

Engineering Data

Stromberg-Carlson No. 250 Radio Receivers

STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY
Rochester, New York

ELECTRICAL SPECIFICATIONS

Type of Circuit.....	Superheterodyne with Automatic Frequency Control
Tuning Ranges.....	} A—530 to 1600 Kc.; B—1600 to 4800 Kc.; C—4800 to 11,000 Kc. D—11,000 to 22,000 Kc.; E—22,000 to 60,000 Kc.
Number and Types of Tubes.....	} 2 No. 6K7, 1 No. 6A8, 2 No. 6J7, 1 No. 6B8, 1 No. 6H6, 1 No. 6F5, 1 No. 6C5, 2 No. 6L6, 1 No. 6G5, 1 No. 5U4G
Input Voltage Rating.....	105 to 125 Volts A. C.
Power Frequency Rating.....	25 to 60 Cycles and 50 to 60 Cycles
Input Power Rating.....	145 Watts
Frequency of Intermediate Amplifier.....	465 Kilocycles

APPARATUS SPECIFICATIONS

No. 250-L.....	50 to 60 Cycles; P-27631 Chassis; P-27504 Loud Speaker
No. 250-LB.....	25 to 60 Cycles; P-27632 Chassis; P-27504 Loud Speaker

CIRCUIT DESCRIPTION

The No. 250 Receiver is a thirteen tube Automatic Frequency Control (A. F. C.) and "Adjustable High Fidelity" receiver employing metal tubes. There are five tuning ranges in this receiver. The Short-Wave Foreign spectrum is divided into two ranges in this receiver; this arrangement gives "spread-band" tuning which enables the operator to tune the receiver to stations located in these ranges with far greater ease. The Automatic Frequency Control circuit is arranged so that it is effective only in the Standard Broadcast Range and should only be operated after a signal has been carefully tuned in with the A. F. C. knob set to the "Off" position. With this control operating, the receiver will be automatically kept in tune with the desired station as long as the station is operating or provided the signal has no fading characteristics. In tuning in a distant station which is weak, it will be found that the Automatic Frequency Control will not hold this station if a strong signal is present in either adjacent channel. This same phenomenon will occur if two stations, in adjacent channels are almost of equal signal strength with the weakest signal fading slightly; with this condition the strong signal will have a tendency to "pull in" when the receiver is tuned to the station which is slightly weaker and fading.

Maximum selectivity between adjacent stations located in the Standard Broadcast Range is obtained by the use of an additional tuned radio frequency ("Bi-resonator") circuit. When any of the other ranges are in operation, this additional tuned circuit is cut out of the receiver circuit. When either the Aircraft or Short Wave ranges are in operation the receiver functions as a three gang tuning capacitor receiver and when the Ultra Short Wave range is in operation the receiver functions as a two gang tuning capacitor receiver. When reception conditions warrant, the fidelity of this receiver can be increased by rotating the "Tone-Fidelity" switch control knob in a clockwise rotation from the normal position of this control. High fidelity reproduction is obtained in two steps from the normal position of this control. The maximum undistorted power output of this receiver is 15 watts when working into the loud speaker supplied with this receiver (P-27504 Loud Speaker). This speaker has a voice coil impedance of 1½ ohms and its field coil resistance, when cold, is 505 ohms.

These receivers are also equipped with the Stromberg-Carlson Acoustical Labyrinth, a device which extends the bass response and provides reproduction only from the front of the cabinet, eliminating all cabinet resonance. Sound diffusing vanes are also employed in front of the loud speaker opening which distribute the higher pitched tones, thereby providing excellent reproduction in all parts of the room by spreading out these directional frequencies. These receivers are also provided with a low level bass frequency compensating circuit, which in conjunction with the volume control circuit, operates so that balanced reproduction is obtained for any setting of the volume control. A "Bass" control is also provided to increase the response at the lower (bass) audio frequencies if desired when operating the receiver at medium or low volume levels.

A metal guard frame is furnished on these receivers to prevent damage to the chassis components and also to facilitate ease of servicing should this become necessary. Do not turn the chassis over on its guard frame without first removing the tuning indicator unit which is secured to the metal guard frame. To remove the tuning indicator unit from the guard frame, first unscrew the knurled screw which holds the tuning indicator's clamp to the metal guard frame, which will then allow the tuning indicator unit to be removed from the guard frame.

The various tubes are used in these receivers as follows: One No. 6K7 tube is used in the R. F. Amplifier, and the other No. 6K7 tube is used in the I. F. Amplifier. The No. 6A8 tube is used as a Demodulator tube. One No. 6J7 tube is used as the Oscillator tube, and the other No. 6J7 tube is used in the Oscillator Control Circuit for Automatic Frequency Control. The No. 6B8 tube is used as an I. F. Amplifier, Demodulator, and A. V. C. tube. The No. 6H6 tube is the Discriminator tube for the Automatic Frequency Control circuit. The No. 6F5 tube is used as the Audio Amplifier tube and the No. 6C5 tube is used as the Phase Inverter tube of the Audio Amplifier. The two No. 6L6 tubes are used in the Audio Power Output stage. The No. 5U4G tube is the Rectifier tube of the Power Supply Unit, and the No. 6G5 tube is used for indicating resonance in the Tuning Indicator System.

