

## OWNERS MANUAL

120 CHANNEL AM/USB/LSB MOBILE  
10 CHANNEL WEATHER BUREAU RECEIVER  
DETACHABLE LCD CONTROL PANEL WITH MEMORY  
BATTERY BACK-UP BUILT IN  
**MODEL 79-290**

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## SPECIFICATIONS (CB)

### GENERAL

Channels	40 CH/AM//USB/LSB (120 ch. total)
Frequency Range	26.965 + 27.405 CB
Frequency Control	Phase Lock Loop (PLL) synthesizer
Frequency Tolerance	0.005%
Frequency Stability	0.001%
<b>Operating Temperature</b>	
Range	-20° C to + 50° C
Microphone	Plug-in dynamic; with push-to-talk switch and co
Input Voltage	13.8 V DC nominal, 15.9 max., 11.2 V min ( negative ground)

## TRANSMITTER

Power Output	AM 4 Watts SSB 12 Watts PEP
Modulation	AM/SSB
Intermodulation Distortion	SSB 3 <sup>rd</sup> order, more than -25 dB 5 <sup>th</sup> order, more than -35 dB
SSB Carrier Suppression	55 dB
Unwanted Sideband	50 dB
Frequency Response	AM 350 to 2500 Hz

## RECEIVER

Sensitivity	.50 uv AM .25 uv SSB
IF Frequency IF	AM/FM: 10.695 MHz 1 <sup>st</sup> IF, 455 kHz 2 <sup>nd</sup> SSB: 10.695 MHz
Adjacent-Channel Rejection	60 dB AM/SSB
Automatic Gain Control (AGC)	Less than 10 dB change in audio output for inputs from 10 to 100.000 microvolts
Squelch Adjustable;	threshold <.50 uv tight 1000 uv
Audio Output Power	4 watts into 8 ohms

## *WEATHER RECEIVER*

Channels			
1 162.550	2 162.400	3 162.475	4 162.425
5 162.450	6 162.500	7 162.525	
8 161.550	9 161.775	10 163.275	

\*All specifications subject  
to change without notice

Your new Midland model 79-290 represents cutting edge technology in the communications field. From its high tech detachable control panel to finned cast aluminum transmitter heatsink it incorporates features found on no other CB. These features include full surface mount technology, fiberglass printed circuit board, dual power output stage, and a digital information screen using a black matrix LCD (liquid crystal display). All the features are under microprocessor control for increased function and reliability. Your Midland 79-290 assures you of having the ultimate technology in a CB radio.

## INSTALLATION

### LOCATION

Plan the location of the transceiver and microphone bracket before starting the installation. Select a location that is convenient for operation and does not interfere with the driver or passengers in the vehicle. The units location must not interfere with airbag operation. In automobiles, the transceiver is usually mounted below the dash panel, with the microphone bracket beside it.

### MOUNTING THE RADIO

The transceiver is supplied with a universal mounting bracket. When mounting the bracket and radio to your car, make sure it is mechanically strong. Also provide a good electrical connection to the chassis of the vehicle. Proceed as follows to mount the transceiver:

1. After you have determined the most convenient location in your vehicle, hold the transceiver with mounting bracket in the exact location desired. If nothing will interfere with mounting it in the desired position, remove the mounting bolts. Before drilling the holes, make sure nothing will interfere or be damaged by the installation of the mounting bolts.
2. Connect the antenna cable plug to the standard receptacle on the rear panel. Most CB antennas are terminated with a type PL 259 plug and mate with the receptacle.
3. Connect the red DC power input wire (with the fuse) to +13.8 Vdc. This wire extends from the rear panel. In automobile installation, +13.8 Vdc is usually obtained from the accessory contact on the ignition switch. This prevents the set being left on accidentally when the driver leaves the car, and also permits operating the unit without the engine running. Locate the accessory contact on most ignition switches by tracing the power wire from the AM/FM radio in the car. The AM/FM radio power circuit generally has noise filtering built-in, making it a good place to connect your CB.
4. Connect the black lead to +13.8 Vdc. This is usually the chassis of the car. Any convenient location with good electrical contact (remove paint) may be used.
5. Mount the microphone bracket on the right side of the transceiver or near the transceiver, using two screws supplied. When mounting in an automobile, place the bracket under the dash so the microphone is readily accessible.

