

R.C.A. Victor Co., Inc.

Model: T7-5

Chassis:

Year: Pre October 1936

Power:

Circuit:

IF:

Tubes:

Bands:

Resources

[Riders Volume 7 - RCA 7-67](#)

[Riders Volume 7 - RCA 7-68](#)

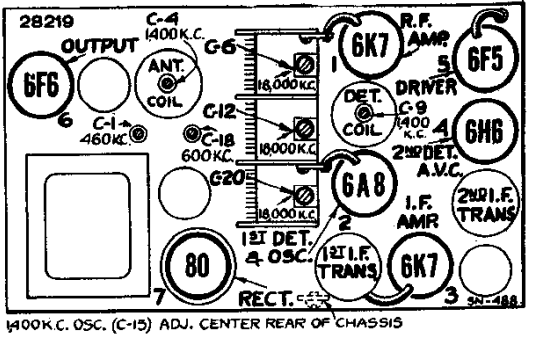
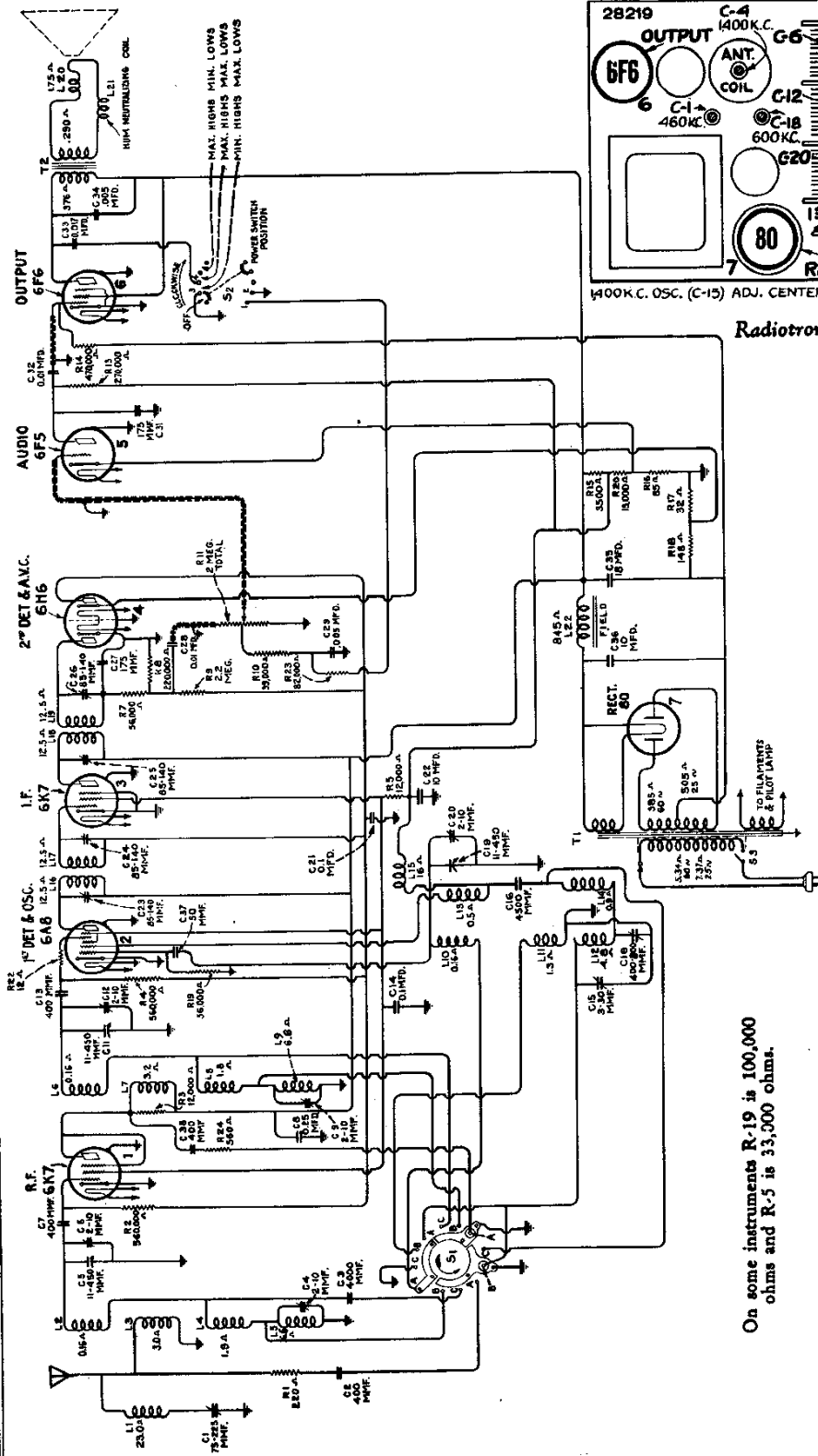
[Riders Volume 7 - RCA 7-69](#)

