

SECTION 11-B RADIO

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SERVICE BULLETIN REFERENCE

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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 de-

veloped 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.

All receivers have a terminal post on the output transformer to provide a connection to the rear seat speaker (package 981104) when this is installed on the rear compartment shelf.

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.

When a rear seat speaker is installed, a separate speaker selector switch is mounted on lower edge of instrument panel. The fully counterclockwise position of selector switch knob turns on the rear speaker only, the midway position turns on both speakers, and the fully clockwise positions turns on the front speaker only.

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

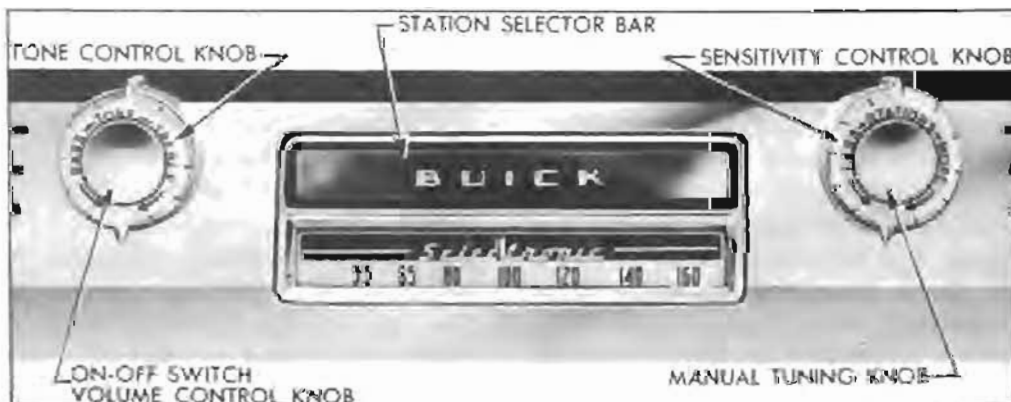


Figure 11-9—Receiver Controls—Selectronic Radio

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 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 all high tension wires for full seat in sockets of coil and distributor cap. Check distributor rotor (resistance type) or external suppressor by substituting a known good one. If external suppressor is used it must be installed at distributor end of coil-to-distributor high tension wire. *Do not use a suppressor and a resistance type distributor rotor together.*

4. If distributor rotor or 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

If radio parts are removed from car for any reason, the instructions contained in this paragraph must be carefully followed to insure proper reinstallation and satisfactory operation of the radio.

Whenever the receiver is being removed from a car equipped with a rear seat speaker, it is advisable to first remove the speaker selector switch from its mounting bracket to avoid straining the wire connections at the switch. Remove receiver, then remove back cover and disconnect switch wires from receiver.

a. Installation of Receiver

1. The radio hangers must be bolted to the radio support brackets with slot openings toward front of car.

2. Thoroughly clean surface around mounting holes in speaker grille to insure a good electrical connection with the receiver.

3. If rear seat speaker is used, remove back cover of receiver and insert the two-wire cable from the speaker selector switch through a vent hole in bottom of receiver, pushing the rubber grommet into place in vent hole. Connect wires to the receiver and reinstall receiver cover. **CAUTION:** *Carefully support receiver until it is installed, to avoid straining the wire connections to speaker selector switch.*

4. 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.

5. 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.

6. 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.

7. Reinstall rear seat speaker selector switch if removed from mounting bracket.

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.*

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 Dynaflow 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.



Figure 11-10—Foot Control Switch Installation

c. Installation of Radio Antenna—Closed Bodies and Model 45R

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° 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

