Hudson-RCA Victor

Model H-6

SIX-TUBE, AUTOMOBILE RECEIVER

SERVICE NOTES

Manufactured By

RCA VICTOR DIVISION

RCA Manufacturing Company, Inc.

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

For

Hudson Motor Car Company

DETROIT, MICH., U. S. A.

Radio Kit—1936—Hudson and Terraplane

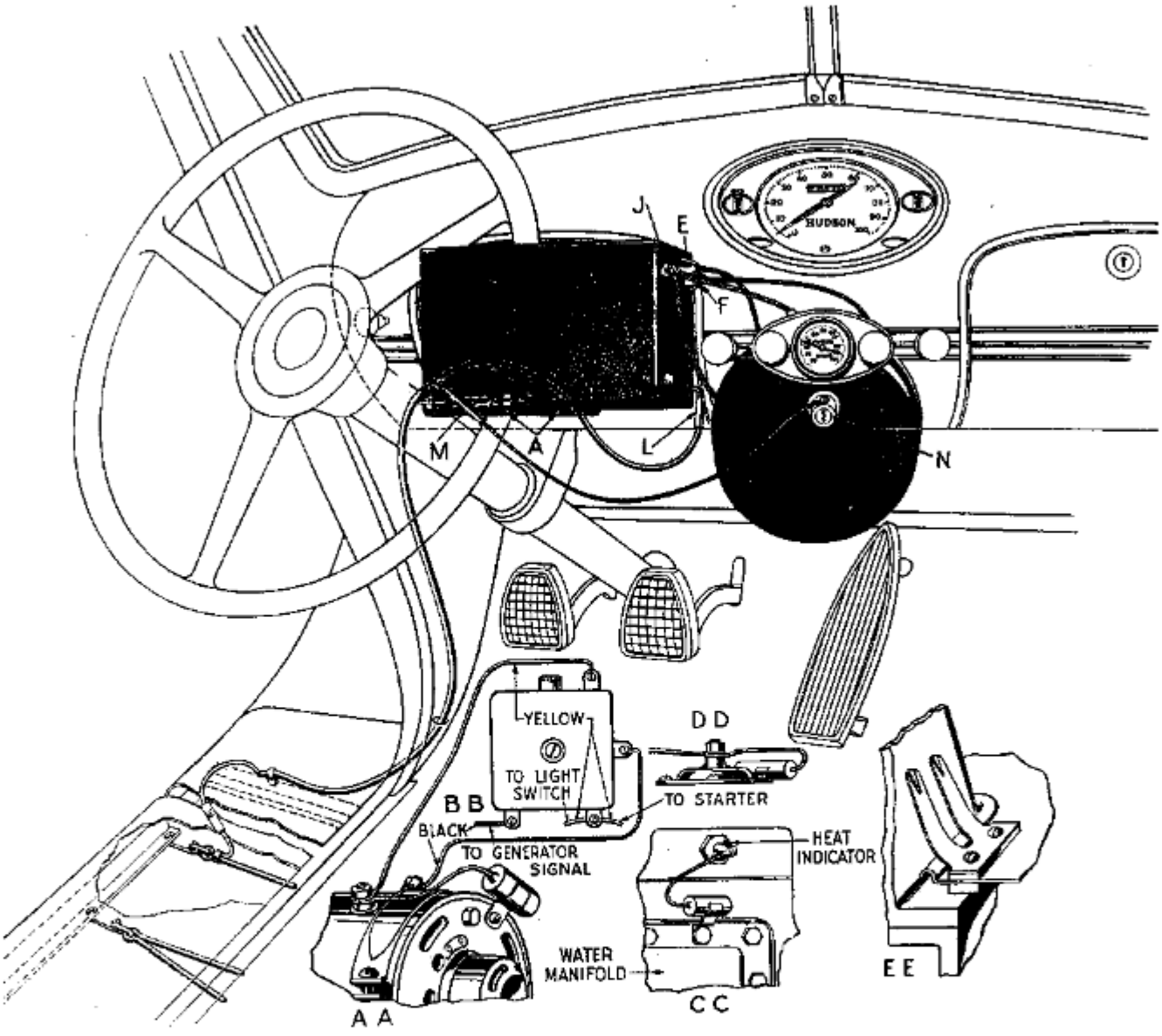

Figure A—Mounting Details and Connections

(See page 4 for instructions)

The Radio Kit, Part No. 47734 Includes:—

1—Receiver Complete
1—Speaker Complete
1—Control Head complete with cables
1—Pilot Light Bulb
1—Feed Cable Assembly and Fuse
1—Aerial Assembly
1—Aerial Lead In with shield and clip
1—Distributor Suppressor
2—Small Condensers (one required on Terraplane Deluxe Models)
1—Large Condenser
1—Ground Strap
3—Ground Forks
Bolts, Nuts, Screws and Lock Washers for mounting units

In order to complete the installation on Terraplane Deluxe Models, a Charge Control (Part No. 47979) is required in addition to the Radio Kit.

HUDSON—RCA VICTOR MODEL H-6

Six-Tube, Superheterodyne, Automobile Receiver

SERVICE NOTES

Electrical Specifications

TUBE COMPLEMENT

(1) RCA-6D6.....Radio Frequency Amplifier
(2) RCA-6A7.....Oscillator and First Detector
(3) RCA-6D6.....Intermediate Amplifier
(4) RCA-6B7, Detector, A-F Amplifier and A.V.C.
(5) RCA-41.....Power Output Amplifier
(6) RCA-84.....Full Wave Rectifier

TUNING RANGE.....540 kc. to 1600 kc.

OUTPUT RATING

Maximum.....3.50 Watts
Undistorted.....1.75 Watts

LOUDSPEAKER

Type.....Electrodynamic
Impedance (v.c.).....3.4 ohms at 400 cycles

POWER RATING

Supply Voltage.....6.3 Volts (Storage Battery)
Current Drain.....6.55 Amperes at 6.3 Volts
Fuse Protection.....15 Amperes

PILOT LAMP.....Mazda No. 51, 7.5 Volts

ALIGNMENT FREQUENCIES

I-F Transformers.....260 kc.
Oscillator Coil.....600 kc. and 1400 kc.
Detector Coil.....1400 kc.
Antenna Coil.....1400 kc.

Mechanical Specifications

RECEIVER UNIT

Height.....6 1/8 Inches
Width.....9 5/8 Inches
Depth.....6 1/2 Inches
Mounting.....5/16 Inch Cap Screws (two)

SPEAKER UNIT

Diameter.....8 3/8 Inches
Depth.....2 7/8 Inches
Cone Diameter.....6 1/2 Inches
Mounting.....5/16 Inch Stud (one)

OPERATING CONTROLS

(1) Operating Switch—Volume Control (2) Tuning Control (3) High Frequency Tone Control

TUNING DRIVE RATIO.....12 to 1

WEIGHT

Receiver, Speaker and Accessories Complete.....22 Pounds
Complete Equipment Packed for Shipment.....25 Pounds

GENERAL DESCRIPTION

This instrument consists of a separated three unit assembly which includes: (1), a six-tube chassis with self contained power conversion system; (2), an electrodynamic loudspeaker; and (3), an operating control head.