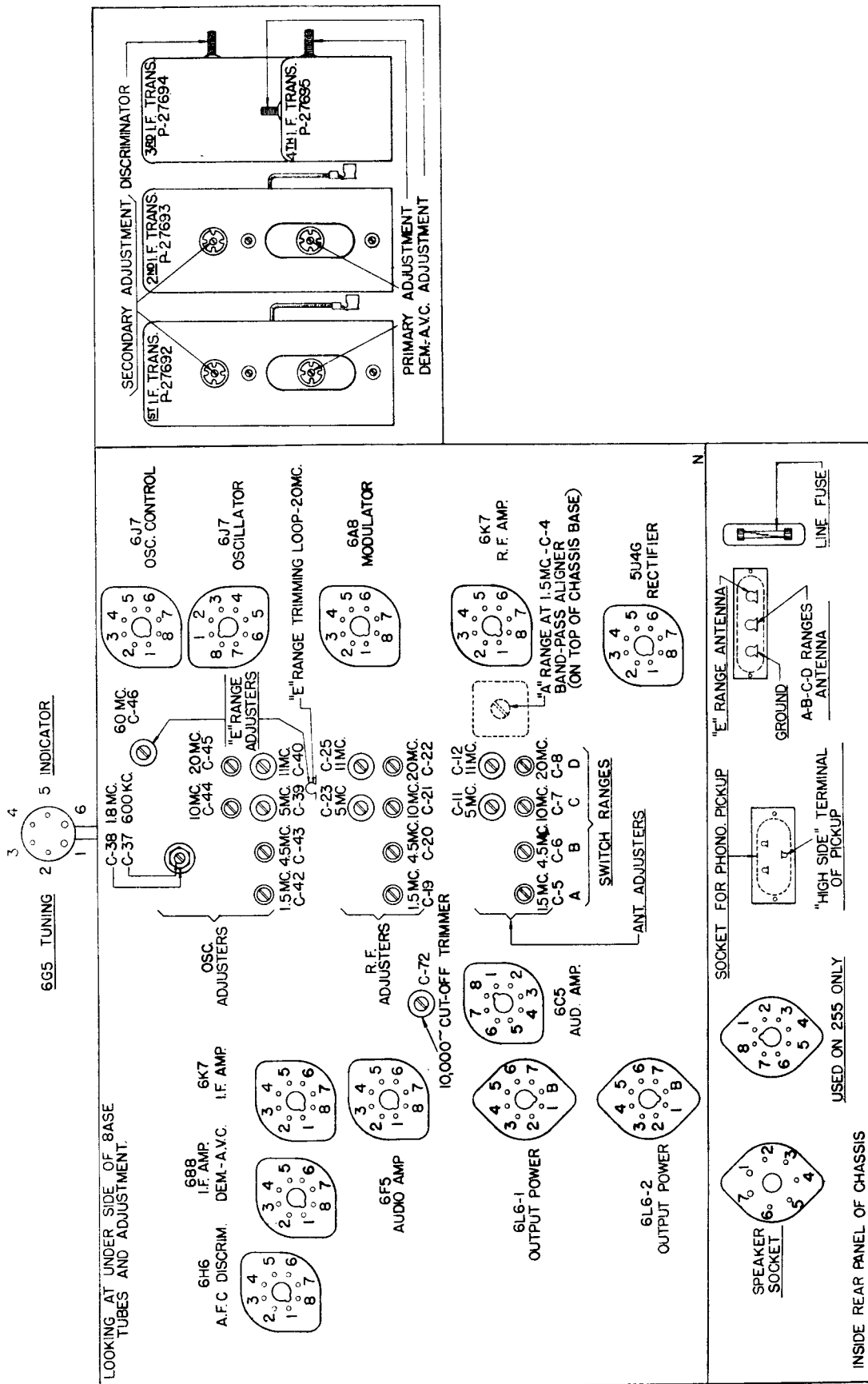


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Adjustments.

NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets. The receiver is, therefore, in operation when the measurements are made. Figure 1, shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 250 volt scale was used.

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6K7	R. F. Amp.	0	0	0	+230	+90	0	+80	<i>6.1</i>	0	2-7	<i>6.1</i>
6A8	Modulator	0	0	0	+230	+80	-2.0	+80	<i>6.1</i>	0	2-7	<i>6.1</i>
6J7	Oscillator	0	0	<i>6.1</i>	+60	+180	0	0	0	0	2-7	<i>6.1</i>
6J7	Oscillator Control	0	0	0	+190	+110	+5.8	0	<i>6.1</i>	+5.8	2-7	<i>6.1</i>
6K7	I. F. Amp.	0	0	0	+235	+90	0	0	<i>6.1</i>	0	2-7	<i>6.1</i>
6B8	I. F. Amp.— Dem.—A. V. C.	0	0	<i>6.1</i>	+225	-0.1	-0.1	+90	0	0	2-7	<i>6.1</i>
6H6	A. F. C. Discriminator	—	0	0	-0.25	0	-0.2	-0.2	<i>6.1</i>	0	2-7	<i>6.1</i>
6F5	Audio Amp.	0	0	0	+135	+135	0	0	<i>6.1</i>	+1.3	2-7	<i>6.1</i>
6C5	Audio Amp.	—	0	0	+100	+135	0	+1.3	<i>6.1</i>	+5.2	2-7	<i>6.1</i>
6L6 No. 1	Audio Output	—	0	0	+300	+305	0	0	<i>6.1</i>	+22	2-7	<i>6.1</i>
6L6 No. 2	Audio Output	—	0	0	+300	+305	0	0	<i>6.1</i>	+22	2-7	<i>6.1</i>
6G5	Tuning Indicator	—	<i>6.1</i>	+0.5	-0.2*	+245 ^b	0	0	—	—	1-6	<i>6.1</i>
5U4G	Rectifier	—	0	+430	—	395	—	395	—	+430	2-8	<i>4.8</i>
Speaker Socket		—	+420	0	0	+430	+430	0	+320	—		

A. C. voltages are indicated by italics. Receiver tuned to 1000 kc., no signal.

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers, and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, the procedure given in these instructions should be carefully followed. The preferred method of aligning these receivers is by the use of a suitable cathode ray oscillograph and frequency modulator unit in conjunction with the standard signal generator.

