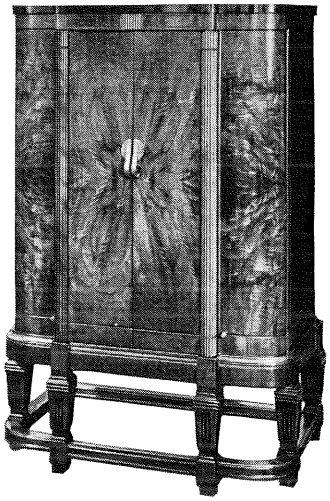
RCA Victor Model 281

Twelve-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

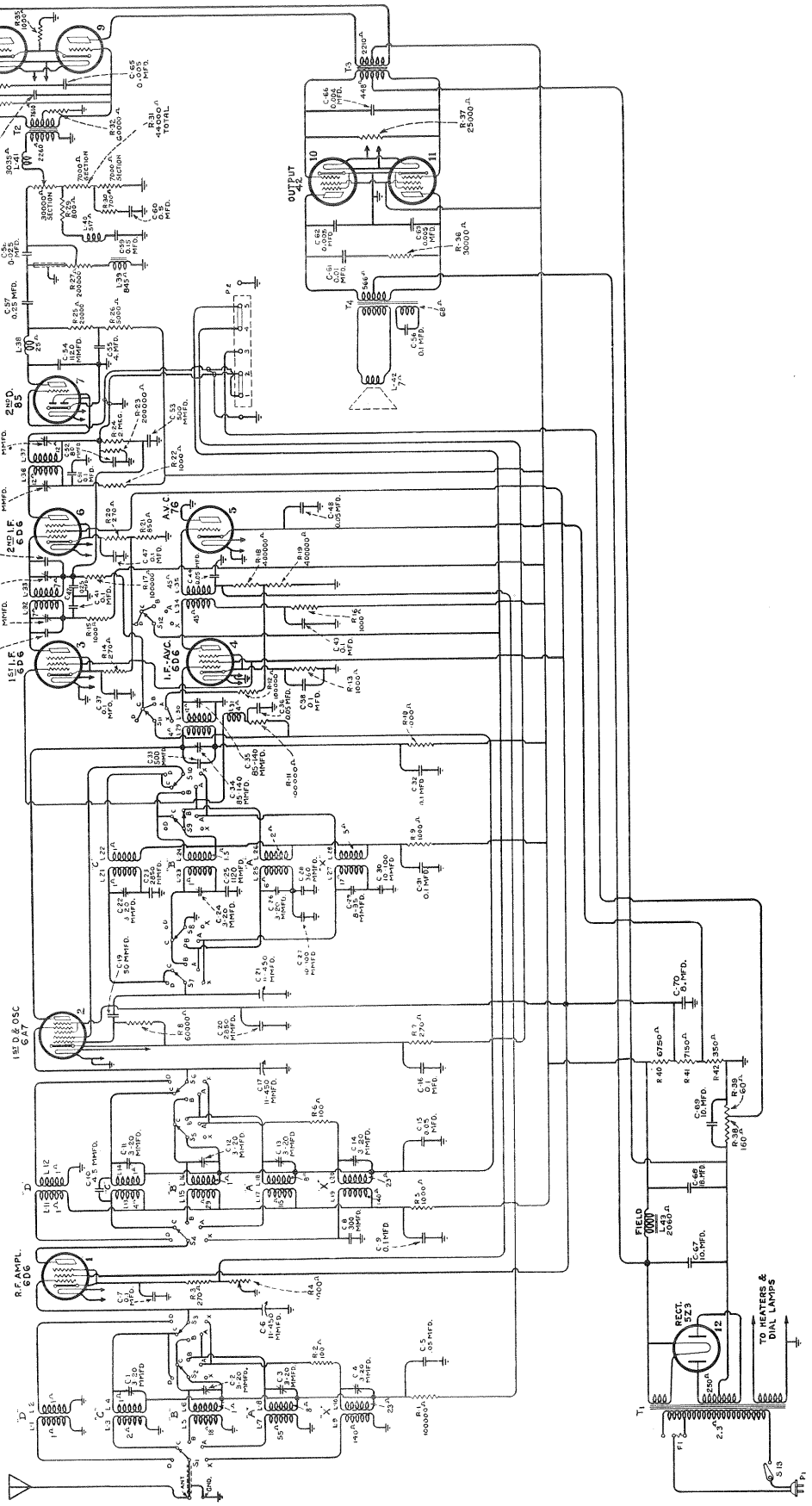


Figure 1—Schematic Circuit Diagram

RCA VICTOR MODEL 281

Twelve-Tube, Five-Band A. C. Superheterodyne

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Voltage Rating ..... 105–125 Volts

Frequency Rating ..... 25–60 and 50–60 Cycles

Power Consumption ..... 130 Watts (all frequencies)

Type and Number of Radiotrons ..... 4 RCA-6D6, 1 RCA-6A7, 3 RCA-76, 1 RCA-85, 2 RCA-42, 1 RCA-5Z3—Total 12

Tuning Frequency Range .....
- Band X ..... 140 K. C.–410 K. C.
- Band A ..... 540 K. C.–1720 K. C.
- Band B ..... 1720 K. C.–5400 K. C.
- Band C ..... 5400 K. C.–18,000 K. C.
- Band D ..... 18,000 K. C.–36,000 K. C.

Line-up Frequencies ..... 175 K. C., 410 K. C., 460 K. C., 600 K. C., 1720 K. C., 5160 K. C., 18,000 K. C.