[Riders Volume 7 - RCA 7-70](#)

[Riders Volume 7 - RCA 7-82](#)

RCA MFG. CO., INC.

MODELS T7-5, C7-6
Schematic, Socket
Trimmers



Radiotron and Coil Locations

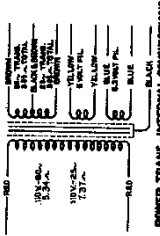
On some instruments R-19 is 100,000 ohms and R-5 is 33,000 ohms.

| FREQUENCY RANGES | ALIGNMENT FREQUENCIES |
|--|---|
| Band A..... 540- 1,625 kc. | Band A..... 600 kc. (osc.), 1,400 kc. (osc, det., ant.) |
| Band B..... 1,625- 5,700 kc. | Band B..... None required |
| Band C..... 5,700-18,000 kc. | Band C..... 18,000 kc. (osc, det., ant.) |
| Intermediate Frequency..... 460 kc. | |
| POWER SUPPLY RATINGS | |
| Rating A..... 105-125 Volts, 50-60 Cycles, 100 Watts | |
| Rating B..... 105-125 Volts, 25-60 Cycles, 105 Watts | |
| Rating C..... 100-130/140-160/195-250 Volts, 40-60 Cycles, 105 Watts | |

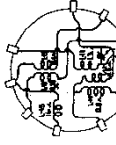
MODELS T7-5, C7-6
Chassis Wiring

RCA MFG. CO., INC.

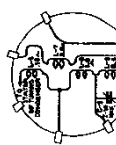
On some instruments R-19 is 100,000 ohms and R-5 is 33,000 ohms.