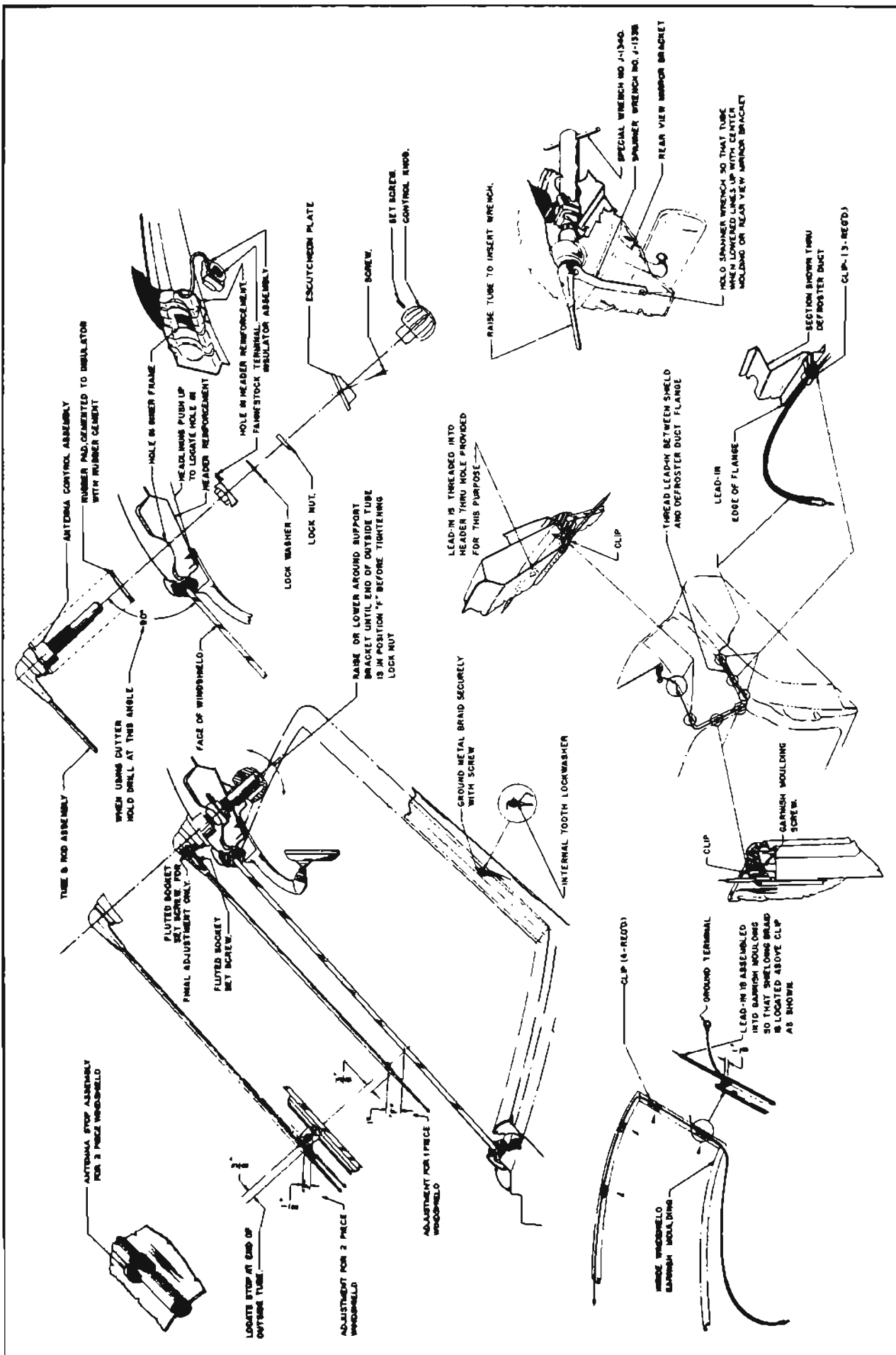


Figure 11-11—Antenna Installation Details—Closed Bodies and Model 45R

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 jobs with two-piece windshield, or 1" from glass on jobs with one-piece windshield. See figure 11-11.

15. Using special Spanner Wrench J 1339 the man on outside must hold the antenna body so that tube, when lowered, will align with the windshield division molding on jobs having two-piece windshield or the rear view mirror bracket on jobs having one-piece windshield. Securely tighten the nut on inside, using 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 ohmmeter. 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 two-piece windshield job, install antenna stop on windshield division molding in location shown in figure 11-11, and tighten screws evenly.

18. If antenna rod does not snap into antenna stop easily (2-piece windshield), or is not correct distance from windshield glass (1-piece

windshield), 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.

First production jobs use an external distributor suppressor which must be securely attached to *distributor* end of high tension wire

from coil. Later production jobs use a resistance type distributor rotor, which can also be used instead of the suppressor on first jobs. *Do not use both the suppressor and rotor on any installation.*

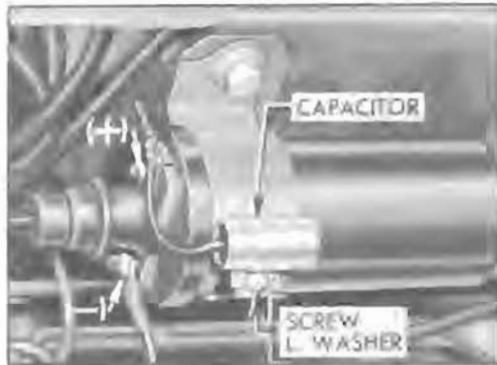


Figure 11-14—Capacitor Mounted on Coil

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.

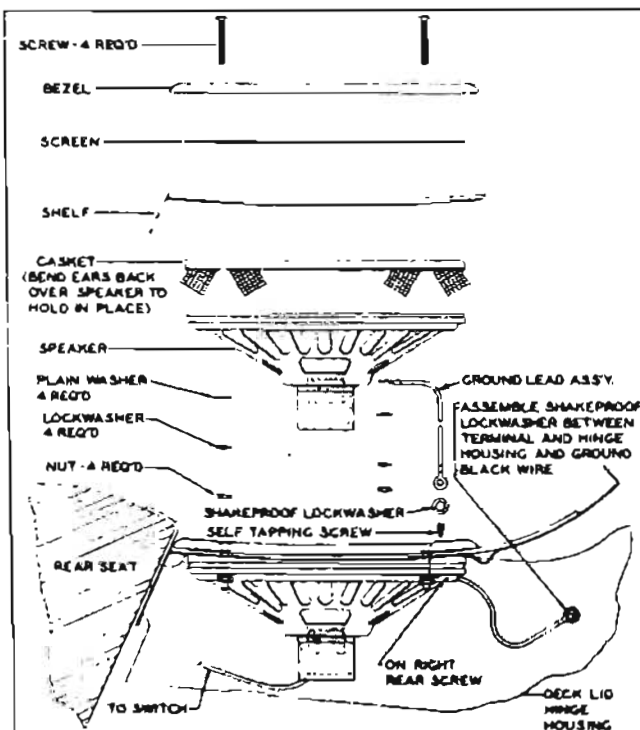


Figure 11-15—Rear Seat Speaker Installation

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.

f. Reinstallation of Rear Seat Speaker (Package 981104)

If rear seat speaker is removed for any reason, be sure to reinstall the speaker, rubber gasket, grille screen, and bezel as shown in figure 11-15. Place one terminal of the black ground wire under the right rear speaker mounting nut. The other end of ground wire is attached to the right trunk lid hinge guard with a screw and a shake proof washer placed between terminal and hinge guard.

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 predominant 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

The tabulated alignment specifications on page 11-18 apply only to the radio models indicated. See figure 11-17 (Sonomatic) or 11-18 (Selectronic) for location of the adjustment screws indicated in the specifications.

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).*

TABULATED ALIGNMENT SPECIFICATIONS—SONOMATIC, MODEL NO. 980979

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 1²⁵/₃₂" 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).

TABULATED ALIGNMENT SPECIFICATIONS—SELECTRONIC, MODEL NO. 980980

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.

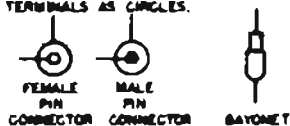
**Before making this adjustment, check the setting of oscillator core "H." The rear of the core should be 1²⁵/₃₂" from the mounting end of the coil form. This measurement is readily made by inserting a suitable plug in the mounting end of the coil form. The core adjustment is made from the mounting end 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.

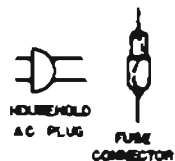
***"L" is the pointer adjustment screw on the end of the core guide bar—adjust so pointer reads 1000 KC.