Maximum Undistorted Output ..... 8 Watts

Maximum Output ..... 16 Watts

PHYSICAL SPECIFICATIONS

Height ..... 43 Inches

Width ..... 27½ Inches

Depth ..... 17¾ Inches

This twelve-tube, five-band all-wave superheterodyne radio receiver is an instrument in which all of the important modern developments known to the radio art have been combined. Its extreme range permits the listener to receive stations from all over the world in a manner not approached by other instruments. A full vision "Airplane" type dial with band indicator and direct calibration in both kilocycles and megacycles provides an easy means of locating stations. A two-speed tuning ratio permits the user to tune either rapidly or slowly through stations. A tuning range from 140 K. C. to 36,000 K. C. (with break from 410 K. C. to 540 K. C.) covers every broadcasting band used throughout the world today.

A high degree of tonal fidelity is obtained through the use of a high-power, high-gain, low-distortion audio amplifier and a large-field, 10-inch electro-dynamic loudspeaker. A diode second detector further improves this characteristic. An aurally compensated volume control ensures to the listener the maintenance of this tone quality at all degrees of volume. High and low frequency tone controls provide a means whereby either the high or low frequency response may be reduced as required by adverse operating conditions (station hum, static, etc.).

Other features include a sensitivity control, two distinct automatic volume control systems, a special R. F. unit of high efficiency which greatly improves the noise to signal ratio of short-wave reception, and an automatic sensitivity change for the short-wave bands. The cabinet is of unusual construction, having a sloping operating panel and tone chambers for eliminating cabinet resonance. It is designed along "moderne" lines of classic simplicity.

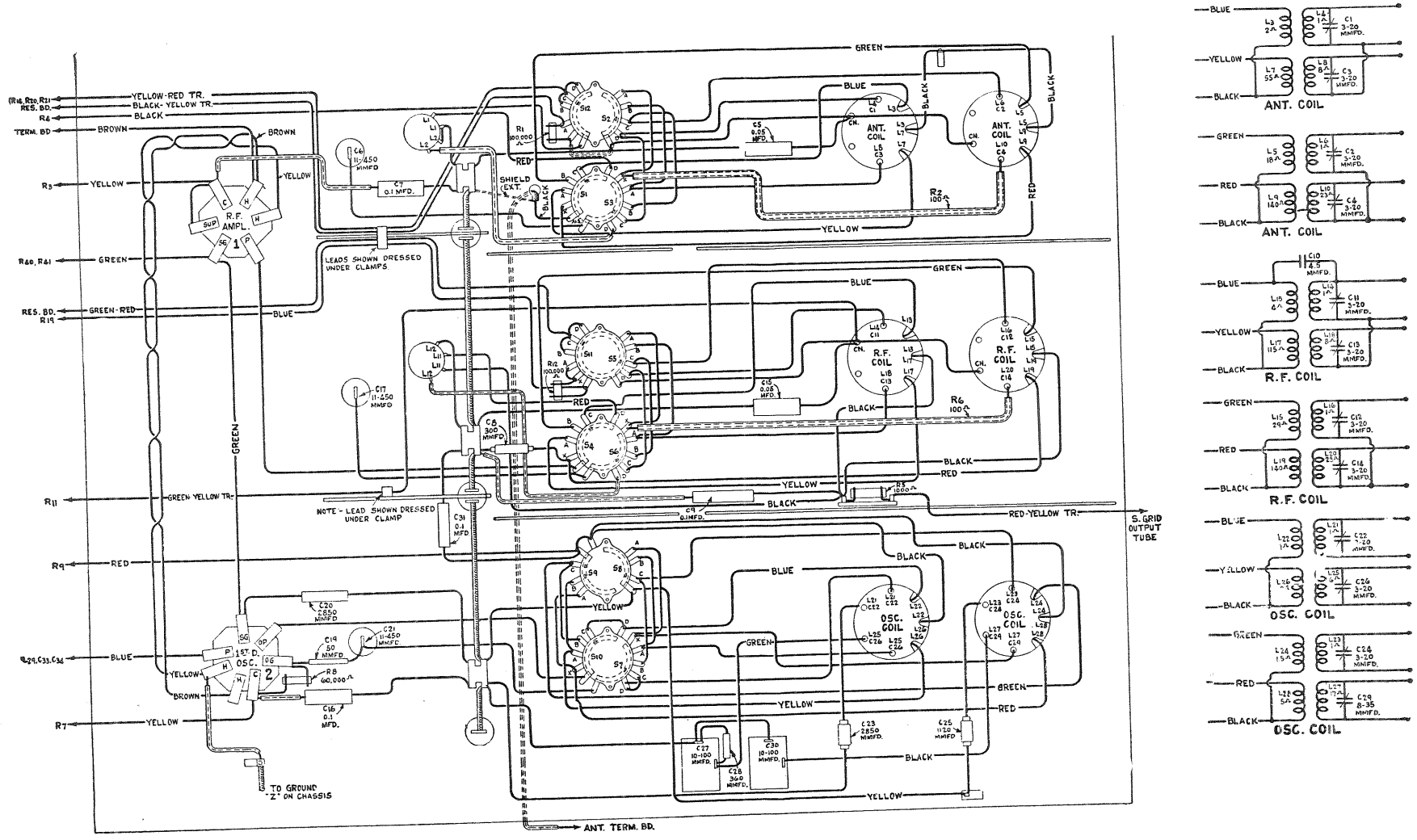


Figure 2—R. F. Assembly Wiring Diagram

DESCRIPTION OF ELECTRICAL CIRCUIT

The general circuit arrangement consists of an R. F. stage, a combined oscillator and first detector stage, two I. F. stages, a combined second detector and automatic volume control, a push-pull audio driver stage and a push-pull Class A output stage. Plate and grid voltages are supplied by the RCA-5Z3 heavy duty rectifier combined with a suitable filtering system. In addition, a double channel A. V. C. stage is provided which uses two additional tubes. Figure 1 shows the over-all schematic circuit diagram while Figure 2 shows the R. F. assembly wiring.

