

SERVICE NOTES

for

RCA Model R-7-LW

ELECTRICAL SPECIFICATIONS

Voltage Rating.....	100-230 Volts
Frequency Rating.....	40-60 Cycles
Power Consumption.....	100 Watts
Antenna Length.....	25-75 Feet
Circuit.....	A.C. Screen Grid Super-Heterodyne
Radiotrons.....	2 RCA-235, 1 UY-224, 2 UY-227, 2 UX-245, 1 UX-280 Total of 8
Radio Frequency Stages.....	One
First Detector.....	Tuned Input Grid Bias
Intermediate Stages.....	One
Second Detector.....	Power Grid Bias
Audio Stages.....	One (Push-Pull)
Rectifier.....	Full Wave UX-280
Loudspeaker.....	Dynamic
Undistorted Output.....	3.0 Watts
Frequency Range.....	550-1500 K.C. and 150-300 K.C.

PHYSICAL SPECIFICATIONS

Height.....	19 inches
Depth.....	10 inches
Width.....	14 inches
Weight alone.....	37 pounds
Weight (Packed for Shipment).....	44 pounds
Packing Case Dimensions.....	16 ³ / ₄ " x 12 ⁷ / ₈ " x 23 ¹ / ₄ "

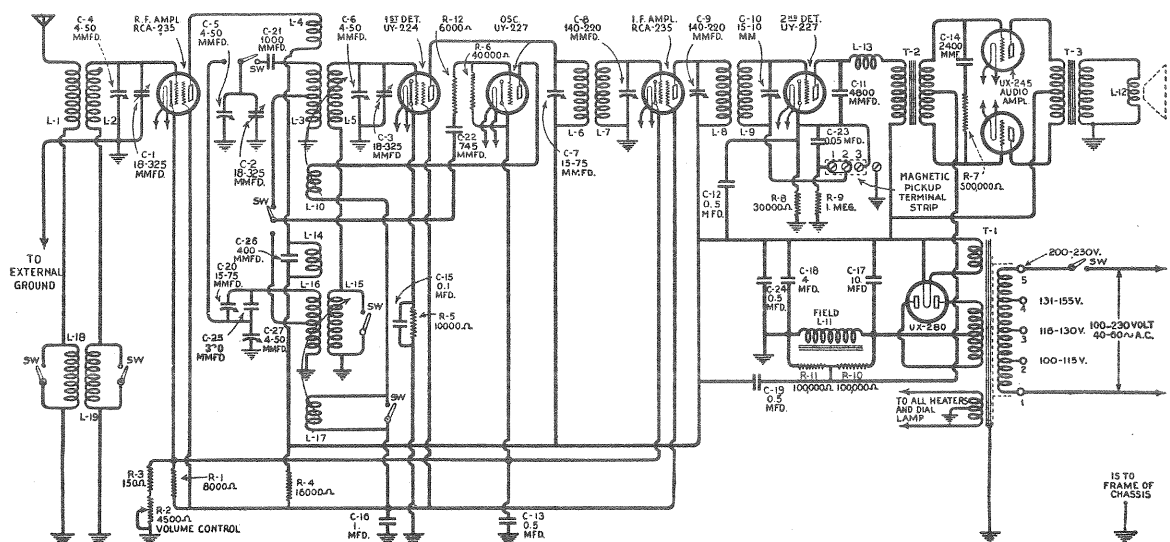


Figure 1—Schematic circuit diagram of R-7-LW

INTRODUCTION

The RCA Model R-7-LW is an eight tube screen grid Super-Heterodyne Receiver incorporating all the features inherent in this circuit and with the additional feature of covering two frequency bands. By means of a Selector Switch the tuning range may be changed from the broadcast range—550 to 1500 K.C.—to the intermediate range of 150 to 300 K.C. The entire mechanism is of compact construction and mounted on a table model cabinet of pleasing design.

SERVICE DATA

A reference to the RCA Superette Model R-7 Service Notes will give the details of the usual service work necessary with this type of receiver.

Figure 1 shows the schematic circuit diagram. Figure 2 shows the location of the various line-up capacitors. Figure 3 gives the correct connections for attaching a magnetic pickup to the R-7-L.W. and Figure 4 shows the wiring diagram. The voltage readings obtained at the Radiotron sockets with one of the usual set analyzers are given on page 3.

I. F. TRANSFORMER ALIGNMENT

A single intermediate frequency amplifier stage is used in this receiver. Two transformers are used and all circuits are tuned to 110 K.C. The circuits are peaked and when alignment adjustments are made, the condensers are adjusted for maximum output.