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.)

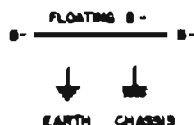
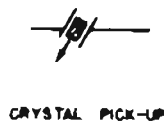
MULTIPLE CONNECTORS IN TERMINAL VIEW SHOWN BY PHYSICAL OUTLINE OF CONNECTORS WITH PINNERS AS SOLID DOTS AND FEMALE TERMINALS AS CIRCLES.



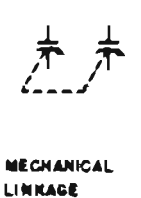
CONNECTORS



POWDERED IRON CORES



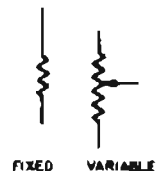
GROUNDS



MECHANICAL LINKAGE



MOTOR



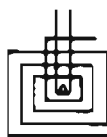
RESISTORS



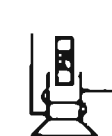
SHIELDING



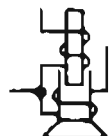
SOLENOID



ANTENNAS

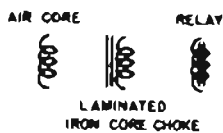


PERMANENT MAGNET



ELECTRO-MAGNETIC

SPEAKERS

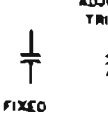


LAMINATED IRON CORE CHOKE



POWDERED IRON CORE

COILS



FIXED



ADJUSTABLE TRIMMER



DIAL TUNING

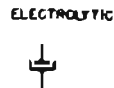
SWITCHES



TEMPERATURE COMPENSATING

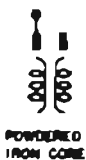


CHASSIS AS ONE PLATE



ELECTROLYTIC

CONDENSERS



POWDERED IRON CORE



LAMINATED IRON CORE AUTO TRANSFORMER

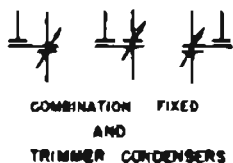


AIR CORE

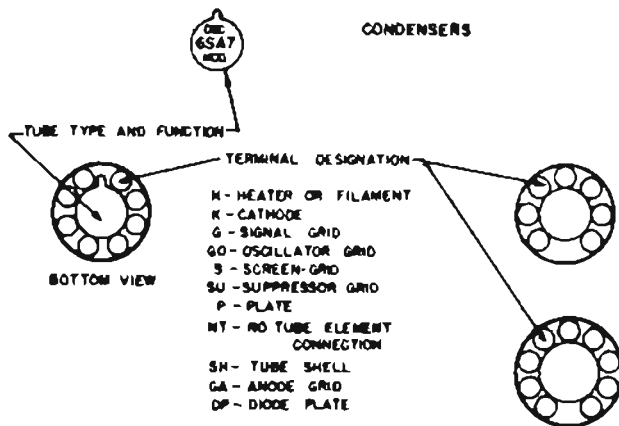


LAMINATED IRON CORE

TRANSFORMERS

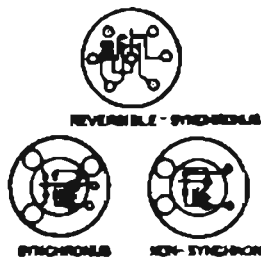


COMBINATION FIXED AND TRIMMER CONDENSERS

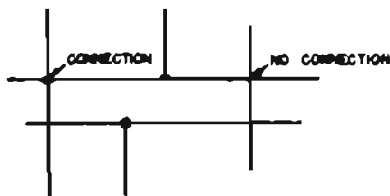


TUBE SOCKETS

MINIATURE TUBE SOCKETS



VIBRATORS



WIRING (GENERAL)

VARIABLE (GENERAL)

