Operator's Manual

MM-014716-001

Rev. R, April 2017

XG-75M/M7300 Series

Mobile Radios

L3HARRIS™

FAST. FORWARD.

MANUAL REVISION HISTORY

REV	DATE	REASON FOR CHANGE
C	Sep/09	Added VHF antennas, added "Enable/Disable Volume Side Tone," and updated to Harris format.
D	Apr/10	Added keypad lock/unlock instructions for ECP, added REGISTER and BND SCAN to P25T status messages.
E	Jan/11	Updated antenna information; other minor updates.
F	Apr/11	Updated for OTP R17, consolidated EDACS, Conventional, P25 operation into one section.
G	Aug/11	Updated antennas; removed reference to ambient light sensor, minor edits.
H	Oct/11	Added Part 80 information.
J	Jan/12	Updated antennas and updated warranty.
K	Oct/12	Added VHF antennas. Added stealth mode, PIN entry, and Control and Status Services.
L	Jun/13	Added Audio Playback. Updated OpenSky operation.
M	Mar/14	Added support for XG-75M. Added Sections 7.37 and 7.38. Updated Data TX/RX Indications.
N	Oct/14	Updated for XGP R4A – added Voice Annunciation and Appendix A.
P	Apr/15	Updated for XGP R5A. Added Preset Buttons to EDACS, Conventional, and P25 operation section. Added French Safety section.
R	Apr/17	Updated Section 7.23.

CREDITS

EDACS, OpenSky, Harris, and VIDA are registered trademarks and TECHNOLOGY TO CONNECT, INFORM AND PROTECT is a trademark of L3Harris Technologies.

AMBE is a registered trademark and IMBE, AMBE+, and AMBE+2 are trademarks of Digital Voice Systems, Inc.

All other brand and product names are trademarks, registered trademarks, or service marks of their respective holders.

NOTICE!

The material contained herein is subject to U.S. export approval. No export or re-export is permitted without written approval from the U.S. Government. Rated: EAR99 in accordance with U.S. Dept. of Commerce regulations 15CFR774, Export Administration Regulations.

Information and descriptions contained herein are the property of L3Harris Technologies. Such information and descriptions may not be copied or reproduced by any means, or disseminated or distributed without the express prior written permission of L3Harris Technologies, PSPC Division, 221 Jefferson Ridge Parkway, Lynchburg, VA 24501.

Repairs to this equipment should be made only by an authorized service technician or 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 manufacturer's warranty.

This product conforms to the European Union WEEE Directive 2012/19/EU. Do not dispose of this product in a public landfill. Take it to a recycling center at the end of its life.

L3Harris products comply with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive.

This manual is published by **L3Harris Technologies** without any warranty. Improvements and changes to this manual necessitated by typographical errors, inaccuracies of current information, or improvements to programs and/or equipment, may be made by **L3Harris Technologies** at any time and without notice. Such changes will be incorporated into new editions of this manual. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose, without the express written permission of **L3Harris Technologies.**

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

FIGURES

TABLE OF CONTENTS

Page

TABLES

L3Harris Technologies, Public Safety and Professional Communications (PSPC) Business, continually evaluates its technical publications for completeness, technical accuracy, and organization. You can assist in this process by submitting your comments and suggestions to the following:

L3Harris Technologies, Inc.
PSPC Business
Technical Publications
221 Jefferson Ridge Parkway
Lynchburg, VA 24501

fax your comments to: 1-434-455-6851
or
e-mail us at: PSPC_TechPubs@l3harris.com

1. REGULATORY AND SAFETY INFORMATION

1.1 SAFETY SYMBOL CONVENTIONS

The following conventions are used in this manual to alert the user to general safety precautions that must be observed during all phases of operation, installation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere violates safety standards of design, manufacture, and intended use of the product. L3Harris assumes no liability for the customer's failure to comply with these standards.

The WARNING symbol calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a WARNING symbol until the conditions identified are fully understood or met.

The **CAUTION** symbol calls attention to an operating procedure, practice, or the like, which, if not performed correctly or adhered to, could result in damage to the equipment or severely degrade equipment performance.

The **NOTE** symbol calls attention to supplemental information, which may improve system performance or clarify a process or procedure.

1.2 REGULATORY APPROVALS

Table 1-1: FCC Type Acceptance

RADIO PART NUMBER	FREQUENCY RANGE/WATTAGE	FCC TYPE ACCEPTANCE NUMBER
RU-144750-041	136-174 MHz, 50 Watt	OWDTR-0055-E
RU-144750-051	136-174 MHz, 110 Watt	OWDTR-0056-E
RU-144750-021	378-430 MHz, 50 Watt	OWDTR-0061-E
RU-144750-031	440-512 MHz, 50 Watt	OWDTR-0062-E
14018-0010-01	330-380 MHz, 40 Watt	N/A[1]
RU-144750-061 Rev. K or earlier)	764-806 MHz, 30 Watt 806-870 MHz, 35 Watt	OWDTR-0060-E
RU-144750-061 (Rev. L or later)	764-806 MHz, 30 Watt 806-870 MHz, 35 Watt	OWDTR-0132-E

Applicable FCC Rules: Part 15, Part 80*, and Part 90
* FCC Part 80 is for 156-162 MHz only.

Table 1-2: Industry Canada Type Acceptance

RADIO PART NUMBER	FREQUENCY RANGE/WATTAGE	IC TYPE ACCEPTANCE NUMBER
RU-144750-041	136-174 MHz, 50 Watt	3636B-0055
RU-144750-051	136-174 MHz, 110 Watt	3636B-0056
RU-144750-021	378-430 MHz, 50 Watt	3636B-0061
RU-144750-031	440-512 MHz, 50 Watt	3636B-0062
14018-0010-01	330-380 MHz, 40 Watt	N/A1
RU-144750-061 (Rev. K or earlier)	764-806 MHz, 30 Watt 806-870 MHz, 35 Watt	3636B-0051
RU-144750-061 (Rev. L or later)	764-806 MHz, 30 Watt 806-870 MHz, 35 Watt	3636B-0132

Applicable Industry Canada Rules: RSS 119; RSS 210

[1] The 14018-0010-01 model is not sold or used in North America.

1.3 RADIO FREQUENCY INTERFERENCE

1.3.1 FCC Part 15

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference; and,
2. This device must accept any interference received, including interference that may cause undesired operation.

1.3.2 Industry Canada

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

1.4 RF ENERGY EXPOSURE AWARENESS AND CONTROL INFORMATION FOR FCC OCCUPATIONAL USE REQUIREMENTS

Before using the two-way mobile radio, review the following important RF energy awareness and control information and operational instructions. Comply with this information and instructions to ensure compliance with RF exposure guidelines.

This radio is intended for use in occupational/controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to remain below RF exposure limits. This radio is NOT authorized for general population, consumer, or any other use.

Changes or modifications not expressly approved by L3Harris could void the user's authority to operate the equipment.

This two-way radio uses electromagnetic energy in the radio frequency (RF) spectrum to provide communications between two or more users over a distance. It uses RF energy or radio waves to send and receive calls. RF energy is one form of electromagnetic energy. Other forms include, but are not limited to, electric power, sunlight, and x-rays. RF energy, however, should not be confused with these other forms of electromagnetic energy, which, when used improperly, can cause biological damage. Very high levels of x-rays, for example, can damage tissues and genetic material.

Experts in science, engineering, medicine, health, and industry work with organizations to develop standards for exposure to RF energy. These standards provide recommended levels of RF exposure for both workers and the general public. These recommended RF exposure levels include substantial margins of protection. All two-way radios marketed in North America are designed, manufactured, and tested to ensure they meet government-established RF exposure levels. In addition, manufacturers also recommend specific operating instructions to users of two-way radios. These instructions are important because they inform users about RF energy exposure and provide simple procedures on how to control it. Refer to the following websites for more information on what RF energy exposure is and how to control exposure to assure compliance with established RF exposure limits:

http://www.fcc.gov/oet/rfsafety/rf-faqs.html

http://www.osha.gov./SLTC/radiofrequencyradiation/index.html

1.5 FEDERAL COMMUNICATIONS COMMISSION REGULATIONS

Before it was marketed in the United States, the XG-75M/M7300 series two-way mobile radios were tested to ensure compliance with FCC RF energy exposure limits for two-way mobile radios. When two-way radios are used as a consequence of employment, the FCC requires users to be fully aware of and able to control their exposure to meet occupational requirements. Exposure awareness can be facilitated by the use of a label directing users to specific user awareness information. The radio has an RF exposure product label. Also, this *Product Safety Manual* and the applicable *Operator's Manual* include information and operating instructions required to control RF exposure and to satisfy compliance requirements.

1.6 COMPLIANCE WITH RF EXPOSURE STANDARDS

The XG-75M/M7300 series two-way mobile radios are designed and tested to comply with a number of national and international standards and guidelines regarding human exposure to RF electromagnetic energy. The radios comply with the IEEE and ICNIRP exposure limits for occupational/controlled RF exposure environment at duty-cycle times of up to 50% (50% transmit, 50% receive) and it is authorized by the FCC for occupational use. In terms of measuring RF energy for compliance with the FCC exposure guidelines, each radio's antenna radiates measurable RF energy only while it is transmitting (talking), not when it is receiving (listening), or in a standby mode.

The XG-75M/M7300 series two-way mobile radios comply with the following RF energy exposure standards and guidelines:

- United States Federal Communications Commission (FCC), Code of Federal Regulations; 47 CFR § 2 sub-part J.
- American National Standards Institute (ANSI)/Institute of Electrical and Electronic Engineers (IEEE) C95.1-2005.
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-2005.
- IC Standard RSS-102, Issue 4, 2010: Spectrum Management and Telecommunications Radio Standards Specification. Radiofrequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands).

Table 1-3 and Table 1-4 list the recommended minimum safe lateral distances for a controlled environment and for unaware bystanders in an uncontrolled environment, from transmitting antennas (i.e., monopoles over a ground plane, or dipoles) at rated radio power for mobile radios installed in a vehicle. Transmit only when unaware bystanders are at least the uncontrolled recommended minimum safe lateral distance away from the transmitting antenna.

Based on the highest radiated RF power and the highest antenna gain in antennas used with XG-75M/M7300 series radios, the distances listed in Table 1-3 and Table 1-4 are considered as safe distances for controlled and uncontrolled environments with the XG-75M/M7300 series mobile radios transmitting at a maximum 50% duty cycle:

1.6.1 Mobile Antennas

The antenna(s) for the radio must be installed in accordance with the antenna installation procedures presented in the radio's *Installation Manual*. Also refer to any special instructions included with the antenna.

Use only approved/supplied antenna(s) or an approved replacement antenna. Unauthorized antennas, modifications, or attachments can cause the FCC RF exposure limits to be exceeded.

1.6.2 Approved Accessories

The radio has been tested and meets FCC RF guidelines when used with accessories supplied or designated for use with it. Use of other accessories may not ensure compliance with the FCC's RF exposure guidelines, and may violate FCC regulations. For a list of approved accessories, refer to the radio's *Installation Manual* and/or to the *Products and Services Catalog*.

1.6.3 Mobile Antennas (Vehicle Installations)

Table 1-3: Rated Power and Recommended Minimum Safe Lateral Distance (Vehicle Installations)

MOBILE RADIO FREQUENCY SPLIT	ANTENNA PART NUMBER	ANTENNA DESCRIPTION	RECOMMENDED MINIMUM LATERAL HUMAN BODY DISTANCE FROM TRANSMITTING ANTENNA	
			CONTROLLED ENVIRONMENT	UNCONTROLLED ENVIRONMENT
VHF (50 W)	AN-225002-001	136 to 174 MHz, 0 dBd Gain	24.8 Inches (63 Centimeters)	55.1 Inches (140 Centimeters)
VHF (50 W)	AN-225006-001	132 to 960 MHz, 0 dBd Gain*		
VHF (50 W)	AN-225002-003	136 to 174 MHz, 3 dBd Gain*	35.0 Inches (89 Centimeters)	78.0 Inches (198 Centimeters)
VHF (50 W)	AN-225002-004	136 to 174 MHz, 2.4 dBd Gain*	32.7 Inches (83 Centimeters)	72.8 Inches (185 Centimeters)
VHF (110 W)	AN-225002-001	136 to 174 MHz, 0 dBd Gain	36.6 Inches (93 Centimeters)	81.9 Inches (208 Centimeters)
VHF (110 W)	AN-225006-001	132 to 960 MHz, 0 dBd Gain*		
VHF (110 W)	AN-225002-003	136 to 174 MHz, 3 dBd Gain*	52.0 Inches (132 Centimeters)	115.7 Inches (294 Centimeters)
VHF (110 W)	AN-225002-004	136 to 174 MHz, 2.4 dBd Gain*	48.4 Inches (123 Centimeters)	107.9 Inches (274 Centimeters)
UHF – L (50 W)	AN-125001-001 (mount) with AN-225003-001 (element)	378 to 430 MHz Standard Rooftop-Mount; 0 dBd Gain	21.3 Inches (54 Centimeters)	47.2 Inches (120 Centimeters)
UHF – L (50 W)	AN-125001-001 (mount) with AN-225003-004 (element)	378 to 430 MHz Standard Rooftop-Mount; Low-Profile 0 dBd Gain		
UHF – L (50 W)	AN-125001-003 (mount) with AN-225003-001 (element)	378 to 430 MHz Thick Rooftop-Mount; 0 dBd Gain		
UHF – L (50 W)	AN-125001-003 (mount) with AN-225003-004 (element)	378 to 430 MHz Thick Rooftop-Mount; Low-Profile 0 dBd Gain		
UHF – L (50 W)	AN-125001-005 (mount) with AN-225003-001 (element)	378 to 430 MHz GPS Combo, Standard Rooftop-Mount; 0 dBd Gain		
UHF – L (50 W)	AN-125001-005 (mount) with AN-225003-004 (element)	378 to 430 MHz GPS Combo, Standard Rooftop-Mount; Low-Profile 0 dBd Gain		
UHF – L (50 W)	AN-125001-007 (mount) with AN-225003-001 (element)	378 to 430 MHz Magnetic-Mount; 0 dBd Gain		
UHF – L (50 W)	AN-125001-007 (mount) with AN-225003-004 (element)	378 to 430 MHz Magnetic-Mount; Low-Profile 0 dBd Gain		

Table 1-3: Rated Power and Recommended Minimum Safe Lateral Distance (Vehicle Installations)

MOBILE RADIO FREQUENCY SPLIT	ANTENNA PART NUMBER	ANTENNA DESCRIPTION	RECOMMENDED MINIMUM LATERAL HUMAN BODY DISTANCE FROM TRANSMITTING ANTENNA	
			CONTROLLED ENVIRONMENT	UNCONTROLLED ENVIRONMENT
UHF – H (50 W)	AN-125001-001 (mount) with AN-225004-001 (element)	450 to 512 MHz Standard Rooftop-Mount; 0 dBd Gain	20 Inches (51 Centimeters)	45 Inches (114 Centimeters)
UHF – H (50 W)	AN-125001-001 (mount) with AN-225004-004 (element)	450 to 512 MHz Standard Rooftop-Mount; Low-Profile 0 dBd Gain		
UHF – H (50 W)	AN-125001-003 (mount) with AN-225004-001 (element)	450 to 512 MHz Thick Rooftop-Mount; 0 dBd Gain		
UHF – H (50 W)	AN-125001-003 (mount) with AN-225004-004 (element)	450 to 512 MHz Thick Rooftop-Mount; Low-Profile 0 dBd Gain		
UHF – H (50 W)	AN-125001-005 (mount) with AN-225004-001 (element)	450 to 512 MHz GPS Combo, Standard Rooftop-Mount; 0 dBd Gain		
UHF – H (50 W)	AN-125001-005 (mount) with AN-225004-004 (element)	450 to 512 MHz GPS Combo, Standard Rooftop-Mount; Low-Profile 0 dBd Gain		
UHF – H (50 W)	AN-125001-007 (mount) with AN-225004-001 (element)	450 to 512 MHz Magnetic-Mount; 0 dBd Gain		
UHF – H (50 W)	AN-125001-007 (mount) with AN-225004-004 (element)	450 to 512 MHz Magnetic-Mount; Low-Profile 0 dBd Gain		
700/800 MHz	AN-125001-002 (mount) with AN-225001-001 (element)	700/800 MHz Standard Rooftop-Mount; 3 dBd Gain	9.8 Inches (25 Centimeters)	21.7 Inches (55 Centimeters)
700/800 MHz	AN-125001-002 (mount) with AN-225001-002 (element)	700/800 MHz Standard Rooftop-Mount; Elevated-Feed 3 dBd Gain		
700/800 MHz	AN-125001-002 (mount) with AN-225001-003 (element)	700/800 MHz Standard Rooftop-Mount; Elevated-Feed, No Ground Plane 3 dBd Gain		
700/800 MHz	AN-125001-002 (mount) with AN-225001-004 (element)	700/800 MHz Standard Rooftop-Mount; Low-Profile 2 dBd Gain		
700/800 MHz	AN-125001-002 (mount) with AN-225001-005 (element)	700/800 MHz Standard Rooftop-Mount; 5 dBd Gain	11.8 Inches (30 Centimeters)	23.6 Inches (60 Centimeters)
700/800 MHz	AN-125001-004 (mount) with AN-225001-001 (element)	700/800 MHz Thick Rooftop-Mount; 3 dBd Gain	9.8 Inches (25 Centimeters)	21.7 Inches (55 Centimeters)

