



ORDER NO.  
**604**

# INSTALLATION & OPERATION INSTRUCTIONS

**HY-GAIN ELECTRONICS CORPORATION**  
Rural Route 3 Lincoln, Nebraska 68505

## 23 CHANNEL CITIZEN BAND MOBILE TRANSCEIVER

### GENERAL DESCRIPTION:

#### Receiver Section

The Hy-Gain 23-M is designed to receive AM signals in the 26.965 to 27.255 MHz Citizens Band. The circuit is a highly sensitive and selective dual conversation super heterodyne type. Full 23 channels, crystal controlled operation is provided by a frequency-synthesized circuit consisting of 12 crystals.

The receiver section includes an S Meter for reading signal strength, an adjustable squelch control to eliminate background noise when no signal is being received, an automatic noise limiter to suppress atmospheric and man-made interference and a delta tune control with a range of 3 KHz, which permits reception of stations that are transmitting slightly off frequency.

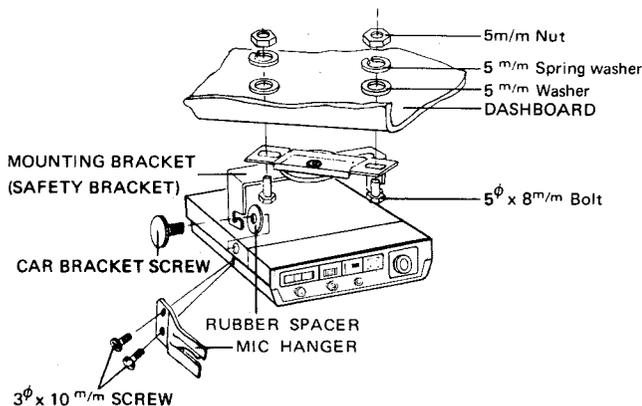
#### Transceiver Section

The transmitter is designed to transmit AM signals in the 26.965 to 27.255 MHz Citizens Band. Crystal synthesized circuit used in the receive section is common to the transmitter, and provides full 23 channel crystal controlled operation. Plate modulation with 100% capability is used with up to 5 watts plate power input to the final RF stage.

### MOBILE INSTALLATION:

#### Transceiver Location

Before installing the unit in the car, truck, boat, etc., make certain to select a location which permits the driver to operate the controls of the unit without interfering with his driving functions. The transceiver can be mounted to the underside of the instrument panel or dash board by means of a special bracket that is supplied with the unit. Attach the bracket to the underside of the panel using the bolt, nut and washer (2 pcs. each) which are provided. Secure the transceiver to the bracket by means of the provided thumb screws. The oval slot in the bracket will permit the unit to be tilted to a position which provides the operator with the best view of the front panel. The

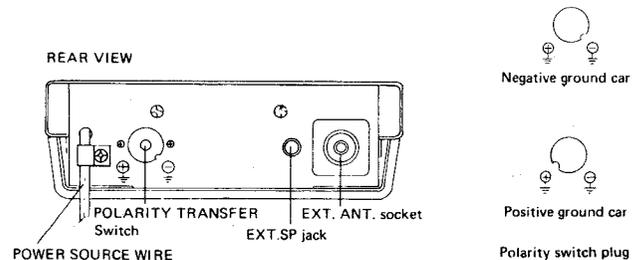


mounting bracket can be rotated to provide the most convenient position.

#### DC Power Connection

The transceiver can be used with either a positive or negative ground vehicle. The polarity switch is located on the rear of the unit. Determine whether your vehicle is positive or negative ground and position the polarity switch in its proper mode.

In a NEGATIVE GROUND vehicle, the fused line goes to the positive battery source of the vehicle. In a POSITIVE GROUND vehicle, the fused line goes to the negative battery source of the vehicle. The unfused lead should be connected to any metal portion of the vehicle chassis.



#### Antenna

The type of antenna best suited for mobile operation is a vertically polarized whip, which can be either of the loaded type, or a full quarter wave. Both types use the metal body of the vehicle as a ground plane. The antenna can be mounted on the trunk deck, either of the rear fenders, or on the roof. When purchasing your mobile antenna you will find full instructions for installation included with the antenna.

