

RCA VICTOR MODEL 236-B

Seven-Tube, Superheterodyne Battery Receiver

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Type and Number of Radiotrons.....	1 RCA-1C6, 2 RCA-34, 2 RCA-30, 1 RCA-32, 1 RCA-19—Total, 7
Total "A" Battery Current.....	0.68 Ampere
Maximum "B" Battery Current.....	21 M. A.
Tuning Range.....	540 K. C.—1720 K. C.
Maximum Undistorted Output.....	1.2 Watts
Maximum Output.....	2.2 Watts
Line-up Frequencies.....	460 K. C., 600 K. C. and 1720 K. C.

PHYSICAL SPECIFICATIONS

Height.....	40½ Inches
Width.....	25⅞ Inches
Depth.....	13⅝ Inches

This seven-tube, battery operated Superheterodyne receiver provides excellent reception of standard-wave broadcasting stations. High sensitivity, excellent selectivity and good fidelity characterize this receiver. Outstanding features include a permanent magnet dynamic type loudspeaker, two-point tone control, Class "B" output stage, vernier drive and excellent

mechanical construction. The chassis is unusually accessible for repair or replacement of parts. A fuse in the "B" battery lead provides protection for the Radiotrons in event of short circuits or wrong battery connections. Figure 1 shows the schematic diagram, while Figure 2 shows the chassis wiring.

DESCRIPTION OF ELECTRICAL CIRCUIT

The circuit is of the superheterodyne type and consists of a combined oscillator-detector stage, two I. F. amplifying stages, a combined second detector and automatic volume control, a two-stage audio amplifier and a Class "B" output stage. A two-pole operating switch opens the "+A" and "+B" battery leads when the switch is turned to the "off" position.

The signal enters the receiver through a shielded antenna lead and is applied through the antenna transformer to the grid circuit of the first detector which also serves as the local oscillator for producing a signal, 460 K. C. higher in frequency than the incoming signal. The combined signals after passing through the first detector produce the I. F. signal.

The I. F. amplifier uses two RCA-34 Radiotrons in conjunction with three transformers. Two of the transformers are tuned very accurately to the I. F. frequency (460 K. C.) by means of suitable trimmer capacitors. The third transformer is untuned and couples the output of the second stage to the input of the second detector, an RCA-30, the plate of which is grounded.

Automatic volume control action is obtained from the voltage drop of a portion of the rectified signal across resistor R-9. The voltage drop constitutes the automatic bias voltage for the first detector and I. F. stages and thereby gives the automatic volume control action of the receiver.