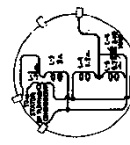
POWER TRANS.-INTERNAL CONNECTIONS



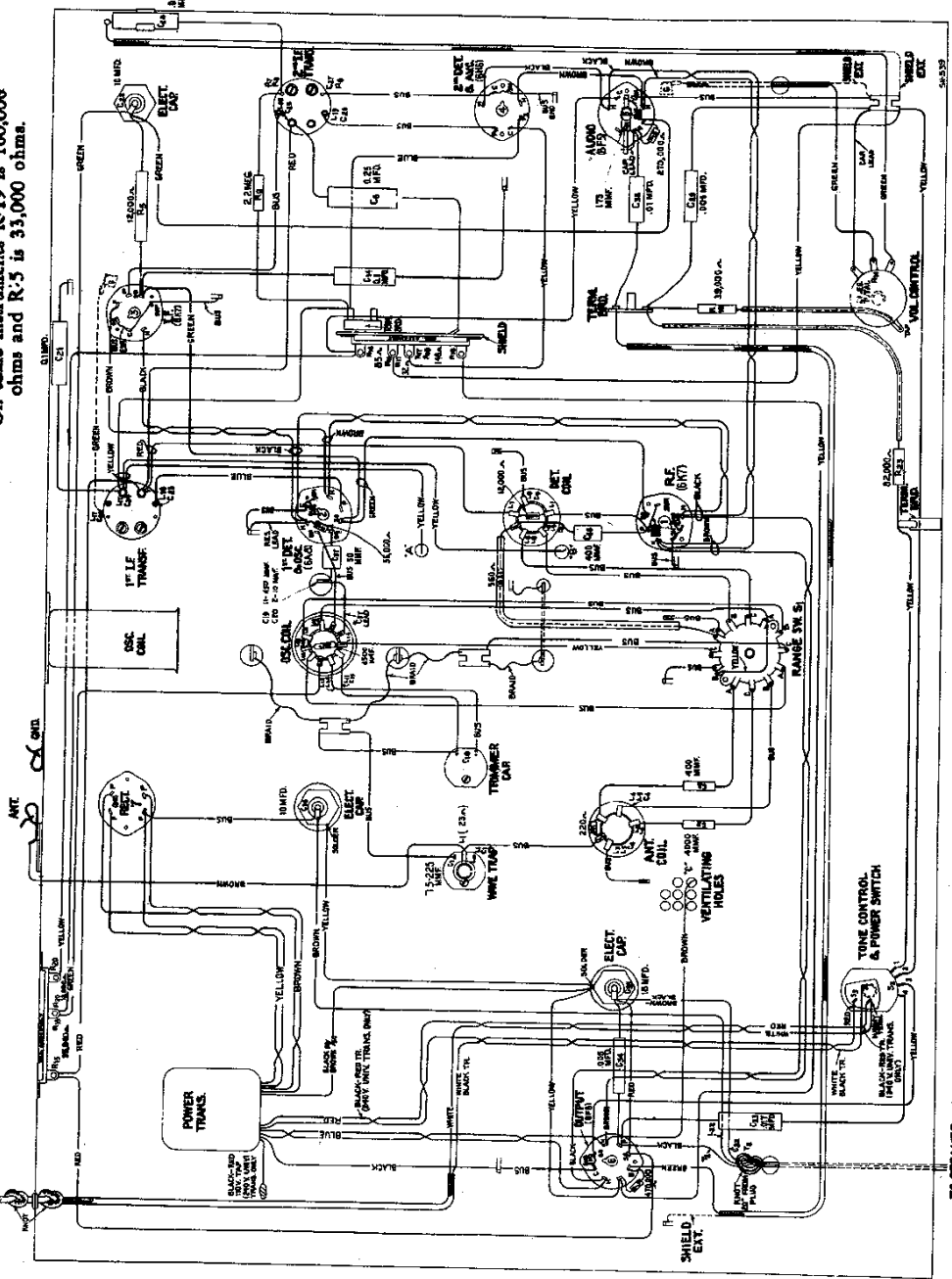
OSC. COIL.-INTERNAL CONNECTIONS



DET. COIL.-INTERNAL CONNECTIONS