C - ADJUSTMENT LETTERS IN SQUARE
- ILLUSTRATION NUMBERS ARE BLANKED
- VALUES ARE VERTICAL NUMBERS
L - LEAD NUMBERS

MISC SYMBOLS

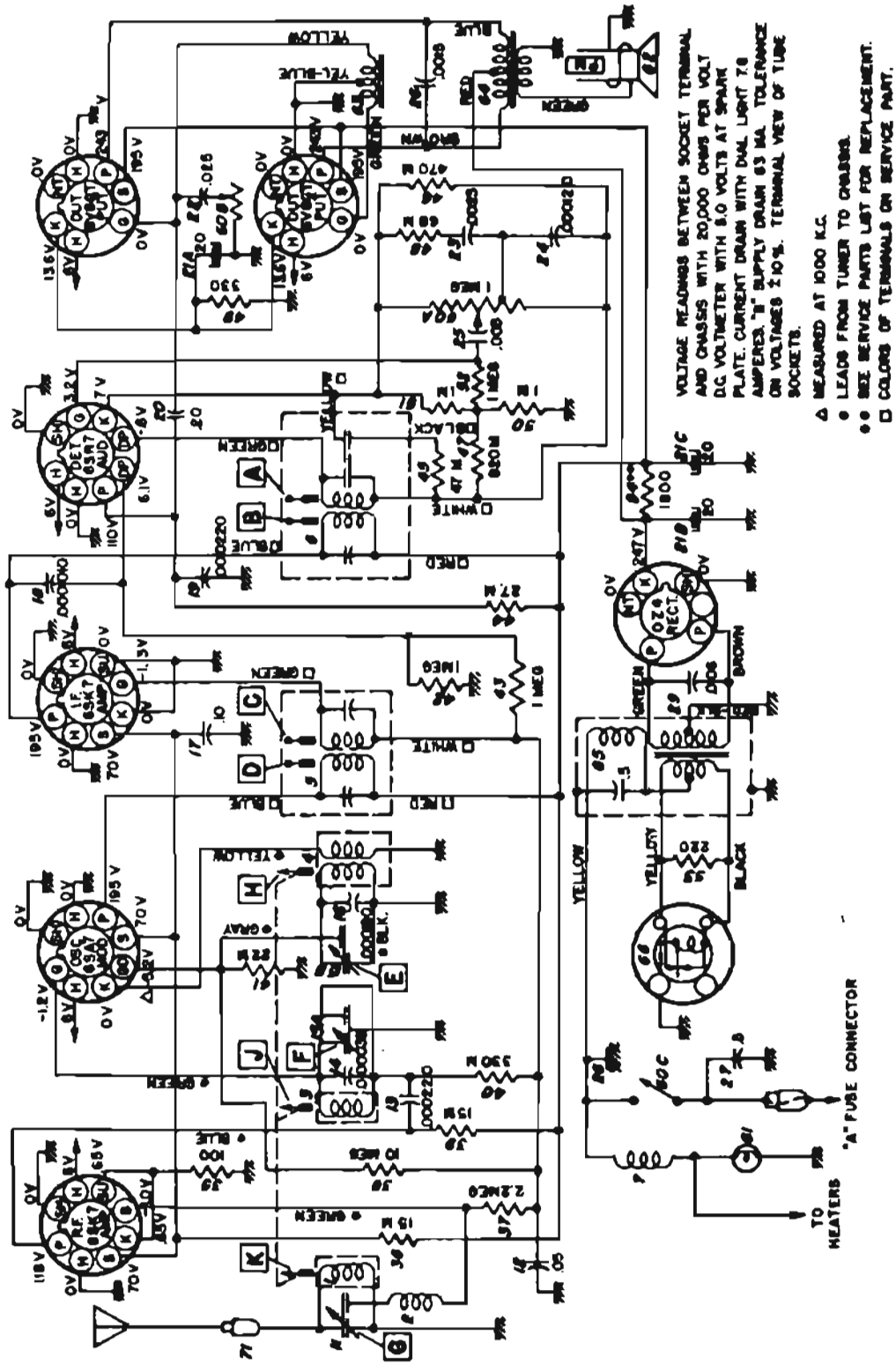


