

**SECTION 11-B**

**RADIO**

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**SERVICE BULLETIN REFERENCE**

Bulletin No.	Page No.	SUBJECT

**11-6 BUICK RADIO DESCRIPTION AND OPERATING INSTRUCTIONS**

The Buick *Sonomatic* and *Selectronic* radio installations consist of a receiver set with built-in speaker mounted at the center of the instrument panel and a 4-section antenna mounted just above the center of windshield. The *Selectronic* radio installation also includes a foot control switch mounted on the toe panel to left of the brake pedal.

The radio receiver employs the superheterodyne circuit. The tuner assembly is of the 3-coil iron core permeability-tuned type. The 8-inch speaker is the permanent magnet type.

The *Sonomatic* radio receiver has five push buttons for touch-tuning of five pre-selected stations. In addition to the push buttons, a control knob permits manual selection of other stations.

The *Selectronic* radio receiver contains an automatic signal-seeking tuner by which the operator can change stations by merely depressing the single selector bar on the receiver, or the foot control switch on the toe panel. The seeking operation is a uni-directional sweep of the broadcast band from low to high frequency with a nearly instantaneous return. The tuning mechanism is driven by a spring loaded mechanical motor which is stopped on station

by a triggering circuit actuated by voltage developed from an incoming signal. The number of stations on which the tuner will stop can be regulated by use of the sensitivity control knob on the receiver. In addition to the automatic tuning, a control knob permits manual selection of stations if desired.

**a. Antenna Operation**

The antenna position is controlled by a knob located just above the center of windshield inside the body. The antenna may be rotated from the "down" to the "upright" positions by turning control knob; however, the rod extensions must be extended or retracted by hand outside the body.

The antenna is hinged so that it will not ordinarily be damaged when coming in contact with low hanging limbs or other obstructions. The hinge allows the antenna to yield forward or backward, and the antenna returns to its normal position automatically as soon as the obstruction is passed. When entering a garage with a low hanging overhead door, however, the antenna should be turned to "down" position to avoid the possibility of damage when the car is backed out of garage.

Locally strong stations can usually be tuned in with antenna in the down position; locally weak stations will require the antenna to be

raised upright and fully extended. To insure adequate sensitivity for selective tuning of the Selectronic radio it is necessary to have antenna in upright position and fully extended.

**b. Switch, Volume, and Tone Control Operation**

The switch and volume control knob is to the left of the dial. See figure 11-9. The first portion of rotation clockwise turns on the radio; further rotation clockwise increases the volume.

The tone control knob is located behind the volume control knob. See figure 11-9. Rotation of tone control knob to extreme "treble" position gives brilliant reproduction of the full tone range. This position will reproduce speech very clearly and distinctly. Rotation counterclockwise toward "bass" diminishes brilliance and accentuates low notes.

**c. Push Button Tuning Operation—Sonomatic Radio**

To tune in the station for which the push button is set simply push the button in as far as possible. The button will move easily at start, then a slightly harder push is required to complete the travel. At end of button travel the tuner will move to the station for which the button has previously been set as described in paragraph 11-8 (b).

**d. Selective Tuning Operation—Selectronic Radio**

*NOTE: To insure adequate sensitivity for selective tuning of the Selectronic radio it is necessary to have antenna in upright position and fully extended.*

With the radio turned on, selective tuning of available stations is accomplished by depressing either the selector bar above the dial (fig. 11-9),

or the foot control switch on toe panel to left of the brake pedal.

When the bar or switch is fully depressed and released the tuner will automatically move to the right and stop, accurately tuned, when it reaches the next station having adequate strength to stop it. The tuner will stop at a station having adequate strength even though the volume control is not turned up high enough for the station to be audible.

When the tuner reaches the right end of the dial it flies back to the left end and again starts moving to the right until it reaches a station having sufficient strength to stop it. By holding the selector bar or foot control switch down, unwanted stations or areas of the dial can be quickly passed over.

The number of stations on which the tuner will stop in selective tuning can be regulated by manual setting of the sensitivity control knob, which is located behind the manual tuning knob to right of the dial. See figure 11-9. This is a step control having six positions. This control is in the circuit only while the tuner is seeking and does not affect the "on station" sensitivity of the receiver.

Turning the sensitivity control knob clockwise, in the direction of arrow marked "MORE," increases the number of stations that can be tuned in. Turning knob counterclockwise, in direction of arrow marked "LESS," decreases the number of stations by eliminating those having weak signal strength in the area where car is located. In the extreme "LESS" position of control knob the tuner usually will stop on the strong local stations only.

If the Selectronic tuner is operated in certain localities or in certain types of buildings where a strong signal is not available, the tuner will

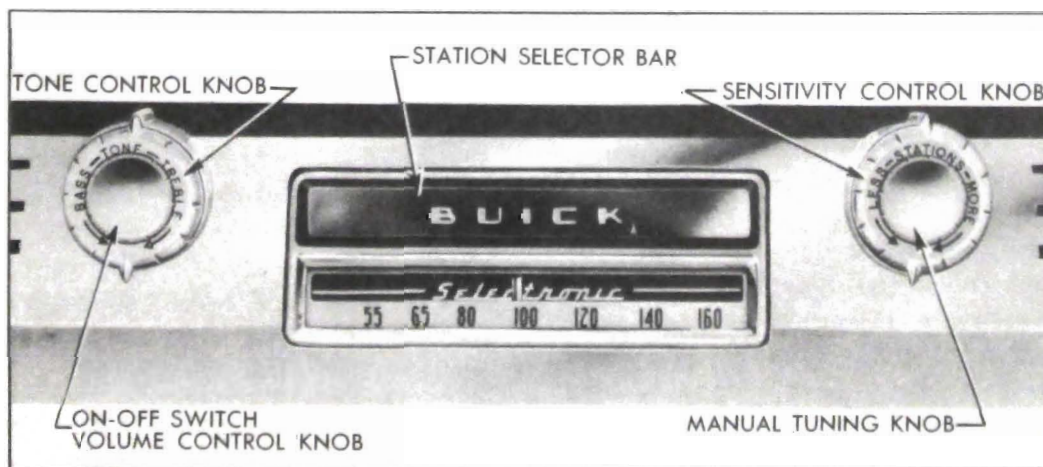


Figure 11-9—Receiver Controls—Selectronic Radio

automatically search the band from one end to the other without stopping until the sensitivity control knob is turned clockwise to include more stations, or until the radio is turned off.

#### **e. Manual Tuning Operation**

The manual tuning knob is to right of the dial. See figure 1-9. On the *Sonomatic* radio, this knob may be used to tune in stations other than those for which the push buttons are set; it is also used when tuning to set the buttons for selected stations. On the *Selectronic* radio, the tuning knob may be used to tune in stations that are too weak to stop the electronic tuning mechanism.

When tuning manually, and particularly when setting up a station on one of the *Sonomatic* push buttons, careful adjustment of the tuning knob is essential to good radio reception.

On *Sonomatic* radio, if the program sounds screechy or distorted, it is probably caused by improper tuning and can be corrected by adjusting the tuning knob slightly. Since the low notes are more affected by tuning than the high ones, it is a good plan to tune the set to a point where the low notes are heard best and high notes are clear but not screechy. Turning the control knob back and forth until the station is almost lost on either side will enable the operator to hear the difference in reception and select an intermediate position giving best results.

### **11-7 RADIO TROUBLE DIAGNOSIS— ON CAR**

The trouble diagnosis information in this paragraph is of a non-technical nature. It is intended as an aid in locating minor faults which can be corrected without a specialized knowledge of radio and without special radio test equipment. If the suggestions given here do not affect a correction, further testing should be done *only by a trained radio technician having proper test equipment.*

#### **a. Radio Is Inoperative or "Dead"**

1. Turn on the radio. The dial should light and the vibrator should buzz.

2. If dial does not light, disconnect the "A" lead cable and check the fuse located in the receptacle in receiver. If fuse is blown it indicates a sticking vibrator; replace fuse and check vibrator, step 3. If fuse is okay check "A" lead cable for proper connection to No. 1 terminal of lighting switch and check cable for open circuit. If source of trouble has not been found, remove

receiver for test by a trained radio technician.

3. If vibrator does not buzz when fuse is okay, remove receiver cover and tap the vibrator. If vibrator starts after tapping, or after installation of a new fuse, let it run for about 15 minutes and then check for any tendency of vibrator to stick by turning radio on and off repeatedly.

Replace the vibrator if it will not start or has a tendency to stick. Replace vibrator if it buzzes unevenly or is exceptionally loud.

4. If vibrator buzzes but radio is dead, check the tubes by replacing one at a time until the bad one is located, or test the tubes with a reliable checker if available.

5. If fuse, vibrator, and tubes are satisfactory, substitute a test antenna consisting of a piece of wire about 10 feet long connected to a standard antenna lead-in cable. Place test antenna outside and away from the car. If radio operates near normal with substitute antenna, some part of car antenna or lead-in is at fault.

Lead-in wire may be checked for "grounds" by removing lead-in cable connector from radio receiver and checking with an ohmmeter from connector tip to car body. This check should show an entirely "open" circuit. CAUTION: *Do not check with a lamp or any device drawing current, since the conductor inside loom is only .010" in diameter and will burn off easily if grounded.*

6. If source of trouble has not been found remove the receiver for test by a trained radio technician.

#### **b. Radio Reception Is Weak**

1. Fully extend the antenna and turn on radio. Turn volume control to maximum position and tune across the dial.

2. If reception seems just slightly weak, tune in a station having good volume for listening and grasp the antenna rod with your hand. If volume increases adjust the antenna trimmer (par. 11-8). If volume decreases proceed with the following steps.

3. Check for weak tubes by replacing one at a time until the faulty one is located, or test the tubes with a reliable checker if available.

4. If tubes are okay, substitute a test antenna as described in step 5, subparagraph a, above. If this does not reveal source of trouble remove the receiver for test by a trained radio technician.