The receiver is compactly housed in a substantial metal case. There are removable covers to permit ready access to the under and top sides of the chassis. Two mounting studs are used for supporting this unit to the steering column bracket on the car.

The loudspeaker mechanism is encased in a cylindrical metal housing. Field and voice coil connections from this unit to the receiver are by means of a shielded cable. The shield forms a common return for each of these circuits. A single support stud is attached at the rear of the speaker case for mounting purposes.

The main operating controls are located on the remote control unit which mounts on instrument panel of the car. A subordinate high-frequency tone control is mounted on the receiver case. Flexible shafts interconnect the remote control knobs and the controlled devices within the receiver housing.

Radio Installation-Operation

1—Lift floor mat and install three ground forks (Part No. 151210) to front, rear and left of floor board opening so that spring fingers contact transmission control housing. (See Insert EE.) The paint must be removed from the floor panel and transmission tower to provide good electrical contact. A spacer (Part No. 151435) should be placed under each ground fork and the parts secured to the floor board with two sheet metal screws (Part No. 71648) and three tapping plates (Part No. 151436).

2—Remove finish plate from center of instrument panel—attached with studs and nuts on back of panel.

3—Put the Radio Receiver in place on top of the steering column support bracket with the control shaft connections E and F on the right, and secure with two cap screws "A." On right-hand drive models, the receiver is mounted with the control shaft connections to the left. NOTE: There are three threaded holes in the bottom of the receiver so that it can be mounted in 1934 and 1935 models as well as 1936.

4—Punch a hole through the front dash pad, using the 3/8" hole located just above the center of the dash reinforcement ribs as a guide.

5—Place wooden spacer on speaker mounting stud and insert stud through hole in dash and dash pad, securing with a washer and nut on the engine side of dash.

6—Remove the control knobs from the control head, and also the nuts located behind the knobs. Insert control head from back of panel, securing by replacing nuts, and then replace control knobs.

7—Insert the driving tongue of the control cable from the right (tuning) knob into the rear (front on right-hand drive) socket F and tighten nut and the driving tongue of the control cable from the left (volume) knob into the forward (rear on right-hand drive) socket and tighten nut. NOTE: On right-hand drive installations the long control cable should be attached to the volume (left) control knob.

8—Insert speaker lead plug "J" into case. The plug has three prongs, unequally spaced—be sure they are aligned with the sockets in the case.

9—Insert pilot light in control head.

10—Attach feed wire to Battery Terminal of the ignition lock "N" and connect to socket "M," being sure that fuse is in place in socket.

11—Lay out antenna on floor under car with lead-in end at front of left running board. Remove all twist and kinks. Attach hook at lead-in to front hole in left running board, second hook to front hole in right running board, continuing back and forth until all but the last hook has been put in place. Start at the right front and work backward, drawing the antenna wire tight to take up slack and permit the last hook to be attached to the right running board.

12—Insert the lead-in through the hole in body floor panel in line with left front door, front pillar post, leading up behind kick panel behind radio receiver and connect to socket "L."

13—Attach one small condenser on gasoline tank gauge unit with one unit mounting screw, attaching condenser terminal to gauge unit terminal. (Insert "DD")

14—Attach one small condenser to upper rear cap screw in engine water manifold and attach condenser terminal to terminal of water temperature gauge element. (Insert "CC"). NOTE: This condenser not required on Terraplane models.

15—Attach large condenser to cap screw at rear of generator and connect condenser terminal to generator battery terminal. (Insert "AA")

16—Install 48763 ground strap from the front muffler bracket to chassis frame. The paint must be removed from points of attachment to insure good electrical contact.

17—Install suppressor in central terminal of distributor.

18—When installing radio on Terraplane Special models with air cooled generator, mount generator charge regulator in place of relay with two screws to two threaded holes in dash provided for the purpose. Fuse cap bar should be on upper face. Remove ground cup from generator "F" terminal. See illustration inserts for wiring diagram. Connect "F" terminal on side of charge regulator to "F" terminal (engine side) of generator. Adjust generator output to 22 amps. cold—17 amps., warm.

19—Turn on volume and tune set to a known local station. Adjust the dial hand to give correct dial reading by turning knurled knob on back of control head.

CIRCUIT ARRANGEMENT

The schematic and wiring layouts of the electrical circuit are shown in Figures 2 and 3, respectively. From these diagrams it may be seen that six Radiotrons are incorporated in the basic Superheterodyne circuit. In sequence, there is an r-f stage, a dual first detector-oscillator stage, a single i-f stage, a second detector-audio amplifier-a.v.c. stage, and a pentode output stage. The power supply system contains a mechanical interrupter and an RCA-84 rectifier Radiotron. The following circuit features are of particular importance:

Noise Filter—Reduction of ignition interference and similar disturbances is brought about by a filter arrangement in the antenna input circut. This filter is a "band-pass" type, having an acceptance band between 540 kc. and 1600 kc., and sharply defined cut-off below and above these two limits. Primary to secondary capacity coupling in the first r-f transformer has been minimized to further suppress interference.

Tuned Circuits—There are seven resonant circuits in the radio frequency end of the receiver. The r-f, first detector and oscillator grid circuits are tuned by a three-gang tuning condenser. The remaining tuned

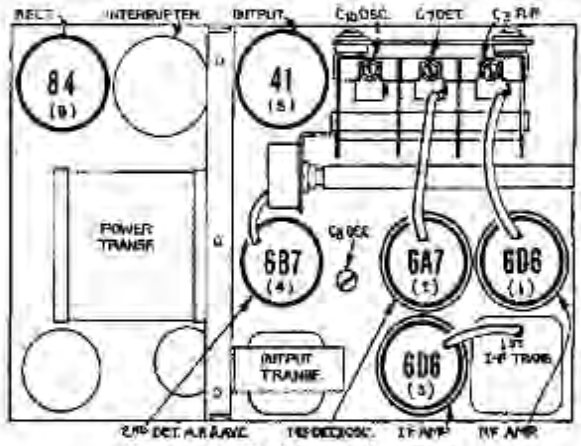

Figure 1—Radiotron Locations

circuits consist of the primary and secondary windings of the i-f transformers which are resonated by trimmers to a nominal frequency of 260 kilocycles.

Detection-A.V.C.—Detection takes place as a result of the rectifying action of the diodes of the RCA-6B7 tube and develops a current through resistors R-7 and R-17. The d-c voltage drop in the resistors R-7 and R-17 due to the detected signal is used for automatically regulating the control grid bias of the r-f and first detector stages. The amplification of these stages thus becomes dependent upon the signal's strength. This process (a.v.c.) compensates for fading signals and reduction of signals due to change of antenna direction, shielding effects of buildings, bridges, etc. A smaller portion of the d-c voltage obtained by detection is tapped from the juncture of R-7 and R-17 and carried to the control grid of the i-f stage. This voltage likewise furnishes automatic volume control.

Audio System—The audio and d-c components of the detected signal are selected from the manual volume control resistor (R-17) by its movable arm and are applied to the control grid of the RCA-6B7. The d-c applied to this grid increases the bias as the a.f. is increased and prevents overload as the volume control is advanced. By virtue of an effect of a high series resistance in the screen grid circuit, the cut-off of the operating characteristic is extended as the control grid bias is increased, thereby preventing distortion. After amplification by the 6B7, the audio signal is transmitted to the output stage and thence to the loudspeaker for final reproduction.

