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SPECIFICATIONS

RECEIVER

CIRCUIT TYPE Dual conversion superheterodyne; Crystal frequency synthesizer provides 23 crystal controlled transmit and receive channels. "Delta" tuning of ± 2 KHz on each channel plus mechanical filter.

SENSITIVITY $0.5\mu\text{V}$ for 10 db S/N to N ratio at 30% at 1000 Hz modulation.

SELECTIVITY 6 db down at ± 2.5 KHz; 45 db down at ± 8 KHz.

INTERMEDIATE FREQUENCY 1st IF: 11.275 MHz. 2nd IF: 455 KHz.

AUDIO OUTPUT 2.7 watts into ext. spkr. jack.

AUXILIARY CIRCUITS Series gate noise limiter, Variable squelch, PA., EX., S/P-RF meter.

TRANSMITTER

FINAL STAGE D.C POWER INPUT 5 watts maximum.

RANGE BOOST Yields high average modulation at average voice levels.

CARRIER DEVIATION Exceeds FCC requirements.

HARMONICS SUPPRESSION Exceeds FCC requirements.

ANTENNA MATCHING Nominal 50Ω (may be used with 30-100 Ω antennas).

SEMI-CONDUCTORS

TRANSISTORS	TR1~TR3:	2SCF11	Silicon Planar
	TR4~TR6:	2SCF5	Silicon Planar
	TR7:	2SCF6	Epitaxial Silicon Planar
	TR8:	2SCF8	Epitaxial Silicon Planar
	TR9:	2SCF2	Silicon Planar
	TR10~TR13, 17:	2SCF11	Silicon Planar
	TR14:	2SBF1	Germanium
	TR15:	2SDF1	Germanium
	TR16:	2SBF1A	Germanium
	TR18, 19:	2SBF5	Germanium

DIODES	D1:	1S1555	Silicon
	D2-D5, 7, 8, 10:	1S34	Germanium
	D6:	RD-9A	Zener
	D9:	VO-6C	Silicon

GENERAL

POWER SUPPLY 12.6 volts DC, negative or positive ground (with internal switching).

ACCESSORIES 1) Push-to-talk dynamic microphone.
 2) DC power cable (1.5 amp fused).
 3) Mobile mounting bracket.

GENERAL INSTRUCTIONS

The Lafayette HB-525E Transceiver is a combination transmitter and receiver designed for use in Class "D" operation in the 27 MHz Citizens Radio service. It is designed to meet the Federal Communications Commission requirements applicable to equipment operating in this service under class "D" emission, and not to be used for any other purpose. Part 95 of the FCC regulations defines operation in this service and the licensee is required to read and understand these regulations prior to operating a CB transmitter. Copies of Manual VI (covering the FCC regulations for the Citizens Band Radio Service) includes Part 95 and are available for \$1.25 from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. A station license may be obtained by submitting a properly completed Station License Application, Form 505, as directed.

It is illegal to operate the transmitter section of this transceiver prior to receiving a valid station license and "call sign". A properly completed Identification Card FCC Form 452-C must be attached to the transmitter.

The unit will provide economical and reliable two-way radio communication in its intended application if installed and operated in accordance with instructions contained herein.

GENERAL DESCRIPTION

The HB-525E is an extremely compact all-transistor 2-way radio providing 23 crystal-controlled transmit and receive channels in the 27 MHz Citizens Band.

Designed and built for reliable, trouble-free performance, the HB-525E uses rugged, heat-resistant transistors in all critical areas. Current drain on 12 volts DC is exceptionally low, permitting continuous mobile operation for long periods of time . . . even with the automobile's motor switched off.

The HB-525E is designed to operate from 12 volt DC (positive or negative ground), but may also be operated from 105-120 volts 50/60 Hz AC when used with the optional solid-state AC power supply unit Model HB-502. The transceiver may also be operated from a 6 volt DC source when used with the optional DC converter unit, Model HB-505.

