RCA Victor Model 262

Ten-Tube, Five-Band A. C. Receiver SERVICE NOTES



SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

A RADIO CORPORATION OF AMERICA SUBSIDIARY

REPRESENTATIVES IN PRINCIPAL CITIES

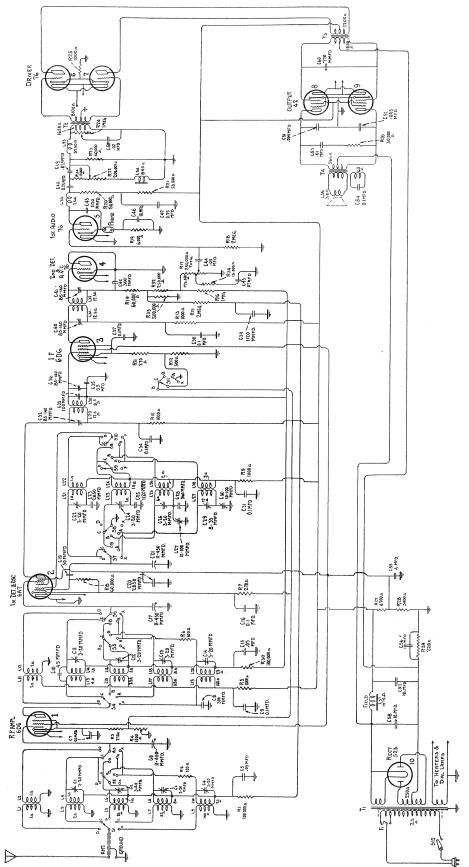


Figure 1—Schematic Circuit Diagram—Models with sensitivity control change for band position

RCA VICTOR MODEL 262

Ten-Tube, Five-Band A. C. Superheterodyne SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Voltage Rating
Frequency Rating
Power Consumption
Type and Number of Radiotrons2 RCA-6D6, 1 RCA-6A7, 4 RCA-76, 2 RCA-42, 1 RCA-5Z3—Total, 10
Tuning Frequency Range. Band X— 140 KC - 410 KC
Line-up Frequencies
PHYSICAL SPECIFICATIONS

Height	 42½ Inches
Width	 26½ Inches
Depth	

This ten-tube, five-band all-wave superheterodyne radio receiver is an instrument in which most of the important modern radio developments have been incorporated. Wide tuning range, excellent sensitivity and selectivity and a large undistorted output contribute to the realization of outstanding performance in all major requirements. The extremely wide tuning range (140 KC to 36,000 KC except for a break between 410 KC and 540 KC) covers every broadcasting, police, aviation and amateur band used throughout the world.

Important new operating features include an "air-plane" type dial with band indicator, a "second" hand for vernier tuning and "band spread," a double-

ratio vernier drive and the usual sensitivity and volume control. A circuit feature is the automatic sensitivity control change that occurs when switching from the long-wave to the short-wave bands. This enables the sensitivity control to maintain its same smooth action in all bands.

A high degree of tonal fidelity is obtained through the use of a high gain, high output, low distortion audio amplifier and a large 10-inch electro-dynamic loudspeaker. The high and low frequency tone controls provide a method whereby the frequency characteristic may be altered for adverse operating conditions such as static, station hum, etc.

DESCRIPTION OF ELECTRICAL CIRCUIT

The general circuit arrangement consists of an R. F. stage, a combined oscillator and first detector, and I. F. stage, a combined second detector and automatic volume control, an audio stage, a push-pull driver stage and a push-pull Pentode output stage. Plate and grid voltages are supplied by the RCA-5Z3 heavy duty rectifier combined with a suitable filtering stage, of which the loudspeaker field is a part. Figures 1 and 2 show the schematic circuit diagrams.

The signal enters the receiver through a shielded antenna lead and is applied to the grid of the R. F. tube through the antenna coupling transformer. The secondary of this transformer is tuned to the signal

frequency by means of one unit of the gang-capacitor The output of this stage is transformer coupled to the grid circuit of the first detector, which is also tuned to the signal frequency by a unit of the gang-capacitor.

Combined with the signal in the first detector is the local oscillator signal, which is always at a 460 KC frequency difference (higher) from the signal frequency. A separate coil system and the third unit of the gang-capacitor are used in the oscillator circuit.