Figure 11-17—Radio Circuit Schematic—Sonomatic Radio
(See Fig. 11-16 for Symbol Legend)

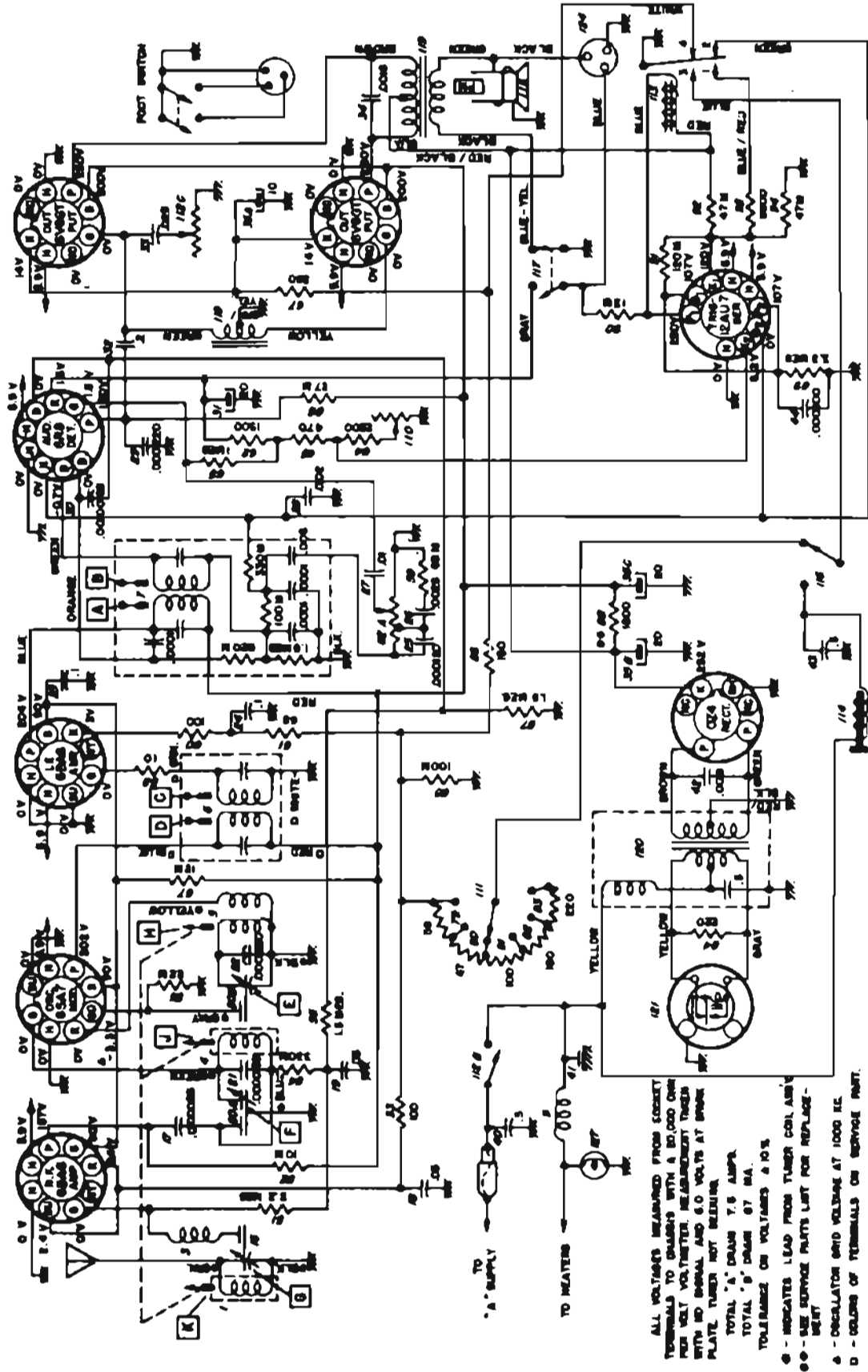
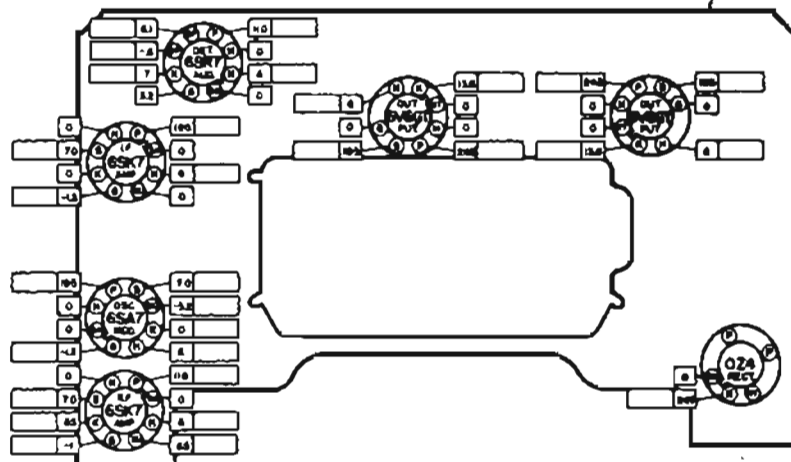
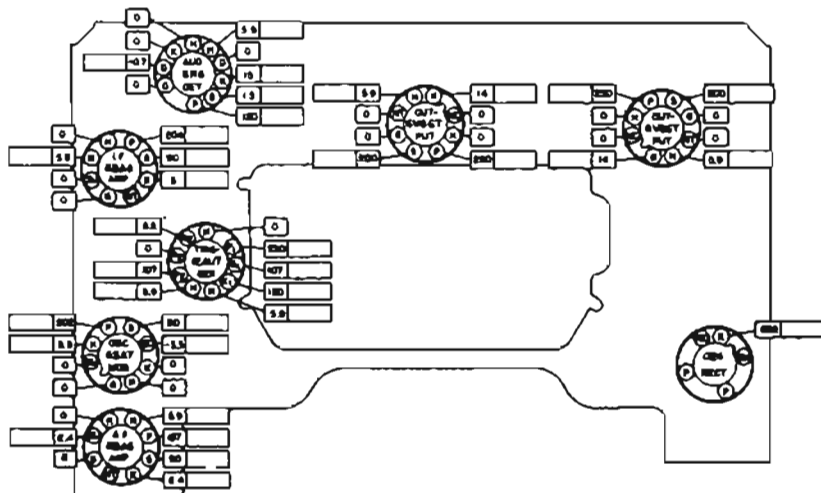