A detailed procedure for making these adjustments follows:

- Procure a modulated R. F. oscillator giving a signal at 110 K.C. A non-metallic screw driver is also necessary. A suitable screw driver is listed in the Replacement Part List (Stock No. 7065).
- Connect an output meter in the circuit. This may be a current square thermo-galvanometer connected to the secondary of the output transformer instead of the reproducer unit cone coil, a 0.5 millimeter connected in series with the plate supply to the second detector or a low range A.C. voltmeter connected across the cone coil of the reproducer.
- Remove the oscillator tube, socket No. 2, and make a good ground connection to the chassis. Place the oscillator in operation and connect its output to the control grid cap of the first detector, socket No. 3. Adjust the oscillator output or the receiver volume control until a deflection is obtained in the output meter.

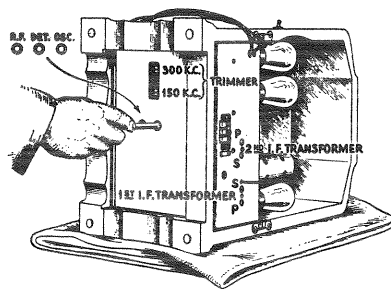


Figure 2—Location of various line-up capacitors

- Now adjust the secondary and primary of the second and first I.F. transformers until a maximum reading is obtained in the output meter. See Figure 2. Go through these adjustments a second time as a slight readjustment may be necessary.

When the adjustments are made, the set should perform at maximum efficiency. However, due to the interlocking of the adjustments, it is a good plan to follow the I.F. adjustments with R.F. and oscillator line-up condenser adjustments. The correct method of doing this is given in the following section.

OSCILLATOR ADJUSTMENTS

Five adjustable condensers are provided for aligning the R.F. circuits and adjusting the oscillator frequency so that it will be at a 110 K.C. difference from the incoming R.F. signal throughout the tuning range of the set. Poor quality, insensitivity, and possible inoperation of the receiver may be caused by these condensers being out of adjustment.

If the other adjustments have not been tampered with and are correctly aligned—the intermediate tuning condensers—the following procedure may be used for adjusting these condensers.

- Procure an R.F. oscillator giving a modulated signal at exactly 1400 K.C., 300 K.C. and 150 K.C. Also procure a non-metallic screw driver, such as Stock No. 7065 and a small socket wrench.
- An output indicator is necessary. This may be a current squared thermo-galvanometer connected to the secondary of the output transformer instead of the cone coil of the reproducer unit, a 0.5 millimeter connected in series with the plate supply to the second detector or a low range A.C. voltmeter connected across the reproducer unit cone coil.

- Turn the station selector until the dial reads exactly 100. Then remove the chassis from the cabinet, being careful not to disturb the setting of the dial. The gang condenser rotor plates should be fully meshed with the stator plates. If not, then the dial drum must be adjusted until such a condition exists. Be sure and tighten the set screws that hold the drum to the condenser shaft.
- Place the oscillator in operation at exactly 1400 K.C. and couple it to the antenna. Set the dial scale at 11 and turn the cabinet on its side. Place a soft pad under the instrument to prevent damage to the cabinet finish. Adjust the coupling between the oscillator and the antenna lead of the set or the volume control until a deflection is obtained in the output meter.
- With the socket wrench adjust the oscillator, first detector and R.F. line-up condensers until a maximum deflection is obtained in the output meter. (See Figure 2).
- Set the oscillator at 300 K.C. Set the Selector Switch to the right for the low frequency band and tune in this signal with the receiver. Adjust the Volume control for a deflection in the output meter. Now adjust the 300 K.C. condenser Figure 2 until maximum output has been obtained. Rock the gang condenser back and forth while making this adjustment.
- Set the oscillator at 150 K.C. and repeat as in (f) only adjust the 150 K.C. trimming condenser shown in Figure 2.

Change the frequency of the oscillator to 1400 K.C. and set the Dial at 11. Shift to the high frequency band. Again make the adjustment given under (d) and (e).

So adjusted, the R.F. circuits are properly aligned and the oscillator will maintain a constant frequency difference from the incoming R.F. signal.

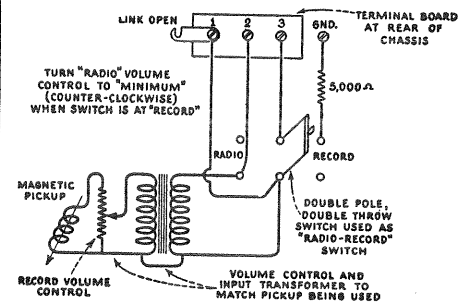


Figure 3—Magnetic Pickup Connections

RADIOTRON SOCKET VOLTAGES

Line Voltage correct for the transformer tap being used

These voltages are taken with the usual Set Analyzers and are not the true voltages at which the Radiotrons operate

