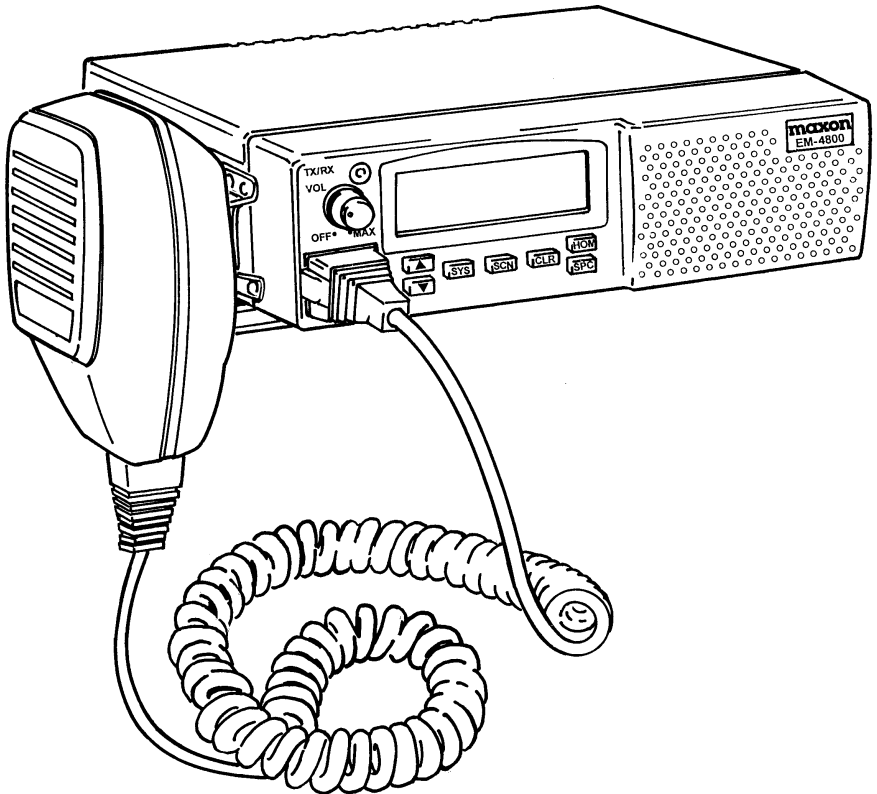

maxon

Model EM-4800

800 MHz

EDACS®/GE-MARC®

Mobile Radio



Operating Instructions

NOTICE!

Repairs to this equipment should be made only by an authorized service technician or at a facility designated by the supplier. Any repairs, alterations or substitutions of recommended parts made by the user to this equipment not approved by the manufacturer could void the user's authority to operate the equipment in addition to the manufacturers warranty.

NOTICE!

The software contained in this device is copyrighted. Unpublished rights are reserved under the copyright laws of the United States.

FCC LICENSING

This unit may or may not require a specific FCC license to operate. The FCC requires that all transmitters in the conventional and some trunked systems to be licensed by the Federal Communications Commission. Some trunked operations now are exempt from individual licensing requirements but may be operated in a licensed system.

Consult your Maxon Dealer regarding specific licensing information (Form 571), or contact the Federal Communications Commission via phone: 888-CALLFCC (1-888-225-5322) or through an FCC District office near you.

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SAFETY INFORMATION

The operator of any mobile radio should be aware of certain hazards common to the operation of vehicular radio transmissions. Possible hazards are:

Explosive Atmospheres: Just as it is dangerous to fuel a vehicle with the motor running, be sure to turn the radio OFF while fueling the vehicle. **Do not** carry containers of fuel in the trunk of the vehicle when the radio is mounted in the trunk.

Interference To Vehicular Electronic Systems: Electronic fuel injection systems, electronic anti-skid braking systems, electronic cruise control systems, etc. are typical of the types of electronic devices that may malfunction due to the lack of protection from radio frequency energy present when transmitting. If the vehicle contains such equipment, consult the dealer for the make of vehicle and enlist his aid in determining if such electronic circuits perform normally when the radio is transmitting.

Dynamite Blasting Caps: Dynamite blasting caps may be caused to explode by operating a radio within 500 feet of the caps. Always obey the "Turn Off Two Way Radio" signs posted where dynamite is being used. When transporting blasting caps in your vehicle:

- a) Carry the blasting caps in a closed metal box with a soft lining.
- b) Leave the radio OFF whenever the blasting caps are being put into or removed from the vehicle.

Radio Frequency Energy: To prevent burns or related physical injury from radio frequency energy, do not operate the transmitter when anyone outside of the vehicle is within two feet of the antenna.

SAFETY INFORMATION, Continued

CAUTION

Before jump starting, charging or changing the vehicle battery, **remove the 10A fuse located in the red lead.** This will insure that the radio is protected from damage during the battery charging process. Replace fuse when charging is completed.

Liquefied Petroleum (LP) Gas Powered Vehicles: Mobile radio installations in vehicles powered by liquefied petroleum gas (with the LP gas container in the trunk or other sealed-off space within the interior of the vehicle) must conform to the National Fire Protection Association standard (NFPA 58) which requires that:

- a) The space containing the radio equipment shall be isolated by a seal from the space containing the LP gas container and its fittings.
- b) Outside filling connections shall be used for the LP gas container.
- c) The LP gas container shall be vented to the outside of the vehicle.

SAFE DRIVING RECOMMENDATIONS FOR MOBILE RADIO USERS*

Exercise caution when using a mobile radio. Become familiar with information on the safe operation of a mobile radio:

- Keep both hands on the steering wheel and the microphone in its cradle whenever the vehicle is in motion.
- Place calls only when the vehicle is stopped. Use recall dialing to speed the time it takes to place a call.
- When talking from a moving vehicle is unavoidable, drive in the slower lane and keep conversations brief.
- If conversation requires taking notes or complex thought, stop the vehicle in a safe place - then continue the call.

* As recommended by the AAA (American Automobile Association)

OPERATING PROCEDURES

Two-way FM radio systems must be operated in accordance with the Rules and Regulations of the Federal Communications Commission (FCC). Operators of two-way radio equipment must be thoroughly familiar with the rules that apply to the intended type of radio operation. Following these rules will help to eliminate confusion, assure the most efficient use of existing radio channels, and result in a smoothly functioning radio network. When using this two-way radio, remember these rules:

- 1) It is a violation of FCC Rules to interrupt any distress or emergency message. As the radio operates in much the same way as a telephone "party line," **always listen to make sure that the line is clear before sending messages.** If someone is sending an emergency message - such as reporting a fire, or asking for help in an accident - KEEP OFF THE AIR! **Emergency calls have priority over all other messages.**
- 2) Use of profane or obscene language is prohibited by federal law.
- 3) It is against the law to send false call letters, or a false distress or emergency message.
- 4) The FCC requires that conversations be kept brief and confined to business. To save time, use coded messages whenever possible.
- 5) Using a radio to send personal messages (except in an emergency) is a violation of the FCC Rules.
- 6) It is against Federal Law to repeat or otherwise make known anything overheard on the radio. Conversations between others sharing a channel must be regarded as confidential.