Figure 11-18—Radio Circuit Schematic—Selectronic Radio
(See Fig. 11-16 for Symbol Legend)



NOTE: THE TUBE SOCKET VOLTAGES, AS MEASURED AT THE FACTORY AND UNDER THE CONDITIONS SHOWN ON THE SCHEMATIC DIAGRAM ARE SHOWN. THE BLANK SPACES ARE PROVIDED SO THE SERVICEMAN MAY FILL IN ACTUAL VOLTAGE READINGS AS TAKEN WITH HIS OWN EQUIPMENT. A NORMAL OPERATING RADIO SHOULD BE USED FOR THESE MEASUREMENTS.

Figure 11-19—Tube Socket Voltages—Sonomatic Radio



NOTE: THE TUBE SOCKET VOLTAGES, AS MEASURED AT THE FACTORY AND UNDER THE CONDITIONS SHOWN ON THE SCHEMATIC DIAGRAM ARE SHOWN. THE BLANK SPACES ARE PROVIDED SO THE SERVICEMAN MAY FILL IN ACTUAL VOLTAGE READINGS AS TAKEN WITH HIS OWN EQUIPMENT. A NORMAL OPERATING RADIO SHOULD BE USED FOR THESE MEASUREMENTS.

Figure 11-20—Tube Socket Voltages—Selectronic Radio

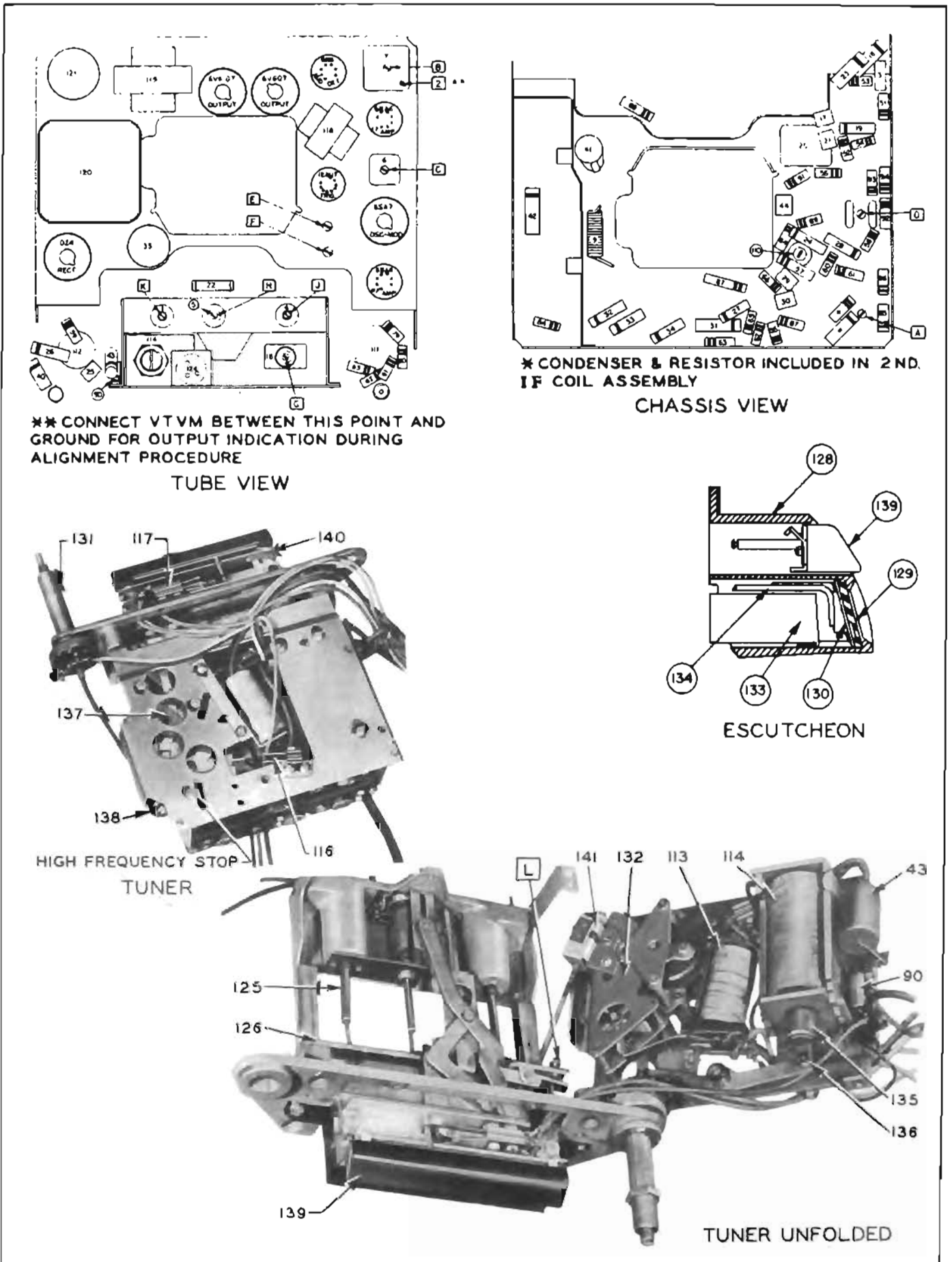


Figure 11-21—Parts Layout—Senomatic Radio

11-11 SONOMATIC RADIO SERVICE PARTS LIST

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

a. Electrical Parts

Illus. No.	Service Part No.	Description
COILS		
1	7258914	Antenna
2	7240251	Antenna Spark Choke
3	7258914	R.F.
4	7260499	Oscillator
5	1219508	1st IF
6	1219509	2nd IF
7	1217846	"A" Spark Choke
CONDENSERS		
11	7258733	Antenna Trimmer
12	1219798	.05 mfd. 200 V Tubular
13	1217736	.000039 mfd. Molded
14	1217736	.000039 mfd. Molded
15	7242454	Dual Trimmer
15A		RF Section
15B		Oscillator Section
16	7257424	.000180 mfd. Compensating
17	1219800	.1 Mfd. 400 V Tubular
18	1215189	.000010 mfd. Molded
19	7236105	.00022 mfd. Molded
20	1219801	.2 Mfd. 400 V Tubular
21	1218474	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. Molded
25	1219792	.005 mfd. 600 V Tubular
26	7236134	.001500 mfd. 800 V Tubular
27	1219675	.5 mfd. 200 V Tubular
28	1217848	Chassis Plate Condenser
29	7240906	.006 mfd. 1600 V Tubular
RESISTORS		
35	1213217	100 ohms 1/2 W Insulated
36	7233653	15,000 ohms 2 W Insulated
37	1214563	2.2 megohms 1/2 W Insulated
38	1215548	10 megohms 1/2 W Insulated
39	7237595	15,000 ohms 1 W Insulated
40	1214557	330,000 ohms 1/2 W Insulated
41	1214550	22,000 ohms 1/2 W Insulated
42	1213282	1 megohm 1/2 W Insulated
43	1213282	1 megohm 1/2 W Insulated
44	1213342	27,000 ohms 1 W Insulated
45	1214553	47,000 ohms 1/2 W Insulated
46	1214559	470,000 ohms 1/2 W Insulated
47	1214561	820,000 ohms 1/2 W Insulated
48	1213844	68,000 ohms 1/2 W Insulated
49	7234563	360 ohms 1 W Wire Wound
50	1213235	1,000 ohms 1/2 W Insulated
51	1213235	1,000 ohms 1/2 W Insulated
52	1213282	1 megohm 1/2 W Insulated
53	7237994	220 ohms 1 W Insulated
54	7242844	1800 ohms 2 W. Wire Wound (or
	7240918	Replace with 2700 ohms 2 W and 5600 ohms 1 W in parallel)
TUBES		
	1211924	OZ4
	7237751	6SK7
	7237752	6SA7
	1218107	6SR7
	1213793	6V6GT
MISCELLANEOUS ELECTRICAL		
60	7258683	Control—Volume, Tone and Switch
60A		Volume Control
60B		Tone Control
60C		Switch

Illus. No.	Service Part No.	Description
61	125588	Lamp—Dial Light
62	7259502	Speaker—8" Round P.M.
63	7258941	Transformer—Input
64	7258945	Transformer—Output
65	7258889	Transformer—Power
66	7239124	Vibrator—Non-synchronous

b. Mechanical Parts

Illus. No.	Service Part No.	Description
CHASSIS		
70	7242034	Connector—"A" Lead
71	7242035	Connector—Antenna
72	1219547	Socket—Dial Light
73	7236279	Socket—Octal Tube
74	7239125	Socket—Vibrator
TUNER		
81	7260421	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	Connecting Link—Pointer
87	7255992	Spring—Pointer Connecting Link
88	7258468	Core—Powdered Iron
89	7258673	Drive Shaft—Manual
90	7260420	Pointer Assy.
	1219845	Pointer Tip Package
91	7258102	Gear and Bushing—Clutch
92	7260416	Ecutcheon Assy.
93	7260423	Dial
94	7260422	Dial Backplate
95	7257415	Spring—Core Bar Connecting Link
96	7258756	Spring—Clutch
97	7255984	Spring—Slide Return
98	1219840	Push Button and Slide Assy. "B"
99	1219841	Push Button and Slide Assy. "U"
101	1219842	Push Button and Slide Assy. "I"
102	1219843	Push Button and Slide Assy. "C"
103	1219844	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	7260414	Worm Gear and Bracket Assy.

c. Installation Parts

Service Part No.	Description
1321178	"A" Lead and Fuse Connector
1912900	Condenser—Generator
1912900	Condenser—Ignition Coil
120151	Fuse—15 Ampe
1341566	Knob—Control
1341535	Knob—Dummy
1341536	Knob—Tone
1853686	Suppressor Adaptor
1217820	Suppressor—Distributor

11-12 SELECTRONIC RADIO SERVICE PARTS LIST—

See figure 11-22 for Illustration Numbers indicated in the following parts list.