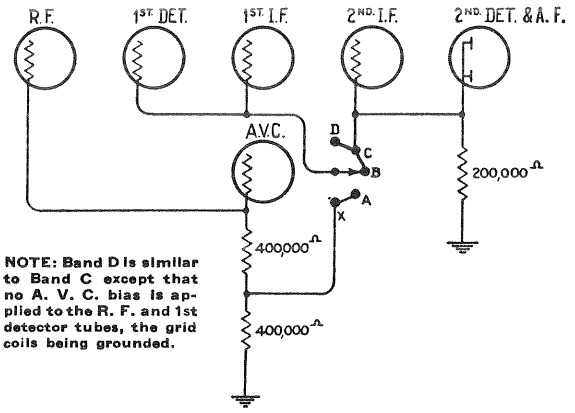


Figure 3—Switching Arrangement of Automatic Volume Control Systems

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 K. C. 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 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 performing other functions which will be discussed.

The output of the first detector which is the I. F. signal (460 K. C.) is fed directly through two tuned circuits to the grid of the automatic volume control I. F. amplifier stage. A coupling coil adjacent to the secondary of this transformer is connected directly to the signal I. F. stage, which is in effect parallel to the A. V. C., I. F. stage. Examining the signal amplifier further we find that the output of the first signal I. F. stage is applied through a transformer to the second I. F. stage and thence through a second transformer to the second detector. Both circuits of each transformer are accurately tuned to the I. F. signal, which is 460 K. C.

Further examining the A. V. C., I. F. stage it will be seen that the output of this stage is applied to the A. V. C. tube through an untuned I. F. transformer. The A. V. C. stage, which is an RCA-76, is operated as a straight rectifier, its plate being grounded and only the grid being used. This tube is shielded in the usual manner. A small grid voltage, approximately 5.0 volts, is maintained so that rectification does not occur until the signal level exceeds this grid voltage. When this occurs, a portion of the rectified signal produces a voltage drop across resistors R-18 and R-19. The drop across both of these resistors constitutes the automatic bias voltage for the R. F. stage. The drop across R-19 alone gives the automatic bias voltage for the first detector and first I. F. stage on bands X and A.

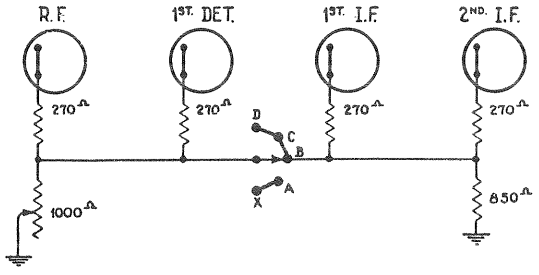


Figure 4—Sensitivity Control Switching Arrangement

Examining the second detector, the diode electrodes provide the detector action while the grid and plate give audio amplification. A portion of the rectified signal also gives a voltage drop across R-23 which is