RECEIVER

The receiver is a highly sensitive and selective double-conversion superheterodyne incorporating a high-quality Mechanical Filter in the 455 KHz IF section for high adjacent channel rejection. The receiver may be operated on any channel in the Citizens Band by means of a front panel selector switch. A squelch control is incorporated which can be used to "quiet" the receiver when no signal is being received and, being variable, can be adjusted for varying degrees of sensitivity to signals. Also included is a full-time Automatic Noise Limiter which materially reduces ignition noise and other undesirable noise interference, and an S/P-RF meter for indicating strength of received signal (s).

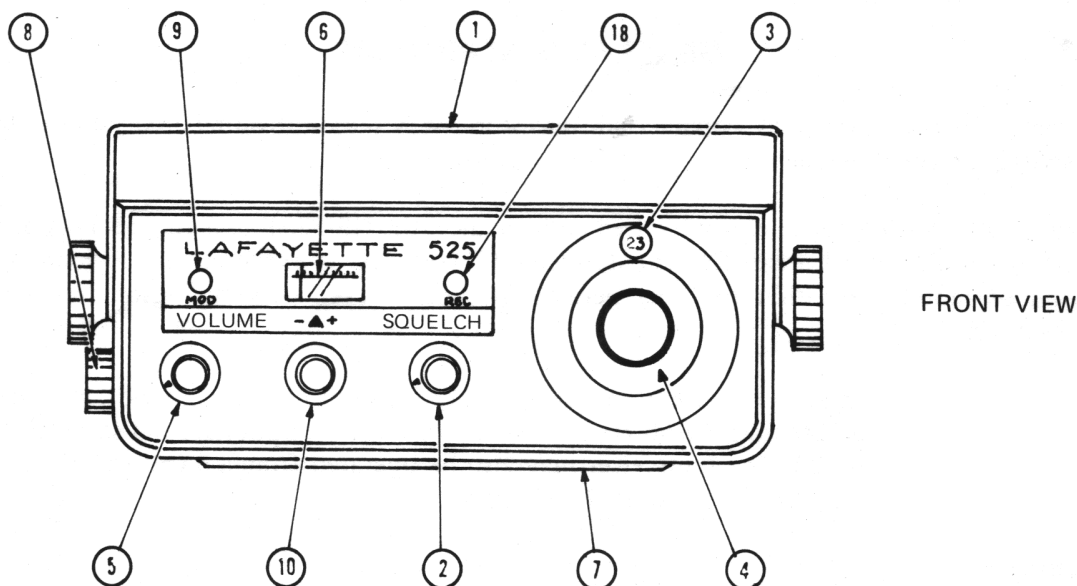
The internal audio stage amplifier and speaker may be used for AUX operation in conjunction with an external source through the EX jack.

TRANSMITTER

The transmitter may be operated on any channel (crystal-controlled) in the Citizens Band and uses a 6-stage circuit (excluding the frequency synthesizer) to develop the legal maximum of 5 watts plate power input to the final RF stage. A special feature in the transmitter is the fulltime "Range-Boost" circuit which concentrates more audio power into the sidebands by providing high average modulation on all syllables. This results in a greater effective range of the transmitted signal at all times. A push-to-talk dynamic microphone (supplied) offers convenient transmit-receive switching which operates through a relay for dependable operation. The microphone and audio stages may be used for public address operation in conjunction with an external PA speaker. The S/P-RF meter indicates relative power output (P-RF).

