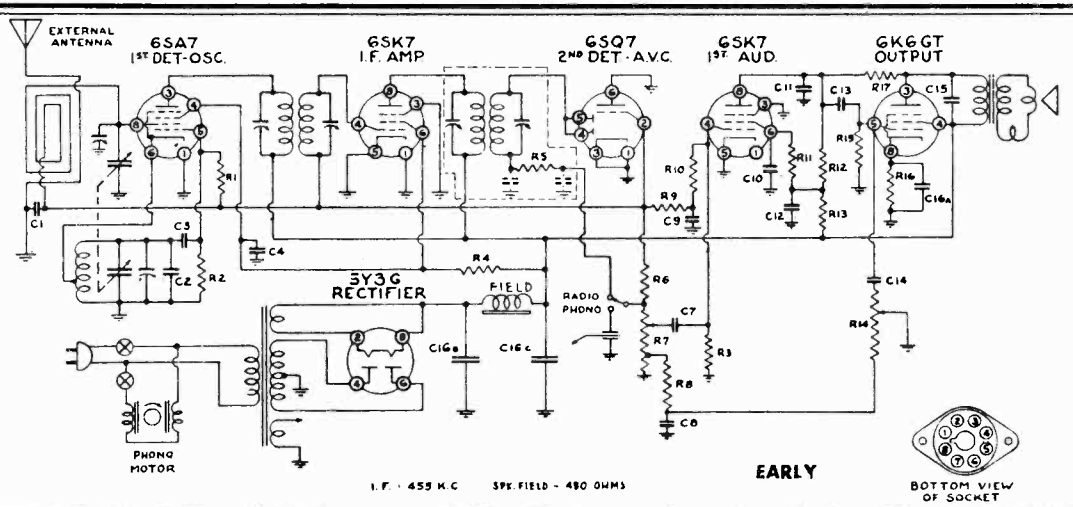
With the oscillator correctly aligned tune in a signal at 20 megacycles and adjust trimmers C11 and C13 to maximum output. Check the alignment at 12 and 15 megacycles and make necessary corrections by pushing or spreading turns on the coils, now readjust trimmer C11 and C13.

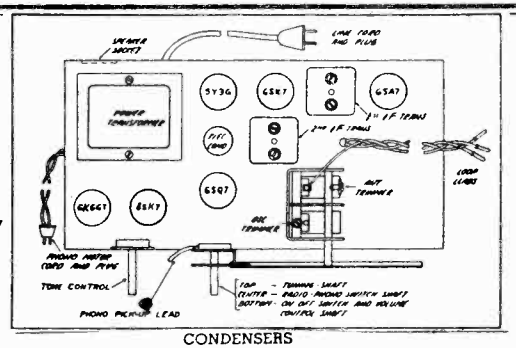
CONNECTING EXTRA SPEAKER

The New Type High Fidelity Scott Permanent Magnet 38 ohm voice coil speaker may be readily connected to a Scott receiver as shown in Fig. 6, with the optional "T Pad" inserted in the voice coil leads where separate control of the extension speaker volume is desired. In case the extension speaker is disconnected the jumper must be changed to connect terminals "V.C." and "38".

WAVE CHANGE SWITCH TROUBLE

Poor contact in the wave change switch can generally be corrected by slightly bending the contacts involved. However, in case a switch section is accidentally damaged beyond repair this section can be replaced by first removing the dial face then removing the two screws which support the wave change detent plate and very carefully pulling out the wave change switch shaft. The damaged section can then be unsoldered, removed, and replaced with a new unit which should be obtained from the Scott Chicago Laboratories before the change is made in order to assure exact duplication of switch position and connections. Note particularly that the small notch near the center of the switch rotor must be in the same position in each switch section.



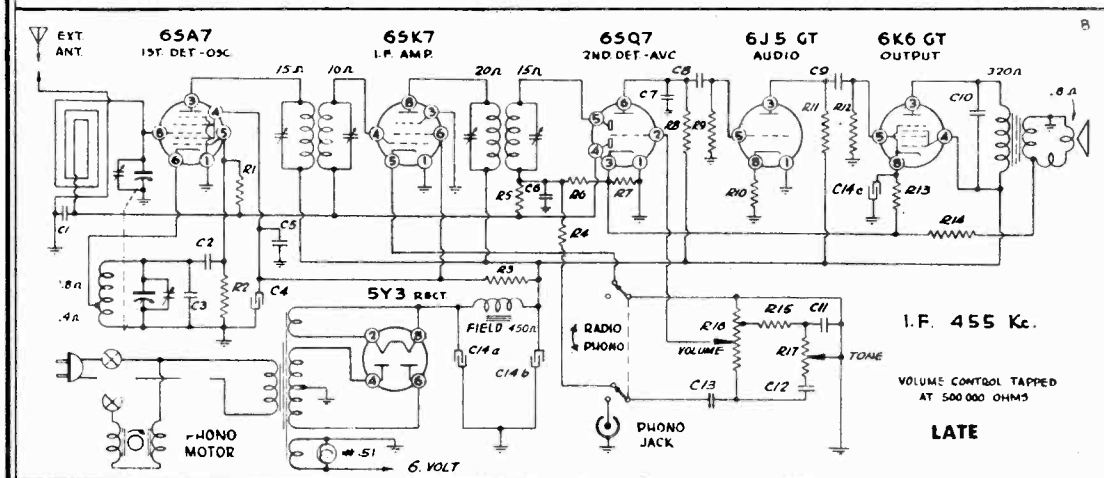


CONDENSERS

Circuit	Capacity	Type	Circuit	Capacity	Type
C1	.05	200v.	C8	.01	400v.
C2	.00005	Mica	C9	.02	400v.
C3	.000025	Mica	C10	.02	400v.
C4	B.Elect	150v.	C11	.02	400v.
C5	.05	400v.	C12	.002	600v.
C6	.00025	Mica	C13	.002	600v.
C7	.00025	Mica	C14a	20.Elect.	350v.
			C14b	20.Elect.	350v.
			C14c	12.Elect.	25v.

RESISTORS

Circuit	Ohms	Type	Circuit	Ohms	Type
R1	10,000,000	½w.	R9	500,000	½w.
R2	20,000	½w.	R10	3,000	½w.
R3	15,000	2w.	R11	50,000	½w.
R4	150,000	½w.	R12	250,000	½w.
R5	2,000,000	½w.	R13	600	½w.
R6	250,000	½w.	R14	350	½w.
R7	22	½w.	R15	30	½w.
R8	250,000	½w.	R16	1,000,000	V.C.
			R17	500,000	T.C.



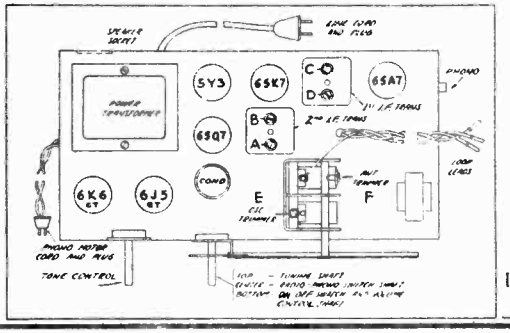
CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.05	200	C10	.05	400
C2	.000025—10%	Mica	C11	.00025	Mica
C3	.00005	Mica	C12	.1	400
C4	.05	400	C13	.01	400
C5	.0001	Mica	C14	.005	600
C6	.0001	Mica	C15	.002	600
C7	.01	400	C16a	20.	25
C8	.02	200	C16b	20.	350
C9	.05	200	C16c	20.	350

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	10,000,000	½	R10	5,000,000	½
R2	20,000	½	R11	1,000,000	½
R3	5,000,000	½	R12	250,000	½
R4	15,000—10%	2	R13	50,000	½
R5	70,000	½	R14	500,000	T.C.
R6	2,000,000	½	R15	500,000	½
R7	500,000	V.C.	R16	600—10%	½
R8	20,000	½	R17	3,000,000	½
R9	1,000,000	½			

C5 and C6 are an integral part of P4858, the 2nd I.F. but are separate condensers when the P4109, 2nd I.F. transformer is used.



ALIGNMENT PROCEDURE

STEP	Correct Signal Generator to—	Radio and Generator Dummy Antenna Between	Set Generator Controls to—	Set Radio Controls to—	Adj. Following Trimmers to Max. Output
1	Tuning Cond. Ant. Stator	.1 mfd.	455 Kc.	1630 Kc.	A, B, C, D I. F.
2	Tuning Cond. Ant. Stator	.1 mfd.	1630 Kc.	1630 Kc.	E Osc.
3	Loop Radiator	Two feet from Radio No Connection	1400 Kc.	1400 Kc.	F. Ant. (Not used in some models)

SEARS ROEBUCK CO.

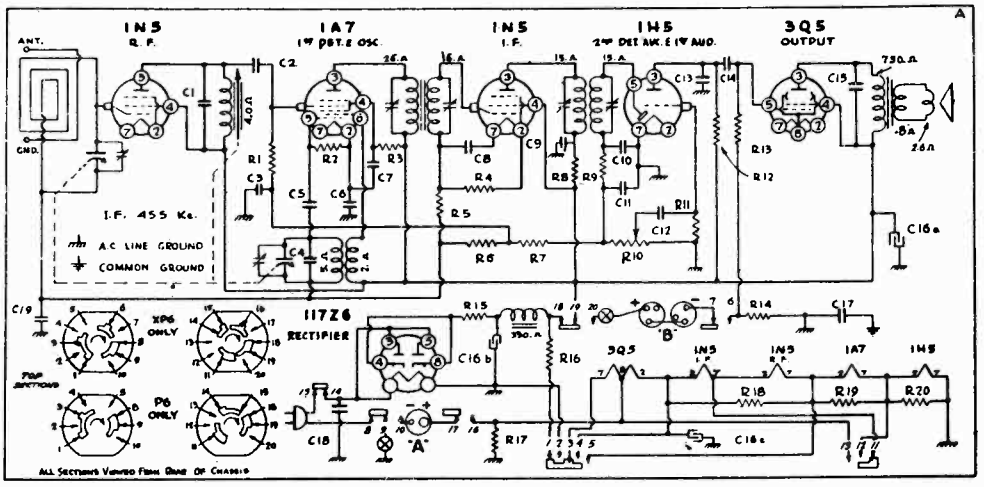
MODEL N6

ISSUE B 1942

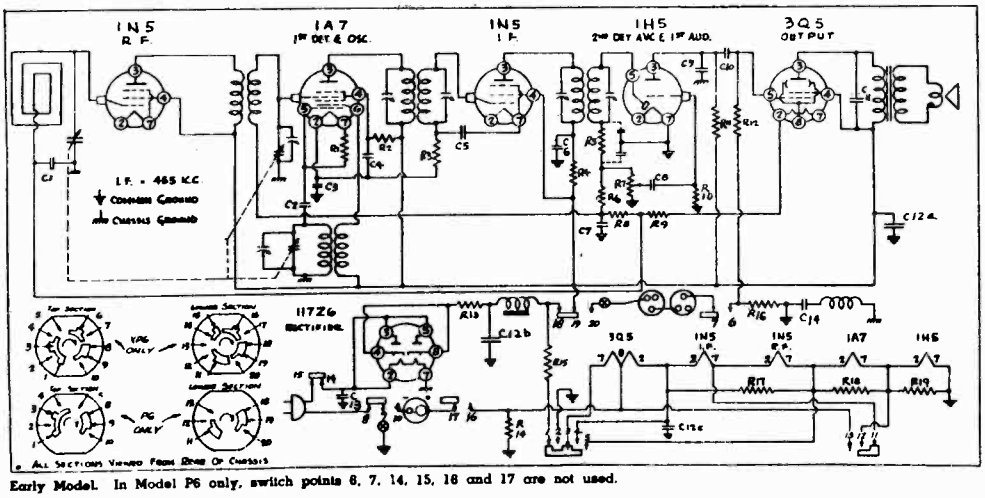
SEARS PAGE 14-1

MODEL P6-XP6

SEARS, ROEBUCK & CO.



Late Model. In model P6 only, switch points 6, 7, 16, and 17 are not used. Power switch in line position. Common ground is chassis ground.



Early Model. In Model P6 only, switch points 6, 7, 14, 15, 16 and 17 are not used.

No.	Ohms	Watts
R1	100,000	½
R2	200,000	½
R3	5,000,000	½
R4	5,000,000	½
R5	5,000,000	½
R6	5,000,000	½
R7	3,000,000	½
R8	5,000	½
R9	70,000	½
R10	1,000,000	V.C

No	Ohms	Watts
R11	15,000,000	½
R12	1,000,000	½
R13	2,000,000	½
R14	400	½
R15	22	½
R16	2,150	5
R17	3,000	½
R18	530	½
R19	200	½
R20	110	½

No.	Capacity (Mfd.)	Volts
C1	.000367 Silver	Mica
C2	.00025	Mica
C3	.01	400
C4	.000015	Mica
C5	.00005	Mica
C6	.25	200
C7	.01	400
C8	.01	400
C9	.05	400
C10	.00005 In I.F.	Can

No.	Capacity (Mfd.)	Volts
C11	.0001	Mica
C12	.01	400
C13	.00025	Mica
C14	.01	400
C15	.002	600
C16a	40.	150
C16b	30.	150
C16c	100.	25
C17	.1	400
C18	.05	400
C19	.05	200

No.	Capacity (Mfd.)	Volts
C1	.05	200
C2	.00005	Mica
C3	.25	200
C4	.01	400
C5	.001	600
C6	.05	400
C7	.05	200
C8	.001	600

No.	Capacity (Mfd.)	Volts
C9	.00025	Mica
C10	.001	600
C11	.002	600
C12a	50. Elect.	150
C12b	30. Elect.	150
C12c	100. Elect.	25
C13	.05	400
C14	.2	200

No.	Ohms	Watts
R1	200,000	½
R2	50,000	½
R3	5,000,000	½
R4	5,000	½
R5	70,000	½
R6	3,000,000	¼
R7	1,000,000	V.C.
R8	5,000,000	½
R9	10,000,000	¼
R10	15,000,000	½

No.	Ohms	Watts
R11	1,000,000	½
R12	2,000,000	½
R13	22—10%	½
R14	1,000	½
R15	2,150—10%	5
R16	400—10%	½
R17	500—10%	½
R18	200—10%	½
R19	110—10%	½

STEP	Connect Signal Generator to—	Dummy Antenna Between Radio and Generator	Set Generator Controls to—	Set Radio Controls to—	Adj. Following Trimmers to Max. Output
1	Grid 1A7 GT	.1	455 Kc	1600 Kc.	A, B, C, D, I. F.
2	Grid 1N5 GT	.1	1600 Kc.	1600 Kc.	E Osc.
3	Grid 1A7 GT	.1	1400 Kc.	1400 Kc.	F — R. F. (Gang Early) on (Slug Late)
4	Loop Radiator	Two feet from Radio No Connection	1400 Kc.	1400 Kc.	G Ant.

Use Aerometer or three turn loop in series with 400 ohm resistor 10" diameter on Signal Generator in Step 4.

ISSUE A 1942

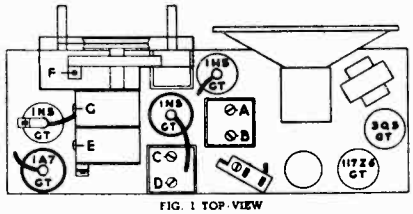


FIG. 1 TOP VIEW

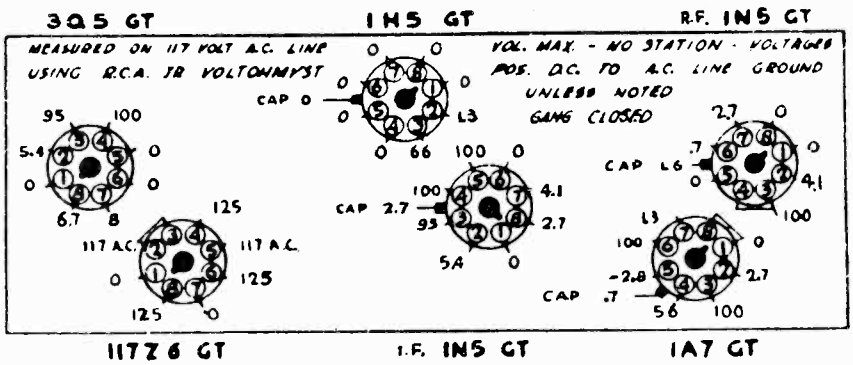
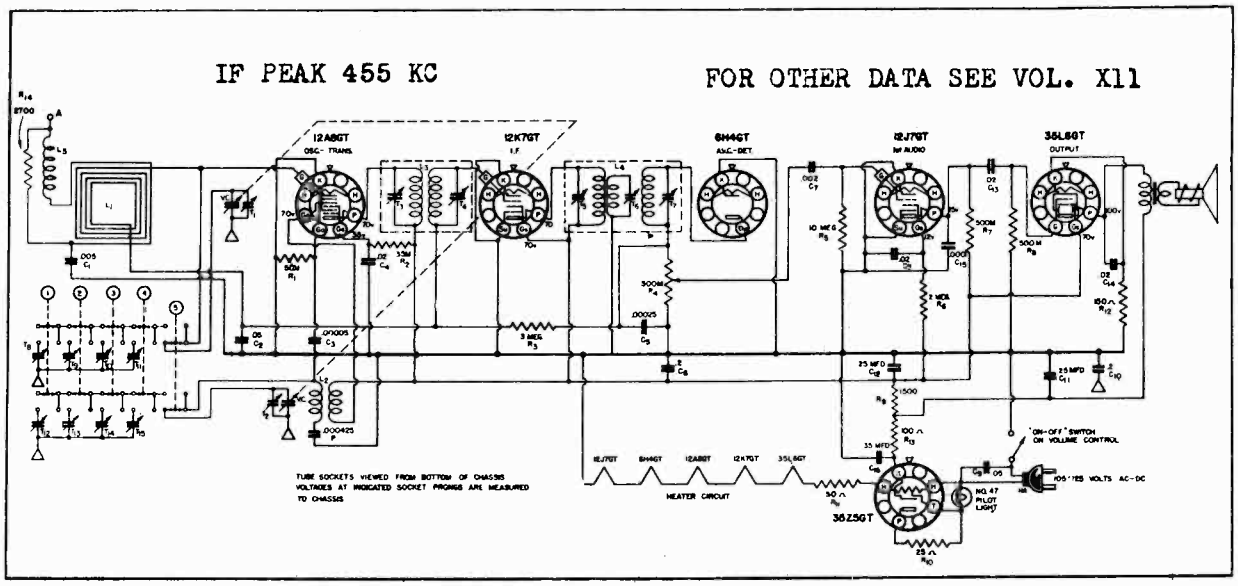


FIG. 2 VOLTAGE CHART

MODEL 2312
Ch. 163.34

SEARS, ROEBUCK & CO.

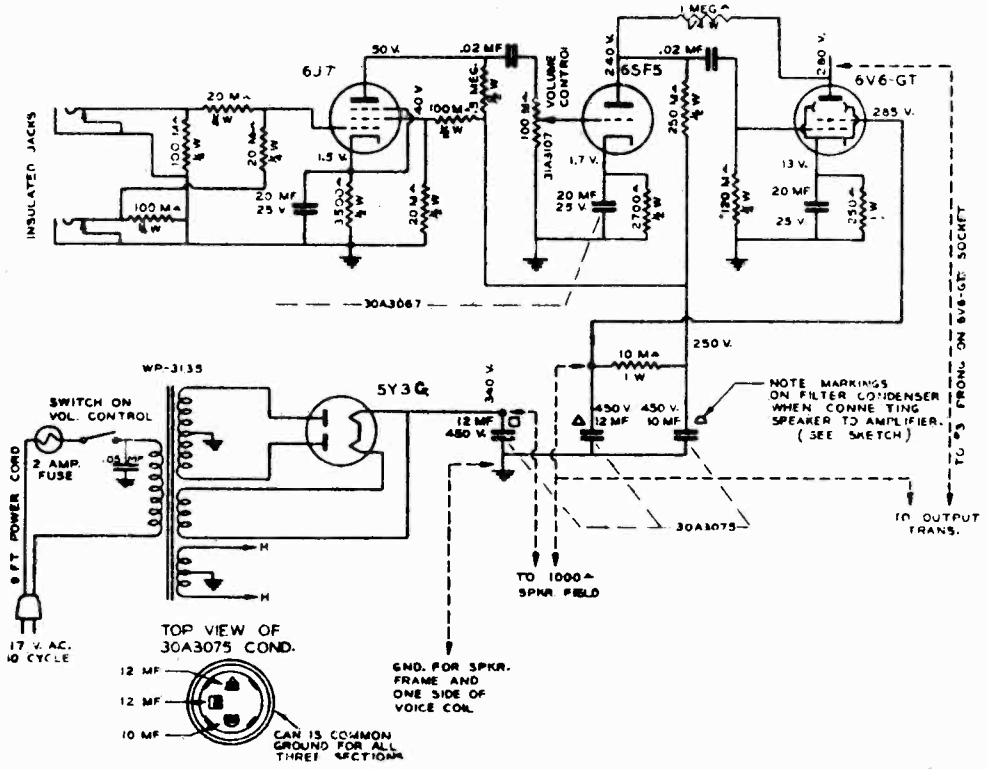
MODELS 1661, Ch.110.414-1
1721, Ch. 110.415-1



CHASSIS IDENTIFIED BY NO. 110.415-1 NO. 110.414-1 HAVE PRIMARY LOOP CIRCUIT REFINEMENTS TO IMPROVE ANTENNA PERFORMANCE. THE CIRCUIT CHANGE CONSISTS OF:

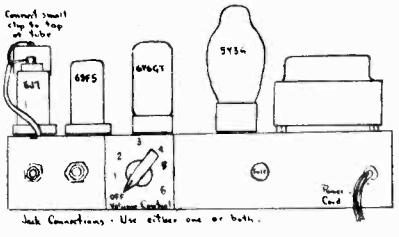
1- Addition of an antenna loading inductance (L5)
2- Addition of a 2700 ohm resistor (R14)

DECEMBER 23, 1940



MODEL 2312

A FOUR TUBE GUITAR AMPLIFIER



POWER OUTPUT

Type - Single Beam Power
Max. - 8 Watts
Undistorted - 5 Watts

POWER SUPPLY

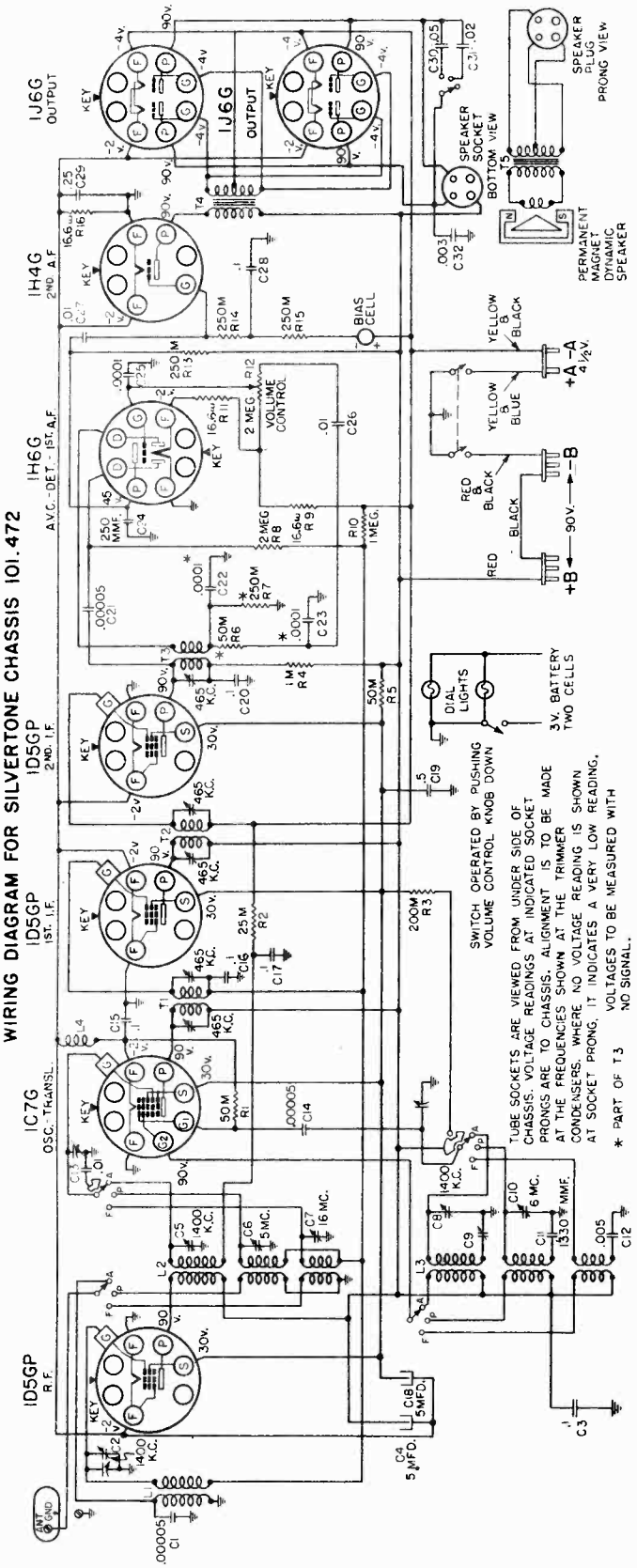
MARCH 17, 1943

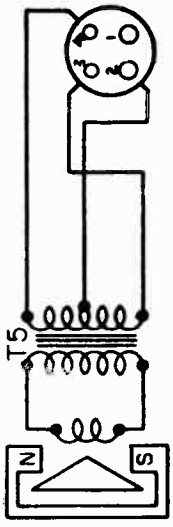
All Models - 105-125 Volts, 50-60 cycles - 50 Watts

MODELS 4608-9, 4628-9,
4638-9, 4648-9,
4723, 4743
Chassis 101.472

SEARS, ROEBUCK & CO.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.472

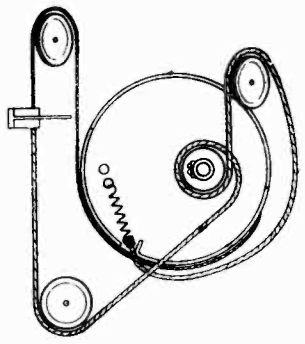




PERMANENT MAGNET DYNAMIC SPEAKER

SPEAKER PLUG PRONG VIEW

1. BLANK
2. RED
3. BROWN
4. GREEN



CONDENSER DRIVE HOOKUP

JUNE 23, 1937

POWER SUPPLY:
"A" Battery (4½ volt dry) . . . . . 1 - #5032P
"A" Battery (4 volt storage) . . . . . 1 - #5049
"B" Batteries . . . . . 2 - #5131P

"A" Drain . . . . . .0.54 amperes
"B" Drain . . . . . 23 ma

FREQUENCY RANGES:

Band "A"	540-1780 kc
Band "P"	1780-6300 kc
Band "F"	5975-18500 kc

ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant.-Transl Trimmer	Padder
Band "A"	1400 kc	1400 kc	600 kc
Band "P"	5 mc	5 mc	Fixed
Band "F"	-	15 mc	Fixed

INTERMEDIATE FREQUENCY . . . . . 465 kc

POWER OUTPUT:
Type . . . . . Class "B"
Undistorted . . . . . 0.5 watts
Maximum . . . . . 1.25 watts

LOUD SPEAKER:
Type . . . . . Permanent Magnet Dynamic
Size . . . . . 6 and 8 inch

Chassis 101.472
Chassis 101.472X

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE
CHASSIS 101.472 AND CHASSIS 101.472X

PRELIMINARY:

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

Output meter reading to indicate 50 milliwatts . . . . . 0.4 volts

Average sensitivity in microvolts for 50 milliwatts 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

Connection of generator ground lead . . . . . Receiver chassis

Generator modulation . . . . . 30%, 400 cycles

Position of Volume Control . . . . . Fully on

Position of Tone Control . . . . . Fully clockwise

Position of Dial Pointer . . . . . To fall on end line of scale (low frequency end). Loosen dial drum set screws and rotate drum if necessary. Tighten set screws after pointer is properly set.

WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"P"	6 mc	465 kc	.1 mfd.	1C7G Grid	T3,T2,T1	IF	30
"A"	1400 kc	1400 kc	.0003 mfd.	Ant. Term.	C8,C5,C2	Osc.,Transl., Antenna	7
"A"	600 kc *(rock)	600 kc	.0003 mfd.	Ant. Term.	C9	Padder	7
"P"	5 mc	5 mc	400 ohms	Ant. Term.	C10,C6	Oscillator Translator	10
"F"	15 mc	15 mc	400 ohms	Ant. Term.	C7	Translator	15

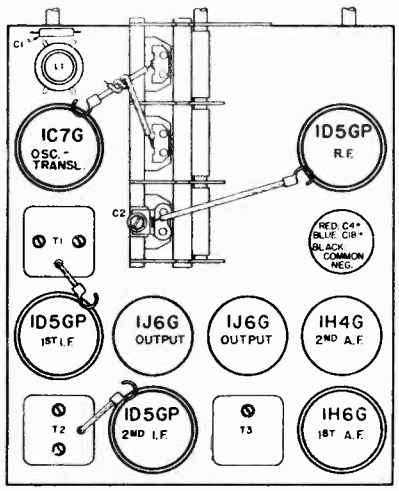
IMPORTANT ALIGNMENT NOTES

Note that the IF must be adjusted with the Wave Band Switch in the "P" position.

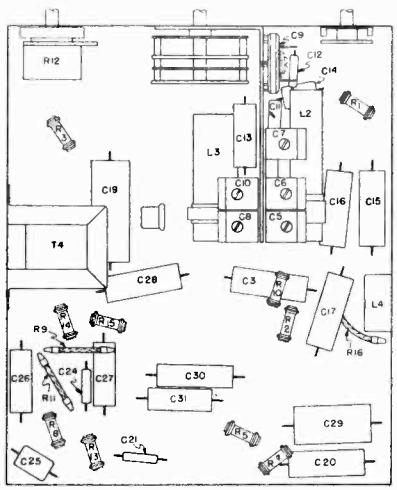
Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

Always keep the output from the signal generator at its lowest possible value to prevent the AVC action of the receiver from interfering with accurate alignment. As the receiver sensitivity is increased through alignment, the output from the generator should be decreased to compensate.

SOCKET, TRIMMERS AND CHASSIS
CHASSIS 101.472



LOCATIONS OF PARTS ON TOP OF CHASSIS



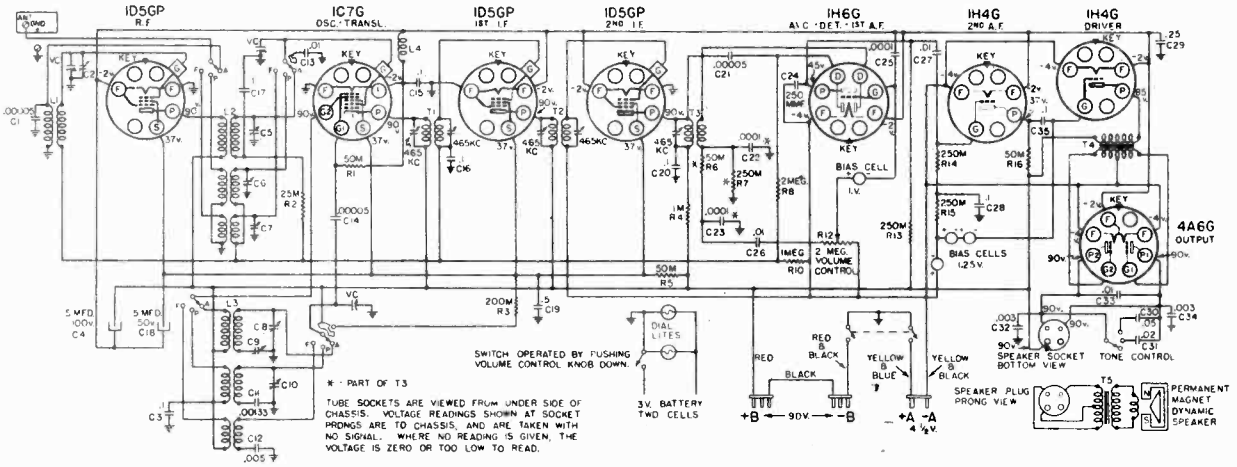
LOCATIONS OF PARTS UNDER CHASSIS

MODELS 4608A-9A, 4628A-9A,
4638A-9A, 4648A-9A, SEARS, ROEBUCK & CO.
4728A, 4748A
Chassis 101.472X

CIRCUIT REVISION TO REDUCE BATTERY DRAIN

Later production of Chassis 101:472 is 101:472X. The revision consists of the two 1J6G output tubes being replaced by a 1H4G driver tube and a 4A6G output tube. These changes reduce the "A" battery drain from .5 amperes to .3 amperes, and reduce the "B" drain from 23 ma. to 15 ma.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.472X

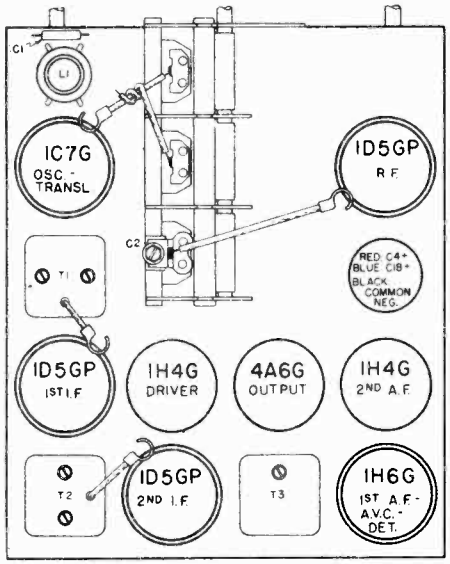


ALIGNMENT FREQUENCIES:-

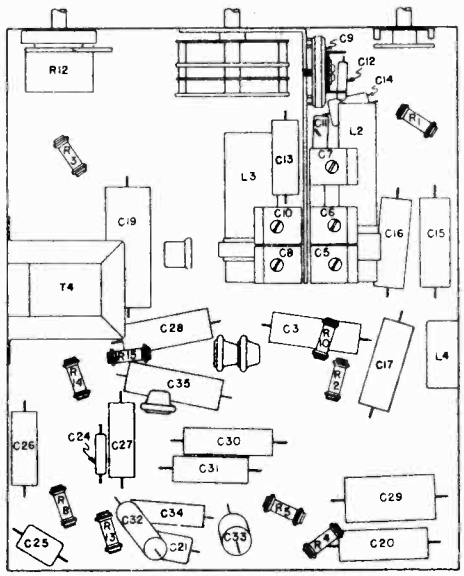
	OSCILLATOR TRIMMER	ANT.-TRANSL. TRIMMER	PADDER
Band "A"	1400 Kc	1400 KC	600 KC
Band "P"	5 MC	5 MC	Fixed
Band "F"	----	15 MC	Fixed

FOR ALIGNMENT SEE CHASSIS 101:472
INTERMEDIATE FREQUENCY PEAK 465 KC

July 6, 1938



LOCATIONS OF PARTS ON TOP OF CHASSIS

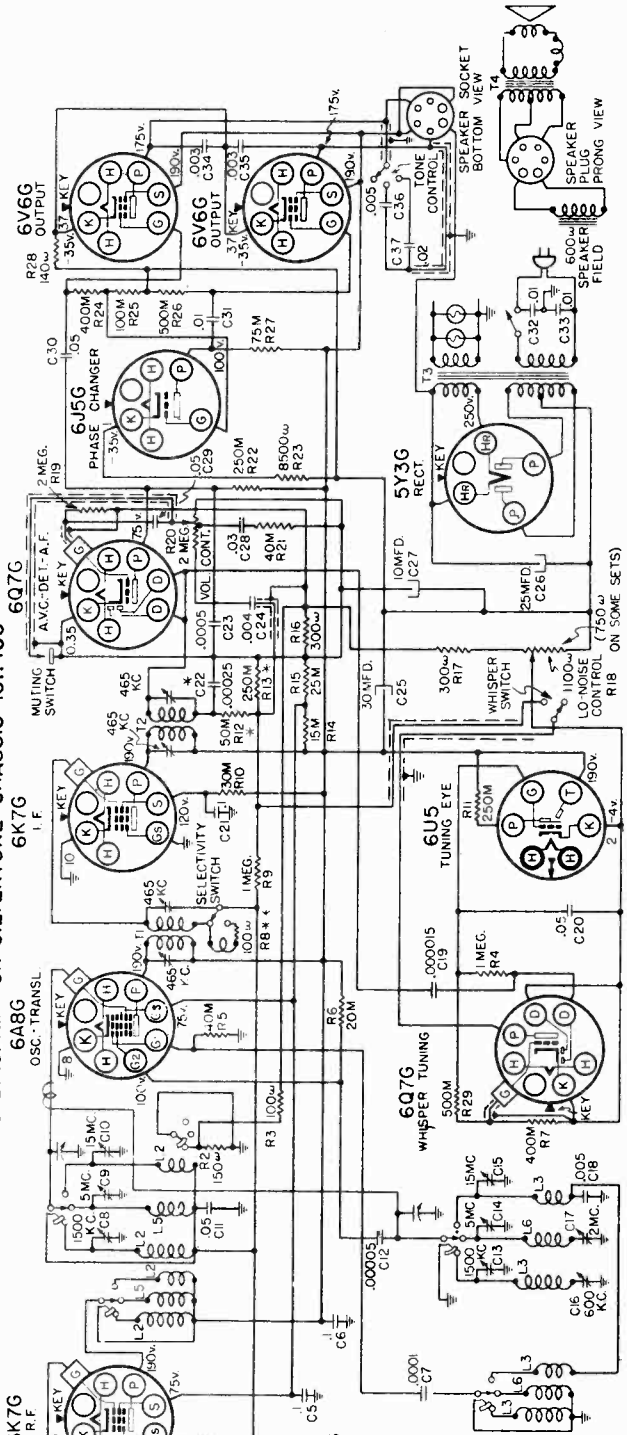


LOCATIONS OF PARTS UNDER CHASSIS

SEARS, ROEBUCK & CO.

MODELS 4666, 4686, 4766, 4786, 4791, 4792
Chassis 101.483

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.483



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
** - PART OF T1
* - PART OF T2

POWER SUPPLY:
All models available . . . . . 105-125 volts, 50-60 cycle, 85 watts
All models available . . . . . 105-125 volts, 25 cycle, 90 watts

FREQUENCY RANGES:

American Band		Oscil.	Ant-Transl.	Oscil.
Intermediate Band		Trimmer	Trimmer	Padder
Foreign Band	Band "AM"	1500 kc	1500 kc	600 kc
	Band "INT"	5 mc	5 mc	2 mc
	Band "FOR"	15 mc	15 mc	Fixed

ALIGNMENT FREQUENCIES: 540-1800 kc; 1760-6100 kc; 6.9-18.2 mc

INTERMEDIATE FREQUENCY . . . . . 465 kc

POWER OUTPUT:
Type . . . . . Push-Pull (Beam Tubes)
Undistorted . . . . . 8 watts
Maximum . . . . . 10 watts

LOUD SPEAKER:
Type . . . . . Dynamic
Size . . . . . 6", 8", 10", 12"
Field coil resistance . . . 600 ohms
App. field coil voltage drop . . . 60 volts

CHASSIS FEATURES:
Number RF stages . . . . . One
Number IF stages . . . . . One
Antenna . . . Doublet or Conventional
Line Noise Filter Condensers
Tuning Eye
Dual Tuning Ratio
Provision for Phonograph Pick-Up Connections

OPERATING FEATURES:
Tone Control . . . . . Three point
Selectivity Control . . . . Two point
Lo-Noise Control
Automatic Volume Control
Roll Over dial with only one scale visible at a time.
Automatic Tuning Dial

OPERATING CONTROLS:
1. Left knob . . "On-Off" switch and Volume
2. Next to left knob . . . Wave Band Switch
3. Center knob . . . . . Tuning
4. Next to right knob. Inner: Selectivity. Outer: Lo-Noise.
5. Right knob . . . . . Tone Control

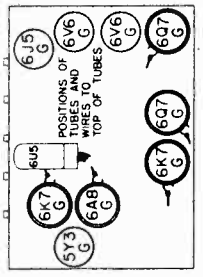
CONTROL OPERATION:
Turning right: Power on; volume increase
Turning right: American, Intermediate, Foreign
Tuning ratio: 6:1; 30:1
Turning right, inner: Sharp, Broad.
Turning right, outer: Normal, Lo-Noise.
Turning right: "LO", "MEDIUM", "HI"

GENERAL INFORMATION

VARIABLE SELECTIVITY:

Variable Selectivity is obtained by a two position switch. It changes the selectivity of the IF input transformer by connecting or disconnecting coupling turns between primary and secondary. The receiver is about three times more sensitive in the "Sharp" position than in the "Broad" position. This difference in sensitivity will not result in a change or volume unless listening to a very weak station. The "Sharp" position should be used for short wave reception in order to obtain maximum sensitivity.

TUBE LAYOUT



FOR AUTOMATIC TUNING DIAL SEE VOL. X PAGES 10-25 and 10-26

OCTOBER 4th, 1937

MODELS 4666, 4686, 4766,
4786, 4791, 4792
Chassis 101.483

SEARS, ROEBUCK & CO.

SUBJECT: CAUSES AND POSSIBLE CURES FOR HUM WHEN KNOB IS TURNED TO LO-NOISE POSITION.

SUBJECT: OTHER TROUBLES THAT HAVE BEEN FOUND, TOGETHER WITH THEIR POSSIBLE CURES.

CAUSES AND REMEDIES FOR HUM:

CAUSE: Defective 6Q7G control tube, having leaky heater.

REMEDY: Change tube. These tubes will probably operate satisfactorily when used as the 2nd detector and 1st AF amplifier.

CAUSE: Pickup of 60 cycle voltage from heater wiring passing close to socket terminals.

REMEDY: Move heater wires away from socket terminals.

CAUSE: Pickup of 120 cycle voltage in wires running to Lo-Noise control switch, because of their proximity to the rectifier tube socket.

REMEDY: Remove wires from vicinity of rectifier tube socket.

CAUSE: Pickup of spurious hum voltages by 6Q7G Lo-Noise control tube, from tuning eye cable.

REMEDY: Remove tuning eye cable from vicinity of 6Q7G Lo-Noise control tube.

OTHER TROUBLES AND THEIR REMEDIES:

CAUSE: Audio distortion at medium to high volume output, when Raytheon 6V6 tubes are used in output stage.

REMEDY: Change tubes to National Union make. Pass 6V6 plate leads close to chassis mounting plate. This is a second choice.

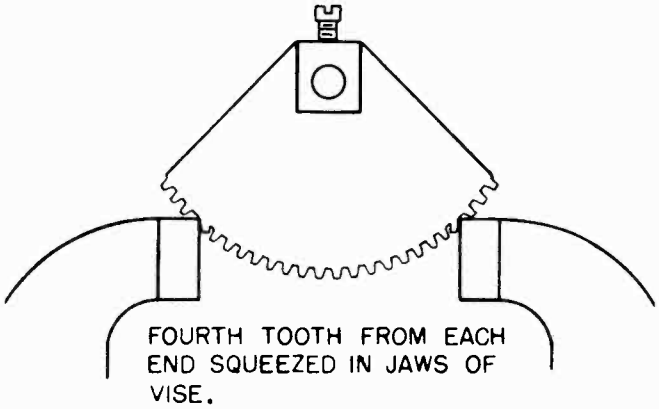
CAUSE: Set noisy when tuning.

REMEDY: This is caused by the intermittent grounding of various parts of the tuning mechanism to the chassis plate through the various pulleys and gears of the tuning assembly. Remedied by locating the intermittent ground and cleaning parts so that steady connection is maintained.

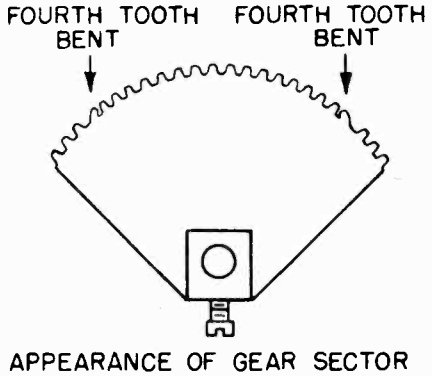
SUBJECT: BENDING WAVE SWITCH GEAR SECTOR TEETH TO PREVENT THE POSSIBILITY OF WAVE SWITCH BEING FORCED PAST ITS STOPS.

Any complaint that the Wave Switch goes beyond its proper stops can be taken care of as described below. This correction was incorporated early in production so that only a very few sets are in service about which there might be complaint. Also, the difficulty occurs only if someone forces the Wave Switch knob quite hard. To prevent the possibility, proceed as follows:

Remove the Wave Switch gear sector and place it in a vise so that the fourth tooth from each end will be bent toward the middle teeth as shown in the Illustration. This will act as a stop to prevent the switch from being turned too far. Then replace the gear sector.



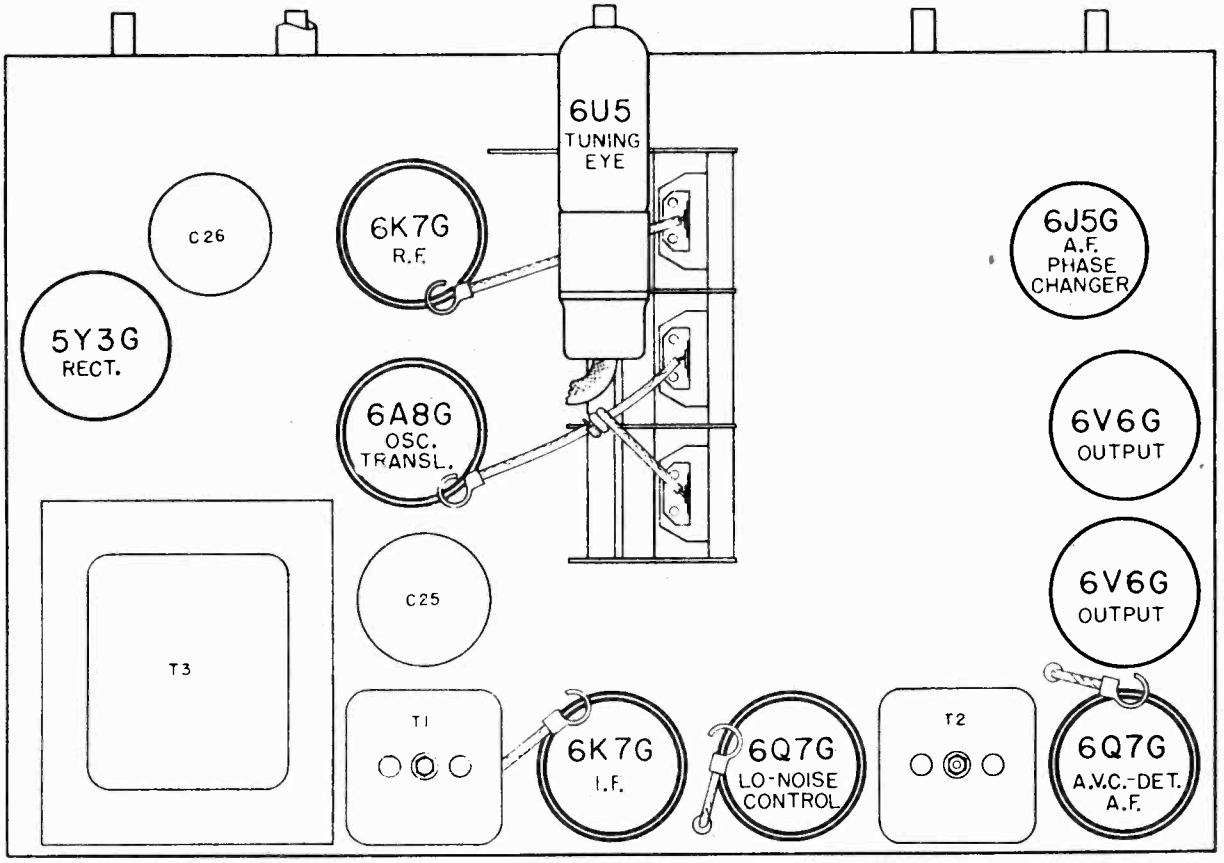
FOURTH TOOTH FROM EACH END SQUEEZED IN JAWS OF VISE.



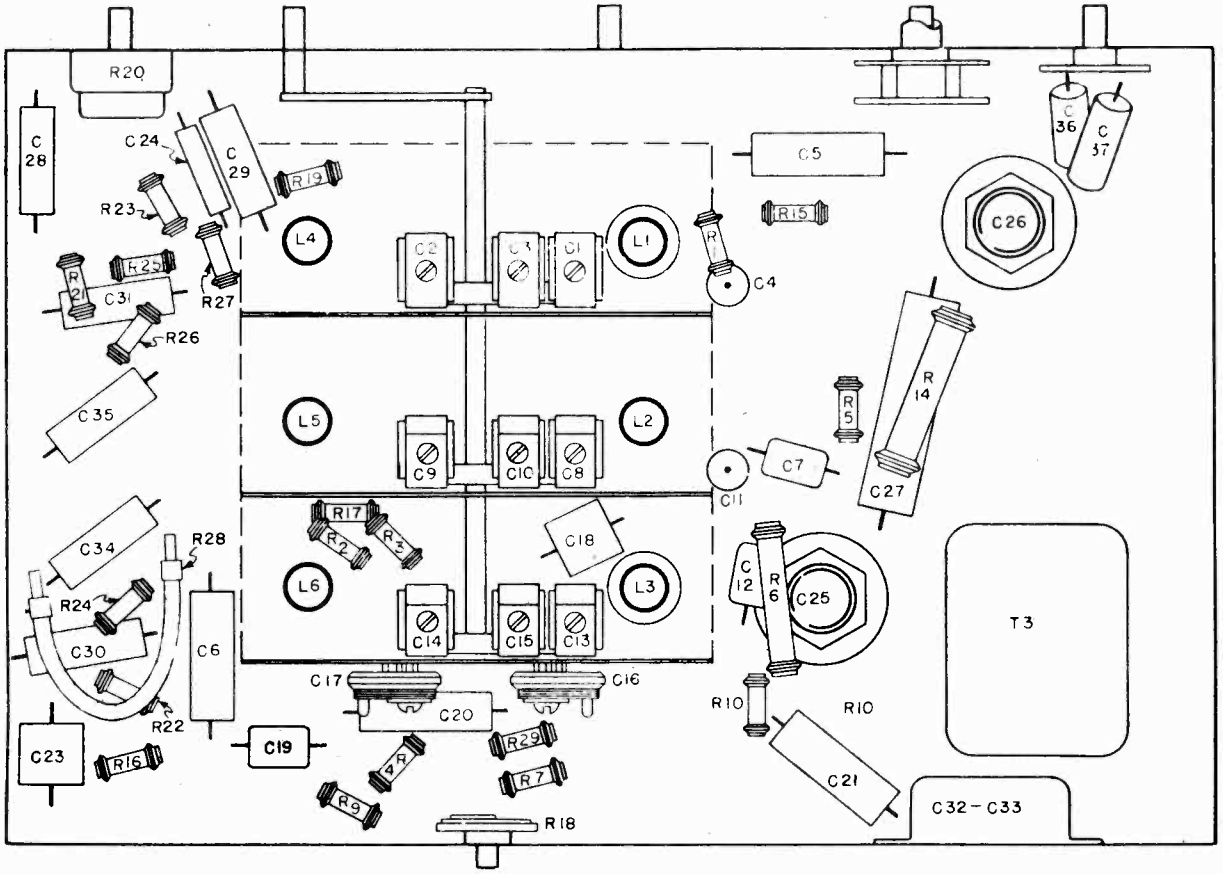
APPEARANCE OF GEAR SECTOR AFTER FOURTH TOOTH FROM EACH END HAS BEEN BENT IN VISE.

SEARS, ROEBUCK & CO.

Chassis 101.483



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections . . . . . Across speaker voice coil

Output meter reading to indicate .5 watts output . . . . . 1.31 volts

Approximate 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

Connection of generator ground lead . . . . . To chassis

Generator modulation . . . . . 30%, 400 cycles

Position of volume control . . . . . Fully clockwise

Position of tone control . . . . . Fully clockwise

Position of selectivity control . . . . . Sharp

Position of Lo-Noise control . . . . . Normal

Position of dial pointer with variable fully closed . . . . . To fall on last calibration mark at 550 kc end of AMERICAN band.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"INT"	1.8 mc	485 kc	.1 mfd.	6A8G Grid	T3,T1	IF	5200
"AM"	1500 kc	1500 kc	.0002 mfd.	Ant. Term.	C13,C8, C1	Oscillator, Transl., RF	35
"AM"	600 kc (rock)	600 kc	.0002 mfd.	Ant. Term.	C16	Padder	20
"INT"	5 mc	5 mc	400 ohms	Ant. Term.	C14	Oscillator	-
"INT"	5 mc (rock)	5 mc	400 ohms	Ant. Term.	C9,C2	Translator, RF	3
"INT"	3 mc (rock)	3 mc	400 ohms	Ant. Term.	C17	Padder	6
"FOR"	15 mc	15 mc	400 ohms	Ant. Term.	C15	Oscillator	-
"FOR"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C10,C3	Translator, RF	10

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.

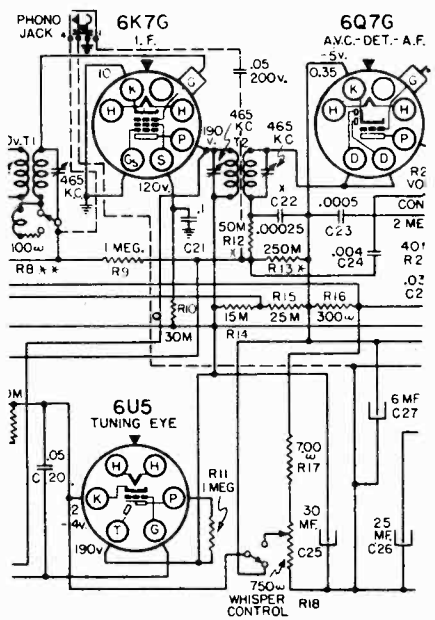
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value, to prevent the AVC action of the set from interfering with accurate alignment.

The shield plate that covers the coil assembly should be left in place while making the alignment adjustments. The trimmer screws are accessible through the holes in the shield.

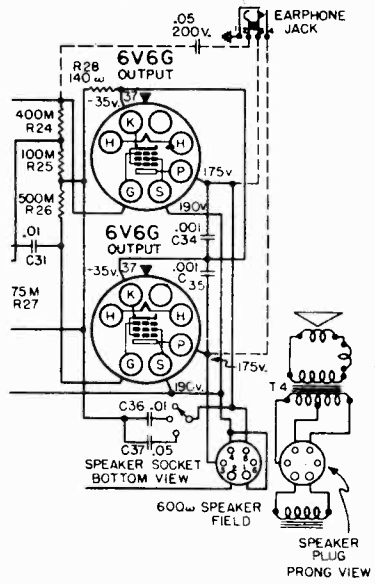
Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy antenna used for alignment of any other band.

No connection should be made to the doublet terminal on the antenna connection block.

DOTTED LINES INDICATE NEW CONNECTIONS

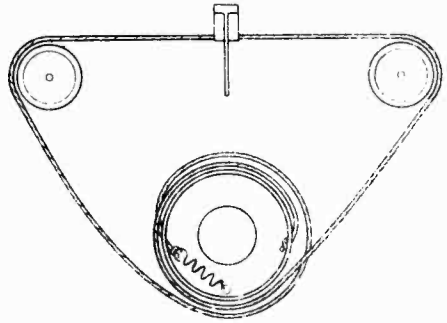


DOTTED LINES INDICATE NEW CONNECTIONS

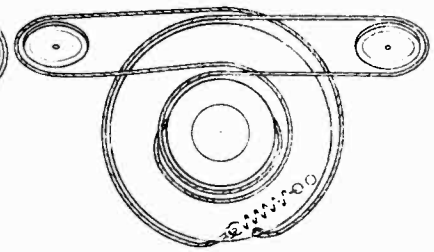


DIAL POINTER AND CONDENSER DRIVE HOOK-UP:

The drive hook-up for the dial pointer and the variable condenser is shown in the illustration.



POINTER DRIVE HOOKUP



CONDENSER DRIVE HOOKUP

SEARS, ROEBUCK & CO.

WAVE TRAPS:

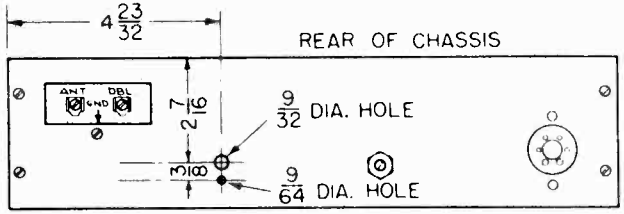
Two wave-traps are available and can be ordered directly from Colonial Radio Corporation, 354 Rano Street, Buffalo, N.Y., using Purchase Order Blank form F5384. The retail selling price is $1.30.

Part #1013117417 wave-trap is designed to eliminate code interference from ship transmitters, airports or air beacon stations, in locations where the receiver is near such transmitters. This trap operates in the vicinity of 465 kc.

Part #1013117416 wave-trap is designed to eliminate whistles and cross modulation troubles that occur when the receiver is located comparatively near some powerful broadcast station.

It is possible to use both traps simultaneously if conditions make this necessary.

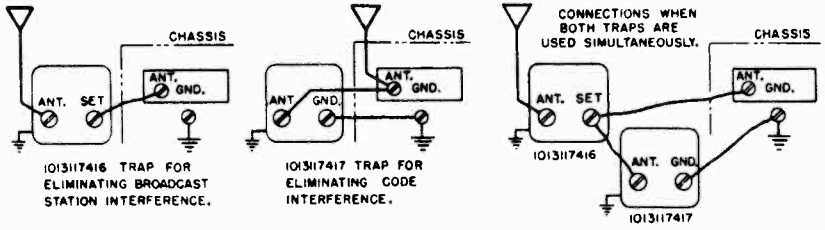
The trap can be mounted within the chassis by drilling the holes shown in the following illustration. It will be necessary to remove the bracket from the trap in order to mount it in the chassis. An alternative method of mounting is to screw the trap to the chassis mounting shelf by means of wood screws through the bracket. If the trap is not mounted on the chassis, it is important to connect a wire from under the head of one of the wood screws to the chassis so that the wave-trap shield becomes grounded to the chassis.



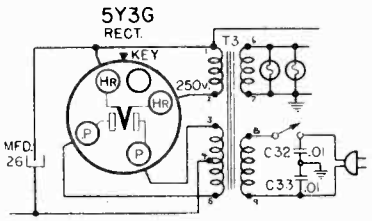
If a conventional antenna is being used with the receiver, the traps are to be connected as described in the next two paragraphs and the illustration that follows them.

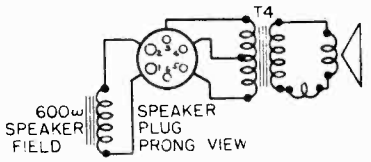
The part #1013117417 trap, for code interference elimination, has two terminals marked, "ANT" and "GND". Connect a wire between the "ANT" terminal of the trap and the "ANT" terminal of the chassis. Connect a wire between the "GND" terminal of the trap and the "GND" terminal of the chassis. The antenna and ground connections to the receiver remain as they were, the trap being connected across them. The trap should be adjusted to minimum response from the interfering station.

Part #1013117416 trap, for broadcast station interference elimination, has two terminals marked, "ANT" and "SET". Disconnect the antenna leadin from the receiver and connect it to the "ANT" terminal of the trap. Connect a wire from the "SET" terminal of the trap to the "ANT" terminal of the chassis. The ground connection to the chassis remains as it was. The trap then is in series between the antenna and the receiver. The trap should be tuned to eliminate the interfering station. The sensitivity of the receiver will be reduced in the region of the frequency to which the trap is tuned.



If a doublet antenna is installed with the receiver, the antenna terminal of the 1013117417 trap must be connected to the antenna lug of the broadcast band antenna coil primary inside the chassis. The 1013117416 trap must be connected between the antenna lug of the broadcast antenna coil primary and the wave switch. Remove the lead between the antenna lug of the primary and the wave switch. Connect the antenna terminal of the trap to the wave switch lug. Connect the set terminal of the trap to the antenna coil lug. See next illustration.



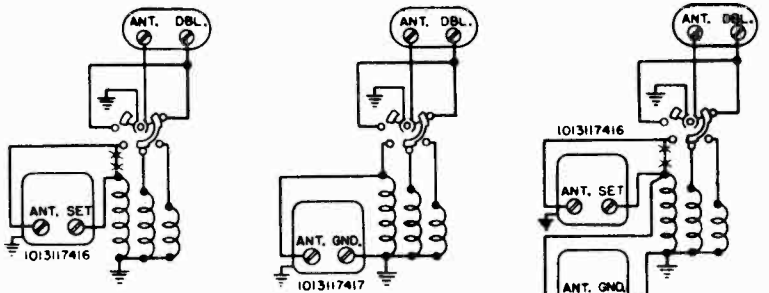


POWER TRANSFORMER COLOR CODE

1,2-Red	5-Blue
3-Red	6,7-Black
4-Slate	8-Black
	9-Green

SPEAKER PLUG COLOR CODE

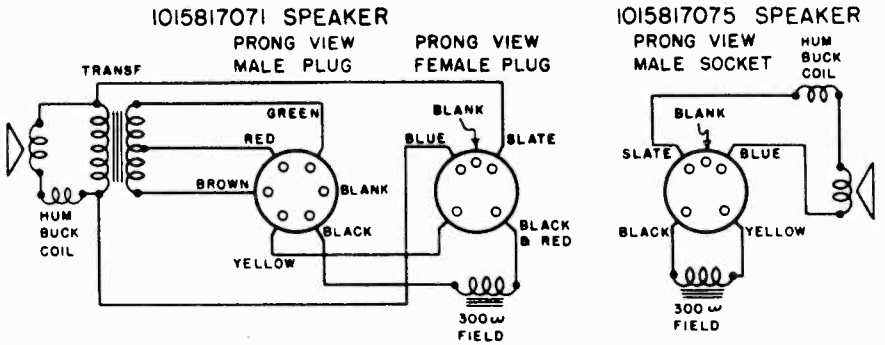
1-Black	4-Red
2-Yellow	5-Green
3-Brown	6-Blank



X X - INDICATES CONNECTION TO BE BROKEN.
WAVE TRAP CONNECTIONS WHEN DOUBLET ANTENNA IS BEING USED

CONNECTIONS OF TWIN SPEAKERS:

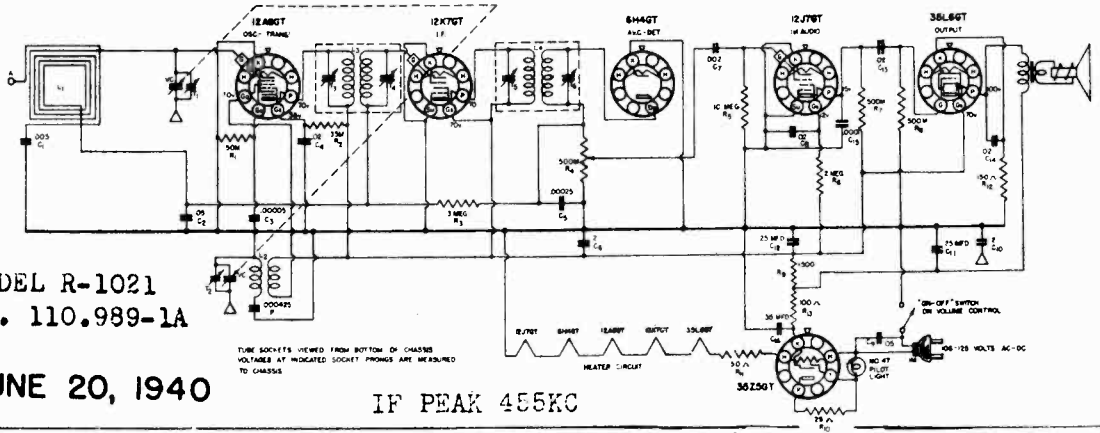
Some of these receivers use twin speakers; part #1015817071 (with transformer) and 1015817075 (without transformer). The connections are shown in the following illustration. 1015817075 speakers that have the letter "D" stamped on them or in which the black field lead comes out nearest the plug have the field coil connections reversed at the plug as compared with the diagram.



MODEL 4714 Power Shifter
Chassis 139.156

SEARS, ROEBUCK & CO.

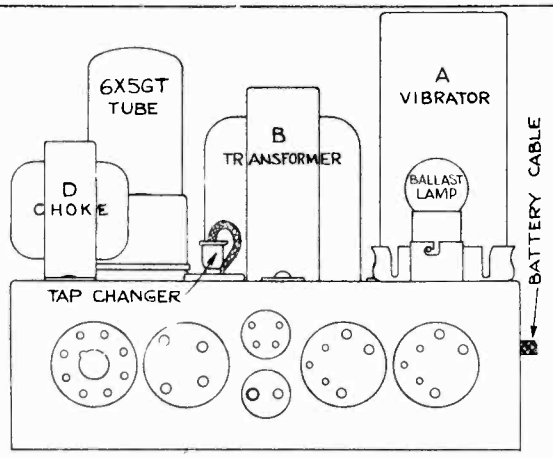
MODEL R-1021
Ch. 110.989-1A

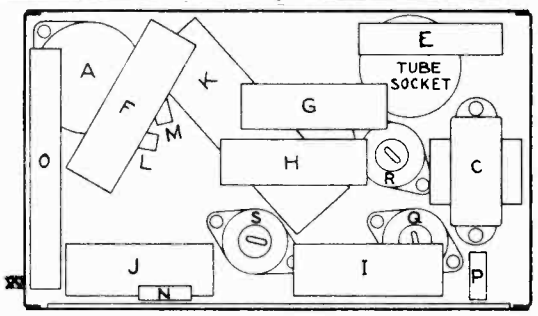


MODEL R-1021
Ch. 110.989-1A

JUNE 20, 1940

IF PEAK 455KC





LOCATION OF PARTS IN CHASSIS

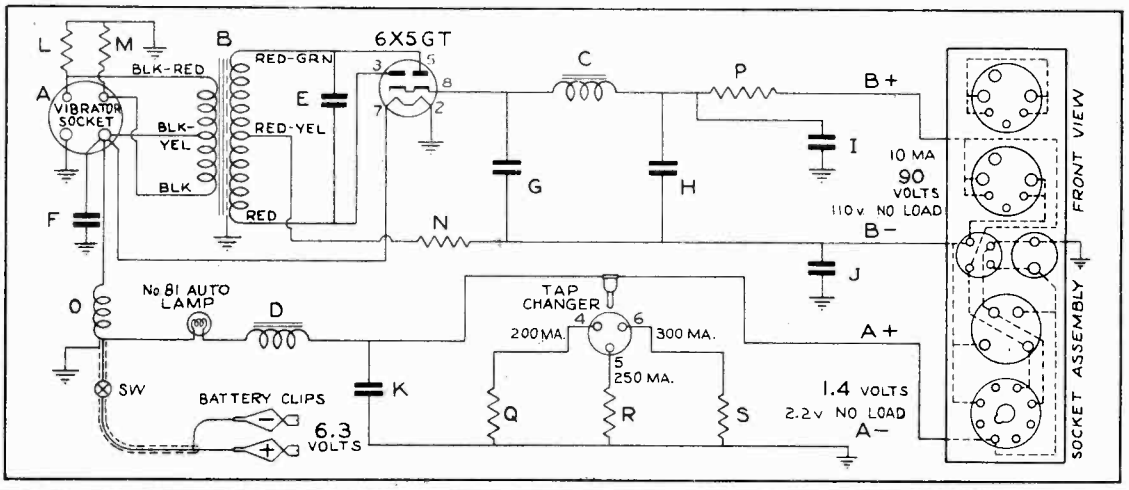
MODEL 4714 Power Shifter
Chassis 139.156
February 9, 1942

"B" SUPPLY FAILS

The vibrator of the "B" supply is loaded very lightly and pitting of the points will not occur over a long period of time. Testing for vibrator failure may be made simple by the substitution method. The 6X5GT tube should be checked in a standard tube tester. The transformer may be tested by measuring A. C. voltage across each side of the secondary by removing the tube. The bi-pass condensers should be tested for breakdown.

"A" SUPPLY FAILS

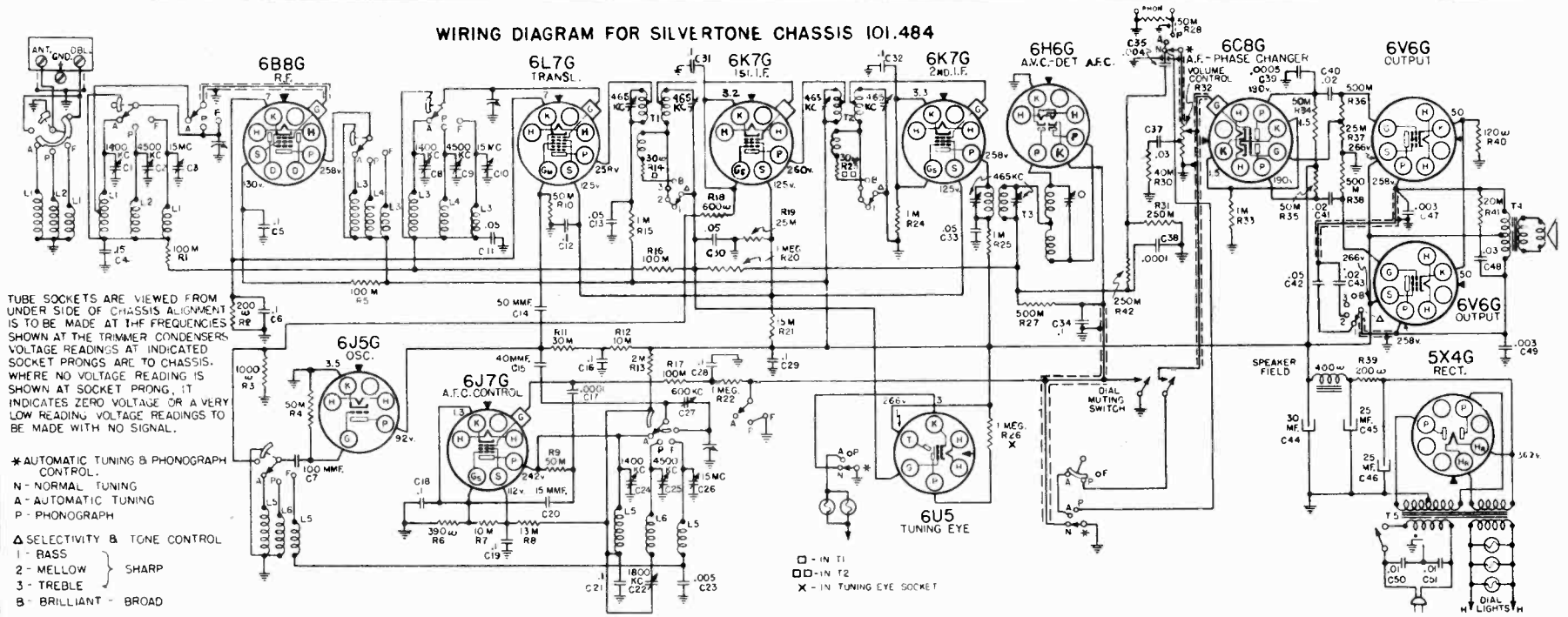
Low "A" voltage may be due to a few minor reasons. The storage battery should be checked first for a terminal voltage of 6 volts. The pin plug position of the tap changer on top the chassis must be in position 4 for a 4 tube radio, and likewise for position 5 and 6. The auto lamp acting as a voltage regulator ballast will burn dimly without a load on the Powr-Shiftr, and the greater the load the brighter this lamp will be. Inside the chassis are three 5 ohm rheostats for factory adjusting the voltage with the correct load at each tap. Rheostat Q is set at 3.5 ohms, R at 4.0 ohms, and S at 4.67 ohms. A small screwdriver may be used for changing this calibration when desired.



SEARS, ROEBUCK & CO.

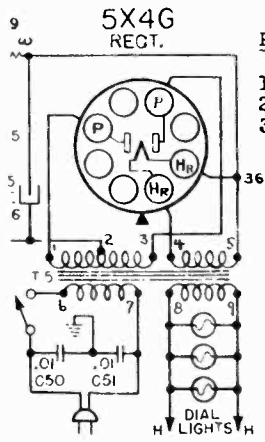
MODELS 4687, 4787
Chassis 101.484

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.484



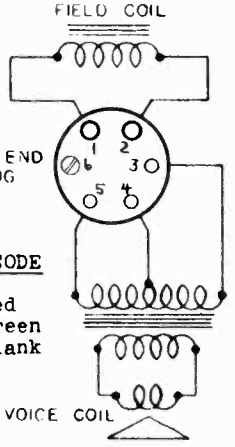
INTERMEDIATE FREQUENCY . . 465 kc

POWER SUPPLY:
All models available . 105-125 volts, 50-60 cycle, 150 watts
All models available . . 105-135 volts, 25 cycle, 150 watts



POWER TRANSFORMER COLOR CODE

1. Blue
2. Slate
3. Red
4-5. Red
6. Black
7. Green
8-9. Black



SPEAKER PLUG COLOR CODE

1. Black
2. Yellow
3. Brown
4. Red
5. Green
6. Blank

LOUD SPEAKER:
Type . . . . . Dynamic
Size . . . . . 12"
Field coil resistance . . . 400 ohms
App. field coil voltage drop . . . 65 volts

FREQUENCY RANGES:
American Band . . . . . 540-1660 kc
Intermediate Band . . . . 1350-5600 kc
Foreign Band . . . . . 5.4-18.2 mc

POWER OUTPUT:
Type . . . . Push-Pull (Beam Tubes)
Undistorted . . . . . 8 watts
Maximum . . . . . 12 watts

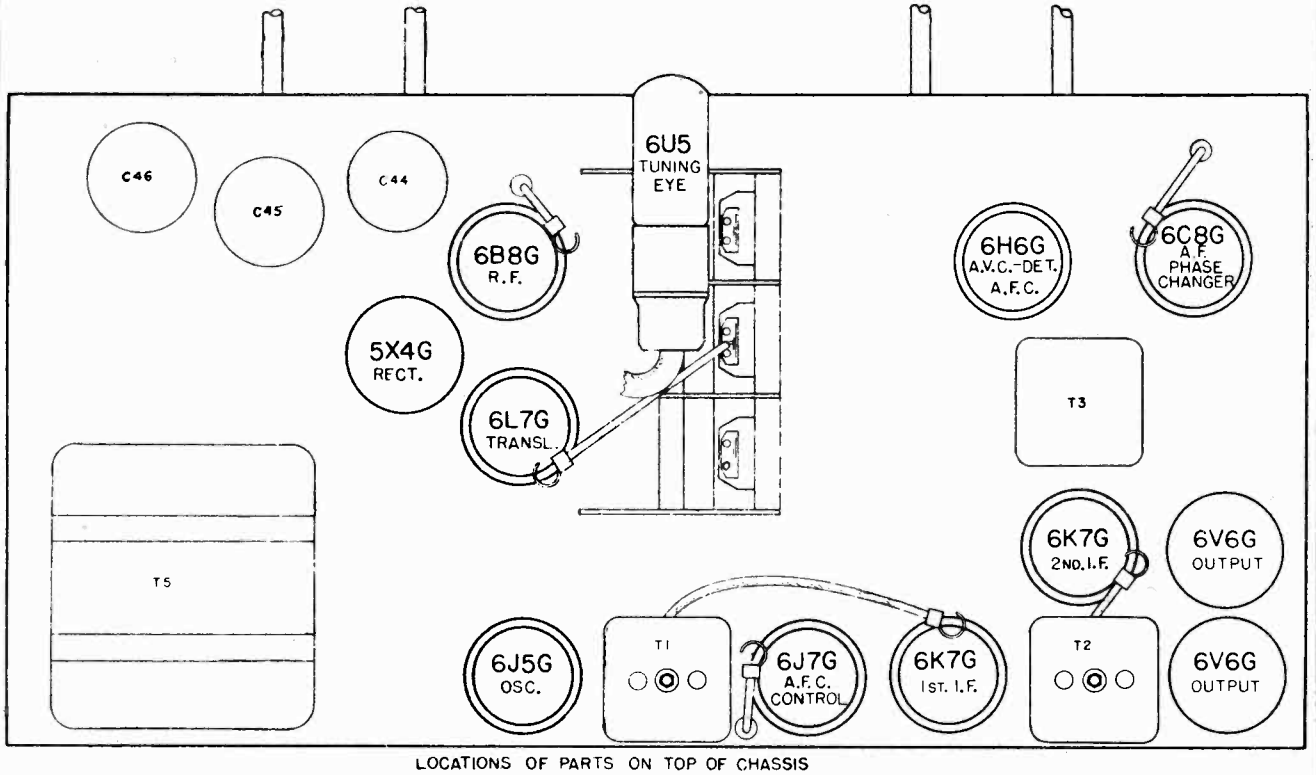
ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant-Transl. Trimmer	Oscil. Padder
Band "AM"	1500 kc	1500 kc	600 kc
Band "INT"	5 mc	5 mc	2 mc
Band "FOR"	18 mc	15 mc	Fixed

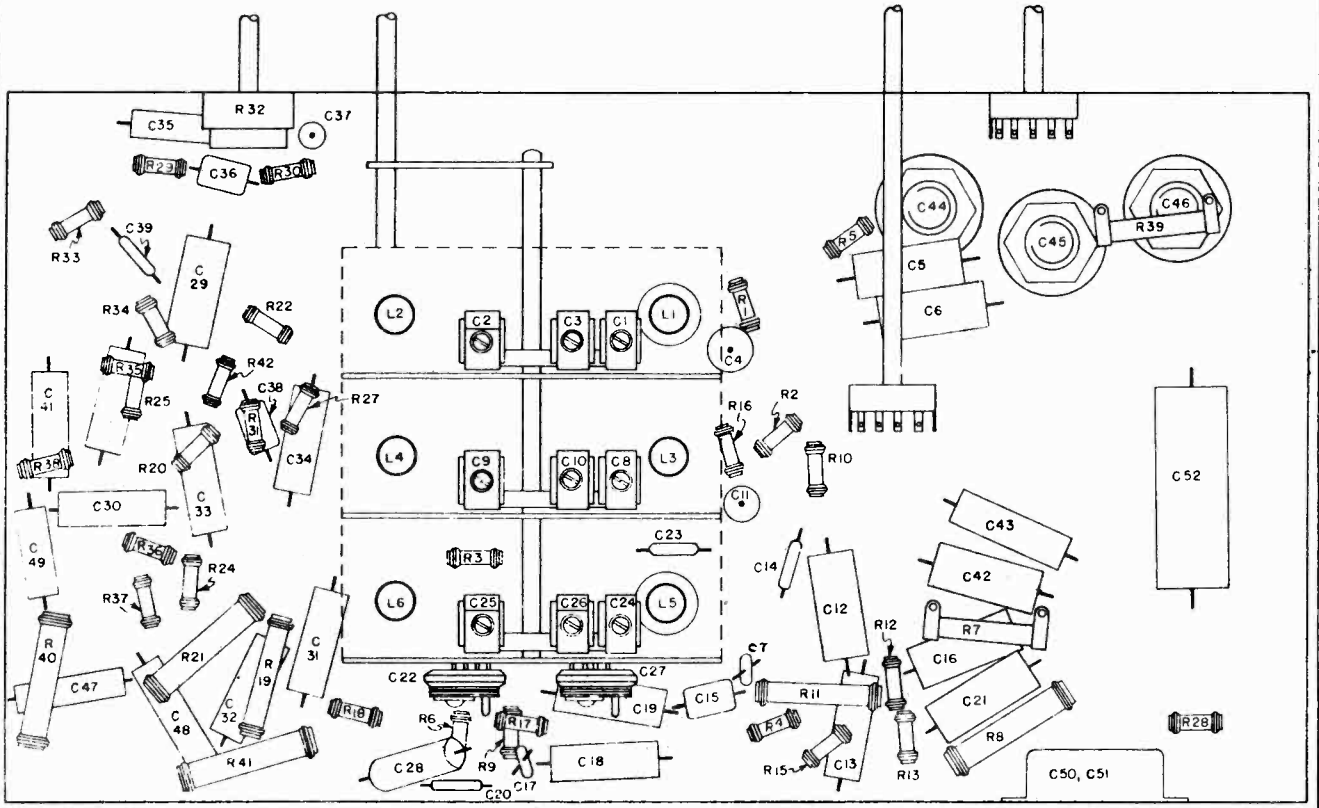
OCTOBER 6, 1937

MODELS 4687, 4787
Chassis 101.484

SEARS, ROEBUCK & CO.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections . . . . . Across speaker voice coil

Output meter reading to indicate .5 watts output . . . . . 1.84 volts

Approximate 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

Connection of generator ground lead . . . . . To chassis

Generator modulation . . . . . 30%, 400 cycles

Position of Volume Control . . . . . Fully clockwise

Position of Tone Control . . . . . "TREBLE"

Position of Radio - Phono Knob . . . . . "REGULAR"

Position of Dial Pointer with variable fully closed — To fall 3/32" to the left of the last mark at the 550 kc end of the AMERICAN band scale.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"INT"	1.7 mc	465 kc	.1 mfd.	6L7G Grid	T3*,T2,T1	IF	-
"AM"	1500 kc	1500 kc	.0002 mfd.	Ant. Term.	C24,C8,C1	Oscilator, Transl.,RF	30
"AM"	600 kc (rock)	600 kc	.0002 mfd.	Ant. Term.	C27	Padder	40
"INT"	5 mc	5 mc	400 ohms	Ant. Term.	C25	Oscillator	-
"INT"	5 mc (rock)	5 mc	400 ohms	Ant. Term.	C9,C2	Tranel.,RF	8
"INT"	2 mc (rock)	2 mc	400 ohms	Ant. Term.	C23	Padder	30
"FOR"	18 mc	18 mc	400 ohms	Ant. Term.	C26	Oscillator	8
"FOR"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C10,C3	Transl., RF	10

IMPORTANT ALIGNMENT NOTES

* Two bottom adjusting screws only. After this alignment has been made and with the IF signal sufficiently strong to show at least one volt on the output meter, adjust the third (top) trimmer screw to the point giving the lowest of the meter reading. This top screw is the AFC discriminator adjustment.

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

Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value, to prevent the AVC action of the set from interfering with accurate alignment.

The shield plate that covers the coil assembly should be left in place while making the alignment adjustments. The trimmer screws are accessible through the holes in the shield.

Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy antenna used for alignment of any other band.

No connection should be made to the doublet terminal on the antenna connection block.

AUTOMATIC FREQUENCY CONTROL ADJUSTMENT

1. Tune in a 1000 kc station to give maximum output meter reading. The station chosen must be of medium strength, one just capable of giving satisfactory reception without background noise. Do not use a strong station. (Or use a 1000 kc signal generator adjusted to give 200 microvolts output and with its modulation switched off.) Connection of the signal is to be made to the antenna terminal of the receiver through a .0002 mfd. condenser. The Tone Control of the receiver must be in the "TREBLE" position and the Volume Control must be all the way on.

2. Connect a 465 kc unmodulated IF signal to the 6L7G translator grid through a 15 mmf. condenser.

3. Carefully turn the variable condenser until "zero beat" note is had. (Tone Control must be in "TREBLE" position.)

4. Turn the Tone Control knob to the "BRILLIANT" position and adjust the discriminator screw for "zero beat" note. (The discriminator adjustment is the top screw of T3.) The correct setting should be obtained at about the center of the trimmer range and the setting will be found to be quite critical.

5. Turn the Tone Control knob back to "TREBLE". The receiver should give "zero beat" note in both "TREBLE" and "BRILLIANT" positions if the discriminator adjustment is properly made. If it does not, carefully repeat the adjustments.

6. The AFC can be checked for "pull-in" in the following manner. Remove the signal generator connection from the 6L7G grid. Connect a 1000 kc generator (with modulation switched on) to the antenna terminal of the receiver, through a .0002 mfd. condenser. Adjust the generator to give 5000 microvolts output and turn the right hand knob of the receiver to "DIAL". Reduce the Volume Control setting of the receiver to give 1-1/2 volts reading on the output meter. Note the exact frequency setting of the signal generator at this output meter reading. Increase the signal generator frequency until the output meter reads one volt and note the frequency setting of the signal generator. Then decrease the signal generator frequency below 1000 kc until the output meter again reads one volt and note the frequency of the generator at this reading of the output meter. If the AFC is operating properly, the signal generator can be shifted approximately 15 kc either side of 1000 kc before the output meter reading is reduced from 1.5 volts to 1 volt.

SUBJECT: REVISION OF "AUTOMATIC FREQUENCY CONTROL ADJUSTMENT"

1. Tune in a 1000 kc station to give maximum output meter reading. The station chosen must be of medium strength, one just capable of giving satisfactory reception without background noise. Do not use a strong station. (Or use a 1000 kc signal generator adjusted to give 200 microvolts output and with its modulation switched off.) Connection of the signal is to be made to the antenna terminal of the receiver through a .0002 mfd. condenser. The Tone Control of the receiver must be in the "TREBLE" position, and the right hand knob in the "REGULAR" position.

2. Connect a 465 kc unmodulated IF signal to the 6L7G translator grid through a 15 mmf. condenser.

3. Carefully turn the variable condenser until "zero beat" note is had. (Tone Control must be in "TREBLE" position, and right hand knob in "REGULAR" position.)

4. Turn the right hand knob to the "DIAL" position and adjust the discriminator screw for "zero beat" note. (The discriminator adjustment is the top screw of T3.) The correct setting should be obtained at about the center of the trimmer range and the setting will be found to be quite critical.

5. Turn the right hand knob back to "REGULAR". The receiver should give "zero beat" note in both "REGULAR" and "DIAL" positions if the discriminator adjustment is properly made. If it does not, carefully repeat the adjustments.

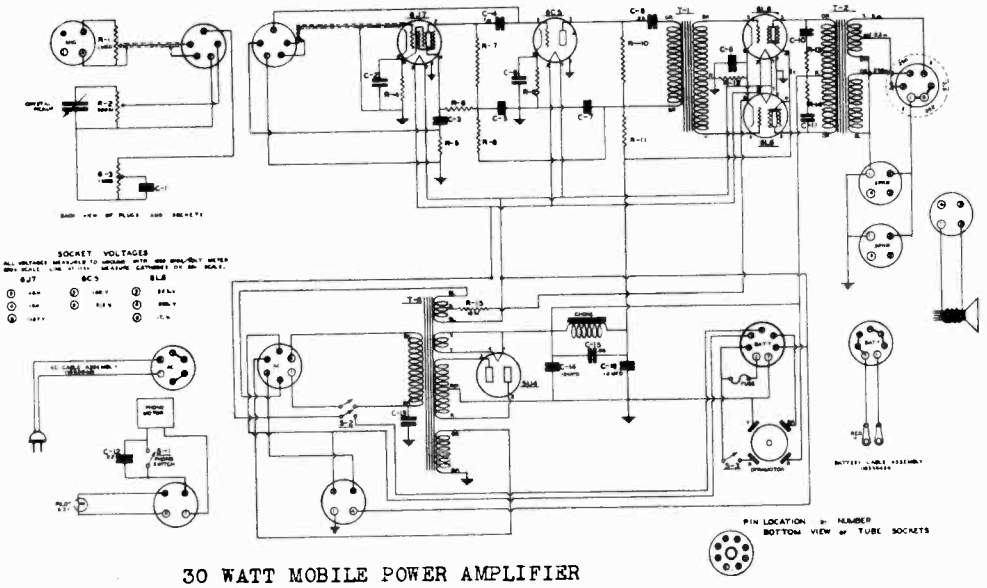
6. The AFC can be checked for "pull-in" in the following manner. Remove the signal generator connection from the 6L7G grid. Connect a 1000 kc generator (with modulation switched on) to the antenna terminal of the receiver, through a .0002 mfd. condenser. Adjust the generator to give 5000 microvolts output and turn the right hand knob of the receiver to "DIAL". Reduce the Volume Control setting of the receiver to give 1-1/2 volts reading on the output meter. Note the exact frequency setting of the signal generator at this output meter reading. Increase the signal generator frequency until the output meter reads one volt and note the frequency setting of the signal generator. Then decrease the signal generator frequency below 1000 kc until the output meter again reads one volt and note the frequency of the generator at this reading of the output meter. If the AFC is operating properly, the signal generator can be shifted approximately 15 kc either side of 1000 kc before the output meter reading is reduced from 1.5 volts to 1 volt.

MAY 18, 1939

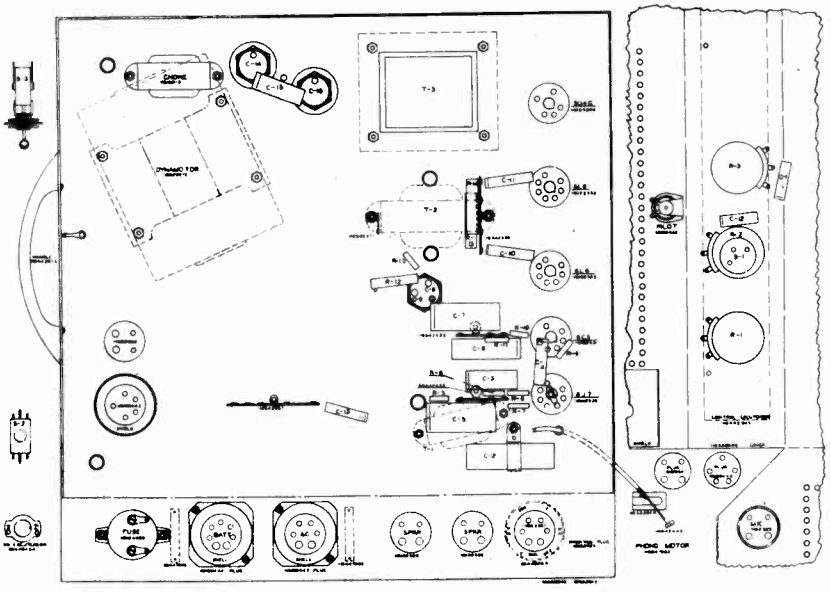
MODEL 5732
Ch. 116.SA2232

SEARS, ROEBUCK & CO.

WIRING DIAGRAM - SILVERTONE MOBILE POWER AMPLIFIER NO. 116.SA2232



30 WATT MOBILE POWER AMPLIFIER



MARCH 14, 1938

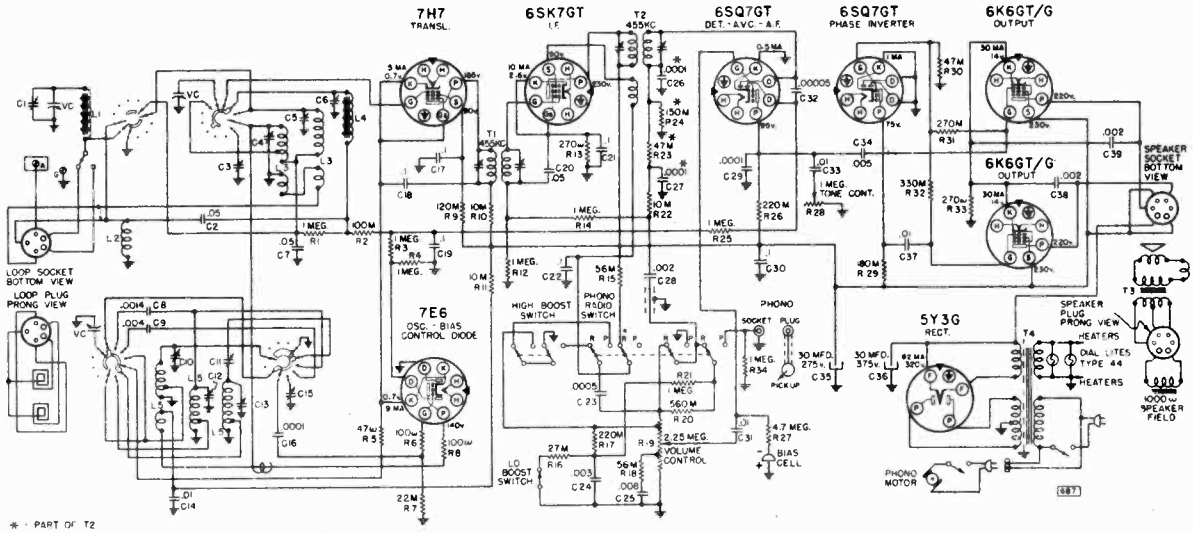
Parts Values

C5, C7	.5MF	R6	2 Meg
C8	.25MF	R7, R8	300M ohm
C3	.1MF	R5	100M ohm
C15	.06MF	R10, R11	30M ohm
C4, C10, C11, C13	.01MF	R4	5000 ohm
C1	.001MF	R9	2500 ohm
C12	.02MF	R15	10M ohm
C2	25MF	R13, R14	15M ohm
C6, C9	Dual 25MF each	R12	125 ohm
C14, C16	10MF	T1	P.P. Input Transformer
R1	Mike control	T2	Output Transformer
R2	Phono Control with Switch	T3	Power Transformer
R3	Tone Control		

MODEL 5502
Ch. 101.687

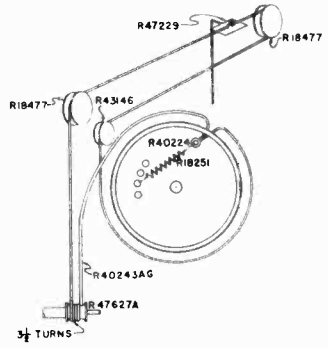
SEARS, ROEBUCK & CO.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.687



* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



OPERATING FEATURES:
- Automatic Volume Control
- Push Button Tuning (5 buttons)
- Push Button and Continuously variable Tone Controls
- Phono-Radio Push Button

APRIL 3, 1942

POWER SUPPLY:

All models available. . . . . 105-125 volt, 60 cycles AC: 100 watts
All models available . . . . . 105-125 volt, 50 cycles AC: 100 watts

FREQUENCY RANGES:

		ALIGNMENT FREQUENCIES: Oscillator Trimmer	Antenna-Trarsl. Trimmer	Padder
Band "A"	540-1700 kc	1750 kc	1410 kc	600 kc
Band "B" Police	1.75-5.5 mc	5900 kc	4500 kc	Fixed
Band "C"	6-18 mc	18.3 mc	15 mc	Fixed
Band "D"	9.4-9.8 mc	9.6 mc	9.6 mc	Fixed

INTERMEDIATE FREQUENCY . . . . . 455 kc

POWER OUTPUT:

Type. . . . . Push Pull Pentode
Undistorted . . . . . 3.5 watts
Maximum . . . . . 7 watts

LOUDSPEAKER:

Type . . . . . Dynamic
Size . . . . . 12 inch
Field coil resistance . . . . 1000 ohms
Approx. field coil voltage drop. . 90 v.

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), and securely locking the adjustment.

MODEL 5502
Ch. 101.687

SEARS ROEBUCK CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

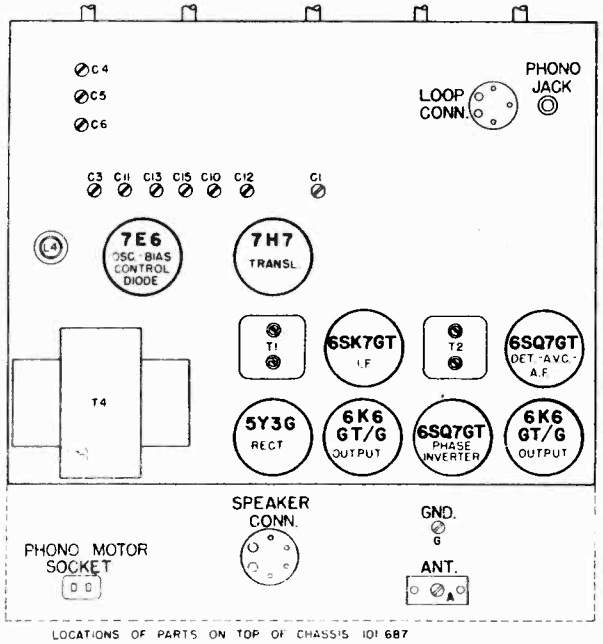
Output meter connections . . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.5 volts
Approximate microvolts input to indicate 500 milliwatts output . . . . . See chart below
Generator ground lead connection . . . . . Receiver chassis
Dummy antenna value 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 . . . . . Fully on
Position of Tone Control . . . . . HI
Position of pointer with tuner fully open. . . . . On mark below 540 kc calibration mark

BAND SWITCH POSITION	POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROX. MICRO-VOLTS
A	Closed	455 kc	.1 mfd.	Trans.Grid	T2 - T1	IF	---
A	Open	1750 kc	.0002 mfd.	Ant.	C1	Osc.	---
A	1410 kc	1410 kc	.0002 mfd.	Ant.	C2	Ant.	25
A	1410 kc	1410 kc	.0002 mfd.	Ant.	C3	Trans.	---
A	600 (Rock)	600 kc	.0002 mfd.	Ant.	C4	Pad.	125
B	Open	5900 kc	400 ohms	Ant.	C5	Osc.	---
B	4500 kc	4500 kc	400 ohms	Ant.	C6	Trans.	35
C	Open	18.3 mc	400 ohms	Ant.	C7	Osc.	---
C	15 mc (Rock)	15.0 mc	400 ohms	Ant.	C8	Trans.	25
D	9.6 mc	9.6 mc	400 ohms	Ant.	C9	Osc.	---
D	9.6 mc (Rock)	9.6 mc	400 ohms	Ant.	C10	Trans.	30

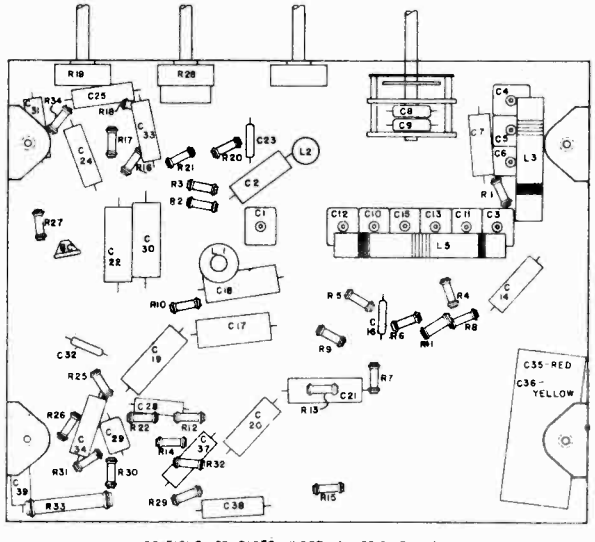
IMPORTANT ALIGNMENT NOTES

The alignment must be done in the order given.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the reciever from interfering with accurate alignment.

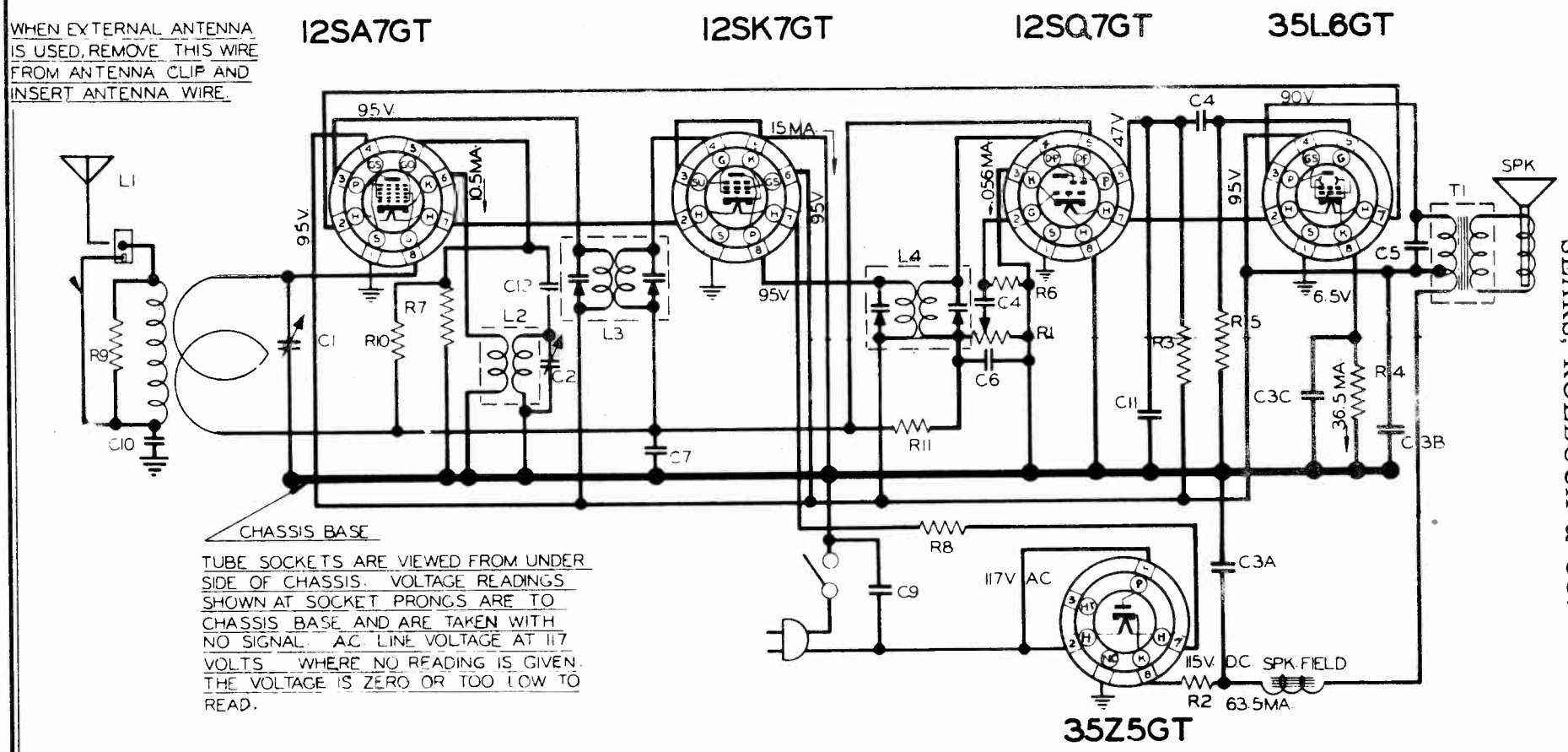


LOCATIONS OF PARTS ON TOP OF CHASSIS 101 687



LOCATIONS OF PARTS UNDER CHASSIS 101.687

FOR ORIGINAL DATA SEE CHASSIS 132.810
IN VOLUME X111



SUBJECT: ADDITION OF SUFFIX -1 TO CHASSIS IDENTIFICATION NUMBER 132.810. CIRCUIT DIAGRAM & PARTS LIST CHANGES, FOR ALL MODELS.

The 1 megohm AVC isolating resistor was increased to 3 megohm (R11) to improve isolation. Certain constructional changes were made in the Oscillator Coil. The Electrolytic Condenser was changed from a 20-10 mfd. 150 V., 20 mfd. 25 V., to a 40-20 mfd. 150 V., 20 mfd. 25 V.

The tube and component layout was changed somewhat to permit more uniform manufacturing. These changes are shown in Fig. 1 and Fig. 2. Figure 1 represents the original (132.810) layout. Fig. 2 represents the supplementary (132.810-1) layout.

The model numbers for the "Walnut" and "Onyx" models have been changed to "7000" and "7002" respectively.

FIVE TUBE, AC-DC, SUPERHETERODYNE

MODELS 7000, 3211, 7002

FACTORY IDENTIFICATION NO. 132.810-1

JUNE 2, 1941

SEARS, ROEBUCK & CO.

MODELS 3211, 7000, 7002
Chassis 132.810-1

MODELS 3211, 7000, 7002
Chassis 132.810-1

SEARS, ROEBUCK & CO.

MODELS 3711, 7001, 7003
Chassis 132.811-1

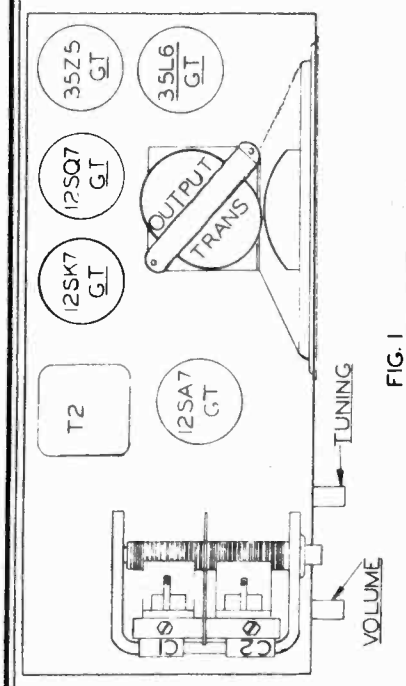


FIG. 1
LOCATION OF PARTS ON TOP OF CHASSIS
132.811

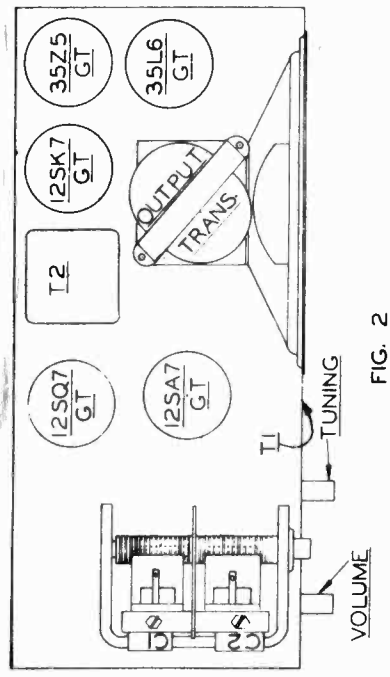
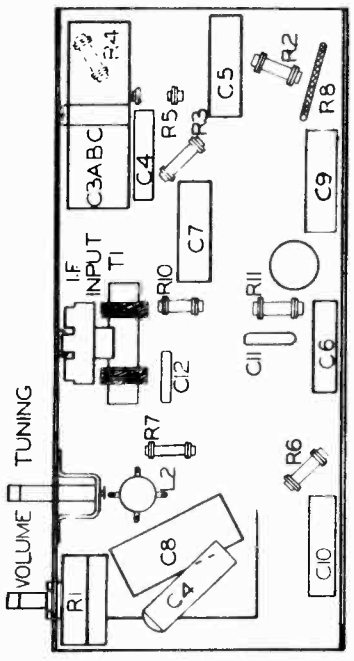


FIG. 2
LOCATION OF PARTS ON TOP OF CHASSIS
132 811-1



LOCATION OF PARTS UNDER CHASSIS
132.811-1
FIG. 3

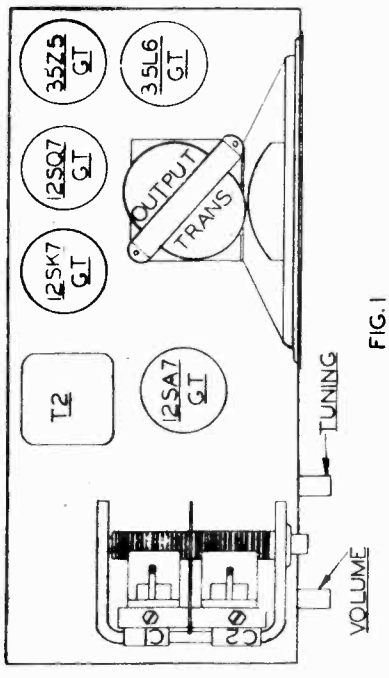


FIG. 1
LOCATION OF PARTS ON TOP OF CHASSIS
132.810

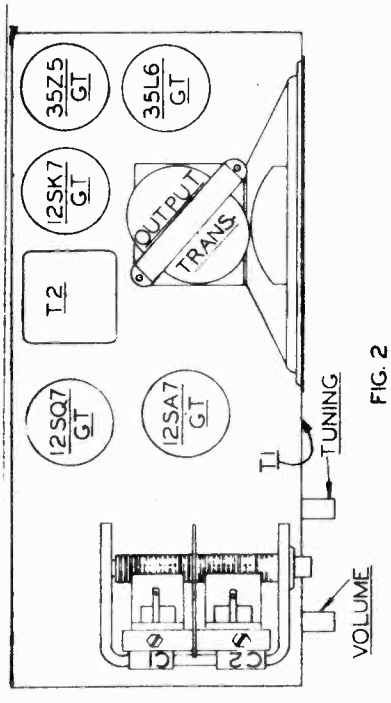
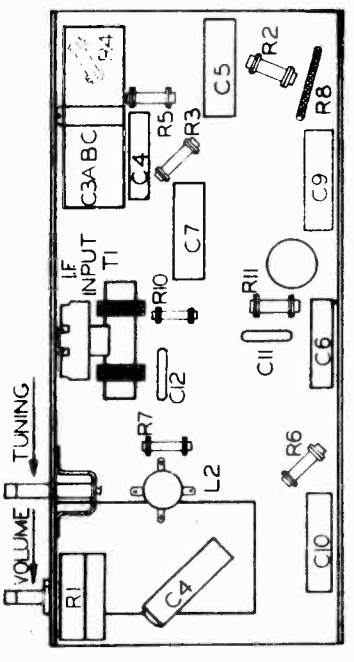


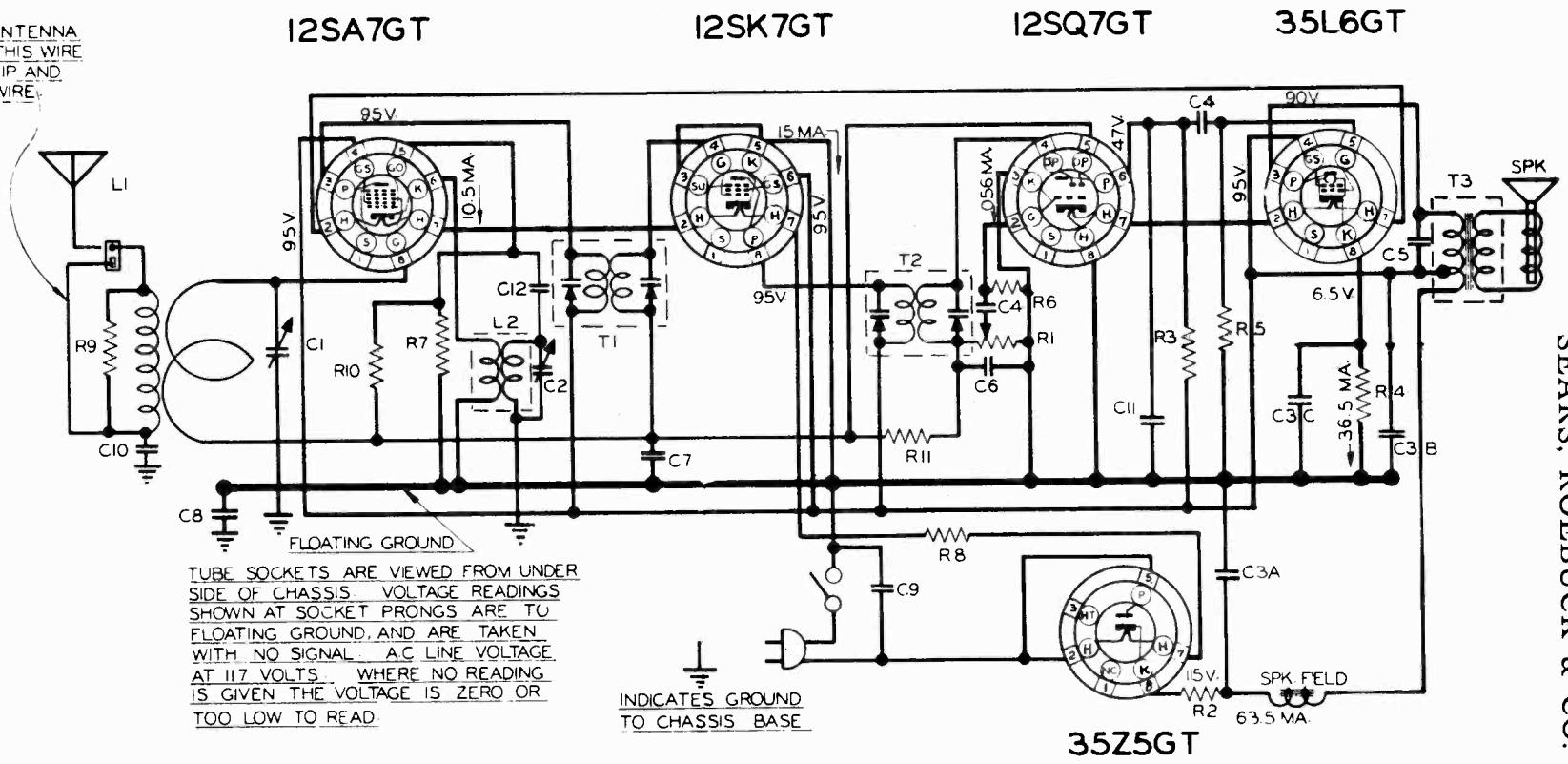
FIG. 2
LOCATION OF PARTS ON TOP OF CHASSIS
132.810-1



LOCATION OF PARTS UNDER CHASSIS
132.810-1
FIG. 3

SEARS, ROEBUCK & CO.

MODELS 3711, 7001, 7003
Chassis 132.811-1



FOR ORIGINAL DATA SEE
CHASSIS 132.811 IN VOL. X111

132.811-1

JUNE 2, 1941

SUBJECT: ADDITION OF SUFFIX -1 TO CHASSIS IDENTIFICATION NUMBER 132.811. CIRCUIT DIAGRAM AND PARTS LIST CHANGES, FOR ALL MODELS.

The 1 megohm AVC isolating resistor was increased to 3 megohm to improve isolation.

Certain constructional changes were made in the Oscillator Coil. The tube and component layout was changed somewhat to permit more uniform manufacturing. These changes are shown in Fig. 1, and Fig. 2. Figure 1 represents the original (132.811) layout. Figure 2 represents the supplementary (132.811-1) layout.

The model numbers for the "Walnut" and "Onyx" models have been changed to "7001" and "7003" respectively.

FIVE TUBE, AC-DC, SUPERHETERODYNE

MODELS 7001, 3711, 7003

FACTORY IDENTIFICATION NO. 132.811-1

MODEL 7C49
Ch. 101.672

SEARS, ROEBUCK & CO.

IMPORTANT ALIGNMENT NOTES

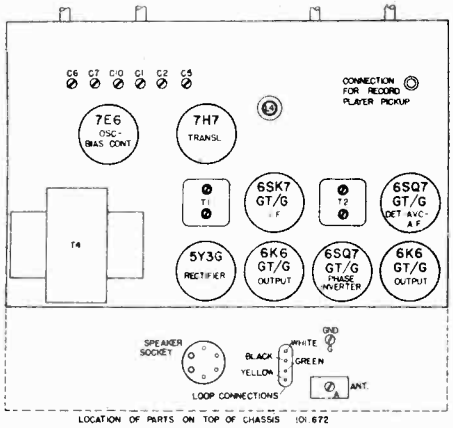
The Alignment must be done in the order given.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.

