

 **Brownie**
by
browning®



40 CHANNEL PHASE LOCK LOOP
AM CITIZENS BAND TRANSCEIVER
INSTALLATION & OPERATING INSTRUCTIONS

BROWNING LABORATORIES, INC.

O'SHEA INDUSTRIAL PARK
LACONIA, NEW HAMPSHIRE 03246
Phone (603) 524-5454

**WITH
PLL
CIRCUITRY**

LIMITED WARRANTY

Browning Laboratories, Inc., warrants each new radio product to be free from defective material and workmanship, and if it is found to be defective within one (1) year from date of first sale to the original retail purchaser, the factory will either, at its discretion, replace or repair equipment or parts which are delivered transportation and insurance prepaid by the owner to us or to our authorized distributor or dealer from whom purchased or to a Browning Authorized Warranty Service Station.

Our obligation is limited to repairing or replacing those products which were delivered intact for examination and, which in our opinion, became defective under normal installation, use, and service and which were not subject to neglect, accident, modification in wiring not of our own instruction, or use in violation of instructions furnished by us. To place warranty in effect, the unit must be warranty registered with the factory at the address listed below.

This warranty is in lieu of other warranties expressed or implied; and no representative or person is authorized to assume for us any other liability in connection with the sale of our products.

Browning Laboratories, Inc., reserves the right to make any changes in design, or to make additions and improvements in its products without imposing any obligation on itself to install them in its products previously sold.

BROWNING LABORATORIES, INC.

BOX 310

LACONIA, NH 03246

NOTE - YOUR UNIT IS NOT IN WARRANTY UNLESS THE WARRANTY CARD IS ON FILE!!

SERVICE ON SUCH UNITS WILL BE CHARGED FOR. MAIL THE CARD NOW.

GENERAL INFORMATION

The BROWNIE Transceiver is designed to comply with necessary requirements to operate in the Class "D" Citizens Radio Service in the 27 MHz (11 meter) Band. The user is required to be cognizant with, and comply with, Part 95 of the FCC Rules which defines operation in this service.

A valid station license and call letters are necessary before operation is permissible. The station license is obtained by submitting a properly and fully completed Form 505, Station License Application. After receipt of the license, the user

must attach to the transmitter a Form 452-C, Transmitter Identification Card. Form 452-C has been included for your convenience.

Anyone may operate a duly licensed transmitter, but the licensee is responsible for violations or infractions of the regulations. Browning Laboratories cannot be held responsible for improper technical adjustments where any unauthorized person has performed any adjustment or used any other than our authorized crystals, components, etc.

PRE-INSTALLATION

To those readily familiar with transistorized CB radio equipment, there is a tendency to install the equipment without reading the details of the Instruction Manual. However, to avoid equipment damage, a few precautions are necessary.

DO NOT

—Attempt to connect the power cord to a primary power source with the power switch on. Determine system polarity before connection. The BROWNIE is wired for negative or positive ground connection. MOST MODERN CARS ARE NEGATIVE GROUND.

IN ANY EVENT THE RED wire always goes to the +(positive) on the battery and the BLACK wire always goes to the -(negative) on the battery.

DO NOT

—Connect the antenna with the power on. Accidental contact with the rear speaker jacks on the rear panel will blow the line fuse.

DO NOT

—Key the transmitter without an antenna connected.

DO NOT

—Replace the fuse with any other type (3AG-2 amp.)

DO NOT

– Attempt alignment of the transmitter to the antenna. Loss of modulation power and inefficient operation possibly resulting in transistor burn-out will occur unless the factory prescribed tuning procedure is followed. Maximum efficiency

of an installation will result when the antenna has a VSWR of less than 1.5:1. The antenna should be tuned, trimmed or replaced, if necessary, to achieve this. In any event do not operate with VSWR greater than 3:1 or damage may occur to your transmitter. NOTE: Antennas already tuned for operation on 1-23 may have to be retuned for 40 channels.

GENERAL DESCRIPTION

The BROWNIE embodies the latest in high frequency transceiver design techniques. Only the most modern silicon transistors are used throughout.

The BROWNIE is a compact transceiver, employing 19 diodes, 6 ICs, and 28 transistors, 1 FET and highly sensitive double conversion superheterodyne receiver, containing ANL for reduction of fierce ignition noise, using highly selective ceramic filter with a built-in rugged speaker and complete with a dynamic microphone, which is intended to provide all channel operation in the class D citizens band service and public address paging.