Power—The heaters of all tubes are supplied directly from the battery of the car through efficient filters within the receiver housing. High voltage d-c plate and bias supply is obtained from the six volt battery by use of a mechanical interrupter and a tube rectifier. The interrupter is adapted for convenient removability by having its base constructed for "plug-in" mounting.

Grounding—The wiring of the receiver chassis is so arranged that sensitive circuits are grounded at points predetermined by careful test. This procedure reduces noise induction caused by interference circulating in the receiver case. Several of the circuits are grouped and grounded at a single point to further eliminate such trouble. The resistance of the chassis, the receiver housing and the shielded cable has been kept as low as possible in order to minimize ignition noise.

SERVICE DATA

Regular maintenance will assure proper operation of this receiver over an extensive period of life. It should therefore receive the same routine inspections and adjustments as are accorded the mechanical and electrical systems of the car. The following service information suggests procedure to be applied in locating and repairing faults which may develop and affect the operation of the receiver.

Defects External To Receiver

Interference—Failure or disconnection of spark suppressing capacitors at gas gauge, temperature indicator, and generator will allow the ignition interference produced at such points to be radiated and picked up by the receiver. Defects in the ignition system not only affect operation of the car but will produce radio interference as well. The system should therefore be thoroughly checked and repaired if necessary. The three pairs of bonding fingers attached to the floor boards which contact the transmission control cover, and the bonding strap from muffler front bracket to chassis frame side member for noise reduction, may develop loose connections and cause intermittent noise level in the receiver. In checking the receiver for noisy operation, it is also wise to make sure that interference is not being caused by disturbing electrical devices which are not part of but are in vicinity of the car.

Battery—Corroded terminals at the storage battery will usually result in low voltage at the receiver and consequent low sensitivity. Noise may also be gen-