In conjunction with these three tuned circuits it is well to point out that five different groups of tuned circuits are used, one group for each tuning band. A

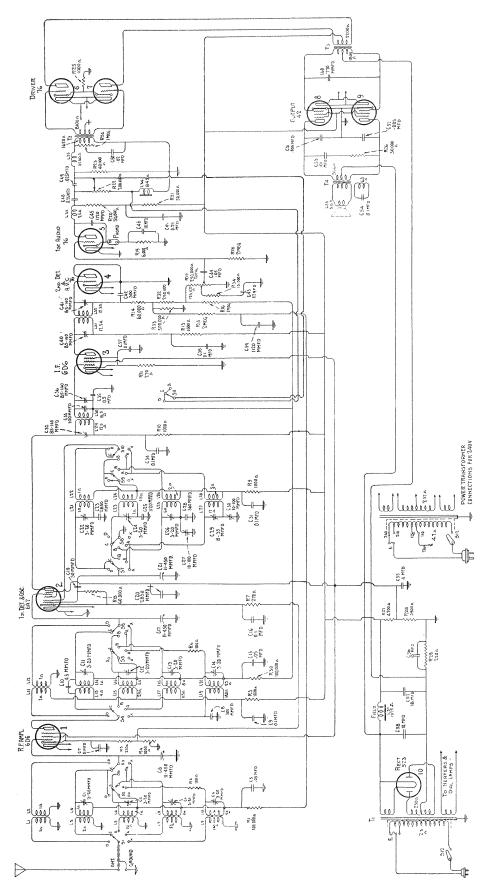


Figure 2—Schematic Circuit Diagram—Models with fidelity change for band position

five-position selector switch is provided for selecting the band in which the desired signal is located. In addition to selecting the desired coil system, additional groups of contacts are provided for short-circuiting the preceding lower frequency R. F. and detector coils and the two preceding oscillator coils. This is to prevent "dead" spots due to absorption effects caused by the coils, the natural period of which without the gang-capacitor connected falls in the next higher frequency band. This gang-switch also has additional contacts for changing the sensitivity in the various bands.

The sensitivity control in bands X and A controls the R. F. and first detector while in bands B, C and D it controls the R. F., first detector and I. F. stage. This is caused by the action of the selector switch. It should also be noted that the sensitivity control is paralleled with a 500-ohm resistor (R-12, Figure 1) in bands B, C and D.

The output of the first detector, which is the I. F. signal (460 KC), is fed directly through two tuned circuits to the grid of the I. F. amplifier stage. The I. F. stage, which utilizes Radiotron RCA-6D6, uses two transformers, which consist of four tuned circuits, all of which are tuned to 460 KC.

The output of the I. F. amplifier is then applied to the grid of the RCA-76 second detector. The plate of this tube is connected to its cathode and the tube operated as a diode detector and automatic volume control. The direct current component of the rectified signal produces a voltage drop across resistors R-32 and R-17. The voltage drop across both resistors constitutes the automatic bias voltage for the R. F. stage, while the drop across R-17 alone constitutes the bias voltage for the first detector and I. F. stage. These automatic bias voltages for the R. F., first detector and I. F. stages give the automatic volume control action of the receiver. It should be noted that resistor R-33 is connected in parallel across resistors R-32 and R-17. This reduces the total amount of resistance in the circuit to a proper value. Resistor R-34 and capacitor C-43, which are connected in series and from a tap on the volume control to ground, provide low frequency, low volume compensation.

The volume control selects the amount of audio voltage that is applied to the grid of the RCA-76 A. F. stage and thereby regulates the volume of the entire receiver. The first audio stage is coupled through a high and low frequency tone control system and transformer to the grid circuit of the push-pull drive stage. It should be noted that a link has been provided in series with the cathode of this stage, so that phonograph connections may be easily made if required.

The driver stage is transformer coupled to the output stage, which consists of two Radiotrons, RCA-42, connected in push-pull. A feature of the output stage is the use of fixed bias, which reduces distortion and

increases the available output. This is accomplished by the use of the drop across R-29, which carries the entire DC output from the rectifier. Naturally the output stage uses but a portion of the total rectified current and current variations in it have but little effect on the drop across the resistor.