Table 1-3: Rated Power and Recommended Minimum Safe Lateral Distance (Vehicle Installations)

MOBILE RADIO FREQUENCY SPLIT	ANTENNA PART NUMBER	ANTENNA DESCRIPTION	RECOMMENDED MINIMUM LATERAL HUMAN BODY DISTANCE FROM TRANSMITTING ANTENNA	
			CONTROLLED ENVIRONMENT	UNCONTROLLED ENVIRONMENT
700/800 MHz	AN-125001-004 (mount) with AN-225001-002 (element)	700/800 MHz Thick Rooftop-Mount; Elevated-Feed 3 dBd Gain	9.8 Inches (25 Centimeters)	21.7 Inches (55 Centimeters)
700/800 MHz	AN-125001-004 (mount) with AN-225001-003 (element)	700/800 MHz Thick Rooftop-Mount; Elevated-Feed, No Ground Plane 3 dBd Gain		
700/800 MHz	AN-125001-004 (mount) with AN-225001-004 (element)	700/800 MHz Thick Rooftop-Mount; Low-Profile 2 dBd Gain		
700/800 MHz	AN-125001-004 (mount) with AN-225001-005 (element)	700/800 MHz Thick Rooftop-Mount; 5 dBd Gain	11.8 Inches (30 Centimeters)	23.6 Inches (60 Centimeters)
700/800 MHz	AN-125001-006 (mount) with AN-225001-001 (element)	700/800 MHz GPS Combo Rooftop-Mount; 3 dBd / 5.15 dBi Gain	9.8 Inches (25 Centimeters)	21.7 Inches (55 Centimeters)
700/800 MHz	AN-125001-006 (mount) with AN-225001-002 (element)	700/800 MHz GPS Combo Rooftop-Mount; Elevated-Feed 3 dBd Gain		
700/800 MHz	AN-125001-006 (mount) with AN-225001-003 (element)	700/800 MHz GPS Combo Rooftop-Mount; Elevated-Feed, No Ground Plane 3 dBd Gain		
700/800 MHz	AN-125001-006 (mount) with AN-225001-004 (element)	700/800 MHz GPS Combo Rooftop-Mount; Low-Profile 2 dBd Gain		
700/800 MHz	AN-125001-006 (mount) with AN-225001-005 (element)	700/800 MHz GPS Combo Rooftop-Mount; 5 dBd / 7.15 dBi Gain	11.8 Inches (30 Centimeters)	23.6 Inches (60 Centimeters)
700/800 MHz	AN-125001-008 (mount) with AN-225001-001 (element)	700/800 MHz Magnetic-Mount; 3 dBd Gain	9.8 Inches (25 Centimeters)	21.7 Inches (55 Centimeters)
700/800 MHz	AN-125001-008 (mount) with AN-225001-002 (element)	700/800 MHz Magnetic-Mount; Elevated-Feed 3 dBd Gain		
700/800 MHz	AN-125001-008 (mount) with AN-225001-003 (element)	700/800 MHz Magnetic-Mount; Elevated-Feed, No Ground Plane 3 dBd Gain		
700/800 MHz	AN-125001-008 (mount) with AN-225001-004 (element)	700/800 MHz Magnetic-Mount; Low-Profile 2 dBd Gain		
700/800 MHz	AN-125001-008 (mount) with AN-225001-005 (element)	700/800 MHz Magnetic-Mount; 5 dBd Gain	11.8 Inches (30 Centimeters)	23.6 Inches (60 Centimeters)

Table 1-3: Rated Power and Recommended Minimum Safe Lateral Distance (Vehicle Installations)

MOBILE RADIO FREQUENCY SPLIT	ANTENNA PART NUMBER	ANTENNA DESCRIPTION	RECOMMENDED MINIMUM LATERAL HUMAN BODY DISTANCE FROM TRANSMITTING ANTENNA	
			CONTROLLED ENVIRONMENT	UNCONTROLLED ENVIRONMENT
700/800 MHz	STI-Co CCAS-SB-700	760 - 820 MHz Concealed Peal-and-Stick Internal-Mount; dBi Gain	7.9 Inches (20 Centimeters)	19.7 Inches (50 Centimeters)

* Element must be trimmed to proper length to minimize antenna system VSWR.

1.6.4 Mobile Antennas (Motorcycle Installations)

Table 1-4: Rated Power and Recommended Minimum Safe Lateral Distance (Motorcycle Installation)

RF BAND	MAX. TX POWER (WATTS)	ANTENNA PART NUMBER	ANTENNA DESCRIPTION	RECOMMENDED MINIMUM LATERAL HUMAN BODY DISTANCE FROM TRANSMITTING ANTENNA	
				CONTROLLED ENVIRONMENT (Centimeters)	UNCONTROLLED ENVIRONMENT (Centimeters)
VHF	20	LE-OM150K.125/TNC	136 to 174 MHz Motorcycle-Mount; 2.5 dBd Gain	53	118
VHF	18	AN-125001-005 (mount) with AN-225002-004 (element)	136 to 174 MHz GPS Combo; No-Ground-Plane (NGP); 2.4 dBd Gain	50	—
	3.6			—	50
UHF- L	43	AN-125001-005 (mount) with AN-225003-005 (element)	378 to 430 MHz GPS Combo, No-Ground-Plane (NGP), 0 dBd Gain	50	—
	8.5			—	50
UHF - H	47	AN-125001-005 (mount) with AN-225004-005 (element)	450 to 512 MHz GPS Combo, No-Ground-Plane (NGP), 0 dBd Gain	50	—
	9.5			—	50
800 MHz	20	LE-OM806HDBKTNCDS	800 MHz Motorcycle-Mount; 3.5 dBd Gain	28	72
700 or 800 MHz	20	AN-125001-006 (mount) with AN-225001-003 (element)	700/800 MHz GPS Combo; no-Ground-Plane (NGP); 3 dBd / 5.15 dBi Gain	50	50

A radio used in a motorcycle installation must be configured with a transmit output power level less than or equal to the **MAX. TX POWER (WATTS)** specification listed in Table 1-4 for the respective frequency band and antenna/antenna element. Refer to the radio's *Installation Manual* for additional information.

When a later-design motorcycle installation kit is employed (which uses antenna element AN-225001-003 or AN-225002-004), the coaxial cable between the radio and the base of the antenna mount cannot be shorter than 44 inches (111.8 centimeters). Refer to the radio's *Installation Manual* for additional information.

A radio intended for a non-motorcycle installation should not be used in a motorcycle installation unless it is reprogrammed per the procedures presented in the radio's *Installation Manual*.

1.7 OCCUPATIONAL SAFETY GUIDELINES AND SAFETY TRAINING INFORMATION

To ensure bodily exposure to RF electromagnetic energy is within the FCC allowable limits for occupational use. Always adhere to the following basic guidelines:

- The push-to-talk button should only be depressed when intending to send a voice message.
- The radio should only be used for necessary work-related communications.
- The radio should only be used by authorized and trained personnel. It should never be operated by children.
- Do not attempt any unauthorized modification to the radio. Changes or modifications to the radio may cause harmful interference and/or cause it to exceed FCC RF exposure limits. Only qualified personnel should service the radio.
- Always use only authorized accessories (antennas, control heads, speakers/mics, etc.). Use of unauthorized accessories can cause the FCC RF exposure compliance requirements to be exceeded.

The information listed above provides the user with information needed to make him or her aware of a RF exposure, and what to do to assure that this radio operates within the FCC exposure limits of this radio.

1.8 COMMON HAZARDS

The operator of any mobile radio should be aware of certain hazards common to the operation of vehicular radio transmissions. Possible hazards include but are not limited to:

- **Explosive Atmospheres** — Just as it is dangerous to fuel a vehicle while its engine is running, be sure to turn the radio **OFF** while fueling the vehicle. If the radio is mounted in the trunk of the vehicle, **DO NOT** carry containers of fuel in the trunk.

  Areas with potentially explosive atmosphere are often, but not always, clearly marked. Turn the radio **OFF** when in any area with a potentially explosive atmosphere. It is rare, but not impossible that the radio or its accessories could generate sparks.

- **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 can malfunction due to the lack of protection from radio frequency (RF) 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.
- **Electric Blasting Caps** — To prevent accidental detonation of electric blasting caps, **DO NOT** use two-way radios within 1000 feet (305 meters) of blasting operations. Always obey the "**Turn Off Two-Way Radios**" (or equivalent) signs posted where electric blasting caps are being used. (OSHA Standard: 1926.900).
- **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 the minimum safe distance from the antenna as specified in Table 1-3 and Table 1-4. Refer to Section 1.2 for additional information.
- **Vehicles Powered By Liquefied Petroleum (LP) Gas** — Radio installation in vehicles powered by liquefied petroleum gas, where the LP gas container is located in the trunk or other sealed-off space within the interior of the vehicle, must conform to the **N**ational **F**ire **P**rotection **A**ssociation standard **NFPA 58**. This requires:
  - The space containing the radio equipment must be isolated by a seal from the space containing the LP gas container and its fittings.
  - Outside filling connections must be used for the LP gas container.
  - The LP gas container space shall be vented to the outside of the vehicle.
- **Vehicles Equipped with Airbags** — For driver and passenger safety, avoid mounting the radio's control head (or any other component) above or near airbag deployment areas. In addition to driver-side and passenger-side front-impact airbags, some vehicles may also be equipped with side-impact airbags. For occupant safety, verify the location of all airbags within the vehicle before installing the radio equipment.

1.9 SAFE DRIVING RECOMMENDATIONS

The American Automobile Association (AAA) advocates the following key safe driving recommendations:

- Read the literature on the safe operation of the radio.
- Keep both hands on the steering wheel and the microphone in its hanger whenever the vehicle is in motion.
- Place calls only when the vehicle is stopped.
- When talking from a moving vehicle is unavoidable, drive in the slower lane. Keep conversations brief.
- If a conversation requires taking notes or complex thought, stop the vehicle in a safe place and continue the call.
- Whenever using a mobile radio, exercise caution.

1.10 OPERATING RULES AND REGULATIONS

Two-way radio systems must be operated in accordance with the rules and regulations of the local, regional, or national government.

In the United States, the XG-75M/M7300 mobile radio 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 particular type of radio operation. Following these rules helps eliminate confusion, assures the most efficient use of the existing radio channels, and results in a smoothly functioning radio network.

Under U.S. law, operation of an unlicensed radio transmitter within the jurisdiction of the United States may be punishable by a fine of up to $10,000, imprisonment for up to two (2) years, or both.

When using a two-way radio, remember these rules:

- It is a violation of FCC rules to interrupt any distress or emergency message. The radio operates in much the same way as a telephone “party line.” Therefore, always listen to make sure the channel is clear before transmitting. Emergency calls have priority over all other messages. If someone is sending an emergency message – such as reporting a fire or asking for help in an accident, do not transmit unless assistance can be offered.
- The use of profane or obscene language is prohibited by Federal law.
- It is against the law to send false call letters or false distress or emergency messages. The FCC requires keeping conversations brief and confined to business. Use coded messages whenever possible to save time.
- Using the radio to send personal messages (except in an emergency) is a violation of FCC rules. Send only essential messages.
- It is against Federal law to repeat or otherwise make known anything overheard on the radio. Conversations between others sharing the channel must be regarded as confidential.
- The FCC requires self-identification at certain specific times by means of call letters. Refer to the rules that apply to the particular type of operation for the proper procedure.
- No changes or adjustments shall be made to the equipment except by an authorized or certified electronics technician.

1.11 OPERATING TIPS

The following conditions tend to reduce the effective range of two-way radios and should be avoided whenever possible:

- Operating the radio in areas of low terrain, or while under power lines or bridges.
- Obstructions such as mountains and buildings.

In areas where transmission or reception is poor, communication improvement may sometimes be obtained by moving a few yards in another direction, or moving to a higher elevation.

2. RENSEIGNEMENTS SUR LA RÉGLEMENTATION ET SÉCURITÉ

2.1 CONVENTIONS SUR LES SYMBOLES DE SÉCURITÉ

Les conventions suivantes sont utilisées dans le présent manuel pour avertir l'utilisateur des précautions générales de sécurité qui doivent être observées pendant toutes les phases d'opération, d'entretien et de réparation de ce produit. Le non-respect de ces précautions ou d'avertissements précisés ailleurs enfreint les normes de sécurité de la conception, de la fabrication et de l'utilisation prévue du produit. L3Harris n'assume aucune responsabilité pour le non-respect de ces normes par le client.

Le symbole MISE EN GARDE attire l'attention sur une procédure ou une pratique qui, si elle n'est pas correctement effectuée ou observée, pourrait entraîner une blessure personnelle. Ne pas poursuivre au-delà d'un symbole de MISE EN GARDE avant que les conditions identifiées soient complètement comprises ou satisfaites.

Le symbole **AVERTISSEMENT** attire l'attention sur une procédure ou une pratique opérationnelle qui, si elle n'est pas correctement effectuée ou observée, pourrait entraîner un bris d'équipement ou une importante baisse de rendement de l'équipement.

Le symbole **REMARQUE** attire l'attention sur des renseignements supplémentaires qui peuvent améliorer le rendement du système ou clarifier un processus ou une procédure.

2.2 CONFORMITÉ À LA RÉGLEMENTATION

Tableau 2-1: FCC Type de Acceptation

NUMÉRO DE PIÈCE DE LA RADIO	FRÉQUENCE RADIO/WATTAGE	FCC TYPE NOMBRE ACCEPTATION
RU-144750-041	VHF 136-174 MHz, 50 Watt	OWDTR-0055-E
RU-144750-051	VHF 136-174 MHz, 110 Watt	OWDTR-0056-E
RU-144750-021	UHF-L 378-430 MHz, 50 Watt	OWDTR-0061-E
RU-144750-031	UHF-H 440-512 MHz, 50 Watt	OWDTR-0062-E
14018-0010-01	330-380 MHz, 40 Watt	N/R
RU-144750-061 (Rev. K or earlier)	764-806 MHz, 30 Watt 806-870 MHz, 35 Watt	OWDTR-0060-E
RU-144750-061 (Rev. L or later)	764-806 MHz, 30 Watt 806-870 MHz, 35 Watt	OWDTR-0132-E

règles de la FCC applicables: Partie 15, Partie 80*, and Partie 90
* FCC Part 80 est à 156-162 MHz only.

Tableau 2-2: Type de Canada Industrie Acceptation

NUMÉRO DE PIÈCE DE LA RADIO	FRÉQUENCE RADIO/WATTAGE	CANADA INDUSTRIE TYPE NOMBRE ACCEPTATION
RU-144750-041	VHF 136-174 MHz, 50 Watt	3636B-0055
RU-144750-051	VHF 136-174 MHz, 110 Watt	3636B-0056
RU-144750-021	UHF-L 378-430 MHz, 50 Watt	3636B-0061
RU-144750-031	UHF-H 440-512 MHz, 50 Watt	3636B-0062
RU-144750-061 (Rev. K or earlier)	764-806 MHz, 30 Watt 806-870 MHz, 35 Watt	3636B-0051
RU-144750-061 (Rev. L or later)	764-806 MHz, 30 Watt 806-870 MHz, 35 Watt	3636B-0132

Reglement applicables d'Industrie Canada: RSS 119; RSS 210

2.3 INTERFÉRENCE DES RADIOFRÉQUENCES

2.3.1 Partie 15 de la FCC

Cet appareil est conforme à la Partie 15 de la réglementation de la FCC. Le fonctionnement est soumis aux deux conditions suivantes :

1. Cet appareil ne doit pas causer une interférence nuisible; et
2. Cet appareil doit accepter toute interférence reçue, y compris une interférence qui peut causer un fonctionnement non souhaité.