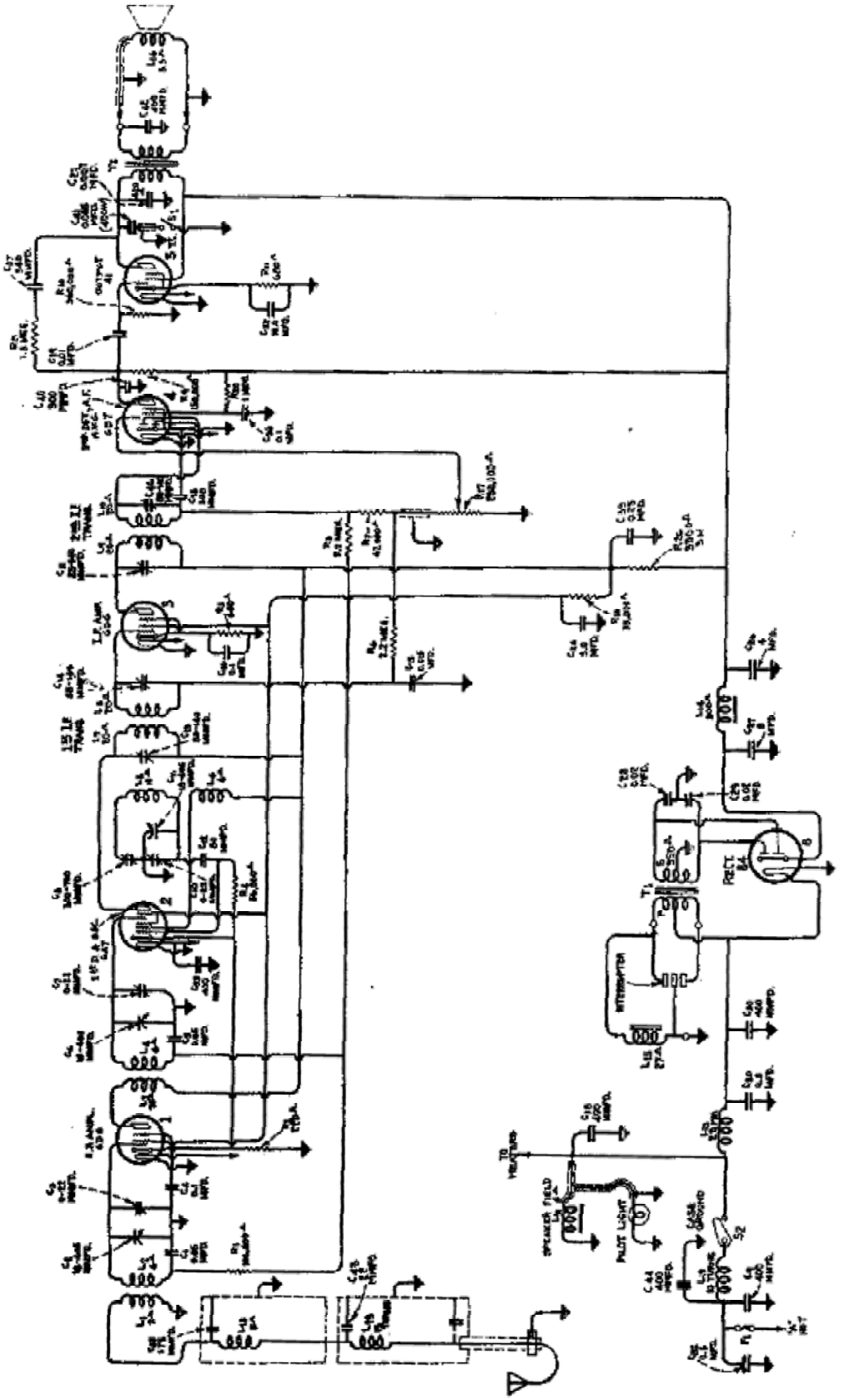

Figure 2—Schematic Circuit Diagram

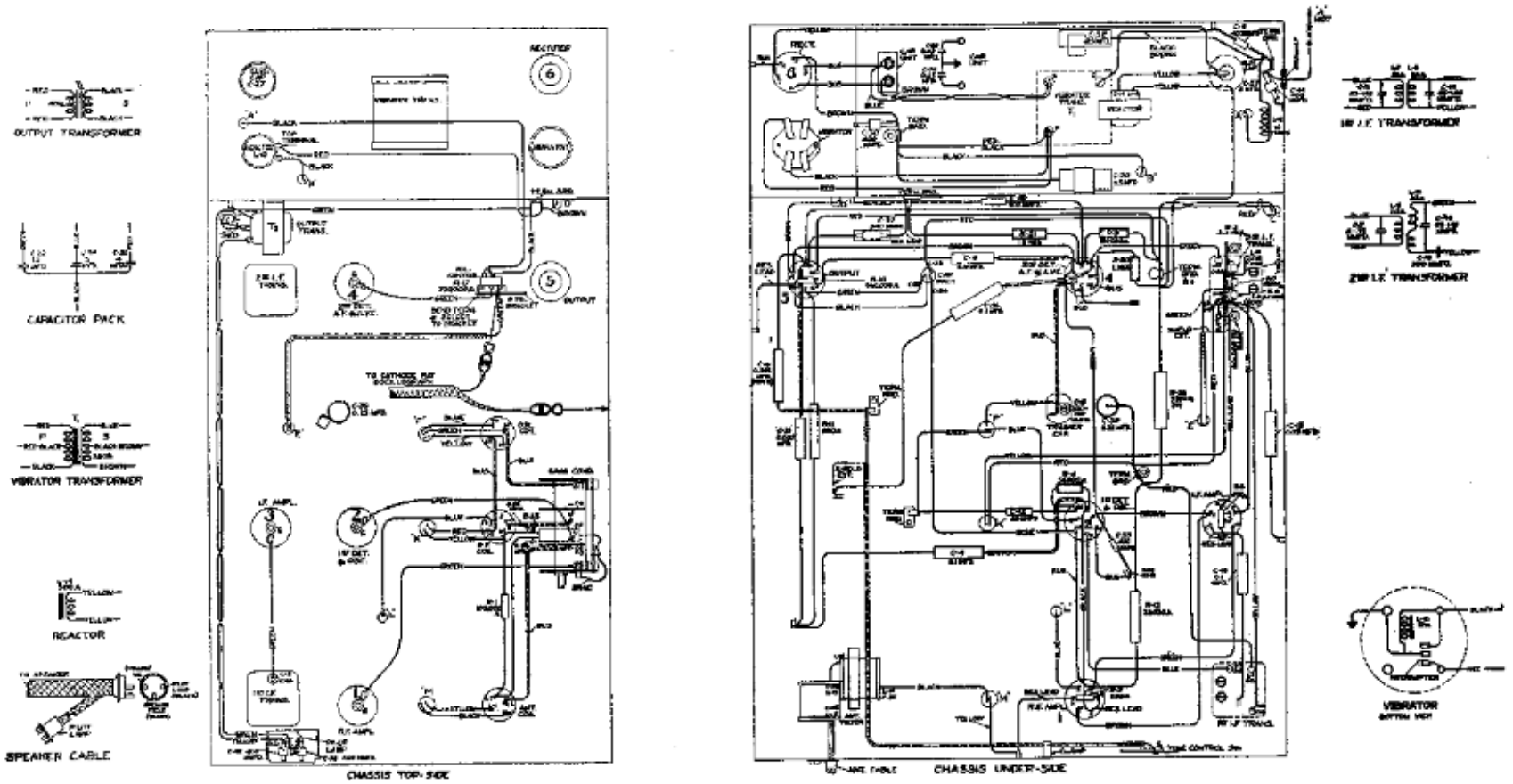

Figure 3—Chassis Wiring Diagram

erated by this condition. Battery conditions will be reflected in the motor operation as well as that of the radio.

Antenna—Vibration may occasionally cause the antenna connnections to become loose or broken. These should be carefully checked and repaired if necessary. Corrosion due to weather is also deleterious at these points. Each connection should be thoroughly cleaned to assure solid contact at all times. The grounding point of the antenna lead shield is at the front, left, running board bracket. This point of connection should not be changed, since its position on the car is very critical in regard to interference. The ground connection to the case of the receiver should be kept in secure connection to the frame of the car at all times; if loose, it may cause intermittent operation of the receiver, loss of sensitivity or will produce noisy reception.

Defects Within Receiver

Total Inoperation—Failure to operate may be due to one or more causes. When a receiver is found in such condition, its parts should be checked as follows:

(a) FUSE—May be burned out or making poor contact. In case of burnout, replace with a fuse of equivalent rating. If second fuse fails, remove receiver from car and investigate condition of interrupter and receiver circuits.

(b) TUBES—Dismount the receiver and remove top cover. Check to see that all tubes are correctly placed in their proper sockets. One or more tubes may be defective. To determine their condition, remove them from the receiver and test with standard tube-testing equipment. If such equipment is unavailable, substitute the tubes with others known to be in good condition. It is not advisable to test the tubes while in the receiver due to measurement errors which would result from the associated circuits.

(c) INTERRUPTER—Improper operation of the power supply interrupter is usually evidenced by reception of "sputtering noise." To check, remove the antenna connection and advance the receiver volume control (engine off). An increase in noise will usually indicate that the interrupter is in poor condition. Further investigation should be made by substitution of the interrupter with one known to be in good condition. No adjustments should be attempted on this unit. The operation of the interrupter and the associated rectifier system may also be proved normal by measurement of the filter output voltage, which should read steady at approximately 245 volts (d.c.). The points of test are indicated by Figure 6.

(d) CIRCUIT—Failures within the basic circuits of the receiver may be isolated by a systematic test procedure. The receiver and speaker should be removed from the car and placed where they will be readily accessible. Covers of the top and bottom of the receiver housing should be removed. Continuity tests should be made to ascertain the condition of the speaker voice coil and field circuits as well as that of the cable interconnecting the receiver and speaker. Battery should then be applied to the equipment, the operating switch turned to "On" and voltage measurements made at the receiver circuits to determine whether or not the power system is functioning properly. If no voltage or incorrect voltage is indicated at the filter output, individual tests should be made on the "A-Hot" wiring,

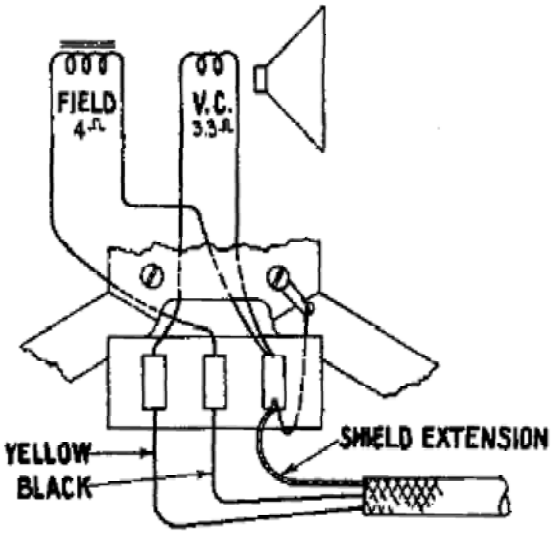

Figure 4—Loudspeaker Schematic and Wiring

rectifier tube, power transformer, interrupter and filter reactor to locate the defective part. If proper voltage is indicated at the filter output, then a thorough voltage analysis of the receiver circuit is in order. Figure 6 gives the values which should be obtained on a receiver in normal operating condition. Deviations from the specified values may be as much as ± 20% before the operation of the receiver is appreciably affected. The absence or erratic reading of one or more of the voltages will indicate a fault in the particular circuit under test; in which case, each transformer, resistor, capacitor, choke and conductor of the circuit should be individually checked for open circuit, short circuit and grounding. Reference to the diagram Figure 2 will give the values of the circuit elements and their schematic relations. Figure 3 illustrates the physical locations of the parts and the color coding of the wiring. Defective parts should be renewed only with genuine factory tested replacements.