To accurately align circuits in these receivers, it is necessary to use a high grade signal generator capable of being modulated 30% and having an output voltage of at least 100,000 microvolts; it will also be necessary to have this output voltage controlled so that only a few microvolts may be fed into the receiver. In conjunction with the signal generator, a sensitive output meter should be used for determining the maximum signal voltage developed across the voice coil of the loud speaker. In addition to this equipment, it will be necessary when making a final adjustment of the "Discriminator" tuned circuit to use a milliammeter having a range of 0 to 10 milliamperes connected in series with the cathode of the No. 6J7 oscillator control tube by means of an adaptor plug inserted between the tube and its socket. The leads to the meter should not be longer than 15", and should be shunted at the socket connections by a capacitor of not less than 0.25 Mfd.

In order to make the aligning adjustments in an easy and satisfactory manner, it is recommended that the Stromberg-Carison P-27657 and P-27658 aligning tools be used.

Before proceeding with the alignment of any circuits in these receivers, except when specifically directed, be sure that the Fidelity Control knob is set for the "Normal" position and that the Automatic Frequency Control knob is set to the "Off" position. The "Off-On-Bass-Phonograph" Control should also be set for the "Normal" position. In making any alignment adjustments always adjust the test oscillator's output voltage to the minimum value where a good alignment may still be obtained, except when specifically directed in these instruc-

tions. Figure 1, shows the location of all the aligning capacitors or adjustments for this receiver. It will not be necessary to remove the chassis in this receiver from its cabinet in order to make any alignment adjustments. The alignment adjustments for the Intermediate Frequency circuits are accessible from the rear of the receiver, and the adjustments for the Radio Frequency circuits are accessible through the apertures located in the bottom metal base plate of the chassis. These apertures are easily accessible through the bottom of the cabinet shelf. Never align any of these receivers without having the metal base plate fastened to the chassis base.

Dial Adjustment

Before aligning the circuits of these receivers, the tuning dial must be properly aligned to "track" with the gang tuning capacitor. To check whether the dial is set correctly with respect to the gang tuning capacitor, rotate the "Rapid Station Selector" knob in a counter-clockwise direction so that the gang tuning capacitor is set to its maximum capacity position. Then, with the receiver turned "on", the illuminated dial indicator line should be exactly centered over the dial alignment lines (black lines) which are located at the extreme low frequency end of each scale on the dial. If these lines do not center over the illuminated dial indicator line, loosen the two set screws located on the hub of the dial. Then, rotate the dial so that these alignment lines are centered over the illuminated dial indicator line. The two set screws of the dial hub should then be securely tightened.

Intermediate Frequency and A. F. C. Circuit Adjustments

The intermediate frequency system employed in this receiver is a complex circuit. The first I. F. amplifier is coupled to the second I. F. amplifier through the No. 6K7 tube. The second and third I. F. transformers are coupled through the pentode section of the No. 6B8 tube. The third I. F. transformer is in effect a distributing network rather than a transformer only; it contains a primary winding coupled to two other networks. One of these networks links the diode stage (Demodulator-A. V. C.) with the I. F. signal, while the other network resembles the secondary of a push-pull transformer and constitutes the tuned "Discriminator" circuit. This "Discriminator" network operating into the No. 6H6 tube supplies the characteristic voltage demanded by the oscillator control tube. The fourth I. F. transformer feeds the diode plates of the No. 6B8 tube.

The intermediate frequency used in these receivers is 465 kilocycles. Because of the necessity of obtaining the proper shape of resonance curve of these stages in a high fidelity receiver, it is recommended that unless it is absolutely essential, these I. F. adjustments be untouched. In the factory these adjustments are made using a visual system which allows the operator to see the exact shape of the resonance curve. For this reason it is best to have these adjustments made at the factory. However, in the case where this cannot be done, the following procedure should be followed:

1. Operate the Range Switch of the receiver to the "A" range position, and set the tuning dial to its extreme low frequency position. Set the Fidelity Control to its "Normal" position, the Automatic Frequency Control knob to the "Off" position and the "Off-On-Bass" Control knob to its "Normal" position. Never attempt to align the R. F. or I. F. circuits of this receiver with the Fidelity Control knob set at any position other than the "Normal Fidelity" position, and the Automatic Frequency Control knob set at the "On" position unless specifically directed in the following paragraphs.