2.3.2 Industrie Canada

Cet appareil est conforme aux normes RSS exemptées de licence d'Industrie Canada. Le fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, y compris une interférence qui peut causer un fonctionnement non souhaité de l'appareil.

2.4 RENSEIGNEMENTS SUR UNE EXPOSITION À L'ÉNERGIE DES RF

2.4.1 Renseignements Sur Le Contrôle Et La Sensibilisation À L'énergie Des RF Pour Les Exigences D'une Utilisation Professionnelle De La FCC

Avant d'utiliser les radios mobiles bidirectionnelles, passez en revue les renseignements et les instructions opérationnelles importants suivants sur le contrôle et la sensibilisation à l'énergie des RF. Se conformer à ces renseignements et instructions pour assurer la conformité aux directives d'exposition aux RF.

Cette radio est destinée à être utilisée dans des conditions professionnelles/ contrôlées, où les utilisateurs ont une pleine connaissance de leur exposition et peuvent exercer un contrôle sur leur exposition pour rester sous les limites d'exposition aux RF. Cette radio N'est PAS autorisée pour la population générale, les consommateurs ou toute autre utilisation.

Des changements ou modifications non expressément approuvés par L3Harris pourraient annuler le droit d'utilisation de l'équipement pour l'utilisateur.

Cette radio bidirectionnelle utilise une énergie électromagnétique dans le spectre des radiofréquences (RF) pour permettre une communication à distance entre deux utilisateurs ou plus. Elle utilise l'énergie des RF ou les ondes radio pour envoyer et recevoir des appels. L'énergie des RF est une forme d'énergie électromagnétique. D'autres formes comprennent, entre autres, l'énergie électrique, la lumière du soleil et les rayons X. Toutefois, l'énergie des RF ne doit pas être confondue avec ces autres formes d'énergie électromagnétique qui, lorsque mal utilisées, peuvent causer des dommages biologiques. Par exemple, des niveaux très élevés de rayons X peuvent endommager les tissus et le matériel génétique.

Des experts en science, en ingénierie, en médecine, en santé et de l'industrie travaillent avec des organismes pour établir des normes pour l'exposition à l'énergie des RF. Ces normes procurent des niveaux recommandés d'exposition aux RF autant aux travailleurs qu'au grand public. Ces niveaux d'exposition aux RF recommandés comprennent d'importantes marges de protection. Toutes les radios bidirectionnelles commercialisées en Amérique du Nord sont conçues, fabriquées et testées pour s'assurer qu'elles satisfont les niveaux d'exposition aux RF établis par le gouvernement. Les fabricants recommandent également des consignes d'utilisation particulières aux utilisateurs de radios bidirectionnelles. Ces instructions sont importantes, car elles informent les utilisateurs sur l'exposition à l'énergie des RF et donnent des procédures simples sur la manière de contrôler cette exposition. Consultez les sites Web suivants (en anglais) pour de plus amples renseignements sur ce qu'est l'exposition à l'énergie des RF et comment contrôler l'exposition pour assurer la conformité aux limites d'exposition établies :

http://www.fcc.gov/oet/rfsafety/rf-faqs.html

http://www.osha.gov./SLTC/radiofrequencyradiation/index.html

2.4.2 Règlements de la Federal Communications Commission (« Commission fédérale des communications » aux États-Unis)

Avant d'être mise sur le marché aux États-Unis, la radio mobile bidirectionnelle XG-75M/M7300 a été testée pour s'assurer de sa conformité aux limites d'exposition à l'énergie des RF de la FCC pour les radios mobiles bidirectionnelles. Lorsque les radios bidirectionnelles sont utilisées à la suite d'une embauche, la FCC demande aux utilisateurs de bien connaître et de pouvoir contrôler leur exposition pour satisfaire les exigences professionnelles. La sensibilisation à l'exposition peut être facilitée par l'utilisation d'une étiquette qui dirige les utilisateurs vers des renseignements particuliers sur la sensibilisation de l'utilisateur. La radio possède une étiquette de produit sur l'exposition aux RF. De plus, le *Manuel sur la sécurité du produit* et le présent *Manuel de l'opérateur* comprennent des renseignements et les consignes d'utilisation nécessaires pour contrôler l'exposition aux RF et pour satisfaire les exigences de conformité.

2.5 CONFORMITÉ AUX NORMES D'EXPOSITION AUX RF

La radio mobile bidirectionnelle XG-75M/M7300 est conçue et testée pour être conforme à un certain nombre de normes et directives nationales et internationales quant à l'exposition humaine à l'énergie électromagnétique des RF. Cette radio est conforme aux limites d'exposition de l'IEEE et de la Commission internationale de protection contre les rayonnements non ionisants pour un environnement professionnel/contrôlé d'exposition aux RF à des périodes de cycle de service allant jusqu'à 50 % (50 % de transmission, 50 % de réception) et elle est autorisée par la FCC pour une utilisation professionnelle. Sur le plan de la mesure de l'énergie des RF pour la conformité aux directives d'exposition de la FCC, l'antenne de la radio irradie une énergie des RF mesurable seulement lorsqu'elle transmet (parler), et non lorsqu'elle reçoit (écouter) ou en mode d'attente.

La radio mobile bidirectionnelle XG-75M/M7300 est conforme aux normes et directives d'exposition à l'énergie des RF suivantes :

- Federal Communications Commission (FCC) américaine, le Code of Federal Regulations; 47 CFR § 2 sous-partie J.
- American National Standards Institute (ANSI)/Institute of Electrical and Electronic Engineers (IEEE) C95.1-2005.
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-2005.
- IC Standard RSS-102, numéro 4, 2010 : Spectrum Management and Telecommunications Radio Standards Specification. Radiofrequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands).

Tableau 2-3 par Tableau 2-4 indiquent les distances latérales sécuritaires minimales recommandées pour un environnement contrôlé et pour les spectateurs ignorants dans un environnement non contrôlé, d'antennes de transmission (c.-à-d., des monopôles sur un plan de sol, ou des dipôles) à une puissance de radio évaluée pour les radios mobiles installées dans un véhicule. Ils ne transmettent que lorsque les spectateurs ignorants sont au moins à la distance latérale sécuritaire minimale recommandée non contrôlée de l'antenne de transmission.

Basées sur la puissance des RF irradiées la plus élevée et le gain d'antenne le plus élevé dans les antennes à utiliser avec le XG-75M/M7300, les distances indiquées dans les Tableau 2-4 (pour une radio de motocyclette), Tableau 2-3 (pour la XG-75M/M7300, 136 à 174 MHz, 50-Watt), (pour la XG-75M/M7300, 136 à 174 MHz, 110-Watt), (pour la XG-75M/M7300, 378 à 512 MHz), (pour la XG-75M/M7300, 700/800 MHz) sont considérées comme des distances sécuritaires pour des environnements contrôlés et non contrôlés avec la radio mobile XG-75M/M7300 qui transmet à un cycle de service maximal de 50 %.

2.5.1 Antennes mobiles

Les antennes pour la radio doivent être installées conformément aux procédures présentées dans le *Manuel sur la sécurité du produit* et dans le *Manuel d'installation*. L'installation est limitée à un ou des véhicules motorisés en métal avec des plans au sol appropriés.

Utilisez uniquement les antennes approuvées/fournies ou une antenne de remplacement approuvée. Des antennes, des modifications ou des accessoires non autorisés peuvent causer un dépassement des limites d'exposition aux RF de la FCC.

2.5.2 Accessoires approuvés

La radio a été testée et satisfait les directives de RF de la FCC lorsqu'elle est utilisée avec les accessoires fournis ou conçus pour être utilisés avec elle. L'utilisation d'autres accessoires peut ne pas garantir la conformité aux directives d'exposition de la FCC et peut enfreindre la réglementation de la FCC. Pour une liste d'accessoires approuvés, consultez le *Manuel d'installation* ou le *Catalogue de produits et services* de L3Harris.

Utilisez toujours des accessoires autorisés L3Harris (antennes, haut-parleurs/micros, etc.). L'utilisation d'accessoires non autorisés peut entraîner un dépassement des exigences de conformité pour une exposition aux RF professionnelle ou contrôlée de la FCC.

2.5.3 Monté Antennes (véhicule)

Tableau 2-3 : Distance latérale sécuritaire minimale recommandée d'une antenne de transmission branchée sur une radio mobile

RF BAND	NUMÉRO DE PIÈCE DE L'ÉLÉMENT DE L'ANTENNE	DESCRIPTION DE L'ANTENNE	DISTANCE MINIMALE RECOMMANDÉE DE L'ANTENNE DE TRANSMISSION POUR LE CORPS HUMAIN	
			ENVIRONNEMENT CONTRÔLÉ	ENVIRONNEMENT NON CONTRÔLÉ
VHF (50 W)	AN-225002-001	136 à 174 MHz, gain de 0 dBd	63 cm (24,8 po)	140 cm (55,1 po)
VHF (50 W)	AN-225006-001	132 à 960 MHz, gain de 0 dBd		
VHF (50 W)	AN-225002-003	136 à 174 MHz, gain de 3 dBd	89 cm (35,0 po)	198 cm (78,0 po)
VHF (50 W)	AN-225002-004	136 à 174 MHz, gain de 2,4 dBd	83 cm (32,7 po)	185 cm (72,8 po)
VHF (110 W)	AN-225002-001	136 à 174 MHz, gain de 0 dBd	93 cm (36,6 po)	208 cm (81,9 po)
VHF (110 W)	AN-225006-001	132 à 960 MHz, gain de 0 dBd		
VHF (110 W)	AN-225002-003	136 à 174 MHz, gain de 3 dBd	132 cm (52,0 po)	294 cm (115,7 po)
VHF (110 W)	AN-225002-004	136 à 174 MHz, gain de 2,4 dBd	123 cm (48,4 po)	274 cm (107,9 po)
UHF-L	AN-125001-001 (monture) avec AN-225003-001 (élément)	378 à 430 MHz; antenne de toit standard; gain de 0 dBd	54 cm (21,3 po)	120 cm (47,2 po)
UHF-L	AN-125001-001 (monture) avec AN-225003-004 (élément)	378 à 430 MHz; antenne de toit standard; gain de 0 dBd; profil bas		
UHF-L	AN-125001-003 (monture) avec AN-225003-001 (élément)	378 à 430 MHz; antenne de toit épais de; gain de 0 dBd		
UHF-L	AN-125001-003 (monture) avec AN-225003-004 (élément)	378 à 430 MHz; antenne de toit épais de; gain de 0 dBd; profil bas		
UHF-L	AN-125001-005 (monture) avec AN-225003-001 (élément)	378 à 430 MHz; combo antenne de toit épais et; gain de 0 dBd		
UHF-L	AN-125001-005 (monture) avec AN-225003-004 (élément)	378 à 430 MHz; combo antenne de toit épais et; gain de 0 dBd; profil bas		
UHF-L	AN-125001-007 (monture) avec AN-225003-001 (élément)	378 à 430 MHz; montage magnétique; gain de 0 dBd		

Tableau 2-3 : Distance latérale sécuritaire minimale recommandée d'une antenne de transmission branchée sur une radio mobile

RF BAND	NUMÉRO DE PIÈCE DE L'ÉLÉMENT DE L'ANTENNE	DESCRIPTION DE L'ANTENNE	DISTANCE MINIMALE RECOMMANDÉE DE L'ANTENNE DE TRANSMISSION POUR LE CORPS HUMAIN	
			ENVIRONNEMENT CONTRÔLÉ	ENVIRONNEMENT NON CONTRÔLÉ
UHF-L	AN-125001-007 (monture) avec AN-225003-004 (élément)	378 à 430 MHz; montage magnétique; gain de 0 dBd; profil bas	54 cm (21,3 po)	120 cm (47,2 po)
UHF-L	AN-125001-001 (monture) avec AN-225004-001 (élément)	450 to 512 MHz; antenne de toit standard; gain de 0 dBd	51 Centimeters (20 po)	114 Centimeters (45 po)
UHF-L	AN-125001-001 (monture) avec AN-225004-004 (élément)	450 to 512 MHz; antenne de toit standard; gain de 0 dBd; profil bas		
UHF-L	AN-125001-003 (monture) avec AN-225004-001 (élément)	450 to 512 MHz; antenne de toit épais de; gain de 0 dBd		
UHF-L	AN-125001-003 (monture) avec AN-225004-004 (élément)	450 to 512 MHz; antenne de toit épais de; gain de 0 dBd; profil bas		
UHF-L	AN-125001-005 (monture) avec AN-225004-001 (élément)	450 to 512 MHz; combo antenne de toit épais et; gain de 0 dBd		
UHF-L	AN-125001-005 (monture) avec AN-225004-004 (élément)	450 to 512 MHz; combo antenne de toit épais et; gain de 0 dBd; profil bas		
UHF-L	AN-125001-007 (monture) avec AN-225004-001 (élément)	450 to 512 MHz; montage magnétique; gain de 0 dBd		
UHF-L	AN-125001-007 (monture) avec AN-225004-004 (élément)	450 to 512 MHz; montage magnétique; gain de 0 dBd; profil bas		
UHF-L	AN102800V1 (n'est plus vendu)	136 à 941 MHz, ¼ - longueur d'onde*; antenne de toit toit standard; gain de 0 dBd		
UHF-H	AN-125001-001 (monture) avec AN-225003-001 (élément)	378 à 430 MHz; antenne de toit standard; gain de 0 dBd	54 cm (21,3 po)	120 cm (47,2 po)
UHF-H	AN-125001-001 (monture) avec AN-225003-004 (élément)	378 à 430 MHz; antenne de toit standard; gain de 0 dBd; profil bas		
UHF-H	AN-125001-003 (monture) avec AN-225003-001 (élément)	378 à 430 MHz; antenne de toit épais de; gain de 0 dBd		

Tableau 2-3 : Distance latérale sécuritaire minimale recommandée d'une antenne de transmission branchée sur une radio mobile

RF BAND	NUMÉRO DE PIÈCE DE L'ÉLÉMENT DE L'ANTENNE	DESCRIPTION DE L'ANTENNE	DISTANCE MINIMALE RECOMMANDÉE DE L'ANTENNE DE TRANSMISSION POUR LE CORPS HUMAIN	
			ENVIRONNEMENT CONTRÔLÉ	ENVIRONNEMENT NON CONTRÔLÉ
UHF-H	AN-125001-003 (monture) avec AN-225003-004 (élément)	378 à 430 MHz; antenne de toit épais de; gain de 0 dBd; profil bas	54 cm (21,3 po)	120 cm (47,2 po)
UHF-H	AN-125001-005 (monture) avec AN-225003-001 (élément)	378 à 430 MHz; combo antenne de toit épais et; gain de 0 dBd		
UHF-H	AN-125001-005 (monture) avec AN-225003-004 (élément)	378 à 430 MHz; combo antenne de toit épais et; gain de 0 dBd; profil bas		
UHF-H	AN-125001-007 (monture) avec AN-225003-001 (élément)	378 à 430 MHz; montage magnétique; gain de 0 dBd		
UHF-H	AN-125001-007 (monture) avec AN-225003-004 (élément)	378 à 430 MHz; montage magnétique; gain de 0 dBd; profil bas		
UHF-H	AN-125001-001 (monture) avec AN-225004-001 (élément)	450 to 512 MHz; antenne de toit standard; gain de 0 dBd	51 Centimeters (20 po)	114 Centimeters (45 po)
UHF-H	AN-125001-001 (monture) avec AN-225004-004 (élément)	450 to 512 MHz; antenne de toit standard; gain de 0 dBd; profil bas		
UHF-H	AN-125001-003 (monture) avec AN-225004-001 (élément)	450 to 512 MHz; antenne de toit épais de; gain de 0 dBd		
UHF-H	AN-125001-003 (monture) avec AN-225004-004 (élément)	450 to 512 MHz; antenne de toit épais de; gain de 0 dBd; profil bas		
UHF-H	AN-125001-005 (monture) avec AN-225004-001 (élément)	450 to 512 MHz; combo antenne de toit épais et; gain de 0 dBd		
UHF-H	AN-125001-005 (monture) avec AN-225004-004 (élément)	450 to 512 MHz; combo antenne de toit épais et; gain de 0 dBd; profil bas		
UHF-H	AN-125001-007 (monture) avec AN-225004-001 (élément)	450 to 512 MHz; montage magnétique; gain de 0 dBd		
UHF-H	AN-125001-007 (monture) avec AN-225004-004 (élément)	450 to 512 MHz; montage magnétique; gain de 0 dBd; profil bas		

