

MIDLAND
INTERNATIONAL®



MODEL 13-976

23 CHANNEL BASE/MOBILE TRANSCEIVER

OWNER'S GUIDE

SYNTHESIZED, AM, USB AND LSB ON ALL 23 CHANNEL TRANSCEIVER



FEDERAL COMMUNICATIONS COMMISSION'S REQUIREMENTS

Your new Midland 13-976 is a combination receiver-transmitter designed, built, and F. C. C. type accepted for licensed Class D operation on any of the 23 frequencies designated as citizens band channels by the Federal Communications Commission. You are required to read and understand Part 95 of the F. C. C. rules and regulations prior to operation of this unit. Part 95 regulations are available from the Superintendent of Documents, Government Printing Office, Washington D. C. 20402. You are also required to complete F. C. C. form 505 and submit it to the F. C. C. in order to receive your license to operate this unit. F. C. C. regulations will be violated if you transmit with this unit prior to receipt of your license.

NOTE: The technical information, diagrams, and charts provided in this manual are supplied for the use of a qualified holder of a first or second class radiotelephone license in servicing this transceiver. It is the user's responsibility to see that this unit is operating at all times in accordance with the F. C. C. Citizens Radio Service regulations.

If you install or service your own transceiver, do not attempt to make any transmitter tuning adjustment. Transmitter adjustments are prohibited by the F. C. C. unless you hold a first or second class radiotelephone license or are in the presence of a person holding such a license. A Citizens Band or Amateur license is not sufficient.

When service is performed by an authorized and licensed person, care must be taken in the replacement of parts to use only authorized parts, in order not to void the type acceptance of this model.

Midland International Corporation, Communications Division, hereby certifies that this unit has been designed, manufactured and F. C. C. type accepted in accordance with Vol. 6, Part 95 of the current F. C. C. rules and regulations as of the date of manufacture.

OWNERS GUIDE

Your 13-976 is a versatile, professional quality transceiver and we strongly suggest that you read this Owners Guide carefully before operation so that you may receive full benefit from its many features.

WARNING: To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

SINGLE SIDEBAND

SSB (Single Sideband) is relatively new in Citizens Band Communications but has been highly effective in commercial amateur and military usage for many years. It is a superior means of wireless communications allowing transmissions of greater distances with a minimum amount of interference and noise.

There are two types of single sideband transmissions, USB (Upper Sideband) and LSB (Lower Sideband). These might be described as half signals and due to the narrow band-width required, will travel over greater distances at lower power than ordinary AM signals. Figure 1 below illustrates USB and LSB signals and the reference carrier line.

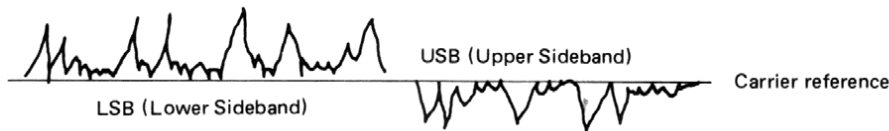


Figure 1

In the actual transmission of either USB or LSB, the carrier is removed. All of the modulation for a transmission is concentrated in either the Upper or the Lower sideband. In the receiver, the carrier is reconstructed and the intelligence or modulated voice is then detected, amplified and converted into an audible sound heard at the speaker.

AM (Amplitude Modulation) has been the standard method of Citizens Band Class D service and transmission for many years and most of the existing transceivers being used today are AM. Technically, Amplitude Modulation is Double Sideband (DSB). In this method of operation, a carrier is transmitted which is modulated or interrupted by voice on both positive and negative sides as represented by figure 2.