#### **c. Radio Noisy with Car Standing Still**

1. Close and securely latch hood before checking for noise.

2. Turn on radio, start engine, and tune radio to a spot between stations. Engine noise will usually appear in radio as a clicking sound that varies in frequency with speed of engine. If noise is present disconnect antenna lead-in cable from receiver.

3. If engine noise stops when antenna is disconnected, check distributor suppressor by substituting a known good one, and make sure that all high tension wires are firmly pushed into sockets in coil and distributor cap. The distributor suppressor must be installed at distributor end of coil to distributor high tension wire; installation at coil end of this wire does not give satisfactory results.

4. If distributor suppressor does not correct the noise, check antenna lead-in cable shield for proper ground (par. 11-9, c).

5. If engine noise continues with antenna disconnected, check ignition coil and generator capacitors for clean, tight connections; also check the bond strap on the water temperature gauge tube to make sure it has a clean tight connection to cowl. Remove generator cover band and observe sparking; if sparking is excessive, check for open armature.

6. If source of noise has not been found, replace ignition coil and generator capacitors with known good ones. Ignition coil capacitor lead must be attached to battery terminal of coil. Generator capacitor lead must be connected to "A" terminal of generator. Both capacitors must have clean metal ground contact.

7. If engine noise is present when engine is running at approximately 2000 RPM, and all items mentioned above are satisfactory, the noise is probably due to the generator regulator. Correction may be made by mounting a .33 mfd capacitor at one of the regulator mounting ground screws and attaching the capacitor lead to the "BAT" terminal of regulator.

#### **d. Radio Noisy with Car Moving at High Speed**

1. Turn on radio and check for engine noise as described in subparagraph *c* above. If engine noise is present, correct as outlined.

2. Drive over different types of roads, especially macadam, with radio on and tuned between stations. Listen for presence of wheel or tire static. In mild form this static shows up as a click in radio that increases with speed; when more severe it shows up as heavy static or a constant roar. The surface of the road determines the strength of static discharge. Wheel

or tire static very seldom occurs on dirt or gravel roads.

3. If wheel or tire static is present, apply brakes lightly and if noise decreases check front wheels to see that static collectors have been properly installed and make sure that all grease has been wiped off contacts.

4. In certain cases of wheel or tire static, the front wheel static collectors alone may not completely eliminate all noise from this source. Static Eliminator Powder, available through G.M.P.D. parts warehouses under Group 9.674, may be used in cases where proper conditioning of static collectors does not remedy tire static. An injector for installing the powder is also available under the same group number. This powder equalizes the positive and negative charges developed by the tire, thus neutralizing the corona effect and eliminating radio interference difficulties from this source.

#### **e. Radio Noisy on Rough Road**

1. Turn on radio and check for engine noise as described in subparagraph *c* above. If engine noise is present, correct as outlined.

2. Jar the receiver by striking the case with heel of hand, or a rubber mallet. If this produces noisy reception, remove receiver cover and tap each tube with handle of screwdriver until noisy tube is found. Make sure that all tubes are firmly pressed into sockets. If this does not correct the noise, remove receiver for test by a trained radio technician.

3. If noisy reception is not produced when receiver is jarred, fully extend antenna and turn radio volume control on full. If noise appears in speaker check antenna and lead-in wire for loose connections. If wiggling lead-in does not cause noise, rap antenna rod with insulated end of screwdriver; if noise then appears, check antenna for shorting to car body or corrosion between antenna sections.

### **11-8 RADIO ADJUSTMENTS—ON CAR**

*When making the adjustments covered in this paragraph it is essential to have the car in a location that is as free as possible from outside interference.*

#### **a. Antenna Trimmer Adjustment**

An antenna trimmer adjustment is provided for matching the antenna coil in the receiver to the car antenna. *This adjustment must always be made after installation of receiver and antenna, or after any repairs to these units. The*

adjustment should also be checked whenever the radio reception is unsatisfactory.

1. Raise antenna to maximum height.
2. Tune radio to a station between 1300 and 1500 K.C. that can barely be heard with volume turned full on.
3. Insert a screwdriver through the opening in receiver cover labeled "Antenna Trimmer Adjustment" and carefully turn the trimmer screw back and forth until a position is found that gives maximum volume.

#### b. Setting Push Buttons to Desired Stations— Sonomatic Radio

1. Turn on the radio.
2. Pull button to left and all the way out.
3. Carefully tune in the desired station manually (par. 11-6, e), then push the button all the way in.
4. Move dial pointer away from the selected station and push the button to make certain the station will be properly tuned in. Turn tuning knob back and forth to make certain that best tuning is obtained with the push button.

## 11-9 RADIO INSTALLATION INSTRUCTIONS

Although radios are usually installed at the factory, occasions may arise requiring installation in the field. It also may be necessary to remove and reinstall the radio receiver, antenna, or interference suppression items in the course of repairs to the car. In all such cases, the instructions contained in this paragraph must be carefully followed to insure proper installation and satisfactory operation of the radio.

#### a. Installation of Receiver

1. Remove control plate from radio speaker grille by prying off with a screwdriver inserted under the lower edge. Remove control hole buttons in the same manner.
2. Remove paper from forward side of speaker grille and remove all loose paper from speaker grille and instrument panel. Loose edges of paper will buzz when radio is played.
3. Thoroughly clean surface around mounting holes in speaker grille to insure a good electrical connection with the receiver.
4. Bolt radio hangers to radio support brackets with slot openings toward front of car.
5. Install receiver by sitting in front seat holding receiver at arm's length while the two threaded bushings are inserted through control holes in speaker grille and the studs on side of

receiver are engaged in the extended lip on the hangers.

6. Install and tighten hex nuts on threaded bushings. Hold receiver so that rubber gasket at speaker opening touches the back of speaker grille, then install large flat washers, lockwashers and nuts on receiver studs and tighten nuts securely.

7. Install tone control knob, felt washer, and volume control knob on shaft to *left* of the dial. Install dummy knob (Sonomatic) or sensitivity control knob (Selectronic), felt washer, and tuning control knob on shaft to *right* of the dial. See figure 11-9.

To install outer knobs simply push them on shafts as far as possible. To remove either knob, insert a small screwdriver in slot on edge of knob and pry against the flat spring located inside the knob.

8. Connect the "A" lead cable to one of the No. 1 (unprotected) terminals of lighting switch. *Never connect to any other terminal.* Install 15 ampere fuse in receptacle in receiver and connect lead to socket in receiver toward left side of car.

9. Connect antenna lead-in wire and foot control cable. (Selectronic only) to receiver, then make antenna trimmer adjustment (par. 11-8). **CAUTION:** *Make certain that leads do not contact windshield wiper drive cables when wiper is running.*

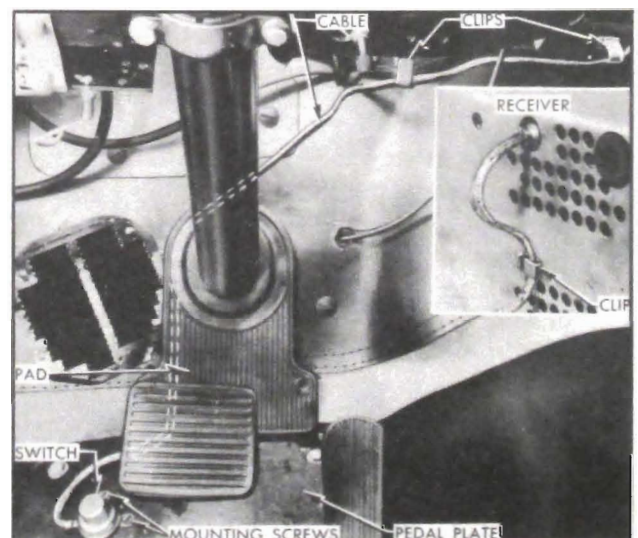


Figure 11-10—Foot Control Switch Installation

#### b. Installation of Selectronic Foot Control Switch

1. Fold back left side of floor mat and insulation to expose pedal plate below steering column.
2. Locate and drill switch mounting holes in

pedal plate using template furnished, then install control switch on pedal plate with screws. **CAUTION:** *Templates are different for Synchro mesh and Dynaflo cars—be sure to use correct template.*

3. Lead the control switch cable up behind left edge of steering column pad and support it in wiring harness clips on rear side of cowl. Plug cable into receiver and attach it to clip on receiver cover. See figure 11-10. **CAUTION:** *Make certain that cable does not contact windshield wiper drive cables when wiper is running.*

4. Carefully lay out and cut holes through insulation and floor mat for switch button, then reinstall floor mat.

### c. Installation of Radio Antenna— Closed Bodies

**IMPORTANT:** *The standard Buick antenna is matched with the receiver within the range of the trimmer adjustment. Other antennas may not match the receiver within the range of the trimmer adjustment; therefore the use of other than a standard Buick antenna is not recommended.*

1. Apply masking tape to area of roof panel where antenna control is to be installed, also to instrument panel along the right windshield garnish molding. This will prevent damage to car finish.

2. Remove right section of windshield garnish molding.

3. Push headlining up against header reinforcement above center of windshield so that hole in reinforcement can be felt. Cut two slits in headlining at right angles to each other, across the hole in reinforcement.

4. The antenna package contains a drill guide having a  $\frac{1}{8}$ " center hole and a smaller hole to one side. Attach a cord through the smaller hole so that guide can be retrieved if accidentally dropped inside the header reinforcement.

5. Insert drill guide through hole in header reinforcement and seat it in square hole in the header inner frame. Drill a  $\frac{1}{8}$ " hole through the roof panel.

6. Use the  $\frac{1}{8}$ " hole to pilot a  $1\frac{1}{8}$ " circular cutter and cut hole through roof panel while holding cutter at  $90^\circ$  to windshield glass. See figure 11-11. Remove masking tape from roof panel.

7. Attach antenna lead-in cable to windshield garnish molding with clips located so that molding screws will pass through them. Cable must be on rear side of molding and a clip must be at

every screw that cable passes so that cable will not be damaged by molding screws. Two short clips are used on side of molding and two or three long clips are used along top of molding, depending on location of hole in header through which cable will be threaded in step 9, below.