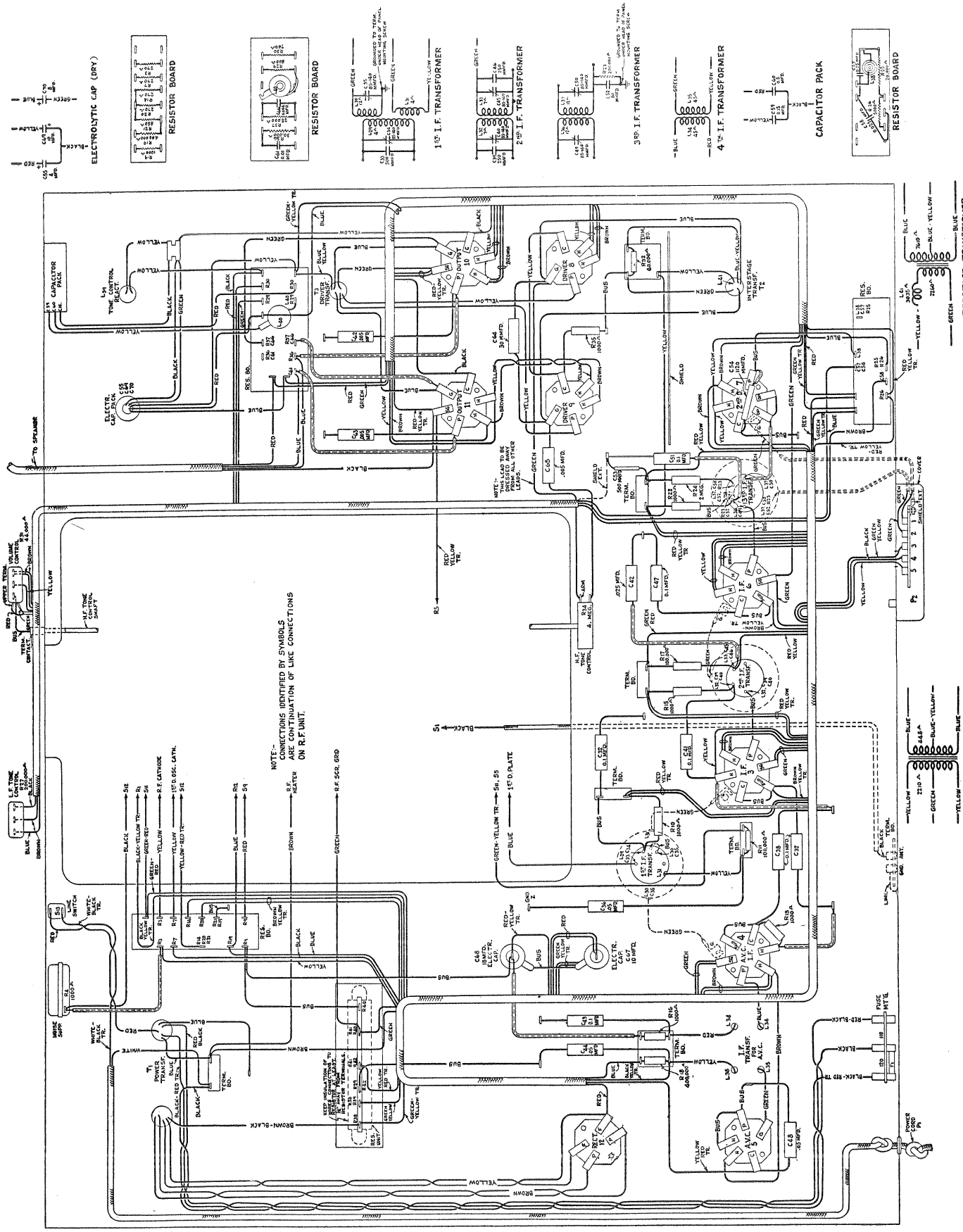


Figure 5—Chassis Assembly Wiring Diagram

a second automatic volume control system for the receiver. The voltage drop is applied to the second I. F. stage in all bands and to the first detector and first I. F. stage in bands B and C. The change in automatic volume control systems is made by an additional group of contacts on the band selector switch. Figure 3 shows the switching arrangements for changing the A. V. C. system in the various bands.

At this point, an explanation as to why two automatic volume control systems are used and why the sensitivity control is changed in different bands may be in order.

Two automatic volume control systems are used because of the different receiving conditions in different bands. For example, in the broadcast and long-wave band (X and A) signal levels are very high. Also due to the use of an aurally compensated volume control, a constant input to the second detector must be maintained. From this, it is evident that the double channel I. F. automatic volume control is ideal. It maintains a constant input to the second detector and yet does not function on an extremely weak signal. In the short-wave bands, however, conditions are different. Signal strengths are always very low and fluctuate widely. For this reason it is important to have some automatic volume control action below the level at which the double channel system works. This is provided by the diode A. V. C. of the second detector, which functions on the first detector and two I. F. stages on the short-wave bands. It should be noted that this action is present on the second I. F. stage on all bands. This further flattens the action of the double-channel system in bands X and A.

At this point it is well to examine the sensitivity control which also changes on different bands. The sensitivity control adjusts the residual bias on the R. F. and first detector stages in bands X and A while it controls the R. F., 1st detector and both I. F. stages on bands B, C, and D. Figure 4 shows the switching arrangement used.

The sensitivity control is changed so that in bands X and A it controls the R. F. and 1st detector while in bands B, C, and D it controls the R. F., 1st detector, 1st I. F. and 2nd I. F. stages. The reason for this is that for a given degree of sensitivity in bands X and A the residual bias will be considerably higher in the R. F. and 1st detector stages than in the bands B, C, and D used. This is to prevent possible overloading of these stages due to the high-signal strengths encountered in bands X and A. Also, in bands B, C, and D, for a given degree of sensitivity the R. F. stage operates at a higher gain, which gives an improved signal to noise ratio. This is caused by the paralleling of the sensitivity control with an 850-ohm resistor in these bands.

Returning to the second detector, we find its output circuit is coupled to the grid circuit of the driver stage through a compensated volume control system, tone control system and transformer. The volume control uses two stages of compensation, which serves to increase the high and low frequencies as the volume is reduced. This compensates for the natural loss in sensitivity of the human ear to the high and low frequencies at low sound levels. A low and a high frequency tone control enables the listener to alter the fidelity of the receiver to his individual taste.

The driver stage, which is a pair of RCA-76 Radiotrons connected in push-pull, is transformer coupled to a pair of RCA-42's which are the output stage. A feature of the output stage is the use of fixed bias, which reduces distortion and increases the available

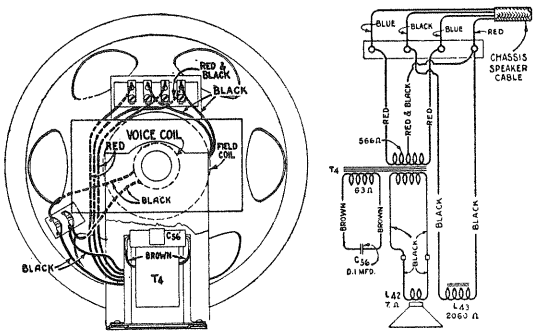


Figure 6—Loudspeaker Wiring

output. This is accomplished by the use of the drop across R-38 and R-39, which carries the entire D. C. output from the rectifier. Naturally the output stage uses but a portion of the total rectified current and current variations in it will have but little effect on the drop across the resistor.

The output of the power stage is coupled through a step-down transformer to the voice coil of the loudspeaker. 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 large field 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 5 shows the chassis wiring while Figure 6 shows the loudspeaker wiring.

(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 properly align this receiver, the following equipment must be used. This is a modulated R. F. oscillator having proper frequency range, an output indicator, an alignment tool, a tuning wand, and a "dummy" Radiotron RCA-76. These parts, which are shown in Figure 8, have been developed by the manufacturer of this receiver for use by service men to duplicate the original factory adjustments. The "dummy" Radiotron, RCA-76, is obtained by removing one heater prong from an otherwise perfect tube.