### IGNITION NOISE INTERFERENCE

Use of a mobile receiver at low signal levels is normally limited by the presence of electrical noise. The primary source of noise in automobile installations is from the vehicle itself. If the CB operates quietly with the car motor turned off it's most likely that the car electrical system is generating noise. In some installations ignition interference may be high enough to make good communications impossible. The electrical noise may come from several sources. Many possibilities exist and variations between vehicles require different solutions to reduce the noise.

## ANTENNA

Mobile whip antennas utilize the metal body of the vehicle as a ground plane. When mounted at a corner of the vehicle they are slightly directional, in the direction of the body of the vehicle. For all practical purposes, however, the radiation pattern is nondirectional. The slight directional characteristic will be observed only at extreme distances. A standard antenna connector (type SO 239) is provided on the transceiver for easy connection to a standard PL 259 cable termination.

If the transceiver is not mounted on a metal surface, it is necessary to run a separate ground wire from the unit to a good metal electrical ground in the vehicle. When installed in a boat, the transceiver will not operate at maximum efficiency without a ground plate, unless the vessel has a steel hull.

Before installing the transceiver in a boat, consult your dealer for information regarding an adequate grounding system and prevention of electrolysis between fittings in the hull and water.

## TUNING THE ANTENNA FOR OPTIMUM SWR

Since there is such a wide variety of base and mobile antennas, this section will strictly concern itself to the various types of mobile adjustable antennas.

Because the antenna length is directly related to the channel frequency, it must be tuned to resonate optimally all 40 channels of the transceiver. Channel 1 requires a longer antenna than Channel 40 because it is lower in frequency.

Due to the various methods of adjusting antennas for proper SWR we have chosen what we think is the optimum method:

### A. Antennas with adjustment screws (set screws).

1. Start with the antenna extended and tighten the set screw lightly enough so that the antenna can be easily shortened by hand for easy adjustment.

2. Set your transceiver to Channel 20. Press the PTT (push-to-talk) switch, and move the antenna down. The SWR meter will show a lower reading each time the

antenna is shortened. By continuing to shorten the antenna you will notice the SWR reading will reach a low point and then start rising again. This means that you have passed the optimum point for Channel 20. Extend the antenna a short distance and again follow the procedure above.

- B. Antennas which must be cut to proper length.
  - 1. Follow the same procedure as above, but adjust the length by cutting 1/4 in. increments until a good match is obtained.
  - 2. Be very careful not to cut too much at a time, as once it is cut, it can no longer be lengthened.
  - 3. The whip is easily cut by filing a notch all the way around and breaking the piece off with pliers.

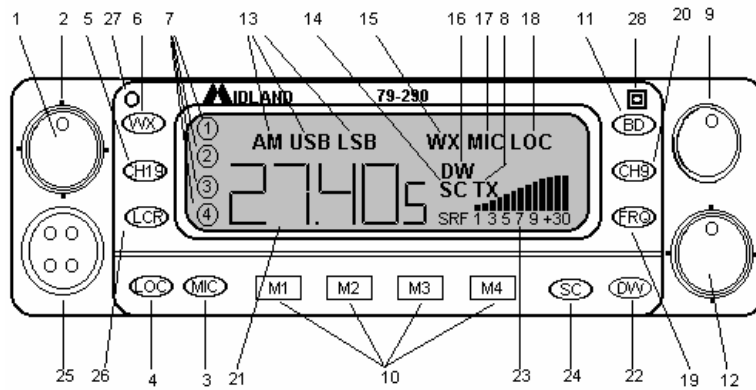
If you are having difficulties in adjusting your antenna, check the following:

- A. All doors must be closed when adjusting the antenna.
- B. Make sure the antenna base is grounded.
- C. Check your coaxial cable routing (it may be pinched when routed into the car).
- D. Try a different location on your car (keeping in mind the radiation pattern you wish).
- E. Is the antenna perfectly vertical?
- F. Try a different location in your neighborhood. Stay away from large metal objects when adjusting (metal telephone posts, buildings, or fences).

**WARNING:** The transmitter may be damaged if operated into a bad antenna system. When adjusting antenna only operate the transmitter as short a time as possible.

### External Speaker

The external speaker jack (EXT. SPK.) on the rear panel is used for remote receiver monitoring. The external speaker should have 8 ohms impedance and be able to handle at least 4 watts. When the external speaker is plugged in, the internal speaker is disabled.



## FRONT PANEL DRAWING

**1. ON/OFF VOLUME (inner dual concentric).** Turn clockwise to apply power to the unit and to set the desired listening level. During normal CB operation, the VOLUME control is used to adjust the output level obtained either at the transceiver speaker or the external speaker, if used.