For optimum results of the mobile installation, the length of the coaxial cable should be ideally 11'9" or multiples thereof. However, lengths other than multiples mentioned above can provide optimum results if the antenna used can be tuned.

The lead in cable should be terminated with a PL-259 coaxial connector which is then attached to the antenna connector at the rear of the transceiver.

#### OPERATING CONTROLS:

1. Volume/On-Off Switch -- controls output level from the speaker. When in the full counter-clockwise position it operates as a power switch.
2. Squelch Control -- this control is used to block out background noise when no signal is on the channel. Squelch is adjustable with higher sensitivity in the full clockwise position.

3. PA Switch -- when the PA Switch is depressed, public address operation with external speaker jack, is possible. To operate as a PA System, press the button on the microphone and speak into it. The PA Switch can be used regardless of the C.B. channel appearing in the channel selector window.

4. Channel Selector Switch -- rotary switch which selects any one of 23 C.B. channels either for transmit or receive. Illuminated channel indicator shows the channel number selected by the switch.

5. Illuminated Meter -- automatically indicates strength of the incoming signal in "S" units on the upper scale; and RF relative output level in the transmit mode on the lower scale.

6. Automatic Noise Limiter Switch -- this switch is used to block out excessive noise primarily generated by the vehicles electrical system.

7. Polarity Switch -- pull out the polarity plug switch on the rear chassis and insert into the proper socket. The cut out portion of the plug should point to the polarity ground of your vehicle.

8. External Speaker Jack -- connect an 8 or 16 ohm external speaker for PA operation.

9. External Antenna Socket -- for attachment to a coaxial antenna cable terminating in a PL-259 connector.

#### OPERATION:

1. Turn the unit on by rotating the volume/on-off switch clockwise until a click is heard.

2. Set the channel selector switch to the desired position.

3. Rotate the squelch control knob counter-clockwise until a rushing noise is heard.

4. Adjust the volume control for your surrounding conditions.

5. Operate the automatic noise limiter switch if there is excessive electrical noise in the unit.

6. Operate the squelch control until the unit is at the squelch threshold.

7. To transmit depress the "Press-To-Talk" button on the microphone and speak in a normal voice two to four inches away from the microphone. To receive release the "Press-To-Talk" button. (Transceivers will operate in

EITHER a talk or listen mode. When completing a transmission it is essential to release the microphone button so that the unit will return to a receive position.)

#### SPECIFICATIONS:

##### Receiver

Circuit type: Dual conversion superheterodyne; crystal frequency synthesizer provides 23 crystal controlled transmit and receive channels. Fine tuning of  $\pm 1.5$  KHz on each channel plus mechanical filter.

Sensitivity: 1  $\mu$ V for 10db S+N to N ratio at 30% at 1000Hz modulation.

Selectivity: 6db down at 3.5KHz; 50db down at  $\pm 10$  KHz.

Intermediate frequency: 1st IF: 11.275MHz. 2nd IF: 455KHz

Audio output: 2.7 watts.

Auxiliary circuits: Series gate noise limiter, Variable squelch, PA.

##### Transmitter

Plate power input: 5 watts maximum

Range boost: Yields high average modulation at average voice levels.

Carrier deviation: Not greater than  $\pm 800$ Hz nominal (exceeds FCC, DOC, etc. requirements)

Harmonic suppression: Exceeds 50db.

Antenna matching: Nominal 50 ohm.

##### General

Power supply: 10.8 to 15.6 volts DC (Nominal 13.2 volts DC), negative or positive ground (with polarity switching).

Accessories: 1) Press talk dynamic microphone  
2) DC power cable (2.2 amp fused)  
3) Mobil mounting bracket  
4) Safety Unit cover  
5) Safety Bracket  
6) Mounting screws

Dimensions: 55(H) x 159(W) x 192(D)mm  
2-1/8"(H) x 6-1/4"(W) x 7-1/2"(D)

Weight: 1.8 kg (4 lbs.)