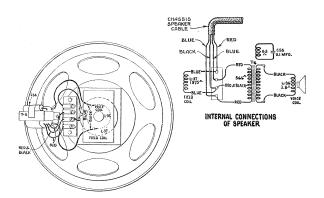


Figure 3—Loudspeaker Wiring

The output of the power stage is coupled through a step-down transformer to the voice coil of the loud-speaker. A separate winding, which is shunted by a capacitor, has been provided in this transformer which gives a very sharp, high-frequency cut-off for the entire audio system. This greatly reduces the reproduction of any high-frequency interchannel interference or other disturbance of a high-frequency character which is outside of the useful musical range.

The loudspeaker used is of the ten-inch type. It is fully capable of handling the high-power, high-quality output of the receiver and converting it into faithful sound reproduction.

Figure 3 shows the loudspeaker wiring, Figures 4 and 6 the chassis wiring and Figures 8 and 10 the R. F. unit wiring.

VARIATIONS IN MODELS

The preceding description of the electrical circuit applies to numerous models of this receiver. However, there are other models in which a change from the foregoing has been made. This change consists of using the section of the band selector switch that formerly changed the sensitivity control, for changing the fidelity in various bands, the sensitivity remaining the same in all bands. This permits the receiver to maintain the utmost fidelity in bands X and A while reducing the low frequency output in bands B, C and D. Such a change results in improved performance.

The sensitivity control in these models operates as formerly in bands X and A. That is, the sensitivity control adjusts the residual bias for the R. F. and first detector stages.

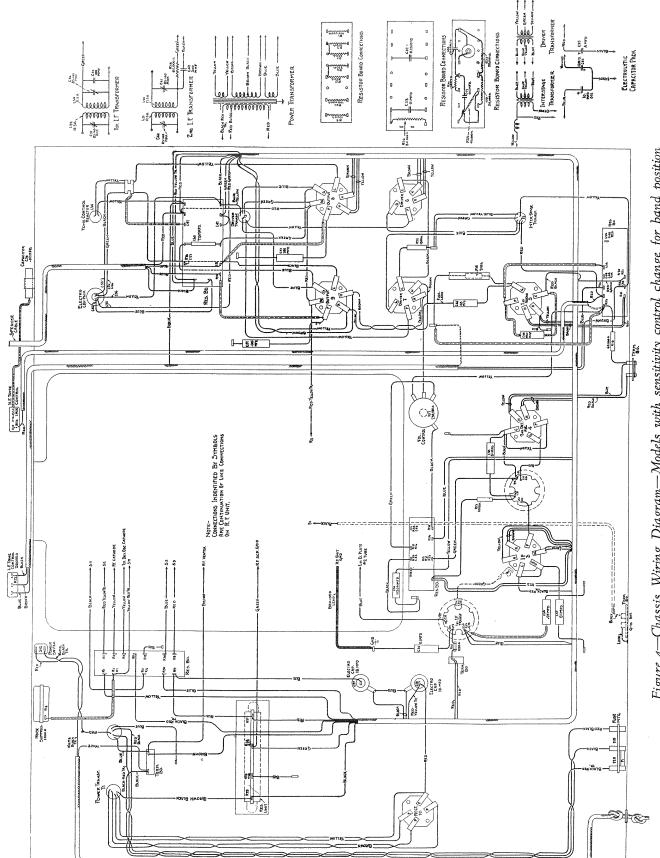


Figure 4—Chassis Wiring Diagram—Models with sensitivity control change for band position

SERVICE DATA

(1) LINE-UP PROCEDURE

The line-up procedure of this receiver is somewhat involved and it is important that these instructions be carefully followed when making adjustments. Properly aligned, this receiver has outstanding performance; improperly aligned, it may be impossible to receive signals on all bands.

Equipment

To align this receiver, proper test equipment must be used. This consists of a modulated R. F. oscillator having proper frequency range, an output indicator, an alignment tool and a tuning wand. These parts, have been developed by the manufacturer of this receiver for use by service men to duplicate the original factory adjustments.

Checking with Tuning Wand

Before making any R. F., oscillator or first detector adjustments, the accuracy of the present adjustments may be checked by means of the tuning wand (Stock No. 6679). The tuning wand consists of a bakelite rod having a brass cyclinder at one end and a special finely divided iron insert at the other end. Inserting the cylinder into the center of a coil lowers its inductance, while inserting the iron end increases its inductance. From this, it is seen that unless the trimmer adjustment for a particular coil is perfect at alignment frequencies, inserting one end of the wand may increase the output of a particular signal. A perfect adjustment is evidenced by a lowering of output when either end of the wand is inserted into a coil.