DC POWER SUPPLY

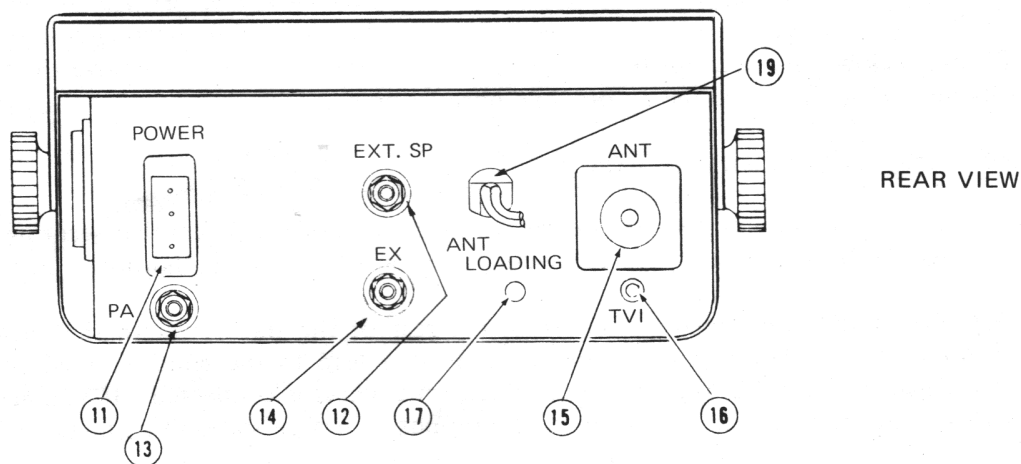
As supplied, the HB-525E is ready for connection to a 12 volt DC, negative ground system (most U. S. vehicles now employ this system). However, the transceiver may be operated with a positive ground system by simply interchanging two wires terminated with push-on lugs in the unit. DC power is fed to the HB-525E by means of a plug-in cord. For safety, one lead (red) is equipped with an in-line fuse of 1.5 amps.



OPERATING CONTROLS AND FEATURES

- (1) MOUNTING BRACKET Specially designed bracket simplifies mobile installation – has "quick-release" feature for fast removal of transceiver.
- (2) SQUELCH This control is used to "quiet" the receiver during "no-signal" conditions. Degree of sensitivity to incoming signals is adjustable. Full clockwise provides maximum squelch;

- (3) CHANNEL INDICATOR Illuminated window shows channel selected.
- (4) CHANNEL/PA/EX Rotary switch selects one of 23 channels for transmit and receive operation, as well as PA and EX (Auxiliary).
- (5) VOLUME/ON-OFF Varies the sound output from the speaker. Also incorporates an "on-off" power switch at the extreme counter-clockwise position.
- (6) S/P-RF METER Indicates signal strength of received signal and is automatically switched to indicate relative power output when in transit mode.
- (7) SPEAKER PM-type 4 x 6" oval speaker located behind grille on underside.
- (8) MICROPHONE SOCKET Four-pin socket for attachment of push-to-talk microphone (supplied).
- (9) TRANSMIT INDICATOR Lamp lights up in the transmit mode. Also acts as modulation indicator.
- (10) DELTA TUNE 3-position switch (-2.0 KHz, Normal, +2.0 KHz) which permits "fine" tuning for reception of stations that are slightly off frequency.



- (11) DC POWER SOCKET DC power for the transceiver supplied through this socket.
- (12) EXT SPKR/PHONES Allows use of headphone for private listening. Insertion of plug automatically silences internal speaker.

- (13) PA OPERATION Insertion of plug into PA jack, (16~32 ohms external speaker) permits PA operation when channel selector is placed in PA position.
- (14) AUX OPERATION Insertion of Plug into EX jack, permits AUX operation when channel selector is placed in EX position.
- (15) ANTENNA RECEPTACLE. For antenna lead-in cable with matching PL-259 connector.
- (16) TVI TRAP Adjustable coil for minimizing TV interference. Preset at factory and does not usually require readjustment.
- (17) ANTENNA LOADING Adjustment for matching unit to the antenna – assures maximum radiated output.
- (18) RECEIVE INDICATOR. Lamp Lights up in the receive mode.
- (19) BURGLAR ALARM LEADS Two leads for use of alarm circuit.