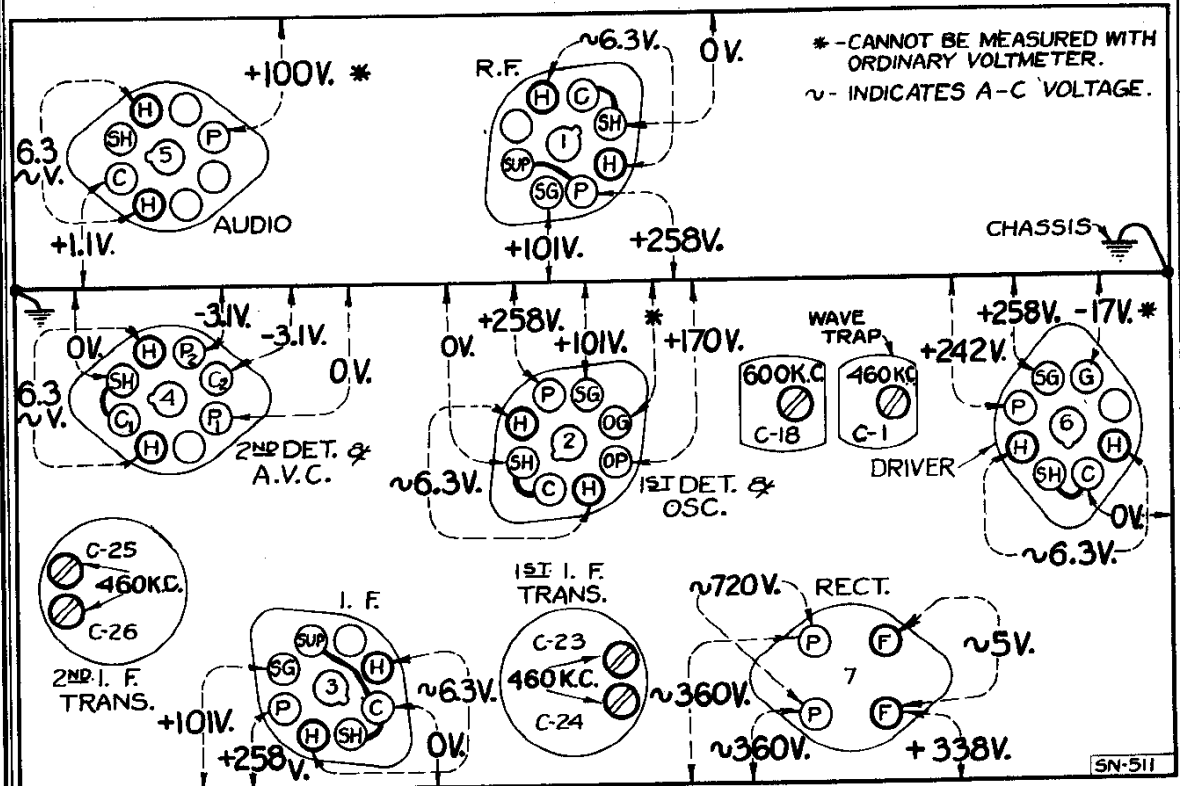
ANT. COIL.-INTERNAL CONNECTIONS



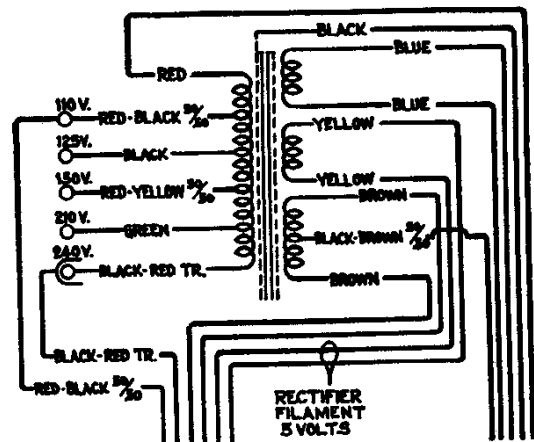
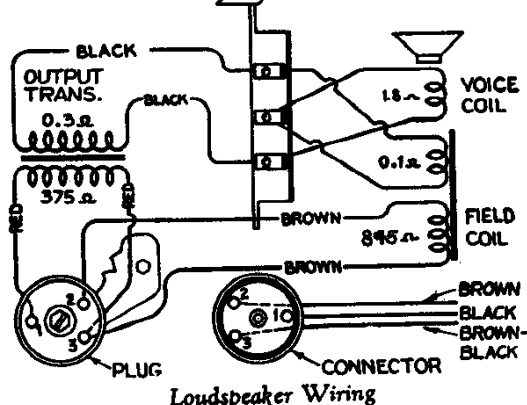
Trimmers, Transformer
Loudspeaker

RCA MFG. CO., INC.