**2. SQUELCH (outer dual concentric).** This control is used to cut off or eliminate receiver background noise in absence of an incoming signal. For maximum receiver sensitivity it is desired that the control be adjusted only to the point where the receiver background noise or ambient background noise is eliminated. Turn fully counterclock-wise then slowly clockwise until the receiver noise disappears (with car engine running). Any signal to be received must now be slightly stronger than the average received noise. Further clockwise rotation will increase the threshold level which a signal must overcome in order to be heard. Only strong signals will be heard at a maximum clockwise setting.

**3. MIC BUTTON:** Adjusts the microphone power in the transmit mode. This is a push on-push off switch. When the MIC symbol is visible in the LCD screen it indicates a reduced microphone power level. This mode is useful when operating in a high noise environment.

**4. LOC BUTTON.** To be used to reduce the gain of the RF amplifier under strong signal conditions. This is a push-push switch. When the "LOC" indicator is visible in the LCD screen the receiver is in the local mode (short range). Normally the unit would be operated in the distant mode (long range) with the "LOC" disabled.

**5. CH 19 BUTTON.** Press this button for instant selection of highway channel 19. The channel or frequency display flashes channel 19 when instant channel 19 is selected. The rotary channel selector is bypassed when the CH19 button is activated. Press the CH 19 button again to return to normal channel selection.

**6. WX BUTTON.** Press this button for instant selection of the NOAA weather bureau or Canadian receiver. Select the proper channel, with the rotary channel selector, for your area. It is normal to hear the same information on more than one channel, select the channel with best sound. To return to CB operation, push the WX button again.

**7. MEMORY CHANNEL INDICATOR.** LCD indicator showing which memory channel has been selected (1 - 4).

**8. TX INDICATOR.** This indicator on the LCD screen will be illuminated when the unit has been set in TX mode.

**9. CHANNEL SELECTOR.** This switch selects any one of the forty Citizens Band channels desired. The selected channel or frequency appears on the LCD readout. The channel selector is bypassed and will not operate when instant channel 9 or 19 has been selected.

**10. M1-M4 BUTTONS.** These 4 buttons are used to enter and select the 4 memory channels. To set channels in the memory, select the desired channel for M1, press and hold the "M1" button until a second beep is heard and the memory channel indicator lights. Your selected channel is now entered at M1. Repeat the above operation for M2 through M4. To recall a memory channel just press the the "M" button.

**11. BD BUTTON (Band Button).** This button is used to select the LSB, USB, AM, mode of operation. Unless the station with which communication is desired is equipped with SSB, the AM mode is normally used. The band "BD" button changes the mode of operation of both transmitter and receiver simultaneously. Turn to "Receiving SSB signals" for a further explanation of single sideband. Continued pressing of the band button causes the unit to keep switching between AM/LSB/USB as indicated by the LCD screen.

**12. CLARIFIER.** This control allows variation of the receiver operating frequencies above and below the assigned frequency. Although this control is intended primarily to tune in SSB signals, it may be used to optimize AM and WX signals as described in the Operating Procedure paragraphs.

**13. BAND INDICATOR.** LCD indication of the band selected by using the band switch button.

**14. SC INDICATOR.** LCD indicator showing when the scan mode has been activated.

**15. WX INDICATOR.** LCD indicator showing when the weather receive mode has been selected.



**16. SC INDICATOR.** LCD indicator showing when the scan mode is activated.

**17. MIC INDICATOR.** LCD indicator showing when the low power microphone mode has been selected.

**18. LOC INDICATOR.** Indicates the local mode of receive has been selected.

**19. FRQ BUTTON.** Pressing this button causes the LCD to switch between channel and 5 digit frequency display.

**20. CH 9 BUTTON.** Pressing this button causes instant selection of emergency channel 9. The LCD display of channel/frequency will flash when instant channel 9 is activated. Other keypad and selectors are disabled when instant channel 9 is selected.

**21. CHANNEL/FREQUENCY INDICATOR.** Displays either the selected channel (CB or weather) or frequency in Mhz (CB only). The indicator is toggled between channel number or frequency by pressing the "FRQ" button.

**22. DW BUTTON.** Pressing this button allows you to monitor 2 channels at the same time. To use this feature select the first channel you wish to receive, adjust the squelch until background noise is muted, and press the DW (dual watch) button. While the DW is still flashing on the LCD screen select the second channel you wish to monitor and press the DW button again. Your radio now toggles between the 2 selected channels until a signal is heard. When a signal is heard the radio will stop on the channel to allow you to listen, and will remain on the channel 10 seconds after the signal disappears to allow answering of the received call. To exit the dual watch mode press the "DW" button again.