Tableau 2-3 : Distance latérale sécuritaire minimale recommandée d'une antenne de transmission branchée sur une radio mobile

RF BAND	NUMÉRO DE PIÈCE DE L'ÉLÉMENT DE L'ANTENNE	DESCRIPTION DE L'ANTENNE	DISTANCE MINIMALE RECOMMANDÉE DE L'ANTENNE DE TRANSMISSION POUR LE CORPS HUMAIN	
			ENVIRONNEMENT CONTRÔLÉ	ENVIRONNEMENT NON CONTRÔLÉ
UHF-H	AN102800V1 (n'est plus vendu)	136 à 941 MHz, ¼ - longueur d'onde*; antenne de toit toit standard; gain de 0 dBd	51 Centimeters (20 po)	114 Centimeters (45 po)
700/800 MHz	AN-125001-002 (monture) avec AN-225001-001 (élément)	Antenne de toit standard de 700/800 MHz; gain de 3 dBd	25 cm (9,8 po)	55 cm (21,7 po)
700/800 MHz	AN-125001-002 (monture) avec AN-225001-002 (élément)	Antenne de toit standard de 700/800 MHz; point d'alimentation surélevé, gain de 3 dBd		
700/800 MHz	AN-125001-002 (monture) avec AN-225001-003 (élément)	Antenne de toit standard de 700/800 MHz; point d'alimentation surélevé, gain de 3 dBd sans plan de sol		
700/800 MHz	AN-125001-002 (monture) avec AN-225001-004 (élément)	Antenne de toit standard de 700/800 MHz; gain de 2 dBd à profil bas		
700/800 MHz	AN-125001-002 (monture) avec AN-225001-005 (élément)	Antenne de toit standard de 700/800 MHz; gain de 5 dBd	30 cm (11,8 po)	60 cm (23,6 po)
700/800 MHz	AN-125001-004 (monture) avec AN-225001-001 (élément)	Antenne de toit épais de 700/800 MHz; gain de 3 dBd	25 cm (9,8 po)	55 cm (21,7 po)
700/800 MHz	AN-125001-004 (monture) avec AN-225001-002 (élément)	Antenne de toit épais de 700/800 MHz; point d'alimentation surélevé, gain de 3 dBd		
700/800 MHz	AN-125001-004 (monture) avec AN-225001-003 (élément)	Antenne de toit épais de 700/800 MHz; point d'alimentation surélevé, gain de 3 dBd sans plan de sol		
700/800 MHz	AN-125001-004 (monture) avec AN-225001-004 (élément)	Antenne de toit épais de 700/800 MHz; gain de 2 dBd à profil bas		
700/800 MHz	AN-125001-004 (monture) avec AN-225001-005 (élément)	Antenne de toit épais de 700/800 MHz; gain de 5 dBd	30 cm (11,8 po)	60 cm (23,6 po)
700/800 MHz	AN-125001-006 (monture) avec AN-225001-001 (élément)	Combo antenne de toit et GPS de 700/800 MHz; gain de 3 dBd / 5,15 dBi	25 cm (9,8 po)	55 cm (21,7 po)

Tableau 2-3 : Distance latérale sécuritaire minimale recommandée d'une antenne de transmission branchée sur une radio mobile

RF BAND	NUMÉRO DE PIÈCE DE L'ÉLÉMENT DE L'ANTENNE	DESCRIPTION DE L'ANTENNE	DISTANCE MINIMALE RECOMMANDÉE DE L'ANTENNE DE TRANSMISSION POUR LE CORPS HUMAIN	
			ENVIRONNEMENT CONTRÔLÉ	ENVIRONNEMENT NON CONTRÔLÉ
700/800 MHz	AN-125001-006 (monture) avec AN-225001-002 (élément)	Combo antenne de toit épais et GPS de 700/800 MHz; point d'alimentation surélevé, gain de 3 dBd	25 cm (9,8 po)	55 cm (21,7 po)
700/800 MHz	AN-125001-006 (monture) avec AN-225001-003 (élément)	Combo antenne de toit et GPS 700/800 MHz; point d'alimentation surélevé, gain de 3 dBd sans plan de sol		
700/800 MHz	AN-125001-006 (monture) avec AN-225001-004 (élément)	Combo antenne de toit et GPS de 700/800 MHz; gain de 2 dBd à profil bas		
700/800 MHz	AN-125001-006 (monture) avec AN-225001-005 (élément)	Combo antenne de toit et GPS de 700/800 MHz; gain de 5 dBd / 7,15 dBi	32 cm (12,6 po)	72 cm (28,3 po)
700/800 MHz	AN-125001-008 (monture) avec AN-225001-001 (élément)	Antenne magnétique de 700/800 MHz; gain de 3 dBd	25 cm (9,8 po)	55 cm (21,7 po)
700/800 MHz	AN-125001-008 (monture) avec AN-225001-002 (élément)	Antenne magnétique de 700/800 MHz; point d'alimentation surélevé, gain de 3 dBd		
700/800 MHz	AN-125001-008 (monture) avec AN-225001-003 (élément)	Antenne magnétique de 700/800 MHz; point d'alimentation surélevé, gain de 3 dBd sans plan de sol		
700/800 MHz	AN-125001-008 (monture) avec AN-225001-004 (élément)	Antenne magnétique de 700/800 MHz; gain de 2 dBd à profil bas		
700/800 MHz	AN-125001-008 (monture) avec AN-225001-005 (élément)	Antenne à monture magnétique de 700/800 MHz; gain de 5 dBd	30 cm (11,8 po)	60 cm (23,6 po)
700/800 MHz	AN102800V1 (n'est plus vendu)	136 à 941 MHz, ¼ - longueur d'onde*; antenne de toit toit standard; gain de 0 dBd	25 cm (9,8 po)	55 cm (21,7 po)

* L'élément mené des pièces AN-225006-001 et AN102800V1 doit être ajusté à une longueur adéquate pour minimiser le ROS du système d'antenne.

2.5.4 Monté Antennes (Motocyclette)

Tableau 2-4: Distance latérale sécuritaire minimale recommandée d'une antenne de transmission branchée sur une radio Motocyclette

RF BAND	NUMÉRO DE PIÈCE DE L'ÉLÉMENT DE L'ANTENNE	DESCRIPTION DE L'ANTENNE	DISTANCE MINIMALE RECOMMANDÉE DE L'ANTENNE DE TRANSMISSION POUR LE CORPS HUMAIN		MAX. TX PUISSANCE (Watts)
			ENVIRONNEMENT CONTRÔLÉ	ENVIRONNEMENT NON CONTRÔLÉ	
VHF	LE-OM150K.125/TNC	136 to 174 MHz motocyclette-monture; gain de 2.5 dBd	53 cm	118 cm	20
VHF	AN-125001-005 (monture) avec AN-225002-004 (élément)	136 to 174 MHz; combo antenne de toit épais e; sans plan de sol;gain de 2.4 dBd	50 cm	—	18
			—	50 cm	3.6
UHF- L	AN-125001-005 (monture) avec AN-225003-005 (élément)	378 à 430 MHz; combo antenne de toit épais e; sans plan de sol;gain de 0 dBd;	50 cm	—	43
			—	50	8.5
UHF - H	AN-125001-005 (monture) avec AN-225004-005 (élément)	450 à 505 MHz; combo antenne de toit épais et; sans plan de sol; gain de 0 dBd	50 cm	—	47
			—	50 cm	9.5
800 MHz	LE-OM806HDBKTNCDS	800 MHz -monture; gain de 3.5 dBd	28 cm	72 cm	20
700 or 800 MHz	AN-125001-006 (monture) avec AN-225001-003 (élément)	700/800 MHz; combo antenne de toit et GPS; point d'alimentation surélevé, gain de 3 dBd sans plan de sol	50 cm	50 cm	20

Une radio utilisé dans une installation de motocyclette doit être configuré avec un niveau de puissance de sortie d'émission inférieur ou égal au **maximum TX Puissance (Watts)** spécifications énumérées dans le Tableau 2-4 pour la bande de fréquence respective et l'élément antenne / antenne. Reportez-vous au manuel d'installation de la radio pour des informations supplémentaires.

Quand un kit d'installation de moto plus tard, la conception est employée (qui utilise élément d'antenne UN AN-225001-003 ou 225002-004), le câble coaxial entre la radio et la base de la monture d'antenne ne peut pas être plus courte que 44 pouces (111,8 cm) . Reportez-vous au manuel d'installation de la radio pour des informations supplémentaires.
Une radio destinés à une installation non-moto ne doit pas être utilisé dans une installation de moto sauf se il est reprogrammé par les procédures présentées dans le Manuel d'installation de la radio.

2.6 RENSEIGNEMENTS SUR LA FORMATION SUR LA SANTÉ ET LA SÉCURITÉ AU TRAVAIL

S'assurer que l'exposition physique à l'énergie électromagnétique des RF se situe dans les limites acceptables de la FCC pour l'utilisation professionnelle. Toujours se conformer aux directives de base suivantes:

- Le bouton de microphone doit être abaissé seulement lorsque l'on souhaite envoyer un message vocal.
- La radio doit être utilisée seulement pour les communications nécessaires liées au travail.
- La radio doit être utilisée seulement par du personnel autorisé et formé. Elle ne doit jamais être utilisée par des enfants.
- Ne tentez pas d'apporter une modification non autorisée à la radio. Des changements ou des modifications à la radio peuvent causer une interférence nocive ou entraîner un dépassement des limites d'exposition aux RF de la FCC. Seul le personnel qualifié doit utiliser la radio.
- Utilisez toujours seulement des accessoires autorisés (antennes, haut-parleurs/micros, etc.). L'utilisation d'accessoires non autorisés peut entraîner un dépassement des exigences de conformité pour une exposition aux RF de la FCC.

Les renseignements donnés ci-dessus donnent à l'utilisateur les renseignements nécessaires pour le sensibiliser à l'exposition aux RF et sur ce qu'il faut faire pour s'assurer que cette radio fonctionne dans les limites d'exposition de la FCC de cette radio.

2.7 DANGERS COURANTS

L'utilisateur de toute radio mobile doit être informé des dangers courants aux transmissions par des radios de véhicules. Les dangers éventuels comprennent, sans toutefois s'y limiter :

- **Atmosphères explosives** – De la même manière qu'il est dangereux de faire le plein d'essence d'un véhicule dont le moteur est en marche, s'assurer que la radio est éteinte (position **OFF**) avant de faire le plein d'essence. **NE PAS** transporter de conteneurs de carburant dans le coffre d'un véhicule si la radio est montée dans celui-ci.

  Les zones avec une atmosphère potentiellement explosive sont souvent, mais pas toujours, clairement signalés. Éteindre la radio (position **OFF**) dans toutes les zones avec une atmosphère potentiellement explosive. Il est rare, mais pas impossible, que la radio ou ses accessoires génère des étincelles.

- **Interférences avec les systèmes électroniques de véhicules** – Les systèmes électroniques à injection de carburant, les systèmes électroniques de freinage antidérapage, les systèmes électroniques de régulateur de vitesse, etc., sont des systèmes pouvant mal fonctionner en raison d'une protection insuffisante contre l'énergie RF présente lors des transmissions. Si le véhicule est équipe de tels systèmes, consulter le concessionnaire pour obtenir des informations sur la marque du véhicule et déterminer si de tels circuits électroniques fonctionnent normalement lorsque le radio émet.

- **Détonateurs électroniques** – Afin d'éviter toute explosion accidentelle des détonateurs électriques, NE PAS UTILISER les radios émetteur-récepteur à moins de 305 mètres (1 000 pieds) d'une opération de dynamitage. Respecter toujours les signes d'extinction des radios

émetteur-récepteur affichés dans les endroits où les détonateurs électriques sont utilisés. (norme OSHA : 1926.900)

- **Énergie des fréquences radio** – Pour prévenir toute brûlure ou toute blessure physique connexe causée par l'énergie des fréquences radio, ne pas faire fonctionner l'émetteur lorsqu'une personne à l'extérieur du véhicule est située en deçà de la distance minimale sécuritaire de l'antenne, comme stipulé à la Section 2.5.
- **Véhicules alimentés au gaz de pétrole liquéfié (GLP)** – L'installation de radios mobiles dans des véhicules alimentés au gaz de pétrole liquéfié avec un réservoir GLP dans le coffre ou dans tout autre espace scellé à l'intérieur du véhicule doit être conforme à la norme **NFPA 58** de la **N**ational **F**ire **P**rotection **A**ssociation. Exigences :
  - L'emplacement qui abrite la radio doit être isolé et scellé de l'emplacement contenant le réservoir de GLP et ses raccords.
  - Des raccords de remplissage extérieurs doivent être utilisés pour le réservoir de GLP.
  - Le réservoir de GLP doit être pourvu d'une évacuation vers l'extérieur du véhicule
- **Véhicules équipés de coussins gonflables** – Pour la protection du conducteur et celle des passagers, éviter d'installer les têtes de commandes de la radio (ou tout autre composant) au-dessus ou à proximité des zones de déploiement de ces coussins gonflables. Outre les coussins gonflables avant du conducteur et du passager, certains véhicules peuvent aussi être équipés de coussins gonflables latéraux. Pour la sécurité des occupants, vérifier l'emplacement de tous les coussins gonflables dans le véhicule avant d'installer équipement radio.

2.8 RECOMMANDATIONS POUR UNE CONDUITE SÉCURITAIRE

Recommandations principales de l'American Automobile Association (AAA) pour une conduite en toute sécurité :

- Lire la documentation sur la sécurité d'utilisation de la radio.
- Garder les deux mains sur le volant et ranger le microphone dans son support durant la conduite du véhicule.
- Effectuer un appel seulement lorsque le véhicule est à l'arrêt.
- Si un appel doit être effectué alors que le véhicule est en mouvement, conduire dans la voie la plus lente. Les conversations doivent être brèves.
- Si une conversation nécessite la prise de notes ou exige une réflexion plus approfondie, arrêter le véhicule dans un endroit sûr et poursuivre l'appel.
- Toujours utiliser une radio mobile avec prudence.

2.9 RÈGLES ET RÉGLEMENTATIONS D'UTILISATION

Les systèmes de radio émetteur-récepteur doivent être utilisés conformément aux règles et réglementations du gouvernement local, régional ou national.

Aux États-Unis, la radio mobile XG-75M/M7300 doit être utilisée conformément aux règles et réglementations de la Commission fédérale des communications (FCC). L'opérateur d'une radio émetteur-récepteur doit être pleinement familiarisé avec les règles qui s'appliquent au fonctionnement d'une radio de ce type. Le respect de ces règles aide à éliminer la confusion, garantit une utilisation hautement efficace des canaux radio existants et assure le bon fonctionnement du réseau radio.

Rappels des règles à suivre lors de l'utilisation d'une radio émetteur-récepteur :

- L'interruption de messages de détresse ou d'urgence constitue une violation des règles de la FCC. Le fonctionnement de la radio est similaire au fonctionnement d'un téléphone « connexion multipoint ». Par conséquent, toujours écouter avant d'émettre afin de s'assurer que le canal est libre. Les appels d'urgence sont prioritaires sur tous les autres messages. Si un message d'urgence est en cours de transmission (pour signaler un incendie ou demander de l'aide à la suite d'un accident, par exemple), ne pas émettre de messages sauf pour venir en aide.
- La loi fédérale interdit l'utilisation d'un langage obscène ou blasphématoire.
- La loi interdit l'envoi de faux indicatifs d'appel ou de faux messages de détresse ou d'urgence. La FCC exige que vos conversations soient brèves et s'en tiennent au sujet de l'appel. Pour gagner du temps, utiliser autant que possible des messages codés.
- L'utilisation de la radio pour l'envoi de messages personnels (sauf en cas d'urgence) constitue une violation des règles de la FCC. Envoyer des messages essentiels uniquement.
- La loi fédérale interdit la répétition ou la diffusion de toute information entendue via les communications radio. Les conversations entre les utilisateurs qui partagent un même canal doivent être traitées comme des messages confidentiels.
- La FCC exige que les utilisateurs s'identifient à certains moments au moyen de leur indicatif d'appel. Se référer aux règles qui s'appliquent au type particulier d'activités pour la bonne procédure à suivre.
- Aucune modification ou aucun ajustement ne doit être fait à l'équipement, sauf par un technicien électronique autorisé et certifié.