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 cylinder 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 7. An example of the proper manner of using the tuning wand would be to assume the external oscillator were set at 1720 and the signal tuned in. The A. V. C. tube would be replaced by the

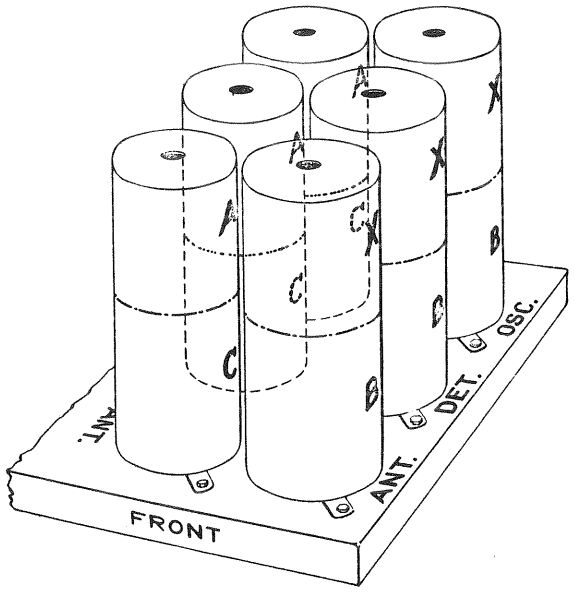
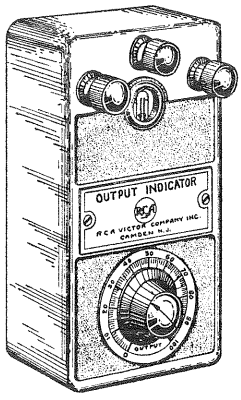


Figure 7—Location of Various Coils in Shields

"dummy" RCA-76 and the output indicator could be connected across the voice coil of the loudspeaker. Then the tuning wand would be inserted, 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

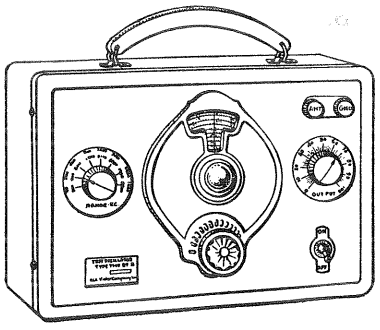


TMV-121-A

Stock No. 4317—Output Indicator

Stock No. 4160—Alignment Tool

Stock No. 6679—Tuning Wand



TMV-97-B

Stock No. 9050—Full Range Test Oscillator

Figure 8—Equipment Required for Aligning Receiver

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

Although this receiver has three I. F. stages, two for the signal and one for the A. V. C., only three transformers having six adjustable capacitors require adjustment. The fourth transformer is in the A. V. C. circuit and is broadly tuned, not requiring adjustments. The transformers are all peaked, being tuned to 460 K. C.

A detailed procedure for making this adjustment follows:

(a) Connect the output of an external oscillator tuned to 460 K. C. between the first detector grid and ground. Connect the output indicator across the voice coil of the loudspeaker. Replace the A. V. C. tube in the receiver with the "dummy" RCA-76.

(b) Place the oscillator in operation at 460 K. C.; place the receiver in operation and adjust the station selector until a point is reached (Band A) where no signals are heard and turn both the volume and sensitivity controls to their maximum position. Reduce the oscillator input until a slight indication is obtained in the output indicator.

(c) Refer to Figure 9. Adjust each trimmer of the I. F. transformers until 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 "X" and "A." Three are required in bands "B" and "C" while none are required in band "D." Band "D" uses the second harmonic of the oscillator while the detector and R. F. coils do not have trimmers.

To properly align the various bands, each band must be aligned individually. The preliminary set-up requires the external oscillator to be connected between the antenna and ground terminals of the receiver. The output indicator must be connected across the voice coil of the loudspeaker while the "dummy" RCA-76 must be placed in the A. V. C. socket. The sensitivity and volume controls must be at their 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 dis-

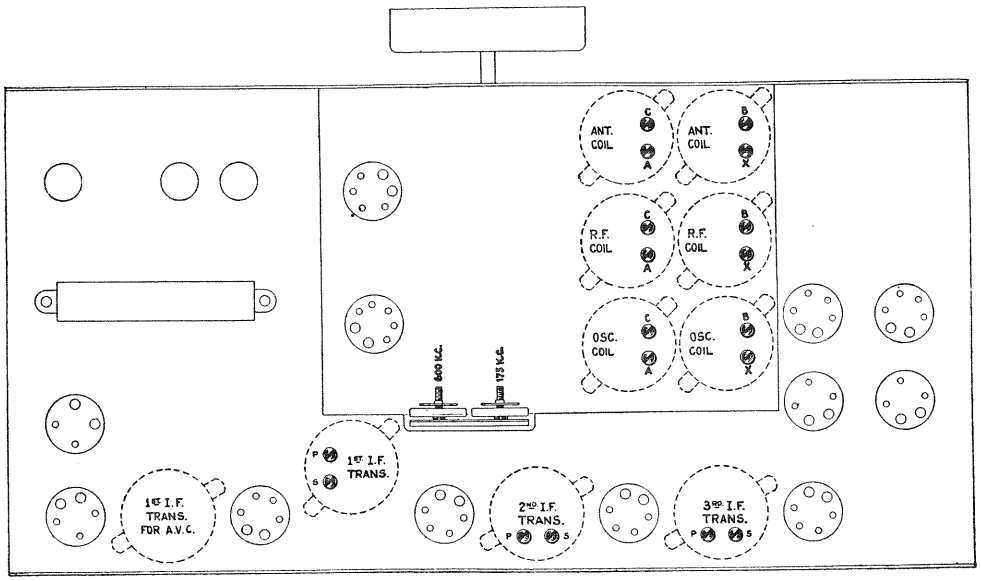


Figure 9—Location of Various Trimmer Capacitors

connect 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 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" of the horizontal line at the highest frequency end of band "A."

Figure 9 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 K. C., set the pointer at 410 K. C. and adjust the oscillator, detector and R. F. trimmers for maximum output.

(b) Shift the external oscillator to 175 K. C. Tune in the 175 K. C. signal irrespective of scale calibration and adjust the series trimmer marked 175 K. C. on Figure 9, for maximum output, at the same time rocking the variable tuning capacitor. Then readjust at 410 K. C. as described in (a).

Band "A"

(a) Tune the external oscillator to 1720 K. C., set the pointer at 1720 K. C. and adjust the oscillator, detector and R. F. trimmers for maximum output.

