MIDLAND LMR
LAND MOBILE RADIO

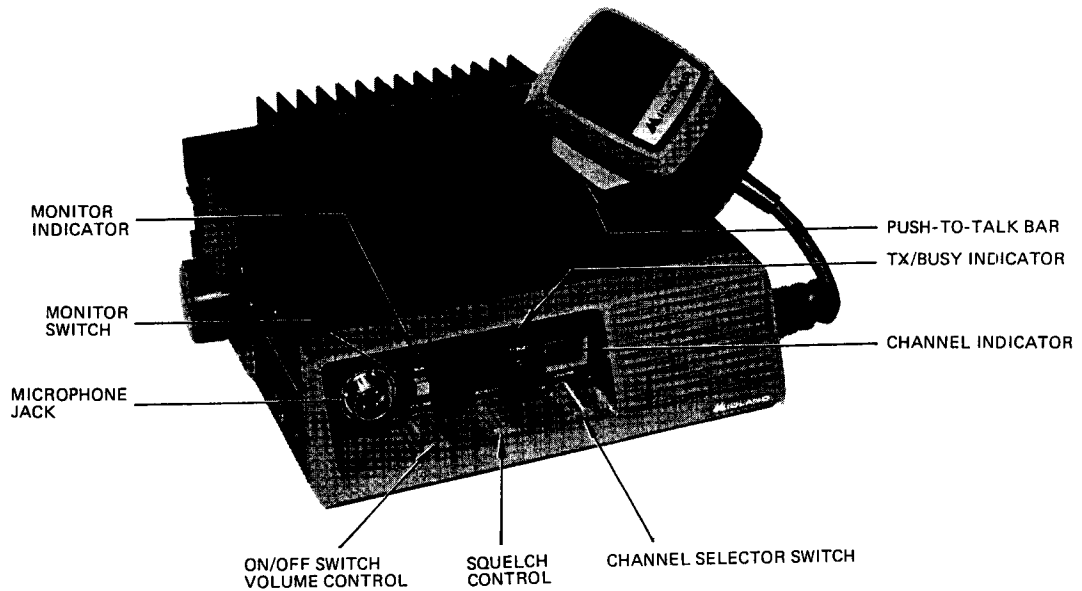# SYN-TECH ™
Synthesized Radio.

2-Way FM Communications
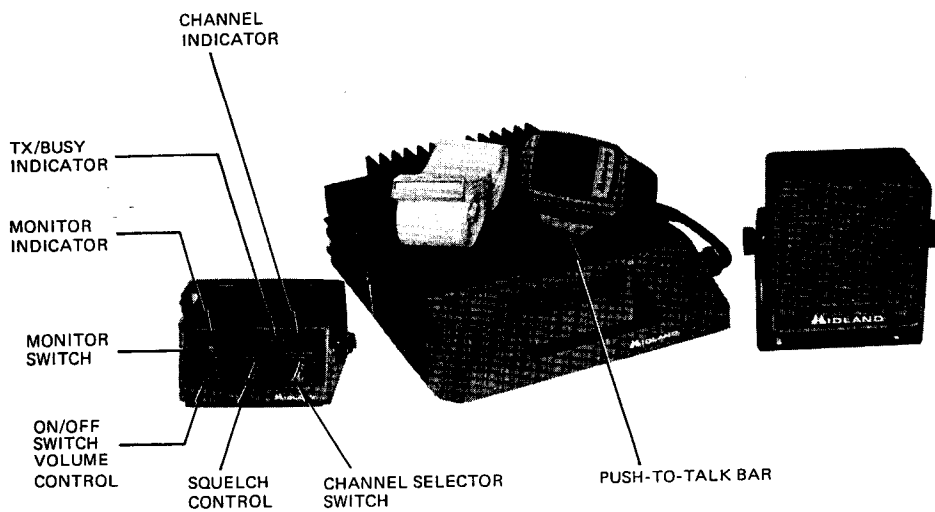
OPERATOR'S MANUAL

DESCRIPTION

This manual furnishes operator information for the Midland SYN-TECH line of FM transceivers in under-dash and trunk-mount configurations.

CONTROLS

Figures 1 and 2 show the operator controls available on the standard SYN-TECH under-dash and trunk-mount transceivers. Refer to the additional figures for optional configurations.