The shields over the R. F. coil assembly have a hole at their top for entrance of the tuning wand. The location of the various coils inside of the shield is shown in Figure 5. An example of the proper manner of using the tuning wand would be to assume the external oscillator were set at 1720 KC and the signal tuned in. The output indicator should be connected across the voice coil of the loudspeaker. Then insert the tuning wand, first one end and then the other end, into the top of the three transformers at the left of the R. F. assembly, facing the front of the chassis. A perfect adjustment of the trimmer would be evidenced by a reduction in output when each end of the wand is inserted in each of the three transformers. If one end—for example, the iron end when inserted in one coil caused an increase in output, then that circuit is low. An increase in the trimmer capacitance would be the proper remedy.

(2) I. F. TUNING CAPACITOR ADJUSTMENTS

This receiver has one I. F. stage, and two transformers having four adjustable capacitors which may require adjustment. The transformers are all peaked at 460 KC.

A detailed procedure for making this adjustment follows:

- (a) Connect the output of an external oscillator tuned to 460 KC between the first detector grid and ground. Connect the output indicator across the voice coil of the loudspeaker.
- (b) Place the oscillator in operation at 460 KC. Place the receiver in operation and adjust the station selector until a point is reached (Band A) where no signals are heard and turn the volume control to its maximum position. Reduce the oscillator input until a slight indication is obtained in the output indicator.

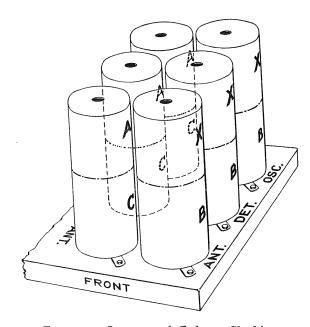


Figure 5-Location of Coils in Shields

(c) Refer to Figure 7. Adjust each trimmer of the I. F. transformers until a maximum output is obtained. Go over the adjustments a second time.

This completes the I. F. adjustments. However, it is good practice to follow the I. F. adjustments with the R. F. and oscillator adjustments due to interlocking which always occurs.

(3) R. F. OSCILLATOR AND FIRST DETECTOR ADJUSTMENTS

Four R. F., oscillator and first detector adjustments are required in bands "A" and "X." Three are required in bands "B" and "C." None are required in band "D."

To properly align the various bands, each band must be aligned individually. The preliminary set-up

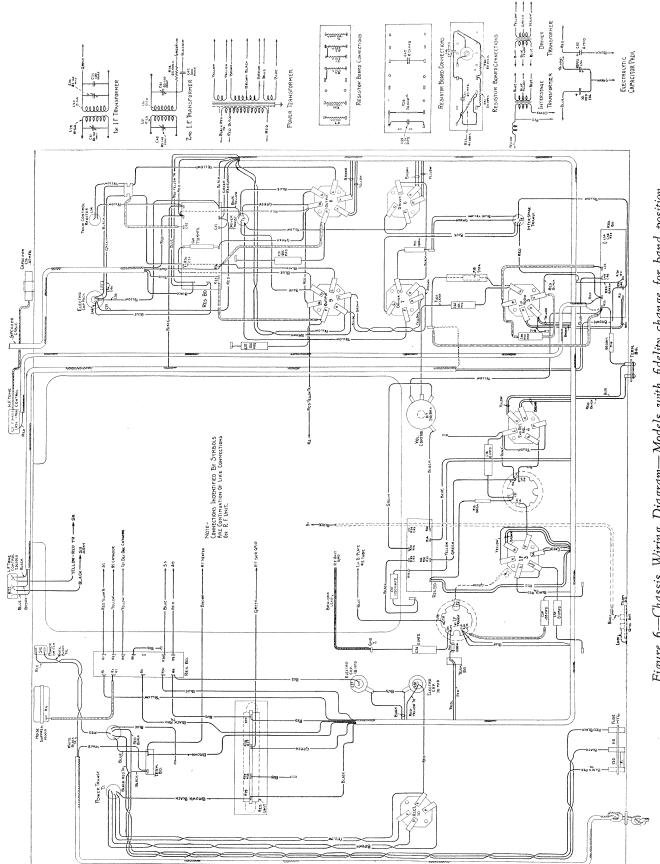


Figure 6—Chassis Wiring Diagram—Models with fidelity change for band position

requires the external oscillator to be connected between the antenna and ground terminals of the receiver and the output indicator must be connected across the voice coil of the loudspeakers. The volume control must be at its maximum position and the input from the oscillator must be at the minimum value possible to get an output indication under these conditions. In the high-frequency bands, it may be necessary to disconnect the oscillator from the receiver and place it at a distance in order to get a sufficiently low input to the receiver.