8. With shielding braid located above the lower right clip, attach cable ground terminal to body pillar where a screw hole is provided. Be sure to clean paint from pillar at this point and attach the terminal with a 10-32 x  $\frac{5}{16}$ " tapping screw, with internal-tooth lockwasher placed between terminal and pillar. See figure 11-11.

9. Thread lower end of cable down through opening at right end of instrument panel, snake upper end of cable up through hole in header (near center) and out through holes in header reinforcement and headlining, then install windshield garnish molding. **CAUTION:** *Pull gently on cable—a hard pull may break the small lead inside the loom.*

10. Remove glove box and attach lead-in cable to flange of defroster duct, using three clips. See figure 11-11. *Make certain that cable does not contact windshield drive cables, then reinstall glove box.*

11. If antenna tube and rod assembly is not assembled to the antenna control assembly, remove fluted socket set screw from control, insert tube so that the hole in tube aligns with screw hole in control then install and tighten set screw securely. Make sure that rubber pad is securely cemented to control insulator with rubber cement. See figure 11-11.

12. Insert bare end of lead-in wire into the Fahnestock terminal on the hard rubber insulator. Push the slack wire up into the hole, insert insulator up through the hole in the header reinforcement, and locate in the square hole of inner frame. The Fahnestock terminal must be located in the upper *left* corner. See figure 11-11.

13. While holding insulator in place have a helper install the control assembly from outside, then install lockwasher and run lock nut up until the assembly is snug but not tight. Use Wrench J 1340 to turn lock nut. See that point of socket set screw does not strike polished ring on outer end of control.

14. Place tube in the "down" position and raise or lower the inside of the antenna control assembly until the end of the outside tube is  $\frac{1}{2}$ " from top of windshield division molding on *Series 40*, or 1" from windshield glass on *Series 50-70*. See figure 11-11.

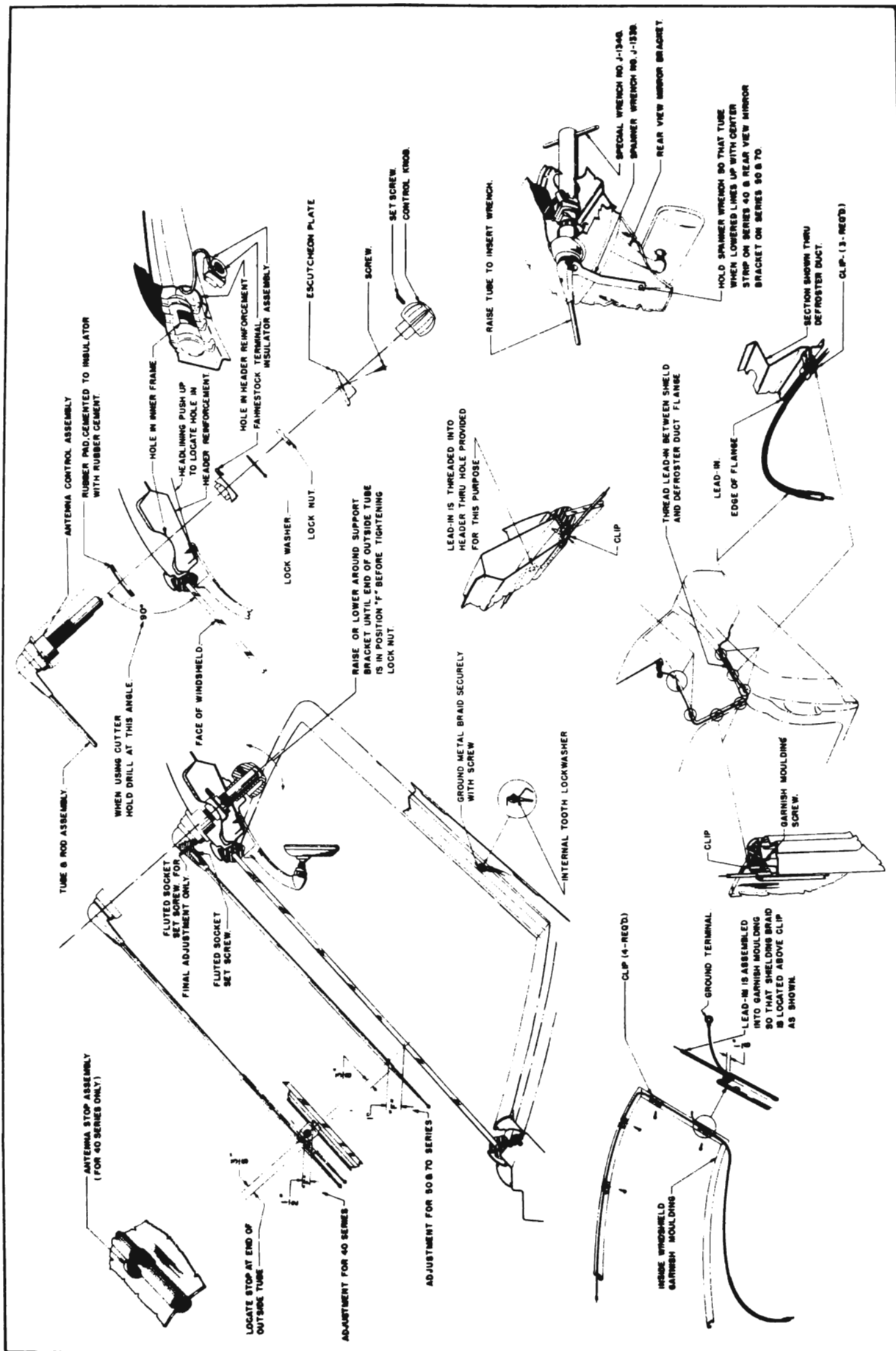


Figure 11-11—Antenna Installation Details—Closed Bodies

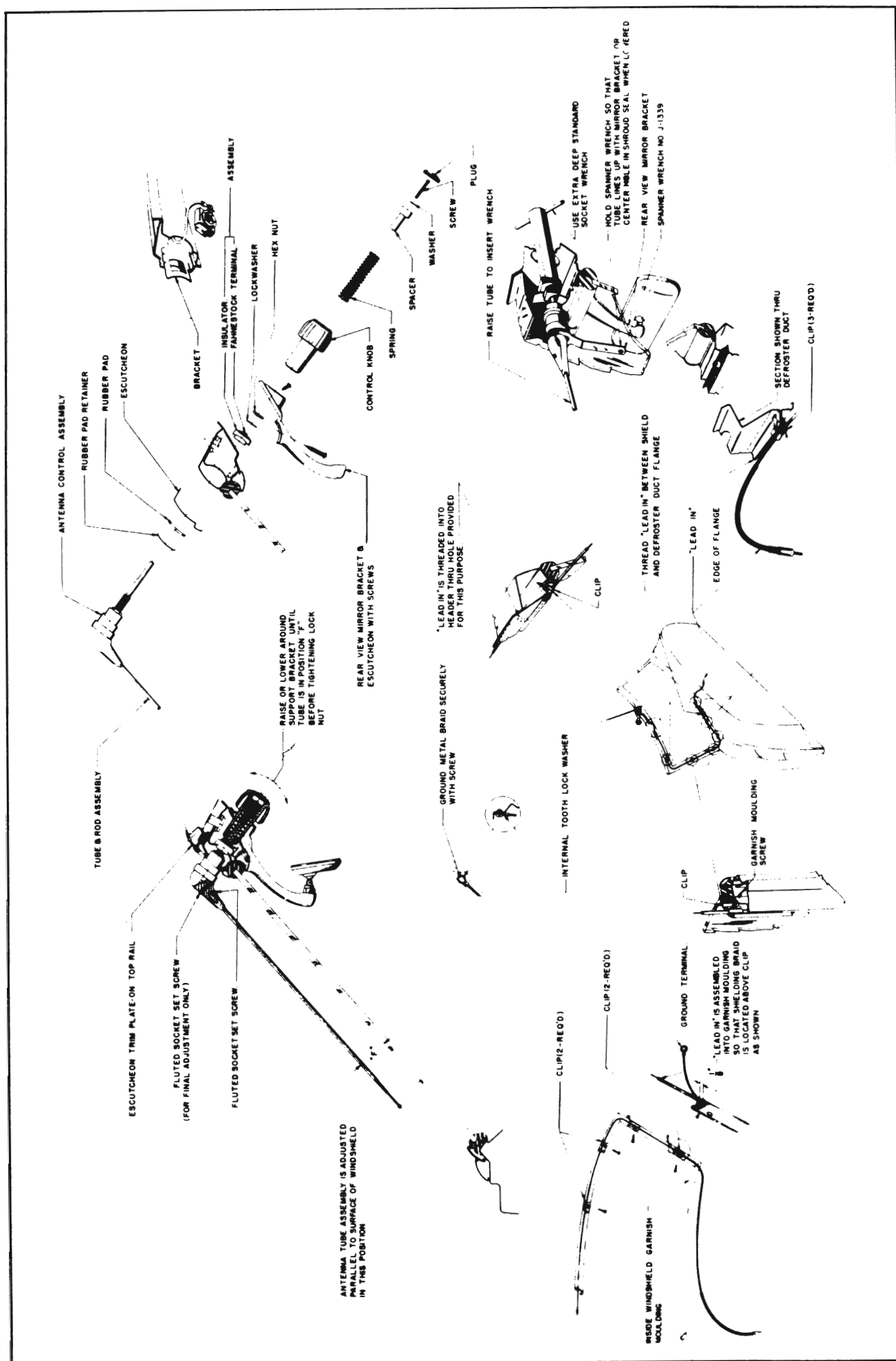


Figure 11-12—Antenna Installation Details—Convertible and Riviera Bodies



15. Using special Spanner Wrench J 1339 the man on outside must hold the antenna body so that the tube, when lowered, will align with the windshield division molding on *Series 40*, or rear view mirror bracket on *Series 50-70*. Securely tighten the nut on inside, using special Wrench J 1340. See figure 11-11.