MODELS T7-5, C7-6
Voltage, Socket



Radiotron Socket Voltages Measured at 115 volts, 60 cycles—No signal input



Primary Resistance—10.5 ohms, Total
Secondary Resistance—330 ohms, Total

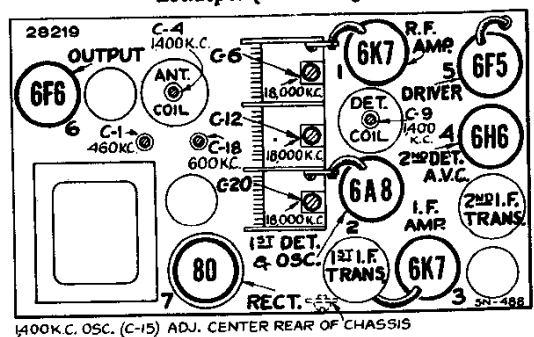


Figure 3—Radiotron and Coil Locations

MODELS T7-5, C7-6
Circuit Data, Parts
Alignment, Data

RCA MFG. CO., INC.

General Features

These two models each employ the same seven-tube chassis. They have the new metal tubes. The tuning range is from 160 to 18,000 kc. Its features include domestic broadcast, police, aircraft and amateur services and also the important foreign short wave broadcast bands at 49, 75, 125, 195, and 16 meters. Chassis features include automatic volume control, 3-point tone control, antenna wave trap, and audio tone compensation. A high level of output is available from the receiver for reproduction by the electrodynamic loudspeaker. The table model (T 7-5) uses an 8-inch dynamic speaker and the console model (C 7-6) uses an improved 12-inch dynamic model. The tuning dial is an illuminated semi-circular type. Each band is distinctively marked with a separate color for each band. Pointer control knob are plainly marked on the control panel with letters indicating each band position placed over color strips corresponding to the band position on the dial. The tuning control is of the dial-ratio type. It permits fast tuning through a 10-to-1 drive ratio and vernier tuning through a 30-to-1 drive ratio. The latter is especially advantageous for accurate tuning of the short-wave stations.

Circuit Arrangement

The conventional Superheterodyne type of circuit, consisting of an r-f stage, a combined first-detector-oscillator stage, a radio-frequency amplifier stage, an automatic-volume-control stage, an audio amplifier stage, an audio power output stage and a high-voltage rectifier power-supply stage, is used.

Tuned Circuits

The antenna coil system and the detector coil system each consist of a single primary and three series-connected secondary windings to provide the three ranges of tuning. The radio-frequency system is similarly wound on a single form. A range selector switch (S-1) is used for connecting the various sections of these three systems. The antenna coil system is in series operation on the band desired. The r-f stage is provided by a variable three-section gang condenser having trimmer capacitors in shunt with each section. There are additional trimmer capacitors across the section of each coil used for Band "A." A series trimmer is also associated with the Band "A" oscillator coil.

The intermediate frequency transformer consists of an RCA-6K7 in a transformer-coupled circuit. This stage operates at a basic frequency of 460 kc. Each winding of both the input and output is tuned by an adjustable trimmer.

Detector and A.V.C.

The modulated signal as obtained from the output of the r-f stage is detected by an RCA-6H6 triode tube. The audio detector system is similar in process to that of the r-f stage for amplification and final reproduction. The d-c voltage which results from detection of the signal is used for automatic volume control. This voltage, which develops across resistor R-8, is applied as automatic control bias to the r-f, first-detector and i-f stages through a suitable resistance filter circuit. The second (auxiliary) diode of the RCA-6H6 is used to supply residual bias for the controlled tubes under conditions of limit or no signal. This diode, under such conditions, draws current which flows through resistors R-8 and R-9, thereby maintaining the desired minimum operating bias on such tubes. On application of signal energy above a certain level, however, the auxiliary diode ceases to draw current and the a.v.c. diode takes over the biasing function.

Audio System

The manual volume control consists of an acoustically tapered potentiometer in the audio circuit between the output of the detector diode and the input grid of the audio-frequency amplifier. This potentiometer has a tone compensating filter connected to it so that the correct audio balance will be obtained at different volume settings. Resistance-capacitance coupling is used between the first audio stage and the power output stage. The output of the power output stage is connected to the dynamic loudspeaker. High-frequency tone control is effected by a capacitor across the plate circuit of the output stage. Speech-mic control is effected by a resistor connected to the automatic volume control circuit. Control of tone is obtained by means of the switch (S-2).