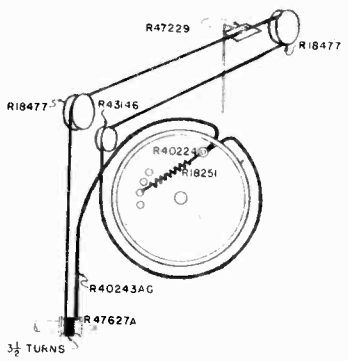
PRELIMINARY:

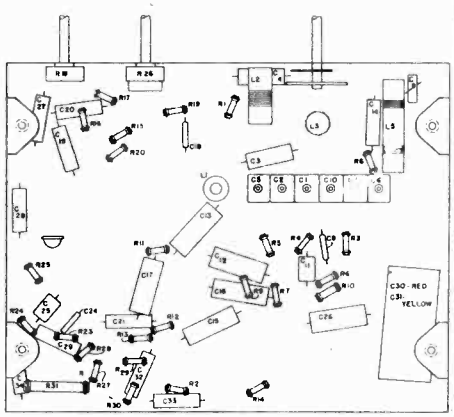
Output Meter Connections . . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.5 watts
Approximate microvolts input to indicate 500 milliwatts output . . . . . See chart below
Generator ground lead connection . . . . . Receiver chassis
Dummy Antenna value 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. . . . . .Fully on
Position of Tone Control . . . . . HI
Position of pointer with tuner fully closed . . . . . Last line below 540 calibration mark

WAVE BAND SWITCH POSITION	POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
A	Closed	455 KC	.1 mfd.	7H7 Transl. grid	T2, T1	IF	---
A	Open	1750 KC	.0002 mfd.	Ant. Terminal	C6	Oscillator	---
A	1410	1410 KC	.0002 mfd.	Ant. Terminal	C5, C2	Ant. Transl.	25
A	600 (rock)	600 KC	.0002 mfd.	Ant. Terminal	C7	Padder	100
B	Open	18.3 MC	400 ohms	Ant. Terminal	C10	SW Oscillator	---
B	15 (rock)	15 MC	400 ohms	Ant. Terminal	C1	Transl.	20

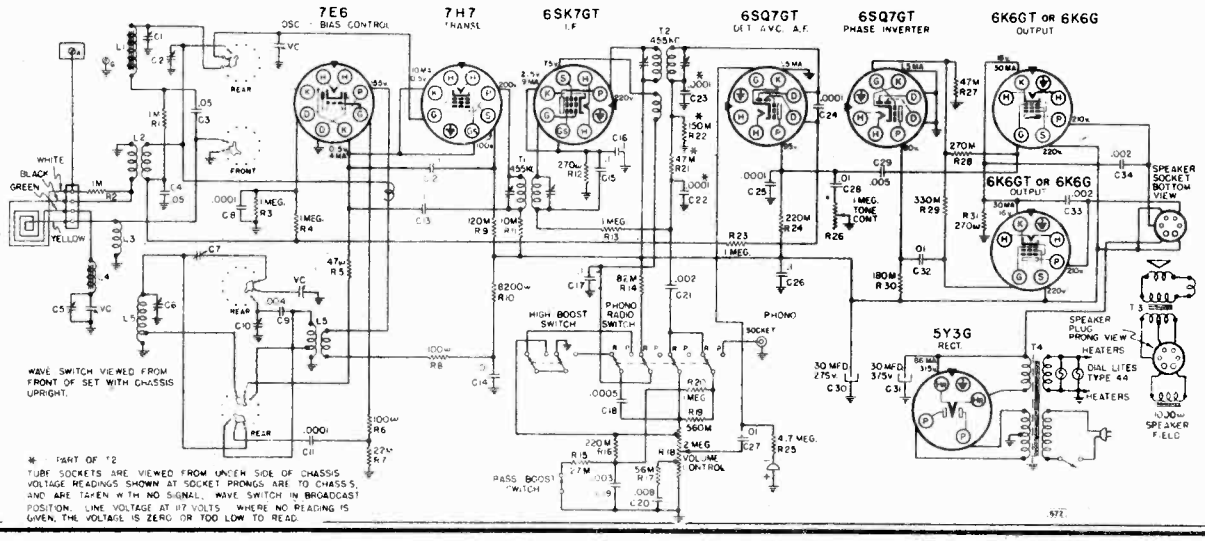


LOCATION OF PARTS ON TOP OF CHASSIS 101.672



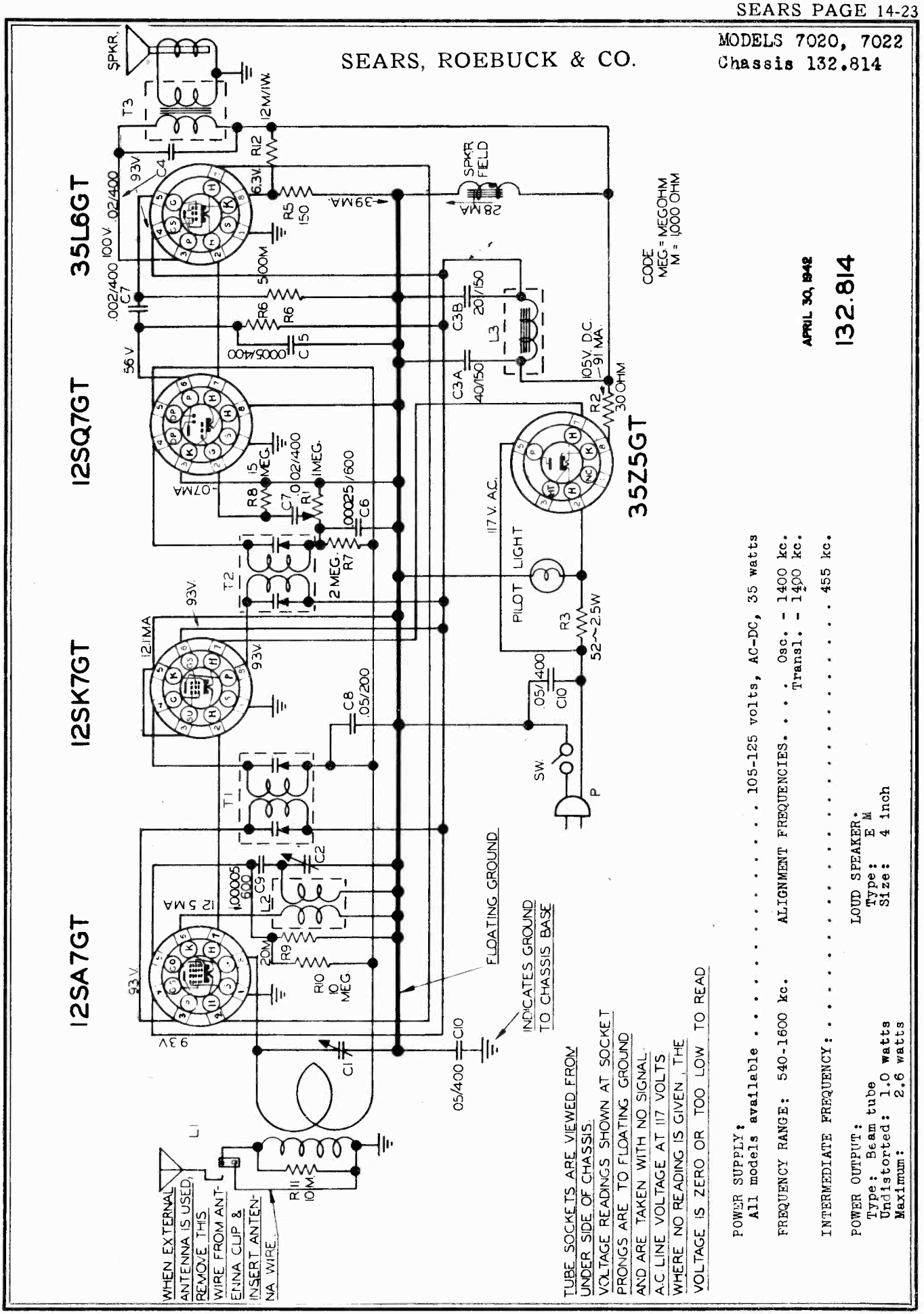

LOCATION OF PARTS UNDER CHASSIS 101672

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.672



SEARS, ROEBUCK & CO.

MODELS 7020, 7022
Chassis 132.814



WHEN EXTERNAL ANTENNA IS USED, REMOVE THIS WIRE FROM ANTENNA CLIP & INSERT ANTENNA WIRE.

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

POWER SUPPLY:
All models available . . . . . 105-125 volts, AC-DC, 35 watts

FREQUENCY RANGE: 540-1600 kc. ALIGNMENT FREQUENCIES. . . . Osc. - 1400 kc.
Transl. - 1400 kc.

INTERMEDIATE FREQUENCY: . . . . . 455 kc.

POWER OUTPUT:
Type: Beam tube
Undistorted: 1.0 watts
Maximum: 2.6 watts

LOUD SPEAKER.
Type: E M
Size: 4 inch

MODELS 7020, 7022
Chassis 132.814

SEARS, ROEBUCK & CO.

FIVE TUBE, AC-DC, SUPERHETERODYNE

MODELS 7020, 7022

FACTORY IDENTIFICATION NO. 132.814

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . . 0.38 volts
Dummy antenna value to be in series with generator output . . . . .See chart below
Connection of generator output lead . . . . . .See chart below
Connection of generator ground lead . . . . . .See chart below
Generator Modulation . . . . . 30%, 400 cycles
Position of Volume Control . . . . . Fully clockwise
Position of Dial Pointer with Variable fully closed. . . . . .See note below

POSITION OF Variable	FREQUENCY GENERATOR	DUMMY ANTENNA	GENERATOR CONNECTION (high)	GENERATOR CONNECTION (low)	TRIMMERS ADJUSTED (In order shown)	TRIMMER FUNCTION	Uv. Input to Haz. Std. Loop to give ½ watt output.
Open	455 kc.	.1 mfd.	12SA7GT grid	Cond. frame	T2, T1	IF	-------
1400 kc.	1400 kc.	.00005 mfd.	Ant. clip	Chassis	C2, C1	Osc-Trans	1600 uv.
600 kc.	600 kc.	.00005 mfd.	Ant. clip	Chassis	Check Point	-----	1000 uv.

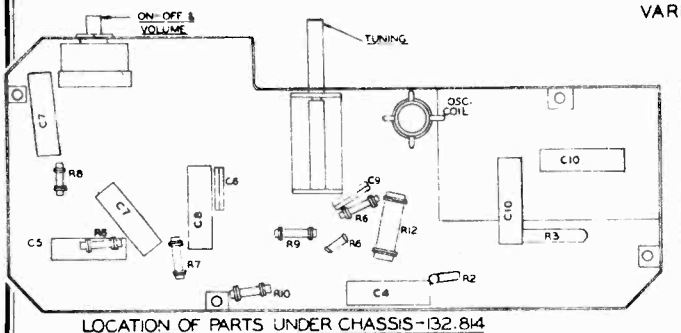
IMPORTANT ALIGNMENT NOTES

With the variable condenser closed the pointer should point vertically upward. When properly set with the variable condenser closed the pointer will point just to the right of the "54" calibration mark.

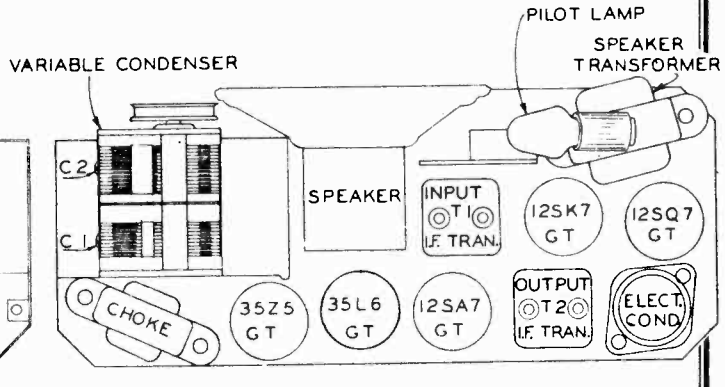
The alignment procedure should be repeated stage by stage, in the original order for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

THE LOOP ANTENNA:

The loop antenna is directional so that reception may be improved or interference lessened by turning the set to a particular position. In locations where the signal strength is too low to give satisfactory reception from the loop antenna, an outside antenna may be connected to the Fahnstock clip on the loop right hand side underneath the receiver. In order to attain maximum performance of the loop, the primary is shorted with a wire under the Fahnstock clip. When an outside antenna is used this wire must be removed from the clip before the antenna is connected.



LOCATION OF PARTS UNDER CHASSIS-132.814



LOCATION OF PARTS ON TOP OF CHASSIS

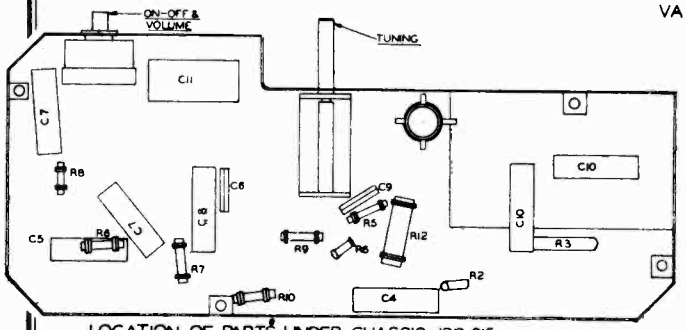
SEARS, ROEBUCK & CO.

MODELS 7021, 7023
Chassis 132.815

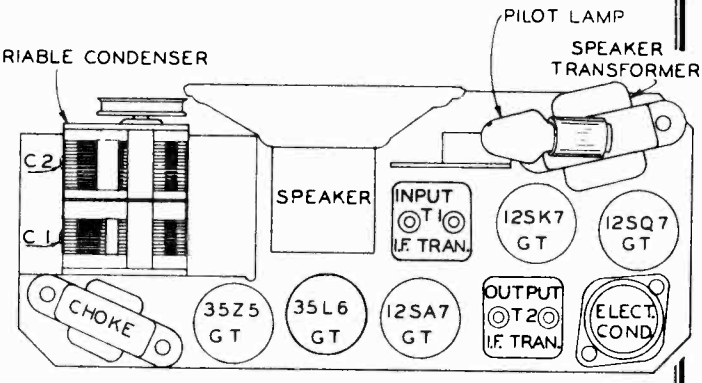
FIVE TUBE, AC-DC, SUPERHETERODYNE

MODELS 7021, 7023

FACTORY IDENTIFICATION NO. 132.815



LOCATION OF PARTS UNDER CHASSIS-132.815



LOCATION OF PARTS ON TOP OF CHASSIS

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts. . . . . 0.38 volts
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of generator output lead . . . . . See chart below
Connection of generator ground lead . . . . . See chart below
Generator Modulation . . . . . 30%, 400 cycles
Position of Volume Control. . . . . Fully clockwise
Position of Dial Pointer with Variable fully closed . . . . . See note below

POSITION OF Variable	FREQUENCY GENERATOR	DUMMY ANTENNA	GENERATOR CONNECTION (high)	GENERATOR CONNECTION (low)	TRIMMERS ADJUSTED (In order shown)	TRIMMER FUNCTION	Uv. Input to Haz. Std. Loop to give ½ watt Output.
Open	455 kc.	.1 mfd.	12SA7GT grid	Minus "B"	T2, T1	IF	- - - - -
1400 kc.	1400 kc.	.00005 mfd.	Ant. clip	Chassis	C2, C1	Osc-Trans	1600 uv.
600 kc.	600 kc.	.00005 mfd.	Ant. clip	Chassis	Check point	----	1000 uv.

IMPORTANT ALIGNMENT NOTES

With the variable condenser closed the pointer should point vertically upward. When properly set with the variable condenser closed the pointer will point just to the right of the "54" calibration mark.

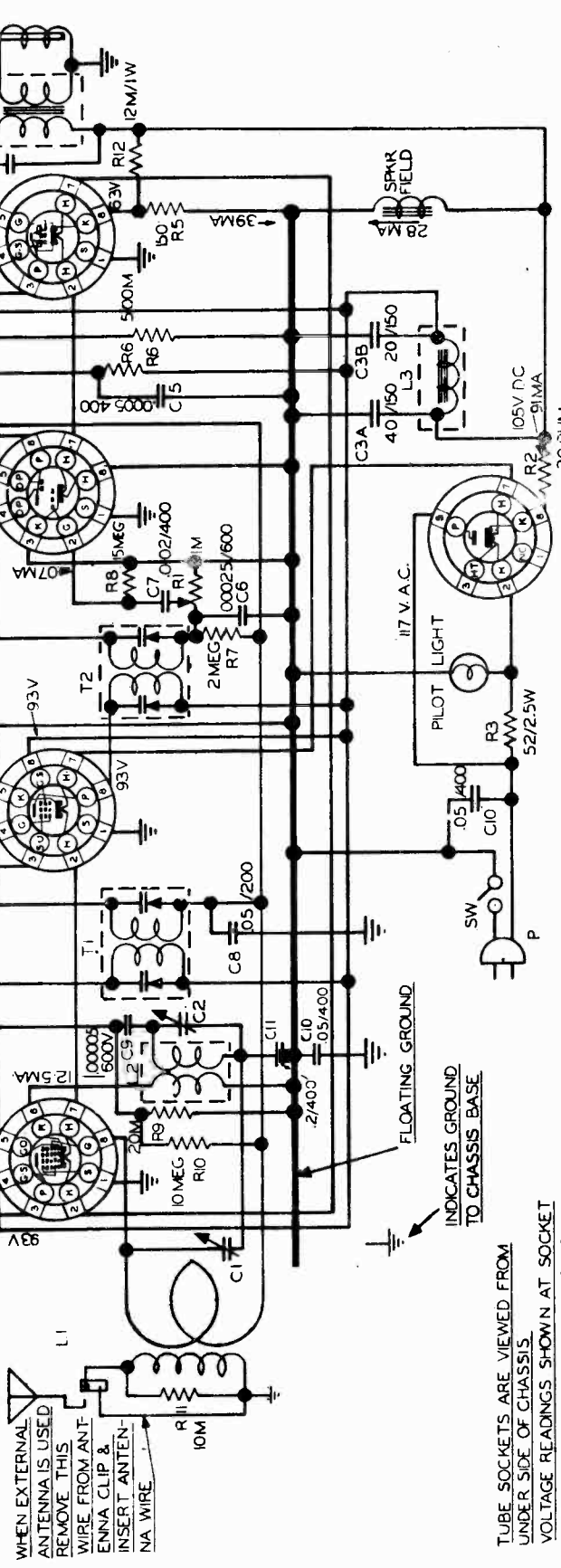
The alignment procedure should be repeated stage by stage, in the original order for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

THE LOOP ANTENNA:

The loop antenna is directional so that reception may be improved or interference lessened by turning the set to a particular position. In locations where the signal strength is too low to give satisfactory reception from the loop antenna, an outside antenna may be connected to the Fahnstock clip on the loop right hand side underneath the receiver. In order to attain maximum performance of the loop, the primary is shorted with a wire under the Fahnstock clip. When an outside antenna is used this wire must be removed from the clip before the antenna is connected.

MODELS 7021, 7023
Chassis 132.815

SEARS, ROEBUCK & CO.



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

ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:
12SA7GT . . . Oscillator-Translator
12SK7GT . . . . . .IF
12SQ7GT . . . . . .Detector-AVC-AF
35L6GT . . . . . .Output
35Z5GT . . . . .Rectifier

POWER SUPPLY:
All models available . . . . . .105-125 volts, AC-DC, 35 watts

FREQUENCY RANGE: 540-1600 kc.

ALIGNMENT FREQUENCIES. . Osc. - 1400 kc.
Transl. -1400 kc.

INTERMEDIATE FREQUENCY: . . . . . 455 kc.

POWER OUTPUT:
Type: Beam Tube
Undistorted: 1.0 watts
Maximum: 2.6 watts

LOUD SPEAKER:
Type: E.M.
Size: 4 inch

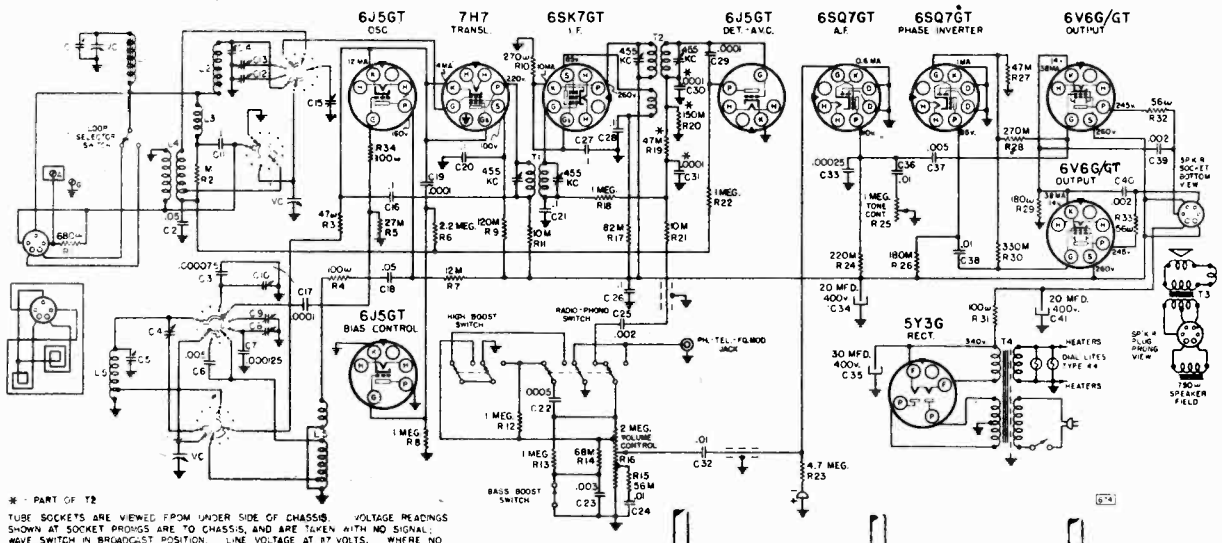
132.815

APRIL 30, 1942

SEARS, ROEBUCK & CO.

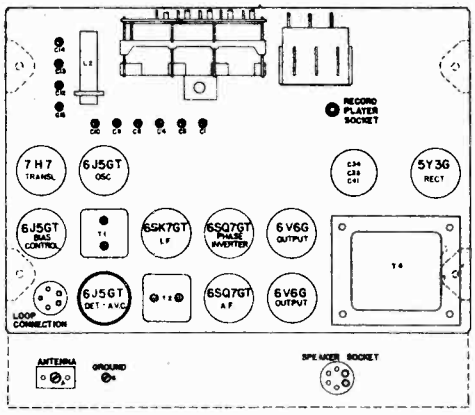
MODELS 7050
Ch. 101.674

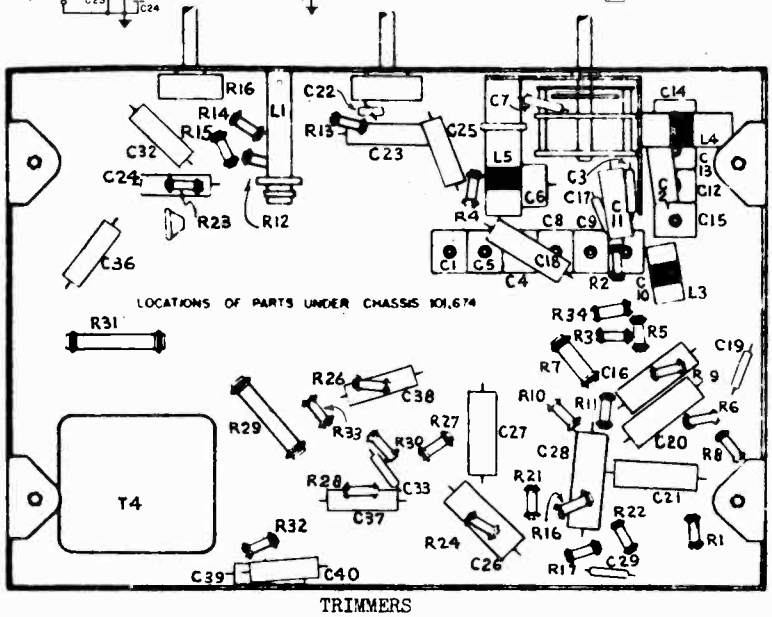
WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.674



* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.





WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	7H7 Grid	T2, T1	IF	--
"A"	Fully Open	1720 kc	.00005 mfd.	Ant. Term.	C5	Oscillator	--
"A"	1410 kc	1410 kc	.00005 mfd.	Ant. Term.	C1, C14	Loop,Transl	15
"A"	600 kc (rock)	600 kc	.00005 mfd.	Ant. Term.	C4	Padder	30
"B"	Fully Open	18.3 mc	400 ohms	Ant. Term.	C9*	Oscillator	--
"B"	16 mc (rock)	16 mc	400 ohms	Ant. Term.	C12	Translator	25
"C"	9.6 mc	9.6 mc	400 ohms	Ant. Term.	C8*	Oscillator	--
"C"	9.6 mc (rock)	9.6 mc	400 ohms	Ant. Term.	C13	Translator	25
"D"	11.7 mc	11.7 mc	400 ohms	Ant. Term.	C10*	Oscillator	--
"D"	11.7 mc (rock)	11.7 mc	400 ohms	Ant. Term.	C15	Translator	25

IMPORTANT ALIGNMENT NOTES

* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.

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

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

When aligning the receiver be sure that the Loop Button is in the OUT position as this connects the loop which has the outside antenna coupling turn.

MODEL 7051
Ch. 101.684

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

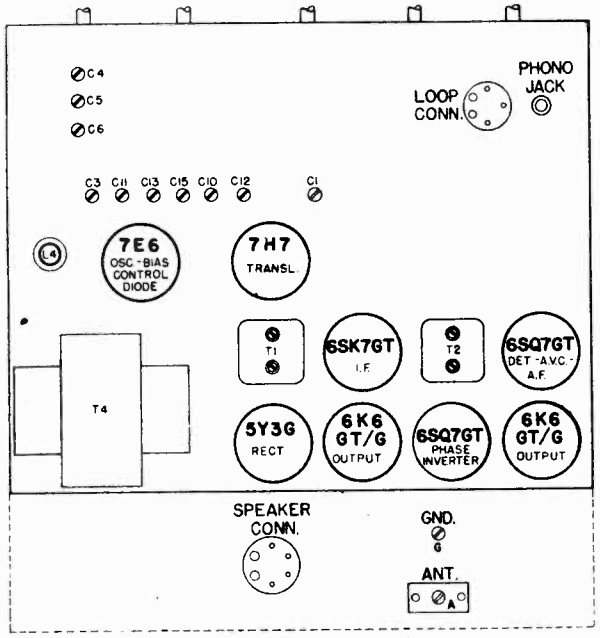
Output meter connections . . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts. . . . . 1.5 volts
Approximate microvolts input to indicate 500 milliwatts output. . . . . See chart below
Generator ground lead connection . . . . . Receiver chassis
Dummy antenna value 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 . . . . . Fully on
Position of Tone Control . . . . . HI
Position of pointer with tuner fully open. . . . . On mark below 540 kc calibration mark

BAND SWITCH POSITION	POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROX. MICRO-VOLTS
A	Closed	455 kc	.1 mfd.	Trans.Grid	T2 - T1	IF	--
A	Open	1750 kc	.0002 mfd.	Ant.	C1	Osc.	--
A	1410 kc	1410 kc	.0002 mfd.	Ant.	C2	Ant.	25
A	1410 kc	1410 kc	.0002 mfd.	Ant.	C3	Trans.	--
A	600 (Rock)	600 kc	.0002 mfd.	Ant.	C4	Pad.	125
B	Open	5900 kc	400 ohms	Ant.	C5	Osc.	--
B	4500 kc	4500 kc	400 ohms	Ant.	C6	Trans.	35
C	open	18.3 mc	400 ohms	Ant.	C7	Osc.	--
C	15 mc (Rock)	15.0 mc	400 ohms	Ant.	C8	Trans.	25
D	9.6 mc	9.6 mc	400 ohms	Ant.	C9	Osc.	--
D	9.6 mc (Rock)	9.6 mc	400 ohms	Ant.	C10	Trans.	30

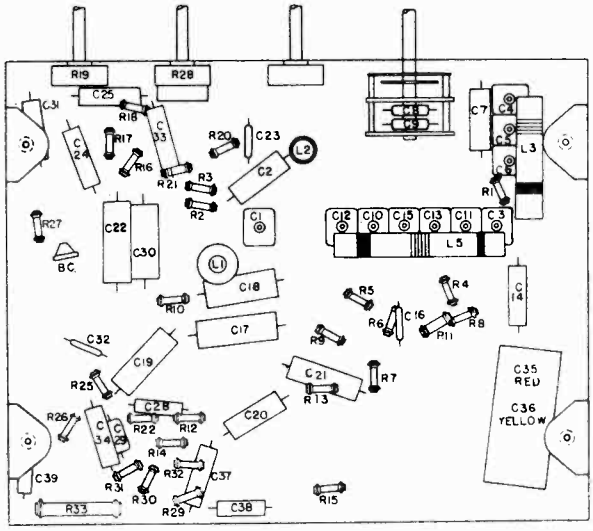
IMPORTANT ALIGNMENT NOTES

The alignment must be done in the order given.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.684

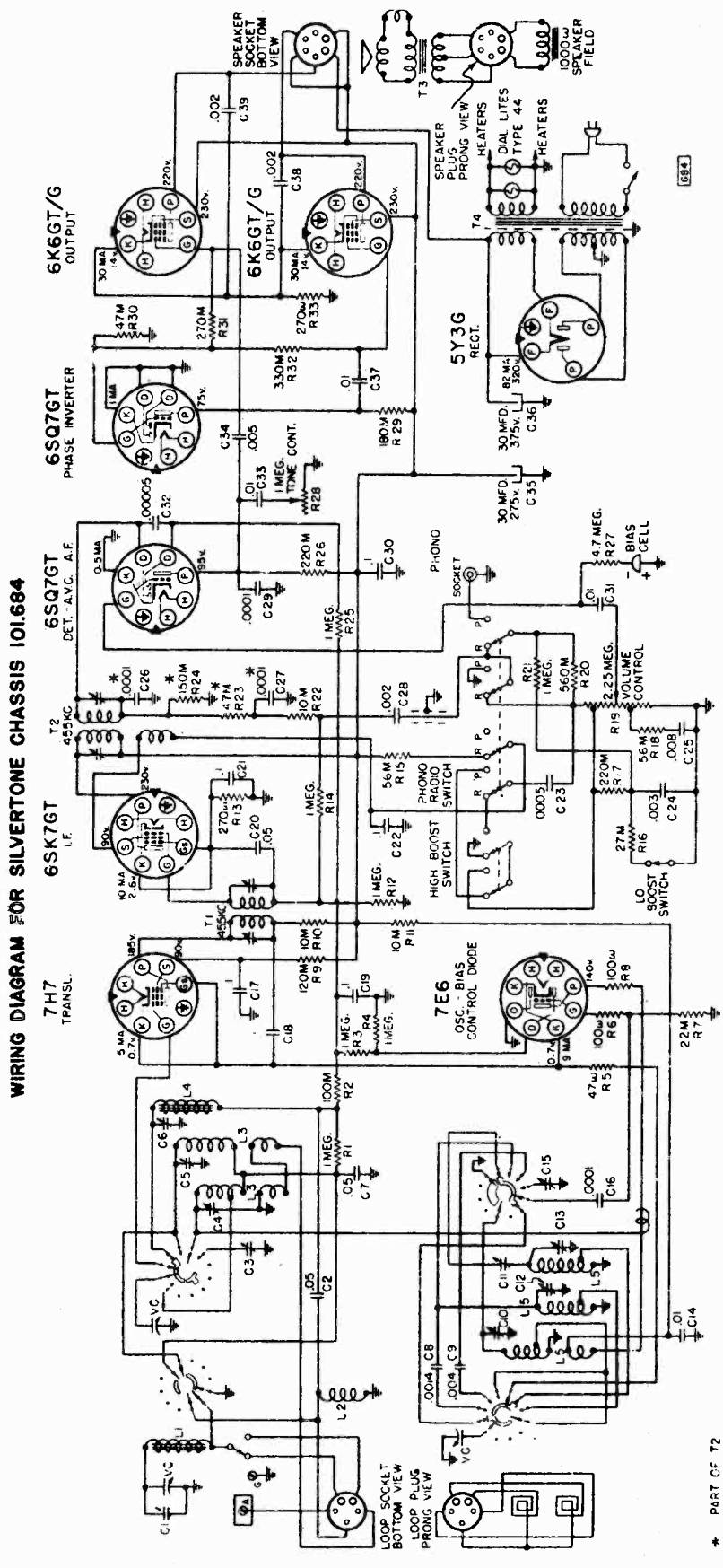


LOCATIONS OF PARTS UNDER CHASSIS 101.684

SEARS, ROEBUCK & CO.

MODEL 7051
Ch. 101.684

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.684



* PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

INTERMEDIATE FREQUENCY
455 kc

APRIL 3, 1942

LOUDSPEAKER:
Type. . . . . Dynamic
Size. . . . . 12 inch
Field coil resistance . . . . . 1000 ohms
Approx. field coil voltage drop. . 80 v.

POWER OUTPUT:
Type . . . . . Push Pull Pentode
Undistorted. . . . . 3.5 watts
Maximum. . . . . 7 watts

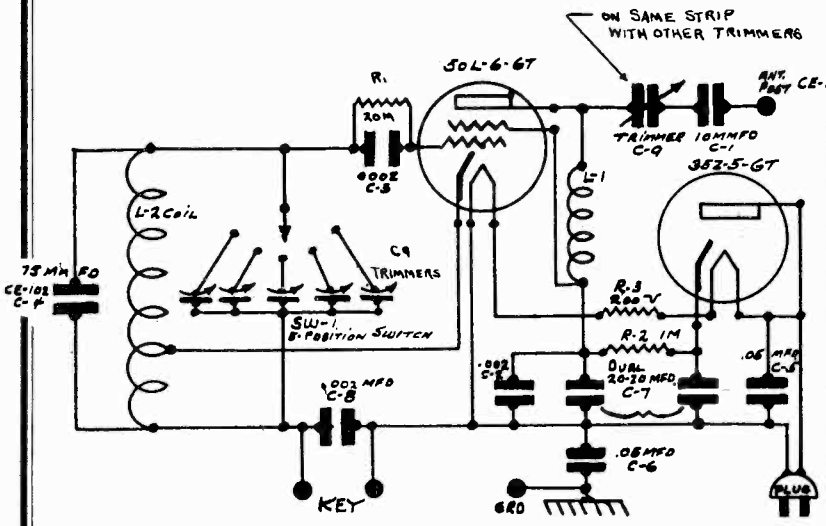
MODEL 100
Ch. 152.100

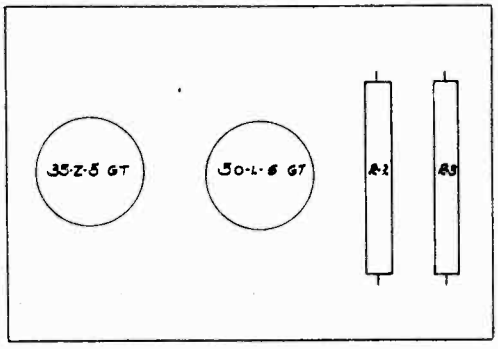
SEARS, ROEBUCK & CO.

MODEL 7069
Ch. 101.658-1

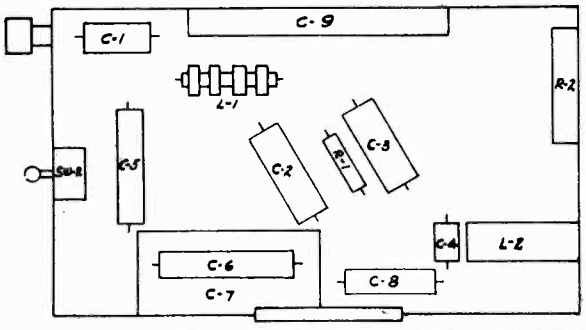
The Model 100 is a five channel miniature C.W. Transmitter enclosed in an enameled steel case and mounted on a wood base board with a Speed X 300 telegraph key. The unit was built to our specifications for code and operating procedure practice.

The unit uses a Electron coupled Hartley oscillator circuit with a five position switch for selecting one of the five tank trimmer condensers. The trimmer condenser adjusting screws are conveniently accessable thru five holes along the lower left hand side of the chassis. The antenna coupling condenser is similarly located and adjusted. A 75 umfd silver ceramic negative coefficient condenser is connected directly across the tuned tank circuit on all five channels to insure frequency stability. The output frequency channels are adjustable from 3.0 to 3.5 megacycles. Cathode circuit keying is employed.





TOP OF CHASSIS



C. W. CODE PRACTICE OSCILLATOR

MODEL #100

MODEL 7069

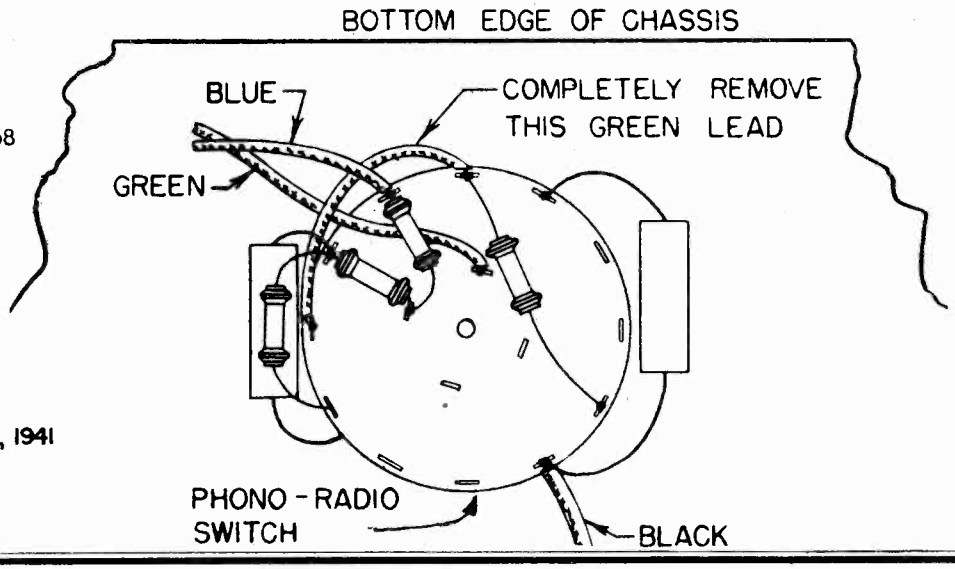
FACTORY IDENTIFICATION NO. 101.658-1

TEN TUBE, FOUR BAND SUPERHETERODYNE, WITH PUSH BUTTON TUNING COMBINED WITH AUTOMATIC RECORD CHANGER

IMPROVEMENT OF PHONOGRAPH OPERATION:

Chasses identified by 101.658 can be improved with the respect to phonograph operation by cutting the green wire on the phono radio switch as shown in the illustration below. Chasses which have had this change made in production are identified by suffix number -1 or a subsequent number.

FOR ORIGINAL DATA SEE CHASSIS 101.658 IN VOL. XIII

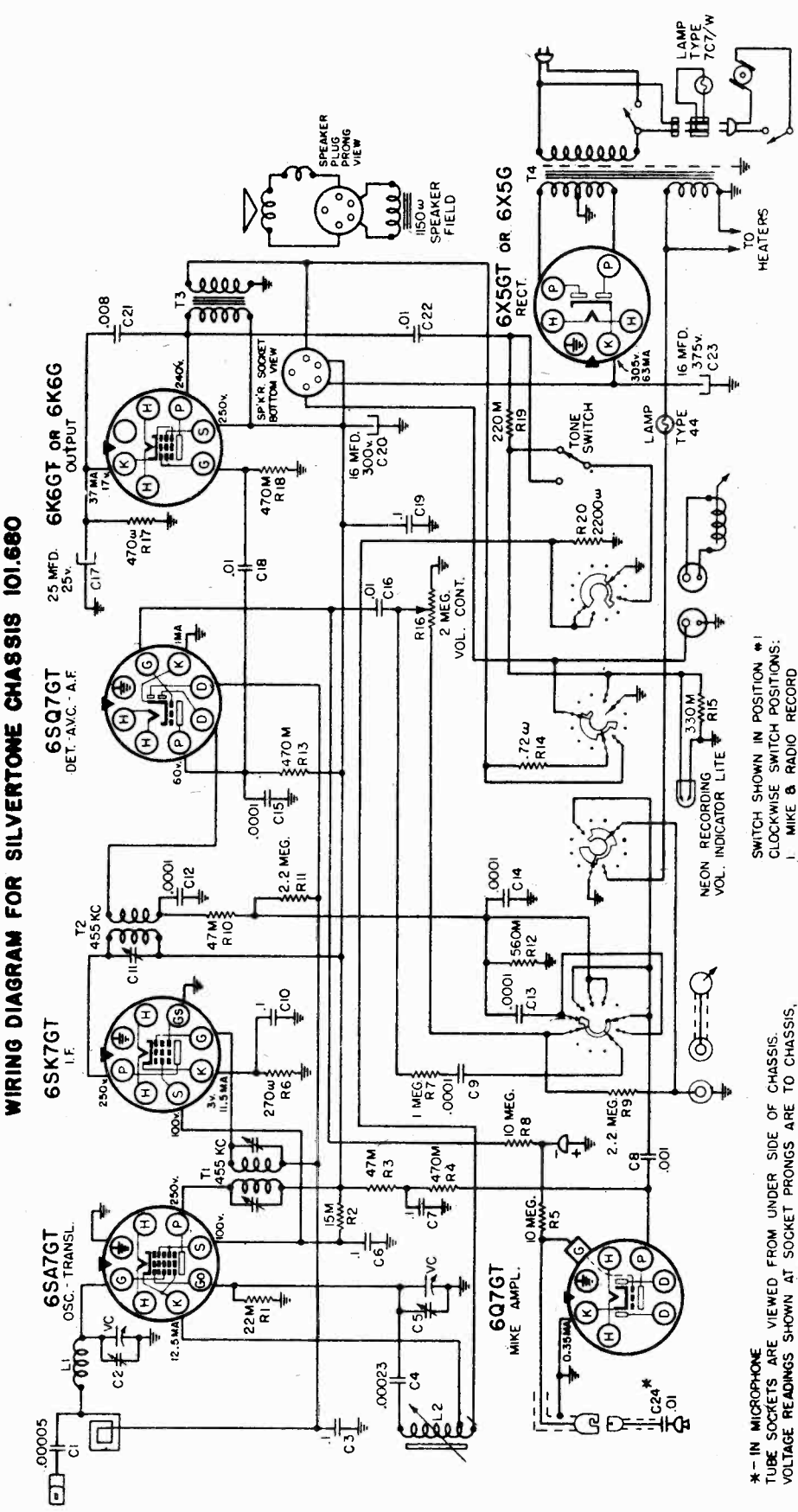


NOVEMBER 18, 1941

SEARS, ROEBUCK & CO.

MODEL 7066
Ch. 101.680

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.680



SWITCH SHOWN IN POSITION #1
CLOCKWISE SWITCH POSITIONS:
1. MIKE & RADIO RECORD
2. MIKE RECORD
3. RADIO RECORD
4. RADIO PLAY
5. PHONO PLAY
6. MIKE
7. MIKE & RADIO

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

APRIL 24, 1942

INTERMEDIATE FREQUENCY . . . . . 455 kc

POWER OUTPUT:
Type . . . . . Pentode
Undistorted. . . . . 2.5 watts
Maximum. . . . . 5 watts

LOUDSPEAKER:
Type. . . . . Dynamic
Size. . . . . 8 inch
Field coil resistance . . . . 1150 ohms
Approx. field coil voltage drop. . . 55 v.

MODEL 7066
Ch. 101.680

SEARS ROEBUCK CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

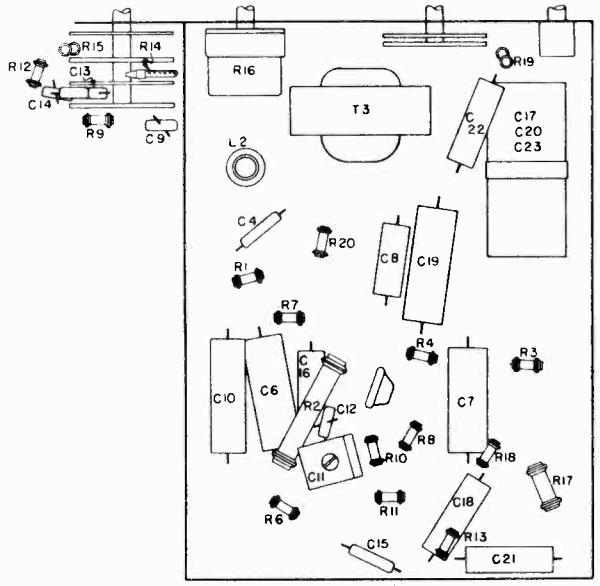
Output meter connection	Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts	1.25 volts
Approximate microvolts input for 500 milliwatts output	See chart below
Dummy antenna value to be in series with generator output	See chart below
Connection of generator output lead	See chart below
Connection of generator ground lead	Receiver chassis
Generator modulation	30%, 400 cycles
Position of Volume Control	Fully clockwise
Position of Tone Control	Counter-clockwise (HI)
Position of Dial Pointer with variable fully closed	On mark below 540 kc calibration mark

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 kc	.1 mfd.	6SA7 Grid	C 11	IF	---
Fully open	1620 kc	.00005 mfd.	Ant. Clip	C 1	Oscillator	---
1410 kc	1410 kc	.00005 mfd.	Ant. Clip	C 2	Translator	125
600 kc (rock)	600 kc	.00005 mfd.	Ant. Clip	L 2	Padder	425

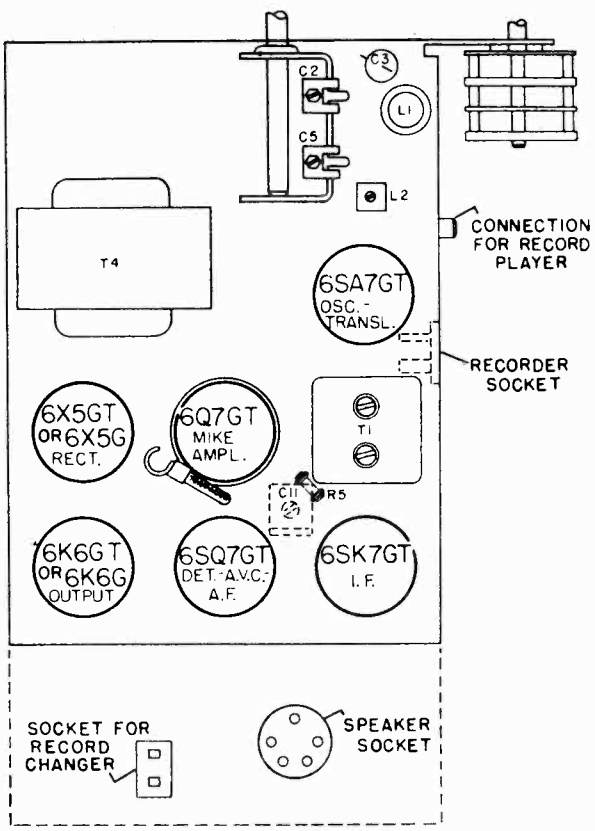
IMPORTANT ALIGNMENT NOTES

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

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.



LOCATIONS OF PARTS UNDER CHASSIS 101.680

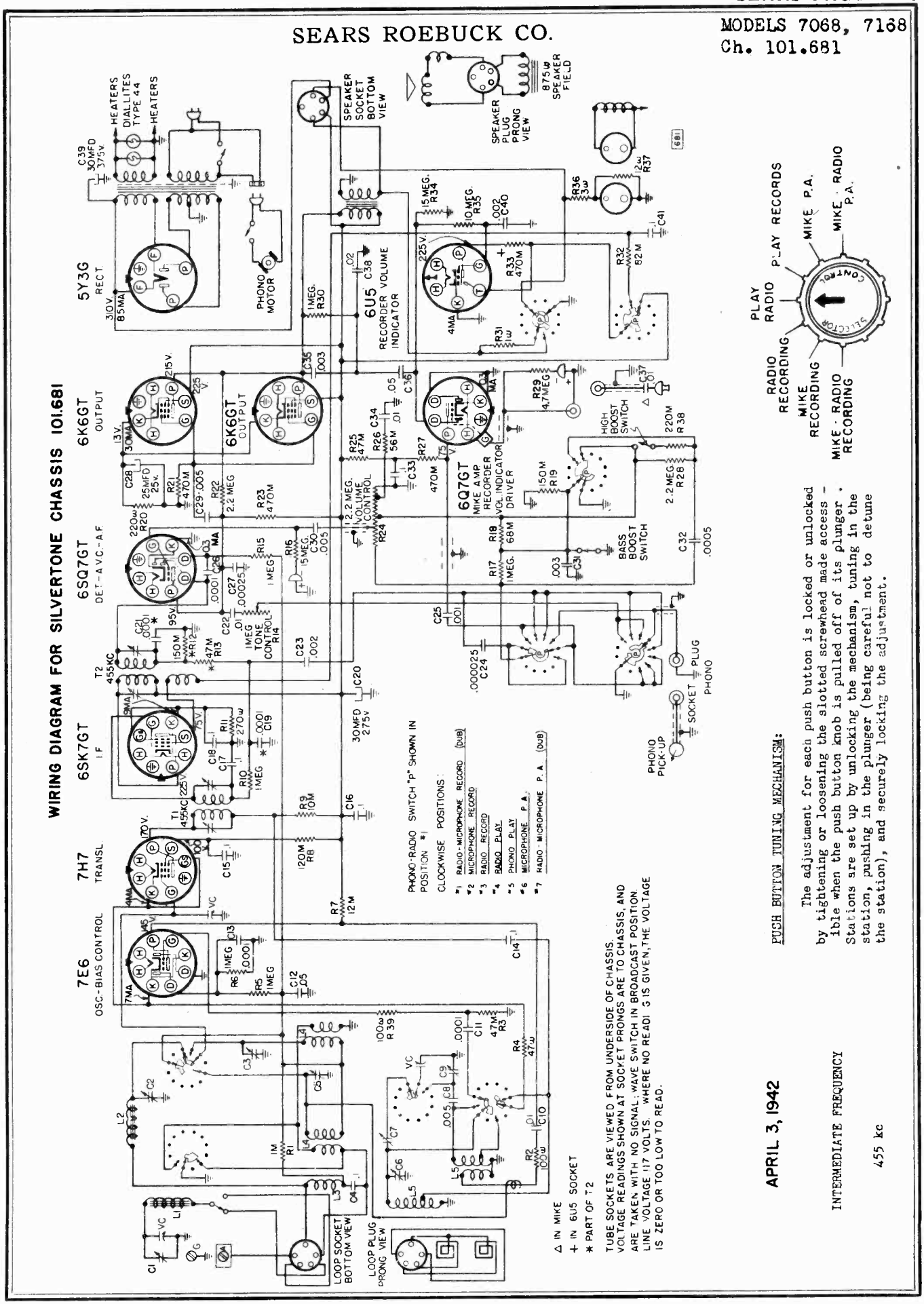


LOCATIONS OF PARTS ON TOP OF CHASSIS - 101.680

SEARS ROEBUCK CO.

MODELS 7068, 7168
Ch. 101.681

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.681



PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), and securely locking the adjustment.

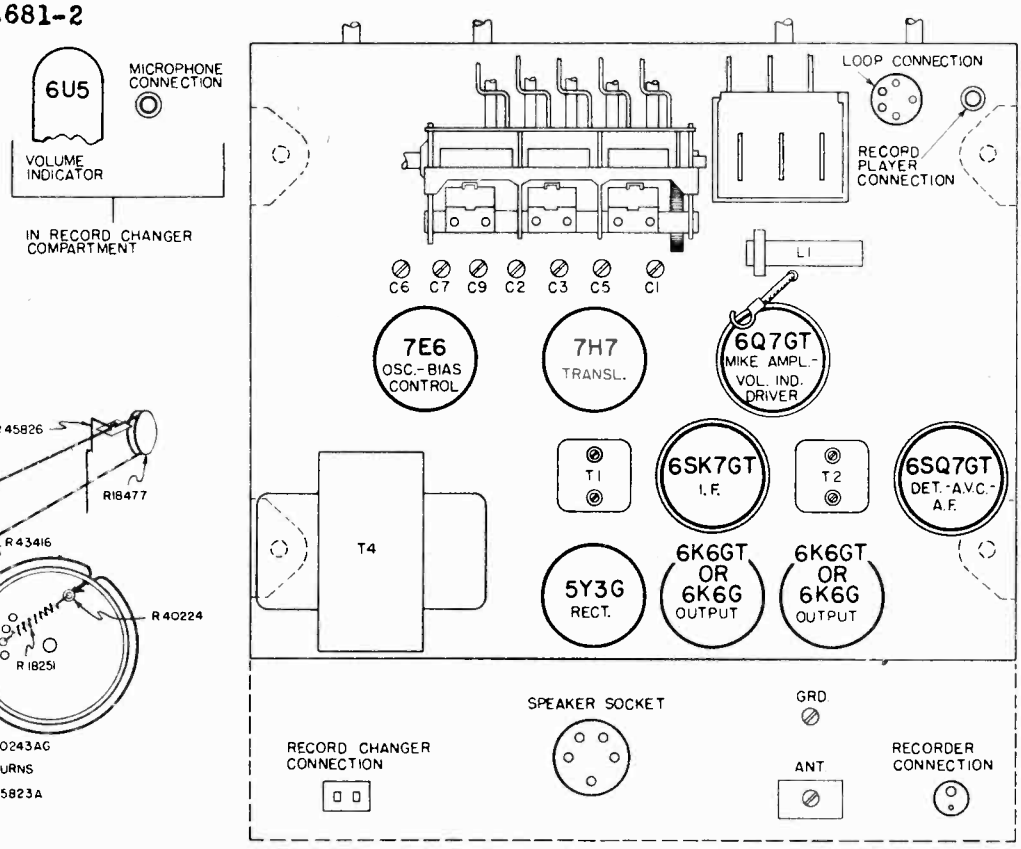
APRIL 3, 1942

INTERMEDIATE FREQUENCY

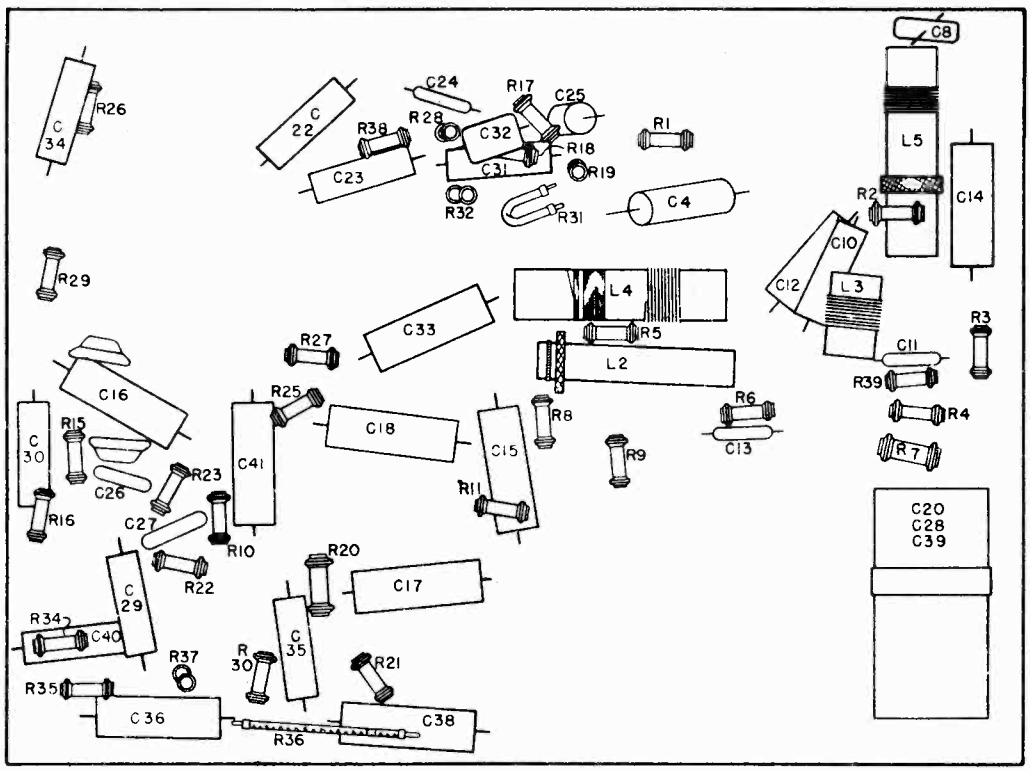
455 kc

MODELS 7068, 7168
Ch. 101.681,
Ch. 101.681-2

SEARS, ROEBUCK & CO.



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.681, -2



LOCATION OF PARTS UNDER CHASSIS - 101.681

SEARS ROEBUCK CO.

ALIGNMENT PROCEDURE

MODELS 7068, 7168
Ch. 101.681,
Ch. 101.681-2

PRELIMINARY:

Output meter connection	Across loudspeaker voice coil
Output mster reading to indicate 500 milliwatts	1.8 volts
Approximate microvolts input to indicate 500 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	Fully on
Position of Tone Control	HI
Position of pointer with tuner fully open	On scribed line on top of pointer guide rail

BAND SWITCH POSITION	POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
A	Closed	455 Kc	.1 mfd.	7H7 Transl. grid	T2, T1	IF	--
A	Open	1720 Kc	.00005 mfd.	Ant. Terminal	C6	Oscillator	--
A	1410	1410 Kc	.00005 mfd.	Ant. Terminal	C1, C3	Ant. Transla.	30
A	600 (rock)	600 Kc	.00005 mfd.	Ant. Terminal	C7,	Padder	125
POL	2.4	2.4 Mc	400 ohms	Ant. Terminal	C2	Transla.	35
B	Open	18.3 Mc	400 ohms	Ant. Terminal	C9	Oscillator	--
B	15 (rock)	15 Mc	400 ohms	Ant. Terminal	C5	Transla.	20

IMPORTANT ALIGNMENT NOTES

* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.

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

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

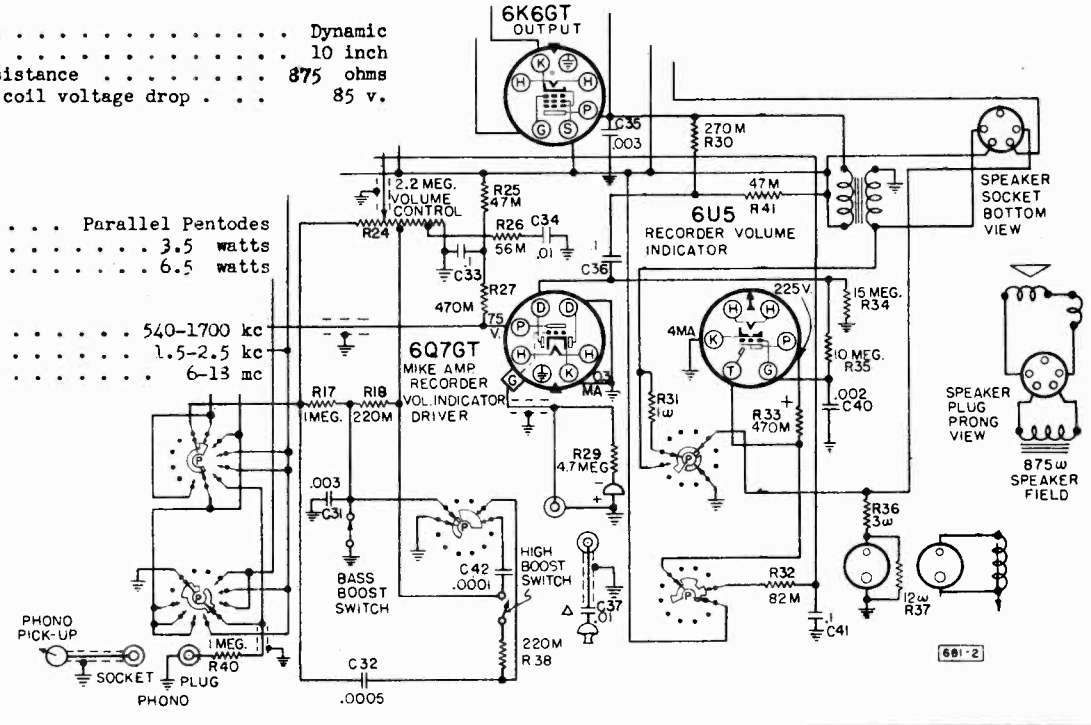
When aligning the receiver be sure that the Loop Button is in the OUT position as this connects the loop which has the outside antenna coupling turn.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.681-2

LOUDSPEAKER:
Type . . . . . Dynamic
Size . . . . . 10 inch
Field coil resistance . . . . . 875 ohms
Approx. field coil voltage drop . . . 85 v.

POWER OUTPUT:
Type . . . . . Parallel Pentodes
Undistorted . . . . . 3.5 watts
Maximum . . . . . 6.5 watts

FREQUENCY RANGES:
Band "A" . . . . . 540-1700 kc
Band "POLICE" . . . . . 1.5-2.5 kc
Band "B" . . . . . 6-13 mc



MODEL 7079
Ch. 101.620-3

SEARS ROEBUCK CO.

MODEL 7081
Ch. 101.636-1

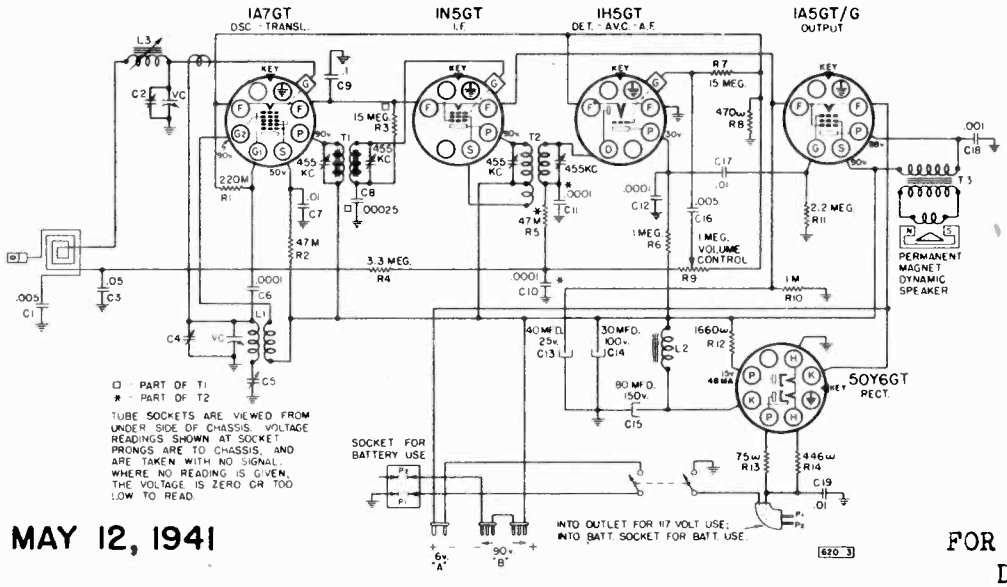
MODEL 7079

FIVE TUBE, BATTERY AC-DC POWERED PORTABLE SUPERHETERODYNE

SUBJECT: ADDITION OF SUFFIX NUMBER -3 TO CHASSIS IDENTIFICATION NUMBER 101.620:

Chassis identified as 101.620-3 are the same as 101.620-2 except that the loop is wound directly on the cabinet frame and covered by the cabinet covering. The loop is of low impedance requiring the addition of an antenna loading coil. Filament circuit revisions are also incorporated.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.620-3



□ - PART OF T1
* - PART OF T2

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

MAY 12, 1941

FOR ORIGINAL DATA SEE INDEX

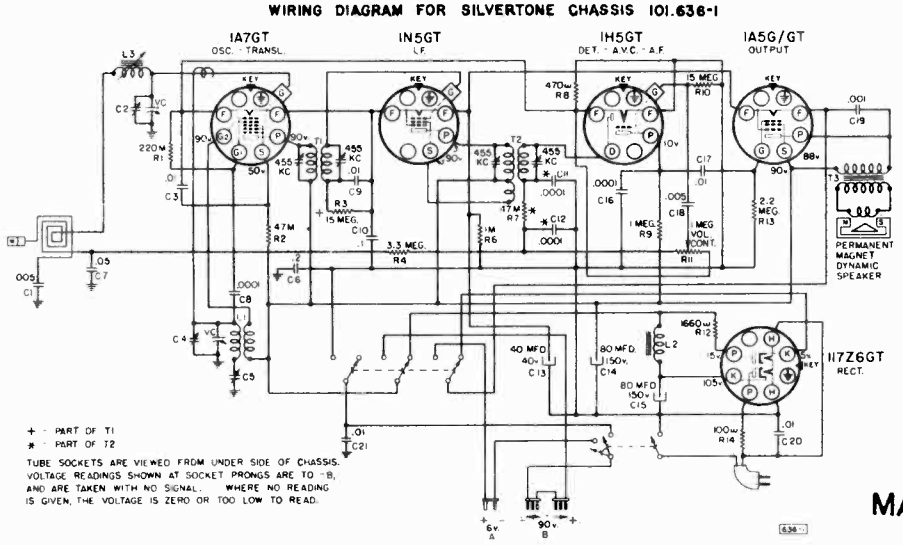
MODEL 7081

FIVE TUBE, BATTERY OR AC-DC POWERED PORTABLE SUPERHETERODYNE

SUBJECT: ADDITION OF SUFFIX NUMBER -1 TO CHASSIS IDENTIFICATION NUMBER 101.636:

Chassis identified as 101.636-1 are the same as 101.636 except that the loop is wound directly on the cabinet frame and covered by the cabinet covering. The loop is of low impedance requiring the addition of an antenna loading coil. The ranges has been extended to cover 540 Kc.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.636-1



+ - PART OF T1
* - PART OF T2

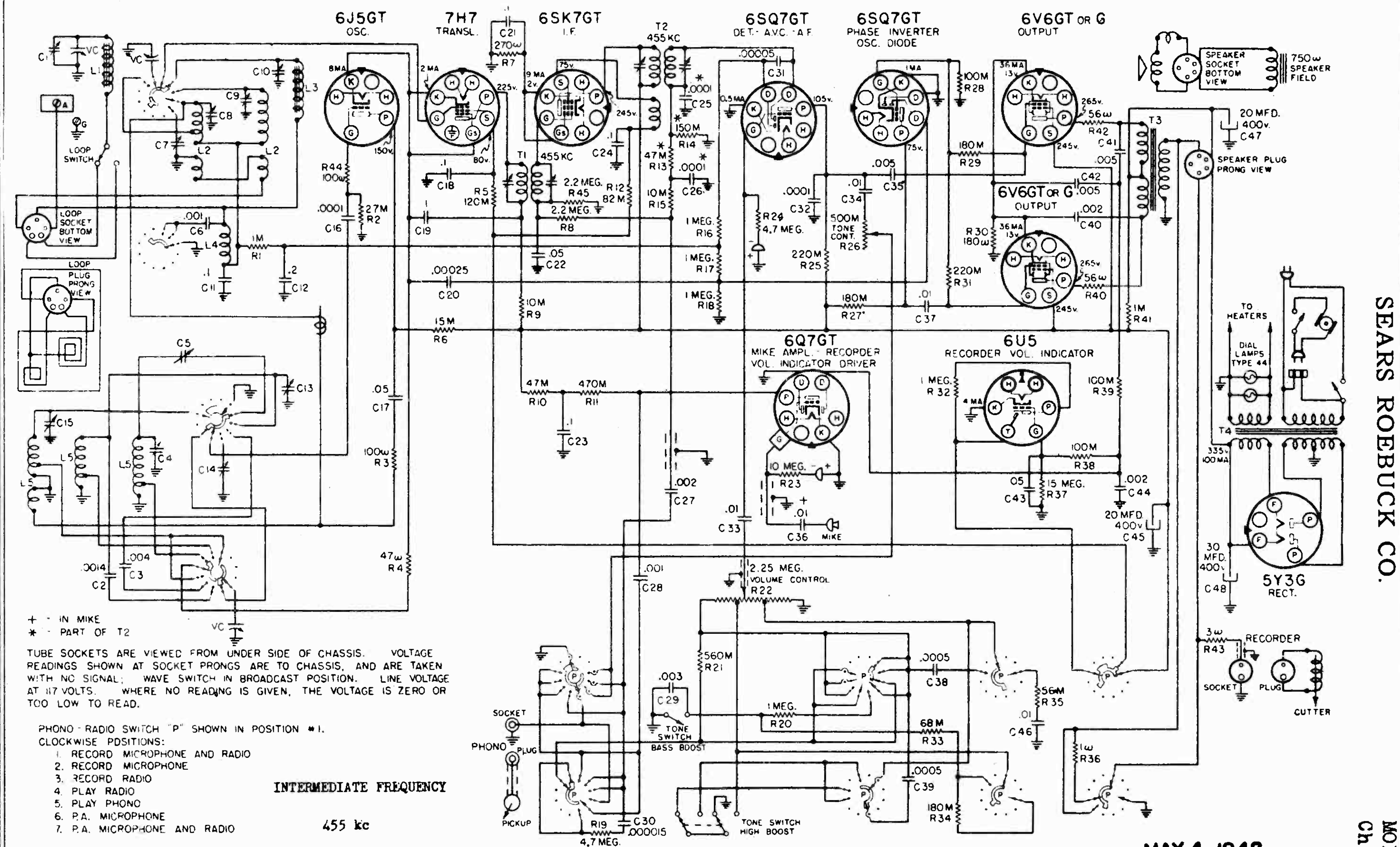
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO -B, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

MAY 12, 1941

SEARS ROEBUCK CO.

MODEL 7070
Ch. 101.682

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.682



\+ - IN MIKE
* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

PHONO - RADIO SWITCH "P" SHOWN IN POSITION #1.
CLOCKWISE POSITIONS:
1. RECORD MICROPHONE AND RADIO
2. RECORD MICROPHONE
3. RECORD RADIO
4. PLAY RADIO
5. PLAY PHONO
6. P.A. MICROPHONE
7. P.A. MICROPHONE AND RADIO

INTERMEDIATE FREQUENCY

455 kc

MAY 4, 1942

POWER OUTPUT:

Type	Push-Pull beam
Undistorted	7.5 watts
Maximum	11 watts

LOUDSPEAKER:

Type	Dynamic
Size	12 inch
Approx. field coil res.	750 ohms
Approx. field coil voltage drop	70 v.

FREQUENCY RANGES:

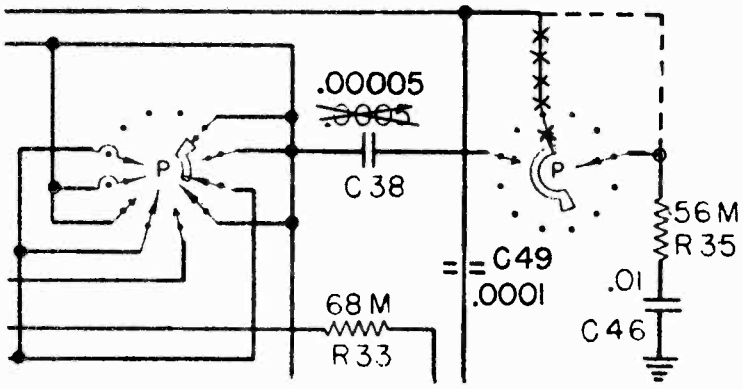
Band "A"	540-1700 kc
Band "B"	1.8-5 mc
Band "C"	5.5-18 mc
Band "D"	9.4-9.8 mc

MODEL 7070
Ch. 101.682,
Ch. 101.682-1

SEARS ROEBUCK CO.

DIFFERENCE BETWEEN 101.682 AND 101.682-1:

Model 682-1 is the same as model 682 except for circuit changes made to improve the tone quality of home recordings. These changes involve the addition of a .0001 mfd. condenser C49, and a change in value for C38 from .0005 mfd. to .00005 mfd. Wiring changes, shown by dotted lines in the following schematic section, also have been made.



ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.8 volts
Approximate microvolts input for 500 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
Position of Volume Control. . . . . Fully clockwise
Position of Dial Pointer with variable fully opened . . . . . On first mark to right of 1700 kc calibration mark

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	7H7 Grid	T2, T1	IF	—
"A"	Fully open	1720 kc	.00005 mfd.	Ant. Term.	C4	Oscillator	—
"A"	1410 kc	1410 kc	.00005 mfd.	Ant. Term.	C1, C10	Loop,Transl	25
"A"	600 kc (rock)	600 kc	.00005 mfd.	Ant. Term.	C5	Padder	100
"B"	Fully open	5.2 mc	400 ohms	Ant. Term.	C13*	Oscillator	--
"B"	4.5 mc (rock)	4.5 mc	400 ohms	Ant. Term.	C9	Translator	35
"C"	Fully open	18.3 mc	400 ohms	Ant. Term.	C15*	Oscillator	—
"C"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C8	Translator	15
"D"	9.6 mc	9.6 mc	400 ohms	Ant. Term.	C14*	Oscillator	--
"D"	9.6 mc (rock)	9.6 mc	400 ohms	Ant. Term.	C7	Translator	25

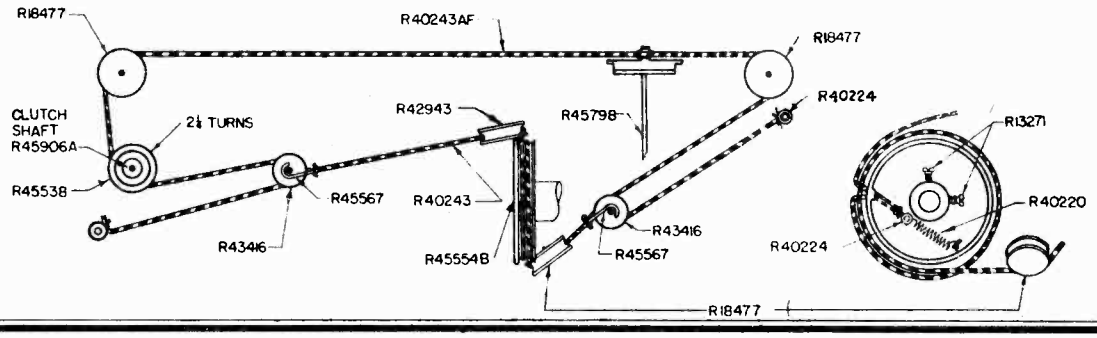
IMPORTANT ALIGNMENT NOTES

* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.

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

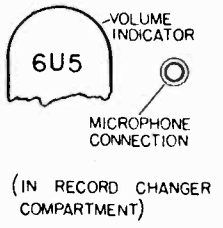
The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

When aligning the receiver be sure that the Loop Button is in the OUT position as this connects the loop which has the outside antenna coupling turn.

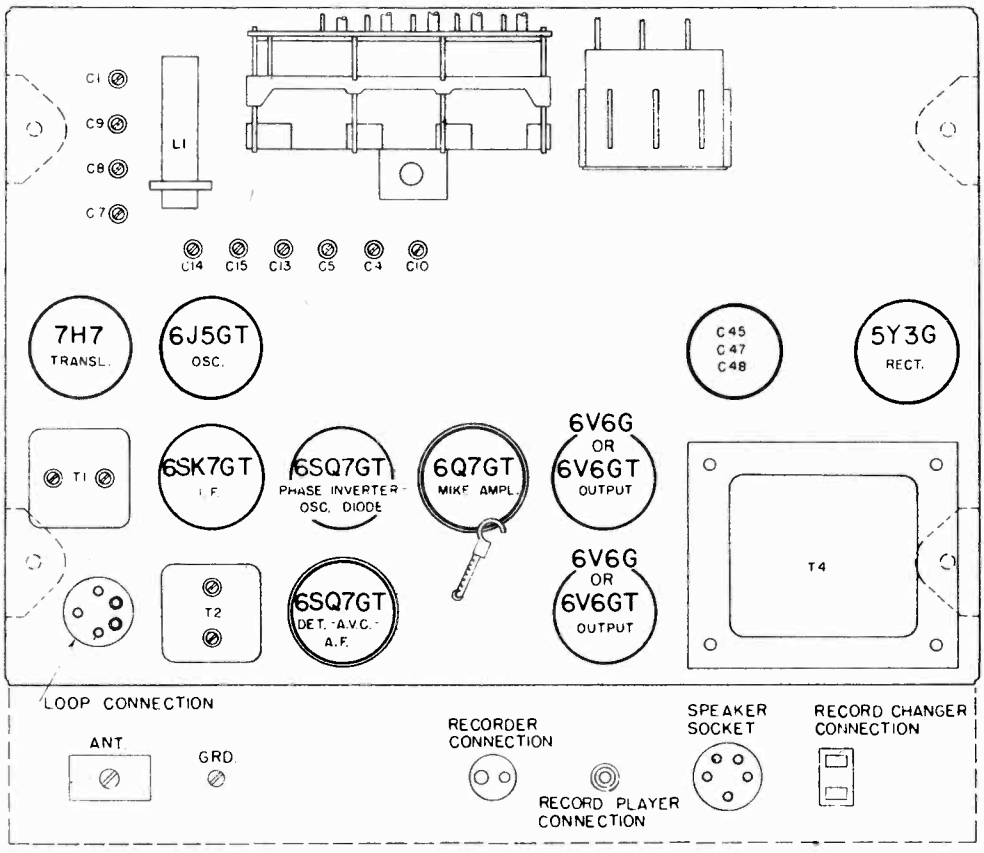


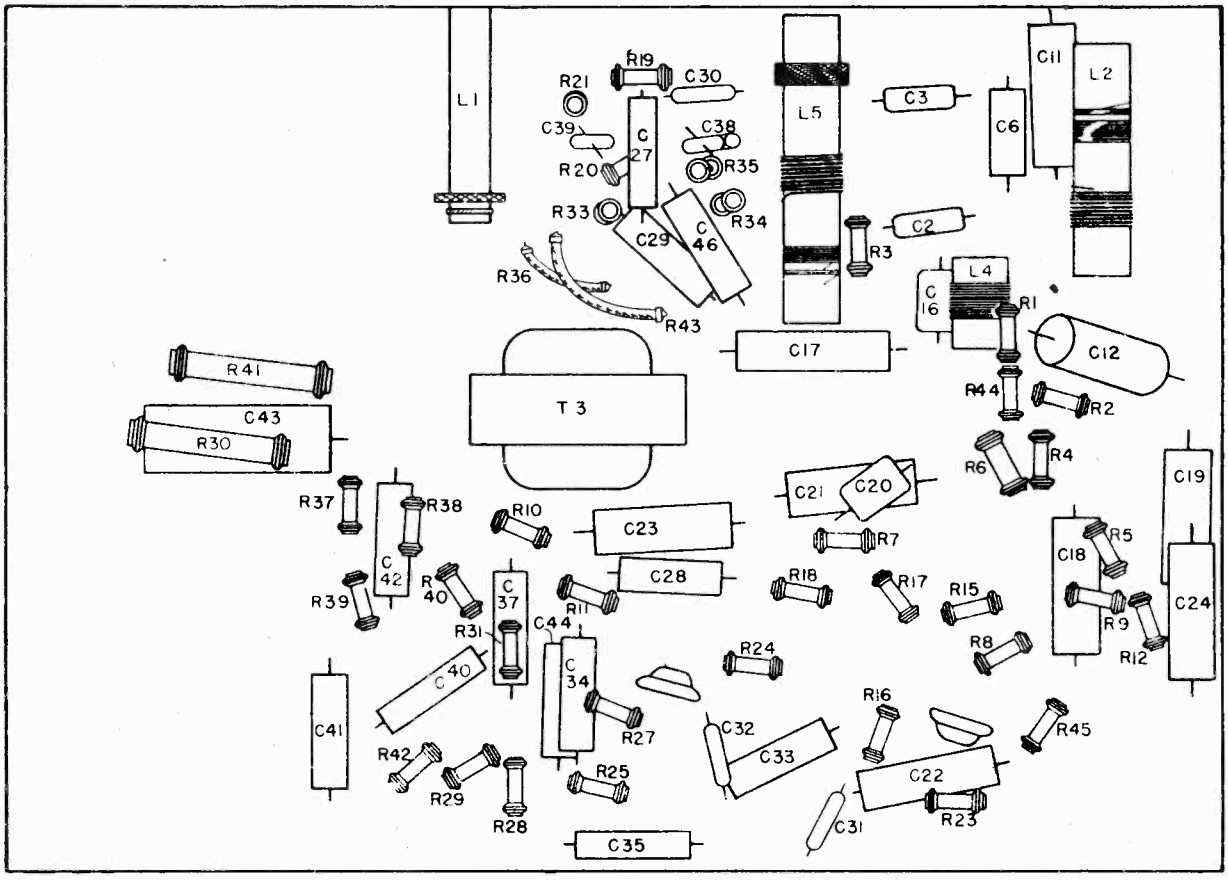
SEARS ROEBUCK CO.

MODEL 7070
Ch. 101.682
Ch. 101.682-1



(IN RECORD CHANGER COMPARTMENT)





LOCATION OF PARTS UNDER CHASSIS - 101.682

MODEL 7093
Ch. 101.666

SEARS ROEBUCK CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

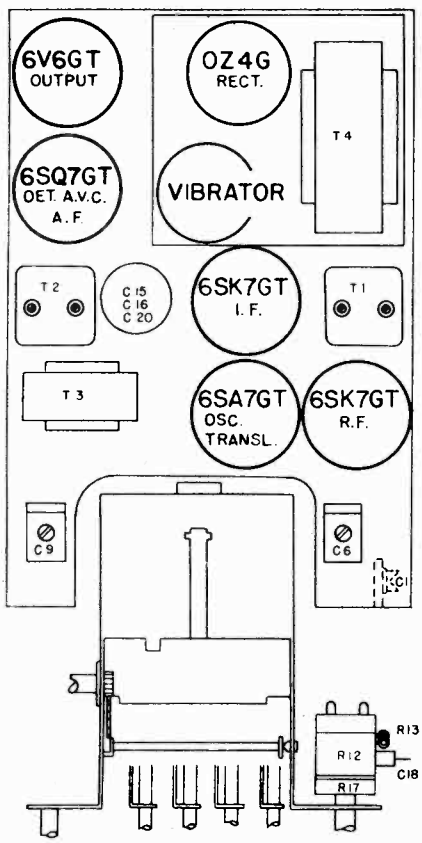
Output meter connections . . . . . Across loud speaker voice coil
Output meter reading to indicate 1 watt. . . . . 1.4 volts
Connection of signal generator ground lead . . . . . Receiver chassis
Connection of signal generator output lead . . . . . See chart below
Approximate microvolts input for 1 watt output . . . . . See chart below
Dummy antenna value to be in series with generator output. . . . . See chart below
Position of Volume Control . . . . . Fully on
Position of Tone Control . . . . . Brilliant

POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Low Freq.Limit	260 Kc	.1 mfd.	Transl.Grid	T2, T1	IF	-
Hi Freq.Limit	1610 Kc	.00005 mfd.	Ant. Conn.	C9,C6,C1	Osc.,RF.,Ant.	10

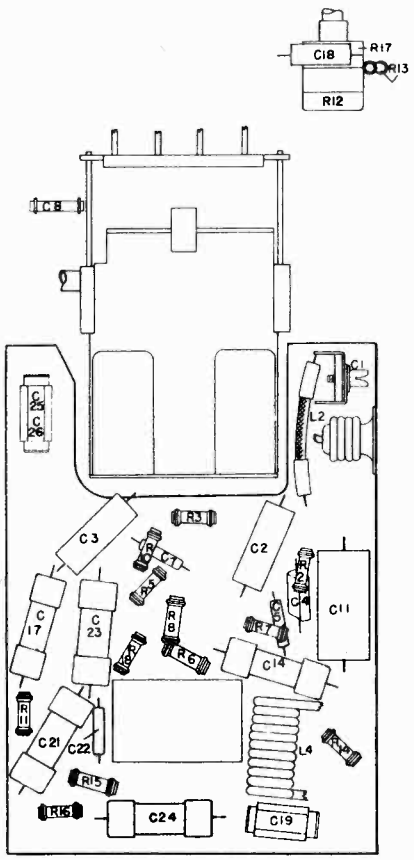
IMPORTANT ALIGNMENT NOTES

The receiver must be in its case during alignment.

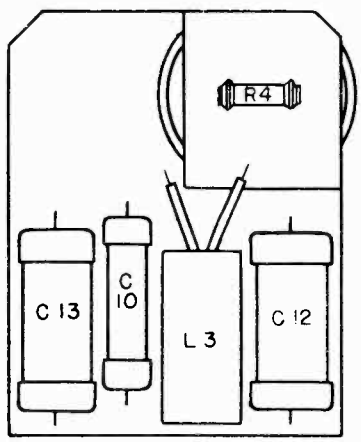
Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.



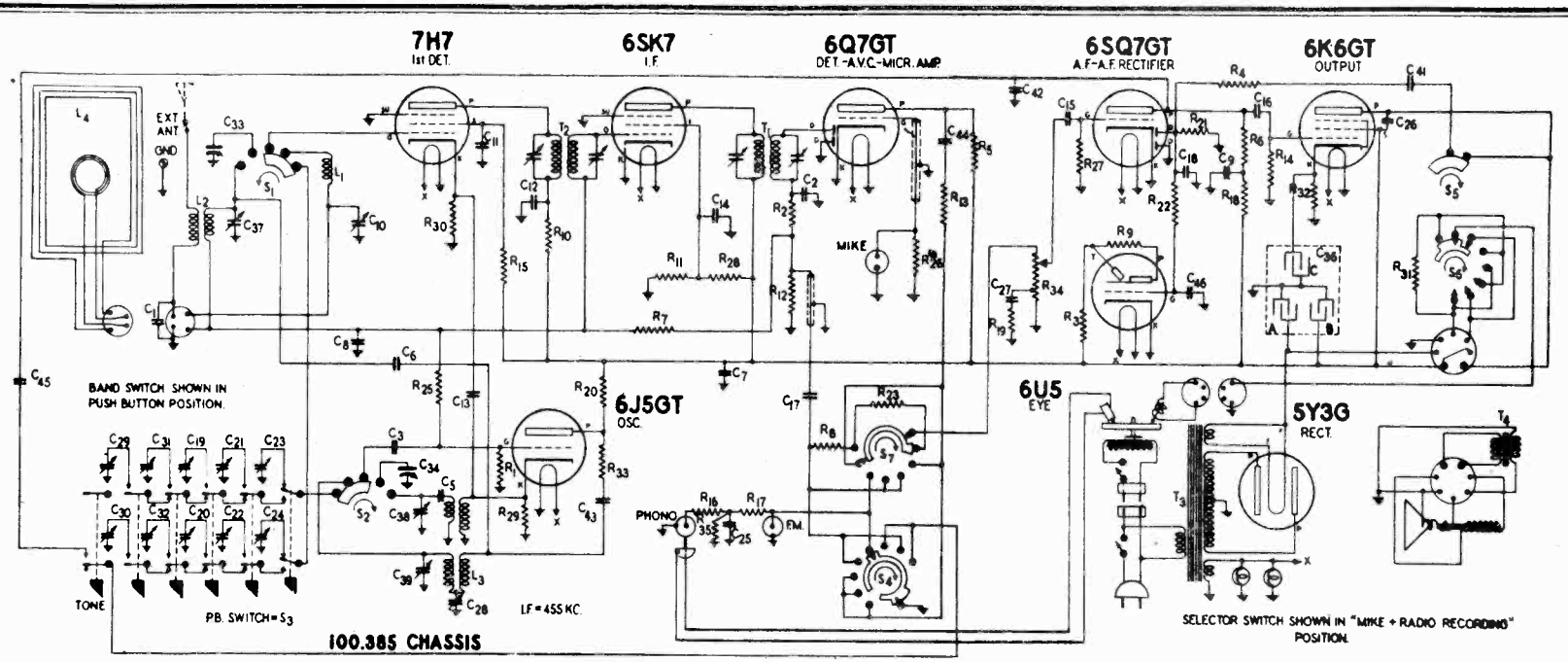
LOCATION OF PARTS
BOTTOM COVER REMOVED



LOCATION OF PARTS UNDER CHASSIS-101.666



LOCATION OF PARTS
UNDER POWER SUPPLY
101.666



FREQUENCY RANGES

(A) Broadcast . . . . . 535 to 1725 KC
(B) Short Wave 5.6 to 18.1 MC

INTERMEDIATE FREQUENCY. . . . . .455 KC

POWER OUTPUT

Type . . . . . Pentode
Undistorted . . . . . 2.8 Watts
Maximum. . . . . 5 Watts

ALIGNMENT FREQUENCIES

1400 KC., 600 KC
16 MC

LOUD SPEAKER

Type. . . . . Electro dynamic
Size. . . . . 10 inch
Field resistance (cold) . . . 900 Ohms

DIAGRAM NUMBER	DESCRIPTION
C1 - C2*	Condenser, mica-110 mmfd.
C3	Condenser, mica-51 mmfd..
C5	Condenser, mica- .0042 mfd
C6	Condenser, wire-3 mmfd. .
C7	Condenser, .1 mfd. 600 V.
C8 - C9	Condenser, .05 mfd. 600 V.
C10	Condenser, loop trimmer .
C11 - C17	Condenser, .01 mfd. 600 V.
C18	Condenser, .008 mfd. 600 V.
C19 - C22	Condenser, push button trimmers (Med.Freq.)
C23 - C24	Condenser, push button trimmers (High Freq.)
C26	Condenser, .002 mfd. 600 V.
C27	Condenser, .04 mfd. 600 V.
C28	Condenser, padder . . . .
C29 - C32	Condenser, push button trimmer (Low Freq.)
C33 - C34	Condenser, variable tuning
C36	Condenser, electrolytic A= 20 mfd., 400 V. B= 15 mfd., 400 V. C= 20 mfd., 25 V.
C37-C38-C39	Condenser, 3 section trimmer
C41	Condenser, 105 mfd. 600 V.
C42	Condenser, mica 110 mmfd.
C43	Condenser, .01 mfd. 600 V.
C44	Condenser, .02 mfd. 600 V.
C45	Condenser, .004 mfd. 600 V.
C46	Condenser, .002 mfd. 600 V.

R1 - R4	Resistor, carbon-47,000 ohms 1/4 watt
R5 - R6	Resistor, carbon-220,000 ohms 1/4 watt
R7-R8-R9	Resistor, carbon-1 megohm, 1/4 watt .
R10	Resistor, carbon-4700 ohms, 1/4 watt.
R11	Resistor, carbon-33,000 ohms, 1/2 watt
R12-R13-R14	Resistor, carbon-470,000 ohms, 1/4 watt
R15 - R18	Resistor, carbon-100,000 ohms, 1/4 watt
R19	Resistor, carbon-10,000 ohms, 1/4 watt.
R20	Resistor, carbon-10,000 ohms, 1 watt.
R21 - R22	Resistor, carbon-2.2 megohm, 1/4 watt
R23	Resistor, carbon-5.5 megohm, 1/4 watt
R24	Resistor, carbon-180 ohms, 1/4 watt .
R25-R26-R27	Resistor, carbon-10 megohm, 1/4 watt.
R28	Resistor, carbon-22,000 ohms, 1 watt.
R29	Resistor, carbon-560 ohms, 1/4 watt .
R30	Resistor, carbon-680 ohms, 1/4 watt .
R31	Resistor, 20 ohms, 1 watt W.W.. . . .
R32	Resistor, 500 ohms, 1 watt W.W. . . .
R33	Resistor, carbon-180 ohms, 1/4 watt .
R34	Volume control - 1 meg. with switch .
	Resistor, carbon-47,000 ohms, 1/4 watt

AUGUST 21 1942

SEE RIDER'S BOOK
"AUTO. RECORD CHANGERS AND RECORDERS"

RECORD CHANGER

The service notes for the 100.201 record changer will apply to the record changing mechanism of the 100.202 record changer which is used on this receiver model.

SEARS ROEBUCK CO.
MODEL 7072
Ch. 100.385

SEARS PAGE 14-41

MODEL 7072
Ch. 100.385

SEARS ROEBUCK CO.

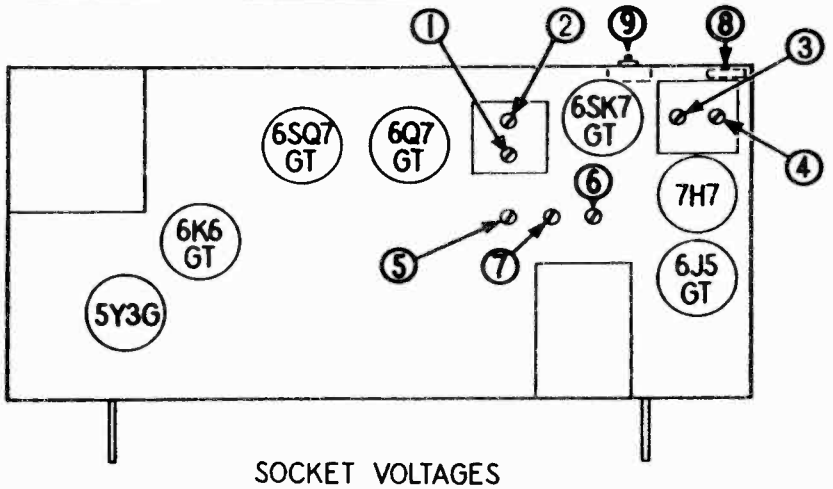
ALIGNMENT PROCEDURE

Before starting the alignment procedure check to see if the pointer is set to the last mark on the 550 KC. end of the dial scale with the gang condenser in full mesh.

Output meter connection----------Across speaker voice coil
Output meter reading to indicate 500 milliwatts----------1.32 volts
Dummy antenna value to be in series with generator output----------See chart below
Connection of generator output lead----------See chart below
Connection of generator ground lead----------To chassis
Generator modulation----------30%, 400 cycles
Approximate signal input to loop for standard output----------600 MV.
Position of Volume Control----------Fully clockwise
Position of Tone Button----------"Out" position
Position of Dial Pointer with gang fully closed----------On mark to left of 550 KC. calibration mark

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on Rear section of Gang Cond.	455 KC	Broadcast	Any Point where it does not affect the signal	1-2 3-4	2nd I.F. 1st. I.F.	Adjust for Maximum Output. Then repeat adjustment.
400 Ohm Carbon Resistor	Terminal marked "Antenna"	16 MC	Short Wave	16 MC	5	Short Wave Oscillator	Adjust for Maximum output. Check to see if proper Peak was obtained by tuning in image at approx. 15.1 MC. If image does not appear, realign at 16 MC, with trimmer screw farther out. Recheck image.
400 Ohm Carbon Resistor	Terminal marked "Antenna"	16 MC	Short Wave	Tune to 16 MC Gen. Sig.	6	Short Wave Antenna	Adjust for Maximum Output. Try to increase output by detuning trimmer and retuning receiver dial until Maximum Output is obtained.
Standard Loop placed 24" from Rec. Loop	Aligning Loop	1400 KC	Broadcast	1400 KC	7	Broadcast Oscillator	Adjust for maximum output.
Standard Loop placed 24" from Rec. Loop	Aligning Loop	1400 KC	Broadcast	Tune to 1400 KC Gen. Sig.	8*	Broadcast Antenna	Adjust for maximum output.
Standard Loop placed 24" from Rec. Loop	Aligning Loop	600 KC	Broadcast	Tune to 600 KC Gen. Sig.	9*	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to increase output by detuning trimmer and retuning receiver dial until Maximum Output is obtained.

*NOTE: ADJUSTMENTS NO. 8 AND NO. 9 SHOULD BE MADE WITH THE SET IN THE CABINET AND WITH LOOP LEADS AND LOOP IN FINAL POSITION. A 50 mmfd. mica condenser in series to the antenna terminal may be used in place of the aligning loop.



SOCKET VOLTAGES

1. VOLTAGES MEASURED WITH SELECTOR SWITCH IN THE POSITION SHOWN IN THE SCHEMATIC DIAGRAM - NO SIGNAL INPUT.
2. VOLUME CONTROL ON FULL

TUBE	FUNCTION	H	K	G	S	SU	P	T	D_1	D_2
7H7	1st. Det.	6.3 A.C.	2.5	NOTE A	110	0	220			
6J5GT	Osc.	6.3	0	-5	-	-	150			
6SK7GT	I.F.	6.3	0	NOTE A	70	0	240			
6Q7GT	2nd. Det. - A.V.C. Micr. Amp.	6.3	0	0	-	-	NOTE B		0	0
6SQ7GT	A.F.-A.F. Rectifier	6.3	0	0	-	-	NOTE B		0	0
6K6GT	Output	6.3	16.5	0	240	-	225			
6U5	Eye	6.3	0	0	-	-	NOTE B	210		
5Y3G	Rectifier	5.0	-	-	-	-	350 A.C.			

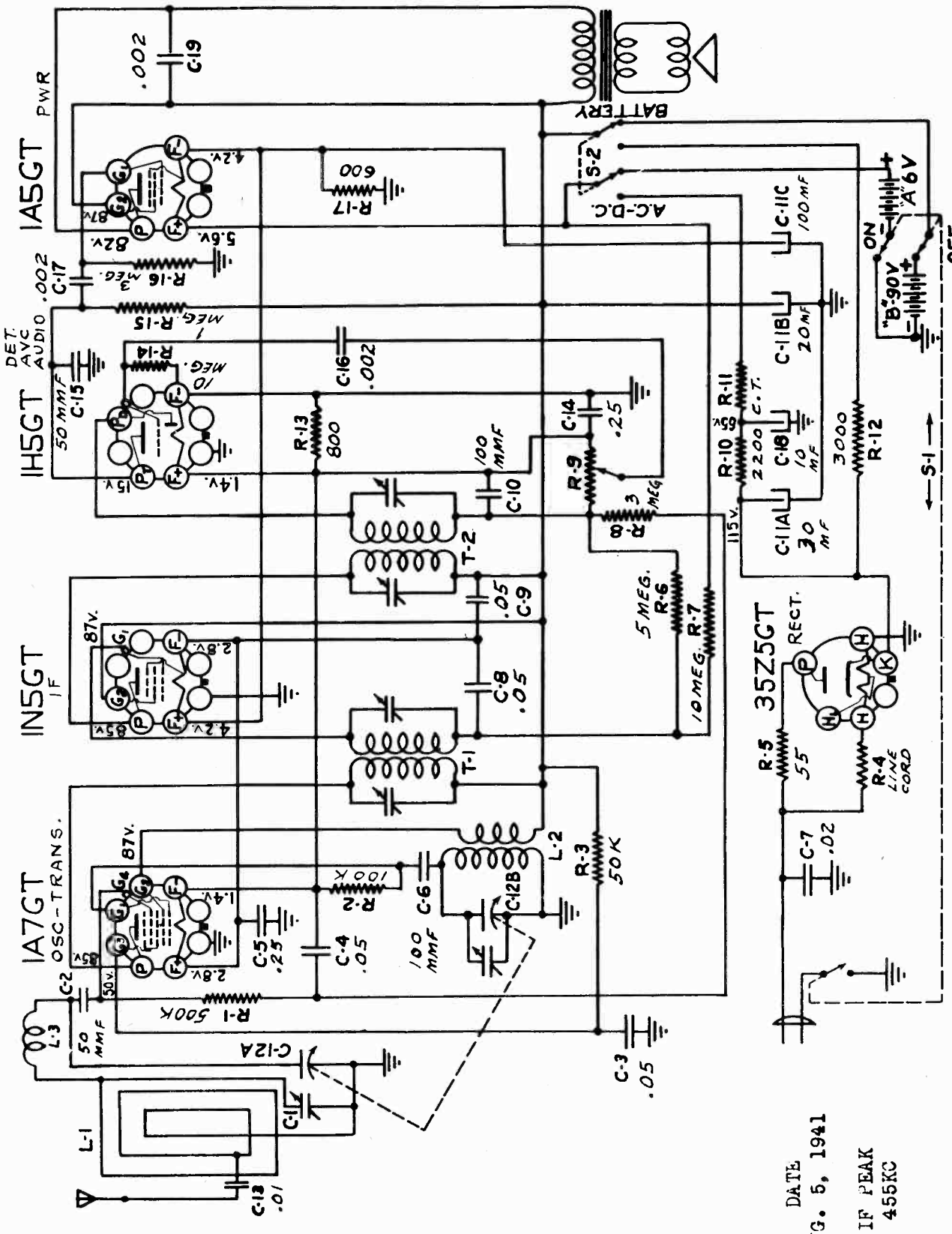
NOTE A: The bias on these grids is controlled by the oscillator grid voltage.

NOTE B: These voltages cannot be measured by means of ordinary meters because of the high circuit resistances involved.

USE A VOLTMETER OF 1000 OHMS PER VOLT.

MODEL 7075
Ch. 109.383

SEARS ROEBUCK CO.



MODEL 7075, Ch. 109.383

SEARS ROEBUCK CO.

MODEL 7077, Ch. 109.409

ALIGNMENT PROCEDURE

Output meter connection.....Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts..... .42 volts
Average sensitivity in microvolts for 50 milliwatts output.....See chart below
Connection of generator output lead.....See chart below
Connection of generator ground lead.....To chassis
Dummy antenna value to be in series with generator output.....See chart below
Generator modulation.....30%, 400 cycles
Position of Volume Control.....Fully clockwise

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS	STANDARD HAZELTINE LOOP APPROX. MICROVOLTS PER METER
Open	455 kc	.1 mfd.	1A7GT Grid	T2 T1	I.F.	100	----
Open	1610	50 mmf.	Ant. Term.	C12b	Oscillator	---	----
1400	1400	50 mmf.	Ant. Term.	C1	Loop	120	300
1000	1000	50 mmf.	Ant. Term.	---	----	200	400
600	600	50 mmf.	Ant. Term.	---	----	600	600

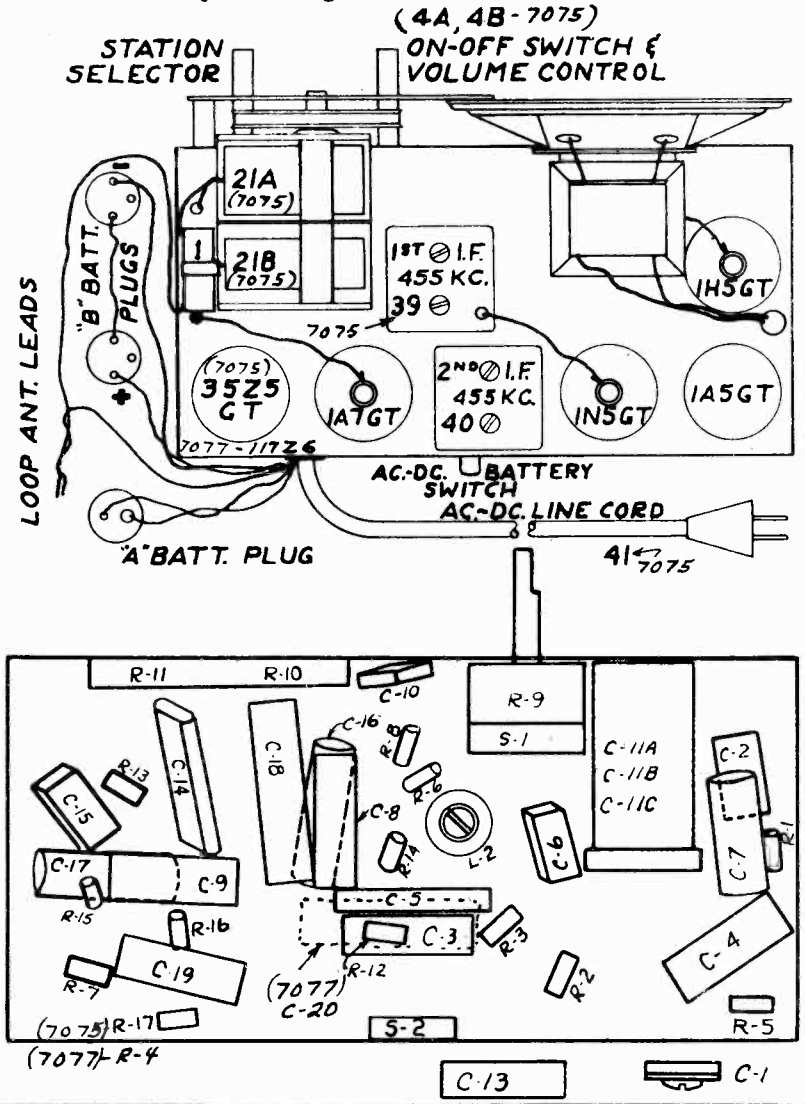
The alignment procedure should be repeated stage by stage in the original order for greatest accuracy.

Always keep the output from the generator at the lowest level possible so that the AVC action will be ineffective.

The location of all the alignment adjustments is shown on the Top View of the chassis.

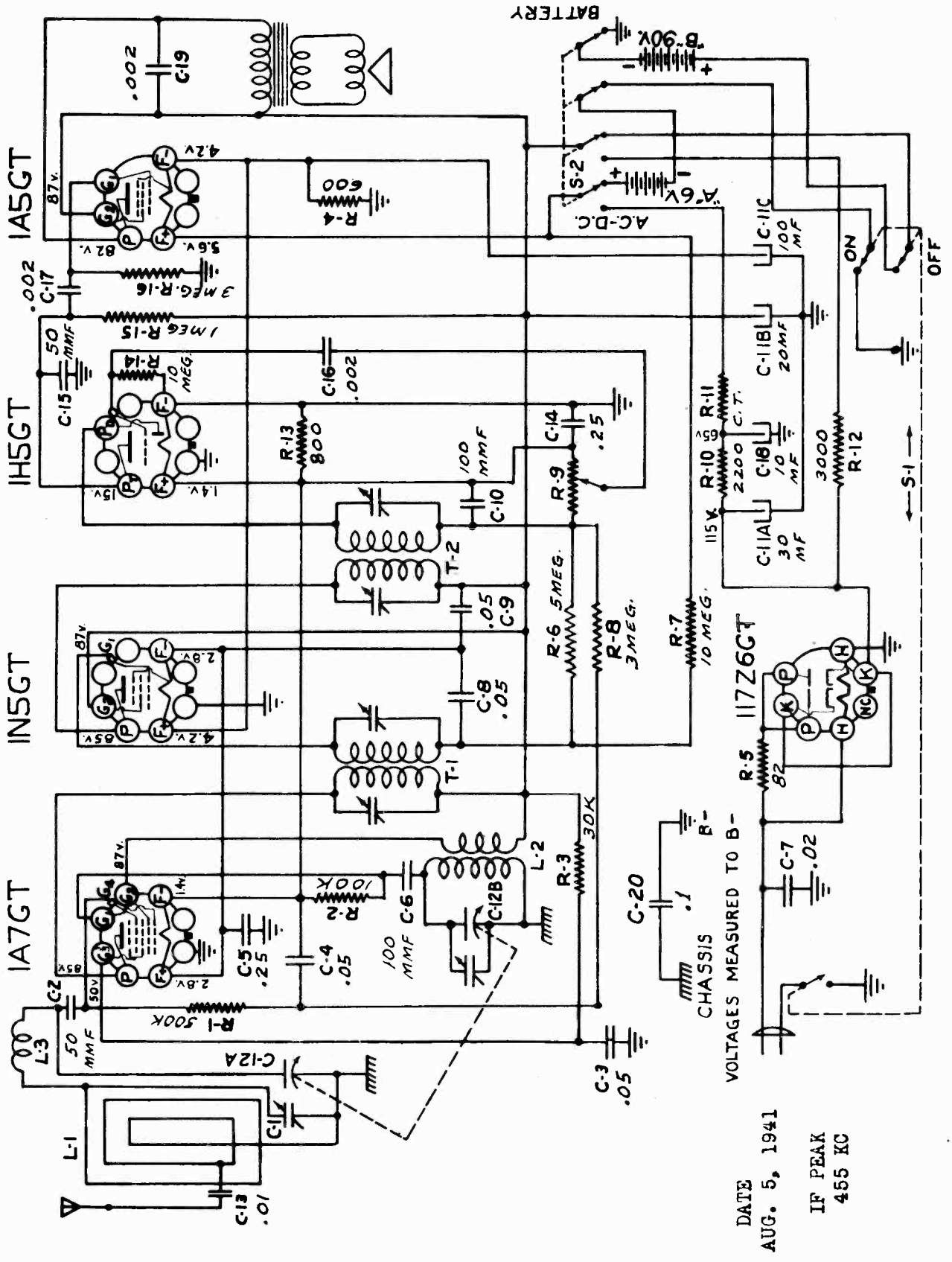
The chassis is removed from the case in order to align the I.F. and oscillator, but the loop antenna must be left connected.

The chassis and the batteries must be in place in the cabinet during loop alignment. The loop trimmer is accessible by removing the back cover.



SEARS ROEBUCK CO.

MODEL 7077
Ch. 109.409



MODEL 7091
Ch. 101.665

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

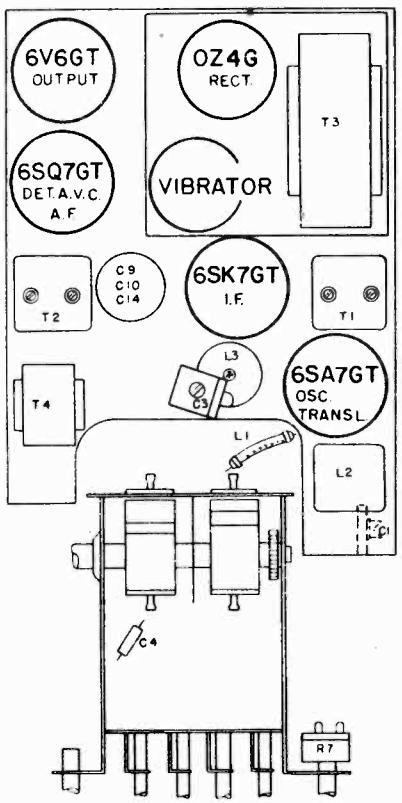
Output meter connections . . . . . Across loud speaker voice coil
Output meter reading to indicate 1 watt. . . . . 1.73 volts
Connection of signal generator ground lead . . . . . Receiver chassis
Connection of signal generator output lead . . . . . .See chart below
Approximate microvolts input for 1 watt output . . . . . .See chart below
Dummy antenna value to be in series with generator output. . . . . .See chart below
Position of Volume Control . . . . . Fully on
Position of Dial Pointer with Tuner open . . . . . Last mark to right of 1400 Kc calibration mark.

POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Low Freq.Limit	455 Kc	.1 mfd.	Transl.Grid	T2, T1	IF	-
Open	1610 Kc	.00005 mfd.	Antenna.Conn.	C3	Oscillator	-
1410	1410 Kc	.00005 mfd.	Antenna Conn.	C1	Antenna	10
600 (rock)	600 Kc	.00005 mfd.	Antenna Conn.	L3	Padder	35

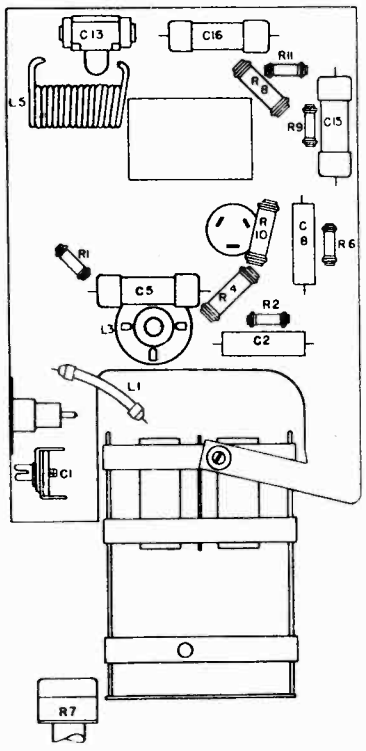
IMPORTANT ALIGNMENT NOTES

The receiver must be in its case during alignment.

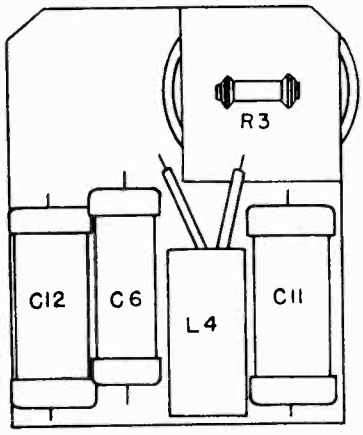
Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.



LOCATION OF PARTS
BOTTOM COVER REMOVED



LOCATION OF PARTS UNDER CHASSIS 101.665



LOCATION OF PARTS UNDER
POWER SUPPLY 101.665

MODEL 7093
Ch. 101.666

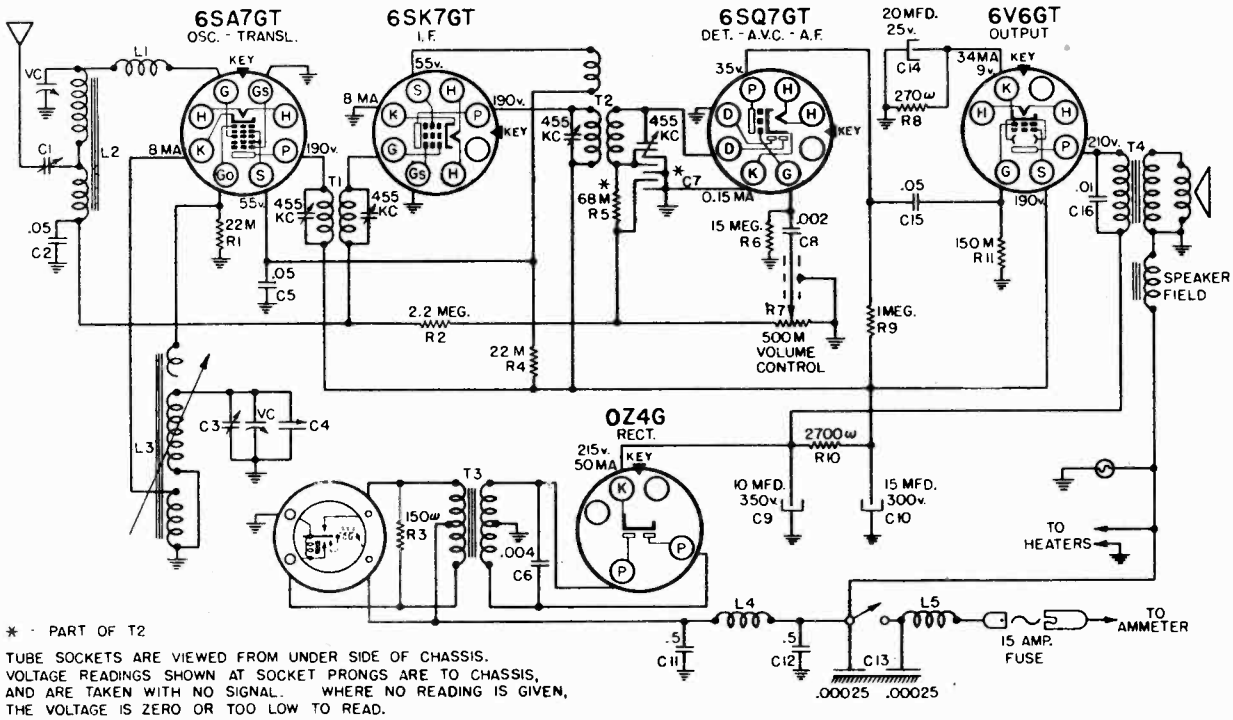
SEARS, ROEBUCK & CO.

MODEL 7091
Ch. 101.665

Power Output:-
Type..... Pentode
Undistorted... 3 watts
Maximum ..... 5 watts

Power Supply ... 6V; 6.2 amps.
Date June 2, 1941
IF Peak .... 455 KC

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.665



* - PART OF T2

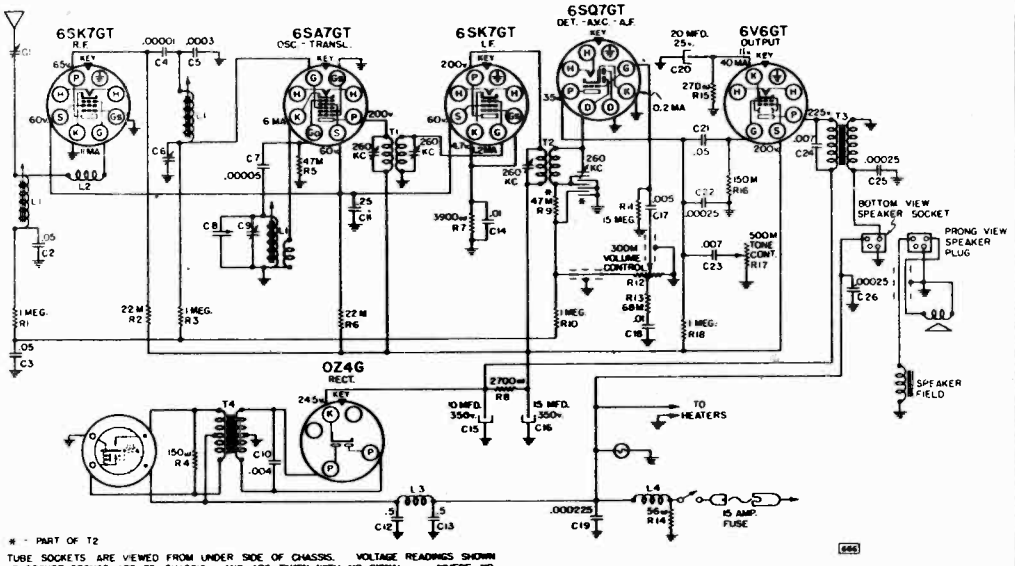
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS,
AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN,
THE VOLTAGE IS ZERO OR TOO LOW TO READ.
"A" BATTERY = 6. VOLTS CURRENT DRAIN = 6.2 AMPERES

665

MATCHING THE ANTENNA:-

An adjusting screw, accessible to a screw driver thru a hole in the left side of the case, is provided to match the receiver to the car antenna. Tune in a very weak station at about 1400 KC, with the volume control fully on. Then turn the adjusting screw to the point affording the maximum volume.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.666



* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.
"A" BATTERY - 6. VOLTS CURRENT DRAIN - 6.5 AMPERES

666

Power Output:-
Type - Pentode
Undistorted 3.5 W
Maximum - 5 W

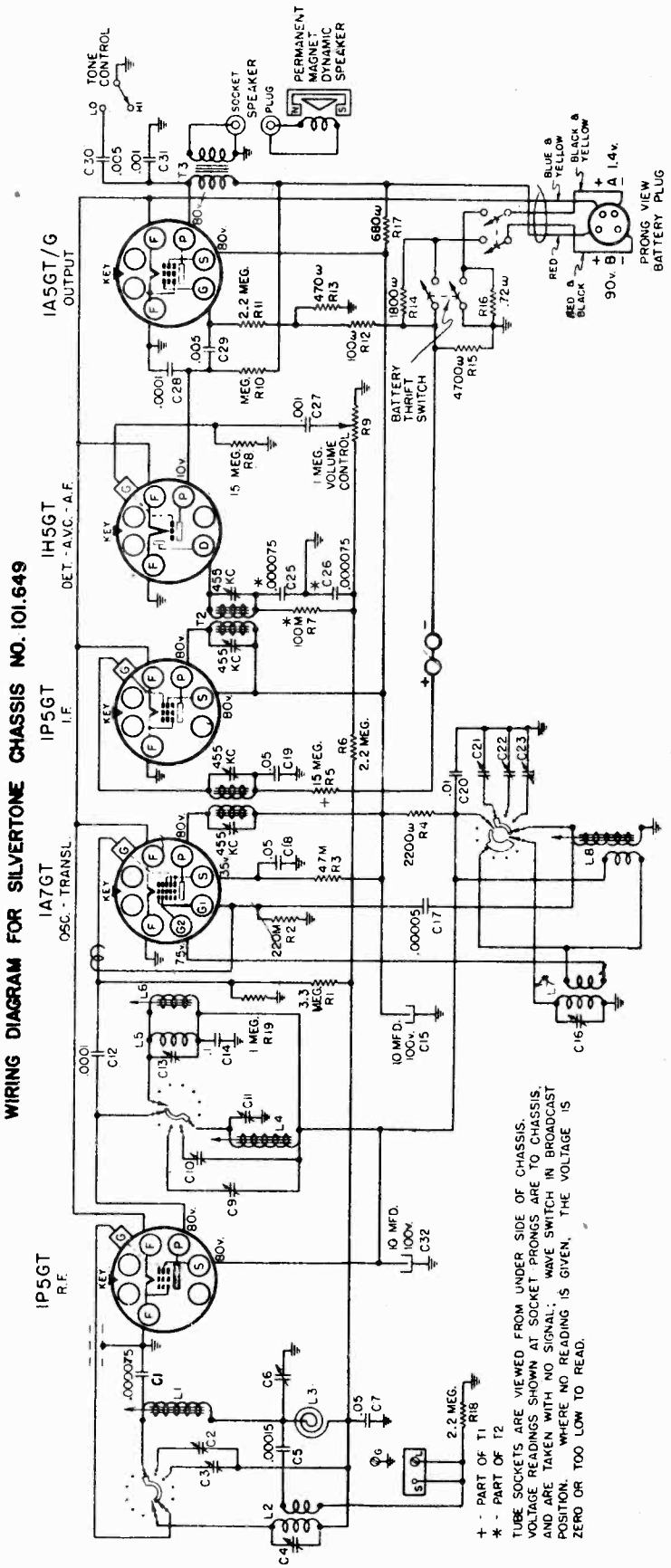
Power Supply:-
6 V. - 6.5 amps.

IF Peak 260 KC

Date
June 6, 1941

MODEL 7110
Ch. 101.649

SEARS ROEBUCK CO.



POWER SUPPLY:
5172 A-B block (1.5V. "A", 90V. "B")
or
5200 or 5202 ..... 2V. Storage "A"
2 - 5150 ..... 45V. "B" Battery
5305 . Adaptor necessary with 2 volt Storage "A"
"A" Drain ..... 0.25 Amperes.
"B" Drain ..... 0.0095 ma.

POWER OUTPUT:
Type ..... Pentodes
Undistorted 0.095 watts
Maximum .. 0.195 watts

LOUDSPEAKER:
Type ..... PM Dynamic.
Size ..... 6 inch

INTERMEDIATE FREQUENCY
455 KC

DATE June 27. 1941

MODELS 7108,
Ch. 101.648;
7158, Ch. 101.648-1

SEARS ROEBUCK CO.