The dial pointer must be properly set before starting any actual adjustments. This is done by turning the variable capacitor until it is at its maximum capacity position. One end of the pointer should point exactly at the horizontal line at the lowest frequency end of band "A," while the other end should point to within 1/64 inch of the horizontal line at the highest frequency end of band "A."

Figure 7 shows the location of the trimmers for each band. Care must be exercised to only adjust the trimmers in the band under test.

Band "X"

- (a) Tune the external oscillator to 410 KC, set the pointer at 410 KC and adjust the oscillator, detector and R. F. trimmers for maximum output.
- (b) Shift the external oscillator to 175 KC. Tune in the 175 KC signal irrespective of scale cali-

bration and adjust the series trimmer marked 175 KC on Figure 7, for maximum output, at the same time rocking the variable tuning capacitor. Then readjust at 410 KC as described in (a).

Band"A"

- (a) Tune the external oscillator to 1720 KC, set the pointer at 1720 KC and adjust the oscillator, detector and R. F. trimmers for maximum output.
- (b) Shift the external oscillator to 600 KC. Tune in the 600 KC signal irrespective of scale calibration and adjust the series trimmer, marked 600 KC on Figure 7, for maximum output, at the same time rocking the variable tuning capacitor. Then readjust at 1720 KC as described in (a).

Band "B"

- (a) Tune the external oscillator to 5160 KC, and set the pointer at 5160 KC. Adjust the oscillator trimmer for maximum output. The trimmer should be set at the first peak obtained when increasing the trimmer capacitor from minimum to maximum.
- (b) Check for the image signal, which should be received at approximately 4240 on the dial. It will be necessary to increase the external oscillator output for this check.

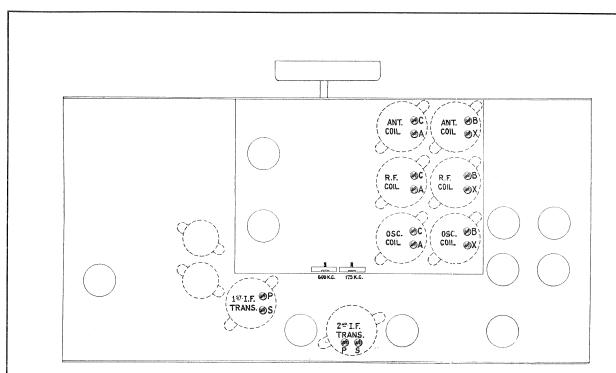
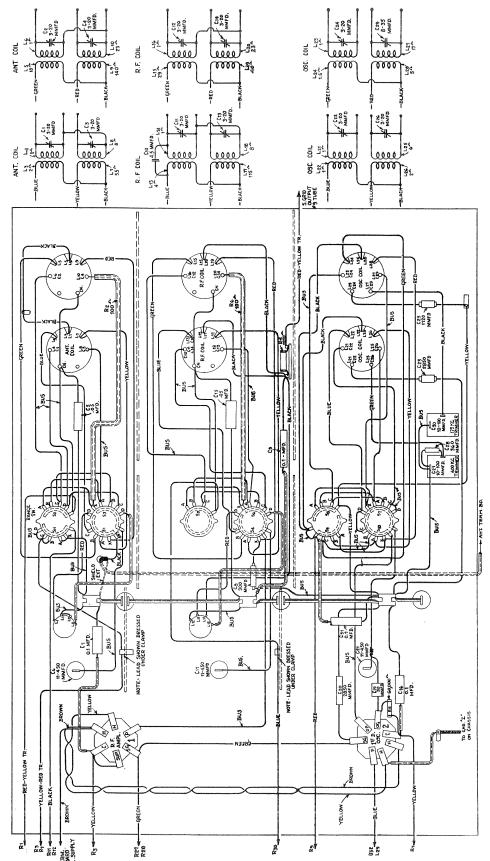


Figure 7—Location of Trimmer Capacitors



Unit Wiring Diagram—Models with sensitivity control change for band position F. Figure 8—R.