a. Electrical Parts

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

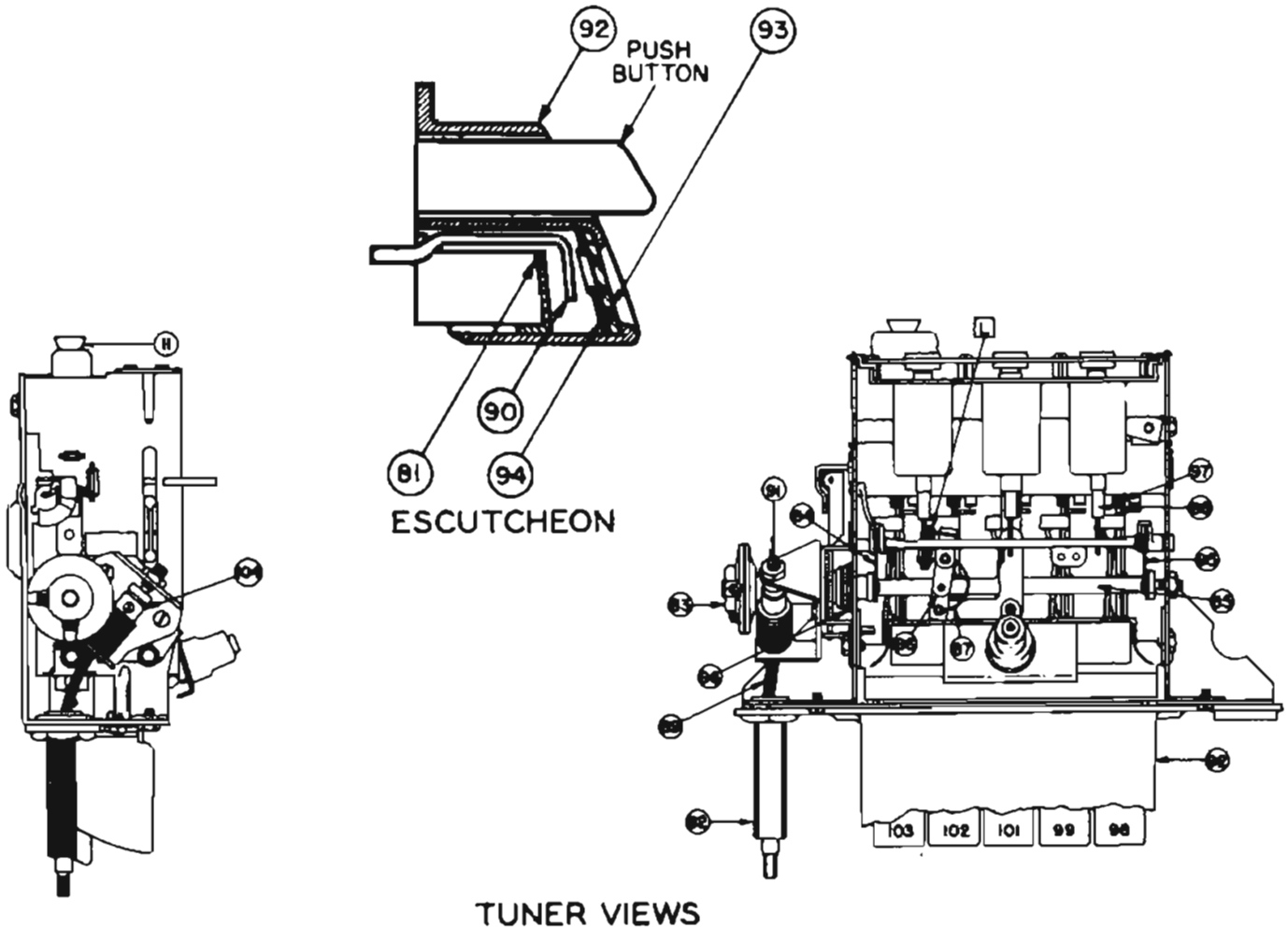
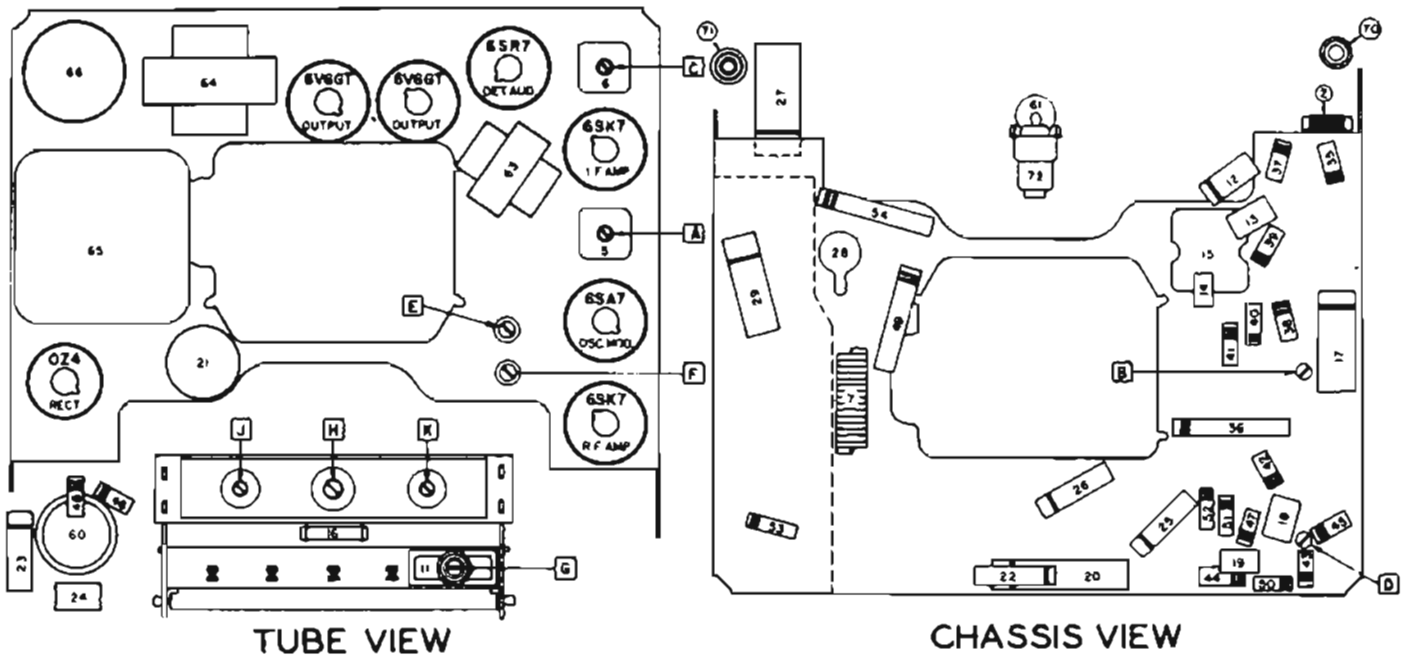