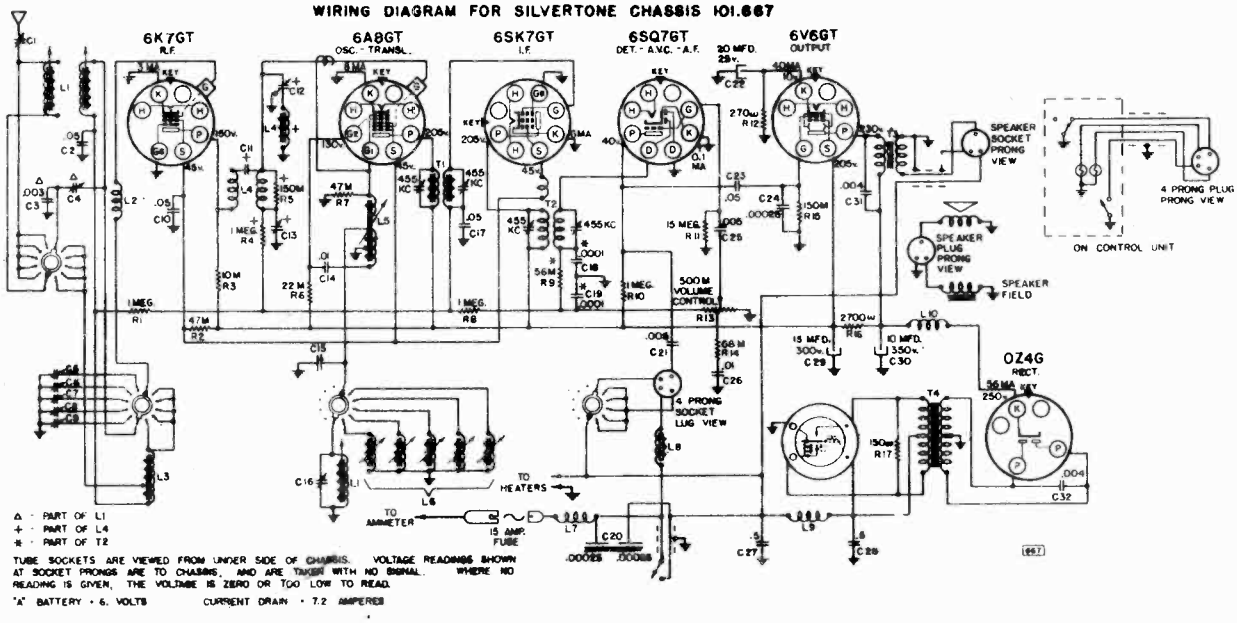
MODELS 6306-3G,
Ch.101.667-A;
7094, Ch. 101.667

Power Supply:- **Models 7094 and 6306-3G**
6 volt; 6.9 amps
Loud Speaker - Dynamic 7"
IF PEAK 455 KC

Power Output:-
Type ..... Pentode
Undistorted .....3.75 watts
Maximum .....5.65 watts

Date June 6, 1941

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.667



Models 7108 and 7158

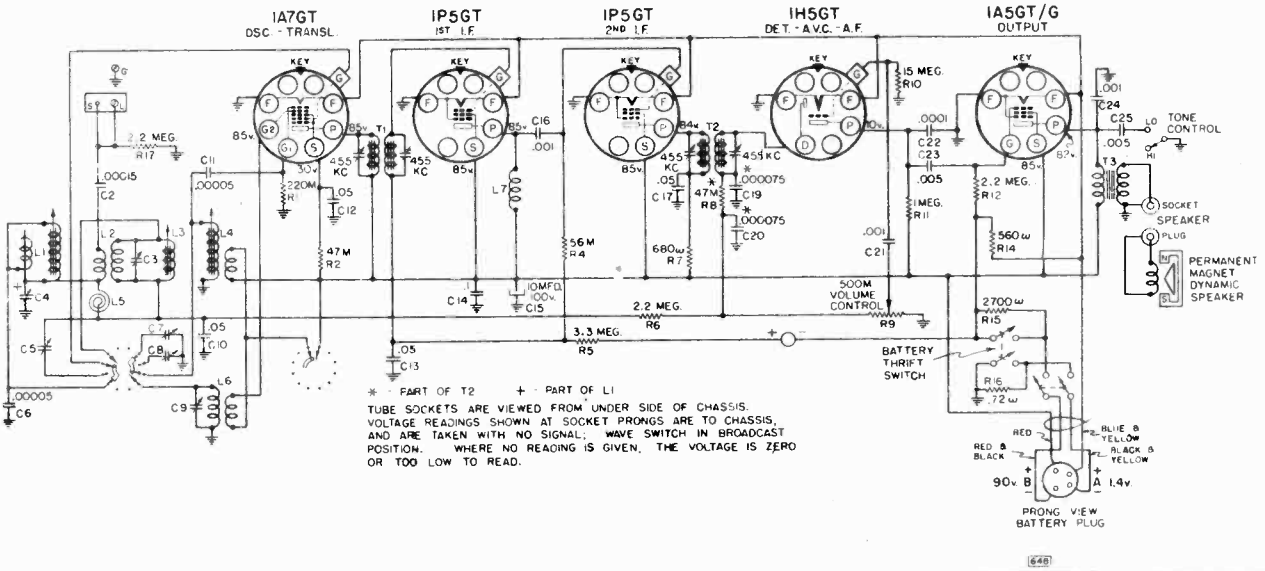
Power Supply:-
5176 .....A-B block (1.5V. "A", 90V. "B")
or
5200 or 5202 ..... 2V. Storage "A"
2 - 5150 ..... 45V. "B" Battery
5305 ..... adaptor necessary with 2V. Storage "A"

IF PEAK 455 KC

"A" drain ..... .25 amps
"B" drain .... .0095 "
Life ..... 7 to 8 months
Power Output:-
Type ..... Pentode
Undistorted .085 watts
Maximum .... .17 watts

Date June 2, 1941

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.648



MODELS 6306-3G,
Ch. 101.667-A;
7094, Ch. 101.667

SEARS, ROEBUCK & CO.

PUSH BUTTON TUNING MECHANISM

To set up the mechanism, insert the call letter tabs in their proper frequency order in the call letter drum. The drum is accessible by removing the snap-in button at the top of the push button unit before mounting the unit. One of the positions is for manual tuning. When this position is reached, the manual tuning dial will become illuminated and the receiver can be tuned manually.

Stations are set up by removing the front grille of the receiver, exposing the station tuning screws. The adjusting screws are labeled. The OSC. screw must be adjusted first; then the ANT. screw. Then repeat the two adjustments.

TO SYNCHRONIZE THE MECHANISM, PUSH THE TUNING BUTTON UNTIL THE MANUAL TUNING DIAL BECOMES ILLUMINATED. REMOVE THE PUSH BUTTON CABLE FROM ITS SOCKET IN THE SIDE OF THE RECEIVER CASE AND THEN PUSH THE BUTTON UNTIL THE "DIAL" TAB COMES INTO VIEW. THEN REINSERT THE CABLE PLUG.

Under certain conditions the mechanism may fall out of synchronism if the button is not pushed all the way in and completely released when operating it. The user should be instructed accordingly.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections . . . . . Across loud speaker voice coil
Output meter reading to indicate 1 watt. . . . . 1.4 volts
Connection of signal generator ground lead . . . . . Receiver chassis
Connection of signal generator output lead . . . . . See chart below
Approximate microvolts input for 1 watt output . . . . . See chart below
Dummy antenna value to be in series with generator output. . . . . See chart below
Position of Volume Control. . . . . Fully on
Position of Tone Control. . . . . Brilliant

POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Low Freq.Limit	455 Kc	.1 mfd.	Transl.Grid	T2, T1	IF	-
Low Freq.Limit	455 Kc	.1 mfd.	Transl.Grid	C12*	IF Wave Trap	-
Hi Freq.Limit	1610 Kc	.00005 mfd.	Ant. Conn.	C16	Oscillator	-
Hi Freq.Limit	2520 Kc.	.00005 mfd.	Ant. Conn.	C13*	Image Rejector	-
Hi Freq.Limit	1610 Kc.	.00005 mfd.	Ant. Conn.	C16	Oscillator	-
Hi Freq.Limit	1610 Kc.	.00005 mfd.	Ant. Conn.	C1	Antenna	-
Hi Freq.Limit	1610 Kc.	.00005 mfd.	Ant. Conn.	C4	R.F.	10
600 Kc (rock)	600 Kc.	.00005 mfd.	Ant. Conn.	L5	Padder	10

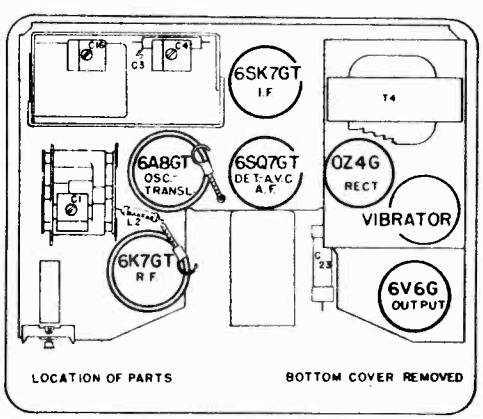
IMPORTANT ALIGNMENT NOTES

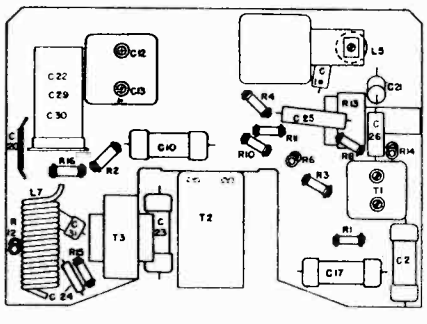
The receiver must be in its case during alignment.

* The signal generator should be adjusted for high output and the trimmer should be adjusted for minimum response.

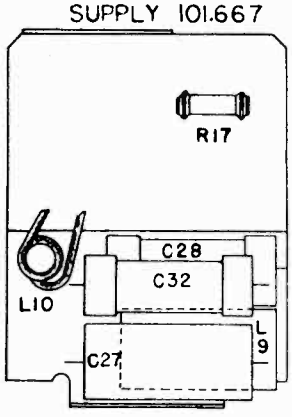
The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment, except as noted by (*) above.





PARTS UNDER POWER SUPPLY 101.667



PRELIMINARY:

SEARS ROEBUCK CO.

MODELS 7108, Ch. 101.648; 7158, Ch. 101.648-1

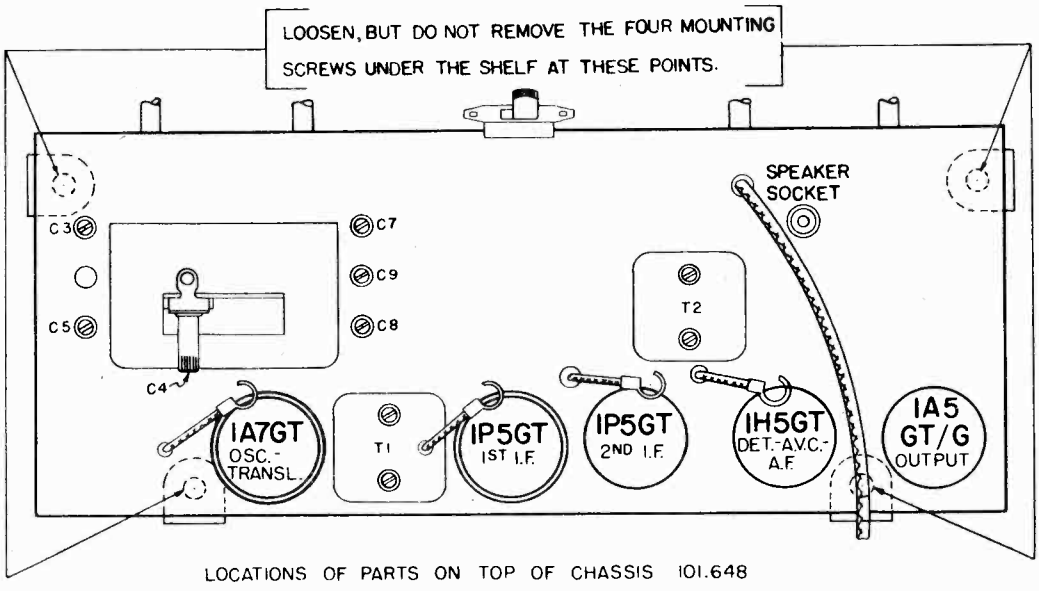
Output meter connection . . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts. . . . . 0.3 volts
Approximate microvolts input for 50 milliwatts output . . . . . See chart below
Generator ground lead connection. . . . . Receiver chassis
Dummy antenna value to be in series with generator output . . . . . See chart below
Connection of generator output lead . . . . . See chart below
Generator modulation . . . . . 30%, 400 cycles
Position of Volume Control. . . . . Fully clockwise
Position of Tone Control. . . . . HI
Position of Dial Pointer with Tuner fully closed. . . . . To left of 540 Kc calibration mark .

POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 Kc	.1 mfd.	1A7GT Translator Grid	T2, T1	IF	-
1700	1700 Kc	.00005 mfd.	Antenna Terminal	C7	Oscillator	-
1700	1700 Kc	.00005 mfd.	Antenna Terminal	C4	Translator	10
15.2	15.2 Mc	400 ohms	Antenna Terminal	C9,C3	Osc.-Trans.	10
11.8	11.8 Mc	400 ohms	Antenna Terminal	C8,C5	Osc.-Trans.	10

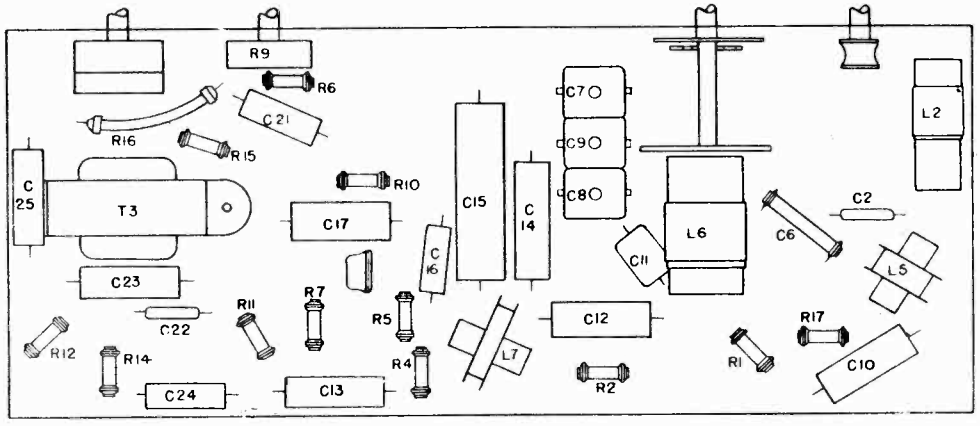
IMPORTANT ALIGNMENT NOTES

Make both the oscillator and translator antenna adjustment at 1700 KC on the BC band.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.



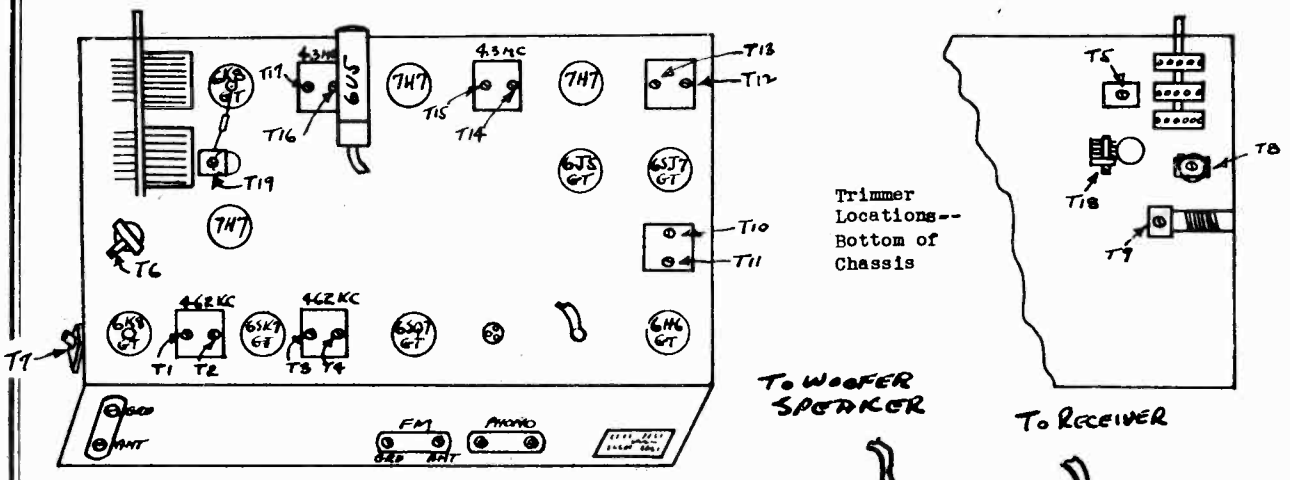
LOCATIONS OF PARTS ON TOP OF CHASSIS 101.648



LOCATION OF PARTS UNDER CHASSIS 101.648

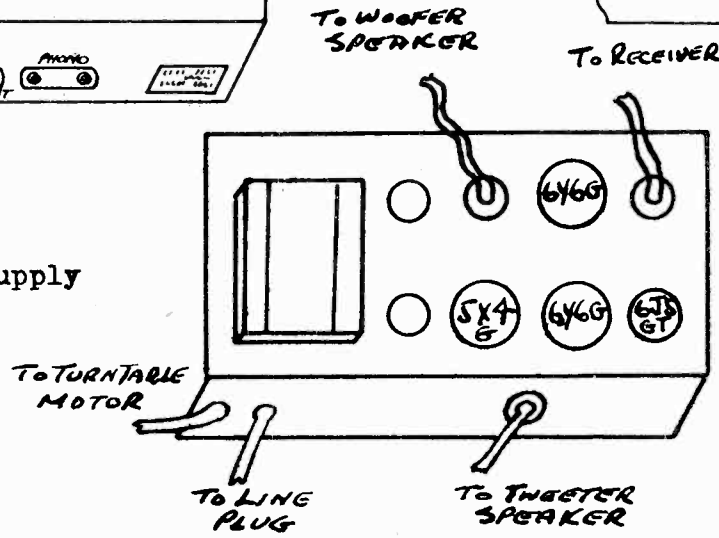
MODEL 7099
Ch. 164.158

SEARS ROEBUCK CO.



Trimmer Locations
Top of Chassis

Trimmer Locations--Bottom of Chassis

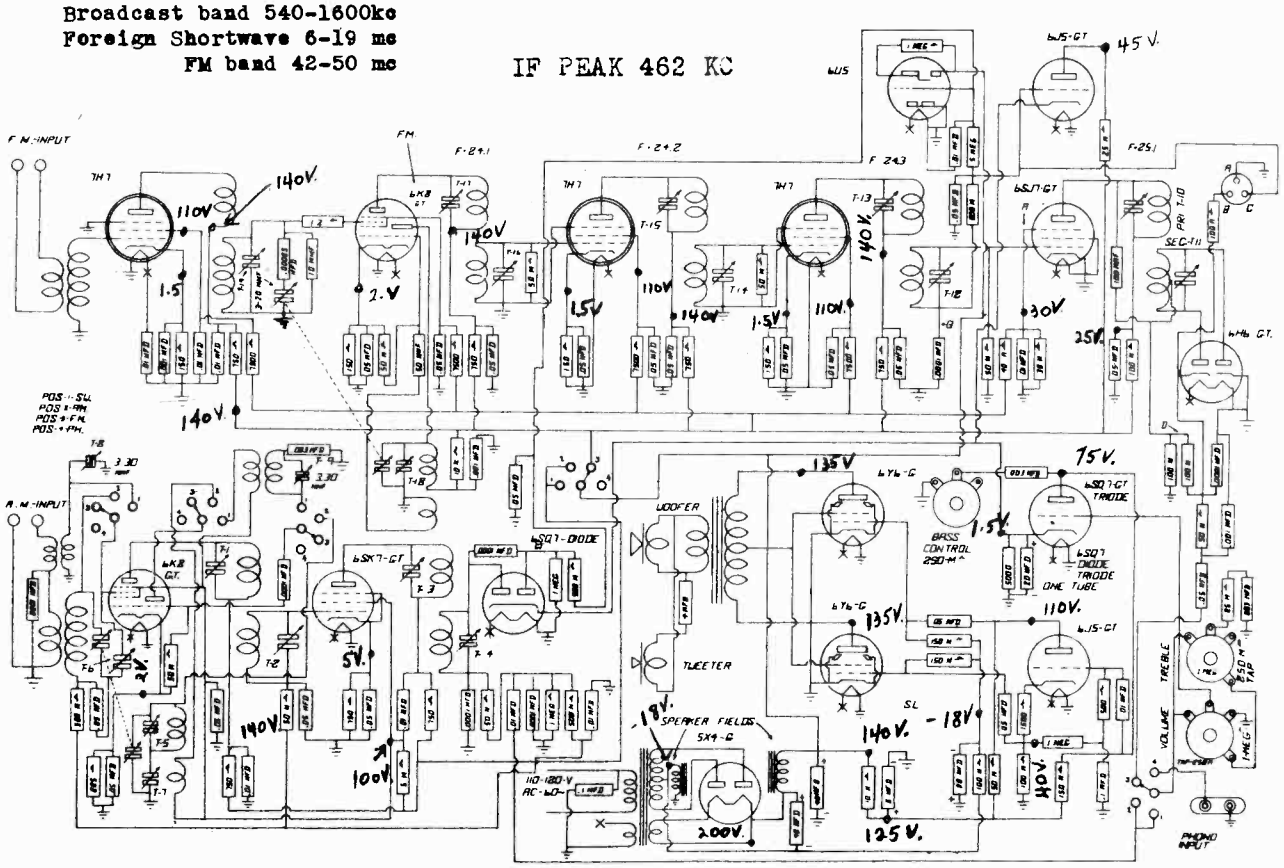


Top of Power Supply Chassis

MAY 15, 1942

Broadcast band 540-1600kc
Foreign Shortwave 6-19 mc
FM band 42-50 mc

IF PEAK 462 KC



All voltage readings taken from ground with 10,000 Ohms Per Volt Meter

POWER OUTPUT:
Type. . .2 - 6Y6G Beam Power Output
Undistorted . . . . . 8 watts
Maximum . . . . . 9½ watts

SPEAKER:
Type. . . . . .Electro-Dynamic
Size, 12 inch . . . .350 ohm field
5 inch . . . . 88 ohm field

TUBES AND FUNCTIONS:

6K8GT (for AM). . . . .Osc.-Transl.	6H6GT. . . . . FM Discriminator
6K8GT (for FM). . . . .Osc.-Transl.	6J5GT. . . . . FM Squelcher
6SK7GT. . . . . .IF Ampl.	6J5GT. . . . . Audio Inverter
6SQ7GT. . . . . .Det-AVC-Audio	2 - 6Y6G . . . . . Push Pull Output
3 - 7H7 . . . . . .RF&IF FM Ampl.	5X4G . . . . . .Rectifier
6SJ7GT. . . . . FM Limiter	6U5. . . . . Tuning Indicator

A M ALIGNMENT PROCEDURE

PRELIMINARY:

AM Output meter connection. . . . . .Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.2 volts
Average sensitivity in microvolts for 500 milliwatts output . . . . . See chart below
Connection of generator Output lead . . . . . See chart below
Connection of generator ground lead . . . . . .To chassis
Dummy antenna value to be in series with generator output . . . . . See chart below
Generator modulation. . . . . 30%, 400 cycles
Position of Volume Control. . . . . Fully clockwise

BROADCAST BAND ALIGNMENT

Position of Variable	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers adjusted in order shown	Trimmer Function	Approximate Microvolts
Closed	462 kc	.1 mfd	Grid of 6K8GT AM	T1, T2, T3, T4	I. F.	110
(Close the gang condenser and set the pointer at the end marker).						
Pointer at 1400 kc	1400	250 mfd	Ant. Term, AM	T5, T6	Oscillator and R F	25
Pointer at 600 kc	600 (Rock)	250 mfd	" " "	T7	Pad the low frequency end of broadcast band	25
Pointer at 1400 kc	1400	250 mfd	" " "	T5	Alignment of high frequency end of oscillator	25

SHORTWAVE BAND ALIGNMENT

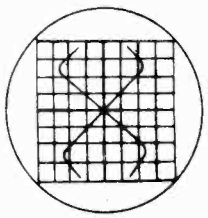
Pointer at 18 mc	18 mc	400 ohm	Ant. Term, Input	T8, T9	Shortwave, alignment of oscillator & antenna input	40 mv
Pointer at 7 mc	7 mc	400 ohm	" " "	If calibration checks SW side is aligned correctly	"	50 mv

F M DISCRIMINATOR ALIGNMENT
(Method A)

Frequency Modulated generator and an Oscillograph are necessary equipment

Closed	4.3 mc	.1	To grid of limiter marked A	There is a three prong socket located on the top of chassis, with plug. A is ground. Connect B to vertical input of Oscillegraph.

Horizontal input of Oscillograph to be connected with timing of FM Signal generator. Align Trimmers on coil F 251, T 10 is primary of discriminator and T 11 secondary, to form perfect synchronous crossover on Oscillegraph as diagrammed to left.



F.M. DISCRIMINATOR ALIGNMENT
(Method B)

Signal generator capable of supplying 1 volt output and a 10 to 20,000 ohm volt meter

Position of Variable	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers adjusted in order shown	Trimmer Function	Approximate Microvolts
Closed	4.3 unmodulated	.1 mfd	Grid of 6SJ7 limiter	T10 maximum deflection. Test meter connected to Point D on circuit diagram thru 100,000 ohms.	Alignment of primary of discriminator.	1 volt
Closed	4.3 unmodulated	.1 mfd	Grid of 6SJ7 limiter	T11 align trimmer for Zero reading on meter with 10m to 20m ohms volt meter connected to point B on test socket	Alignment of secondary of discriminator	1 volt

To check discriminator alignment with generator still connected to grid of 6SJ7 limiter note readings on meter when generator is swung 100 kc above and below 4.3 megacycles. If readings are equal adjustments are perfect. If unequal, Trimmer 10 should be adjusted to give equal readings above and below 4.3 megacycles when generator is set above and below main IF frequencies.

I.F. ALIGNMENT OF FM BAND

Closed	4.3 unmodulated	To grid of 6K8GT FM	T12, T13, T14, T15, T16, T17. 10m to 20m ohm voltmeter to be connected to point C of test socket	Alignment of FM IFs	200 mv

R.F. ALIGNMENT OF FM BAND

48 mc	48 mc	100 ohms FM input	T18, T19	Alignment of Oscillator & RF stage.	Input 200 mc

To check alignment of RF FM section of receiver, set generator at 45 mc, maximum deflection indicated on tuning indicator of receiver. Connect meter to point B of test socket. This should give Zero Reading.

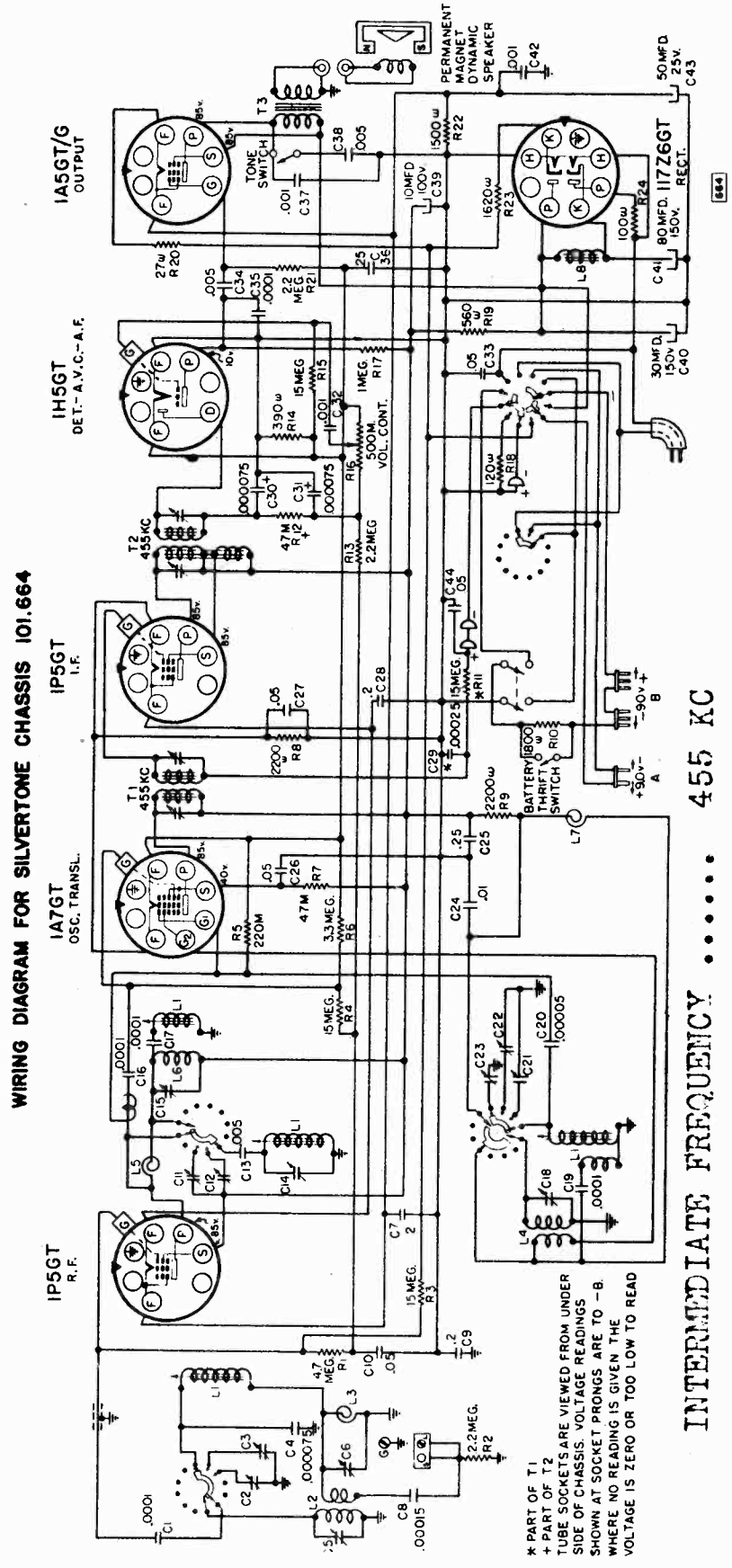
ALIGNMENT OF FM BAND MUST NOT BE MADE UNLESS A DEFECTIVE PART HAS BEEN REPLACED IN FM SECTION.

The alignment procedure should be repeated stage by stage in the original order for greatest accuracy.

On AM always keep the output from the generator at the lowest level possible so that the AVC section will be ineffective.

MODEL 7112
Ch. 101.664

SEARS ROEBUCK CO.



POWER SUPPLY:
5009 ..... A battery (9V.)
2 - 5150 ..... 45V. "B" Battery
105-125 V - AC or DC, 20 watts
"A" Drain ..... 0.05 Amperes
"B" Drain ..... 9.5 ma.

POWER OUTPUT
Type ..... Pentode
Undistorted .... 0.085 watts
Maximum ..... 0.17 watts

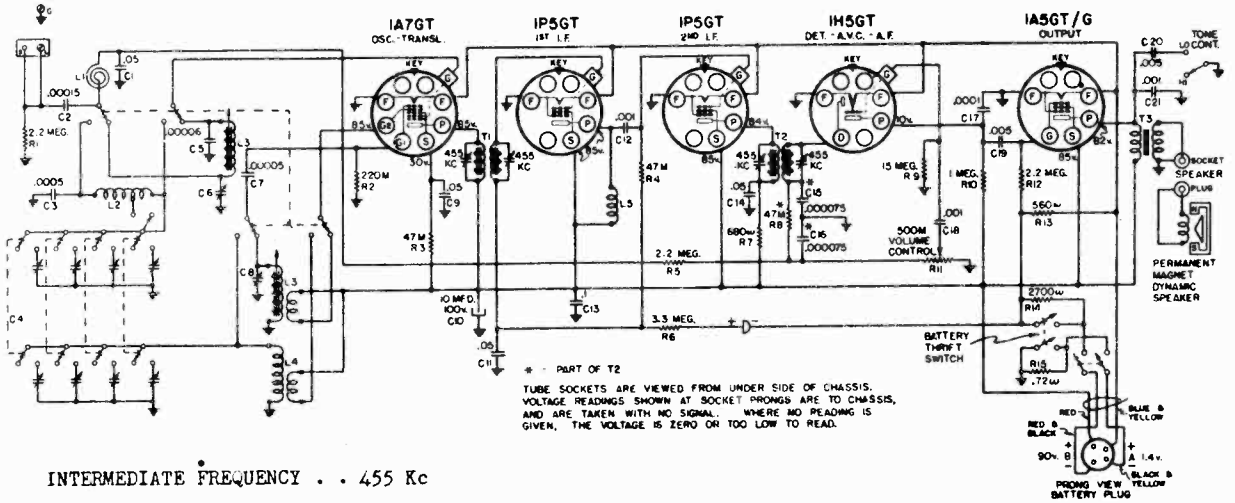
LOUDSPEAKER:
Type ..... PM Dynamic
Size ..... 6 inch

FREQUENCY RANGES:
Broadcast ..... 540-1700 KC
9 MC Spread Band .. 9.45-9.75 MC
11 MC Spread Band 11.62-11.95 MC
15 MC Spread Band 15.01-15.5 MC

MODEL 7106
Ch. 101.663

SEARS ROEBUCK CO.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.663



INTERMEDIATE FREQUENCY . . 455 Kc

PUSH BUTTON ADJUSTMENT AND RESETTING

Each of the push buttons should be set to the desired station in the following manner:

1. Push the manual button in and tune in the desired station manually.
2. Push the #1 button in. Turn the corresponding "ANT" screw all the way in and then unscrew it one-quarter turn.
3. Turn the "OSC" screw until the same station that was tuned in manually is heard with the least amount of background noise.
4. Readjust the "ANT" screw for greatest volume and clarity.
5. Repeat steps 1 to 4 for the remaining push buttons or when resetting for another station.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections . . . . . Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts . . . . . 0.37 volts
Approximate microvolts input to indicate 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. . . . . Fully on
Position of Tone Control. . . . . HI
Position of pointer with tuner fully closed . . . . . To left of 540 kc calibration mark

POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 Kc	.1 mfd.	1A7GT Translator Grid	T2, T1	IF	-
1700	1700 Kc	.00005 mfd.	Antenna Terminal	C8	Oscillator	-
1725	1725 Kc	.00005 mfd.	Antenna Terminal	C6	Translator	15

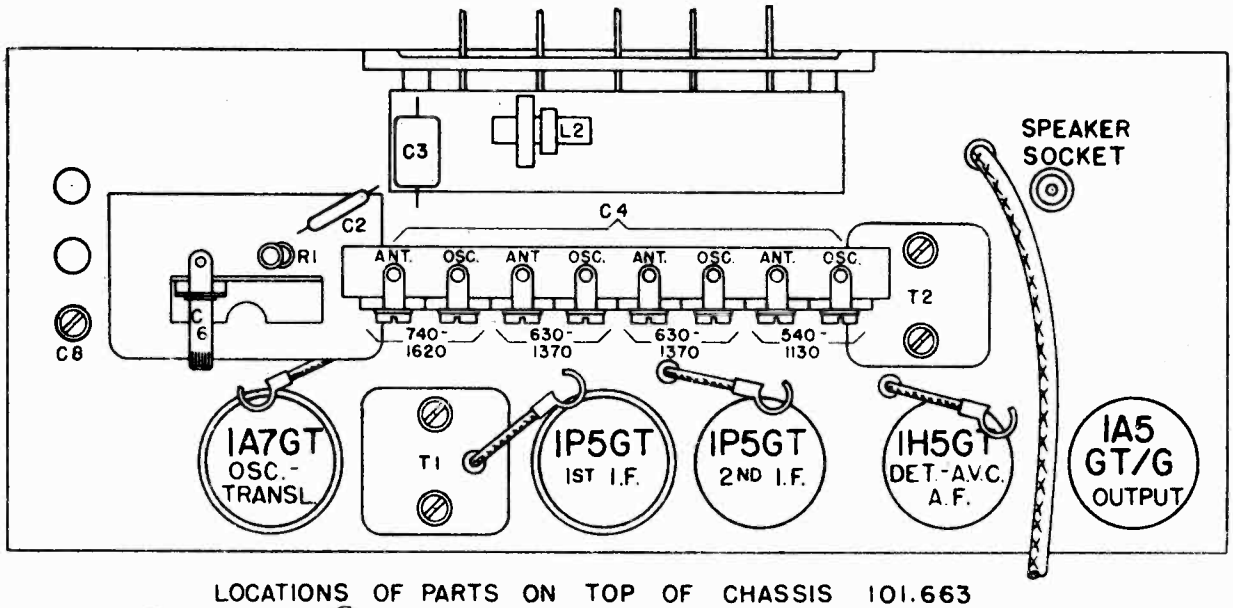
IMPORTANT ALIGNMENT NOTES

After setting the oscillator at 1700 kc do not change it when making the 1725 kc translator adjustment.

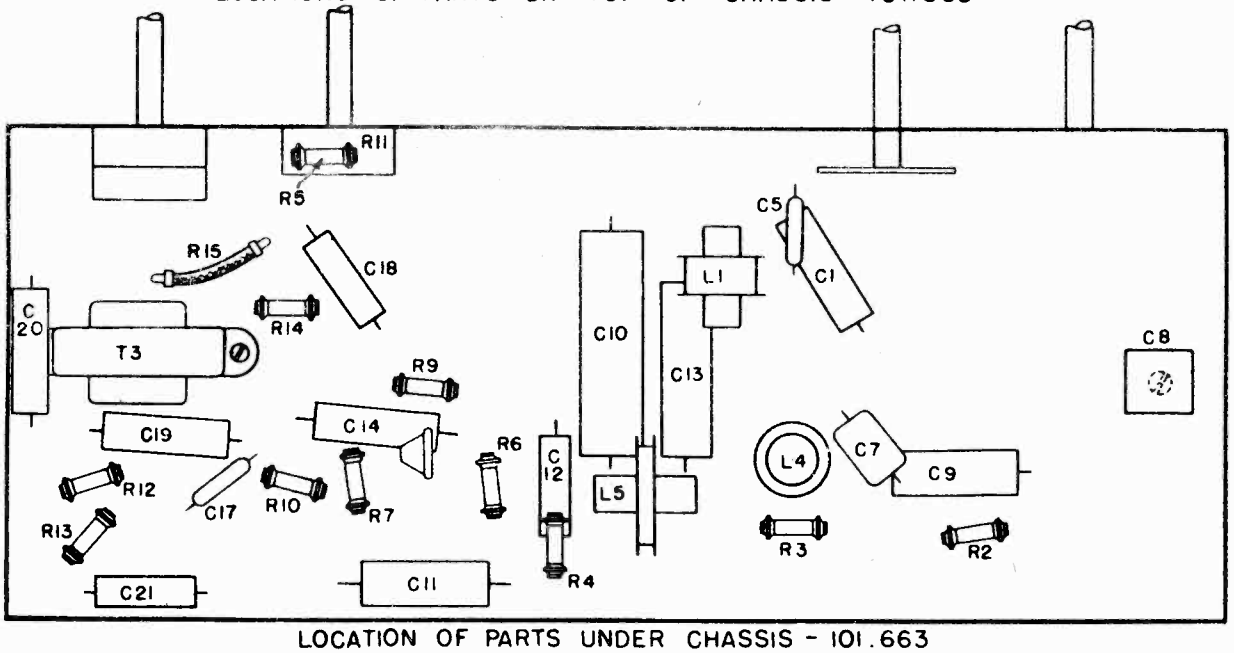
Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.

MODEL 7106
Ch. 101.663

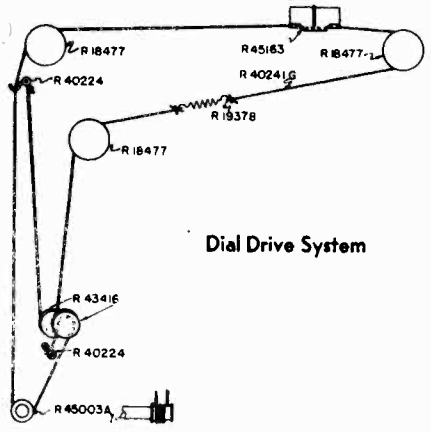
SEARS ROEBUCK CO.



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.663



LOCATION OF PARTS UNDER CHASSIS - 101.663



Dial Drive System

FREQUENCY RANGE:
Broadcast . . . . . 540-1700 Kc

POWER OUTPUT:
Type . . . . . Pentode
Undistorted . . . . . .035 watts
Maximum . . . . . 0.17 watts

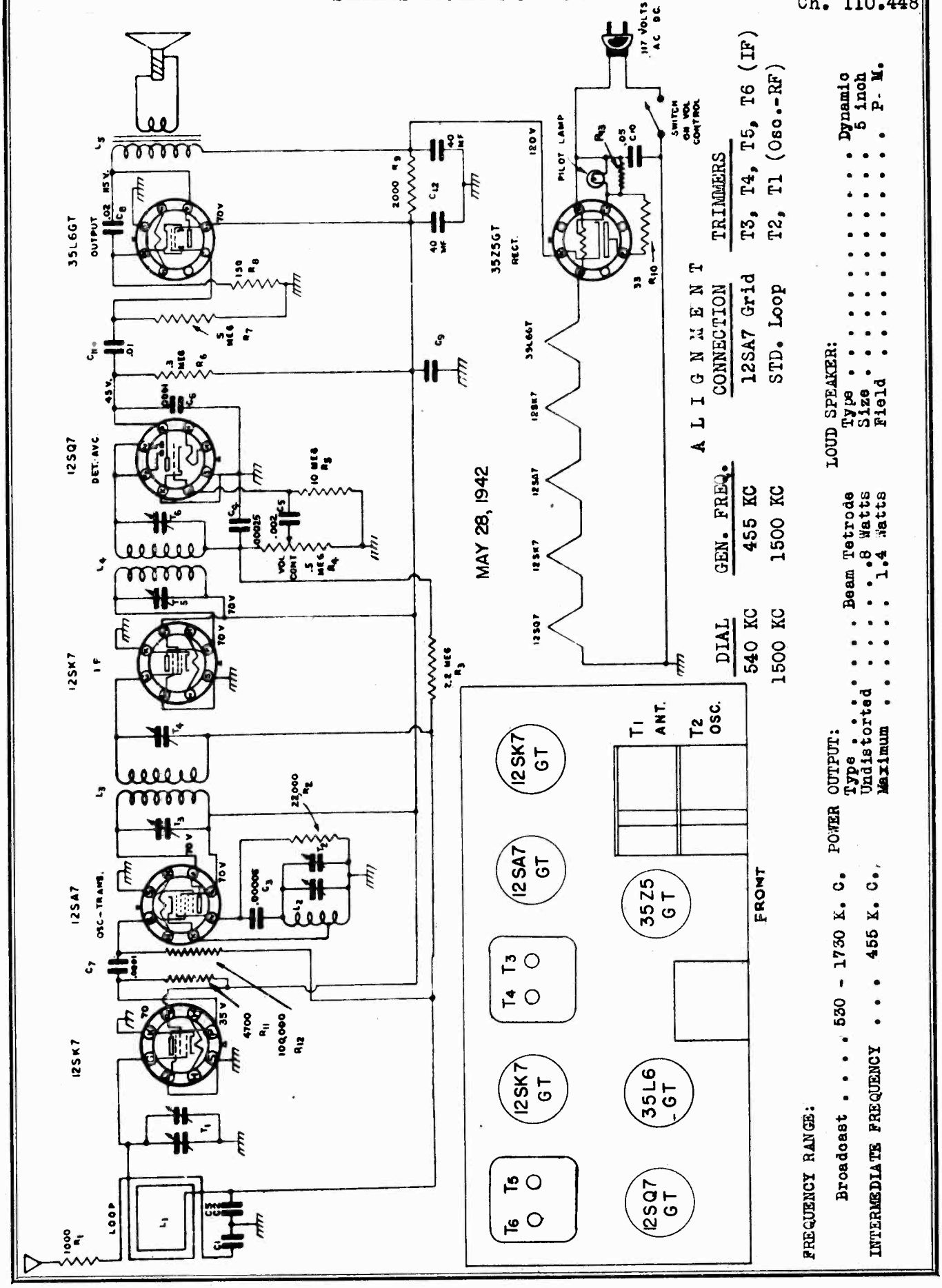
LOUD SPEAKER:
Type . . . . . PM Dynamic
Size . . . . . 6 inch

POWER SUPPLY:
"A" Drain . . . . . 0.25 amperes
"B" Drain . . . . . 0.0095 amperes
Life . . . . . 7 to 8 months

AUGUST 29, 1941

SEARS ROEBUCK CO.

MODEL 7134
Ch. 110.448



ALIGNMENT

DIAL	GEN. FREQ.	CONNECTION	TRIMMERS
540 KC	455 KC	12SA7 Grid	T3, T4, T5, T6 (IF)
1500 KC	1500 KC	STD. Loop	T2, T1 (Osc.-RF)

FREQUENCY RANGE:
Broadcast . . . . 530 - 1730 K. C.

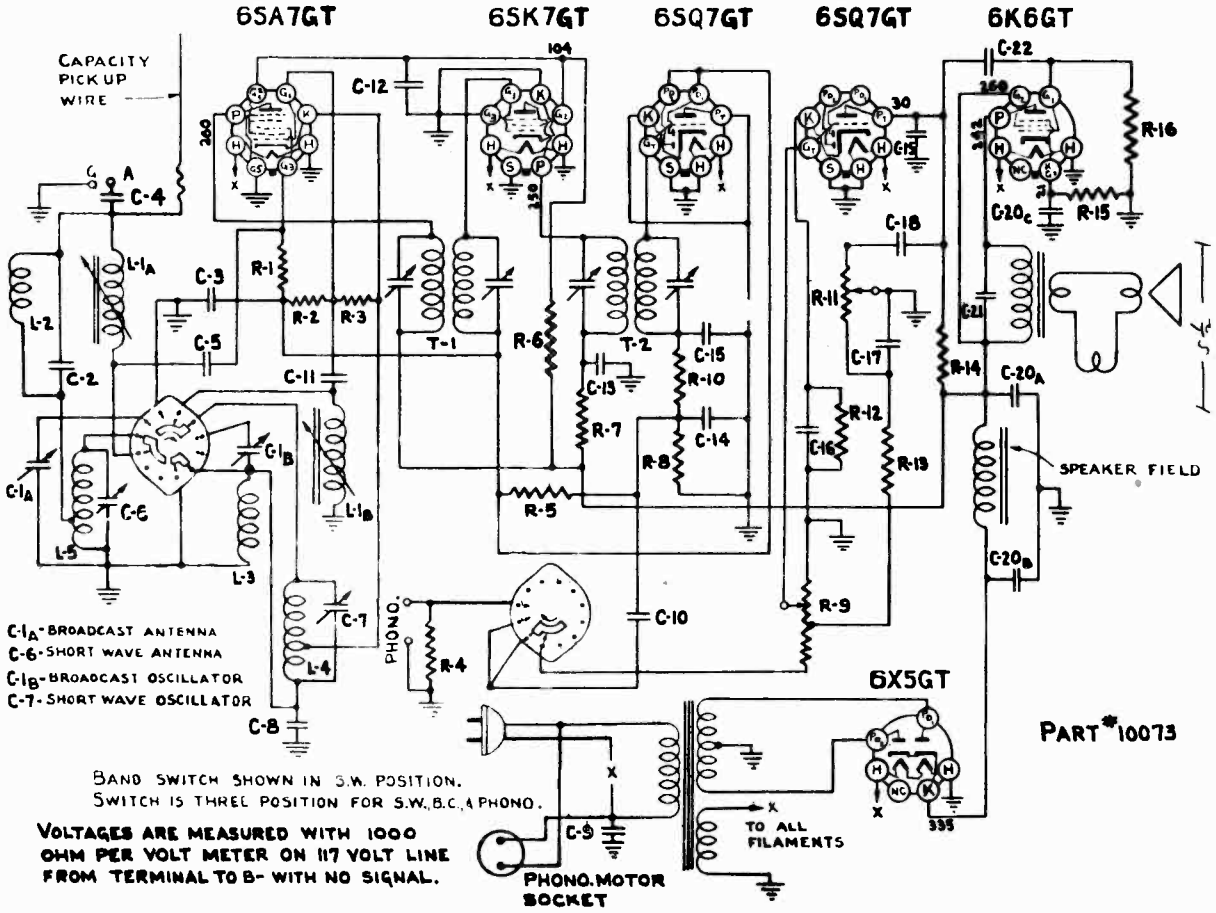
INTERMEDIATE FREQUENCY . . . 455 K. C.

POWER OUTPUT:
Type . . . . . Beam Tetrode
Undistorted . . . . . .8 Watts
Maximum . . . . . 1.4 Watts

LOUD SPEAKER:
Type . . . . . Dynamic
Size . . . . . 5 inch
Field . . . . . P- M.

MODEL 7165
Ch. 109.428

SEARS ROEBUCK CO.



SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION CHASSIS PARTS		SELLING PRICE EACH
	D9662	Bracket--Indicator Background		.20
L-2	D9818	Coil--Antenna Choke		.75
L-3	D9458	Coil--Cathode Choke		.75
L-5	D9653	Coil--Short Wave Antenna		1.15
L-4	D9654	Coil--Short Wave Oscillator		1.00
	D2163	Cable--Drive		.10
R-9	D9655	Control--Volume and Switch		1.25
R-11	D9656	Control--Tone		1.00
C-20a,b,c	D9657	Condenser--Elect. b(15mf-400v.) a10mf.-330v.) c(10mf.-50v.)		1.50
C-16	D6002	Condenser--Elect. 5 mfd-25v.		.50
C-4	D5399	Condenser--Mica 20 mmf.		.25
C-5,11,14,15	D1285	Condenser--Mica 100 mmf.	IF PEAK	.25
C-2	D9627	Condenser--Mica 150 mmf.	455 KC	.25
C-19	D1286	Condenser--Mica 250 mmf.		.25
C-1a,b	D9719	Condenser--Dual Trimmer		.50
C-6,7	D9704	Condenser--Trimmer		.40
C-8	D9672	Condenser--Paper .0015 mfd.-400v.		.20
C-21	D824	Condenser--Paper .002 mfd.-600v.		.20
C-10,17,18	D2763	Condenser--Paper .005 mfd.-600v.		.20
C-22	D568	Condenser--Paper .01 mfd.-400v.		.20
C-3	D580	Condenser--Paper .05 mfd.-200v.		.20
C-9,13	D563	Condenser--Paper .05 mfd.-400v.		.20
C-12	D575	Paper .1 mfd.-400v.		.20
R-15	D9661	Resistor--1w-500 ohm		.20
R-7	D8965	Resistor--1/3 w-1M.		.15
R-12	D7125	Resistor--1/3w-5M.		.15
R-6	D10056	Resistor--3w-12M.		.15
R-3	D7121	Resistor--1/3w-20M.		.15
R-10,13	D8580	Resistor--1/3w-50M.		.15
R-4	D7123	Resistor--1/3w-400M.		.15
R-16,8,14	D6722	Resistor--1/3w-500M.		.15
R-1	D6723	Resistor--1/3w-1 meg.		.15
R-5	D7959	Resistor--1/3w-3 Meg.		.15
R-2	D8402	Resistor--1/3w-15 meg.		.15
L-1a, L-1b	D9663	Tuner--Permeability		2.50
	D9664	Transformer--Power		5.00
T-1	D9993	Transformer--1st I.F.		2.25
T-2	D9893	Transformer--2nd I.F.		2.25
T-3	D10055-1	Transformer--Output		2.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ALIGNMENT PROCEDURE

Output meter connection.....Across speaker voice coil
Phono Radio Switch.....Radio Position
Connection of generator ground lead.....To Chassis
Connection of generator output lead.....See chart below
Dummy antenna value to be used in series with generator.....See chart
Position of volume control.....Full on (Clockwise)
Position of Tone Control.....In Brilliant Position

POSITION OF TUNING DIAL	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED
High Frequency end	455 kc.	.1 mfd.	6SA7 Grid	Align IF. Four Trimmers
Low Frequency end	535 kc.	.1 mfd.	6SA7 Grid	Oscillator Trimmer
				Set limit of Band
1400 kc.	1400 kc.	200 mmf.	Antenna Lead-with built-in antenna connected	Antenna Trimmer Tune to max.
10 mc.	10 mc.	400 ohms	Antenna Lead-with built-in antenna connected	Short wave oscillator trimmer Set limit of band
9.6 mc.	9.6 mc.	400 ohms	Antenna Lead-with built-in antenna connected	Short wave antenna trimmer Tune to max.

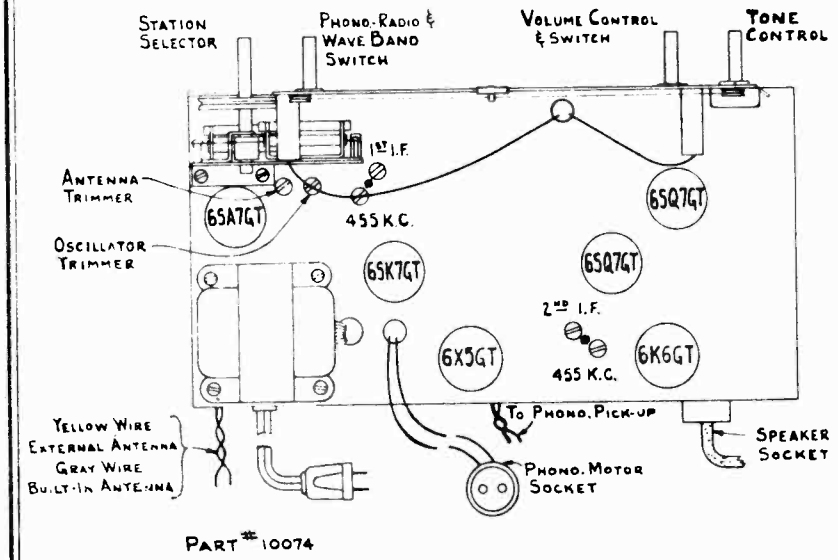
REPEAT above Alignment Procedure at least once.

POWER SUPPLY 105-125 Volts AC
60 cycle, 65 watts.

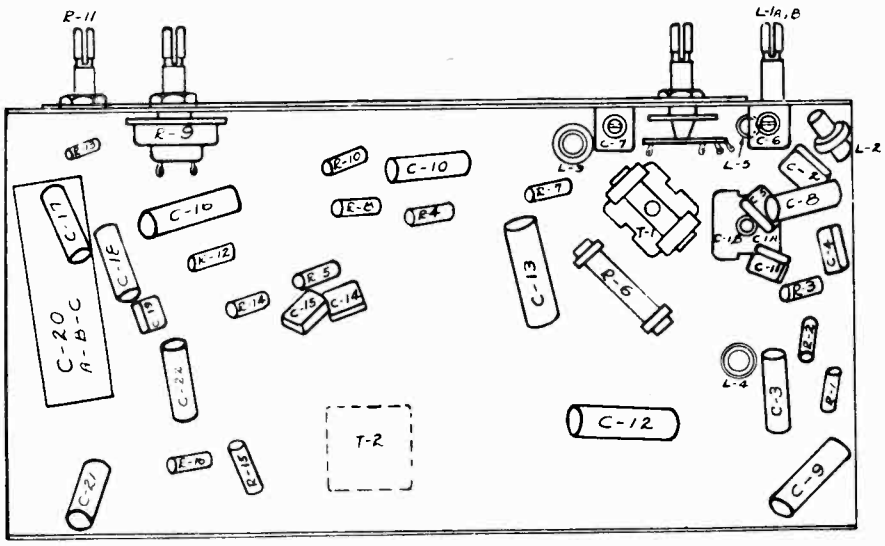
SPEAKER
Type ..... Dynamic
Size ..... 10 Inch
Field Resistance ....1200 Ohms

TUBES AND FUNCTIONS
6SA7GT ..... Oscillator Translator
6SK7GT ..... IF Amplifier
6SQ7GT ..... Detector-AVC
6SQ7GT .....Audio Amplifier
6K6GT .....Power Output
6X5GT ..... Rectifier

POWER OUTPUT
Type ..... Pentode
Undistorted ..... 3.6 Watts
Maximum ..... 4.7 Watts



PART # 10074



SEARS ROEBUCK CO.

MARCH 25, 1942

MODEL 7165
Ch. 109.423

MODEL 7167
Ch. 101.662-1A

SEARS ROEBUCK CO.

PRELIMINARY:

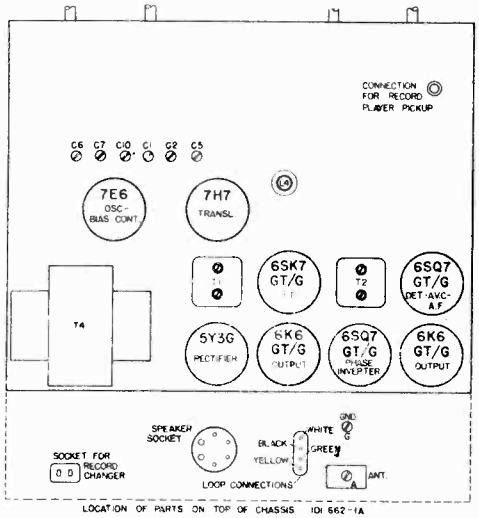
Output Meter Connections . . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.5 volts
Approximate microvolts input to indicate 500 milliwatts output . . . . . See chart below
Generator ground lead connection . . . . . Receiver chassis
Dummy Antenna value 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. . . . . Fully on
Position of Tone Control . . . . . HI
Position of pointer with tuner fully closed . . . . . Last line below 540 calibration mark

BAND SWITCH POSITION	POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
A	Closed	455 KC	.1 mfd.	7H7 Transl. grid	T2, T1	IF	---
A	Open	1750 KC	.0002 mfd.	Ant. Terminal	C6	Oscillator	---
A	1410	1410 KC	.0002 mfd.	Ant. Terminal	C5, C2	Ant. Transl.	25
A	600 (rock)	600 KC	.0002 mfd.	Ant. Terminal	C7	Padder	100
B	Open	18.3 MC	400 ohms	Ant. Terminal	C10	Sw Oscillator	---
B	15 (rock)	15 MC	400 ohms	Ant. Terminal	C1	Transl.	20

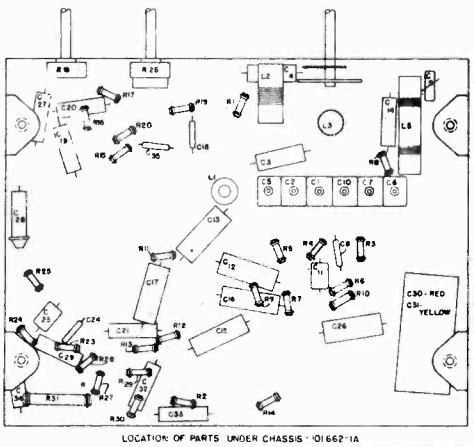
IMPORTANT ALIGNMENT NOTES

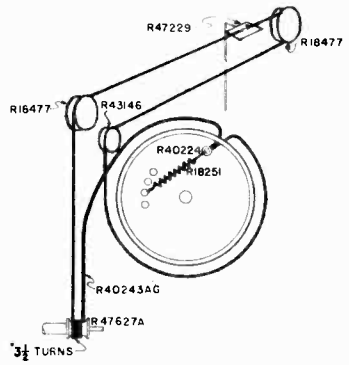
The Alignment must be done in the order given.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.



LOCATION OF PARTS ON TOP OF CHASSIS 101 662-1A


LOCATION OF PARTS UNDER CHASSIS 101662-1A



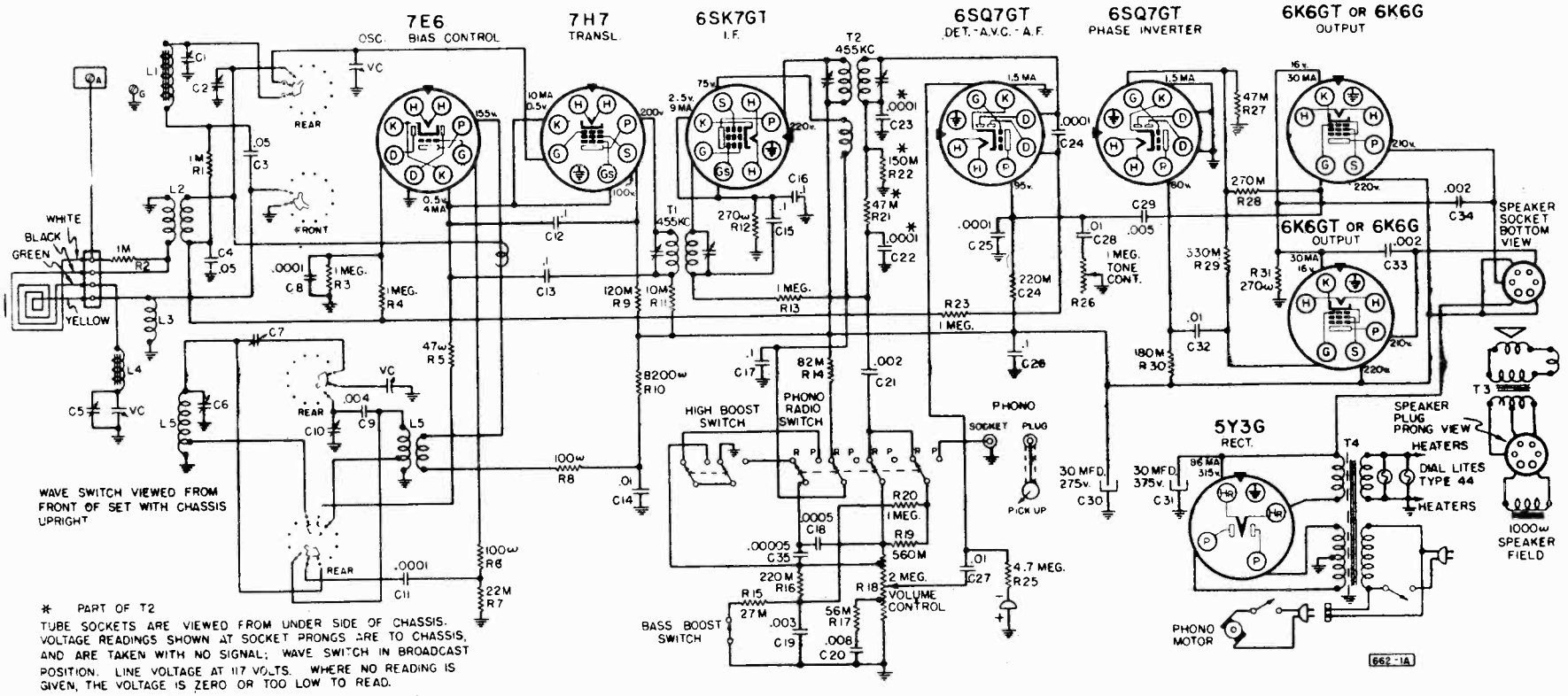
Push Button Mechanism

Adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in station, pushing in plunger (being careful not to detune station), and securely locking the adjustment.

SEARS ROEBUCK CO.

MODEL 7167
Ch. 101.662-1A

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.662-1A



WAVE SWITCH VIEWED FROM FRONT OF SET WITH CHASSIS UPRIGHT

* PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

POWER OUTPUT:
- Type ..... Push Pull Pentodes
- Undistorted ..... 3.5 watts
- Maximum ..... 7 watts

INTERMEDIATE FREQUENCY ..... 455 KC

Date June 9. 1942

FREQUENCY RANGES:
- Band "A" ..... 540-1700 KC
- Band "B" ..... 6-18 MC

LOUDSPEAKER:
- Type ..... Dynamic
- Size ..... 10 inch
- Field Coil Resistance 1000 ohms
- Approx. field coil voltage drop 95 V.

MODEL 7168
Ch. 101.681-1A

SEARS ROEBUCK CO.

PRELIMINARY:

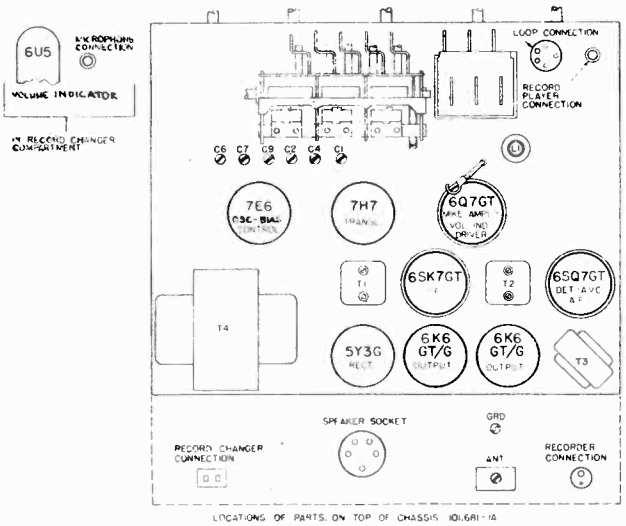
Output meter connections . . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.3 volts
Approximate microvolts input to indicate 500 milliwatts output . . . . . .See chart below
Generator ground lead connection . . . . . Receiver chassis
Dummy Antenna value 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 . . . . . Fully on
Position of Tone Control . . . . . HI
Position of pointer with tuner fully closed . . . . . .Last line below 540 calibration mark

BAND SWITCH POSITION	POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
A	Closed	455 KC	.1 mfd.	7H7 Transl. grid	T2, T1	IF	----
A	Open	1750 KC	.0002 mfd.	Ant. Terminal	C6	Oscillator	----
A	1410 KC	1410 KC	.0002 mfd.	Ant. Terminal	C1, C2	Ant. Transl.	30
A	600 (rock)	600 KC	.0002 mfd.	Ant. Terminal	C7	Padder	125
B	Open	13.3 MC	400 ohms	Ant. Terminal	C9	SW Oscillator	----
B	15 (rock)	15 MC	400 ohms	Ant. Terminal	C4	SW Transl.	20

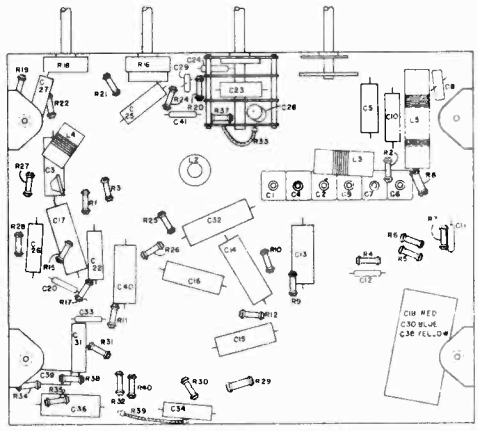
IMPORTANT ALIGNMENT NOTES

The Alignment must be done in the order given.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.681-1A


LOCATION OF PARTS UNDER CHASSIS 101.681-1A

TUBES AND FUNCTIONS:

7E6 . . . . . Oscillator, Bias Control
7H7 . . . . . .Translator
6SK7GT . . . . . IF
5Y3G. . . . . .Rectifier
6SQ7GT . . . . . .Detector-AVC-AF
6SQ7GT . . . . . Phase Changer
2 - 6K6GT or 6K6G . . . . . Output

POWER SUPPLY:

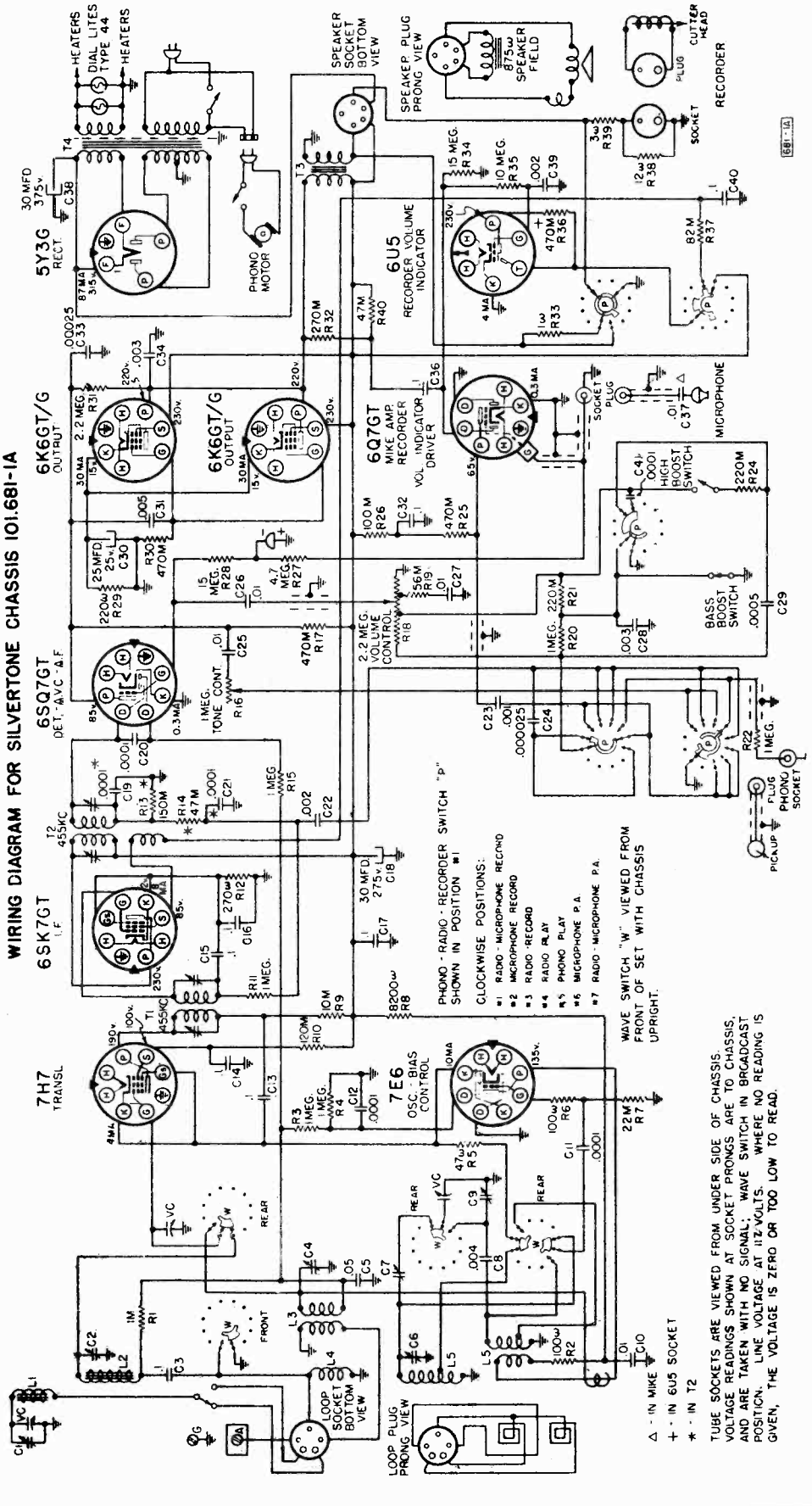
All models available . . . . . 105-125 volt, 60 cycles AC: 100 watts

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), and securely locking the adjustment.

SEARS ROEBUCK CO.

MODEL 7168
Ch. 101.681-1A



POWER OUTPUT:
Type ..... Parallel Pentodes
Undistorted ..... 3.5 watts
Maximum ..... 7 watts

INTERMEDIATE FREQUENCY ... 455 KC
Date June 9, 1942
LOUDSPEAKER:
Type ..... Dynamic

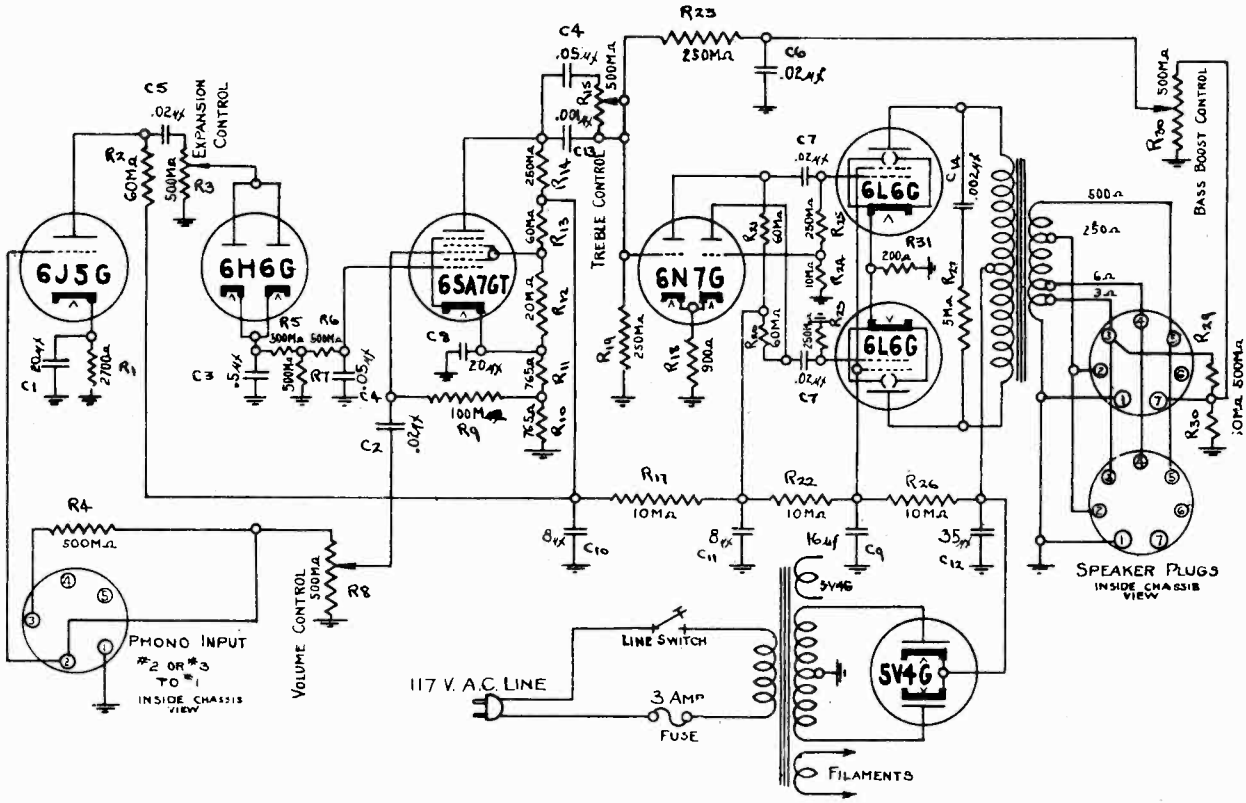
Size ..... 10 inch
Field coil resistance 875 ohms
Approx. field coil voltage drop 95 V.

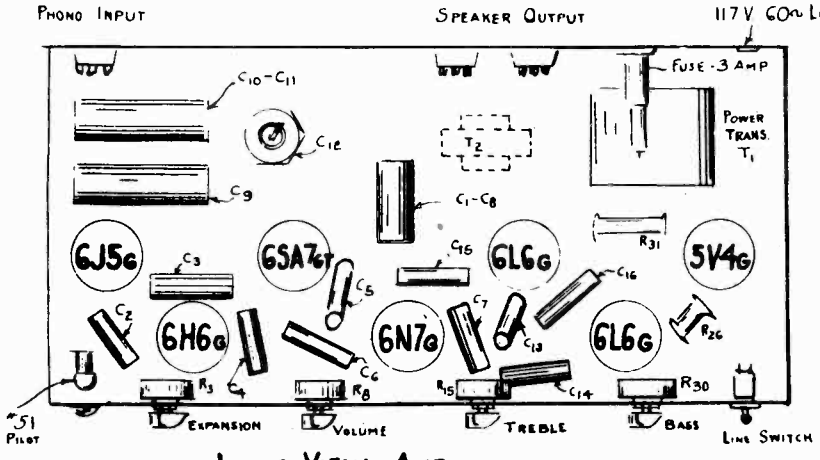
MODELS 7356, 7984, 12870
Chassis 138.250

SEARS ROEBUCK CO.

18 WATT, 7 TUBE, 3 STAGE, PHONOGRAPH AMPLIFIER

WITH VOLUME EXPANSION AND BASS BOOST





INSIDE VIEW AMP.

APRIL 19, 1943

TUBE COMPLEMENT

1 6J5G . . . Voltage Amplifier for volume expansion
1 6SA7GT . . . . Input for pickup
2 6L6G . . . . . Output
1 6H6G . . . Rectifier for volume expansion voltage
1 6N7G . . . . . .Inverter-driver
1 5V4G . . . . . .Rectifier

POWER SUPPLY

110-125 Volts, 50-60 cycle, A.C., 130 Watts

INPUT

Phonograph input for crystal or other high impedance pickups.

OUTPUT

3, 6, 250 and 500 ohms for P.M. speakers

MODEL 7188
Ch. 109.417

SEARS ROEBUCK CO.

AUTOMATIC RECORD CHANGER

GENERAL SPECIFICATIONS

Motor.....105-125 volts 60 cycles
Plays.....Ten 12 inch records
Plays.....Twelve 10 inch records
Plays.....Home recordings

TECHNICAL SERVICE DATA

1. There is no strain on the mechanism when the tonearm is accidentally rotated during its cycle. Merely return the tonearm to engage its proper notch--"H" for playing home recording discs or "A" for standard records.

2. The height-gauge prevents vertical shocks from reaching the mechanism. Rotate the height-gauge until the needle is approximately 1/16 inch below the top surface of the turntable.

3. The set screws for adjusting the tonearm are above the motorboard. If it is necessary to loosen these screws while servicing, reset as follows: Tighten one set-screw, turn on the motor, allowing the changing cycle to proceed until the tonearm starts to drop, at which point turn off the motor, stop the turntable before the tonearm has completed its drop and loosen the set screw. Then, while holding the tonearm over the record so that the needle is midway between the outer edge of the record and the beginning of the recording, tighten the set screws.

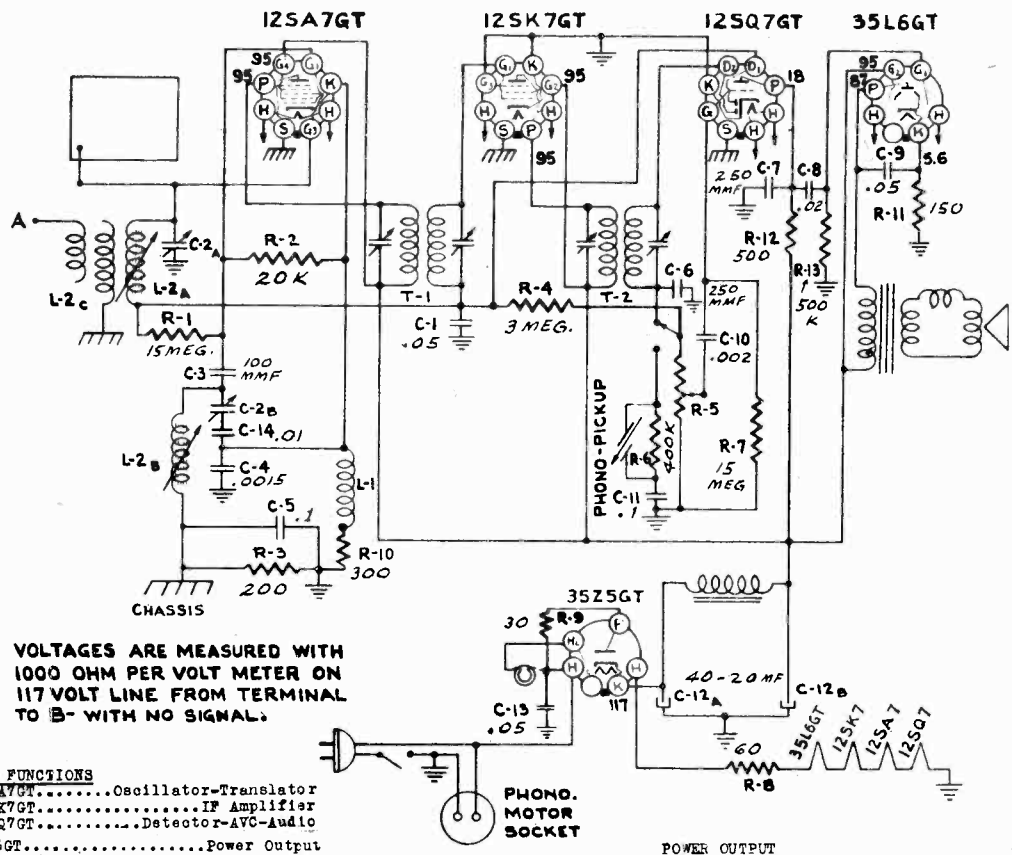
4. The automatic record support can be turned in either direction when adjusting for 10-inch or 12-inch records. The record support post is gauged in production so that the distance from the edge of the automatic record support when adjusted for playing 10-inch records to the nearest edge of the center spindle is 4 27/32 inches.

5. The record changer is adjusted in production so that the automatic mechanism is tripped when the needle is between 1 21/32 and 1¾ inches from the edge of the center spindle. This adjustment away from the tonearm bearing will cause the automatic mechanism to be engaged when the needle is at a greater distance from the spindle and bending the bracket towards the tonearm bearing will cause the engagement to occur when the needle is at a lesser distance from the spindle.

6. When replacing the four speed nuts that fasten the bottom strap, drive the three small speed nuts up tight with a hammer, but replace the large speed nut on the center spindle firmly with the fingers.

7. The three main bearings are made of "Oilite" bronze. They contain an oil supply sufficient for the life of the machine. After two years of normal use, add three drops of oil to the two felt washer reservoirs on the main motor bearing, a drop on the rubber tired motor idler pulley bearing and two drops on the ball thrust bearing at the bottom of the center spindle. Operation of any record changer below normal room temperature will result in reduced turntable speed and consequently poor reproduction.

   Keep the rubber belt and the rubber tire of the motor idler pulley free of grease, oil, and dirt. A cloth dampened with naphtha is recommended for cleaning these rubber parts.



VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT METER ON 117 VOLT LINE FROM TERMINAL TO B- WITH NO SIGNAL.

PHONO. MOTOR SOCKET

TUBES AND FUNCTIONS

12SA7GT.....Oscillator-Translator
12SK7GT.....IF Amplifier
12SQ7GT.....Detector-AVC-Audio
35L6GT.....Power Output
35Z5GT.....Rectifier

POWER OUTPUT

Type.....Beam Power
Undistorted..... .70 watts
Maximum..... .95 Watts

MODEL 7188
Ch. 109.417

SEARS ROEBUCK CO.

Output Meter Connection.....Across speaker voice coil
Connection of generator lead.....See chart below
Connection of generator ground lead.....Return of Phono Pickup
Dummy Antenna Value to be in series with generator output.....See chart below
Generator Modulation.....30%, 400 cycles
Position of Volume Control.....Fully clockwise
Phono-Radio Switch.....Radio position

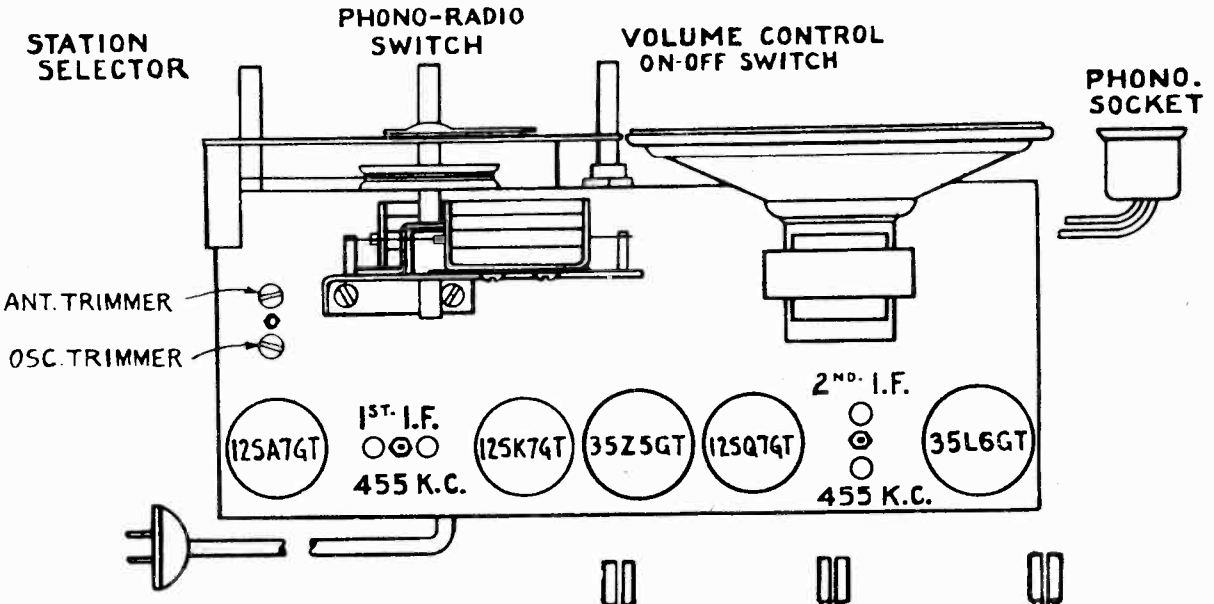
DIAL POSITION	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (In order shown)	REMARKS
H.F. End	I.F. 455 kc.	.1 mfd.	12SA7 Grid	T1, T2	Tune to max.
H.F. End (1720)	1720 kc.	200 mmf.	Antenna	Oscillator trimmer	Set limit of band
1400	1400 kc.	200 mmf.	Antenna	Antenna trimmer*	Tune to max.

*Capacitor plate must be connected while adjusting this trimmer.
The alignment procedure should be repeated stage by stage in the original order for greatest accuracy. Always keep the output from the generator at the lowest possible level so that the AVC action of the receiver is ineffective.

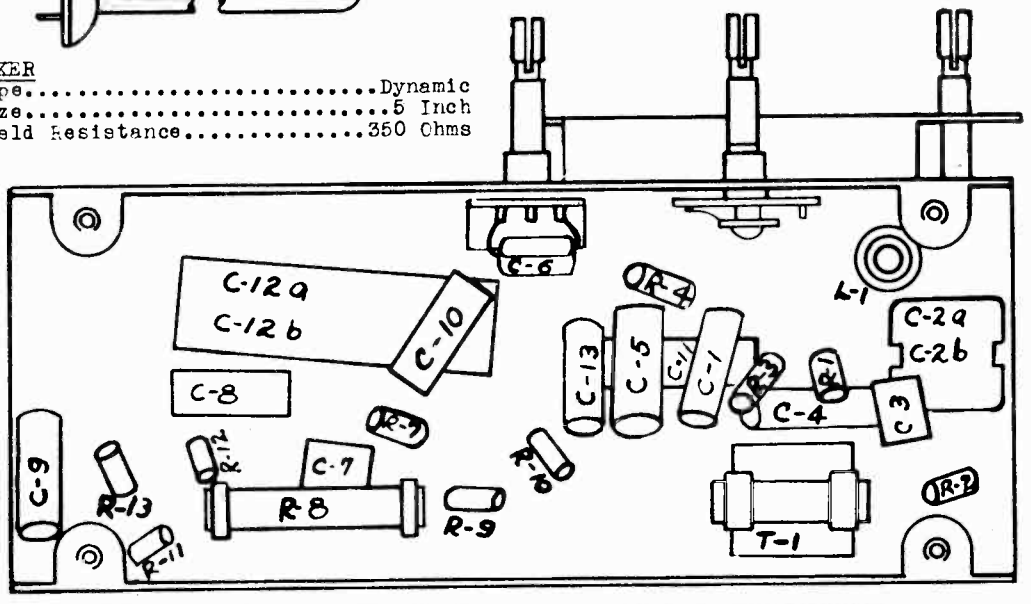
POWER SUPPLY.....105-125 volts AC 50 Watts
60 cycle only

FREQUENCY RANGE.....535 to 1720 kc.

ALIGNMENT FREQUENCIES.....Intermediate frequency 455 kc., Oscillator 1720 kc., Antenna 1400 kc.



SPEAKER
Type.....Dynamic
Size.....5 Inch
Field Resistance.....350 Ohms

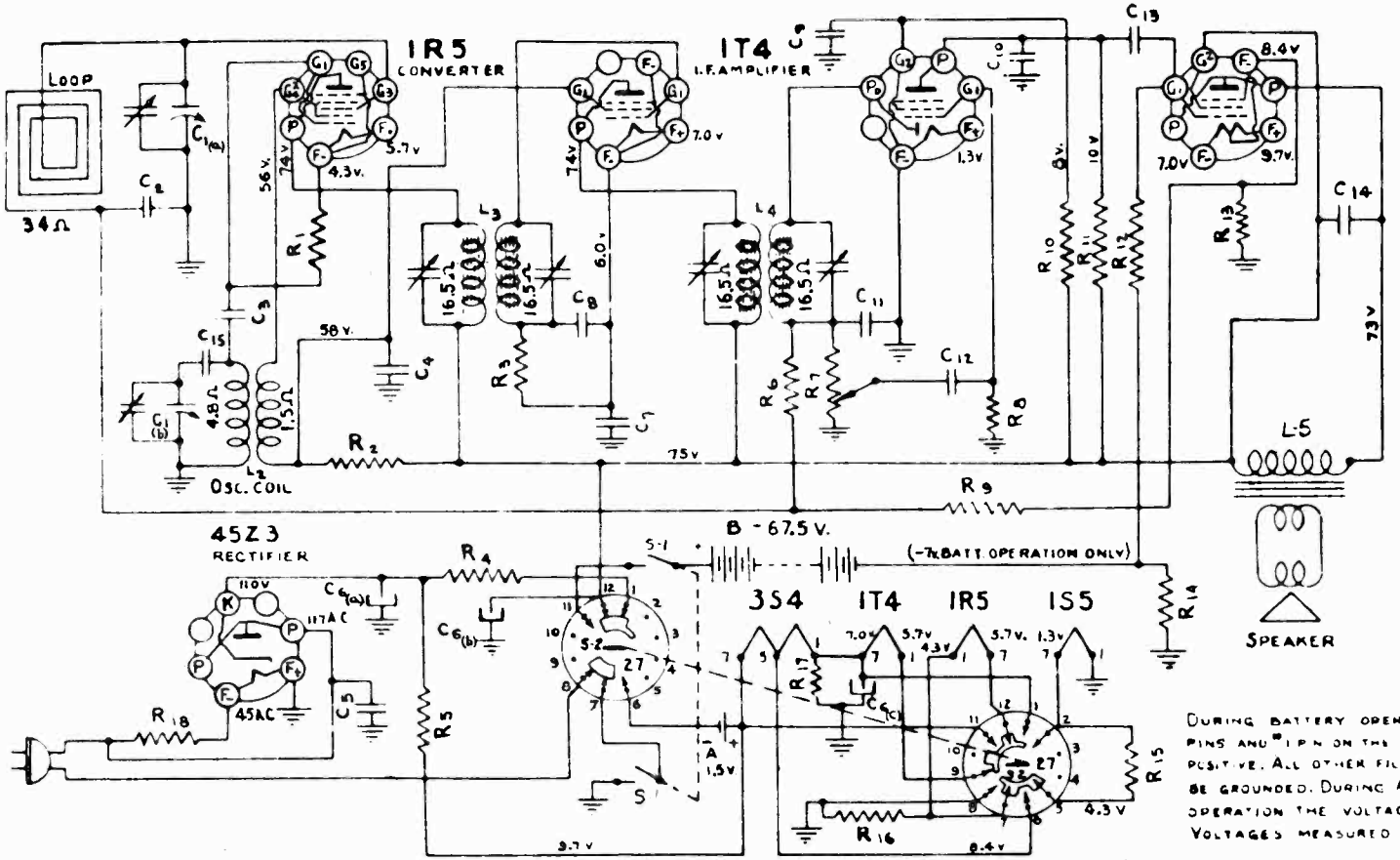


SCHEMATIC LOCATION	PART NO.	DESCRIPTION CHASSIS PARTS	SELLING PRICE EACH
R7	D8958	Control-Volume 1 meg.	1.25
C1	D9563	Condenser-Variable	2.25
C6,A,B,C	D8952	Condenser Elect 30 mfd-150 V 20 mfd.-150 V - 100 mfd.-12 V	1.00
C4, C8	D8830	Condenser-Paper-.01-120 V	.20
C7	D9135	Condenser-Paper-.25-.75 V	.20
C13	D581	Condenser-Paper-.005-600 V	.20
C2, C9	D580	Condenser-Paper-.05-200 V	.20
C14	D568	Condenser-Paper-.01-400 V	.20
C5	D563	Condenser-Paper-.05-400 V	.20
C12	D8540	Condenser-Paper-.001-600 V	.20
C11	D1286	Condenser-Mica 250 MMF	.20
C10	D2780	Condenser-Mica 50 MMF	.20
C3	D1285	Condenser-Mica 100 MMF	.20
C15	D8959	Condenser-Mica 485±2% MMF	.30
R15	D8963	Resistor-55 ohm, 1/2 Watt	.15
R14	D8964	Resistor-700 ohm, 1/3 Watt	.15
R5	D9314	Resistor-2200 ohm, Wire Wound	.35
R16	D8965	Resistor-1M 1/3 Watt	.15
R17	D8966	Resistor-1700 ohm, 1/3 Watt	.20
R13	D8968	Resistor-3M 1/3 Watt	.15
R4	D9468	Resistor-3M 1 Watt	.20
R2	D7125	Resistor-5M 1/3 Watt	.15
R1	D7122	Resistor-100M 1/3 Watt	.15
R11	D6723	Resistor-1 Meg 1/3 Watt	.15
R12	D8970	Resistor-2 Meg 1/3 Watt	.15
R6, R10	D8847	Resistor-4 Meg 1/3 Watt	.15
R3	D6724	Resistor-5 Meg 1/3 Watt	.15
R8	D6562	Resistor-10 Meg 1/3 Watt	.15
R9	D635	Resistor-6 Meg 1/3 Watt	.15

RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

1S5 2ND DET., AF, AVC.

354 OUTPUT



ALIGNMENT FREQUENCIES:

IF PEAK ... 455 KC

Oscillator 1610 KC

Antenna .. 1400 KC

FEBRUARY 27, 1942

During battery operation all "7" pins and "1" pin on the 354 will be 1.5 V positive. All other filament pins will be grounded. During A.C. or D.C. 117 volt operation the voltages will be as indicated ±20%. Voltages measured with 1000 ohm per volt meter.

SEARS ROEBUCK CO.

MODEL 7189
Ch. 109.378

SEARS PAGE 14-67

MODEL 7189
Ch. 109.378

SEARS ROEBUCK CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

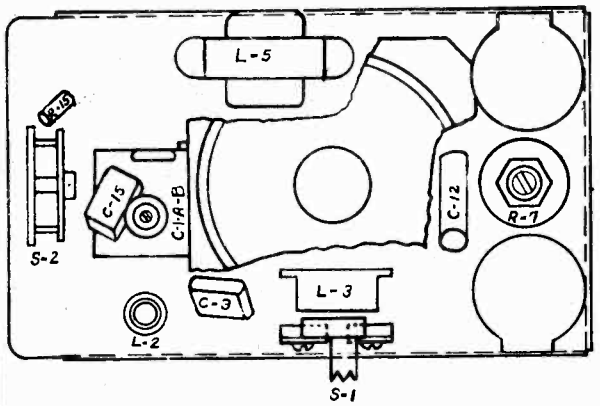
Output meter connection.....Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts.....0.42 volts
Generator ground lead connection.....To chassis through 0.1 mfd. cond.
Connection of generator output lead.....See table below
Generator modulation.....30%, 400 cycles
Position of Volume Control.....Fully on
Position of pointer with variable fully closed.....On 54° K. C.

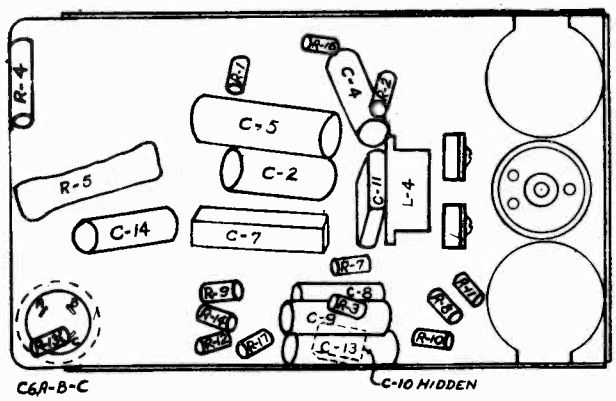
GENERATOR	CONNECTION AT RADIO	DUMMY ANTENNA	DIAL	TRIMMERS TO TUNE	REMARKS
IF 455 K.C.	1R5 Grid	.1 Mfd.	H. F. End	IF Transformers 4 Trimmers	Tune to Max.
1600 K.C.	1R5 Grid	------	H. F. End (1600)	Oscillator Trimmer	Set Limit of band
1400 K.C.	Standard loop or single turn from generator lossely coupled	------	1400	Antenna Trimmer	Tune to Max.

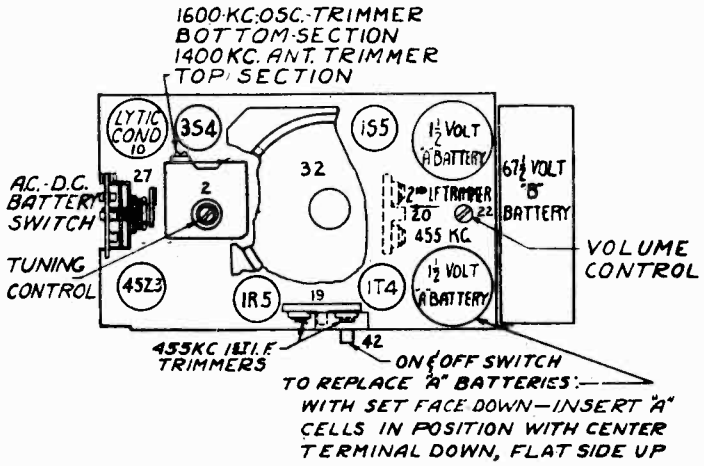
IMPORTANT ALIGNMENT NOTES:

The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.
The location of all the alignment adjustments is shown on the Top View of the chassis.
The chassis is removed from the case in order to align the I.F. and oscillator, but the loop antenna must be left connected.
The chassis and the batteries must be in place in the cabinet during loop alignment. The loop trimmer is accessible by removing the back cover.







TUBES AND FUNCTIONS
1R5.....Oscillator-Translator
1T4.....IF Amplifier
1S5.....Detector-AVC-Audio

3S4.....Power Output
45Z3.....Rectifier

POWER OUTPUT
Type.....Pentode Tube
Undistorted..... .095 Watts
Maximum..... .125 Watts

SPEAKER
Type.....Permanent Magnet
Size.....5½ Inch

POWER SUPPLY.....105-125 volts AC or DC 20 Watts
or batteries 1 "B" Battery #5071 and 2 "A" batteries #4650.

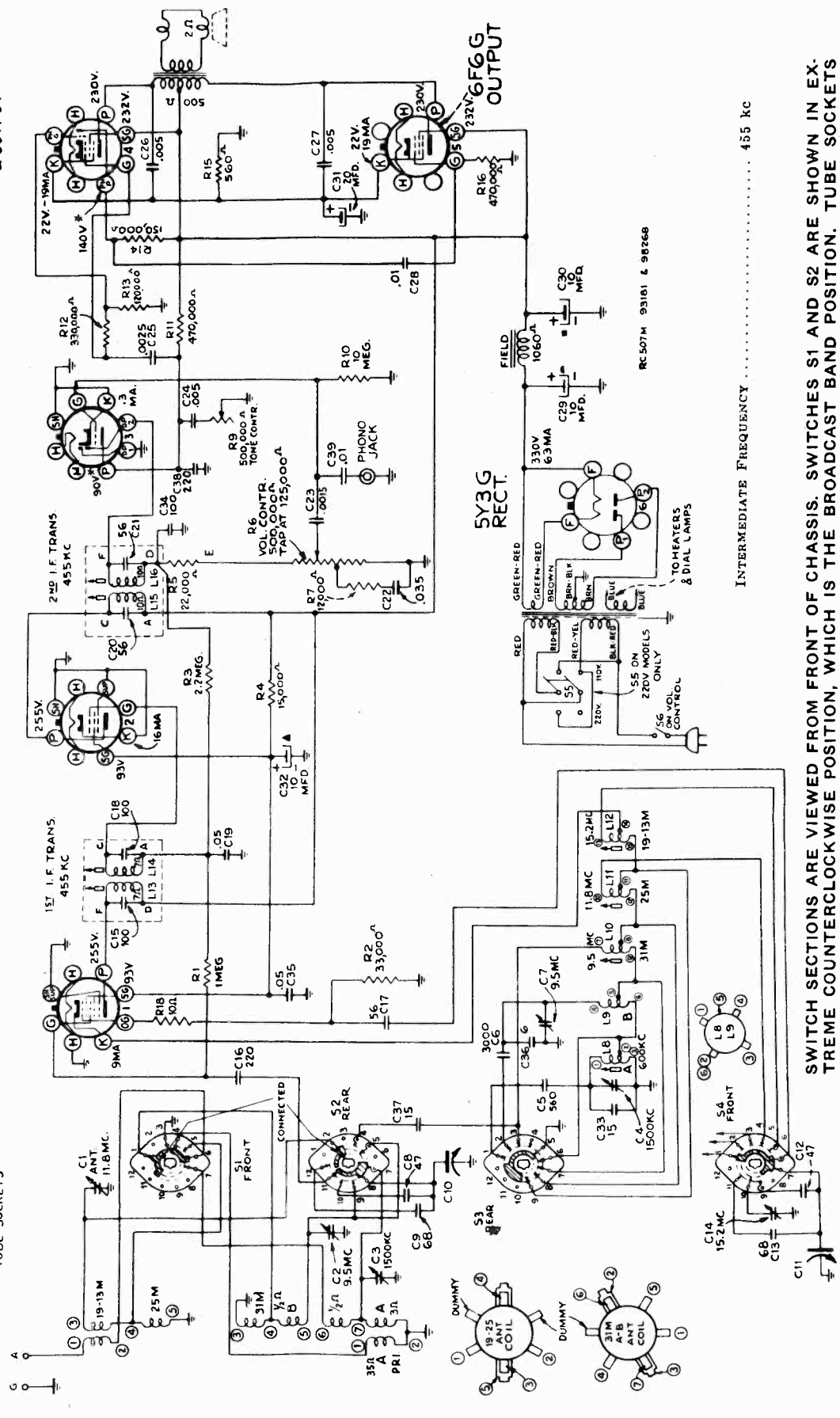
FREQUENCY RANGE.....540 to 1600 kc.

ALIGNMENT FREQUENCIES.....Intermediate frequency 455 kc., Oscillator 1610 kc., Antenna 1400 kc.

MODEL 7905 Export
Chassis 126.234

SEARS ROEBUCK CO.

WIRING DIAGRAM FOR SILVERTONE CHASSIS—126.234



SWITCH SECTIONS ARE VIEWED FROM FRONT OF CHASSIS. SWITCHES S1 AND S2 ARE SHOWN IN EXTREME COUNTERCLOCKWISE POSITION, WHICH IS THE BROADCAST BAND POSITION. TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING VOLTAGES TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE CATHODE CURRENTS IN MILLIAMPERES. VOLTAGES WITH STAR (★) ARE ACTUAL OPERATING VOLTAGES IN HIGH RESISTANCE CIRCUITS, MEASURED WITH ELECTRONIC VOLTMETER.

January 6, 1942

MODEL 7905 Export
Chassis 126.234

SEARS ROEBUCK CO.

Calibration Scale on Variable Condenser Drive Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment when chassis is out of cabinet; therefore, a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale (see "Dial Drive Drawing") must be in a vertical position when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

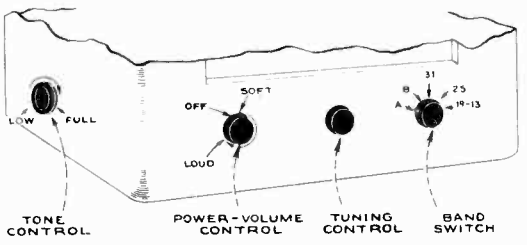
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet attach the dial pointer to the drive cable with variable condenser fully closed and pointer on last calibration mark at 550 kc end of Broadcast "A" band. The dial pointer has a spring clip for attachment to the cable.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

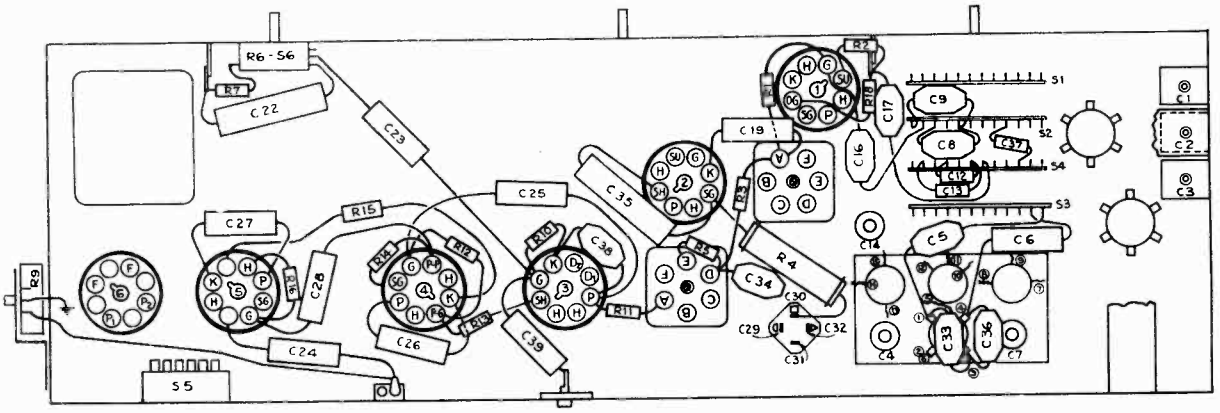
In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.



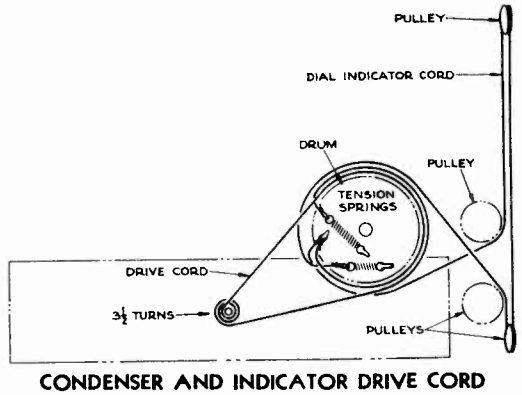
CONTROLS



TUBE, TRIMMER AND PARTS LOCATION—BOTTOM VIEW

Tuning Dial:

The tuning shaft is connected through a cord drive to a drum on the condenser shaft. A second cord drives the dial indicator by passing over a pulley on the chassis. "Condenser and Indicator Drive Cord" illustration shows the complete cord drive assembly and the correct number of turns which the cord should be wrapped around the drive shaft and condenser drum.



CONDENSER AND INDICATOR DRIVE CORD

POWER OUTPUT:

Type	Pentode
Undistorted	3.0 watts
Maximum	3.5 watts

POWER SUPPLY RATING:

105-120 volts, 25 cycle	75 watts
105-120 volts, 50-60 cycle	75 watts
105-130, 140-160, 200-250 volts, 50-60 cycle	75 watts

LOUDSPEAKER:

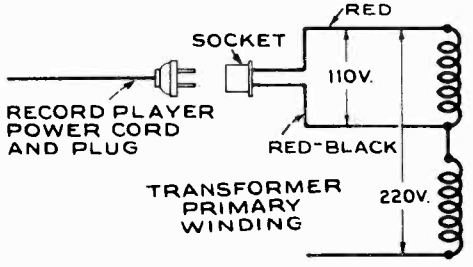
Type	6-inch electrodynamic
Voice Coil Impedance at 400 Cycles	3.4 ohms
Field Coil Resistance	1,060 ohms

FREQUENCY RANGES:

Standard Broadcast (A)	540-1,720 kc (555-174 m)
Medium Wave (B)	3,000-9,500 kc (100-31.5 m)
31 Meter Spread Band	9,500-12,500 kc (31.5-24.0 m)
25 Meter Spread Band	11,800-16,000 kc (25.5-18.8 m)
19-16-13 Meter Spread Band	15,500-22,500 kc (19.5-13.3 m)

CHASSIS FEATURES:

Jack for Phonograph Attachment
Magnetite-Core Adjusted I-F Transformers, and Oscillator Coils
Automatic Volume Control
High-Frequency Tone Control
Aural-Compensated Volume Control
Spread Bands for Short Wave Reception



RECORD PLAYER CONNECTIONS (220V—110V)

SEARS ROEBUCK CO.

MODEL 7905 Export
Chassis 126.234

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections	Across speaker voice coil
Output meter reading to indicate 1.0 watt output	1.8 volts
Approximate average sensitivity in microvolts for 1.0 watt output	See chart below
Dummy antenna value to be inserted in series with generator output	See chart below
Connection of generator output lead	See chart below
Connection of generator ground lead	To chassis
Generator modulation	30%, 400 cycles
Position of Volume Control	Fully clockwise
Position of Tone Control	Fully clockwise

LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS ON TOP OF CHASSIS

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
"A"	Low End	455 kc	.001 mfd.	6SK7 I-F Grid	L15, L16	2nd I-F Trans.	4,000
"A"	Low End	455 kc	.001 mfd.	6SA7 Det.-Osc. Grid	L13, L14	1st I-F Trans.	70
"25 Meter"	11.8 mc (138.5°)	11.8 mc	300 ohms	Ant.	L11, C1	Osc.,* Ant.	23
"25 Meter"	15.2 mc (18.5°)	15.2 mc	300 ohms	Ant.	C14	Osc.*	
"19-13 Meter"	15.2 mc (156°)	15.2 mc	300 ohms	Ant.	L12	Osc.*	56
"31 Meter"	9.5 mc (156°)	9.5 mc	300 ohms	Ant.	L10, C2	Osc.,* Ant.	23
"Medium Band"	9.5 mc (11.5°)	9.5 mc	300 ohms	Ant.	C7, C2	Osc.,* Ant.	23
"Standard Band"	1,500 kc (27°)	1,500 kc	.0002 mfd.	Ant.	C4, C3	Osc., Ant.	16
"Standard Band"	600 kc (149.5°) (Rock)	600 kc	.0002 mfd.	Ant.	L8	Osc.	16

IMPORTANT ALIGNMENT NOTES

* Use minimum capacity peaks if two peaks can be obtained.

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

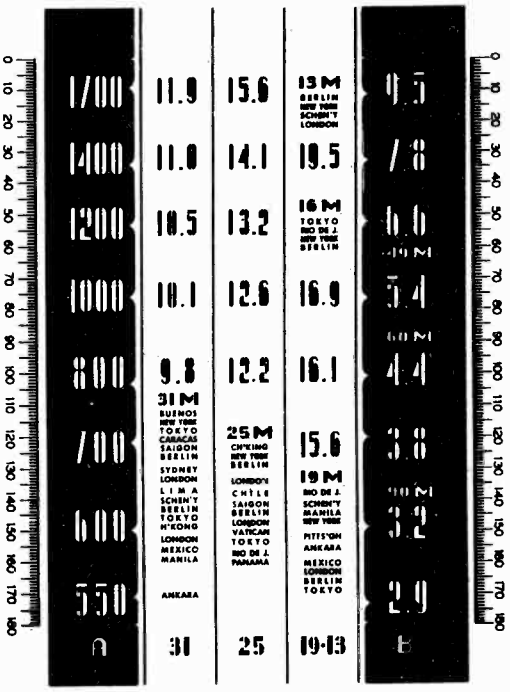
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value to prevent the a-v-c action of the set interfering with accurate alignment.

Adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band.

Note.—Oscillator tracks 455 kc above signal on all bands.

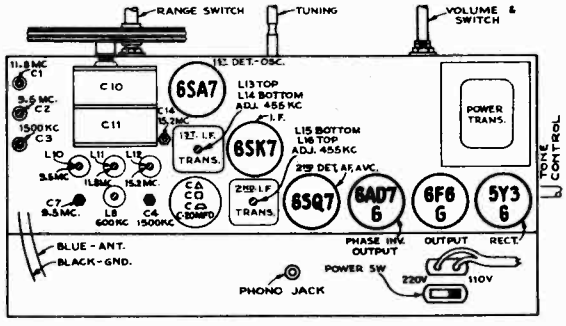
Values shown under, "Microvolts," are only approximate.



Calibration Scale

Reduced Reproduction of Receiver Dial, and Corresponding 180-0° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 150° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Ptocedure."



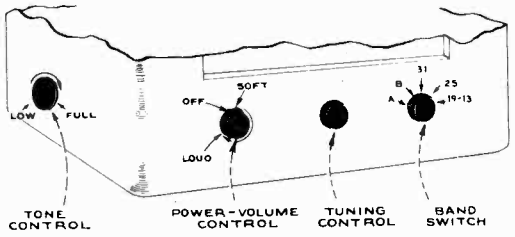
TUBE, TRIMMER AND PARTS LOCATION

MODEL 7906 Export
Chassis 126.235

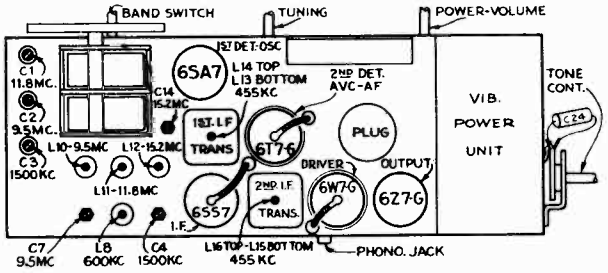
SEARS ROEBUCK CO.

Calibration Scale on Variable Condenser Drive Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment when chassis is out of cabinet; therefore, a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale (see "Dial Drive Drawing") must be in a vertical position when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.



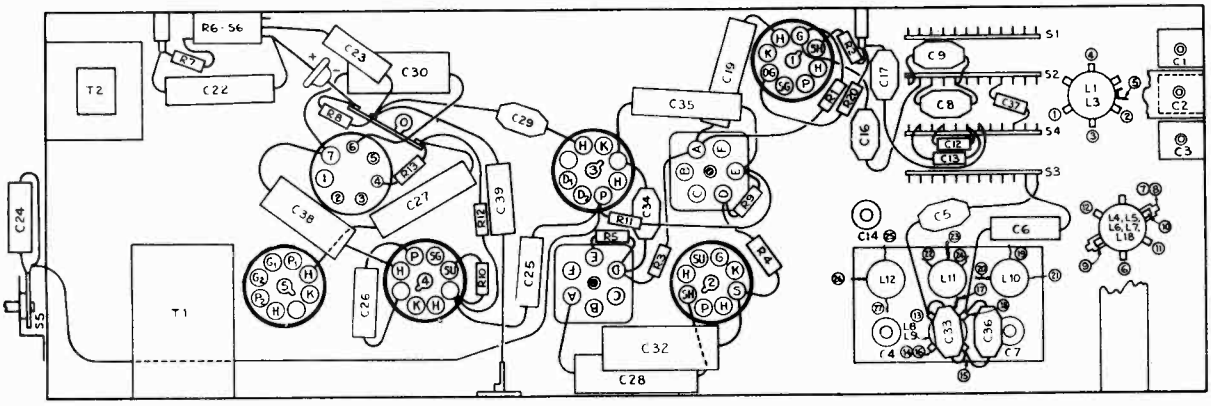
CONTROLS



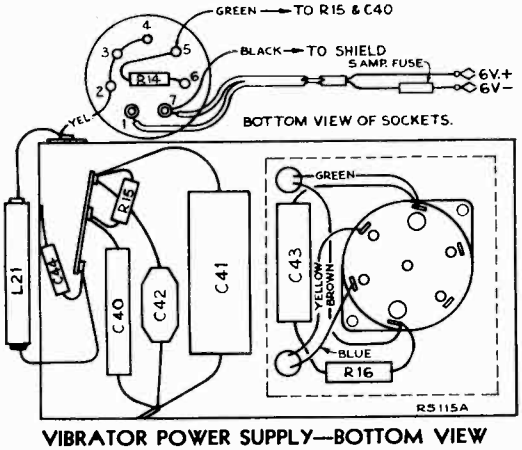
TUBE, TRIMMER AND PARTS LOCATION—TOP VIEW

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial - Indicator Adjustment.—After fastening the chassis in the cabinet attach the dial pointer to the drive cable with variable condenser fully closed and pointer on last calibration mark at 550 kc end of Broadcast "A" band. The dial pointer has a spring clip for attachment to the cable.



TUBE, TRIMMER AND PARTS LOCATION—BOTTOM VIEW



VIBRATOR POWER SUPPLY—BOTTOM VIEW

A-C Power Supply Unit

An A-C Power Supply Unit is available for the Model 7906 receiver. The installation of this unit allows the receiver to be operated on 105-125, 200-250 volts, 25-60 cycle a-c power supply. Installation is as follows:

a. Disconnect the battery leads. Detach the socket connecting the short cable from the Vibrator Power Unit to the Chassis.

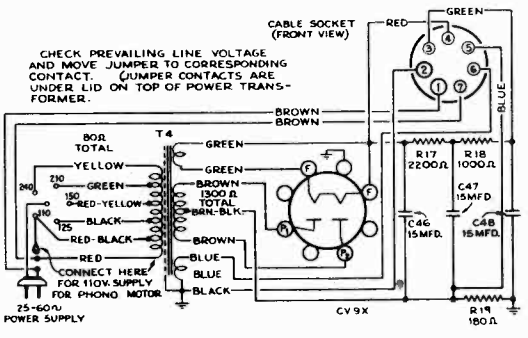
b. Set the switch on the A-C Power Unit for the voltage that is to be used, A-C 105 to 125 or 210 to 250 volts 25 to 60 cycles. Then attach the A-C Power Unit Cable to the chassis.

c. If desired, the Vibrator Unit may be removed from the chassis by unfastening the two screws on the chassis apron.

