

# GROUP 11

## RADIO, HEATER, AIR CONDITIONER

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### SECTION 11-A

#### RADIO

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### 11-1 BUICK RADIO DESCRIPTION AND OPERATING INSTRUCTIONS

#### a. Description

The Buick radio installation consists of a receiver with separate speaker mounted at the center of the instrument panel, and a sectional antenna mounted on left front fender, and suppression parts installed at various locations to eliminate interference. The *Wonderbar* radio installation also includes a foot control switch mounted on the toe panel to left of the brake pedal. Some installations may also include a separate speaker mounted on the shelf behind the rear seat.

The *Wonderbar and Sonomatic* radio receivers both have five push buttons for push-tuning of five pre-selected stations. In addition to the push buttons, a control knob permits manual selection of other stations.

The *Wonderbar* radio receiver also 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 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.

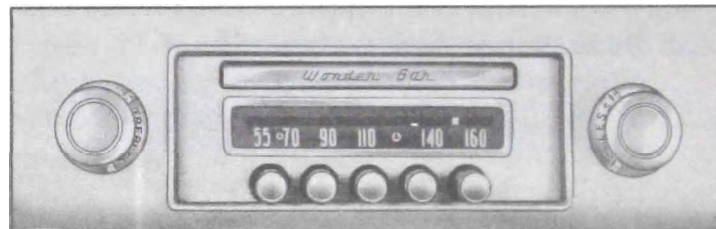


Figure 11-1—Receiver Controls—Wonderbar Radio

A manual antenna which must be extended and retracted by hand is standard equipment. An electrically operated antenna is available as optional equipment. In the latter antenna, a motor drives a nylon tape attached to the upper section of the antenna. A 3-position toggle switch on lower edge of instrument panel controls the motor, which will run in either direction. Pulling the switch handle back raises the antenna and pushing handle forward lowers the antenna. When the handle is released the switch returns to center "Off" position.

**CAUTION:** *Never attempt to force an electric antenna up or down by hand. This will cause permanent damage to the operating mechanism.*

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

**CAUTION:** *The radio should be turned off while starting the engine because the vibrator may stick and be damaged if cranking motor is operated with radio turned on.*

Clockwise rotation of the switch knob, to left of dial, turns the radio on, and further rotation increases the volume.

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High fidelity (true tone) is provided when the tone control knob, behind the switch knob, is at the mid position of the tone control range. Rotation clockwise of the tone control knob will diminish bass speaker response. Rotation counterclockwise will diminish treble speaker response.

The rear seat speaker may be optionally installed at the factory or by the dealer. On the 70 and the 700 series the assembly will be concealed beneath the package shelf and the bezel will be eliminated.

When rear seat speaker is installed, a separate rotary fader speaker control is mounted on the left side of the instrument panel. The fully counterclockwise position of the rotary control knob turns on the rear speaker only, the midway position blends front and rear speakers together and the fully clockwise position turns on the front speaker only.

**c. Push Button Tuning Operation—  
Wonderbar or Sonomatic**

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 rest at the station for which the button has previously been set as described in paragraph 11-3 (b).

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

*NOTE: To insure adequate sensitivity for selective tuning of the Wonderbar radio it is best to have antenna extended at least half way.*

With the radio turned on, selective tuning of available stations is accomplished by depressing either the selector bar above the dial (fig. 11-1), 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 is regulated by manual setting of the sensitivity control knob, which is located behind the manual tuning knob to right of the dial. See figure 11-1. This is a step control having four 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 received. 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 Wonderbar tuner is operated in certain localities or around buildings where a strong signal is not available, the tuner will automatically search the band from one end to the other without stopping. The sensitivity control knob should be turned clockwise to include more stations, and the antenna should be fully extended when this condition is encountered.

**e. Manual Tuning Operation**

The manual tuning knob is to right of the dial. See figure 11-1. On either 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 *Wonderbar* radio, the tuning knob may also 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 push buttons, careful adjustment of the tuning knob is essential to good radio reception.

On push button selection, 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 apparently 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. This point may be most readily found by listening to the background noise and tuning for the lowest volume and pitch of this noise. 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 the intermediate position giving best results.