**NOTE:** *If there is any doubt of the location of the Fahnestock terminal the lead-in wire should be checked for "grounds" with an ohm-meter. It should, of course, show an entirely "open circuit." Do not check with a lamp or any device drawing current as the conductor inside of the loom is only .010" in diameter and will burn off easily if grounded. For the same reason, care should be taken to see that the bare terminal on the end of the plug does not touch any "hot" terminal behind the instrument panel.*

16. Install antenna escutcheon plate, threading screws into holes provided in header reinforcement. Install knob and tighten set screw securely.

17. On *Series 40*, install antenna stop on windshield division molding in location shown in figure 11-11, and tighten screw evenly.

18. If antenna rod does not snap into antenna stop easily on *Series 40*, or is not correct distance from windshield glass on *Series 50-70*, the fluted socket set screw can be turned in against the polished ring to make a small adjustment of the antenna rod. This adjustment should be used only for a very slight change.

19. Connect lead-in cable to receiver and make the trimmer adjustment described in paragraph 11-8.

#### d. Installation of Radio Antenna— Convertible and Riviera Bodies

Installation details are clearly shown in figure 11-12. The installation procedure is very similar to that on closed bodies (subpar. c, above) except for the following points:

- (1) The insulator is installed with the Fahnestock terminal toward *right* side of body.
- (2) A rubber pad retainer, rubber pad, and escutcheon are used on outside of header.
- (3) The inside escutcheon is integral with the rear view mirror bracket.
- (4) The control knob is installed with a spring, spacer, washer, screw, and plug.
- (5) Antenna rod is set parallel to windshield glass at center.

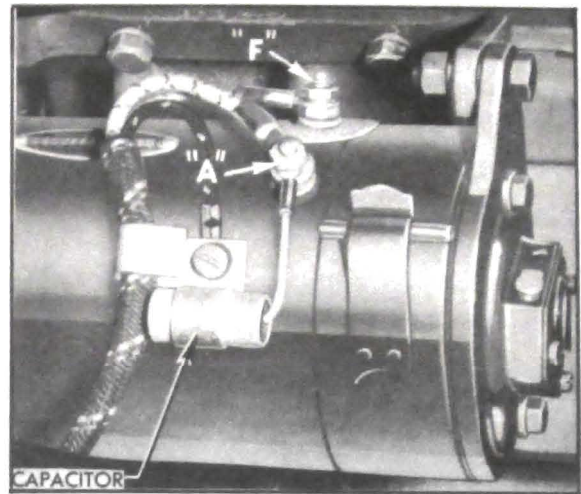


Figure 11-13—Capacitor Mounted on Generator

#### e. Installation of Interference Suppression Parts

Figure 11-13 shows proper installation of the capacitor to prevent interference caused by the generator. Note that capacitor lead is connected to the armature ("A") terminal of generator. Capacitor must never be connected to the field ("F") terminal as this will cause bad pitting of the voltage regulator points, thus preventing it from operating properly.

The distributor suppressor must be securely attached to the coil-to-distributor high tension wire at the distributor end. Installation of suppressor on coil end of wire will not give satisfactory results.

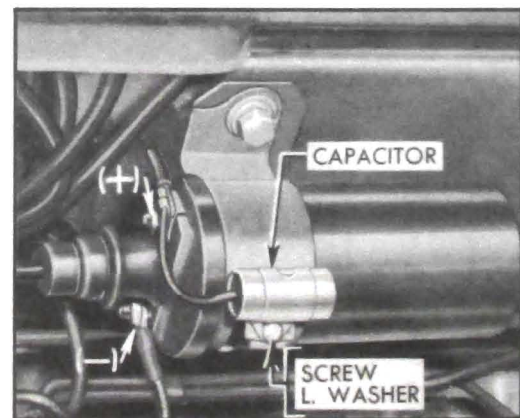


Figure 11-14—Capacitor Mounted on Coil

The coil capacitor is mounted on the coil bracket and the lead is connected to the battery (+) terminal of coil. See figure 11-14. If capacitor is connected to the distributor (-) terminal excessive pitting of distributor contact points will result.

A static collector is installed in each front wheel hub grease cap. For good results the

grease cap and the center of steering knuckle spindle must be clean and free from grease. The center of static collector is made of self-lubricating material.

In addition to the items mentioned above, a bond strap is attached to the temperature gauge tube. This strap must have a clean tight connection to the dash.

## 11-10 RADIO ALIGNMENT PROCEDURE

*Under no circumstance should alignment be attempted without calibrated test oscillator and output meter, or by untrained personnel.*

These alignment instructions must be rigidly adhered to and all adjustments must be made in the order given.

### a. Alignment Preliminaries

The radio receiver should be functioning before the various aligning adjustments are made. Trouble shooting, if necessary, should precede the final adjustment. Receiving signals at correct dial setting depends upon having the proper relation between tuning condenser and the dial scale. Pointer or dial setting is necessary because the scales are not linear with frequency and all scales are precalibrated for maximum accuracy.

### b. Superheterodyne Theory and Alignment

Buick Sonomatic Auto Radios employ the superheterodyne circuit which uses an intermediate frequency (I-F) amplifier, the characteristics of which largely govern the selectivity of the receiver. The I-F amplifier characteristics are determined principally by the adjustment and design of the I-F transformers. It is, therefore, important that the I-F amplifier be correctly adjusted to provide the best selectivity. These adjustments are in the form of iron cores placed within the coils. During alignment it is necessary only to adjust these iron cores as specified in the tabulated alignment procedure, to obtain best operation. Incorporated in every superheterodyne is a local oscillator, the output of which mixes with the incoming signal from the antenna. The local oscillator does not operate at the same frequency as the incoming signal which is to be received. The resonant (acceptance) frequency of the I-F amplifier establishes the difference in frequency required; 260 K.C. is used on Buick radios. The local oscillator operates at a frequency higher than the incoming signal, the two predominating resultant frequencies produced are the sum

and the difference of the two frequencies. The design of these receivers is such that the difference in frequency is the same as the I-F amplifier resonant frequency. Modulation of the incoming signal will be present as modulation of input to the I-F amplifier.

### c. Effects of R-F or I-F Misalignment

The effects of misaligned R-F or I-F stages are most commonly observed as a loss of sensitivity either over a portion or over entire band; loss of sensitivity, often characterized by the selectivity being noticeably unequal on the two sides of the point of best reception; change in fidelity; and inaccurate dial readings. Loss of fidelity will be apparent as a loss of high or low audio frequencies. If the I-F amplifier is not tuned to the specified frequency, the oscillator and other tuned circuits will not track. The dial readings will then be incorrect and a portion of the band will have low sensitivity.

### d. Test Oscillator Connections— Dummy Antenna Use

The chassis or frame of the radio receiver is considered as being at ground potential and the "O" or "GND" terminal of the test oscillator should be connected to the chassis wherever good contact can be established. The "ANT" or "HIGH" terminal of the Test Oscillator output must be connected to the antenna connector or other points in the radio receiver as specified in "Tabulated Alignment Specifications" (subpar. *g* or *h*). The use of a fixed condenser in series with the test oscillator lead is specified in some instances. A .1 mfd. condenser is used in aligning the I-F stages and a 0.000082 mfd. condenser is used in series with the antenna connector. This condenser, sometimes called "Dummy Antenna," provides a proper input loading to the receiver. It is important that this condenser be connected at the point where the Test Oscillator lead joins the radio set, and should not be connected at the test oscillator. Shielded leads should be used.

### e. Output Meter Connections

Any standard type of output meter can be employed during alignment. The meter should be connected across the secondary of the output transformer. It is best to leave the voice coil connected while using the output meter. It is essential that an output meter with sufficient sensitivity be used to avoid the possibility of using too much Test Oscillator output

to get a readable indication on the output meter. Sometimes it is desirable to connect the output meter from plate to plate of output tubes; when this connection is employed be sure that a .1 mfd. condenser is connected in series with the meter to afford protection from the d-c potential.

#### **f. Alignment of the Tuned Circuits**

Tuning adjustment with trimmers or adjustable iron cores is accomplished while applying a modulated signal, of the specified frequency to the input of the stage being adjusted. Maximum Output Meter indication, of the amplitude of Audio-Frequency output, of the radio receiver, shows when tuning is correct. The various tuned circuits are aligned by adjusting each in this manner. During all alignment adjustment, the output of the Test Oscillator must be kept as low as possible, consistent with a reasonable output meter indication, to prevent A-V-C action from taking place and making all adjustments seem very broad.

The tuning tool used must have a minimum of metal so it will cause little or no tuning reaction. If removing the tool, after making an adjustment, reduces the output appreciably, a slight compensating mistuning will correct the

error and produce maximum output when the tool is removed.

#### **g. Tabulated Alignment Specifications— Sonomatic Radio**

These alignment specifications apply only to Sonomatic radios bearing the following numbers:

<b>Car Series</b>	<b>Radio Model</b>
1st 40 . . . . .	980847
2nd 40—All 50, 70 . . . . .	980868

See figure 11-16 for location of adjustment screws indicated in the tabulated alignment specifications, given on page 11-19.

#### **h. Tabulated Alignment Specifications— Selectronic Radio**

These alignment specifications apply only to Selectronic radios bearing Model No. 980899.

See figure 11-17 for location of adjustment screws indicated in the tabulated alignment specifications given on page 11-19.