Socket Voltages with the A-C Power Supply Unit

(LINE SUPPLY VOLTAGE, 110 VOLTS)

Tube	Filament Voltage	Plate Voltage	Screen Voltage	Plate Current	Cathode Current
6SA7	6.15	182	66	1.1	6.0
6SS7	6.15	182	66	8.3	10.1
6T7G	6.15	55*		.25	.25
6W7G	6.15	178	182	7.0	8.8
6Z7G	6.15	207		9.7	9.7
5Y3G	4.55	Rectifier voltage 210, "B" current 34.9			

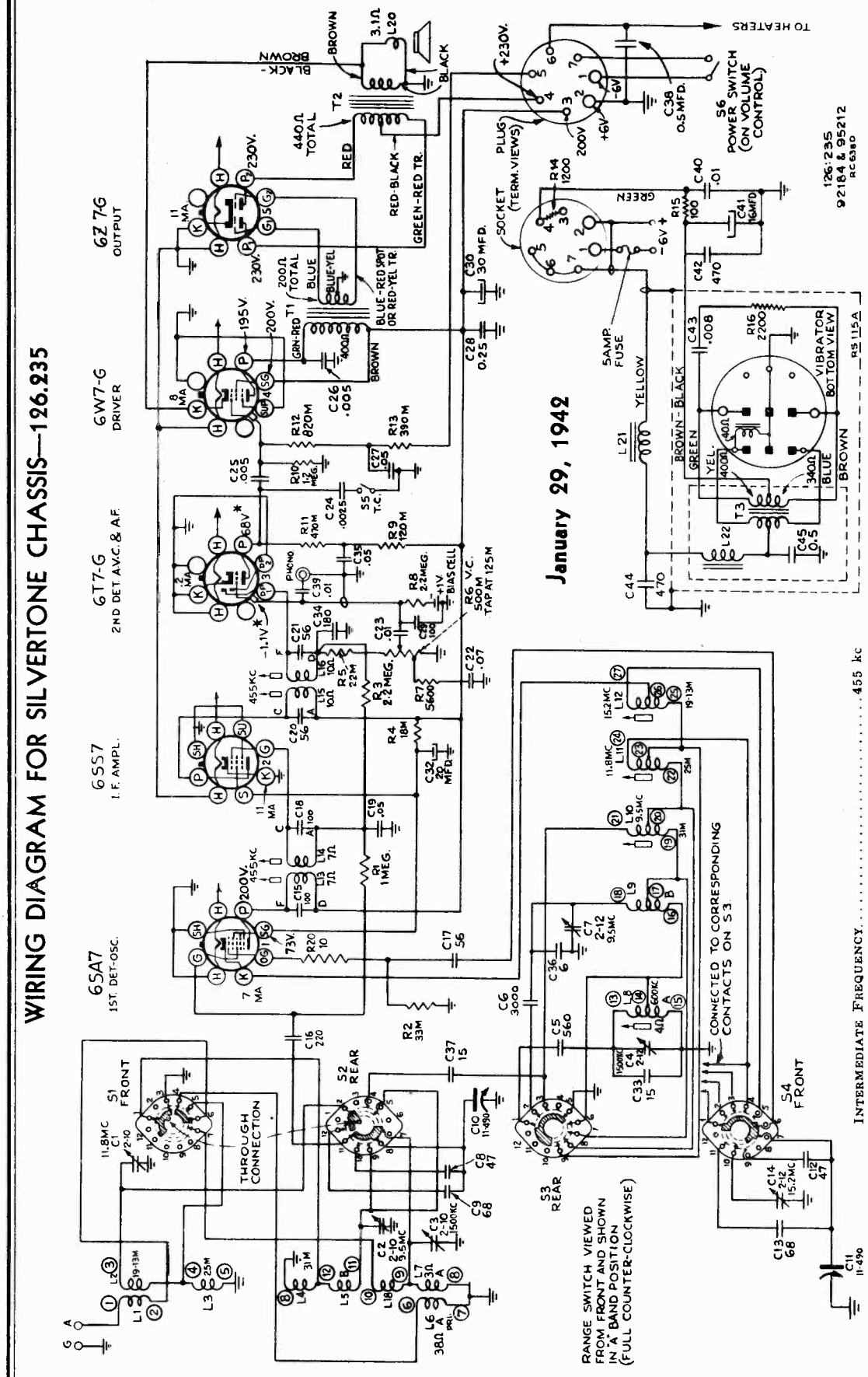


A-C POWER UNIT WIRING DIAGRAM

SEARS, ROEBUCK & CO.

MODEL 7906 Export
Chassis 126.235

WIRING DIAGRAM FOR SILVERTONE CHASSIS—126.235



MODEL 7906 Export
Chassis 126.235

SEARS ROEBUCK CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections ..... Across speaker voice coil
Output meter reading to indicate 1.0 watt output ..... 1.8 volts
Approximate average sensitivity in microvolts for 1.0 watt output ..... See chart below
Dummy antenna value to be inserted in series with generator output ..... See chart below
Connection of generator output lead ..... See chart below
Connection of generator ground lead ..... To chassis
Generator modulation ..... 30%, 400 cycles
Position of Volume Control ..... Fully clockwise
Position of Tone Control ..... Fully clockwise
Position of Dial Pointer with variable tuning condenser fully closed ..... To fall on last calibration mark at 540 KC end of "Broadcast" band

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
A Band	Low End	455 kc	.01 mfd.	6SS7 I-F Grid	L15, L16	2nd I-F Trans.	2,100
A Band	Low End	455 kc	.01 mfd.	6SA7 1st Det. Grid	L13, L14	1st I-F Trans.	56
25M Band	11.8 mc (138.5°)	11.8 mc	300 ohms	Ant.	L11, C1	osc., ant.	35
25M Band	15.2 mc (17.0°)	15.2 mc	300 ohms	Ant.	C14	osc.*	
19-13M Band	15.2 mc (156.0°)	15.2 mc	300 ohms	Ant.	L12	osc.*	42
31M Band	9.5 mc (156.0°)	9.5 mc	300 ohms	Ant.	L10, C2	osc., ant.	38
B Band	9.5 mc (11.5°)	9.5 mc	300 ohms	Ant.	C7, C2	osc.*	35
A Band	1,500 kc (26.0°)	1,500 kc	.0002 mfd.	Ant.	C4, C3	osc., ant.	14
A Band	600 kc (150.0°) (Rock)	600 kc	.0002 mfd.	Ant.	L8 (Rock)	osc.	14

IMPORTANT ALIGNMENT NOTES

* Use minimum capacity peaks if two peaks can be obtained.

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

Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value to prevent the a-v-c action of the set interfering with accurate alignment.

Adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band.

Note.—Oscillator tracks 455 kc above signal on all bands.

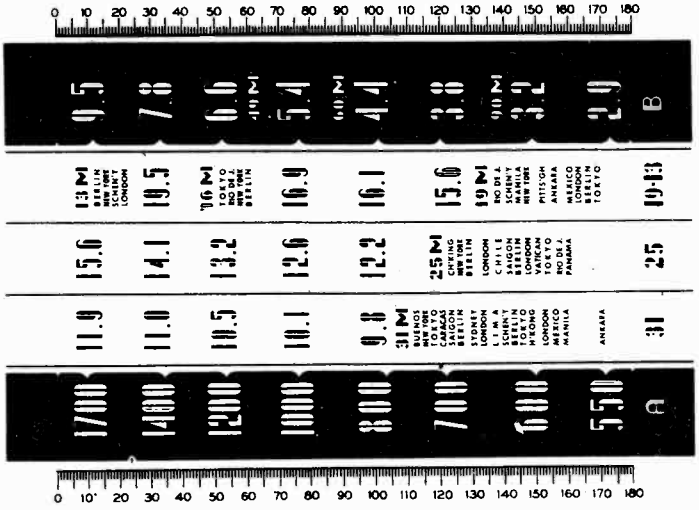
Values shown under, "Microvolts," are only approximate.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.



Calibration Scale

Reduced Reproduction of Receiver Dial, and Corresponding 180-0° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 150° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

POWER OUTPUT	Battery Supply	A-C Supply
Undistorted	3.1 watts	3.0 watts
Maximum	4.5 watts	4.0 watts

LOUDSPEAKER

Type ..... 6-inch, permanent-magnet dynamic
Voice-coil Impedance at 400 cycles ..... 3.4 ohms

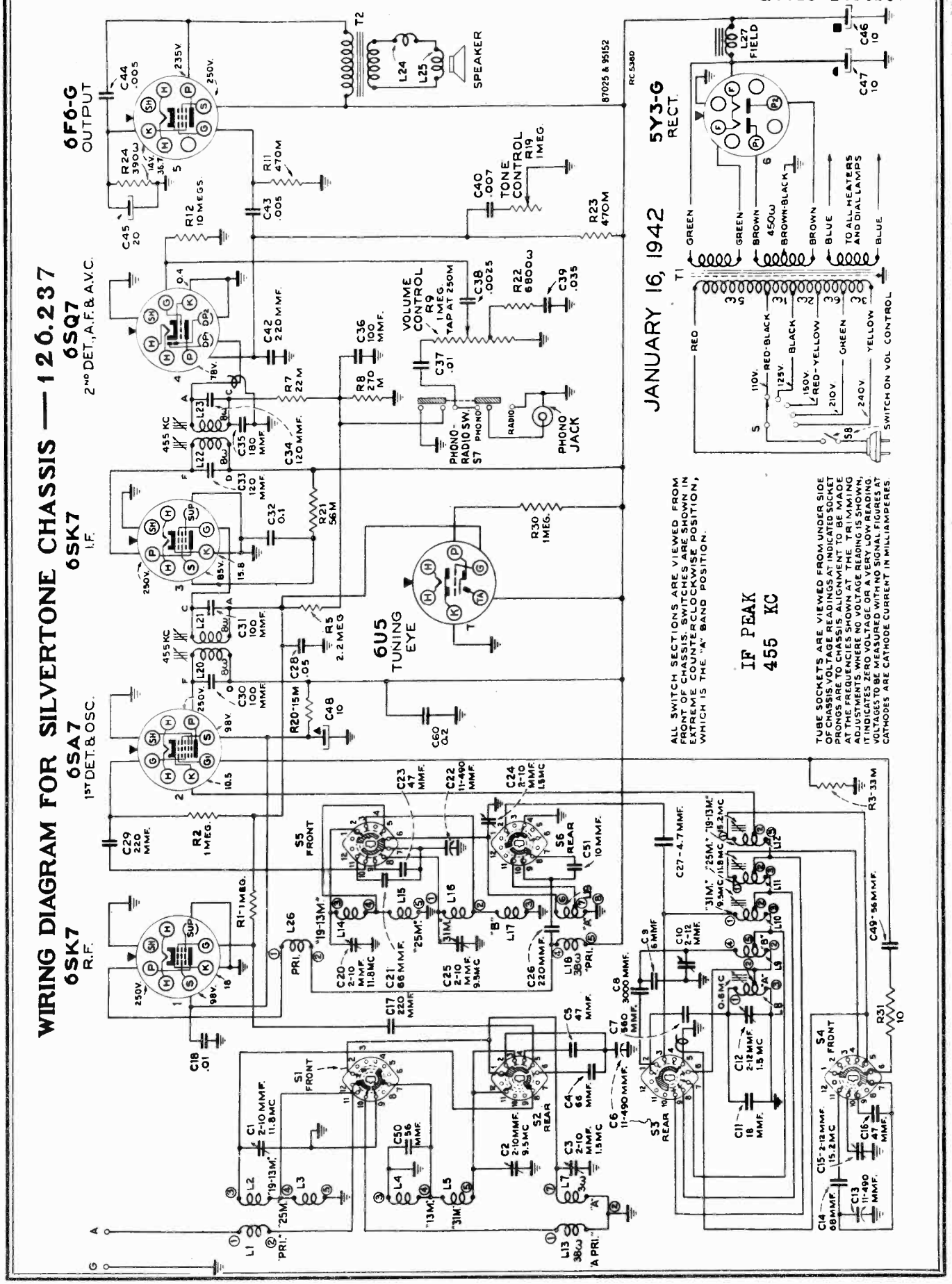
POWER SUPPLY RATINGS:

With vibrator power supply unit:
6.3 volts, total current drain ..... 3.2 amperes
With A-C power supply unit:
100-130/140-160/195-250 volts, 25-60 cycles ..... 38 watts

SEARS, ROEBUCK & CO.

MODEL 7910 Export
Chassis 126.237

WIRING DIAGRAM FOR SILVERTONE CHASSIS — 126.237



MODEL 7910 Export
Chassis 126.237

SEARS ROEBUCK CO.

Chassis Features:
Jack and Switch for Phonograph Attachment
Magnetite-Core Adjusted I-F Transformers, and Oscillator Coils
Automatic Volume Control
High-Frequency Tone Control
Aural-Compensated Volume Control
No. R-F Stages (all bands)..... one
Spread Bands for Short Wave Reception

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections..... Across speaker voice coil
Output meter reading to indicate 1.0 watt output..... 1.8 volts
Approximate average sensitivity in microvolts for 1.0 watt output..... See chart below
Dummy antenna value to be inserted in series with generator output..... See chart below
Connection of generator output lead..... See chart below
Connection of generator ground lead..... To chassis
Generator modulation..... 30%, 400 cycles
Position of Volume Control..... Fully clockwise
Position of Tone Control..... Fully clockwise

LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS ON TOP OF CHASSIS

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
"A"	Low End	455 kc	.001 mfd.	6SK7 I-F Grid	L22, L23	2nd I-F Trans.	4,000
"A"	Low End	455 kc	.001 mfd.	6SA7 Det.-Osc. Grid	L20, L21	1st I-F Trans.	70
"25 Meter"	11.8 mc (138.5°)	11.8 mc	300 ohms	Ant.	L11, C1, C20	Osc.,* Ant., Det.	7
"25 Meter"	15.2 mc (18.5°)	15.2 mc	300 ohms	Ant.	C15	Osc.*	8.5
"19-13 Meter"	15.2 mc (156°)	15.2 mc	300 ohms	Ant.	L12	Osc.*	7
"31 Meter"	9.5 mc (156°)	9.5 mc	300 ohms	Ant.	L10, C2, C25	Osc.,* Ant., Det.	5.6
"Medium Band"	9.5 mc (11.5°)	9.5 mc	300 ohms	Ant.	C10	Osc.*	3
"Standard Band"	1,500 kc (27°)	1,500 kc	.0002 mfd.	Ant.	C12, C3, C24	Osc., Ant., Det.	2
"Standard Band"	600 kc (149.5°) (Rock)	600 kc	.0002 mfd.	Ant.	L8	Osc.	1.5

IMPORTANT ALIGNMENT NOTES

* Use minimum capacity peaks if two peaks can be obtained.

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

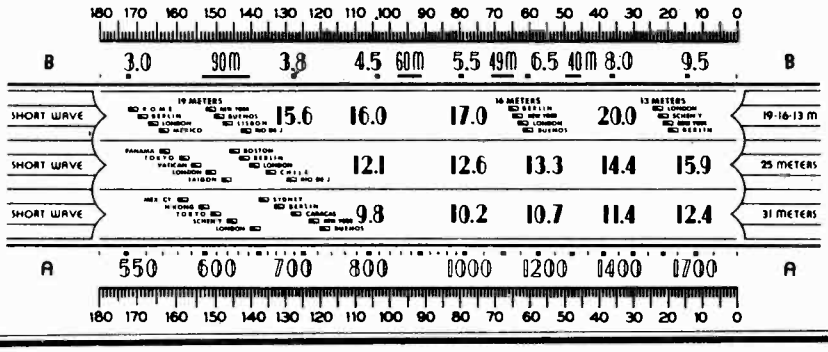
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value to prevent the a-v-c action of the set interfering with accurate alignment.

Adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band.

Note.—Oscillator tracks 455 kc above signal on all bands.

Values shown under, "Microvolts," are only approx. nate.



Calibration Scale

Reduced Reproduction of Receiver Dial, and Corresponding 180-0° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 150° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

Calibration Scale on Variable Condenser Drive Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment when chassis is out of cabinet; therefore, a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale (see "Dial Drive Drawing") must be in a vertical position when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet attach the dial pointer to the drive cable with variable condenser fully closed and pointer on last calibration mark at 550 kc end of Broadcast "A" band. The dial pointer has a spring clip for attachment to the cable.

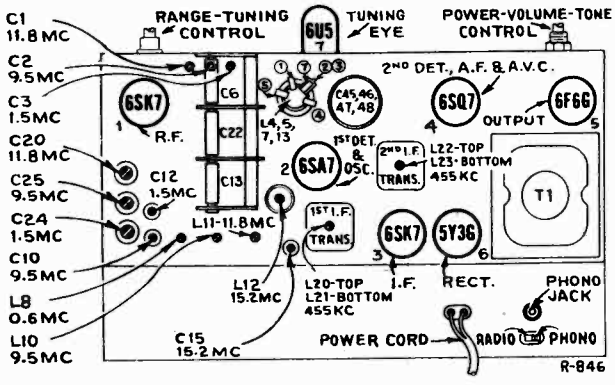


FIG. 3. TUBE, TRIMMER AND PARTS LOCATION

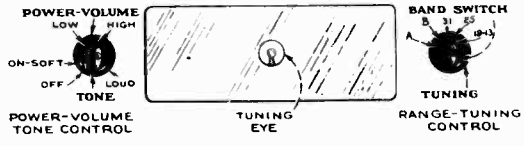


FIG. 4. CONTROLS

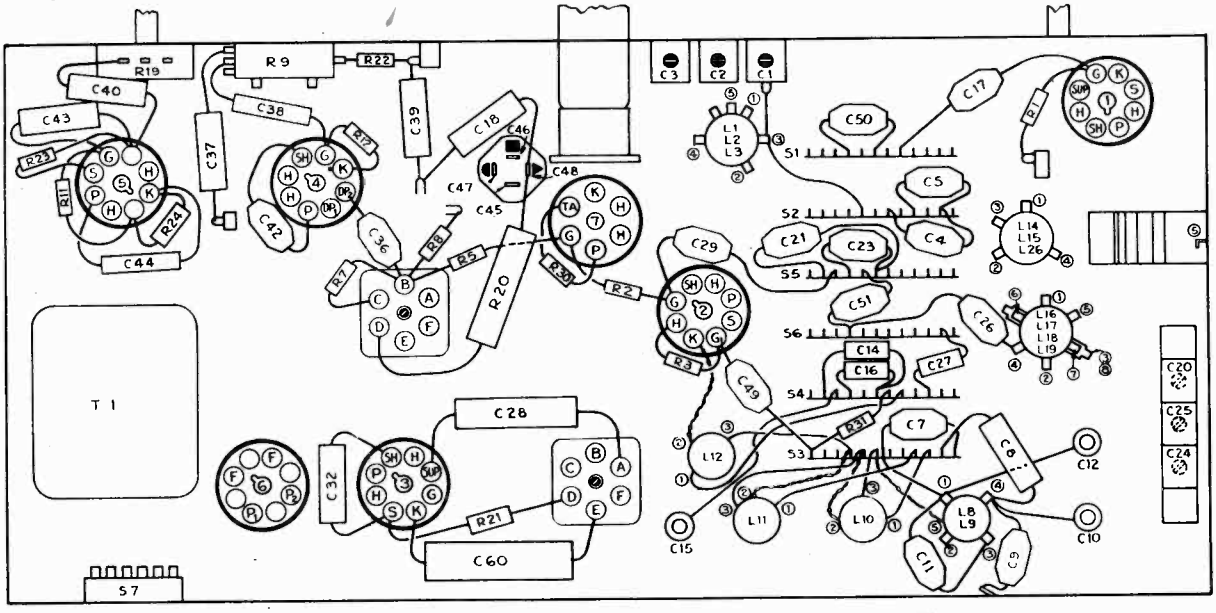


FIG. 5. TUBE, TRIMMER AND PARTS LOCATION—BOTTOM VIEW

Loudspeaker:

Type	6-inch electrodynamic
Voice Coil Impedance at 400 Cycles	3.4 ohms
Field Coil Resistance	1,060 ohms

Power Output:

Type	Pentode
Undistorted	2.5 watts
Maximum	4.5 watts

Frequency Ranges:

Standard Broadcast	540-1,720 kc (555-174 m)
Medium Wave	3,000-9,500 kc (100-31.5 m)
31 Meter Spread Band	9,500-12,500 kc (31.5-24.0 m)
25 Meter Spread Band	11,800-16,000 kc (25.5-18.8 m)
19-16-13 Meter Spread Band	15,500-22,500 kc (19.5-13.3 m)

Power Supply Rating:

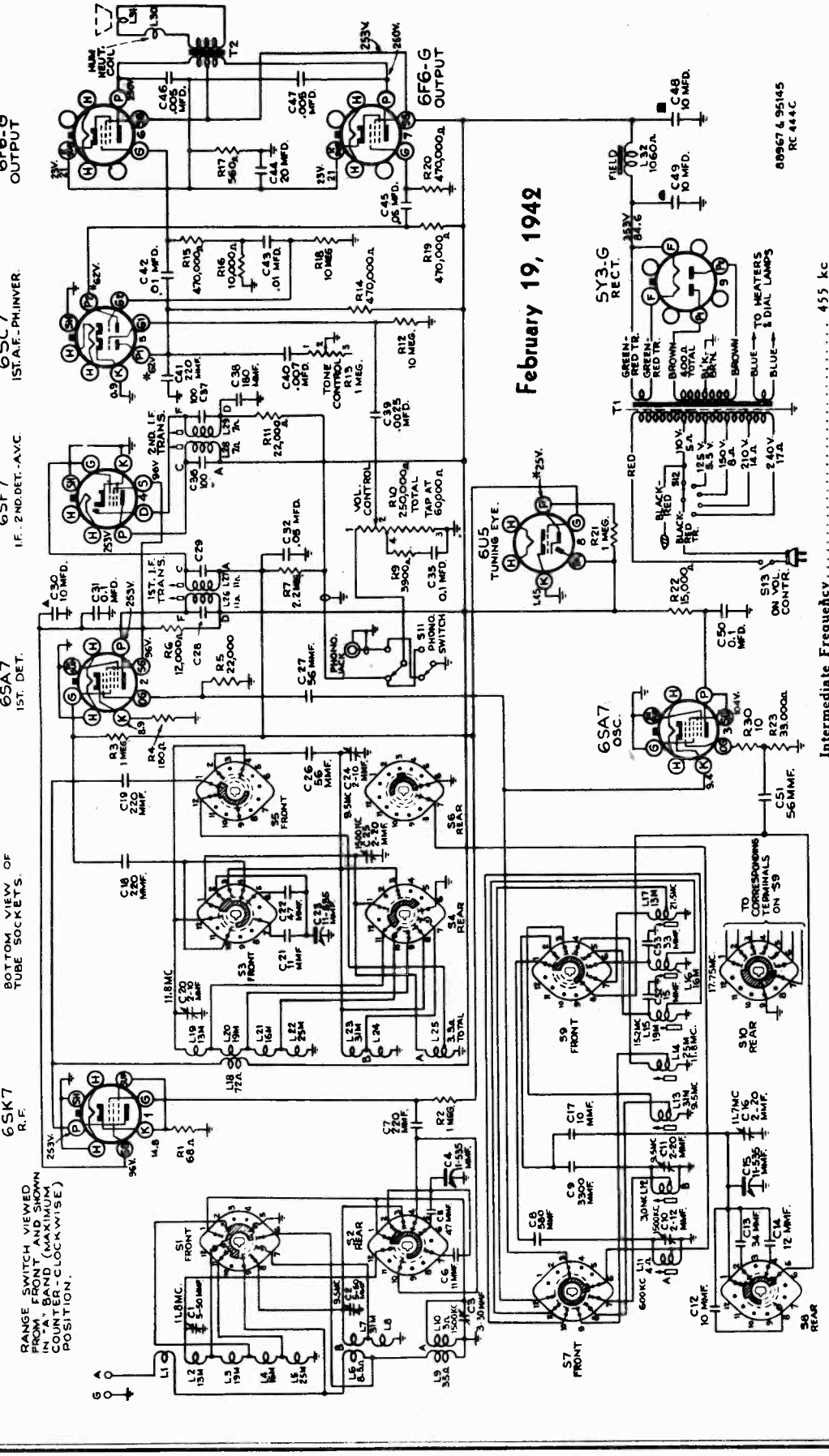
105-120 volts, 25 cycle	75 watts
105-120 volts, 50-60 cycle	75 watts
105-130, 140-160, 200-250 volts, 50-60 cycle	75 watts

MODEL 7915 Export
Chassis 126.238

SEARS, ROEBUCK & CO.

WIRING DIAGRAM FOR SILVERTONE CHASSIS—126.238

February 19, 1942



ALL SWITCH SECTIONS ARE VIEWED FROM FRONT OF CHASSIS. SWITCHES ARE SHOWN IN EXTREME COUNTERCLOCKWISE POSITION, WHICH IS THE "A" BAND POSITION. TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING VOLTAGES TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES. VOLTAGES WITH STAR (★) ARE ACTUAL OPERATING VOLTAGES IN HIGH RESISTANCE CIRCUITS MEASURED WITH ELECTRONIC VOLTMETER.

88967 & 95145
RC 444C

SEARS, ROEBUCK & CO.

MODEL 7915 Export
Chassis 126.238

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections	Across speaker voice coil
Output meter reading to indicate 1.0 watt output	1.5 volts
Approximate average sensitivity in microvolts for 1.0 watt output	See chart below
Dummy antenna value to be inserted in series with generator output	See chart below
Connection of generator output lead	See chart below
Connection of generator ground lead	To chassis
Generator modulation	30%, 400 cycles
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)	Trimmer Function	Approximate Microvolts
A Band	Low End	455 kc	.01 mfd.	6SF7 1-F Grid	L28, L29	2nd I-F Trans.	8,400
A Band	Low End	455 kc	.01 mfd.	6SA7 1st Det. Grid	L26, L27	1st I-F Trans.	154
31M Band	9.5 mc (20°)	9.5 mc	300 ohms	Ant.	L13, C2, C24	Osc.,** Ant., Det.**	8.4
31M Band	11.7 mc (171°)	11.7 mc	300 ohms	Ant.	C16	Osc.**	
B Band	9.5 mc (180°)	9.5 mc	300 ohms	Ant.	C11	Osc.**	
B Band	3.0 mc (0°) (Rock)	3.0 mc	300 ohms	Ant.	L12	Osc.**	11.0
A Band	1,500 kc (149°)	1,500 kc	.0002 mfd.	Ant.	C10, C3, C25	Osc., Ant., Det.	4.9
A Band	600 kc (27°) (Rock)	600 kc	.0002 mfd.	Ant.	L11	Osc.	3.5
25M Band	11.8 mc (33°)	11.8 mc	300 ohms	Ant.	L14, C20, C1	Osc.,** Det.,* Ant.	8.4
19M Band	15.2 mc (37°)	15.2 mc	300 ohms	Ant.	L15	Osc.*	10.5
16M Band	17.7 mc (40°)	17.7 mc	300 ohms	Ant.	L16	Osc.***	9.8
13M Band	21.5 mc (55°)	21.5 mc	300 ohms	Ant.	L17	Osc.***	15.4

IMPORTANT ALIGNMENT NOTES

*Rock gang condenser slightly while peaking. Use maximum capacity peak if two peaks can be obtained.

**Use peak with plunger out if two peaks can be obtained.

***Use peak with plunger in if two peaks can be obtained.

Note.—Oscillator tracks above signal on "A," "B," "31M," "25M" and "19M" bands; below signal on "16M" and "13M" bands.

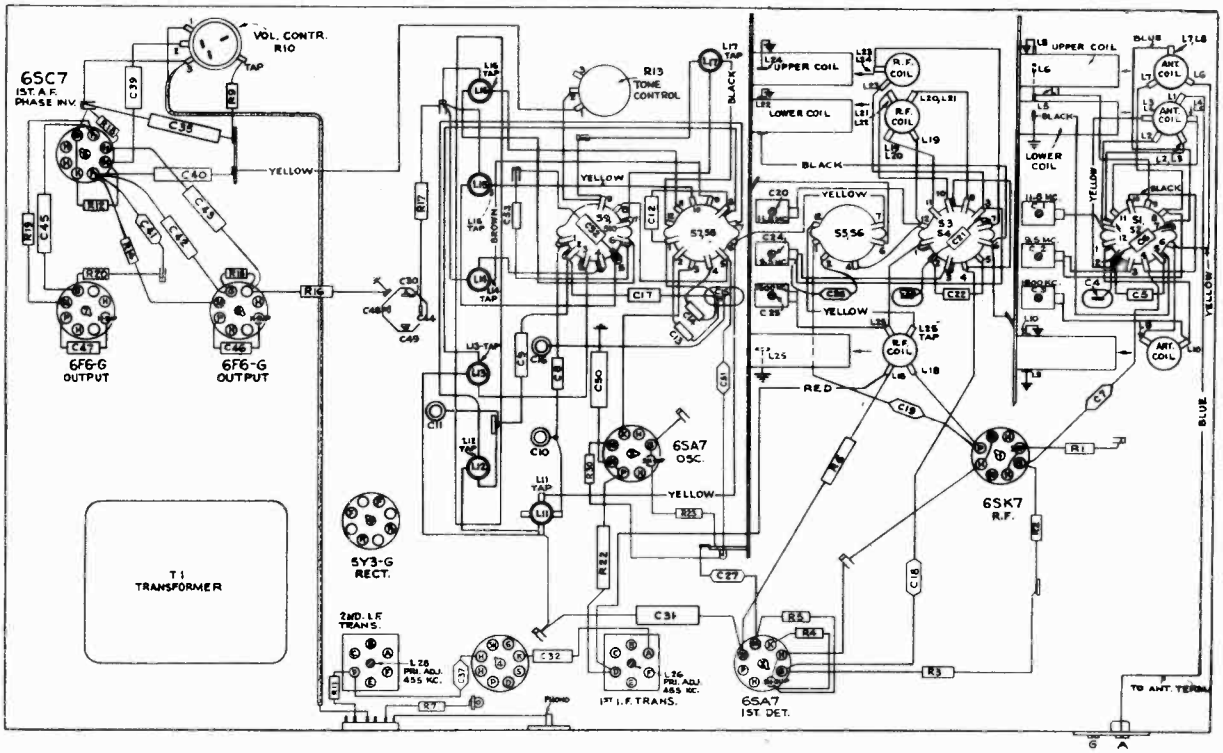
Where indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two while making this adjustment.

Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output of the generator at its lowest possible value to prevent the AVC action of the set from interfering with accurate alignment.

Adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band.

Values shown under "Microvolts" are only approximate.



TUBE, TRIMMER AND PARTS LOCATION—BOTTOM VIEW

MODEL 7915 Export
Chassis 126.238

SEARS ROEBUCK CO.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "0" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

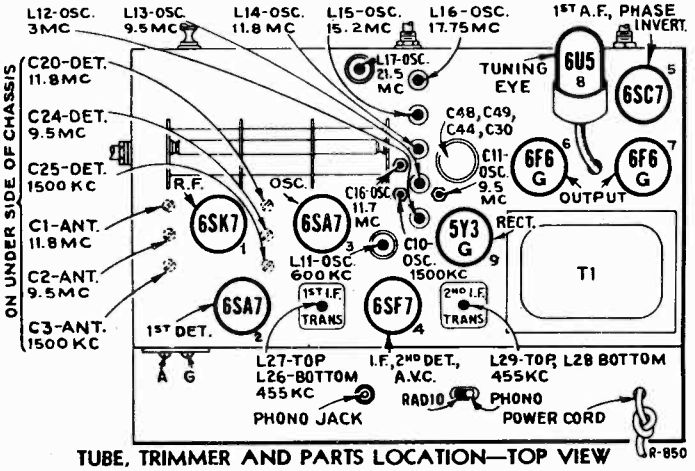
To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

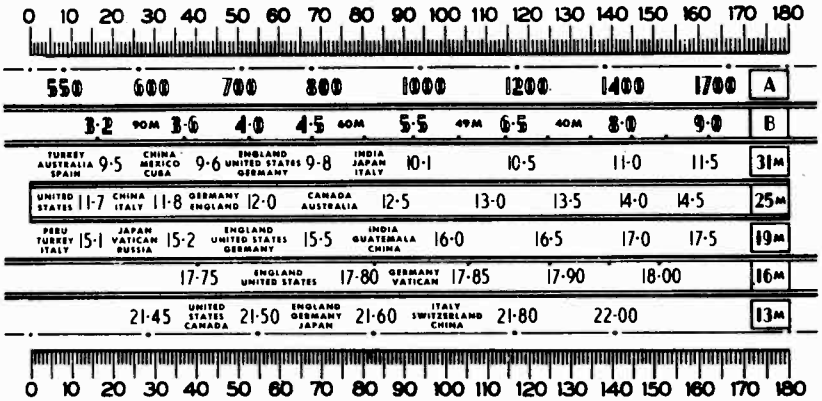
In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.



TUBE, TRIMMER AND PARTS LOCATION—TOP VIEW



Calibration Scale

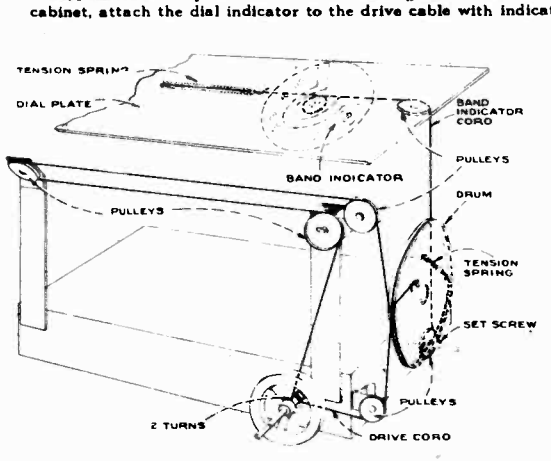
Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 27° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

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

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.



CONDENSER AND INDICATOR DRIVE CORD

Tuning Dial:

The tuning shaft is connected through a cord drive to a drum on the condenser shaft. A second cord drives the band indicator by passing over a pulley on the band switch shaft. The complete cord drive assembly and the correct number of turns which the cord should be wrapped around the drive shaft and condenser drum, is shown in "Condenser and Indicator Drive Cord" illustration.

Loudspeaker:

Type (63K5) ..... 8-inch Electrodynamic
Voice Coil Impedance ..... 2.2 ohms at 400 cycles

Power Supply:

105-120 volts, 25 cycle ..... 100 watts
105-130, 140-160, 200-250 volts, 60 cycle ..... 100 watts

Chassis Features:

Jack and Switch for Phonograph Attachment.
Magnetite-Core Adjusted I-F Transformers, and Oscillator Coils.
Automatic Volume Control.
High-Frequency Tone Control.
Aural-Compensated Volume Control.
R-F Stage on all Bands.
Spread Bands for Short Wave Reception.
Tuning Drive Ratio ..... 25 to 1

Power Output:

Type ..... Push Pull Pentode
Undistorted ..... 4.5 watts
Maximum ..... 5 watts

MODELS 3915, 8916, 8917, 8918, 8919, 8920
Chassis 138.120

SEARS ROEBUCK CO.

TUBES AND FUNCTIONS:

1 6J7G	Input	1 6W5G	Rectifier
1 6N7G	Driver	1 6N7G	3rd Stage
2 6L6G	Output		

POWER SUPPLY: . . . . . 110-125 Volts, 50-60 cycle, AC only, 115 Watts or 6 volts DC

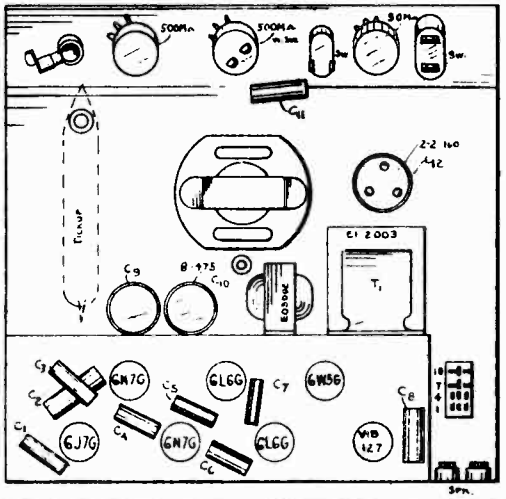
FREQUENCY CHARACTERISTICS. . . . . Curve-Substantially flat from 50 to 10,000 cycles

INPUTS:
1 input position to accomodate high impedance crystal, velocity, or no voltage velotron microphones, and one high impedance phono unit

PICKUP: - High impedance crystal type, 500M ohms

SPEAKERS: 12 inch permanent magnet type, 6 ohm voice coil. Standard equipment - Jensen type PM12C

GAIN . . . . . Approx. 124 DB

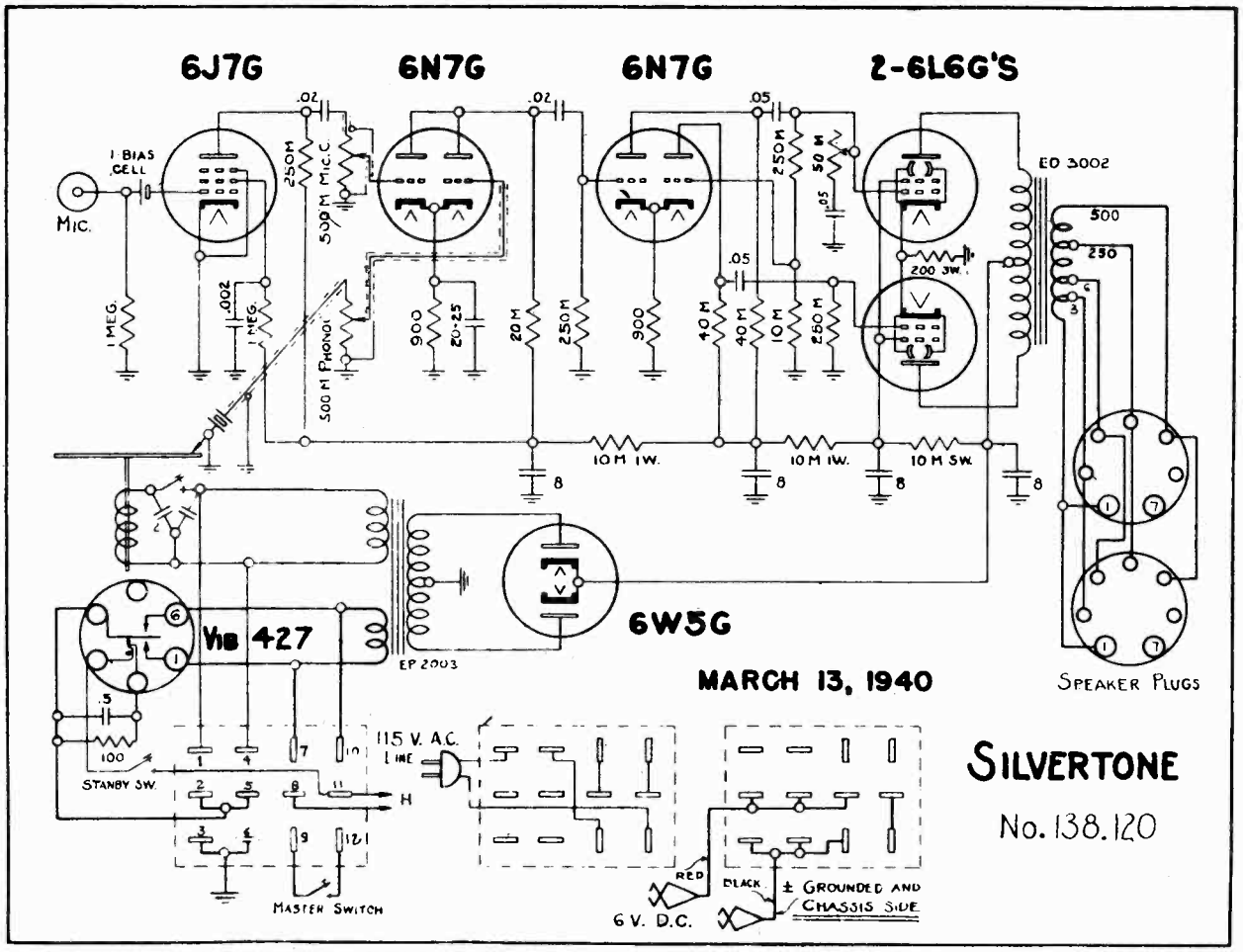


GENERAL INFORMATION AND SERVICE HINTS

This system is a combination 6 volt DC, 115 Volt 60 cycle AC system. Input is provided for one high impedance microphone. A self contained crystal pick-up and rim drive phono motor permit reproduction of recorded music.

When operated on a 6 volt storage battery the DC power is transformed to AC by means of a vibrator. AC operation is in the conventional manner.

To change from 6 volt operation it is only necessary to change from the 6 volt power cable to the AC cable. Each cable is equipped with a multi-point plug which makes proper connections when plugged into the amplifier. The 6 volt cable is equipped with two battery clips.



MODELS 8935, 8936,
8937, 8938,
8939, 8940,
8941, 8942

SEARS, ROEBUCK & CO.

Chassis 138.180

TUBE COMPLEMENT:

2	6J7G . . . . . Input	1	5V4G . . . . . Rectifier
1	6N7G . . . . . Driver	3	6C5G . . . . . 2nd Stage
2	6L6G . . . . . Output		

POWER SUPPLY:. . . . . .110-125 volts, 50-60 cycle, AC only, 135 watts

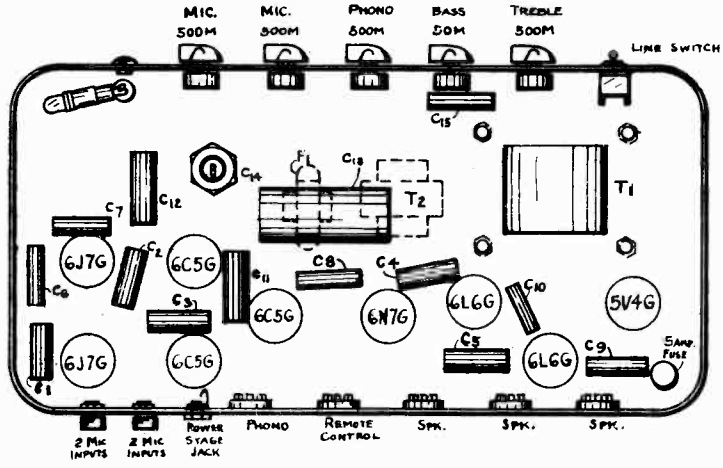
FREQUENCY CHARACTERISTICS. . .Curve-substantially flat from 50 to 10,000 cycles per second

INPUTS:
4 input positions each to accomodate high impendance crystal velocity, or no voltage velotron microphones, and one high impedance phono unit.

PICKUP:- High impedance crystal type, 500M ohms

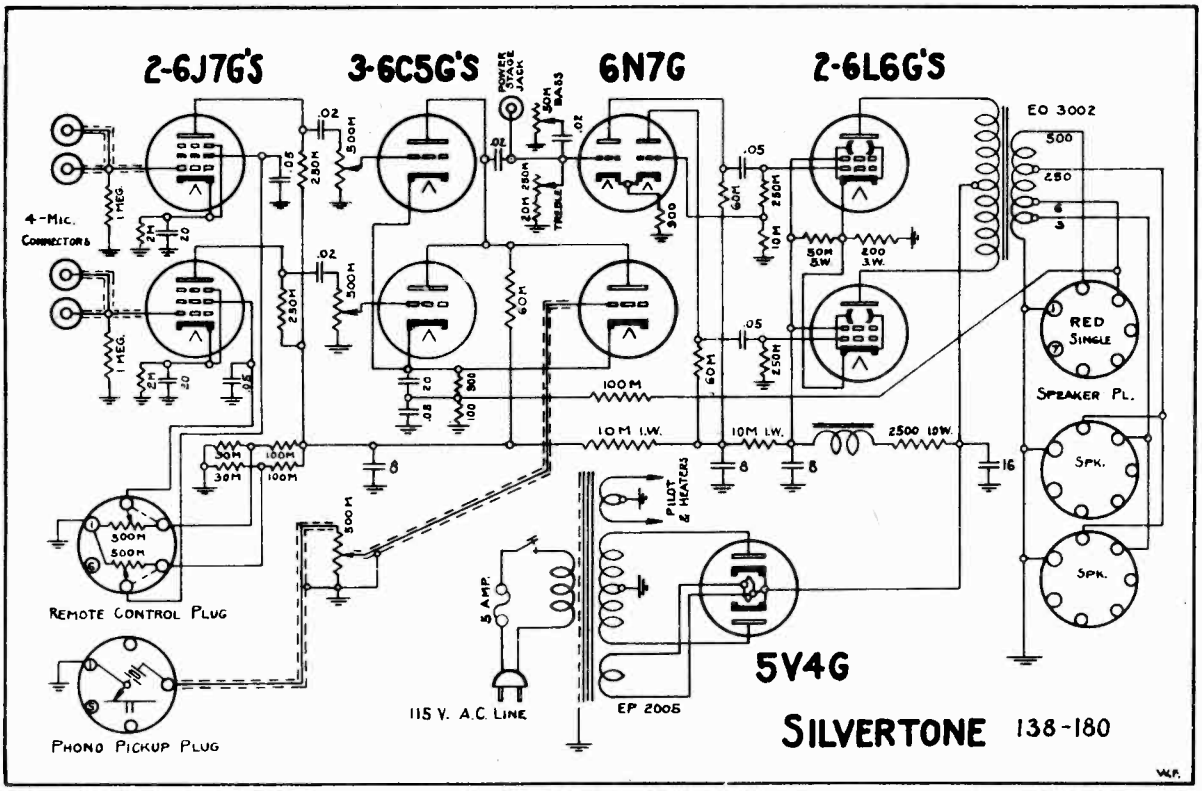
SPEAKERS: 12 inch permanent magnet type, 6 ohm voice coil. Standard equipment Jensen PM12H

GAIN:. . . . . Approximately 126 DB



MARCH 11, 1940

This unit contains a four stage amplifier having four high impedance microphone inputs feeding through 2 - 6J7G tubes which in turn feed two 6C5G's. The phono input feeds through a 6C5G, then both microphone and phono inputs feed into a 6N7G phase inverter which in turn feed 2 - 6L6G's. The rectifier is a 5V4G.



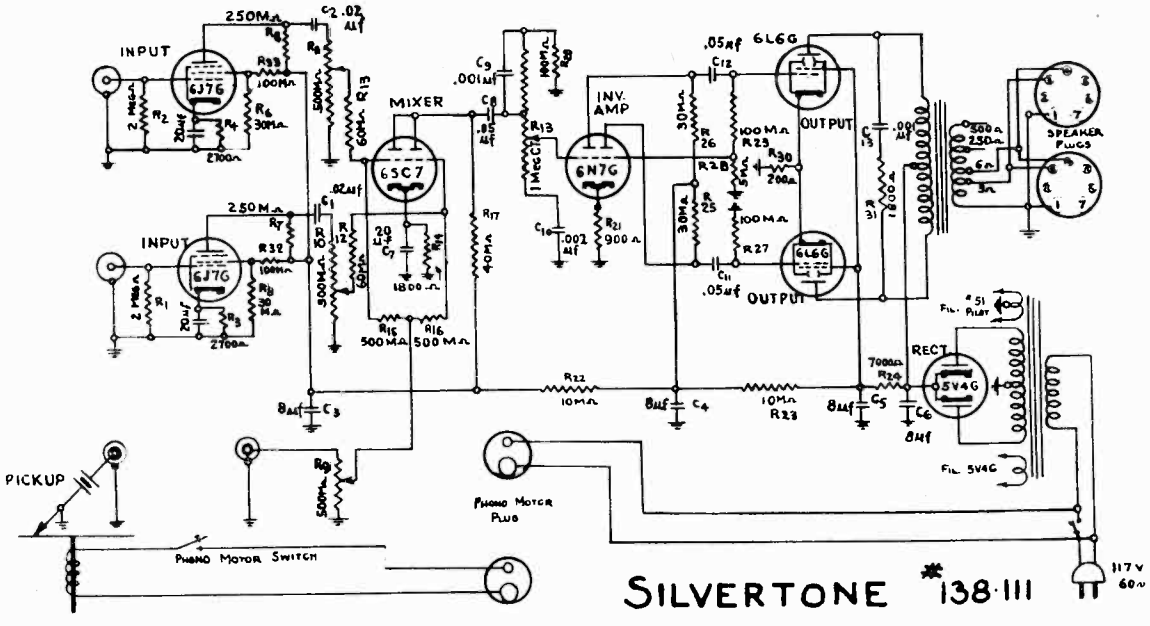
MODELS 12874, 12875
Chassis 138.007

SEARS, ROEBUCK & CO.

MODELS 12865, 12866, 12867
Chassis 138.111

22 WATT, 7 TUBE, 4 STAGE HIGH GAIN AMPLIFIER

MODELS 12865, 12866, 12867



APRIL 19, 1943

OUTPUT IMPEDANCE

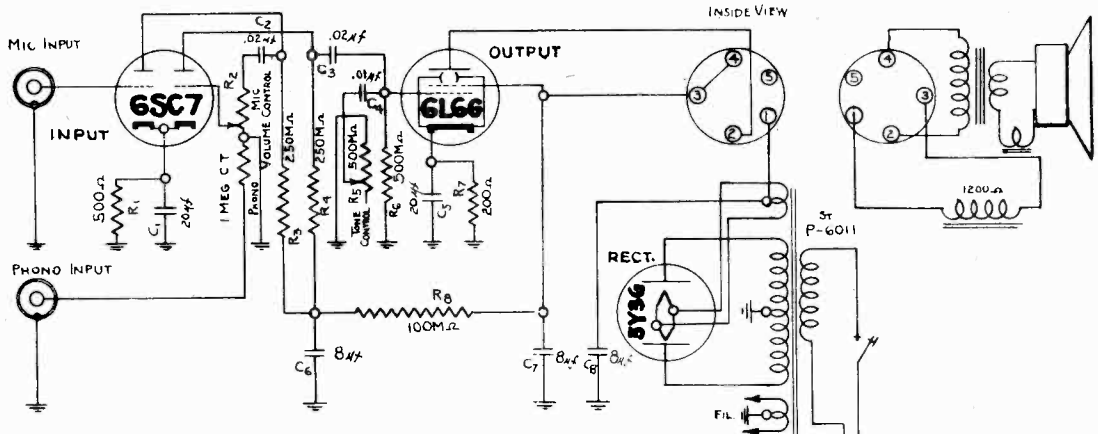
3, 6, 250 and 500 ohms

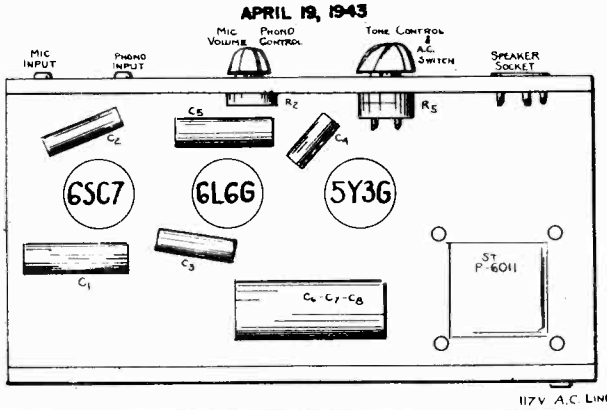
GAIN

Microphone - approx. 125 db
Phonograph - approx. 80 db

7 WATT, 3 TUBE, 2 STAGE AMPLIFIER

MODELS 12874, 12875





INPUTS

One input for crystal phono pick-up
One input for crystal or other high impedance microphone

OUTPUT IMPEDANCE

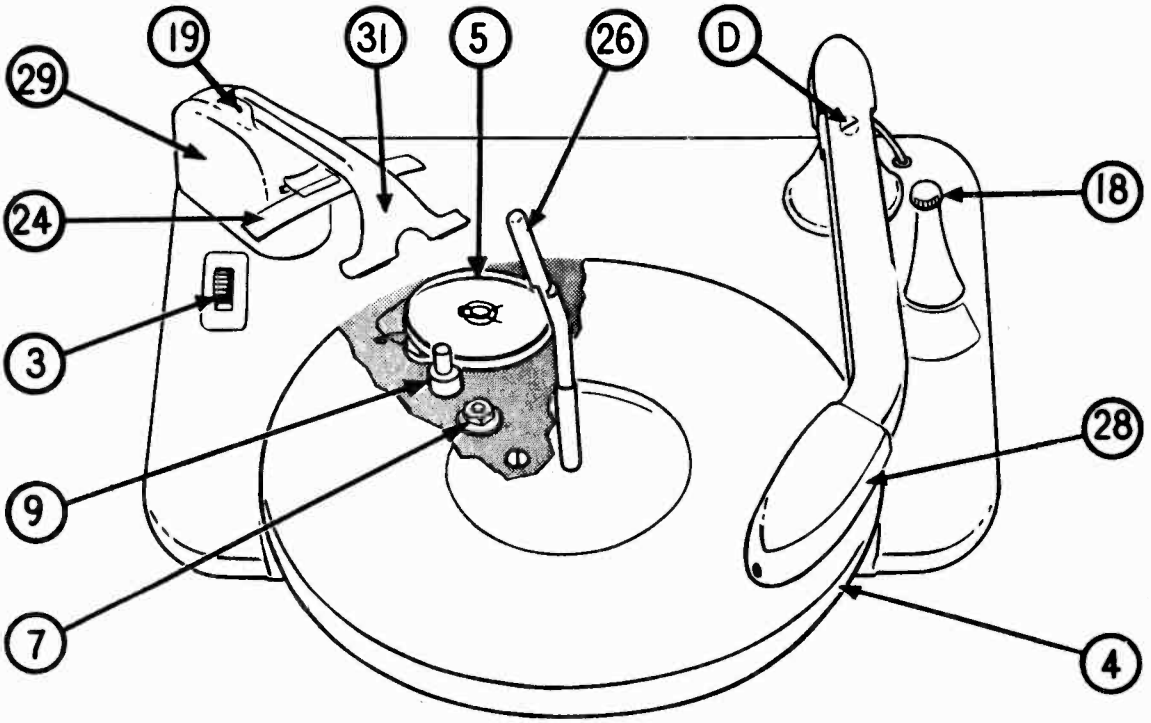
4000 ohms directly from plate of 6L6G
Field Supply for 1500 ohm speaker field

GAIN

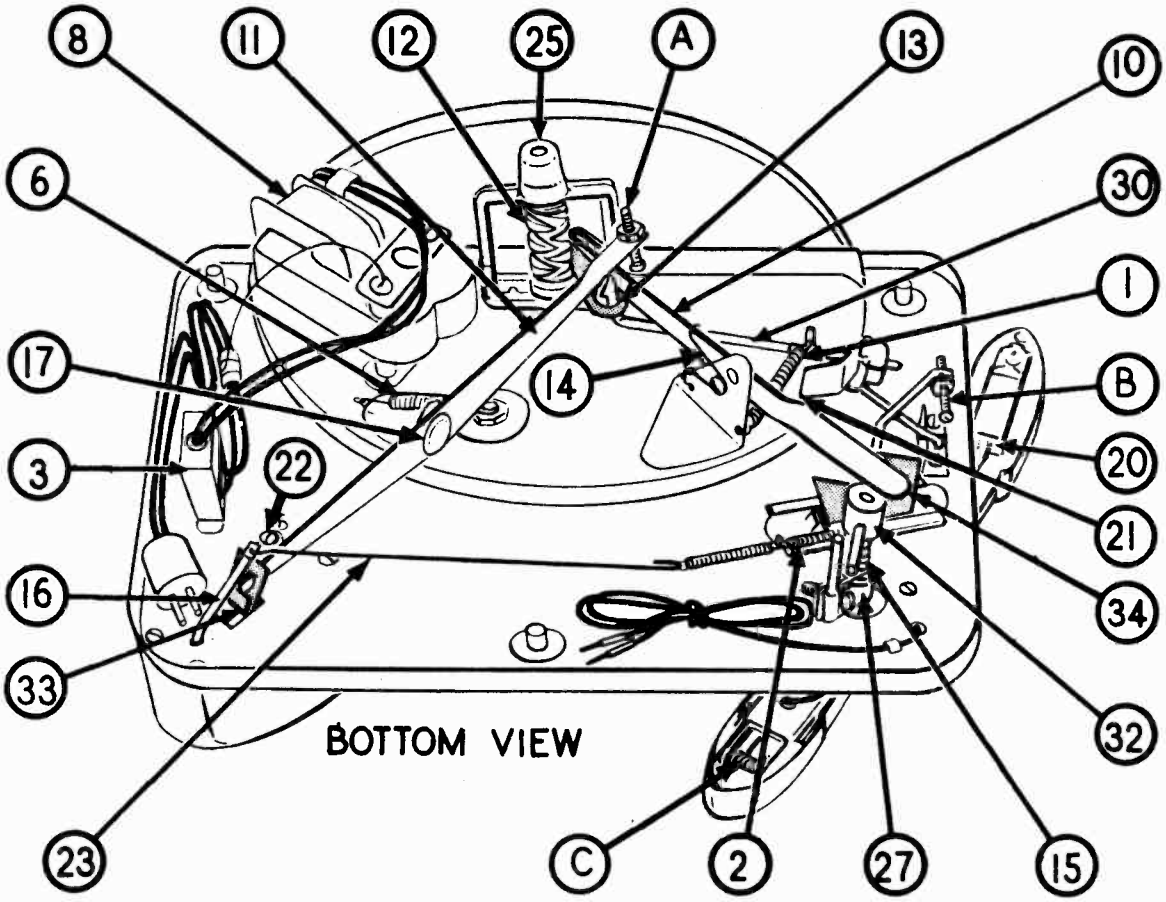
Microphone input-approximately 110 db
Phono input-approximately 70 db

MODEL 100.301
Record Changer

SEARS, ROEBUCK & CO.



TOP VIEW



BOTTOM VIEW

APRIL 30 1942

AUTOMATIC RECORD CHANGER USED IN CONJUNCTION WITH 100.384-1 CHASSIS

FACTORY IDENTIFICATION NO. 100.301

TROUBLES & THEIR REMEDIES

1. NOISE WHILE CYCLING
This trouble is caused by the FOLLOWER ARM (10) being bent out of position. Straighten the arm.

2. TURNTABLE RUBS
Loosen set screw on WORM (12) with an Allen wrench and raise the spindle about 1/16".

3. DOES NOT CYCLE WITH REJECT BUTTON
Check to see if TRIP LINK (30) is releasing FOLLOWER (13). If TRIP LINK releases FOLLOWER but will not center on threads of WORM, bend the FOLLOWER ARM (10).

4. MOTOR SLOWS DOWN DURING CYCLING
Bend paddle end of FOLLOWER ARM (10) down slightly or loosen the EJECTOR SCREW (22) slightly.

5. RECORDS DO NOT DROP
Tighten EJECTOR SCREW (22) slightly. Always check on full stack of 10-12" records. Set screw so that bottom record just falls.

6. RECORD DROPS ON TONE ARM
Bend back end of FOLLOWER ARM (10) up slightly. Make sure EJECTOR SCREW (22) is adjusted properly.

7. MECHANISM KEEPS REPEATING ON TOP OF WORM
Bend TRIP LINK (30) back slightly so as to loosen the TRIP SPRING (Diagram No. 1) tension on FOLLOWER (13). It may be necessary to first loosen the set screw on the TRIP. If this does not correct the trouble, check the FOLLOWER ARM (10) to make sure it is straight and bend slightly if necessary.

8. MECHANISM KEEPS REPEATING ON BOTTOM OF WORM
This indicates a bent FOLLOWER ARM (10). Straighten arm.

9. FOLLOWER FLUTTERS WHILE PLAYING
Check to see if FOLLOWER ARM (10) is all the way up to top of WORM (12), if not, bend arm slightly in toward WORM to stop binding.

10. FOLLOWER ARM BINDS
Bend FOLLOWER ARM away from fulcrum at both sides of rivet.

11. FOLLOWER JAMS

Bend FOLLOWER ARM to straighten.

12. TONE ARM DOES NOT LAND AT BEGINNING OF RECORD OR MISSES RECORD ENTIRELY
Check EJECTOR to see if it is set for correct size of record. If EJECTOR is set for correct record size, the SET DOWN POSITION ADJUSTMENT should be loosened and the position of the TONE ARM adjusted as described under "TONE ARM SET-DOWN POSITION ADJUSTMENT."

13. TONE ARM DOES NOT GO INTO CYCLE AT END OF RECORD
Check to see if record has spiral finishing groove. If it has not, reject record by means of REJECT BUTTON. If trouble lies with mechanism, adjust screw "B" as described under "TONE ARM TRIP POSITION ADJUSTMENT."

14. RECORDS WEAR EXCESSIVELY
Check needle to see if worn out or defective. If needle is not cause of wear, lift the tone arm and increase the tension of the spring at the base as described under "NEEDLE PRESSURE ADJUSTMENT."

15. TONE ARM SLIPS OUT OF RECORD GROOVES OR SLIDES ACROSS RECORD
This is usually due to insufficient needle pressure. The needle pressure may be increased by loosening the spring tension at the base of the tone arm as described under "NEEDLE PRESSURE ADJUSTMENT."

16. TONE ARM SLIDES ACROSS TOP RECORD OF STACK
This is due to the tone arm having insufficient height to clear the top record on the turntable. This can be remedied by raising the tone arm height by means of the "TONE ARM HEIGHT ADJUSTMENT 'D'."

17. "WOW" IN RECORD REPRODUCTION
This is usually due to worn rubber rim on the idler wheel. If this is the case, replace the idler wheel.

DESCRIPTION OF CYCLE

To start the cycle on models with a switch on the base plate or on the radio control panel, turn on the switch and press down on the TONE ARM. This depresses the REJECT BUTTON (#18 on Diagram) on top of the rest post, which in turn through TRIP LINK (30) engages the FOLLOWER (13), starting the cycle.

When FOLLOWER (13) engages in WORM (12), FOLLOWER ARM (10) is pivoted at the pivot, lifting CRANK (32) which raises TONE ARM. CRANK (32) is fastened to the lift pin. As this rises and strikes the incline at the angular upper end of the INDEX PLATE (34), it causes a rotation of the CRANK (32) which in turn contacts the CRANK PIN (27) fastened to the TONE ARM shaft and swings the TONE ARM inward until the CRANK (32) strikes INDEX PLATE (34). Then as the FOLLOWER (13) returns to its starting position, the CRANK (32) drops, setting the TONE ARM on the record.

The set down position for 10" or 12" records is automatically controlled when the ejector is positioned so that the edge of the 10" or 12" records rest on the support bracket. The RECORD EJECTOR (24) can be set in the 10" or 12" position by merely slightly lifting it and pulling or pushing it in or out until the 10" or 12" numbers show at the edge of the opening in the housing.

ADJUSTMENTS

All adjustments can be made with record changer disconnected from the power outlet.

TONE ARM SET-DOWN POSITION ADJUSTMENT: To adjust the set-down position of the tone arm, trip the reject button and turn the turntable by hand in a clockwise direction until the CRANK (Diagram No. 32) strikes the INDEX PLATE (Diagram No. 34) and the TONE ARM starts downward toward the record. Loosen the screw on #27 and, holding the CRANK in contact with the lower portion of the INDEX PLATE, move the TONE ARM until it is directly above a point 1/8" in from the outside of a record of the size indicated on the EJECTOR SLIDE (24). Retighten the screw and carry the mechanism through the remainder of the cycle.

EJECTOR ARM SETTING (A): The adjustment of screw "A" determines the point in the cycle in which the next record falls. Turning the screw clockwise causes record falling to be delayed, while turning the screw counter-clockwise causes the records to fall earlier in the cycle. This screw should be adjusted using a 12 inch record in the 12 inch position. Adjust the screw so that the record falls when the tone arm has moved to its extreme outside position in the change cycle. Tighten the locking nut after the adjustment has been made.

TONE ARM TRIP POSITION ADJUSTMENT (B): The trip position is adjusted by screw "B". For proper operation the screw should be adjusted to trip the mechanism at the eccentric finishing groove on a record. This will assure satisfactory operation for the majority of records in use. Turning the screw clockwise will cause earlier tripping of the mechanism; turning counter-clockwise will delay the tripping. Tighten the locking nut on the screw when the correct adjustment has been obtained.

NEEDLE PRESSURE ADJUSTMENT (C): To increase the weight on the needle, should it jump grooves or slide across the grooves too easily, lift the tone arm, and relieve the spring tension by releasing the small sprocket wheel a quarter turn at a time. On the other hand, should the records and needle wear too fast, increase the spring tension with the sprocket to decrease the needle pressure.

TONE ARM HEIGHT ADJUSTMENT (D): The height to which the tone arm rises during the change cycle is governed by the adjustment of the screw under the tone arm on the top of the tone arm post. Turning this ecrew clockwise will lower the height to which the tone arm rises and vice versa. The proper adjustment may be made by placing 12 ten inch records on the turntable and adjusting the screw to the point where the tone arm clears the top record during the change cycle.

EJECTOR SETTING: The small screw, (Diagram No. 22), makes two adjustments: It varies the tension of the spring used on the EJECTOR mechanism (24); and it also moves the stationary position of the EJECTOR with respect to the rest of the mechanism. To lower the spring tension on the EJECTOR, loosen the lock nut on the screw and turn the screw counter-clockwise. Turning the screw counter-clockwise also moves the EJECTOR farther away from the SPINDLE. Turning the screw clockwise increases the tension of the EJECTOR spring and also moves the EJECTOR closer to the SPINDLE.

The correct adjustment of the screw may be obtained as follows:

Set the EJECTOR for 12" records and place ten 12" records on the spindle. Turn the turntable by hand and observe record dropping. The screw should be adjusted so that the bottom record just falls. The screw is correctly set when almost entirely in the "out" position. The spring tension on the EJECTOR is then relatively small and stalling of the motor is less likely to occur.

NOTE: After adjusting this screw, check the adjustment of "A". Remember to tighten the locking nut after adjusting a screw.

MODEL 101.202
Record Changer

SEARS ROEBUCK CO.

SILVERTONE

RADIO REPAIR PARTS PRICE LIST AND SERVICE INSTRUCTIONS

AUTOMATIC RECORD CHANGER AND HOME RECORDER UNIT

FACTORY IDENTIFICATION NO. 101.202

Authorized Replacement Parts for this model may be obtained from any Sears, Roebuck and Co. Retail Store or Mail Order branch. Always give part numbers and the chassis identification number.

The following description should help greatly in analyzing the cause of any mechanical trouble that may be encountered. The reference numbers serve to identify parts shown on the accompanying photographs.

AUTOMATIC CHANGING CYCLE

After the RECORDS have been arranged in the desired order, move the MOVABLE RECORD SUPPORT (24) to the proper position. The FRICTION SPRING (38) will hold it in position. Load the RECORDS on the SPINDLE (2) and bring the HOLD DOWN FINGER (26) to rest on the top RECORD. Move the CONTROL BUTTON (16) to the REJ position and release. It will be returned to the AUT position by the INDEX SPRING ASSEMBLY (39) acting against the CONTROL LEVER ASSEMBLY (15). These operations will have started the TURNTABLE (1) rotating and tripped MECHANISM. The STUD in the CONTROL LEVER (15) has contacted and rotated the AUTO TRIP LEVER (13) until the STUD in the AUTO TRIP LEVER (13) is released from the NOTCH in the AUTO TRIP CAM (31).

Then the DRIVE WHEEL CARRIER LEVER (12) rotates on STUD (40), being pulled by the SPRING (34) until the DRIVE WHEEL (27) contacts the inside of the RIM of the TURNTABLE (1). The SPRING (34) maintains this contact during the change cycle. The rotating TURNTABLE (1) now drives the DRIVE WHEEL (27) to which is attached at the lower end of the SMALL SHAFT the FRICTION DRIVE PULLEY (28). This rotary motion is transmitted through the INTERMEDIATE DRIVE WHEEL AND PINION ASSEMBLY (29) to the MAIN CAM ASSEMBLY (30) causing it to rotate. The TONE ARM (6) is first lifted vertically, through the LIFT PIN (8), then swings outward and is held there until after the RECORD has dropped onto the TURNTABLE (1).

The feeding of the RECORDS is as follows: The ROLLER mounted on the FEED LEVER (17) rides against the WALL on the BOTTOM SIDE of the MAIN CAM (30), pulled by the SPRING (36). This WALL RECEDES at the proper time and allows the SPRING (36) to rotate the FEED LEVER (17), which is pivoted on the ALIGNING BRACKET (20). The opposite end of the FEED LEVER (17) is connected to the INTERMEDIATE FEED LEVER (18), which pivots in the FEED SUPPORT (23).

The upper end of the INTERMEDIATE FEED LEVER (18) engages a ROUND HOLE in the FEED FINGER (19) so that the motion being transmitted can be effective for either 10 INCH or 12 INCH RECORDS. As this FEED FINGER (19) slides forward, it contacts the BOTTOM RECORD of the stack. Only the BOTTOM RECORD has clearance between the bottom of the CAP (3) and the LEDGE of the SPINDLE (2). It is carried forward until it drops from the LEDGE onto the TURNTABLE (1). Now, of course, the next RECORD comes down to rest on the SPINDLE (2).

The MAIN CAM (30) continues its rotation and resets the feed mechanism, pulling the FEED FINGER (19) back to its original position. Also the TONE ARM (6) is swung back to a position over the EDGE of the RECORD. This is done by the WALL on the TOP SIDE of the CAM (30) and later by the LEAF SPRING (41) working against the PIN in the SWEEP LEVER (9), which is clamped to the SLEEVE (7). This SLEEVE (7) extends up through the MOTORBOARD (42) to the TONE ARM (6).

The purpose of the LEAF SPRING (41) is to provide a FLEXIBLE MEMBER which will thrust the PIN in the SWEEP LEVER (9) against the STOP LEVER (11) but, nevertheless, allow PIN to stop against whichever STEP has been set up.

The SELECTION of the proper STEP on the STOP LEVER (11) is the means of automatically bringing the NEEDLE down on the EDGE of the RECORD to be played. The STOP LEVER (11) pivots on a stud attached to the MOTORBOARD (42). The opposite end of the STOP LEVER (11) rests against the STOP SELECTOR ROD (22) for 12 INCH RECORDS and against the STOP SELECTOR DOG (21), attached to the STOP SELECTOR ROD (22), for 10 INCH RECORDS.

The STOP SELECTOR ROD (22) extends upward through the MOTORBOARD (42) and FEEDER SUPPORT (23) to connect with a SWIVEL in the MOVABLE RECORD SUPPORT (24). Thus the DROP POINT for the NEEDLE is SET AUTOMATICALLY when the MOVABLE RECORD SUPPORT (24) IS POSITIONED, for the proper size RECORD.

SEARS ROEBUCK CO.

As the MAIN CAM (30) continues its rotation the PULL IN SPRING (33), attached to the SWEEP LEVER (9), holds the PIN against the STOP LEVER (11), while the LEAF SPRING (41) moves clear of the PIN. During this cam movement the TONE ARM (6) is lowered slowly until the NEEDLE rests on the EDGE of the RECORD.

As the MAIN CAM (30) nears HOME POSITION the ROLLER on the FEED LEVER (17) rolls over a PEAK on the CAM WALL and at this moment the NOTCH in the AUTO TRIP CAM (31) pulls against the STUD in the AUTO TRIP LEVER (13), rotating the DRIVE WHEEL CARRIER LEVER (12) and disengaging the DRIVE WHEEL (27) from the RIM of the TURNTABLE (1).

The engagement of the STUD in the AUTO TRIP LEVER (13) with the NOTCH in the AUTO TRIP CAM (31) is maintained by the TRIP LEVER SPRING (37).

At this time the SPRING (36)performs a HOMING function, that is, it pulls the ROLLER on the FEED LEVER (17) down the SLOPE on the CAM WALL into the HOMING NOTCH, holding, the MECHANISM in proper position and adding a little clearance between the DRIVE WHEEL (27) and the TURNTABLE (1). During the last movement of the CAM(30) the PROJECTION ON THE CAM (30) engages the bent down EAR on the STOP LEVER (11) rotating the STOP LEVER (11) out of range of the PIN in the SWEEP LEVER (9) allowing the TONE ARM (6) to move freely across the RECORD. If the EDGE of the RECORD has a STARTING SPIRAL the NEEDLE will be LEAD into the MUSIC GROOVES. If the EDGE of the RECORD is SMOOTH the PULL IN SPRING (33) will PULL the NEEDLE into the MUSIC GROOVES.

The SLEEVE (4) on the SPINDLE (2) reduces to a MINIMUM the FRICTION of the RECORDS rubbing against the SPINDLE (2). The downward load of the TURNTABLE (1) and RECORDS is carried on the THRUST BEARING (5).

There are TWO AUTOMATIC means of TRIPPING the MECHANISM besides the REJ position of the CONTROL BUTTON (16) described previously.

The POSITIVE TRIP operates as follows: The TONE ARM (6) moving in toward the SPINDLE (2) carries with it the SWEEP LEVER (9), which contacts the HEAD of the POSITIVE TRIP SCREW (32) mounted in the AUTO TRIP LEVER (13). Thus the AUTO TRIP LEVER (13) is rotated until the STUD is released from the NOTCH in the AUTO TRIP CAM (31).

The RATCHET TRIP operates as follows: As the TONE ARM (6) moves across the RECORD the TOOTHED EDGE of the SWEEP LEVER (9) rides against the PAWL (14) mounted on the AUTO TRIP LEVER (13). When the NEEDLE follows into the ECCENTRIC GROOVE an OSCILLATING movement is imparted to the SWEEP LEVER (9). During the OUTWARD movement the TEETH in the EDGE of the SWEEP LEVER (9) catch on the PAWL (14), causing it to STAND UP, rotating the AUTO TRIP LEVER (13) and releasing the STUD from the NOTCH in the AUTO TRIP CAM (31).

THE AUTOMATIC LOCKOUT MECHANISM

When making a RECORDING or when playing RECORDS MANUALLY the AUTOMATIC LOCKOUT LEVER (44) when depressed at the end marked "R" interferes with the CONTROL LEVER (15) so that it cannot be moved into AUT or REJ position. Also an INTERFERENCE or LOCKED condition is maintained between the end of the CONTROL LEVER (15) and the STUD near the outer end of the DRIVE WHEEL CARRIER LEVER (12) so that the CARRIER LEVER (12) CANNOT ROTATE even though the STUD in the AUTO TRIP LEVER (13) is swung out of the NOTCH in the AUTO TRIP CAM (31).

THE AUTOMATIC FEED FOR THE CUTTER ARM

The TURNTABLE HUB (45) acting as a PULLEY drives the RUBBER TIRE WHEEL (46). To this WHEEL (46) is attached the PINION (47) which drives the GEAR (48). The Pinion (49) is attached to Gear (48) and drives the GEAR (50). Attached to the GEAR (50) is the DRIVE PULLEY (51) which drives the RUBBER COVERED SECTOR (52). As the CUTTER ARM (54) is brought into the EDGE of the RECORDING BLANK the SECTOR (52) engages the DRIVE PULLEY (51) and the STYLUS is then FED across the RECORD, cutting about 110 LINES PER INCH. The STYLUS will continue its inward travel until a distance from the SPINDLE (2) of about 1 5/8 inches is reached. The CUTTER ARM should then be lifted and can be pulled back toward its rest, overcoming the FRICTION of the SECTOR (52) against the DRIVE PULLEY (51) in doing this.

ADJUSTMENT OF THE RECORDER FEED MECHANISM

The positions of the three STUDS (55, 56 and 57) have been very carefully set at the factory and should not require any adjustment. However, if it is certain that the position of one or more of these studs has shifted, proceed as follows: Remove the TURNTABLE (1) and loosen the THREE NUTS (58) on the bottom of the MOTORBOARD (42). Remove the GEAR & PINION ASSEMBLY (48-49). Tighten the NUT (58) on STUD (55) very slightly until the STUD (55) will hold its position definitely, but can be shifted readily by light blows on the sides of the NUT (58).

HOLD THE TURNTABLE (1) LEVEL AND ROTATE TO AND FRO AS IT IS LOWERED. THIS WILL ALLOW THE HUB (45) TO ROLL INTO ENGAGEMENT WITH THE DRIVE WHEEL (46). Move the STUD (55) a little at a time until DEFINITE, but NOT EXCESSIVE FRICTION is established between the rubber tire of DRIVE WHEEL (46) and the TURNTABLE HUB (45).

The friction can be tested by taking a long pencil and holding the ERASER against the DRIVE WHEEL TIRE (46) while rotating the TURNTABLE (1) slowly by hand. The FORCE thus applied against the PENCIL ERASER should seem CONSIDERABLE although the friction should not be great enough to SLOW DOWN the TURNTA SPEED.

MODEL 101.202

SEARS ROEBUCK CO.

The next step, with the TURNTABLE (1) removed, is to adjust the STUD (57). The NUT (58) on this STUD (57) should be tightened slightly as described before and the STUD (57) should be moved as previously mentioned, a little at a time, until a DEFINITE but NOT EXCESSIVE FRICTION is established between the DRIVE PULLEY (51) and the SECTOR (52). This adjustment can be tested as follows: By swinging the CUTTER ARM (54) to and fro the SECTOR (52) should SPIN the GEAR & DRIVE PULLEY (50-51) EASILY when they are not held. Now, when the GEAR (50) is held there should be CONSIDERABLE DRAG of the SECTOR (52) against the DRIVE PULLEY (51) when the CUTTER ARM (54) is swung to and fro as before.

The GEAR & PINION ASSEMBLY (48-49) should now be replaced on STUD (56). The STUD (56) should be shifted a little at a time, as before stated, until a fairly close mesh of the gear teeth is attained at all points (47-48) and (49-50). The GEARS AND PINIONS MUST NOT BIND AT ANY POINT however. After this setting has been established, carefully tighten all three NUTS (58).

A final check of these adjustments can be made with a testing recording, to see whether a proper spacing of the grooves is being maintained. Speed can be checked by means of a standard STROBOSCOPE disc for 78 RPM turntables. The speed check to be made while STYLUS IS CUTTING.

ELEVATION OF THE CUTTER ARM

The elevation of the CUTTER ARM (54) has been set at the factory and should not need any adjustment. The procedure is very simple in case it should become necessary, however. The ELEVATION ADJUSTING SCREW is turned COUNTER CLOCKWISE to RAISE and CLOCKWISE to LOWER the CUTTER ARM (54). (This screw can be seen in the CUTTER ARM BRACKET (53) when the CUTTER ARM (54) is raised). The NUT is used to lock the ELEVATION ADJUSTING SCREW in place after making adjustment. The LOWER EDGE of the CUTTER ARM (54) should be PARALLEL with the TOP SURFACE of a SINGLE RECORDING DISC laying on the TURNTABLE.

ADJUSTMENTS OF THE CHANGER MECHANISM

If the RUBBER DRIVE PULLEY (28) does not have enough friction against the INTERMEDIATE DRIVE WHEEL (29), the mechanism may not be driven through the complete cycle. Also, the slipping that will occur in this case will soon wear a groove in the RUBBER PULLEY (28) requiring early replacement of the part. The friction can be increased by loosening the BOTTOM of the two NUTS (43), running both NUTS (43) up a little tighter against the RUBBER PULLEY (28) and then locking the two NUTS (43). Too much friction of the PULLEY (28) against the INTER. DRIVE WHEEL (29) may cause the TRIPPING of the mechanism to be SLUGGISH. Also the MAIN CAM (30) may NOT pull HOME.

If the RECORD SUPPORTS (24-25) get damaged, the RECORDS MAY NOT REST EVENLY on all BUTTONS. In this case the RECORD SUPPORTS (24-25) should be straightened until the TOP SURFACES OF ALL BUTTONS are the same VERTICAL DISTANCE from the MOTORBOARD (42). Care must be taken to see that the BUTTONS on the MOVABLE RECORD SUPPORT (24) are correct for BOTH 10 INCH and 12 INCH positions.

If the TONE ARM (6) has been strained out of position, it can be reset as follows: Loosen the SCREW (10) in the SWEEP LEVER (9) just enough to allow a reasonable amount of friction between the SWEEP LEVER (9) and the SLEEVE (7). Then by holding the SWEEP LEVER (9) and moving the TONE ARM (6) the estimated correct amount, the new setting can be tested as follows: Trip the mechanism (WITH POWER OFF), by moving the CONTROL BUTTON (16) to REJ and release. Then rotate the TURNTABLE (1) by hand until the NEEDLE is coming down and is about 1/16 inch above the record. IF THE NEEDLE IS NOT ABOUT 1/8 INCH inside the EDGE of the RECORD, the correction can be made with the CAM (30) in this position. Very carefully, hold the PIN in the SWEEP LEVER (9) against the STOP LEVER (11) and move the TONE ARM (6) to the proper position (NEEDLE 1/8 INCH INSIDE EDGE OF RECORD). BE SURE THE MOVABLE RECORD SUPPORT (24) IS SET FOR THE SIZE RECORD THAT IS ON THE TURNTABLE (1). Make certain that about 1/64 INCH END PLAY IS MAINTAINED AT THE TONE ARM PIVOT SLEEVE (7) before tightening the CLAMP SCREW (10) on the SWEEP LEVER (9).

The ELEVATION of the TONE ARM (6) can be adjusted as follows: Remove the LIFT PIN (8) and STRAIGHTEN THE BEND of the PIN (8) slightly to RAISE the TONE ARM (6). To LOWER the TONE ARM (6) the LIFT PIN (8) should be BENT more nearly to the shape of a RIGHT ANGLE. The amount of bending to be slight until the PIN (8) is tried again. BE CAREFUL NOT TO KINK THE LONG LEG OF THE PIN (8). THERE IS DANGER OF CAUSING A BIND IN THE SLEEVE (7).

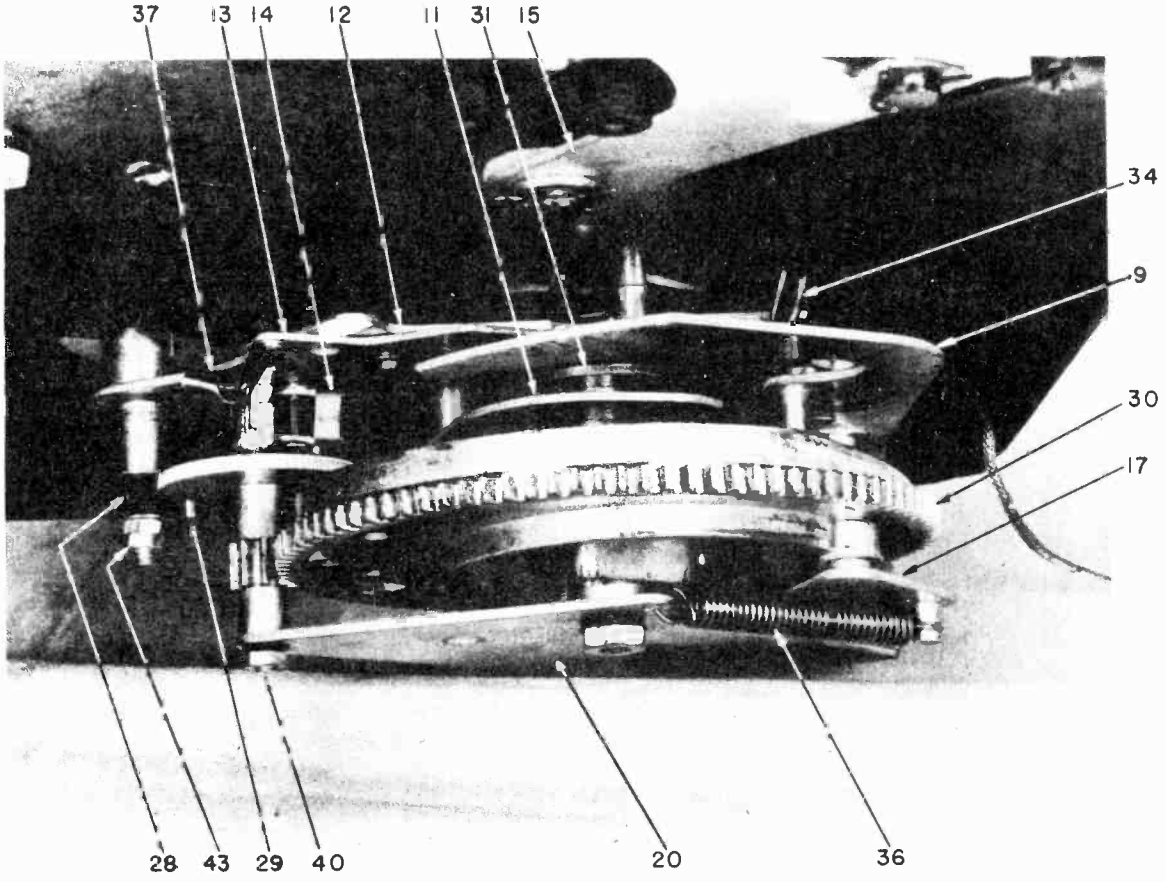
The POSITIVE TRIP SCREW (32) should be turned COUNTER-CLOCKWISE for an EARLIER TRIP and CLOCKWISE for a LATER TRIP.

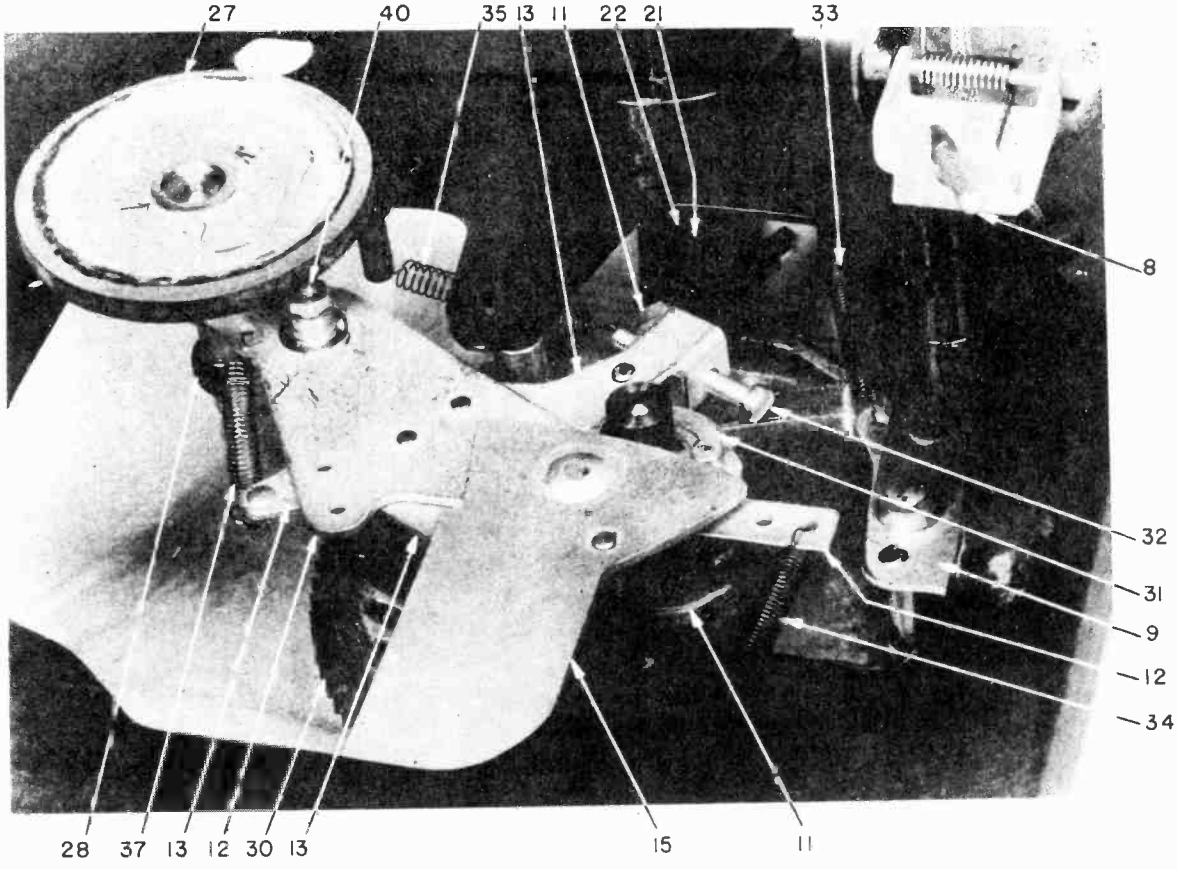
LUBRICATION

The THRUST BEARING (5) may be lubricated with a LIGHT GREASE. Any of the other bearings may be lubricated with a GOOD QUALITY LIGHT OIL. DO NOT ALLOW ANY LUBRICANT TO COME IN CONTACT WITH ANY RUBBER PART OR, WITH ANY FRICTION DRIVE PART EITHER RUBBER OR OTHER MATERIAL.

MODEL 101.202

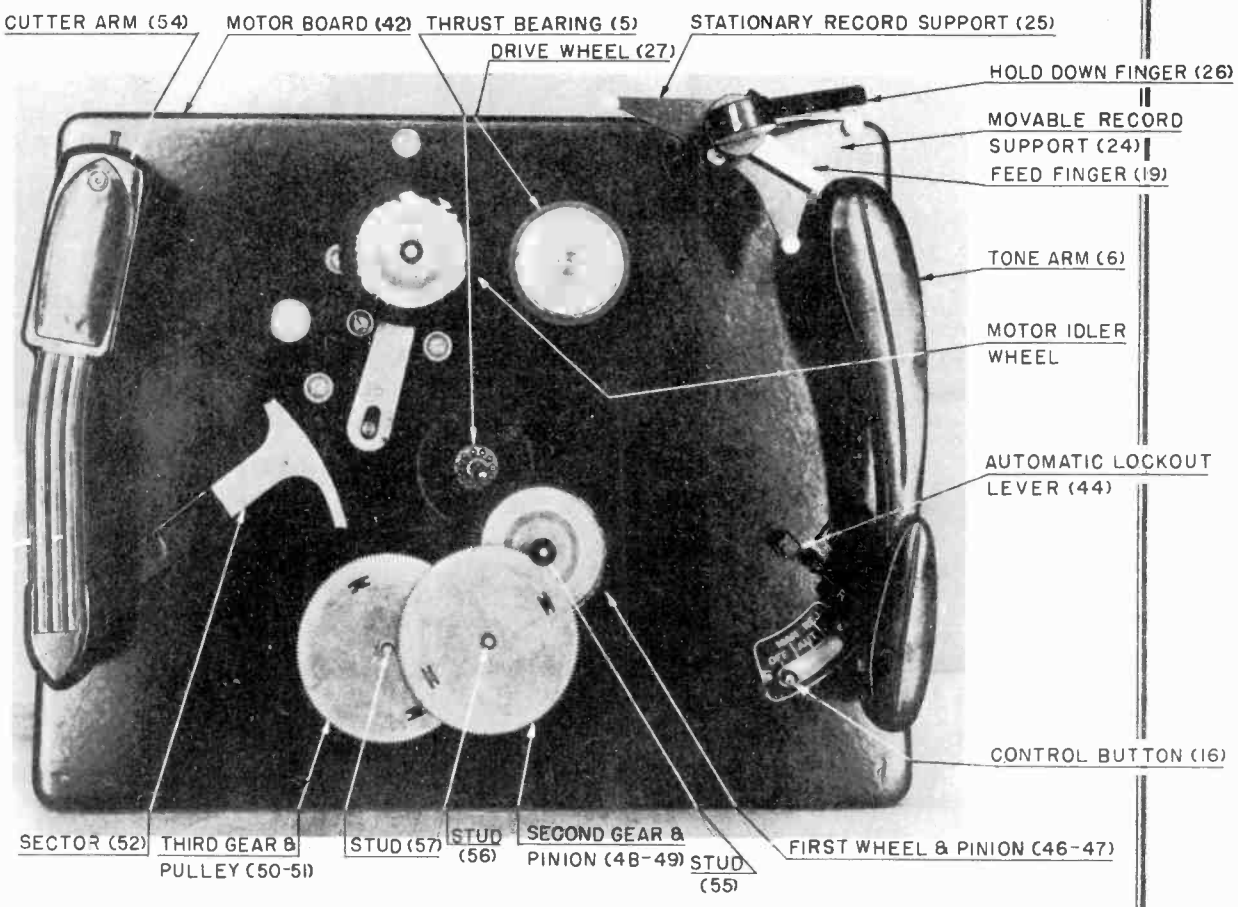
SEARS, ROEBUCK & CO.

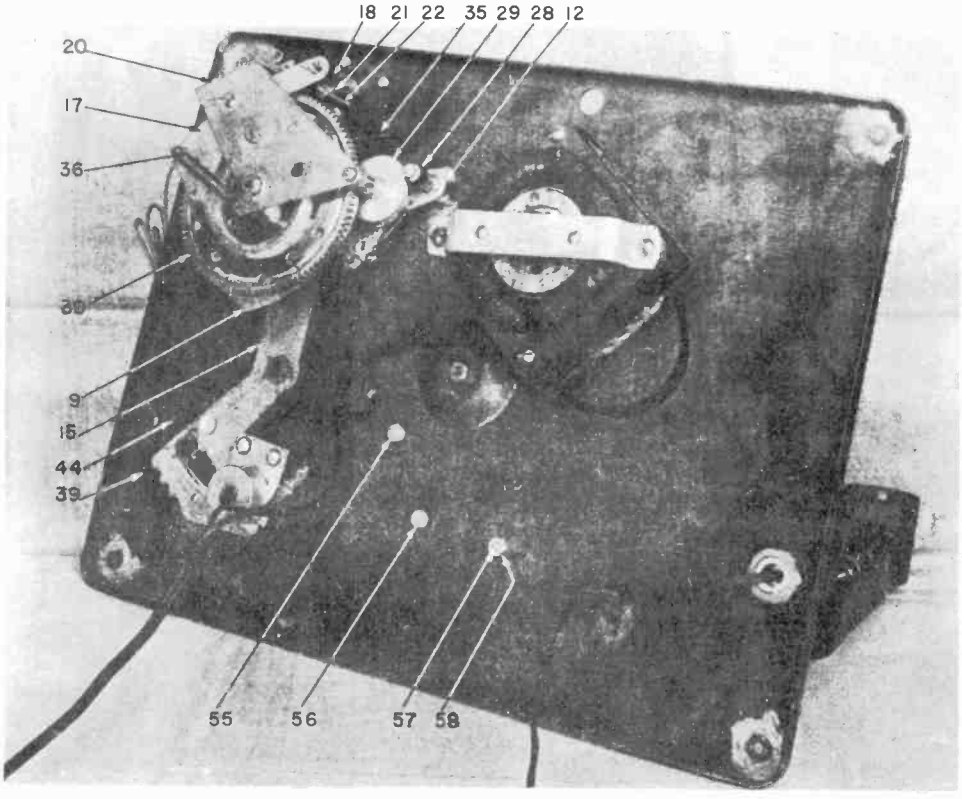




MODEL 101.202

SEARS, ROEBUCK & CO.





SEARS ROEBUCK CO.

MODELS 101.605, 101.606
Recorder

101.605 differs from 101.606 in the pickup cartridge used. 101.605 uses part No. R46346 cartridge. 101.606 uses part No. R47584 cartridge.

All of the recorder mechanism is above the base plate so that in most cases it is not necessary to remove the unit from the cabinet to make any operating adjustments required.

Alphabetically arranged index letters are used in the illustrations. Parts with prefixed letter "E" will be found in the illustration of the top of the unit. Parts with the prefix letter "F" will be found in the illustration of the bottom of the unit. Adjustments that may be required are described in the following paragraphs.

First remove the turntable and inspect gears and drive discs for imperfect mesh or worn gear teeth. It will be found desirable to use a gauge which just fits the turntable shaft and has a diameter of 1.000 to 0.995. This gauge should be placed in position, or the distance from the center of the shaft to the drive disc, EE, should be accurately measured to be .500 to .498.

Once this distance has been correctly determined, a light tap of a hammer on a block of wood placed at the base of the drive disc stud, EC, may be sufficient to relocate the stud. All the gear studs, EC, EB, EH, may be relocated this way if great care is observed.

If the distance is greater than a few thousandths of an inch, it may be advisable to loosen the lock nuts which hold the studs. These are below the base plate and may necessitate the removal of the unit from the cabinet.

When it is certain that the drive disc, EE, will contact the turntable hub with just enough force to assure positive drive, the gear and collar, EJ, should be inverted on its stud, EH, so that the contact between the sector, EI, and the collar may be observed. The adjustment of the stud, EH, is made in the same way as described previously. Again caution is required in striking the blow with a block of wood or similar cushioning material at the large base of the stud. Never strike the shank of the stud.

When the proper adjustment has been reached, the sector, EI, should drive the gear and collar assembly, EJ, positively, yet should be readily returned to rest position when the gear, EJ, is held solidly.

The intermediate gear assembly, EF, is moved in the manner described previously until a complete mesh is obtained with the other gears, without tight spots.

The gears are then reassembled in their original order, the locking pin, EA, and washer, ED, are replaced and the turntable is lightly set on the shaft. A slight spinning motion imparted to the table will aid in proper seating of the rim and the hub against the respective drive discs.

After the turntable is firmly seated on the shaft, with the drive pin, EG, in the slot of the hub, a few trials should be made to see if there is too much or too little traction against the sector, EI.

When lubricating the studs and gear hubs, use only fine light grease, using great care that none touches any of the rubber driving surfaces.

The arm, post and sector assembly may be removed by removing the fillister head lock screw in the post just below the arm. Be sure to rotate the assembly to clear the turntable or remove the table before lifting this assembly. Disconnect the cutter leads, FC, before removing this assembly. Use only fine light grease for post and bushing lubricant.

The lock, FH, which prevents the automatic operation of the changer should be adjusted so that the foot of the lock rod, FI, clears the follower when the cutter arm is in the rest position and just moves so as to be beneath the follower when the arm is removed from the rest.

Adjustment of the cutter arm, FB, is accomplished by turning the screw, FG, which is exposed when the arm is raised, until the head of the arm is just 1/4" above the surface of a record to be cut. Tighten the lock nut after adjusting.

Cutting stylus pressure is adjusted by means of the knurled, round nut, FF, in the body of the arm.

The cutting pressure should be 1-1/2 ounces or the width of the groove should be just as wide as the uncut surface, depending upon the method of observation.

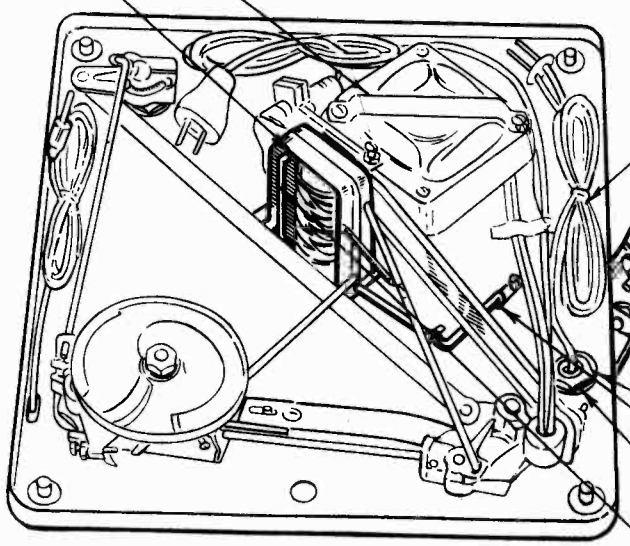
If it is found necessary to replace the cutting head, FD, the stylus set screw, FA, is removed, then by applying a slight force with the thumb to the suspension spring, FE, the head may be easily grasped and dislodged from its seat. Unhook from the suspension spring and replace.

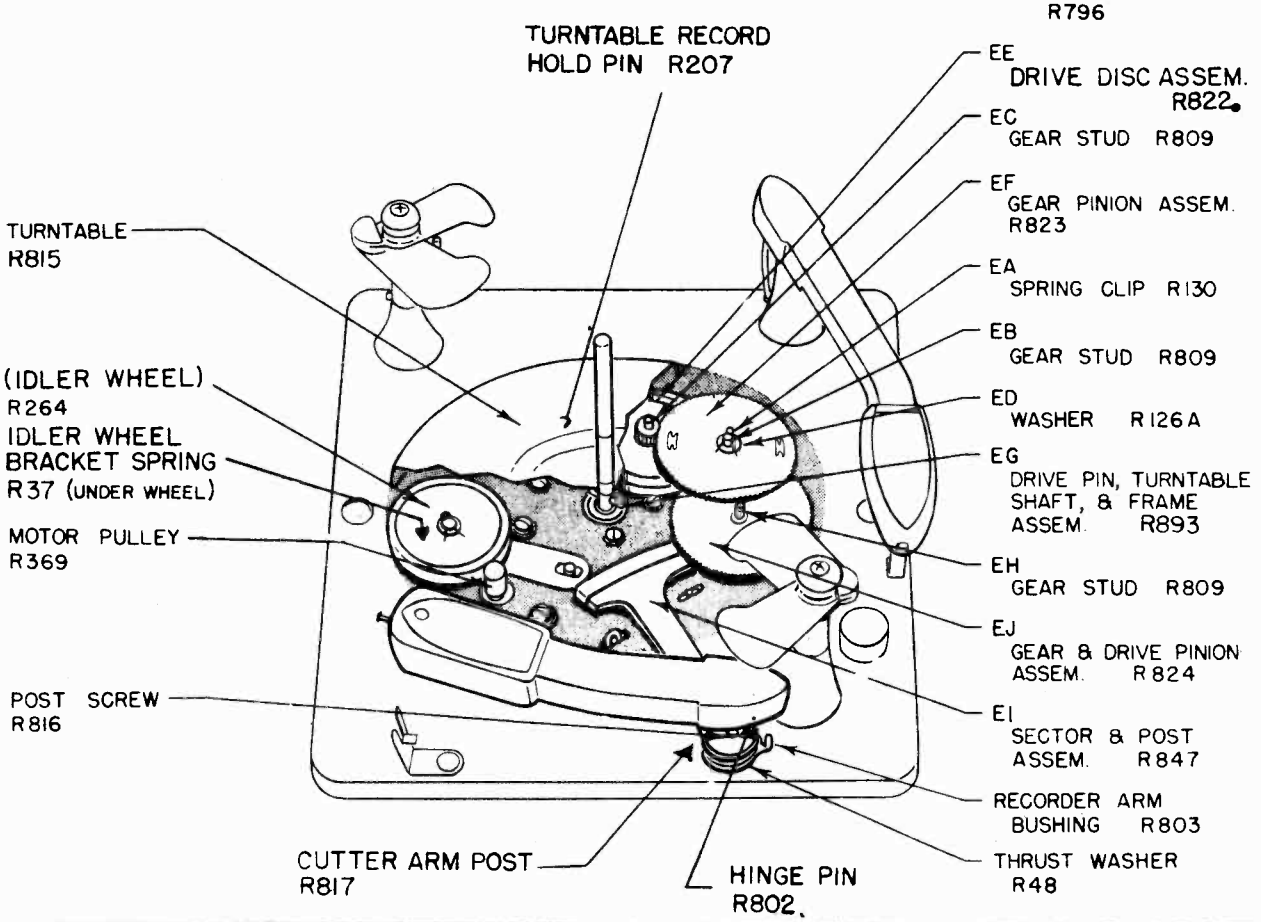
DECEMBER 21, 1942

MODELS 101.605,
101.606

SEARS ROEBUCK CO.

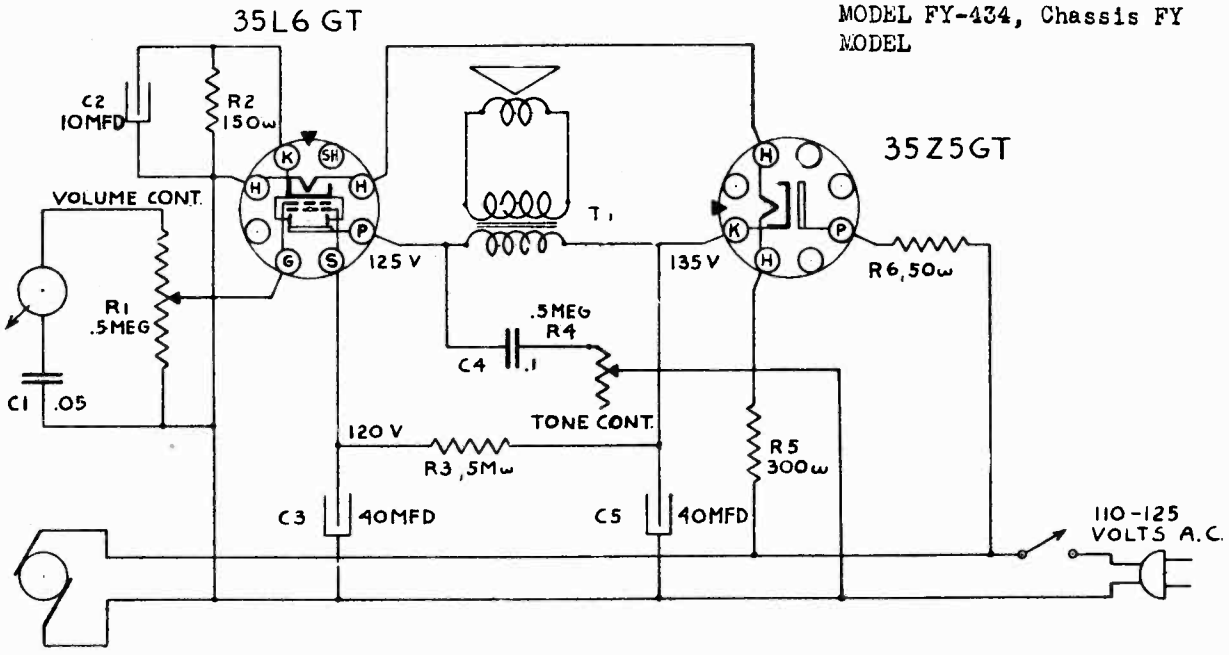
Recorder





SEARS, ROEBUCK & CO.

MODEL 5818, Chassis 184.5818
MODEL 5819, Chassis 178.5819
MODEL FY-434, Chassis FY
MODEL



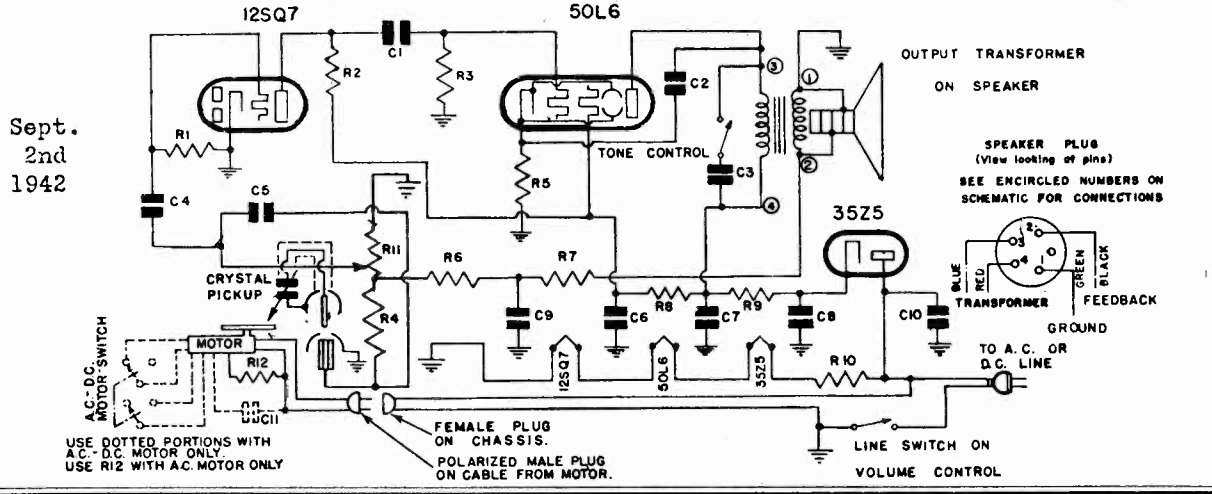
Model 5818 Chassis 184.5818 A. C. Record Player Amplifier January 4, 1943
" 5819 " 178.5819 Electric Phonograph November 25, 1942

Model FY - 434 Chassis FY Electric Amplified Portable Phonograph

When ordering, specify part numbers. List price each effective as of Dec. 1, 1941. Subject to change without notice.

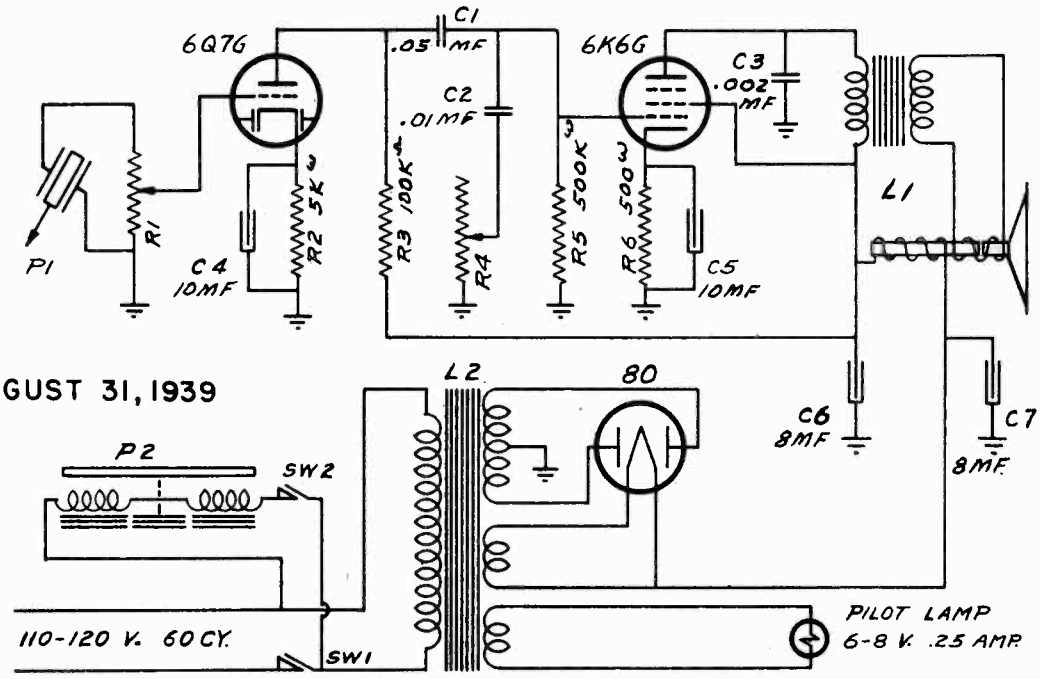
*Item	Part No.	DESCRIPTION	PRICE
R1	4XR-327	15 megohm ¼ watt carbon resistor	$ .16
R2, R3	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R4, R6	KR-57	1 megohm ¼ watt carbon resistor	.16
R7	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R8	KR-51	2,500 ohm ¼ watt carbon resistor	.16
R9	9JR-450	175 ohm 1 watt carbon resistor	.16
R10	9YR-460	133 ohm 3 watt wire-wound resistor	.25
R11	9YR-459	Volume control 2.5 megohm	.80
R12	KR-55	250,000 ohm ¼ watt carbon resistor	.16
C1, C2	LC-65	0.02 mf, 400 volt tubular condenser	.20
C3	BC-12	0.05 mf, 200 volt tubular condenser	.20
C4	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C5	IC-51A	0.00001 mf, mica condenser	.20
C6, C7 C8	8JC-513B	Multiple dry electrolytic condenser, 150 volt; C6, C8—20 mf, C7—40 mf	.95
C9	FC-29	0.02 mf, 200 volt tubular condenser	.20
C11	9JC-534	0.05 mf, 200 volt tubular condenser	.20

Sept. 2nd 1942



MODEL 5827, Chassis 134.903
MODEL 5827, Chassis 138.903

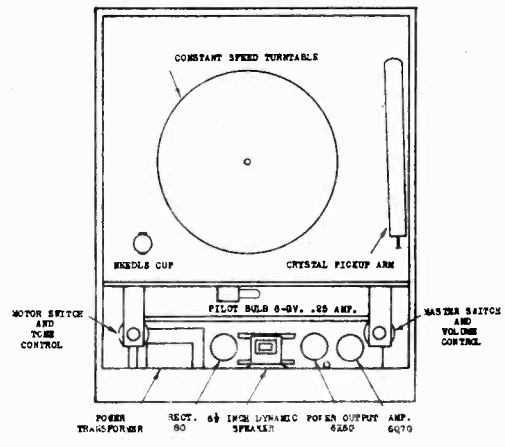
SEARS, ROEBUCK & CO.

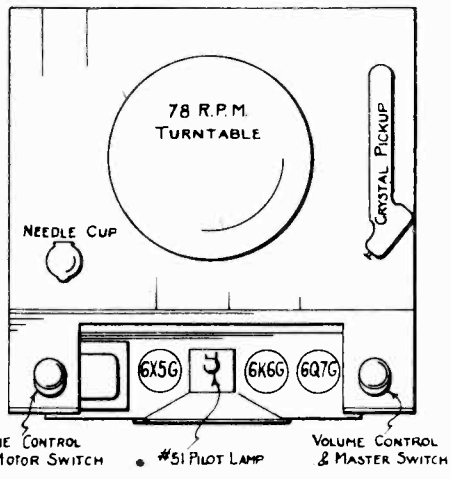


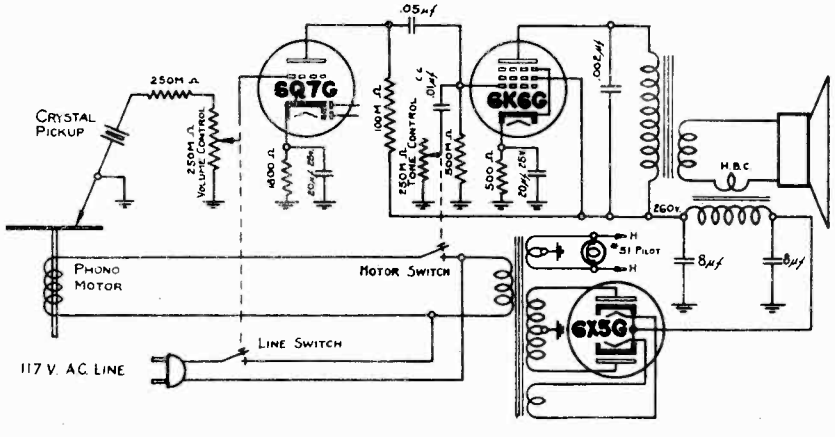
CHASSIS
134.903

AUGUST 31, 1939

COMPLETE PHONOGRAPH ASSEMBLY







JANUARY 18, 1940 **SILVERTONE** 138.903

Tube Complement

6Q7G	Amplifier
6K6G	PWR Output
6X5G	Rectifier

Power Consumption
50 Watts

Portable
Electric
Phonograph

SEARS ROEBUCK CO. MODEL 5828, Chassis 138.906
MODEL 5829, Chassis 138.904

PORTABLE ELECTRIC PHONOGRAPH

TUBE COMPLEMENT

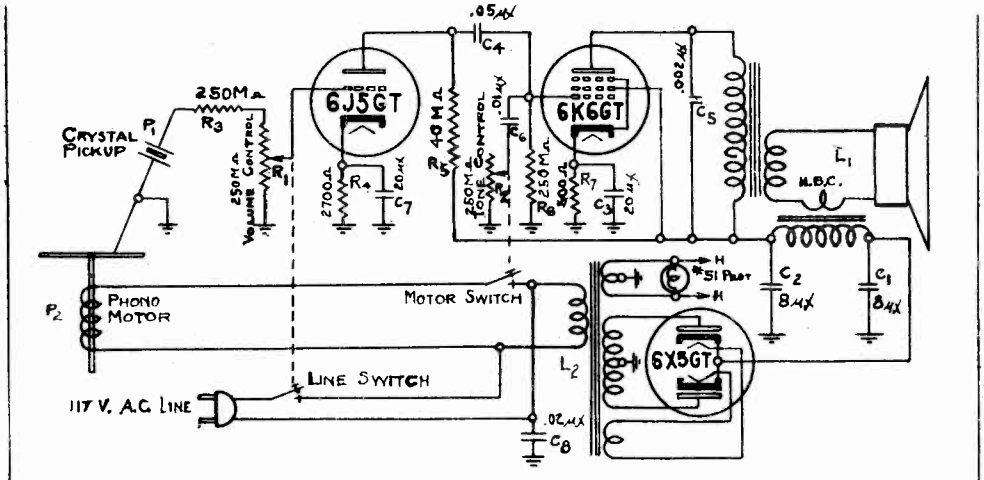
6J5GT . . . . . Amplifier
6K6GT . . . . . Power Output
6X5GT . . . . . Rectifier

JANUARY 4, 1943

POWER SUPPLY:

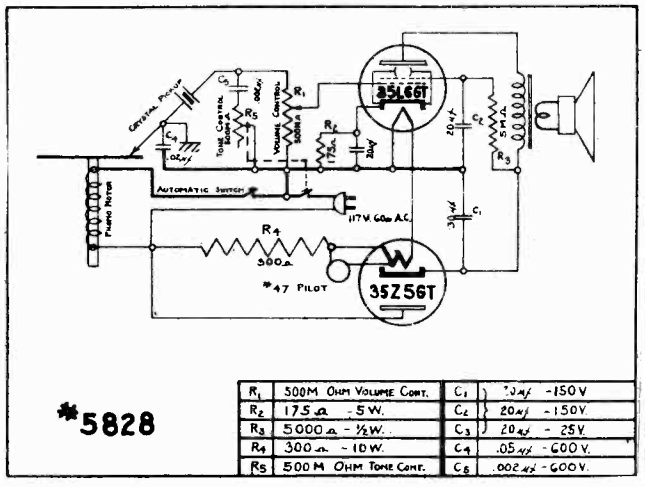
Model 5829 is supplied for operation from 105 to 125 volts, 60 cycles, AC only.

Power Consumption . . . . . 50 Watts



SILVERTONE *5829

R1	250 M Ω Volume Control	R5	40M Ω ½ Watt	C1	8 μf - 450 V.	C5	.002 μf - 400 V.
R2	250 M Ω Tone Control	R6	250 M Ω ½ Watt	C2	8 μf - 450 V.	C6	.01 μf - 400 V.
R3	250 M Ω ½ Watt	R7	500 Ω 1 Watt	C3	20 μf - 25 V.	C7	20 μf - 25 V.
R4	2700 Ω ½ Watt			C4	.05 μf - 400 V.	C8	.02 μf - 400 V.



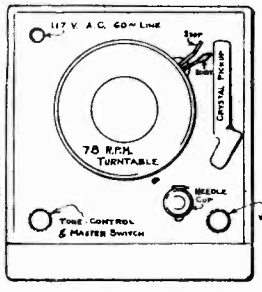
*5828

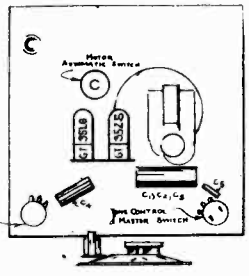
R1	500M Ohm Volume Cont.	C1	30 μf - 150 V
R2	175 Ω - 5 W.	C2	20 μf - 150 V
R3	5000 Ω - ½ W.	C3	20 μf - 25 V.
R4	300 Ω - 10 W.	C4	.05 μf - 600 V.
R5	500 M Ohm Tone Cont.	C5	.002 μf - 600 V.