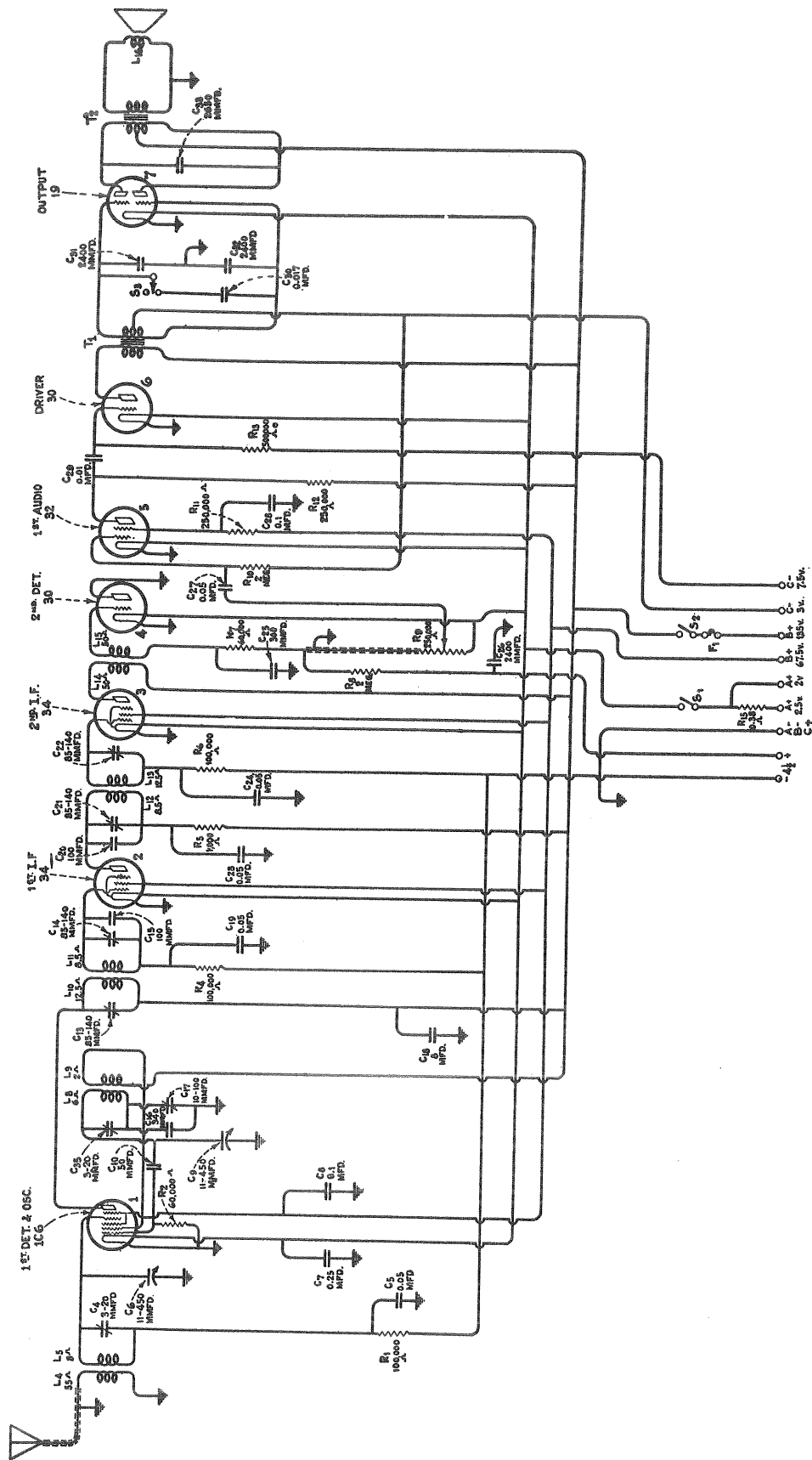


Figure 1—Schematic Circuit Diagram

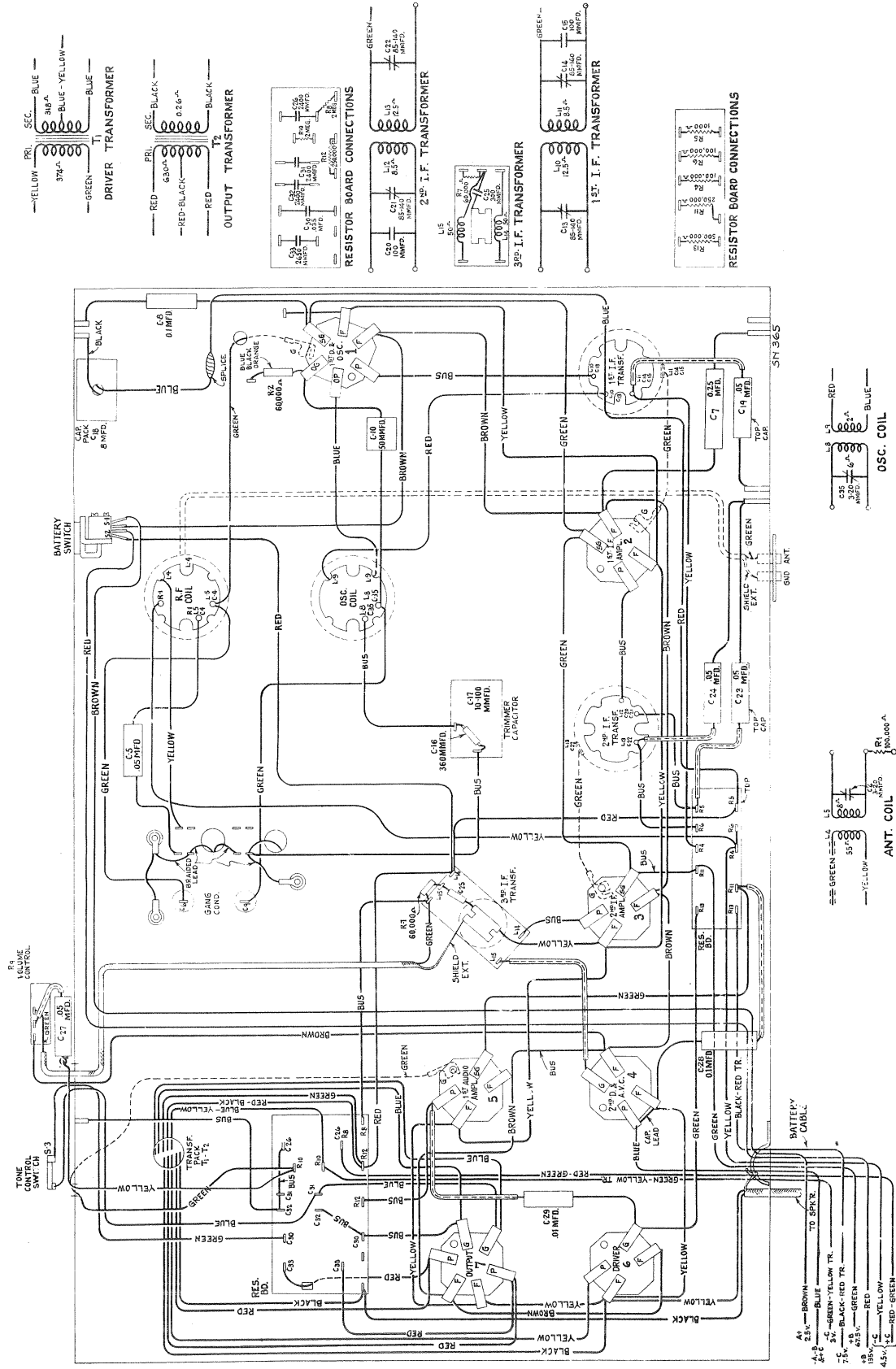


Figure 2—Chassis Wiring Diagram

The volume control selects the desired amount of audio signal from the drop across R-9 and applies it to the grid circuit of the first audio stage, RCA-32.

The output of the first audio stage is resistance coupled to the grid circuit of the RCA-30 driver stage, which is transformer coupled to the Class "B" output stage. The output stage utilizes the twin amplifier Radiotron RCA-19, which has two separate sets of elements and eliminates the necessity of having two

separate tubes for a Class "B" output stage. The plate circuit of this tube is transformer coupled to the cone coil of the permanent magnet dynamic loudspeaker.

Plate, grid and filament voltages are supplied by individual batteries. Two +A leads are provided, one permitting operation on a 2-volt storage cell; and the other used for operation on a 2.5-volt "Eveready Air Cell."

SERVICE DATA

(1) Line-Up Capacitor Adjustments

To properly align this receiver, it is essential that a modulated R. F. oscillator of suitable frequency range such as Stock No. 9050, an output indicator, Stock No. 4317, and an alignment tool, Stock No. 4160, be available. Figure 4 shows the location of the various line-up capacitors.