En vertu de la loi des États-Unis, l'utilisation d'un émetteur radio sans licence sur le territoire américain est punissable d'une amende d'un maximum de 10 000 $, d'un emprisonnement de deux (2) ans au maximum, ou les deux.

3. MARINE FREQUENCIES

Refer to Table 3-1: Marine Frequencies for a list of maritime frequencies per United States Coast Guard (USCG), National Oceanic and Atmospheric Administration (NOAA), and Canadian Department Fisheries and Oceans, August 2009:

- United States (US)
- International (Intl)
- Canada (CA)

Table 3-1: Marine Frequencies

CHANNEL			FREQUENCY		CHANNEL USAGE
US	INTL	CA	SHIP (MHZ)	SHORE (MHZ)	
	1	1	T: 156.05 R: 160.65	T: 160.65 R: 156.05	International: Public Correspondence, Port Operations
1a			T/R: 156.05	T/R: 156.05	US: Port Operations and Commercial, Vessel Traffic Service (VTS). New Orleans/Lower Mississippi area.
	2	2	T: 156.10 R: 160.70	T: 160.70 R: 156.10	International: Public Correspondence, Port Operations
	3	3	T: 156.15 R: 160.75	T: 160.75 R: 156.15	International: Public Correspondence, Port Operations
	4		T: 156.20 R: 160.80	T: 160.80 R: 156.20	International: Public Correspondence, Port Operations
		4a	T/R: 156.20	T/R: 156.20	Canada: Department Fisheries Ocean (DFO)/Canadian Coast Guard only in British Columbia coast area. Commercial fishing in east coast area
	5		T: 156.25 R: 160.85	T: 160.85 R: 156.25	International: Public Correspondence, Port Operations
5a		5a	T/R: 156.25	T/R: 156.25	US: Port Operations or VTS in Houston, New Orleans and Seattle areas.
6	6	6	T/R: 156.30	T/R: 156.30	US: Intership Safety International: Intership Canada: May be used for search and rescue communications between ships and aircraft.
	7		T: 156.35 R: 160.95	T: 160.95 R: 156.35	International: Public Correspondence, Port Operations
7a		7a	T/R: 156.35	T/R: 156.35	US: Commercial
8	8	8	T/R: 156.40	T/R: 156.40	US: Commercial (Intership only) International: Intership Canada: Also assigned for intership in the Lake Winnipeg area.
9	9	9	T/R: 156.45	T/R: 156.45	US: Boater Calling. Commercial and Non-Commercial. International: Intership, Port Operations Canada: Commercial - British Columbia coast area. May be used to communicate with aircraft and helicopters in predominantly maritime support operations.

Table 3-1: Marine Frequencies

CHANNEL			FREQUENCY		CHANNEL USAGE
US	INTL	CA	SHIP (MHZ)	SHORE (MHZ)	
10	10	10	T/R: 156.50	T/R: 156.50	US: Commercial International: Intership, Port Operations Canada: Commercial - British Columbia coast area. May also be used for communications with aircraft engaged in coordinated search and rescue and antipollution operations.
11	11	11	T/R: 156.55	T/R: 156.55	US: Commercial. VTS in selected areas. International: Port Operations Canada: VTS - British Columbia coast area. Also used for pilotage purposes.
12	12	12	T/R: 156.60	T/R: 156.60	US: Port Operations. VTS in selected areas. International: Port Operations Canada: VTS - British Columbia coast area. Also used for pilotage purposes.
13	13	13	T/R: 156.65	T/R: 156.65	US: Intership Navigation Safety (Bridge-to-bridge). Ships >20m length maintain a listening watch on this channel in US waters. International: Intership, Port Operations Canada: VTS - British Columbia coast area. Also used for pilotage purposes.
14	14	14	T/R: 156.70	T/R: 156.70	US: Port Operations. VTS in selected areas. International: Port Operations Canada: VTS - British Columbia coast area. Also used for pilotage purposes.
15	15	15	T/R: 156.75	T/R: 156.75	US: Environmental (Receive only). Used by Class C Emergency Position-Indicating Radio Beacons (EPIRBs). International: Intership, Port Operations Canada: Port operations and Ship Movement - British Columbia coast area. All operations limited to 1-watt maximum power. May also be used for on-board communications.
16	16	16	T/R: 156.80	T/R: 156.80	US: International Distress, Safety and Calling. Ships required to carry radio, US Coast Guard (USCG), and most coast stations maintain a listening watch on this channel. International: International Distress, Safety and Calling Canada: International Distress, Safety and Calling
17	17	17	T/R: 156.85	T/R: 156.85	US: State Control International: Intership, Port Operations Canada: Port operations and Ship Movement - British Columbia coast area. All operations limited to 1 watt maximum power. May also be used for on-board communications.
	18		T: 156.90 R: 161.50	T: 161.50 R: 156.90	International: Public Correspondence, Port Operations
18a		18a	T/R: 156.90	T/R: 156.90	US: Commercial Canada: Towing - British Columbia coast area.
	19		T: 156.95 R: 161.55*	T: 161.55* R: 156.95	International: Public Correspondence, Port Operations
19a		19a	T/R: 156.95	T/R: 156.95	US: Commercial Canada: DFO/Canadian Coast Guard. Pacific Pilots - British Columbia coast area.

Table 3-1: Marine Frequencies

CHANNEL			FREQUENCY		CHANNEL USAGE
US	INTL	CA	SHIP (MHZ)	SHORE (MHZ)	
20	20	20	T: 157.00 R: 161.60	T: 161.60 R: 157.00	US: Port Operations (Duplex) International: Public Correspondence, Port Operations Canada: Port operations only with 1 watt maximum power.
20a			T/R: 157.00	T/R: 157.00	US: Port Operations
	21		T: 157.05 R: 161.65*	T: 161.65* R: 157.05	International: Public Correspondence, Port Operations
21a		21a	T/R: 157.05	T/R: 157.05	US: US Coast Guard only Canada: DFO/Canadian Coast Guard only.
		21b	- -	T/R: 161.65	
	22		T: 157.10 R: 161.70	T: 161.70 R: 157.10	International: Public Correspondence, Port Operations
22a		22a	T/R: 157.10	T/R: 157.10	US: Coast Guard Liaison and Maritime Safety Information Broadcasts. Broadcasts announced on channel 16. Canada: For communications between Canadian Coast Guard and non-Canadian Coast Guard stations only.
	23	23	T: 157.15 R: 161.75	T: 161.75 R: 157.15	International: Public Correspondence, Port Operations
23a			T/R: 157.15	T/R: 157.15	US: US Coast Guard only
		23b	- -	T/R: 161.75	Canada: Continuous Marine Broadcast (CMB) service.
24	24	24	T: 157.20 R: 161.80	T: 161.80 R: 157.20	US: Public Correspondence (Marine Operator) International: Public Correspondence, Port Operations
25	25	25	T: 157.25 R: 161.85	T: 161.85 R: 157.25	US: Public Correspondence (Marine Operator) International: Public Correspondence, Port Operations Canada: Also assigned for operations in the Lake Winnipeg area.
		25b		T/R: 161.85	
26	26	26	T: 157.30 R: 161.90	T: 161.90 R: 157.30	US: Public Correspondence (Marine Operator) International: Public Correspondence, Port Operations
27	27	27	T: 157.35 R: 161.95	T: 161.95 R: 157.35	US: Public Correspondence (Marine Operator) International: Public Correspondence, Port Operations
28	28	28	T: 157.40 R: 162.00	T: 162.00 R: 157.40	US: Public Correspondence (Marine Operator) International: Public Correspondence, Port Operations
		28b	- -	T/R: 162.00	Canada: Continuous Marine Broadcast (CMB) service.
	60	60	T: 156.025 R: 160.625	T: 160.625 R: 156.025	International: Public Correspondence, Port Operations
	61		T: 156.075 R: 160.675	T: 160.675 R: 156.075	International: Public Correspondence, Port Operations
61a		61a	T/R: 156.075	T/R: 156.075	Canada: DFO/Canadian Coast Guard only in British Columbia coast area.

Table 3-1: Marine Frequencies

CHANNEL			FREQUENCY		CHANNEL USAGE
US	INTL	CA	SHIP (MHZ)	SHORE (MHZ)	
	62		T: 156.125 R: 160.725	T: 160.725 R: 156.125	International: Public Correspondence, Port Operations
		62a	T/R: 156.125	T/R: 156.125	Canada: DFO/Canadian Coast Guard only in British Columbia coast area.
	63		T: 156.175 R: 160.775	T: 160.775 R: 156.175	International: Public Correspondence, Port Operations
63a		63a	T/R: 156.175	T/R: 156.175	US: Port Operations and Commercial, VTS. New Orleans/Lower Mississippi area. Canada: Tow Boats - British Columbia coast area.
	64	64	T: 156.225 R: 160.825	T: 160.825 R: 156.225	International: Public Correspondence, Port Operations
64a		64a	T/R: 156.225	T/R: 156.225	Canada: Commercial fishing only.
	65		T: 156.275 R: 160.875	T: 160.875 R: 156.225	International: Public Correspondence, Port Operations
65a		65a	T/R: 156.275	T/R: 156.275	US: Port Operations Canada: Search and rescue and antipollution operations on the Great Lakes. Towing on the Pacific Coast. Port operations only in the St. Lawrence River areas with 1 watt maximum power. Intership in inland Manitoba, Saskatchewan, and Alberta areas.
	66		T: 156.325 R: 160.925	T: 160.925 R: 156.325	International: Public Correspondence, Port Operations
66a		66a	T/R: 156.325	T/R: 156.325	US: Port Operations Canada: Port operations only in the St. Lawrence River/Great Lakes areas with 1 watt maximum power. 1 watt marina channel - British Columbia coast area.
67	67	67	T/R: 156.375	T/R: 156.375	US: Commercial. Used for Bridge-to-bridge communications in lower Miss. River. Intership only. International: Intership, Port Operations Canada: May also be used for communications with aircraft engaged in coordinated search and rescue and antipollution operations. Commercial fishing only in east coast and inland Manitoba, Saskatchewan, and Alberta areas. Pleasure craft - British Columbia coast area.
68	68	68	T/R: 156.425	T/R: 156.425	US: Non-Commercial International: Port Operations Canada: For marinas, yacht clubs and pleasure craft.
69	69	69	T/R: 156.475	T/R: 156.475	US: Non-Commercial International: Intership, Port Operations Canada: Commercial fishing only - east coast area. Pleasure craft - British Columbia coast area.
70	70	70	T/R: 156.525	T/R: 156.525	US: Digital Selective Calling (voice communications not allowed) International: Digital selective calling for distress, safety and calling Canada: Digital selective calling for distress, safety and calling
71	71	71	T/R: 156.575	T/R: 156.575	US: Non-Commercial International: Port Operations Canada: Ship Movement - British Columbia coast area.Marinas and yacht clubs - east coast and on Lake Winnipeg.

Table 3-1: Marine Frequencies

CHANNEL			FREQUENCY		CHANNEL USAGE
US	INTL	CA	SHIP (MHZ)	SHORE (MHZ)	
72	72	72	T/R: 156.625	T/R: 156.625	US: Non-Commercial (Intership only) International: Intership Canada: May be used to communicate with aircraft and helicopters in predominantly maritime support operations. Pleasure craft - British Columbia coast area
73	73	73	T/R: 156.675	T/R: 156.675	US: Port Operations International: Intership, Port Operations Canada: May also be used for communications with aircraft engaged in coordinated search and rescue and antipollution operations. Commercial fishing only in east coast and inland Manitoba, Saskatchewan, and Alberta areas.
74	74	74	T/R: 156.725	T/R: 156.725	US: Port Operations International: Port Operations Canada: VTS and Ship Movement British Columbia coast area.
75	75	75	T/R: 156.775	T/R: 156.775	International: Port Operations Canada: Simplex port operation, ship movement and navigation related communication only. 1 watt maximum.
76	76	76	T/R: 156.825	T/R: 156.825	International: Port Operations Canada: Simplex port operation, ship movement and navigation related communication only. 1 watt maximum.
77	77	77	T/R: 156.875	T/R: 156.875	US: Port Operations (Intership only) International: Intership Canada: Pilotage - British Columbia coast area; 25 watts. Port operations only in the St. Lawrence River/Great Lakes areas with 1 watt maximum power.
	78		T: 156.925 R: 161.525	T: 161.525 R: 156.925	International: Public Correspondence, Port Operations
78a		78a	T/R: 156.925	T/R: 156.925	US: Non-Commercial Canada: Fishing Industry - British Columbia coast area.
	79		T: 156.975 R: 161.575	T: 161.575 R: 156.975	International: Public Correspondence, Port Operations
79a		79a	T/R: 156.975	T/R: 156.975	US: Commercial. Non-Commercial in Great Lakes only Canada: Fishing Industry - British Columbia coast area.
	80		T: 157.025 R: 161.625	T: 161.625 R: 157.025	International: Public Correspondence, Port Operations
80a		80a	T/R: 157.025	T/R: 157.025	US: Commercial. Non-Commercial in Great Lakes only Canada: Fishing Industry - British Columbia coast area.
	81		T: 157.075 R: 161.675	T: 161.675 R: 157.075	International: Public Correspondence, Port Operations
81a		81a	T/R: 157.075	T/R: 157.075	US: US Government only - Environmental protection operations Canada: DFO/Canadian Coast Guard use only.
	82		T: 157.125 R: 161.725	T: 161.725 R: 157.125	International: Public Correspondence, Port Operations
82a		82a	T/R: 157.125	T/R: 157.125	US: US. Government only Canada: DFO/Canadian Coast Guard use only.

Table 3-1: Marine Frequencies

CHANNEL			FREQUENCY		CHANNEL USAGE
US	INTL	CA	SHIP (MHZ)	SHORE (MHZ)	
	83		T: 157.175 R: 161.775	T: 161.775 R: 157.175	International: Public Correspondence, Port Operations
83a		83a	T/R: 157.175	T/R: 157.175	US: US Coast Guard only Canada: DFO/Canadian Coast Guard and other Government agencies.
		83b	- -	T/R: 161.775	
84	84	84	T: 157.225 R: 161.825	T: 161.825 R: 157.225	US: Public Correspondence (Marine Operator) International: Public Correspondence, Port Operations
85	85	85	T: 157.275 R: 161.875	T: 161.875 R: 157.275	US: Public Correspondence (Marine Operator) International: Public Correspondence, Port Operations
86	86	86	T: 157.325 R: 161.925	T: 161.925 R: 157.325	US: Public Correspondence (Marine Operator) International: Public Correspondence, Port Operations
87	87	87	T: 157.375 R: 161.975	T: 161.975 R: 157.375	US: Automatic Identification System duplex repeater International: Port Operations Canada: Port operation and ship movement - east coast area. Pleasure craft - British Columbia coast area.
87a			T/R: 157.375	T/R: 157.375	US: Public Correspondence (Marine Operator)
		87b	T/R: 161.975	T/R: 161.975	Canada: Automatic Ship Identification and Surveillance System.
	88	88	T: 157.425 R: 162.025	T: 162.025 R: 157.425	US: Commercial, Intership only. International: Port Operations Canada: Port operation and ship movement - British Columbia coast area.
88a			T/R: 157.425	T/R: 157.425	US: Commercial, Intership only. Canada: Automatic Ship Identification and Surveillance System.
		88b	T/R: 162.025	T/R: 162.025	
WX1		WX1		R: 162.55	
WX2		WX2		R: 162.4	
WX3		WX3		R: 162.475	
WX4				R: 162.425	
WX5				R: 162.45	
WX6				R: 162.5	
WX7				R: 162.525	

4. PRODUCT DESCRIPTION

The XG-75M/M7300 mobile is a state-of-the-art radio designed to meet the critical demands of its users. The XG-75M/M7300 mobile supports multiple operating modes, including OpenSky® digital trunked operation (700/800 MHz radios only), Enhanced Digital Access Communications System (EDACS®) or ProVoice™ trunked modes, P25 digital trunked mode, P25 digital conventional mode, and analog conventional mode.

The XG-75M mobile radio is essentially an M7300 mobile radio running XGP radio software/firmware. Otherwise, an XG-75M radio is identical to a similar-RF-banded M7300 radio.

The optional Global Positioning System (GPS) receiver module can provide standard GPS formatted data over the air for vehicle tracking systems.

Data Encryption Standard (DES) and the optional Advanced Encryption Standard (AES) are available for maximum communications security.

The XG-75M/M7300 radio uses the CH-721 Control Head which is available in two models: System and Scan. The display is designed to maximize readability and ease of use. The CH-721 utilizes a 3-line 12-character alphanumeric display with large buttons, volume knob, and channel knob, providing a user-friendly interface.