BURGLAR ALARM CIRCUIT

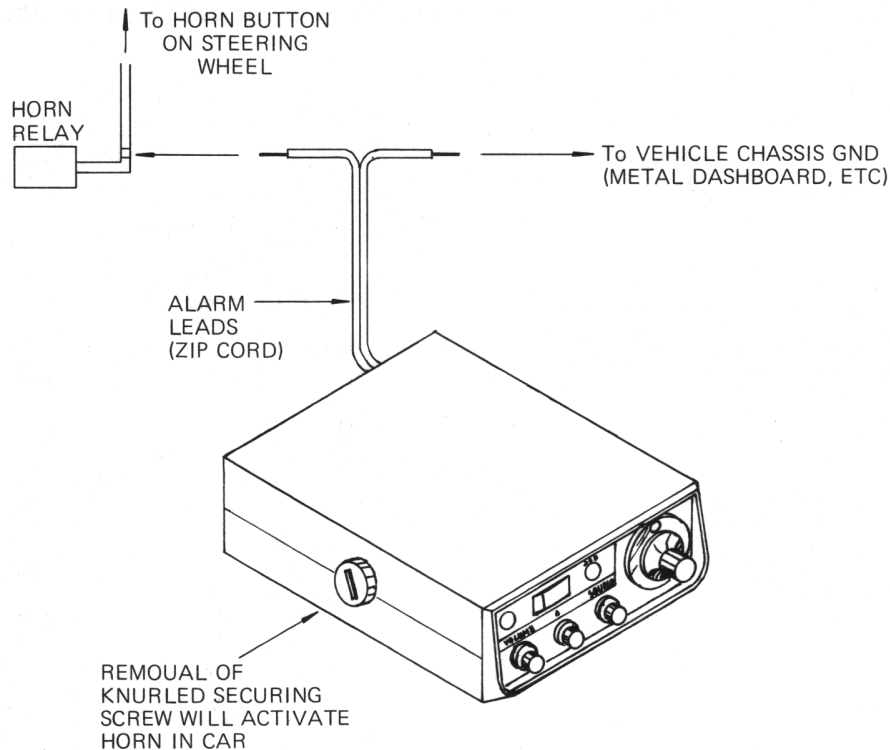
The transceiver is equipped with a built-in switching circuit designed to discourage the removal of the unit by unauthorized persons. This switching circuit, which operates upon removal of the left-hand knurled thumbscrew from the transceiver, terminates in two zip-cord leads at the rear of the unit. When these leads are connected to the automobile horn circuit and ground, as indicated below, any attempt to remove the thumbscrew in order to remove the transceiver from its mounting will cause the automobile horn to blow.

CONNECTING THE ALARM LEADS

NOTE: Be sure to mount the transceiver in the automobile with knurled securing screws at each side tightened before connecting the alarm leads to the horn circuit.

Connect one of the two zip-cord leads from the rear of the transceiver to the chassis of the vehicle (or metal dashboard, etc.). Connect the other lead to the same terminal on the horn relay to which the horn button lead from the steering wheel is connected. If you are in doubt about this connection, check with your local automotive service station or garage.

IMPORTANT: Be sure to install these leads as inconspicuously as possible so that they are concealed from view.



MOBILE INSTALLATION

DC POWER SUPPLY

WARNING: As supplied, the HB-525E is wired to operate from a battery source of 12.6 volts DC, on negative ground systems. Connecting the unit to a positive ground vehicle without making the necessary internal wiring change will blow 1.5A primary fuse. Before making any power connections you must determine whether the vehicle has a negative or positive ground electrical system and follow the appropriate instructions below.

NEGATIVE GROUND SYSTEMS

Connect the fused power lead (RED) of the DC power cord to the positive or "hot" side of the electrical system. Points normally available for this purpose are the accessory post on the ignition switch, the voltage regulator side of the ammeter or the accessory side of the fuse block. The other lead (BLACK) should be connected to the metal firewall or any other point that is connected to the vehicle chassis.

POSITIVE GROUND SYSTEMS

Before using the HB-525E for operation in vehicles with a positive ground electrical system, the following internal wiring change must be made.