## 11-2 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 quietly.

2. If dial does not light, check the fuse located in fuse block. If fuse is blown it may indicate a sticking vibrator; replace fuse and check vibrator, step 3. If fuse is okay check radio lead cable for proper connection to fuse block. 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 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.*

5. If source of trouble has not been found remove the receiver and 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.

6. If radio is still inoperative it should be tested 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. 11-3). If volume decreases proceed with the following steps.

3. Substitute a test antenna as described in subparagraph a, above.

4. Open the receiver and 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. 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. Start engine, turn on radio 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.

4. Check antenna lead-in cable shield and motor lead shield (electric antenna) for proper ground (par. 11-4).

5. If engine noise continues with antenna disconnected, check ignition coil and generator capacitors for clean, tight connections; also check the bond strap between engine and cowl to make sure that there are clean tight connections at both ends. Observe generator armature

and brushes; 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. Regulator capacitor must be connected to "BAT" terminal of regulator. All capacitors must have clean metal ground contact.

#### **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 electrical charges developed by the tire thus 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 movement of 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.

#### **f. Radio Noisy When Car Equipment is Operated**

When excessively loud "clicks" and "pops" are heard in the radio due to the operation of directional signals, brake lights, power seats or power windows, all ground connections to the radio antenna and lead-in wire should be thoroughly checked. A poor ground connection at any point can produce the above trouble.

#### **g. Electric Antenna Operates too Slow**

1. If operation of antenna to full up or down position is slower than 12 seconds check for dirty, corroded, or bent antenna sections. Antenna sections must be kept clean and straight and may occasionally be oiled sparingly on surface with a light machine oil.

2. If antenna sections are clean and straight and operation is still too slow, check all wiring including ground connections to cowl; also check for defective control switch.

3. If cause of slow operation has not been found, remove antenna and check for defective tube and nylon assembly or defective motor.

#### **h. Electric Antenna Does Not Operate**

1. If antenna fails to operate and motor does not operate as indicated by deflection on charge indicator, then check fuse, all wiring including ground connection to cowl; also check for defective control switch.

2. If motor still does not operate, or new fuse blows out, either the motor or its leads are faulty and must be repaired or replaced.

3. When motor operates but antenna will not raise or lower, then check for dirty corroded or bent antenna sections.

4. If antenna still fails to operate it will be necessary to remove antenna from car, disassemble for inspection and service.

### 11-3 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 600 and 1000 K.C. that can barely be heard with volume turned full on.
3. Open glove box. Insert a screwdriver up through the opening and into receiver adjacent to the lead-in cable (fig. 11-2). Carefully turn the trimmer screw back and forth until a position is found that gives maximum volume.

#### b. Setting Push Buttons to Desired Stations

1. Turn on the radio.
2. Pull button to left and all the way out. It is desirable to set up the push buttons in logical sequence. For example, lowest frequency desired station on first button, next higher frequency station on second button, etc.
3. Carefully tune in the desired station manually, 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.
5. Turn tuning knob back and forth to make certain that best tuning is obtained with the push button. If best tuning is not obtained, repeat steps 2, 3, 4.

### 11-4 RADIO INSTALLATION INSTRUCTIONS

If radio parts are removed from car for any reason, the following instructions must be carefully observed to insure proper reinstallation and satisfactory operation. These instructions cover reinstallation only; if an original installation is to be made carefully follow instructions contained in the parts package, particu-

larly with reference to cutting holes in sheet metal and trim.

**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.*

#### a. Installation of Receiver

1. Remove upper instrument panel center section.
2. Install receiver by sitting in front seat and holding receiver at arm's length while the two threaded bushings are inserted through control holes in instrument panel. Install and tighten hex nuts on bushings.
3. Start cap screws with captive lockwashers into both sides of receiver through holes in support brackets and tighten cap screws securely.
4. Install tone control knob and volume control knob with felt washer on shaft to *left* of the dial. Install dummy knob (Sonomatic) or sensitivity knob (Wonderbar) and tuning control knob with felt washer on shaft to *right* of dial. See figure 11-2.