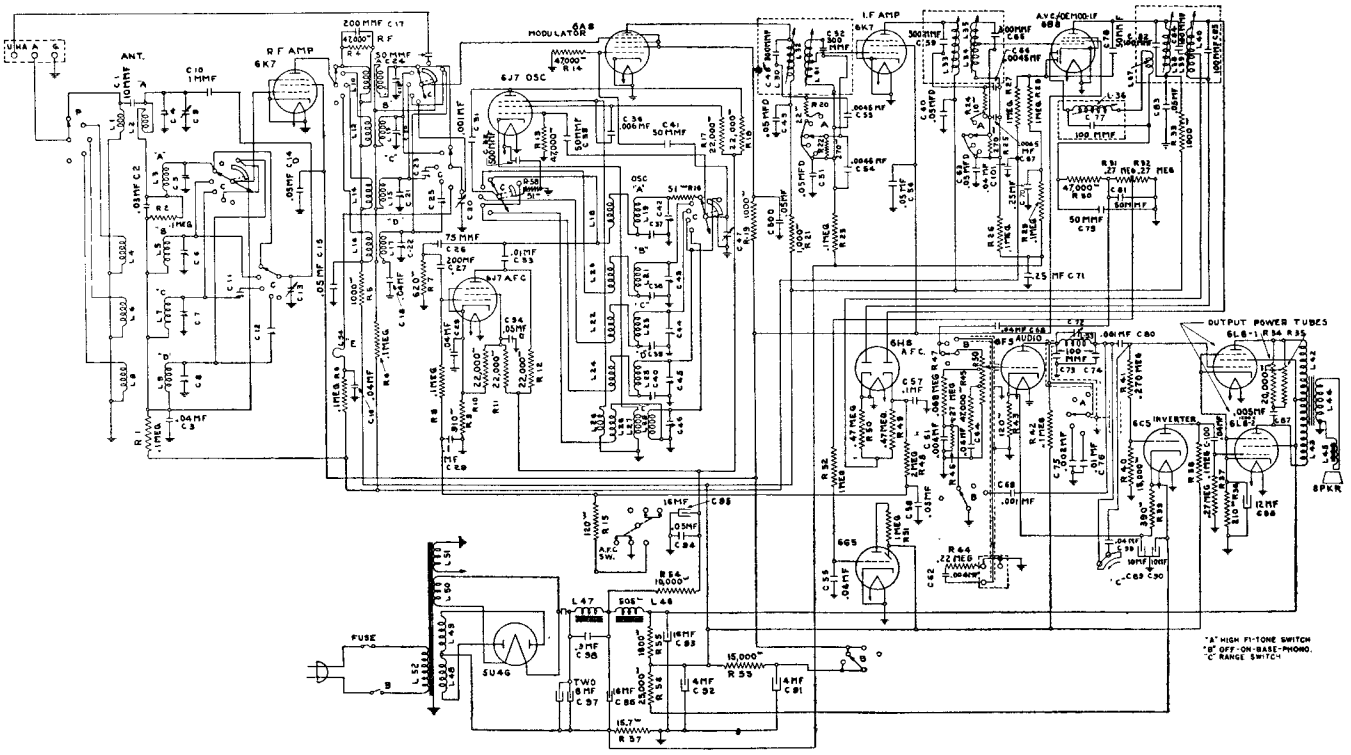


Fig. 2. Schematic Circuit.

2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6A8 modulator tube, a modulated signal of 465 kilocycles from the signal generator, using a 0.1 Mfd. capacitor in series with the connection between the output terminal of the signal generator and the grid of the No. 6A8 tube. Do not remove the chassis grid lead connecting to this tube. The ground (or low side) terminal of the signal generator should be connected to either the chassis base or the ground binding post terminal.
3. Now noting from Figure 1, the alignment adjustments for the First, Second, Third, and Fourth I. F. Transformers, align the I. F. circuits in the following manner:
 - Adjust the third I. F. transformer primary circuit for maximum output.
 - Adjust the fourth I. F. transformer circuit for maximum output.
 - Adjust the third I. F. transformer "Discriminator" circuit midway between the peaks where maximum output is obtained.
 - Adjust the second I. F. transformer secondary circuit for maximum output.
 - Adjust the second I. F. primary circuit for maximum output.
 - Adjust the first I. F. secondary circuit for maximum output.
 - Adjust the first I. F. primary circuit for maximum output.

Carefully make all the above adjustments, watching carefully the output meter and reduce the output of the test oscillator as required.

To make the final adjustment of the "Discriminator" circuit proceed as follows:

Check the position of the A. F. C. control knob which should be set to the "off" position. Before making this circuit adjustment be sure that the I. F. Amplifier is tuned exactly to 465 kilocycles. With the signal generator still set at a frequency of 465 kilocycles, adjust the signal generator's output control so that a signal of 50,000 to 100,000 microvolts is fed into the No. 6A8 Modulator tube. Now observe the reading of the milliammeter which is connected in series with the cathode of the No. 6J7 oscillator control tube. Rotate the A. F. C. Control knob to the "on" position, and observe whether there is any difference in the reading of the milliammeter. When this circuit is correctly adjusted, there should be no difference in the reading of the milliammeter when the A. F. C. Control knob is rotated from the "off" to the "on" position. If there is any difference in the milliammeter reading while rotating the Automatic Frequency Control knob to the "off" and "on" position, at a rate of about two cycles per second, adjust the "Discriminator" circuit by means of the screw adjustment located on the third I. F. transformer until the meter reading has the same value regardless of whether the A. F. C. Control knob is rotated to the "on" or "off" position. When this condition is obtained the "Discriminator" circuit of these receivers is properly adjusted.

Radio Frequency Adjustments

The alignment of the radio frequency circuits in these receivers should be very carefully made and in the order specified.

When making any aligning adjustments of these circuits, the A. F. C. Control knob should be rotated to the "off" position, the Fidelity Control knob should be set for "Normal" operation, and the "Off-On-Bass-Phonograph" Control knob should also be set for "Normal" operation.

Alignment of Ultra-Short Wave Range (Also referred to as "E" Band)

In order to align the circuits of this range, it is desirable to have a signal generator whose high frequency range will go to 60 megacycles. Such equipment, however, is rare and costly, and in most cases it will be necessary to make use of a signal generator whose high frequency range does not extend beyond 20 megacycles, using harmonics of 20 megacycles for aligning this range on 60 megacycles.