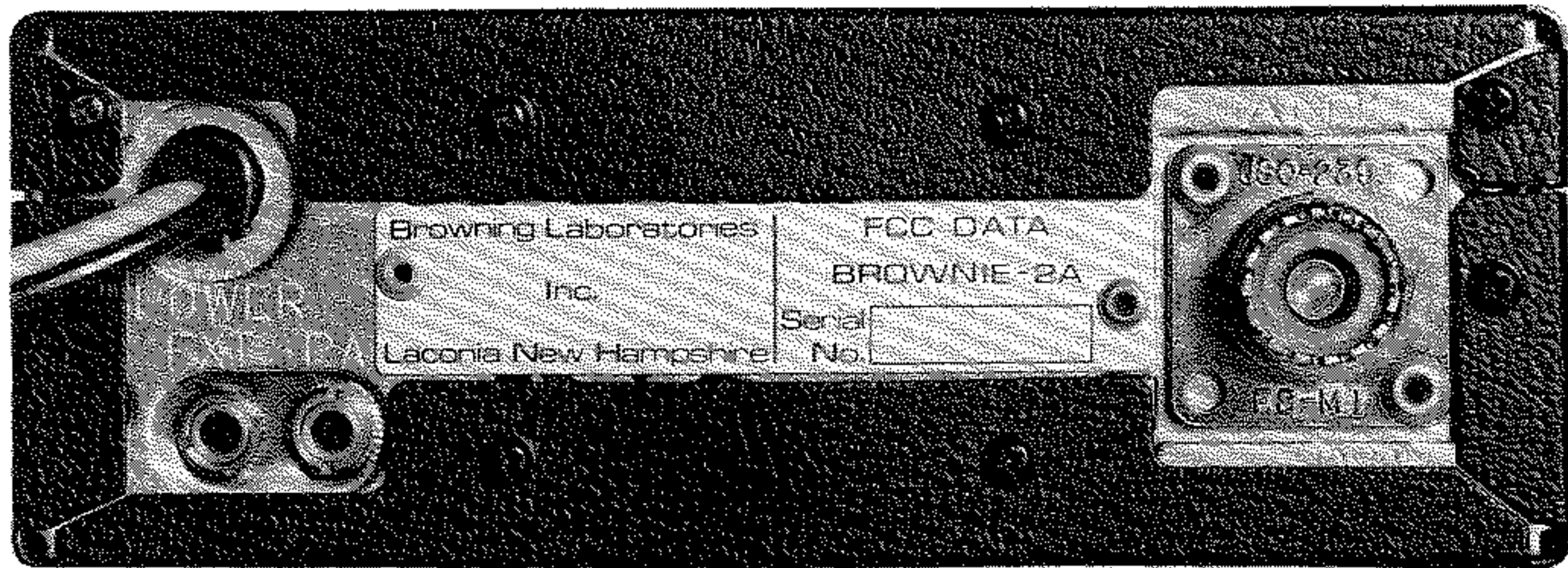
Forty channel operation is made possible with 3 crystals, in a highly stable Phase Locked Loop Circuit.

Receiver voltages are zener regulated to maintain sensitivity and squelch operation over a wide input voltage excursion.

All transmitter transistors are oversized silicon units.

The BROWNIE is designed to operate from a nominal 12-volt DC negative ground source.

The BROWNIE will operate over a nominal input voltage range of 12.4 to 15.2 volts without damage or serious loss of communication.



TECHNICAL SPECIFICATIONS

Receiver

Sensitivity — 1uV for 10dB $\frac{s+n}{n}$ @ 30%
modulation @ 1000 Hz

Selectivity — 4 kHz @ 6 dB
20 kHz @ 40 dB

Image rejection — Better than 40 dB

Squelch — minimum sensitivity 1uV, maximum signal
stop, factory setting 30 uV

Noise Limiter — Series gate approximately 65%
clipping level

Audio Output — 2 watts 8 ohm Speaker High level Class
B Audio

Transmitter

Power Output — Better than 3.5 watts @ 13.8 volts

Modulation 85% minimum guaranteed sine-wave
100% average speech

Microphone

High output dynamic

Weight

3 lbs. with microphone

Size

2 $\frac{3}{8}$ " H \times 6 $\frac{3}{10}$ " W \times 9 $\frac{3}{8}$ " D

INSTALLATION

Select a suitable mounting position keeping the following in mind.

- Controls must be convenient and visible.
- The location should not interfere with driver or operator's normal functions.
- The transceiver should not be in the way of heater ducts, air conditioning outlets or direct blast air inlets.
- The transceiver should be protected from rain and spray. In some commercial vehicles and in marine applications, vertical mounting may prove more convenient. The BROWNIE may be mounted in any position without performance change.