**CAUTION:** *Make sure that spring clips on outer knobs properly engage flats on control shafts.*

5. Connect the radio lead cable to the fuse block. Install proper fuse (par. 10-5, b) in fuse clips and connect radio lead cable to lead at left lower corner of receiver. See figure 11-2.
6. If Wonderbar foot control was disconnected or removed, reinstall with cable running up behind right edge of steering column pad. Plug cable into receiver and attach it to clip on receiver. See figure 11-2.
7. Connect antenna lead-in wire to receiver, then temporarily position upper instrument panel, while connecting speaker wire.
8. Complete instrument panel installation and make antenna trimmer adjustment (par. 11-3).

#### b. Installation of Interference Suppression Parts

The capacitor lead is connected to the armature ("A") terminal of generator and to the "BAT" terminal of regulator. Capacitors must never be connected to the field ("F") terminal of either unit as this will cause bad pitting of

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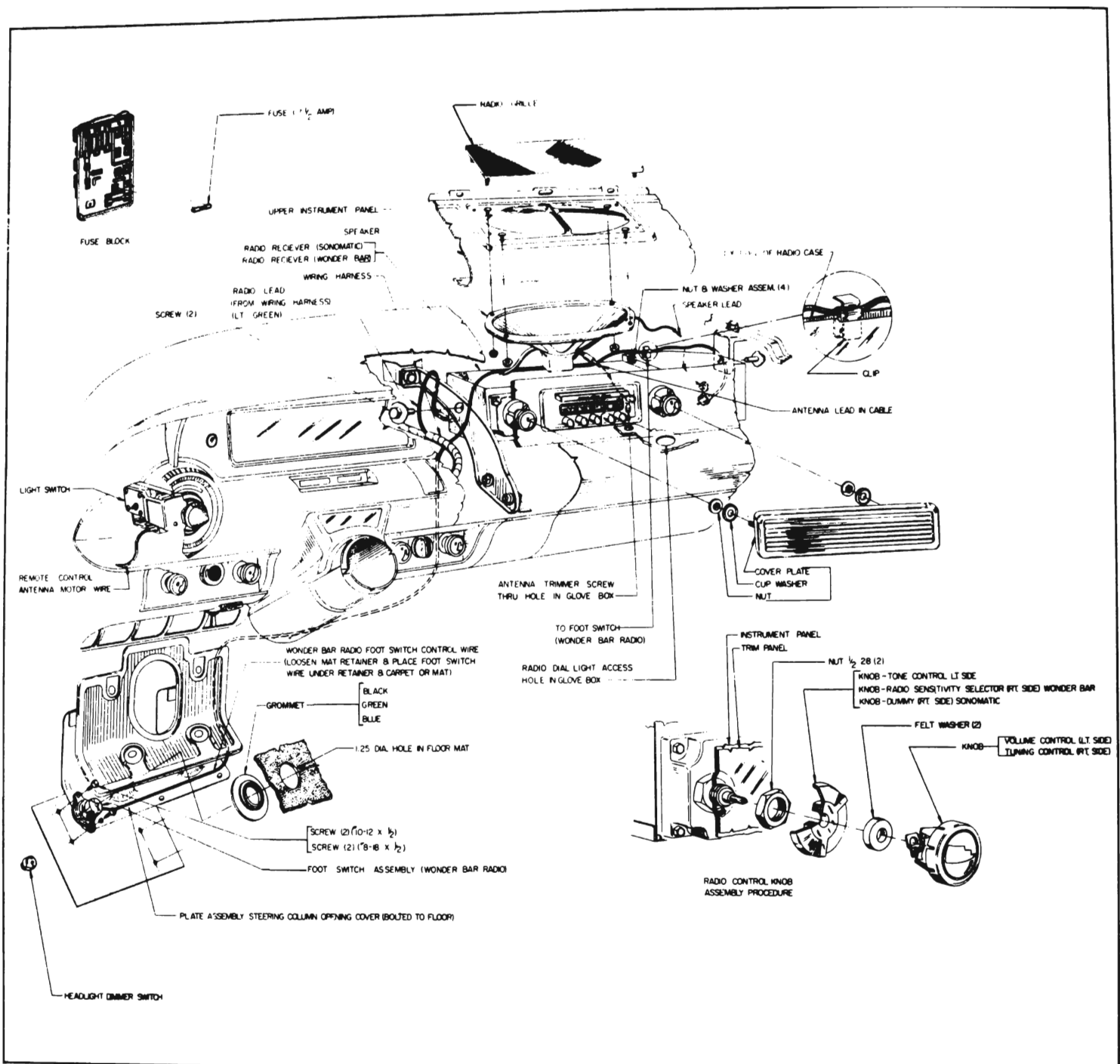


Figure 11-2—Receiver Installation

the voltage regulator points, thus preventing it from operating properly.

