



MODEL-309

OWNER'S MANUAL

40 channel CB Transceiver

Professional Quality And Performance Standards

Advanced Circuitry With PLL Synthesis

GENERAL INSTRUCTIONS

Your model is an all solid-state SSB/AM transceiver for 27MHz Citizens' Band use. It uses a frequency synthesized circuit to provide Phase Locked Loop controlled transmit and receive operation on all 40 channels. You can use your transceiver on any one of the 40 channels in the conventional AM mode, plus the same 40 channels in either the Upper Single Sideband or Lower Single Sideband mode. The flexibility of SSB mode not only doubles the effective number of channels from 40 to 80, but also increases the effective range of communication because all the power is concentrated in one sideband to provide 100 percent talk-power. Single Sideband reception also adds advantages in sensitivity and selectivity, plus lower signal-to-noise. This of course also contributes to increase in operating range.

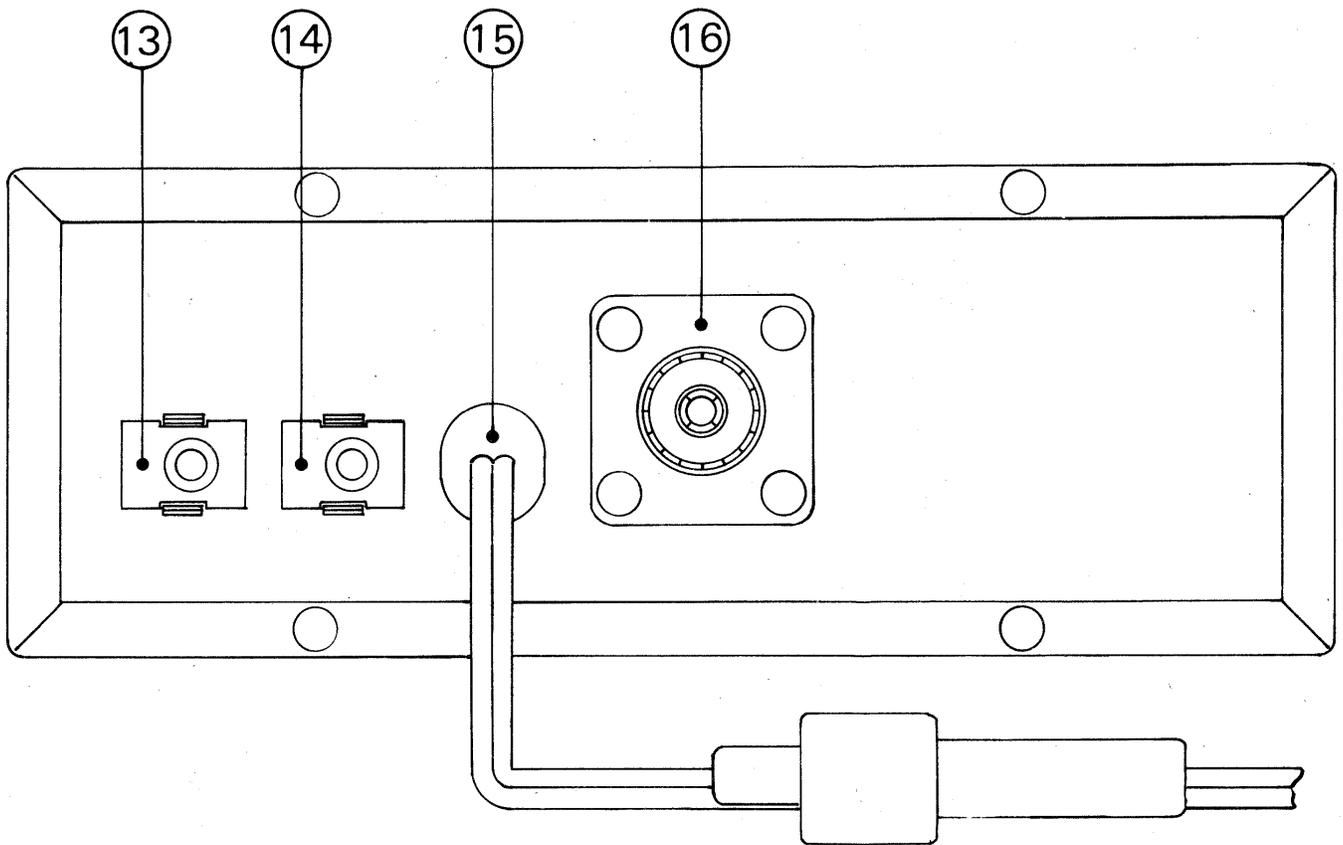
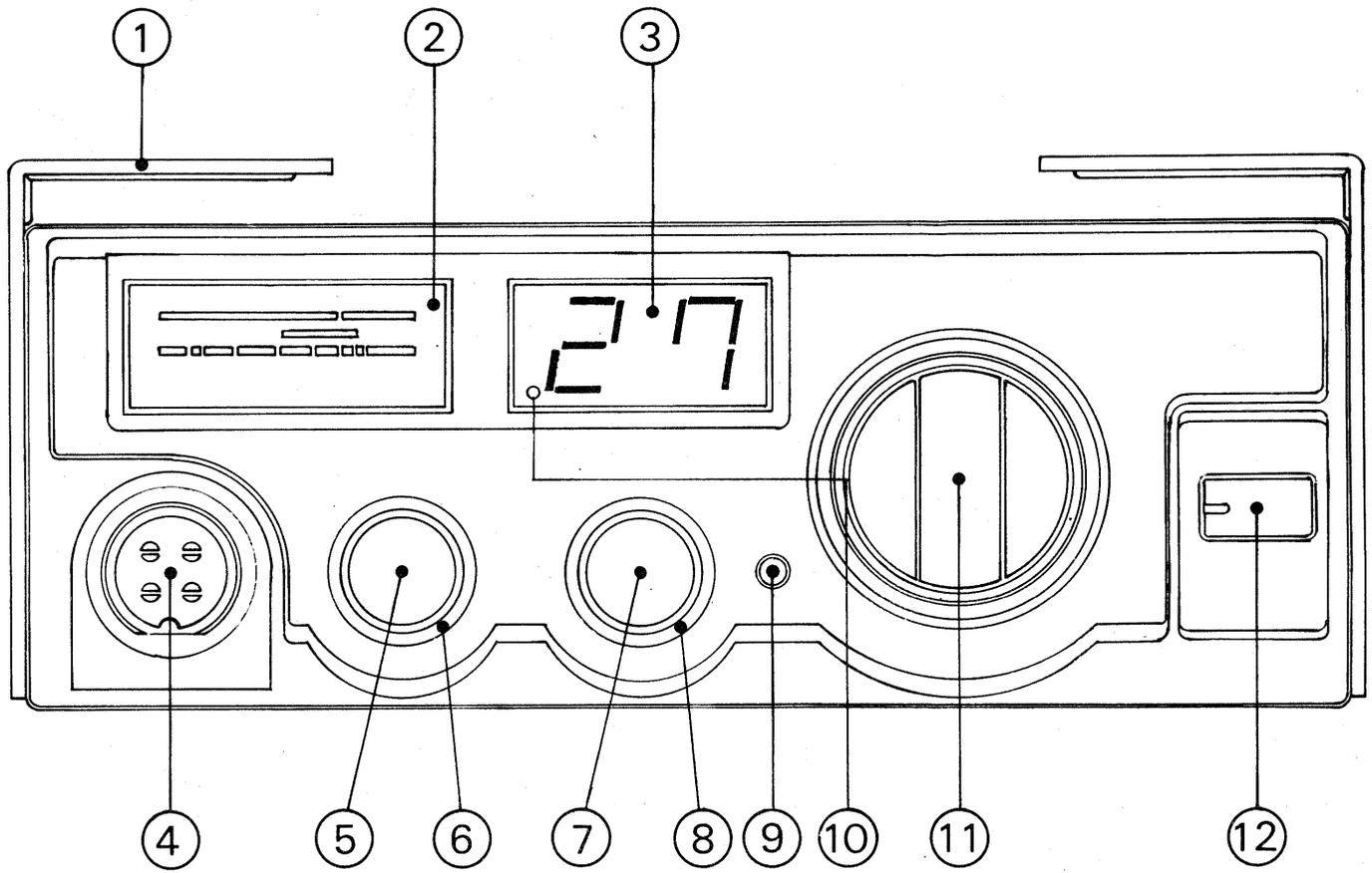
Your model is carefully designed for ease of operation. You can select the SSB mode of the Upper Sideband or Lower Sideband, and/or AM with simple switch of the button. Transmission is simple, too - just press the microphone button. Ordinarily SSB signals reach farther and are heard more clearly than equivalent AM signals. SSB reception on the selected sideband is simple, too - you just adjust the Clarifier control for fine tuning of the received voice.