OPERATING PROCEDURES, Continued

- 7) The FCC requires the operator to identify himself at certain times by means of call letters. Refer to the rules that apply to the particular type of operation for the proper procedure.

NOTE: The GE-MARC and EDACS trunking environments have automatic identification features built in and do not require the user to identify by means of call letters.

- 8) No changes or adjustments shall be made to the equipment except by an authorized or certified electronics technician.

OPERATING TIPS

Operating the radio in low areas of terrain or while under power lines or bridges will reduce the effective range of two-way radios. These areas should be avoided whenever possible.

In areas where transmission or reception is poor, insure that the antenna is vertical (particularly if a glass mount antenna is used). Moving a few yards in another direction or moving to higher ground may also help improve radio communication.

INTRODUCTION

The EM-4800 is a synthesized, microprocessor-based, FM mobile which provides reliable two-way communications in the Enhanced Digital Access Communications System (EDACS) trunking environment, GE-MARC trunking system and conventional communications systems.

In the EDACS or trunked system mode, the user selects a communications system and group. Channel selection is transparent to the user and is controlled via digital communication with the system controller. This provides advanced programmable features and fast access to communication channels.

In the conventional mode, the user selects a channel and communicates directly on that channel. A system refers to a set of channels. A channel is a transmit/receive radio frequency pair.

The exact operation of the radio will depend on the operating mode, the radio programming and the particular radio system. Most features described in this manual may be enabled or disabled through programming. Consult the system administrator for the particular features that are programmed into the radio.

This manual provides instructions for operating in either of the three systems (EDACS, GE-MARC, conventional). A separate section is provided for each system with a complete set of instructions for operating the radio within that system.

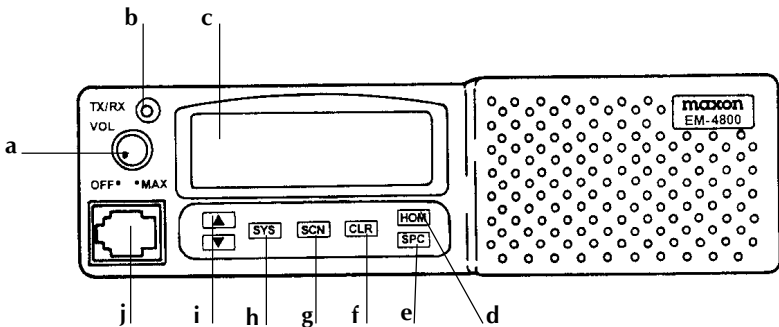
INTRODUCTION, Continued

NOTE: This radio allows the operator to switch between an EDACS, GE-MARC and conventional system. Special attention should be given to the system selected and the operating characteristics of the radio while working within that system.

FRONT PANEL CONTROLS

The operating controls are located on the radio's front panel:

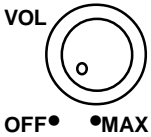
- a) Power On-Off/Volume control
- b) TX/RX LED
- c) Liquid Crystal Display (LCD)
- d) **HOM**e button
- e) **SPeC**ial call button
- f) **CLearR** button
- g) **SCaN** button
- h) **SYStem** select button
- i) Up/Down control
- j) Microphone connector



The radio's LCD provides seven alphanumeric characters to show the selected system/group, operational mode of the radio, and radio status indicators. A dual color indicator lamp glows red when the radio is transmitting (TX) and green when receiving a signal (RX).

An optional DTMF microphone is available to permit manual telephone interconnect calls, storing of numbers, etc. Information on DTMF microphone operation is detailed within this manual.

FRONT PANEL CONTROLS, Continued



POWER ON/OFF-VOLUME KNOB: Provides power to radio, adjusts receiving volume and powers off the radio.



GROUP/CHANNEL SELECT BUTTON: Scrolls through the group or channel lists (depending upon programming) and provides selection from scan list, phone list, system, etc.)



SYSTEM SELECT BUTTON: Used with select buttons above, permits selection of the desired programmed system.



SCAN ON/OFF BUTTON: Toggles scan operation on and off; also provides lockout of a selected group or channel from the scan list when used with the **SYS** button.



CLEAR BUTTON: When in the EDACS or GE-MARC radio system, the **CLear** button is used to exit the special call mode and return to the normal system/group display. When in the conventional radio system, pressing this button will enable monitoring of the channel.



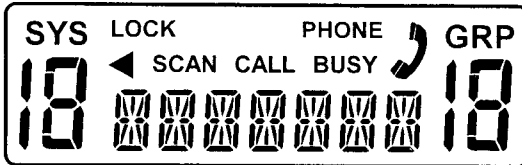
HOME BUTTON: Automatically selects a desired group and/or system.







SPECIAL CALL: Places the radio in Special Call mode, allowing individual and interconnect calls to be made in an EDACS or GE-MARC system.

LCD INDICATORS

The 7-character alphanumeric display identifies the selected system/group, operating modes or error conditions. There are also status indicators (defined below):



- SYS** Indicates the number of the current system in an EDACS, GE-MARC or conventional system.
- GRP** Indicates the number of the current group in an EDACS or GE-MARC system.
- LOCK** This indicator will only be present when the optional DTMF microphone is used. When displayed, the keypad is locked on the DTMF microphone to prevent accidental transmission.
- BUSY** Indicates when the radio receives a call, when a conventional channel is in use or when transmitting on a trunked channel.
- PHONE** In EDACS or GE-MARC systems, the PHONE and  status flags will appear to indicate the radio is placed in the special call mode.
- CALL** Indicates an individual call in EDACS or GE-MARC systems.
-  **SCAN** Indicates scan is enabled.
-  Indicates a trunked group or conventional channel is scan enabled.
-  Indicates the radio is in a special call or interconnect mode. Also illuminates when PHONE is displayed.