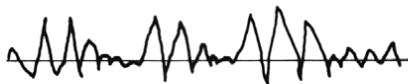
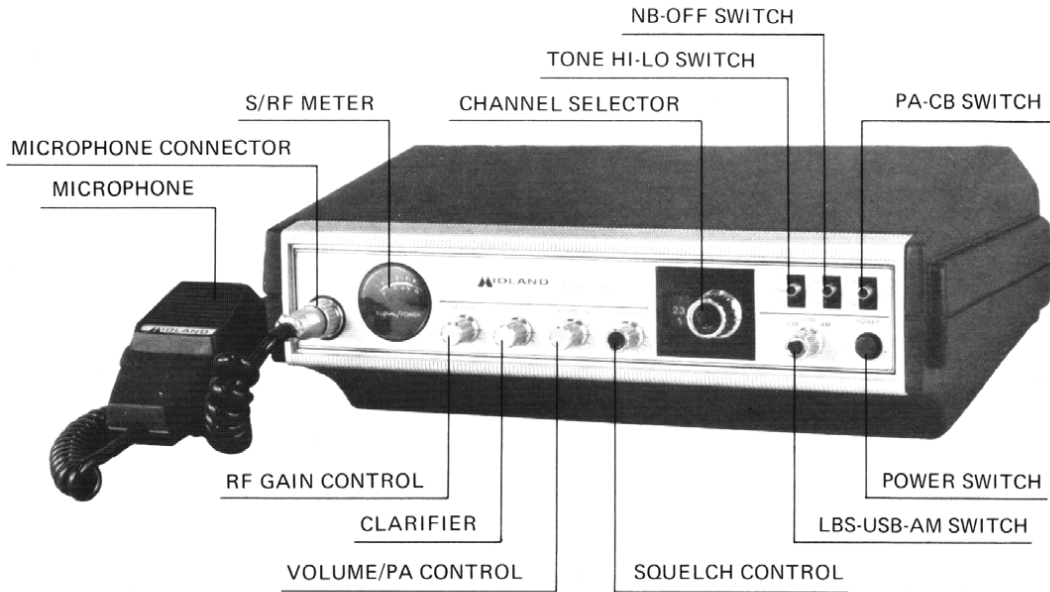


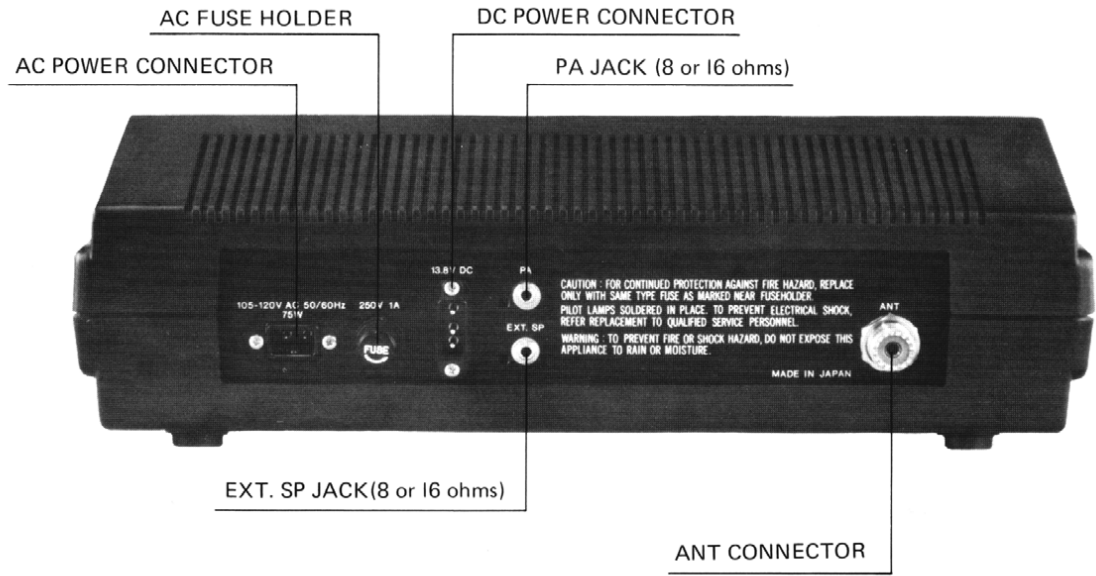
Figure 2

COMPATIBILITY

The '13-976 is designed to be completely compatible with all current modes of Class D operation, including single sideband, (upper or lower), double sideband, or conventional AM and is equipped with separate transmitter circuitry to provide high level AM (Amplitude Modulated) transmissions and True SSB (Single Sideband) transmissions. The receiver section is also capable of receiving AM and SSB. The mode of operation for both receiver and transmitter sections is automatically selected by the mode selector switch.

OPERATION OF CONTROLS





CLARIFIER

When receiving SSB signals, adjust the CLARIFIER knob carefully and fix at such a position where the incoming signal can be heard most clearly. Because of the characteristics of an SSB signal, it is extremely important to adjust this control. With improper CLARIFIER adjustment, the signal will not be intelligible. The sound will be distorted. SSB tuning will become easy as you acquaint yourself with the operation of this control. After adjusting it to clarify once, no adjustment is needed if you stay on the same mode and channel, receiving the same station.