The built-in resistance of each spark plug wire approximates 4,000 ohms per foot.

The coil capacitor is mounted on the coil bracket and the lead is connected to the battery positive (+) terminal of coil. If capacitor is connected to the distributor negative (—) terminal excessive pitting of distributor contact points will result.

A new non-interchangeable static collector for 1958 is installed in each front wheel hub cup. For good results the cup 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, bond straps are connected between the cowl and the rear corners of the engine.

### c. Installation of Electric Antenna

Figure 11-3 shows all necessary details for reinstalling the electric motor driven antenna. The installation procedure is very similar to that described for manual antenna (Subpar. d) except for the following points.

1. Bring the motor wire through grommet in cowl with the lead-in cable and attach lead-in

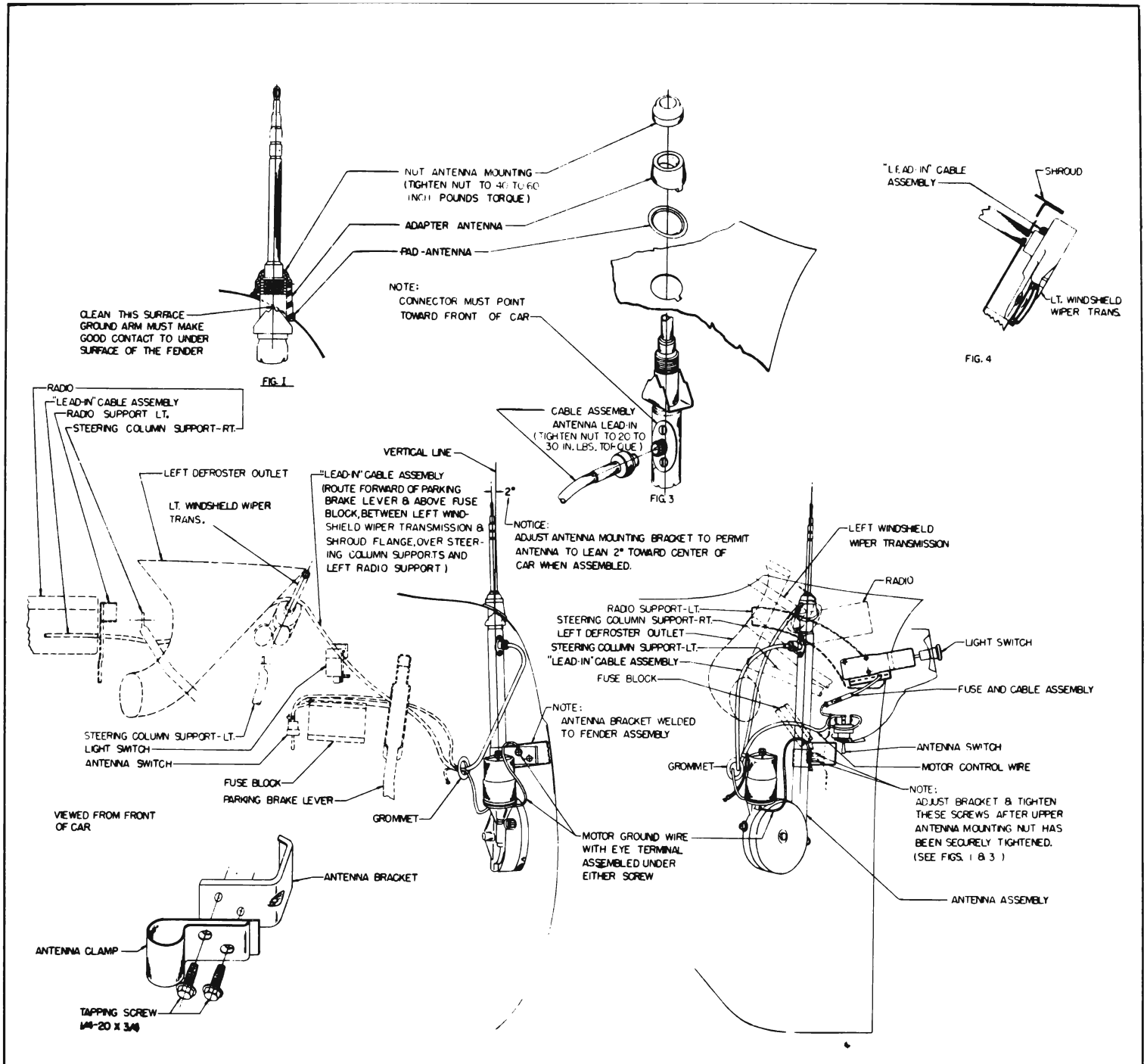


Figure 11-3—Electrical Antenna Installation Details

ground lead to cowl with a 10-16 x 1/2" tapping screw, with internal lockwashers on both sides of terminal. Motor ground lead attaches to lower bracket clamp screw. See fig. 11-3.

2. Connect black wire to No. 1 terminal, orange wire to No. 2 terminal, fuse and cable assembly to No. 3 terminal of antenna control switch.

3. Insert antenna switch into hole in lower flange of instrument panel and install escutcheon, lockwasher and nut.

4. Connect fuse and cable assembly to vacant red terminal of lighting switch.

5. Check antenna for travel time from fully