We add all the other wanted features for optimum communication - RF Gain Control, Squelch Control, Noise Blanker, full-time Automatic Noise Limiter to combat ignition noise and S-RF-PA level meter.

This transceiver is designed to operate from a normal 12 volt DC supply (positive or negative ground system).

FRONT & REAR PANEL VIEW and FUNCTIONS

1. Mounting Bracket Specially designed brackets simplify installation. Have "quick-release" feature for fast removal of the transceiver.
2. S-RF-PA Level Meter Illuminated meter indicates relative incoming signal strength when receiving, relative RF power output when transmitting and relative PA power output when PA is operated.
3. Channel Indicator Indicate a channel selected.
4. MIC Connector 4-pin socket for attachment of the push-to-talk microphone.
5. Volume Control & Power ON-OFF Switch Vary sound output from the speaker, also with a power switch.
6. RF Gain Control Adjust as required to optimize signal. This control is functional in both AM and SSB modes, and is used primarily to optimize reception in strong signal areas. The gain is reduced by counter-clockwise rotation of the control. Normal position is full clockwise.
7. Clarifier & N.B. ON-OFF Switch Permit slight adjustment of the receiver tuning. Used for clarity on SSB reception and fine tuning of stations on AM reception. Also incorporate the Noise Blanker switch.
8. Squelch Control This control is used to "Quiet" the receiver during "no signal" condition. Degree of the sensitivity to incoming signal is adjustable. Full clockwise provides maximum squelch and full counter-clockwise provides no squelch action.
9. N.B. Indicator The lamp will illuminate when the Noise Blanker SW is ON.
10. TX, PA Indicator The LED will illuminate during TX and PA mode of operation.
11. Channel Selector The rotary switch selects CB channels of 1-40 for transmit and receive operation.
12. Mode Switch The "PA" position sets the transceiver to the function as a Public Address amplifier. The "AM" position sets the transceiver to the function as an AM transmitter and receiver. The "USB" position sets the transceiver to the function as an Upper Single Sideband transmitter and receiver. The "LSB" position sets the transceiver to the function as a Lower Single Sideband transmitter and receiver.
13. PA Speaker Jack Jack for connection of an 8 ohm PA speaker when using in this mode.
14. EXT Speaker Jack Jack for connection of a headphone for private listening or an 8 ohm external speaker. Insertion of a plug automatically silences the internal speaker.
15. DC Power Cable Power for the transceiver is supplied through this cable.
16. Antenna Connector For antenna lead-in cable with matching PL-259 connector.



MOBILE INSTALLATIONS

A location in the Car or Truck should carefully be chosen for convenience of operation and non-interference with normal driving functions. Mounting may be under the dash or the instrument panel or any place where a secure installation can be made.

DC POWER CONNECTION

This transceiver may be operated from a 12 volt DC battery source on Negative or Positive ground system. It is designed to operate within an input voltage range of 11.6 to 15.6 volts DC. Make sure that the voltage to the transceiver does not exceed 15.6 volts DC.

NOTE:

Before making any power connection, you must determine whether the vehicle or boat has a negative or positive electrical ground system. Then make the following connections.

1. Using the end of the DC power cable, connect the fused Red lead to the "+" (positive) side of the electrical system and the Black lead to the "-" (negative) side of the electrical system. In case of the negative ground system, the Red lead should be connected to the accessory post on the ignition switch, the voltage regulator side of the ammeter and/or the accessory side of the fuse block. The Black lead should be connected to the metal firewall or any other point that is connected to the vehicle chassis(ground).
2. In case of the positive ground system, the Black lead should be connected to the accessory post on the ignition switch, the voltage regulator side of ammeter and/or the accessory side of the fuse block. The Red lead should be connected to the metal firewall or any other point that is connected to the vehicle chassis(ground).