(c) The antenna and detector trimmers should now be peaked for maximum output.

Band "C"

(a) Tune the external oscillator to 18,000 KC, and set the pointer at 18 M. C. Adjust the oscillator trimmer for maximum output. The

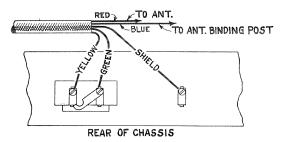


Figure 9—Junior "Duo" Connections

trimmer should be set at the first peak obtained when increasing the trimmer capacity from minimum to maximum.

- (b) Check for the image signal, which should be received at approximately 17,080 on the dial. It may be necessary to increase the external oscillator output for this check.
- (c) Reduce the capacity of the detector trimmer. while rocking the tuning capacitor, until the

signal disappears. The first detector circuit is then aligned with the oscillator circuit and the RCA-6A7 tube is blocked. Then increase the capacity of the detector trimmer, while rocking the tuning capacitor, until the signal is peaked for maximum output.

(d) The antenna trimmer should now be peaked for maximum output. It is not necessary to rock the main tuning capacitor while making this adjustment.

Band "D"

No adjustments are required for band "D."

(4) MAGNETIC PICKUP CONNECTIONS

A terminal board (link in series with first audio stage cathode) is provided at the rear of the chassis for adding phonograph facilities to this instrument. Figure 9 shows the connections that will be required for the Junior "Duo" turntable assembly.

(5) VOLTAGE READINGS

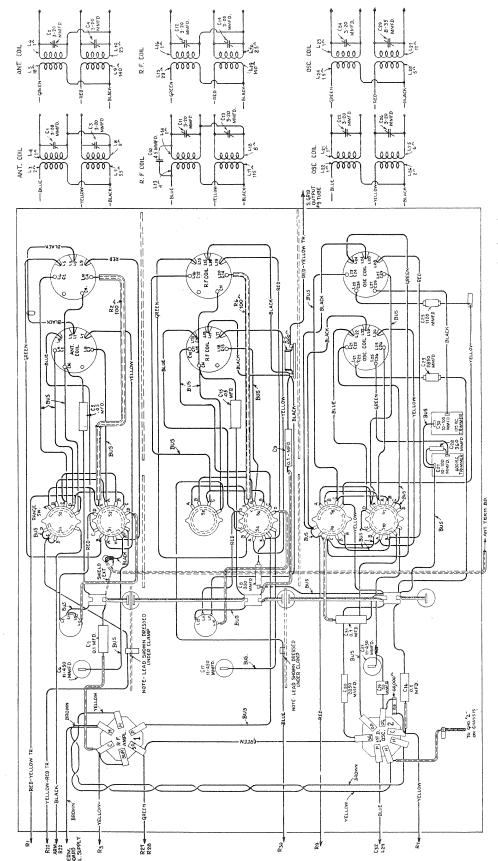
The following voltages are those at the various tube sockets while the receiver is in operating condition. No allowance has been made for currents drawn by the meter, and if low-resistance meters are used, such allowances must be made. Figure 11 shows a chart in which the various voltages of the tube contacts are shown.

RADIOTRON SOCKET VOLTAGES

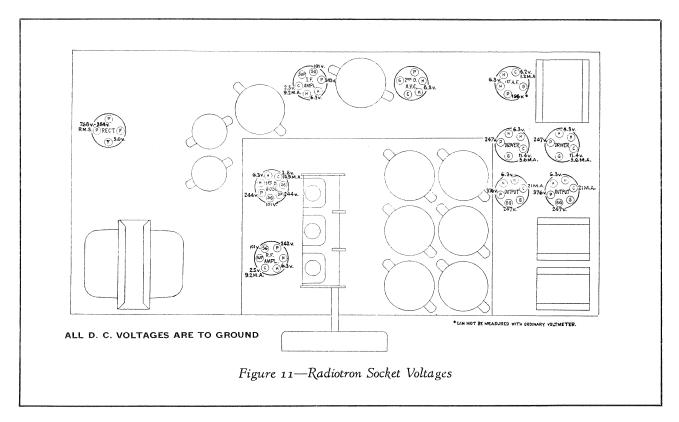
120-Volt A. C. Input-Volume and Sensitivity Controls Maximum-Band Switch at "A"-No Signal