retracted to fully extended positions. If time is more than 12 seconds check connections at both switches. If antenna still operates too slow, or is inoperative, refer to paragraph 11-2 (sub-par. g, h).

#### d. Installation of Manual Antenna

1. When an antenna is being installed on a fender, make a template from similar fender to properly locate the hole for the body tube. A template may be obtained from an antenna parts package, if available.

2. Remove burr from hole cut in fender and clean under surface of fender around hole for good ground contact of antenna.

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3. Loosely assemble antenna mounting support to inner face of bracket.

4. Connect antenna lead-in cable to the antenna assembly, tighten securely, then insert antenna assembly through hole from under fender, with antenna lead-in connector pointing toward front of car.

5. Place adapter and mounting nut on antenna assembly over pad and tighten nut securely, using Antenna Nut Wrench J 5185-1.

6. Connect antenna clamp (on body tube) to mounting support bracket, fully extend antenna, and adjust mounting support and clamp so that the antenna will lean two degrees rearward and

two degrees inward from vertical. Tighten support and clamp securely. See figure 11-4.

7. Remove plug from hole provided in left side of cowl. Install grommet and thread lead-in cable through grommet until ground lead is inside body.

8. Loop cable up behind instrument panel and over top of left wiper transmission and plug into back of radio receiver.

9. Attach cable ground lead to cowl at hole provided. Be sure to clean paint from cowl surface at this point, then attach the lead terminal with a 10-16 x 1/2" tapping screw. See figure 11-4.