1. Place the transceiver upside down (speaker grille upward) with the front control panel facing you.

2. Remove the four Phillips head screws (two on each side of the unit) fastening the uppermost chassis cover.

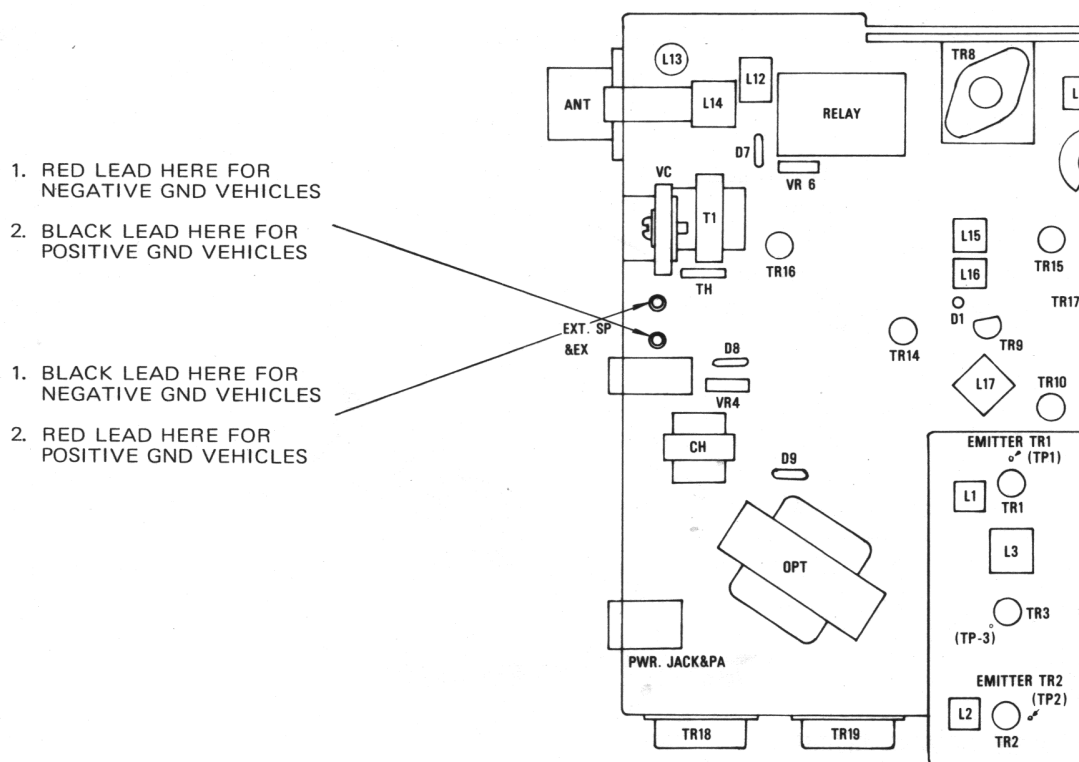


FIGURE 1

3. Remove the chassis cover with caution because the speaker is connected directly into the unit by means of two leads terminated with push-type lugs.
4. Refer to Figure 1 which shows the location of the two leads (red and black) which must be interchanged for positive ground operation. Each lead is attached to its terminal by a push-on type lug. To remove, simply pull steadily on the lug. Interchange the two leads as indicated in the diagram and push each lug down over its assigned terminal.
5. Replace the chassis cover, making sure the speaker leads are properly attached to the speaker terminals and have not become loose.

Connect the DC power cord as follows: Connect the fused (red) lead to the vehicle "hot" point or source (in the case of positive ground vehicles this is the negative battery side). Connect the black lead to the vehicle chassis, or any other point that is connected to the chassis.

ATTACHING THE POWER CORD TO THE TRANSCEIVER

The plug at the end of the DC power cord is attached to the socket at the rear of the transceiver. Notice that the pins are unequally spaced, allowing the plug to be inserted only in one direction.