MONITOR INDICATOR

MONITOR SWITCH

MICROPHONE JACK

PUSH-TO-TALK BAR

TX/BUSY INDICATOR

CHANNEL INDICATOR

ON/OFF SWITCH VOLUME CONTROL

SQUELCH CONTROL

CHANNEL SELECTOR SWITCH

FIG. 1   UNDER-DASH UNITS

CHANNEL INDICATOR

TX/BUSY INDICATOR

MONITOR INDICATOR

MONITOR SWITCH

ON/OFF SWITCH VOLUME CONTROL

SQUELCH CONTROL

CHANNEL SELECTOR SWITCH

PUSH-TO-TALK BAR

FIG. 2   TRUNK-MOUNT UNITS

OPERATION (STANDARD UNIT)

TO TURN THE UNIT ON

Apply power to the transceiver by rotating the combined ON-OFF and VOLUME control clockwise unitil a click is heard. The LED channel display will illuminate, indicating the selected channel. If the radio power source is uninterrupted, the channel in use when the unit is turned off will be displayed at turn on. Display intensity is automatically adjusted to match varying ambient light conditions.

At unit turn-on several unit self tests are performed. A 90 series display and beeping from the unit speaker is indication of an error condition. If the error indications continue after turning the unit off and back on, return the unit to your dealer for service.

NOTE: To insure frequency stability within specification limits, do not transmit for at least one minute after unit turn-on when operating at –30 degrees Centigrade (–20 Fahrenheit).

CHANNEL SELECTION

The LED display indicates the selected channel. To change to the next higher numbered channel, rotate the channel selector to the right against the stop and release. To skip over several channels, rotate against the stop and hold until the desired channel is reached. To change to lower numbered channels, rotate the channel selector to the left in the same manner. When the end of the programmed channels is reached, rollover to the beginning channel is automatic.

TO RECEIVE (CARRIER SQUELCH UNITS)

1. Turn the Squelch control fully counterclockwise.
2. Adjust the VOLUME control to a comfortable listening level.
3. With no received signal, adjust the SQUELCH control by turning it slowly clockwise until the noise is just squelched (cuts out).
4. The TX/Busy indicator will glow green whenever a signal is on channel. Adjust the VOLUME control to the desired listening level.

TO RECEIVE (TONE SQUELCH UNITS)

1. Adjust the volume and squelch controls as described for carrier squelch operation.
2. To hear Tone Squelch signals only, set the microphone hang-up box switch to the Tone position, the Radio MON switch to the out position, and place the microphone in the hang-up box.
3. To hear all on-channel signals, depress the MON switch, set the hang-up box switch to OFF, or remove the microphone from the hang-up box.

NOTE: If the selected channel has not been programmed for a tone frequency, carrier squelch operation is automatic.

TO TRANSMIT (CARRIER SQUELCH UNITS)

Remove the microphone from the hang-up bracket. Hold the microphone about one inch

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from the lips and turned about 30 degrees away from the face. Press the Push-To-Talk bar on the microphone. The TX/Busy indicator will glow RED and the radio will transmit a carrier. Speak slowly and clearly across the microphone in a normal or slightly louder-than-normal voice. At the end of the message, release the Push-To-Talk and replace the microphone.

TO TRANSMIT (TONE SQUELCH UNITS)

Lift the microphone out of the hang-up switch box. Listen for other stations which may be transmitting. If signals are heard, wait until the channel is clear before proceeding. Hold the microphone about one inch from the lips and turned about 30 degrees away from the face. Press the Push-To-Talk bar on the microphone. The TX/Busy indicator will glow RED and the radio will transmit a carrier. Speak slowly and clearly across the microphone in a normal or slightly louder-than-normal voice. At the end of the message release the Push-To-Talk bar and replace the microphone. This returns the radio receiver to tone coded squelch operation.