Receiver

The power required for operation of this receiver is supplied through transformer T-1. This transformer has an adjustable secondary winding to provide primary and secondary windings. This shield prevents interference which is on the power supply circuit from entering the receiver and conversely reduces the tendency of the receiver to re-radiate into the power circuit. An RCA-80 furnishes the d-c voltages necessary for plate, screen, cathode, and grid potentials. The field winding of the loudspeaker is used as a reactor in the filter circuit which is simultaneously receives its magnetizing current. The heaters of all Radiotrons are supplied from a low voltage (6.3 volt) winding on the power transformer. One side of this winding is at ground potential.

Service Data

The various diagrams of this bulletin contain such information as will be needed to diagnose causes for defective operation when such a condition develops. Values of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles, such as R-3, L-2, C-1, etc., are provided for reference between the diagrams and the replacement parts list. Locating of the parts in the schematic circuit is facilitated by the fact that the numerical titles increase from left to right on the diagram. The coils, resistors, and transformer windings are rated in terms of their resistances only. Resistances of less than one ohm are generally omitted.

Alignment Procedure

Proper alignment is vital to the proper functioning of this receiver. There are four trimming adjustments provided in the r-f system, three in the oscillator coil system, two in the detector coil system, and two in the antenna coil system. Each of these trimmers has been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions of climate which have been since service purposes. Incorrect alignment is usually evidenced by loss of sensitivity, improper tone quality, and poor selectivity. These indications will generally be present together.

The correct performance of the receiver can only be obtained when the alignment is performed with adequate and reliable test apparatus. The manufacturer of this instrument has a complete assortment of such service equipment available. This equipment, illustrated and described on a separate page of this booklet, may be purchased from authorized distributor and dealers.

The signal generator is required as a source of the specified alignment frequencies. Visual indication of the receiver output during the adjustment is necessary to enable the serviceman to obtain an accuracy of alignment which is not possible by listening to the signal. The RCA Victor Stock No. 9995 Full-Range Oscillator and the RCA Victor Stock No. 4317 Neon Output Indicator are especially suitable and fulfill the above requirements.

The following procedure should be followed in adjusting the various trimmer capacitors:

r-f Trimmer Adjustments

The four trimmers of the r-f transformers are located as shown by Figure 4. Each must be aligned to a basic frequency of 460 kc. To do this, attach the Output Indicator across the voice coil circuit of the output transformer primary. Connect the output of the test oscillator between the control-grid of the RCA-6A8 first detector tube and chassis-ground. Tune the oscillator to 460 kc. Rotate the receiver volume control to its full position and adjust the receiver tuning control to a point within its range where no interference is encountered either from local broadcast stations or the heterodyne oscillator. Increase the output of the test oscillator until a slight indication is apparent on the speaker. Then adjust the two trimmers, C-25 and C-26, of the second i-f transformer to produce maximum (peak) indicated receiver output. Then, adjust the two trimmers, C-23 and C-24, of the first i-f transformer for maximum (peak) receiver output as shown by the indication. During these adjustments, regulate the test oscillator output so that the indication is always as full as possible. By doing so, broadness of

tuning due to a.v.c. action will be avoided. It is advisable to repeat the adjustment of all i-f trimmers a second time to assure that the interaction between them has not disturbed the original adjustment.

r-f Trimmer Adjustments

The seven trimmers associated with the r-f, first detector, and oscillator circuits have two functions shown by Figure 3. The three trimmers which are at all times directly in shunt with the variable tuning condenser reactance that the high-frequency range (Band C) be aligned first. The range selector switch should, therefore, be turned to its Band C position for the first adjustment. The Output Indicator should be left connected to the output terminals of the test oscillator to the antenna and ground terminals of the receiver.

Calibrate the dial by rotating the tuning control until the variable condenser plates are in their full mesh (maximum capacity) position and adjusting the dial pointer so that its end points to the horizontal graduation (530 kc.) at the low frequency end of the Band A scale.