(b) Shift the external oscillator to 600 K. C. Tune in the 600 K. C. signal irrespective of scale calibration and adjust the series trimmer, marked 600 K. C. on Figure 9, for maximum output, at the same time rocking the variable tuning capacitor. Then readjust at 1720 K. C. as described in (a).

Band "B"

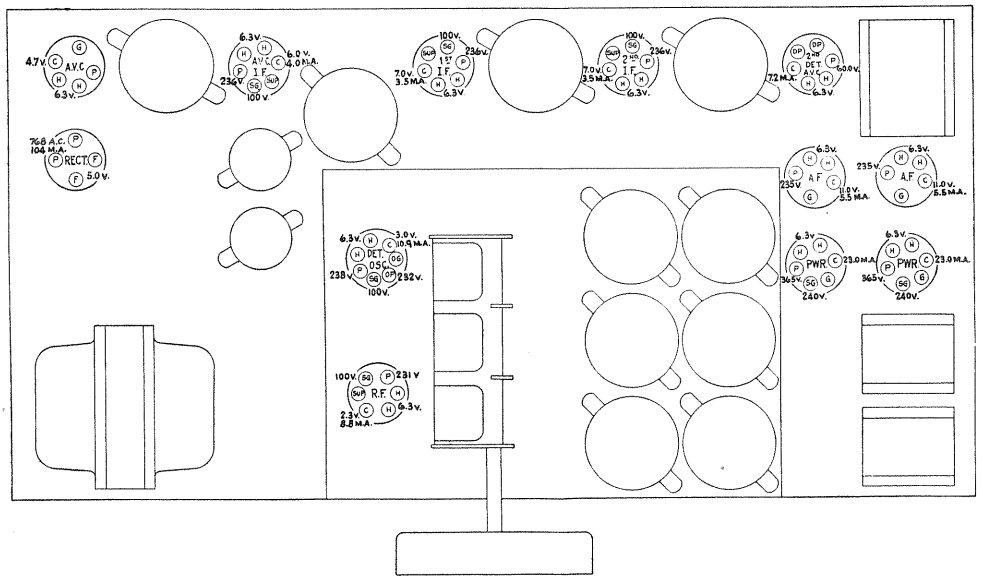
(a) Tune the external oscillator to 5160 K. C., and set the pointer at 5160 K. C. Adjust the oscillator trimmer for maximum output. The trimmer should be set at the first peak obtained when increasing the trimmer capacitor from minimum to maximum.

(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.

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

Band "C"

(a) Tune the external oscillator to 18,000 K. C., and set the pointer at 18 M. C. Adjust the oscillator trimmer for maximum output. The trimmer should be set at the first peak obtained when increasing the trimmer capacity from minimum to maximum.



ALL D. C. VOLTAGES ARE TO GROUND

Figure 10—Radiotron Socket Voltages

(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 is provided at the rear of the chassis for adding phonograph facilities to this instrument. In general, it is best to operate the phonograph with its volume control at its maximum output position and use the radio receiver volume control for adjusting volume. The radio volume control is compensated and will result in much better tone quality at low volume than will be obtained if it is operated open and the volume adjusted from the pickup volume control. Figure 11 shows the various types of connections that will be required for the different turntable assemblies.

(5) VOLTAGE READINGS

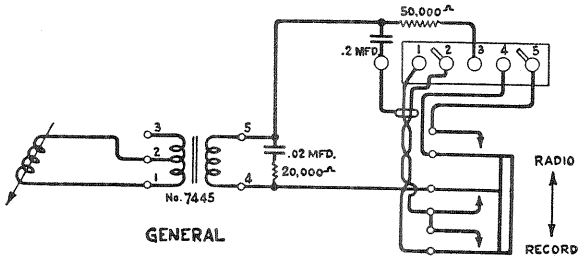
The following voltages are those at the various tube sockets while the receiver is in operating condition. No allowance has been made for currents drawn by the meter, and if low-resistance meters are used, such allowances must be made.

RADIOTRON SOCKET VOLTAGES

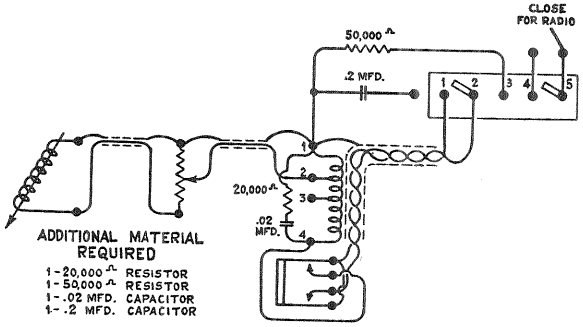
Maximum Sensitivity—No Signal—120-Volt A. C. Input

Radiotron No.		Cathode to Ground, Volts	Screen Grid to Ground, Volts	Plate to Ground, Volts	Cathode Current, M. A.	Heater Volts, A. C.
RCA-6D6—R. F.		2.3	100	231	8.8	6.3
RCA-6A7	Osc.	3.0	—	232	10.9	6.3
	Det.		100	238		
RCA-6D6—1st I. F.		7.0	100	236	3.5	6.3
RCA-6D6—2nd I. F.		7.0	100	236	3.5	6.3
RCA-6D6—A. V. C.–I. F.		6.0	100	236	4.0	6.3
RCA-76—A. V. C.		4.7	—	0	0	6.3
RCA-85—2nd Det.		0	—	60	7.2	6.3
RCA-76—A. F.		11.0	—	235	5.5	6.3
RCA-76—A. F.		11.0	—	235	5.5	6.3
RCA-42—Power		0	240	365	23.0	6.3
RCA-42—Power		0	240	365	23.0	6.3
RCA-5Z3—Rectifier		—	—	768/384 RMS	104.0	5.0

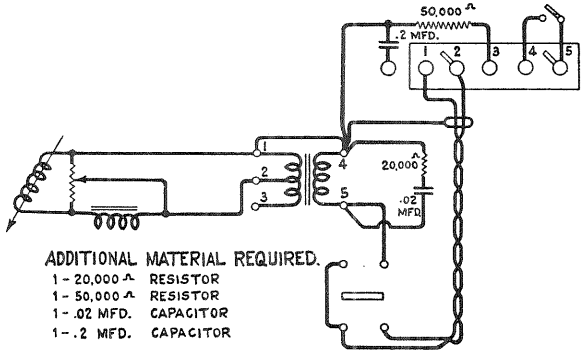
Power Transformer connected to 120-volt Tap.