Figure 11-22—Parts Layout—Selectronic Radio

Illus. No.	Service Part No.	Description	Illus. No.	Service Part No.	Description
6	1219508	1st I.F.			
7	1219602	2nd I.F.			
9	1217846	Hash Choke			
CONDENSERS					
16	7259308	Antenna Trimmer			
17	7236104	.000068 mfd Mica			
18	7230592	.05 mfd 200 V Tubular			
19	7230592	.05 mfd 200 V Tubular			
20	7242454	Dual Trimmer			
20A		RF Section			
20B		Oscillator Section			
21	1217736	.000039 mfd Ceramic			
22	7267567	.000260 mfd Compensating			
23	7231536	.1 mfd 400 V Tubular			
24	7231536	.1 mfd 200 V Tubular			
25	7240577	.000120 mfd Mica			
26	7240578	.0025 mfd 400 V Tubular			
27	1208600	.01 mfd 400 V Tubular			
28	7237836	.002 mfd 600 V Tubular			
29	7236105	.000220 mfd Mica			
30	7236104	.000068 mfd Mica			
31	1219660	20 mfd 50 V Electrolytic			
32	7240579	.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	7232403	.5 mfd 200 V Tubular			
41	1217848	Chassis Plate Condenser			
42	7240906	.006 mfd 1600 V Tubular			
43	7232403	.5 mfd 100 V Tubular			
44	1210275	.000100 mfd Mica			
RESISTORS					
51	1214563	2.2 Megohms ½ W Insulated			
52	1211085	10,000 Ohms 1 W Insulated			
53	1213217	100 Ohms ½ W Insulated			
54	1214557	330,000 Ohms ½ W Insulated			
55	1213283	1.5 Megohms ½ W Insulated			
56	1214550	22,000 Ohms ½ W Insulated			
57	1212491	12,000 Ohms 2 W Insulated			
58	1215107	10 Ohms ½ W Insulated			
59	1213844	68,000 Ohms ½ W Insulated			
60	1213217	100 Ohms ½ W Insulated			
61	1215558	68 Ohms ½ W Insulated			
62	1219488	1500 Ohms ½ W Insulated			
64	1214545	2200 Ohms ½ W Insulated			
65	1213282	1 Megohm ½ W Insulated			
66	1213342	27,000 Ohms 1 W Insulated			
67	7234563	360 Ohms 1 W (Wire Wound)			
79	1214540	56 Ohms ½ W Insulated			
80	1213489	47 Ohms ½ W Insulated			
81	1213217	100 Ohms ½ W Insulated			
82	1215559	180 Ohms ½ W Insulated			
83	7257835	220 Ohms ½ W Insulated			
84	7237994	220 Ohms 1 W Insulated			
86	1213220	150 Ohms ½ W Insulated			
87	1211142	1.5 Megohms ½ W Insulated			
88	1214573	1,800 Ohms 2 W Wire Wound			
89	1214564	3.3 Megohms ½ W Insulated			
90	7231539	13,000 Ohms 1 W Insulated			
91	1213271	120,000 Ohms ½ W Insulated			
92	1216157	47,000 Ohms 1 W Insulated			
93	1216154	6,800 Ohms 1 W Insulated			
94	1216157	47,000 Ohms 1 W Insulated			
TUBES					
	1211924	0Z4			
	1213793	6V6GT			
	1219496	6R8			
	1217690	6BA6			
	1219485	12AU7			
	7237752	6SA7			
MISCELLANEOUS ELECTRICAL					
			112	7242034	"A" Lead Connector
				7258683	Control - Volume - Tone and Switch
				112A	Volume
				112B	Tone
				112C	Switch
			111	7259311	Control - Sensitivity
			110	7242204	Delay Adjustor
			113	7259009	Relay
			114	1219861	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	7258889	Transformer - Power
			121	7239124	Vibrator - Non-synchronous
b. Mechanical Parts					
Illus. No.	Service Part No.	Description	Illus. No.	Service Part No.	Description
CHASSIS					
				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
TUNER					
			125	7259201	Core - Powdered Iron
			126	7259178	Core Guide Bar
			127	125588	Dial Light
			128	7260454	Ecutcheon Assy.
			129	7260455	Dial
			130	7260422	Dial Backplate
			131	7259341	Manual Drive Assy.
			132	1219610	Motor Gear Train Assy.
			133	7260456	Pointer Backplate
			134	1219847	Pointer Tip Pkg.
			135	7259164	Solenoid Plunger
			136	7259100	Spring Clip
			137	7259055	Spring - Motor Power
			138	7259207	Spring - Worm Anti-Rattle
				1219846	Station Selector Bar Pkg.
			139	7260709	Station Selector Bar
					Toggle Plate
			140	7259111	Spring (2)
					"C" Washer
			141	7259026	Worm and Bracket Assy.
c. Installation Parts					
	Service Part No.	Description		Service Part No.	Description
				1321178	"A" Lead Assy.
				1338763	Condenser - Generator
				1910147	Condenser - Ignition
				120151	Fuse - 15 Amp.
				1341337	Knob - Sensitivity
				1341536	Knob - Tone Control
				1341566	Knob - Tuning
				7258903	Switch - Foot Control
				1853686	Suppressor - Adapter
				1207820	Suppressor - Distributor