The CH-721 control head can be mounted with the radio (Front Mount) or it can be mounted and operated remotely. For remote mount installations configured with a CH-721 control head, all normal radio operations and interfaces can be handled via the control head connected to the radio unit via a 3-wire Controller Area Network (CAN) cable. Two control heads may be attached to a radio. Each control head provides a serial access point for data and any one (only one at a time) can be connected to a data device such as a personal computer.

Where multiple control heads are connected or where a dash-mount radio is installed with an additional remote control head, the following features are available from each position:

- Outgoing voice calls can be initiated. Either control head can initiate a call but only one can talk at a time. The other connected control head hears both sides of the conversation.
- Incoming and outgoing audio can be heard. (Outgoing audio is not broadcast at the source position.)
- Independent audio control is available.
- Radio settings such as talk group, scan mode etc., can be controlled. (Any connected control head can override the radio settings of another connected control head.)
- Comfort settings, such as volume and display brightness that are applicable to the individual control head can be adjusted and cannot be overridden by another control head.
- An optional intercom function is available between control units. Audio is broadcast to ALL connected control heads.

5. CHANGE OPERATING MODE (700/800 MHZ RADIOS ONLY)

5.1 CHANGE FROM OTP MODE

To change from OTP operating mode to EDACS, Conventional, and P25 (ECP/XGP) Modes:

1. Use  , **CLEAR/CLR**, or **OPTION/OPT** to cycle through the menu until the “App Mode” appears in the bottom line of the display.
2. Use  to choose an available mode. Press **MENU** and confirm (Y/N) with  and press **MENU** again.
3. Press the **MENU** button to confirm.

Or

Preset button **C** can be configured via programming to reboot the radio into a particular application mode.

Or

Quick Button command 1# transitions the radio to ECP/XGP mode. If ECP/XGP mode is not loaded in the radio, the radio displays “No App.”

5.2 CHANGE TO OTP MODE

1. Use  to scroll through available systems until OpenSky is displayed.
2. The radio transitions to OTP mode.

6. OPENSKY OPERATION (700/800 MHZ RADIOS ONLY)

6.1 CH-721 FRONT PANEL COMPONENTS

The front panel of the control head includes a dot matrix display, controls for menu navigation, an emergency button, three pre-set buttons, a Power On-Off/Volume Control knob, and a microphone connector. In addition, the system model control head features a DTMF keypad (Figure 6-1).

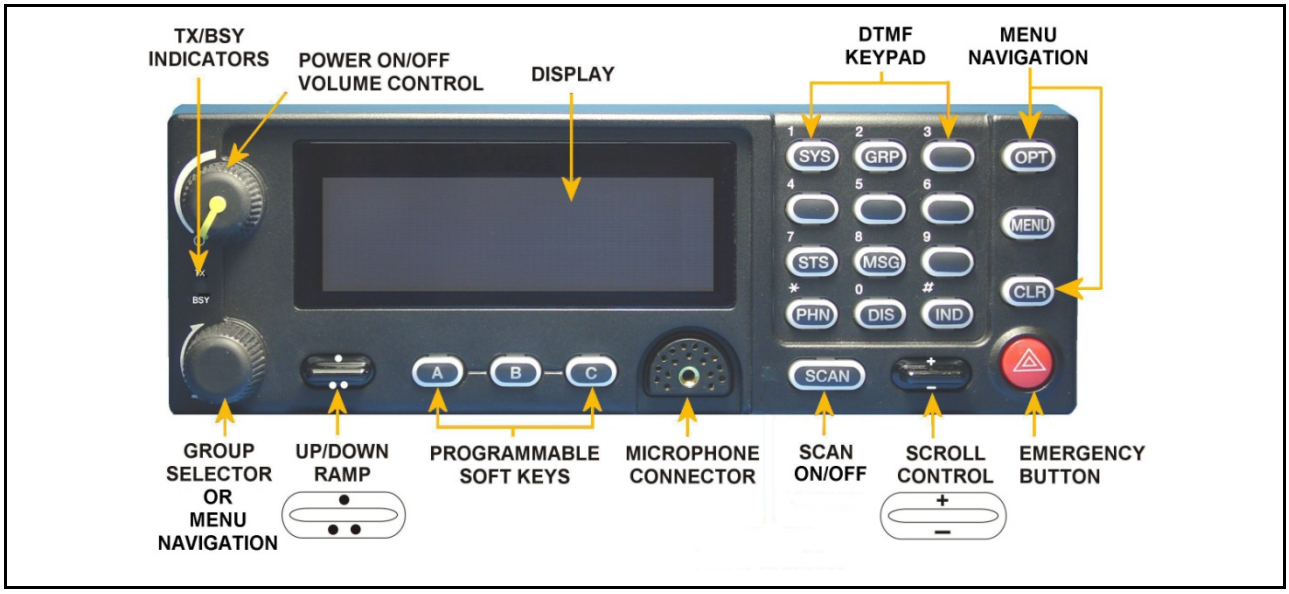


Figure 6-1: System Model

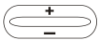
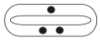
Figure 6-2: Scan Model

The buttons on the front panel are backlit for operation in a low ambient light level such as nighttime operation. Some buttons also flash to provide feedback of various operating conditions.

NOTE

Button function may vary depending upon radio programming. Any non-DTMF button can be configured to various functions via the at**chkeymap command. Refer to the AT command manual (MM-016649-001) for all possible events. Table 6-1 describes the default configuration.

Table 6-1: Front Panel Default Controls and Functions

PART	FUNCTION
Power On-Off/Volume Control Knob	Turn knob clockwise to power on the radio and increase volume. Turn counter-clockwise to decrease volume and power off the radio.
Mic Connection	Connection for hand-held, hands-free, speaker-mic, headset, or programming cable.
	If enabled through programming, the emergency button sends an emergency and opens voice communication on the currently selected talk group or the default emergency talk group (depending upon how the system is defined).
	While in the dwell display, scrolls through available talk groups. Scrolls through selections within the active menu (available talk groups, preprogrammed speed dial numbers, canned alert messages, etc.).
	**IF ENABLED VIA PROGRAMMING**, while in the dwell display, scrolls through available talk group. Scrolls through selections within the active menu (available talk groups, preprogrammed speed dial numbers, canned alert messages, etc.). Or Increases and decreases the display brightness.
	**IF ENABLED VIA PROGRAMMING**, scrolls through available menu items.
OPT/OPTION	Scrolls through available menu items.
CLR/CLEAR	
MENU	Press to activate the current selection. In some cases, this is not necessary as the last selection automatically activates after a short period. Also exits Stealth Mode.
Display Area	Menu selections and messages. Network Connectivity icon. RSSI Indicator. Current Volume Level icon. Volume represented numerically within the display (0 = Muted, 40 = Loudest). User may select which one of several dwell displays the radio uses.
Pre-Set Buttons **A**, **B**, & **C**	These buttons are used to store and recall user-selectable parameters such as scan mode, selected profile, selected talk group, and priority talk group. Different parameters can be stored at each of the three different pre-set buttons. Preset button C can be configured via programming to reboot the radio into a particular application mode. Contact your system administrator to determine if this feature is enabled in your radio.

PART	FUNCTION
SCAN	Toggles the Scan Mode ON/OFF. • If the Scan Mode is Normal and the Scan Mode is toggled off, when the Scan Mode is toggled On the Scan Mode is set to Normal. • If the Scan Mode is Fixed and the Scan Mode is toggled off, when the Scan Mode is toggled On the Scan Mode is set to Fixed. • If the Scan Mode is off when the radio boots up when the Scan Mode is toggled On the Scan Mode is set to Normal.

6.2 POWER UP AND VOLUME CONTROL

6.2.1 Power Up

1. Rotate the Power On-Off/Volume Control knob clockwise to power on the radio. The display illuminates when the radio powers up.
2. Wait for the power-up sequence to complete, which takes approximately ten (10) seconds.

   During this time, if enabled for auto registration, the radio is provisioned with a customized user personality designed for the user's specific needs by the OpenSky network administrator.

   If this personality contains encrypted talk groups or if the user is authorized for, and intends to use, manual encryption, User Login must be performed unless the radio has been programmed to auto-login. This requires a system model control head so that the User ID and password can be entered.
3. When provisioning is complete, the radio displays the Dwell Display.

   If User Login is required, the bottom line of the Dwell Display flashes the message "**Pls Login**."

6.2.2 Volume Control

Turn the Power On-Off/Volume Control knob clockwise to increase the volume and counter-clockwise to decrease the volume. The radio sounds a tone to indicate the current volume level.

6.3 SELF-TEST

After power-up, the XG-75M/M7300 radio undergoes a multi-function automatic registration procedure. As many as sixteen (16) possible radio profiles are downloaded to the radio from the network in response to the User's ID.

6.4 LOGIN TO THE NETWORK

Login occurs either automatically (auto registration) if the radio has a valid registration or, if enabled and authorized for encryption (Section 6.32), requires the user to enter a User ID and password.

If encryption is enabled and authorized on the radio, the user is prompted to "Pls Login" with the *1 login command, a User ID, and password [System Model Control Head required].

1. Press *1 (Login command).
2. Enter the full 10-digit User ID.
3. Press the # key.
4. Enter the password.

- If the radio is configured for alpha-numeric passwords and the password has consecutive duplicate numbers ("MES**33**" for example), enter # between the consecutive duplicate numbers so the radio does **not** interpret the entry as a letter ("D" in this example).
- If the radio is configured for numeric-only passwords, do not enter # between duplicated numbers.

5. Press the # key twice for alpha-numeric passwords or once for numeric only passwords.

The User ID may be remembered from the previous login. (Refer to Section 6.5 for further details regarding log off commands.) The password is established before the radio is put into operation. Contact the local OpenSky network administrator for more information.

NOTE

If necessary, contact radio system administration personnel for login assistance and/or radio-specific login instructions.

6.5 LOG OFF THE NETWORK

The *0## command de-registers the radio. Typically, this is automatically performed when powering down the radio. Using this method, the User ID is remembered by the radio so only the password is needed at next login. Manually log off by pressing *0## (requires System Model).

6.6 TURN THE RADIO OFF

To turn the radio off, rotate the **Power On-Off/Volume Control knob** counter-clockwise. In multiple control head installations, turning off the last powered-up control head also automatically turns off the radio.

If enabled via programming, several user-selected radio settings (i.e., scan mode, pre-set buttons, and side tone levels) are maintained for the next operational session. At the next radio power-up, maintained settings automatically restore, along with the network personality settings. In multiple control head installations, settings are maintained for each control head position.

NOTE

If power is abruptly disconnected from the radio prior to executing the correct turn-off procedure, user-selected radio settings and last-tuned channel information are lost. This can extend the time required for the radio to register with the network upon the subsequent power-up.

6.7 MENU DISPLAY AND CONTROL AREA

Following power-up, the radio display shows the default talk group (Figure 6-3).  , **OPT/OPTION,** or **CLR/CLEAR** changes the display to the next available menu. In many cases, the dwell display automatically re-appears after no menu buttons are pressed for a short period of time (between 10 and 30 seconds). For some menus such as the GPS and User ID menus, this does not occur unless the menu up/down buttons are pressed.

When the dwell display is active, it changes to reflect the current profile, received talk group/caller ID (when available), or channel if the channel menu is enabled. The second line of dwell menu changes when the user presses the MENU button.

The radio's display is highly interactive. It responds in the top and bottom text lines as the user presses the menu buttons to scroll through the menu loop and the entries for each menu.

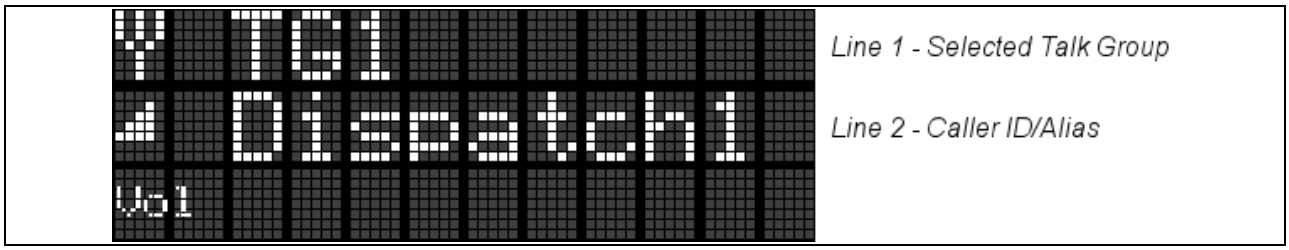


Figure 6-3: Typical Display

6.8 RADIO STATUS ICONS

Status Icons indicate the various operating characteristics of the radio. The icons show operating modes and conditions (see Table 6-2). The location of icons on the display may vary depending on configuration.

Table 6-2: Icons and Descriptions

ICON	DESCRIPTION
 Antenna	Indicates data registration.
	Volume bars – above VOL text indicates relative volume level.
	RSSI indicator appears next to the Antenna icon.

6.9 DWELL DISPLAY

When not engaged in menu selection, the first two lines of the display default to the user-defined display, known as the "dwell display." The top line indicates the currently selected talk group. The second line displays the currently selected profile, caller ID/alias[2], received talk group, and current channel name. Press the **MENU** button to scroll through and view one of these second line options.

6.10 ERROR MESSAGES

This section lists and describes the error messages that may be displayed by the XG-75M/M7300 during OpenSky operation.

MESSAGE	DESCRIPTION
NOAUT01	Unspecified MDIS error. If condition persists in strong signal conditions, contact your system administrator.
MDENIED	Unspecified MDIS error. If condition persists in strong signal conditions, contact your system administrator.
UNAUTH3	Unauthorized IP. The radio network ID has not been added to network.
UNAUTH4	Bad authentication. If condition persists in strong signal conditions, contact your system administrator.

[2] Alias is a logical ID name such as "J_Smith." The name corresponds to a user ID such as 003-542-0001.

MESSAGE	DESCRIPTION
UNAUTH5	Unsupported authentication. If condition persists in strong signal conditions, contact your system administrator.
MDISBSY	The MDIS is busy. If condition persists in strong signal conditions, contact your system administrator.
DUP IP	Duplicate IP.
BADIKEY	Invalid infrastructure public key sequence number (IPKSN).
BADEKEY	Invalid end-system public key sequence number (EPKSN).
UNK MES	Unknown mobile end system (MES). If condition persists in strong signal conditions, contact your system administrator.
NOAUT05	MDIS failed mutual authentication. If condition persists in strong signal conditions, contact your system administrator.
BADMDIS	MDIS failed mutual authentication. If condition persists in strong signal conditions, contact your system administrator.
MDS BSY	MDIS busy – retry.
UNK DOM	Unknown home domain. If condition persists in strong signal conditions, contact your system administrator.
KEYSYNC	Mismatched key sequence number.
UNK ALG	Unknown/unsupported encryption algorithm.
BADSIZE	Unsupported MDIS key size.
NOAUT11	MES failed data mutual authentication. If condition persists in strong signal conditions, contact your system administrator.
NOAUT12	No response from MDIS. If condition persists in strong signal conditions, contact your system administrator.
NOREPLY	No SME response from MDIS. If condition persists in strong signal conditions, contact your system administrator.
VDENIED	Unspecified VNIC error. If condition persists in strong signal conditions, contact your system administrator.
BAD VID	Invalid voice user ID. Check User ID. If correct, contact your system administrator.
HOM DWN	The Home VNIC is down. Retry. If error continues, contact your system administrator.
SRV BSY	The serving VNIC is busy (congested).
MAX USR	The maximum users are already registered with the specified user ID. OpenSky allows one User ID to log onto the network using up to three different radios. Use *0## command or power down one of the other radios to de-register the radio.
NAS BSY	The system cannot provision MES because of an administrative process.

MESSAGE	DESCRIPTION
NOAUTHM	The MES failed voice mutual authentication. If a valid radio displays this error, contact TAC.
NOSUPRT	The MES cannot support the required provision. If condition persists in strong signal conditions, contact your system administrator.
NOAUTHV	VNIC does not support or failed mutual authentication. If condition persists in strong signal conditions, contact your system administrator.
PLS LOGIN	If enabled and authorized for encryption, the radio requires the user to enter a User ID and password if not programmed to auto-login. Login with the keypad.
BAD PWD	An invalid password has been entered. Verify the password and re-enter.
OVER_TEMP	The radio may be too hot. The radio ceases transmitting if it exceeds an operational temperature threshold. Let the radio cool before attempting to transmit. Report this failure to authorized technician.
No App	ECP/XGP mode is unavailable (not programmed).
NO PRIV	Missing required privilege.
NO SYNC	No forward-channel sync (weak or no coverage). If condition persists in strong signal conditions, contact your system administrator.
No Access	Incoming encrypted voice cannot be decrypted. If condition persists in strong signal conditions, contact your system administrator.
NO REG	Not registered with MDIS, VNIC, or both.
Locked Out	Another control head is actively using the user interface.
DISABLED	Function disabled (e.g., function invalid in current context).