Radiotron No.		Cathode to Ground Volts, D. C.	Screen Grid to Ground Volts, D. C.	Plate to Ground Volts, D. C.	Cathode Current, M. A.	Heater Volts, A. C.
RCA-6D6-	–R. F.	2.5	101	242	9.2	6.3
RCA-6A7	Detector	2.8	101	244	10.9	6,3
	Oscillator	Nacional Contract		244		,
RCA-6D6-	–I. F.	2.5	101	242	9.2	6.3
RCA-76—2	nd Det. AVC	0	-		0	6.3
RCA-76—A	1. F.	6.2		196*	1.2	6.3
RCA-76—I	Dríver	11.4		247	5.6	6.3
RCA-76—I	Dríver	11.4		247	5.6	6.3
RCA-42—P	'ower	0	247	376	21.0	6.3
RCA-42—Power		0	247	376	21.0	6.3
RCA-5Z3—Rectifier		-		768/384 R. M. S.	112	5.0

^{*}Cannot be measured with ordinary voltmeter.



F. Unit Wiring Diagram—Models with fidelity change for band position Figure 10—R.



REPLACEMENT PARTS

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

^{*}R12 Resistor—500 ohms—Some Models

REPLACEMENT PARTS (Continued)

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

ock Io.	Description	List Price	Stock No.	Description	List Price
556	Screw—Volume control mounting assembly		4656	Screw—Chassis mounting screw assembly—	
)50	—Comprising one bushing, one washer,			Comprising one bushing, one washer, one	
	one shakeproof washer and one nut	\$0.18		shakeproof washer, and one nut (four sets	00.40
152	Shield—First audio, second detector A.V.C.			required to mount chassis)	\$0.18
	or driver Radiotron shield	.35	7800	Shield—Antenna, detector or oscillator coil	4
583	Shield—Second detector—A.V.C. Radiotron		4450	shield	.4
	shield top	.20	4452	Shield—First detector-oscillator Radiotron	.3
153	Shield—I. F. Radiotron shield	.32	2602	shield Shield—Radiotron shield top	.2
300	Shield—Intermediate frequency transformer	4-	3683	Shield—Radiotron shield top Shield—R. F. amplifier Radiotron shield	.4
	shield	.45	4454	Socket—Dial lamp socket	.3
359	Socket—4-contact rectifier Radiotron socket	.30	3529 7485	Socket—Grant ramp socket	
184	Socket—5-contact first audio, second detector	.35	7403	socket	.4
	A.V.C. or driver Radiotron socket		3572	Socket — 7-contact first detector-oscillator	•
185	Socket—6-contact I. F. Radiotron socket	.40	3372	Radiotron socket	.3
576	Socket—6-contact output Radiotron socket	.40	7836	Switch—Range switch (S1, S2, S3, S4, S5,	
686	Strip—"ANT-GND" terminal strip—Two	20	7030	S6, S7, S8, S9, S10, S11)	3.0
	terminals and link	.20			
796	Switch—Operating switch (S12)	.62	l	DRIVE ASSEMBLIES	
795	Tone control—Bass tone control (R22)	1.30	4362	Arm—Band indicator operating arm	.2
548	Tone control—Treble tone control (R24)	1.25	10194	Ball—Steel ball for variable condenser drive	
341	Transformer—Audio transformer pack com-		10151	assembly—Package of 20	.2
	prising interstage transformer and reactor	4.05	4422	Clutch—Tuning condenser drive clutch as-	
	(T2, L35)	4.05	1122	sembly—Comprising drive shafts, balls,	
1 31	Transformer—First intermediate frequency	2 20		ring, spring and washers—Assembled	.8
	transformer (L29, L30, C32, C33, C36).	2.28	4455	Dial—Station selector dial	
433	Transformer—Second intermediate frequency	245	7799	Drive—Variable tuning condenser drive as-	•
	transformer (L31, L32, C40, C41, C42)	2.15	1133	sembly complete	2.4
832	Transformer—Driver transformer (T3)	2.85	4364	Gear—Spring gear assembly complete with	
505	Transformer—Power transformer—105–125	625	1301	hub, pinion, gear cover and spring	.9