**23. SRF METER DISPLAY.** In the receive mode the LCD indicator shows the relative incoming signal strength ("s" units). The stronger the received signal the more segments will light. In the transmit mode the display will activate according to the transmitter power. If the meter activates less than half scale it can indicate an antenna problem.

**24. SC BUTTON.** This button activates the scan operation. To operate scan adjust the squelch until the background noise is muted. Press the "SC" button, the unit will begin rapidly scrolling through the channels until a signal is heard. The unit will remain stopped on the last active channel 10 seconds after the signal disappears to allow time for the user to answer the message. To exit scan press the "SC" button again.

**25. MICROPHONE CONNECTOR.** Connection for the microphone. Plug the microphone into the connector and securely tighten the outer threaded sleeve.

#### PRESS-TO-TALK MICROPHONE

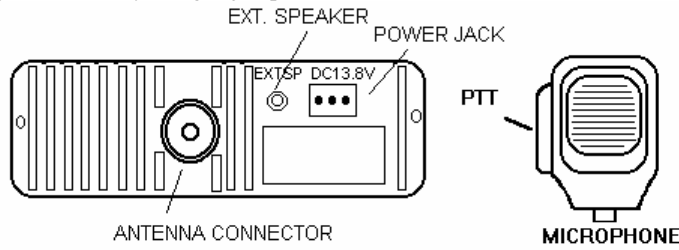
The receiver and transmitter are controlled by the press-to-talk switch on the microphone. Press the switch and the transmitter is activated, release switch to receive. When transmitting, hold the microphone 2 in. from the mouth and speak clearly in a normal "voice". The radio comes complete with a low-impedance (500 ohm) dynamic microphone.

**NOTE:** The receiver audio will not function unless the microphone is connected

**26. LCR BUTTON.** Pressing this button causes the unit to revert to the previously selected channel.

**27. TX INDICATOR.** This lamp glows red when the transmitter has been activated.

**28. CONTROL PANEL RELEASE BUTTON.** Pressing this button causes the front panel to unlock for removal. Always use care when removing or replacing the control panel. **NOTE:** Before removing the front panel turn the power off. To replace the panel insert the left edge first and slowly push the panel in place until locked. Due to the microprocessor control, at rare times errors may occur in the display or the display may become blank. Usually these errors can be cleared by removing and replacing the control panel. If necessary the display may be manually reset by removing the control panel and shorting the pins as indicated on the back of the control panel. The pins may be shorted by using a jumper wire or tweezers.



**REAR PANEL DRAWING**

**POWER JACK.** Accepts 13.8 VDC power cable with built-in fuse.

**EXT SP.** Accepts 4 to 8 ohm, 5 watt external speaker. When an external speaker is connected to this jack, the built-in speaker is automatically disconnected.

**ANTENNA.** Accepts 50 ohm coaxial cable with a type PL-259 plug.

#### OPERATING PROCEDURE TO RECEIVE

1. Be sure that power source, microphone and antenna are connected to the proper connectors before going to the next step.
2. Turn unit on by turning the VOL control clockwise on your transceiver.
3. Set the VOLUME for a comfortable listening level.
4. Set the "BD" button to the desired mode (AM/USB/LSB).
5. Listen to the background noise from the speaker. Turn the SQUELCH control slowly clockwise until the noise JUST disappears (no signal should be present). Leave the control at this setting. The SQUELCH is now properly adjusted. Do not advance the control too far, or some of the weaker signals will not be heard.
6. Set the CHANNEL switch to the desired channel.
7. Set the "LOC" button off for maximum RF gain.
8. Adjust the CLARIFIER control to clarify the SSB signals or to optimize AM/WX signals.

#### **OPERATING PROCEDURE TO TRANSMIT**

1. Select the desired channel of transmission.
2. Set the "MIC" button to off for microphone high power.
3. If the channel is clear, depress the push-to-talk switch on the microphone and speak in a normal voice.