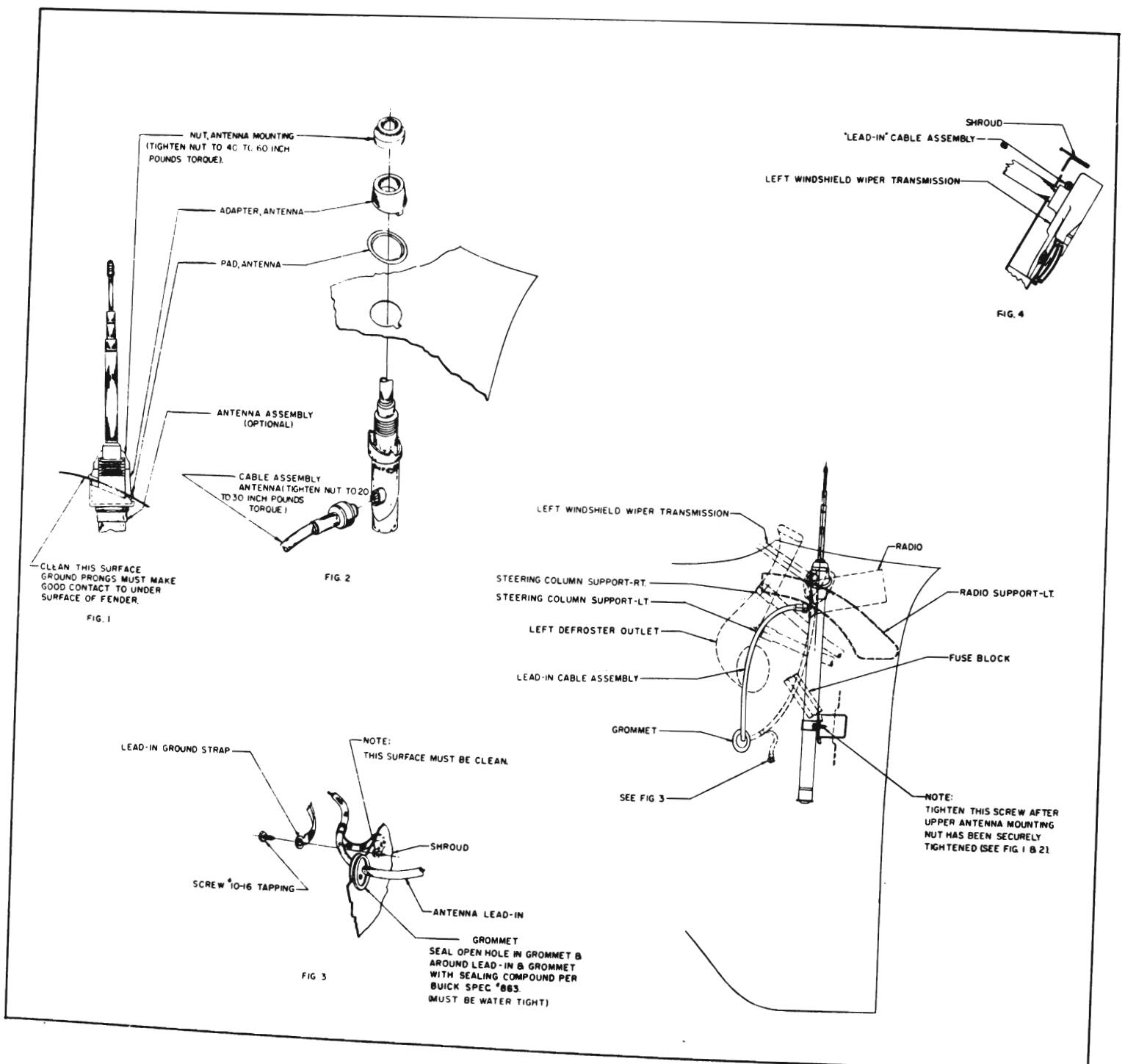


Figure 11-4—Manual Antenna Installation Details



### e. Installation of the Rear Seat Speaker

Rear seat speakers may be installed by either the factory or by the dealers in 1958.

A rotary fader speaker control is used to vary the volume of each speaker. When the knob is turned, one speaker impulse gradually fades and the other speaker impulse becomes greater. At the extremes (full clockwise or full counterclockwise) only 1 speaker can be heard. At mid point both speakers can be heard equally.

1. Use template to locate and centerpunch hole in instrument panel directly beneath the left air vent. Drill the hole with  $\frac{3}{8}$  drill.

2. Remove glove box.

3. Remove the green speaker wire from the receptacle on the right side of the radio.

4. Install the rotary fader control thru the hole in instrument panel and secure with nut. Press knob assy. on the control shaft.

5. Connect the green speaker wire to control harness and plug 2nd control harness wire into receptacle in the right side of the radio.

6. Replace glove box.

7. Remove sill plates on the side and run wire rearward under the floor mats approximately 2" from the left edge of the mat. Replace sill plates.