TO TURN THE UNIT OFF
Rotate the ON-OFF/VOLUME counter clockwise until a click is heard.
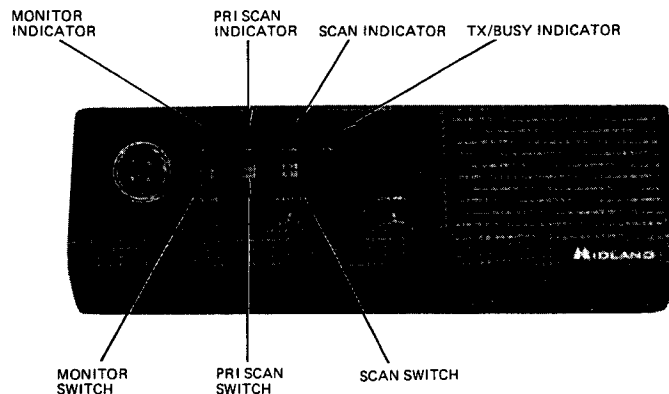
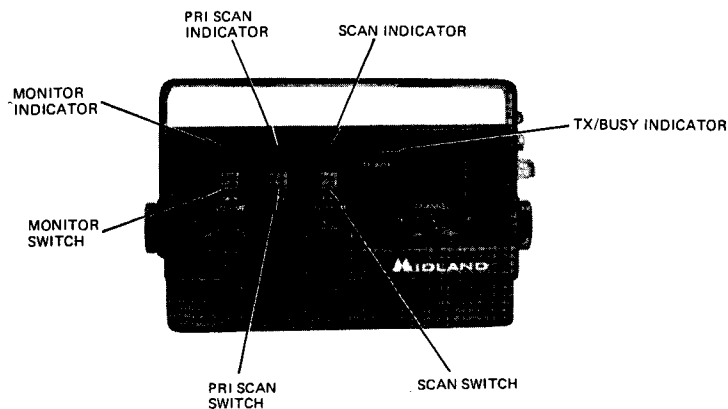### SCANNING UNITS (OPTIONAL)

FIG. 3 UNDER-DASH UNITS

FIG. 4 TRUNK-MOUNT UNITS

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OPERATION

For normal carrier and tone squelch operation, refer to the standard radio operation instructions.

SCAN OPERATION

SYN-TECH Scan operation characteristics are determined when the transceiver is programmed by selecting one of three available scan modes. These three modes are called Normal, Modified and Secondary and are described in detail below. Before operating the transceiver make sure which scan mode has been programmed.

DELETING A SCAN CHANNEL

In all three scan modes, any channel (except the operator-selected priority channel) can be deleted from the scan sequence. When the PRI or SCAN buttons are engaged and the scanner is stopped on a channel, the displayed channel is deleted by rotating the channel selector counterclockwise to the "DN" position and releasing. If the same channel number occurs in both the "A" and "B" scan groups, it will be deleted from both groups. All deleted channels will be returned to the preprogrammed scan groups when the unit power switch is cycled off and on or when both the PRI and SCAN pushbuttons are released. To delete a scan channel while scanning is occurring, turn the SQUELCH control counterclockwise to stop the scan (and press the MON switch on tone-equipped units), rotate the channel selector switch clockwise to the "UP" position and hold until the desired channel number is displayed, then turn the channel selector switch to the "DN" position and release.

NORMAL SCAN MODE

The Normal Scan mode allows scanning of two groups of channels programmed as "A" and "B" groups and selectable by the pushbuttons marked PRI (Scan A) and SCAN (Scan B).

PRI (Scan A) OPERATION

The PRI button activates scanning of all channels programmed in the "A" Scan group while rapidly sampling the PRIORITY channel. (The PRIORITY channel is the channel number selected by the user before the PRI button is pressed and can be any channel programmed in the radio, regardless of whether it is in the "A" Scan group). If the PRIORITY channel is found active when sampled, the scanner locks on the PRIORITY channel and a 2-beep tone alerts the user that the channel being received is the PRIORITY channel. When the PRIORITY channel signal disappears, the scanner waits for a short period then resumes the scan sequence. If the scanner stops on a non-priority channel, the PRIORITY channel is rapidly sampled for activity. If the priority channel becomes active, the scanner alerts the user and locks on the priority channel as described above.

If the microphone is keyed at any time while the PRI button is engaged, the radio will transmit on the PRIORITY channel. When the microphone key is released, the scanner waits on the PRIORITY channel for a short period, then resumes scanning.

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SCAN (Scan B) OPERATION

The SCAN pushbutton activates scanning of all channels programmed in the "B" Scan group without sampling a PRIORITY channel. (The channel displayed when the SCAN button is pressed is not sampled but will cause a beep alert if it is active when scanned. This beep can be eliminated by selecting a channel outside the "B" scan group before engaging the SCAN button). If a scanned channel is found to be active, the scanner will lock on the channel until it disappears. While the scanner is stopped on a channel, keying the microphone will activate the transmitter on the same channel. If the microphone key is pressed after scanning has resumed, the radio will transmit on the last channel on which the scanner was stopped. This allows the operator to reply to a call even though the scan has restarted. When the SCAN switch is released, the radio will return to the last scan stop channel.