*NOTE: When aligning the Selectronic radio be sure to use a vacuum tube voltmeter as indicated and be sure to follow the alignment sequence given—(Notice that the primary of the 2nd I.F. is aligned first).*

**See page 11-25 for Radio Service Parts List**

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**TABULATED ALIGNMENT SPECIFICATIONS—SONOMATIC**


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Output Meter Connections . . . . . Across Voice Coil  
 Generator Return . . . . . To Receiver Chassis  
 Dummy Antenna . . . . . In Series With Generator

Volume Control Position . . . . . Maximum Volume  
 Tone Control Position . . . . . Treble  
 Generator Output . . . . . Minimum for Readable Indication

Steps	Series Condenser or Dummy Antenna	Connect Signal Generator to	Signal Generator Frequency	Tune Receiver to	Adjust in Sequence For Max. Output
1	0.1 mfd.	6SA7 Grid (Pin #8)	260 KC	High Frequency Stop	A, B, C, D
2	0.000082 mfd.	Antenna Connector	1615 KC	High Frequency Stop	*E, F, G
3	0.000082 mfd.	Antenna Connector	1000 KC	Signal Generator Signal	J, K
4	0.000082 mfd.	Antenna Connector	1615 KC	High Frequency Stop	F, G
5	0.000082 mfd.	Antenna Connector	1000 KC	Signal Generator Signal	L**

\*Before making this adjustment check mechanical setting of oscillator core "H." The rear of the core should be  $1\frac{25}{32}$ " from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form.) Core adjustments should be made with an insulated screw driver, and core studs should be cemented in place with glyptal or household cement after alignment.

\*\*L is the pointer adjustment screw which is on the connecting link, between the pointer assembly and the parallel guide bar. It should be adjusted so that the dial pointer corresponds with the 1000 KC mark on the dial. (On first "0" of "100.")

With the radio installed and the car antenna plugged in adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station near 1400 KC (see sticker on case).

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**TABULATED ALIGNMENT SPECIFICATIONS—SELETRONIC**


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Output Meter Connection . . . . . VTVM from [2] to chassis  
 (see fig. 11-21, Tube View)  
 Generator Return . . . . . Receiver Chassis  
 Dummy Antenna . . . . . In series with generator

Volume Control . . . . . Maximum Volume  
 Tone Control . . . . . Treble  
 Generator Output . . . . . Not to exceed 2 volts at VTVM

Step	Dummy Antenna	Connect To	Signal Generator Frequency	Tune Receiver to	Adjust in Sequence For Max. Output
1	0.1 mfd.	6SA7 Grid (Pin 8)	260 KC	*High Frequency Stop	A, B, C, D
2	0.000082 mfd.	Antenna Connector	1615 KC	High Frequency Stop	**E, F, G
3	0.000082 mfd.	Antenna Connector	600 KC	Signal Generator Signal	J, K
4	0.000082 mfd.	Antenna Connector	1615 KC	Signal Generator Signal	F, G
5	0.000082 mfd.	Antenna Connector	1000 KC	Signal Generator Signal	***L

\*To tune to high frequency, put a 0.070" feeler gauge (or bare #13 wire) in slot against the high frequency stop. Depress station selector bar and allow the planetary arm to run against the feeler gauge. Turn the radio off and then back on.

\*\*Before making this adjustment, check the setting of oscillator core "H." The rear of the core should be  $1\frac{25}{32}$ " from the mounting end of the coil form. This measurement is readily made by inserting a suitable plug in the mounting end of the coil form. The core adjustment is made from the mounting end of the coil form with an insulated screwdriver. (It will be necessary to

steady the core guide bar while making these adjustments. This can be done by applying a downward pressure on the guide bar at the antenna coil end.) If this adjustment is necessary, first dissolve the glyptal seal on the core stud and be sure to re-seal after making the adjustment.

\*\*\*"L" is the pointer adjustment screw on the end of the core guide bar—adjust so pointer reads 1000 KC.

With the radio installed and the antenna plugged in, adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station near 1400 KC (see sticker on case.)

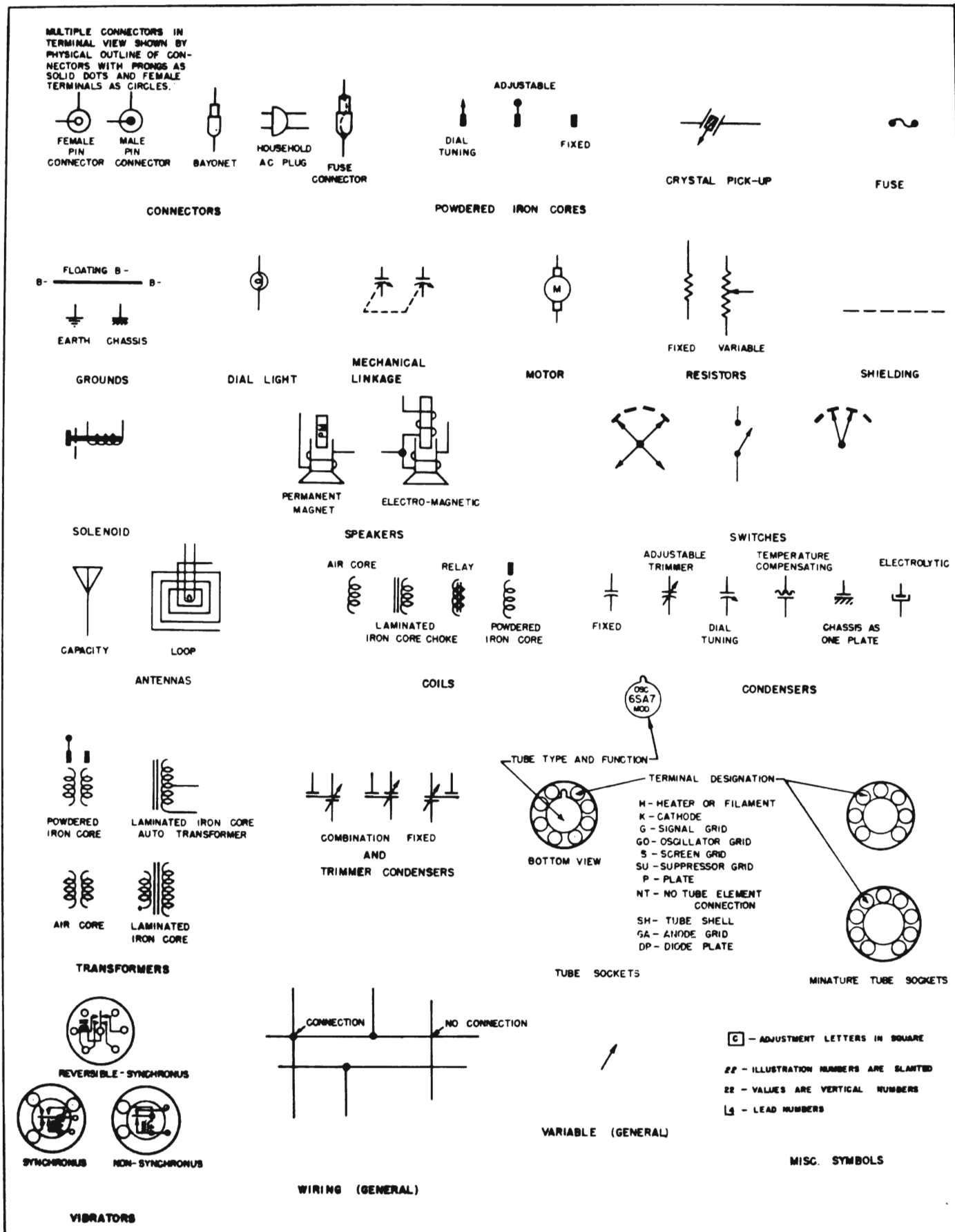


Figure 11-15—Symbol Legend for Figures 11-16 and 11-17

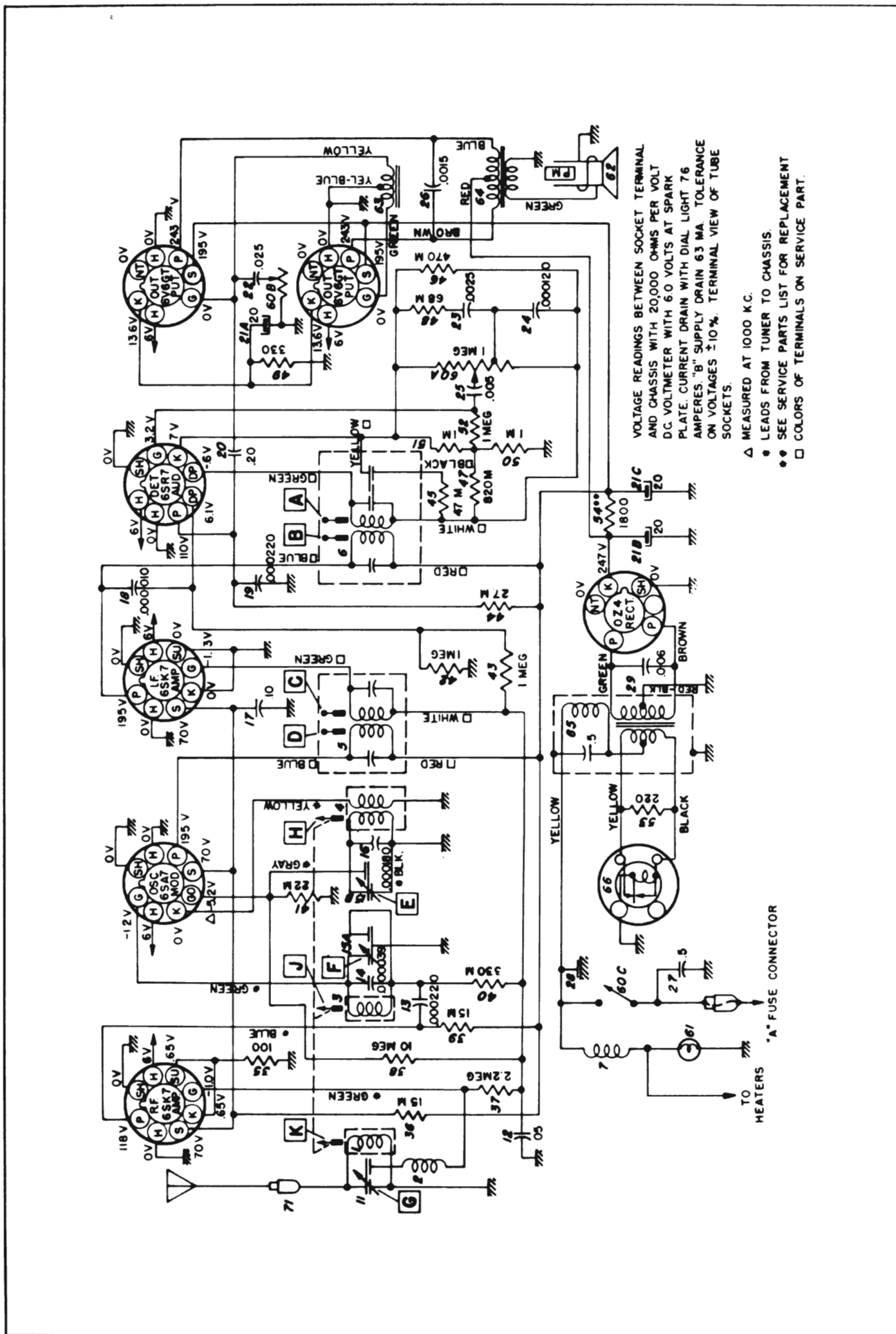


Figure 11-16—Radio Circuit Schematic—Sonomatic Radio  
(See fig. 11-15 for Symbol Legend)