ELECTRIC PHONOGRAPH

MODEL 5828

FACTORY IDENTIFICATION NO. 138.906





*5828

TUBE COMPLEMENT

35L6GT . . . . . Amplifier
35Z5GT . . . . . Rectifier

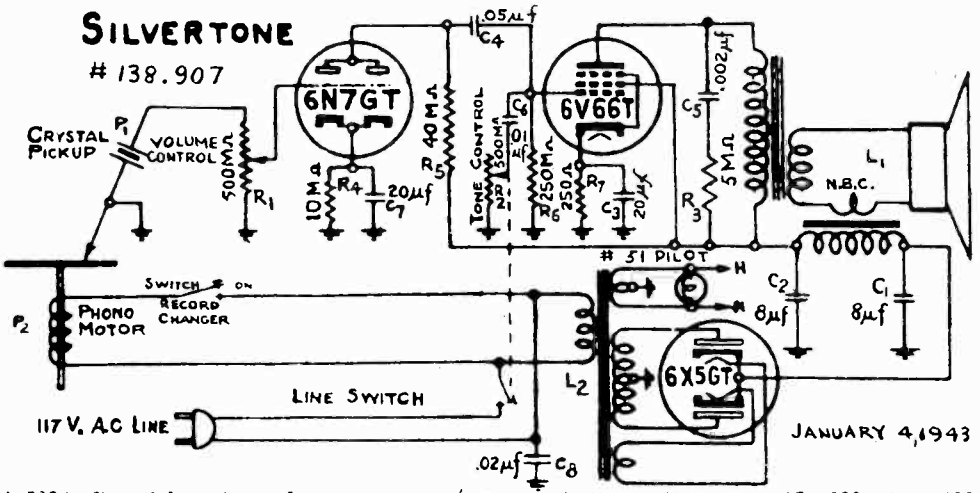
POWER SUPPLY

JANUARY 4, 1943

Model 5828 is supplied for operation from 105 to 125 volts, 60 cycles, A.C. only.

Power consumption . . . . . 40 Watts

MODEL 5833, Chassis 138.907
MODEL 6226, Chassis 134.802, -1 SEARS ROEBUCK CO.



R1 500M Ohms Volume Control	R5 40M Ohms 1/2 W.	C1 8 Mf. - 450 V.	C5 .002 Mf. - 400 V.
R2 500M Ohms Tone Control	R6 250M Ohms 1/2 W.	C2 8 Mf. - 450 V.	C6 .01 Mf. - 400 V.
R3 5000 Ohms 1/2 W.	R7 250 Ohms 1 W.	C3 20 Mf. - 25 V.	C7 20 Mf. - 25 V.
R4 10M Ohms 1/2 W.		C4 .05 Mf. - 400 V.	C8 .02 Mf. - 400 V.

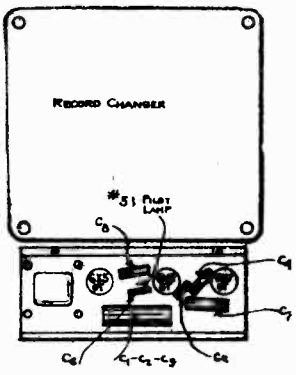
PORTABLE ELECTRIC PHONOGRAPH
MODEL 5833

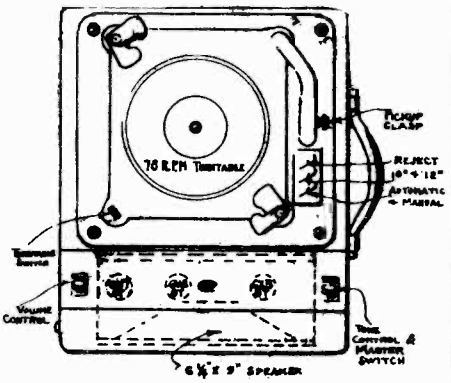
POWER SUPPLY

Model 5833 is supplied for operation from 105 to 125 Volts, 60 cycles AC Power Consumption - 50 Watt.

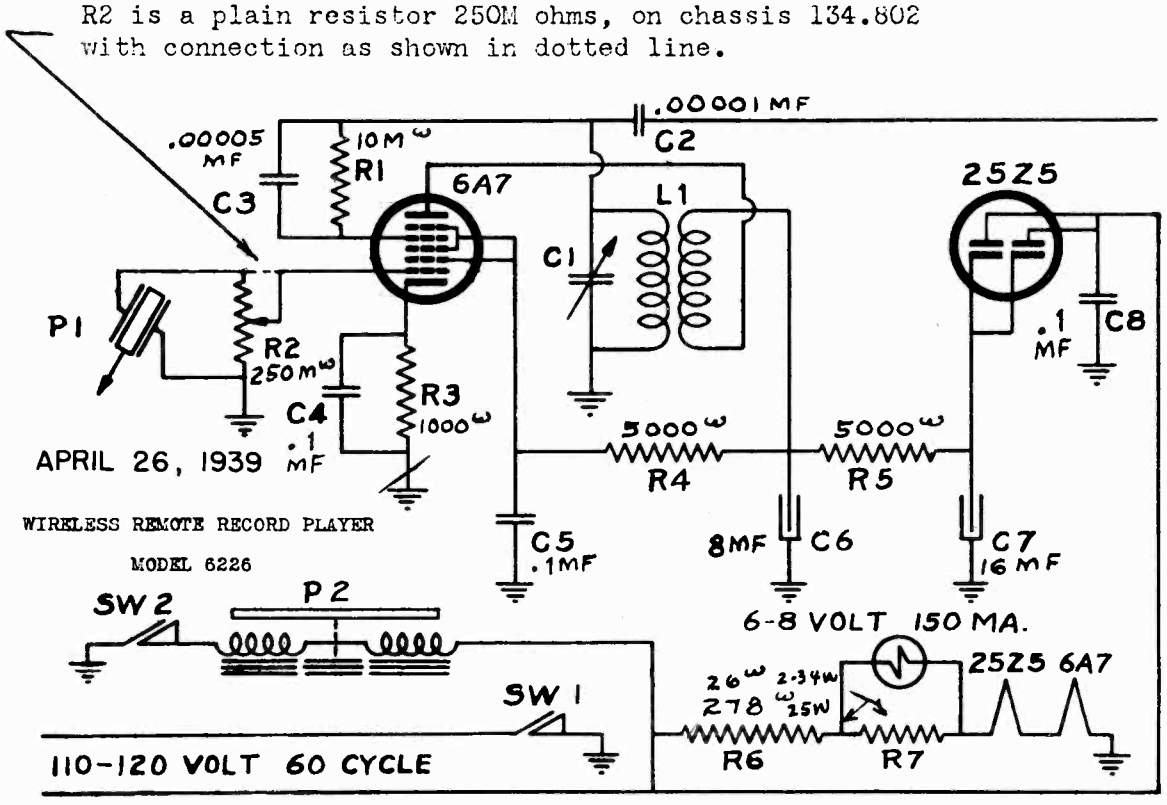
TUBE COMPLEMENT

6N7GT . . Amplifier
6V6GT . . Power Output
6X5GT . . Rectifier

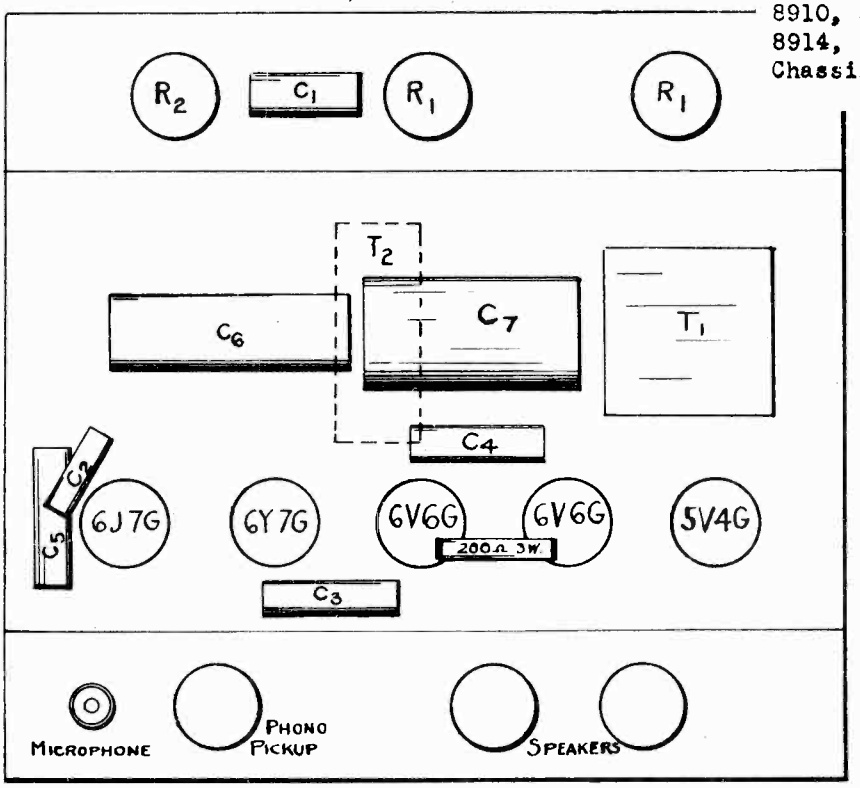


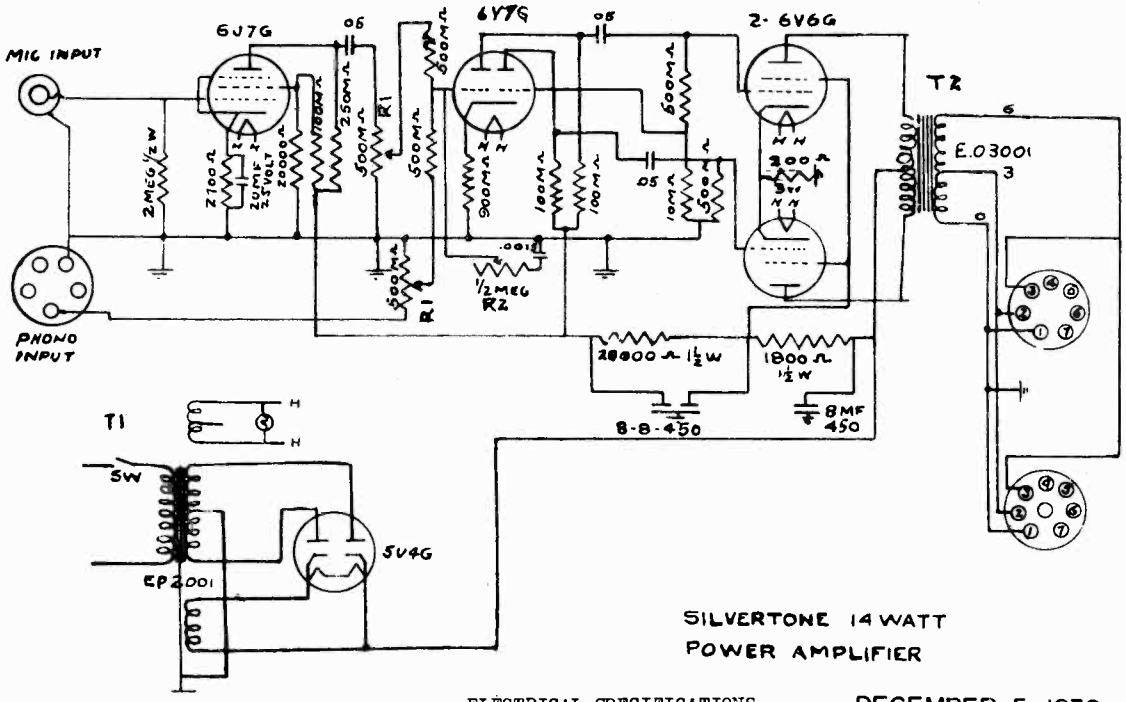


R2 is a plain resistor 250M ohms, on chassis 134.802 with connection as shown in dotted line.



SEARS, ROEBUCK & CO. MODELS 8906, 8907, 8908, 8909, 8910, 8911, 8912, 8913, 8914,
Chassis 138.100





SILVERTONE 14 WATT POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS DECEMBER 5, 1939

TUBE COMPLEMENT:
1 6J7G . . . . . Input
1 6Y7G . . . . . Inverter Amplifier
2 6V6G . . . . . Output
1 5V4G . . . . . Rectifier

POWER SUPPLY: . . . . . 110-125 volts, 50-60 cycle, AC 88 Watts

FREQUENCY CHARACTERISTICS . . . . Curve - substantially flat from 50 to 10,000 cycles per second

INPUTS:
2 input positions each to accomodate high impedance crystal, velocity, or no voltage velotron microphones, and one high impedance phono unit

PICKUP: High impedance crystal type, 500M ohms

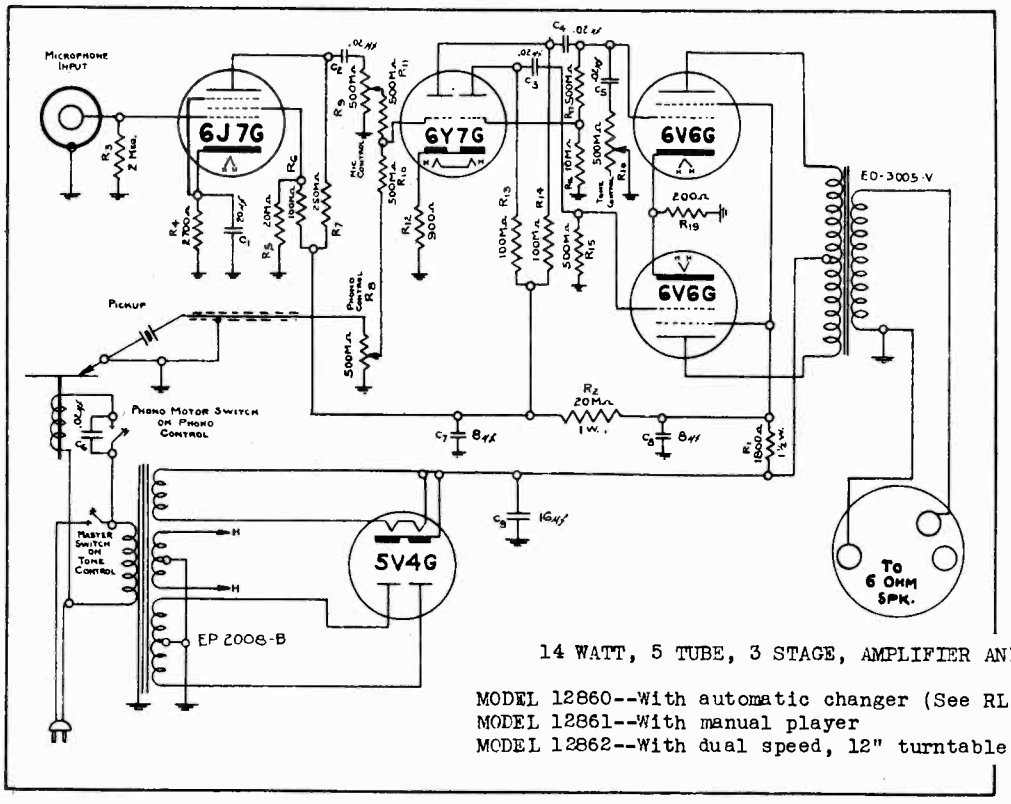
SPEAKERS: 8 inch permanent magnet type, 6 ohm voice coil. Standard equipment - Jensen type PM8C

GAIN: . . . . . Approx. 118 DB

OUTPUT IMPEDANCE: . . . . . 3-4 and 6-8 ohms

MODELS 12860, 12861, 12862
Chassis 138.150

SEARS, ROEBUCK & CO.



14 WATT, 5 TUBE, 3 STAGE, AMPLIFIER AND RECORD PLAYER

MODEL 12860--With automatic changer (See RL 277).
MODEL 12861--With manual player
MODEL 12862--With dual speed, 12" turntable and long tone arm

TUBE COMPLEMENT

1 6J7G. . . . . Input
1 6Y7G. . . . . Inverter-Amplifier
2 6V6G . . . . . Output
1 5V4G . . . . . Rectifier

INPUTS

One input position to accomodate crystal or other high impedance microphone, and one high impedance phono unit.

OUTPUT

6 ohm secondary for P.M. speaker

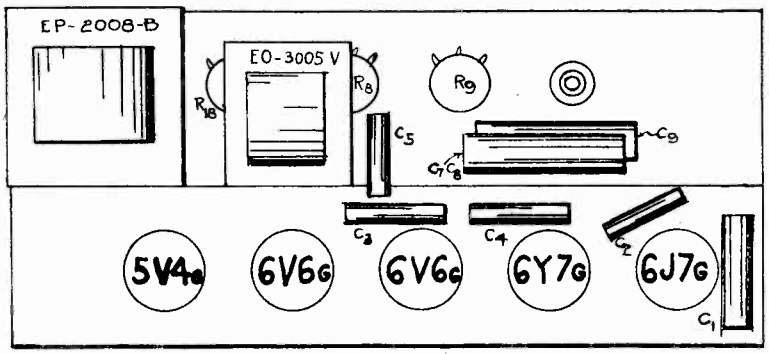
GAIN

Approx: . . . . . 118 db.

MECHANICAL SPECIFICATIONS (Amplifier)

OPERATING CONTROLS (Amplifier)

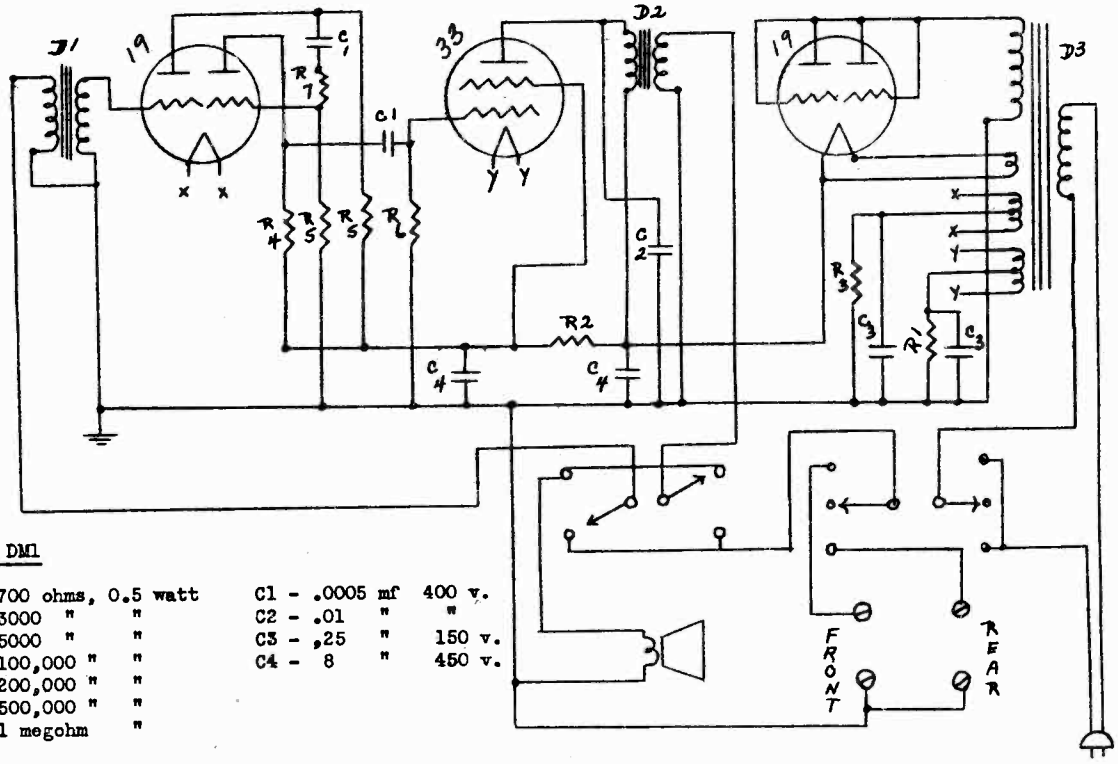
1 Phono volume control
1 microphone volume control
1 Tone control and A.C. switch



INSIDE VIEW

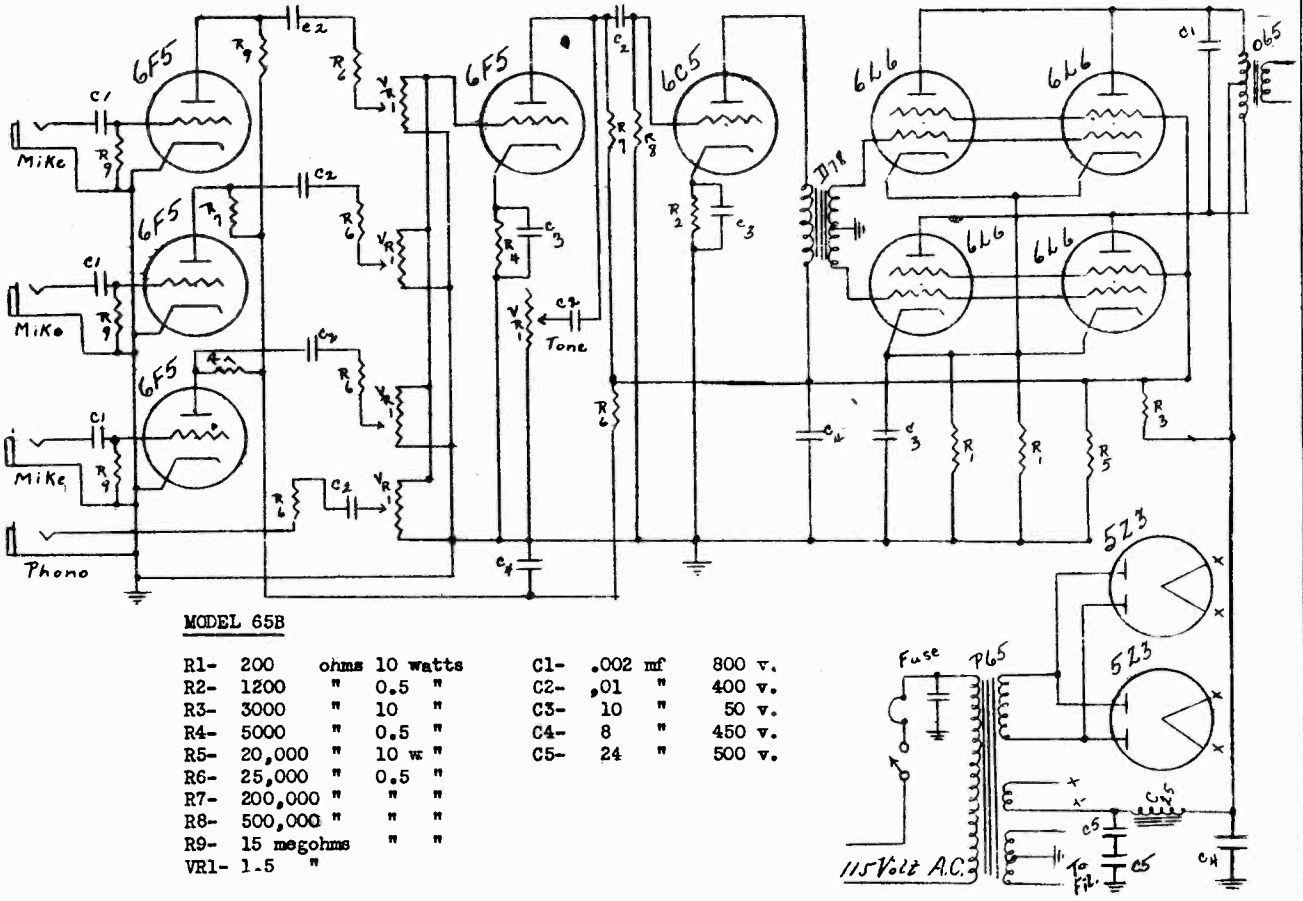
MODEL DM1
MODEL 65B

SETCHELL-CARLSON, INC.



MODEL DM1

R1 - 700 ohms, 0.5 watt		C1 - .0005 mf	400 v.
R2 - 3000 "	"	C2 - .01 "	"
R3 - 5000 "	"	C3 - .25 "	150 v.
R4 - 100,000 "	"	C4 - 8 "	450 v.
R5 - 200,000 "	"		
R6 - 500,000 "	"		
R7 - 1 megohm	"		



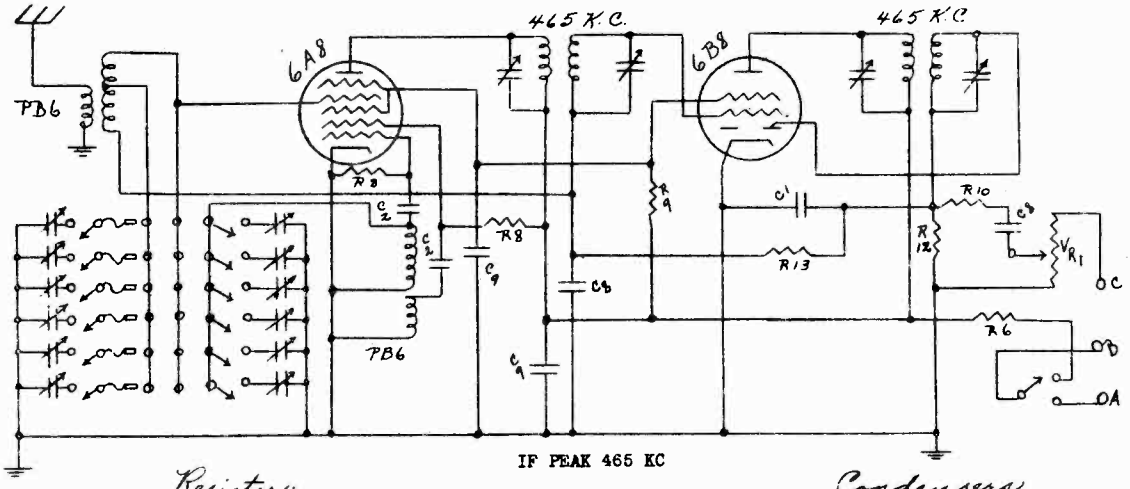
MODEL 65B

R1-	200 ohms	10 watts	C1-	.002 mf	800 v.
R2-	1200 "	0.5 "	C2-	.01 "	400 v.
R3-	3000 "	10 "	C3-	10 "	50 v.
R4-	5000 "	0.5 "	C4-	8 "	450 v.
R5-	20,000 "	10 w "	C5-	24 "	500 v.
R6-	25,000 "	0.5 "			
R7-	200,000 "	" "			
R8-	500,000 "	" "			
R9-	15 megohms	" "			
VR1-	1.5 "				

MODEL RA50

SETCHELL-CARLSON, INC.

Setchell - Carlson — Model R.A. 50



IF PEAK 465 KC

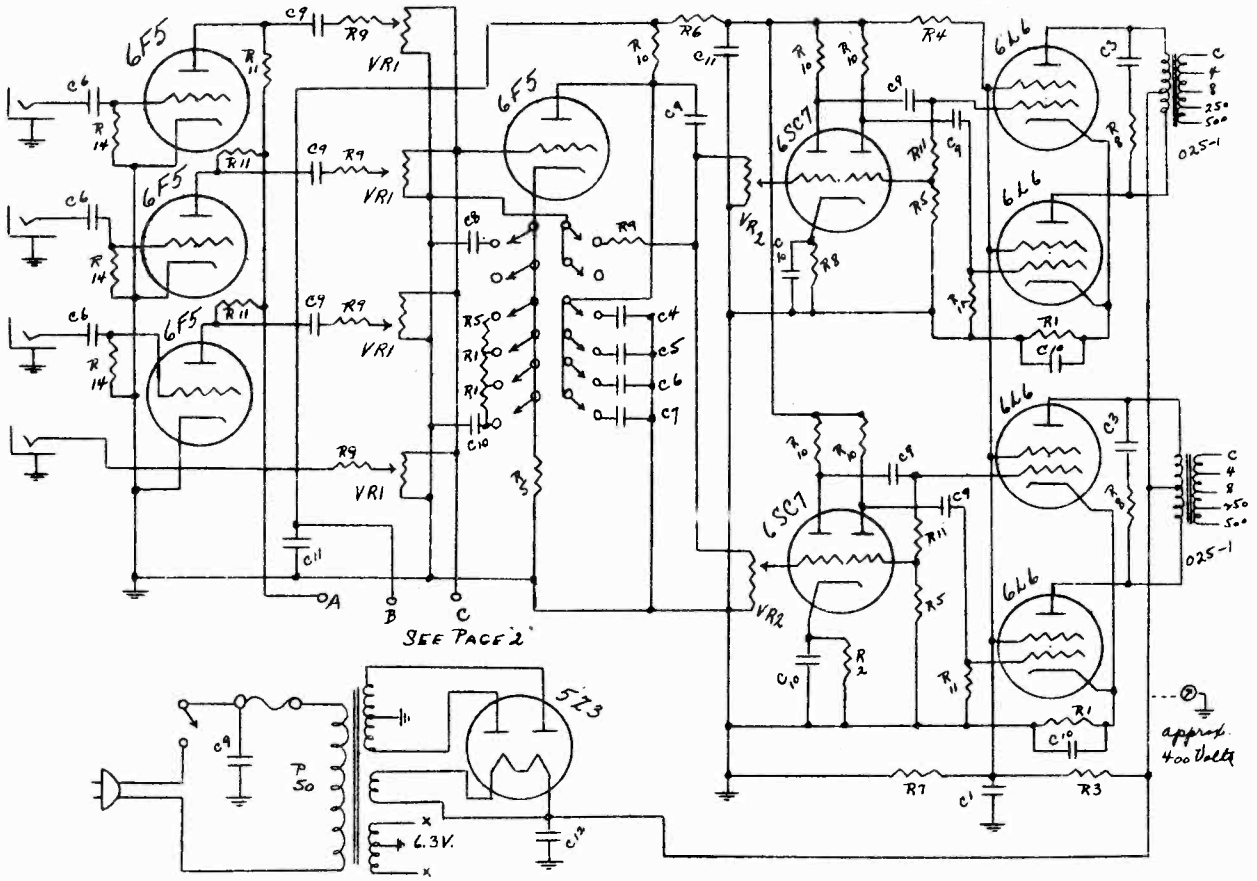
Resistors

R1- 700 ~ 5 Watt
R2- 1700 ~ 1/2 "
R3- 2500 ~ 10 "
R4- 3000 ~ 1/2 "
R5- 5000 ~ 1/2 "
R6- 10,000 ~ 1/2 "
R7- 20,000 ~ 10 "
VR1- 5 Meg. Vol. Contr.

R8- 25,000 ~ 1/2 Watt
R9- 50,000 ~ " "
R10- 100 M ~ " "
R11- 700 M ~ " "
R12- 500 M ~ " "
R13- 1 Meg ~ " "
R14- 15 Meg ~ " "
VR2- 1/2 Meg. Vol. Contr.

Condensers

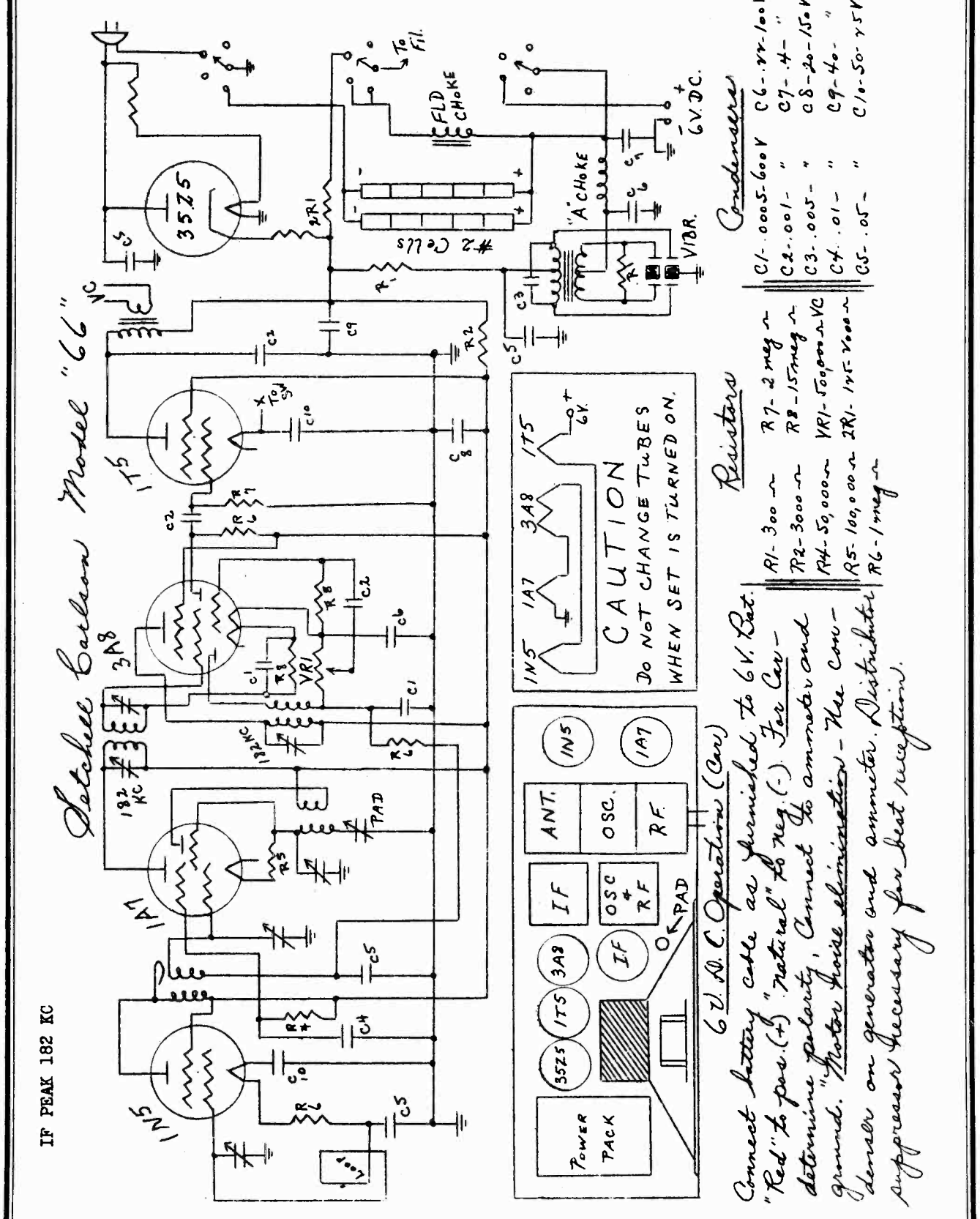
C1- .0001 Mfd. Mica
C2- .0005 " "
C3- .001 " 600 V paper
C4- .0025 " 400 " "
C5- .005 " " " "
C6- .01 " " " "
C7- .025 " " " "
C8- .1 " 700 V. "
C9- .1 " 400 V. "
C10- 10 " 50 V. Electrolytic
C11- 10 " 450 V. "
C12- 25 " 500 V. "



SEE PAGE 2

MODEL 66

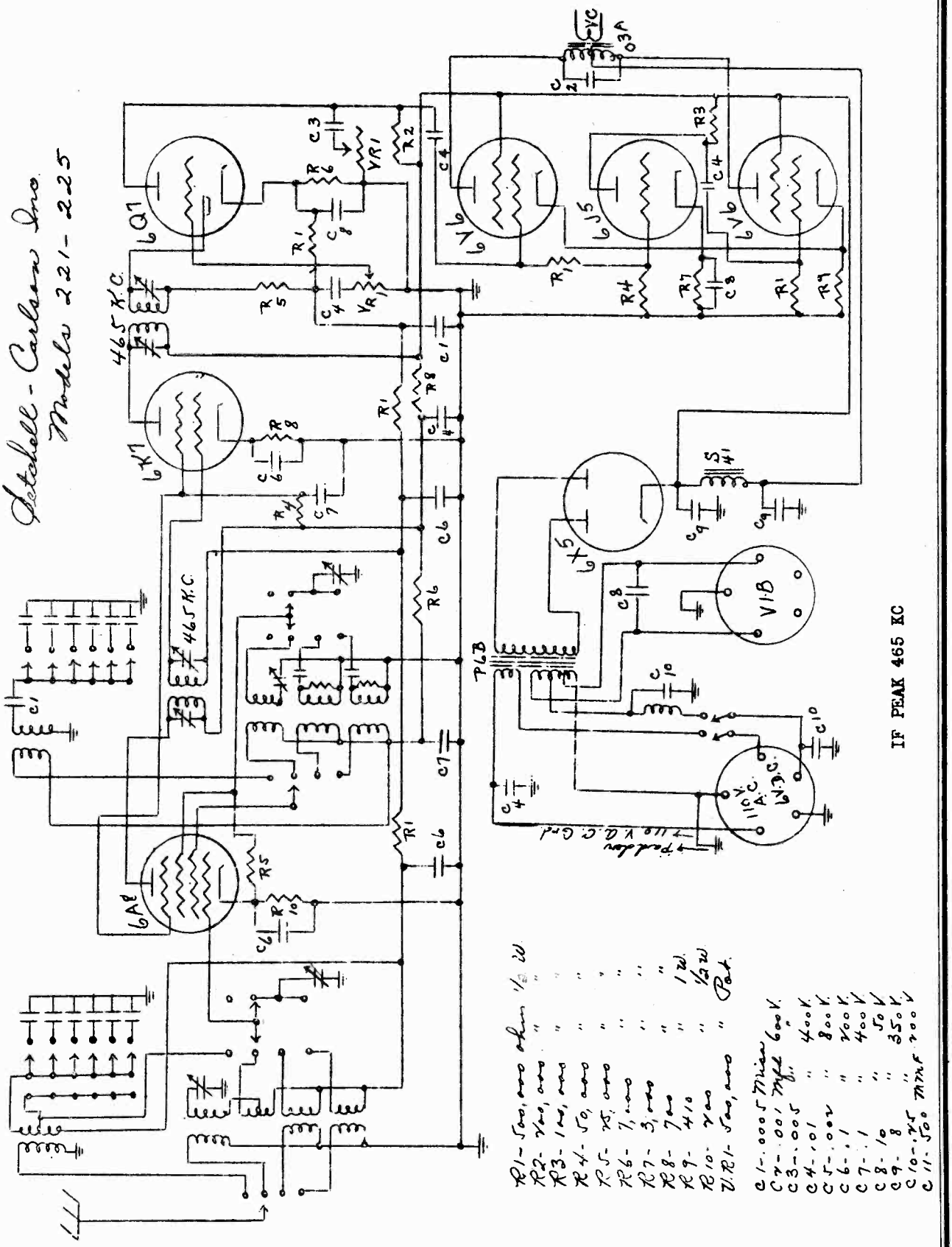
SETCHELL-CARLSON, INC.



MODELS 221, 225

SETCHELL-CARLSON, INC.

Setchell - Carlson Inc.
Models 221 - 225



R1- 5000 ohms 1/2 W
R2- 100, 000 " "
R3- 1 meg " "
R4- 50, 000 " "
R5- 25, 000 " "
R6- 1, 000 " "
R7- 3, 000 " "
R8- 750 " 1 W.
R9- 410 " 1/2 W
R10- 200 " Pot.

C1- .0005 Mica 600 V.
C2- .001 Mfd. " "
C3- .005 " " 400 V.
C4- .01 " " 800 V.
C5- .002 " " 400 V.
C6- .1 " " 400 V.
C7- .1 " " 50 V.
C8- 10 " " 350 V.
C9- 8 " " 200 V.
C10- .25 Mfd " "
C11- 500 Mmf " "

SETCHELL-CARLSON, INC.

MODEL 421RD
Radio-Dor-A-Fone

MODEL 421 RD RADIO-DOR-A-FONE

ATTACH EXTERNAL SPEAKER to terminals in back of chassis marked "Ext. Spkr." Switch directly over these terminals is to turn radio reception "off or on" to the external speaker.

NOTE: If additional antenna is not used, ground wire should be connected to Ant. Post. (Eliminates dead spot.)

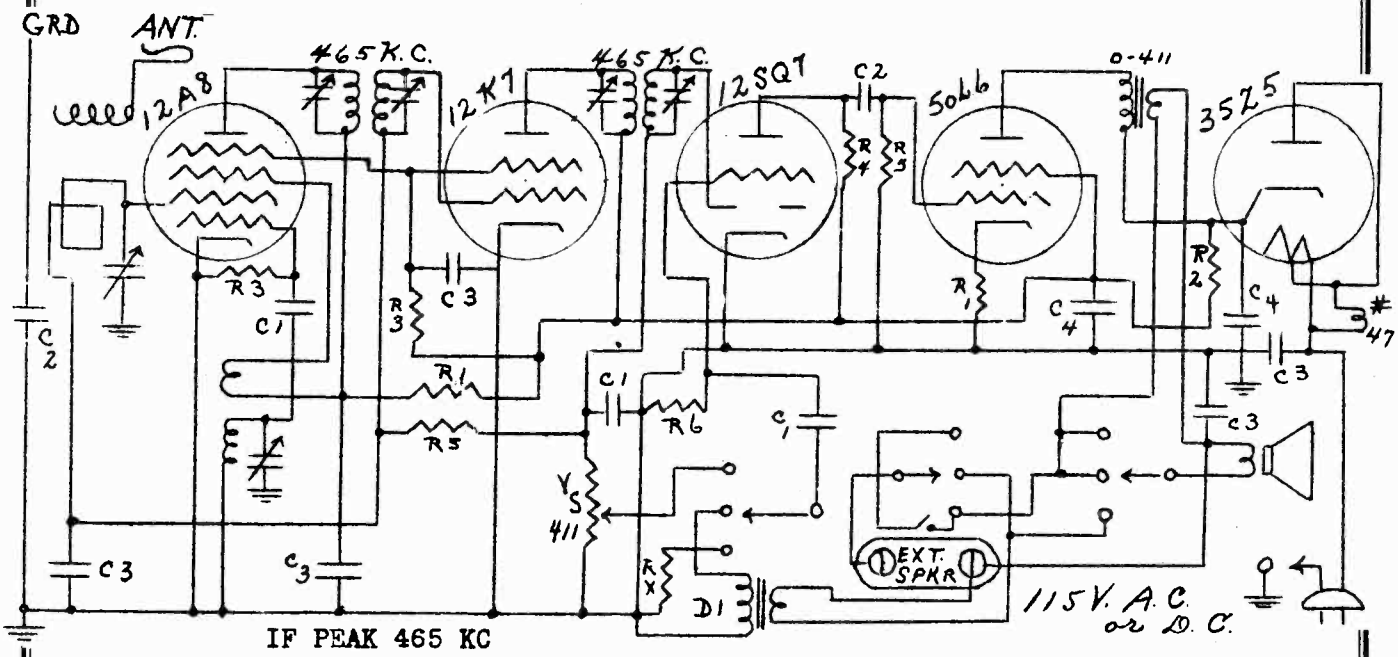
DIRECT CURRENT - When used on 110 volts D.C. reverse plug in wall socket if set is dead.

EXTERNAL SPEAKER connections are isolated and are free from ground except through an .05 by-pass condenser for RF purposes. Resistor marked RX can be raised or omitted to increase sensitivity on "Talk-Listen" positions, however, this will increase feed-back.

"OFF-ON" SWITCH is incorporated with the volume control, which is the small knob on the lower right side. Set the pointer knob to "Radio" for regular radio reception. Set the switch in rear of chassis to turn "off or on" radio reception to external speaker as desired. Position of this switch does not alter operation of Dor-A-fone "talk or listen" position. Volume control position does not alter operation of Dor-A-fone "talk or listen" position.

TO TALK through to the external speaker, turn pointer knob to "Talk" position

TO LISTEN from external speaker, turn pointer knob to "Listen" position.



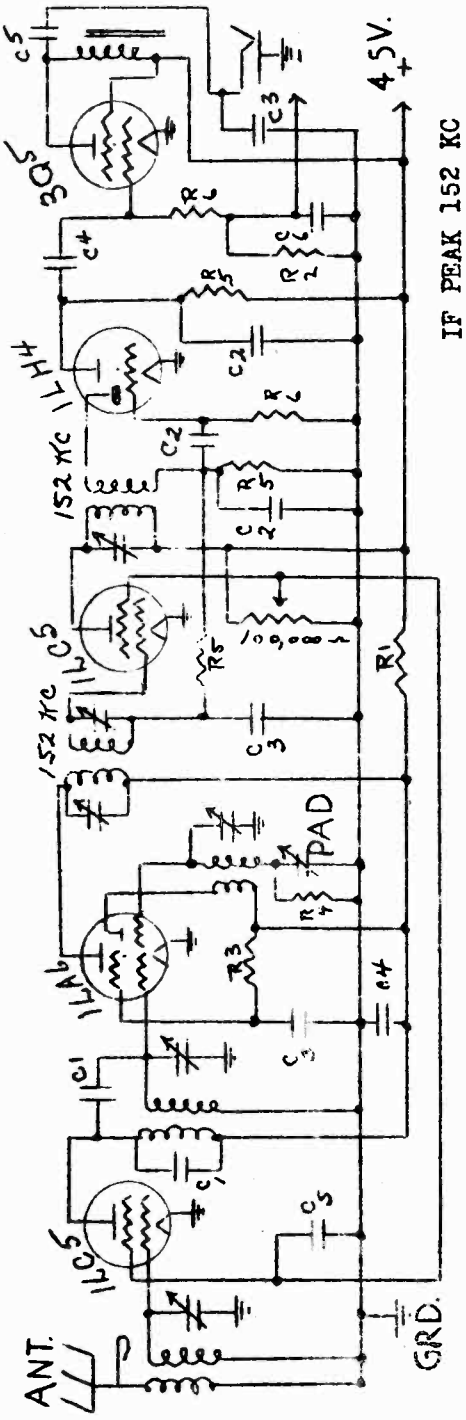
IF PEAK 465 KC

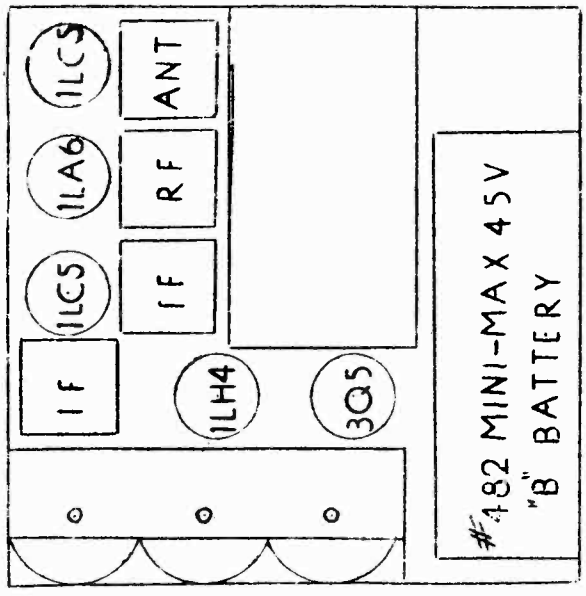
R1- 200 ohms 0.5 w.	R5- 0.5 megohm 0.5w.	C1- .0005 mf 600V	VS411-0.5 meg
R2- 1200 " "	R6- 15 " "	C2- .01 " 400V	Vol.Cont.
R3- 50,000 " "	RX- 100,000 ohms.	C3- .05 " 200V	D1-Input Trans.
R4- 200,000" "	(Raise or omit for higher gain talk-listen)	C4- 50-20 " 150V	C411-Output "

MODEL 501

SETCHELL-CARLSON, INC.

SETCHELL - CARLSON MODEL 501





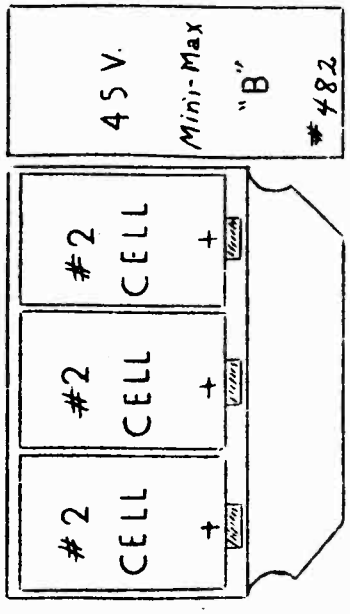
RESISTORS

R1-150 OHMS
R2-600 "
R3-25,000 "
R4-200000 "
R5-1 MEG "
R6-2 MEG "

CONDENSERS

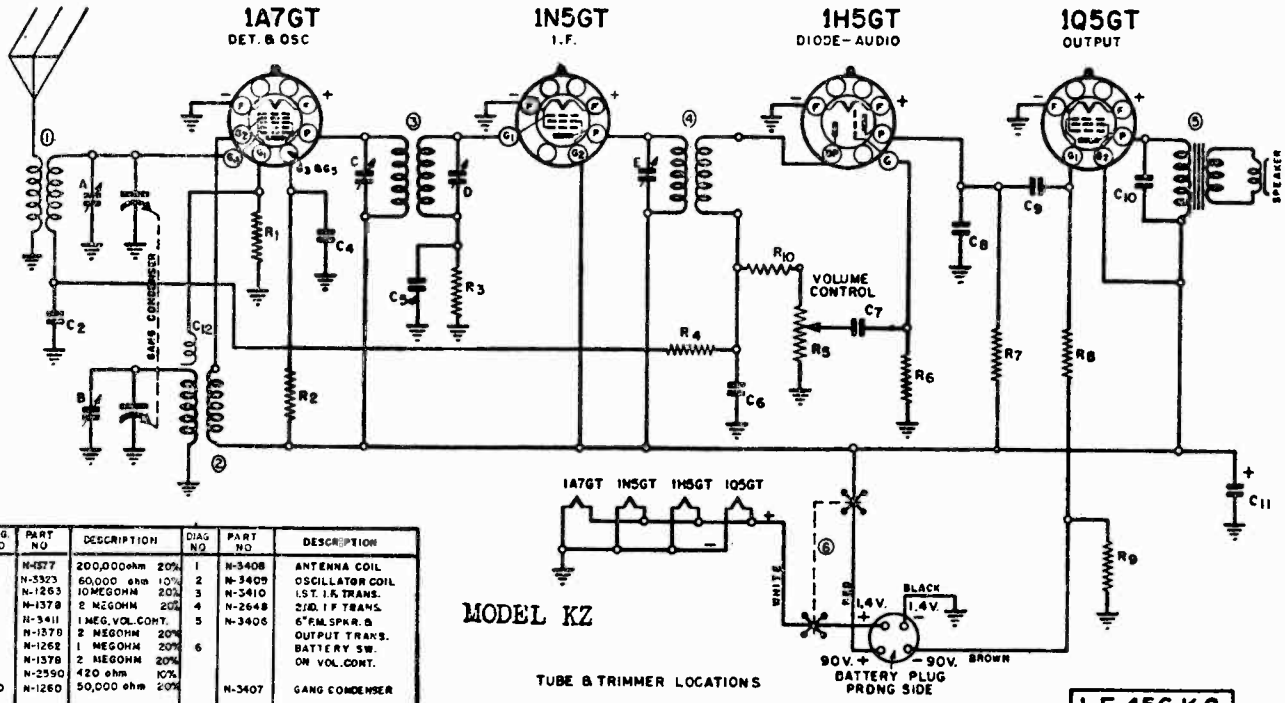
C1-.00002 MICA
C2-.0005 MICA
C3-.001 600 VOLT
C4-.01 400 "
C5-.05 200 "
C6-.1 50 "

REAR VIEW



SONORA PRODUCTS, INC.

MODEL KZ
MODEL LP

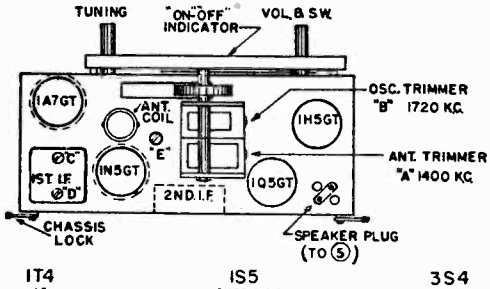


MODEL KZ

DIAG. NO	PART NO	DESCRIPTION	DIAG NO	PART NO	DESCRIPTION
R1	N-1577	200,000ohm 20%	1	N-3408	ANTENNA COIL
R2	N-3323	60,000 ohm 10%	2	N-3409	OSCILLATOR COIL
R3	N-1263	10 MEGOHM 20%	3	N-3410	I.S.T. I.F. TRANS.
R4	N-1378	2 MEGOHM 20%	4	N-2648	2ND. I.F. TRANS.
R5	N-3411	1 MEG. VOL. CONT.	5	N-3406	6" P.M. SPKR. & OUTPUT TRANS.
R6	N-1378	2 MEGOHM 20%	6		BATTERY SW. ON VOL. CONT.
R7	N-1262	1 MEGOHM 20%			
R8	N-1378	2 MEGOHM 20%			
R9	N-2590	420 ohm 10%		N-3407	GANG CONDENSER
R10	N-1260	50,000 ohm 20%			
		(all resistors are .5 watt size.)		N-1525	BATTERY CABLE
C2	N-1345	.05 MFD. 200V.			
C4	N-1345	.05 MFD. 200V.			
C5	N-1376	.02 MFD. 400V.			
C6	N-1342	50 MMFD. 20%,			
C7	N-2712	.004MFD. 400V.			
C8	N-1342	50 MKFD. 20%			
C9	N-1344	.01 MFD. 400V.			
C10	N-2712	.004 MFD. 400V.			
C11	N-1367				
C12	——	CAPACITY IN OSCILLATOR COIL			

CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION, VOL. VIII.

TUBE & TRIMMER LOCATIONS



I.F. 456 K.C.

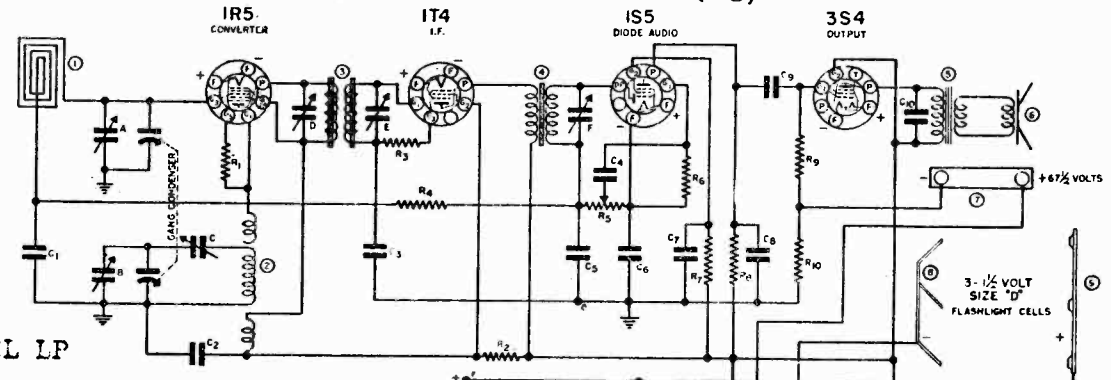
NOTE: TUBE SOCKETS SHOWN FROM WIRING SIDE.

4 TUBE - 1½ VOLT

SUPERHETERODYNE
SINGLE BAND

DRAWN V.J.F. APPROVED
JULY 11, 1940.

KZ



MODEL LP

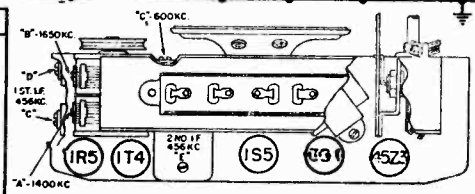
DIAG. NO.	PART NO.	DESCRIPTION
R1	N-1778	100,000 OHM .5W 20%
R2	N-4278	4,700 OHM .5W 10%
R3	N-1263	10 MEGOHM .5W 20%
R4	N-4277	2.2 MEGOHM .5W 20%
R5	N-4213	1 MEGOHM VOLUME CONTROL
R6	N-4028	6.8 MEGOHM .5W 20%
R7	N-4062	3.3 MEGOHM .5W 20%
R8	N-1262	1 MEGOHM .5W 20%
R9	N-4277	2.2 MEGOHM .5W 20%
R10	N-4279	820 OHM .5W 10%
R11	N-4228	680 OHM .5W 10%
R12	N-4280	56 OHM .5W 10%
R13	N-4281	1800 OHM .5W 10%
R14	N-4065	2200 OHM .5W 10%
R15		1870 OHM 4.8W 5%
R16	N-4252	82 OHM 1.3W 10%
R17		1000 OHM 5.6W 10%
	N-4185	2 GANG CONDENSER
1	N-4296	LOOP ANTENNA (wood)
	N-4253	LOOP ANTENNA (PLASTIC)
2	N-4257	OSCILLATOR COIL
3	N-4170	1 ST I.F. TRANSFORMER
4	N-4259	2 ND I.F. TRANSFORMER
5	N-4256	OUTPUT TRANSFORMER
6	N-4255	3½" P.M. SPEAKER
7	N-4274	B BATTERY CONNECTOR
8	N-4220	A BATTERY SPRING CONTACT (NEGATIVE)
9	N-4222	A BATTERY CONTACT STRIP (POSITIVE)
	N-4215	CHANGEOVER SWITCH

SWITCH SHOWN IN COUNTER-CLOCKWISE (AC-DC) POSITION.
(BOTH VIEWS AS SEEN FROM SHAFT END)

POS.	CONTACTS MADE FRONT	CONTACTS MADE REAR
AC-DC	8-9, 11-1	2-3, 4-10
OFF	NONE	1-2-4, 8-10-11
BATTERY	2-3, 9-10	3-4-5-6, 8-9-10-12-2

I.F. 456 KC

DIAG NO.	PART NO.	DESCRIPTION
C1	N-1345	.05 MFD. 200 V.
C2	N-1345	.05 MFD. 200 V.
C3	N-1344	.01 MFD. 400 V.
C4	N-2712	.004 MFD. 400 V.
C5		.0001 MFD. (on 2nd I.F. coil)
C6	N-1351	.1 MFD. 200 V.
C7	N-1344	.01 MFD. 400 V.
C8	N-1342	50 MMFD. MICA
C9	N-1344	.01 MFD. 400 V.
C10	N-2712	.004 MFD. 400 V.
C11		100 MFD. 12 V.
C12	N-4206	30 MFD. 150 V. ELECTROLYTIC
C13		30 MFD. 150 V.
C14	N-1346	.05 MFD. 400 V.



TUBE AND TRIMMER LOCATIONS

45Z3 RECTIFIER

LINE CORD DISCONNECTS WHEN BACK IS REMOVED

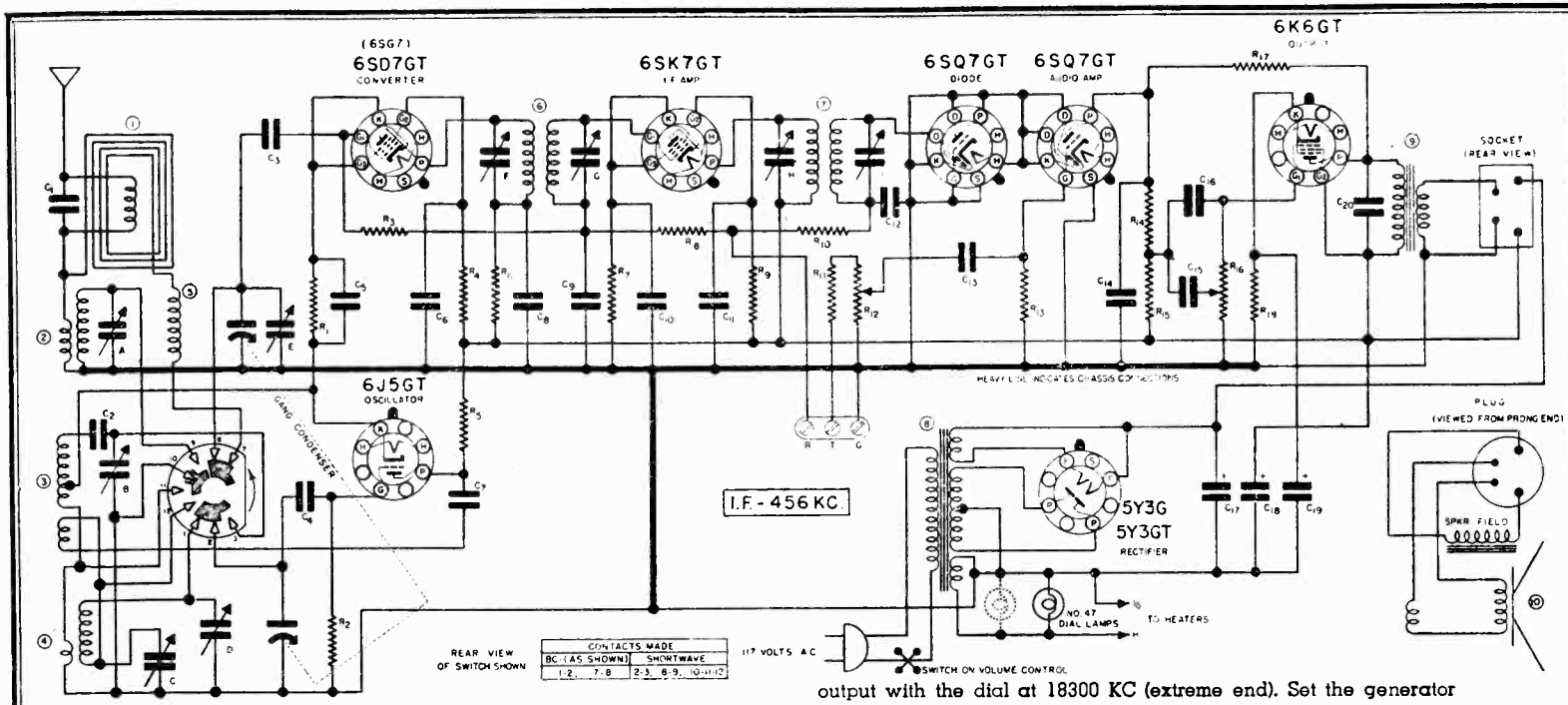
5 TUBE - 3 WAY PORTABLE

BATTERY, 110-120 VOLTS AC OR DC.
SUPERHETERODYNE
SINGLE BAND

DRAWN - APP'D
MAY, 1941.

MODELS LW, LWU

SONORA PRODUCTS, INC.

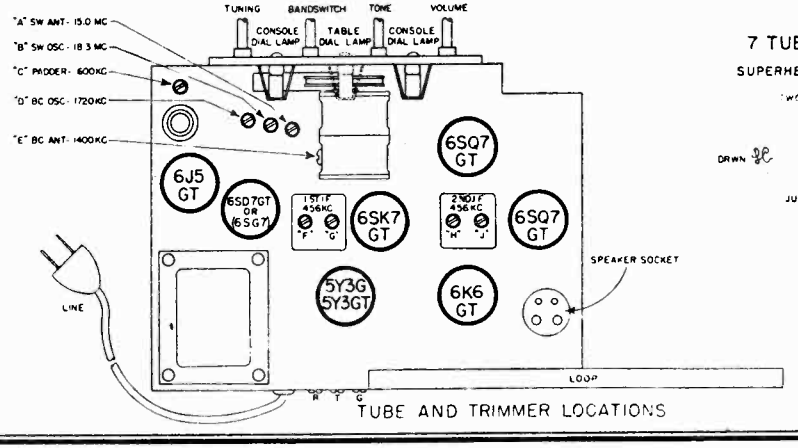


D.SG. NO	PART NO	DESCRIPTION
R_1	N-3741	1,000 OHM 5W 10%
R_2	N-4063	47,000 OHM 5W 20%
R_3	N-4062	3.3 MEGOHM 5W 20%
R_4	N-4423	330,000 OHM 5W 20%
R_5	N-4451	27,000 OHM, 5W, 10% (TABLE)
R_5	N-4422	47,000 OHM, 1W, 10% (CONSOLE)
R_6	N-1258	10,000 OHM .5W 20%
R_7	N-4121	270 OHM, 5W, 10% (TABLE)
R_7	N-4420	330 OHM, 5W, 10% (CONSOLE)
R_8	N-1262	1 MEG. OHM 5W 20%
R_9	N-4063	47,000 OHM, 5W, 20% (TABLE)
R_9	N-4120	68,000 OHM, 5W, 20% (CONSOLE)
R_{10}	N-4087	47,000 OHM 5W 20%
R_{11}	N-4064	33,000 OHM 5W 20%
R_{12}	N-4096	0.5 MEGOHM VOLUME CONTROL
R_{13}	N-1263	10 MEGOHM 5W 20%
R_{14}	N-4064	33,000 OHM 5W 20%
R_{15}	N-4423	330,000 OHM 5W 20%
R_{16}	N-4399	0.5 MEGOHM TONE CONTROL
R_{17}	N-4424	2.2 MEGOHM 5W 10%
R_{18}	N-4421	470 OHM 1W 10%
C_1	N-1343	.00025 MFD. MICA 20%
C_2	N-3690	.004 MFD. MICA 5%
C_3	N-1343	.00025 MFD. MICA 20%
C_4	N-1342	.00005 MFD. MICA 20%
C_5	N-1345	.05 MFD. 200V. 20%
C_6	N-1376	.02 MFD 400V. 20%
C_7	N-1344	.01 MFD 400V 20%
C_8	N-1623	.1 MFD. 400V. 20%
C_9	N-1345	.05 MFD. 200V. 20%
C_{10}	N-1351	.1 MFD. 200V 20%
C_{11}	N-1623	.1 MFD. 400V. 20%
C_{12}	N-1374	.0001 MFD. MICA 20%
C_{13}	N-1344	.01 MFD 400V 20%
C_{14}	N-1374	.0001 MFD. MICA 20%
C_{15}	N-1347	.006 MFD. 600V 20%
C_{16}	N-1344	.01 MFD 400V 20%
C_{17}	N-4411K	12 MFD. 400WV. / 10MFD 400WV. / 20MFD. 25 WV. ELECTROLYTIC (TABLE)
C_{17}	N-4429	14 MFD 450WV. / 14 MFD 450WV. / 20 MFD 25 WV. ELECTROLYTIC (CONSOLE)
C_{20}	N-1347	.006 MFD 600V. 20%
	N-4397	2 GANG CONDENSER
	N-4400	BANDSWITCH
1	N-4401	LOOP ANTENNA (TABLE)
1	N-4428	LOOP ANTENNA (CONSOLE)
2	N-4402	SW ANTENNA COIL
3	N-4404	SW OSCILLATOR COIL
4	N-4403	BC OSCILLATOR COIL
5	N-4407	LOOP SERIES COIL
6	N-4405	1ST I.F. TRANSFORMER
7	N-4406	2ND I.F. TRANSFORMER
8	N-4396	POWER TRANSFORMER (TABLE)
8	N-4427	POWER TRANSFORMER (CONSOLE)
9	N-4395	OUTPUT TRANSFORMER (TABLE)
9	N-4426	OUTPUT TRANSFORMER (CONSOLE)
10	N-4394	6" DYNAMIC SPEAKER (TABLE)
10	N-4425	8" DYNAMIC SPEAKER (CONSOLE)

I.F. ALIGNMENT. With the wave switch in the Broadcast Band and the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6SG7 or 6SD7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis base. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. With the switch turned to the broadcast position, connect the antenna to the generator through a 100 MMF dummy and the ground of the set (Black wire) to the generator ground. Set the dial and generator at 1720 KC. Align the BC oscillator trimmer for maximum output. Set the generator at 1400 KC and tune-in signal with the dial. Adjust antenna trimmer for maximum output. Next set the generator at 600 KC and tune in the signal with the dial. Adjust the BC pad by rocking the gang back and forth while adjusting the pad until maximum output is attained. Recheck the adjustment at 1400 KC as the pad adjustment may have caused misalignment.

SHORT WAVE BAND ALIGNMENT. With the band switch turned to the S. W. position, connect the generator to the antenna with a 400 ohm dummy and the ground of the set (Black wire) to the generator ground. Adjust the S. W. oscillator to give a maximum output with the dial at 18300 KC (extreme end). Set the generator at 15000 KC and tune-in the signal with the dial. Adjust the antenna trimmer for maximum output. With a strong signal input turn the dial to approximately 1 M. C. lower in frequency and pick up the image frequency. If the image is not received, it will be necessary to return the dial to 18300 KC to reduce the capacity in the oscillator trimmer until a second signal is received. Proceed as before with the alignment of the antenna and recheck for image frequency.



TUBE AND TRIMMER LOCATIONS

7 TUBE A.C.

SUPERHETERODYNE

TWO BAND

DRWN

APP'D

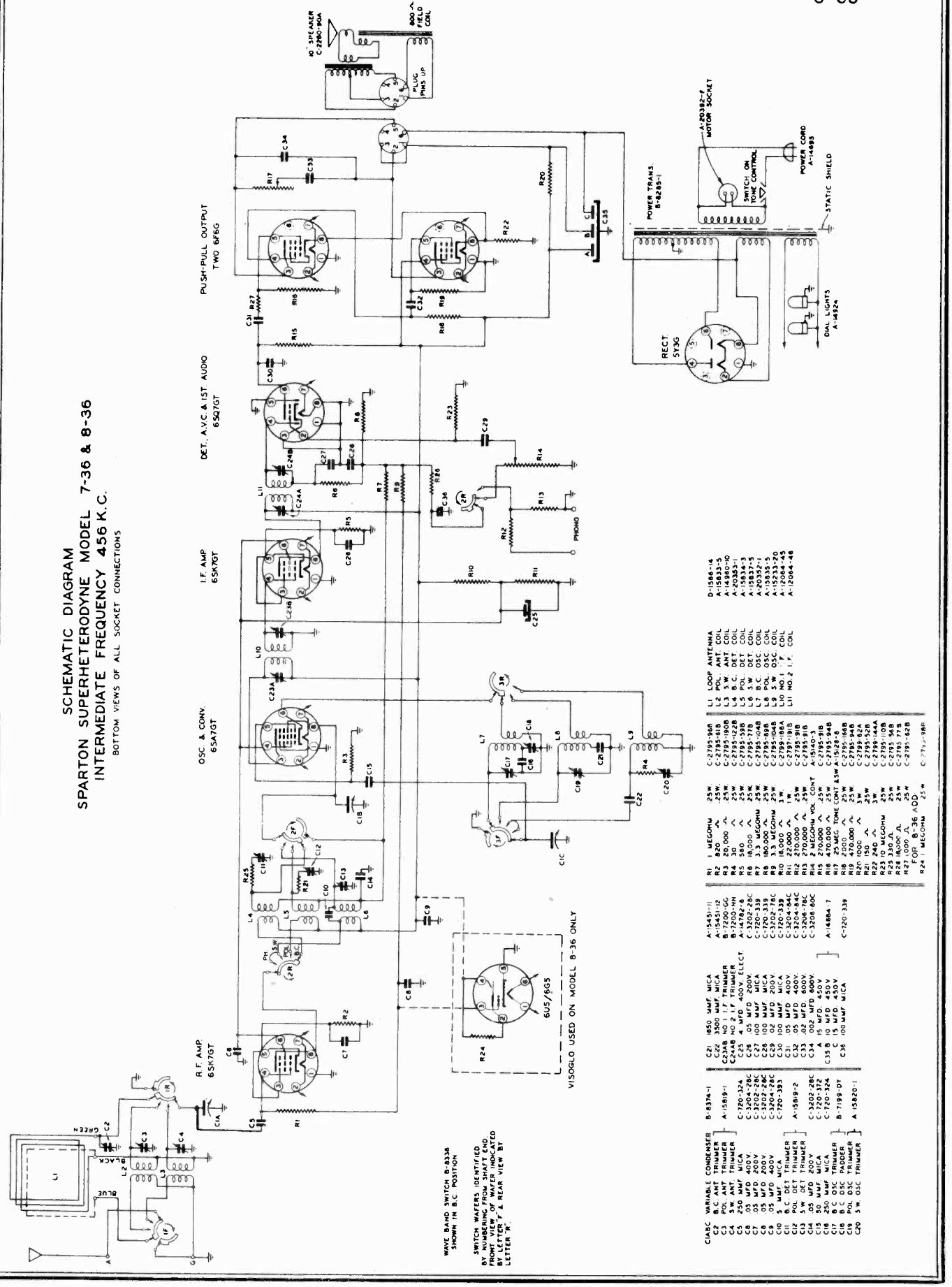
JUNE, 1941

THE SPARKS-WITHINGTON CO.

MODELS 7EW36, 7-36, 8-36

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 7-36 & 8-36
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



C1A,B,C	VARIABLE CONDENSER	B-8374-1
C2	B.C. ANT TRIMMER	A-15819-1
C3	POL. ANT TRIMMER	
C4	S.W. ANT TRIMMER	
C5	250 MMF MICA	C-720-324
C6	.05 MFD 400V	C-3204-28C
C7	.05 MFD 200V	C-3202-28C
C8	.05 MFD 200V	C-3202-28C
C9	.05 MFD 400V	C-3204-28C
C10	5 MMF MICA	C-720-393
C11	B.C. DET. TRIMMER	A-15819-2
C12	POL. DET. TRIMMER	
C13	S.W. DET. TRIMMER	
C14	.05 MFD 200V	C-3202-28C
C15	50 MMF MICA	C-720-372
C16	250 MMF MICA	C-720-324
C17	B.C. OSC. TRIMMER	B-7199-DY
C18	POL. OSC. TRIMMER	
C19	POL. OSC. TRIMMER	A-15820-1
C20	S.W. OSC. TRIMMER	
C21	1850 MMF MICA	A-15451-11
C22	3500 MMF MICA	A-15451-12
C23A,B	360 I.F. TRIMMER	B-7200-GG
C24A,B	NO 2 I.F. TRIMMER	B-7200-HH
C25	4 MFD 400 V. ELECT.	A-14782-8
C26	.05 MFD 200V.	C-3202-28C
C27	100 MMF MICA	C-720-339
C28	100 MMF MICA	C-720-339
C29	.02 MFD 200V	C-3202-28C
C30	100 MMF MICA	C-720-339
C31	.05 MFD 400V	C-3204-94C
C32	.05 MFD 400V	C-3204-94C
C33	.02 MFD 600V	C-3206-76C
C34	.002 MFD 600V	C-3206-66C
C35	A 15 MFD 450V	A-14884-7
	B 10 MFD 450V	
	C 15 MFD 450V	
C36	100 MMF MICA	C-720-339

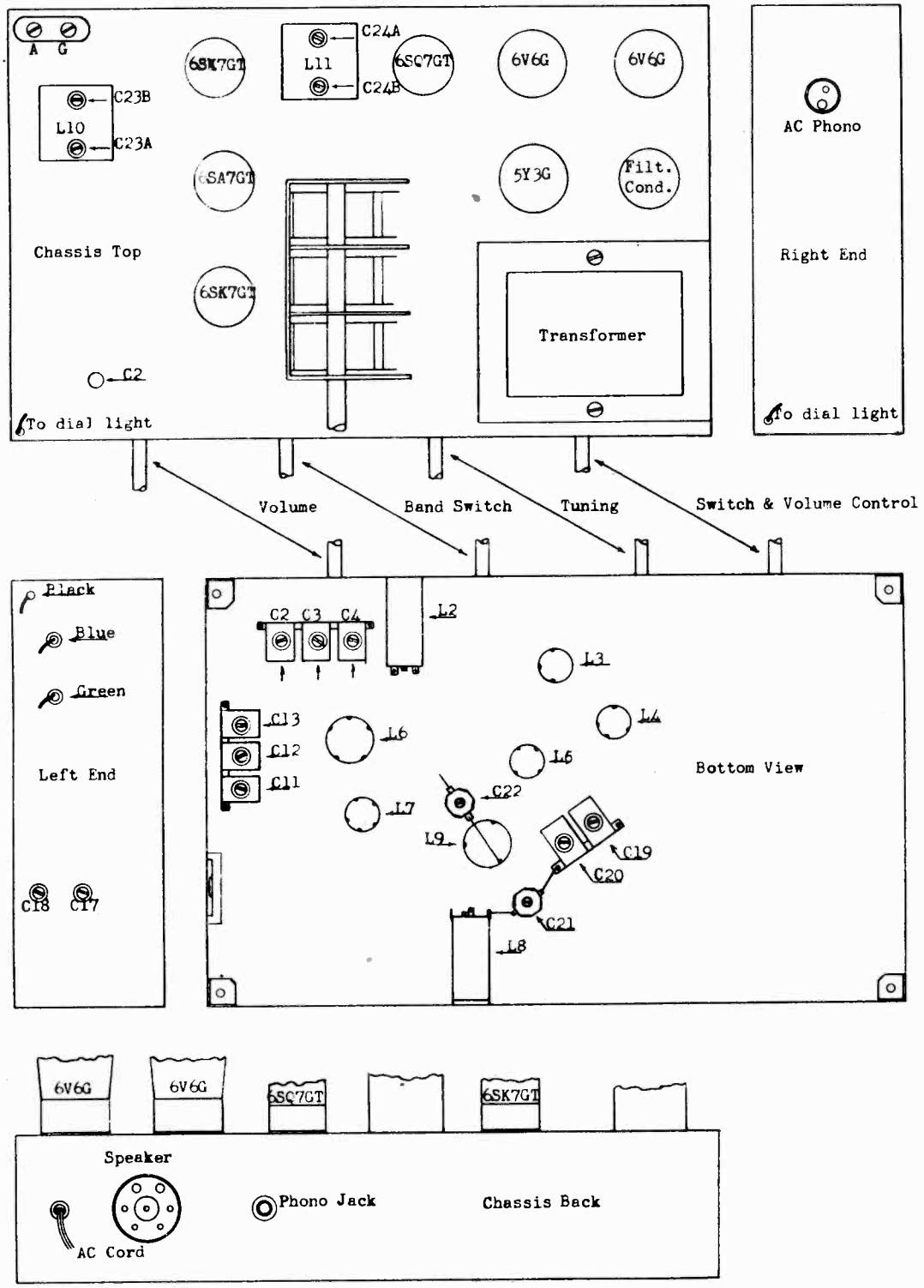
L1	LOOP ANTENNA	D-1566-14
L2	POL. ANT. COIL	A-15833-5
L3	S.W. ANT. COIL	A-14980-10
L4	B.C. DET. COIL	A-20385-1
L5	POL. DET. COIL	A-15834-3
L6	S.W. DET. COIL	A-15837-5
L7	B.C. OSC. COIL	A-20392-1
L8	POL. OSC. COIL	A-15835-5
L9	S.W. OSC. COIL	A-15838-20
L10	NO. 1 I.F. COIL	A-12064-46
L11	NO. 2 I.F. COIL	A-12064-48

R1	1 MEGOHM	25W	C-2795-96A
R2	820 Ω	.25W	C-2795-91B
R3	30,000 Ω	.25W	C-2795-112B
R4	560 Ω	.25W	C-2795-128B
R5	580 Ω	.25W	C-2795-59B
R6	18,000 Ω	.25W	C-2795-77B
R7	3.3 MEGOHM	.25W	C-2795-104B
R8	180,000 Ω	.25W	C-2795-80B
R9	1.5 MEGOHM	.25W	C-2795-106A
R10	18,000 Ω	1W	C-2799-108A
R11	22,000 Ω	1W	C-2797-191B
R12	270,000 Ω	.25W	C-2795-91B
R13	270,000 Ω	.25W	C-2795-91B
R14	2 MEGOHM VOL. CONT.		A-15451-3
R15	270,000 Ω	.25W	C-2795-91B
R16	470,000 Ω	.25W	C-2795-94B
R17	25 MEG. TONE CONT.	.25W	A-15128-8
R18	2700 Ω	.25W	C-2795-96B
R19	47,000 Ω	.25W	C-2795-104B
R20	1000 Ω	3W	C-2799-82A
R21	150 Ω	.25W	C-2795-52B
R22	240 Ω	3W	C-2799-144A
R23	1.5 MEGOHM	.25W	C-2795-110B
R24	1 MEGOHM	.25W	C-2795-106B
R25	10,000 Ω	.25W	C-2795-77B
R26	18,000 Ω	.25W	C-2795-96B
R27	1,000 Ω	.25W	C-2795-62B
	FOR 8-36 ADD		
R24	1 MEGOHM	.25W	C-2795-98B

MODELS 7EW36,7-36,
8-36

THE SPARKS-WITHINGTON CO.

CHASSIS DIAGRAM



THE SPARKS-WITHINGTON CO.

MODELS 7EW36, 7-36, 8-36

ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING CONDENSER SETTING	TRIMMERS	REMARKS
1	Set dial pointer even with stop line when condenser gang is fully meshed.							
2	I. F.	*	1.mf cond.	456KC	BC	Open	C24 A&B	Peak Accurately
							C23 A&B	" "
3	Broadcast Band	Ant.	See Note	1500 KC	BC	1500 KC	C17 osc.trim	" "
							C11 det.trim	" "
							C2 ant. trim	" "
4				600 KC	BC	600 KC	C18 osc.pad	Rock **
5	Repeat operation 3).							
6	Check Calibration & Sensitivity at 600 KC, 1000 KC & 1500 KC.							
7	Police Band	Ant.	See Note	5 MC	Police Band	5 MC	C19 osc.trim	Peak Accurately
							C12 det.trim	Rock **
							C3 ant.trim	Rock **
							C21 osc. trim	See operation #8
8	Oscillator Padder C21 is precision set at the factory and should not be readjusted in the field.							
9	(Repeat operation 7).							
10	Check Calibration & Sensitivity at 1.8 MC & 5 MC.							
11	SW Band	Ant.	See Note	18 MC	SW Band	18 MC	C20 osc.trim	Peak Accurately
							C13 det.trim	Rock **
							C4 ant. trim	Rock **
							C22 osc. pad	See operation #12
12	Oscillator Padder C22 is precision set at the factory and should not be readjusted in the field.							
13	(Repeat operation 10).							
14	Check Calibration & Sensitivity at 6 MC & 18 MC.							
15	Check operations 1 to 11 inclusive.							

NOTES: Use Dummy Antenna as described on page No. 1 of this bulletin.
* Connect generator to pin #6 on 6SA7GT Osc-conv. tube.
** Rock dial while adjusting for maximum output.

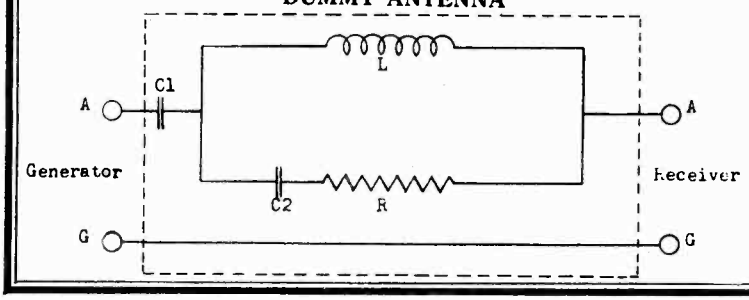
VOLTAGE CHART

Line Voltage: 117 Volts A.C.
Position of Volume Control: Full with dial tuned to Quiet Channel
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of socket prongs to Gnd, See prong on schematic dia.							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SK7GT	R. F. Amp.	0	0	3.5	0	3.5	75.1	6.3*	250
6SA7GT	Osc-conv.	0	0	250	75.1	-7	0	6.3*	-1.3
6SK7GT	I. F. Amp.	0	0	5.2	0	5.2	75	6.3*	250
6SQ7GT	Det-AVC-1st Audio	0	-.2	0	-.2	0	103	6.3*	0
6F6G	Push Pull Output	0	0	265	240	0	0	6.3*	30
6F6G	Push Pull Output	0	0	265	250	0	-	6.3*	30
5Y3G	Rectifier	0	355	250	360*	0	360*	0	355

NOTES: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.
* AC Volts.

DUMMY ANTENNA



Note: When using this dummy antenna the generator output impedance should be 10 ohms or lower.

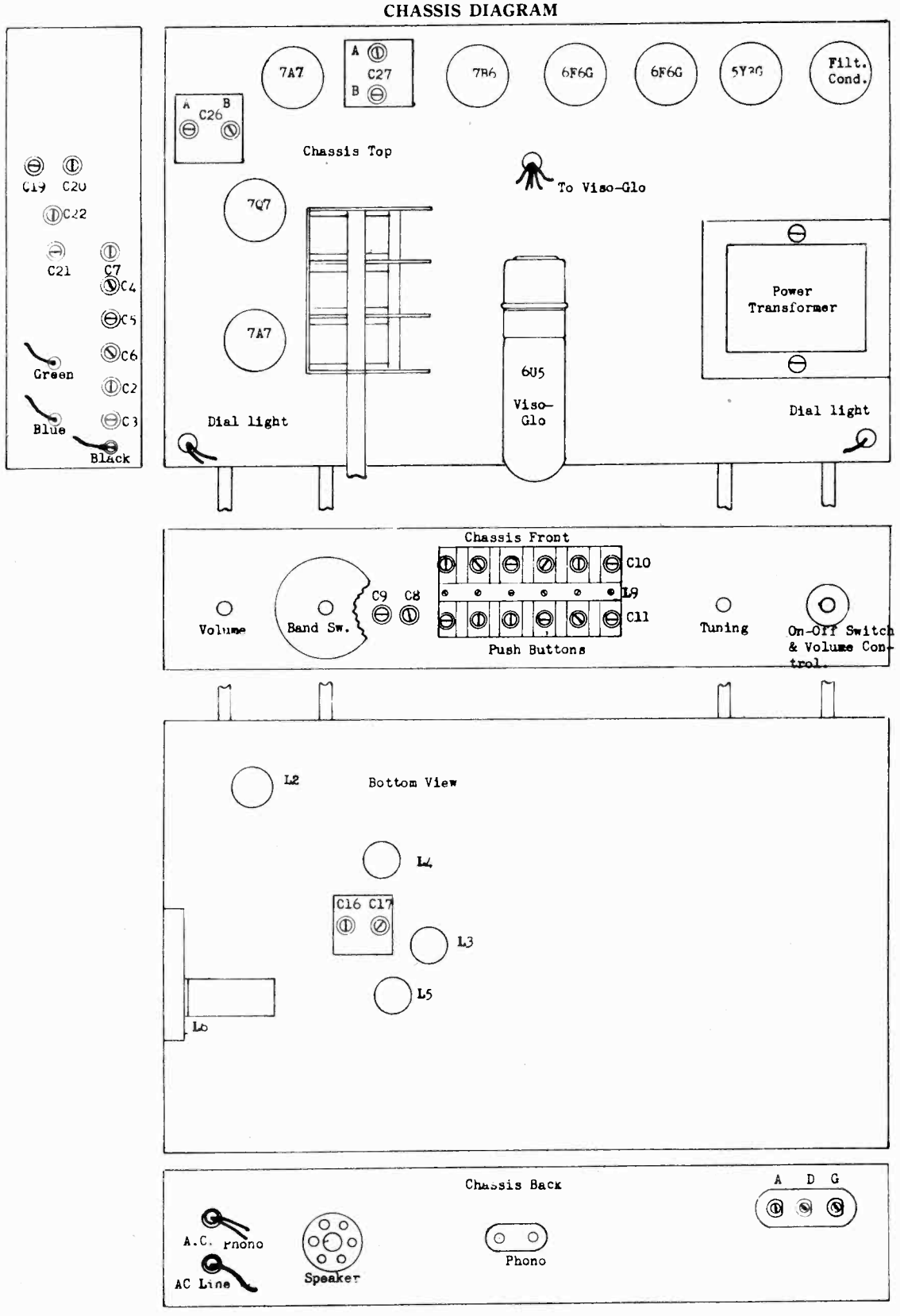
C1 - 200 mmf. Condenser
C2 - 400 mmf. Condenser
R - 100 ohms Resistor
L - 20 Microhenryies Choke
---- Case Shield

Choke Coil Specifications
Tubing - 3/8" diameter bakelite
Wire - No. 38 Enameled
Turns - 59 closely wound (Impregnated)

MODELS 8W31,8-61,
8W61,8W71

THE SPARKS-WITHINGTON CO.

CHASSIS DIAGRAM



THE SPARKS-WITHINGTON CO.

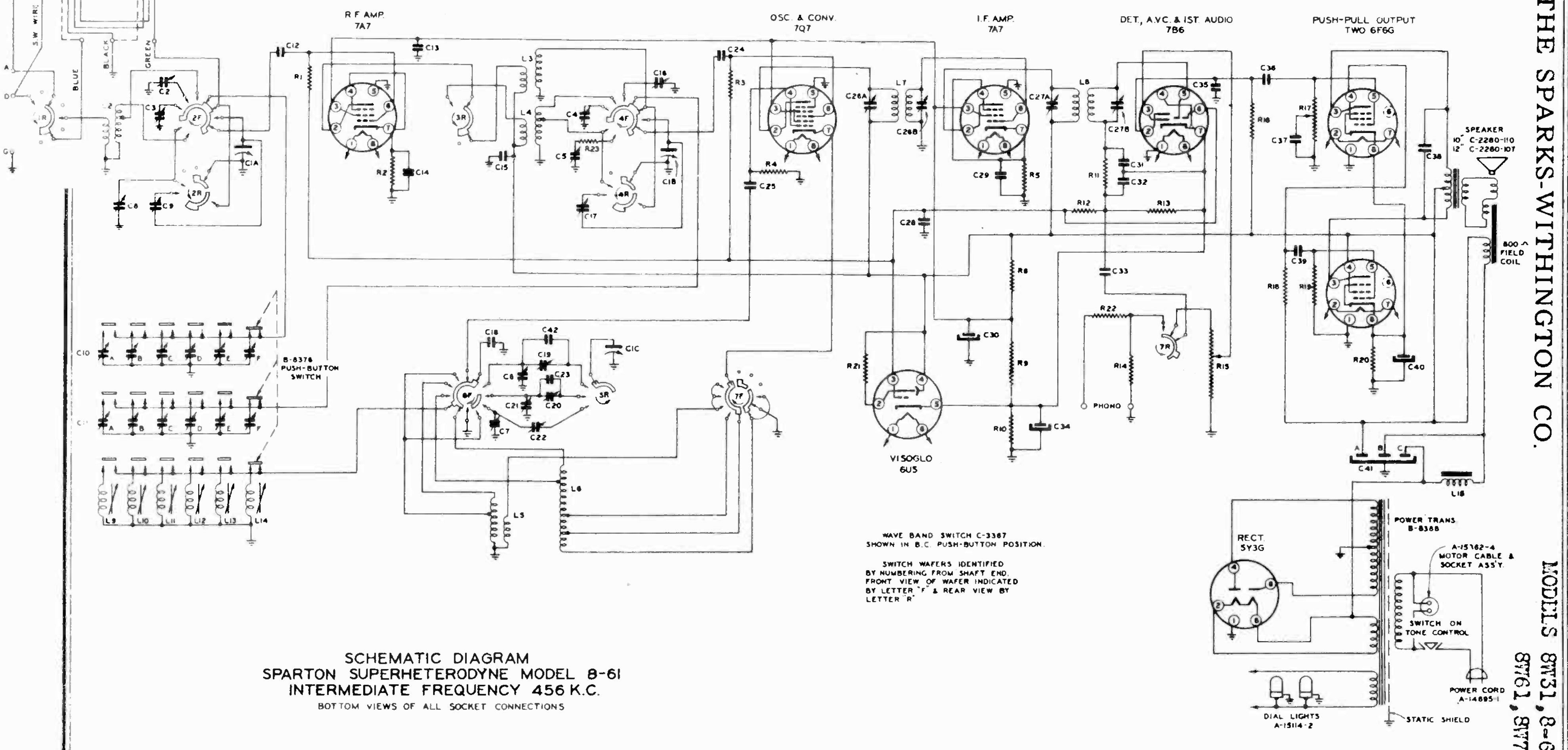
MODELS 8W31, 8-61, 8W61, 8W71

C1ABC	VARIABLE CONDENSER	B-8374
C2	POL. ANT. TRIMMER	A-15868-1
C3	B.C. " "	A-15868-1
C4	B.C. DET. "	A-15868-1
C5	POL. " "	A-15868-1
C6	B.C. OSC. "	A-15868-1
C7	S.W. " "	A-15868-1
C8	S.W. ANT. TRIMMER	B-8244-GD
C9	S.W. ANT. PADDER	B-8244-GD
C10A-F	ANT. P.B. TRIMMER	A-15825-3
C11A-F	R.F. P.B. TRIMMER	A-15825-4
C12	250 MMF. MICA	C-720-324
C13	.05 MFD. 400V.	C-3204-28C
C14	.05 MFD. 200V.	C-3202-84C
C15	.05 MFD. 400V	C-3204-28C
C16	S.W. DET. TRIMMER	B-7200-FG
C17	S.W. DET. PADDER	B-7200-FG
C18	350 MMF. MICA	B-8285-4
C19	B.C. OSC. PADDER	B-7200-YY
C20	POL. OSC. PADDER	B-7200-YY
C21	POL. OSC. TRIMMER	B-7200-DG
C22	S.W. OSC. PADDER	B-7200-DG

C23	2300 MMF. MICA	C-720-392
C24	250 MMF. MICA	C-720-324
C25	50 MMF. MICA	C-720-372
C26AB	NO. 1 I.F. TRIMMER	B-7200-GG
C27AB	NO. 2 I.F. TRIMMER	B-7200-NN
C28	.05 MFD. 200V.	C-3202-84C
C29	.05 MFD. 200V.	C-3202-84C
C30	4 MFD. 400V. ELECT.	A-14782-8
C31	100 MMF. MICA	C-720-339
C32	100 MMF. MICA	C-720-339
C33	.02 MFD. 200V.	C-3202-134C
C34	50 MFD. 25V. ELECT.	A-14782-6
C35	100 MMF. MICA	C-720-339
C36	.05 MFD. 400V.	C-3204-84C
C37	.003 MFD. 800V.	C-3208-82C
C38	.003 MFD. 800V.	C-3208-82C
C39	.05 MFD. 400V.	C-3204-84C
C40	20 MFD. 25V. ELECT.	A-14782-9
C41A	15 MFD. 450V. ELECT.	A-14884-7
C41B	10 MFD. 450V. ELECT.	A-14884-7
C41C	15 MFD. 450V. ELECT.	A-14884-7
C42	250 MMF. MICA	C-720-324

R1	1 MEGOHM	.25W.	C-2795-98B
R2	1000 Ω	.25W.	C-2795-62B
R3	1 MEGOHM	.25W.	C-2795-98B
R4	20,000 Ω	.25W.	C-2795-190B
R5	820 Ω	.25W.	C-2795-154B
R6	18,000 Ω	3 W.	C-2799-77A
R7	DELETED		
R8	DELETED		
R9	22,000 Ω	1 W.	C-2797-191B
R10	220 Ω	.25W.	C-2795-143B
R11	18,000 Ω	.25W.	C-2795-77B
R12	3.3 MEGOHM	.25W.	C-2795-104B
R13	180,000 Ω	.25W.	C-2795-89B
R14	270,000 Ω	.25W.	C-2795-91B
R15	2 MEG. VOL. CONT.		A-15140-2
R16	270,000 Ω	.25W.	C-2795-91B
R17	.5 MEG. TONE CONT. & SW.		A-15129-12
R18	2000 Ω	.25W.	C-2795-166B
R19	470,000 Ω	.25W.	C-2795-94B
R20	240 Ω	3W	C-2799-144A
R21	1 MEGOHM	.25W.	C-2795-98B
R22	270,000 Ω	.25W.	C-2795-91B
R23	36 Ω	.25W.	C-2795-124B

L1	LOOP ANTENNA	D-1566-9
L2	POL. & S.W. ANT. COIL	A-20301
L3	B.C. DET. COIL	A-20353
L4	POL. & S.W. DET. COIL	A-20302
L5	POL. & S.W. OSC. COIL	A-20300
L6	B.C. OSC. COIL	A-20352
L7	NO. 1 I.F. COIL	A-12084-45
L8	NO. 2 I.F. COIL	A-12084-46
L9-L14	P.B. B.C. OSC. COIL	B-8387
L15	FILTER CHOKE	A-15388



SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 8-61
INTERMEDIATE FREQUENCY 456 K.C.
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

MODELS 8W31,8-61,
8W61,8W71

THE SPARKS-WITHINGTON CO.

Sparton Superheterodyne Model 8-Series

VOLTAGE CHART

Models 8W31, 8W71 and 8W61.

Line Voltage: 117 Volts A.C.

Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. See Prong Nos. on Schematic Diagram								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9
7A7	R-F Amplifier	0	260	65	3	0	0	3	6.2*	-
7Q7	Osc - Converter	0	260	65	-4	0	0	0	6.2*	-
7A7	I-F Amplifier	0	245	70	2.5	0	0	2.3	6.2*	-
7B6	2nd Det - AVC - 1st Audio	0	180	0	.8	.4	0	.7	6.2*	-
6F6G	Power Amplifier	0	0	245	240	0	260	6.2*	18	-
6F6G	Power Amplifier	0	0	245	235	0	0	6.2*	18	-
6U5	Viso-Glo	6.2*	270	0	280	0	0	-	-	-
5Y3G	Rectifier	0	340	0	345*	0	345*	0	340	-

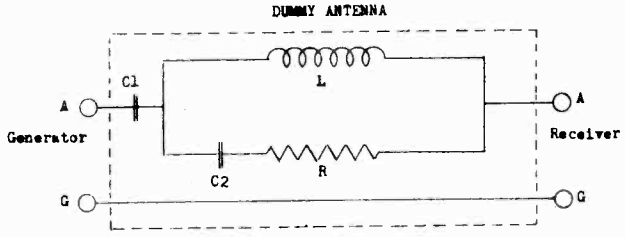
Notes: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20000 ohms per volt voltmeter.
*AC volts.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND SETTING	TRIMMERS	REMARKS
1	Set dial pointer even with left hand stop line with condenser gang fully meshed							
2	I.F.	*	.1 MFD	456 KC	B.C.	Open	C27 A&E	Peak Accurately
3							C26 A&B	Peak Accurately
4	Broadcast Band	Ant.	See Note	1500 KC	B.C.	1500 KC	C6 Osc.	" "
							C4 R.F.	" "
							C3 Ant.	" "
5				600 KC	B.C.	600 KC	C19 Pad	Rock **
6	Repeat operation 4.							
7	Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC.							
8	Police Band	Ant.	See Note	7 MC	Police	7 MC	C21 Osc.	Peak Accurately
							C5 R.F.	" "
							C2 Ant.	" "
9				2.5 MC	Police	2.5 MC	C20 Pad	Rock **
10	Check calibration and sensitivity at 7 MC, 4 MC and 2.5 MC.							
11	Short Wave Band	Ant.	See Note	11.7	S.W.	11.7	C70sc. trim	Peak Accurately
							C16 RF. trim	Rock **
							C8 Ant.trim	" **
12				9.3	S.W.	9.3	C22 osc.pad	Peak Accurately
							C17 RF pad	Rock **
							C9 Ant. pad	Rock **
13	Repeat operations 12 as many times as necessary until additional gain cannot be obtained.							
14	Check calibration and sensitivity at 11.7 and 9.3.							
15	Check operations 1 to 14.							

NOTES: Use dummy antenna as described on page 1.
*Connect generator to pin #6 on 7Q7 osc. conv. tube.
**Rock dial while adjusting for maximum output.

DUMMY ANTENNA



C1 - 200 mmf. condenser
C2 - 400 mmf. condenser
R - 100 ohms
L - Choke Coil
---- Case Shield

Choke Coil Specification
Tubing - 3/8" diameter bakelite
Wire - No. 38 enameled.
Turns - 59 closely wound (Impregnated)

Note: When using this dummy antenna the generator output impedance should be 10 ohms or lower.

THE SPARKS-WITHINGTON CO.

MODEL 642-X

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 642-X
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

WAVE-BAND SWITCH B-8334
SHOWN IN POSITION FOR
585-175 M BAND

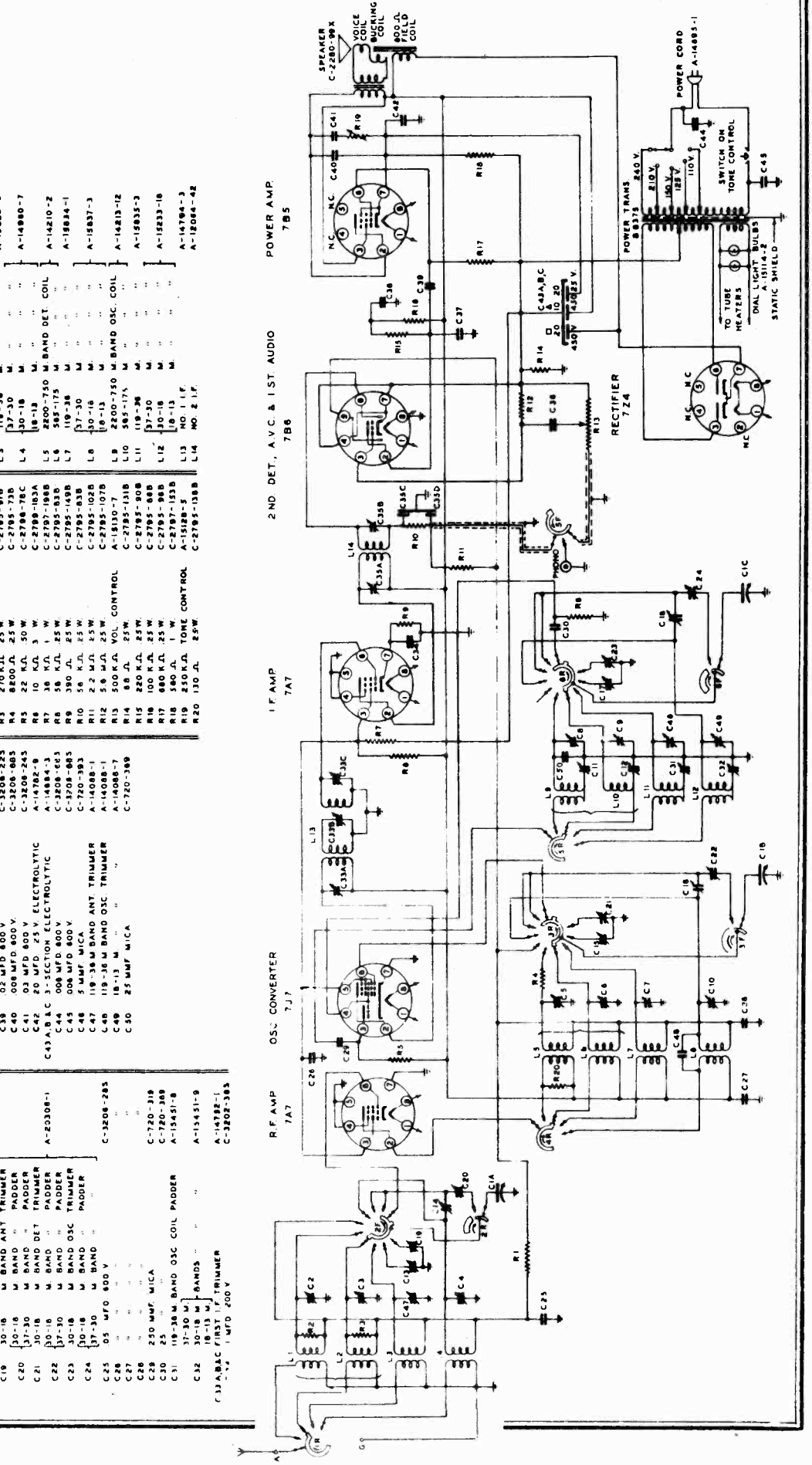
SWITCH WAFERS IDENTIFIED BY NUMBERING FROM SHAFT END.
SCHEMATIC OF FRONT OF WAFER INDICATED BY LETTER "F."
& OF REAR BY LETTER "R."

C1A,B,C	3-GANG CONDENSER	B-8013	
C2	2200-750 M BAND ANT TRIMMER		A-14199-4
C3	585-175 M " " "		
C4	18-13 " " "		
C5	2200-750 M BAND DET TRIMMER		A-14199-4
C6	585-175 M " " "		
C7	110-36 " " "		
C8	2200-750 M BAND OSC. TRIMMER		A-14199-4
C9	585-175 M " DET "		
C10	18-13 " " "		
C11	2200-750 M OSC PADDER		B-7199-DY
C12	585-175 M " "		
C13	37-30 M BAND ANT TRIMMER		
C14	18-13 " " PADDER		
C15	37-30 M BAND DET TRIMMER	A-20306	
C16	18-13 " " PADDER		
C17	37-30 M BAND OSC TRIMMER		
C18	18-13 " " PADDER		
C19	30-18 M BAND ANT TRIMMER		
C20	18-13 " " PADDER		
C21	37-30 M BAND DET TRIMMER		
C22	18-13 " " PADDER	A-20306-1	
C23	37-30 M BAND OSC TRIMMER		
C24	18-13 " " PADDER		
C25	05 MFD 600 V	C-3206-285	
C26	" " "		
C27	" " "		
C28	" " "		
C29	250 MMF MICA	C-720-319	
C30	25 " "	C-720-368	
C31	110-36 M BAND OSC COIL PADDER	A-15431-8	
C32	37-30 M BANDS " " "	A-15431-9	
	30-18 M		
	18-13 M		
C33,A,B,C	FIRST I.F. TRIMMER	A-14782-1	
C34	1 MFD 200 V	C-3202-383	

C35A,B,C,D	SECOND I.F. TRIMMER	A-20114	
C36	02 MFD 600 V	C-3206-225	
C37	250 MMF MICA	C-720-319	
C38	1 MFD 600 V	C-3206-385	
C39	02 MFD 600 V	C-3206-225	
C40	008 MFD 600 V	C-3206-085	
C41	03 MFD 600 V	C-3206-245	
C42	20 MFD 25 V ELECTROLYTIC	A-14782-8	
C43,A,B & C	3-SECTION ELECTROLYTIC	A-14884-3	
C44	008 MFD 600 V	C-3206-085	
C45	006 MFD 600 V	C-3206-065	
C46	5 MMF MICA	C-720-393	
C47	110-36 M BAND ANT TRIMMER	A-14058-1	
C48	110-36 M BAND OSC TRIMMER	A-14058-1	
C49	18-13 M " "	A-14058-7	
C50	25 MMF MICA	C-720-369	

R1	100 K.Ω. .25 W	C-2795-868	
R2	470 K.Ω. .25 W	C-2795-848	
R3	270 K.Ω. .25 W	C-2795-818	
R4	8200 Ω. .25 W	C-2795-738	
R5	22 K.Ω. .50 W	C-2798-78C	
R6	10 K.Ω. 3 W	C-2798-183A	
R7	38 K.Ω. 1 W	C-2797-198B	
R8	56 K.Ω. .25 W	C-2795-838	
R9	390 Ω. .25 W	C-2795-1498	
R10	56 K.Ω. .25 W	C-2795-838	
R11	2.2 MΩ .25 W	C-2795-1028	
R12	5.6 MΩ .25 W	C-2795-1078	
R13	500 K.Ω. VOL. CONTROL	A-15130-7	
R14	68 Ω. .25 W.	C-2795-1318	
R15	220 K.Ω. .25 W.	C-2795-908	
R16	100 K.Ω. .25 W	C-2795-888	
R17	680 K.Ω. .25 W	C-2795-988	
R18	560 Ω. 1 W	C-2797-1538	
R19	250 K.Ω. TONE CONTROL	A-15128-5	
R20	130 Ω. .25W	C-2795-1388	

L1	2200-750 M. BAND ANT. COIL		A-14209-8
L2	585-175 M. " " "		A-15833-3
L3	110-36 M. " " "		
	37-30 " " "		
L4	30-18 M. " " "		A-14980-7
	18-13 M. " " "		
L5	2200-750 M. BAND DET. COIL		A-14210-2
L6	585-175 M. " " "		
L7	110-36 M. " " "		A-15834-1
	37-30 " " "		
L8	30-18 M. " " "		A-15837-3
	18-13 M. " " "		
L9	2200-750 M. BAND OSC. COIL		A-14213-12
L10	585-175 M. " " "		
L11	110-36 M. " " "		A-15835-3
	37-30 " " "		
L12	30-18 M. " " "		A-15233-10
	18-13 M. " " "		
L13	NO. 1 I.F.		A-14784-3
L14	NO. 2 I.F.		A-12064-42

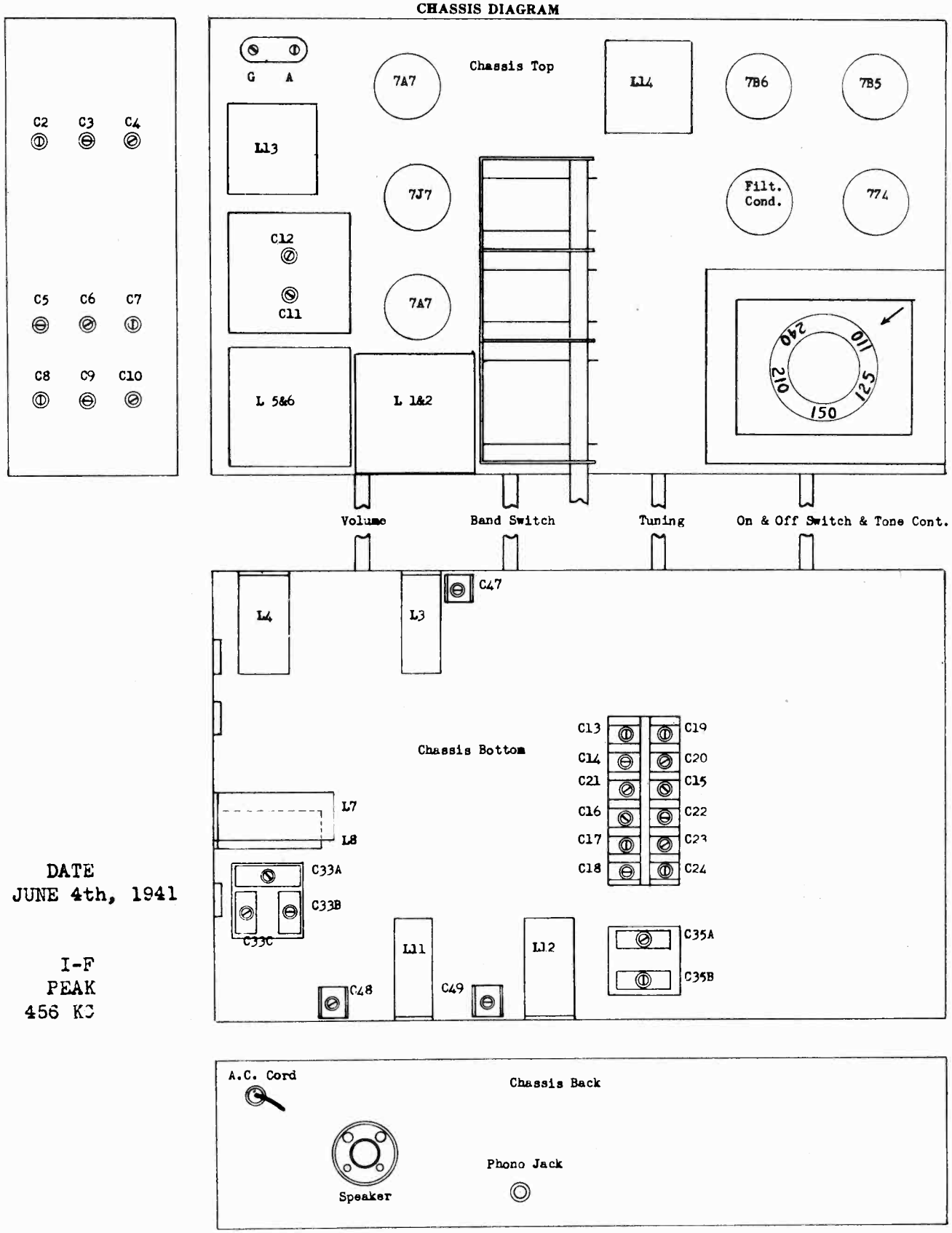


MODEL 642-X

THE SPARKS-WITHINGTON CO.

Sparton Superheterodyne Models 642-X

CHASSIS DIAGRAM



DATE
JUNE 4th, 1941

I-F
PEAK
456 KC

Sparton Superheterodyne Models 642-X

VOLTAGE CHART

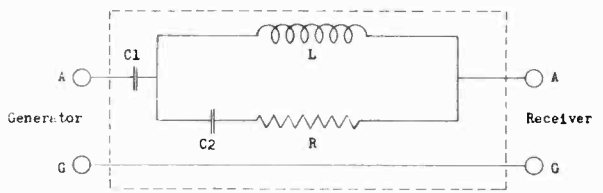
Line Voltage: 117 Volts AC

Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. See Prong Nos. on Schematic Dia.								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9
7A7	R-F Amplifier	6.2*	165	120	0	0	-1.8	0	0	-
7J5	Oscillator-Converter	6.2*	235	130	8.8	120	-2.2	0	0	-
7A7	I-F Amplifier	6.2*	235	120	0	0	0	3.8	0	-
7B6	2nd Det - AVC - 1st Audio	6.2*	90	-2.2	-2.1	-2.2	-2.5	-2.1	0	-
7B5	Power Amplifier	0	225	235	0	185	-.2	13	6.2*	-
7Z4	Rectifier	6.2*	50*	320*	0	0	320*	380	0	-

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.
*AC volts.

DUMMY ANTENNA



C1 - 200 mmf. condenser
C2 - 400 mmf. condenser
R - 100 ohms
L - Choke coil
---- Case shield

Choke Coil Specification
Tubing - 3/8" Diameter bakelite
Wire - No. 38 enameled
Turns - 59 closely wound (Impregnated)

Note: When using this dummy antenna the generator output impedance should be 10 ohms or lower.

Sparton Superheterodyne Models 642-X

ALIGNMENT CHART

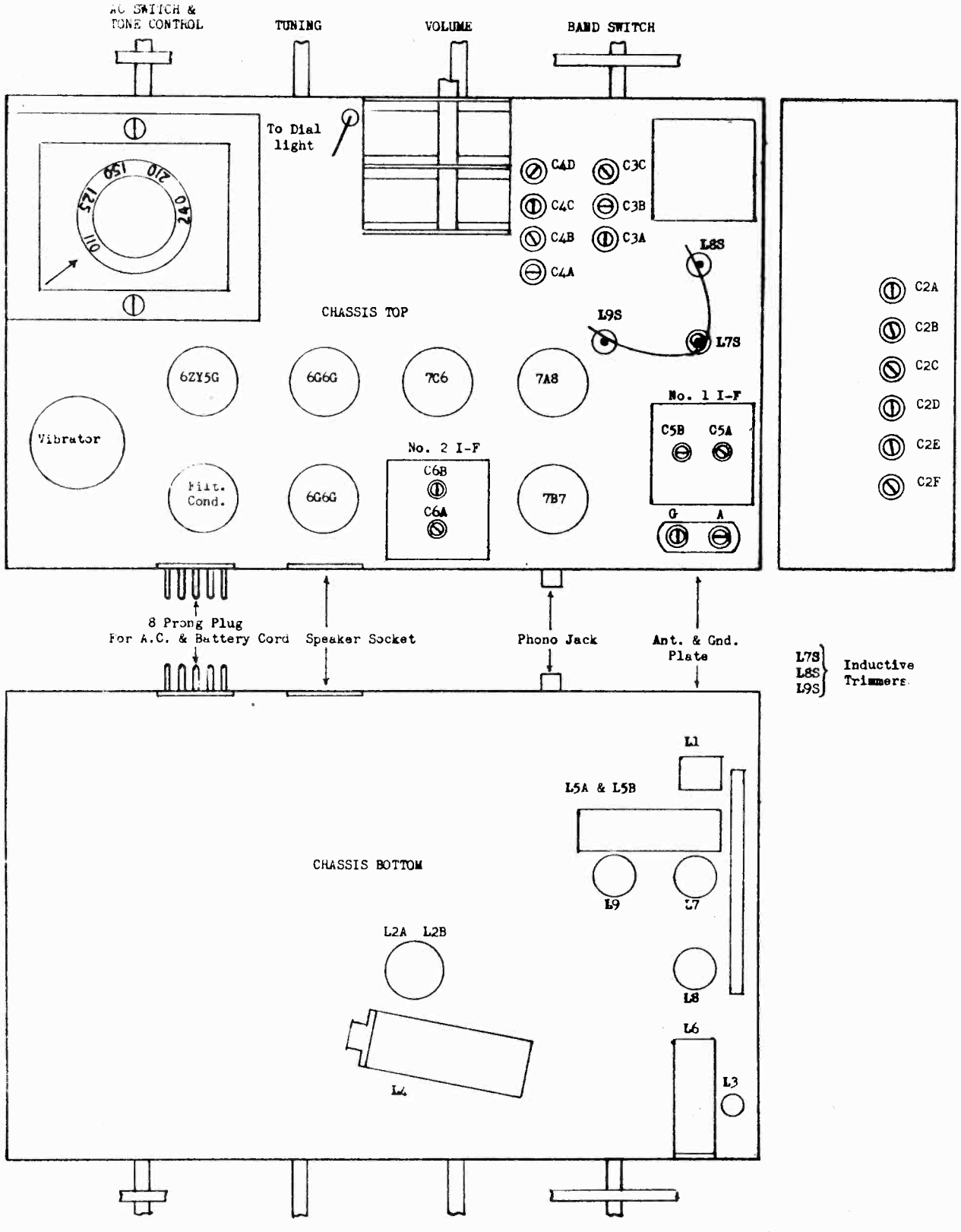
OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	BAND SWITCH SETTING	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer even with left hand stop line with condenser gang fully meshed.							
2	I.F.	****	.1 mf.	565 to 175 M	456	Open	C35 A&B	Peak accurately
3							C33 B*	**
4							C33 A &C	Peak accurately
5							C33 B*	" "
6	CAUTION: Do not readjust trimmers C35 A&B and C33 A&C after C33 B has been peaked.							
7	565 to 175 M	ANT	See Note	565 to 175 M	200 M (1500 Kc)	200 M	C9 Osc.Trim	Peak accurately
							C6 Det.Trim	" "
							C3 Ant.Trim	" "
8					500 M (600 KC)	500 M	C12 Osc.Pad	***
9	Repeat operation 7.							
10	Check calibration and sensitivity at 200 M, 300 M and 500 M.							
11	2200 to 750 M	ANT	See Note	2200 to 750 M	800 M (375 Kc)	800 M	C8 Osc.Trim	Peak accurately
							C2 Ant. "	" "
12							C5 Det. "	" "
					1900 M (158 KC)	1900 M	C11 Osc.Pad	***
13	Repeat operation 11.							
14	Check calibration and sensitivity at 800 M, 1900 M.							
15	C31 & 32 Osc. Padders are precision set at the factory and should not be moved.							
16	119 to 36 M	ANT	See Note	119 to 36 M	36 M (8.35MC)	36 M	C48 Osc.Trim	Peak accurately
							C47 Ant. "	" "
							C7 Det. "	" "
17						Fixed	C31 Osc.Pad	See Operation 15
18	Repeat operation 16.							
19	Check calibration and sensitivity at 80 and 110 M							
20	All trimmers should be adjusted to the fundamental of the test signal and not to the image.							
21	18 to 13 M	ANT	See Note	18 to 13 M	13 M (23.1MC)	13 M	C49 Osc.Trim	***
							C4 Ant. "	***
							C10 Det. "	***
22	See operation 31.							
23	30 to 18 M	ANT	See Note	30 to 18 M	18.5 M (16.2 MC)	18.5 M	C23 Osc. "	***
							C19 Ant. "	***
							C21 Det. "	***
24	See operation 31.							
25	37 to 30 M	ANT	See Note	37 to 30 M	29.5M (10.15MC)	29.5M	C17 Osc. "	***
							C13 Ant. "	***
							C15 Det. "	***
26					36 M	36 M	C24 Osc.Pad	***
							C32 Osc."	See Note A.
							C20 Ant. "	***
							C22 Det. "	***
27	Note A: Do not change setting of padders C24, 20 and 22 after adjusting in operation 26.							
28	30 to 18 M	ANT	See Note	30 to 18 M	Check at 29 M (10.3MC)	Check at 29 M	C24 Osc.Pad	See Note A.
							C32 Osc. "	See Operation 15
							C20 Ant. "	See Note A
							C22 Det. "	See Note A
29	See operation 31.							
30	18 to 13 M	ANT	See Note	18 to 13 M	18.3 M (16.3MC)	18.3 M	C18 Osc. "	***
							C32 Osc. "	See Operation 15
							C14 Ant. "	***
							C16 Det. "	***
31	Repeat operations 21, 23, 25, 26, 28 and 30, as many times as necessary until additional gain cannot be obtained.							