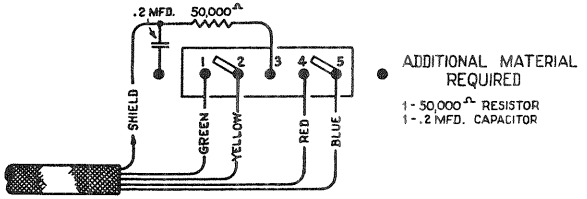
General Connections



End Table Connections



Portable Turntable Connections



Junior "Duo" Connections

Figure 11—Magnetic Pickup Connections

REPLACEMENT PARTS

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

Stock No.	Description	List Price
	RECEIVER ASSEMBLIES	
4372	Bracket—Low frequency tone or volume control mounting bracket	$0.20
4406	Bracket—High frequency tone control mounting bracket	.25
2747	Cap—Contact cap—Package of 5	.50
4407	Capacitor—30 mmfd. (C64)	.25
4405	Capacitor—80 mmfd. (C52)—Package of 5	.85
4376	Capacitor—250 mmfd.—Located on second intermediate frequency transformer (C39, C46)—Package of 5	.80
4404	Capacitor—500 mmfd. (C33, C53)—Package of 5	.85
4409	Capacitor—1120 mmfd. (C54)	.35
4070	Capacitor—.004 mfd. (C66)	.42
3643	Capacitor—.005 mfd. (C62, C63)	.25
6512	Capacitor—.005 mfd. (C65)	.28
3787	Capacitor—.01 mfd. (C61)	.30
3888	Capacitor—.05 mfd. (C36, C44, C48)	.25
3765	Capacitor—.025 mfd. (C42, C58)	.34
4645	Capacitor—.1 mfd. (C32, C41, C43, C51)	.25
3877	Capacitor—.1 mfd. (C37, C38, C47)	.32
3702	Capacitor—.25 mfd. (C57)	.42
7790	Capacitor—10 mfd. (C67)	1.05
7788	Capacitor—18 mfd. (C68)	1.10
7787	Capacitor pack—Comprising one .15 mfd. and one .5 mfd. capacitors (C59, C60)	1.10
7789	Capacitor pack—Comprising one 4., one 8. and one 10. mfd. capacitors (C55, C69, C70	2.68
4358	Clamp—Electrolytic capacitor clamp	.15
7806	Coil—Second detector plate choke coil (L38)	.30
4371	Cover—Fuse mount cover	.15
4359	Cover—Terminal board cover	.15
10907	Fuse—3-ampere—Package of 5	.40
3376	Mount—Fuse mount 105–125-volt instrument	.40
7784	Reactor—Tone control reactor (L39)	1.30
7483	Reactor—Volume control compensating reactor (L40)	.68
6135	Resistor—270 ohms—Carbon type—¼ watt (R3, R7, R14, R20)—Package of 5	1.00
4240	Resistor—700 ohms—Carbon type—¼ watt (R30)—Package of 5	1.00
4375	Resistor—800 ohms—Carbon type—¼ watt (R29)—Package of 10	2.00
6247	Resistor—850 ohms—Carbon type—¼ watt (R21)—Package of 5	1.00
4687	Resistor—1,000 ohms—Carbon type—¼ watt (R9, R10, R13, R15, R16, R22, R35)—Package of 10	$2.00
3110	Resistor—25,000 ohms—Carbon type—¼ watt (R37)—Package of 5	1.00
3602	Resistor—60,000 ohms—Carbon type—¼ watt (R32)—Package of 5	1.00
3118	Resistor—100,000 ohms—Carbon type—¼ watt (R11, R17)—Package of 5	1.00
3116	Resistor—200,000 ohms—Carbon type—¼ watt—Located on third I. F. transformer (R23)—Package of 5	1.00
4368	Resistor—400,000 ohms—Carbon type—¼ watt (R18, R19)—Package of 10	2.00
6242	Resistor—2 megohms—Carbon type—¼ watt (R24, R33)—Package of 5	1.00
3413	Resistor—5,000 ohms—Carbon type—½ watt (R26)—Package of 5	1.00
2240	Resistor—30,000 ohms—Carbon type—1 watt (R36)	.22
5817	Resistor—20,000 ohms—Carbon type—3 watt (R25)	.25
6997	Resistor—Total resistance 14,470 ohms with 160–60–350–7150 and 6750 ohm sections (R38, R39, R40, R41, R42)	.95
7804	Rheostat—Noise suppressor rheostat (R4)	1.30
4453	Shield—First I. F., AVC—I. F. or second I. F. Radiotron shield	.32
3683	Shield—Radiotron shield top	.20
4452	Shield—Second detector or AVC Radiotron shield	.35
7800	Shield—Shield for intermediate frequency coils	.45
3859	Socket—4-contact rectifier Radiotron socket	.30
7484	Socket—5-contact AVC Radiotron socket	.35
6676	Socket—6-contact output Radiotron socket	.40
7485	Socket—6-contact driver Radiotron socket	.40
7796	Switch—Operating switch (S13)	.62
7795	Tone control—Low frequency (R27)	1.30
7797	Tone control—High frequency (R34)	1.35
7794	Transformer—AVC intermediate frequency transformer (L34, L35)	.82
7785	Transformer—Driver transformer (T3)	2.40
7791	Transformer—First intermediate frequency transformer (L29, L30, L31, C33, C34, C35)	2.35
9505	Transformer—Power transformer 105–125-volt, 50–60 cycle (T1)	6.35
9506	Transformer—Power transformer 105–125 volts, 25–40 cycles	8.90
7792	Transformer—Second intermediate frequency transformer (L32, L33, C39, C40, C45, C46)	2.22