Tube No.	Cathode to Heater Volts, D. C.	Cathode or Filament to Control Grid Volts, D. C.	Cathode to Screen Grid Volts, D. C.	Cathode or Filament to Plate Volts, D. C.	Plate Current M. A.	Screen Grid Current M. A.	Heater or Filament Volts, A. C.
VOLUME CONTROL AT MINIMUM							
1	40	40	55	200	0	0	2.4
2	40	0	—	50	4.0	—	2.4
3	8.0	7.0	90	240	0.5	0.25	2.4
4	40	40	55	200	0	0	2.4
5	25	*5.0	—	220	0.5	—	2.4
6	—	*30.0	—	245	30.0	—	2.4
7	—	*30.0	—	245	30.0	—	2.4
VOLUME CONTROL AT MAXIMUM							
1	3.5	3.5	70	240	5.0	**0.7	2.4
2	2.5	0	—	65	5.5	—	2.4
3	5.0	5.0	70	235	0.5	0.25	2.4
4	3.5	3.5	70	240	5.0	**0.7	2.4
5	25	*5.0	—	220	0.5	—	2.4
6	—	*30	—	245	25.0	—	2.4
7	—	*30	—	245	25.0	—	2.4

*Not true reading due to resistance in circuit.
 **This reading may be + or - depending on age of tube.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
RECEIVER ASSEMBLY					
2240	Resistor—30,000 Ohms—Carbon type—Package of 1...	\$0.70	3227	Coil—Antenna loading coil.....	\$1.10
2546	Resistor—1,000,000 Ohms—Carbon type—Package of 5.....	3.00	3228	Switch—Toggle switch for band changing.....	1.50
2563	Resistor—6,000 Ohms—Carbon type—Package of 5.....	3.00	3230	Coil—1st detector and oscillator coil.....	3.00
2731	Resistor—10,000 Ohms—Carbon type—Package of 5.....	2.00	3231	Control—Volume control—Complete with mounting nut.....	1.55
2746	Socket—Dial lamp socket.....	.50	3232	Capacitor—280 MMFD—Package of 5.....	2.50
2747	Caps—Grid contactor caps—Package of 5.....	.50	7054	Cord—Power cord.....	1.00
2749	Capacitor—2400 MMFD.....	1.50	7062	Capacitor—Adjustable oscillator trimmer capacitor—15-70.....	1.00
2875	Knobs—Station selector, band selector or volume control knob—Package of 5.....	1.50	7063	Capacitor—Adjustable trimmer capacitor 5-40.....	1.00
2881	Bracket—Dial lamp bracket—Package of 5.....	.50	7065	Screwdriver—Non-metallic screwdriver for line-up adjustments.....	1.10
2882	Socket—UY Radiotron socket complete with insulator—5 used.....	.50	7238	Capacitor—Comprising four 0.5 MFD., one 0.05 MFD., one 0.1 MFD. and one 1.0 MFD. capacitors in metal container.....	3.50
2957	Condenser—10 MFD Electrolytic condenser with mounting nut and washers.....	3.00	7239	Transformer—Audio transformer assembly.....	6.00
2963	Resistor—8,000 Ohms—Carbon type—Package of 5.....	2.50	7241	Capacitor—3 gang tuning condenser.....	8.00
2968	Socket—UX Radiotron socket complete with insulator—3 used.....	.50	7299	Capacitor—745 MMFD.....	.70
2970	Resistor—500,000 Ohms—Carbon type—Package of 5.....	2.50	7336	Transformer—1st intermediate transformer.....	3.00
2973	Board—Magnetic pickup terminal board—Package of 2.....	.50	7337	Transformer—2d intermediate transformer.....	3.00
2994	Coil—2d detector R.F. choke coil.....	.60	7338	Board—Resistor board complete less resistors and coil.....	1.00
2997	Coil—R.F. coil.....	1.90	7339	Switch—Rotary Band Selector switch—Complete with mounting nut and washers.....	1.90
2999	Shaft assembly—Dial scale drive shaft.....	.50	8680	Transformer—Power transformer—105-125 volts—25-40 cycles.....	12.00
3000	Dial—Dial drum and scale complete.....	.60	8768	Coil capacitor and switch—Complete with mounting nuts and escutcheon.....	9.00
3003	Cushions—Receiver chassis mounting cushions—Package of 4.....	.50	8769	Transformer—Power transformer—100-230—40-60 cycles.....	12.50
3006	Capacitor—1000 MMFD.....	.50	REPRODUCER		
3056	Shield—Radiotron shield—3 used—Package of 2.....	.50	8559	Ring—Cone retaining ring.....	.80
3057	Condenser—4 MFD. Electrolytic condenser with mounting nuts and washers.....	2.50	8601	Cone—Reproducer paper cone—Package of 5.....	15.00
3058	Resistor—100,000 Ohms—Carbon type—Package of 5.....	2.50	8639	Coil—Reproducer field coil assembly—Comprising field coil, magnet and cone housing.....	5.00
3060	Resistor—40,000 Ohms—Carbon type—Package of 5.....	3.50	CABINET		
3061	Switch—Toggle type—Operating switch with mounting nut.....	.70	3005	Screw assembly—Reproducing mounting screws, nut and washers—Package of 1 set of 4 each.....	.50
3081	Resistor—16,000 Ohms—Carbon type—Package of 1.....	.60	3229	Escutcheon—Station selector escutcheon—Complete with mounting screws.....	.70
3085	Capacitor—400 MMFD.....	.60	7242	Baffle board and grill cloth.....	1.00
3225	Lever—Switch lever—Package of 2.....	1.00	9391	Cabinet—Cabinet complete less equipment.....	15.00
3226	Coil—Oscillator and 1st detector loading coil.....	1.25			