Note: Use dummy antenna as described on page 1.
*Bronze color trimmer screw.
**Turn trimmer screw all way down.
***Rock dial while adjusting for maximum output.
****Generator connected to pin #6 of 7J7 oscillator tube.

MODELS 672-6XA, 672-6XE

THE SPARKS-WITHINGTON CO.

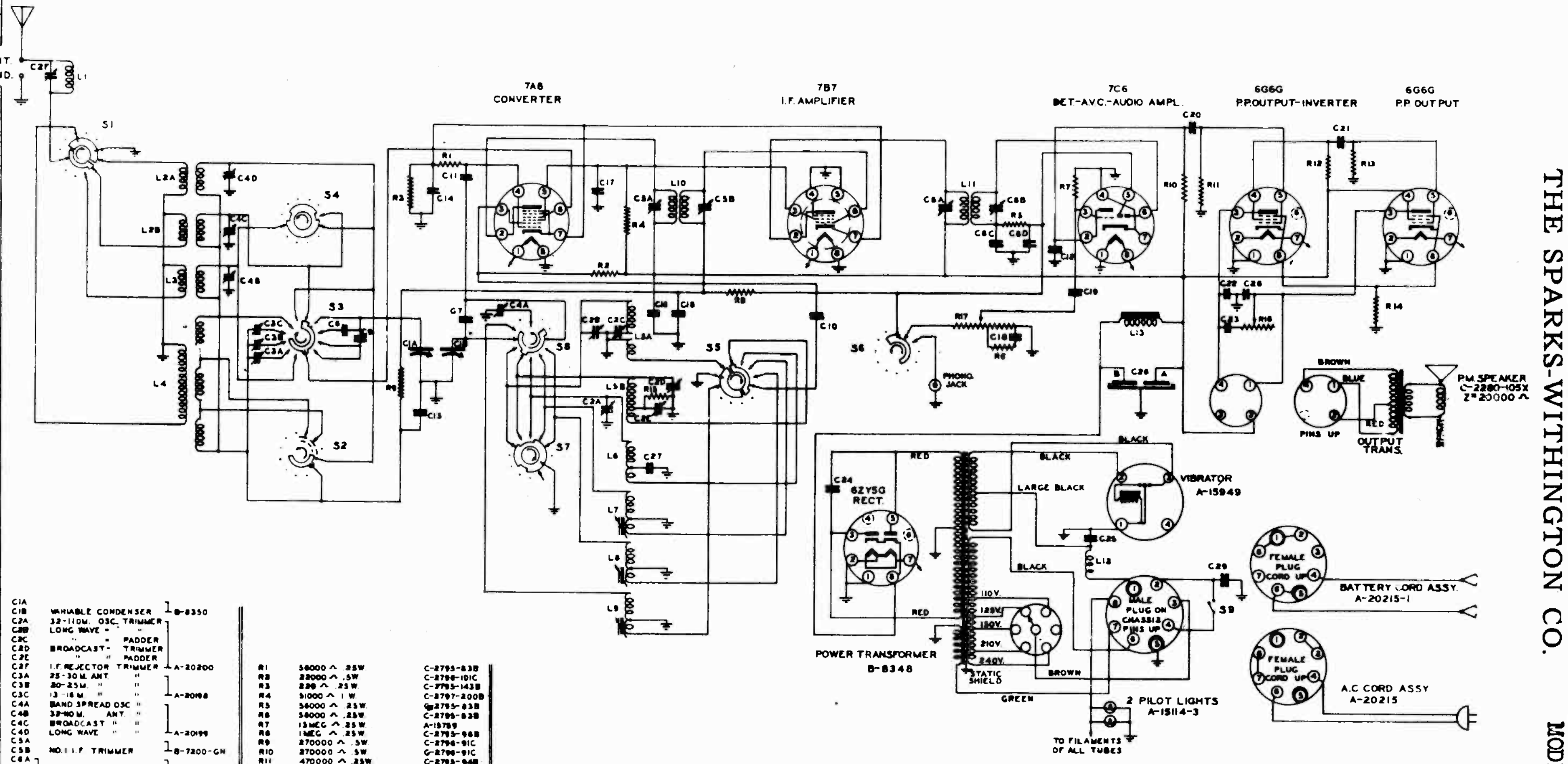
672-6XA and 672-6XE



THE SPARKS-WITHINGTON CO.

MODELS 672-6XA, 672-6XE

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 672-6X



BOTTOM VIEW OF TUBE & VIBRATOR SOCKETS.

INTERMEDIATE FREQUENCY 456 K.C.
LONG WAVE, BROADCAST & 32-110M BAND - OSCILLATOR FREQUENCY ABOVE SIGNAL FREQ.
25-30M., 20-25M. & 13-16M. BANDS " " BELOW " "

C1A		
C1B	VARIABLE CONDENSER	B-8350
C2A	32-110M. OSC. TRIMMER	
C2B	LONG WAVE " "	
C2C	" " PADDER	
C2D	BROADCAST - TRIMMER	
C2E	" " PADDER	
C2F	I.F. REJECTOR TRIMMER	A-20200
C3A	25-30M. ANT. "	
C3B	20-25M. " "	
C3C	13-16M. " "	A-20198
C4A	BAND SPREAD OSC "	
C4B	32-110M. ANT. "	
C4C	BROADCAST " "	
C4D	LONG WAVE " "	A-20199
C5A		
C5B	NO.1 I.F. TRIMMER	B-7200-GN
C6A		
C6B	NO.2 I.F. TRIMMER	
C6C		
C6D	TWEET FILTER	A-20114
C7	70 MMF. CERAMIC	A-20252-1
C8	50 MMF. "	A-20252-2
C9	65 MMF. "	A-20252-3
C10	1000 MMF. MICA	C-720-297
C11	50 MMF. "	C-720-372
C12	100 MMF. "	C-720-318
C13	.05 MFD 400V	C-3204-285
C14	.25 MFD 200V	C-3202-415
C15	.05 MFD 400V	C-3204-285
C16	.1 MFD 600V	C-3206-385
C17	.1 MFD 600V	C-3206-385
C18	.03 MFD 200V.	C-3202-1365
C19	.01 MFD. 400V	C-3204-1325
C20	.03 MFD. 600V	C-3206-1365
C21	.03 MFD. 600V	C-3206-1365
C22	.002 MFD. 600V	C-3206-1165
C23	.01 MFD 600V	C-3206-1325
C24	.005 MFD 1600V	C-3216-60A5
C25	.5 MFD 120V HASH	A-20207
C26A	30 MFD. 450V. ELECTROLYTIC	
C26B	15 MFD 450V. "	A-14927-2
C27	1710 MMF. PADDER	A-15451-7
C28	.002 MFD. 600V	C-3206-1165
C29	.01 MFD. 600V	C-3206-1325

R1	56000 ^ .25W.	C-2795-83B
R2	22000 ^ .5W	C-2796-101C
R3	220 ^ .25W.	C-2795-143B
R4	51000 ^ 1 W.	C-2797-200B
R5	56000 ^ .25W.	C-2795-83B
R6	56000 ^ .25W	C-2795-83B
R7	15 MEG ^ .25W.	A-15789
R8	1 MEG ^ .25W	C-2795-98B
R9	270000 ^ .5W.	C-2796-91C
R10	270000 ^ .5W	C-2796-91C
R11	470000 ^ .25W	C-2795-94B
R12	3900 ^ .5W.	C-2796-173C
R13	470000 ^ .25	C-2795-94B
R14	510 ^ .5W.	C-2796-152C
R15	10000 ^ .25W.	C-2795-74B
R16	.5 MEG. ^ TONE CONT. & SW.	A-15129-10
R17	.5 MEG. ^ VOL. CONTROL	A-15148

L1	I.F. REJECTOR COIL	A-15772-1
L2A	LONG WAVE ANT. COIL	
L2B	BROADCAST " "	A-14200-9
L3	32-110 ANT. COIL	A-15774-1
L4	BAND SPREAD ANT. COIL	A-20217
L5A	LONG WAVE OSC "	
L5B	BROADCAST " "	A-14213-13
L6	32-110M " "	A-15773-1
L7	25-30M " "	A-20218-2
L8	20-25M " "	A-20218-1
L9	13-16M " "	A-20218
L10	NO.1 I.F. COIL	A-12064-43
L11	NO.2 I.F. "	A-12064-44
L12	HASH CHOKE	A-20206
L13	FILTER CHOKE	B-8349

BAND SW. SHOWN IN B.C. POSITION.
ARROWS POINT TO S.W. POSITIONS.

S1	BAND SW. SEC. 1-FRONT	
S2	" " " 1-REAR	
S3	" " " 2-FRONT	
S4	" " " 2-REAR	
S5	" " " 3-FRONT	
S6	" " " 3-REAR	
S7	" " " 4-FRONT	
S8	" " " 4-REAR	B-8333
S9	ON-OFF SW. ON R16	

MODELS 672-6XA,672-6XE

THE SPARKS-WITHINGTON CO.

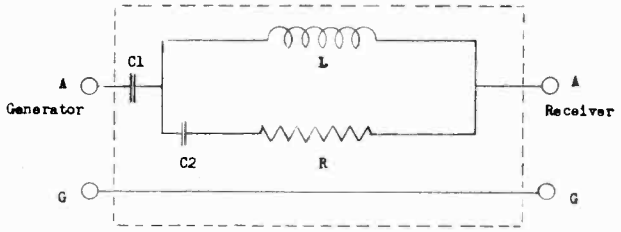
VOLTAGE CHART

Line Voltage: 117 Volts — Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. See Nos. on Schematic Dia.							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
7A8	Converter	6*	180	125	-1.2	55	0	1.75	0
7B7	I-F Amplifier	6*	180	55	0	0	0	1.75	0
7C6	2nd Detector-AVC-1st Audio	6*	100	0	0	0	0	—	0
6G6G	Push-Pull Power Output	6*	0	175	180	0	-	0	10
6G6G	Push-Pull Power Output	6*	0	175	180	0	-	0	10
6Z5G	Rectifier	0	0	170*	-	170*	-	6*	185*

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.
*AC volts.

DUMMY ANTENNA



Note: When using this dummy antenna the generator output impedance should be 10 ohms or lower.
C1 - 200 mmf. Condenser.
C2 - 400 mmf. Condenser.
R - 100 ohms.
---- Case Shield
L - Choke Coil

Choke Coil Specification.
Tubing - 3/8" Diameter Bakelite.
Wire - No. 38 Enameled.
Turns - 59 Closely wound (Impregnated.)

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	BAND SWITCH SETTING	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer at extreme end of calibration scale with variable condenser fully closed.)							
2	I.F.	Converter Grid (#6)	.1 mf.	BC	456 KC	Open	C6 A&B	2nd I-F **
							C5 A&B	1st I-F **
3	Rejector	ANT.	*	BC	456 KC	Closed	C2F	Adjust to minimum
4	Broadcast Band	ANT.	*	BC	1500 KC	1500 KC	C2D Osc.	**
							C4C Ant.	**
5					600 KC	600 KC	C2E Pad.	**
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 1500 KC, 1000 KC, 750 KC and 600 KC)							
8	Long-Wave Band	ANT.	*	LW	400 KC	400 KC	C2B Osc.	**
							C4D Ant.	**
9					150 KC	150 KC	C2C Pad.	**
10	(Repeat operation 8)							
11	(Check calibration and sensitivity at 400 KC, 250 KC and 150 KC)							
12	32-110 M Band	ANT.	*	32-110 M	9000 KC	9000 KC	C2A Osc.	**
							C4B Ant.	**
13	(Check calibration and sensitivity at 9000 KC and 2500 KC)							
14	20-25 M Band	ANT.	*	20-25 M	17000 KC	17000 KC	C4A Osc.	**
							C3B Ant.	**
15					11600KC	11600KC	L8S Osc.	**
16	(Repeat operation 14 and 15 until calibration is perfect)							
17	(Check calibration and sensitivity at 17000 KC and 11500 KC)							
18	25-30 M	ANT.	*	25-30 M	12000 KC	12000 KC	C3A Ant.	**
19					9500 KC	9500 KC	L7S Osc.	**
20	(Repeat operation 18)							
21	(Check calibration and sensitivity at 12000 KC and 9500 KC)							
22	13-16 M Band	ANT.	*	13-16 M	23000 KC	23000 KC	C3C Ant.	**
23					17500 KC	17500 KC	L9S Osc.	**
24	(Repeat operation 22)							
25	(Check calibration and sensitivity at 23000 KC and 17500 KC)							

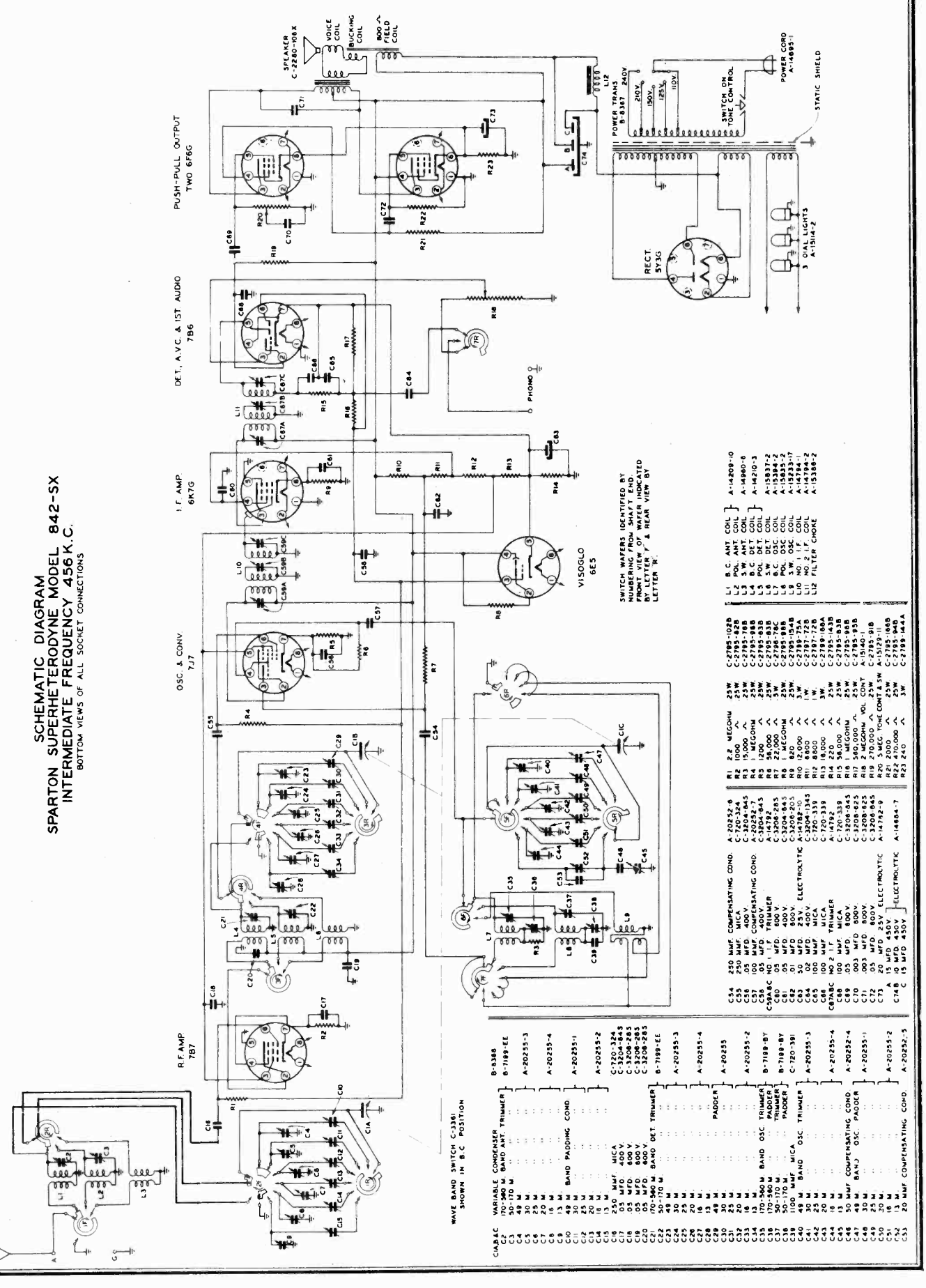
Notes: *Use standard dummy antenna. See Page ( ).
**Peak accurately. Make sure adjustments are made on fundamental of signal and not on image. See note at bottom of schematic diagram.

MODEL 842-SX

THE SPARKS-WITHINGTON CO.

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 842-SX
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



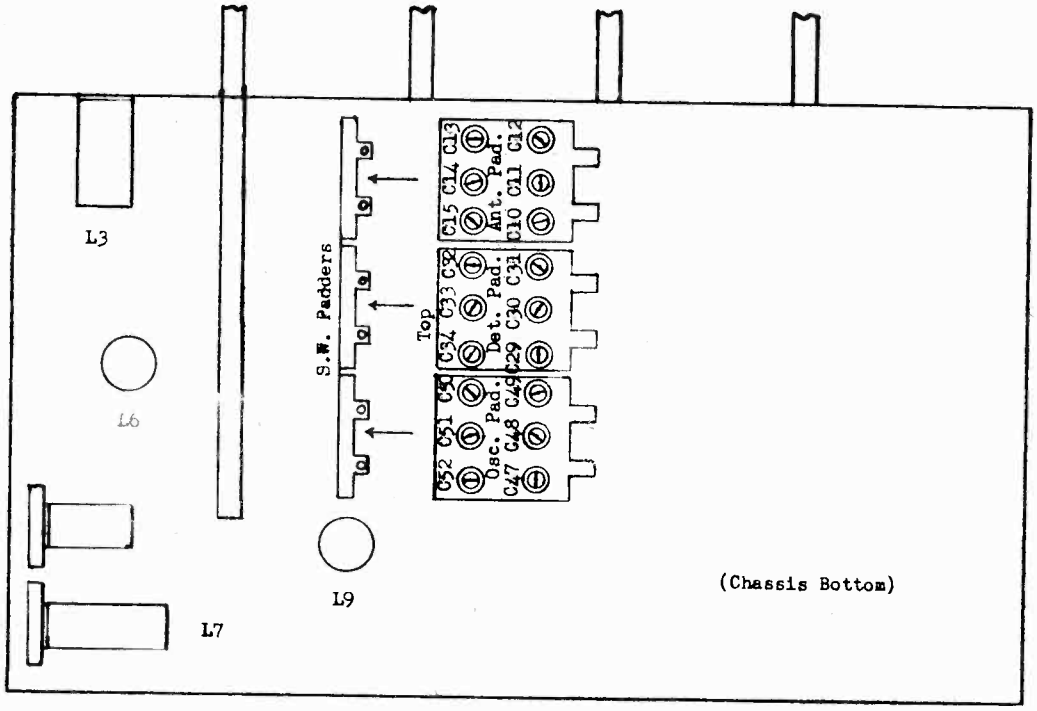
C1A,B,C	VARIABLE CONDENSER	B-8388	C54	250 MMF	COMPENSATING COND.	A-20252-6	R1	2.2 MEGOHM	25W
C2	170-360 M BAND ANT. TRIMMER	B-7189-EE	C55	250 MMF	MICA	C-720-324	R2	1000 Ω	25W
C3	50-170 M		C56	.05 MFD.	400 V	C-3204-845	R3	15,000 Ω	25W
C4	49 M	A-20255-3	C57	100 MMF	COMPENSATING COND.	A-20252-7	R4	1 MEGOHM	25W
C5	30 M		C58	.05 MFD.	400 V	C-3204-845	R5	1200 Ω	25W
C6	20 M		C59A,B,C	NO 1 I.F.	TRIMMER	A-14792	R6	56,000 Ω	25W
C7	16 M		C60	.05 MFD.	800 V	C-3208-285	R7	22,000 Ω	5W
C8	13 M	A-20255-4	C61	.05 MFD.	400 V	C-3204-845	R8	1 MEGOHM	25W
C9	49 M		C62	.01 MFD.	800 V	C-3208-205	R9	820 Ω	25W
C10	30 M	BAND PADDING COND.	C63	.05 MFD.	400 V	C-3204-845	R10	22,000 Ω	2W
C11	20 M		C64	.02 MFD.	400 V ELECTROLYTIC	C-3204-1345	R11	6800 Ω	1W
C12	16 M	A-20255-1	C65	100 MMF	MICA	C-720-339	R12	8800 Ω	1W
C13	13 M		C66	100 MMF	MICA	C-720-339	R13	16,000 Ω	2W
C14	49 M		C67A,B,C	NO 2 I.F.	TRIMMER	A-14792	R14	220 Ω	25W
C15	30 M	A-20255-2	C68	100 MMF	MICA	C-720-339	R15	56,000 Ω	25W
C16	.05 MFD.	400 V	C69	.05 MFD.	400 V	C-3204-845	R16	1 MEGOHM	25W
C17	.05 MFD.	400 V	C70	.003 MFD.	800 V	C-3208-825	R17	560,000 Ω	25W
C18	.05 MFD.	400 V	C71	.003 MFD.	800 V	C-3208-825	R18	2 MEGOHM VOL. CONT	
C19	.05 MFD.	400 V	C72	.05 MFD.	800 V	C-3206-845	R19	270,000 Ω	25W
C20	170-360 M BAND OSC. TRIMMER	B-7189-EE	C73	20 MFD.	25V ELECTROLYTIC	A-14762-9	R20	5 MEG. TONE CONT. & SW	
C21	50-170 M		C74 A	15 MFD.	450V	ELECTROLYTIC	A-14664-7	R21	270,000 Ω
C22	49 M		C74 B	15 MFD.	450V			R22	270,000 Ω
C23	30 M	A-20255-3	C74 C	15 MFD.	450V			R23	240 Ω
C24	20 M								
C25	16 M								
C26	13 M								
C27	49 M								
C28	30 M	A-20255-4							
C29	20 M								
C30	16 M								
C31	13 M								
C32	49 M	PADDER							
C33	30 M								
C34	20 M	A-20255-2							
C35	16 M								
C36	13 M								
C37	170-360 M BAND OSC. TRIMMER	B-7189-BY							
C38	50-170 M								
C39	1100 MMF MICA	C-720-381							
C40	49 M								
C41	30 M BAND OSC. TRIMMER	A-20255-3							
C42	25 M								
C43	20 M								
C44	16 M	A-20255-4							
C45	13 M								
C46	50 MMF COMPENSATING COND.	A-20252-4							
C47	49 M								
C48	30 M BAND OSC. PADDER	A-20255-1							
C49	25 M								
C50	20 M	A-20255-2							
C51	16 M								
C52	13 M	A-20252-5							
C53	20 MMF COMPENSATING COND.								

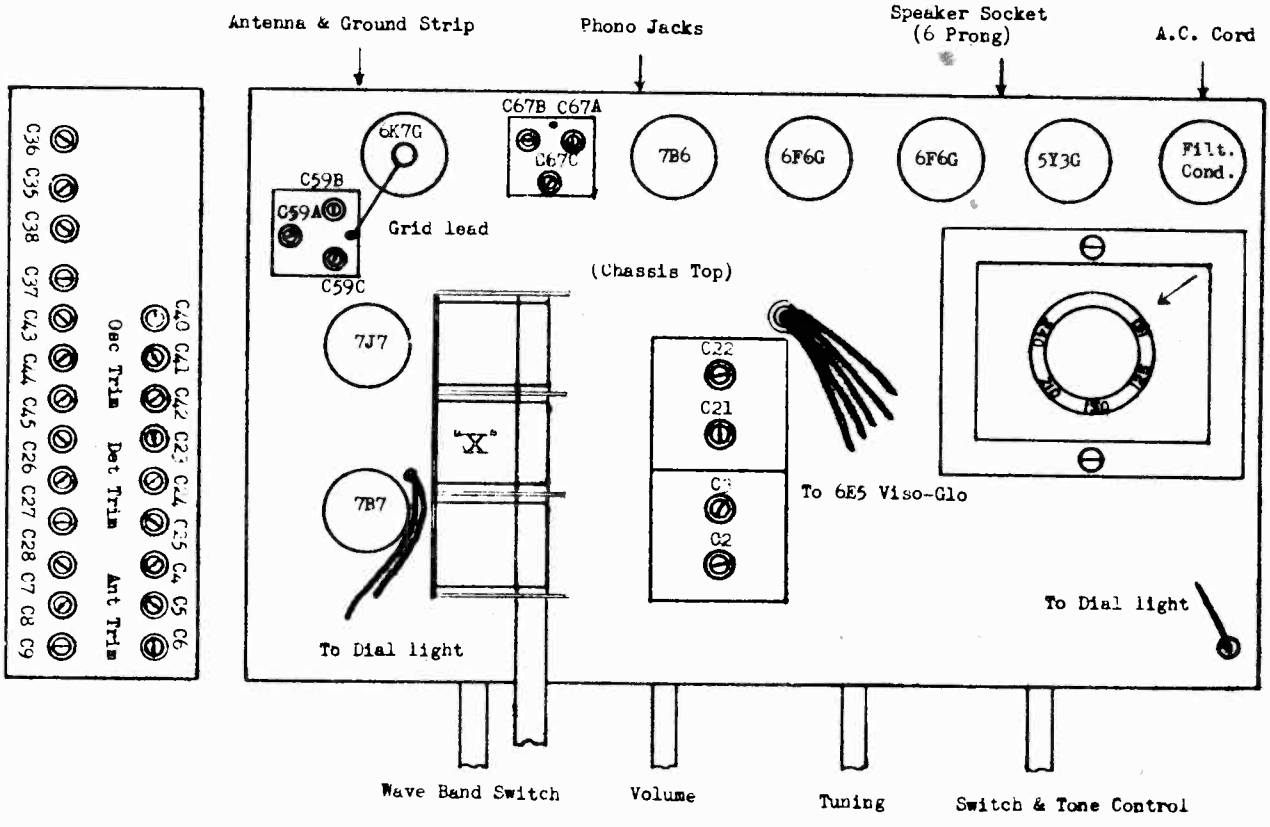
L1	B.C. ANT COIL	A-14209-10	C-2785-1028	25W
L2	POL. ANT. COIL		C-2785-828	25W
L3	S.W. ANT. COIL	A-14980-6	C-2785-788	25W
L4	P.C. DET. COIL	A-14210-3	C-2785-988	25W
L5	POL. DET. COIL		C-2785-888	25W
L6	S.W. DET. COIL	A-15837-2	C-2785-838	25W
L7	B.C. OSC. COIL	A-15384-2	C-2786-78C	5W
L8	POL. OSC. COIL	A-15835-2	C-2785-988	25W
L9	S.W. OSC. COIL	A-15233-17	C-2785-1548	25W
L10	NO. 1 I.F. COIL	A-14784-2	C-2785-1548	25W
L11	NO. 2 I.F. COIL	A-14784-2	C-2787-728	1W
L12	FILTER CHOKE	A-15386-2	C-2787-728	1W
			C-2789-108A	3W
			C-2785-1438	25W
			C-2785-938	25W
			C-2785-988	25W
			C-2785-938	25W
			A-15140-1	
			C-2785-918	25W
			A-15129-11	
			C-2785-1068	25W
			C-2785-948	25W
			C-2789-1444	3W

MODEL 842-SX

THE SPARKS WITHINGTON CO.

842-SX





MODEL 842-SX

THE SPARKS WITHINGTON CO.

April 18, 1941

ALIGNMENT CHART

Sparton Superheterodyne Model 842 SX

(Important - Before any adjustments are made be sure to read the special note under Alignment Chart

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	BAND SWITCH SETTING	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set drive wheel so that pointer is at end of calibration scales with condenser gang fully meshed)							
2	I.F.	Connect to Stator of Detector Section of C1 (See Chassis Diagram)	.1 mf.	170-560 Meters	(456 KC)	Open	C67B*	**
3							C67A C67C	Peak accurately
4							C67B*	Peak accurately
5							C59B*	**
6							C59A C59C	Peak accurately
7							C59B*	Peak accurately
8	CAUTION: Do not readjust trimmers C67A & C and C59A & C after red spot trimmers C67B & C59B have been peaked)							
9	170-560 Meter Band	ANT	See Note	170-560 Meters	200 M (1500 KC)	200 M	C35 Osc.	Trim.
							C21 Det.	Trim.
							C2 ANT.	Trim.
10					500 M (600 KC)	500 M	C36 Osc.	Pad.
11	(Repeat operation 9)							
12	(Check calibration and sensitivity at 200 M, 300 M and 500 M)							
13	50-170 Meter Band	ANT	See Note	50-170 Meters	55 M (5.46 MC)	55 M	C37 Osc.	Trim.
							C22 Det.	Trim.
							C3 ANT.	Trim.
14					150 M (2.0 MC)	150 M	C38 Osc.	Pad.
15	(Repeat operation 13)							
16	(Check calibration and sensitivity at 55M, 95M and 150M)							
17	49 Meter Band	ANT	See Note	49 Meters	35 M	35 M	C40 Osc.	Trim.
18					48 M	48 M	C47 Osc.	Pad.
19					35 M (8.55 MC)	35 M	C23 Det.	Trim.
							C4 ANT.	Trim.
20					48 M (6.27 MC)	48 M	C29 Det.	Pad.
							C10 ANT.	Pad.
21	(Check carefully all adjustments for 49 meter band. Be sure band limits are covered)							
22	30 Meter Band	ANT	See Note	30 Meters	27 M	27 M	C41 Osc.	Trim.
23					34.5 M	34.5 M	C48 Osc.	Pad.
24					27 M (11.2 MC)	27 M	C24 Det.	Trim.
							C5 ANT.	Trim.
25					34.5 M (8.69 MC)	34.5 M	C30 Det.	Pad.
							C11 ANT.	Pad.
26	(Check carefully all adjustments for 30 meter band. Be sure band limits are covered.							
27	25 Meter Band	ANT	See Note	25 Meters	22 M	22 M	C42 Osc.	Trim.
28					26 M	26 M	C49 Osc.	Pad.
29					22 M (13.6 MC)	22 M	C25 Det.	Trim.
							C6 ANT.	Trim.
30					26 M (11.5 MC)	26 M	C31 Det.	Pad.
							C12 ANT.	Pad.
31	(Check carefully all adjustments for 25 meter band. Be sure band limits are covered.)							

Continued

MODEL 842-SX

THE SPARKS WITHINGTON CO.

ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	BAND SWITCH SETTING	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
32	20 Meter Band	ANT	See Note	20 Meters	18.5 M	18.5 M	C43 Osc.	Trim.
33					21.1 M	21.1 M	C50 Osc.	Pad.
34					18.5 M (16.2 MC)	18.5 M	C26 Det.	Trim.
							C7 Ant.	Trim.
35					21.1 M (14.2 MC)	21.1 M	C32 Det.	Pad.
							C13 Ant.	Pad.
36	(Check carefully all adjustments for 20 meter band. Be sure band limits are covered.)							
37	16 Meter Band	ANT	See Note	16 Meters	15.7 M	15.7 M	C44 Osc.	Trim.
38					17.7 M	17.7 M	C51 Osc.	Pad.
39					15.7 M (19.1MC)	15.7 M	C27 Det.	Trim.
							C8 Ant.	Trim.
40					17.7 M (16.9MC)	17.7 M	C33 Det.	Pad.
							C16 Ant.	Pad.
41	(Check carefully all adjustments for 16 meter band. Be sure band limits are covered.)							
42	13 Meter Band	ANT	See Note	13 Meters	13.8 M	13.8 M	C45 Osc.	Trim.
43					15.2 M	15.2 M	C52 Osc.	Pad.
44					13.8 M (21.7 MC)	13.8 M	C28 Det.	Trim.
							C9 Ant.	Trim.
45					15.2 M (19.7 MC)	15.2 M	C34 Det.	Pad.
							C15 Ant.	Pad.
46	(Check carefully all adjustments for 13 meter band. Be sure band limits are covered.)							

*Bronze color trimmer screw.
**Turn trimmer screw all the way down.
Note - Use dummy antenna described on page (1).

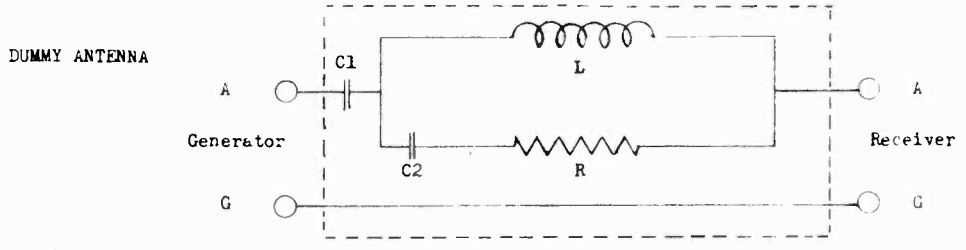
SPECIAL NOTE: All band trimmers should be adjusted to the fundamental of the test signal and not to the image.

VOLTAGE CHART

Line Voltage: 115 Volts
Position of Band Switch Broadcast
Position of Volume Control Full with Antenna Disconnected
Position of Tap Plug - 110 Volts

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Dia.)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap.
7B7	R.F. Amplifier	0	290	75	4.2	0	0	4.2	6.1*	-
7J7	Osc - Converter	0	290	100	-1	75	4.1	4.5	6.1*	-
6K7G	I-F Amplifier	0	6	290	120	0	-	6.1*	9	0
7B6	2nd Det - AVC - 1st Audio	0	150	0	1.2	.5	0	1.2	6.1*	-
6F6G	Push-Pull Power Output	0	6	290	285	0	295	6.1*	20	-
6F6G	Push-Pull Power Output	0	0	290	285	0	295	6.1*	20	-
5X3G	Rectifier	0	375*	0	350*	0	375*	0	350*	-
6E5	Viso-Glo	0	250	0	295	0	6.1*	-	-	-

Notes: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter.
*AC volts.



Note: When using this dummy antenna the generator output impedance should be 10 ohms or lower.

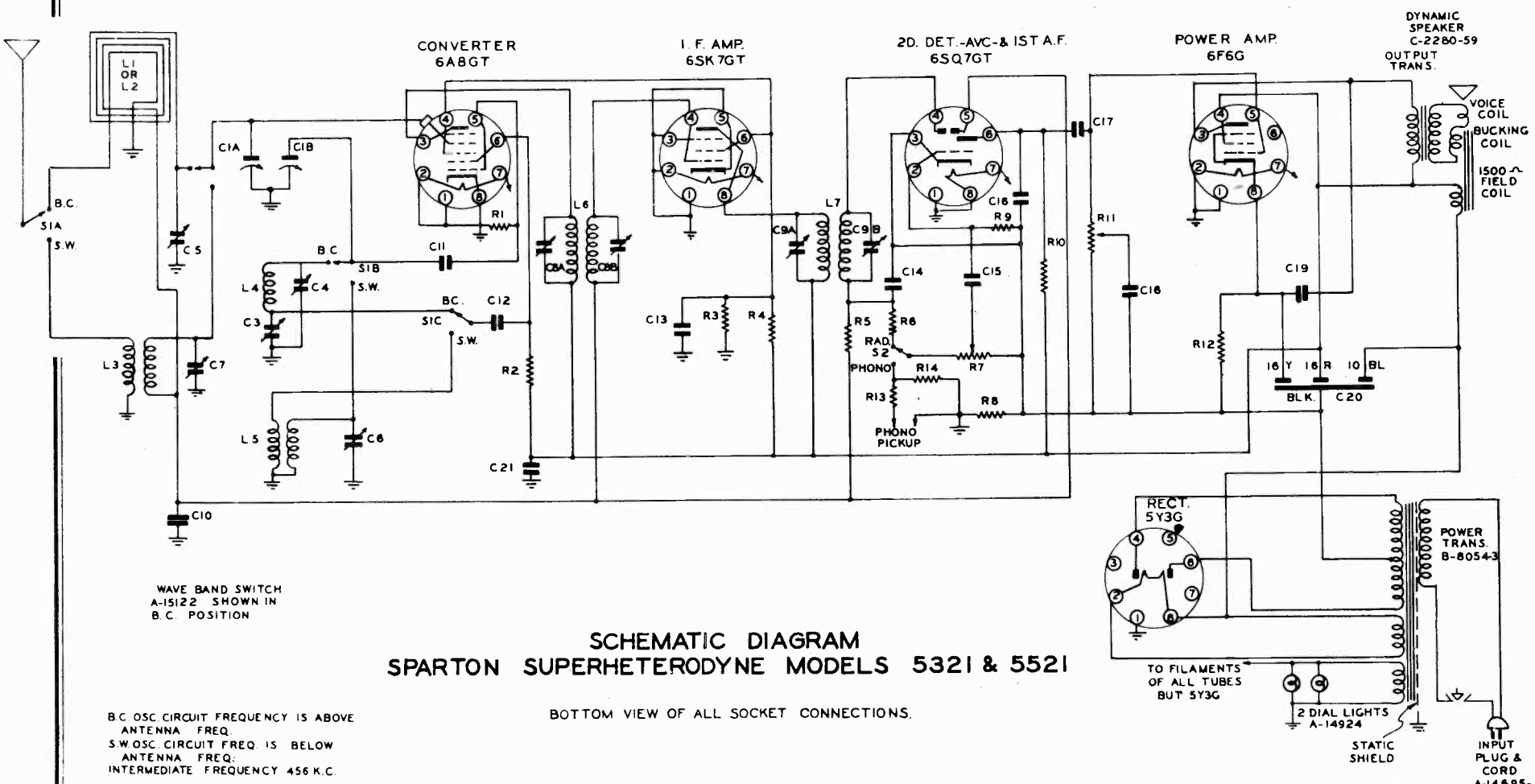
C1 - 200 mmf. Condenser
C2 - 400 mmf. Condenser
R - 100 ohms Resistor
L - 20 microhenryies Choke
---- Case Shield

Choke Coil Specifications
Tubing - 3/8" diameter bakelite.
Wire - No. 38 Enameled.
Turns - 59 closely wound (Impregnated)

C1A&B	VARIABLE CONDENSER	B-8235
C-3	B.C. OSC. PADDER	A-15758-1
C-4	B.C. OSC. TRIMMER	
C-5	B.C. ANT. TRIMMER	
C-6	S.W. OSC. TRIMMER	
C-7	S.W. ANT. TRIMMER	A-14088-5
C8A&B	NO.1 I.F. TRIMMER	B-7200-GN
C9A&B	NO.2 I.F. TRIMMER	B-7200-NN
C10	.05 MFD. 600V.	C-3206-28C
C11	50 MMFD. MOLDED	C-720-372
C12	.001 MFD. 600V.	C-3206-58C
C13	.1 MFD. 400V.	C-3204-38C
C14	250 MMFD. MOLDED	C-720-319
C15	.02 MFD. 400V.	C-3204-22C
C16	100 MMFD. MOLDED	C-720-339
C17	.02 MFD. 600V.	C-3208-22C
C18	.006 MFD. 400V.	C-3204-68C
C19	.006 MFD. 800V.	C-3208-68C
C20	16-16-10 MFD. ELECT.	A-14780-1
C21	.1 MFD. 600V.	C-3206-38C

R1	33000 Ω	.25W.	C-2795-80B
R2	22000 Ω	.5W.	C-2796-78C
R3	47000 Ω	1W.	C-2797-82B
R4	22000 Ω	2W.	C-2798-191A
R5	3.3 MEG.	.25W.	C-2795-104B
R6	27000 Ω	.25W.	C-2795-79B
R7	.5 MEG Ω	VOL. CONT.	A-15130-5
R8	56 Ω	.5W.	C-2796-47C
R9	5.6 MEG.	.25W.	C-2795-107B
R10	270,000 Ω	.25W.	C-2795-91B
R11	.5 MEG.	TONE CONT. & SW.	A-15129-2
R12	680 Ω	1W.	C-2797-60B
R13	270000 Ω	.25W. 5521 ONLY	C-2795-91B
R14	270 000 Ω	.25W.	C-2795-91B

L1 B.C. ANT. COIL-5521-	C-3290-8
L2 B.C. ANT. COIL-5321-	C-3290-9
L3 S.W. ANT. COIL	A-14682-15
L4 B.C. OSC. COIL	A-15920-1
L5 S.W. OSC. COIL	A-15233-16
L6 NO.1 I.F. COIL	A-12064-39
L7 NO.2 I.F. COIL	A-12064-49
S1A-B-C WAVE BAND SW.	A-15122
S2 PHONO-RADIO SW.	A-15754-1



WAVE BAND SWITCH A-15122 SHOWN IN B.C. POSITION

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODELS 5321 & 5521

BOTTOM VIEW OF ALL SOCKET CONNECTIONS.

B.C OSC. CIRCUIT FREQUENCY IS ABOVE ANTENNA FREQ.
S.W. OSC. CIRCUIT FREQ. IS BELOW ANTENNA FREQ.
INTERMEDIATE FREQUENCY 456 K.C.

MODELS 5321,5521

THE SPARKS WITHINGTON CO.

Sparton Superheterodyne Models 5321 & 5521

VOLTAGE CHART

Line Voltage: 117 Volts A.C. Position of Volume Control: Full with Dial Turned to Quiet Channel
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6A8GT	Converter	0	6*	249	95	-8.2	162	0	0	-4.2
6SK7GT	I-F Amplifier	0	0	0	-2	0	95	6*	249	-
6SQ7GT	2nd Det & AVC	0	-1.4	-1.2	-1.6	-1.8	105	6*	0	-
6F6G	Power Amplifier	0	0	230	249	-.4	-1.2	6*	96	-
5Y3G	Rectifier	0	310	0	300*	0	300*	0	310	-

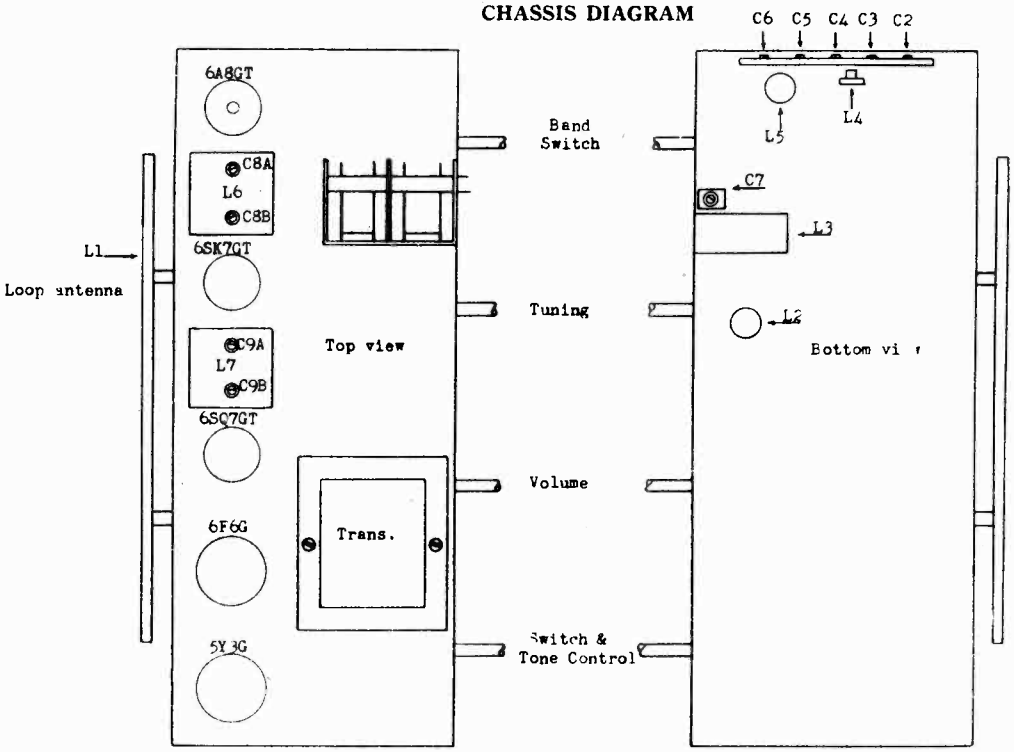
Notes: Voltage readings are for schematic in this Bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter.
*AC volts.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer even with left hand stop line when condenser plates are fully meshed.							
2	I.F.	6A8GT Grid	.1mf.Con.	456 KC	Broad cast	Open	C9 A&B	Peak accurately
							C8 A&B	Peak accurately
3	BC	Ant.	200 mf. Cond.	1600 KC	BC	1600 KC	C4 Osc.Trim	Peak accurately
4				600 KC	BC	1600 KC	C5 Ant.Trim	Peak accurately
5	Repeat operation 3.						C3 Osc. Pad	**
6	Check calibration and sensitivity at 600 KC, 900 KC and 1600 KC.							
7	SW	Ant.	*	18 MC	SW	18 MC	C6 Osc.Trim	**
							C7 Ant.Trim	**
8	Repeat operation 7.							
9	Check calibration and sensitivity at 7 MC.							

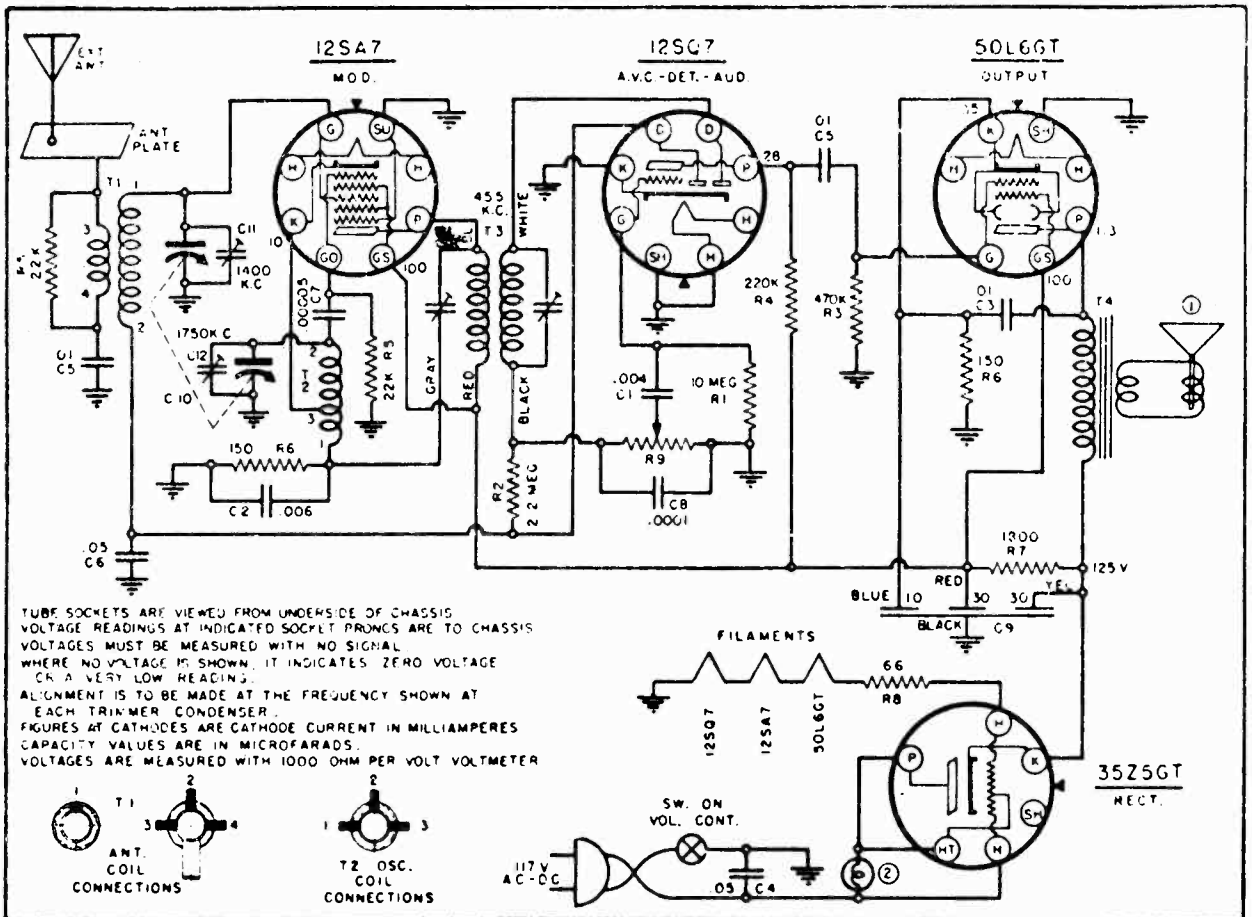
*100 ohms and 200 mf. in series.
**Rock dial while adjusting for maximum output.

CHASSIS DIAGRAM



SPIEGEL, INC.

MODEL 1-40

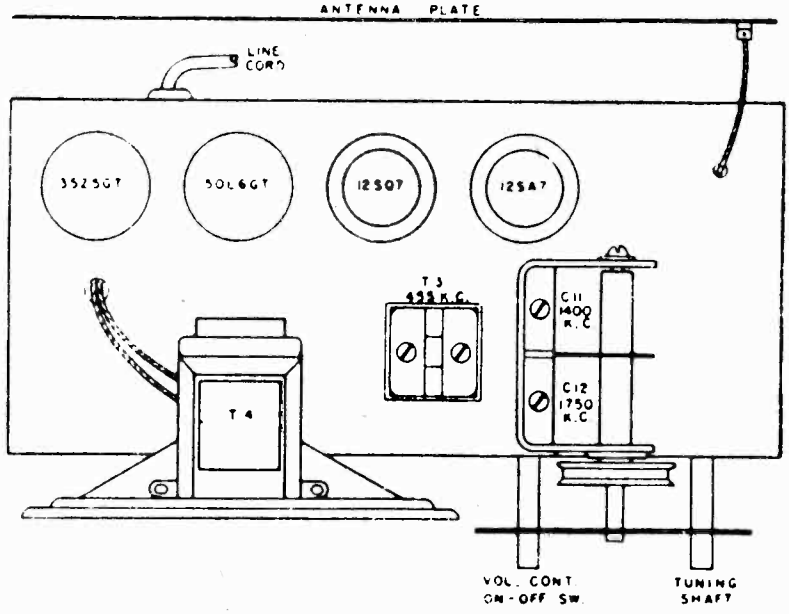


TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER

CODE	PART NO	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W RESISTOR
R 2	60-179	2.2 " " "
R 3	60-178	470K OHM " "
R 4	60-180	220K " " "
R 5	60-185	22K " " "
R 6	60-184	150 " " "
R 7	60-438	1800 " 1/2 W "
R 8	60-647	66 " 1 1/2 W. "
R 9	24-152	500K " VOL. CONT. & SW.

CODE	PART NO	DESCRIPTION
C 1	16-125	.004 MFD. 400V TUBULAR COND.
C 2	16-148	.006 " " " "
C 3	16-119	.01 " " " "
C 4	1607	.05 " " " "
C 5	16-121	.01 " 200V. " "
C 6	1622	.05 " " " "
C 7	1503	.00005 MFD. MICA COND.
C 8	1501	.0001 " " "
C 9	18-265	30 X 30 AT 150V. & 10 AT 25V. ELECT.
C 10	19-169	2 GANG VAR. COND. ALSO C11 & C12

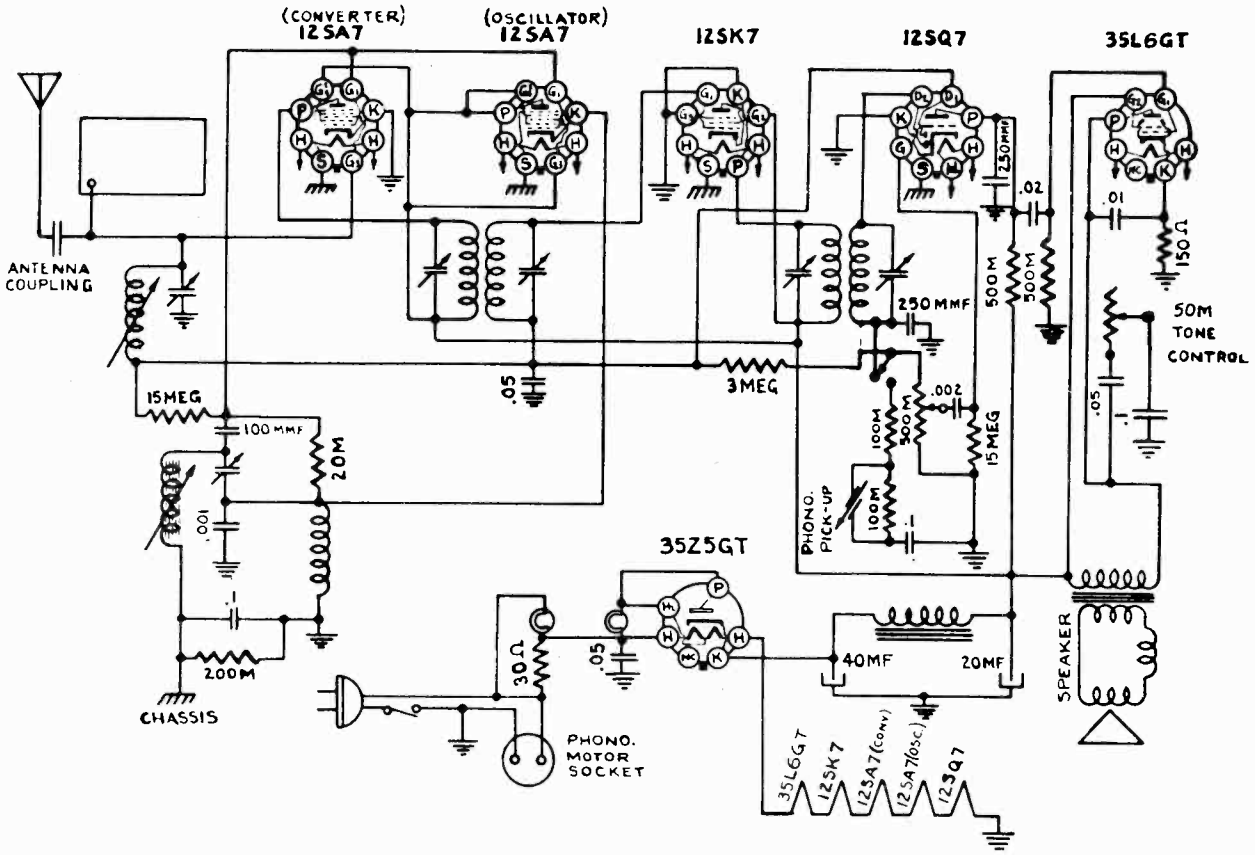
CODE	PART NO	DESCRIPTION 1-40
T 1	10-367	ANTENNA COIL
T 2	10-366	OSCILLATOR COIL
T 3	10-368	I.F. TRANSFORMER
T 4	80-205	OUTPUT TRANS (ON SPKR)
①	79-305	5" P.M. SPEAKER
②	89-4	#47 PILOT LIGHT

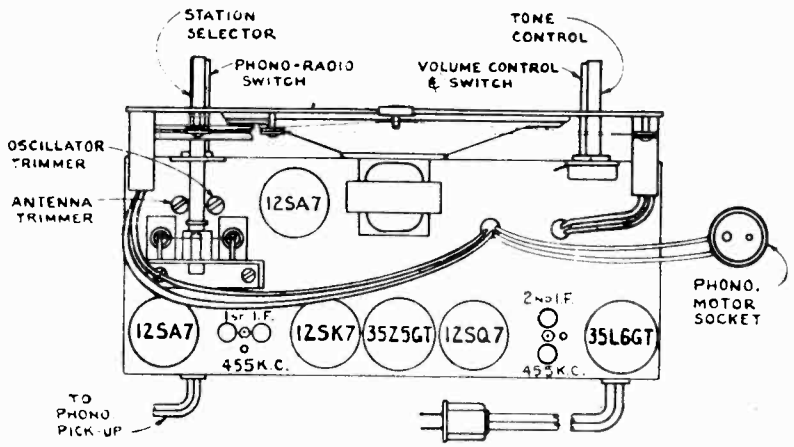


LOCATION OF PARTS ON TOP OF CHASSIS

MODEL 512

SPIEGEL, INC.





GENERATOR	CONNECTION AT RADIO	DUMMY ANTENNA	DIAL	TRIMMER TO TUNE	REMARKS
I. F. 455 kc	12SA7 Grid	.1 mfd	H. F. end	I. F. Transformers	Tune to Max.
1720 kc	Ext. Ant. Wire	200 mmf	H. F. end	Oscillator Trimmer	Set Limit of band
1400 kc	Ext. Ant. Wire	200 mmf	1400	Antenna Trimmer	Tune to Max.

FOR DATA ON DETROLA MODEL N-100 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

SPIEGEL, INC.

MODEL 572-1M

VOLTAGE CHART

"A" Battery voltage: 1½ volts
"B" Battery voltage: 90 volts
Position of Volume Control: Full with Antenna Disconnected
Position of Band Selector Switch: Broadcast

Tube	Function	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
1A7G	Osc. - Converter	83	1.3	83	18	*	83	0	83	0
1N5G	I.F. Amp.	0	1.3	83	83	-	-	0	0	0
1H5G	Det. AVC-AF	-	1.2	*	-	0	0	0	-	0
1A5G	P.A.	-	1.3	78	83	0	-	0	0	-
1A5G	P.A.	-	1.3	78	82	0	-5	0	0	-

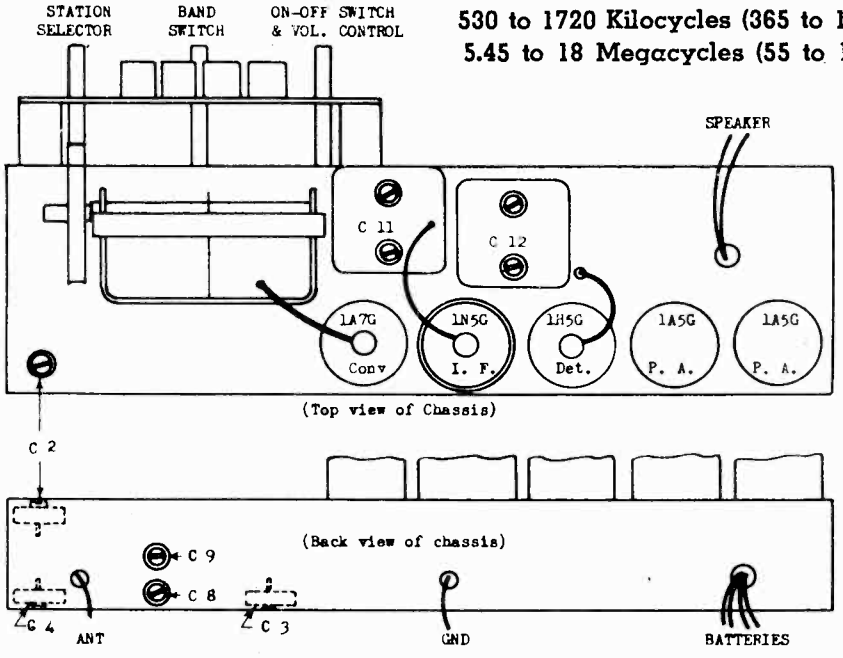
Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.
*Cannot be measured with 1000 ohms per volt voltmeter.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer even with last calibration mark when condenser gang is closed)							
2	I.F.	1A7G Grid	.1 mf.	456 KC	BC	Open	C12 A&B C11 A&B	
3	I-F Rej.	Ant.	200 mf.	456 KC	BC	Closed	C2	Adjust to minimum
4	Broadcast Band	Ant.	200 mf.	1500 KC	BC	1500 KC	C8 (Osc.) C3 (Ant.)	
5				600 KC	BC	600 KC	C9 (Pad.)	**
6	(Repeat operation 4).							
7	(Check calibration and sensitivity at 1500 KC, 900 KC and 600 KC)							
8	SW Band	Ant.	*	18 MC	SW	18 MC	C4 (Ant.)	**
9	(Check calibration and sensitivity at 6. MC and 18. MC)							
10	(Check operations 1 to 9 inclusive.)							

*100 ohm non-inductive resistor and 200 mmf. condenser in series.
**Rock dial while making this adjustment. Make certain that adjustment is made on fundamental signal and not on image. Peak accurately.

530 to 1720 Kilocycles (365 to 174 Meters)
5.45 to 18 Megacycles (55 to 16.6 Meters)



ADJUSTING THE PUSH-BUTTON TUNER

Pull off push-button knobs so that slots in end of shafts are accessible.

Using a small screwdriver or other tool that will fit the slot in the end of the shaft, push the shaft in as far as it will go and turn to the right or left until the dial pointer has moved to the desired station frequency. Be sure the shaft is pushed all the way in and the station is tuned in accurately.

Repeat the procedure for each of the remaining three buttons.

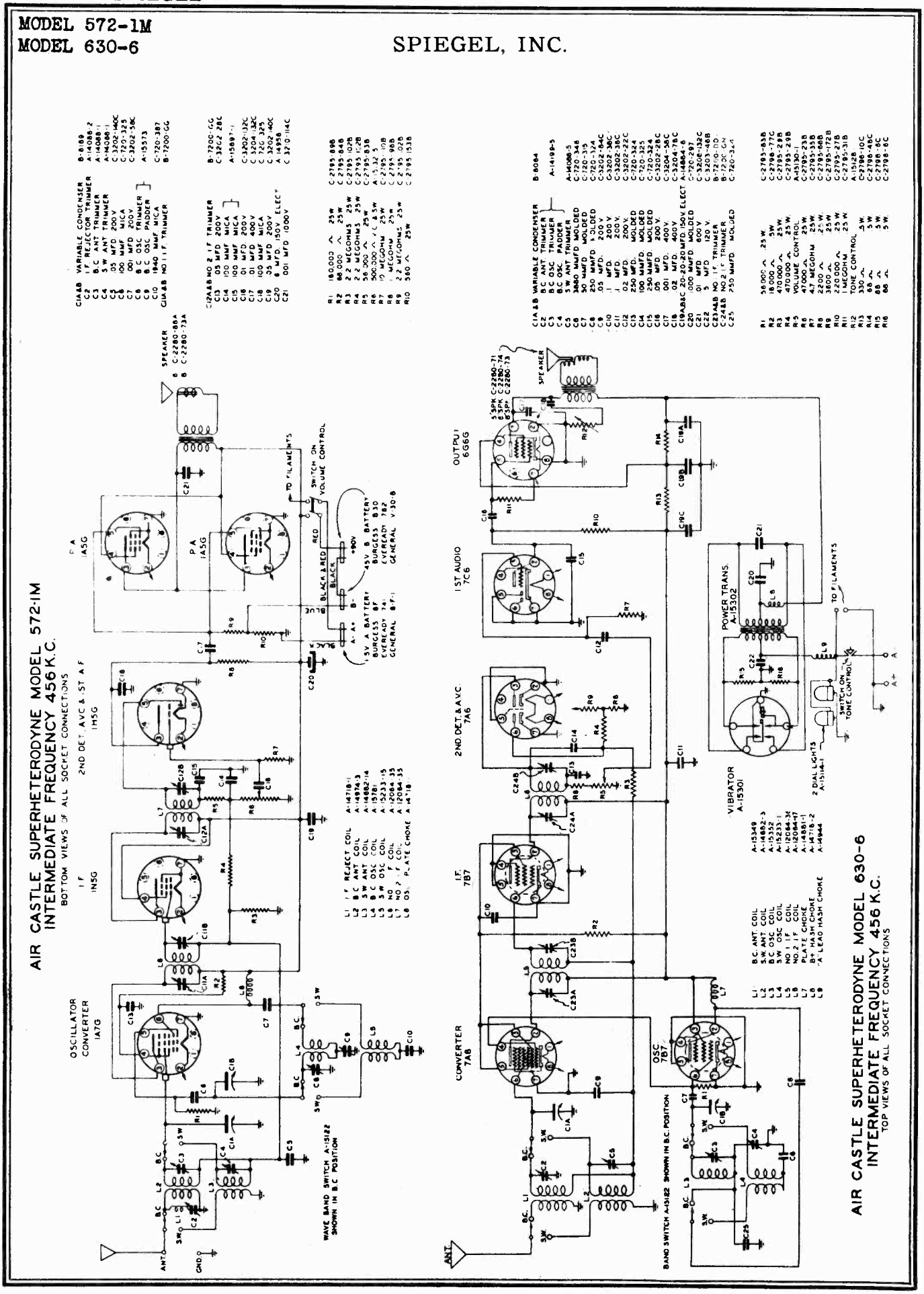
Check all buttons by pushing them in, one at a time, to determine whether desired stations are tuned properly.

Insert proper tab in end of each button knob, and replace knob.

Any of the four stations to which the push-button tuner has been adjusted may now be received simply by pushing the button for the desired station.

MODEL 572-1M
MODEL 630-6

SPIEGEL, INC.



SPIEGEL, INC.

VOLTAGE CHART

Condition of Storage Battery - Good (6 Volts) Position of Volume Control: Full with Antenna Disconnected
Band Switch - Broadcast

Tube	Function	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
7A8	Converter	6	110	45	-20	45	0	0	0
7B7	Oscillator	6	110	110	0	0	-20	0	0
7B7	I. F. Amp.	6	110	45	0	0	0	0	0
7A6	2 Det. AVC	6	0	0	0	0	0	0	0
7C6	1st Aud. Amp.	6	16	0	--	0	0	0	0
6G6G	Power Amp.	0	0	110	115	0	—	6	0

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% - or - on all measurements Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer to last dial mark when condenser plates are flush							
2	I.F.	Ant.	.1	456	BC	Open	C-24 A & B	Peak Accurately
							C-23 A & B	Peak Accurately
3	Broadcast Band	Ant.	200 mmf.	1500	BC	1500	C-3 Osc.	Peak Accurately
							C-2 Ant.	Peak Accurately
4				600	BC	600	C-4 Pad.	Peak Accurately
5	(Repeat operation 3)							
6	(Check calibration and sensitivity at 600KC, 900 KC and 1500 KC)							
7	S.W. Band	Ant.	*	18MC	SW	18MC	C-5 Ant.	**
8	(Check calibration and sensitivity at 6.0 MC and 18.0 MC)							
9	(Check operation 1 to 8 inclusive)							

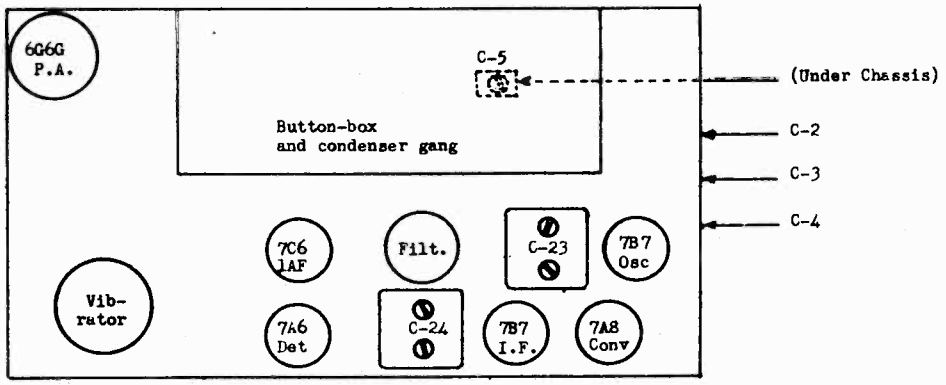
*100 ohm non-inductive resistor and 200 mmf. condenser in series.
**Rock dial while making this adjustment. Make certain that adjustment is made on fundamental signal and not on image. Peak accurately.

Selector Switch	Dial Scale	Meters	or	Kilocycles	or	Megacycles
"B" Broadcast	Upper	.....550 to 174		**545** to **1725**		.54 to 1.7
"S" Short-Wave	Lower	..... 54 to 15		5600 to 20000		**5.6** to **20.**

MODEL

630-6

Battery Operated



ADJUSTING THE PUSH BUTTON TUNER

TO ADJUST BUTTONS, loosen selected button by turning one-half turn to the left (counter-clockwise). Push this loosened button in as far as it will go, and while in this position, tune in manually the station desired or indicated by tab in end of button.

Then, with the button still pushed in as far as it will go, tighten by turning button to the right (clockwise) until it can be tightened no more.

Be sure the station is tuned in accurately when pushed in button is tightened.

Repeat the procedure for each of the remaining three buttons and stations.

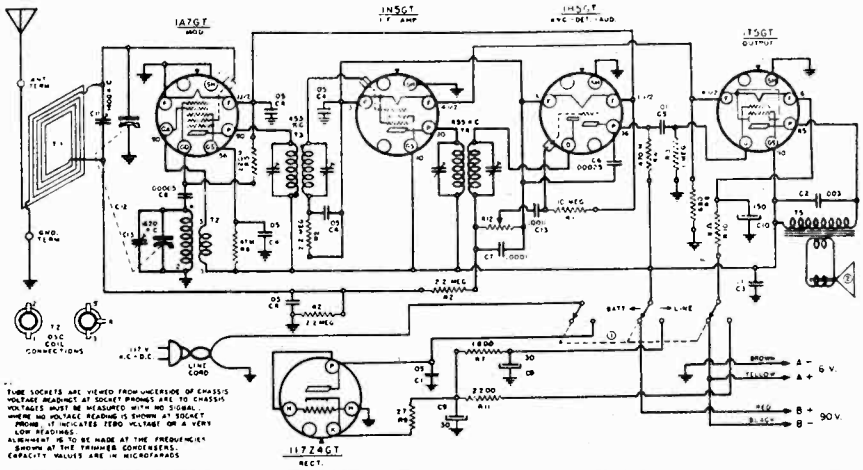
Be sure the buttons have been tightened firmly.

Check all buttons by pushing them in, one at a time, to determine whether desired stations are tuned in properly.

Any of the four stations to which the push button tuner has been adjusted may now be instantly received simply by pushing the button for the desired station.

MODEL EP-2121
MODELS DP-7450, EP-2450

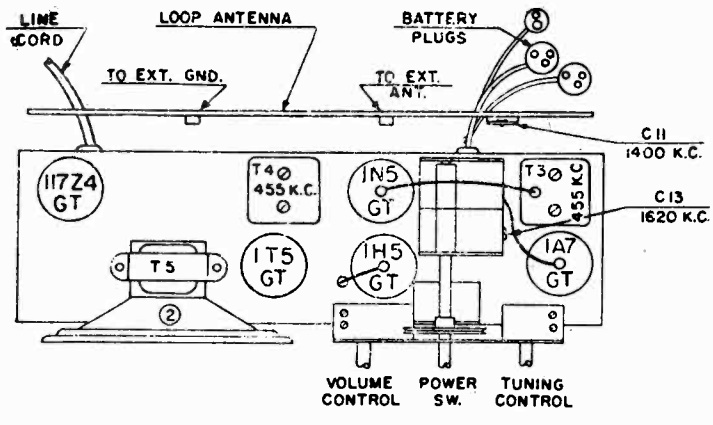
SPIEGEL, INC.



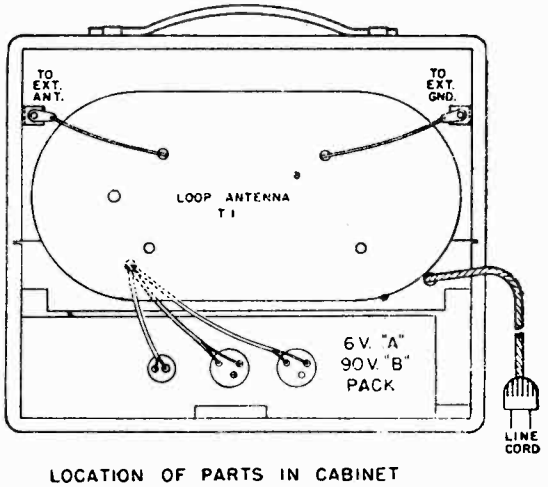
CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION
C1	16G7	.05 MFD 400 V. TUBULAR COND.	R1	60-193	.10 MEGOHM 1/2 W RESISTOR	T1	82-33	LOOP ANTENNA
C2	16-138	.003 " " "	R2	60-179	.22 " " "	T2	10-350	OSCILLATOR COIL
C3	16-135	.1 " " "	R3	60-193	.10 " " "	T3	10-379	I.F. TRANSFORMER
C4	16G7	.05 " " "	R4	60-178	470 OHM " "	T4	10-343	2 ND I.F. TRANSFORMER
C5	16-121	.01 " " "	R5	60-180	2200 OHM " "	T5	.....	OUTPUT TRANSFORMER
C6	1504	.00025 MFD MICA CONDENSER	R6	60-177	.47 M " "			
C7	150-	.0001 " " "	R7	60-257	1800 " " "	S	69-151	POWER SWITCH
C8	1503	.00005 " " "	R8	60-159	470 " " "	Z	70-314-8	5 PIN PLUG
C9	18-268	30-30 " 150 M.V. ELECTROLYTIC	R9	60-63	27 " " "			
C10	18-271	150 " 25 M.V. "	R10	64-128	.27 M " "			
C11	50-129	TRIMMER ON LOOP	R11	60-252	2200 " 1 W "			
C12	19-178	3 GANG VARIABLE COND. ALSO C13	R12	74-150	1 MEGOHM VOLUME CONTROL			
C13	16-126	.001 MFD. 400 V. TUBULAR COND.						

2-54

MODEL EP-2121



LOCATION OF PARTS ON TOP OF CHASSIS



LOCATION OF PARTS IN CABINET

I. F. ALIGNMENT

MODELS DP-7450 EP-2450 ALIGNMENT

Set the variable condenser at minimum capacity, (dial pointer at 1550 K. C.). Connect the two leads from a good, modulated signal generator, the ground lead to the radio chassis and the other lead through a .1 mfd. condenser, to the grid cap of the 6A8GT with the tube's grid lead still in place.

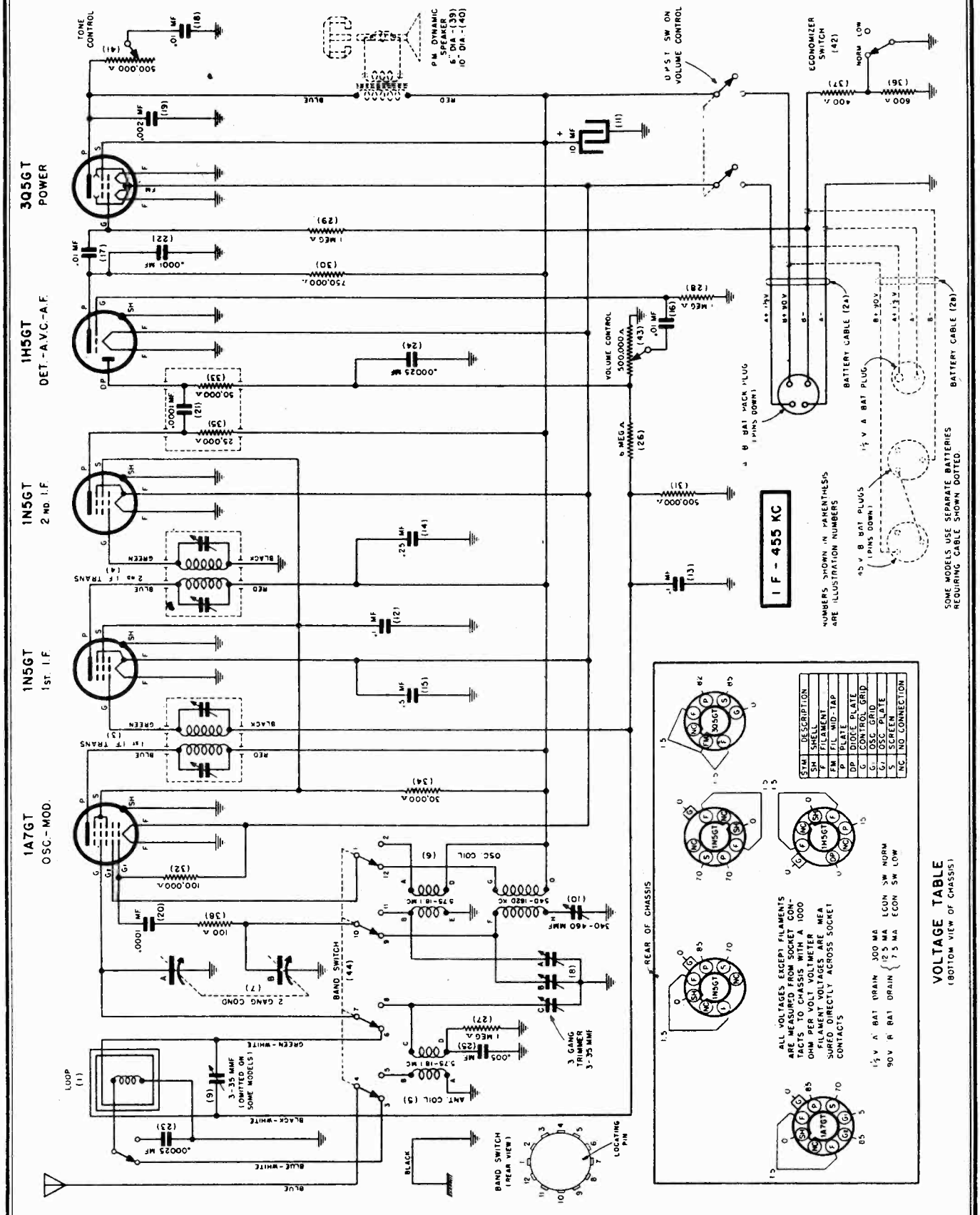
Connect the leads from a fully charged 6 volt storage battery to the receiver chassis and battery lead, the polarity being reversible.

With the set in operation and the volume control full on, set the signal generator to 456 K. C. and increase its output until the signal is heard in the set's speaker. Starting with the second I. F., adjust the I. F. trimmers for maximum output, decreasing he signal generator output as the receiver output increases.

The generator output in all the alignment adjustments should be adjusted so the meter will read approximately .4 volts continually.

MODEL 604

SPIEGEL, INC.



5.75-18.1 M. C. — 52.2-16.6 METER BAND
USE SECTION OF THE DIAL that is calibrated from 5.75-18.1 M. C.

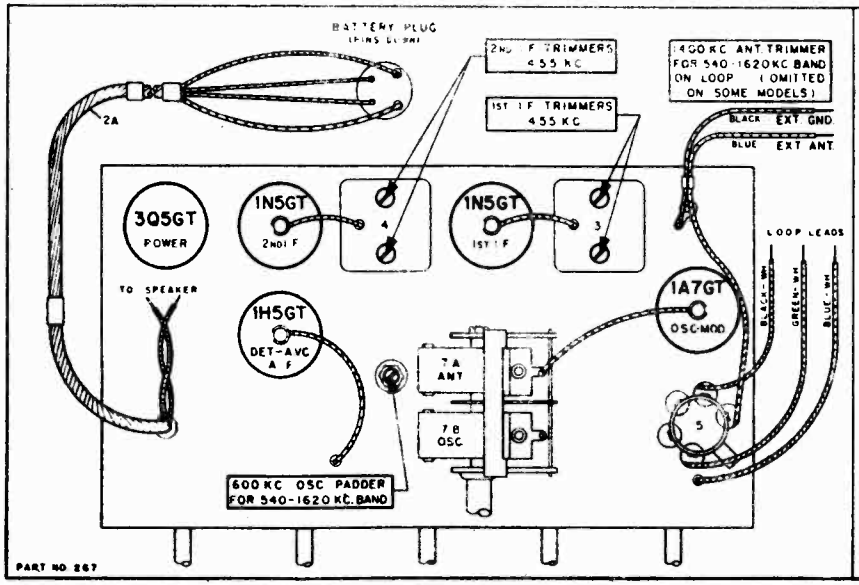
540-1620 K.C.—555-185 METER BAND
USE SECTION OF DIAL THAT IS CALIBRATED FROM 540-1620 K.C.—555-185 METERS.

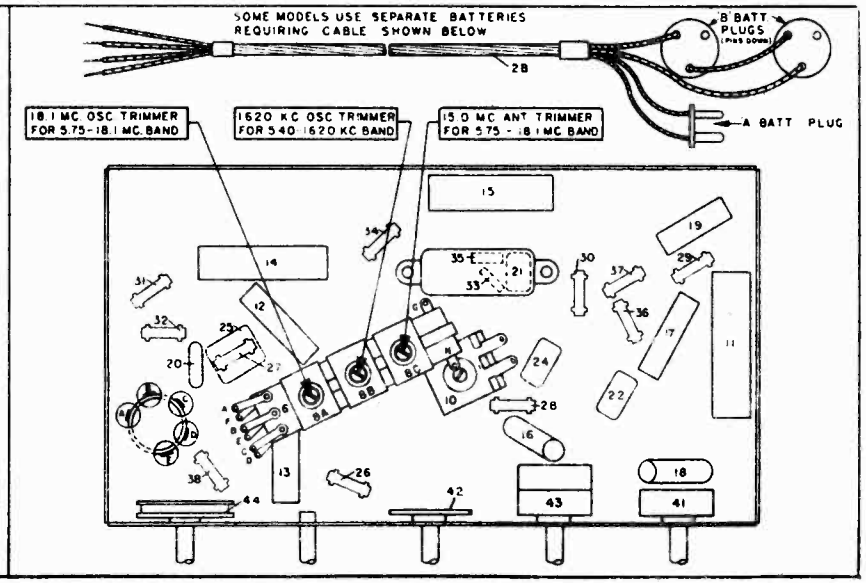
ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1620 kilocycle oscillator trimmer, 600 K.C. padder, and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—Be SURE THAT NEITHER MOVES WHILE ALIGNING.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test Oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F alignment use any band position.	Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid cap of 1A7GT tube. Low side to frame of condenser through .01 Mfd. condenser.	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1620 to 540 K.C. Band	1 Exactly 1620 K.C.	Exactly 1620 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	Adjust 1600 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	While rocking gang condenser adjust 1400 K.C. loop trimmer for maximum output.
	3 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.75 to 18.1 M.C. Band	1 Exactly 18.1 M.C.	Exactly 18.1 M.C.	400 Ohm carbon resistor	High side to Blue Ant. Lead. Low side to black ground lead.	Adjust 18.1 M.C. oscillator trimmer for maximum output.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to Blue Ant. Lead. Low side to black ground lead.	While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.



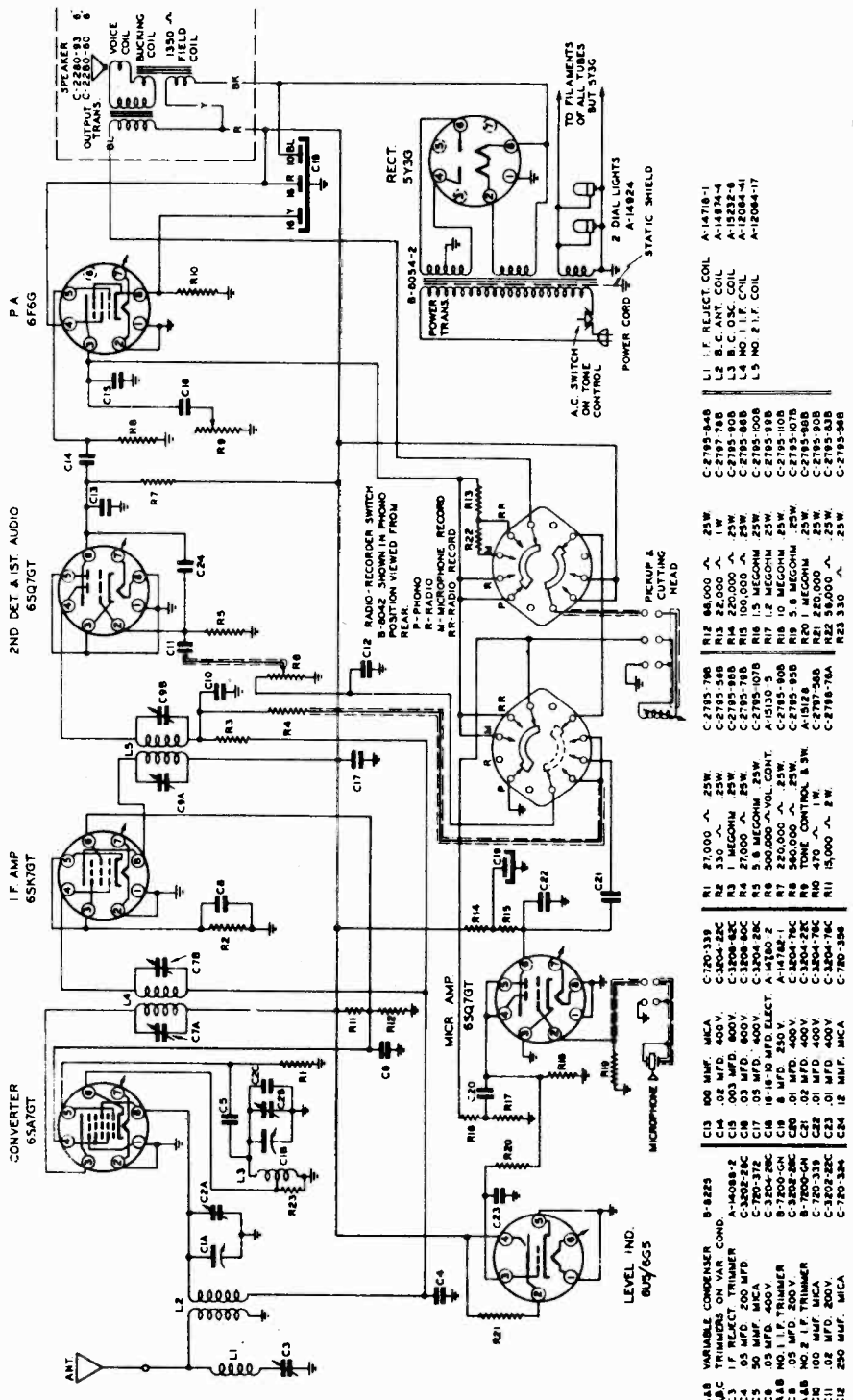


MODEL 661

SPIEGEL, INC.

SCHEMATIC DIAGRAM
AIR CASTLE SUPERHETERODYNE MODEL 661
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



C1A,B	VARIABLE CONDENSER	B-8225	C13	100 MMF. MICA	C-320-339	R1	27,000 Ω .25W	C-2795-798	R12	66,000 Ω .25W	C-2795-848	L1 I.F. REJECT. COIL	A-14710-1
C2A,B,C	TRIMMERS ON VAR. COND.	A-14088-2	C14	.02 MFD. 400 V.	C-3204-22C	R2	330 Ω .25W	C-2795-568	R13	22,000 Ω 1W	C-2797-788	L2 B.C. ANT. COIL	A-14734-4
C3	I.F. REJECT TRIMMER	C-3202-28C	C15	.003 MFD. 600 V.	C-3208-42C	R3	1 MEGOHM .25W	C-2795-988	R14	220,000 Ω .25W	C-2795-908	L3 B.C. OSC. COIL	A-15232-8
C4	.05 MFD. 200 MFD	C-3202-28C	C16	.03 MFD. 600 V.	C-3208-60C	R4	27,000 Ω .25W	C-2795-798	R15	100,000 Ω .25W	C-2795-988	L4 NO 1 I.F. COIL	A-12084-41
C5	50 MMF. MICA	C-320-372	C17	.05 MFD. 400 V.	C-3204-28C	R5	5.6 MEGOHM .25W	C-2795-1078	R16	1.5 MEGOHM .25W	C-2795-1008	L5 NO 2 I.F. COIL	A-12084-17
C6	.05 MFD. 400 V.	C-3204-28C	C18	16-16-10 MFD. ELECT.	A-14180-2	R8	500,000 Ω VOL. CONT.	A-15130-5	R17	1.2 MEGOHM .25W	C-2795-898		
C7A,B	NO. 1 I.F. TRIMMER	B-7200-GH	C19	8 MFD. 250 V.	A-14782-1	R7	220,000 Ω .25W	C-2795-908	R18	10 MEGOHM .25W	C-2795-1108		
C8	.05 MFD. 200 V.	C-3204-28C	C20	.01 MFD. 400 V.	C-3204-22C	R8	560,000 Ω .25W	C-2795-938	R19	5.6 MEGOHM .25W	C-2795-1078		
C9A,B	NO. 2 I.F. TRIMMER	B-7200-GH	C21	.01 MFD. 400 V.	C-3204-22C	R9	1 MEGOHM VOL. CONT. & SW.	A-14183	R20	470,000 Ω .25W	C-2795-868		
C10	100 MMF. MICA	C-320-339	C22	.01 MFD. 400 V.	C-3204-76C	R10	470 Ω 1W	C-2797-568	R21	220,000 Ω .25W	C-2795-908		
C11	.02 MFD. 200 V.	C-3202-22C	C23	.01 MFD. 400 V.	C-3204-76C	R11	15,000 Ω 2W	C-2796-78A	R22	56,000 Ω .25W	C-2795-838		
C12	250 MMF. MICA	C-320-384	C24	12 MMF. MICA	C-320-356				R23	330 Ω .25W	C-2795-568		

BROADCAST BAND
540 to 1700 Kilocycles
555 to 176 Meters

1. **DESCRIPTION:** Table Model Radio-Phonograph and Record Maker Combination featuring full vision, illuminated Dial for extended Broadcast Band; Automatic Volume Control; Interference Rejector; Continuously Variable Tone Control; high quality Microphone; Selector Switch, enabling the user to make home recordings of radio programs or by means of the microphone, to play records and to use the set as a regular Radio Receiver; Level Indicator Tube ("Eye") for Recording; and six-inch Dynamic Speaker.

MODEL 661

SPIEGEL, INC.

Superheterodyne Model 661

VOLTAGE CHART

Line voltage: 117 volts		Position of Volume Control; Full with Ant. disconnected Position of Band Switch: Broadcast							
Tube	Function	Voltage of socket prongs to Gnd. (See prong no's. on diagram)							
		No 1	No 2	No 3	No 4	No 5	No 6	No 7	No 8
6SA7GT	Oscillator-Converter	0	0	220	77	-7.2	0	6.1*	0
6SK7GT	I-f Amplifier	0	0	2.7	0	2.7	77	6.1*	220
6SQ7GT	Det-AVC-1st Audio	0	**	0	0	0	58	6.1*	0
6F6G	Power Amplifier	0	0	200	220	0	57	6.1*	15
6SQ7GT	Microphone Amplifier	0	**	0	**	**	45	6.1*	0
6U5/6G5	Record. Level Indicator	6.1*	19	0	220	0	0	-	-
5Y3G	Rectifier	0	320*	-	280*	-	280*	-	320*

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless otherwise designated, voltages in table are + DC voltages.

* AC volts

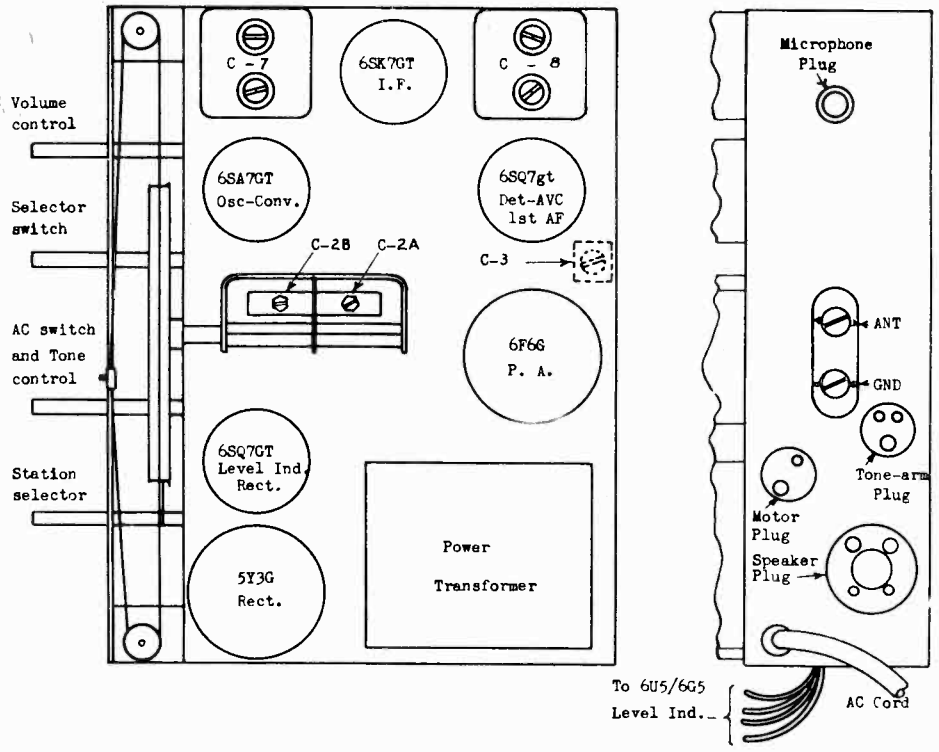
** Cannot be measured with 1000 ohms/volt voltmeter.

Check cutting head voltage with cutting head connected using signal generator (1000 KC 30% modulated) connected to "Ant" and "Gnd". With Selector switch in "Record Radio" position, advance gain until Level Indicator (6U5/6G5 tube) closes without over-lapping. AC voltage as measured from 6F6G plate to ground (AC meter in series with .1 mf. 400 volt condenser) should be approximately 52 volts.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer to last calibration mark at low end of dial with condenser gang fully closed)							
2	I. F.	Ant.	.1 mf.	456 kc	*	open	C8 A & B	2nd. I.F.
							C7 A & B	1st. I.F.
3	Rejector	Ant.	200 mmf.	456 kc	*	closed	C3	Adjust to minimum
4	Broadcast Band	Ant.	200 mmf.	1500 kc	*	1500 kc	C2B	oscillator
5				1500 kc	*	1500 kc	C2A	antenna
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 kc, 900 kc, and 1500 kc.)							
8	(Check operations 1 to 7 inclusive)							

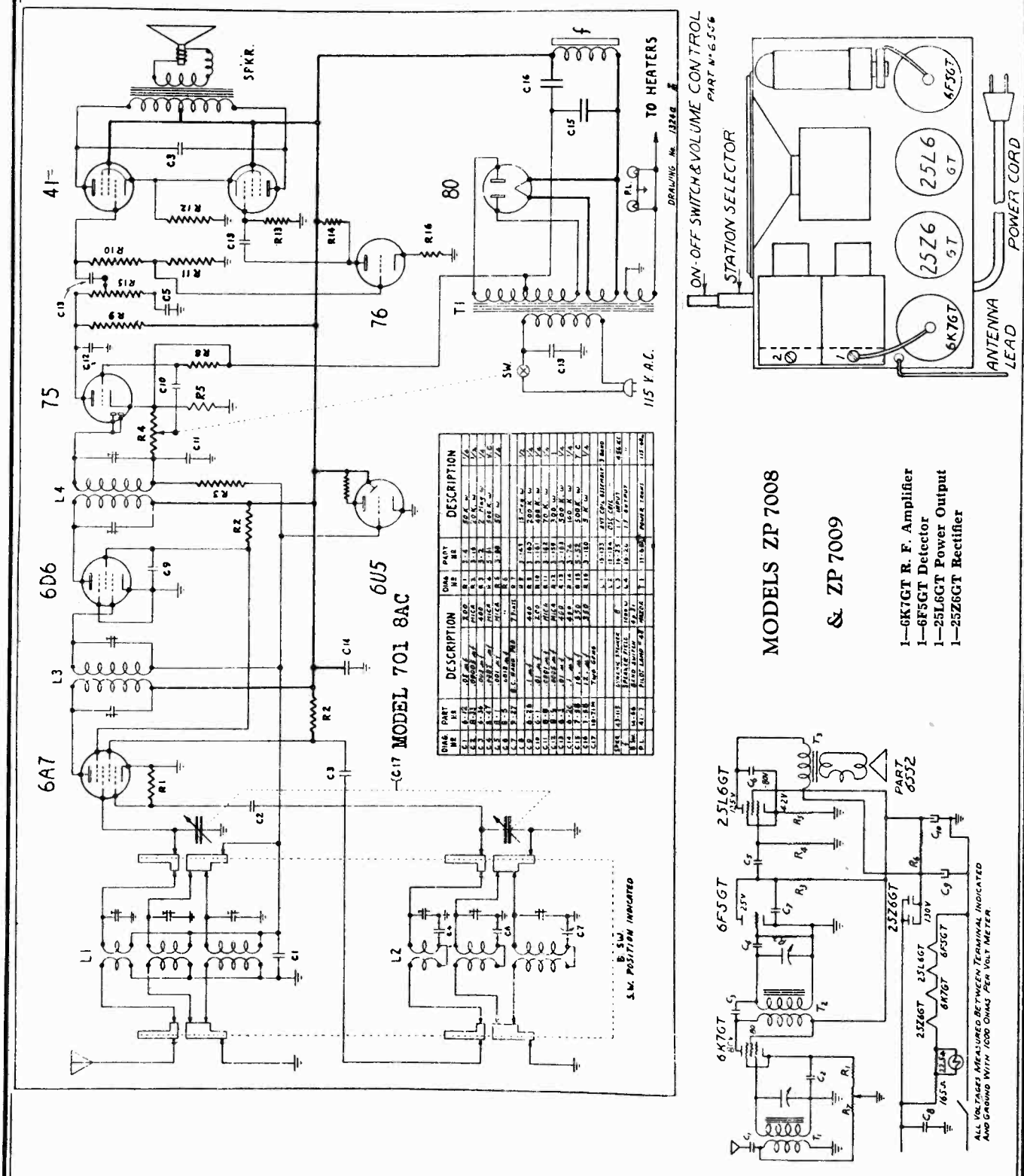
* "RECEIVE RADIO"



WARNING: Do not, under any circumstances, connect this Combination to any other alternating current (a. c.) power supply source than as specified above, nor to a direct current (d. c.) power supply system, as it will be damaged

SPIEGEL, INC.

MODEL 701 8AC
MODELS ZP-7008,
ZP-7009



ALIGNMENT DATA

ALIGNMENT: The alignment of this receiver requires the use of a test oscillator that will cover the following frequencies: 456, 1400, 600, 5100, 1800 and 15,000 KC, and an output meter which is to be connected across the output transformer on the speaker. All alignments should be made with the volume control set at maximum and the output of the test oscillator set as low as possible to prevent the automatic volume control from operating and thus giving incorrect reading during alignment.

INTERMEDIATE FREQUENCY: Set oscillator to 456 KC. Feed this to the grid of the (6A7) tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the **broadcast padding** condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

INTERMEDIATE BAND: For a dummy antenna use a .0002 mfd. mica condenser in series with a 400 ohm carbon resistor. Set band switch to the intermediate band position and feed a 5100 KC signal from the oscillator. Set dial pointer at 5100 KC. Adjust intermediate antenna and intermediate oscillator trimmers for maximum output.

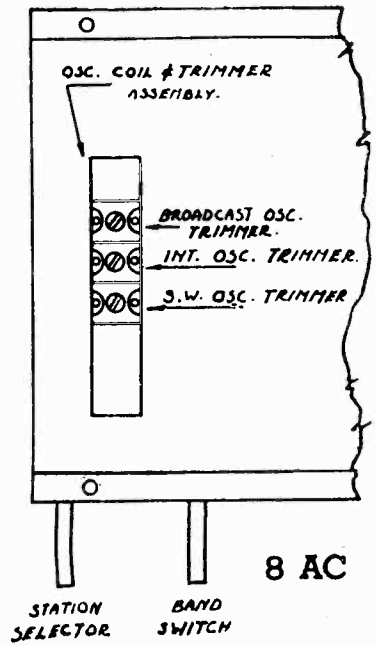
No other adjustments are necessary for aligning this Band.

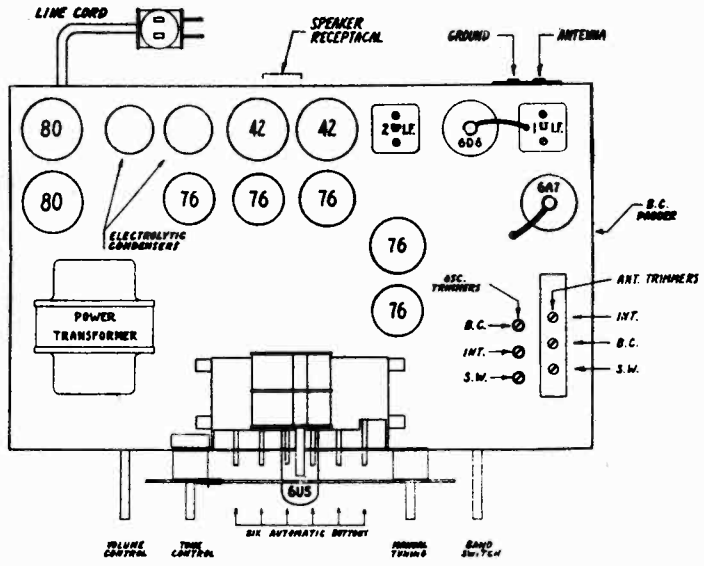
SHORT WAVE: Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

It is advisable to check the sensitivity at 6000 KC to determine whether the circuits are properly aligned. Should the receiver lack sensitivity at this frequency check the .0087 mica condenser for short circuit.

SWITCH POSITION	BAND	RANGE IN KILOCYCLES
Left	Broadcast	535—1620 KC
Center	Intermediate	1620—5350 KC
Right	Short Wave (foreign)	5200—16600 KC

The short wave range includes the five important short wave channels 19, 25, 31, 39 and 49 meters.

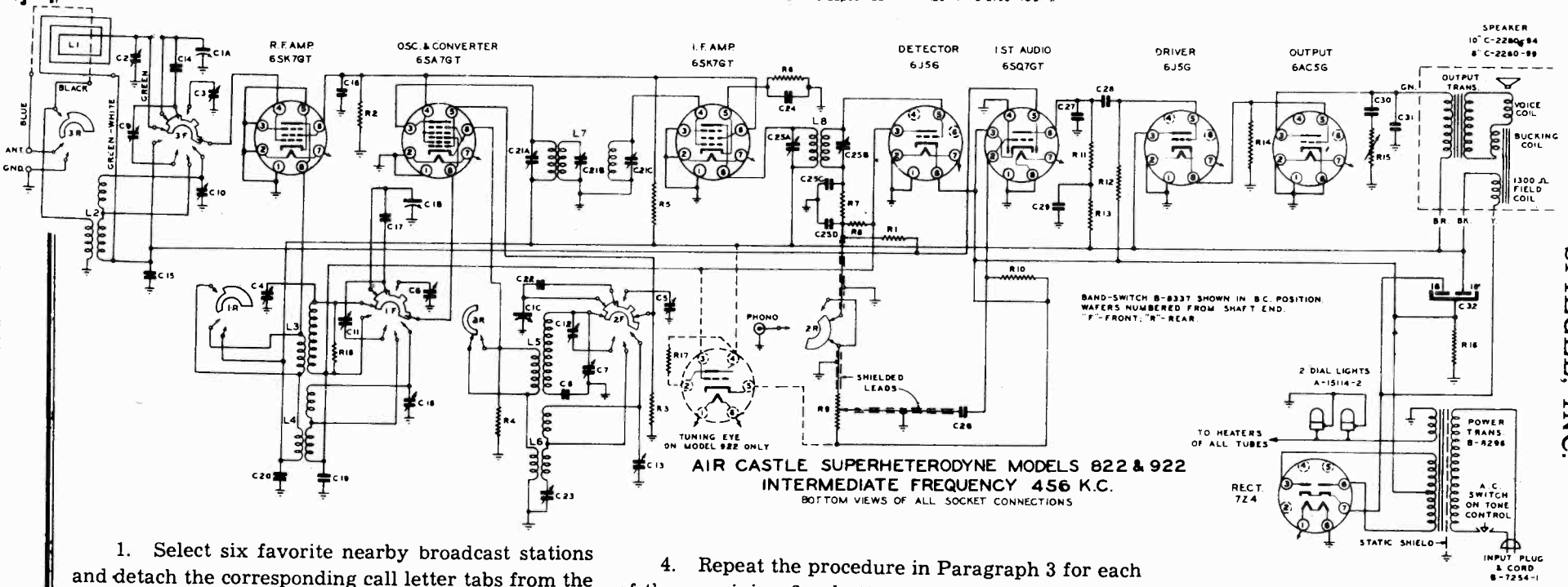




C1A,B&C	3-GANG VARIABLE CONDENSER	B-8398
C2	B.C. ANT. TRIMMER	A-14088-7
C3	5.7-7.8 & 7.4-10.0 MC. ANT. TRIMMER	A-20343
C4	B.C. DET. TRIMMER	
C5	5.7-7.8 & 7.4-10.0 MC. OSC. "	
C6	5.7-7.8 & 7.4-10.0 MC. DET. "	
C7	B.C. OSC. TRIMMER	
C8	" " PADDER	
C9	9.9-13.4 & 12.6-16.8 MC. ANT. PADDER	A-20343-1
C10	9.9-13.4 & 12.6-16.8 MC. " TRIMMER	
C11	9.9-13.4 & 12.6-16.8 MC. DET. PADDER	
C12	9.9-13.4 & 12.6-16.8 MC. OSC. "	
C13	9.9-13.4 & 12.6-16.8 MC. " TRIMMER	
C14	5.7-7.7 & 7.4-10.0 MC. ANT. PAD., 195 MMF.	B-8265-5
C15	.1 MFD. 400 V.	C-3204-38C
C16	.1 MFD. 400 V.	C-3204-38C
C17	5.7-7.6 & 7.4-10.0 MC. DET. PAD., 195 MMF.	B-8265-5
C18	9.9-13.4 & 12.6-16.8 MC. DET. TRIMMER	A-14088-7
C19	.1 MFD. 400 V.	C-3204-38C
C20	.1 MFD. 400 V.	C-3204-38C
C21	NO.1 I.F. TRIMMER	A-14792-1
C22	5.7-7.8 & 7.4-10.0 MC. OSC. PAD., 195 MMF.	B-8265-5
C23	S.W. OSC. CIRCUIT PADDER	A-15451-10
C24	.1 MFD. 200 V.	C-3202-38C
C25	NO.2 I.F. TRIMMER	A-20114
C26	.02 MFD. 400 V.	C-3204-22C
C27	250 MMF MICA	C-720-324
C28	.05 MFD. 400 V.	C-3204-140C
C29	.1 MFD. 400 V.	C-3204-38C
C30	.03 MFD. 600 V.	C-3206-80C
C31	.006 MFD. 600 V.	C-3206-66C
C32	16-16 MFD. ELECTROLYTIC	A-20188

R1	2.2 MEG.	.25 W.	C-2795-102B
R2	27,000 Ω	1 W.	C-2797-193B
R3	15,000 Ω	.25 W.	C-2795-187B
R4	470 Ω	.25 W.	C-2795-151B
R5	9,100 Ω	1 W.	C-2795-182A
R6	300 Ω	.25 W.	C-2795-148B
R7	56,000 Ω	.25 W.	C-2795-83B
R8	2.2 MEG.	.25	C-2795-102B
R9	VOL. CONTROL .5 MEG.		A-15130-2
R10	4.7 MEG.	.25 W.	C-2795-106B
R11	270,000 Ω	.25 W.	C-2795-91B
R12	470,000 Ω	.25 W.	C-2795-94B
R13	100,000 Ω	.25 W.	C-2795-86B
R14	22,000 Ω	.25 W.	C-2795-78B
R15	TONE CONTROL .25 MEG.		A-15128-7
R16	47 Ω	.25 W.	C-2795-48B
R17	220,000 Ω (ON MODEL 922 ONLY)	.25 W.	C-2795-90B
R18	22,000 Ω	.25 W.	C-2795-78B

L1	LOOP ANTENNA	C-3280-7 TABLE MODEL; D-1568-10 CONSOLE
L2	5.7-7.8, 7.4-10.0, 9.9-13.4 & 12.6-16.8 MC. ANT. COIL	A-14960-9
L3	B.C. DET. COIL	A-15838-1
L4	5.7-7.8, 7.4-10.0, 9.9-13.4 & 12.6-16.8 MC. DET. COIL	A-15837-4
L5	B.C. OSC. COIL	A-15394-3
L6	5.7-7.8, 7.4-10.0, 9.9-13.4 & 12.6-16.8 MC. OSC. COIL	A-15233-19
L7	NO. 1 I.F. COIL	A-14794-3
L8	NO. 2 I.F. COIL	A-12064-42



AIR CASTLE SUPERHETERODYNE MODELS 822 & 922
INTERMEDIATE FREQUENCY 456 K.C.
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

1. Select six favorite nearby broadcast stations and detach the corresponding call letter tabs from the station call letter tab sheets supplied.

2. Any tab may be used for any button.

3. Using a small screw driver furnished with radio, or other tool that will fit the screw in the end of the button, push the first button in as far as it will go, and turn to the right or left until the dial pointer has moved to the correct point on the dial for receiving that same station. Be sure the button is pushed all the way in and the station is tuned in accurately.

4. Repeat the procedure in Paragraph 3 for each of the remaining five buttons.

5. Check all six buttons by pushing them in, one at a time, to determine whether the desired stations are all tuned in properly.

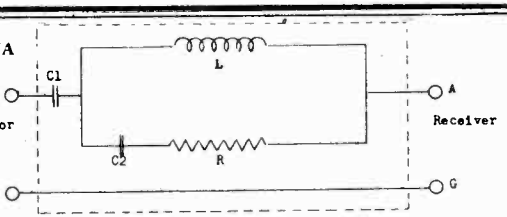
6. Insert the proper station call letter tab in each button by pressing it in position.

7. Any of the six stations to which the automatic push button tuner has been adjusted may now be received simply by pushing the button all the way in for the desired station.

The tuning range of each band

Position of Switch		Meters	Kilocycles
1	Broadcast	548 to 186	547 to 1,610
2	Short-wave	18 to 24	16,800 to 12,600
3	Short-wave	22.5 to 30	13,400 to 9,900
4	Short-wave	30 to 40	10,000 to 7,400
5	Short-wave	40 to 53	7,600 to 5,700
6	Phone—Use Tip Jack at Back of Chassis.		

DUMMY ANTENNA

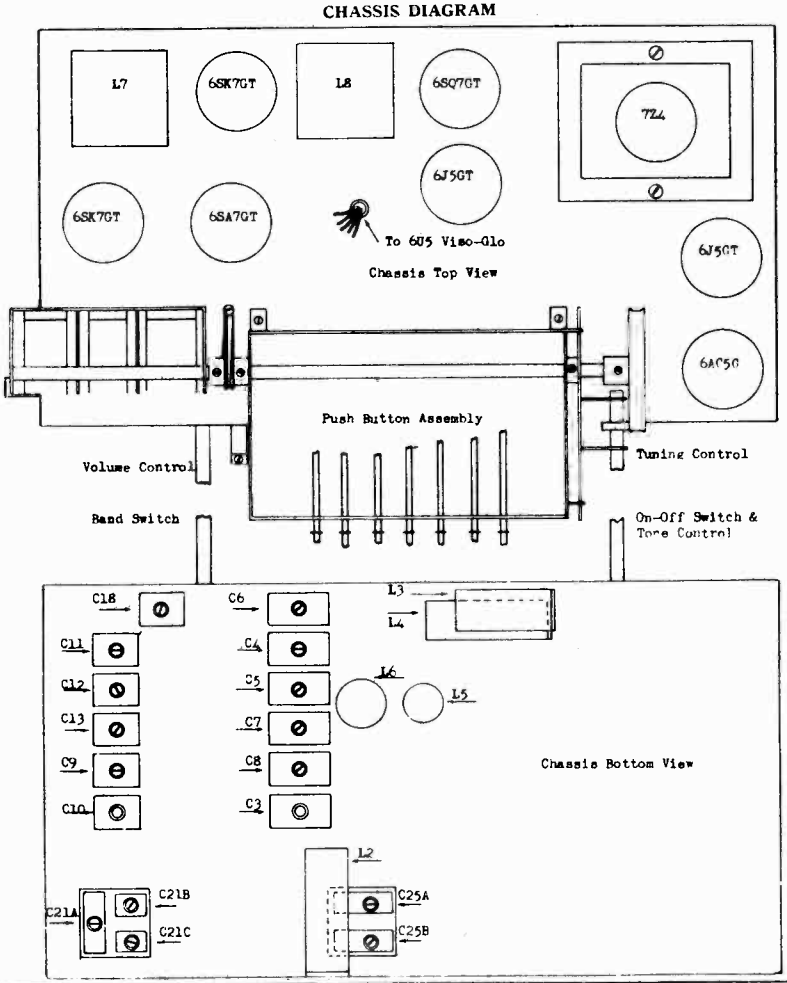


C1 - 200 mmf. Condenser
C2 - 400 mmf. Condenser
R - 100 ohms
L - Choke Coil
---- Case Shield

Choke Coil Specifications
Tubing - 3/8" Diameter Bakelite
Wire - No. 38 Enameled
Turns - 59 closely wound (Impregnated)

Note: When using this dummy antenna the generator output impedance should be 10 ohms or lower.

CHASSIS DIAGRAM



VOLTAGE CHART

Line Voltage: 117 Volts A.C. — Position of Volume Control: Full with dial turned to quiet channel. Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. See Schematic Diagram							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SK7GT	R-F Amplifier	0	0	0	-2.3	0	85	6.2*	225
6SA7GT	Osc - Converter	0	0	225	85	-3.2	0	6.2*	-2.2
6SK7GT	I.F. Amplifier	0	0	0	0	3	85	6.2*	225
6J5G	Detector	0	0	-2.2	-2.1	-3	182	6.2*	-2.1
6SQ7GT	1st Audio	0	-2.3	-2.1	0	-2.3	80	6.2*	0
6J5G	Driver	0	0	220	85	0	0	6.2*	8.3
6AC5G	Power Amplifier	0	0	210	0	8.3	-2.1	6.2*	0
724	Rectifier	6.2*	0	290*	0	0	290	0	0
6U5	Viso-Glo	6.2*	220	-.3	225	-2.2	0	-	-

Notes: Voltage readings are for schematic diagram in this bulletin. Allow 15% - or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter.
*AC volts.

ALIGNMENT CHART

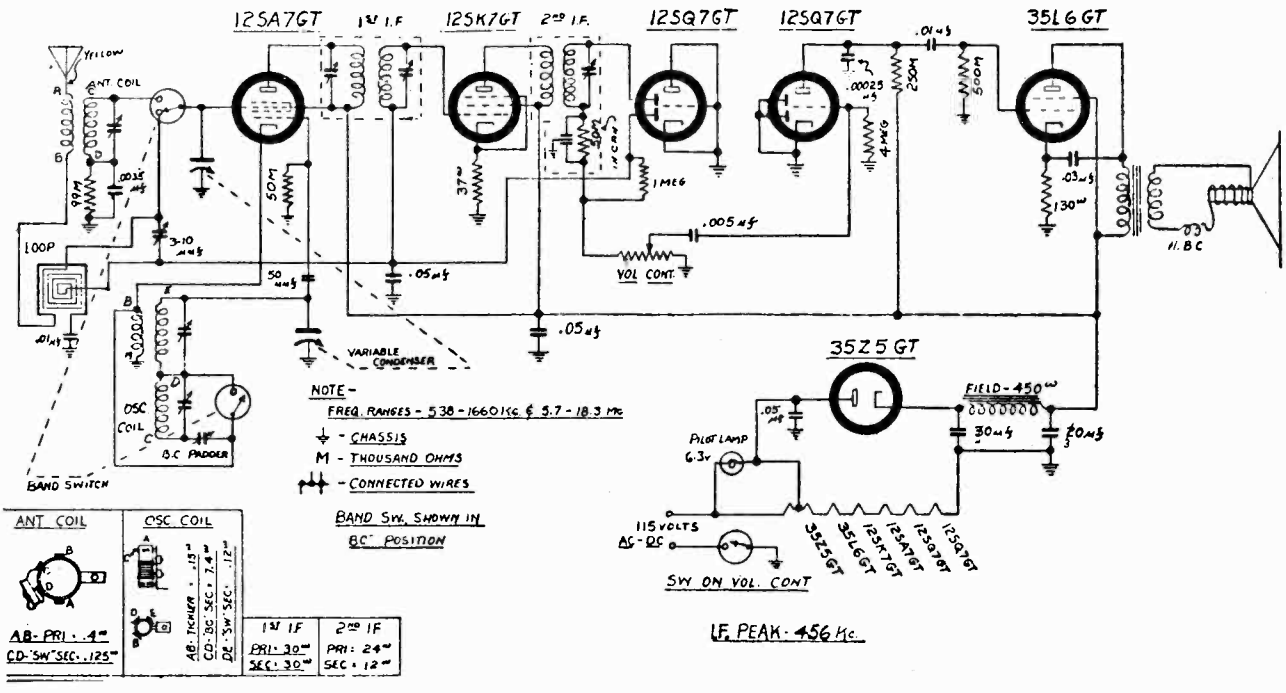
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer even with left hand stop line when condenser gang is fully meshed.							
2	I.F.	#4 Pin 6SA7GT	.1 MFD Cond.	456 KC	BC	Open	C25 A&B	Peak accurately
3							C21 B*	**
4							C21 A&C	Peak accurately
5							C21 B	Peak accurately
6	BC	Ant.	See Note	1600 KC	BC	1600 KC	C7 Osc. Tr	Peak accurately
							C2 Ant. "	Peak accurately
							C4 Det. "	Peak accurately
7				600 KC	BC	600 KC	C8 Osc.Pad	***
8	Repeat operations 6 and 7.							
9	Check calibration and sensitivity at 600 KC, 1000 KC and 1600 KC.							
10	#5 Band	Ant.	See Note	16.5 MC	#5 Band	16.5 MC	C13 Osc.Tr.	Peak accurately
							C10 Ant.*	Peak accurately
							C18 Det."	Peak accurately
11				12.6 MC	#5 Band	12.6 MC	C12 Osc.Pad	***
							C9 Ant.Pad	***
							C11 Det."	***
12	Repeat operations 10 and 11.							
13	Check calibration and sensitivity at 12.6 MC and 16.5 MC.							
14	#4 Band	Ant.	See Note		#4 Band	Check calibration and sensitivity at 13 MC, 11 MC and 10 MC.		
15	#3 Band	Ant.	See Note	9.75 MC	#3 Band	9.75 MC	C5 Osc.Tri.	***
							C3 Ant. "	***
							C6 Det. "	***
16	Check calibration and sensitivity of #3 band at 7.6 MC.							
17	#2 Band	Ant.	See Note	7.6 MC	#2 Band	7.6 MC	Check calibration and sensitivity at 7.6 MC.	
18	Repeat operations on bands #5, 4, 3 and 2 in this sequence as many times as necessary until additional gain can not be obtained.							