In aligning the radio frequency circuits for this range, replace the 0.1 mfd. capacitor which was placed in series with the signal generator's output lead for the I. F. alignment with a 400-ohm carbon type resistor. This lead should then be connected to the antenna binding post marked "U. H. A." located on the rear of the receiver chassis. The ground terminal (or low side) of the signal generator should be connected to the ground binding post on the receiver.

1. Operate the Range Switch on the receiver chassis to the "E" range position and set the signal generator's frequency and the receiver's tuning dial to 60 megacycles.
2. Adjust the aligning capacitor C-46 until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 20 megacycles and adjust the "E" range trimming loop, L-54, until maximum voltage output is obtained on the output meter. The adjustment of this loop is obtained by distorting its normally circular shape until it offers the correct inductive effect. If the oscillator does not track with the tuning dial scale at this frequency, it will be necessary to also adjust the oscillator's tuning loop.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 60 megacycles and repeat operation No. 2.

Alignment of Short-Wave Range (Also referred to as "D" Band)

In aligning the radio frequency circuits for this range use the same artificial antenna (400-ohm carbon type resistor) in series with the output terminal of the signal generator as was used for aligning the Ultra-Short Wave Range. Connect this lead to the antenna binding post marked "A" located on the rear of the receiver chassis, and align as follows:

1. Operate the Range Switch on the receiver chassis to the "D" range position and set the signal generator's frequency and the receiver's tuning dial to 20 megacycles.
2. Adjust aligning capacitors C-45, C-22, and C-8 respectively; and at the same time rotate the gang tuning capacitor slightly back and forth through resonance until maximum voltage output is obtained on the output meter.

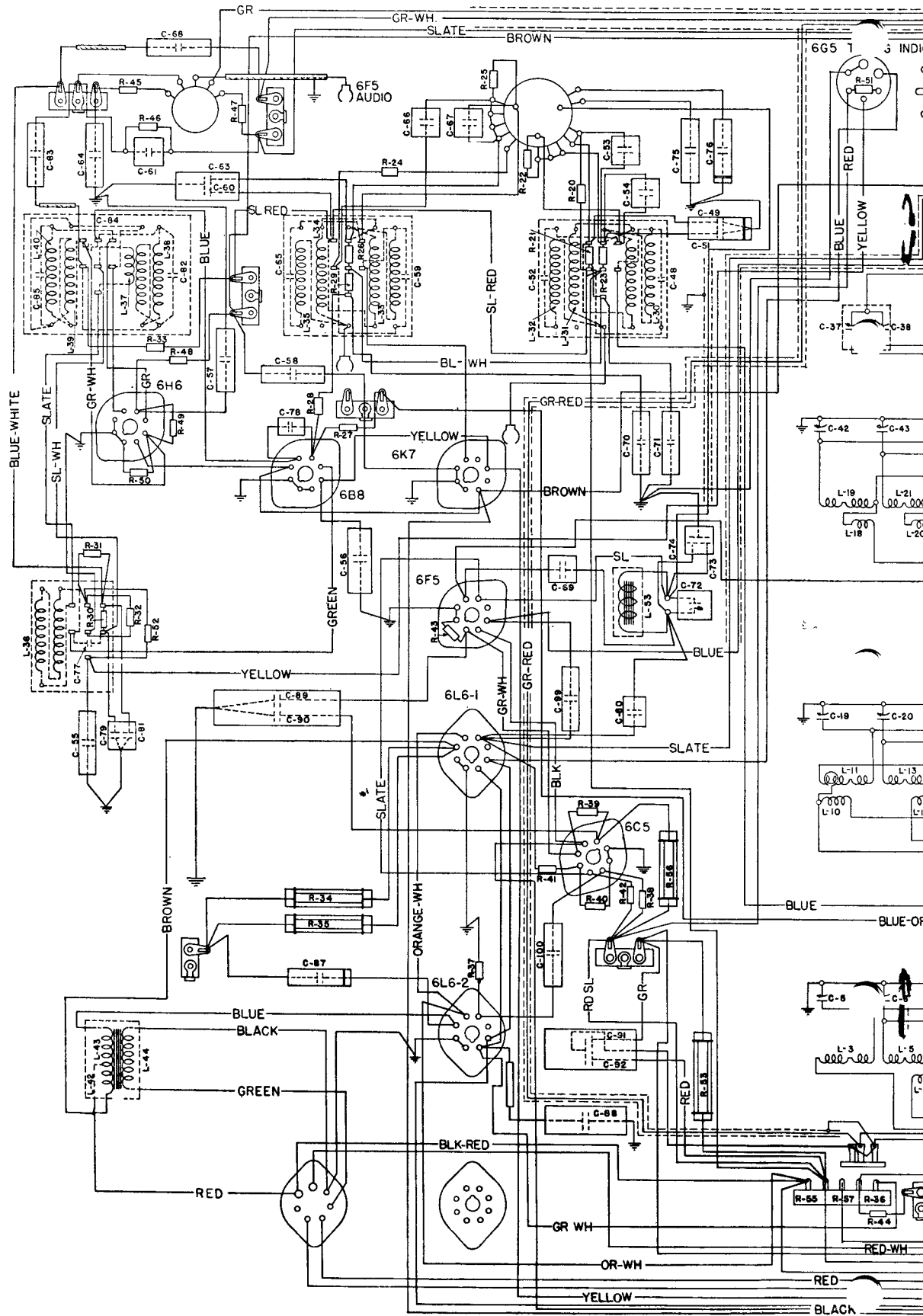
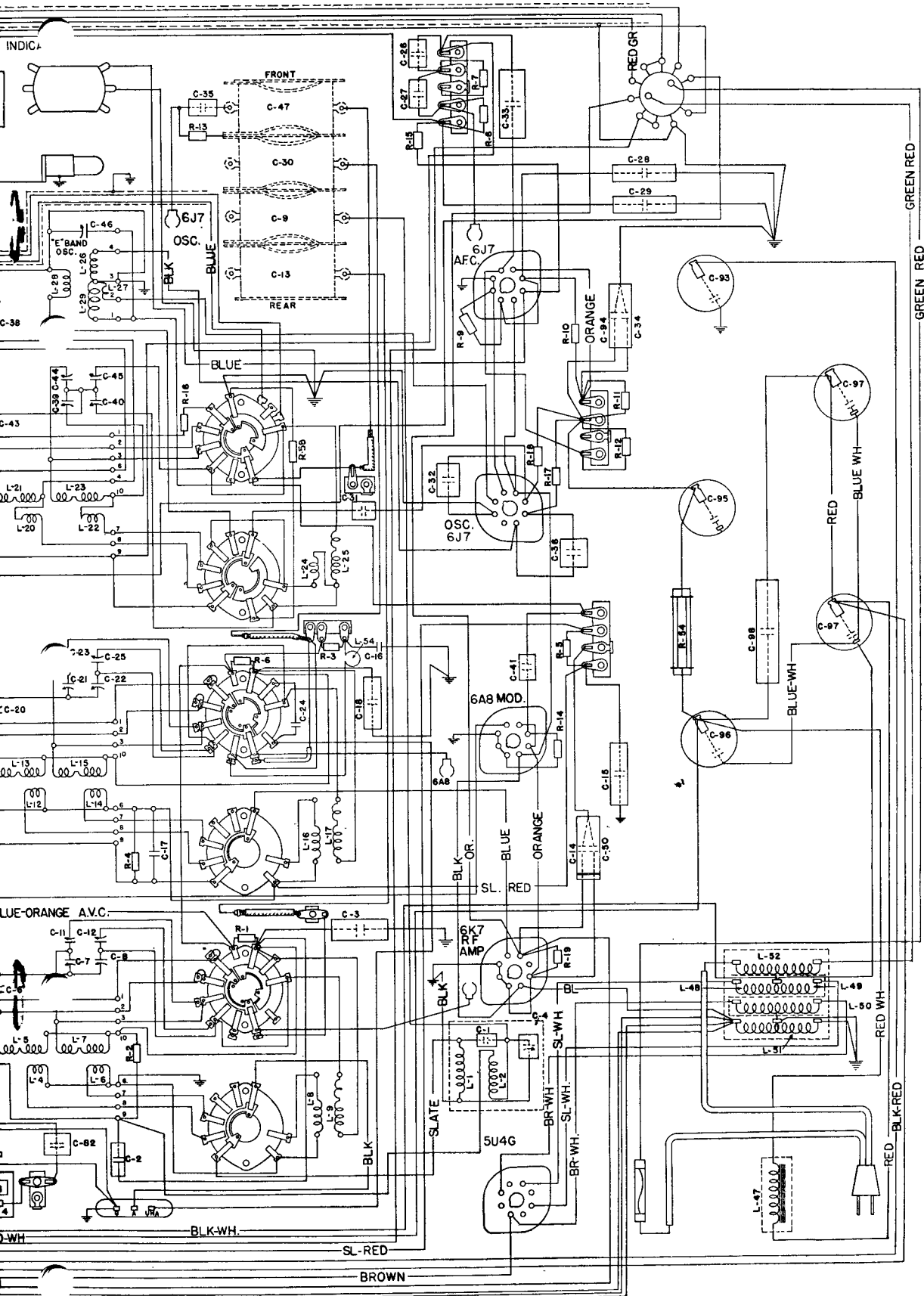