PRI plus SCAN OPERATION

When both the PRI and SCAN buttons are pushed in, the A and B group channels are sequentially scanned (A group, then B group, then A, etc.). All Scan A features apply while A group channels are scanned, and Scan B features apply during group B Scan. This is **NOT** a recommended mode of operation since the operator may not know whether Scan A or Scan B type operation is applicable at any given moment.

MODIFIED SCAN MODE

The Modified Scan mode allows scanning of A and B group channels in a manner identical to that of the Normal Scan mode. This mode also provides a crossover mode between the PRI and SCAN types of operation.

PRI (Scan A) OPERATION

Identical to operation described for the Normal mode.

SCAN (Scan B) OPERATION

Identical to operation described for the Normal mode.

PRI plus SCAN OPERATION

When both the PRI and SCAN buttons are pressed, scanning stops on the current scan stop channel (or the last previous scan stop channel if scanning is occurring). There is no PRIORITY channel monitoring and transmit will occur on the displayed channel. This mode is most often used by an operator who wants to answer a call on a non-priority channel while in the PRIORITY scan mode (PRI button engaged). To do this the operator presses the SCAN button and the receiver and transmitter is immediately locked on the calling channel. The operator can also transmit and receive on other channels by manual activation of the channel selector switch. When the SCAN button is released, PRI mode operation is restored with the previously selected PRIORITY channel still applicable.

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SECONDARY SCAN MODE

The Secondary Scan Mode allows scanning of A and B group channels in a manner identical to that of the Normal Scan mode. The Secondary mode also provides the capability of operating on a manually selected SECONDARY channel while monitoring the PRIORITY channel.

PRI OPERATION

PRI operation allows transmit/receive operation on an operator-selected SECONDARY channel with rapid sampling of the operator-selected PRIORITY channel while in the receive mode. The PRIORITY channel is manually selected with the channel selector switch before pressing the PRI button. The SECONDARY channel is then manually selected with the channel selector switch. The PRIORITY and SECONDARY channels may be chosen from any programmed channel whether programmed for scan or not. If the PRIORITY channel becomes active, the receiver switches from the SECONDARY channel to the PRIORTY channel and a 2-beep alert is sounded in the speaker. The receiver stays on the PRIORITY channel for a period after the channel clears. If the microphone key is pressed during this period, transmit occurs on the PRIORTY channel. After the microphone key is released, the receiver stays on the PRIORITY channel for a period of time. If the channel stays clear and the microphone is not keyed during this period, the receiver reverts to the SECONDARY channel. When the PRI button is released, the radio returns to manual operation on the previously selected PRIORTY channel. If the PRI button is re-engaged, the radio goes to the SECONDARY channel.

SCAN (Scan B) OPERATION

Identical to that described for the Normal Scan mode except that the unit reverts to the manually selected channel when the SCAN button is released.

PRI plus SCAN OPERATION

Identical to PRI operation in the Normal mode.

SET SWITCH   CALL LED   HORN ON/OFF SWITCH

FIG. 5   UNDER-DASH UNITS

CALL LED   HORN ON/OFF SWITCH

SET SWITCH
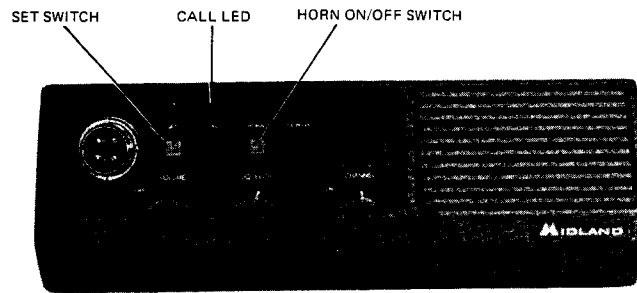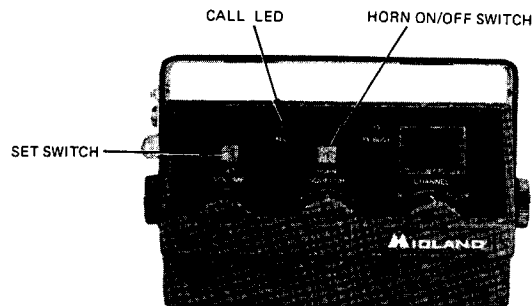
FIG. 6   TRUNK-MOUNT UNITS

OPERATION

For normal carrier and tone squelch operation, refer to the standard radio operation instructions.