*Bronze color trimmer screw.
**Turn trimmer screw all the way down.
***Rock dial while adjusting for maximum output.
Note: Use Dummy Antenna as described on page 2.

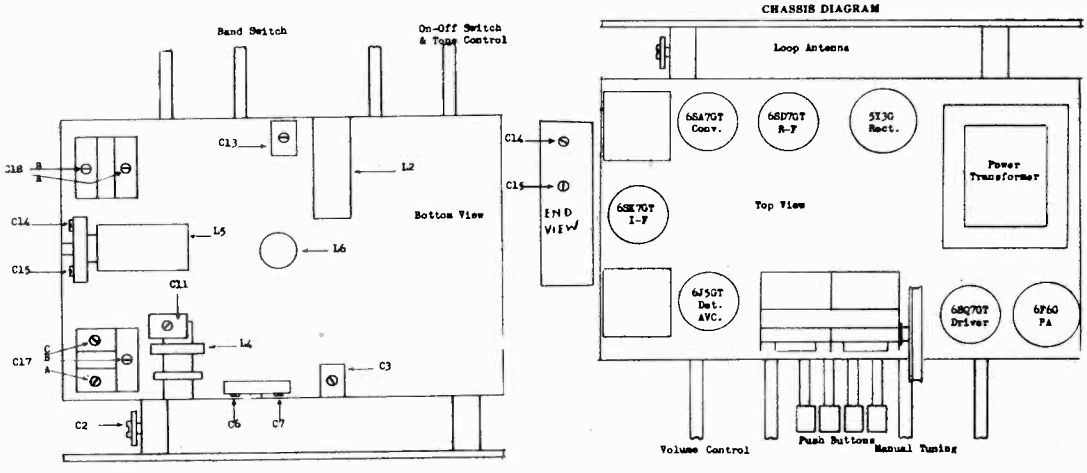
SPIEGEL, INC.

MODELS DP-7006, DP-7007
MODELS DP-7012-50-60
EP-2016

MODELS DP-7006, DP-7007

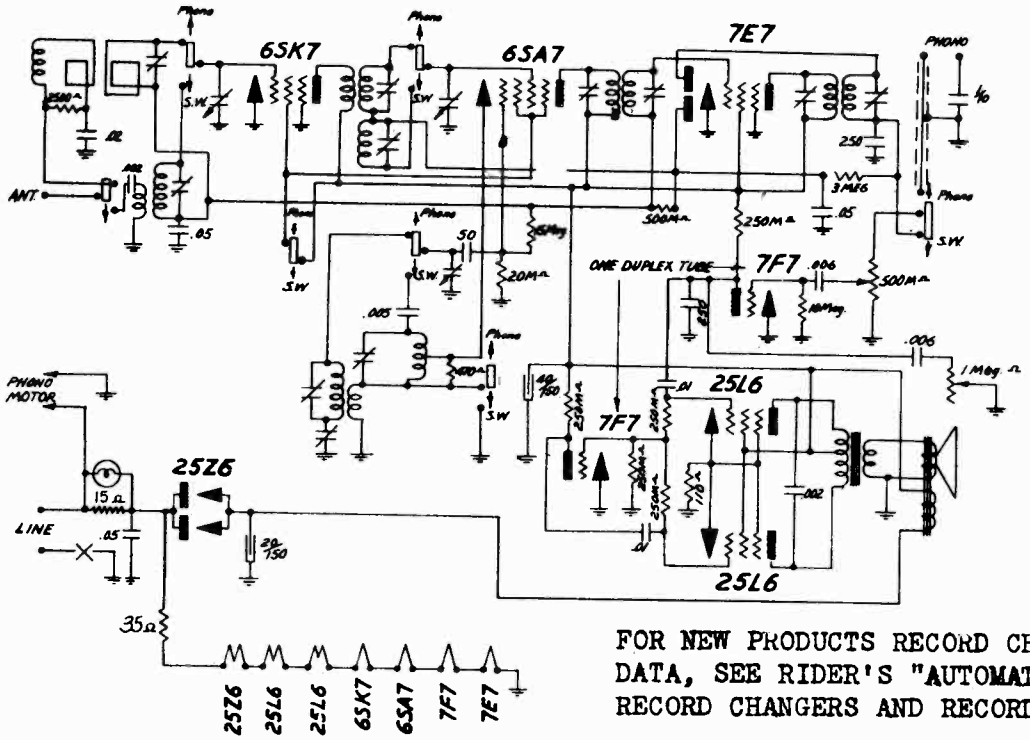


MODELS EP-2016, DP-7012-50-60



MODEL DP-7016

SPIEGEL, INC.



Band switch sections shown in Broadcast setting.

FOR NEW PRODUCTS RECORD CHANGER DATA, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS"

POWER SUPPLY:

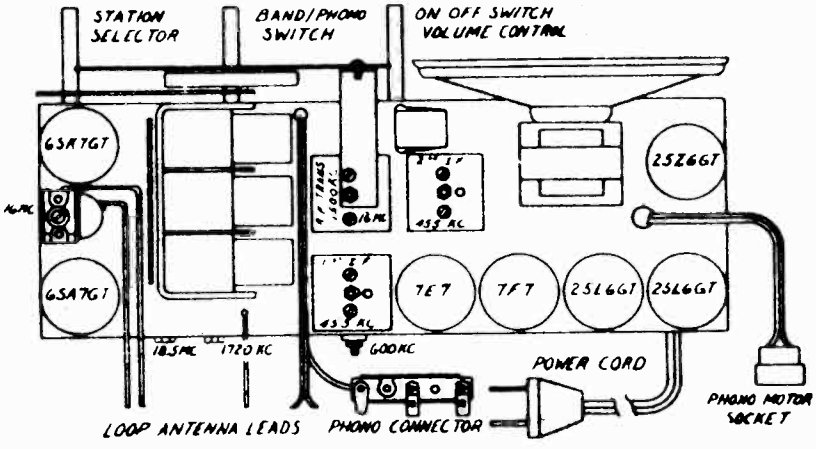
This radio receiver is to be used only with 105-125 volt alternating current (AC) 60 cycles supply, as printed on the red warning tag attached to the line cord. Use with 50 cycle alternating current is permissible only if specified on the line cord tag.

To prevent serious damage to the phonograph motor, do not operate this receiver from a direct current (DC) power supply. Your local power company representative, or engineer in charge of maintenance for your residence will provide information regarding the type of power used.

TUBES:

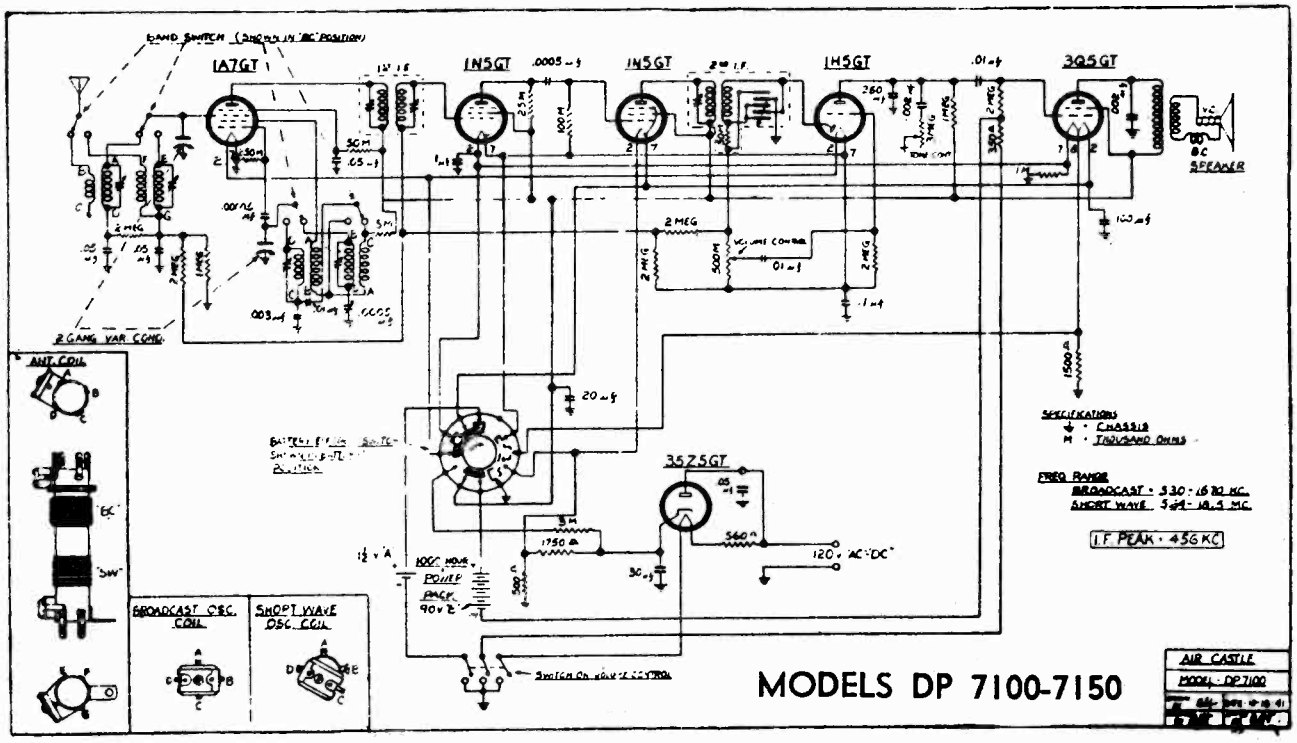
With the cabinet back removed, the receiver's tubes will also be visible. Be sure that each of the tubes is pushed all the way down in its proper socket, as indicated in the following illustration.

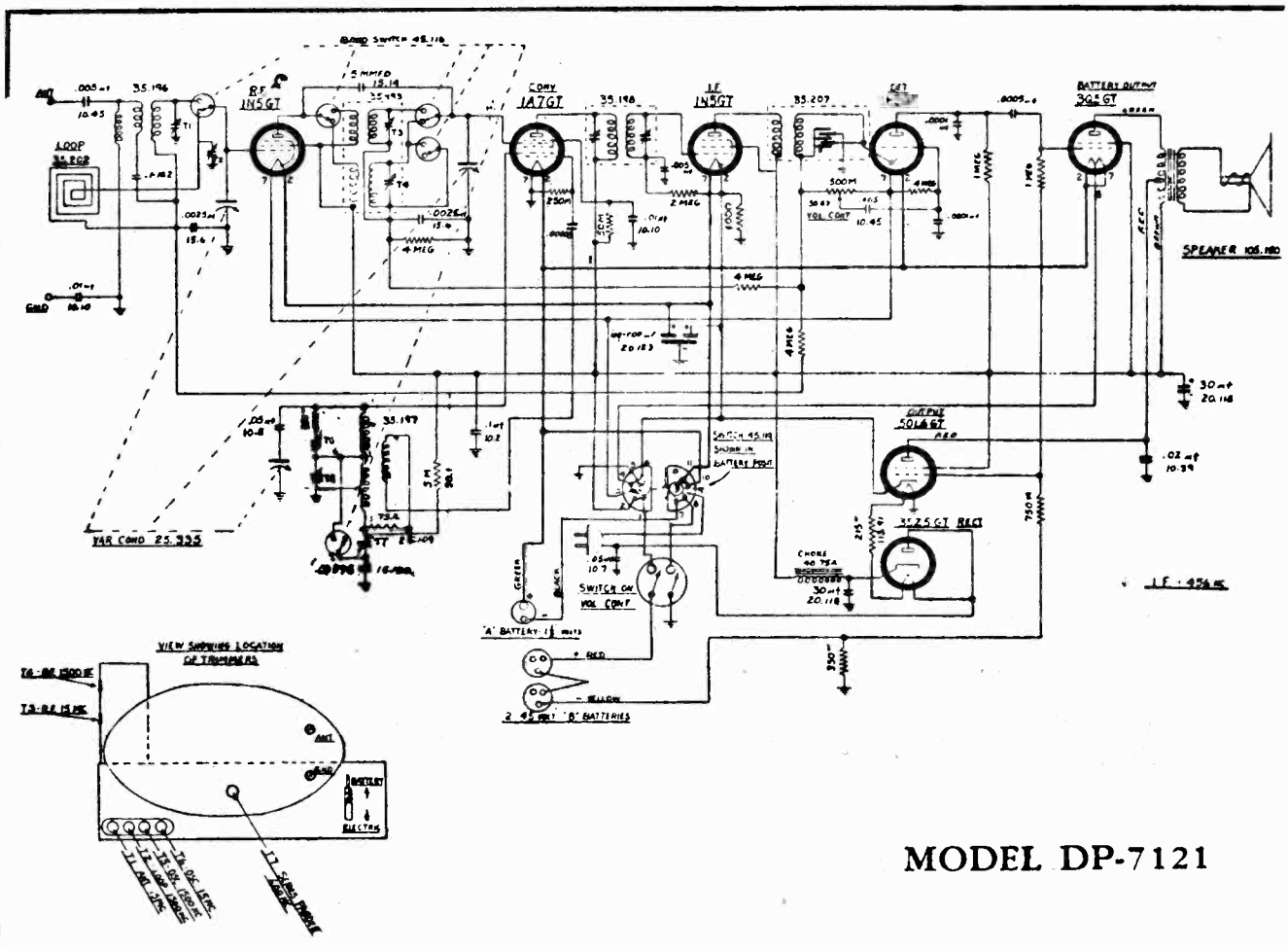
Replace the cabinet back.



SPIEGEL, INC.

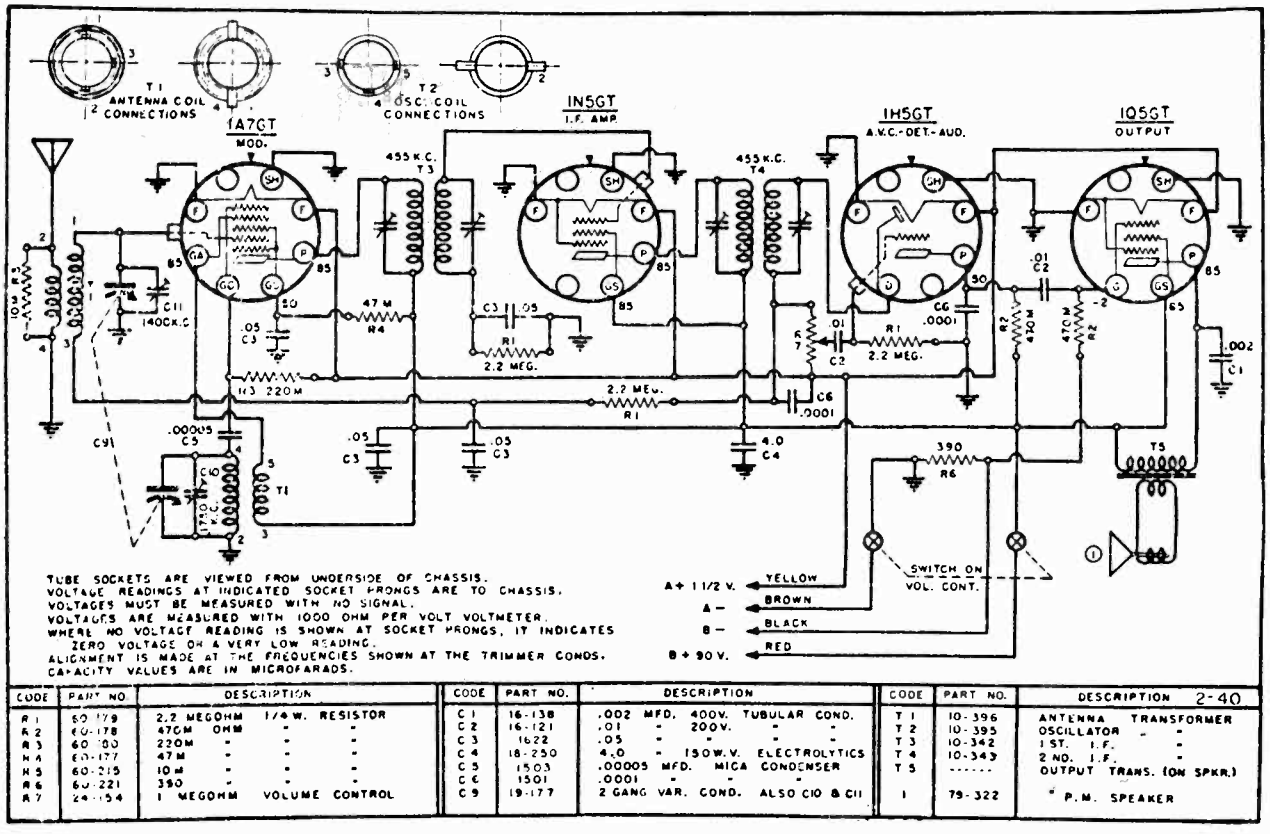
MODELS DP-7100,7150
MODEL DP-7121 Series





MODEL DP-7112(1-421)

SPIEGEL INC.

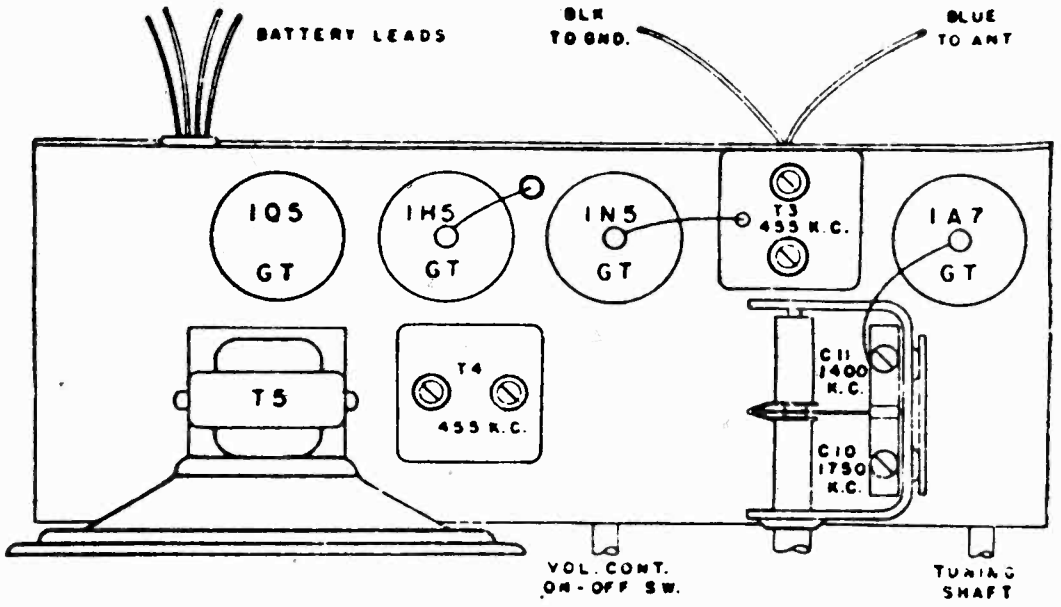


TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDS.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO	DESCRIPTION
R1	50-179	2.2 MEGOHM 1/4 W. RESISTOR
R2	50-178	470M OHM - -
R3	50-100	220M - - -
R4	50-177	47M - - -
R5	50-215	10M - - -
R6	50-221	390 - - -
R7	24-154	1 MEGOHM VOLUME CONTROL

CODE	PART NO.	DESCRIPTION
C1	16-138	.002 MFD. 400V. TUBULAR COND.
C2	16-121	.01 - 200V. - -
C3	1622	.05 - - - -
C4	18-250	4.0 - 150 W.V. ELECTROLYTICS
C5	1503	.00005 MFD. MICA CONDENSER
C6	1501	.0001 - - -
C9	19-177	2 GANG VAR. COND. ALSO C10 & C11

CODE	PART NO.	DESCRIPTION 2-40
T1	10-396	ANTENNA TRANSFORMER
T2	10-395	OSCILLATOR - -
T3	10-342	1 ST. I.F. -
T4	10-343	2 ND. I.F. -
T5	------	OUTPUT TRANS. (ON SPKR.)
1	79-322	P.M. SPEAKER

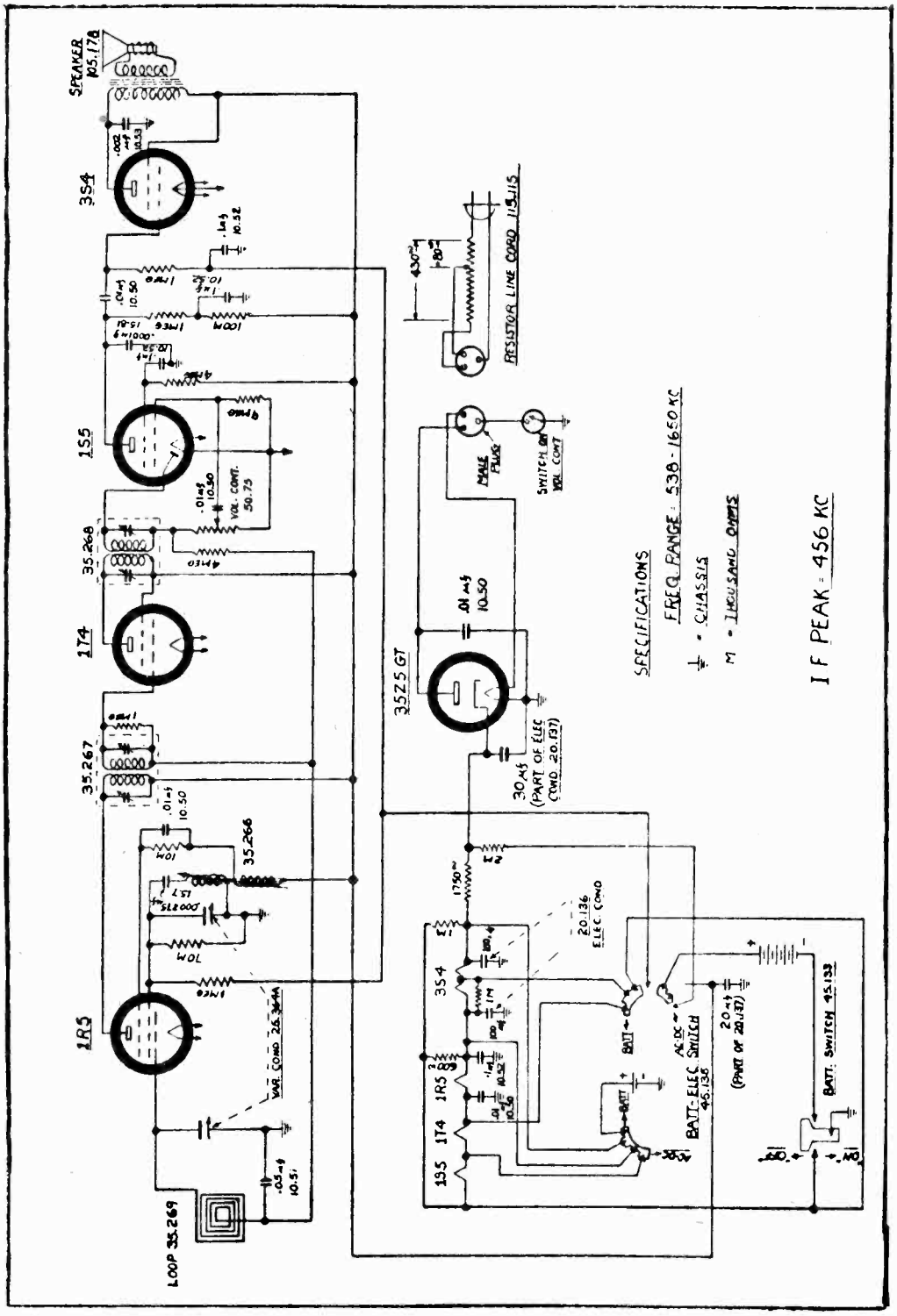


LOCATION OF PARTS ON TOP OF CHASSIS

MODEL DP-7122

SPIEGEL, INC.

SCHEMATIC DIAGRAM MODEL DP7122

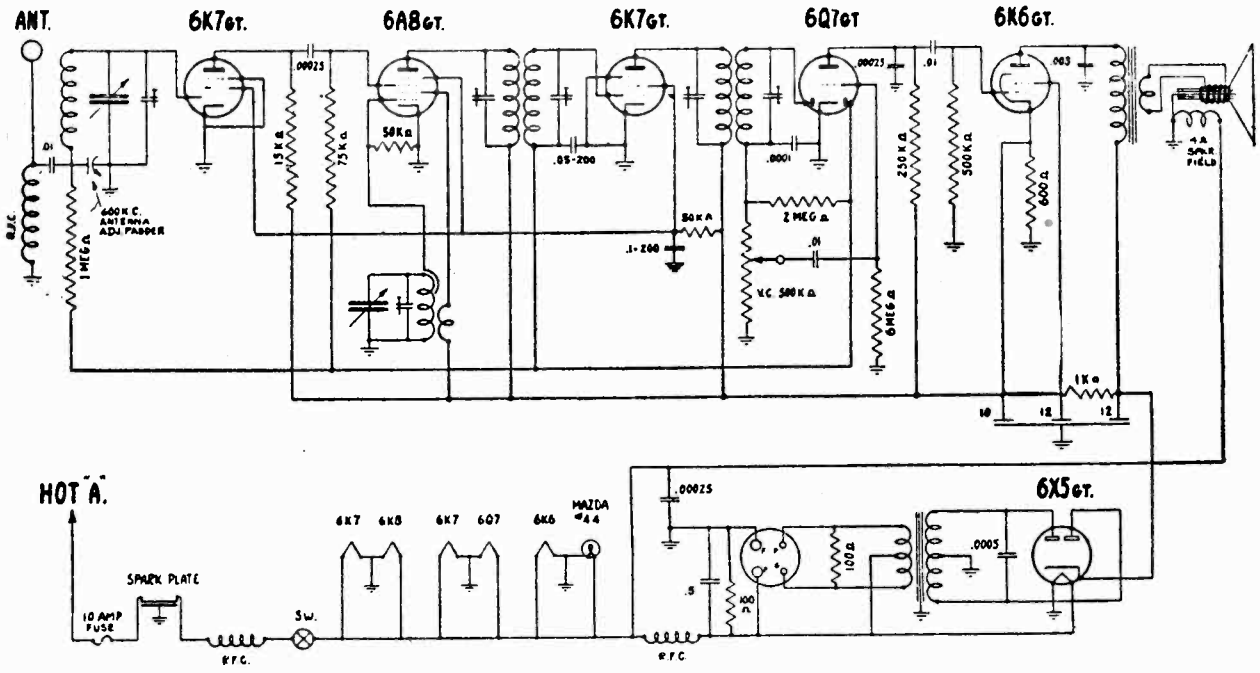


TUNING RANGE: 535 to 1650KC (560 to 182 Meters) covers Standard American Broadcast and some State Police. The manufacturer assumes no liability for police call transmission which is intended for authorized police use only and is confidential.

This 5 tube Receiver is designed to operate on self-contained Battery Power Unit or 105-125 Volts, 40-60 Cycles Alternating Current (AC) or 105-125 Volts Direct Current. (DC).

MODELS DP-7450, EP-2450

SPIEGEL, INC.



6-TUBE PUSH BUTTON SUPERHETERODYNE AUTO RADIO

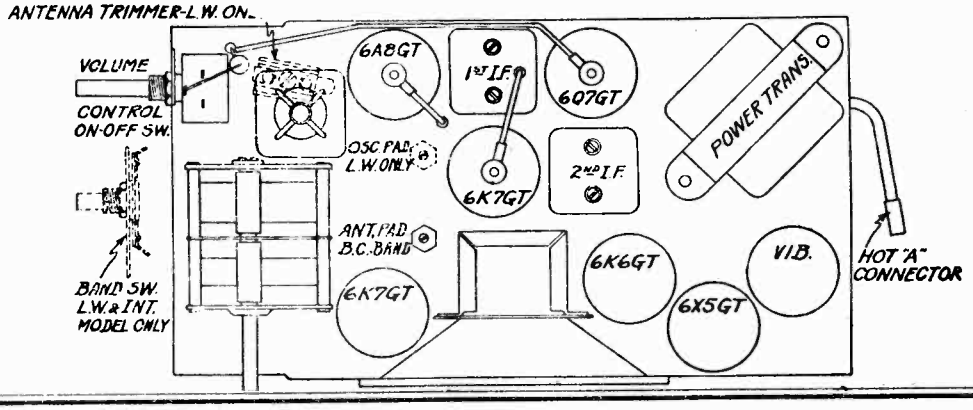
This radio is designed to operate on 6 volts D.C. *only*. A special model is built to operate on 12 volts D.C. and it will carry a tag plainly marked so. The tuning range covers the Standard Broadcast Band from 538 to 1550 kilocycles.

R. F. ALIGNMENT

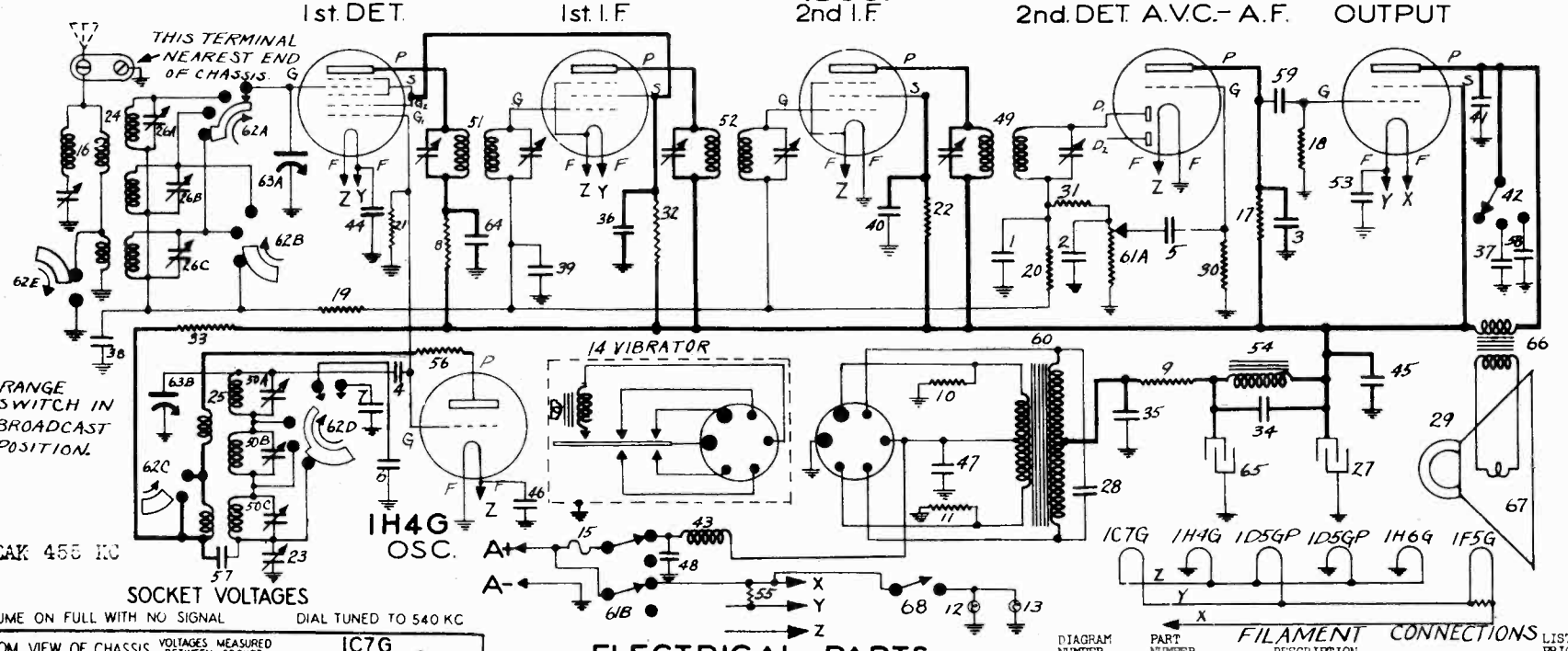
With the variable condenser still full open, set the generator to 1550 K. C. Connect the generator lead to the antenna lead through a .0001 mfd. condenser as dummy antenna Adjust the oscillator trimmer for maximum output. Set the receiver dial and the generator to 1400 K.C. so the signal comes through, and adjust the antenna trimmer for maximum output.

Set the receiver dial and generator to 600 K.C. and adjust the oscillator padder for maximum output by rocking the variable condenser (with the tuning knob) as the padder is adjusted.

Return the dial and generator setting to 1400 K.C. and check for alignment.



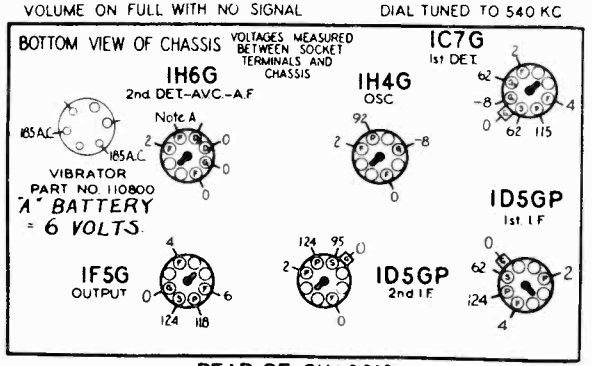
STEWART-WARNER 06-6H CHASSIS (MODEL 06-6HI)



IF PEAK 455 KC

SOCKET VOLTAGES

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



REAR OF CHASSIS

Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE A: Voltage on this plate will be low when read on a meter having a resistance of 1000 ohms per volt.

ELECTRICAL PARTS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-2-3	83539	Condenser - mica 260 mmfd.	.20
4	83783	Condenser - mica 110 mmfd.	.20
5	8F185	Condenser - ceramic tube .006 mfd. 600 volt-	.25
6	8F475	Condenser - mica .00123 mfd. (3%)	.25
7	88681	Condenser - mica .00255 mfd. (3%)	.30
8	110557	Resistor - carbon 4700 ohms 1/4 watt	.12
9-10-11	110560	Resistor - carbon 100 ohms 1/4 watt	.12
12-13	110629	Dial lamp - 6.3 volt - .25 amps.	.15
14	110800	Vibrator - synchronous	4.25
15	110F95	Fuse - 3 amp. 250 volt	.12
16	112796	Coil - wave trap (with trimmer)	.50
17	112970	Resistor - insulated 330,000 ohms 1/4 watt-	.15
18-19	112971	Resistor - insulated 470,000 ohms 1/4 watt-	.15
20	112972	Resistor - insulated 1 megohm 1/4 watt	.15
21	112965	Resistor - insulated 68,000 ohms 1/4 watt	.15
22	112966	Resistor - 100,000 ohms 1/4 watt	.12
23	113063	Condenser - padder	.36
24	113068	Coil - antenna	.94
25	113071	Coil - oscillator	1.20
26A to 26C	113095	Condenser-trimmer(3 section)for antenna coil	1.25
27	113422	Condenser-electrolytic 8 mfd. 200 volt	.42
28	114277	Condenser - oil filled .01 mfd. 2000 volts-	.24
29	M-115092	Speaker - P.M. 6"	7.00
30	116060	Resistor - insulated 10 meg. 1/4 watt	.12
31	116058	Resistor - insulated 47,000 ohms 1/4 watt	.12
32	116059	Resistor - insulated 22,000 ohms 1/4 watt	.12
33	116063	Resistor - carbon 10,000 ohms 1/4 watt	.15
34-35-36	116625	Condenser - .1 mfd. 600 volt	.25
37	116647	Condenser - .004 mfd. 600 volt	.15
38-39-40	116819	Condenser - .05 mfd. 600 volt	.20
41	117022	Condenser - .002 mfd. 600 volt	.15
42	117025	Switch - tone control	.60
43	117332	Choke coil in "A" line	.30
44-45	118206	Condenser - .25 mfd. 600 volt	.35
46-47-48	118225	Condenser - .5 mfd. 150 volt	.45
49	118442	Transformer - 3rd I.F.	1.00
50A to 50C	118446	Condenser-trimmer(3 section)for oscillator	.42
51-52	118447	Transformer - 1st and 2nd I.F.	1.10
53	118452	Condenser - electrolytic 100 mfd. 8 volt	.55
54	118453	Filter choke	1.00
55	118806	Resistor - 45 ohms 1/2 watt W.W.	.12
56	118807	Resistor - 30 ohms 1/4 watt	.10
57-58-59	119193	Condenser - .01 mfd. 600 volt	.15
60	119233	Transformer - power - 6 volt	4.60
61A - 61B	119357	Volume control 1/4 meg. with switch	1.30
62A to 62D	119358	Range switch	1.40
63A - 63B	119359	Condenser - variable tuning	2.40
64	119414	Condenser - .02 mfd. 600 volt	.15
65	119428	Condenser - electrolytic 20 mfd. 200 volt	.60
66	M-119467	Transformer - output for M-115092 speaker	1.80
67	M-119468	Cone & Voice coil for M-115092 speaker	1.80
68	119470	Switch for dial light	.45

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL 06-6H1
Chassis 06-6H

STEWART-WARNER CORP.

06-6H CHASSIS (RECEIVER MODEL 06-6H1)

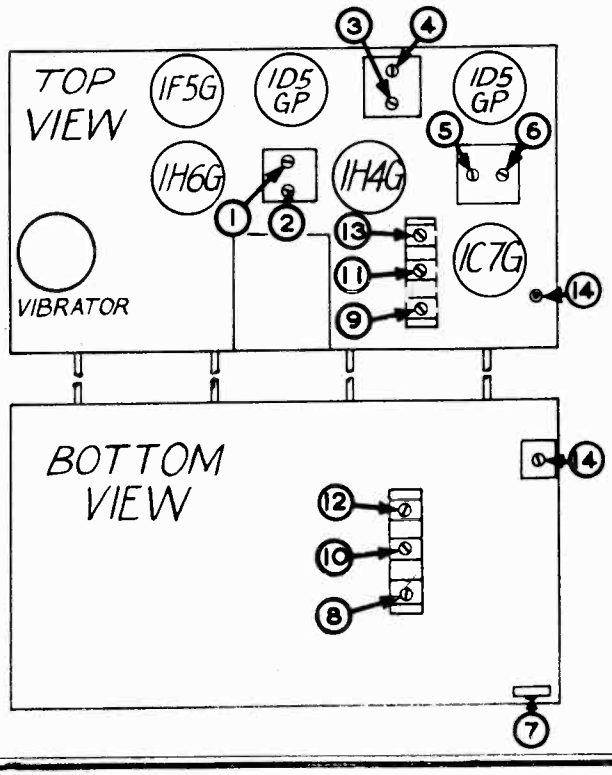
ALIGNMENT EQUIPMENT & PROCEDURE

For alignment, an output meter and an accurately calibrated signal generator with a tuning range from 455 KC to 20 MC are required.

1. Connect the output meter across the voice coil or between the plate of the 1F5G tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the chassis of the receiver.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. With the gang condenser in full mesh set the pointer 1¼" from left end of brown dial plate. This may be accomplished by releasing the clip on the pointer slider; where it attaches to the dial cord.

IMPORTANT:-THE BROADCAST BAND MUST BE ALIGNED AFTER THE SHORT-WAVE BAND AND POLICE BAND.

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RANGE SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD CONDENSER	CONTROL GRID OF 1C7G TUBE	455 KC	BROADCAST (Clockwise)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2-3 4-5-6	I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	455 KC	BROADCAST (Clockwise)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	7	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC	SHORT-WAVE (Counter-clockwise)	20 MC 7¼" FROM LEFT END OF BROWN DIAL PLATE	8	SHORT-WAVE OSCILLATOR	ADJUST TO BRING IN SIGNAL. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 19.1 MC IF IMAGE DOES NOT APPEAR REALIGN AT 20 MC WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC	SHORT-WAVE (Counter-clockwise)	TUNE TO 20 MC GENERATOR SIGNAL	9	SHORT-WAVE ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC	INTERMEDIATE (Center)	6 MC 7 1/8" FROM LEFT END OF BROWN DIAL PLATE	10	INTERMEDIATE OSCILLATOR	ADJUST TO BRING IN SIGNAL. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 5.1 MC IF IMAGE DOES NOT APPEAR REALIGN AT 6 MC , WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC	INTERMEDIATE (Center)	TUNE TO 6 MC. GENERATOR SIGNAL	11	INTERMEDIATE ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
200 MMFD CONDENSER	ANTENNA TERMINAL	1500 KC.	BROADCAST (Clockwise)	7 1/8" FROM LEFT END OF BROWN DIAL PLATE	12	BROADCAST OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
200 MMFD CONDENSER	ANTENNA TERMINAL	1500 KC.	BROADCAST (Clockwise)	TUNE TO 1500 KC. GEN.SIG.	13	BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
200 MMFD CONDENSER	ANTENNA TERMINAL	600 KC.	BROADCAST (Clockwise)	TUNE TO 600 KC. GENERATOR SIGNAL	14	BROADCAST OSCILLATOR (Series Pad)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.

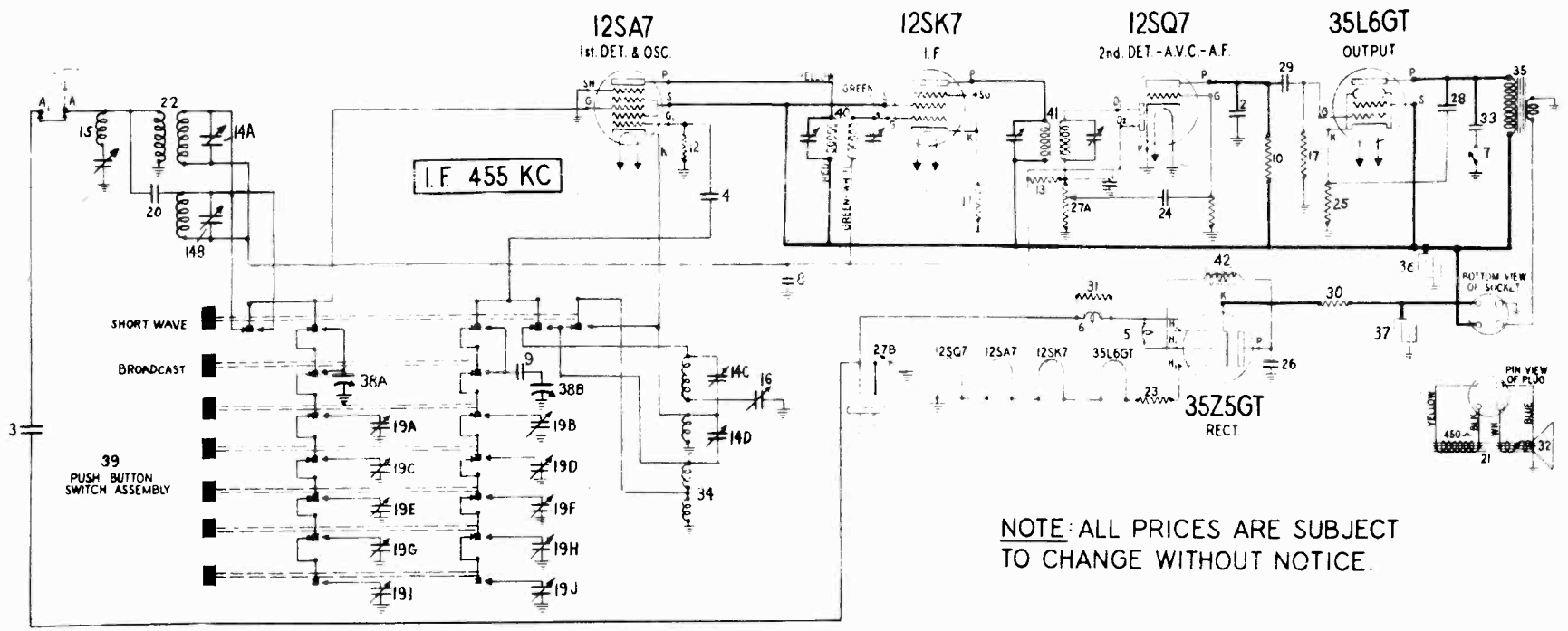


MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
113424	"A" Cable & Clip Assembly	1.45
114955	Clamp - for dial cord	.01
117057	Cord - drive supplied in 3 ft. lengths	.15
116948	Cord - pointer drive supplied in 6 ft. lengths	.18
117029	Drive drum & bushing	.50
119461	Escutcheon & dial assembly	1.60
119167	Knob - tuning or volume	.10
12349	Nut - 8-32 for speaker mounting--Per C	.45
119434	Pointer	.30
117019	Reflector - for pilot light	.04
81145	Retaining ring - for drive shaft--Per C	.50
83624	Screw - self tapping 8 X 1/4	.01
85827	Set Screw - 8-32 Square head	.02
112874	Screw - #10 X 1 1/8 Chassis Mtg.	.01
119218	Screw - escutcheon mounting	.02
110794	Shield cup clips-for retaining vibrator shield	.20
112864	Shield - for tubes	.08
117832	Socket - dial lamp (with lamp) ungrounded	.15
119472	Socket - dial lamp (grounded)	.10
85427	Socket - octal base (standard)	.15
81834	Socket - 6 prong (for vibrator)	.10
113177	Spring - dial cord tension	.09
116981	Spring - for pointer	.02
117033	Tuning shaft	.12
111456	Washer - spring washer--Per C	.50
110829	Washer - flat steel, for mtg. chassis	.01
116530	Washer (paper) for back of knobs	.005

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

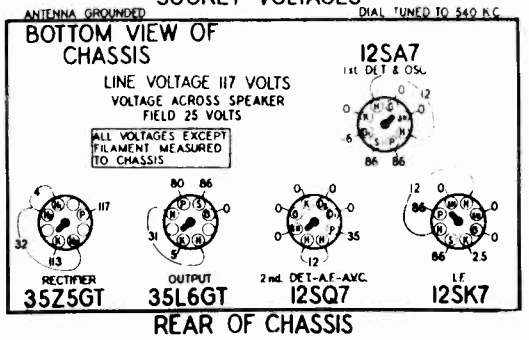
STEWART-WARNER MODEL 07-5EX CHASSIS



ELECTRICAL PARTS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-4-5	[illegible]	Condenser - mica 250 mmfd.	.20
4	[illegible]	Condenser - mica 5% mmfd.	.15
5-6	85234	Lamp - dial 5 to 6 volt (Mazda 51)	.16
[illegible]	88084	Switch - tone control	.30
8	68189	Condenser - paper .05 mfd. 200 volt	.25
9	86587	Condenser - mica .0042 mfd.	.35
10	120553	Resistor - carb. 220,000 ohms ½ watt	.12
11	120560	Resistor - carb. 100 ohms 1/4 watt	.12
12	120586	Resistor - carb. 33,000 ohms 1/4 W.	.12
13	110580	Resistor - carb. 3.3 meg. 1/4 watt	.12
14A to 14D	112792	Condenser - trimmer 4 section	.60
15	112793	Coil - wave trap (with trimmer)	.50
[illegible]	112789	Condenser - padder (530 to 630 mmfd)	.36
[illegible]	112[illegible]	Resistor - insul. 470,000 ohm ½ watt	.15
[illegible]	112375	Resistor - carb. 10 meg. 1/4 watt	.12
19A to 19J	1.4[illegible]	Trimmer condenser strip - for push buttons	2.25
20	114389	Condenser - mica 15 mmfd.	.12
21	110[illegible]	Speaker - dynamic 5"	.48
22	112421	Coil - antenna - S.C. & S.W.	.90
23	116527	Resistor - 10[illegible] ohms 10% 3 W. W.W.	.28
24	116347	Condenser - .004 mfd. 600 volt	.15
25	116702	Resistor - 140 ohms 10% 8 W. W.W.	.12
26	116819	Condenser - .05 mfd. 600 volt	.20
27A - 27B	116834	Volume control - 1 meg. (with switch)	1.10
28-29	116893	Condenser - .02 mfd. 600 volt	.15
30	116967	Resistor - 25 ohm 1 W. 10% W.W.	.18
31	116968	Resistor - 40 ohm 2 W. 10% W.W.	.16
32	116982	Cone & Voice coil for U-115058 spkr.	1.55
33	116984	Condenser - .04 600 volts	.20
34	117517	Coil - oscillator	1.00
35	117621	Transformer - output	1.00
36	117622	Condenser - elec. 16 mfd. 150 volt	.55
37	117623	Condenser - elec. 40 mfd. 150 volt	.85
38A - 38B	117625	Condenser - tuning with drum	3.00
39	117368	Push button switch	2.60
40	117673	Transformer - 1st I. F.	1.20
41	117674	Transformer - 2nd I. F.	1.20
42	116232	R. F. Choke	.48

SOCKET VOLTAGES



Use a high resistance voltmeter of 1000 ohms per volt

MODEL 07-5EX
MODEL 07-5NX

STEWART-WARNER CORP.

ALIGNMENT PROCEDURE

For alignment, an output meter and an accurately calibrated signal generator are required.

1- Connect the output meter across the voice coil or between the plate of the 35L6GT output tube and chassis through a .1 mfd. condenser, depending upon the type of meter. The more sensitive type should be connected across the voice coil.

2- Connect the ground lead of the signal generator to the chassis of the receiver through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results as the signal generator may be connected to one side of the power line, or it may be grounded externally. A .1 mfd. non-inductive condenser should be connected in series with the antenna lead from the signal generator and the dummy antenna given in the table.

3- Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.

4- The pointer should be in a horizontal position when the gang condenser is in full mesh. If it is not, it will be necessary to remove the dial window by pushing out the clips holding it in place and setting the pointer to the correct position. Be sure that the dial face is in the correct position when this is done.

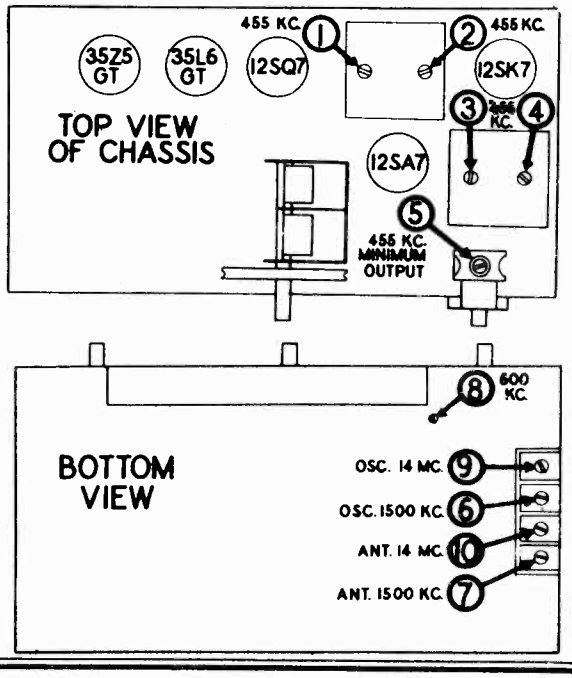
5- Remove the connector from between the A and A_1 terminals.

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	PUSH BUTTON POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	FRONT LUG OF GANG CONDENSER	455 KC	"BROADCAST" PUSHED IN	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2ND I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
					3-4	1ST I.F.	
200 MMFD. MICA CONDENSER	"A" TERMINAL	455 KC	"BROADCAST" PUSHED IN	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
200 MMFD. MICA CONDENSER	"A" TERMINAL	1500 KC	"BROADCAST" PUSHED IN	1500 KC	6	BROADCAST OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
200 MMFD. MICA CONDENSER	"A" TERMINAL	1500 KC	"BROADCAST" PUSHED IN	TUNE TO 1500 KC GENERATOR SIGNAL	7	BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT
200 MMFD MICA CONDENSER	"A" TERMINAL	600 KC	"BROADCAST" PUSHED IN	TUNE TO 600 KC GENERATOR SIGNAL	8	BROADCAST OSCILLATOR (Series Pad)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	"A" TERMINAL	14 MC	"SHORT WAVE" PUSHED IN	14 MC	9	SHORT WAVE OSCILLATOR (Shunt)	ADJUST TO BRING IN SIGNAL. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 13.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 14 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	"A" TERMINAL	14 MC	"SHORT WAVE" PUSHED IN	14 MC	10	SHORT WAVE ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.

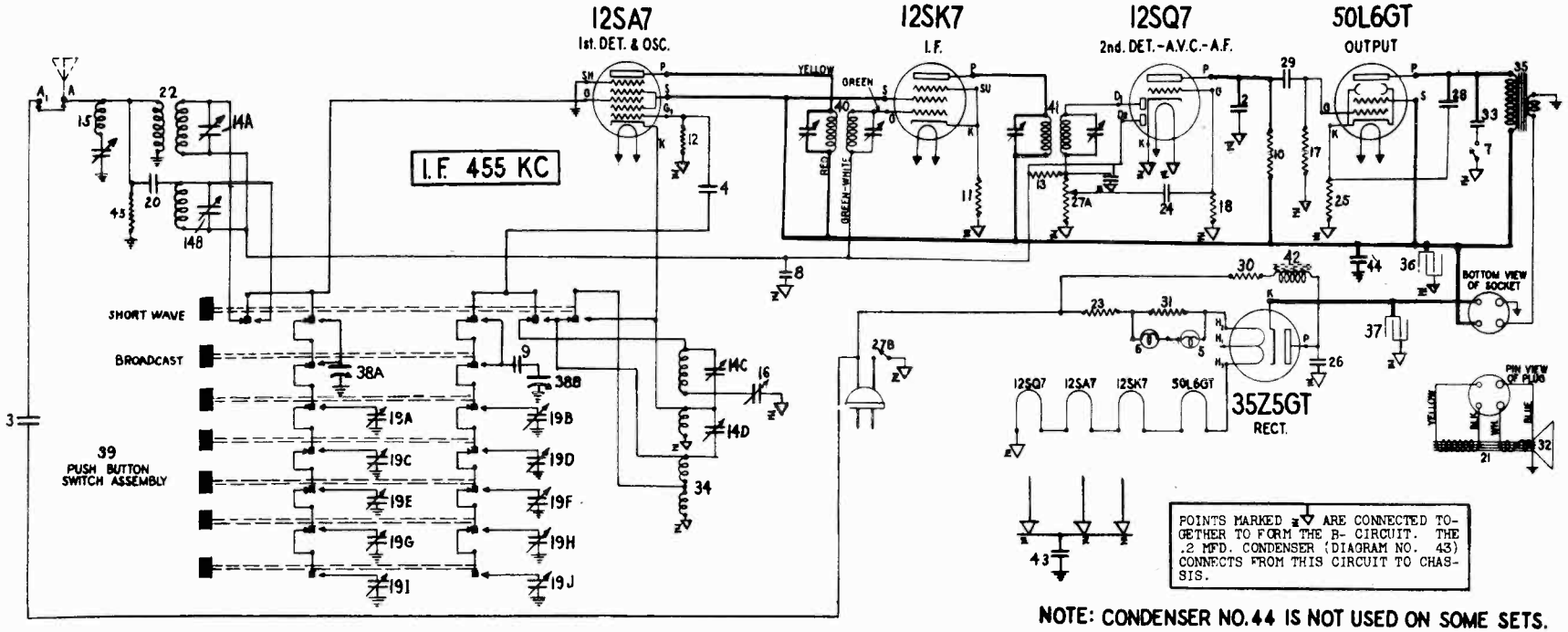
DIAL & MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
116940	Back - cabinet	.22
83552	Bolt - chassis mtg. (#10 X 7/8)	.03
116900	Cabinet	6.55
117782	Call tabs and instruction sheets	.48
114955	Clamp - for dial cord	.01
112745	Clip - coil mounting	.01
112764	Clip - dial scale retaining	.01
112798	Clip - for mtg. wave trap coil	.01
85321	Connector - for internal antenna	.01
116948	Cord-dial drive (supplied in 6 ft. lengths)	.18
116810	Dial window	.35
117753	Dial scale	.25
113589	Felt Pad - (cabinet feet)	.06
116556	Insulator Pilot Light	.10
116773	Knob - tuning or volume	.10
116883	Pointer	.16
113102	Push Button - only	.08
81145	Retaining ring - for drive shaft	.50
83824	Screw - self tapping #8 X 1/4	.01
85040	Screw - #6 Hex. Hd. Per C	.35
116831	Shaft - tuning	.12
116793	Socket - for pilot light	.40
85427	Socket - octal base (standard)	.15
110501	Socket - 4 prong (for speaker)	.16
111090	Spacer - steel, mechanism mounting to chassis	.02
114968	Spring - dial cord tension	.03
113189	Tab - celluloid - for push button	.09
116223	Terminal strip - for antenna (A-A_1)	.12
111456	Washer - spring washer	.50
116530	Washer - (paper) for back of knobs	.005

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



STEWART-WARNER MODEL 07-5NX CHASSIS



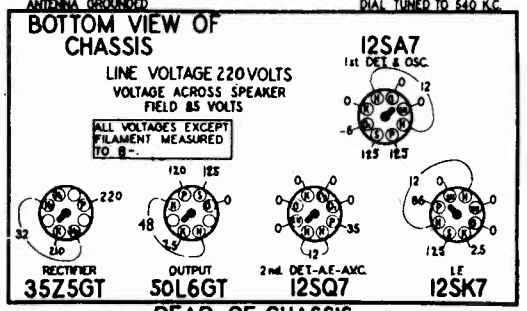
NOTE: CONDENSER NO. 44 IS NOT USED ON SOME SETS.

ELECTRICAL PARTS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-2-3----	63539	---Condenser - mica 260 mmfd.----------	.20
4------	85061	---Condenser - mica 51 mmfd.----------	.15
5-6-----	85298	---Lamp - dial 6 to 8 volt (Mazda 51)--	.16
7------	88054	---Switch - tone control--------------	.30
8------	88189	---Condenser - paper .05 mfd. 200 volt-	.25
9------	88587	---Condenser - mica .0042 mfd.--------	.35
10------	110591	--Resistor - carb. 680,000 ohms ½ watt	.12
11------	110560	--Resistor - carb. 100 ohms 1/4 watt--	.12
12------	110566	--Resistor - carb. 33,000 ohms 1/4 W.-	.12
13------	110580	--Resistor - carb. 3.3 meg. 1/4 watt--	.12
14A to 14D-	112792	--Condenser - trimmer 4 section-------	.60
15------	112798	--Coil - wave trap (with trimmer)-----	.50
16------	112799	--Condenser - padder (530 to 630 mmfd)	.36
17------	112871	--Resistor - insul. 470,000 ohm ½ watt	.15
18------	110580	--Resistor - carb. 3.3 meg. 1/4 watt--	.12
19A to 19J-	114964	--Trimmer condenser strip - for push buttons----------	2.25
20------	114969	--Condenser - mica 15 mmfd.----------	.12
21----	R-115076	--Speaker - dynamic 5"----------	3.50
22------	116421	--Coil - antenna - B.C. & S.W.--------	.90
23------	118149	--Power cord (with resistor)----------	1.00

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
24------	116647	--Condenser - .004 mfd. 600 volt------	.15
25------	116092	--Resistor - 140 ohms 1 watt W.W.-----	.15
26------	116819	--Condenser - .05 mfd. 600 volt-------	.20
27A - 27B-	116834	--Volume Control - 1 meg.(with switch)	1.10
28-29----	116893	--Condenser - .02 mfd. 600 volt-------	.15
30-------	69771	--Resistor - 90 ohms 2 watts W.W.-----	.12
31------	111514	--Resistor - 170 ohms 2 watts W.W.----	.15
32----	R-116209	--Cone & Voice coil assembly for R-115076 speaker----------	1.40
33------	116984	--Condenser - .04 600 volts----------	.20
34------	117517	--Coil - oscillator----------	1.00
35------	117821	--Transformer - output----------	1.00
36------	117622	--Condenser - elec. 18 mfd. 150 volt--	.55
37------	118248	--Condenser - elec. 30 mfd. 400 volts-	1.00
38A - 38B-	117625	--Condenser - tuning with drum--------	3.00
39------	117668	--Push button switch----------	2.60
40------	117673	--Transformer - 1st I.F.----------	1.20
41------	117674	--Transformer - 2nd I.F.----------	1.20
42------	118232	--R. F. Choke----------	.48
43------	116706	--Condenser - .2 mfd. 600 volt--------	.35
44-------	89532	--Condenser - .25 mfd. 200 volt-------	.32
45------	110576	--Resistor - carb. 10,000 ohms ½ watt-	.12

SOCKET VOLTAGES



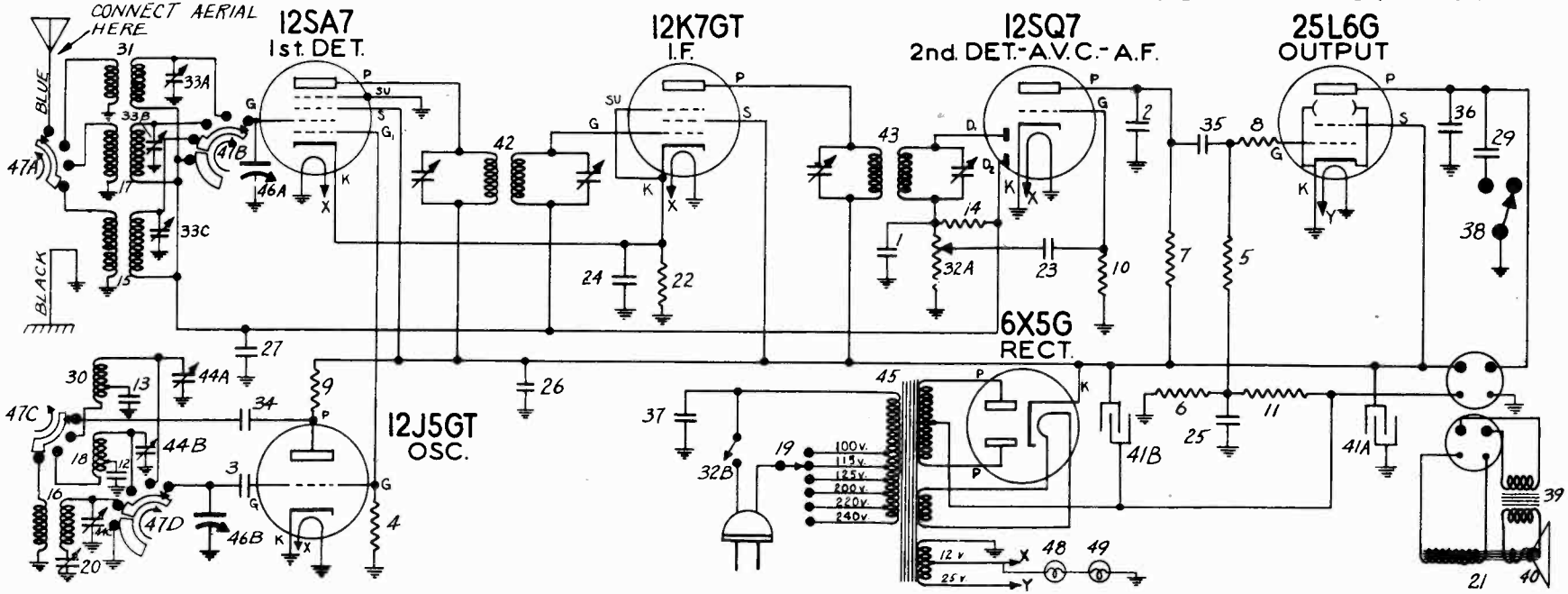
Use a high resistance voltmeter of 1000 ohms per volt

ALIGNMENT PROCEDURE AND TRIMMER LOCATIONS FOR MODEL 07-5NX ARE THE SAME AS THOSE FOR MODEL 07-5EX

RETURN SIGNAL GENERATOR AND OUTPUT METER GROUND LEADS TO B- INSTEAD OF CHASSIS ON THIS MODEL.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

STEWART WARNER 010-6KX CHASSIS (MODEL 010-6K1-X)



IF PEAK 455 KC

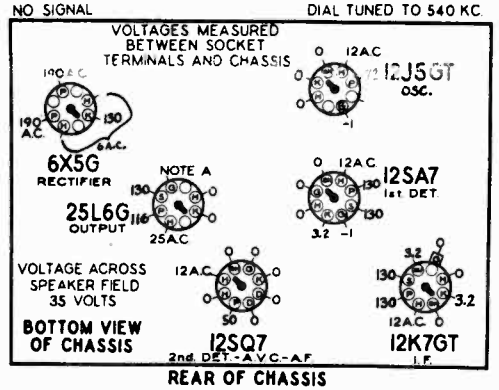
ELECTRICAL PARTS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-2	83639	Condenser - mica 260 mmfd	.20
3	86173	Condenser - mica 50 mmfd	.20
4	110552	Resistor - carbon 47,000 ohms 1/4 watt	.12
5-6	110553	Resistor - carbon 220,000 ohms 1/4 watt	.12
7	110559	Resistor - carbon 470,000 ohms 1/4 watt	.12
8	110560	Resistor - carbon 100 ohms 1/4 watt	.12
9	110565	Resistor - carbon 22,000 ohms 1/4 watt	.12
10	110560	Resistor - carbon 3.3 meg. 1/4 watt	.12
11	110591	Resistor - 680,000 ohms 1/4 watt	.12
12	112426	Condenser - mica 1650 mmfd	.30
13	112427	Condenser - mica 4050 mmfd	.40
14	112973	Resistor - insulated 1.5 megohm 1/4 watt	.15
15	113295	Coil - antenna (B. C.)	1.20
16	113297	Coil - oscillator (B. C.)	.48
17	113298	Coil - antenna (Police)	.50
18	113412	Coil - oscillator (Police)	1.20
19	1141-8	Rotor - voltage switch (on power transformer)	.60
20	114259	Condenser - padding	.46
21	U-115088	Speaker - dynamic 6"	5.50
22	116082	Resistor - 150 ohms 1/4 watt	.12
23	116647	Condenser - .004 mfd. 600 volt	.15
24-25-26	116706	Condenser - .2 mfd. 600 volt	.35
27-28	116819	Condenser - .05 mfd. 600 volt	.20
29	116964	Condenser - .04 mfd. 600 volt	.20
30	117530	Coil - oscillator (Short Wave)	.60
31	117819	Coil - antenna (Short Wave)	.65
32A - 32B	119068	Volume control - 1 meg. (with switch)	1.00
33A to 33C	119174	Condenser - trimmer 3 section	.45
34 to 37	119192	Condenser - .01 mfd. 600 volt	.15
38	119214	Switch - tone control	.48
39	U-119228	Transformer-output for U-115088 speaker	1.80
40	U-119229	Cone & Voice Coil for U-115088 speaker	1.80
41A - 41B	119343	Condenser - electrolytic 20-40 mfd. 200 volt	1.40
42	119480	Transformer - 1st I.F.	1.40
43	119482	Transformer - 2nd I.F.	1.30
44A to 44C	119485	Condenser - trimmer 3 section	.38
45	119486	Power transformer	7.50
46A - 46B	119492	Condenser - tuning - with drum	3.00
47A to 47D	119493	Range switch	1.35
48-49	110629	Lamp - 6.3 volt - .25 amps	.15

Prices subject to change without notice.

SOCKET VOLTAGES

NO SIGNAL — DIAL TUNED TO 540 KC.



Use a voltmeter of at least 1000 ohms per volt.

NOTE A: The bias on the grid of the 25L6G output tube is -8.5 volts but due to the high resistances of resistors 8 & 11 there will be only a small deflection on an ordinary meter.

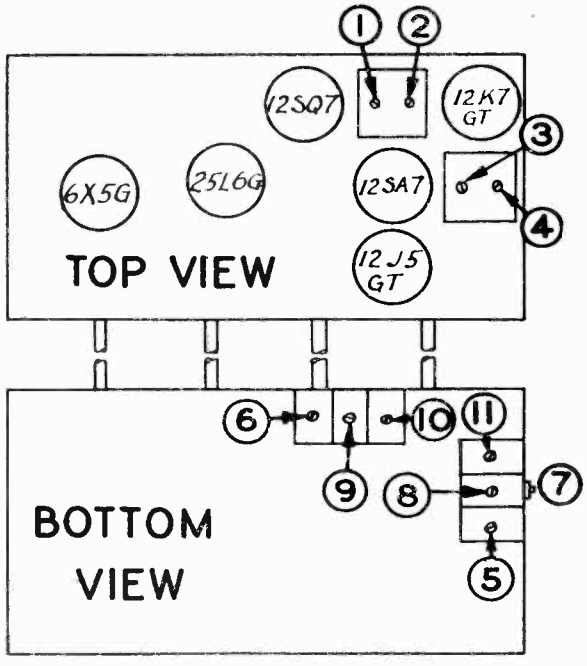
STEWART-WARNER CORP.

MODEL 010-6K1-X
Chassis 010-6KX

ALIGNMENT DATA FOR 010-6KX CHASSIS

1. Connect the output meter across the voice coil or from the plate of the 25L6G output tube to ground through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the black wire coming from the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. The pointer should be in a horizontal position with the gang condenser in full mesh.

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD CONDENSER	LUG ON REAR SECTION OF GANG COND.	455 KC	BROADCAST	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2 3-4	2nd I.F. 1st I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
200 MMFD. MICA CONDENSER	BLUE WIRE COMING FROM CHASSIS	1500 KC	BROADCAST	1500 KC	5	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
200 MMFD. MICA CONDENSER	BLUE WIRE COMING FROM CHASSIS	1500 KC	BROADCAST	TUNE TO 1500 KC GENERATOR SIGNAL	6	BROADCAST DETECTOR	ADJUST FOR MAXIMUM OUTPUT
200 MMFD. MICA CONDENSER	BLUE WIRE COMING FROM CHASSIS	600 KC	BROADCAST	TUNE TO 600 KC GENERATOR SIGNAL	7	BROADCAST OSCILLATOR (SERIES)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	BLUE WIRE COMING FROM CHASSIS	5 MC	INTERMEDIATE	5 MC	8	INTERMEDIATE OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 4.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 5 MC WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	BLUE WIRE COMING FROM CHASSIS	5 MC	INTERMEDIATE	TUNE TO 5 MC GENERATOR SIGNAL	9	INTERMEDIATE ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	BLUE WIRE COMING FROM CHASSIS	20 MC	FOREIGN	20 MC	10	FOREIGN OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 19.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 20 MC WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	BLUE WIRE COMING FROM CHASSIS	20 MC	FOREIGN	TUNE TO 20 MC GENERATOR SIGNAL	11	FOREIGN ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.



MISCELLANEOUS PARTS

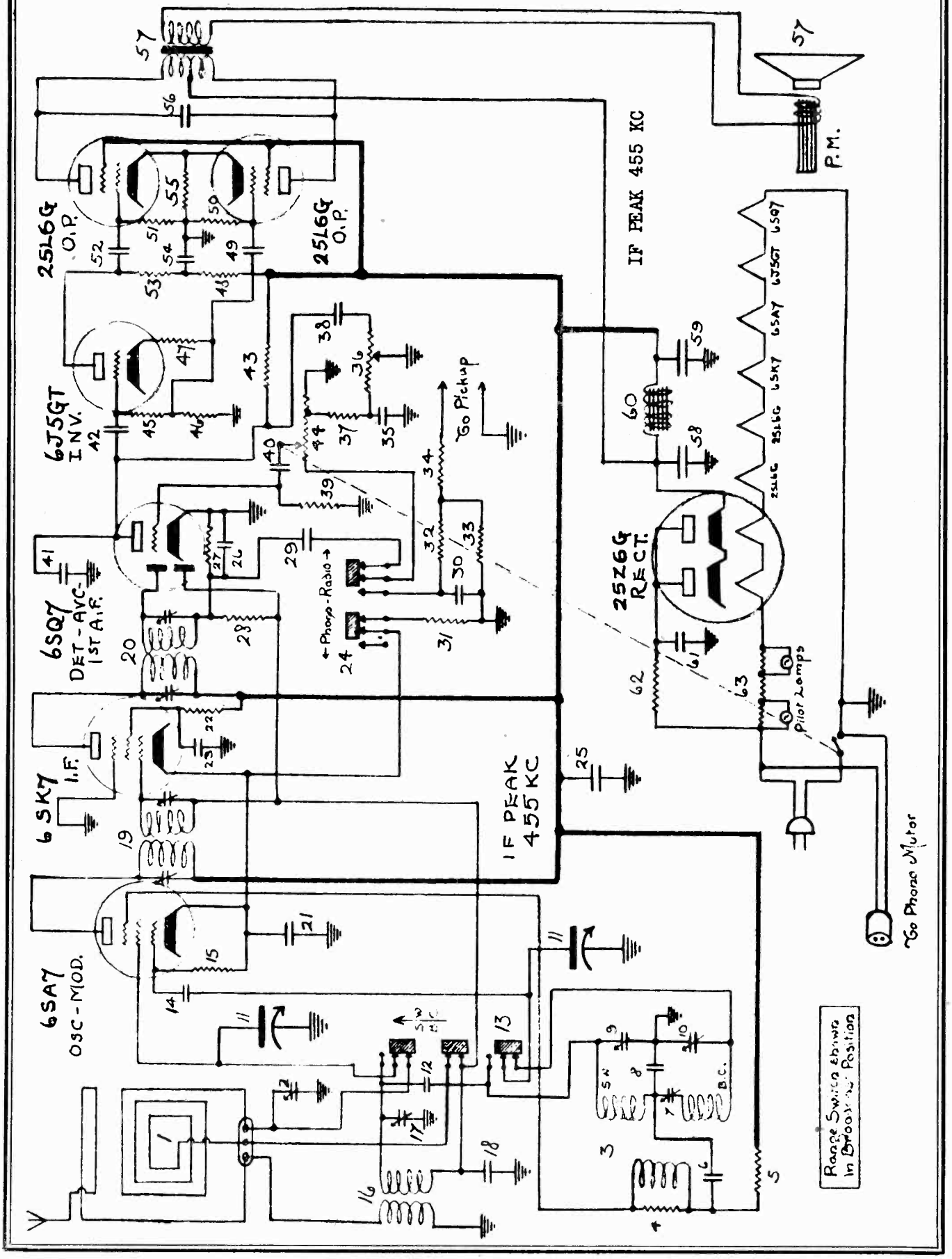
PART NUMBER	DESCRIPTION	LIST PRICE
114955	Clamp - for dial cord	.01
112745	Clip - coil mounting	.01
116948	Cord - dial drive (supplied in 6 ft. lengths)	.18
119494	Dial scale	.28
119208	Escutcheon - dial	.80
119167	Knob	.10
116883	Pointer	.16
81145	Retaining ring - for drive shaft Per C	.50
119218	Screw - escutcheon mounting	.02
112874	Screw - #10 X 1 1/8 chassis mtg	.01
119204	Shaft - tuning	.10
114968	Spring - dial cord tension	.03
113122	Socket - dial lamp (ungrounded)	.12
111008	Socket - dial lamp (grounded)	.12
85427	Socket - octal base (standard)	.15
110501	Socket - 4 prong (for speaker)	.15
110829	Washer - flat steel, for mtg. chassis	.01
116530	Washer (paper) for back of knobs	.005
111456	Washer - spring washer on tuning shaft Per C	.50

Prices subject to change without notice.

PRINTED IN UNITED STATES OF AMERICA

MODEL 17-7B

STEWART-WARNER CORP.



PARTS LIST

Item	Part No.	Description
1	160381	Loop antenna assembly
2	119345	Loop antenna trimmer
3	160128	Osc. coil assembly
4	110573	Carbon resistor 2200 ohms ± 20% 1/4 watt
5	112964	Carbon resistor 1500 ohms ± 20% 1/4 watt
6	119193	Paper condenser .01 mf 600 V.
7	119934	Variable padding condenser
8	68587	Mica condenser .0042 mf ± 3%
9	160344	S.W. osc. trimmer condenser - 3-strip
10	160344	B.C. osc. trimmer condenser - 3-strip
11	160247	Variable tuning condenser, 2-gang
12	110850	Wire capacitor, 7 mmf
13	160334	Range Switch
14	85061	Mica condenser .000051 mf
15	110564	Carbon resistor 100,000 ohms ± 20% 1/4 watt
16	160227	S.W. antenna coil assembly
17	160344	S. W. antenna trimmer condenser, 3-strip
18	116819	Paper condenser .05 mf 600 V.
19	119758	1st I. F. coil assembly
20	119759	2nd I. F. coil assembly
21	116706	Paper condenser .2 mf 600 V.
22	110563	Carbon resistor 10,000 ohms ± 10% 1/4 watt
23	116819	Paper condenser .05 mf 600 V.
24	160237	Phono-Radio switch
25	116625	Paper condenser .1 mf 600 V.
26	83539	Mica condenser .00026 mf
27	110584	Carbon resistor 330,000 ohms ± 20% 1/4 watt
28	110570	Carbon resistor 2.2 megohms ± 20% 1/4 watt
29	119414	Paper condenser .02 mf 600 V.
30	83539	Mica condenser .00026 mf
31	110590	Carbon resistor 180 ohms ± 10% 1/4 watt
32	110553	Carbon resistor 220,000 ohms ± 20% 1/4 watt
33	110564	Carbon resistor 100,000 ohms ± 20% 1/4 watt
34	110564	Carbon resistor 100,000 ohms ± 20% 1/4 watt
35	119817	Paper condenser .004 mf 600 V.
36	160361	Tone control, 1 megohm
37	110552	Carbon resistor 47,000 ohms ± 20% 1/4 watt
38	119417	Paper condenser .006 mf 600 V.
39	112975	Carbon resistor 10 megohms ± 20% 1/4 watt
40	119817	Paper condenser .004 mf 600 V.
41	83539	Mica condenser .00026 mf
42	119414	Paper condenser .02 mf 600 V.
43	110553	Carbon resistor 220,000 ohms ± 20% 1/4 watt
44	160238	Volume control, 1 megohm
45	110559	Carbon resistor 470,000 ohms ± 20% 1/4 watt
46	110565	Carbon resistor 22,000 ohms ± 20% 1/4 watt
47	110573	Carbon resistor 2200 ohms ± 20% 1/4 watt
48	110565	Carbon resistor 22,000 ohms ± 20% 1/4 watt
49	119414	Paper condenser .02 mf 600 V.
50	110559	Carbon resistor 470,000 ohms ± 20% 1/4 watt

PARTS LIST(Continued)

Item	Part No.	Description
51	110559	Carbon resistor 470,000 ohms ± 20% 1/4 watt
52	119414	Paper condenser .02 mf 600 V.
53	110565	Carbon resistor 22,000 ohms ± 20% 1/4 watt
54	116706	Paper condenser .2 mf 600 V.
55	118810	Wire-Wound resistor 110 ohms ± 10% 1 watt
56	119417	Paper condenser .006 mf 600 V.
57	115124	Speaker assembly
58	116470	Electrolytic condenser dual 20 mf 150 V.
59	113472	Electrolytic condenser 40 mf 150 V.
60	161266	Filter Choke
61	116819	Paper condenser .05 mf 600 V.
62	116752	Wire-wound resistor 33 ohms ± 10% 1 watt
63	161238	3 section wire-wound resistor 30-50-30 ohms

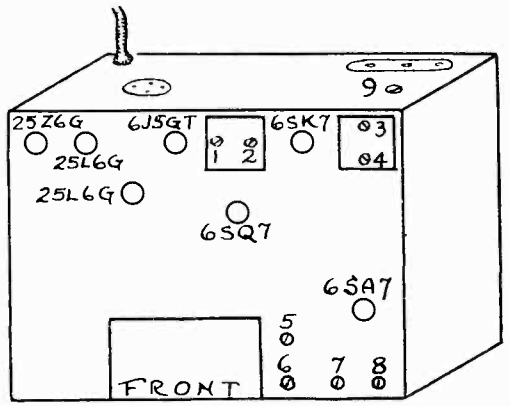
ALIGNMENT FREQUENCIES

1,2 - 2nd I-F trimmers - 455 kc
3,4 - 1st I-F trimmers - 455 kc
5 - Padder - 600 kc
6 - S-W Osc.trimmer - 1.6 mc
7 - BC Osc.trimmer -1500 kc
8 - S-W R-F trimmer - 1.6 mc
9 - BC R-F(loop) " -1500 kc

VOLTAGES

Tube	E_p	E_{sg}	E_c	E_g
6SA7	110	95	2.5	--
6SK7	110	85	2.5	--
6SQ7	60			
6J5GT	65		1.7*	
25L6GT	110	110	8.0	

*- Across 2200-ohm resistor



I-F ALIGNMENT: Connect 455-kc signal to 6SA7 grid. Adjust trimmers 1,2,3,and 4 for maximum output.

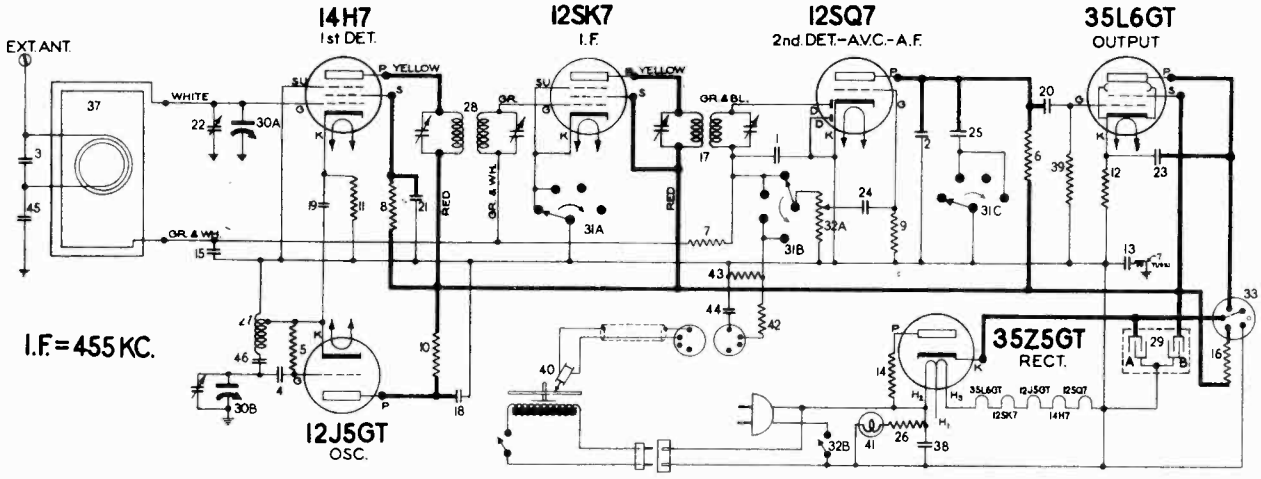
R-F ALIGNMENT: BC- with loop antenna connected (or dummy coil simulating it), adjust trimmers 7 and 9 at 1500 kc and 5 at 600 kc. Check at 1000 kc.

S-W- Adjust trimmer 6 and 8 at 1.6 mc. Check at 6000 kc.

After complete cabinet installation, trimmer 9 should be re-adjusted for maximum output,using 1500 kc radiated signal.

MODEL 206HA

STEWART-WARNER CORP.



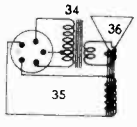


DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1-2---	83539	Condenser, Mica. 260 mmfd.
3-4---	83783	Condenser, Mica. 110 mmfd.
5-----	110552	Resistor, carbon, 47,000 ohms ½ watt
6-----	110553	Resistor, carbon, 220,000 ohms ½ watt
7-----	110570	Resistor, carbon, 2.2 meg. ½ watt
8-----	110578	Resistor, carbon, 68,000 ohms ½ watt
9-----	112975	Resistor, carbon, 10 meg. ½ watt
10----	116068	Resistor, carbon 680 ohms ½ watt
11----	116079	Resistor, insulated, 1200 ohms ½ watt
12----	116092	Resistor, 140 ohms 1 watt, W.W.
13----	116706	Condenser, .2 mfd. 600 V
14----	116752	Resistor, 33 ohm, 1 watt, W.W.
15----	116819	Condenser, .05 mfd. 600 volts
16----	118835	Resistor, insulated, 1500 ohms 1 watt
17----	119024	Transformer, 2nd I.F.
18 to 21	119193	Condenser, .01 mfd. 600 volts
22----	119345	Condenser, trimmer (loop)
23----	119414	Condenser, .02 mfd. 600 volt
24----	119817	Condenser, .004 mfd. 600 volt
25----	119875	Condenser, .002 mfd. 600 volt
26----	160078	Resistor, carbon 220 ohms 1 watt
27----	500408	Coil, oscillator
28----	500801	Transformer, 1st I.F.
29----	501213	Condenser, electrolytic - A - 40 Mfd. 150V B - 20 Mfd. 150V
30A-30B	501403	Condenser, tuning
31A-31B-31C---	501404	Switch - tone & phono
32A-32B	501405	Volume control, 1 meg. (with switch)
33----	501448	Speaker cable & plug
34----	U-501459	Transformer, output for U-501460 spkr.

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
35----	U-501460	Speaker, dynamic (6")
36----	U-501461	Cone & voice coil for U-501460 spkr.
37----	501981	Loop antenna & cabinet back
38----	116819	Condenser, .05 mfd. 600 volts
39----	110559	Resistor, carbon, 470,000 ohms ½ watt
40----	500725	Crystal cartridge
41----	500897	Lamp - dial (Mazda C7)
42----	112970	Resistor, carbon, 330,000 ohms ½ watt
43----	110559	Resistor, carbon, 470,000 ohms ½ watt
44----	116625	Condenser, .1 mfd. 600 volts
45----	119193	Condenser; .01 mfd. 600 volts
46----	116819	Condenser, .05 mfd. 600 volts

MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION
114955	Clamp, for dial cord
112745	Clip, coil mounting
117057	Cord, drive
501406	Dial scale
501462	Knob
501463	Knob (with marker)
81145	Retaining ring for tuning shaft
116690	Socket, octal base
160392	Socket, octal (rectifier)
160171	Socket, (4 prong)
160294	Socket, for 14H7 (8-prong)
500896	Socket, pilot lamp for Mazda C7
161327	Tuning shaft
111456	Washer, spring washer for tuning shaft Per C
501395	Window, dial

ALIGNMENT PROCEDURE

Connect the output meter across the voice coil or from the plate of the 35L6GT output tube to B - through a .25 mfd. condenser.

Connect the ground lead from signal generator to B - through a .25 mfd. condenser for all alignment steps.

Turn the center control on the receiver to a radio position and set the volume control to the maximum position.

Set dial pointer to last marking on dial with gang in full mesh.

Connect hot lead from signal generator to stator on rear section of gang using 200 mmfd. in series as dummy.

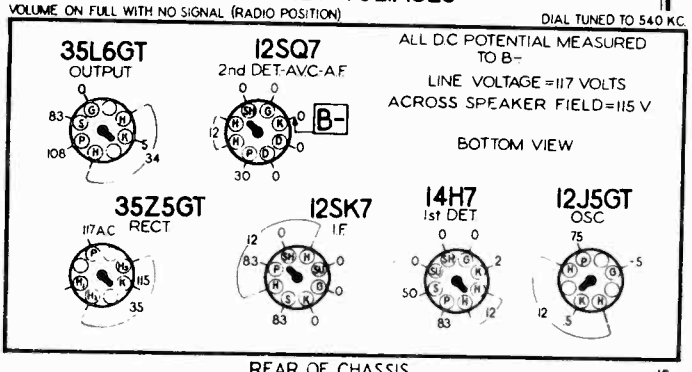
Set generator to 455 KC. and adjust trimmer screws on top of I.F. transformer cans for maximum output.

Connect hot lead to antenna terminal on loop through a 200 mmfd. condenser as a dummy. Set dial to 1400 KC. and adjust trimmer on front section of gang for maximum output on a 1400 KC. generator signal.

Place chassis in cabinet and using connections in "7," place loop in position and adjust loop trimmer at rear of chassis for maximum output while tuning dial to maximum signal.

SOCKET VOLTAGES

VOLUME ON FULL WITH NO SIGNAL (RADIO POSITION) — DIAL TUNED TO 540 KC.



REAR OF CHASSIS

ALL VOLTAGES MEASURED IN RADIO POSITION. USE A HIGH RESISTANCE VOLTMETER OF AT LEAST 1000 OHMS PER VOLT.

ADJUSTING TONE ARM INDEXING ON 10" & 12" RECORDS

When adjusting tone arm indexing, it is only necessary to make the adjustment for one size of record. Proceed as follows:

1. With the switch knob in the "off" position, move the TONE ARM to the "rest" position so that its outer edge is approximately lined up with the extreme outside edge of the record changer panel.
2. Loosen the two set screws on the under side of the record changer panel (see Fig. V, point "t").
3. Line up the outer edge of the TONE ARM with the outer edge of the record changer panel by eye.
4. Place a 12 inch record on the turntable, put the machine into automatic operation by pulling the SWITCH KNOB to the "Reject" position and releasing it. Note the point at which the needle FIRST strikes the margin of the 12 inch record. (The word "first" is used to indicate the fact that after the needle has touched the record, the booster spring will attempt to move the needle in toward the center. Proper setting of the tone arm indexing position is concerned only with the point at which the needle first makes contact with the record).
5. If the needle did not strike the record approximately an eighth of an inch in from the outside edge, move the TONE ARM in the desired direction a slight amount by slipping the TONE ARM LEVER (see Fig. IV, Item 24) which has been previously loosened at two set screws (see Fig. V. point "t").
6. After obtaining a correct indexing of the TONE ARM on the 12 inch diameter records, check the indexing on a 10 inch diameter record and tighten the two set screws firmly.

NOTE: Incorrect action of the booster spring or TONE ARM RETARD LEVER may produce the effect of improper TONE ARM indexing. (See Section VIII).

"AUTOMATIC" TRIP ADJUSTMENTS

This changer incorporates a dual trip to insure positive cut-off on various types of records.

A. MINIMUM CIRCLE DIAMETER TRIP

After the TONE ARM has played in far enough so that the distance of the needle from the center spindle is approximately 1-7/8 inches, the record changer will trip regardless of whether or not there is a cut-off or eccentric groove on the record. This type of trip is known as "a minimum circle diameter trip."

The diameter of this minimum circle is set at the factory to be approximately 3-3/4 inches.

Variations in adjustment or readjustment of this operation can be obtained by moving the TRIP SHOE (see Fig. IV, Item 23) slightly. The TRIP SHOE is locked in position by means of a screw when the adjustment has been satisfactorily completed. This screw can be adjusted thru a hole cut in the main drive gear, when the machine is not in a change cycle.

B. ECCENTRIC GROOVE TRIP

A second tripping device has been included which operates due to any outward movement of the TONE ARM after it has played to within approximately 2-1/2 inches of the center spindle. This trip is actuated by a small dog, (Fig. IV, point k) engaging the fine toothed ratchet, and is adjusted at the factory.

TONE ARM ADJUSTMENTS (OTHER THAN INDEXING)

A. NEEDLE PRESSURE

The needle pressure is controlled by means of the counter-balance spring (see Fig.II, Item 10) at the rear of the arm. The spring tension has been set to provide the needle pressure necessary for correct operation of the pickup. Do not change the tension of this spring unless record or needle wear is excessive.

B. TONE ARM HEIGHT ADJUSTMENTS

The TONE ARM HEIGHT ADJUSTMENT SCREW (Fig. II, Item 8) controls only the height of the TONE ARM when it is in the playing position with no record on the turntable. The correct setting of this adjustment screw is that which, under the above condition, allows the TONE ARM to descend until the needle point is very slightly below the level of the turntable surface.

The TONE ARM HEIGHT ADJUSTMENT SCREW should not be used to adjust the height to which the TONE ARM rises during a change cycle; this height is controlled solely by the length of the TONE ARM LIFT PIN (Fig. II, Item 9).

"BOOSTER" SPRING ADJUSTMENTS

A BOOSTER SPRING SETTING

The function of the booster spring (Fig. V, Item 11) is to move the needle from the margin of the record into the first groove automatically. This booster spring is built into the TONE ARM LOCATOR LEVER (see Fig. IV, Item 25) and consists of a single piece of light spring wire (see Fig. V, Item 11). The side pressure exerted by this spring should be just sufficient so that the needle will move across the margin of a record which contains no lead-in groove. After any adjustment of this booster spring, check its operation on both 10 inch and 12 inch records to make sure that it functions properly.

Do not increase the operating pressure of the booster spring to such a point that it tends to make the needle slide across the first few record grooves. Access to the booster spring can be obtained when the TONE ARM is in the "Rest" position, with the SWITCH KNOB turned "off", by moving the TONE ARM LOCATOR LEVER assembly out toward the edge of the changer sub-panel with the finger.

B. TONE ARM RETARD LEVER ADJUSTMENTS

The function of the TONE ARM RETARD LEVER (Fig. V, Item 4) is to provide a smooth motion of the tone arm as it moves from the outer edge of the panel in towards the edge of the record to be played, during an automatic change cycle.

An additional function of the TONE ARM RETARD LEVER is to prevent action of the BOOSTER SPRING (Fig. V, Item 11) until the needle has lowered onto the outer edge of the record to be played. Insufficient tension of the TONE ARM RETARD LEVER SPRING (Fig. V, Item 3) will permit action of the BOOSTER SPRING before the needle comes to rest on the record, giving the effect of incorrect tone arm indexing. Excessive pressure of the TONE ARM RETARD LEVER SPRING will cause rough, jerky action of the TONE ARM as it moves from the outer edge of the changer panel.

ACTION OF THE SWITCH KNOB

A. "OFF" POSITION

With the SWITCH KNOB in the "Off" position, the TONE ARM will lock at the extreme outside edge of the changer panel. This locked position of the TONE ARM results from the engagement of the TONE ARM LATCH LEVER (Fig. IV, Item 1) with the projection on the TONE ARM LEVER (Fig. IV, Item 24, point d).

B. "MANUAL" POSITION

When the SWITCH KNOB is thrown to the "Manual" position, the electrical switch circuit is closed and the TONE ARM is freed from its locked position due to the action of the projection on the MAIN CONTROL SLIDE (Fig. IV, Item 21) which partially disengages the TONE ARM LATCH LEVER by striking it on its projection at point "e" (Fig. V). At the same time the TONE ARM LOCATOR LEVER (Fig. IV, Item 25) is held at point "r" (Fig. V) by the upper slide. In this position, it is essential that the engagement between the upper slide and TONE ARM LOCATOR LEVER be positive as shown in Fig. V. The purpose of the spring (Fig. V, left, Item 9) attached to the upper slide is to provide a means whereby the engagement at point "r" (Fig. V) may be made should the SWITCH KNOB be moved to the "Manual" position when the TONE ARM LEVER (Fig. IV, Item 24) is not in the outward position. (Such an action would occur when the SWITCH KNOB is moved from the "Automatic" position to the "Manual" position while a record is being played). The TONE ARM LOCATOR LEVER (Fig. IV, Item 25) would then be against either the 10 inch or 12 inch indexing stop, and as the TONE ARM is swung into the outside rest position, the TONE ARM LOCATOR LEVER (Fig. IV, Item 25) must be able to catch at point "r" (Fig.V).

When the TONE ARM is in the "Rest" position and the SWITCH KNOB is thrown to "Manual", it is essential that the sequence be carefully observed between the action of the LATCH LEVER (Fig. IV, Item 1) and the upper slide (Fig. V, point "r"). The upper slide should be in a position to provide a positive stop for the TONE ARM LOCATOR LEVER (Fig. IV, Item 25) BEFORE the LATCH LEVER (Fig. IV, Item 1) releases the tone arm lever (Fig. IV, Item 24); otherwise the TONE ARM will be scraped across the turntable. Also, it is essential that the engagement at "r" be such that there is a hooking action at this point in order to prevent the TONE ARM LOCATOR LEVER (Fig. IV, Item 25) and the TONE ARM from sweeping toward the center when the switch is moved out of the "Manual" position.

The SWITCH KNOB performs the additional function of preventing the trip mechanism from operating when the SWITCH KNOB is in the "Manual" position. The motion of the MAIN CONTROL SLIDE (Fig. IV, Item 21) is transmitted through the CONNECTING LINK (Fig. V, Item 12) to the MANUAL AND REJECT LEVER (Fig. IV, Item 17). The projection on this lever at point "w" (Fig. V) engages the upper end of the CLUTCH ENGAGEMENT LEVER (Fig. III, Item 6) at point "h" (Fig. IV) and so prevents the CLUTCH ENGAGEMENT LEVER from engaging the lower projections of the continuously rotating pinion gear thus preventing the start of a change cycle.

C. "AUTOMATIC" POSITION

With the SWITCH KNOB in the "Automatic" position, the TONE ARM LATCH LEVER (Fig. IV, Item 1) will lock the TONE ARM LEVER at point "d" (Fig. IV) at any time when the TONE ARM is moved to the outside position. This tone arm latch is released during a change cycle through its engagement at point "s" (Fig. V) with the main drive gear. As noted above under Section B, the TONE ARM LOCATOR (Fig. IV, Item 25) and the upper slide (Fig. IV, point "p") hook together at point "r" (Fig. V) during "Manual" operation. When the SWITCH KNOB is thrown into "Automatic" or "Reject" position, these two parts completely disengage during the next change cycle due to the cam action of the main drive gear which forces the tone arm lever to the outer edge of the sub-panel and allows the upper slide (Fig. IV, point "p") to clear the TONE ARM LOCATOR LEVER at point "r".

The TONE ARM LOCATOR LEVER provides the 10 inch and 12 inch indexing for the TONE ARM during automatic operation by its engagement with the 12 INCH RESET LEVER (Fig. IV, point "g", Item 18). The 12 INCH RESET LEVER must hook securely behind the projecting tip on the TONE ARM LOCATOR LEVER (as shown at point "r" on Fig. IV)

STEWART-WARNER CORP.

when the 12 inch record is being played. This is to prevent the TONE ARM LOCATOR LEVER and the TONE ARM from sweeping toward the center should the 12 inch setting of the selector arms be changed to 10 inch while the TONE ARM is playing a 12 inch record. (See Section X also).

D. "REJECT" POSITION

When the SWITCH KNOB is pushed into the "Reject" position, the motion of the SWITCH KNOB is transmitted to the MANUAL AND REJECT LEVER (Fig. IV, Item 17)(as described under Section B). The projection at "u" (Fig. V) engages the projecting stud on the TRIP LEVER near point "k" (Fig. IV). The TRIP LEVER releases the CLUTCH ENGAGEMENT LEVER (Fig. III, Item 6) at point "h" (Fig. IV). The SWITCH KNOB should not remain in the "Reject" position. The SWITCH KNOB is returned to the "Automatic" position due to the tension in the SWITCH SPRING (Fig. V, Item 10) acting on the SWITCH LEVER (Fig. V, Item n).

E. "A.C." SWITCH OPERATION

In Figure IV the SWITCH KNOB is in the "off" position. The electrical motor switch is open. If the switch knob and the MAIN CONTROL SLIDE (Fig. IV, Item 21) are moved downwards, referring to Fig. IV, into the "Automatic" position, the right end of the SWITCH LEVER (Fig. IV, Item n) will rest against the panel stud located just to the lower right of the A.C. SWITCH (Fig. IV, Item 22). The SWITCH LEVER (Fig. IV, Item n) will then move the A.C. SWITCH to the "on" position.

Through its engagement with the projection on the MAIN CONTROL SLIDE (Fig. IV, Item 21), the DETENT LEVER (Fig. IV, Item m) prevents the SWITCH SPRING (Fig. V, Item 10) tension from pulling the MAIN CONTROL SLIDE into the "off" position.

Further movement of the MAIN CONTROL SLIDE, into the "Reject" position, results in increased SWITCH SPRING (Fig. V, Item 10) tension which will return the slide to the "Automatic" position after the finger is removed from the SWITCH KNOB.

The Switch Knob is in the "Manual" position, with the A.C. SWITCH "on", in Figure V. The SWITCH LEVER (Fig. V, Item n) is against the panel stud to the left of the A.C. SWITCH, near the edge of the panel. This position of the SWITCH LEVER corresponds to the "on" position of the SWITCH LEVER when in "Automatic" operation except the force is applied on the opposite side of the SWITCH LEVER, bearing in the opposite direction.

"SELECTOR ARM" ADJUSTMENTS

SETTING OF SELECTOR ARMS

The position of the SELECTOR ARMS (Fig. 1, Item 4) determines the TONE ARM indexing for ten inch or twelve inch records, through the position of the 12 INCH SET CAM (Fig. IV, Item 20). The position of this cam determines the position of the 12 INCH SET LEVER (Fig. IV, Item 19) which communicates the motion of the SET CAM to the 12 INCH SET SLIDE (Fig. IV, Item 18). The 12 INCH SET SLIDE (Fig. IV, Item 18) serves as a stop for the TONE ARM LOCATOR (Fig. IV, Item 25) at point "v" for 12 inch records, or point "r" for 10 inch records.

The 12 INCH RESET LEVER SPRING (Fig. V, Item 9) must be stronger than the 12 INCH RESET SLIDE SPRING (Fig. V, Item 9). Point "v" on the TONE ARM LOCATOR LEVER should then hook securely with point "g" on the 12 INCH RESET SLIDE if the setting of the SELECTOR ARMS is changed to the ten inch setting while the changer is playing a twelve inch record automatically.

ACTION OF SELECTOR ARMS

The SELECTOR ARMS (Fig. 1, Item 4) are rotated by the DRIVE LINK (Fig. IV, Item 4). The DRIVE LINK is moved by the CIRCULAR CAM (Fig. V, Item X) on the MAIN DRIVE GEAR ASSEMBLY (Fig. V, Item 2). The motion of the DRIVE LINK (Fig. IV, Item 4) is communicated to the SELECTOR SHAFT through the DRIVE CRANKS (Fig. IV, Item 6) and the DRIVE CRANK PAWL-RATCHET WASHER combination (Fig. IV, Item 9, 10). Failure of the DRIVE CRANK PAWL (Fig. IV, Item 9) to engage the RATCHET WASHER (Fig. IV, Item 10) will prevent the SELECTOR ARMS from synchronizing correctly and failure to select records may result. This condition may also be due to improper setting of the SELECTOR ARMS during loading, (see separate operating instructions). A damaged or broken DRIVE PAWL SPRING (Fig. IV, Item 7) or a bind in the DRIVE CRANK PAWL (Fig. IV, Item 9) will result in improper record selection.

MISCELLANEOUS MECHANICAL NOTES

"RUMBLE"

1. Remove the turntable and inspect the rubber rimmed MOTOR IDLER PULLEY (Fig. II, Item 14) for flat or worn spots which would tend to jar the turntable.

2. With the TURNTABLE removed, rotate the TURNTABLE SPINDLE to be sure that it turns smoothly.

"WOW" OR SPEED VARIATION

1. Remove the TURNTABLE and rotate the TURNTABLE SPINDLE (Fig. II, Item 1) with the fingers to determine whether it tends to bind. High friction at this point may be sufficient to cause the motor to slow down instantaneously. Apply ONLY a drop or two of light oil to the two spindle bearings. If the turntable shaft is bent to such an extent that replacement is necessary, it is recommended that the entire SPINDLE & PINION GEAR ASSEMBLY (Fig.IV, Item 13, also Fig. V) be replaced instead of replacing only the SPINDLE ASSEMBLY. This SPINDLE & PINION GEAR ASSEMBLY (see Fig. V) is fitted with precision machines at the factory, thus insuring proper clearances and smooth operation.

REPEATED TRIPPING

Turn off the changer during a change cycle so that the CLUTCH ENGAGEMENT LEVER (Fig. III, Item 6) may be observed. This CLUTCH ENGAGEMENT LEVER should lock into the up position due to its engagement with the TRIP LEVER (Fig. IV, Item 14) at the point "h" (Fig. V). If this engagement is not positive, inspect the bearing point of the TRIP LEVER (Fig. IV, Item 15) for evidences of dirt or binding. A more positive engagement may be obtained by strengthening the spring (Fig. IV, Item 11). CAUTION: This spring tension must be JUST SUFFICIENT to lock the CLUTCH ENGAGEMENT LEVER in the up position. Excessive tension of the spring will result in failure to trip.

Repeated tripping may also be due to the fact that the SWITCH KNOB does not return to the "Automatic" position when released. This condition can result from insufficient tension in spring (Fig. V, Item 10), or excessive friction or binding in the motion of the MAIN CONTROL SLIDE (Fig. IV, Item 21).

FAILURE TO TRIP

Turn off the changer during a change cycle so that the CLUTCH ENGAGEMENT LEVER (Fig. III, Item 6) may be actuated with the finger while the trip lever is being held away, so that the CLUTCH ENGAGEMENT LEVER does not lock in the "up" position. The CLUTCH ENGAGEMENT LEVER must fall by gravity. CAUTION: It is not advisable to use any lubricant at the bearing point of the CLUTCH ENGAGEMENT LEVER (Fig. III, points c); this bearing is intended to be a loose fit, and must be checked for binds.

Excessive pressure on spring (Fig. IV, Item 11) would tend to make the needle jump out of the cut-off groove of the record (see paragraph D-1 above) and prevent tripping.

The Shielded Pickup Lead Wire (Fig. II, Item 2) must have sufficient slack between the TONE ARM and the point where the tone arm lead enters the sub-panel to permit free sidewise movement of the tone arm. The Shielded Lead should be so positioned that it loosely rests near the tone arm post immediately below the point at which it leaves the tone arm bracket. Under no circumstances should the Shielded Wire be fastened in place, pulled taut, or restrict free tone arm movement. This is particularly important in machines which use extremely light pressure pickup cartridges.

INSUFFICIENT POWER TO COMPLETE A CHANGE CYCLE

Inspect the bearing of the MAIN DRIVE GEAR (Fig. V, Item 2) for excessive friction or binding.

JAMMING OF THE MECHANISM

Should the changer jam at any time during a change cycle for some reason other than jamming of the SELECTOR ARMS with the records being changed, remove the records and attempt to free the machine by rotating the turntable in a reverse direction through a quarter turn. If the jam is apparently cleared by such action, the machine should be checked by operating it automatically several times, but with no records.

If the jam does not clear by rotating the turntable in a reverse direction, inspect the underside of the changer panel for damaged or missing parts.

Inspect the meshing of the DRIVE GEAR (Fig. V, Item 2) with the PINION GEAR (on SPINDLE shaft). If the two gears do not mesh (that is, if they are not so timed as to fit together properly) it is probably due to the fact that the CLUTCH ENGAGEMENT LEVER (Fig. III, Item 6) has been damaged or bent. This CLUTCH ENGAGEMENT LEVER is intended to so contact one of the lower projections on the PINION GEAR (on the SPINDLE) that the teeth of this PINION GEAR and the teeth of the MAIN DRIVE GEAR (Fig. V, Item 2) will be timed to fit together properly whenever the mechanism starts a change cycle. If the CLUTCH ENGAGEMENT LEVER (Fig. III, Item 6) is bent, it may be straightened until, by trial, the two gears mesh properly when the changer is tripped. It is advisable that the changer mechanism be operated by hand so that this timing or meshing between the two gears can be more closely observed during any adjustments or inspection.

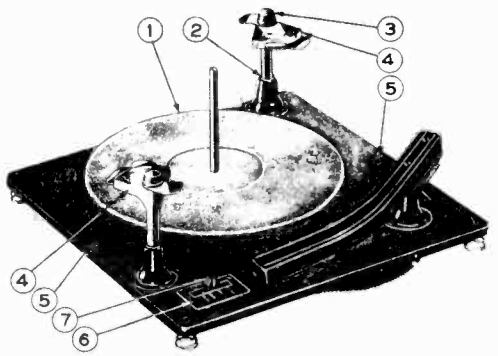


FIGURE I

ITEM	PART NO.	DESCRIPTION
1	C-29048	- Turntable
2	J-72025	- Thrust Washer
3	C-29135	- Selector Knob
4	C-29156-A	- Record Support Arm, Blade and Shaft Assembly
6	B-27074	- Control Escutcheon
7	C-29136	- Switch Control Knob

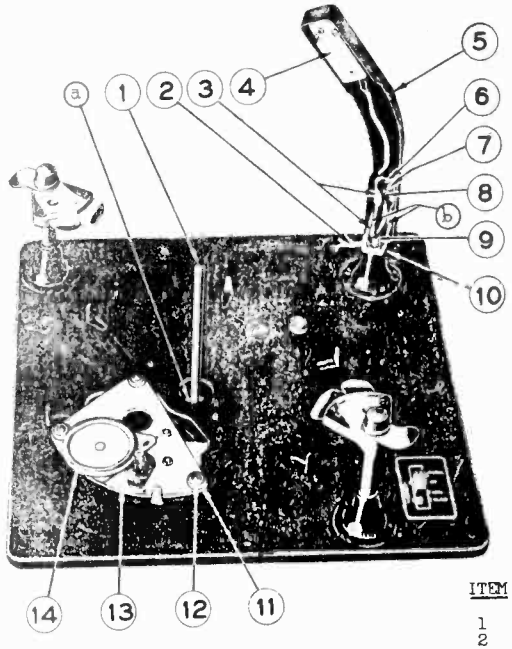
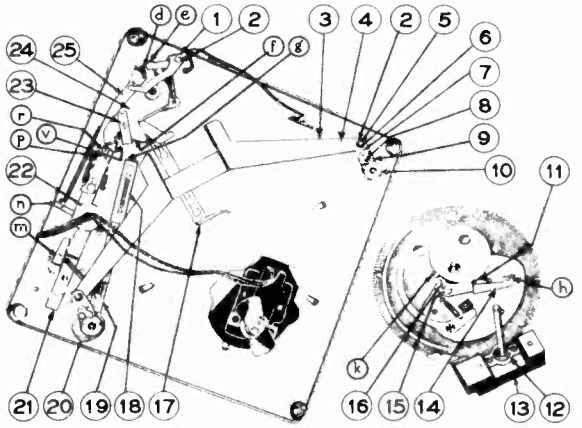


FIGURE II

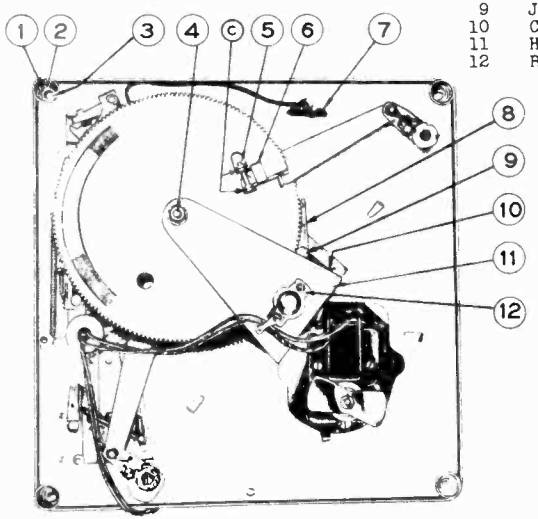
ITEM	PART NO.	DESCRIPTION
1	C-29161-A	- Spindle, Pin and Ball Assembly
3	C-29150-A	- Tone Arm Shaft and Bracket Assembly
4	500725	- Tone Arm Cartridge
5	C-29153-A	- Tone Arm
6	J-78008	- Grommet
7	C-29128	- Tone Arm Adjusting Lock Spring
8	J-71051	- Tone Arm Height Adjusting Screw
9	C-29016	- Tone Arm Lift Pin
10	C-29127	- Tone Arm Counter Balance Spring
11	J-22144	- Motor Mounting Grommet
12	J-22266	- Motor Mounting Bushing
13	C-29028	- Motor Assembly (60 Cycle)
14	(161104	- Motor Pulley - 2" Dia.
	(117806	- Motor Pulley - 2¼" Dia.



ITEM	PART NO.	FIGURE IV DESCRIPTION
1	C-29018	- Tone Arm Latch Lever
2	J-22021	- "C" Washer
3	C-29155	- Drive Link and Crank Assembly
4	C-29079	- Drive Link
5	C-29083	- Drive Crank Shoulder Rivet
6	C-29105	- Drive Crank
7	C-29129	- Drive Pawl Spring
8	C-29118	- Drive Pawl Shoulder Rivet
9	C-29112	- Drive Crank Pawl
10	C-29036	- Ratchet Washer
11	B-27092	- Trip Lever Spring
12	C-29089	- Spindle Bearing Retainer
13	C-29158-A	- Spindle and Gear Bracket Assembly (Complete)
14	C-29162-A	- Trip Lever Assembly
15	C-29100	- Trip Lever Shoulder Screw
16	B-27063	- Trip Dog Spring
17	C-29063	- Manual and Reject Lever
18	C-29059	- 12" Set Slide
19	C-29060	- 12" Set Lever
20	C-29113	- 12" Set Cam
21	C-29160-A	- Main Control Slide Assembly
22	B-27026	- Switch
23	C-29011	- Trip Shoe
24	C-29151-A	- Tone Arm Lever Assembly
25	C-29019	- Tone Arm Locator
	C-29117	- 12" Set Cam Pin (Not shown used with Item 20)

ITEM	PART NO.	DESCRIPTION
1	C-29130	- Tone Arm Locator and Latch Spring
2	C-29122-A	- Drive Gear and Cam Assembly
3	B-27067	- Retard Lever Spring
4	B-27065	- Tone Arm Retard Lever
5	B-27088	- Retard Lever Shoulder Screw
6	C-29133	- Lower Slide Spring
7	C-29061	- 12" Reset Lever Spring
8	J-22094	- Detent Arm Spring
9	J-22058	- Upper Slide and Reset Slide Spring
10	C-29131	- Switch Spring
11	H-20129	- Booster Spring
12	B-27028	- Connecting Link

FIGURE III



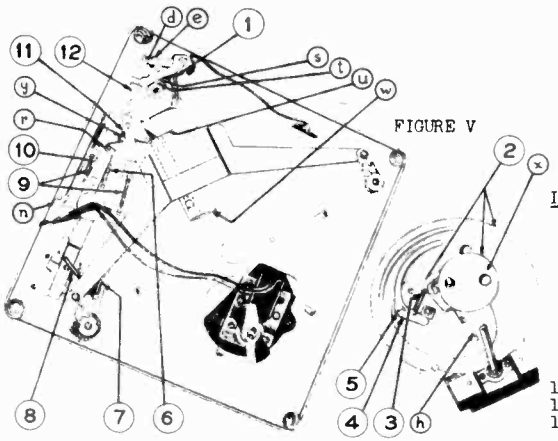
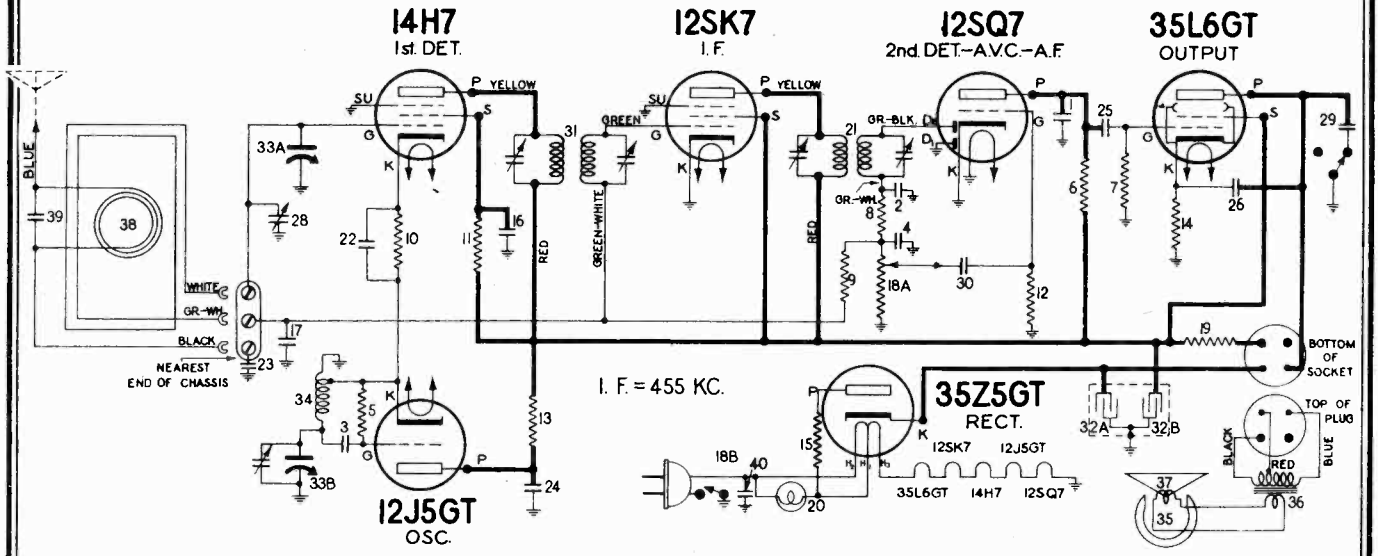


FIGURE V

ITEM	PART NO.	DESCRIPTION
1	H-20198	- Panel Mounting Spring
2	C-29114	- Spring Retainer Cup
3	J-79024	- Rivet
4	C-29074	- Drive Gear Shaft
5	C-29088	- Clutch Engagement Lever Pin
6	C-29087	- Clutch Engagement Lever
7		- Terminal Strip
8	C-29077	- Drive Gear Stop Lever
9	C-29067	- Stop Lever Shoulder Rivet
10	C-29086	- Stop Lever Spring
11	C-29125-A	- Spindle Housing and Stop Lever Assy.
12	C-29090	- Thrust End Spindle Bearing Retainer

CHASSIS 206F

STEWART-WARNER CORP.