	volts—50–60 cycles (T1)	6.35	4361	Indicator—Band indicator—Celluloid lettered	,,
506	Transformer—Power transformer—105-125	0.00	1501	—D. C. B. A. X	
	volts—25–40 cycles	8.90	4363	Pointer—Station selector main (large) pointer.	
507	Transformer—Power transformer—105–250	C 40	4367	Pointer—Station selector vernier (small)	•
	volts—40–60 cycles	6.40	1507	pointer	
650	Volume control (R17)	1.38	3943	Screen—Celluloid screen for dial light—	
			0510	Package of 2	
	R. F. UNIT ASSEMBLIES		3993	Screw—No. 6-32-5/32" square head set	•
			3333	screw for band indicator operating arm or	
747	Cap—Contact cap—Package of 5	.50		variable condenser drive—Package of 10	
646	Capacitor—4.5 mmfd. (C10)	.20 .25	4377	Spring—Band indicator and arm tension	
633	Capacitor—300 mmfd. (C8)	.30		spring—Package of 5	
981	Capacitor—360 mmfd. (C28)	.22	4378	Stud—Band indicator operating arm stud—	
413	Capacitor—300 mmfd. (C25)	.25	ĮĮ.	Package of 5	
412	Capacitor—2,850 mmfd. (C23)	.35		CABLE ASSEMBLIES	
524	Capacitor—2,850 mmfd. (C20)	.34			
615	Capacitor—0.05 mfd. (C5, C15)	.25	4653	Cable—Main cable	1.
417 415	Capacitor—0.1 mfd. (C7, C16)	.30	4654	Cable—4-conductor—Reproducer cable	•
	Capacitor—0.1 mfd. (C9, C31)	.25	4655	Cable—Shielded cable—From low-frequency	
645	Capacitor—Adjustable capacitor (C27, C30)	.78		tone control to resistor boards	
861	Clamp—Antenna lead clamp and screw—	1 .70	ll	REPRODUCER ASSEMBLY	
420	Package of 10	.40	4645	Capacitor-0.1 mfdLocated on output	
410	Coil—Antenna coil—Band "D" (L1, L2)	.70	1013	transformer (C54)	
803	Coil—Antenna coil—BS.W. (L3, L4, L7,		7835	Coil—Field coil, magnet and cone support	
	I.8. C1. C3)	1.82	1 , 022	(L37)	4.
810	Coil—Antenna coil—P.BL.W. (L5, L6,		8969	Cone—Reproducer cone (L36)—Package of 5.	6
010	L9, L10, C2, C4)	2.10	9543	Reproducer—Reproducer complete	10
805	Coil—Detector coil—BS.W. (L13, L14,		6999	Screen—Dust (cloth) screen—Package of 6	10.
003	L17, L18, C11, C13)	2.15	7834	Transformer—Output transformer and ca-	
808	Coil—Detector coil—P.BL.W. (L15, L16,		1 '034	pacitor (T4, C54)	3.
500	L19, L20, C12, C14)	2.05			5.
421	Coil—Detector coil—Band "D" (L11, L12).	.70		MISCELLANEOUS PARTS	
807	Coil—Oscillator coil—BS.W. (L21, L22,	1	4677	Bezel-Metal bezel (escutcheon) for station	
507	L25, L26, C22, C26)	1.62		selector dial glass	
809	Coil—Oscillator coil—P.BL.W. (L23, L24,		6614	Glass—Station dial glass	
009	L27, L28, C24, C29)	1.70	3829	Knob—Bass or treble tone control, volume	
'QO4	Condenser—3-gang variable tuning condenser	1 2.75		or sensitivity control range switch or oper-	
801	(C6, C17, C21)		I	ating switch knob—Package of 5	1
240	Lamp—Dial lamp—Package of 5	. 60	4657	Knob—Knob station selector knob—Package	
340	Resistor—1,000 ohms—Carbon type—1/4		1037	of 5	
370	Package of 10 (R 5)	. 2.00	4678	Ring—Retaining ring for dial glass—Pkg. of 5.	
C02	watt—Package of 10 (R5)	- 2.00	4119	Screw—8–32–1/4" headless set screw for knob	
3602	Resistor—60,000 ohms—Carbon type—1/4	. 1.00	1 4119	—Stock No. 4657—Package of 20	
1110	watt—Package of 5 (R8)	1.00	4393	Screw—8-32-5/16" headless set screw for	
141 V	Resistor—100 ohms—Flexible type—Package		1 7393	knob—Stock No. 3829—Package of 10	
1418	of 10 (R2, R6)	. 1.50	11		