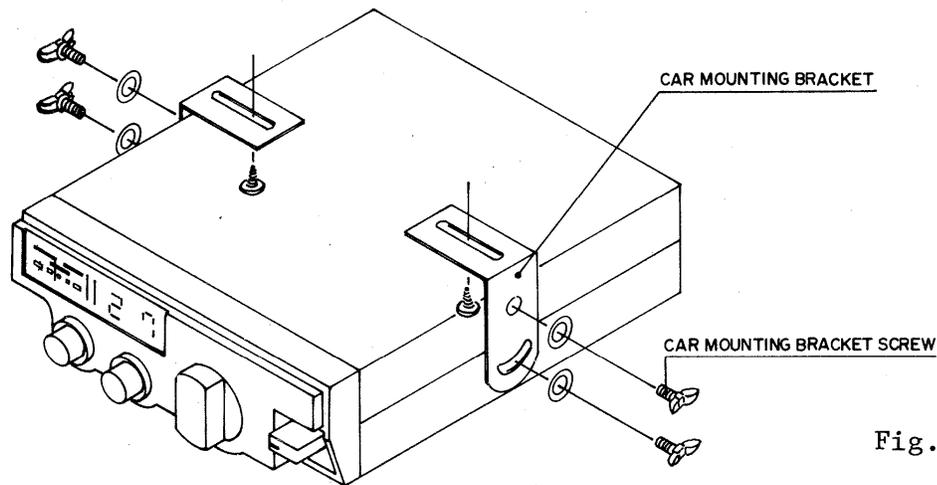


Fig. 1

TRANSCEIVER MOUNTING

Before installing the transceiver in a car, truck and 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 and etc., by means of the special brackets which are supplied with the transceiver. Attach the brackets to the underside of the instrument panel using self-threading screws (See Fig. 1).

Secure the transceiver to the brackets by means of the large knurled thumbscrews. Tilt the transceiver to a position which provides the operator with the best view of the front panel, then tighten knurled thumbscrews securely.

ANTENNA CONNECTION

The antenna lead-in cable (RC-58U or RC8/U) should be terminated with a PL-259 type coaxial connector which should then be attached to the matching SO-239 connector at the rear of the transceiver.

MICROPHONE CONNECTION

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

MOBILE ANTENNA

The antenna system is included the transmission line and it is very important that you use the correct type of the transmission line. The transmission line should be the coaxial type and should have an impedance equal to the antenna impedance which must be 50 ohms. Generally speaking, you should keep the length of the transmission line minimum. Remember that line losses increase with frequency. To use a foam-insulated coax for best results. The above discussion is as important for reception as it is for transmission. If a mismatch exists between the antenna and the transceiver, the excellent sensitivity and signal-to-noise ratio of the receiver circuitry will be defeated.

FIXED STATION ANTENNA

The most popular fixed station antenna is a 5/8 wave type for omnidirectional operation and various beam antennas for directional operation. The directivity can be a disadvantage unless a rotator is used. Since a beam antenna is directional, it generally reduces noise and interference from all other directions. This can be a decided advantage on the CB bands where man-made noise is a problem. The antenna system should be adequately grounded and extreme care should be exercised to prevent it from contacting with a power line during installation.

IGNITION INTERFERENCE

Your transceiver is equipped with a special RF Noise Silencer which is designed to provide outstanding 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 which include all necessary parts and instructions. Take your vehicle to a skilled auto radio technician who will be able to carry out the suppression for you.

USING YOUR TRANSCEIVER

Do not transmit without a suitable antenna or load to the antenna connector. For installation, refer to that section.