VOLUME/PA CONTROL

This controls the sound output from the speaker when receiving or from the public address (PA) speaker connected to the PA jack on the rear panel. The volume control does not affect transmitting output.

POWER SWITCH

This turns the power on or off.

SQUELCH CONTROL

Turning the control clockwise quiets the receiver when signals are not being received and allows a quiet standby operation. It functions only in the receive mode and does not affect the receiver volume when signals are being received.

To adjust, when no signals are present, rotate the squelch control clockwise until the receiver is quieted. Incoming signals will automatically release the squelch. Careful adjustment is necessary as a setting too far to the right will not allow weaker signals to release the squelch.

LSB-USB-AM SWITCH

Controls the mode of operation for the transmitter and receiver simultaneously and allows selection of conventional AM operation or SSB operation on either upper or lower side band. In order to communicate with another transceiver, you must use the same operating mode.

CHANNEL SELECTOR

This controls both transmitter and receiver frequencies simultaneously and may be set to any of the 23 channel positions indicated. All necessary crystals are supplied for full 23 channel operation.

RF GAIN CONTROL

Controls RF gain when receiving. To increase RF gain (reception sensitivity) turn the knob to the clockwise direction and to decrease counter-clockwise direction.

PA-CBSWITCH

This transceiver may also be used as a PA (Public Address) amplifier by placing the switch in the PA position and connecting a suitable 8 or 16 ohms PA speaker to the "PA" jack on the rear panel. Press the Push-to-Talk bar on the microphone and speak at the microphone. Then your voice will be heard from the PA speaker.

For regular 2-way communications, the switch must be placed in the "CB" position.

NB-OFF SWITCH

The NB (Noise Blanker) is a circuit designed to reduce impulse noises such as ignition noise from vehicles, etc., without significantly affecting the basic sensitivity of the receiver.

TONE HI-LO SWITCH

This is a two-step tone control. Placing the switch in the “HI” or “LO” position boosts treble or bass sound, respectively.

S/RF METER

This gives the relative strength of incoming signals when receiving and RF power output when transmitting.

MIC JACK

This accepts the plug from the microphone supplied with the unit.

ANT CONNECTOR

Used for antenna connection, matches PL-259 standard type.

EXT.SP JACK

Used for a connecting external speaker (8 or 16 ohm).

This jack accepts a standard (3.5 mm ϕ) 2 circuit phone plug. When the plug is inserted into the jack, the built-in speaker is automatically disconnected.

PA JACK

This will be used for connection of PA speaker (8 or 16 ohms), see “PA-CB” switch in this manual. This jack accepts a standard (3.5 mm ϕ) 2 circuit phone plug.

AC POWER CONNECTOR

AC power for the transceiver supplied through this socket, using the AC power cable supplied.

DC POWER CONNECTOR

Used for connection of DC power cord supplied with the unit.

MOBILE INSTALLATION

Safety and operating convenience are the primary factors to consider when mounting any piece of equipment in an automobile. Be sure that the transceiver controls may be easily reached by the operator. Also be sure that connecting cables do not interfere with the operation of the brake, accelerator, etc.

ANTENNA CONNECTION

Any Citizens Band beam, dipole, ground plane or vertical antenna may be used. A ground plane type antenna will provide good coverage, and since it is essentially non-directional, it is ideal in base station to mobile operation. From base station to base station or point-to-point operation a directional beam will give greater distance even under adverse conditions. The range of the transceiver also depends on the height of the antenna so whenever possible, select the highest location within F. C. C. limits.

A vertical whip antenna is best suited for mobile operation. A non-directional antenna should be used for best results in any case. The base-loaded whip antenna will normally provide effective communication or for greater range and more reliable operation a full quarter-wave whip may be used. Either of these antennas use the metal car body as a ground plane and the shield of the base lead as well as the metal case of the transceiver should be grounded. A standard antenna connector (type SO-239) is provided on the transceiver for easy connection to a standard PL-259 coax plug. Following the antenna manufacturer's instructions carefully will insure proper operation.

Whatever the type of antenna selected, it is important that it be properly adjusted and matched and the connecting transmission line be in good condition so as to avoid a high VSWR (voltage standing wave ratio). A VSWR over 3.5 results in reduced radiated power and may cause instability and damage to the final output stage of the transceiver.