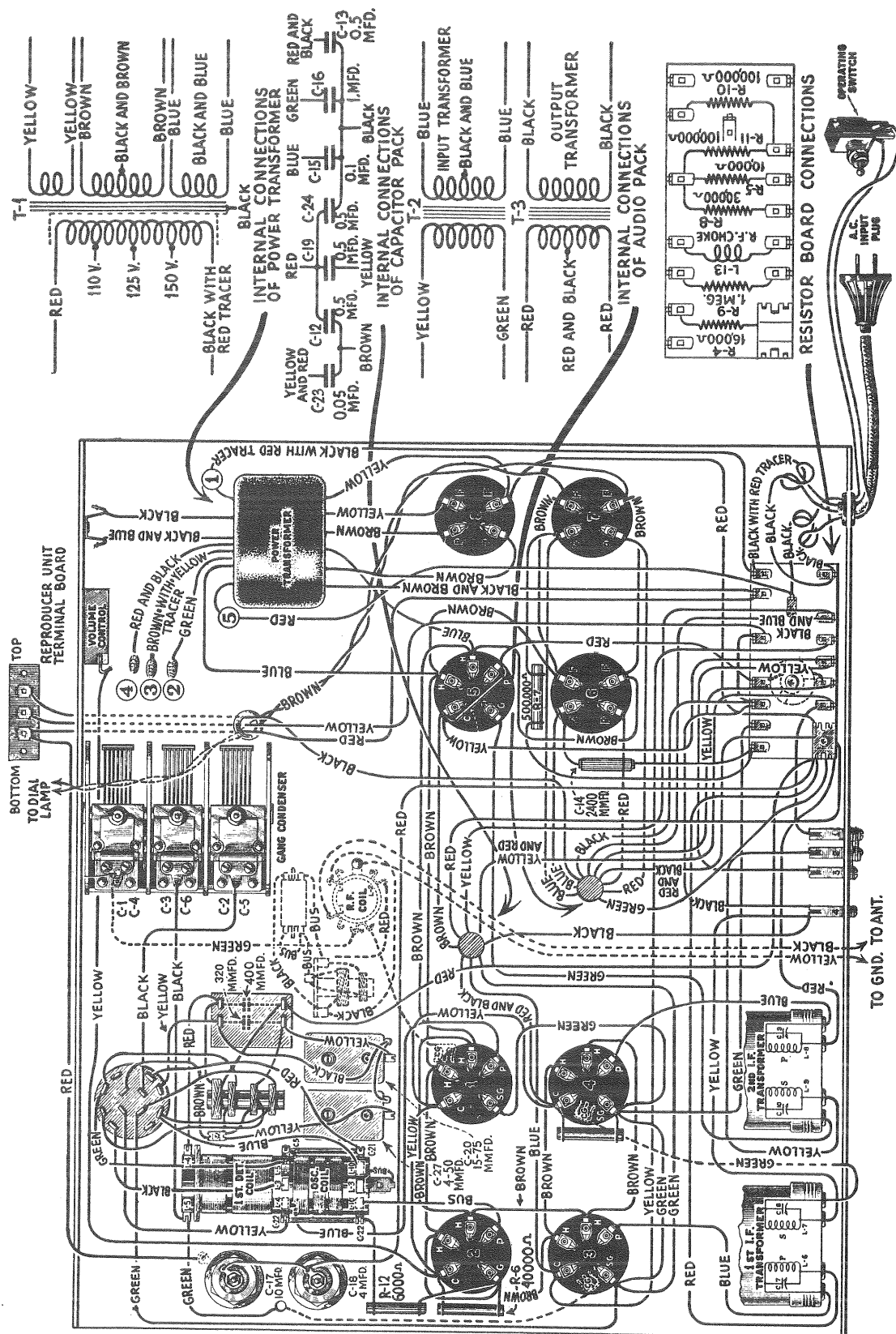


Figure 4—Wiring diagram of R-7-LW

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