6.11 PERSONALITY

As illustrated in Figure 6-4, a personality defines the profiles and talk groups available to the user. It is the structuring of a collection of profiles and privileges established by the OpenSky network administrator to provide the user with a comprehensive set of profiles to communicate effectively with the necessary talk groups or individuals.

Personalities are stored on the network and downloaded over-the-air to the radio. This process is called “provisioning.” Provisioning occurs at radio power-up and at user log-in. Each personality can contain up to sixteen (16) profiles and each profile can contain up to sixteen talk groups.

6.11.1 Profiles

As stated above, each profile can contain up to sixteen (16) talk groups. A profile also defines the radio’s emergency behavior. All transmissions are made on the selected talk group (displayed on the top line of the dwell display). The user can change the selected talk group to any of the other talk groups within the profile.

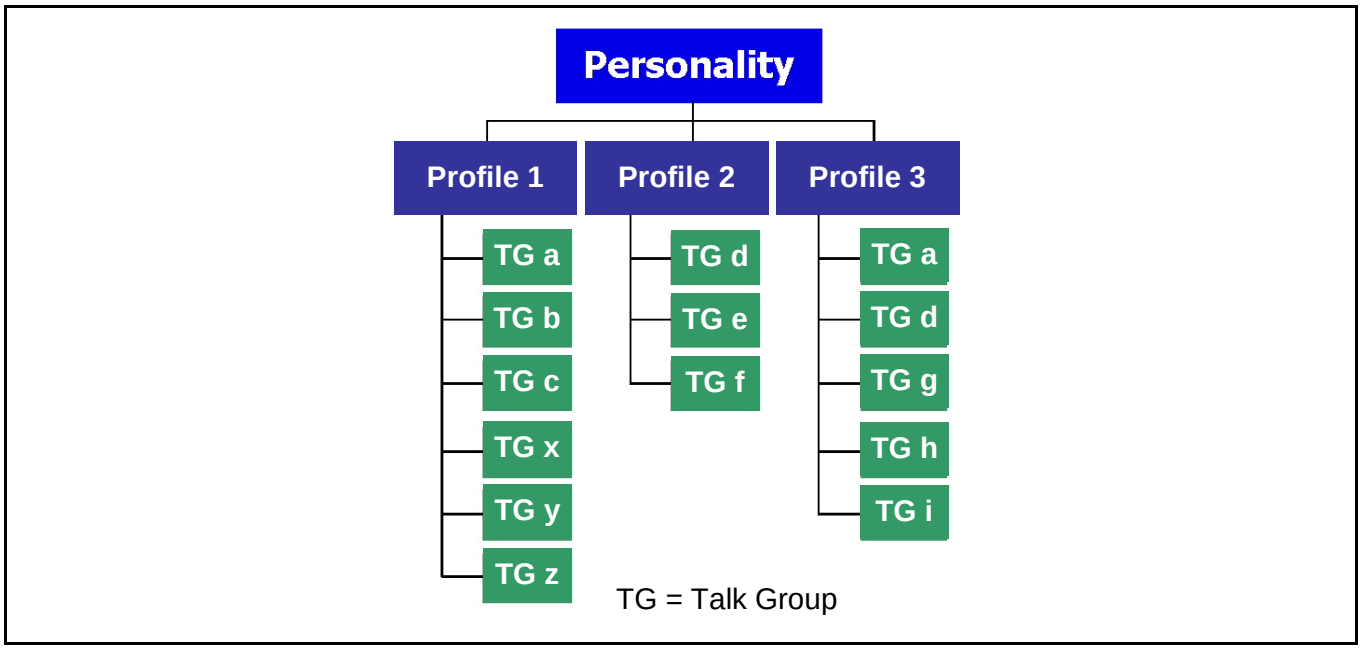


Figure 6-4: Personality Structure Example

NOTE

If Global Profile is enabled by the system administrator, the number of available talk groups to scan doubles.

6.11.2 Talk Groups

A talk group represents a set of users that regularly need to communicate with one another. There can be any number of authorized users assigned to a talk group. Talk groups are established and organized by the OpenSky network administrator. An OpenSky talk group is similar to a channel within a conventional FM radio system.

6.12 ALERT TONES

The XG-75M/M7300 radio also provides audible Alert Tones or “beeps” to indicate the various operating conditions (see Table 6-3).

Table 6-3: XG-75M/M7300 OpenSky Mode Alert Tones

NAME	TONE	DESCRIPTION
Call Queued	1 low tone/2 high tones	Call queued for processing.
Call Denied	3 short beeps	Radio is out of coverage area or requested talk group is active.
Grant (or Go-Ahead)	1 short beep	Sounds when resources become available for a call request placed in the queue (if enabled) upon channel access. If the radio roams to another site while transmitting, then it auto rekeys and begins transmitting on that tower. It gives a second grant tone to let the user know they have roamed.
Priority Bump	1 short tone	Stopped current incoming call in favor of higher-priority incoming call.
Call Removed	1 long low-pitched tone	Notifies the user access to the channel has been lost (out of coverage area or pre-empted by higher-priority call).
Selective Alert Received	1 short tone, 2 short beeps, 1 short tone	Only played once to indicate a selective alert has been received.
Emergency Tone	3 long tones	Sounds when an emergency is declared.
Emergency Cleared	1 long low-pitched tone	Sounds when an emergency is cleared.
Volume	1 short tone	Reflects current volume level.
Selective Call Ring	A ringing tone similar to a telephone	Ringing is repeated every four seconds until the call is accepted or rejected by the radio being called or until the network drops the call if unanswered after one minute.
PSTN Ring	1 medium-pitch repeating tone	Two ring tone - one generated by the radio when there is an incoming telephone call or an outgoing telephone call attempt is waiting for the telephone interconnect gateway equipment to dial the Public Switched Telephone Network (PSTN). The second ring tone sounds when the gateway equipment has dialed the number.
Roam	2 short tones, 1 high-pitched and 1 low-pitched	Sounds when the radio transitions from one base station site to another while transmitting voice.
Out of Range	Tri-tone beep	If enabled via programming, sounds when the radio is not within operational range with base station.
Priority Bump	Single medium mid-pitched tone.	Sounds when the current received call is preempted by a higher priority call.

NAME	TONE	DESCRIPTION
Site Found Tone	Three short high-pitched tones.	Sounds when the selected site is found using the Site Lock Menu.
Site Not Found Tone	Three short high-pitched tones.	Sounds when the selected site is not found using the Site Lock Menu.

6.13 BASIC MENU STRUCTURE

Table 6-4 illustrates the basic XG-75M/M7300 OpenSky menu structure. Menu items vary depending upon system programming, radio hardware, and optional configurations. All menus except the dwell display menu can be turned off by network administration personnel.

Table 6-4: Basic Menu Structure

MENU NAME	RADIO DISPLAYS	USAGE NOTES
	To/From Dwell Display	
	, **CLR**, or **OPT**	
Engineering Display	bit-error rates, RSSI data, sync status, current channel and registration status	Displays radio system connection data. For engineering use.
	, **CLR**, or **OPT**	
Silent Emergency	"**SilentEmerg**"	Use to toggle Silent Emergency "On" or "Off."
	, **CLR**, or **OPT**	
Operating Mode	"**App Mode**"	Use to choose an available mode (OTP, ECP/XGP, or OCF). Press **MENU** and confirm (Y/N) with and press **MENU** again.
	, **CLR**, or **OPT**	
GPS Fix	"**GPS Fix**"	Radio's current GPS latitude and longitude position scrolls across top line of the display. Applies to GPS-equipped radios only.
	, **CLR**, or **OPT**	
User ID	"**User ID**"	User's identification/name scrolls across top line of the display (if programmed).
	, **CLR**, or **OPT**	
IP Address	"**IP Address**"	Radio's Internet Protocol (IP) address scrolls across top line of the display.
	, **CLR**, or **OPT**	
Station Identification	"**Station ID**"	Station's identification/name scrolls across top line of the display (if programmed).
	, **CLR**, or **OPT**	
Stealth Mode	"**StealthMenu**"	Use to turn Stealth Mode "On."
	, **CLR**, or **OPT**	
Treble Level	"**Treble Menu**"	Use to choose speaker/headset treble level (LOW, MEDIUM, MEDHIGH, or HIGH). Press **Select** to return to dwell display.
	, **CLR**, or **OPT**	
Display Brightness	"**Bright Menu**"	Use to dim or brighten. Press **MENU** to return to dwell display.
	, **CLR**, or **OPT**	

MENU NAME	RADIO DISPLAYS	USAGE NOTES
Side Tone Level	"**Side Menu**"	Use  to choose side tone level (Off, Low, Med, or High). Press **MENU** to return to dwell display.
 , **CLR**, or **OPT**		
Intercom	"**INTERCOM**"	Use  to turn intercom "On" or "Off." Press **MENU** to return to dwell display.
 , **CLR**, or **OPT**		
See Next Page		
See Previous Page		
Selected Channel	"**ChannelMenu**"	Allows the user to display and change the current channel. Press **MENU** to return to dwell display.
 , **CLR**, or **OPT**		
Scan Mode	"**ScnModeMenu**"	Use  to select Scan Mode (Normal, No Scan, or Fixed). Press **MENU** to return to dwell display.
 , **CLR**, or **OPT**		
Talk group Lock Out	"**LockOutMenu**"	Use  to choose a talk group for locking/unlocking. Press **MENU** to toggle "<" on (locked out) and off.
 , **CLR**, or **OPT**		
Priority 1 Talk group	"**Priority1**"	Use  to choose new priority talk group. Press **MENU** to return to dwell display.
 , **CLR**, or **OPT**		
Priority 2 Talk group	"**Priority2**"	Use  to choose new priority talk group. Press **MENU** to return to dwell display.
 , **CLR**, or **OPT**		
Emergency Dismiss	"**EmgDismiss**"	Use  to choose emergency talk group. Press **MENU** to dismiss.
 , **CLR**, or **OPT**		
Alerts Received	"**AlertsRcvd**" or oldest message	"No alerts" or alert message text scrolls in display. Use  to view messages.
 , **CLR**, or **OPT**		
Alert Destination	"**AlertDest**"	Use  to choose a speed-dial number. Press **MENU** to go to "AlertMsg" menu. Scroll through canned messages with  . Press **MENU** to send message and return to dwell display.
 , **CLR**, or **OPT**		
Status LED	"**Status LED**"	Press **MENU**, then use  to turn the TX/RX LED "On" or "Off."
 , **CLR**, or **OPT**		
Client Mode	"**Client Mode**"	Use  to choose Client Mode (Network or SOI).
 , **CLR**, or **OPT**		
Speed Dial	"**SpeedDial**"	Use  to choose a speed-dial number. Press **MENU**, then use  to select canned message.
 , **CLR**, or **OPT**		
Profile Selection	"**ProfileMenu**"	Use  to choose an available profile. Press **MENU** to return to dwell display.
 , **CLR**, or **OPT**		

MENU NAME	RADIO DISPLAYS	USAGE NOTES
Request to Talk Message	**"RTT Msg"**	Use +/– to scroll through available messages. Press **MENU** to send the selected message.
	, **CLR**, or **OPT**	
Status Message	**"Status Msg"**	Use +/– to scroll through available messages. Press **MENU** to send the selected message.
	, **CLR**, or **OPT**	
Talk group Selection	"**TalkGrpMenu**"	Use +/– to choose a talk group in current profile. Press **MENU** to return to dwell display.
	, **CLR**, or **OPT**	
Site Lock	"**Site Lock**"	Use +/– to scroll through sites. Press **MENU** to select site.
	, **CLR**, or **OPT**	
OTP Software Version	**"Software Ver"**	Displays OTP software version Press **MENU** to return to dwell display.
	, **CLR**, or **OPT**	
RF Diagnostics	"**Diagnostics**"	Use +/– to scroll through RF diagnostics displays. Press **MENU** to reset RF diagnostics counters.
	, **CLR**, or **OPT**	
Priority 3 Talk Group	"**Priority 3**"	Use +/– to choose Priority 3 talk group. Press MENU to toggle "**<**" on (selected) and off.
	, **CLR**, or **OPT**	
Public Address	**"PA"**	Use +/– to scroll to turn Public Address ON and OFF.
	, **CLR**, or **OPT**	
External Speaker	**"SPKR SEL"**	Use +/– to scroll to turn the External Speaker ON and OFF.
Use , **CLR**, or **OPT** to scroll through menus.		

NOTE

Menus vary depending upon system programming, radio hardware, and optional configurations.

6.14 DUAL-TONE MULTI-FREQUENCY

Dual-Tone Multi-Frequency (DTMF) is the system used by touch-tone telephones. DTMF assigns a specific tone frequency to each key so a microprocessor can easily identify its activation. The radio supports DTMF with a system model control head (Figure 6-1). This allows for specific tasks such as entering a user ID and password, or Selective Calling.

When a key on the DTMF keypad is pressed, the DTMF tone is played through the radio's speaker.

6.15 KEYPAD

6.15.1 Keypad Commands (System Model Control Head)

To perform a command from the keypad, press the ***** key followed by one of the pre-set function keys as follows:

Table 6-5: Keypad Function Commands

KEYPAD COMMAND	FUNCTION
***0**	**Log off command:** **0##* (logs the user off the system). See page 46 for additional information.
***1**	**Login command:** **1<User ID> # <Password>* # (required for encryption). See page 45 for additional information.
***2**	**Status Message:** **2 <0...9> #.*
***4**	**Enter Scene of Incident Mode (SOI) on specified channel and band:** **4#<ccc>#*<bb>*#* where *ccc* is the SOI channel number and *bb* is the number assigned to each frequency band. **Press *40# to exit SOI mode.**
***5**	**RTT Message:** **5 <0...9> #*.
***7**	**Initiate Selective Alert command:** **7<Target ID>#[Choose Message]#*. See page 66 for additional information.
***8**	**Radio-to-Radio Call command:** **8<Selective call number># (PTT to dial)*.
***9**	**Public Switched Telephone Network (PSTN) Call command:** **9 <telephone number># (PTT to dial).* See page 67 for additional information.
***32**	**Begin Manual Encryption command:** **32<Pre-Determined Encryption Key >#* 1 – 16 digit encryption key for 128 bit encryption; 17 – 32 digit encryption key for 256 bit encryption. See page 71 for additional information.
***33**	**End Manual Encryption command**: **33#*

6.15.2 Quick Buttons (System Model Only)

Quick Keys are a two-button sequence that gives the radio user quick access to certain menu items. Quick keys act as a toggle function.

Table 6-6: Quick Button Functions

QUICK KEYS	FUNCTION
1#	**Transition to ECP/XGP mode.** If ECP/XGP is not loaded in the radio, the radio displays “No App.”
2#	**Stealth Mode On/Off.**
3#	**Scan Mode On/Off.** • If the Scan Mode is Normal when the Scan Mode is toggled Off, the Scan Mode is Normal when toggled On again. • If the Scan Mode is Fixed when the Scan Mode is toggled Off, the Scan Mode is Fixed when Scan Mode is toggled On again. • If the Scan Mode is Off when the radio boots up, the Scan Mode is Normal when Scan Mode is toggled On.
4#	**Lights/Tones On/Off.** This turns the TX/RX LEDs and Side Tones On/Off. If the radio is in Stealth mode, this quick button is disabled since the user is not able to turn on the light/tones in Stealth Mode.
5#	This quick key sequence is used to set the current active profile to the default profile in the personality as defined in the UAS.
7#	This quick key sequence is used to transmit the RTT Automatic Normal Message to the console.
8#	This quick key sequence is used to transmit the RTT Automatic Priority Message to the console.

6.15.3 Keypad Lock/Unlock

To lock or unlock the keypad:

1. Press the **MENU** button.
2. While the **MENU** button is pressed, within one second press the **OPTION** button.
3. A brief message is displayed on the 2nd line of the display (Kypd Lck, Kypd Unlck).