DISPLAY MESSAGES

During radio operation, various messages are displayed on the LCD. Typical messages include radio operation (radio in programming mode) and error messages (radio failure).

| MESSAGE | DESCRIPTION |
|---------|--|
| NC | Out of range - no connection between radio and system site. Incorrect system selected, radio is out of coverage area, etc. |
| AGENCY | Indicates an agency call. |
| ALLCALL | Indicates an all call message. |
| INDV | Indicates an individual call. |
| CONV FS | Conventional failsoft - displays when a failure of the EDACS system occurs. All communications will be in conventional mode. |
| PROGRAM | Indicates radio is in the programming mode. |
| SYN LOC | Indicates that the synthesizer is unable to load and lock on the channel properly. |

ALERT TONES

The radio generates a number of alert tones (beeps) to indicate various events or operating conditions. These alert tones can be enabled or disabled by programming. Function is described below assuming tones are programmed.

Power-up: A single tone will sound on power-up after the radio passes a self test.

Carrier Control Timer: If the programmed time for continuous transmission is exceeded, five short high-pitched warning tones followed by a single, long low-pitched tone will be heard. The transmitter will shut down shortly after the alert

ALERT TONES, Continued

tones are heard, interrupting communications. Release and re-key the P-T-T button to maintain communications. This will reset the carrier control timer and turn the transmitter back on.

Key Press: A short low-pitched tone sounds to indicate a button has been pressed.

TRUNKED OPERATION TONES - Out-Of-Range:

EDACS: A single low-pitched tone will sound immediately after the P-T-T button is pressed, indicating the radio is out of range of the repeater. The radio will try to place a call for a short period (3 seconds) after the initial attempt. The radio will generate a second low-pitched tone when it gives up trying to place the call. The system may be off the air or the radio may require servicing if the radio is within the calling range and these tones are heard.

GE-MARC: Five beeps will sound shortly after the P-T-T button is pressed when the radio is out of range of the repeater or the radio is inoperative. If the "Call Retry" is active, the radio will try the channel at twenty second intervals for five minutes.

TRUNKED OPERATION TONES - System Busy:

EDACS: Three short, medium-pitched tones will sound when the P-T-T button is pressed to indicate that the receiving party is already engaged in another call or the system is busy and its queue is full. You must re-key later to access the system.

GE-MARC: A low pitched tone will sound when the P-T-T button is pressed to indicate that all channels are busy.

ALERT TONES, Continued

TRUNKED OPERATION TONES - Clear To Talk:

A short burst tone indicates that the radio has acquired a channel and the user may proceed to talk.

TRUNKED OPERATION TONES - Available System:

A short low-pitched tone indicates the radio is attempting to connect to the first available repeater. A 2-second, high-pitched pulsing tone indicates when a repeater is available and the radio is attempting connection.

TONES IN A CONVENTIONAL SYSTEM - Receive Only Channel:

A warbling tone sounds when a transmit attempt is made on a receive only channel.

TURNING ON THE RADIO

Rotate the power on/off-volume control clockwise, out of detent, to turn on the radio. A short beep (if enabled through programming) indicates the radio is ready for operation. The display will show the last selected system and group.

If communication with the system's control channel cannot be established in the EDACS trunked environment, the NC (out of range) message will be displayed. You may find it necessary to move to another location or select another trunking system to re-establish the control channel link for trunked mode operations.

The radio will automatically transmit a "log-in" message when turned on or whenever the radio roams into a new system when changing the group selection. This "log-in" message includes the logical ID and the group ID for that radio.

RECEIVING A CALL

Turn on the radio as directed above. Adjust the power on/off-volume control clockwise to the desired audio level. Select the desired system by pressing the **SYS** button and then using the ▲ or ▼ button to scroll to the desired system. Only systems programmed can be selected.

Select the desired group by pressing the ▲ or ▼ button. Only groups programmed can be selected. The radio is now ready to receive calls.

NOTE: To move quickly through system or group selections, press and hold the ▲ or ▼ button.

EDACS OPERATION

RECEIVING A CALL, Continued

Individual Call

If an individual call (directed only to your radio) is received, the radio unsquelches on the assigned group. The BUSY icon will light. If programmed, the individual call receive tones (one high-pitched followed by one low-pitched tone) will sound and the originator's ID (dependent upon programming) is displayed for a short time.

To answer the call, press the P-T-T button and begin talking if caller's ID is still in display. If caller's ID is no longer in the display, press the **SPC** button to display caller's ID, then press P-T-T and begin talking.


Group Call

When the radio receives a group call, it unsquelches on the assigned channel and the BUSY icon appears.

If programmed, the group call receive tone (a single tone) will sound. The group name originator's ID (if programmed) will be shown in display.

Interconnect Call

When the radio receives an interconnect call (a telephone call directed to your radio), the radio unsquelches on the assigned channel and BUSY displays.

If programmed, the interconnect call receive tones (one high-pitched followed by one low-pitched tone) will sound. The PHONE and  will be displayed. Press the P-T-T button and begin talking.

EDACS OPERATION

SENDING A CALL


Turn the radio on and select the desired system and group. Ensure that no one is transmitting on the selected system and group and that the radio is in a service area. If the BUSY icon is showing on the LCD, place your call later.

Press and hold the P-T-T button. The radio will perform the necessary signaling required to obtain a communications channel. If the signaling is unsuccessful, the radio will sound the appropriate alert tone(s).

When the channel has been acquired, the red TX indicator lights and the BUSY icon is displayed. If programmed, the clear to talk tone will sound.

Hold the microphone about 3 inches from your mouth and speak normally into the microphone. Release the P-T-T button to listen for a reply.

Sending A Special Call

Press the **SPC** button to place the radio into the special call mode and access a pre-programmed alphanumeric list of individual call or interconnect numbers. If programmed, the special call alphanumeric list will be displayed. The PHONE and  icon will be displayed.

Use the ▲ or ▼ button to scroll through the special call list. Once the desired individual/interconnect call number is displayed, press and hold the P-T-T button to initiate the call. The radio performs the necessary signaling required to obtain a working channel.

EDACS OPERATION

SENDING A CALL, Continued

Sending A Special Call, Continued

Individual Call: When the signaling is successfully completed, BUSY is displayed and the clear to talk tone sounds. Speak directly into the microphone. Release the P-T-T button to listen for a reply.

Interconnect Call: When the signaling is successfully completed, BUSY is displayed and the proper DTMF tones will be sent and heard at the speaker. When someone answers, press the P-T-T button and speak directly into the microphone. Release the P-T-T button to listen for a reply.

NOTE: Messages cannot be received when the P-T-T button is pressed.

If the signaling is unsuccessful, the radio will remain in the special call mode and sound the appropriate alert tone(s).

To return to the normal system/group, press the **CLR** button to exit the special call mode.