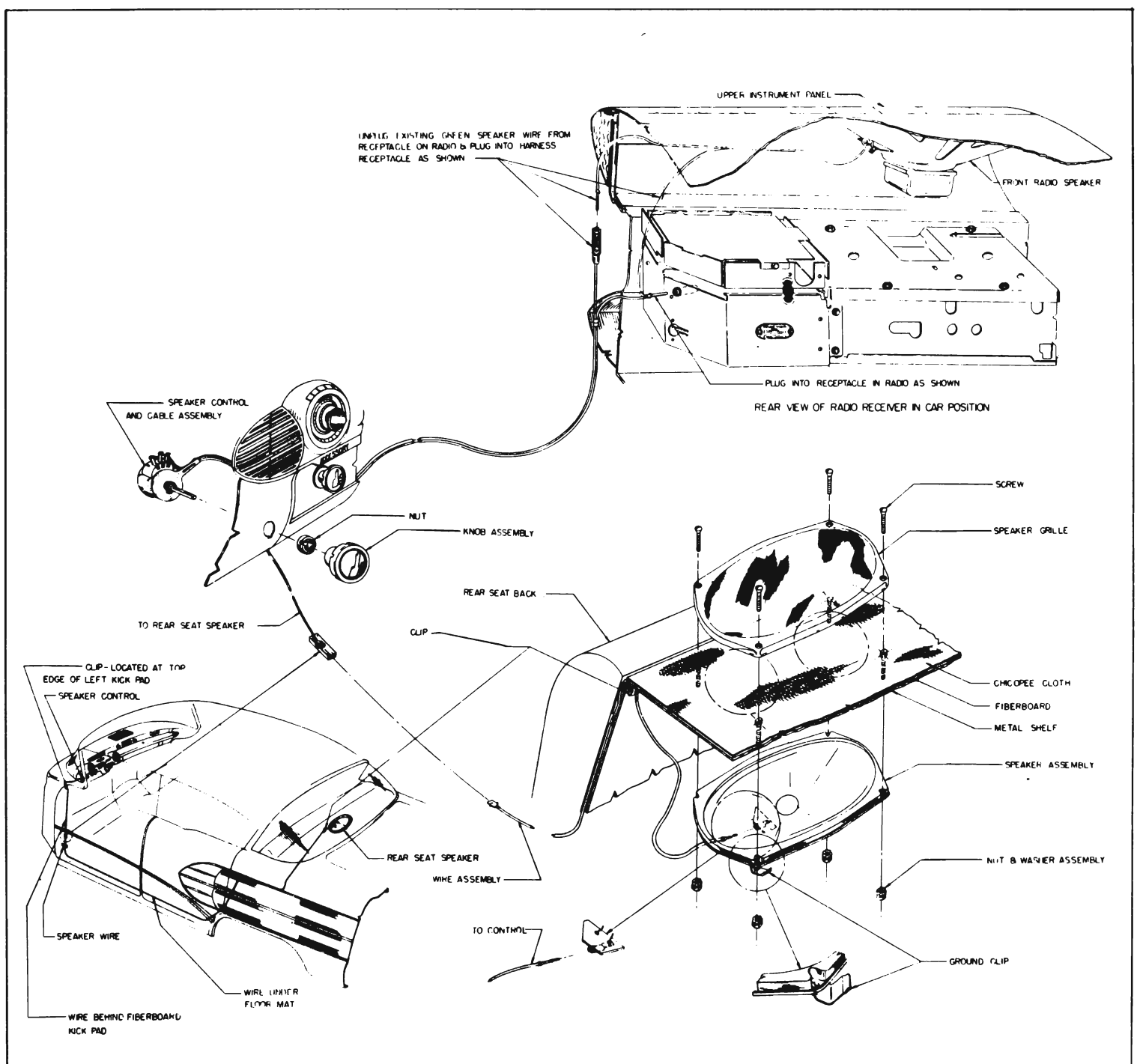


Figure 11-5—Rear Seat Speaker Installation



12. Place bezel and screen together (in series 40, 60 and 50 only) and secure to top of package shelf and to assy. with 4 bolts provided. On models 70 and 700 exceptions are made to the above figure. The assy. on these models is concealed beneath the shelf giving a built in appearance by eliminating the bezel and the screen.

13. Connect wire to the receptacle in the rear seat speaker assy. and pull any slack under the rear seat before replacing the cushions.