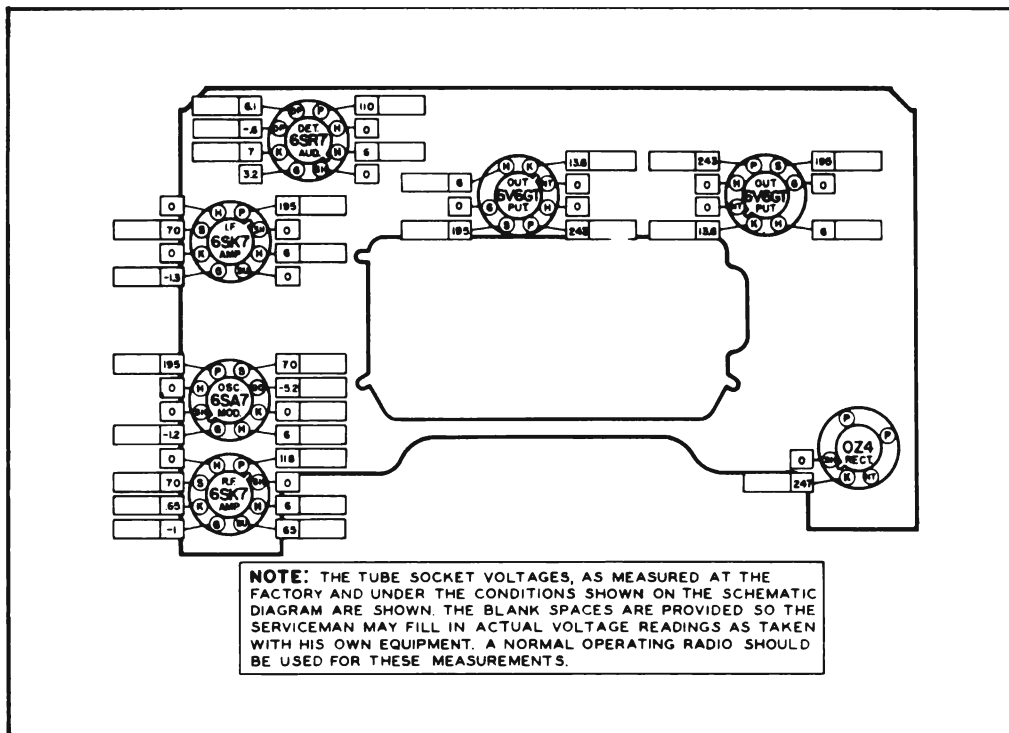


Figure 11-18—Tube Socket Voltages—Sonomatic Radio

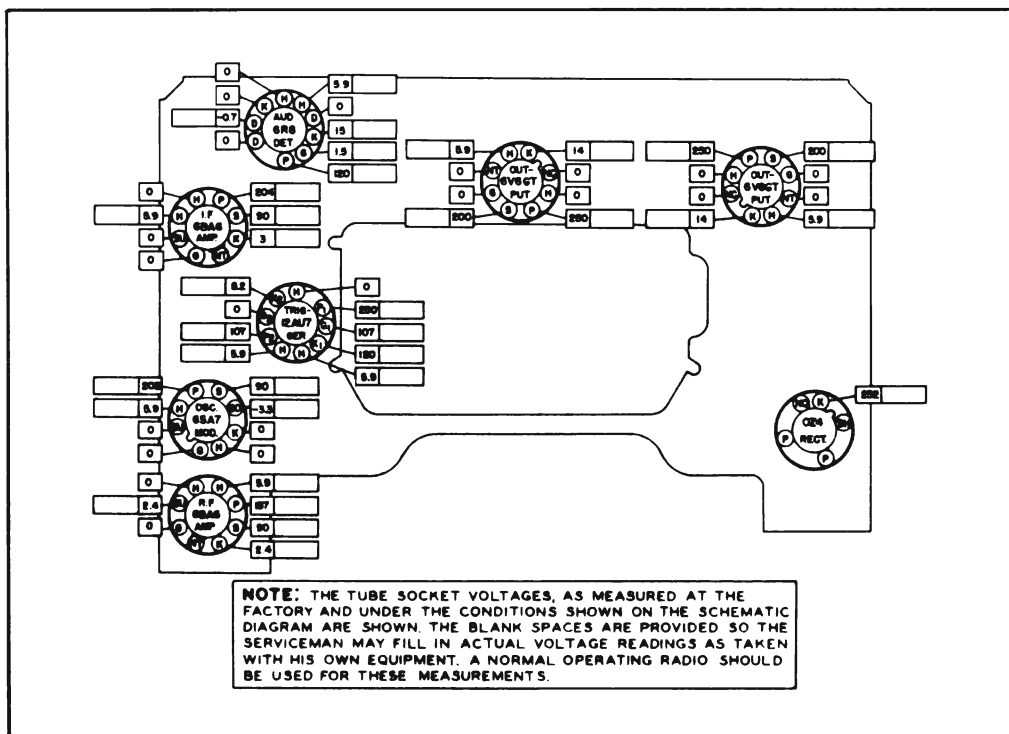


Figure 11-19—Tube Socket Voltages—Selectronic Radio



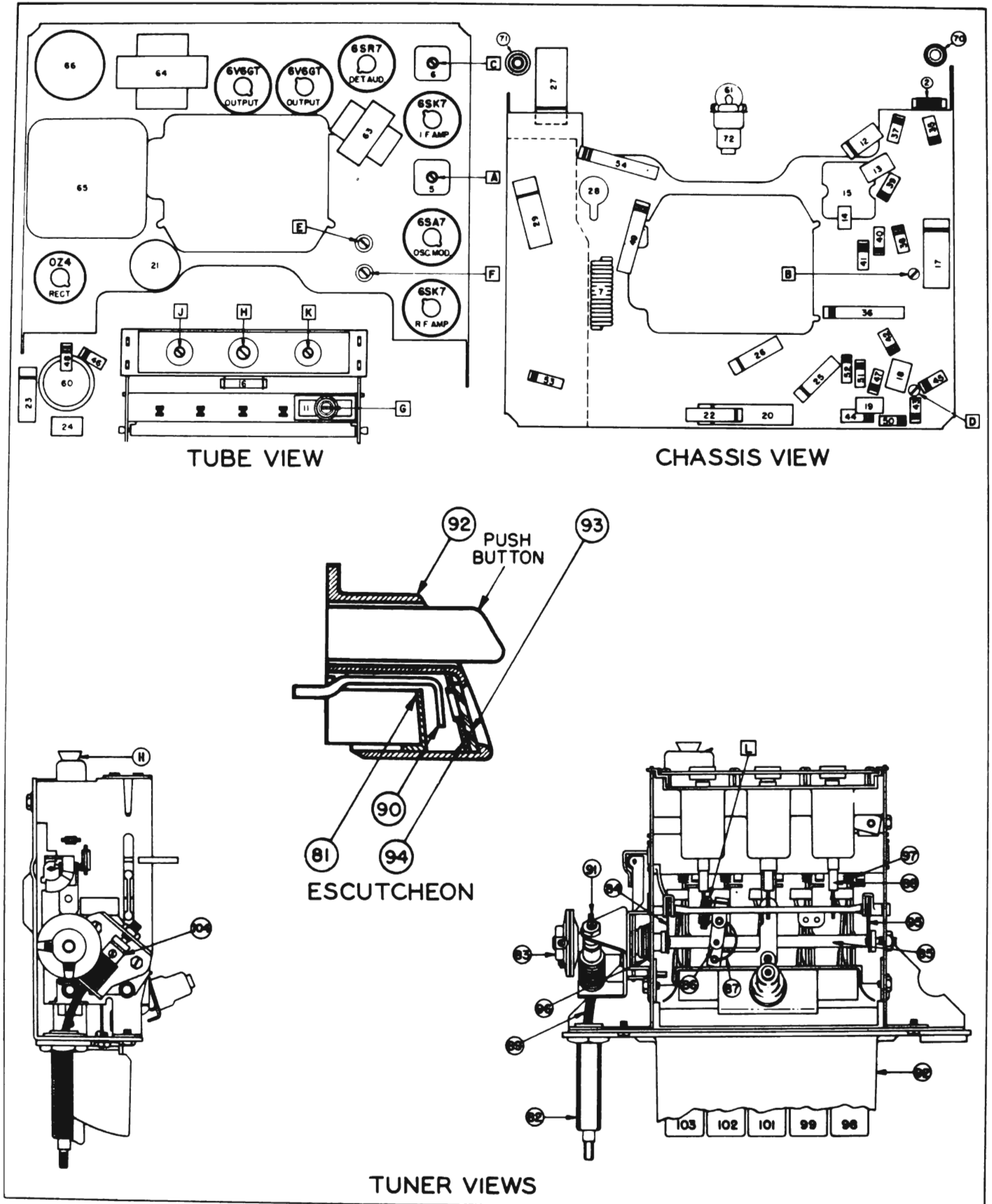


Figure 11-20—Parts Layout—Senomatic Radio

## 11-11 RADIO SERVICE PARTS LIST— SONOMATIC

See figure 11-20 for Illustration Numbers indicated in the following parts list.