SCAT OPERATION

A Single Channel Autonomous Trunking (SCAT) System operates with the same set of features as a standard EDACS system. The only significant user change relates to the BUSY icon. Since only one channel (operating as both control and working channel) exists in a SCAT system, the BUSY icon will be displayed when the SCAT channel is in the working channel mode. When the transmission on the channel is completed, the BUSY icon will disappear to indicate the return of SCAT control channel signaling.

EDACS OPERATION

CONVENTIONAL FAILSOFT

In the unlikely event of a failure of the EDACS system, communications may take place in conventional failsoft mode. The radio will be automatically directed to a communications channel set up for this purpose. During this mode of operation, CONV FS will be displayed. An increase in activity on the channel may be noticed, so be careful not to transmit until the channel is clear (ensure that no BUSY icon is showing).

Operation during conventional failsoft will be the same as on a conventional system, except that it will not be possible to select a communications channel or use emergency and special call features. When trunking is restored, the radio will automatically be returned to normal operation.

SCAN OPERATION

Group Scan

Only groups that are part of the radio's scan list may be scanned. Groups are added to the scan list on a per system basis through PC programming. Each system's group scan list is retained in memory when the radio is turned off.

NOTE: The radio may also be programmed to provide priority group scan capability which operates similar to priority scan in conventional systems. The following is a description of PC programmable scan features:

Scan Hang Time: The delay time the radio waits before resuming scan after the P-T-T is released or after the carrier has dropped a channel.

EDACS OPERATION

SCAN OPERATION, Continued

Group Scan, Continued

TX Select: The group the radio will transmit on while scanning. The radio will be programmed to transmit on either the scanned group or the selected group.

Scan List (privileges): Pre-programmed list of groups that may be scanned.

Enable/Disable Scan

To enable group scan, press the **SCN** button. The SCAN icon will be displayed. To disable group scan, press and release the **SCN** button. The SCAN icon will disappear from the display.

Add/Delete Groups

Groups can be added or deleted from the scan list as needed. Scan must be disabled to add/delete a group on the scan list.

To add groups: Select the desired group. Press the **SYS** button, then press **SCN**. The ◀ icon will appear and the group will be added to the scan list. If the current group is already in the scan list, the ◀ icon will display. You do not need to repeat the steps.

To delete groups: Select the desired group. To delete the group from the scan list, press the **SYS** button, then press **SCN**. The ◀ icon will turn off and the group will be removed from the scan list.

EDACS OPERATION

SCAN OPERATION, Continued


Priority Group Scan

When scan is enabled, the radio will listen for calls on the groups in the scan list. While receiving a scanned group call, the radio will continue to monitor the priority group. If a call is received on a priority group while the radio is already connected to a scanned group, that call will be dropped and the radio will accept the call on the priority group.

DTMF MICROPHONE OPERATION

When an optional DTMF microphone is used with the EM-4800 mobile radio, several features are available. These include manually entered individual and interconnect calls, user storage of individual and interconnect numbers, recall of user stored individual and interconnect numbers and enable/disable of keypress alert tones. The following paragraphs describe these features.

Sending A Manually Entered Individual Call

Press the **SPC** button to put the radio into the special call mode. The display will show the last accessed special call name/number from the pre-programmed special call selection. PHONE and  will be displayed.

Enter the ID number of the radio to be called. The last digit entered will always be displayed on the far right side. Any previously entered digits will scroll left. Only the last seven characters will be visible at a time with the leading character scrolling off the display upon each new entry.

EDACS OPERATION

DTMF MICROPHONE OPERATION, Continued

Sending a Manually Entered Individual Call, Continued

NOTE: To recall the last individual number entered manually from the keypad, press the **9^{RCL}** button.

Press and hold the P-T-T button to initiate the call. The radio performs the necessary signaling required to obtain a working channel.

When the signaling is successfully completed, the BUSY icon is displayed and the clear to talk tone sounds. Speak directly into the microphone. Release the P-T-T to listen for a reply. If the signaling is unsuccessful, the radio will remain in the special call mode and sound the appropriate alert tone(s).

When the call is completed, press **CLR** button once to return to normal operation. PHONE and **)** will disappear.

Key press: **SPC**, (Radio ID#), **9^{RCL}**, P-T-T, **CLR**/**MON**

Sending a Manually Entered Interconnect Call

Press the **SPC** button to put the radio into the special call mode. The display will show the last accessed special call name/number from the pre-programmed special call selection. PHONE and **)** will be displayed.

Enter the telephone number to be called. The last digit entered will always be displayed on the far right side. Any previously entered digits will scroll left. Only the last seven characters will be visible at a time with the leading character scrolling off the display upon each new entry.

EDACS OPERATION

DTMF MICROPHONE OPERATION, Continued

Sending a Manually Entered Interconnect Call, Continued

NOTE: To recall the last individual number entered manually from the keypad, press the **9^{RCL}** key.

Complete the telephone entry by pressing the ***^{PHN}** button. A tone will sound after entry, indicating the digits are for an interconnect call.

Press and release the P-T-T button to initiate the call. The radio performs the necessary signaling required to obtain a working channel.

When the signaling is successfully completed, the BUSY icon is displayed and the proper DTMF tones will be sent and heard at the speaker. If the signaling is unsuccessful, the radio will remain in the special call mode and sound the appropriate alert tone(s).

When someone answers, press the P-T-T and speak directly into the microphone. Release the P-T-T to listen for a reply. When the call is completed, press the **CLR
MON** button once to return to normal operation. PHONE and **)** will disappear.

Key press: **SPC**, (Phone #), **9^{RCL}**, ***^{PHN}**, P-T-T, **CLR
MON**

Storing Individual and Interconnect Numbers

Press the **SPC** button to put the radio into the special call mode. The display will show the last accessed special call name/number from the pre-programmed special call list. PHONE and **)** will be displayed.

EDACS OPERATION

DTMF MICROPHONE OPERATION, Continued

Storing Individual and Interconnect Numbers, Continued

Enter the ID or telephone number to be stored. The last digit entered will always be displayed on the far right. Any previously entered digits will scroll left. Only the last seven characters will be visible at a time with the leading character scrolling off the display upon each new entry.

Complete the entry by pressing the **#^{IND}** button for individual numbers and the ***^{PHN}** button for telephone inter-connect numbers. A tone will sound after entry to confirm button press.

Enter a digit between 0 and 9 to select a storage location. A tone will sound after entry to confirm button press.

There are 10 storage locations for individual numbers and 10 storage locations for interconnect numbers. Press the **8^{STR}** key to complete the storage procedure. Press the **CLR** button once to return to normal operation. **PHONE** and **)** will disappear.