I. F. Tuning Adjustments

The I. F. amplifier comprises two stages which have three transformers. The third transformer is untuned so that only a total of four tuned circuits are used. Refer to Figure 4 and proceed as follows:

- (a) Short-circuit the antenna and ground terminals and tune the receiver so that no signal is heard. Set the volume control at maximum and connect a ground to the ground terminal.
- (b) Connect the test oscillator output between the first detector control grid and chassis ground. Connect the output indicator across the voice coil of the loudspeaker and adjust the oscillator output so that, with the receiver volume control at maximum, a slight glow is obtained in the output indicator.
- (c) Adjust the secondary and primary of the first and then the second I. F. transformers until a maximum deflection is obtained. The third transformer is untuned and does not require adjusting. Keep the oscillator output at a low value so that only a slight glow is obtained in the output indicator at all times. Go over these adjustments a second time, as there is a slight interlocking of adjustments. This completes the I. F. alignment.

R. F. and Oscillator Adjustments

The important points to remember are the need for using the minimum oscillator output to obtain an indication in the output device with the volume control at its maximum position and the manner of obtaining the proper high-frequency oscillator and detector adjustments.

The R. F. line-up capacitors are located at the bottom of the coil assemblies instead of their usual position on the gang capacitor. They are all accessible from the bottom of the chassis except the 600 K. C. series capacitor, which is accessible from the top of the chassis. Proceed as follows:

- (a) Connect the output of the oscillator to the antenna and ground terminals of the receiver. Check the position of the dial pointer when the tuning capacitor plates are fully meshed. It should be coincident with the radial line adjacent to the dial reading of 540.

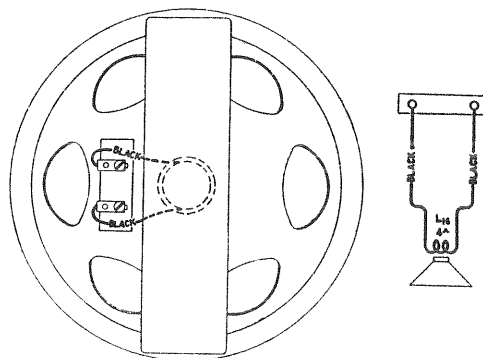


Figure 3—Loudspeaker Wiring

- (b) Then set the Test Oscillator at 1720 K. C., the dial pointer at 1720, and adjust the oscillator output so that a slight glow will be obtained in the output indicator when the volume control is at its maximum position. Adjust the two trimmers under the two R. F. coils, see Figure 4, until a maximum output is obtained. Then shift the Test Oscillator frequency to 600 K. C. The trimmer capacitor, accessible from the top of the chassis, should now be adjusted for maximum output while rocking the main tuning capacitor back and forth through the signal. Then repeat the 1720 K. C. adjustment.

(2) Voltage and Current Measurements

Voltage and current values listed in the following table and indicated at the Radiotron socket contacts on Figure 4 form a reference basis for test of the receiver. It is to be noted that all voltages are given with respect to chassis-ground, excepting those appearing across the filaments (F-F). The values shown are

obtainable when the receiver is in normal operating condition. They do not take into account inaccuracies caused by current consumed in the voltmeter used for the tests; the lower the voltmeter resistance, the lower the degree of accuracy. Allowances must therefore be made, dependent upon the type of test instrument used, for the loading effect of the voltmeter on the circuit.