Proceed further as follows:

- (a) Adjust the test oscillator to 18,000 kc and set the receiver tuning control to a dial reading of 18,000 kc.
(b) Regulate the output of the test oscillator until a slight indication is apparent at the receiver output section of the variable condenser to the point of maximum (peak) receiver output.
(c) Adjust the trimmer, C-12, of the detector section of the variable condenser, simultaneously rocking the receiver tuning control backward and forward through the 18,000 kc. range until maximum receiver output results from these combined operations.
(d) With the receiver tuning control set to 18,000 kc, adjust the trimmer, C-6, on the antenna section of the variable condenser to the point which produces maximum (peak) indicated receiver output.
(e) Change the receiver range selector to its Band A position and set the receiver tuning control to a dial reading of 1,400 kc.
(f) Adjust the high frequency trimmers of the Band A oscillator, detector, and antenna coils, C-15, C-9, and C-4 respectively, to their full mesh at which each produces maximum indicated receiver output.
(g) Shift the test oscillator frequency to 600 kc and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received.
(h) Tune the low frequency trimmer, C-18, of the oscillator Band A coil, simultaneously rocking the tuning control of the receiver backward and forward through the signal, until maximum indicated receiver output results from these combined operations.
(i) Adjust the trimmer, C-20, of the antenna section of the variable condenser to the point which produces maximum (peak) indicated receiver output.
(j) Adjust the trimmer, C-6, on the antenna section of the variable condenser to the point which produces maximum (peak) indicated receiver output.

Wave-Trip Adjustment

With the receiver in operation using its normal antenna system extend the point at which the intermediate frequency interference is most intense. Then adjust the wave trap trimmer to the point which causes maximum suppression of the interference. This trimmer is adjusted to 460 kc. during manufacture; however, local conditions may require a readjustment, depending upon the interfering frequency.

Radiotron Socket Voltages

The voltage values indicated on the Radiotron socket contacts to chassis on Figure 4 will assist in the location of causes for faulty operation. Each value as specified should hold within +/- 20% when the receiver is normally operated at its rated supply voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. The voltages given are actual operating values and do not allow for inaccuracies which may be caused by the loading effect of a voltmeter's internal resistance. This resistance should be duly considered for all readings. The amount of circuit resistance shunting the meter during measurement will determine the accuracy to be obtained, the error increasing as the meter resistance becomes comparable to or less than the circuit resistance. For the majority of readings, a meter having an internal resistance of 1000 ohms per volt will be satisfactory when the range used for each reading is chosen as high as possible consistent with good readability.

Universal Transformer

The special transformer used on some receivers of this type is adaptable to several ranges of voltage as given under Rating C of Electrical Specifications. Its schematic and wiring are shown by Figure 5. Terminals are provided at the top of the transformer case for changing the primary connections to suit the voltage available. Note that a 110-volt tap is brought out separately for supplying a phonograph motor.

Electrical Specifications

Table with columns: FREQUENCY RANGES, Band A, Band B, Band C, Intermediate Frequency, ALIGNMENT FREQUENCIES, Band A, Band B, Band C.

RADIOTRON COMPLEMENT

- (1) RCA-6K7, Radio-Frequency Amplifier
(2) RCA-6AR, First Detector-Oscillator
(3) RCA-6K7, Intermediate Amplifier
(4) RCA-6H6, Second Detector-A.V.C.
(5) RCA-6F1, Audio Voltage Amplifier
(6) RCA-6F6, Audio Power Amplifier
(7) RCA-6H6, Full-Wave Rectifier

LOUDESPEAKER

TYPE: Electrodynamic
Voice Coil Impedance: 2.25 ohms at 400 cycles

POWER OUTPUT

Undistorted: 2.25 Watts
Maximum: 5.0 Watts

POWER SUPPLY RATINGS

Rating A: 105-125 Volts, 50-60 Cycles, 100 Watt
Rating B: 105-125 Volts, 25-60 Cycles, 100 Watt
Rating C: 100-110/140-160/190-210 Volts, 40-60 Cycles, 105 Watts