Key press (storing an individual call number):

SPC, (Radio ID#), **#^{IND}**, **0 - 9^{RCL}**, **8^{STR}**, **CLR**

Key press (storing an interconnect number):

SPC, (Phone #), ***^{PHN}**, **0 - 9^{RCL}**, **8^{STR}**, **CLR**

Recalling Manually Stored Individual and Interconnect Numbers

Press the **SPC** button to place the radio into the special call mode. Press the **#^{IND}** button to recall the individual call list or the ***^{PHN}** button to recall the interconnect call list. The display will blank and a tone will sound. Enter the

EDACS OPERATION

DTMF MICROPHONE OPERATION, Continued

Recalling Manually Stored Individual and Interconnect Numbers

desired storage location number (0-9).

Press the **9^{RCL}** button. If the number is from the individual call list, the ID number will be displayed. If the number is from the interconnect call list, the last seven digits of the telephone will be displayed. If the memory location is blank, the radio will sound a low-pitched tone after the **9^{RCL}** key is pressed.

Once the desired number is displayed, press and release the P-T-T to initiate the call. The radio performs the necessary signaling required to obtain a working channel.

To recall and place an individual call:

#^{IND}, 0 - 9^{RCL}, 9^{RCL}, P-T-T

To recall and place an interconnect call

#^{IND}, 0 - 9^{RCL}, 9^{RCL}, P-T-T

EDACS OPERATION

DTMF MICROPHONE, Continued

Recalling Manually Stored Individual and Interconnect Numbers, Continued

Individual Call: When the signaling is successfully completed, BUSY is displayed, the red TX indicator lights and the clear to talk tone sounds. Press the P-T-T and speak directly into the microphone. Release the P-T-T to listen for a reply.

Interconnect Call: When the signaling is successfully completed, BUSY is displayed and the proper DTMF tone will be sent and heard in the speaker. When someone answers, press the P-T-T and speak directly into the microphone. Release the P-T-T to listen for a reply.

When the call is completed, press the **CLR** button once to exit the special call mode and return to normal operation.

Keypad Lock

The keypad on the DTMF microphone can be locked at any time. To lock the keypad, press the **5^{LCK}** button. All buttons on the microphone except P-T-T, and **5^{LCK}** will be locked, preventing undesired or accidental key presses. To unlock the keypad, press the **5^{LCK}** button.

Keypad Mute

The keypad can be muted at anytime. To mute the keypad, press and release the **6^{MUT}** button. All buttons will be muted. To unmute the keypad, press and release the **6^{MUT}** button.

~ End of EDACS Operating Section ~

GE-MARC OPERATION

TURNING ON THE RADIO

Rotate the power on/off-volume control clockwise, out of detent, to turn on the radio. A short beep (if enabled through programming) indicates the radio is ready for operation. The display indicates the last selected system/area and group.

RECEIVING A CALL

Turn on the radio and adjust the audio level. Select the desired area (system) by pressing the **SYS** button and then using the ▲ and ▼ button to scroll to the desired area. Only areas programmed can be selected.

Select the desired group by pressing the ▲ and ▼ button to scroll to the desired group. Only groups programmed can be selected. The radio is now ready to receive calls.

NOTE: To move quickly through area/system or group selections.

Individual Call: If an individual call (call directed only to your radio) is received, the radio unscquelches on the assigned group. The BUSY icon will light. If programmed on, the individual call received tone (one high-pitched followed by one low-pitched tone) will sound and the originator's ID or just "ID" (dependent upon programming) is displayed for a short time.

To answer the call, press the P-T-T button and begin talking if caller's ID is still in display. If the caller's ID is no longer in the display, press the **SPC** button to display the caller's ID, then press P-T-T and begin talking.


GE-MARC OPERATION

RECEIVING A CALL, Continued

Group Call

When the radio receives a group call, it unsquelches on the assigned channel and the BUSY icon appears. If programmed on, the group call receive tone (a single tone) will sound. The group name originator's ID (if programmed) will be shown in the display.

Interconnect Call

When the radio receives an interconnect call (a telephone call directed to your radio), the radio unsquelches on the assigned channel and the BUSY icon appears. If programmed on, the interconnect call received tones (one high-pitched tone followed by one low-pitched tone) will sound. The PHONE and  icon will be displayed. Press the P-T-T button and begin talking.

SENDING A CALL

Turn the radio on and select the desired area (system) and group. Ensure that no one is transmitting on the selected area and group and that the radio is in a service area.

Press and release the P-T-T button. The radio will perform the necessary signaling required to obtain a communications channel. If the signaling is unsuccessful, the radio will sound the appropriate alert tone(s).

A one second low-frequency tone will sound if the call cannot be completed due to all available channels being busy, and the BUSY icon will show on the LCD. Retry the call later.

GE-MARC OPERATION

SENDING A CALL, Continued


A sequence of five beeps will sound if the radio cannot access a channel due to being out of range of the GE-MARC system or an inoperative radio. Any subsequent call requests will be ignored for 20 seconds. However, if the area is changed, a call request may be initiated in the new area.



NOTE: If the call retry option has been programmed and is active, the radio will automatically try to acquire a channel at 20 second intervals for five minutes before returning to the normal area and group display.

When the channel has been acquired, the red TX indicator lights and the BUSY icon will appear. If programmed, the clear to talk tone will sound.

Hold the microphone about 3 inches from your mouth and speak normally into the microphone. Release the P-T-T button to listen for a reply.

Sending A Special Call

Press the **SPC** button to place the radio into the special call mode and access a pre-programmed alphanumeric list of individual call or interconnect numbers. If programmed, the special call alphanumeric list will be displayed. The PHONE and  icon will be displayed.

Use the  or  button to scroll through the special call list. Once the desired individual/interconnect call number is displayed, press and hold the P-T-T button to initiate the call. The radio performs the necessary signaling required to obtain a working channel.

GE-MARC OPERATION

SENDING A SPECIAL CALL, Continued

Individual Call: When the signaling is successfully completed, the BUSY icon appears and the clear to talk tone sounds. Hold the microphone about 3 inches from your mouth and speak normally into the microphone. Release the P-T-T button to listen for a reply.

Interconnect Call: When the signaling is successfully completed, the BUSY icon appears and the proper DTMF tones will be sent and heard at the speaker.

When someone answers, press the P-T-T button and speak directly into the microphone. Release the P-T-T button to listen for a reply. Messages cannot be received when the P-T-T button is pressed.

If the signaling is unsuccessful, the radio will remain in the special call mode and sound the appropriate alert tone(s). To exit the special call mode and return the normal area/group, press the **CLR** button.