Fig. 3. Wirin



Wiring Diagram.

3. Set the signal generator's frequency and the receiver's tuning dial to 11 megacycles and adjust aligning capacitors C-40, C-25, and C-12 respectively; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 20 megacycles and repeat operation No. 2.

Alignment of Short-Wave Range (Also referred to as "C" Band)

In aligning the radio frequency circuits for this range use the same artificial antenna and binding post on the receiver chassis as was used for aligning the "D" range.

1. Operate the Range Switch on the receiver chassis to the "C" range position and set the signal generator's frequency and the receiver's tuning dial to 10 megacycles.
2. Adjust the aligning capacitors C-44, C-21, and C-7 respectively; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 5 megacycles and adjust the aligning capacitors C-39, C-23, and C-11 respectively; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 10 megacycles and repeat operation No. 2.

Alignment of Aircraft Range (Also referred to as "B" Band)

In aligning the radio frequency circuits for this range, use the same artificial antenna and antenna binding post as was used for aligning the "C" range, and align this range as follows:

1. Operate the Range Switch on the receiver chassis to the "B" range position and set the signal generator's frequency and the receiver's tuning dial to 4.5 megacycles.
2. Adjust the aligning capacitors C-43, C-20, and C-6 respectively; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 1.8 megacycles and adjust the aligning capacitor C-38 and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 4.5 megacycles and repeat operation No. 2.

Alignment of Standard Broadcast Range (Also referred to as "A" Band)

In aligning the radio frequency circuits for this range, replace the 400-ohm resistor in series with the signal generator's output with a 200-micro-microfarad capacitor and align this range as follows:

1. Operate the Range Switch to the "A" range position and set the signal generator's frequency and the receiver's tuning dial to 1.5 megacycles (1500 kilocycles).
2. Adjust the aligning capacitors C-42, C-19, C-4, and C-5 respectively; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 0.6 megacycles (600 kilocycles) and adjust the aligning capacitor C-37; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 1.5 megacycles and repeat operation No. 2.