Intermittent Operation—Operation may sometimes be irregular. In the majority of cases, the source of such trouble is at a connection or within a tube. Exchange of the tubes is the most definite method of tracing tube defects of this sort. A connection which is intermittent can not be readily disclosed by regular test methods. Each connection of the complete system of wiring should be carefully inspected and checked to assure that it is secure. Intermittent or distorted reception may occasionally be caused by a partially defective resistor, capacitor, or winding. This type of defect is difficult to isolate; however, the suspected parts

should be carefully checked for proper value, leakage, shorted turns, etc. Should it be impossible to locate the fault by such a method, the receiver should be placed in operation and allowed to operate at full volume for several hours. The weakened or defective part will generally fail completely under such condition and its identification can be established by the regular continuity or voltage tests.

Alignment Procedure

There are a total of eight trimmer adjustments provided. Four of these are involved with the i-f system and the remainder are associated with the antenna, oscillator and first detector coils. They are precisely adjusted at the factory to give the correct performance. Their settings should remain intact indefinitely when the receiver is used under ordinary conditions, however, necessity for re-adjustment may occasionally occur from continued extremes of climate, tampering, purported alteration for service purposes, or after repairs have been made to the r-f or i-f tuned circuits. Improper alignment usually causes the receiver to be insensitive, non-selective, and subnormal in respect to tone quality. Such indications will usually exist simultaneously.

In re-adjusting the trimmers to their normal settings, it is important to apply a definite procedure and to use adequate and reliable test equipment. A standard test oscillator such as the RCA Stock No. 9595, will be required as the source of signal at the specified alignment frequencies. Means for indication of the receiver output during alignment is also necessary to accurately show when the correct point of adjustment is reached. Two indication methods are applicable. One requires use of Cathode-Ray Oscillograph equipment and the other requires a voltmeter or glow type of indicator. The Cathode-Ray alignment method is advantageous in that the indication provided is in the form of a wave image which represents the resonance characteristics of the circuits being tuned. This type of alignment is possible through use of apparatus such as the RCA Stock No. 9558 Frequency Modulator and the RCA Stock No. 9545 Cathode Ray Oscillograph. Alignment by the output meter method should be indicated by an instrument such as the RCA Stock No. 4317 Neon Glow Indicator. The two procedures are outlined as follows:

OUTPUT METER ALIGNMENT

Place the receiver in operation with its two covers removed. Attach the Output Indicator across the loudspeaker voice coil circuit or across the output transformer primary. Advance the receiver volume control to its maximum position, letting it remain in such position for all adjustments. For each trimming operation, regulate the test Oscillator output control so that the signal level is as low as possible and still observable at the receiver output. Use of such small signal will obviate broadness of tuning which would otherwise result from a.v.c. action on a stronger one.

I-F Adjustments

(a) Connect the output of the test Oscillator between the control grid cap of the i-f tube (RCA-6D6) and chassis-ground. Adjust the frequency of the Oscillator to **260 kc.** Tune the receiver to a point where no interference is received from the heterodyne oscillator or local stations.

(b) Adjust the trimmers, C-46 and C-17, of the second i-f transformer so that each produces maximum (peak) receiver output as shown by the indicating device.

(c) Remove the Oscillator from the i-f tube input and connect it between the control grid cap of the first detector tube (RCA-6A7) and chassis-ground. Allow its tuning to remain at 260 kc. Tune the receiver to avoid interference as in (a).

(d) Adjust the trimmers, C-14 and C-13, of the first i-f transformer for maximum (peak) receiver output. The indication for this adjustment will be broad due to the "flat-top" characteristic of the i-f system. The two trimmers, C-14 and C-13, should, therefore, be very carefully aligned so that the indicator remains fixed at maximum as the Oscillator is shifted through a range 2 kc. above and below its nominal setting of 260 kc. An irregular double peaked indication is to be avoided.

R-F Adjustments

(a) Check the calibration of the dial scale of the remote control unit by rotating the tuning control until the variable condenser plates are in full mesh (maximum capacity). This will carry the dial pointer to its minimum frequency position. The knurled shaft at the rear of the control box should then be turned until the dial pointer sets exactly on the last graduation at the low frequency end of the dial scale.

(b) Connect the output of the test Oscillator to the antenna-ground terminals of the receiver with a 100 mmfd. capacitor in series with the antenna lead. Tune the Oscillator to **1400 kc.** Allow the Output Indicator to remain attached to the receiver output.

(c) Tune the receiver so that the dial reading is **1400 kc.** Then adjust the oscillator, detector and antenna coil trimmers, C-10, C-7 and C-3 respectively, tuning each to the point producing maximum indicated receiver output.

(d) Shift the Oscillator frequency to **600 kc.** and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. The oscillator series trimmer, C-8, should then be adjusted, simultaneously rocking the receiver tuning control backward and forward through the signal until maximum (peak) receiver output results from the combined operations. The adjustment of C-10 should be repeated as in (c) to correct for any change in its alignment due to the adjustment of C-8.

CATHODE-RAY ALIGNMENT

Place the receiver in operation with its two covers removed. Attach the Cathode-Ray Oscillograph vertical input terminals to the second detector output, with the "Hi" connected to the high side of the volume control potentiometer and the "O" connected to the re-

ceiver chassis. Advance the vertical amplifier gain control of the Oscillograph to full-on, allowing it to remain at such position for *all* adjustments. Turn the vertical "A" amplifier to "On". Set the Oscillograph power switch to "On" and adjust the intensity and focusing controls to give a sharply defined spot on the screen. Interconnect the Frequency Modulator impulse generator terminals to the Oscillograph "Ext. Sync." terminals as shown by Figure 5.

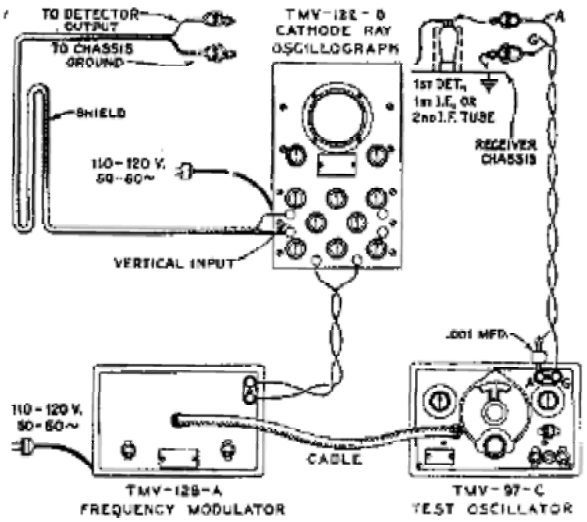

Figure 5—Alignment Apparatus Connections

I-F Adjustments

(a) Connect the output of the test Oscillator between the control grid cap of the *i-f* tube (RCA-6D6) and chassis-ground. Tune the Oscillator to **260 kc.**, place its modulation switch to "On" and its output range switch to "Hi". The Frequency Modulator must not be connected to the Oscillator for the preliminary adjustments.

(b) Set the Cathode-Ray Oscillograph horizontal "B" amplifier to "Timing" and the synchronizing switch (timing) to "Int". Place the synchronizing input and frequency controls to about their mid-positions. Turn the range switch to its No. 1 position.