For a negative (–) ground vehicle, connect the red fused power cord to a well regulated source such as an ammeter terminal, ignition accessory terminal or cigar lighter.

“Tapping off” of dome or convenient light wires is not recommended as these circuits are usually wired very lightly and some power loss would be encountered. Always install the black wire from the radio to the vehicle chassis or system ground to reduce noise pickup. If the vehicle is positive (+) ground, reverse the black and red wires.

Install the radio in the mounting bracket and connect the antenna. It is essential for maximum performance that a good antenna be used. See ANTENNAS for a discussion of antenna types.

The special spanner type screws used to mount the BROWNIE in its bracket makes it very theft resistant as the wrench must be used to mount or dismount the unit. The wrench provides a great deal of leverage. Be careful not to damage screws by too much pressure. **DO NOT KEEP THE WRENCH IN GLOVE COMPARTMENT.** Leave it home-or on Key ring.

Extra wrenches \$ 1.00.

OPERATION

Operation of the BROWNIE Transceiver is simple and self-explanatory to those familiar with CB equipment.

After power is connected, set the front panel switches to CB and ANL Off or Left. Turn power on. With the volume at about one-half setting and the squelch control counter-clockwise, noise and/or signals should be heard. If the unit is inoperative, determine that the pilot lamp is on, if not, recheck power connections and line fuse.

The SQUELCH control should be rotated slowly clockwise to silence background noise, or weak or undesirable signals.

When the ANL switch is in the off or left position the audio noise limiter is not in operation. In the ANL position the audio noise limiter is in operation.

When installed in a vehicle whose ignition system proves to be an unusually noisy one, local measures can be taken on the vehicle to reduce such noise. Consult your distributor to determine the most economical method of suppressing the ignition noise. Usually simple suppression of spark plugs may suffice. However, more difficult cases may require special techniques. Sometimes generator and voltage regulator "hash" may be troublesome. Special capacitors and/or complete kits are available depending upon requirements. Little can be done to reduce noise interference from other mobile sources. Your BROWNIE has the finest noise suppression circuitry available today regardless of cost.

The meter has two scales the upper an S meter reading when receiving showing the relative strength of the signal being received. When transmitting the lower scale will show the relative power output.

OPERATION

Public Address or Loud Hail Functions

Auxiliary circuitry provided in the BROWNIE enables it to be used as a public address system or loud hailer.

A trumpet or horn speaker of 8 ohms impedance is desirable for this purpose. Connect the speaker to a suitable length of cable using a standard 1/8" plug at the radio end.

The plug is inserted in the P.A. jack. Placing the "PA CB" switch in "PA" will silence the receiver. When it is desired to speak, depress the mike key. Feedback effects which cause "ringing" or "howling" are reduced by placing the P.A. speaker as far from the microphone as possible. Avoid having the speaker and microphone facing each other. The volume control also controls P.A. volume.

The EXT jack functions in the CB position and can be used to operate an external speaker for receiving purposes. Any suitable speaker of 8 ohms is satisfactory.

MOBILE NOISE SUPPRESSION

Mobile noise is present in all automobiles but can be reduced by using ignition, suppression and bonding techniques. Any part of the automobile that is radiating noise (while the engine is running) can readily be detected by connecting a 20" piece of coaxial cable to the antenna jack. At the other end of the cable, bare the coax shield 6 inches, then strip approximately 1/4" of the center conductor insulation.

While using this probe, any increase in radiated noise will give a corresponding increase in audio output. When the noise probe is touched to a noise radiating portion of the auto, an unbonded section will produce increased noise (NOTE: All performed while engine is running). The noise radiating part should now be connected to the chassis with a copper strap.

Continue this probing and bonding until the noise is substantially reduced.

- A. BONDING: Use 1" copper braid to interconnect parts of the automobile that can radiate noise such as:
- (1) Hood to firewall
 - (2) Bumper to body and chassis
 - (3) Rear light fixture to body
 - (4) Tailpipe to body
 - (5) Either side of muffler to body and chassis
 - (6) Chassis to body in several places
 - (7) Ignition coil body to firewall

When braid connections are made, be sure to clean the metal "bright" and coat with grease before tightening the connection. This will prevent contact corrosion which is the chief cause of noise.