Adjustment of 10 Kilocycle Audio Cut-Off Filter

The adjustment of this filter is correctly made at the factory and no additional adjustment is required.

PROCEDURE FOR OBTAINING REPRODUCTION FROM PHONOGRAPH RECORDS

A socket having three contacts is provided on the rear of the chassis base, and is wired to the "Off-On-Bass-Phonograph" switch assembly located on the front of the receiver. A three prong plug is also inserted in the socket so that if at any time it is desired to use an electric pick-up and phonograph unit in conjunction with this receiver, it may readily be accomplished.

In order to obtain the best quality of phonograph reproduction from this receiver, a Stromberg-Carlson No. 10 Record Player is recommended. This record player is equipped with a correctly designed single record playing motor unit, and uses a crystal type pick-up in conjunction with a specially equalized circuit. To attach this instrument to a No. 250 Receiver, it is only necessary to remove the three-prong plug furnished with the receiver and insert the three-prong plug which comes with the unit into the three-prong socket located on the rear of the chassis base. Then, the power supply plug of the phonograph unit should be inserted into a suitable power supply receptacle, and the unit will be ready for use.

If the Stromberg-Carlson No. 10 Record Player is not used and the electric pick-up to be used is of the high impedance type, it will be necessary to connect a low capacity shielded cable between the three-prong plug furnished with the receiver and the pick-up. This shielded cable should be of the low capacity type, in order

to prevent the excessive cutting of high frequencies which is caused when a shielded cable having high capacity is used. The length of the shielded cable used should be kept as short as possible.

If a pick-up of the low impedance type is used, it will be necessary to connect a "matching transformer" between the three-prong plug and the pick-up. The transformer should be located as near to the receiver as possible, in which case it will not be necessary to use a shielded cable.

REPLACEMENT PARTS

Piece Number	Schematic Circuit Designation	Part
21984		Fuse Block Assembly
22775	C98	Capacitor, .4 Mfd.
23517		Tube Socket, 7 Prong
24268		Cord, Power Supply
24314	C1	Capacitor, Type "O", 10 Mmfd.
24402	C29, C57	Capacitor, .1 Mfd.
24405	C3, C16, C18, C28, C55, C64, C68, C99, C100, C101	Capacitor, .04 Mfd.
24559	C84	Capacitor, Type "O", 100 Mmfd.
24994	C15, C56, C58, C83	Capacitor, .05 Mfd.
25149	C33, C76	Capacitor, .01 Mfd.
25481	C75	Capacitor, .002 Mfd.
25487	C31, C69, C80	Capacitor, Type "W", .001 Mfd.
25498	C89, C90	Electrolytic Capacitor, 10 Mfd., 25 Volts; 10 Mfd., 25 Volts
25526	R53	Resistor, Type "F", 15,000 Ohms
25539		Tube Socket, 8 Prong
26062	R54	Resistor, Type "F", 10,000 Ohms
26287		Pilot Lamp
26309	R24	Resistor, Type "E", 10 Ohms
26313	R20	Resistor, Type "E", 22 Ohms
26322	R15, R43	Resistor, Type "E", 120 Ohms
26326	R22, R25	Resistor, Type "E", 270 Ohms
26328	R39	Resistor, Type "E", 390 Ohms
26333	R5, R19, R21, R33	Resistor, Type "E", 1,000 Ohms
26349	R10, R11, R12, R17	Resistor, Type "E", 22,000 Ohms
26353	R4, R13, R14, R30, R45	Resistor, Type "E", 47,000 Ohms
26357	R2, R8, R23, R26, R29, R38	Resistor, Type "E", .1 Megohm
26361	R44	Resistor, Type "E", .22 Megohm
26362	R31, R32, R37, R46	Resistor, Type "E", .27 Megohm
26365	R49, R50	Resistor, Type "E", .47 Megohm
26369	R27, R28, R51, R52	Resistor, Type "E", 1 Megohm
26373	R48	Resistor, Type "E", 2.2 Megohms
26383	R1, R3, R6	Resistor, Type "EI", .1 Megohm
26410		Grid Clip Assembly
26417	C10	Capacitor (Gimmick)
26512	C73, C74	Capacitor, Two, Type "W", 100 Mmfd.
26515	L53	Coil Assembly (High Frequency Cut-Off Filter)
26531		Socket (Tuning Indicator Tube)
26568	C72	Capacitor (High Frequency Cut-Off Filter)
26678		Socket, Phonograph Unit
26735		Antennas and Ground Binding Posts
26751		Switch Assembly, "Off-On-Bass-Phono" Control
26775	R34, R35	Resistor, Type "F", 20,000 Ohms
26819		Fuse, 5 Amperes
27008	C36	Capacitor, Type "W", .006 Mfd.
27009	C32	Capacitor, Type "2", 500 Mmfd.
27073	C77, C82, C85	Capacitor, 100 Mmfd.
27092		Rubber Bushing
27101	C17	Capacitor, Type "O", 200 Mmfd.
27105		Washer, Felt
27106		Washer, Dial Clamp
27108	C14, C34, C49, C50, C51, C60, C63, C94	Capacitor, Two, .05 Mfd.
27121		Insulating Tube
27125	R56	Resistor, Type "F", 25,000 Ohms
27305	C24, C35, C41, C78	Capacitor, Type "O", 50 Mmfd.
27309	C48, C52, C59, C65	Fixed Capacitor, First I. F. Transformer
27337	C61, C62	Capacitor, Type "W", .004 Mfd.
27407	R18	Resistor, Type "EB", 22,000 Ohms
27411		Clamp Assembly
27504	L45, L46	Loud Speaker
27569	R60	Potentiometer, Volume Control
27588	C5, C6, C7, C8, C11, C12	Capacitors, Aligning
27589	C19, C20, C21, C22, C23, C25	Capacitors, Aligning
27592	L3, L4, L5, L6, L7	Bi-Resonator Coil "A" Range, Antenna Transformer "B" and "C" Ranges
27593	L10, L11, L12, L13, L14, L15	R. F. Transformer, "A", "B", and "C" Ranges.
27594	L18, L19, L20, L21, L22, L23	Oscillator Transformer, "A", "B", and "C" Ranges
27608		Range Switch Assembly
27635	L48, L49, L50, L51, L52	Power Transformer (50 to 60 Cycles Chassis)
27636	L48, L49, L50, L51, L52	Power Transformer (25 to 60 Cycles Chassis)
27643	L8, L9	Antenna Transformer, "D" Range
27644	L16, L17	R. F. Transformer, "D" Range
27645	L24, L25	Oscillator Transformer, "D" Range
27692	L30, L31, L32	First I. F. Transformer
27693	L33, L34, L35	Second I. F. Transformer
27694	L37, L38, L39, L40	Third I. F. Transformer
27695	L36	Fourth I. F. Transformer
27710	C9, C13, C30, C47	Gang Tuning Capacitor
27715		Coupling Assembly (Tuning Drive)
27720		Gear and Bracket Assembly
27728		Spring
27731		Drive Assembly
27732		Mask Assembly
27733		Lever Assembly, Mask Actuator
27735		Rod
27736		Spring Washer
27737		Indicator Frame Assembly
27748		Dial
27751		Tube Socket, 8 Prong
27752		Brace, Dial Support
27758	C97	Electrolytic Capacitor, 8 Mfd., 500 Volts
27754	C96	Electrolytic Capacitor, 16 Mfd., 480 Volts
27755	C93	Electrolytic Capacitor, 16 Mfd., 350 Volts
27756	C95	Electrolytic Capacitor, 16 Mfd., 300 Volts
27757	C91, C92	Electrolytic Capacitor, 4 Mfd., 250 Volts; 4 Mfd., 100 Volts
27758	C26	Capacitor, Type "O", 75 Mmfd.
27759	C88	Capacitor, 12 Mfd., 30 Volts