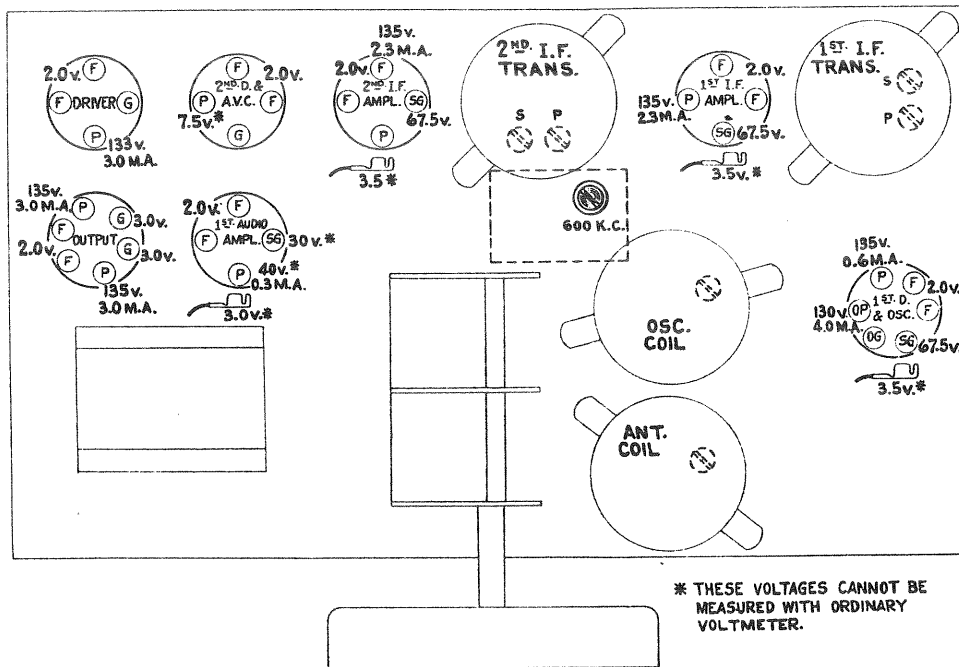


Figure 4—Line-Up Capacitor Locations and Voltage Values at Socket Contacts

RADIOTRON SOCKET VOLTAGES

Volume Control at Maximum—No Signal—135 Volt "B" Battery—4.5 and 7.5-Volt Bias Batteries

Radiotron No.		Control Grid to Ground	Screen Grid to Ground	Plate to Ground	Plate, M. A.	Filament Volts
RCA-1C6	1st Detector	3.5*	67.5	135	0.6	2.0
	Oscillator	—	—	130	4.0	
RCA-34—I. F.		3.5*	67.5	135	2.3	2.0
RCA-34—I. F.		3.5*	67.5	135	2.3	2.0
RCA-30—Detector AVC		—	—	—	—	2.0
RCA-32—Audio		3.0*	30*	40*	0.3	2.0
RCA-30—Driver		7.5*	—	133	4.0	2.0
RCA-19—Power		3.0	—	135	3.0	2.0

*These voltages cannot be measured with ordinary voltmeter.

REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
RECEIVER ASSEMBLIES					
2747	Cap—Contact cap—Package of 5.....	\$0.50	4538	Transformer—Third intermediate frequency transformer (L14, L15).....	\$2.15
4498	Capacitor—8 mfd. (C18).....	1.25	4533	Transformer pack—Audio transformer pack—Comprising driver and output transformer (T1, T2).....	3.98
4442	Capacitor—50 mmfd. (C10).....	.22	4535	Volume control (R9).....	1.40
3981	Capacitor—300 mmfd. (C25).....	.30	REPRODUCER ASSEMBLIES		
4413	Capacitor—360 mmfd. (C16).....	.22	4541	Cable—2-conductor reproducer cable.....	.38
2749	Capacitor—2400 mmfd. (C26).....	.35	9432	Cone—Reproducer cone (L16).....	1.88
4801	Capacitor—2400 mmfd. (C31, C32).....	.50	7820	Magnet—Cone housing and magnet assembly.....	8.98
4529	Capacitor—2650 mmfd. (C33).....	.32	7819	Reproducer complete.....	12.18
4858	Capacitor—0.01 mfd. (C29).....	.25	4234	Rivet—Cone mounting rivet—Package of 100.....	.66
4518	Capacitor—0.05 mfd. (C27).....	.52	DRIVE ASSEMBLY		
4836	Capacitor—0.05 mfd. (C5, C19, C23, C24).....	.30	4996	Dial—Station selector dial.....	.75
4906	Capacitor—0.017 mfd. (C30).....	.25	4798	Drive—Variable tuning condenser drive assembly complete.....	1.50
4791	Capacitor—0.1 mfd. (C8, C28).....	.24	4363	Pointer—Station selector pointer.....	.18
4840	Capacitor—0.25 mfd. (C7).....	.30	4669	Screw—No. 8-32-5/32 square head set screw for condenser drive—Package of 10.....	.25
3861	Capacitor—Adjustable trimmer capacitor (C17).....	.78	4997	Shaft—Condenser drive shaft.....	.28
4796	Coil—Antenna coil (L4, L5, R1, C4).....	2.30	MISCELLANEOUS ASSEMBLIES		
4800	Coil—Oscillator coil (L8, L9, C35).....	1.90	4895	Bezel—Metal bezel (escutcheon) and crystal for station selector drive.....	.55
4504	Condenser—2-gang variable tuning condenser (C6, C9).....	2.78	4289	Body—Fuse connector body—Package of 10.....	.35
4370	Resistor—1,000 ohms—Carbon type— $\frac{1}{4}$ watt—Package of 10 (R5).....	2.00	7867	Cable—8-conductor battery cable complete.....	.78
3602	Resistor—60,000 ohms—Carbon type— $\frac{1}{4}$ watt (R2, R7)—Package of 5.....	1.00	4288	Cap—Fuse connector cap—Package of 10.....	.36
3118	Resistor—100,000 ohms—Carbon type— $\frac{1}{4}$ watt (R1, R4, R6)—Package of 5.....	1.00	6516	Connector—Fuse connector complete.....	.16
3744	Resistor—250,000 ohms—Carbon type— $\frac{1}{4}$ watt (R11, R12)—Package of 5.....	1.00	4286	Ferrule—Fuse connector ferrule and bushing—Package of 10.....	.38
6186	Resistor—500,000 ohms—Carbon type— $\frac{1}{4}$ watt (R13)—Package of 5.....	1.00	3748	Fuse—0.5 ampere—Package of 5.....	.40
6242	Resistor—2 megohms—Carbon type— $\frac{1}{4}$ watt (R8, R10)—Package of 5.....	1.00	4290	Insulator—Fuse connector insulator—Package of 10.....	.35
4521	Shield—Antenna, oscillator or I. F. transformer shield.....	.42	4449	Knob—Station selector, volume control, tone or battery switch knob—Package of 5.....	.60
7487	Shield—Second detector Radiotron shield—"AVC".....	.25	4644	Resistor—0.38 ohms—Flexible type—Filament series (R15)—Package of 5.....	.80
3942	Shield—First detector and oscillator Radiotron shield.....	.18	4638	Screw—Chassis mounting screw assembly—Comprising eight cushions, four screws, four washers, four lockwashers and four spacers.....	.52
3056	Shield—First I. F., second I. F., first audio Radiotron shield—Package of 2.....	.40	3238	Screw—6-40- $\frac{17}{32}$ " knurled head—Set screw for operating switch knob No. 3088—Package of 10.....	.25
4794	Socket—4-contact Radiotron socket.....	.15	4613	Screw—8-32- $\frac{7}{16}$ " headless set screw for station selector volume control, tone control or range switch knob—Package of 10.....	.25
4784	Socket—4-contact audio amplifier—Radiotron socket.....	.15	4284	Spring—Fuse connector spring—Package of 10.....	.30
4786	Socket—6-contact detector-oscillator Radiotron socket.....	.15	4797	Switch—Operating switch.....	1.50
4785	Socket—6-contact output Radiotron socket.....	.15	4285	Washer—Fuse connector insulating washer—Package of 10.....	.22
4799	Switch—Tone control switch (S3).....	.62			
4431	Transformer—First intermediate transformer (L10, L11, C13, C14, C15).....	2.28			
7840	Transformer—Second intermediate transformer (L12, L13, C20, C21, C22).....	2.35			