### a. Electrical Parts

Illus. No.	Service Part No.	Description
<b>COILS</b>		
1	7258914	Antenna
2	7240251	Antenna Spark Choke
3	7258914	R.F.
4	7258911	Oscillator
5	1219508	1st IF
6	1219509	2nd IF
7	1217846	"A" Spark Choke
<b>CONDENSERS</b>		
11	7258733	Antenna Trimmer
12	7230592	.05 mfd. 200 V Tubular
13	7236105	.000220 mfd. Mica
14	1217736	.000039 mfd. Ceramic
15	7242454	Dual Trimmer
15A		RF Section
15B		Oscillator Section
16	1217738	.000180 mfd. Ceramic
17	7231536	.1 Mfd. 400 V Tubular
18	1215189	.000010 mfd. mica
19	7236105	.000220 mfd. mica
20	7240579	.2 Mfd. 400 V Tubular
21	7240724	Electrolytic
21A		20 mfd. 25 V
21B		20 mfd. 400 V
21C		20 mfd. 400 V
22	1211232	.025 mfd. 400 V Tubular
23	7240578	.0025 mfd. 400 V Tubular
24	7240577	.000120 mfd. Mica
25	7230767	.005 mfd. 600 V Tubular
26	7236134	.0015 mfd 800 V Tubular
27	7236621	.5 mfd. 200 V Tubular
28	1217848	Chassis Plate Condenser
29	7240906	.006 mfd. 1600 V Tubular
<b>RESISTORS</b>		
35	1213217	100 ohms ½ W Insulated
36	7233653	15,000 ohms 2 W Insulated
37	1214563	2.2 megohms ½ W Insulated
38	1215548	10 megohms ½ W Insulated
39	7237595	15,000 ohms 1 W Insulated
40	1214557	330,000 ohms ½ W Insulated
41	1214550	22,000 ohms ½ W Insulated
42	1213282	1 megohm ½ W Insulated
43	1213282	1 megohm ½ W Insulated
44	1213342	27,000 ohms 1 W Insulated
45	1214553	47,000 ohms ½ W Insulated
46	1214559	470,000 ohms ½ W Insulated
47	1214561	820,000 ohms ½ W Insulated
48	1213844	68,000 ohms ½ W Insulated
49	1214572	330 ohms 2 W Insulated
50	1213235	1,000 ohms ½ W Insulated
51	1213235	1,000 ohms ½ W Insulated
52	1213282	1 megohm ½ W Insulated
53	7237994	220 ohms 1 W Insulated
54	7242844	1800 ohms (Replace with 2700 ohms 2 W and 5600 ohms 1 W in parallel)
	7240918	2 W
<b>TUBES</b>		
	1211924	0Z4
	7237751	6SK7
	7237752	6SA7
	1218107	6SR7
	1213793	6V6GT
<b>MISCELLANEOUS ELECTRICAL</b>		
60	7258683	Control—Volume, Tone and Switch
60A		Volume Control
60B		Tone Control
60C		On-Off Switch

Illus. No.	Service Part No.	Description
61	125588	Lamp—Dial Light
62	7255895	Speaker—8" Round P.M.
63	7258941	Transformer—Input
64	7258945	Transformer—Output
65	1219642	Transformer—Power
66	7239124	Vibrator—Non-synchronous

### b. Mechanical Parts

Illus. No.	Service Part No.	Description
<b>CHASSIS</b>		
70	7242034	Connector—"A" Lead
71	7242035	Connector—Antenna
72	1219547	Socket—Dial Light
73	7236279	Socket—Octal Tube
74	7239125	Socket—Vibrator
<b>TUNER</b>		
81	7258679	Backplate—Pointer
82	7258675	Bushing—Manual Drive
83	7258072	Clutch Disc—Driven
84	7258203	Connecting Link—Core Bar
85	7258211	Core Guide Bar—Parallel
86	7256271	Pointer Connecting Link
87	7255992	Spring—Pointer Connecting Link
88	7258468	Core—Powdered Iron
89	7258673	Drive Shaft—Manual
90	7258678	Pointer Assy.
	1219093	Pointer Tip Package
91	7256102	Gear and Bushing—Clutch
92	7258676	Escutcheon Assy.
93	7256885	Dial
94	7256886	Dial Backplate
95	7257415	Spring—Core Bar Connecting Link
96	7258756	Spring—Clutch
97	7255984	Spring—Slide Return
98	1219455	Push Button and Slide Assy. "B"
99	1219456	Push Button and Slide Assy. "U"
101	1219457	Push Button and Slide Assy. "I"
102	1219458	Push Button and Slide Assy. "C"
103	1219459	Push Button and Slide Assy. "K"
	1219124	Push Button Insert "B"
	1219125	Push Button Insert "U"
	1219126	Push Button Insert "I"
	1219127	Push Button Insert "C"
	1219128	Push Button Insert "K"
104	7256866	Worm Gear and Bracket Assy.

### c. Installation Parts

Service Part No.	Description
1321178	"A" Lead and Fuse Connector
6015	Condenser—Generator
6015	Condenser—Ignition Coil
120151	Fuse—15 Amps
1341566	Knob—Control
1341535	Knob—Dummy
1341536	Knob—Tone Control
6008	Suppressor Adaptor
6001	Suppressor—Distributor

## 11-12 RADIO SERVICE PARTS LIST— SELECTRONIC

See figure 11-21 for Illustration Numbers indicated in the following parts list.

### a. Electrical Parts

Illus. No.	Service Part No.	Description
<b>COILS</b>		
1	7257979	Antenna
3	7240251	Antenna Spark Choke
4	7257979	R.F.
5	7259184	Oscillator