TWO-TONE SELECTIVE SIGNALLING OPERATION

Two-tone decoder operation is activated by depressing the unit SET switch. In this condition, the unit remains squelched for all signals except those of the correct channel frequency which are also encoded by the correct two-tone signal. Upon receipt of the correctly encoded signal, the squelch is opened, the CALL light is illuminated, and if the HORN switch is engaged, an external horn or buzzer will be momentarily activated. The CALL light will remain lit to indicate a call has been received. To extinguish the CALL light and reset the system, replace the microphone in the hang-up box.

INSTALLATION

UNDERDASH UNITS

The unit may be mounted in any convenient location using the mounting bracket and hardware provided. The mounting bracket may be positioned under the unit for hump-mount installations. Locate the microphone clip or hang-up box in a location convenient to the user.
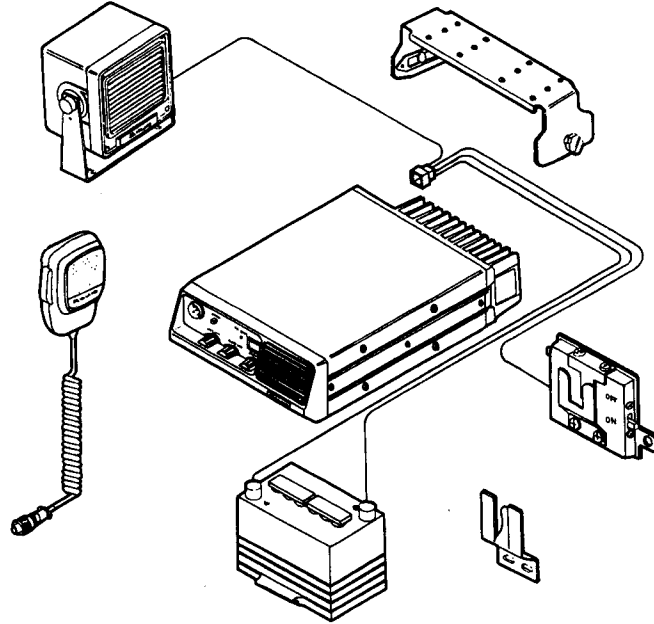