TRANSCIVER MOUNTING

Before installing the transceiver in a car, truck, boat, etc., be sure to choose a location which is convenient to the operating controls, and will not interfere with the normal functions of the driver. The transceiver may be mounted to the underside of the instrument panel or dashboard of a car, truck, etc., by means of the special bracket that is supplied with the transceiver. Attach the bracket to the underside of the instrument panel using four self-threading screws (See Fig. 2). Secure the transceiver to the bracket by means of the large knurled thumbscrews the oval slot in the bracket will permit the unit to be tilted to a position which provides the operator with a better view of the front panel.

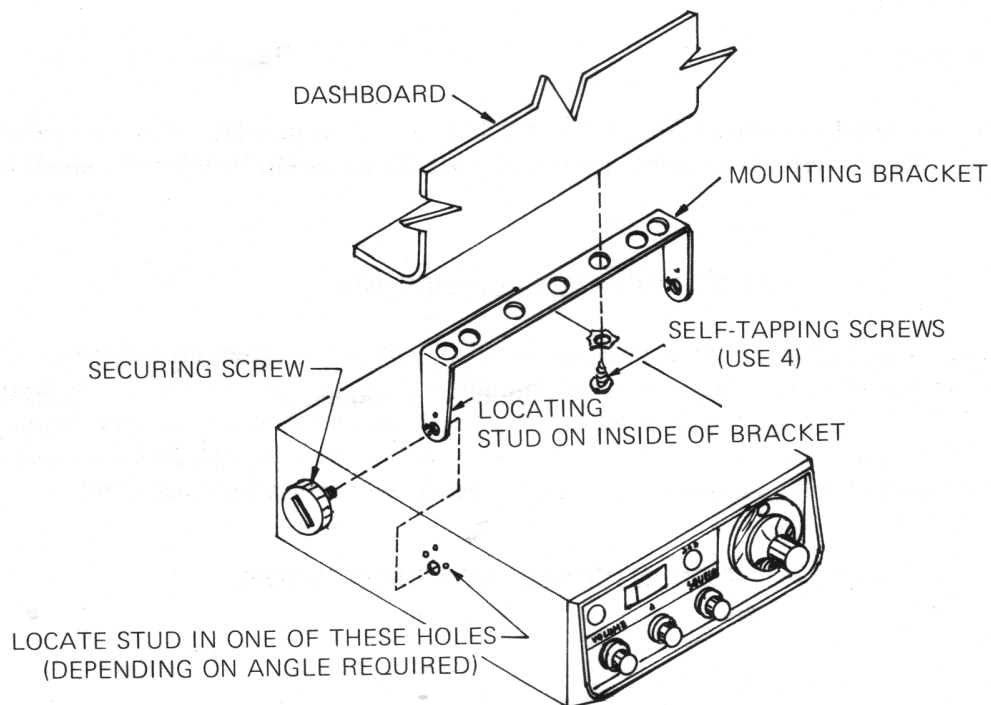


FIGURE 2. MOBILE INSTALLATION

MICROPHONE BRACKET

The small size of the HB-525E prohibits mounting a microphone bracket directly to the chassis. We recommend, therefore, that the microphone bracket be attached to the dashboard of the automobile or in any other convenient location. If one desires to do this without drilling holes, a magnetic mounting plate may be used and the microphone bracket attached to it.

MICROPHONE CONNECTION

Insert the 4-pin plug at the end of the coiled cord into the microphone socket at the side of the transceiver.

ANTENNA CONNECTION

The antenna lead-in cable (RG-58/U or RG-8/U) should be terminated with a PL-259 type male coaxial connector which should then be attached to the matching SO-239 connector at the rear of the transceiver.

AC POWER CONNECTION

As supplied, the HB-525E is designed to operate from a 12 volt DC battery source. For AC operation (house current), the solid-state power supply unit Model HB-502 is required.

The AC line cord from the power supply unit should be connected to an outlet supplying 105-120 volts 50/60 Hz AC.