DTMF MICROPHONE OPERATION


When an optional DTMF microphone is used with the mobile radio, several features are available. These include manually entered individual and interconnect calls, storage of individual and interconnect calls, user storage of individual and interconnect numbers, recall of user stored individual and interconnect numbers and enable/disable of keypress alert tone.

The following paragraphs describe these features.

GE-MARC OPERATION

DTMF MICROPHONE OPERATION, Continued

Sending A Manually Entered Individual Call

Press the **SPC** button to put the radio into the special call mode or **button 7** to put the radio into conference call mode. The SYS icon displays "SP" and the GRP icon displays last accessed call number from the pre-programmed special call list for this area. PHONE and  icon will appear.

Enter the ID number of the radio to be called. The last digit entered will always be displayed in the far right. Any previously entered digits will scroll left. Only the last seven characters will be visible at a time with the leading character scrolling off the display upon each new entry.

NOTE: To recall the last manually entered number, press the **9^{RCL}** key.

Complete the entry by pressing **#^{IND}**. This indicates the digits are for an individual call. A tone will sound to confirm key press.

Press and release the P-T-T button to initiate the call. The radio performs the necessary signaling required to obtain a working channel. When the signaling is successfully completed, the BUSY icon will display and the clear to talk tone sounds.


Hold the microphone about 3 inches from your mouth and speak directly into the microphone. Release the P-T-T to listen for a reply. If the signaling is unsuccessful, the radio will remain in the special call mode and sound the appropriate alert tone(s).

When the call is completed, press the **CLR**
MON key once to

GE-MARC OPERATION

DTMF MICROPHONE OPERATION, Continued


Sending A Manually Entered Individual Call, Continued

return to normal operation. PHONE and  icon will disappear.

Key press: **SPC**, **0** - **9^{RCL}**, **#^{IND}**, P-T-T, $\frac{\text{CLR}}{\text{MON}}$

Key press (conf. call): **SPC**, **0** - **9^{RCL}**, **#^{IND}**, P-T-T, $\frac{\text{CLR}}{\text{MON}}$

Sending A Manually Entered Interconnect Call

Press the **SPC** button to put the radio into the special call mode or **button 7** to put the radio into conference call mode. The SYS icon displays "SP" and the GRP icon displays last accessed call number from the pre-programmed special call list or it will be blank if no special call list is programmed for this area. PHONE and  icon will appear.

Enter the telephone number to be called. The last digit entered will always be displayed in the far right side. Any previously entered digits will scroll left. Only the last seven characters will be visible at a time with the leading character scrolling off the display upon each new entry.

NOTE: To recall the last manually entered number from the keypad, press **9^{RCL}** key.

Complete the telephone entry by pressing the ***^{PHN}** button. The ***^{PHN}** button indicates the digits are for an interconnect call. A tone will sound to confirm key press.


Press and release the P-T-T button to initiate the call. The radio performs the necessary signaling required to obtain a working channel.

GE-MARC OPERATION

DTMF MICROPHONE OPERATION, Continued

Sending A Manually Entered Interconnect Call, Continued

When the signaling is successfully completed, the BUSY icon will appear and the proper DTMF tones will be sent and heard at the speaker. If the signaling is unsuccessful, the radio will remain in the special call mode and sound the appropriate alert tone(s).

When someone answers, press the P-T-T and speak directly into the microphone. Release the P-T-T to listen for a reply. When the call is completed, press the $\frac{\text{CLR}}{\text{MON}}$ button to return to normal operation. PHONE and  icon will disappear.

Key press: **SPC, 0 - 9^{RCL}, *^{PHN}, P-T-T, $\frac{\text{CLR}}{\text{MON}}$**

Key press (conf. call): **7, 0 - 9^{RCL}, *^{PHN}, P-T-T, $\frac{\text{CLR}}{\text{MON}}$**

Storing Individual and Interconnect Numbers

To store an individual call number:

SPC, 0 - 9^{RCL}, #^{IND}, 0 - 9^{RCL}, 8^{STR}

To store an individual conference number:

7, 0 - 9^{RCL}, #^{IND}, 0 - 9^{RCL}, 8^{STR}

To store an interconnect number:

SPC, 0 - 9^{RCL}, *^{PHN}, 0 - 9^{RCL}, 8^{STR}


To store an interconnect conference number:

7, 0 - 9^{RCL}, *^{PHN}, 0 - 9^{RCL}, 8^{STR}

GE-MARC OPERATION

DTMF MICROPHONE OPERATION, Continued



Storing Individual and Interconnect Numbers, Continued

Press the **SPC** button to put the radio into the special call mode or **button 7** to put the radio into conference call mode. The SYS icon displays "SP" and the GRP icon displays last accessed call number from the pre-programmed special call list or it will be blank if no special call list is programmed for this area. PHONE and  icon will appear.

Enter the ID or telephone number to be stored. The last digit entered will always be displayed in the far right side of the display. Any previously entered digits will scroll left. Only the last seven characters will be visible at a time with the leading character scrolling off the display upon each new entry.

Complete the entry by pressing the **#^{IND}** key for individual numbers and the ***^{PHN}** key for telephone interconnect numbers. A tone will sound upon entry.

Enter a digit between 0 and 9 to select a storage location. A tone will sound to confirm key press. There are 10 storage locations for individual numbers and 10 storage locations for interconnect numbers.

Press the **8^{STR}** key to complete the storage procedure. Press the  key once to return to normal operation. The PHONE and  icon will disappear.

Key press (storing individual call numbers):

SPC, 0 - 9^{RCL}, (Radio ID#), 0 - 9^{RCL}, 8^{STR}, 

Key press (storing individual conference numbers):

7, 0 - 9^{RCL}, (Radio ID#), 0 - 9^{RCL}, 8^{STR}, 

GE-MARC OPERATION

DTMF MICROPHONE OPERATION, Continued

Storing Individual And Interconnect Numbers, Continued

Key press (storing an interconnect number):

SPC, 0 - 9^{RCL}, *^{PHN}, 0 - 9^{RCL}, 8^{STR}

Key press (storing an interconnect conference number):

7, 0 - 9^{RCL}, *^{PHN}, 0 - 9^{RCL}, 8^{STR}

Recalling Manually Stored Individual and Interconnect Numbers

Key press (recall/place individual call):

SPC, #^{IND}, 0 - 9^{RCL}, 9^{RCL}, P-T-T

Key press (recall/place ind. call in conference call mode):

7, #^{IND}, 0 - 9^{RCL}, 9^{RCL}, P-T-T

Key press (recall/place interconnect call):

SPC,*^{PHN}, 0 - 9^{RCL}, 9^{RCL}, P-T-T

Key press (recall/place intercon. call - conference call mode):

7,*^{PHN}, 0 - 9^{RCL}, 9^{RCL}, P-T-T

Press the **SPC** button to place the radio into the special call mode. Press the **#^{IND}** button to recall the individual call list or the ***^{PHN}** button to recall the interconnect call list. The display will blank and a tone will sound.