IF PEAK 455 KC

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser, Mica. 260 Mmfd.	$ .20
3-4	83783	Condenser, Mica. 110 Mmfd.	.20
5	110552	Resistor-Carbon, 47,000 Ohms ½ Watt	.12
6	110553	Resistor-Carbon, 220,000 Ohms ½ Watt	.12
7	110559	Resistor-Carbon, 470,000 Ohms ½ Watt	.12
8	110566	Resistor-Carbon, 33,000 Ohms ½ Watt	.12
9	110570	Resistor-Carbon, 2.2 Meg. ½ Watt	.15
10	110573	Resistor-Carbon, 2,200 Ohms ½ Watt	.12
11	110578	Resistor-Carbon, 68,000 Ohms ½ Watt	.12
12	110580	Resistor-Carbon, 3.3 Meg. ½ Watt	.12
13	116068	Resistor-680 Ohms ½ Watt	.12
14	116092	Resistor-140 Ohms 1 Watt, Wire Wound	.14
15	116752	Resistor-33 Ohms 1 Watt, Wire Wound	.15
16-17	116819	Condenser- .05 Mfd. 600 Volt	.20
18A-18B	116834	Volume Control- 1 Megohm with switch	1.10
19	116835	Resistor-Insulated, 1,500 Ohms 1 Watt	.15
20	116921	Lamp-Dial (Mazda #47)	.15
21	119024	Transformer-2nd I.F.	1.15
22 to 26	119193	Condenser- .01 Mfd. 600 Volt	.15
27	119214	Switch-Tone Control	.48
28	119345	Condenser-Trimmer	.20
29	119414	Condenser- .02 Mfd. 600 Volt	.15
30	119417	Condenser- .006 Mfd. 600 Volt	.15
31	500131	Transformer- 1st I.F.	1.10
32A-32B	500256	Condenser-Electrolytic (A-40 Mfd. 150 V. (B-20 Mfd. 150 V.	1.00
33A-33B	500403	Gang Condenser & Drum (With Osc. Trimmer)	2.50
34	500408	Coil-Oscillator	.42
35	R-500423	Speaker-P.M. (5 inch)	4.50
36	R-500424	Transformer-Output, for R-500423 Spkr.	1.60
37	R-500425	Cone & Voice Coil for R-500423 Spkr.	1.60
38	500465	Cabinet Back & Loop Assem.	1.70
39	88686	Condenser-Mica, 200 Mmfd.	.14
40	116819	Condenser- .05 Mfd. 600 Volt	.20

MISCELLANEOUS PARTS

Part Number	Description	List Price
500462	Cabinet	$7.00
112745	Clip-coil mounting	.01
112764	Clip-dial scale retaining	.01
117057	Cord-drive supplied in 3' lengths	.15
500404	Dial scale	.35
116810	Dial window-acetate	.35
119167	Knob	.10
110496	Plug-Speaker (4 prong)	.12
116883	Pointer	.16
83552	Screw-Chassis Mtg.	.03
116831	Shaft-tuning	.12
110501	Socket-Speaker (4 prong)	.16
116793	Socket - for dial light	.40
160294	Socket - 8 prong for 14W7	.12
114876	Socket-Octal (rectifier)	.15
119791	Socket-Octal	.12
114968	Spring-Dial cord tension	.03

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

ALIGNMENT PROCEDURE

ALIGN THIS RECEIVER IN THE CABINET WITH LOOP CONNECTED

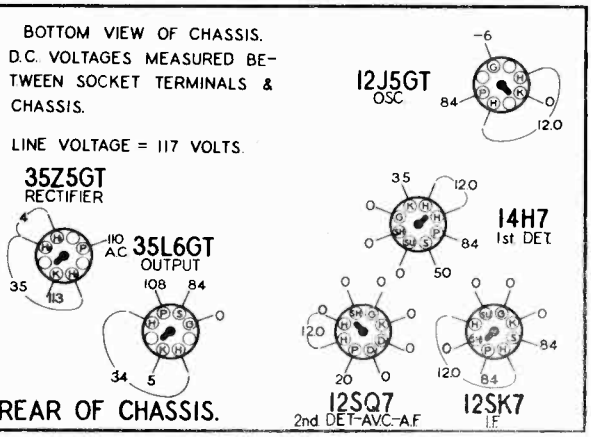
1. Connect output meter across the voice coil; or from 35L6GT plate to chassis.
2. Connect the ground lead of the signal generator to the chassis through a .25 mfd. condenser.
3. Set the volume control to the maximum volume position.
4. Set dial pointer in a horizontal position with gang condenser in full mesh.
5. Connect the antenna lead of the signal generator to the lug on the top of the rear section of the gang condenser, using a 200 mmfd. mica condenser in series.
6. Set the signal generator to 455 KC. Set receiver dial to a point where it does not affect signal. Adjust the trimmer screws on the top of each I.F. transformer for maximum output.
7. Connect the output of the signal generator in series with a 200 mmfd. mica condenser to the blue wire extending from the loop. Turn the receiver dial to 1500 KC.
8. Set the signal generator to 1500 KC. and adjust the trimmer on the front section of the receiver gang condenser for maximum output of the oscillator signal.
9. Place the loop antenna in its final position at the rear of the cabinet and adjust the trimmer screw on the back of the chassis for maximum output at 1500 KC.

SOCKET VOLTAGES

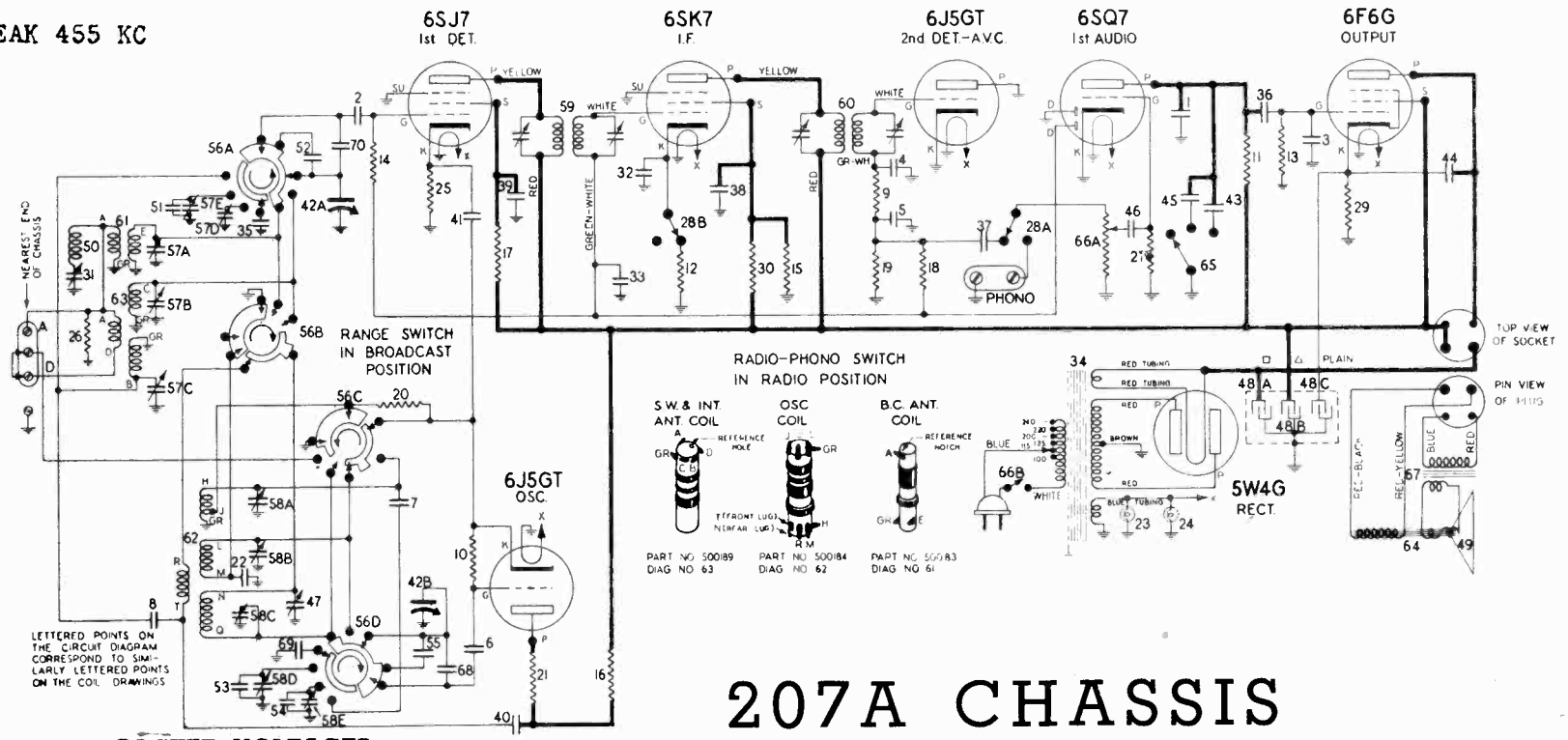
NO SIGNAL CONDITION DIAL TUNED TO 540 KC.

BOTTOM VIEW OF CHASSIS.
D.C. VOLTAGES MEASURED BETWEEN SOCKET TERMINALS & CHASSIS.

LINE VOLTAGE = 117 VOLTS.



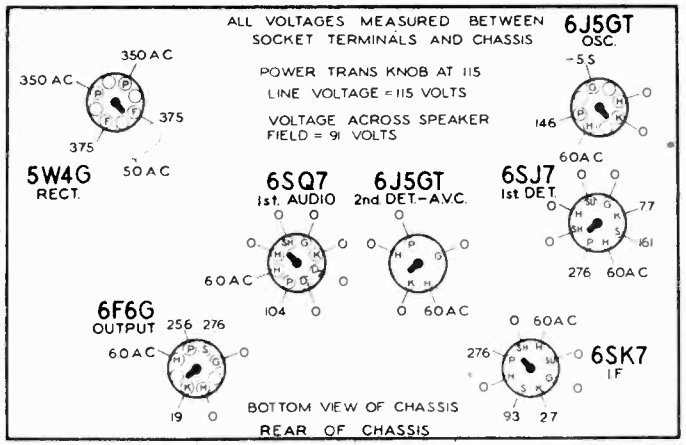
USE A VOLTMETER OF 1000 OHMS PER VOLT.



207A CHASSIS

SOCKET VOLTAGES

ANTENNA GROUNDED **DIAL TUNED TO 540 KC.**



Use a voltmeter of 1000 ohms per volt.

Diagram Number	Part Number	Description
1-2	83539	Condenser mica 260 mmfd.
3 to 5	83783	Condenser—mica 110 mmfd.
6	85061	Condenser—mica 51 mmfd.
7	88587	Condenser—mica .0042 mfd.
8	110510	Condenser—wire 3 mmfd.
9-10	110552	Resistor carbon 47,000 ohms ¼ watt
11	110553	Resistor carbon 220,000 ohms ¼ watt
12	110556	Resistor—carbon 330 ohm ¼ watt
13-14	110559	Resistor carbon 470,000 ohms ¼ watt
15-16	110562	Resistor—carbon 22,000 ohms ½ watt
17	110564	Resistor carbon 100,000 ohms ¼ watt
18	110570	Resistor carbon 2.2 Meg. ¼ watt
19	110584	Resistor carbon 330,000 ohms ¼ watt
20-21	110590	Resistor carbon 180 ohms ¼ watt
22	110985	Condenser mica .00224 mfd.
23-24	112636	Lamp dial Mazda No. 44 (frosted)
25-26	112952	Resistor carbon 3300 ohm ¼ watt
27	112975	Resistor carbon 10 Meg. ¼ watt
28A-28B	114141	Switch D.P.D.T. (Phono)
29	114335	Resistor wire wound 430 ohms 2 watt
30	116054	Resistor carbon 27000 ohm 1 watt
31	116599	Condenser trimmer for wave trap
32-33	116819	Condenser .05 mfd. 600 volt
34	117774	Transformer power 100-240 V. 40-133 cycles
35	118771	Condenser silver mica 300 mmfd.
36 to 41	119193	Condenser .01 mfd. 600 volt
42A-42B	119291	Condenser variable tuning

Diagram Number	Part Number	Description
43	119417	Condenser .006 mfd. 600 volt
44 to 46	119875	Condenser—.002 mfd. 600 volts
47	119934	Condenser—padder
48A-48B-48C	160174	Condenser electrolytic Section A—20 mfd. 400 volt Section B—15 mfd. .400 volt Section C—10 mfd. 25 volt
49	M-160312	Cone & Voice Coil for M-500200 speaker
50	160606	Wave Trap Coil
51	160625	Condenser silver mica 60 mmfd.
52-53	161011	Condenser silver mica 75 mmfd.
54	161126	Condenser silver mica 21 mmfd.
55	500043	Condenser silver mica 125 mmfd.
56A to 56D	500164	Band switch
57A to 57E 58A to 58E	500168	Condenser trimmer (5 section)
59	500169	Transformer 1st I.F.
60	500171	Transformer 2nd I.F.
61	500183	Coil broadcast antenna
62	500184	Coil oscillator
63	500189	Coil short wave antenna
64	M-500200	Speaker Dynamic (6")
65	500207	Switch tone
66A-66B	500208	Volume Control—1 Meg. (with switch)
67	M-500210	Transformer output for M-500200 speaker
68	500212	Condenser compensating 200 mmfd.
69	500213	Condenser silver mica 350 mmfd.
70	500259	Condenser compensating 275 mmfd.

CHASSIS 207A

STEWART-WARNER CORP.

ALIGNMENT PROCEDURE FOR 207A CHASSIS

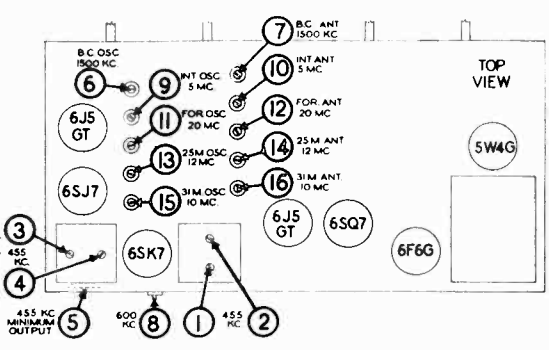
1. Connect the output meter across the voice coil or from the plate of the 6F6G output tube to ground through a .1 mfd. condenser.
2. Connect the ground lead of the signal generator to the chassis. Be sure the connector is between the center terminal and "D" on the antenna strip.
3. Keep the volume control in the maximum position throughout alignment.
4. THE ORDER OF ALIGNMENT STEPS SHOWN BELOW MUST BE FOLLOWED EXACTLY.

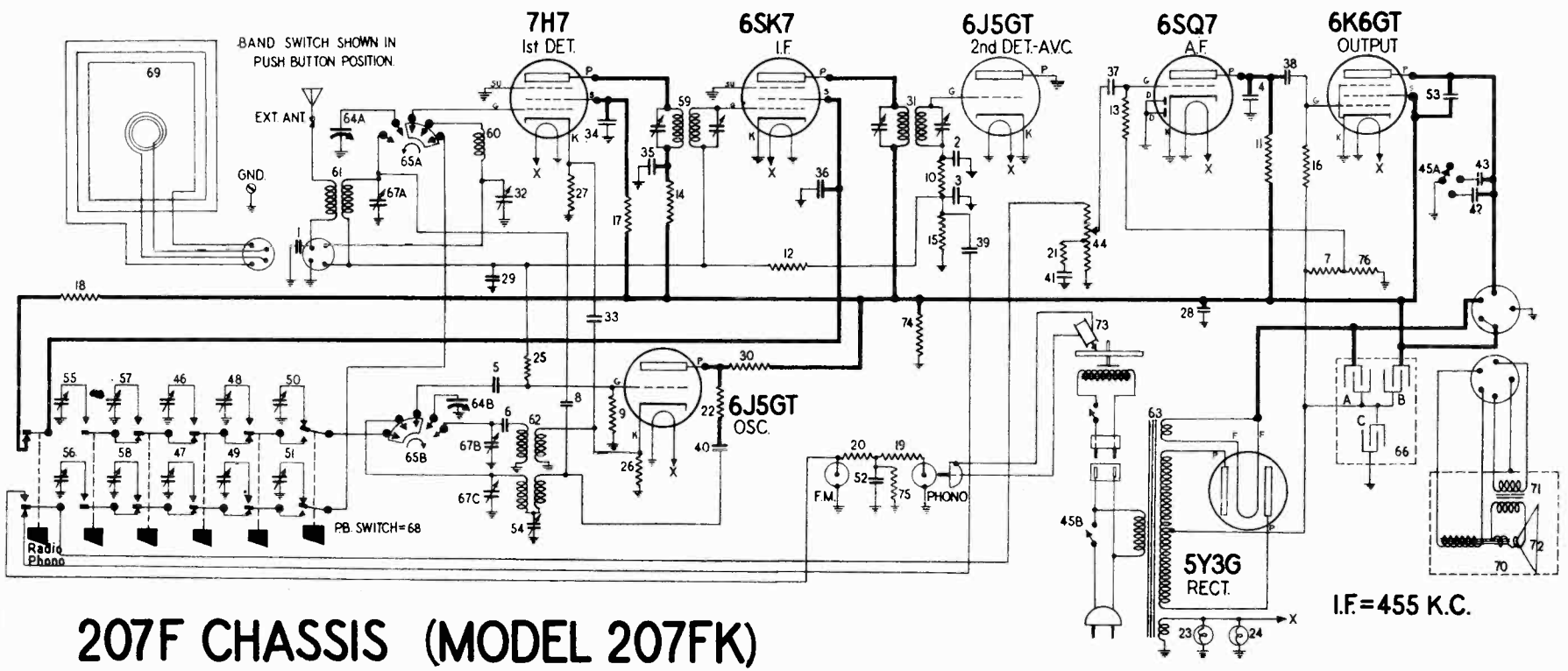
Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on Front Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	"A" Terminal	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	5	Wave Trap	Adjust for Minimum Output, Using a Strong Generator Signal.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	7	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	"A" Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	8	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	"A" Terminal	5 MC	Intermediate	5 MC	9	Intermediate Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 4.1 MC. If image does not appear, Realign at 5 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"A" Terminal	5 MC	Intermediate	Tune to 5 MC Generator Signal	10	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	"A" Terminal	20 MC	Foreign	20 MC	11	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 19.1 MC. If Image does not appear, Realign at 20 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"A" Terminal	20 MC	Foreign	Tune to 20 MC Generator Signal	12	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	"A" Terminal	12 MC	1st Position	12 MC	13	25 Meter Oscillator	Adjust for maximum output. Use the signal encountered with the trimmer screw farthest in.
400 OHM Carbon Resistor	"A" Terminal	12 MC	1st Position	Tune to 12 MC Generator Signal	14	25 Meter Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	"A" Terminal	10 MC	2nd Position	10 MC	15	31 Meter Oscillator	Adjust for maximum output. Use the signal encountered with the trimmer screw farthest in.
400 OHM Carbon Resistor	"A" Terminal	10 MC	2nd Position	Tune to 10 MC Generator Signal	16	31 Meter Antenna	Adjust for Maximum Output.

MISCELLANEOUS PARTS

Part Number	Description	List Price
114955	Clamp—for dial cord	$0.01
112745	Clip—Coil Mounting (Small)	.01
112798	Clip—for Mtg. Wave Trap Coil	.01
116009	Clip—for Ant. Coil Mtg. (Large)	.01
117057	Cord—drive supplied in 3' lengths	.15
500175	Dial Scale	.70
117029	Drive Drum & Bushing	.50
500188	Escutcheon—dial (with glass)	1.60
160219	Knob	.06
119987	Pointer	.11
81145	Retaining Ring for Tuning Shaft	Per C .50
114148	Rotor—Voltage Switch (on power transformer)	.50
85827	Set Screw 8-32 square head for drive drum	.02
110501	Socket 4 prong (for speaker)	.16
119791	Socket octal	.12
114876	Socket octal (rectifier)	.15
114878	Socket octal, with special ground	.15
160026	Socket condenser Mtg.	.04
113177	Spring dial cord tension	.09
119824	Terminal Strip with Connector for Antenna	.14
84407	Terminal Strip phono	.12
111456	Washer spring washer for tuning shaft	Per C .50

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

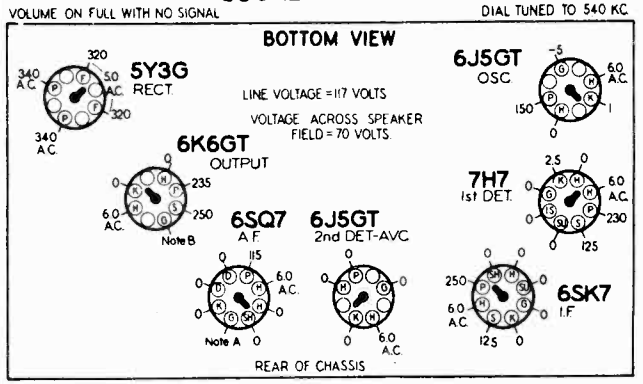




207F CHASSIS (MODEL 207FK)

SOCKET VOLTAGES

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



NOTE A: The bias voltage on this grid is -1 volt measured across resistor No. 76.

NOTE B: The bias voltage on this grid is -16 volts measured across resistors 7 & 76.

USE A HIGH RESISTANCE VOLTMETER OF 1000 OHMS PER VOLT.

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1 to 4	83763	Condenser, mica. 110 Mmfd.
5	85061	Condenser, mica. 51 Mmfd.
6	88587	Condenser, mica. .0042 Mfd.
7	89762	Resistor, wire wound, 220 ohm 1 watt
8	110510	Condenser, wire, 3 Mmfd.
9-10	110552	Resistor, carbon, 47,000 ohm 1/4 watt
11	110553	Resistor, carbon, 220,000 ohm 1/4 watt
12-13	110554	Resistor, carbon 1 Megohm 1/4 watt
14	110557	Resistor, carbon, 4700 ohm 1/4 watt
15-16	110559	Resistor, carbon, 470,000 ohm, 1/4 watt
17 to 20	110564	Resistor, carbon, 100,000 ohm, 1/4 watt
21	110569	Resistor, carbon, 10,000 ohm, 1/4 watt
22	110590	Resistor, carbon, 180 ohm, 1/4 watt
23-24	110629	Dial light bulb, 6.3 volt (Mazda #44)
25	112975	Resistor, carbon, 10 Meg. 1/4 watt
26	116078	Resistor, 560 ohm, 1/4 watt
27	116080	Resistor, insulated, 680 ohms, 1/4 watt
28	116625	Condenser, .1 Mfd. 600 volt
29	116819	Condenser, .05 Mfd. 600 volt
30	116805	Resistor, carbon, 10,000 ohm 1 watt
31	119024	Transformer, 2nd I.F.
32	119132	Condenser, trimmer
33 to 40	119193	Condenser, .01 Mfd. 600 volt
41 to 42	119414	Condenser, .02 Mfd. 600 volt
43	119417	Condenser, .006 Mfd. 600 volt
44	119634	Volume control, 1 Megohm
45A-45B	119640	Off-On switch & tone control
46 to 49	119663	Condenser, push button trimmer(750-1375 KC)
50-51	119664	Condenser, push button trimmer(980-1600 KC)
52-53	119875	Condenser, .002 Mfd. 600 volt
54	119934	Condenser, padder
55 to 58	500127	Condenser, push button trimmer(540-1000 KC)
59	500801	Transformer, 1st I.F.
60	500911	Coil, loading
61	501042	Coil, short wave antenna
62	501043	Coil, oscillator (B.C. & S.W.)
63	501044	Transformer, power 60 cycles
64A-64B	501057	Condenser, variable tuning
65A-65B	501059	Switch, band
66	501060	Condenser, Electrolytic A=20 Mfd. 400 volt B=15 Mfd. 400 volt C=20 Mfd. 25 volt
67A-67B-67C	501067	Condenser, 3 section trimmer
68	501068	Switch, push button
69	501153	Loop antenna
70	M-501170	Speaker, dynamic 10 inch
71	M-501183	Transformer, output for M-501170 spkr.
72	M-501184	Cone & voice coil for M-501170 spkr.
73	501238	Crystal cartridge for tone arm
74	116076	Resistor, carbon, 33,000 ohms, 2 watt
75	110584	Resistor, carbon, 330,000 ohms 1/4 watt
76	501196	Resistor, carbon, 20 ohms, 1/4 watt

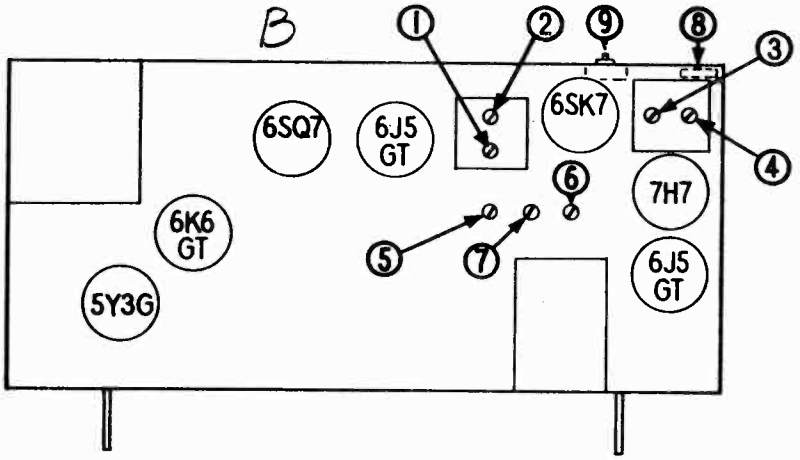
MODEL 207FK
Chassis 207F

STEWART-WARNER CORP.

ALIGNMENT PROCEDURE

1. Connect the output meter across the voice coil or from plate of the 6K6G output tube to chassis through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis.
3. Push the RADIO-PHONO SWITCH in.
4. Turn the volume control to the maximum position and keep it in this position throughout the alignment procedure.
5. Check the pointer to see that it is correctly set to low freq. end of dial scale with gang in full mesh.
6. The loop must be connected as indicated in circuit diagram at all times.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 Mfd. Condenser	Lug on front section of Gang Condenser	455 KC	"A" Position	Any Point Where it does not affect the signal	1-2	2nd. I.F.	Adjust for Maximum Output. Then repeat adjustment.
					3-4	1st. I.F.	
400 Ohm Carbon Resistor	Antenna Terminal (Blue Wire)	16 MC	"B" Position	16 MC	5	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC. with Trimmer Screw farther out. Recheck Image.
400 Ohm Carbon Resistor	Antenna Terminal (Blue Wire)	16 MC	"B" Position	Tune to 16 MC Gen. Sig.	6	Foreign Antenna	Adjust for Maximum Output. Try to increase output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
200 Mmfd. Mica Condenser	Antenna Terminal (Blue Wire)	1500 KC	"A" Position	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
Now replace the chassis and loop antenna in the cabinet before proceeding further.							
200 Mmfd. Mica Condenser	Antenna Terminal (Blue Wire)	1500 KC	"A" Position	Tune to 1500 KC Gen. Sig.	8	Broadcast Antenna	Adjust for Maximum Output.
200 Mmfd. Mica Condenser	Antenna Terminal (Blue Wire)	600 KC	"A" Position	Tune to 600 KC Gen. Sig.	9	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to increase output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.



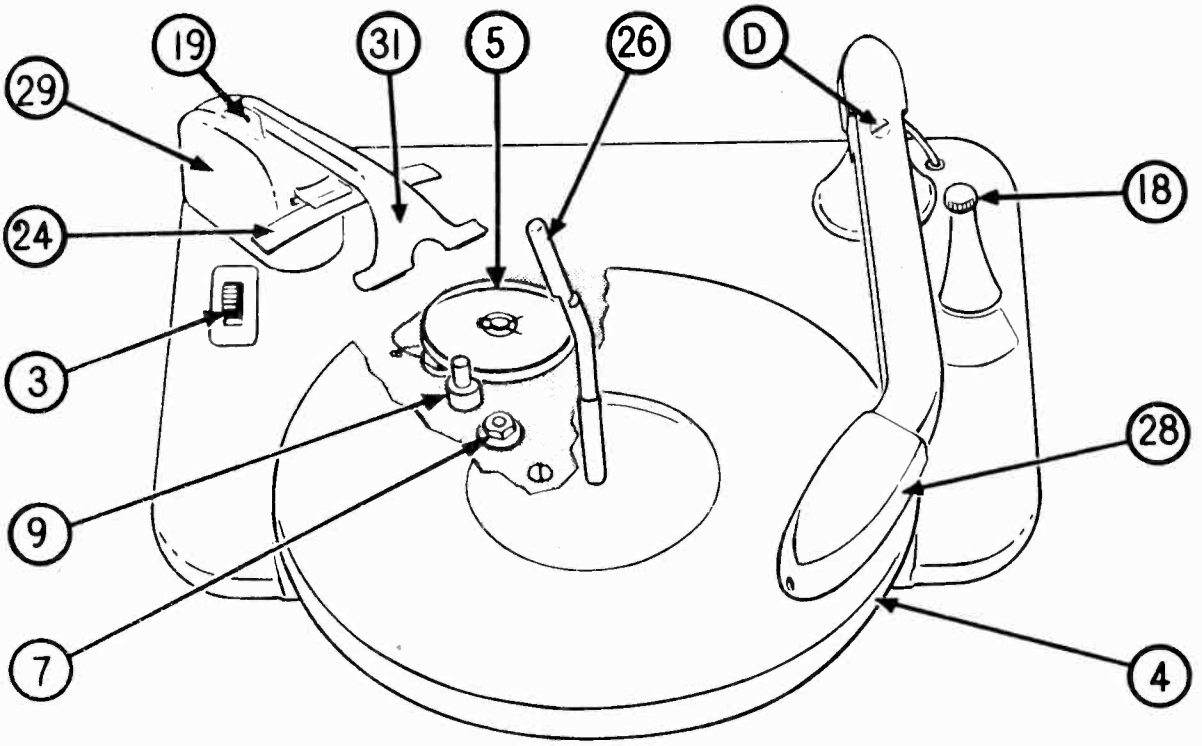
MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
110405	Cable-pickup	.50
114955	Clamp, for dial cord	.01
112745	Clip, coil mounting	.01
117057	Cord, drive (supplied in 3 ft. lengths)	.15
500839	Dial background	.14
501791	Dial scale	
501792	Dial escutcheon with glass	
501036	Knob "Band"	.16
501035	Knob, "Tone"	.16
119968	Knob, "Tune"	.16
119971	Knob, "Volume"	.16
501988	Needle-phonograph	
160354	Pilot lamp socket	.10
119987	Pointer	.11
119953	Push button	.07
81145	Retaining ring for tuning shaft--Per C	.50
113463	Rubber bushing, chassis mtg.	.03

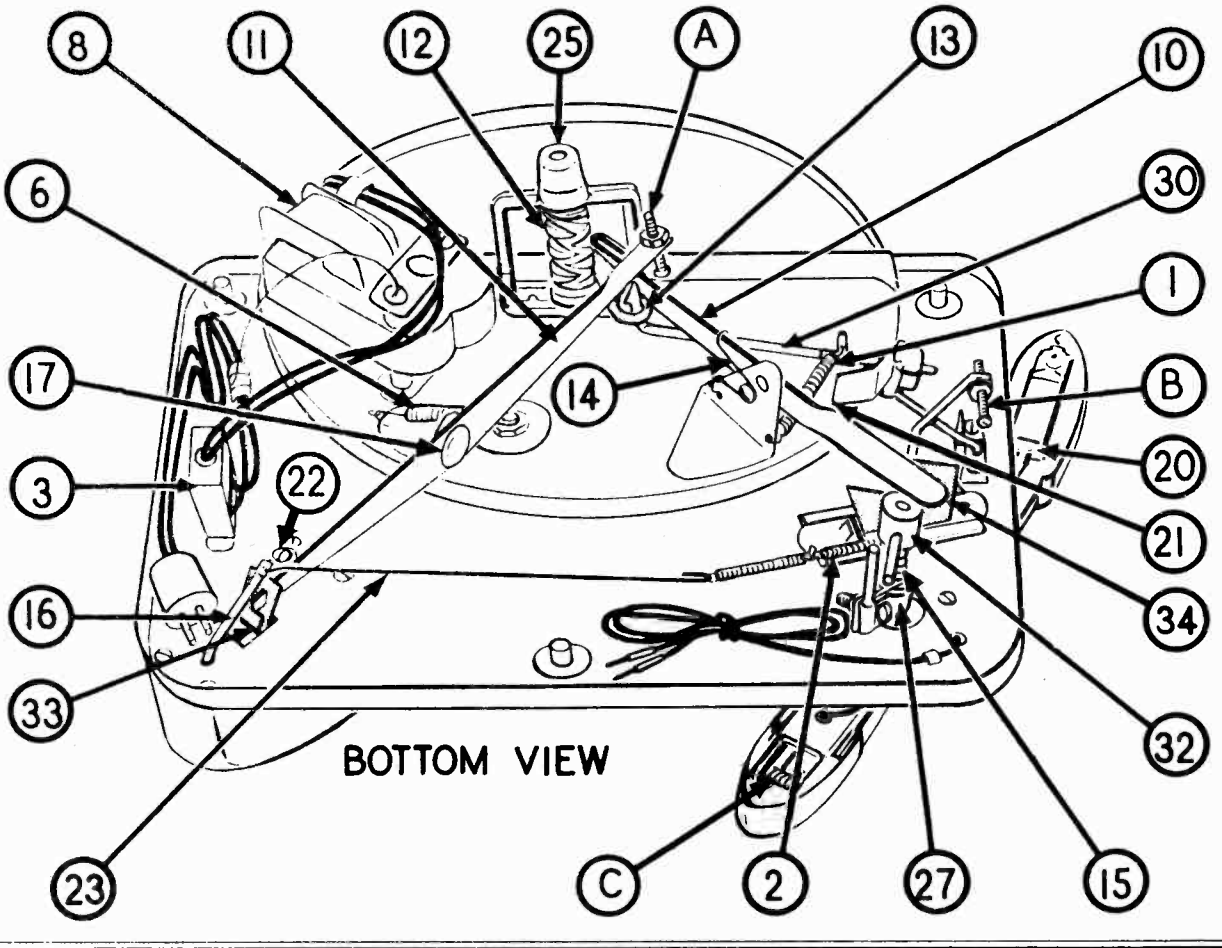
PART NUMBER	DESCRIPTION	LIST PRICE
85040	Screw, #6 Hex. Hd.--Per C	.35
112874	Screw, #10 X 1-1/8 chassis mounting	.01
114914	Screw, special head for mtg. escutcheon--Per Dz.	.05
501041	Shaft, tuning	.10
111090	Spacer, steel - Mtg. for gang	.02
500051	Socket, for loop antenna	.15
117704	Socket, for speaker, 5 prong	.13
160294	Socket, for 7H7 8 prong	.12
119791	Socket, octal	.12
114876	Socket, octal (Rectifier)	.15
114878	Socket, octal with special ground	.15
160039	Socket, phono	.08
161384	Spring, dial cord tension	.06
160229	Station call letter tabs	.45
110829	Washer, flat steel, for mtg. chassis	.01
111456	Washer, spring washer for tuning shaft--Per C	.50

CHASSIS 207DL, 207FK, 208CK

STEWART-WARNER CORP.



TOP VIEW



BOTTOM VIEW

DESCRIPTION OF CYCLE

To start the cycle on models with a switch on the base plate or on the radio control panel, turn on the switch and press down on the TONE ARM. This depresses the REJECT BUTTON (#18 on Diagram) on top of the rest post, which in turn through TRIP LINK (30) engages the FOLLOWER (13), starting the cycle.

When FOLLOWER (13) engages in WORM (12), FOLLOWER ARM (10) is pivoted at the pivot, lifting CRANK (32) which raises TONE ARM. CRANK (32) is fastened to the lift pin. As this rises and strikes the incline at the angular upper end of the INDEX PLATE (34), it causes a rotation of the CRANK (32) which in turn contacts the CRANK PIN (27) fastened to the TONE ARM shaft and swings the TONE ARM inward until the CRANK (32) strikes INDEX PLATE (34). Then as the FOLLOWER (13) returns to its starting position, the CRANK (32) drops, setting the TONE ARM on the record.

The set down position for 10" or 12" records is automatically controlled when the ejector is positioned so that the edge of the 10" or 12" records rest on the support bracket. The RECORD EJECTOR (24) can be set in the 10" or 12" position by merely slightly lifting it and pulling or pushing it in or out until the 10" or 12" numbers show at the edge of the opening in the housing.

ADJUSTMENTS

All adjustments can be made with record changer disconnected from the power outlet.

TONE ARM SET-DOWN POSITION ADJUSTMENT: To adjust the set-down position of the tone arm, trip the reject button and turn the turntable by hand in a clockwise direction until the CRANK (Diagram No. 32) strikes the INDEX PLATE (Diagram No. 34) and the TONE ARM starts downward toward the record. Loosen the screw on #27 and, holding the CRANK in contact with the lower portion of the INDEX PLATE, move the TONE ARM until it is directly above a point 1/8" in from the outside of a record of the size indicated on the EJECTOR SLIDE (24). Retighten the screw and carry the mechanism through the remainder of the cycle.

EJECTOR ARM SETTING (A): The adjustment of screw "A" determines the point in the cycle in which the next record falls. Turning the screw clockwise causes record falling to be delayed, while turning the screw counter-clockwise causes the records to fall earlier in the cycle. This screw should be adjusted using a 12 inch record in the 12 inch position. Adjust the screw so that the record falls when the tone arm has moved to its extreme outside position in the change cycle. Tighten the locking nut after the adjustment has been made.

TONE ARM TRIP POSITION ADJUSTMENT (B): The trip position is adjusted by screw "B". For proper operation the screw should be adjusted to trip the mechanism at the eccentric finishing groove on a record. This will assure satisfactory operation for the majority of records in use. Turning the screw clockwise will cause earlier tripping of the mechanism; turning counter-clockwise will delay the tripping. Tighten the locking nut on the screw when the correct adjustment has been obtained.

NEEDLE PRESSURE ADJUSTMENT (C): To increase the weight on the needle, should it jump grooves or slide across the grooves too easily, lift the tone arm, and relieve the spring tension by releasing the small sprocket wheel a quarter turn at a time. On the other hand, should the records and needle wear too fast, increase the spring tension with the sprocket to decrease the needle pressure.

TONE ARM HEIGHT ADJUSTMENT (D): The height to which the tone arm rises during the change cycle is governed by the adjustment of the screw under the tone arm on the top of the tone arm post. Turning this screw clockwise will lower the height to which the tone arm rises and vice versa. The proper adjustment may be made by placing 12 ten inch records on the turntable and adjusting the screw to the point where the tone arm clears the top record during the change cycle.

EJECTOR SETTING: The small screw, (Diagram No. 22), makes two adjustments: It varies the tension of the spring used on the EJECTOR mechanism (24); and it also moves the stationary position of the EJECTOR with respect to the rest of the mechanism. To lower the spring tension on the EJECTOR, loosen the lock nut on the screw and turn the screw counter-clockwise. Turning the screw counter-clockwise also moves the EJECTOR farther away from the SPINDLE. Turning the screw clockwise increases the tension of the EJECTOR spring and also moves the EJECTOR closer to the SPINDLE.

The correct adjustment of the screw may be obtained as follows:

Set the EJECTOR for 12" records and place ten 12" records on the spindle. Turn the turntable by hand and observe record dropping. The screw should be adjusted so that the bottom record just falls. The screw is correctly set when almost entirely in the "out" position. The spring tension on the EJECTOR is then relatively small and stalling of the motor is less likely to occur.

NOTE: After adjusting this screw, check the adjustment of "A". Remember to tighten the locking nut after adjusting a screw.

TROUBLES & THEIR REMEDIES

1. NOISE WHILE CYCLING
This trouble is caused by the FOLLOWER ARM (10) being bent out of position. Straighten the arm.

2. TURNTABLE RUBS
Loosen set screw on WORM (12) with an Allen wrench and raise the spindle about 1/16".

3. DOES NOT CYCLE WITH REJECT BUTTON
Check to see if TRIP LINK (30) is releasing FOLLOWER (13). If TRIP LINK releases FOLLOWER but will not center on threads of WORM, bend the FOLLOWER ARM (10).

4. MOTOR SLOWS DOWN DURING CYCLING
Bend paddle end of FOLLOWER ARM (10) down slightly or loosen the EJECTOR SCREW (22) slightly.

5. RECORDS DO NOT DROP
Tighten EJECTOR SCREW (22) slightly. Always check on full stack of 10-12" records. Set screw so that bottom record just falls.

6. RECORD DROPS ON TONE ARM
Bend back end of FOLLOWER ARM (10) up slightly. Make sure EJECTOR SCREW (22) is adjusted properly.

7. MECHANISM KEEPS REPEATING ON TOP OF WORM
Bend TRIP LINK (30) back slightly so as to loosen the TRIP SPRING (Diagram No. 1) tension on FOLLOWER (13). It may be necessary to first loosen the set screw on the TRIP. If this does not correct the trouble, check the FOLLOWER ARM (10) to make sure it is straight and bend slightly if necessary.

8. MECHANISM KEEPS REPEATING ON BOTTOM OF WORM
This indicates a bent FOLLOWER ARM (10). Straighten arm.

9. FOLLOWER FLUTTERS WHILE PLAYING
Check to see if FOLLOWER ARM (10) is all the way up to top of WORM (12), if not, bend arm slightly in toward WORM to stop binding.

10. FOLLOWER ARM BINDS
Bend FOLLOWER ARM away from fulcrum at both sides of rivet.

11. FOLLOWER JAMS

Bend FOLLOWER ARM to straighten.

12. TONE ARM DOES NOT LAND AT BEGINNING OF RECORD OR MISSES RECORD ENTIRELY
Check EJECTOR to see if it is set for correct size of record. If EJECTOR is set for correct record size, the SET DOWN POSITION ADJUSTMENT should be loosened and the position of the TONE ARM adjusted as described under "TONE ARM SET-DOWN POSITION ADJUSTMENT."

13. TONE ARM DOES NOT GO INTO CYCLE AT END OF RECORD
Check to see if record has spiral finishing groove. If it has not, reject record by means of REJECT-BUTTON. If trouble lies with mechanism, adjust screw "B" as described under "TONE ARM TRIP POSITION ADJUSTMENT."

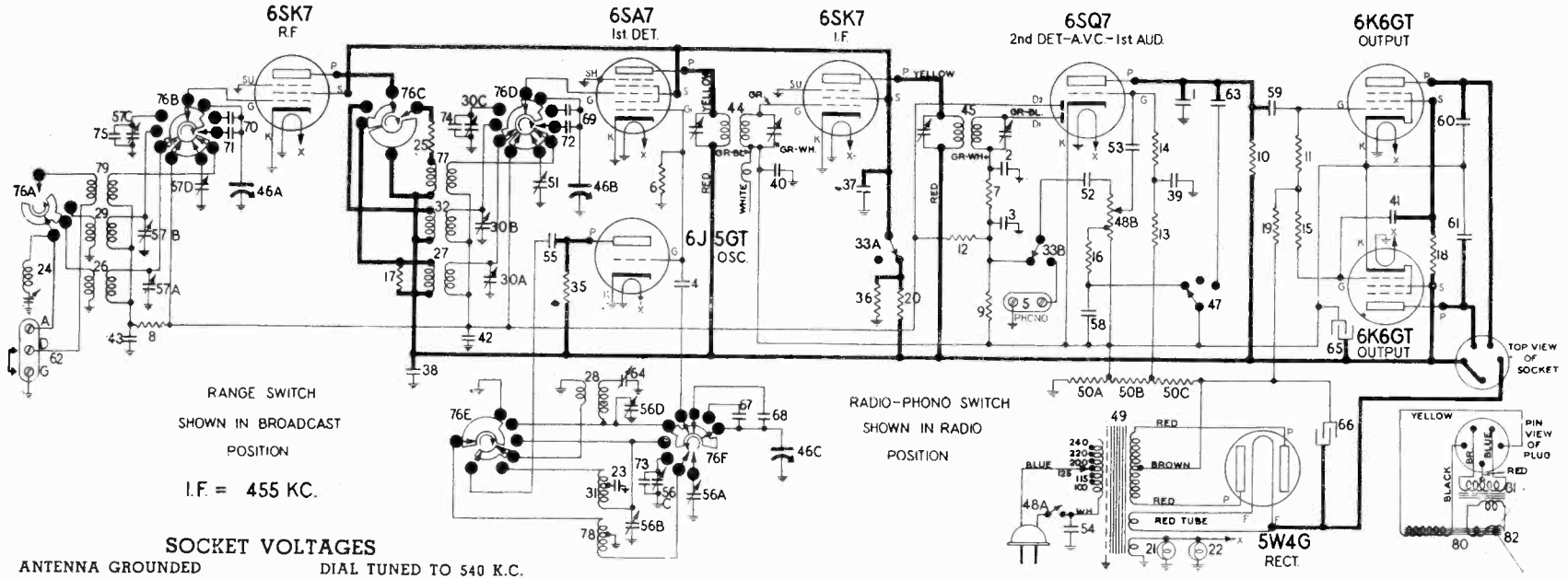
14. RECORDS WEAR EXCESSIVELY
Check needle to see if worn out or defective. If needle is not cause of wear, lift the tone arm and increase the tension of the spring at the base as described under "NEEDLE PRESSURE ADJUSTMENT."

15. TONE ARM SLIPS OUT OF RECORD GROOVES OR SLIDES ACROSS RECORD
This is usually due to insufficient needle pressure. The needle pressure may be increased by loosening the spring tension at the base of the tone arm as described under "NEEDLE PRESSURE ADJUSTMENT."

16. TONE ARM SLIDES ACROSS TOP RECORD OF STACK
This is due to the tone arm having insufficient height to clear the top record on the turntable. This can be remedied by raising the tone arm height by means of the "TONE ARM HEIGHT ADJUSTMENT 'D'."

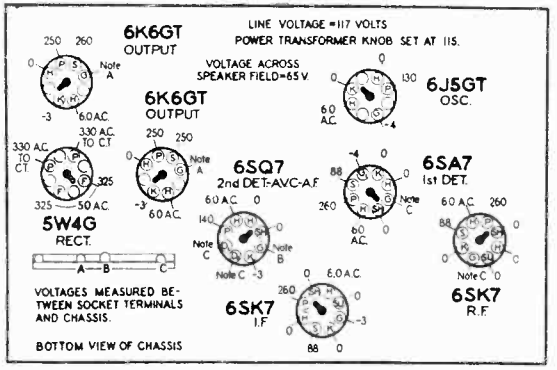
17. "WOW" IN RECORD REPRODUCTION
This is usually due to worn rubber rim on the idler wheel. If this is the case, replace the idler wheel.

STEWART-WARNER MODEL 208A CHASSIS



SOCKET VOLTAGES

ANTENNA GROUNDED — DIAL TUNED TO 540 K.C.



All voltages measured in radio position. Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE A: The 6K6GT grid bias voltage is — 24.5 volts measured between terminals A and C on the bias resistor.

NOTE B: The 6SQ7 grid bias voltage is — 1.8 volts measured between terminals A and B on the bias resistor.

NOTE C: The voltage present at these elements is —3 volts measured between terminal A on the bias resistor and chassis.

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser, mica 260 mmfd.	$ .20
2-3-4	83783	Condenser, mica 110 mmfd.	.20
5	84407	Terminal strip—phono	.12
6-7	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
8 to 11	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
12-13-14	110554	Resistor—carbon 1 megohm ¼ watt	.12
15	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
16	110566	Resistor—carbon 33,000 ohms ¼ watt	.12
17-18	110573	Resistor—carbon 2,200 ohms ¼ watt	.12
19	110578	Resistor—carbon 68,000 ohms ¼ watt	.12
20	110595	Resistor—carbon 12,000 ohms 3 watts	.20
21-22	110629	Dial light bulb—6.3 volt (Mazda No. 44)	.15
23	112426	Condenser—mica, 1650 mmfd.	.30
24	112796	Coil—wave trap (with trimmer)	.50
25	112963	Resistor—insulated 330 ohms ¼ watt	.15
26	113295	Coil—antenna (B.C.)	1.20
27	113296	Coil—Det. (B.C.)	1.30
28	113297	Coil—oscillator (B.C.)	.48
29	113298	Coil—antenna (Intermediate)	.50
30^-30B-30C	113320	Condenser—trimmer—3 section	.54
31	113412	Coil—oscillator (Intermediate)	1.20
32	113609	Coil—Det. (Intermediate)	.50
33A-33B	114141	Switch—D.P.D.T.	.44
34	114148	Rotor—voltage switch (on power transformer)	.50
35	116055	Resistor—carbon 22,000 ohms ½ watt	.12
36	116086	Resistor—18,000 ohms 1 watt	.16
37-38-39	116625	Condenser—.1 mfd. 600 volt	.25
40	116706	Condenser—.2 mfd. 600 volt	.35
41 to 43	116819	Condenser—.05 mfd. 600 volt	.20
44	117610	Transformer—1st I.F.	$1.60
45	117612	Transformer—2nd I.F.	1.60
46A-46B-46C	117665	Condenser—variable tuning	5.00
47	117678	Switch—tone control	.55
48A-48B	117685	Volume control 1 meg. with switch	1.00
49	117774	Transformer—power 100-240 volt 40-133 cycle	7.60
50A-50B-50C	117786	Resistor—Bias strip, A—85 ohms; B—20 ohms; C—270 ohms	.42
51	119132	Condenser—trimmer	.20
52 to 55	119193	Condenser—.01 mfd. 600 volt	.15
56A to 56D	119283	Condenser—trimmer (4 section)	.60
57A to 57D			
58	119415	Condenser—.015 mfd. 600 volt	.15
59	119417	Condenser—.006 mfd. 600 volt	.15
60-61	119817	Condenser—.004 mfd. 600 volt	.15
62	119824	Antenna terminal strip with connector	.14
63	119875	Condenser—.002 mfd. 600 volt	.15
64	119934	Condenser—padder	.36
65-66	500026	Condenser—electrolytic 16 mfd. 450 volts	.78
67 to 69	500041	Condenser—silver mica 160 mmfd.	.25
70 to 72	500042	Condenser—silver mica 150 mmfd.	.22
73 to 75	500043	Condenser—silver mica 125 mmfd.	.22
76A to 76F	500044	Switch—Band	2.50
77	500061	Coil—short wave Det.	.65
78	500062	Coil—short wave oscillator	.62
79	500063	Coil—short wave antenna	.64
80	M-500090	Speaker—dynamic (9 in. oval)	7.00
81	M-500091	Transformer—output for M-500090 speaker	1.75
82	M-500092	Cone & Voice coil for M-500090 speaker	1.75

Prices Subject to Change Without Notice

CHASSIS 208A

STEWART-WARNER CORP.

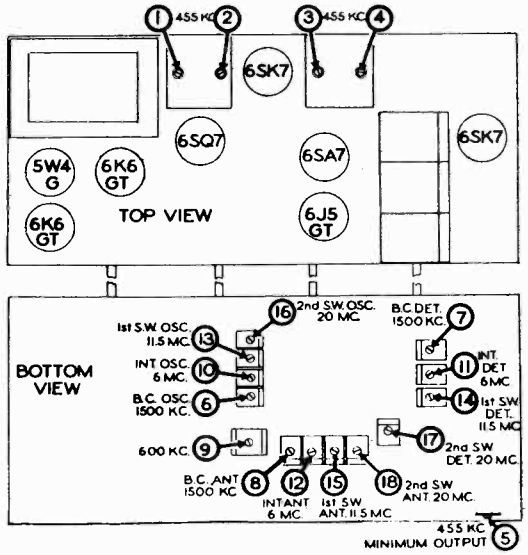
ALIGNMENT PROCEDURE FOR 208A CHASSIS

1. Connect the output meter across the voice ccil or across the plates of the 6K6GT output tubes. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis or to the "G" terminal at the back of the chassis. NOTE: The "G" and "D" terminals on this terminal strip must be connected together.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. With the gang condenser in full mesh, set the pointer to the last mark on the left end of the dial scale. If the pointer is incorrectly set, it is only necessary to loosen the set screws on the dial cord drive drum and push the gang condenser to full mesh with the pointer properly set, then retighten the set screws.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Middle Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	"A" Terminal	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	5	Wave Trap	Adjust for Minimum Output, Using a Strong Generator Signal.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	"A" Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	7	Broadcast Detector	Adjust for Maximum Output.
					8	Broadcast Antenna	
200 MMFD. Mica Condenser	"A" Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	"A" Terminal	6 MC	Intermediate	6 MC	10	Intermediate Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 5.1 MC. If Image does not appear, Realign at 6 MC. with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"A" Terminal	6 MC	Intermediate	Tune to 6 MC Generator Signal	11	Intermediate Detector	Adjust for Maximum Output.
					12	Intermediate Antenna	
400 OHM Carbon Resistor	"A" Terminal	11.5 MC	1st S.W.	11.5 MC	13	1st S.W. Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 10.6 MC. If Image does not appear, Realign at 11.5 MC. with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"A" Terminal	11.5 MC	1st S.W.	Tune to 11.5 MC Generator Signal	14	1st S.W. Detector	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
					15	1st S.W. Antenna	
400 OHM Carbon Resistor	"A" Terminal	20 MC	2nd S.W.	20 MC	16	2nd S.W. Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 19.1 MC. If Image does not appear, Realign at 20 MC. with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"A" Terminal	20 MC	2nd S.W.	Tune to 20 MC Generator Signal	17	2nd S.W. Detector	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
					18	2nd S.W. Antenna	

MISCELLANEOUS PARTS

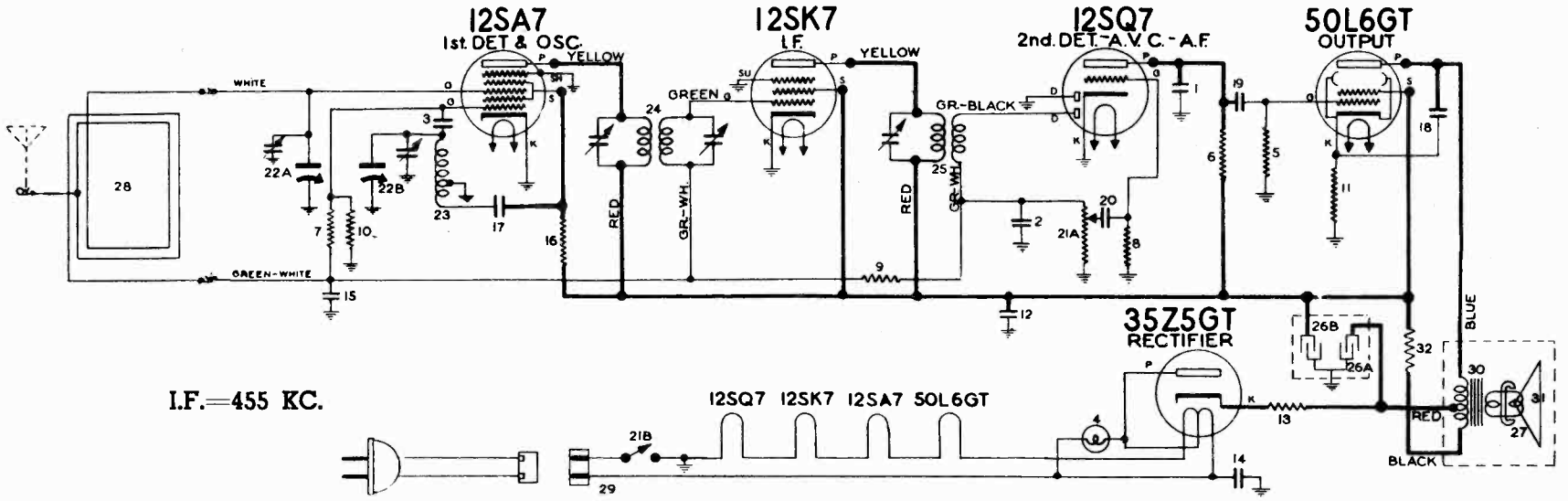
Part Number	Description	List Price
114032	Bracket and pulley assembly right hand	$ .34
114034	Bracket and pulley assembly left hand	.34
112874	Chassis mtg. bolt No. 10 x 1 1/8"	.01
114955	Clamp for dial cord	.01
112745	Clip coil mounting	.01
116948	Cord dial drive (supplied in 6 ft. lengths)	.18
117057	Cord drive (supplied in 3 ft. lengths)	.15
114915	Dial mtg. plate	.38
113338	Drum dial drive	.54
160182	Escutcheon dial	2.10
88348	Eyelet for dial cord Per Dz.	.05
160219	Knob push on	.06
117662	Pointer assembly	.32
112762	Pulley dial cord drive	.04
113463	Rubber bushing chassis mtg.	.03
83624	Screw self tapping No. 8 x 1/4	.01
114914	Screw special head for mtg. escutcheon Per Dz.	.15
111116	Screw No. 5 x 5/8; mechanism mtg.	.02
85040	Screw No. 6 Hex. Hd. Per C	.35
85827	Set Screw 8-32 Square Head for drive drum	.02
117704	Socket for speaker 5 prong	.13
114876	Socket octal (for rectifier)	.15
119791	Socket octal	.12
114878	Socket octal with special ground	.15
111090	Spacer steel mtg. for gang	.02
113177	Spring dial cord tension	.09
113205	Thrust plate for tuning shaft	.02
117664	Tuning shaft	.32
110829	Washer flat steel for mtg. chassis	.01



PRICES SUBJECT TO CHANGE WITHOUT NOTICE

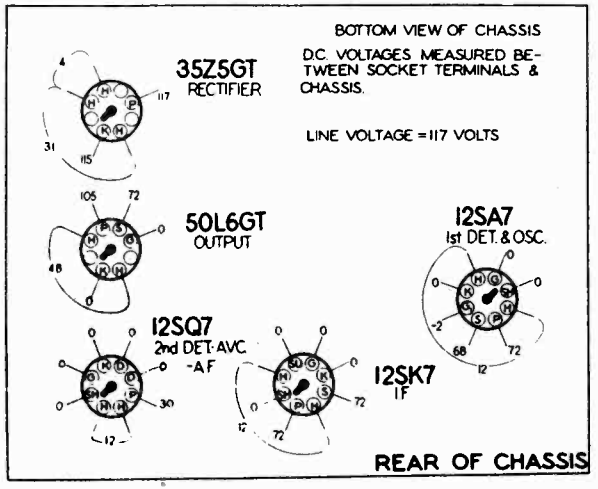
STEWART-WARNER R-358 CHASSIS

(RECEIVER MODELS R-3581 to R-3589)



SOCKET VOLTAGES

Volume on full with no signal. Dial tuned to 540 KC



Use a voltmeter of 1000 ohms per volt.

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser, Mica. 260 Mmfd.	$ .20
2-3	83783	Condenser, Mica. 110 Mmfd.	.20
4	85296	Lamp-Dial 6 to 8 Volt (Mazda 51)	.16
5	112971	Resistor—Insulated, 470,000 Ohms ¼ Watt	.15
6	112987	Resistor—Insulated, 220,000 Ohms ¼ Watt	.15
7-8	116050	Resistor—Insulated, 10 Meg. ¼ Watt	.12
9	116056	Resistor—2.2 Megohms ¼ Watt.	.10
10	116059	Resistor—Insulated, 22,000 Ohms ¼ Watt	.12
11	116092	Resistor—140 Ohms 1 Watt W.W.	.14
12	116625	Condenser—.1 Mfd. 600 Volt	.25
13	116752	Resistor—33 Ohms 1 Watt, Wire Wound	.15
14-15	116819	Condenser—.05 Mfd. 600 Volt	.20
16	118803	Resistor—(Insulated)—680 Ohms ¼ Watt	.12
17 to 19	119193	Condenser—.01 Mfd. 600 Volt	.15
20	119875	Condenser—.002 Mfd. 600 Volts.	$ .15
21A-21B	500223	Volume Control—1 Meg. (With Switch)	.95
22A-22B	500225	Condenser—Variable Tuning	3.00
23	500232	Coil—Oscillator	.52
24	500233	Transformer—1st I.F.	1.15
25	500236	Transformer—2nd I.F.	1.10
26A-26B	500256	Condenser—Electrolytic, {A—40 Mfd. 150 V. / B—20 Mfd. 150 V.}	1.00
27	C-500257	Speaker—P.M. Dynamic (4")	2.80
28	500288	Loop Antenna	.95
29	500291	Socket for power cord cable	.30
30	C-500360	Transformer—Output for C-500257 Speaker	1.95
31	C-500361	Cone & Voice Coil for C-500257 Speaker	1.65
32	67986	Resistor—2,000 Ohms. 1 Watt.	.25

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(RECEIVER MODELS R-3581 to R-3589)
ALIGNMENT PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. **Connect the output meter across the voice coil; or, using a condenser in series, connect between the plate of the 50L6GT output tube and chassis.**
2. **Connect the ground lead of the signal generator to chassis through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to use the series condenser may have serious results, as one side of the power line may be grounded in the signal generator, or hum may be encountered.**
3. **Turn the volume control to the maximum volume position and leave it in this position throughout the entire alignment procedure.**
4. **Set the dial pointer to the last mark after 55 on the dial with the gang condenser in full mesh.**
5. **The loop antenna must be connected and in the same relative position to the chassis as when in the cabinet**

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator To Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Mica Condenser	Lug On Rear Section Of Variable Condenser	455 KC	Any Point Where It Does Not Affect the Signal	1	2nd I.F.	Adjust the screws on the top of each I.F. can for maximum output. Then repeat adjustment.
				2-3	1st I.F.	
No Connection	Place Lead from Signal Generator Near Loop	1500 KC	1500 KC	4 (Trimmer screw at side of front section of variable condenser.)	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
No Connection	Place Lead from Signal Generator Near Loop	1500 KC	Tune To 1500 KC Generator Signal	5 (Trimmer screw at side of rear section of variable condenser.)	Broadcast Antenna (Shunt)	Adjust for Maximum Output.

MISCELLANEOUS PARTS

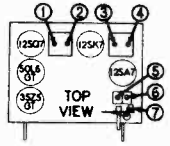
Part Number	Description	List Price
114955	Clamp—for dial cord	$ .01
112745	Clip—Coil Mounting	.01
117057	Cord—Drive, supplied in 3' lengths	.15
500258	Dial Scale	.12
500267	Knob—Tuning or Volume	.15
500218	Pointer	.08
81145	Retaining Ring for Tuning Shaft	Per C .50
160026	Socket—Condenser Mtg.	.04
116793	Socket—For Dial Light	.40
500291	Socket—For Power Cord Cable	.30
116690	Socket—Octal Base	.12
161384	Spring—Dial cord tension	.06
111972	Washer—Extruded and tapped (for Mtg.)	.05
111456	Washer—Spring washer for tuning shaft	Per C .50
500219	Window—Dial	.30

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CHASSIS R-386 ALIGNMENT PROCEDURE

1. Connect output meter across voice coil or from 50L6GT plate through a .1 mfd. condenser to chassis.
2. Set Volume Control in maximum position.
3. Connect signal generator ground through a .1 mfd. condenser to chassis.
4. Set dial pointer to 180 with slugs all the way out.

Dummy Ant. in Series with Sig. Gen.	Connection Sig. Gen. Output to Receiver	Sig. Gen. Freq.	Receiver Dial Setting	Trimmer No.	Trimmer Description	Type of Adjustment
200 Mmfd. Mica Condenser	Grid of 12SA7 Tube	455 KC	Any place where it does not affect signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust screws on top of I.F. cans for maximum output
200 Mmfd. Mica Condenser	Antenna Terminal	1600 KC	1600 KC	5	B.C. Osc.	Adjust for maximum output
200 Mmfd. Mica Condenser	Antenna Terminal	1600 KC	Tune to 1600 KC Gen. Sig.	6	B.C. Ant.	Adjust for maximum output
200 Mmfd. Mica Condenser	Antenna Terminal	1400 KC	Tune to 1400 KC Gen. Signal	7	B.C. Ant. Coil	Adjust moveable Antenna Coil for maximum output



NOTE: After completing adjustment No. 7 return slugs to maximum out position and check trimmer No. 6, If no appreciable change in trimmer adjustment is necessary for maximum output, the antenna circuit is tracking. If the trimmer No. 6 requires considerable change it will be necessary to repeat adjustment No. 7 again. These two adjustments (Nos. 6 & 7) should be made several times until no change in trimmer adjustment for maximum output is necessary at either point.

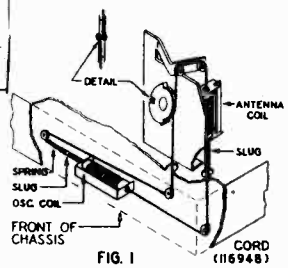


FIG. 1

DRUM SHOWN WITH SLUGS IN FULL OUT POSITION

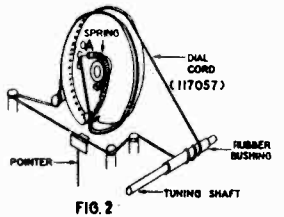


FIG. 2

TO RESTRING TUNING MECHANISM

1. Form a loop in one end of the cord and attach it to the hook nearest to the dot on the slug marked with a yellow dot. Form another loop through the hook farthest from the dot on the slug with the white dot and adjust the length so that the distance from the iron end of the slug to the iron end of the other is 2 15/16 inches.
2. Attach another length of cord to the other end of the yellow dot slug and drop the assembly through the hole in the top of the antenna coil leaving the newly added length of cord on the top end.
3. Pass the lower slug through the hole in the chassis, around the lower pulley and through the oscillator coil.
4. Now pass the cord from the top end over the two pulleys at the top of the mounting bracket, around the rear side of the small irregularly shaped pulley (see Fig. 1) threading it through the slots as shown in the "Detail" drawing and across the front down through the second hole in the chassis. Pass the cord under the upper pulley and around the top of the left hand pulley.
5. Form a loop and attach to spring (part no. 501145). Attach spring to slug in oscillator coil and adjust loop in cord to give normal tension.
6. The iron slug in the oscillator coil should project 1/2" from the end of the coil when the drive pulley is in its maximum counter-clockwise position. This may be adjusted by sliding the cord in the slots shown in the "Detail" drawing.
7. If the procedure outlined in the steps above has been carefully followed, the colored dot ends of the slugs will enter the coil last when the slugs are fully entered in the coils.
8. After restringing tuning mechanism, perform the alignment indicated under " Alignment Procedure " above.

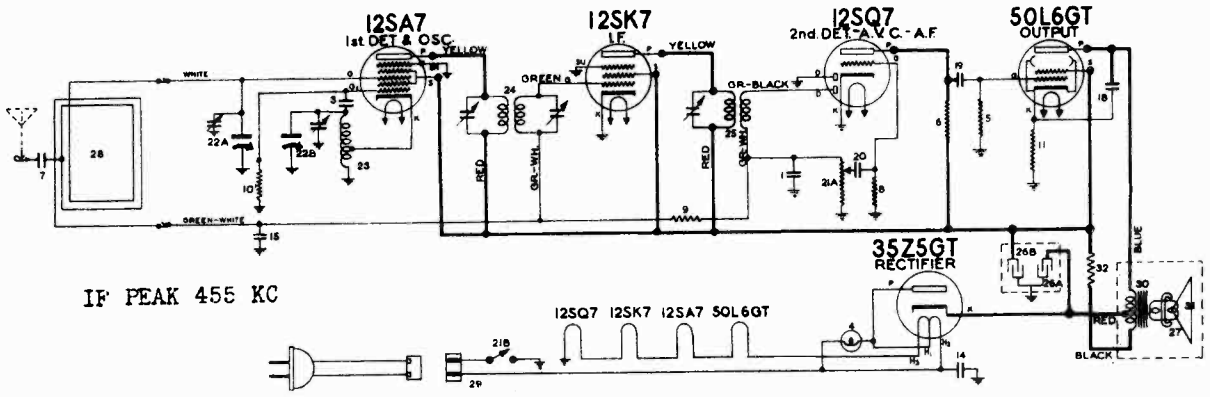
TO RESTRING DIAL CORD

1. Set drum to position shown in Figure 2 with slugs in full out position (shown in Fig. 1).
2. Attach one end of the dial cord to point A on the drum.
3. Pass the cord through the opening at the bottom of the drum around the rear of the left side over the top and make two and one half turns around the rubber bushing on the tuning shaft as shown in Fig. 2.
4. Pass the cord around the guides as shown and over the front edge of the drum around and up through the opening at the bottom of the drum.
5. Attach spring to point A and bring it over hub of drum.
6. Form a loop in the cord and adjust for normal tension on the spring. (See Fig. 2).
7. Set the pointer to 1600 KC on the dial scale with the drum in the maximum counter-clockwise position.

STEWART-WARNER CORP.

MODELS R-3581S to R-3589S
Chassis R-358S

STEWART-WARNER R-358S CHASSIS
(RECEIVER MODELS R-3581S TO R-3589S)



ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1------	83539	Condenser, Mica. 260 Mmfd.----------	$ .20
3------	83783	Condenser, Mica. 110 Mmfd.----------	.20
4------	85296	Lamp-Dial 6-8 Volt (Mazda 51)----------	.16
5------	112971	Resistor-(Ins.) 470,000 Ohms 1/4 Watt----	.15
6------	112987	Resistor-(Ins.) 220,000 Ohms 1/4 Watt----	.15
7------	64833	Condenser, Mica. 70 Mmfd.----------	.26
8------	116050	Resistor-(Ins.) 10 Meg. 1/4 Watt----------	.12
9------	116056	Resistor-2.2 Megohms 1/4 Watt----------	.10
10------	116059	Resistor-(Ins.) 22,000 Ohms 1/4 Watt-----	.12
11------	116092	Resistor-140 Ohms 1 Watt W.W.----------	.14
12------	116625	Condenser, .1 Mfd. 600 Volt--(Not used)--	.25
14-15---	116819	Condenser, .05 Mfd. 600 Volt----------	.20
17 to 19	119193	Condenser, .01 Mfd. 600 Volt----------	.15
20------	119875	Condenser, .002 Mfd. 600 Volt----------	.15
21A-21B-	500223	Volume Control, 1 Meg. (With Switch)-----	.95
22A-22B-	500225	Condenser, Variable Tuning----------	3.00
23------	500855	Coil, Oscillator----------	
24------	500233	Transformer, 1st I.F.----------	1.15
25------	500236	Transformer, 2nd I.F.----------	1.10
26A-26B-	500256	Condenser, Electrolytic, (A-40 Mfd. 150 V.) (B-20 Mfd. 150 V.)----------	1.00
27-----C-500257		Speaker, P.M. Dynamic (4")----------	2.80
28------	500288	Loop Antenna----------	.95
29------	500291	Socket for power cord cable----------	.30
30-----C-500360		Transformer, Output for C-500257 Speaker-	1.95
31-----C-500361		Cone & Voice Coil for C-500257 Speaker---	1.65
32------	67986	Resistor-2,000 Ohms 1 Watt----------	.25

MISCELLANEOUS PARTS

Part Number	Description	List Price
114955	Clamp, for dial cord----------	$ .01
112745	Clip, Coil Mounting----------	.01
117057	Cord, Drive, supplied in 3' lengths----------	.15
500258	Dial Scale----------	.12
500287	Knob (R-3581 & R3582)----------	.15
500639	Knob (R-3583)----------	.10
500218	Pointer----------	.08
81145	Retaining Ring for Tuning Shaft----------Per C	.50
160026	Socket, Condenser Mtg.----------	.04
116793	Socket, For Dial Light----------	.40
500291	Socket, For Power Cord Cable----------	.30
116690	Socket, Octal Base----------	.12
161384	Spring, Dial cord tension----------	.06
111972	Washer, Extruded and tapped (for Mtg.)----------	.05
111456	Washer, Spring washer for tuning shaft-----Per C	.50
500219	Window, Dial----------	.30

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

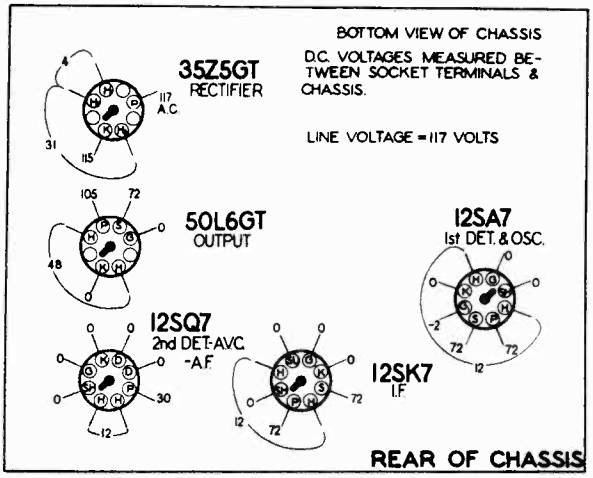
ALIGNMENT PROCEDURE

ALIGN THIS RECEIVER WITH LOOP CONNECTED & IN SAME RELATIVE POSITION TO CHASSIS AS WHEN IN CABINET

1. Connect output meter across voice coil; or from 50L6GT plate to chassis.
2. Connect the ground lead of the signal generator to chassis through a .25 mfd. condenser.
3. Set the volume control to the maximum volume position.
4. Set dial pointer to last mark after 55 with gang in full mesh.
5. Connect the antenna lead of the signal generator to the lug on the side of the rear section of the gang condenser, using a 200 mmfd. mica condenser in series.
6. Set the signal generator to 455 KC. Set receiver dial to a point where it does not affect signal. Adjust the trimmer screws on the top of each I.F. transformer for maximum output.
7. Disconnect signal generator lead from gang and place it near the loop. Turn the receiver dial to 1500 KC.
8. Set the signal generator to 1500 KC. and adjust the trimmer on front section of the receiver gang condenser for maximum output of the oscillator signal.
9. Adjust the trimmer on rear section of gang for maximum output at 1500 KC.

SOCKET VOLTAGES

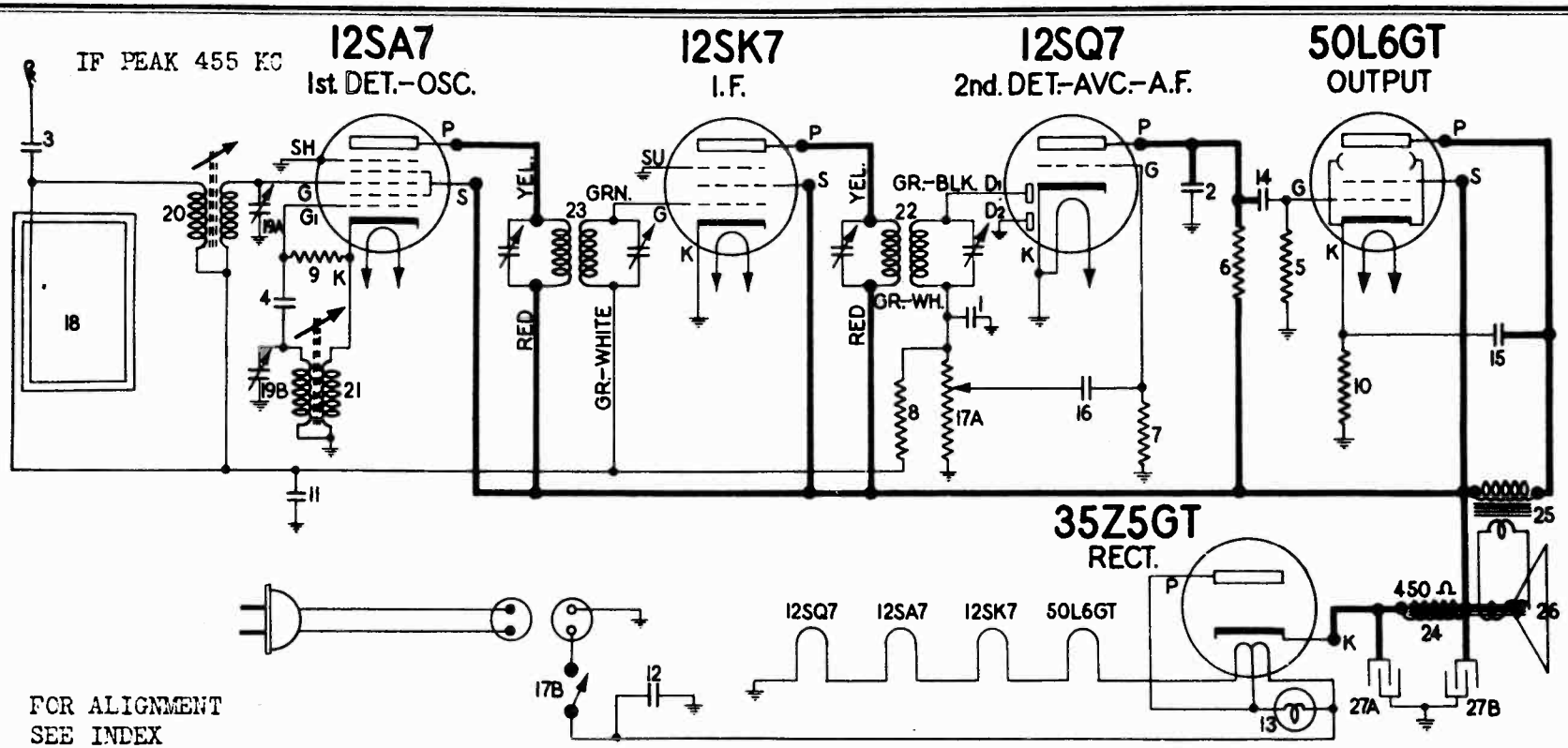
DIAL TUNED TO 540 KC. **NO SIGNAL CONDITION**



CIRCUIT NOTES

THIS MANUAL APPLIES ONLY TO THE R-358S CHASSIS. SERVICE DATA FOR THE R-358 CHASSIS IS CONTAINED ON ANOTHER SHEET

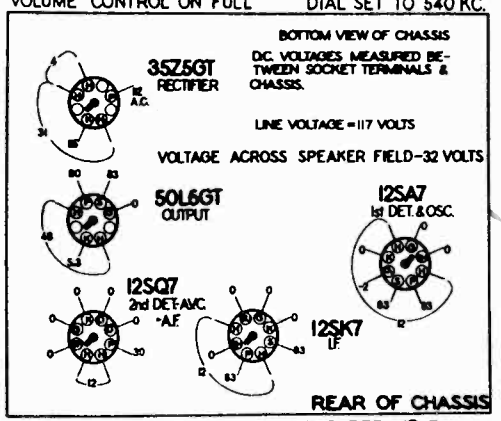
The main difference between the two chassis is the method of obtaining feedback in the oscillator circuit. Please note that the two oscillator coils bear different part numbers.



FOR ALIGNMENT
SEE INDEX

SOCKET VOLTAGES

VOLUME CONTROL ON FULL DIAL SET TO 540 KC.



USE A VOLTMETER OF 1000 OHMS PER VOLT

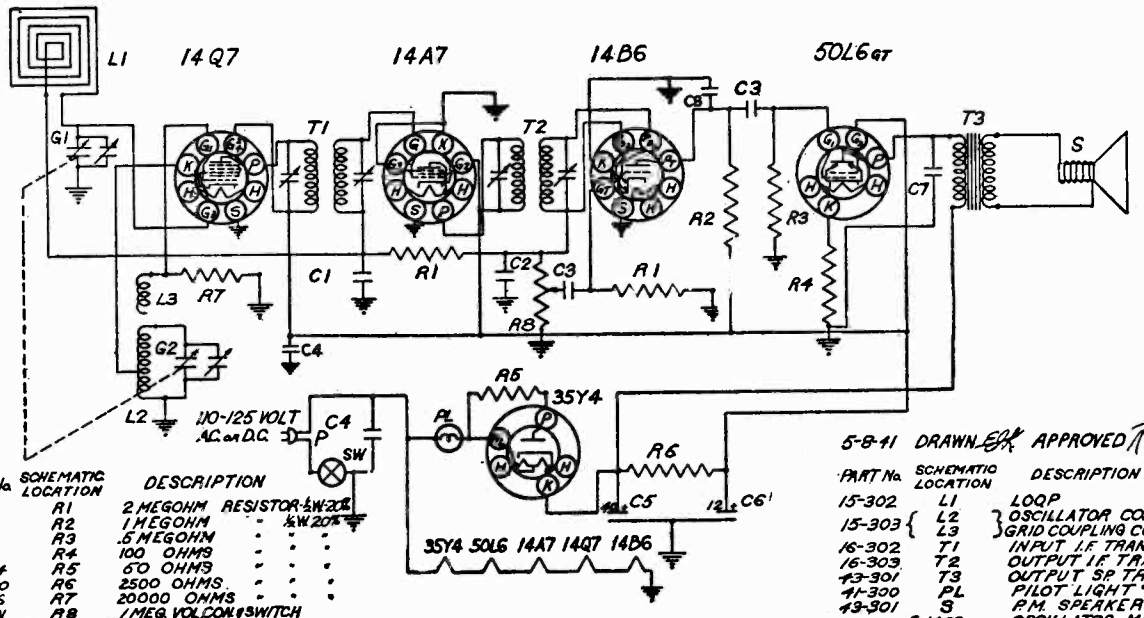
DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1-2	83539	Condenser - mica 260 mmfd.
3	85061	Condenser - mica 51 mmfd.
4	88686	Condenser - mica 200 mmfd.
5	112971	Resistor - insulated, 470,000 ohm ½ watt
6	112987	Resistor - insulated, 220,000 ohm ½ watt
7	116050	Resistor - insulated, 10 meg. ½ watt
8	116056	Resistor - 2.2 meg. ½ watt
9	116059	Resistor - insulated, 22,000 ohm ½ watt
10	116092	Resistor - 140 ohm, 1 watt-wire wound
11-12	116819	Condenser - .05 mfd. 600 volt
13	118921	Lamp-Dial (Mazda #47)
14-15	119193	Condenser - .01 mfd. 600 volt
16	119875	Condenser - .002 mfd. 600 volt
17A-17B	500223	Volume Control - 1 meg. (with switch)
18	501150	Loop Antenna
19A-19B	501223	Condenser - trimmer (2 sections) (A-35 mmfd.) (B-238 mmfd.)
20	501157	Coil - antenna (with slug)
21	501158	Coil - oscillator (with slug)
22	501166	Transformer - 2nd I.F.
23	501233	Transformer - 1st I.F.
24	R-500916	Speaker - dynamic (4")
25	R-501163	Transformer - output for R-500916 Spkr.
26	R-501164	Cone & Voice Coil for R-500916 Spkr.
27A-27B	501213	Electrolytic Condenser (A-40 mfd. - 150 volt) (B-20 mfd. - 150 volt)

MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION
114955	Clamp - for drive cord
112764	Clip - coil mounting
116948	Cord - tuning mech. drive (6 ft. length)
117057	Cord - dial drive (3 ft. length)
501099	Dial Scale
501140	Drive - drum & bushing
501135	Drive - shaft & disc
500639	Knob - gold
500287	Knob - tuning or volume
500218	Pointer
81145	Retaining ring - for tuning shaft - Per C
85827	Set Screw - 8/32 square head
160026	Socket - condenser mtg.(used with alum. can only)
500291	Socket - power cord cable
116690	Socket - octal base
500499	Socket - pilot lamp (with leads)
161384	Spring - dial cord tension
501145	Spring - tension for tuning mech.
500216	Tuning shaft
111972	Washer - extruded & tapped (mtg.)
111456	Washer - spring washer for tuning shaft - Per C
500219	Window - dial

TRAV-LER KARENOLA RADIO & TELEV. CORP.

MODELS T-501L, T-530A-L, MODEL T-2625



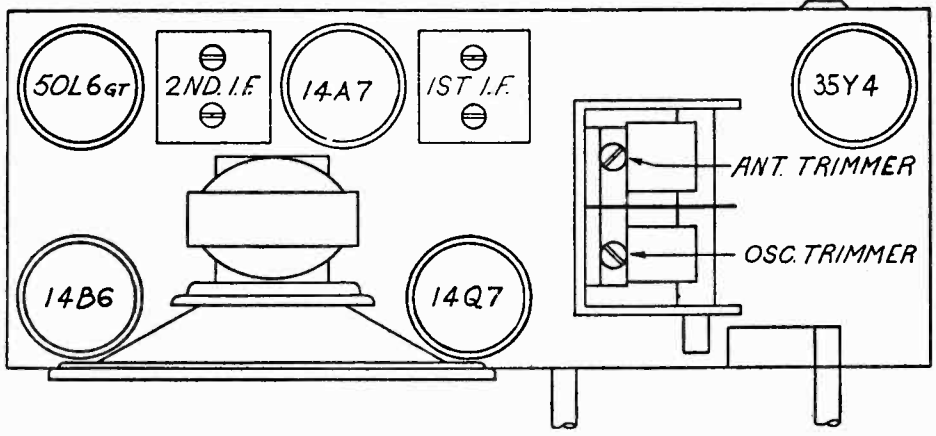
PART No.	SCHEMATIC LOCATION	DESCRIPTION
3-2	R1	2 MEGOHM RESISTOR ½W 20%
3-6	R2	1 MEGOHM " " "
3-1	R3	.5 MEGOHM " " "
3-31	R4	100 OHMS " " "
3-174	R5	60 OHMS " " "
3-120	R6	2500 OHMS " " "
3-26	R7	20000 OHMS " " "
5-301	R8	1 MEG VOL CON & SWITCH
10-301	G1, G2	GANG CONDENSER
6-12	C1	.05 MFD. 200V. COND.
6-8	C2	.0001 MFD. MICA "
6-3	C3	.01 MFD. 400V. "
6-14	C4	.05 MFD. 400V. "
7-301	C5, C6	40 MFD., 12 MFD. ELECTROLYTIC
6-306	C7	.005 MFD. 600V. COND.
6-305	C8	.0005 MFD. 400V. "

5-8-41 DRAWN APPROVED

PART No.	SCHEMATIC LOCATION	DESCRIPTION
15-302	L1	LOOP
15-303	L2	OSCILLATOR COIL
	L3	GRID COUPLING COIL
16-302	T1	INPUT I.F. TRANS.
16-303	T2	OUTPUT I.F. TRANS.
43-301	T3	OUTPUT S.P. TRANS
41-300	PL	PILOT LIGHT #47
43-301	S	P.M. SPEAKER
40-301	14Q7	OSCILLATOR MIXER
	14A7	I.F. AMPLIFIER
	14B6	DETECTOR-AUDIO
	50L6 GT	AUDIO AMPLIFIER
	35Y4	RECTIFIER
34-5	P	LINE CORD
6-301	SW	SWITCH ON VOL CON.

MODELS T-501-L and T-530A-L

110-125 VOLTS 60 CYCLES A.C. or D.C.



FOR ALIGNMENT INSTRUCTIONS SEE THE NEXT PAGE

IF PEAK 456 KC

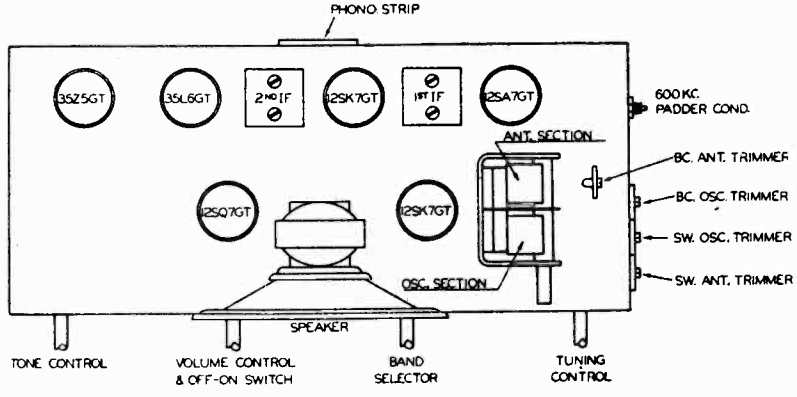
FIGURE-1

VOLUME CONTROL & OFF-ON SWITCH

TUNING SHAFT

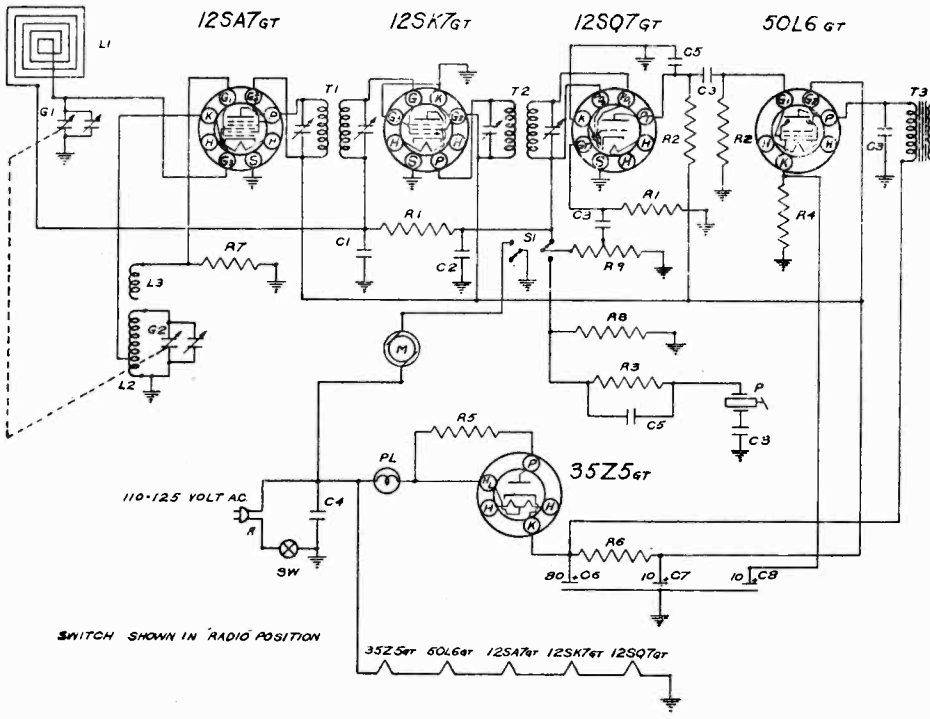
TUBE AND TRIMMER LOCATION
110-125 VOLTS 60 CYCLE AC OR DC

MODEL T-2625



MODEL T-2625
FIG. 1

MODELS TK-509, TK-510 TRAV-LER KARENOLA RADIO & TELEV. CORP.



IF PEAK 456 KC

3-11-41 DRAWN BY [illegible] APPROVED BY [illegible]

PART No	SCHEMATIC LOCATION	DESCRIPTION
3-2	R1	2 MEG. ½W 20% RESISTOR
3-6	R2	1 MEG. " " "
3-1	R3	.5 MEG. " " "
3-31	R4	100 " " " "
3-174	R5	50 " " " "
3-120	R6	2500 " " " "
3-26	R7	25000 " " " "
3-62	R8	200000 " " " "
6-301	R9	1 MEGOHM VOL. CONTROL
	SW	SWITCH
H-301	S1	CHANGEOVER SWITCH
6-12	C1	.05 MFD. 200V CONDENSER
6-8	C2	0001 MFD MICA "
6-9	C3	.01 MFD. 400V. "
6-14	C4	.05 MFD. 400V "
6-306	C5	.0005 MFD. 400V "
7-301	C6	80 MFD. 150V ELECTROLYTIC
	C7	10 MFD. 150V ELECTROLYTIC
	C8	10 MFD. 25V ELECTROLYTIC
15-302	L1	LOOP
16-303	L2	OSCILLATOR COIL
	L3	GRID COUPLING COIL
16-302	T1	INPUT I.F. TRANSFORMER
16-303	T2	OUTPUT I.F. "
43-301	T3	OUTPUT TRANSFORMER
	S	6" P.M. SPEAKER
41-300	PL	PILOT LIGHT #47
34-3	A	POWER CORD
51-301	P	CRYSTAL PICKUP L-26A
10-301	G1	GANG CONDENSER
	G2	GANG CONDENSER
55-300	M	PHONO MOTOR
40-301	12SA7GT	OSCILLATOR-MIXER
	12SK7GT	I.F. AMPLIFIER
	12SQ7GT	DETECTOR-AUDIO
	50L6GT	AUDIO AMPLIFIER
	35Z5GT	RECTIFIER

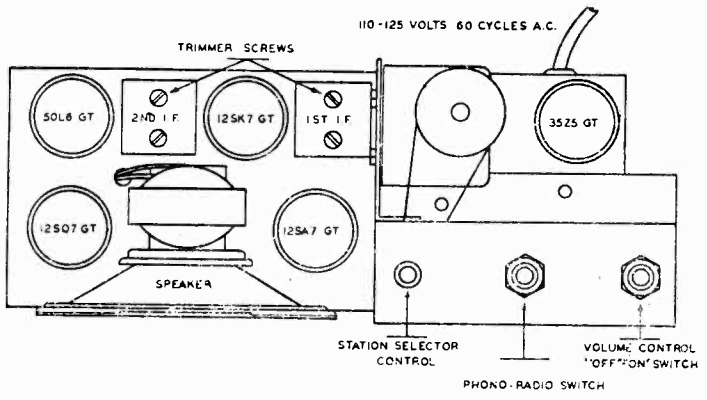


FIGURE - 1

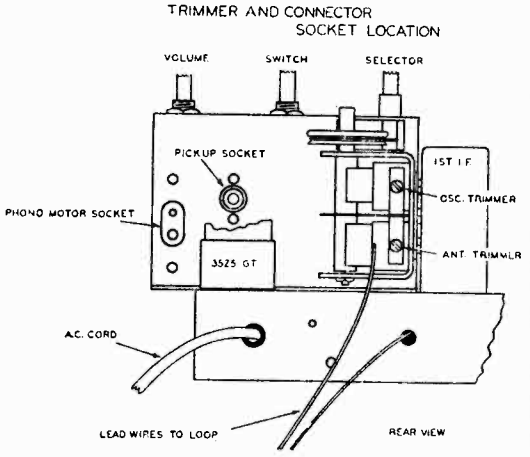


FIGURE - 2

Remove chassis from cabinet for alignment.

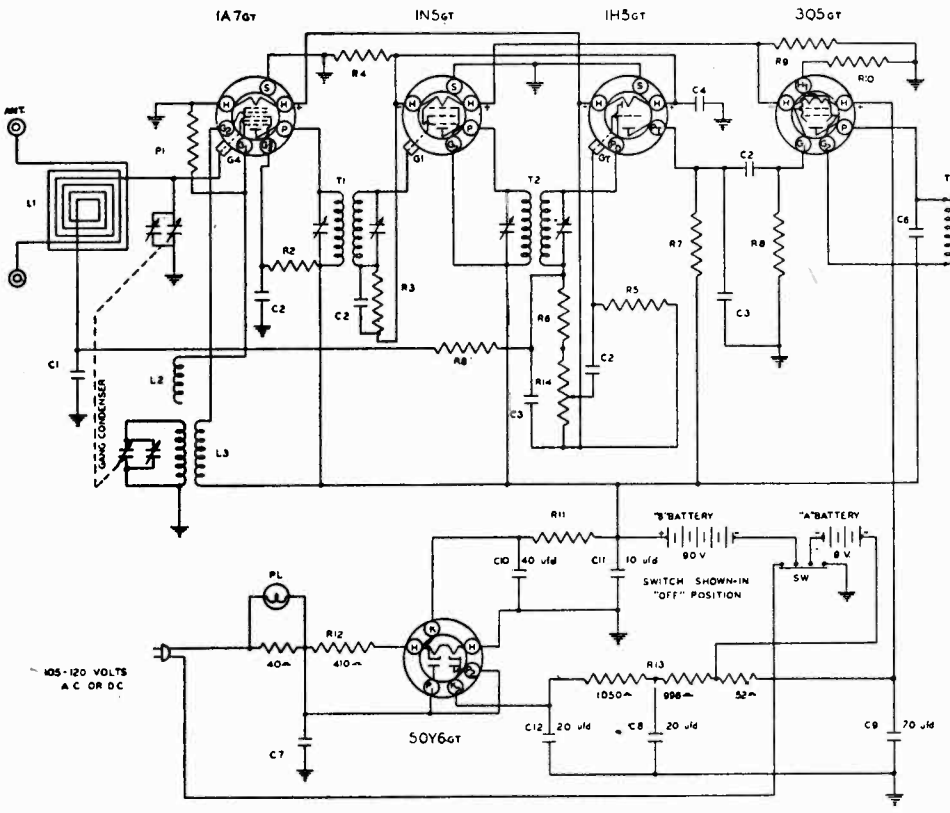
A signal generator is required having the following frequencies: 456KC, 1400KC, 1720KC.

First Step: Connect the generator lead through a .1 mfd. condenser to the terminal lug next to the Antenna trimmer on top of the tuning condenser. The ground lead from the generator may be connected to any convenient spot on the metal chassis. Adjust generator to 456KC and adjust IF trimmer screws until a maximum reading is noted on the output meter which has been connected across the speaker. The tuning condenser should be turned out to complete minimum capacity when aligning the IF. With generator lead still connected to antenna trimmer terminal, adjust generator frequency to 1720KC, and with tuning condenser still at minimum, adjust oscillator trimmer till the 1720KC signal is tuned in. Next, remove generator leads from set and connect both to a transmitting loop. This loop can be made with 2 turns of wire about 6 inches in diameter. Adjust generator frequency to 1400KC. Turn tuning condenser until the signal is tuned in and adjust antenna trimmer until a maximum reading is noted. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory so as to insure proper alignment at the lower frequency end of the dial.

ALIGNMENT FOR MODELS
T-501-L
T-530A-L
TK-509
TK-510
T3-512

TRAV-LER KARENOLA RADIO & TELEV. CORP.

MODEL TB-512



IF PEAK 456 KC.

MODEL TB-512

PART NO.	SCHEMATIC LOCATION	DESCRIPTION
3-135	R1	100000Ω ½W. 20% RESISTOR
3-27	R2	40000Ω " " "
3-9	R3	4 MEG Ω " " "
3-314	R4	2000Ω " 10% "
3-141	R5	6 MEG. Ω " 20% "
3-157	R6	50,000Ω " " "
3-309	R7	1 MEG. Ω " " "
3-2	R8	2 MEG. Ω " " "
3-315	R9	800Ω " 10% "
3-150	R10	1000Ω " " "
3-316	R11	2200Ω " " "
4-304	R12	450Ω 10.5-W.-10% -W.W. "
4-303	R13	2100Ω 5.5-W.-5% -W.W. "
5-305	R14	1 MEG VOLUME CONTROL &
	SW	SWITCH
6-12	C1	.05 MFD.-200V CONDENSER
6-3	C2	.01 " -400V "
6-46	C3	.0001 " -600V "
6-70	C4	.1 " -200V "
6-69	C5	.0005 " -600V "
6-68	C6	.001 " " "
6-14	C7	.05 " -400V "
7-306	C8	20 " -80V ELECTROLYTIC CONDENSER
7-305	C9	70 " -7V " "
7-304	C10	40 " -150V " "
	C11	10 " " " "
	C12	20 " " " "
15-311	L1	LOOP
15-310	L2	OSCILLATOR COIL
	L3	" "
16-306	T1	INPUT I.F. TRANSFORMER
16-303	T2	OUTPUT I.F. "
43-306	T3	" " ON
	SPKR.	P.M. SPEAKER
41-300	PL	PILOT LIGHT #47
40-305	1A7 GT	OSCILLATOR-MIXER
	1N5 GT	I.F. AMPLIFIER
	1H5 GT	DETECTOR-AUDIO
	30S GT	POWER AMPLIFIER
	50Y6 GT	RECTIFIER

The following is a table of manufacturers and their battery type number:

"B" BATTERIES
(2 Required)

Mfgr.	Volts	Type No.
Burgess	45 "B"	M30
General	45 "B"	W30B
Bright Star	45 "B"	3033
Usalite	45 "B"	640
Rayovac	45 "B"	P7830
Eveready	45 "B"	482

"A" BATTERIES
(2 Required)

Mfgr.	Volts	Type No.
Burgess	4½ "A"	G3
General	4½ "A"	3H3
Bright Star	4½ "A"	361
Usalite	4½ "A"	683
Rayovac	4½ "A"	P83A
Eveready	4½ "A"	746

TUBE AND TRIMMER LOCATION

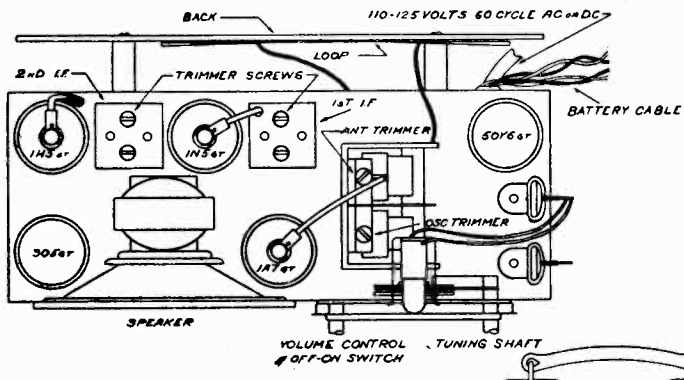
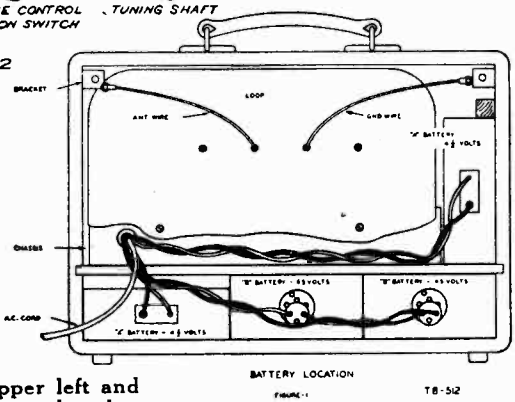


FIGURE-2

FOR ALIGNMENT, SEE INDEX



BATTERY LOCATION

FIGURE-1 TB-512

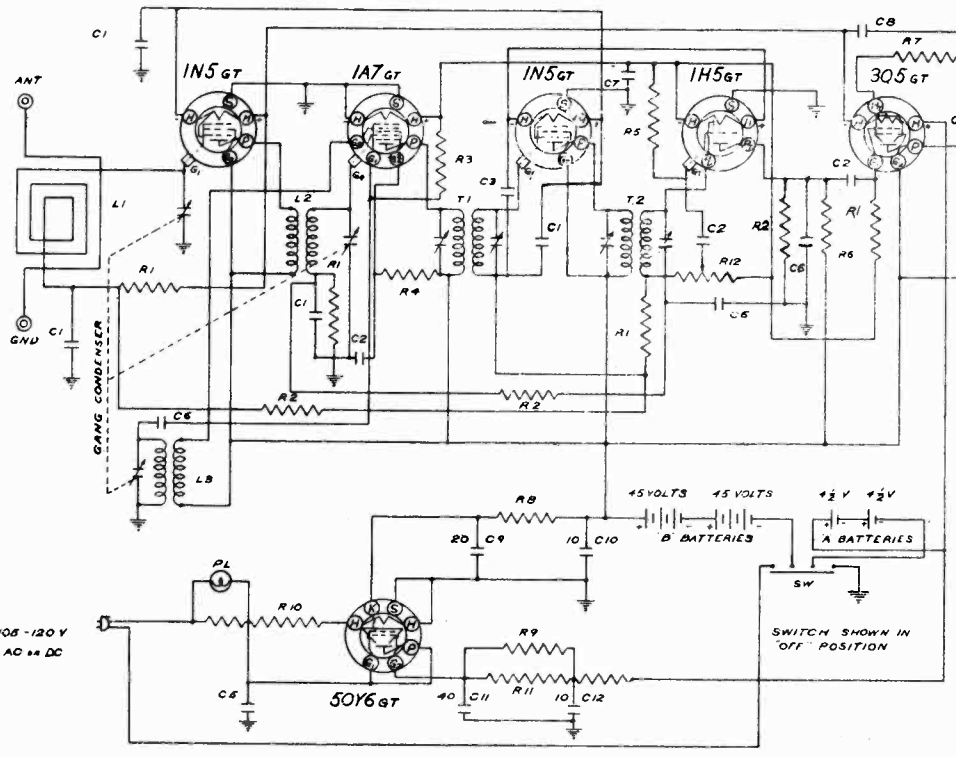
BATTERY SERVICING

(See Figure No. 1)

To replace batteries, loosen and remove the two screws at the upper left and right hand corners of the cabinet back. Remove the back and pull out the plug from each battery. Never pull on the wires connected to the plugs as they may break. Always grasp the plug form between the fingers, or use a flat blade to pry out the plug. Observe with care the position of the batteries and plugs when replacing. Be sure that batteries and plugs are replaced as shown in the "Battery Location" diagram. (Figure No. 1)

MODEL TB-601
MODEL T-2625

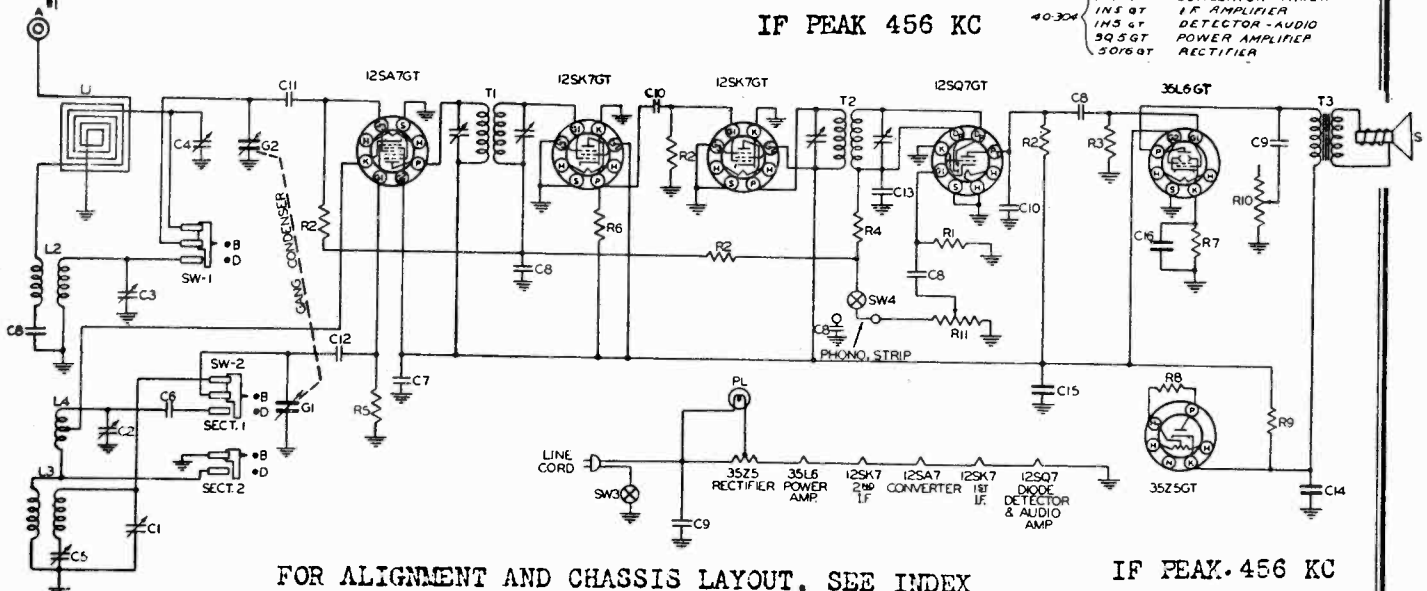
TRAV-LER KARENOLA RADIO & TELEV. CORP.



PART NO	SCHEMATIC LOCATION	DESCRIPTION
3-2	R1	2 MEG ~ ½ W 20% RESISTOR
3-6	R2	1 " " " "
3-108	R3	150,000 " " " "
3-157	R4	50,000 " " " "
3-311	R5	3 MEG " " " "
3-309	R6	500,000 " " " "
3-24	R7	700 " " " "
3-312	R8	3000 " " " "
3-8	R9	25000 " " " "
4-301	R10	465 ~ WIRE WOUND "
4-302	R11	2280 ~ " "
5-304	R12	2 MEG ~ VOLUME CONTROL
	SW	& SWITCH
6-12	C1	.05 MFD. 200V CONDENSER
6-3	C2	.01 MFD. 400V "
6-46	C3	.1 MFD. 200V "
6-60	C4	.002 MFD. 400V "
6-42	C5	.1 MFD. 400V "
6-307	C6	.00025 MFD. 600V "
6-308	C7	25 MFD. 25V "
	C8	70 MFD. 7V "
7-303	C9	20 MFD. 150V ELECTROLYTIC
	C10	10 MFD. 150V ELECTROLYTIC
	C11	40 MFD. 150V ELECTROLYTIC
	C12	10 MFD. 35V ELECTROLYTIC
15-306	L1	LOOP
16-307	L2	RF COIL
15-308	L3	OSCILLATOR COIL
16-306	T1	INPUT I.F. TRANSFORMER
16-305	T2	OUTPUT I.F. "
43-303	T3	OUTPUT "
	S	ON P.M. SPEAKER
41-300	PL	PILOT LIGHT #47
40-304	1N5 GT	RF AMPLIFIER
	1A7 GT	OSCILLATOR-MIXER
	1N5 GT	I.F. AMPLIFIER
	1H5 GT	DETECTOR-AUDIO
	30S GT	POWER AMPLIFIER
	50Y6 GT	RECTIFIER

DRAWN BY E.J.K. APPROVED BY J.F.R.

IF PEAK 456 KC



FOR ALIGNMENT AND CHASSIS LAYOUT, SEE INDEX

IF PEAK. 456 KC

PART NO	SCHEMATIC LOCATION	DESCRIPTION
3-2	R1	2 MEG ~ ½W 20% RESISTOR
3-6	R2	1MEG ~ " " "
3-1	R3	500M ~ " " "
3-4	R4	50M ~ " " "
3-116	R5	30M ~ " " "
3-321	R6	1700 ~ " 10% "
3-34	R7	100 ~ " 20% "
3-174	R8	50 ~ " "
3-37	R9	2500 ~ " " "
5-311	R10	25M ~ TONE CONTROL
5-310	R11	1MEG ~ VOLUME CONTROL
9-305	C1	BC. OSC. TRIMMER COND.
	C2	SW. OSC. TRIMMER COND.
	C3	SW. ANT. TRIMMER COND.
9-47	C4	BC. ANT. TRIMMER COND.
9-27	C5	BC. OSC. PADDER COND.

PART NO	SCHEMATIC LOCATION	DESCRIPTION
	C6	SW. OSC PADDER COND. 250WV (ON COIL)
6-26	C7	.01 MFD. 400 VDC PAPER COND.
6-3	C8	.01 MFD. " " "
6-14	C9	.05 MFD. " " "
8-10	C10	.00025 MFD. 20% MICA COND.
8-43	C11	.0005 MFD. " " "
8-13	C12	.00005 MFD. " " "
8-8	C13	.0001 MFD. " " "
A7-302	C14	80 MFD. 150WV ELECTROLYTIC COND.
	C15	10 MFD. " " "
	C16	10 MFD. 25 WV " "
15-315	L1	BC. LOOP
15-316	L2	SW. ANTENNA COIL
15-317	L3	BC OSCILLATOR COIL
	L4	SW. " "
43-301	S	P.M. SPEAKER

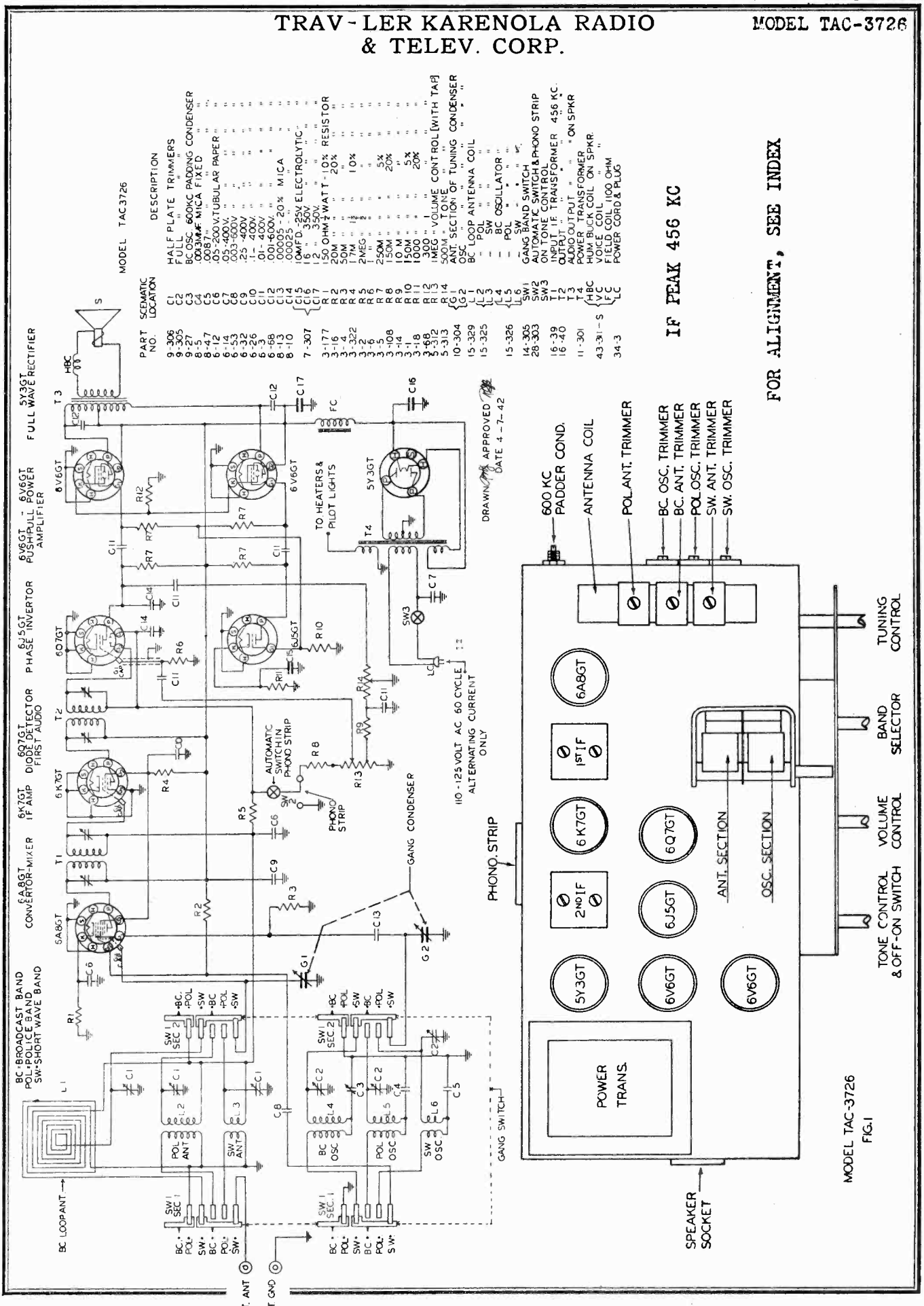
PART NO	SCHEMATIC LOCATION	DESCRIPTION
16-39	T1	INPUT IF TRANSFORMER
16-40	T2	OUTPUT IF "
	T3	OUTPUT TRANSFORMER (ON SPKR)
14-307	SW1	BAND SWITCH
	SW2	" "
	SW3	ON-OFF SWITCH ON VOL. CONTROL
28-303	SW4	PHONO. JACK & SWITCH
47	PL	PILOT LIGHT
40-306	12SA7GT	CONVERTER
	12SK7GT	1ST & 2ND IF
	12SQ7GT	DIODE DETECTOR & AUDIO AMP.
	35L6GT	POWER AMPLIFIER
	35Z5GT	RECTIFIER
10-304	G1	OSCILLATOR TUNING COND.
	G2	ANTENNA TUNING COND.

DRAWN BY J.F.R. APPROVED BY J.F.R. MARCH 2, 1942

MODEL T-2625

TRAV-LER KARENOLA RADIO & TELEV. CORP.

MODEL TAC-3726



MODEL T-2625
MODEL TAC-3726

TRAV-LER KARENOLA RADIO & TELEV. CORP.

ALIGNMENT FOR MODEL 2625

I. F. Alignment: Connect the generator lead through a .1MFD condenser to the terminal lug on the "Antenna" section of the gang condenser. The ground lead from the generator should be connected to the chassis base. Set the generator at 456KC. Adjust the trimmer screws in the 1st and 2nd I. F. cans (see Fig. No. 1) until a maximum reading is noted on the output meter.

The receiver volume control should be turned to maximum during the I F and all subsequent alignments, to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

BC or Broadcast Alignment: With the generator leads still connected as in I. F. Alignment, rotate the tuning condenser to complete minimum capacity. Set the generator to 1720KC. Adjust the BC oscillator trimmer until the signal is tuned in. Next, remove the generator leads and connect them to the antenna lead of the loop antenna, through a 100 MMFD condenser. Set the generator to 1400KC and rotate the tuning condenser until the signal is tuned in. Adjust the BC antenna trimmer until a maximum reading is noted on the output meter. Set the generator to 600KC and turn the tuning condenser until the signal is tuned in. Rock the tuning control back and forth slowly until a maximum reading is noted on the output meter. It is advisable to return to the 1720KC adjustment and recheck that setting to make sure it has not changed while padding at 600KC.

SW or Short Wave Alignment: Set the generator at 18.3MC. Turn the receiver band switch to short wave position. Turn the tuning condenser to complete minimum capacity. The generator leads should be connected to the antenna lead of the loop through a 400 Ohm resistor. Adjust the S. W. oscillator trimmer slowly until the 18.3MC signal is tuned in. At this point, it will be well to make sure that the fundamental signal is tuned in. Turn up the generator output and tune the receiver to approximately 17.3MC. At this point, the 18.3MC signal will be heard again but much weaker. This is the image frequency. If the image is not heard, then turn the tuning condenser back to complete minimum and readjust the SW oscillator trimmer. Remember the image must always be heard (at 2 times the IF frequency in KC) lower in frequency than the fundamental signal. After the oscillator has been properly set, tune the signal generator to 16MC and rotate the tuning control until the signal is tuned in. Adjust the SW antenna trimmer until a maximum reading is noted on the output meter. It is advisable to rock the gang slowly while adjusting the antenna trimmer. Set the generator to 6MC and tune the signal in on the receiver. Check the alignment at this frequency. No adjustment should be necessary, as the coils have been carefully checked before leaving the factory. A fixed oscillator padding condenser is used at 6MC.

ALIGNMENT FOR MODEL TAC-3726

IF Alignment: Connect the generator lead through a .1 mfd. condenser to the terminal lug on the "Antenna" section of the gang condenser. The ground lead from the generator should be connected to the chassis base. Set the generator at 456KC. Adjust the trimmer screws in the first and second IF cans (See Fig. No. 1) until a maximum reading is noted on the output meter.

The receiver volume control should be turned to maximum during the IF and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

BC OR BROADCAST ALIGNMENT: With the generator leads still connected as in IF alignment, rotate the tuning condenser until the dial pointer comes to 1400KC. Set the signal generator at 1400KC and adjust the BC oscillator trimmer until the signal is tuned in. Remove the generator lead from the gang condenser and connect it to the yellow wire which protrudes from the back of the set through a 100 mmfd. condenser. Adjust the BC antenna trimmer until a maximum reading is noted on the output meter. Set the generator to 600KC and turn the tuning condenser until the signal is tuned in. Rock the tuning control back and forth slowly until a maximum reading is noted on the output meter. It is advisable to return to the 1400KC adjustment and recheck that setting to make sure it has not changed while padding at 600KC.

INT. OR POLICE BAND ALIGNMENT: The generator lead should now be connected to the antenna lead through a 400 ohm resistor. Rotate the tuning condenser until the dial pointer comes to 5MC. Turn the band switch to INT or Police position. Set the generator to 5MC and adjust the POL oscillator trimmer until the signal is tuned in. Adjust the POL antenna trimmer until a maximum reading is noted on the output meter. Set the generator to 1.8MC and tune the receiver until the signal is tuned in. Check the alignment at this frequency. No adjustments should be necessary as a fixed oscillator pad is used at this frequency and the coils and condenser have been thoroughly checked at the factory.

SW OR SHORT WAVE ALIGNMENT: Set the generator at 18MC. Turn the receiver band switch to short wave position. Turn the tuning condenser until the dial pointer comes to 18MC. The generator lead should be connected to the antenna lead through a 400 ohm resistor. Adjust the S.W. oscillator trimmer slowly until the 18MC signal is tuned in. At this point, it will be well to make sure that the fundamental signal is tuned in. Turn up the generator output and tune the receiver to approximately 17MC. At this point, the 18MC signal will be heard again but much weaker. This is the image frequency. If the image is not heard, then turn the tuning condenser back to 18MC and readjust the SW oscillator trimmer. Remember the image must always be heard (at two times the IF frequency in KC) lower in frequency than the fundamental signal. After the oscillator has been properly set, tune the signal generator to 16MC and rotate the tuning control until the signal is tuned in. Adjust the SW antenna trimmer until a maximum reading is noted on the output meter. It is advisable to rock the gang slowly while adjusting the antenna trimmer. Set the generator to 6MC and tune the signal in on the receiver. Check the alignment at this frequency. No adjustment should be necessary as the coils have been carefully checked before leaving the factory. A fixed oscillator padding condenser is used at 6MC.