(c) Increase the output of the Oscillator until a deflection is noticeable on the Oscillograph screen. The figure obtained represents several waves of the detected signal, the amplitude of which may be observed as an indication of output. Cause the wave image formed (400 cycle waves) to be spread completely across the screen by advancing the horizontal "B" gain control. The image should be synchronized and made to remain motionless by adjustment of the synchronizing input and frequency controls.

(d) Adjust trimmers C-46 and C-17 of the second *i-f* transformer to produce maximum vertical deflection of the oscillographic wave which is present on the screen. This adjustment places the transformer in exact resonance with the 260 kc. signal.

(e) The sweeping operation should follow, using the Frequency Modulator. Shift the Oscillograph synchronizing switch to "Ext", change its range switch to No. 2 position and set the frequency control to its midposition. Place the Frequency Modulator in operation with its sweep range switch in the "Lo" position. Interconnect the test Oscillator and Frequency Modulator with the special shielded patch cord provided. Turn the Oscillator modulation switch to "Off".

(f) Increase the frequency of the test Oscillator by slowly turning its tuning control until two separate, distinct and similar waves appear on the screen. These waves will be identical in shape but will be totally disconnected and appearing in reversed positions. They will have a common base line which is discontinuous. Adjust the frequency and synchronizing input controls of the Oscillograph to get the proper waves and to make them remain motionless on the screen. Continue increasing the Oscillator frequency until the forward and reverse curves move together and overlap with their highest points exactly coincident. This condition will obtain at an Oscillator setting of approximately 280 kc.

(g) With the images established as in (f), retune the second i-f trimmers, C-46 and C-17, so that they cause the curves on the Oscillograph screen to become exactly coincident throughout their lengths and have maximum amplitude.

(h) Without altering the adjustments of the apparatus, shift the output connections of the Oscillator to the input of the i-f system, i.e., between the first detector (RCA-6A7) control grid and ground. Regulate its output so that the amplitude of the oscillographic image is approximately the same as used above for adjustment (g) of the second i-f transformer.

(i) The first *i-f* transformer trimmers, C-14 and C-13, should then be adjusted so that they cause the forward and reverse curves to become coincident throughout their lengths and have maximum amplitude. The composite wave obtained in this manner represents the resonance characteristic of the total i-f system. Lack of symmetry or irregularity of the resultant image will indicate the presence of a defect in the *i-f* system.

R-F Adjustments

(a) Calibrate the scale of the receiver by rotating the tuning control until the variable condenser is at full mesh, and then turning the knurled shaft at the rear of the control box to bring the dial pointer to the last graduation at the low frequency end of the scale.

(b) Attach the output of the test Oscillator to the receiver input, i.e., between the antenna and ground terminals with a 100 mmfd. capacitor in series with antenna lead. Accurately tune the Oscillator to **1400 kc.** The Oscillograph should be left connected to the second detector output circuit as for the above i-f adjustments. Return

the synchronizing switch to its "Int" position and turn the range switch to its No. 1 position.

(c) Tune the receiver to a dial reading of **1400 kc.** Then regulate the Oscillator output so as to increase the amplitude of the waves on the Oscillograph screen to a conveniently observable size. The several waves of detected signal, as appearing on the screen, should be synchronized by operation of the synchronizing and frequency controls. Trimmers, C-10, C-7 and C-3, of the oscillator, detector and antenna coils should then be adjusted so that each causes maximum vertical deflection (amplitude) of the images.

(d) The Oscillator modulation should then be turned to "Off" and the Frequency Modulator placed in operation connected to the Oscillator with the shielded patch cord. Change the Oscillograph synchronizing switch to "Ext", set its range switch to its No. 2 position and the frequency control slightly above its mid-position.

(e) Increase the frequency of the test Oscillator gradually, until the point is reached where the two similar, distinct and separate wave images appear on the screen and become coincident at their highest points. This will occur at an Oscillator setting of approximately 1500 kc. These waves should be synchronized on the Oscillograph screen by careful re-adjustment of the synchronizing and frequency controls. Re-adjust trimmers C-10, C-7 and C-3 to produce complete coincidence at maximum amplitude of the two waves.

(f) Disconnect the Frequency Modulator from the Oscillator. Switch the modulation switch of the Oscillator to "On" and tune the Oscillator to **600 kc.** Set the synchronizing switch of the Oscillograph to "Int" and turn the range switch to No. 1 position.

(g) Tune the receiver station selector control so as to pick up the **600 kc.** signal, disregarding the dial reading at which it is best received.

(h) Change the Oscillograph synchronizing switch to "Ext", and place the Oscillator modulation switch to "Off". Interconnect the Frequency Modulator and Oscillator with the special shielded patch cord. Return the range control of the Oscillograph to its No. 2 position and set the frequency control slightly above its mid-position.

(i) Shift the test Oscillator to its **200-400 kc.** range and tune it to the point at which the forward and reverse waves show on the Oscillograph screen. This condition will obtain at an Oscillator setting of approximately 230 kc. The signal obtained from the Oscillator for this adjustment will be the third harmonic of **200 kc.** An increase in the Oscillator output may be necessary. The trimmer C-8 should then be adjusted to the point which produces maximum amplitude of the oscillographic images. It will