FIG. 7   UNDER-DASH INSTALLATION DIAGRAM

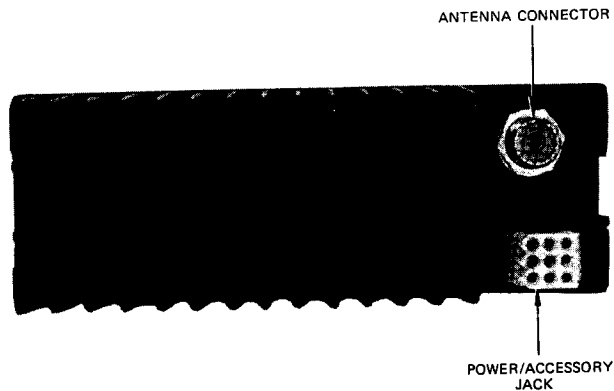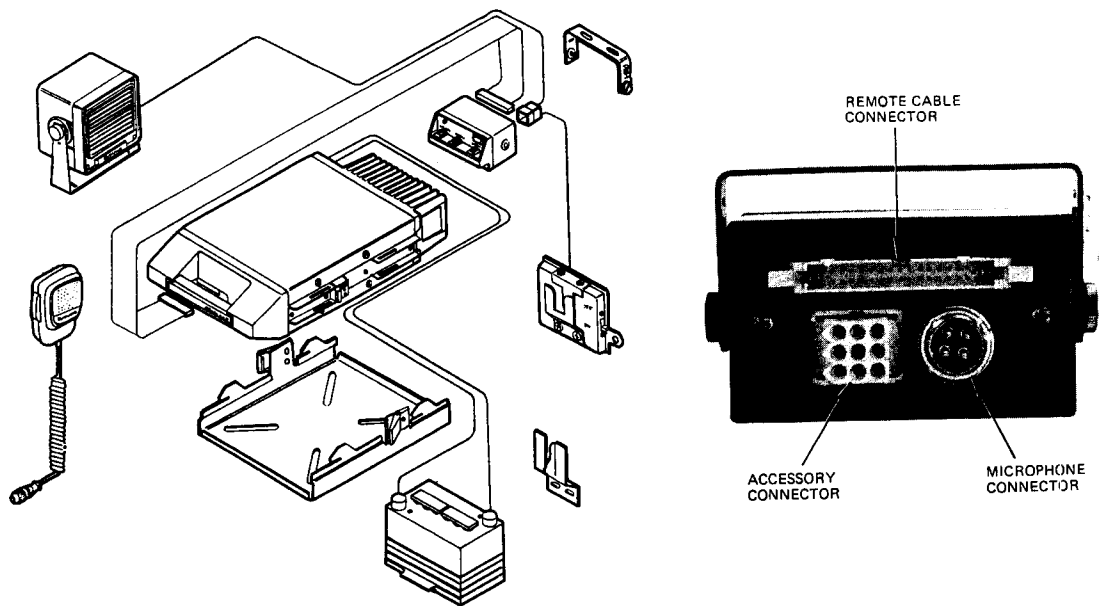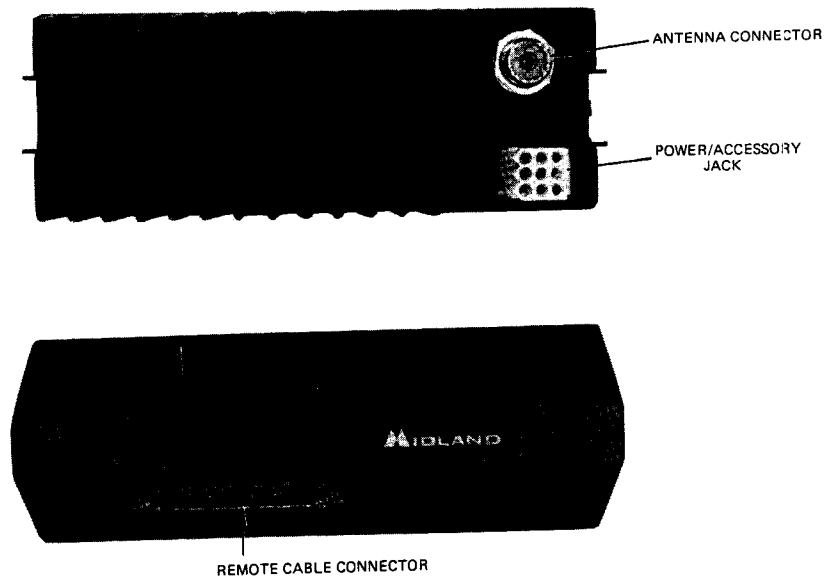
ANTENNA CONNECTOR

POWER/ACCESSORY JACK

FIG. 8   UNDER-DASH UNIT CONNECTOR

TRUNK-MOUNT UNITS

Mount the control head, external speaker and microphone clip or hang-up box in the desired location using hardware provided. Install the unit mounting tray with hardware provided, allowing sufficient room for unit installation and removal. Route the control cable away from sources of damage. The flat cable configuration allows installation under carpeting or floor mats if desired. Mate the control cable ends with the unit and control head, making sure the retaining clips are fully closed.

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FIG. 9 TRUNKMOUNT INSTALLATION DIAGRAM

REMOTE CABLE CONNECTOR

ACCESSORY CONNECTOR

MICROPHONE CONNECTOR

ANTENNA CONNECTOR

POWER/ACCESSORY JACK

REMOTE CABLE CONNECTOR

FIG. 10 TRUNK-MOUNT UNIT CONNECTORS

ALL UNITS

Mount the antenna and route the coaxial cable to the unit. Route the unit power leads to a source of 13.8VDC, preferrably the unit battery (red lead) and chassis ground (black lead). For additional information on installation, refer to the service manual for your specific unit.

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MEMO:

GENERAL SAFETY INFORMATION

DO NOT operate a mobile radio transmitter when someone outside the vehicle is within two feet (0.6 meter) of the antenna.

DO NOT operate the transmitter of any radio unless all RF connectors are secure and properly terminated.

DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.

All equipment must be grounded according to Midland installation instructions for safe operation.

All equipment should be serviced only by a qualified technician.

Refer to the unit service manual for additional safety information.

SERVICE MANUALS

Testing, alignement and service instructions are provided in the service manual for each model and are available from Midland at the address shown below.

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