Mechanical Specifications

Tuning Dial: Radiotrons: 100-110 and 300-1
Chassis Base Dimensions: 11 1/2 x 7 3/8 x 2 1/2 inches

MODEL T 7-5 MODEL C 7-6

Table with columns: Height, Width, Depth, Weight (Net), Weight (Shipping), Operating (C) Voltages, Range Selector, Full-Wave Switch-Tone

REPLACEMENT PARTS

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

Table with columns: Stock No., Description, Part Price, Stock No., Description, Part Price. Includes sections for RECEIVER ASSEMBLIES, CONDENSERS, COILS, RESISTORS, CAPACITORS, SOLENOIDS, and SWITCHES.

REPLACEMENT PARTS (Continued)

Table with columns: Stock No., Description, Part Price, Stock No., Description, Part Price. Includes sections for TRANSFORMERS, COILS, RESISTORS, CAPACITORS, SOLENOIDS, and SWITCHES.

NOTES

- (1) Best notes on heterodyning (whistles) may be encountered in some instances on these receivers due to excessive antenna capacitance. This condition may be corrected by reducing the size of the antenna or by inserting a 150 mmfd capacitor in series with the antenna lead. This may be accomplished in the receiver by removing the lead which connects from the antenna terminal to the wave trap inductance L-1 and inserting the condenser between these points.

MODELS T7-5, T8-14, T8-16
T10-1, T10-3
Speaker Data

RCA MFG. CO., INC.

SUPPLEMENT TO RCA VICTOR MODELS T 7-5, T 8-14, T 8-16, T 10-1, and T 10-3 SERVICE NOTES

On receiver Models T 7-5 and T 8-14, three different type speakers are used. They can be readily identified by the following numbers stamped on them: (1) RL 63-4, (2) 76365-1, and (3) 76365-3.

On receiver Models T 10-1 and T 10-3, two different type speakers are used: (1) RL 63-5 and (2) 76365-2.

On receiver Model T 8-16, two different type speakers are used: (1) RL 63-4 and (2) 76365-3.

The internal connections and replacement parts for speakers RL 63-4 and RL 63-5 are given in the Service Notes, while the schematic diagrams given below indicate the color code and wiring to the plug and connector for speakers: (1) 76365-1, (2) 76365-2, and (3) 76365-3. The replacement parts appear opposite the respective speakers.

REPLACEMENT PARTS

| | | Stock No. | DESCRIPTION | LIST PRICE |
|----------------|----------------------------------|-----------|---|------------|
| 76365-1 | | 11836 | CONE—Reproducer cone..... | \$1.75 |
| | | 5118 | CONNECTOR—3-contact male connector for reproducer..... | .25 |
| | | 9634 | REPRODUCER—Complete..... | 6.40 |
| | | 11837 | TRANSFORMER—Output transformer.. (Field and hum coils not removable.) | 1.56 |
| | | | | |
| 76365-2 | | 11841 | COIL—Field coil..... | 2.15 |
| | | 11842 | COIL—Hum neutralizing coil..... | .30 |
| | | 11838 | CONE—Reproducer cone..... | 2.00 |
| | | 5039 | CONNECTOR—4-contact male connector for reproducer..... | .25 |
| | | 9636 | REPRODUCER—Complete..... | 6.60 |
| | | 11839 | SPRING—Reproducer center support casting clamping spring—Package of 2.. | .30 |
| 11840 | TRANSFORMER—Output transformer.. | 1.66 | | |
| 76365-3 | | 11844 | COIL—Field coil..... | 2.00 |
| | | 11842 | COIL—Hum neutralizing coil..... | .30 |
| | | 11838 | CONE—Reproducer cone..... | 2.00 |
| | | 5118 | CONNECTOR—3-contact male connector for reproducer..... | .25 |
| | | 9635 | REPRODUCER—Complete..... | 6.40 |
| | | 11839 | SPRING—Reproducer center support casting clamping spring—Package of 2.. | .30 |
| | | 11843 | TRANSFORMER—Output transformer.. | 1.56 |

The prices quoted above are subject to change without notice.