REPLACEMENT PARTS—(Continued)

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

Stock No.	Description	List Price
7793	Transformer—Third intermediate frequency transformer (L36, L37, C49, C50, C52, R23)	$2.50
7786	Transformer pack—Comprising one reactor and interstage transformer (L41, T2)	4.25
7798	Volume control (R31)	2.05
	R. F. UNIT ASSEMBLIES	
4646	Capacitor—4.5 mmfd. (C10)	.20
4416	Capacitor—50 mmfd. (C19)—Package of 5	1.25
3981	Capacitor—300 mmfd. (C8)	.30
4413	Capacitor—360 mmfd. (C28)	.22
4412	Capacitor—1120 mmfd. (C25)	.25
4524	Capacitor—2850 mmfd. (C23)	.35
4615	Capacitor—2850 mmfd. (C20)	.34
4417	Capacitor—0.05 mfd. (C5, C15)	.25
4415	Capacitor—0.1 mfd. (C7, C16)	.30
4645	Capacitor—0.1 mfd. (C9, C31)	.25
3861	Capacitor—Adjustable capacitor (C27, C30)	.78
4420	Clamp—Antenna lead clamp and screw—Package of 10	.40
4410	Coil—Antenna coil—Band "D" (L1, L2)	.70
7803	Coil—Antenna coil—"B"—"SW" (L3, L4, L7, L8, C1, C3)	1.82
7810	Coil—Antenna coil—"PB"—"LW" (L5, L6, L9, L10, C2, C4)	2.10
7805	Coil—Detector coil—"B-SW" (L13, L14, L17, L18, C11, C13)	2.15
7808	Coil—Detector coil—"PB-LW" (L15, L16, L19, L20, C12, C14)	2.05
4421	Coil—Detector coil—Band "D" (L11, L12)	.70
7807	Coil—Oscillator coil—"B-SW" (L21, L22, L25, L26, C22, C26)	1.62
7809	Coil—Oscillator coil—"PB-LW" (L23, L24, L27, L28, C24, C29)	1.70
7801	Condenser—3-gang variable tuning condenser (C6, C17, C21)	4.42
4419	Lead—Shield single-conductor antenna lead	.45
4370	Resistor—1,000 ohms—Carbon type—¼ watt (R5)—Package of 10	2.00
3602	Resistor—60,000 ohms—Carbon type—¼ watt (R8)—Package of 5	1.00
3118	Resistor—100,000 ohms—Carbon type—¼ watt (R1, R12)—Package of 5	1.00
4418	Resistor—100 ohms—Flexible type (R2, R6)—Package of 10	1.50
7800	Shield—Antenna, detector or oscillator coil shield	.45
4452	Shield—First detector oscillator coil shield	.35
3683	Shield—Radiotron shield top	.20
4454	Shield—R. F. amplifier Radiotron shield	.44
3529	Socket—Dial lamp socket	.32
7485	Socket—6-contact Radiotron socket	.40
3572	Socket—7-contact Radiotron socket	.38
4686	Strip—Terminal strip engraved "ANT-GND"	.20
7802	Switch—Range switch (S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12)	4.05

Stock No.	Description	List Price
	CABLE ASSEMBLIES	
7815	Cable—Audio cable	$0.62
7813	Cable—From L. F. tone control, volume control to resistor boards	.72
7812	Cable—Main cable	1.30
7814	Cable—Reproducer cable—4-conductor	.45
	REPRODUCER ASSEMBLIES	
4193	Board—Terminal board	.32
9509	Coil—Field coil, magnet and cone support (L43)	11.46
7000	Cone—Reproducer cone (L42)—Package of 5	9.45
9508	Reproducer complete	17.40
6999	Screen—Dust screen—Package of 6	.12
4506	Transformer—Output transformer and capacitor (T4, C56)	2.85
	MISCELLANEOUS ASSEMBLIES	
4677	Bezel—Metal bezel (escutcheon) for station selector dial	.56
6614	Glass—Station selector dial glass	.30
4425	Knob—Station selector knob—Package of 5	.75
3829	Knob—Volume control, tone control, noise suppressor or range switch knob—Package of 5	1.10
4340	Lamp—Dial lamp—Package of 5	.60
4678	Ring—Station selector dial glass retaining ring—Package of 5	.34
4119	Screw—8-32-¼" headless set screw for knob—Stock Number 4425—Package of 20	.38
4393	Screw—8-32-5/16" headless set screw for knob—Stock Number 3829—Package of 10	.25
	DRIVE ASSEMBLIES	
4362	Arm—Band indicator operating arm	.28
10194	Ball—Steel ball for variable condenser drive assembly—Package of 20	.25
4422	Clutch—Tuning condenser drive clutch assembly—Comprising drive shaft, balls, ring, spring and washers assembled	.88
4455	Dial—Station selector dial	.60
7799	Drive—Variable tuning condenser drive assembly complete	2.45
4364	Gear—Spring gear assembly complete with hub pinion, gear cover and spring	.96
4361	Indicator—Band indicator—Celluloid-lettered D-C-B-A-X	.12
4363	Pointer—Station selector main pointer—Large	.18
4367	Pointer—Station selector vernier pointer—Small	.15
3993	Screw—No. 6-32-5/32" square head set screw for variable condenser drive assembly—Package of 10	.25
4377	Spring—Band indicator and arm tension spring—Package of 5	.25
4360	Stem—Pointer stem assembly	.35
4378	Stud—Band indicator operating arm stud—Package of 5	.25