27760	C87	.	.	.	.	Capacitor, .005 Mfd., 1,000 Volts
27761	R7	.	.	.	.	Resistor, Type "E", 620 Ohms
27762	R9	.	.	.	.	Resistor, Type "EB", 910 Ohms
27764	R36, R55, R57	.	.	.	.	Resistor, "B" Voltage Divider
27765	L42, L43, L44	.	.	.	.	Output Transformer
27767	L47	.	.	.	.	Choke Assembly
27769	L1, L2	.	.	.	.	Antenna Transformer, "A" Range
27773	.	.	.	.	.	Switch Assembly, High Fidelity-Tone Control
27778	.	.	.	.	.	Switch, A. F. C.
27779	.	.	.	.	.	Crank Arm
27782	C2	.	.	.	.	Capacitor, .03 Mfd.
27882	C4	.	.	.	.	Capacitor, H. F. Aligner for "A" Range Antenna Transformer
27916	L26, L27, L28, L29	.	.	.	.	Oscillator Transformer, "E" Range
27921	C46	.	.	.	.	Capacitor, Aligner, "E" Range
27986	.	.	.	.	.	Shield, "D" and "E" Range Coils
27988	L54	.	.	.	.	Antenna Transformer Tuning Loop, "E" Range
27989	C37, C38	.	.	.	.	L. F. Aligners for "A" and "B" Range Oscillators
27994	.	.	.	.	.	Pilot Lamp Socket Assembly
27996	.	.	.	.	.	Cable Assembly (Tuning Indicator Unit)
27998	C27	.	.	.	.	Capacitor, Type "O", 200 Mmfd.
27999	C79, C81	.	.	.	.	Capacitor, Type "WD", 50 Mmfd.
28001	C53, C54, C66, C67	.	.	.	.	Capacitor, Type "W", .0045 Mfd.
28002	C70, C71	.	.	.	.	Capacitor, .25 Mfd., 150 Volts
28003	R40	.	.	.	.	Resistor, Type "E", 15,000 Ohms
28004	R41	.	.	.	.	Resistor, Type "E", .27 Megohm
28005	R16, R58	.	.	.	.	Resistor, Type "E", 51 Ohms
28008	.	.	.	.	.	Cable Assembly, Phonograph Switch to Phonograph Socket
28034	C89, C40, C42, C43, C44, C45	.	.	.	.	Capacitors, Aligning
28179	R47	.	.	.	.	Resistor, Type "EB", 68,000 Ohms

MISCELLANEOUS PARTS

27800	.	.	.	.	.	Knob Assembly (Used on Volume, Range Switch and Off-On-Bass-Phonograph Controls' Shafts)
27801	.	.	.	.	.	Knob Assembly (Used on Fidelity and A. F. C. Controls' Shafts)
27802	.	.	.	.	.	Knob Assembly (For Rapid Station Selector Control Shaft)
27803	.	.	.	.	.	Knob Assembly (For Vernier Station Selector Control Shaft)
27628	.	.	.	.	.	Felt Washer (Used on Volume, Fidelity, Range Switch, A. F. C., and Off-On-Bass-Phonograph Controls' Shafts)
27630	.	.	.	.	.	Felt Washer (Used on Rapid Station Selector Control Shaft)