TO RECEIVE AM SIGNALS

1. Set the RF Gain Control (6) maximum clockwise.
2. Set the Squelch Control(8) maximum counter-clockwise.
3. Set the Mode Switch(12) to AM.
4. Push the Power Switch(5) ON.
5. Set the Channel Selector(11) to the desired channel.
6. Adjust the Squelch Control(8) to cut out annoying background noise when no signal is being received. To do this, set the Channel Selector(11) to a channel where no signals are present (or wait until signals cease on your channel). Then rotate the Squelch Control(8) in a clockwise direction to the point where the background noise just stops. Now, if a signal is present, you will hear it without being disturbed by noise on the channel in between signals. When properly set, the Squelch will keep the receiver "dead" until a signal is coming in on that channel. Do not set the Squelch too high or weak signals. This will not be able to "open" the Squelch circuit. To receive weak signals, it is best to leave the Squelch setting to the minimum position (maximum counter-clockwise).
7. Use the Clarifier(7) to tune in slightly off-frequency stations.
8. Adjust the Volume Control(5) for suitable listening level.

TO RECEIVE SSB SIGNALS

1. Set the RF Gain Control(6) maximum clockwise.
2. Set the Squelch Control(8) maximum counter-clockwise.
3. Set the Mode Switch(12) to either LSB or USB, depending on which sideband is being used by the transmitting station.
4. Push the Power Switch(5) ON.
5. Set the Channel Selector(11) to the desired channel.
6. Adjust the Squelch Control(8) as noted above.
7. Use the Clarifier(7) to tune in the SSB signal. The SSB tuning takes practice, it is not difficult, it just takes a little experience. When first listening to an SSB signal, it will probably not be understandable. The noise may sound like "Donald Duck" or just a low guttural sound. In either case, adjust the Clarifier(7) very slowly to bring the signal into its natural voice level range. If the signal is "Donald Duck" like, tune the Clarifier(7) to lower tones. If the signal is low and guttural, tune the Clarifier(7) to higher tones. Careful tuning will make the noise sound natural. If you try above procedure and are not able to make the signal intelligible, it may be operated on the other sideband. Try the other SSB mode (LSB or USB as the case may be).
8. Adjust the Volume Control(5) for suitable listening level.

NOTES ON RECEIVING

An SSB signal produces a fluttering and unintelligible sound when receiving in the AM mode. In such a case, use either the LSB or USB mode and adjust the Clarifier for intelligibility. You can tune AM signals when the Mode Switch is in the LSB or USB position, tune the Clarifier to eliminate the steady tone caused by the AM carrier ("zero-beat" the tone so it disappears). When receiving an extremely strong signal, you will find it best to use the RF Gain Control to vary the volume (rather than using the Volume Control).

GENERAL TRANSMITTING INSTRUCTIONS

Make sure that the proper connections have been made on the power cable, antenna system and microphone, and the correct cable has been used. Be sure that the transceiver is properly grounded (if not mounted directly to a metal surface). To transmit, (after all controls are preset for receive), hold and press the microphone "push-to-talk switch". Hold the microphone about 5-10 centimeters from your mouth and speak in a normal tone of voice. Release the "push-to-talk switch" to receive.

SPECIFICATIONS

Receiver Section

Receiving System	Single conversion superheterodyne for SSB and AM
Sensitivity	AM : 0.5 μ V for 10dB S+N/N SSB: 0.3 μ V for 10dB S+N/N
Bandwidth	4.5KHz @ -6dB down with monolithic crystal filter
Image Rejection	80dB
Audio Output Power	2 Watts (Ext)
Intermediate Frequency	11.275MHz

Transmitter Section

SSB Generation	Double balanced modulator with monolithic crystal filter
AM Modulation	Low level (driver and pre-driver) class B
Frequency Response	400Hz to 2,500Hz
RF Output Power	SSB: 12Watts PEP, AM: 4Watts
Harmonic Suppression	65dB down

General

Power Source	13.8V DC (11.6 - 15.6)
Speaker	3" 8 ohms
Circuitry	29 transistors, 4 FET's, 69 diodes, 5 IC's, 2 LED's
Frequency Control	Phase Locked Loop synthesizer
Channels	40 channels
Dimensions	150mm(W) x 55mm(H) x 190mm(D)
Weight	Main unit: 1.4Kgs

NOTE: Improvements may result in features or specifications change without notice.

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