#### **RECEIVING SSB SIGNALS**

There are 3 types of signals presently used for communications in the Citizens Band: AM, USB, and LSB. When the MODE switch on your unit is placed in the AM position, only standard double-sideband, full carrier signals will be detected. An SSB signal may be recognized while in the AM mode by its characteristic "Donald Duck" sound and the inability of the AM detector to produce an intelligible output. The USB and LSB modes will detect upper sideband and lower sideband respectively, and standard AM signals. SSB reception differs from standard AM reception in that SSB receiver does not require a carrier or opposite sideband to produce an intelligible signal. A single-sideband transmitted signal consists only of the upper or the lower sideband and no carrier is transmitted. The elimination of the carrier from the AM signal helps to eliminate the biggest cause of whistles and tones heard on channels which make even moderately strong AM signals unreadable. Also, SSB takes only half of an AM channel, therefore two SSB conversations will fit into each channel, expanding the 40 AM channels to 80 SSB channels. The reduction in channel space required also helps in the receiver because only half of the noise and interference can be received with 100% of the SSB signal.

An SSB signal may be received only when the listening receiver is functioning in the same mode. In other words, an upper sideband signal (USB) may be made intelligible only if the receiver is functioning in the USB position.

If a lower sideband (LSB) signal is heard when the receiver is in the USB mode, no amount of tuning will make the signal intelligible. The reason for this may be understood if you consider that when modulation is applied to the transmitter's microphone in the USB mode, the transmitter's output frequency is increased whereas in the LSB mode the transmitter's output frequency is decreased. The result in listening to the receiver is that when the "BD" is in the proper mode (either USB, or LSB), a true reproduction of single tone of modulation will result, and if the tone is increased in frequency (such as a low-pitched whistle or a high-pitched whistle) you will hear the increase in the output tone of the receiver. If the incorrect mode is selected, an increase in tone of a whistle applied to the transmitter will cause a decrease in the resultant tone from the receiver.

Thus when a voice is used in place of a whistle or tone, in the proper listening mode the voice will be received correctly whereas in the incorrect mode, the voice will be translated backwards and cannot be made intelligible by the voice lock control. When listening to AM transmission, a correct sideband is heard in either mode since both upper and lower sideband are received.

Once the desired SSB mode has been selected, frequency adjustment may be necessary in order to make the incoming signal intelligible, the CLARIFIER control allows the operator to vary frequency above and below the exact-center frequency of the received signal. If the sound of the incoming signal is high or low pitched, adjust the operation of the CLARIFIER. Consider it as performing the same function as a phonograph speed control. When the speed is set too high, voices will be high-pitched and if set too low, voices will be low-pitched. Also, there is only one correct speed that will make a particular record produce the same sound that was recorded. If the record is played on a turntable that rotated in the wrong direction (opposite sideband) no amount of speed control (CLARIFIER) will produce an intelligible sound. An AM signal received while listening in one of the SSB modes will produce a steady tone (carrier) in addition to the intelligence, unless the SSB receiver is tuned to exactly the same frequency by the CLARIFIER control.

#### TO RECEIVE WEATHER

Press the WX button and select the desired channel for your area. The squelch and scan functions do not operate in the weather mode.

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#### LIMITED WARRANTY.

Midland Consumer Radio will repair or replace, at its option without charge, any Midland Mobile, Base Station, or full power Hand-Held Citizens Band transceiver

which fails due to a defect in material or workmanship within one year following the initial consumer purchase.

This warranty does not include any carrying cases, earphones, or telescoping antennas which may be a part of or included with the warranted product, or the cost of labor for removal or re-installation of the product in a vehicle or other mounting.

Performance of any obligation under this warranty may be obtained by returning the warranted product, freight prepaid, along with proof of purchase date, to Midland Consumer Radio, Warranty Service Department 1670 North Topping, Kansas City, Missouri 64120, or to any "Midland Authorized Warranty Service Station," or to the place of purchase (if a participating dealer).

Warranty information and the location of the nearest "Midland Authorized Warranty Service Station," may be obtained by writing Midland Consumer Radio, Warranty Service Department.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**Note:** The above warranty applies only to merchandise purchased in the United States of America or any of the territories or possessions or from a U.S. military exchange. For warranty coverage on merchandise purchased elsewhere, consult the supplemental warranty information included with this product or ask your dealer.

## **SERVICE**

If it ever becomes necessary to return your unit for service:

Pack the unit in its original box and packing. Improper packing may result in damage during shipment.

Include a full description of any problems. Include your telephone number.

You do not need to return accessory items (brackets, screws, power cord, antenna, etc.) unless they may be directly related to the problem.

Include a photocopy of the bill of sale or other proof of purchase showing the date of sale. This information must be included before warranty service can be considered.

## **MIDLAND**

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