- B. IGNITION RADIATION SUPPRESSION requires the use of resistor spark plugs, feed thru capacitors and distribution suppressors. Of prime importance is a properly adjusted ignition system. The following steps will serve as a guide:
- (1) SPARK PLUGS: Install resistor spark plugs or Belden IRS cable.
 - (2) DISTRIBUTOR CAP: Install suppression resistor or IRS cable between distributor cap and ignition coil.
 - (3) GENERATOR: Install 0.5 mfd. coaxial capacitor (Sprague 48 P 18 or equivalent) at the "A" terminal of generator.
 - (4) ALTERNATORS: Require no attention except when the diodes become defective or when the "slip-rings" are dirty.
 - (5) IGNITION COIL PRIMARY: Install 0.1 mfd. coaxial capacitor (Sprague No. 48 P9 or equivalent) in the lead from ignition switch to coil. Keep capacitor close to coil terminals. Clean the metal around the coil mounting bracket to engine block, apply grease and retighten mounting screws.

MOBILE NOISE SUPPRESSION

- (6) (a) REGULATOR FIELD TERMINAL: Connect a 39 ohm resistor in series with a 0.01 mfd. ceramic capacitor between the field terminal and ground.
 - (b) ARMATURE TERMINAL: Insert 0.02 mfd. coaxial capacitor. (Sprague No. 48P 18 or equivalent).
 - (c) BATTERY TERMINAL: Repeat (b).
 - (7) GAUGES: Install 0.5 mfd. 200 volt capacitors from terminals to ground.
 - (8) WHEELS AND TIRES: Inject special graphite powder (available at automobile parts suppliers) into the tires.
- CAUTION: Do not connect any capacitor alone from the field terminal of the generator to ground. Observe (+) (-) carefully.

- C. ALTERNATORS: The prime cause of alternator whine is dirty slide-rings and faulty diodes. If further whine is encountered;
 - (1) Install 0.5 mfd. coaxial capacitor at the alternator terminals.
 - (2) Install 0.25 mfd. coaxial capacitor at the regular terminals.
 - (3) For extreme cases of whine; install a shielded lead between the alternator and regulator field terminals.

ANTENNAS

No other single part of the system can be as significant a factor in complete success or total failure of performance as the antenna installation.

It is advisable not to experiment but rather to use performance proven antennas. Many new "miracle" antennas appear on the market from time to time, but most of them disappear after a short period.

If a shortened antenna is desirable there are several successful types that the Browning distributor will recommend. Shortened types are very successful mounted in the center of the roof and somewhat less efficient when mounted on or near the front or rear fender or rear quarter deck.

Bumper mounts are inadvisable because of their extreme directivity.

The length of the cable from the antenna to the radio is, contrary to popular belief, not important. What is important is that the antenna have low VSWR. If a shortened type of antenna is used, it is mandatory that the VSWR be checked. If the VSWR is greater than 1.5:1 the antenna must be adjusted in accordance with the manufacturers instructions.

Do not attempt VSWR checks if the vehicle is parked closer than 35 feet from a large fence, metal building, etc.

TECHNICAL FACTS

The CB field is, unfortunately, overrun with much technical information of dubious origin. Many users, in an attempt to improve performance, expend much effort and money only to be disappointed. It is hoped that this brief semi-technical treatise will enlighten the user and help to avoid costly errors and achieve optimum performance with minimum effort.

Contrary to some popular opinions that a transmitter can be tuned to match the antenna any transmitter to perform properly, must have the antenna adjusted to match its output impedance. This is necessary with tube sets as well. CB

radios (tube and transistor) are designed to operate into a 50-52 ohm load. Depending on the antenna installation and type, the effective impedance of the antenna can vary a great deal from this value.

In any transistor transmitter or receiver, successive stages are interdependent on proper alignment to gain top performance. When an adjustment is made in one area, it can change the alignment in another. Our units are designed and built to accept an antenna impedance tolerance of 35 to 70 ohms. All stages are tuned to their optimum at the factory and should not be readjusted in the field.

WARNING

The use of this equipment must comply with Part 95 of the Federal Communications Commission Rules and Regulations and failure to do so will subject the operator and all owners to severe fines and penalties.

The proper adherence to these rules and regulations by all will improve the efficiency and operating pleasure for everyone.

Any alterations of the transmitter both internal and external by anyone other than the manufacturer is a violation of F. C.C. regulations and punishable accordingly and voids your warranty.

Only a licensed FCC Technician is allowed to make adjustments to the transmitter.

Whenever changing of a component is necessary, replace only with quality parts recommended by Browning, failure to do so could result in improper functioning of the unit and will subject the operator and all owners to severe fines and penalties.