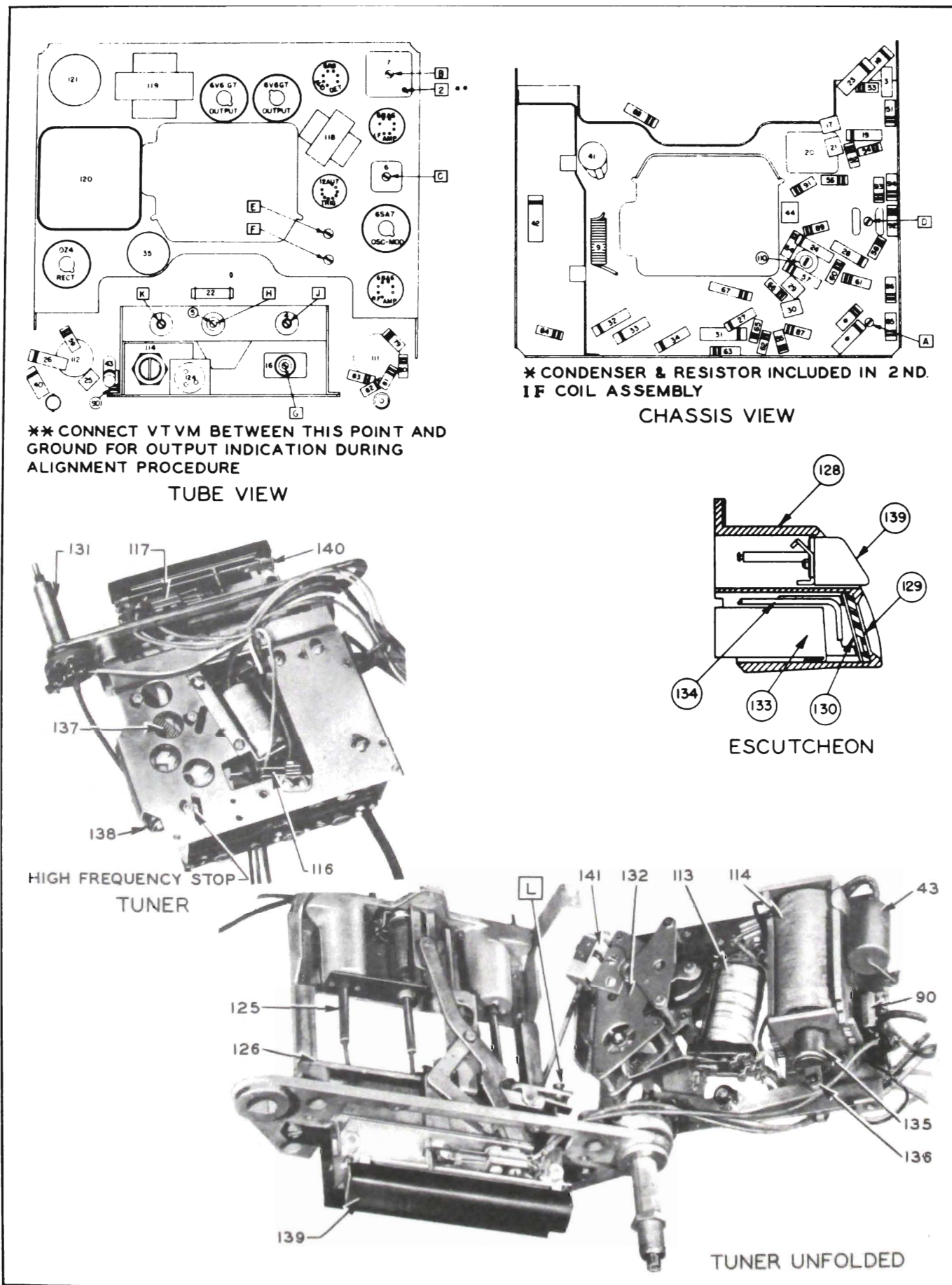


Figure 11-21—Parts Layout—Selectronic Radio

Illus. No.	Service Part No.	Description
6	1219508	1st I.F.
7	1219602	2nd I.F.
9	1217846	Hash Choke
<b>CONDENSERS</b>		
16	7259308	Antenna Trimmer
17	G 680	.000068 mfd Mica
18	E 503	.05 mfd 200 V Tubular
19	E 503	.05 mfd 200 V Tubular
20	7242454	Dual Trimmer
20A		RF Section
20B		Oscillator Section
21	G 390	.000039 mfd Ceramic
22	7257567	.000260 mfd Compensating
23	E 104	.1 mfd 400 V Tubular
24	E 104	.1 mfd 200 V Tubular
25	7240577	.000120 mfd Mica
26	7240578	.0025 mfd 400 V Tubular
27	E 103	.01 mfd 400 V Tubular
28	E 202	.002 mfd 600 V Tubular
29	G 221	.000220 mfd Mica
30	G 680	.000068 mfd Mica
31	1219660	20 mfd 50 V Electrolytic
32	E 204	.2 mfd 400 V Tubular
33	1211232	.025 mfd 400 V Tubular
34	7236134	.0015 mfd 800 V Tubular
35	7259128	Electrolytic
35A		10 mfd 100 V
35B		20 mfd 400 V
35C		20 mfd 400 V
40	E 504	.5 mfd 200 V Tubular
41	1217848	Chassis Plate Condenser
42	H 602	.006 mfd 1600 V Tubular
43	E 504	.5 mfd 100 V Tubular
44	G 101	.000100 mfd Mica
<b>RESISTORS</b>		
51	A 225	2.2 Megohms 1/2 W Insulated
52	B 103	10,000 Ohms 1 W Insulated
53	A 101	100 Ohms 1/2 W Insulated
54	A 334	330,000 Ohms 1/2 W Insulated
55	A 155	1.5 Megohms 1/2 W Insulated
56	A 223	22,000 Ohms 1/2 W Insulated
57	1212491	12,000 Ohms 2 W Insulated
58	A 100	10 Ohms 1/2 W Insulated
59	A 683	68,000 Ohms 1/2 W Insulated
60	A 101	100 Ohms 1/2 W Insulated
61	1215558	68 Ohms 1/2 W Insulated
62	1219488	1500 Ohms 1/2 W Insulated
63	1219487	470 Ohms 1/2 W Insulated
64	A 222	2200 Ohms 1/2 W Insulated
65	A 105	1 Megohm 1/2 W Insulated
66	B 273	27,000 Ohms 1 W Insulated
67	7234563	360 Ohms 1 W (Wire Wound)
69	1214540	56 Ohms 1/2 W Insulated
80	A 470	47 Ohms 1/2 W Insulated
81	A 101	100 Ohms 1/2 W Insulated
82	1215559	180 Ohms 1/2 W Insulated
83	A 221	220 Ohms 1/2 W Insulated
84	B 221	220 Ohms 1 W Insulated
85	A 104	100,000 Ohms 1/2 W Insulated
86	A 151	150 Ohms 1/2 W Insulated
87	A 155	1.5 Megohms 1/2 W Insulated
88	{ C 272 B 562	1,800 Ohms 2 W Wire Wound (or replace with 2700 Ohms 2 W and 5600 Ohms 1 W in parallel)
89	A 335	3.3 Megohms 1/2 W Insulated
90	7231539	13,000 Ohms 1 W Insulated
91	1213271	120,000 Ohms 1/2 W Insulated
92	B 473	47,000 Ohms 1 W Insulated
93	1216154	6,800 Ohms 1 W Insulated
94	B 473	47,000 Ohms 1 W Insulated

**TUBES**

5003	OZ4
5241	6V6GT
5541	6R8
5252	6BA6
5328	12AU7
5222	6SA7

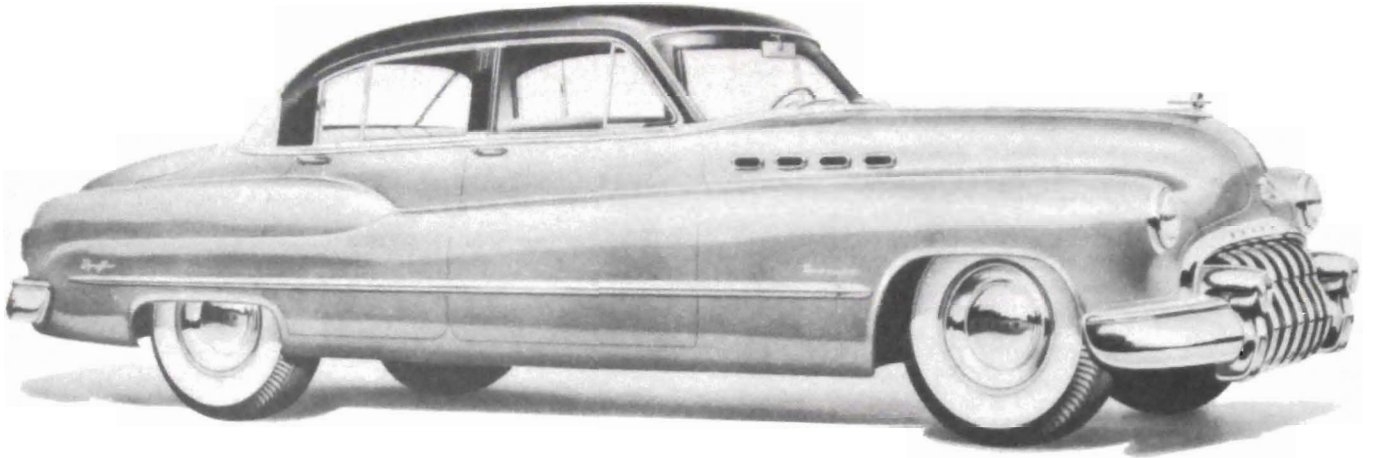
Illus. No.	Service Part No.	Description
<b>MISCELLANEOUS ELECTRICAL</b>		
	7242034	"A" Lead Connector
112	7258683	Control - Volume - Tone and Switch
112A		Volume
112B		Tone
112C		Switch
111	7259311	Control - Sensitivity
110	7242204	Delay Adjustor
113	7259009	Relay
114	1219661	Solenoid
115	7259502	Speaker 8" PM
	7258903	Switch - Foot Switch Assy.
116	7259011	Switch - Tuner Return
117	7259012	Switch - Station Selector
118	7258941	Transformer - Input
119	7259336	Transformer - Output
120	6060	Transformer - Power
121	8542	Vibrator - Non-synchronous

**b. Mechanical Parts**

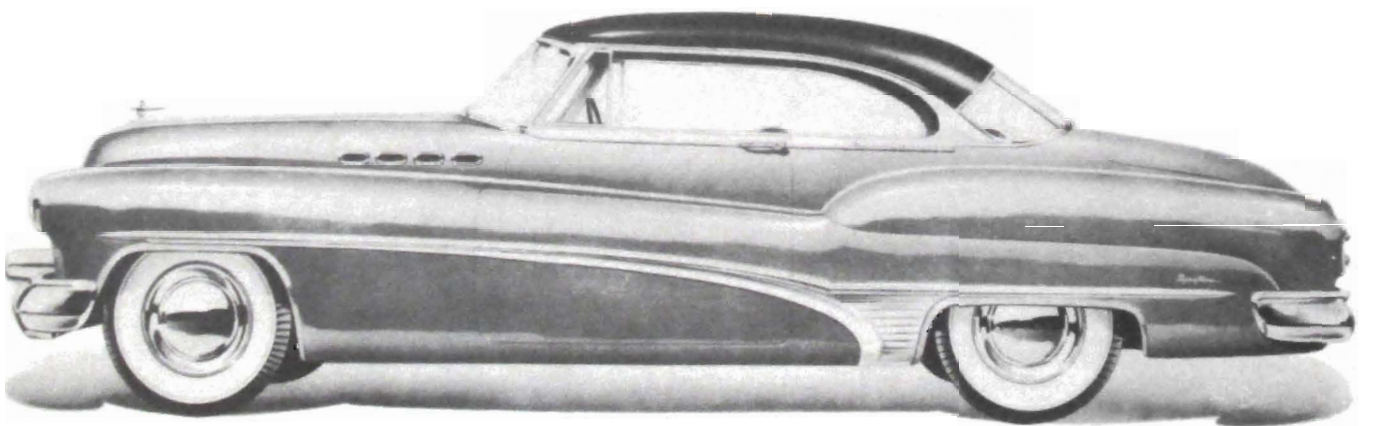
Illus. No.	Service Part No.	Description
<b>CHASSIS</b>		
	7242035	Antenna Connector
124	7259392	Socket - Foot Switch
	7236279	Socket - Octal Tube
	7259307	Socket - 9 Pin Miniature
	7258073	Socket - 7 Pin Miniature
	7239125	Socket - Vibrator
<b>TUNER</b>		
125	7259201	Core - Powdered Iron
126	7259178	Core Guide Bar
127	55	Dial Light
128	7259347	Escutcheon Assy.
129	7259310	Dial
130	7256886	Dial Backplate
131	7259341	Manual Drive Assy.
132	1219610	Motor Gear Train Assy.
133	7259498	Pointer Backplate
134	1219093	Pointer Tip Pkg.
135	7259164	Solenoid Plunger
136	7259100	Spring Clip
137	7259055	Spring - Motor Power
138	7259207	Spring - Worm Anti-Rattle
	1219612	Station Selector Bar Pkg.
139	7259309	Station Selector Bar
		Toggle Plate
140	7259111	Spring (2)
		"C" Washer
	1219124	Push Bar Insert "B"
	1219125	Push Bar Insert "U"
	1219126	Push Bar Insert "I"
	1219127	Push Bar Insert "C"
	1219128	Push Bar Insert "K"
141	7259026	Worm and Bracket Assy.

**c. Installation Parts**

Service Part No.	Description
1321178	"A" Lead Assy.
6030	Condenser - Generator
6030	Condenser - Ignition
120151	Fuse - 15 Amp.
1341337	Knob - Sensitivity
1341536	Knob - Tone Control
1341566	Knob - Tuning Control
7258903	Switch - Foot Control
1853686	Suppressor - Adapter
1217820	Suppressor - Distributor



**Model 71**



**Model 76R**