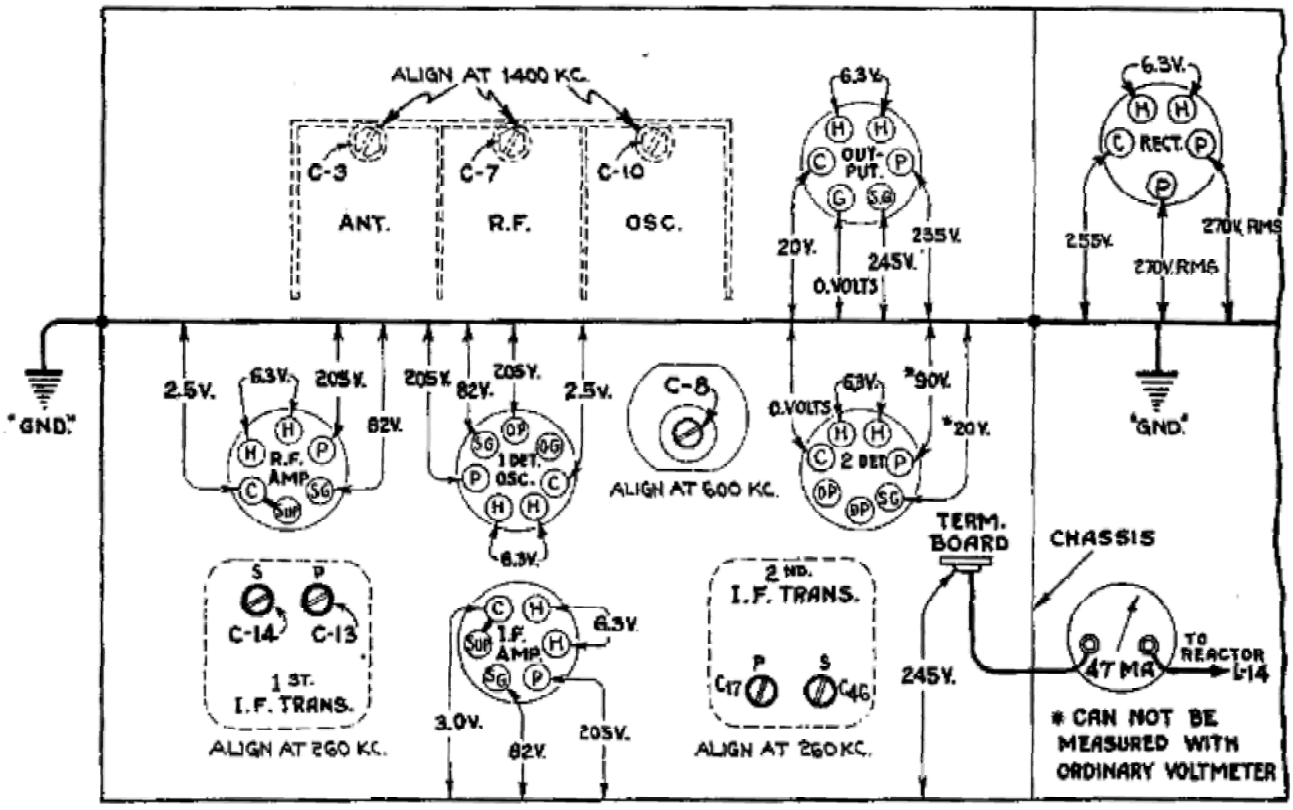

Figure 6—Radiotron Socket Voltages to Chassis

(Measured at 6.3 volts battery supply—Volume Control Maximum—No Signal)

not be necessary to rock the tuning control for this adjustment, inasmuch as the Frequency Modulator is varying the signal in an equivalent manner.

(j) Retune trimmers C-10, C-7 and C-3 as in (c), (d) and (e) to correct for any change in high frequency alignment which may have been caused by the adjustment of C-8.

Tuning Condenser Drive

Smooth control should be obtained over the entire tuning range of the variable condenser. If irregularity is present, check the action of the gear mechanism for binding or backlash at every point within the tuning range. A bind may be due to improper mesh between the small pinion gear and the large gears on the condenser shaft. To correct such a condition, remove the insulating coupling on the pinion of the tuning gear, loosen the two screws holding the gear plate and adjust the mesh of the gears to a position which gives smooth operation.

Gear backlash is prevented by the small compression spring between the two large gears on the rotor shaft. To check for this backlash, rotate the pinion slowly in both directions, observing the free gear (on rotor shaft) carefully to determine if it shifts without turning the rotor. If backlash is apparent, the large gear assembly should be removed and the free gear moved (against spring compression) 2 to 3½ teeth in relation to the fixed gear, and the assembly slid in place on the shaft and in mesh with the pinion. The set screws holding the large gears should be securely tightened.

Interrupter

The mechanical interrupter used in combination with a tube rectifier in the power system is constructed with a plug-in base so as to be easily removed from the receiver. Its adjustments have been correctly set during manufacture by means of special equipment. In cases of faulty operation of the interrupter, a renewal should be made.

Radiotrons

Deterioration of tubes and their approach to failure is usually evidenced by noisy or intermittent operation, loss of sensitivity and distorted tone quality. When suspected as faulty, the tubes should be removed from the receiver and checked with standard tube testing apparatus. It is not feasible to test the tubes while in the receiver due to measurement inaccuracies which would result from the effects of the circuits.

A "lasso" formed with a strong cord will be found helpful in removing the tubes from their sockets. The loop in the cord should be placed over the tube and tightened around the tube base. A direct pull upward will disengage the tube.

Receiver Housing

The screws holding the receiver chassis to the case and those securing the covers must all be in place and tightly installed, inasmuch as they appreciably affect the ground resistance of the assembly and will consequently have a bearing on the amount of ignition noise received.

Circuit Voltages

The voltages indicated at the socket contacts on Figure 6 will serve to assist in analyzing defective circuit conditions. Each value as specified should hold within ± 20% when the receiver is normally operative at rated supply voltage. They are actual operating values and do not take into account measurement inaccuracies which may be due to the loading effect of a voltmeter's internal 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 check is chosen as high as possible, consistent with good readability. 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.

Hudson-RCA Victor

Model H-6

SIX-TUBE, AUTOMOBILE RADIO RECEIVER

REVISED REPLACEMENT PARTS LIST FOR STANDARD SERVICE NOTES

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

Hudson Stock No.	RCA Stock No.	Description
		RECEIVER ASSEMBLIES
BO 151312	11409	Band—Tube shield rubber band—Package of 5
BO 151313	11425	Cable—Antenna cable—Receiver end.
BO 151314	11415	Cap—Radiotron shield (slotted) cap..
BO 151315	11130	Capacitor—Adjustable capacitor—C8.
BO 151316	5021	Capacitor—80 Mmfd.—C12
BO 151317	11171	Capacitor—400 Mmfd.—C9, C30, C33, C38, C42, C44
BO 151318	11413	Capacitor—400 Mmfd.—C37
BO 151319	11633	Capacitor—900 Mmfd.—C40
BO 151320	5148	Capacitor—.007 Mfd.—C21
BO 151321	4883	Capacitor—.01 Mfd.—C19
BO 151322	4792	Capacitor—.015 Mfd.—C15
BO 151323	11483	Capacitor—.02—.02 Mfd.—C28, C29.
BO 151324	5196	Capacitor—.035 Mfd.—C41
BO 151325	5016	Capacitor—.05—.05 Mfd.—C1, C5...
BO 151326	4841	Capacitor—0.1 Mfd.—C4, C16
BO 151327	11414	Capacitor—0.1 Mfd.—C36
BO 151328	4967	Capacitor—0.25 Mfd.—C39
BO 151329	11418	Capacitor—0.5 Mfd.—C20
BO 151330	11471	Capacitor—0.5 Mfd.—C32
BO 151331	4961	Capacitor—8 Mfd.—C27
BO 151332	4958	Capacitor pack—Comprising one 3 Mfd. one 4. Mfd. and one 10 Mfd. —C22, C24, C26
BO 151333	5068	Clip—Vibrator (Ground cup) clip...
BO 151334	11472	Coil—Antenna coil—L1, L2
BO 151484	4968	Coil—Choke coil—L12
BO 151335	11422	Coil—Oscillator coil—L5, L6
BO 151336	11629	Coil—R.F. coil—L3, L4
BO 151337	11421	Condenser—3 gang variable tuning condenser—C2, C3, C6, C7, C10, C11
BO 151338	11419	Coupling—Tuning condenser drive coupling—Short
BO 151339	11420	Coupling—Volume control drive coupling—Long
BO 151340	11405	Filter—Antenna filter—L18, L19, C35, C43
BO 151341	11424	Gear—Variable condenser drive gear—Located on condenser shaft and meshes with pinion Stock #11423..
BO 151343	11484	Lead—Lead assembly "A" plus lead chassis end
BO 151342	11423	Pinion—Variable condenser drive pinion meshes with gear—Stock #11424
BO 151344	11628	Plug—Bracket and speaker plug complete
BO 151345	4963	Reactor—Filter (Air core) reactor—L13
BO 151346	11408	Reactor—Filter (Iron core) reactor—L14
BO 151347	11174	Resistor—220 ohms—Carbon type—1/4 watt (R2) Package of 5
BO 151348	5031	Resistor—680 ohms—Carbon type—1/4 watt (R5) Package of 5
BO 151349	5026	Resistor—680 ohms—Carbon type—1 watt (R11) Package of 5
BO 151350	5032	Resistor—3300 ohms—Carbon type—2 watt (R26)
BO 151351	5033	Resistor—33,000 ohms—Carbon type —1 watt (R13) Package of 5
BO 151352	5132	Resistor—47,000 ohms—Carbon type —1/10 watt—R7—Package of 5
BO 151353	5029	Resistor—56,000 ohms—Carbon type —1/4 watt (R4) Package of 5
BO 151354	3118	Resistor—100,000 ohms—Carbon type —1/4 watt (R1) Package of 5
BO 151355	5027	Resistor—150,000 ohms—Carbon type —1/4 watt (R9) Package of 5
BO 151356	5035	Resistor—560,000 ohms—Carbon type —1/4 watt (R10) Package of 5
BO 151357	3033	Resistor—1 Megohm—Carbon type—1/4 watt (R20) Package of 5
BO 151358	5028	Resistor—1.8 Megohm—Carbon type —1/4 watt (R21) Package of 5
BO 151359	11151	Resistor—2.2 Megohm—Carbon type 1/4 watt—Package of 5—R3, R6...
BO 151360	3584	Ring—Antenna, RF or Oscillator coil retaining ring—Package of 5
BO 151361	4953	Shield—First intermediate frequency transformer shield
BO 151362	4956	Shield—Second intermediate frequency transformer shield
BO 151363	3623	Shield—Antenna, RF or oscillator coil shield
BO 151364	11416	Shield—Radiotron shield (long) Less cap
BO 151365	11417	Shield—Radiotron shield (short) Less cap