Enter the desired storage location number 0-9. Press the **9^{RCL}** key. If the number is from the individual call list, the ID number will be displayed. If the number is from the interconnect call list, the last seven digits of the telephone number will be displayed.

If the memory location is blank, the radio will sound a low pitched tone after the **9^{RCL}** button is pressed. Once the desired number is displayed, press and release the P-T-T to

GE-MARC OPERATION, Continued

Recalling Manually Stored Individual and Interconnect Numbers, Continued

initiate the call. The radio performs the necessary signaling required to obtain a working channel.

Individual Call: When the signaling is successfully completed, BUSY is displayed, the red TX indicator lights and the clear to talk tone sounds. Press the P-T-T and speak directly into the microphone. Release the P-T-T to listen for a reply.

Interconnect Call: When the signaling is successfully completed, BUSY is displayed and the proper DTMF tone will be sent and heard in the speaker. When someone answers, press the P-T-T and speak directly into the microphone. Release the P-T-T to listen for a reply.

When the call is completed, press the **SPC** button *twice* to exit the special call mode and return to normal operation.

SCAN OPERATION

Wide Area System Scan

When operating within a GE-MARC System, the radio may be programmed to scan up to 20 groups from other GE-MARC systems. The radio will scan the groups in the selected systems and if its programmed collect tone is not seen, then it will proceed to scan and the groups of the systems in the wide area scan list. The group selection may change upon switching to the new system.

Group Scan

Only Groups that are part of the radio's scan list may be

GE-MARC OPERATION

SCAN OPERATION, Continued

Group Scan, Continued

scanned. Groups are added to the scan list on a per-system basis through PC programming. Each system's group scan list is retained in memory when the radio is turned off.

Enable/Disable Group Scan

To enable group scan, press the **SCN** button. The SCAN icon will appear. To disable group scan, press and release the **SCN** button - the SCAN icon will disappear.

Add/Delete Groups

Groups can be added or deleted from the scan list as desired. **NOTE:** Scan must be disabled to add or delete a Group on the scan list.

To add groups: Select the desired group to be added. Press the **SYS** button, then press **SCN**. The ◀ icon will appear and the group will be added to the scan list. If the current group is already included in the scan list, the ◀ icon will display.

To delete groups: Select the desired group to be deleted. Press the **SYS** button and then press the **SCN** button. The ◀ icon will turn off and the group will be removed from the scan list.

DIRECT MODE

The direct (or talk around) mode provides short range, line-of-sight communications - this mode is not functional in a trunked system.

GE-MARC OPERATION

DIRECT MODE, Continued

Receiving and Sending A Message

Press the **SYS** button and use the ▲ or ▼ button to select the direct mode system. The SYS display will indicate the current system selected.

Press **CLR** to disable squelch and monitor the channel. Adjust the volume control to the desired audio level.

Press the P-T-T and send the message. The red TX indicator will illuminate and the BUSY icon will appear. Release the P-T-T to listen for a reply.

~ End of GE-MARC Operating Section ~

CONVENTIONAL MODE OPERATION

TURNING ON THE RADIO

Rotate the power on-off/volume control clockwise, out of detent, to turn on the radio. A short beep (if enabled through programming) indicates the radio is ready for operation. The display will indicate the last selected system and channel.

SENDING A MESSAGE

Turn on the radio and adjust the power on-off/volume control to the desired audio level. Select a system by pressing the **SYS** button and then using the ▲ and ▼ button to scroll to the desired system. Only programmed systems can be selected. Select the desired channel by pressing the ▲ or ▼ button to scroll through the channel selections. Only programmed channels can be selected.

Press the **CLR** button to disable squelch and monitor the channel. Re-adjust the volume control if necessary.

Hold the microphone about 3 inches from your mouth, press the P-T-T and speak normally into the microphone.

Release the P-T-T when your transmission is complete and listen for a reply.

RECEIVING A MESSAGE

With the radio powered on, make system and group selections as detailed above. Re-adjust the volume control if necessary. The radio is now ready to receive calls.

SQUELCH ADJUSTMENT

In normal operation the squelch is automatically set by the

CONVENTIONAL MODE OPERATION

SQUELCH ADJUSTMENT, Continued

radio and does not require adjusting. If it becomes necessary to adjust the squelch, use the following procedure.

NOTE: The radio must be on a conventional system or an EDACS working channel (i.e., receiving a voice call) to adjust the squelch. It is recommended to adjust squelch from a conventional system.

Press and hold the **SYS** button. Use the ▲ button to open the squelch or the ▼ button to close the squelch.

SENDING A MANUALLY ENTERED INTERCONNECT CALL (USING THE OPTIONAL DTMF MICROPHONE)

Select a channel in the conventional system that has telephone interconnect capability. The radio should be programmed for DTMF operation on this channel.

Press and hold the P-T-T to key the transmitter. While holding the P-T-T, press either the *^{PHN} or #^{IND} button (as required by the radio system) to obtain a telephone line. The radio will transmit the selected tone.

Release the P-T-T and listen for a dial tone. When the dial tone is heard, press and hold the P-T-T while you enter the desired telephone number through the microphone key pad. As you enter each digit, a sidetone will be heard in the speaker as the radio transmits the DTMF tone (if programmed).

After all digits have been keyed, release the P-T-T. When someone answers, press the P-T-T and speak directly into the microphone. Release the P-T-T when you stop talking to listen for a reply.

CONVENTIONAL MODE OPERATION

SENDING A MANUALLY ENTERED INTERCONNECT CALL, Continued

At the completion of the call, press and hold the P-T-T and then press the *^{PHN} or #^{IND} key (as required by the radio system) to disconnect from the interconnect facility.

SCAN OPERATION

Only channels that are part of the radio's scan list may be scanned. Channels are added to the scan list on a per system basis through PC programming. The scan list is retained in memory when the radio is turned off. The following is a description of PC programmable scan features:

Scan Hang Time: The delay of time the radio waits before resuming scan after P-T-T is released or after the carrier has dropped a channel.

TX Select: The channel the radio will transmit on while scanning. The radio will be programmed to transmit on either the scanned channel or the selected channel.