14. Make certain the speaker frame grounding clip makes contact with metal shelf.

15. Replace rear seat cushion and back.

16. Replace rear compartment cardboard panel.

### 11-5 RADIO SERVICE PARTS—ALIGNMENT PROCEDURES

Radio service parts and alignment procedures are available through United Motors Service Outlets.

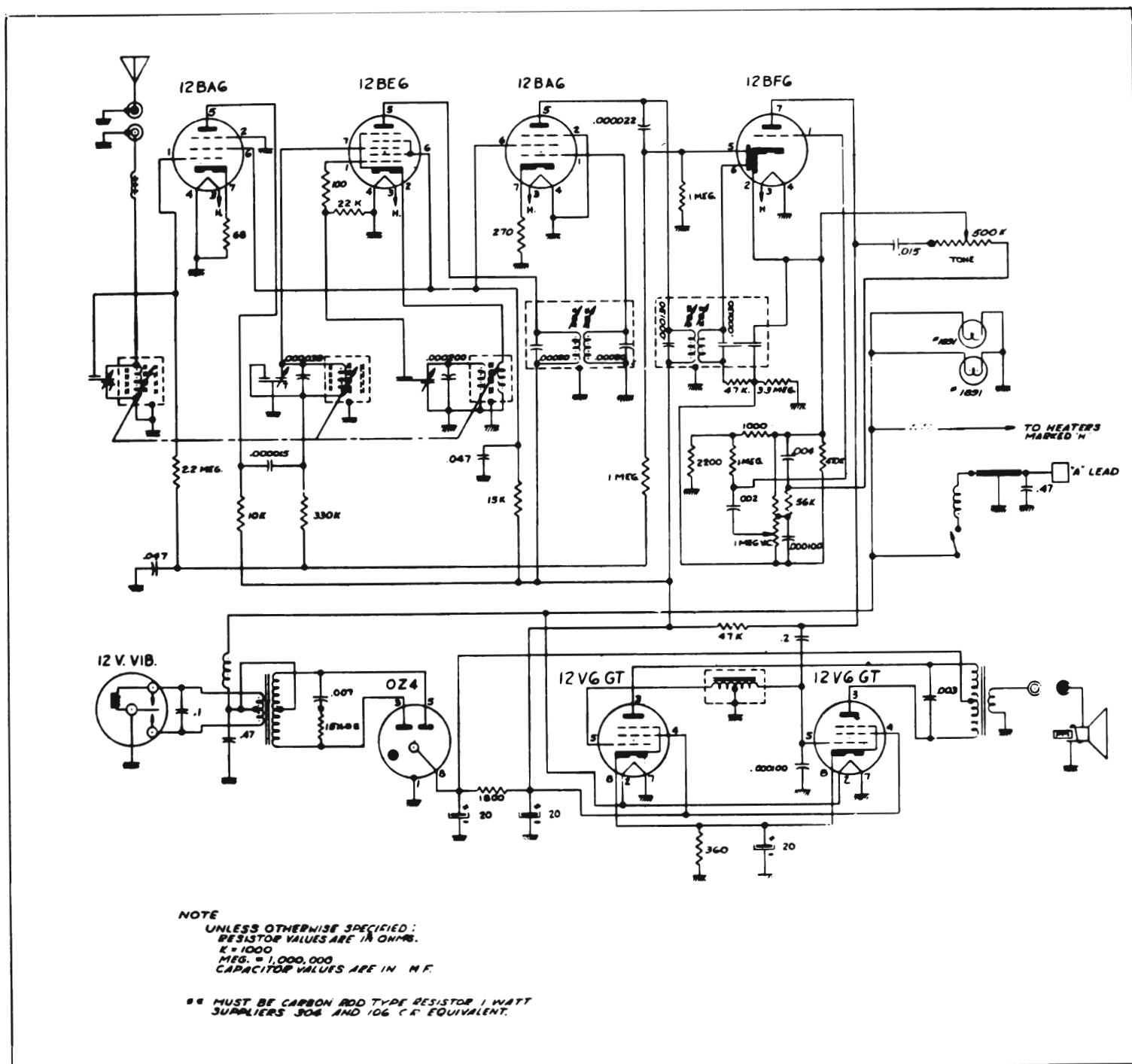


Figure 11-8—Radio Circuit Schematic—Sonamatic