REPLACEMENT PARTS (Continued)

Hudson Stock No.	RCA Stock No.	Description
BO 151366	6980	Socket—4 contact vibrator socket....
BO 151367	5058	Socket—5 contact Radiotron socket...
BO 151368	4946	Socket—6 contact Radiotron socket...
BO 151369	4947	Socket—7 contact Radiotron socket...
BO 151370	11411	Switch—Tone control switch—(S1)..
BO 151371	5064	Stud—Variable condenser mounting stud assembly—Comprising 1 stud, 1 washer, 1 lockwasher and 1 bushing .....
BO 151372	11402	Transformer—First intermediate frequency transformer—(L7, L8, C13, C14) .....
BO 151373	11407	Transformer — Output transformer — (T2) .....
BO 151374	11403	Transformer—Second intermediate frequency transformer—(L9, L10, C17, C18, C46).....
BO 171375	11412	Transformer—Vibrator transformer—(T1) .....
BO 171376	11406	Volume control—(R17, S2).....
		CONTROL HEAD AND FLEXIBLE SHAFT ASSEMBLIES
BO 151377	11434	Bezel—Station selector dial bezel—depth 15/32" — used with retainer 11435 and pointer shaft 11429....
	11906	Bezel—Station selector dial bezel—depth 29/64" — used with retainer 11907 and pointer shaft 11960....
BO 151378	11431	Cover—Control head rear cover.....
BO 151379	11436	Crystal—Station selector dial crystal..
BO 151380	11428	Dial—Tuning dial and bushing.....
BO 151381	11430	Gear—Station selector idler gear—Meshes with gear Stock #11429....
BO 151382	11429	Gear and shaft—Tuning dial pointer shaft and gear assembly — shaft length 2 3/32" — used with bezel 11434 and retainer 11435 .....
BO 151204	11440	Head—Control head complete.....
BO 151383	11437	Indicator—Station selector indicator pointer .....
BO 71641	11765	Lamp—Dial lamp.....
BO 151384	11435	Retainer—Station dial crystal retainer —depth 13/32" — used with bezel 11434 and pointer shaft 11429....
	11907	Retainer—Station Selector Dial Retainer—depth 13/32"—used with bezel 11906 and pointer shaft 11960.....
BO 151385	11427	Shaft—Tuning condenser flexible drive shaft assembly.....
BO 151386	11426	Shaft—Volume control flexible drive shaft assembly.....
BO 151387	11432	Shaft—Volume control drive shaft—Located in control head.....
	11960	Shaft and Gear—Tuning Dial Pointer Shaft and Gear Assembly — shaft length 2 5/32"—used with bezel 11906 and retainer 11907.....
	11961	Tube—Rubber Tube approx. 7½" long used to hold dial crystal in Bezel Stock #11434 or 11906.....
BO 151388	11433	Shaft and gear—Tuning dial station selector drive shaft and gear assembly —Located in control head.....
BO 151389	11439	Spring—Volume or tuning control shaft holding spring—Package of 10
	11909	Washer—Spring washer used to hold gear on shaft in assembly stock #11429 and 11960—package of 10.
	11908	Washer—Spring washer used to hold shaft and gear assembly stock #11429 and 11960 in control head—package of 10 .....
		VIBRATOR ASSEMBLIES
BO 151333	5068	Clip—Vibrator clip (grounding cup).
BO 151366	6980	Socket—4 contact vibrator socket.....
BO 151391	5067	Vibrator complete—L15.....
		REPRODUCER ASSEMBLIES
BO 151392	11441	Cable—Reproducer and dial lamp cable complete with dial lamp socket....
BO 151485	11675	Coil—Field coil—L11.....
BO 151393	11442	Cone—Reproducer cone—L16.....
BO 151394	11444	Housing—Reproducer housing complete—Less speaker.....
BO 151206	9625	Reproducer complete.....
BO 151395	11443	Stud—Reproducer mounting stud assembly—Comprising—1 stud, 1 nut, 1 lockwasher and 3 flat washers....
		MISCELLANEOUS ASSEMBLIES
BO 151402	11447	Capacitor—Gas gauge capacitor.....
BO 151401	11632	Capacitor—Temperature gauge capacitor .....
BO 151403	11846	Capacitor—0.5 Mfd. generator or ammeter capacitor.....
BO 151396	6516	Connector—Fuse connector complete..
BO 71406	5023	Fuse—15 ampere fuse—F1—Package of 5 .....
BO 151397	4132	Knob—Tone control knob—Package of 5.....
BO 151398	11445	Knob—Tuning or volume control knob —Package of 5.....
BO 151207	11448	Lead—"A" lead and female section of fuse connector with clip—Approximately 24" long.....
BO 151399	11446	Suppressor—Distributor suppressor....
BO 150688		Antenna & Lead-in Wire Assembly....
BO 151208		Lead-in Wire and Shielding Loom Assy.
BO 48757		Antenna Insulator .....
BO 48758		Antenna Clip .....
BO 48760		Antenna Anchor Clip.....
BO 18447		Lead-in Wire Clip Bolt.....
BO 48673		Lead-in Wire Clip Bolt Nut.....
BO 71073		Ground Strap Assy. (Muffler Bracket to Frame.....
BO 151210		Ground Fork (Trans. opening Floor Cover) .....
BO 151435		Ground Fork Spacer.....
BO 71648		Ground Fork Screw.....
BO 151436		Ground Fork Tapping Plate.....

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