Scan List (privileges): Pre-programmed list of channels that may be scanned.

Enable/Disable Scan

To enable scan, press the **SCN** button. The SCAN icon will display. To disable scan, press and release the **SCN** button. The SCAN icon will disappear from the display.

Add/Delete Channels

Channels can be added or deleted from the scan list as needed. NOTE: Scan must be disabled to add/delete a

CONVENTIONAL MODE OPERATION

SCAN OPERATION, continued

Add/Delete Channels, continued

channel on the scan list.

To add channels: Select the desired channel. Press the **SYS** button, then press **SCN**. The ◀ icon will appear and the channel will be added to the scan list. If the current channel is already in the scan list, the ◀ icon will display. You do not need to repeat the steps.

To delete channels: Select the desired channel. To delete the channel from the scan list, press the **SYS** button, then press **SCN**. The ◀ icon will turn off and the group will be removed from the scan list.

The Selected Channel

The selected channel is the channel in the display when scan is activated . When a signal is not being received, the radio reverts to this channel for transmitting. When a signal is being received, the radio can be PC programmed to either revert to the selected channel or remain on the received channel for transmission.

The selected channel does not necessarily have to be a channel in the scan list. It will be temporarily entered into the scan list and scanned until the selected channel is changed.

When scan is turned off, the radio will return to the selected channel.

CONVENTIONAL MODE OPERATION

SCAN OPERATION, Continued

Display

Channel Indicator: While no signal is being received, the channel indicator will always show the selected channel. When an active channel is received, the channel indicator will show the received channel.

Scan Indicator: When the **SCN** button is pushed, the radio will light the SCAN icon and begin scanning. The SCAN indicator will flash when the microphone is taken off-hook to show the radio is no longer scanning (only if the radio is programmed not to scan off-hook).

Transmitting While In Scan

Transmitter operation in scan is determined by the programming of the radio's personality:

Off hook - scan not enabled (default): With off-hook scan disabled (normal default condition), all scanning will stop when the microphone is taken off-hook. The SCAN icon will flash to show all scanning has stopped. If a signal is not being received when the microphone is placed off-hook, the radio will transmit on the selected channel. If a signal is being received when the microphone is taken off-hook, the radio can be PC programmed (using the "scan transmit option") to either stay on the receive channel or revert to the selected channel. When the microphone is placed back on-hook, the radio will immediately start scanning, even if the received channel was still active.

CONVENTIONAL MODE OPERATION

SCAN OPERATION, Continued

Transmitting While In Scan, Continued

Off-hook scan enabled: With off-hook scan enabled, moving the microphone off-hook will not affect scan operation. The radio will continue scanning. If a signal is not being received, the radio will transmit on the selected channel. If a signal is being received, the radio can be PC programmed (using the "scan transmit channel" option) to either stay on the receive channel or revert to the selected channel when the microphone P-T-T is keyed.

On-hook: When the microphone is on-hook and the radio is not receiving a channel, the radio always transmits on the selected channel.

When the radio is receiving a channel, the radio's personality can be programmed to transmit either on the received channel or the selected channel. If the radio was programmed for the selected channel, the display will change to the selected channel when the transmitter is keyed.

MAINTENANCE AND BASIC CARE

ANTENNA REMOVAL: It is strongly recommended that your antenna be removed from its mounting prior to passing through an automatic car wash in order to prevent antenna and/or vehicle damage. Refer to your antenna instruction guide for information on how to safely remove the antenna from its mounting.

FUSE REPLACEMENT: The radio is protected by one or more fuses located in the cables connected to the vehicle power

CONVENTIONAL MODE OPERATION

MAINTENANCE AND BASIC CARE, Continued

source(s). If the radio fails to operate, the problem may be a defective fuse. Replace the fuse(s) with a similar type and size. The fuse may be obtained from the radio supplier or most electrical supply stores. If, however, the trouble persists (the radio continues to blow fuses or remains inoperative) check with the radio supplier.

| | |
|------------------------|-------------------------------------|
| Radio power (red lead) | 10 Amp fast blow fuse Type AGC15 |
|------------------------|-------------------------------------|

JUMP STARTING THE VEHICLE: Before jump starting, charging or changing the vehicle battery, **remove the 10A fuse located in the red lead.** This will insure that the radio is protected from damage during the battery charging process. Replace fuse when charging is completed.

OPERATOR'S RADIO SETUP

Radio Type:

Frequency Band:

Operator's Name:

| SYSTEM NUMBER | SYSTEM NAME | TRUNKED (T) or CONV (C) | GRP/CHAN NUMBER | GRP/CHAN NAME |
|---------------|-------------|-------------------------|-----------------|---------------|
| | | | | |

LIMITED WARRANTY

Maxon America, Inc. (herein "Maxon") warrants each new radio product manufactured or supplied by it to be free from defects in material or workmanship under normal use and service for two (2) years, provided that the user has complied with the requirements stated herein. The warranty period begins on the date of purchase from an Authorized Maxon Sales and Service Outlet. This warranty is not assignable or transferrable. Maxon is not responsible for any ancillary equipment which is attached or used in conjunction with Maxon products.

During this period, if the end user experiences difficulties with a Maxon product, it should be returned to the Authorized Maxon Sales and Service Outlet from which it was purchased. The Authorized Maxon Sales and Service Outlet will return for repair to Maxon America, Inc. or to its Authorized Repair Depot. Product returned to Maxon America, Inc. must be shipped freight prepaid and be accompanied by a Return Authorization (RA) number, obtained prior to shipment from Maxon's Customer Service Department. The user is responsible for the payment of any charges or expenses incurred for the removal of the product from the vehicle or other site of its use, for the reinstallation of the repaired unit in such site, for the transportation of the product to the place of repair and for the return of the repaired product to the place of its use.

Maxon shall have no obligation to make repairs or to cause replacement required with result from normal wear and tear or necessitated in whole or in part by catastrophe, the fault or negligence of the user, improper or unauthorized alterations, repairs to the product, incorrect wiring, use of the product in a manner for which it was not designed, or by causes external to the product. This warranty is void if the serial number is altered, defaced or removed.

Maxon's sole obligation hereunder shall be to repair or replace the product covered in this Warranty. Replacement, at Maxon's option may include a similar or higher-featured product. Repair, at Maxon's option, may include the replacement of parts or boards with functionally equivalent reconditioned or new parts or boards. Replaced parts, accessories, batteries or boards are warranted for the balance of the original time period. All replaced parts, accessories, batteries or boards become the property of Maxon America, Inc.

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This Warranty is void for sales and deliveries outside of the U.S.A.

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