6 VOLT DC OPERATION

The transceiver may also be operated from a 6 volt DC source by using a DC converter available for this purpose. This converter is available from Lafayette Radio as Model HB-505 (Stock No. 99-2084).

TV INTERFERENCE SUPPRESSION

This transceiver is equipped with a built-in series-resonant trap which offers little opposition to the transmitter output frequency but which will minimize any spurious emissions at the second harmonic (54 MHz). This trap, which is adjustable, has been preset at the factory to insure minimum TV interference, and should not require further adjustment. A procedure for adjusting the trap (when necessary) will be found in the section dealing with transmitter alignment.

AUTO IGNITION INTERFERENCE SUPPRESSION

AUTO

Your transceiver is equipped with a full-time Automatic Noise Limiter designed to provide efficient reduction of ignition noise. Ignition interference should not therefore be a problem in most cases. However, sufficient noise may be generated by some vehicles to make it necessary to install additional suppression. Several noise suppressor kits are available (such as Lafayette HP-204, Stock No. 42-0905) which include all necessary parts and instructions. Alternatively, you can take the vehicle to a skilled auto radio technician who will be able to carry out the suppression for you.

ANTENNAS

The results obtained with your new Lafayette Citizens Band Transceiver will be greatly determined by the efficiency of the antenna system used. Due to the complexity of the subject, it is not within the scope of this manual to provide detailed information on antenna systems. Although this section does contain some general information which may be of value to the beginning CB enthusiast, we suggest you purchase one of the numerous books available which covers this subject in greater detail. The Howard W. Sams publication by David E. Hicks, "CB Radio

Antenna Guidebook", is particularly recommended. This book offers a complete guide to the selection and installation of CB antennas and includes a great deal of information that will be useful in obtaining optimum results with your antenna system.

MOBILE ANTENNAS

The type of antenna best suited for mobile service is a vertically polarized whip antenna. The vertical whip is non-directional and can be of the loaded type (top, center or base loaded), or a full quarter-wave, the latter usually being more efficient. Both types use the metal body of the vehicle as a "ground plane". There are a number of locations that may be used for the installation of an antenna on a car. Four of the most popular locations are those shown in Figure 3.

FRONT COWL MOUNTING

Front cowl mounting offers a number of advantages. The CB antenna can be mounted in place of the regular auto radio antenna and will thus provide the minimum of installation problems. The antenna can then be used for both the CB and standard auto radio by employing any of the commercially made two-way couplers available (such as the Lafayette HP-202, Stock No. 42-0903). In this location you can install a short loaded whip, with only a small loss of efficiency.

The horizontal radiation pattern in such a location is slightly irregular, radiation being slightly greater in the direction of the rear fender opposite to the side on which the front cowl antenna is mounted.

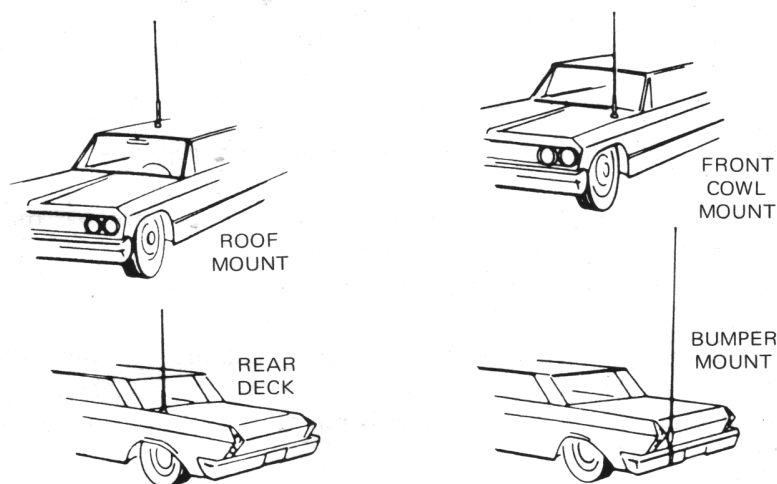


FIGURE 3.