6.15.4 Password Entry

Password entry requires a system model control head. Password characters are encrypted on the display using symbols to indicate the entry. The encryption symbols for each entry appears in the display as they are scrolled through, for example: '-' and '+'. Press the # key twice to complete the entry process.


NOTE

If the password is wrong, the radio does not successfully register with the network for wide area voice reception. The radio can still be used in single-site mode.

6.15.5 DTMF Overdial

Using the keypad on a System Model, the radio can transmit DTMF tones corresponding to numbers/characters 0 - 9, *, and # on the keypad. To overdial numbers/characters, transmit by pressing and holding the PTT button and then, press the corresponding keys (one at a time) on the keypad.

6.16 CHANGE THE ACTIVE PROFILE

The radio can store up to sixteen (16) standard profiles, one of which is the currently active profile. To change the currently active profile:

1. Scroll through the menu until “ProfileMenu” is displayed.
2. Use  to scroll through the list of available profiles.
3. Profile becomes active when selected for longer than two (2) seconds, when the **MENU** is pressed, or when the menu is changed.

6.17 ENABLE/DISABLE VOLUME SIDE TONE

The Volume Side Tone sounds when adjusting the volume control.

To enable or disable this tone:

1. Power off the radio.
2. Press and hold the B button while turning the radio on.

6.18 CHECK OR CHANGE THE SELECTED TALK GROUP

Each profile stored in the radio can have up to sixteen (16) talk groups. One talk group within the currently active profile is set as the “selected talk group.” For the radio user, the selected talk group is typically the focus of most voice transmissions and receptions. There are two ways to change the selected talk group:

First Method:

1. Scroll through the menu until “TalkGrpMenu” appears on the bottom line of the display. The currently selected talk group appears in the top line of the display.
2. Use  to scroll through the available list of talk groups in the active profile. This list is determined by the OpenSky network administrator.

Second Method:

From the dwell display, use the talk group selection knob or  to scroll through the available list of talk groups in the active profile.

6.19 ADJUST DISPLAY AND BUTTON BACKLIGHT BRIGHTNESS

1. Scroll through the menu until “Bright Menu” appears.
2. Use  to increase or decrease brightness. Display and button backlight brightness immediately dims or brightens.

Or

If enabled via programming,  increases/decreases brightness.

6.20 STEALTH MODE

For some users, it is important to be able to turn off the radio's display lights, button backlighting, volume and side tones, but not radio traffic. For example, in covert operations, lights and sounds could inadvertently expose an otherwise unobservable radio user. For this purpose, the radio has a Stealth feature that disables the radio display light, indicator light, and audible side tones.

When Stealth Mode is on, the radio continues to scan the programmed list of talk groups and the user can key-up on the selected talk group. All buttons are disabled except for PTT, Emergency, 2# and **MENU**. Since the screen is blank the user cannot see the result of other button presses.

6.20.1 Enable Stealth Mode

1. Scroll through the menu until "StealthMenu" appears.
2. To immediately turn Stealth Mode on, press (+) or (-) with  .

Or

Press quick button command 2# on the System Model control head.

6.20.2 Disable Stealth Mode

To turn Stealth Mode off, press quick button command 2# or the **MENU** button on the radio's front panel.

6.21 ADJUST SIDE TONE AUDIO LEVEL

The radio sounds confirming tones called "side tones" when its buttons are pressed. Most users find this audible confirmation helpful when navigating the menus. Side tone audio level can be adjusted or turned completely off using the "Side Menu."

For covert operations, it may be necessary to turn off side tones. For safety's sake, turning off the radio during covert operations is not recommended.

To temporarily disable the side tones that could expose the user's presence and position, use the menu buttons to access the "Side Menu" and select "Off" from the menu choices.

If the radio is operating properly but side tones are not heard when the menu buttons are pressed, the side tones are probably turned off. To turn them back on, access the "Side Tone" menu and select a setting other than "off."

Use the following procedure to set side tone level:

1. Scroll through the menu until the "Side Menu" appears in the bottom line of the display.
2. Use  to change to the desired level (Off, Low, Medium, and High). To turn side tones completely off, use the "Off" setting.

6.22 CHANGE OPERATING MODE

1. Scroll through the menu until “App Mode” appears in the bottom line of the display.
2. Use  to choose an available mode. Press **MENU** and confirm (Y/N) with  and press **MENU** again.

Or

Preset button C can be configured via programming to reboot the radio into a particular application mode.

Or

Quick Button command 1# transitions the radio to ECP/XGP mode. If ECP/XGP mode is not loaded in the radio, the radio displays “No App.”

6.23 RECEIVE AND TRANSMIT VOICE CALLS

As soon as the radio completes the startup/login/provision/self-test sequence and registers on the OpenSky network, voice calls from talk groups in the active profile are audible.

6.23.1 Receive a Voice Call


NOTE

The Alias/User ID/Talk Group name is only displayed if that dwell display option is selected using the **MENU** button. For example, if the user sets the dwell display option to profile, the profile continues to be displayed when a call is received.

No action is required to receive a voice call. The display responds to incoming voice calls as follows:

- When the dwell display is set to received talk group, the scan mode is Normal or Fixed:
  a. If the received talk group matches the selected talk group, then the alias (if available) or user ID of the incoming caller is displayed.
  b. If the received talk group does not match the selected talk group, then the received talk group name is displayed
- When the dwell display is set to received talk group and the Scan Mode is None, the radio only receives voice on its selected talk group. When the call is received, the alias (if available) or the user ID of the incoming caller is displayed.
- When the dwell display is not set to received talk group, then there is no display indication of an incoming call.


NOTE

A radio receiving a System All Call displays “All Call” instead of the alias. A radio not transmitting on a talk group in emergency status drops all other calls to scan into an All Call.

Refer to Section 6.27 for detailed information on talk group scanning. Refer to Section 6.32 for detailed information regarding sending and receiving encrypted calls.

6.23.2 Transmit a Voice Call

Transmit a voice call as follows:

1. Turn the radio on.
2. If required, login to the network using a user ID and password (see Section 6.4).
3. Select the talk group on which you want to transmit.
4. Press and hold the **Push-to-Talk (PTT)** button on the hand-held microphone, pause for a moment, and then speak normally. For maximum clarity, hold the microphone approximately 2 inches from the mouth and do not shout or whisper into it. If the call is queued by the network, wait for the grant tone to sound before speaking.
5. Release the PTT button when finished speaking.

Refer to Section 6.32 for detailed information regarding sending and receiving encrypted calls.

6.24 ADJUST AUDIO TREBLE LEVEL

The tone of received signals can be adjusted using the radio's "Treble Menu" as follows:

1. Scroll through the menu until "Treble Menu" appears. The radio's current treble level setting indicates in the top line of the display. There are four levels available: low, medium, medium-high, and high.
2. Use  to increase or decrease treble level.
3. Press the **MENU** button or wait a few seconds to return to the Dwell Display.

6.25 INTERCOM MODE

The optional intercom mode gives users at multiple control heads connected to the same radio the ability to communicate with each other without transmitting over-the-air. Turn intercom mode on and off using the "INTERCOM" menu as follows:

1. Scroll through the available menu items until "INTERCOM" appears in the display.
2. Use  to toggle between "On" and "Off."

When intercom mode is turned on:

- Incoming voice calls override intercom communications for the duration of the voice call. The radio and associated control heads remain in intercom mode and intercom communications resume when the voice call ends.
- "TG: INTERCOM" appears in the control head's display when talking on the intercom. This indicates microphone audio is not sent out on the selected talk group; rather, it remains localized between the radio control positions (i.e., the control heads connected to the mobile radio).
- If a call exists on the currently selected talk group when a PTT button is pressed at one of the control heads, "TG: in use" appears in the display to indicate intercom mic audio cannot preempt the call on the talk group.

CAUTION

A user at a radio with only one control head/front panel can turn intercom mode on. In this case, pressing the microphone's PTT button does **NOT** send microphone audio anywhere.

6.26 TALK GROUP LOCK OUT

There are two ways of focusing voice communications by suppressing calls from talk groups in the currently active profile:

1. **No Scan:** By turning scan off (selecting "No Scan" via the "ScnModeMenu"), only the selected talk group is audible.
2. **Lock Out:** By locking out selected talk groups, the "chatter" of the locked out talk groups cannot be heard. This focuses the user's scanning resources to calls only on desired talk groups.

Talk group lock out is a scan-related feature. With lock out, one or more talk groups in the active profile can be temporarily disabled from being scanned. Calls are not received on locked-out talk groups. Lock out settings are not retained between profile changes or when the radio is power cycled.

NOTE

Lock out is a listening (receive) function and only blocks received calls on locked out talk groups. Lock out does not affect transmit capability. The above methods do not apply to recent emergency lock outs.

Only talk groups in the active profile can be locked out, since they are the only talk groups whose voice calls can be heard on the radio.

NOTE

P1, P2, and P3 talk groups cannot be locked out.

The default emergency and emergency-capable talk groups can be locked out if they are NOT in an emergency state. If a talk group is locked out and is subsequently changed to the currently selected talk group, it is automatically unlocked by the radio so the user can hear calls on the talk group. The radio may be configured so all talk groups are automatically locked out by default. In this case, they must be manually unlocked, if desired.

6.26.1 Lock Out a Talk Group

1. Scroll through the menu until "LockOutMenu" appears in the bottom line of the display. The name of a talk group in the currently active profile appears in the top line.
2. Use  to scroll through the list of talk groups, if any, until the desired talk group for lock out appears in the top line of the display.
3. Press the **MENU** button to lockout the displayed talk group. A less than symbol (**<**) appears next to the talk group's name.
4. Repeat steps 2 and 3, as needed, to lock out additional talk groups.

The dwell display re-appears a few seconds after button presses end.

While scrolling through talk groups in the active profile, the only talk groups that appear in the "LockOutMenu" are those in the active profile.

6.26.2 Unlock a Talk Group

1. Scroll through the menu until "LockOutMenu" appears in the bottom line of the display. The name of a talk group in the currently active profile appears in the top line.
2. Use  to scroll through the list of talk groups, if any, until the talk group desired for unlocking appears in the top line of the display. A less-than symbol ("<") appears next to the name of a talk group that is currently locked out.
3. Press the **MENU** button to unlock the talk group. The less-than symbol ("<") next to the name of the talk group disappears. The dwell display appears as soon as the radio acknowledges the selection.


NOTE

- Changing the active profile removes any lock outs you have made.
- Turning off the radio removes any lock outs you have made.

6.27 SCANNING

Three scanning modes are available for the radio, but only one can be active at any time. Changing the scanning mode changes the way the radio scans voice calls for all of profiles in the radio personality, no matter which profile is or becomes active.

As described in Table 6-7, the choice of scanning mode changes the span of communications with all the talk groups in the radio's profiles, but does not affect interaction with the talk groups.

Table 6-7: Scan Modes

SCAN MODE	EXPLANATION
No Scan	**Eliminates distractions**. Full communications (transmit and receive) on selected talk group. No calls received from other talk groups.
Normal (Default)	The user can scan all talk groups in the active profile that are not locked out as long as there is demand on the site. Priority (P1, P2, and P3) groups are user selectable. Receive calls from more than one talk group, if available from the current site. Allows dragging of the selected talk group, P1, P2, P3, and default emergency talk groups to the site on which the radio is registered. (If other calls are available at the site, they also can be heard but they are not be actively dragged.) The default emergency talk group, as well as any emergency-enabled talk groups, is only dragged if it is in emergency mode.
Fixed	Functions the same as Normal Scan Mode, except the priority groups are fixed to the selected profile's pre-defined P1 and P2 groups (configured via the UAS).

6.27.1 Check or Change Active Scan Mode

The currently active scan mode does not appear in the dwell display. To check it, access "ScnModeMenu" and observe it in the top line of the display. To change the active scan mode:

1. Scroll through the menu until "ScnModeMenu" appears in the display.
2. Use  to scroll through the scan options until the desired mode appears. See Table 6-7.

Or

Use the quick button option 3#.

6.27.2 Scan Priority

The following lists the scanning priority order (from highest to lowest):

- System All Call
- Selected talk group in emergency state
- Default emergency group in emergency state
- Selected talk group
- Emergency capable group in emergency state
- Priority 1 talk group
- Priority 2 talk group
- Priority 3 talk group
- Other (non-priority)

6.27.3 Change Priority 1 and Priority 2 Talk Groups

Follow this procedure to set talk groups in the current profile as the Priority 1 or Priority 2 talk group:

1. Scroll through the menu until "Priority1" or "Priority2" appears in the bottom line of the display (Priority 1 group has higher priority than the Priority 2 group. The talk group currently set as the priority talk group appears in the top line of the display.
2. Use  to select a new priority talk group.
3. Press the **MENU** button to set the newly selected talk group as the priority talk group.

6.27.4 Change Priority 3 Talk Groups

Follow this procedure to set talk groups in the current profile as Priority 3 talk groups:

1. Scroll through the menu until "Priority 3" appears in the bottom line of the display. The name of a talk group in the currently active profile appears in the top line.
2. Use  to scroll through the list of talk groups, if any, until the desired talk group for Priority 3 appears in the top line of the display.
3. Press the **MENU** button to select/deselect the displayed talk group as a Priority 3 talk group. A less than symbol (**<**) appears next to the talk group's name.
4. Repeat steps 2 and 3, as needed, to select/deselect additional talk groups.

6.28 MAKE SELECTIVE CALLS

Selective Calling is a feature that allows two radio units to obtain and utilize an independent voice path for a private call. Radios can be configured to both initiate and receive Selective Calls or to only receive Selective Calls.

In the OpenSky system, a source radio can be configured to initiate Selective Calls through a pre-programmed list in memory. This method uses the “speed dial list” set up by the OpenSky network administrator and provisioned as part of the registration process.

In addition, a properly equipped source radio can initiate a Selective Call to any radio in the system by entering the ten-digit voice user ID (which looks like a telephone number) of the target device. Entering a Selective Call number without using the speed dial feature requires a system model control head (Figure 6-1). See Section 6.14 for more detail.

NOTE

Selective Calls are terminated if an emergency is declared. The network limits Selective Calls to ten (10) minutes maximum.

Table 6-8 lists and defines the messages that may be displayed by the radio during a Selective Call.

Table 6-8: Status of Selective Call

STATUS MESSAGE	DEFINITION
Busy	Peer is involved in another selective/PSTN call.
Disconnect	Selective/PSTN call was terminated for unknown reason.
Network Err	Selective/PSTN call cannot continue because of an unspecified network error.
Reject	Peer or this user declined request to establish selective/PSTN call.
Unavailable	Peer cannot be reached for selective/PSTN call.
Calling	Calling peer (i.e., for selective or PSTN calls).
Connecting	Establishing selective/PSTN call with peer.
Hangup	Peer or this user terminated selective/PSTN call.
Lim 10 min	Selective/PSTN call limited to 10 minutes.
Timing Out	Selective/PSTN call has 10 seconds remaining before limit is reached (shown for 5 seconds).
Sel Call	Selective Call is active.

6.28.1 Manually Dial a Selective Call (System Model Control Head)

1. Press *8 on the keypad.
2. Enter the number of the radio to be called (e.g., 027-001-0006). If the region number (first 3 digits; 027 in this example) is the same as this radio’s region number, these digits do not need to be entered. Likewise, if the region and agency numbers (first 6 digits; 027-001 in this example) are the same as this radio’s numbers, these digits do not need to be entered. Leading zeros can also be ignored.
3. Press and release the # key.
4. Wait approximately two (2) seconds.

5. Press and release the PTT button to initiate the Selective Call request. When the called party accepts the call, press the PTT again and begin speaking.

6.28.2 Speed Dial a Selective Call

NOTE

Speed dial numbers are defined and provisioned by the OpenSky network administrator and cannot be manually entered into the radio by the user. Contact the administrator if changes to the speed dial list are required.

1. Scroll through the menu until “SpeedDial” appears in the bottom line of the display.
2. Using , scroll through the pre-programmed speed-dial numbers until the desired number appears in the display.
3. Press and release the PTT button to ring the other user.
   a. The ring tone is sounded.
   b. If the other user accepts the call, the called user’s alias appears in the initiating caller’s display. The two are now in a private call until one ends the call, the call is terminated due to an initiated emergency, or the maximum time limit of ten (10) minutes is reached.
4. To end the call, press the # button or (**-**) using .

6.28.3 Receive a Selective Call

When someone calls in from another radio using the Selective Call function, a ring sounds in the speaker and/or headset. Press up or down using or any number key to accept an incoming Selective Call. Press the microphone’s PTT button when speaking (transmitting) to the caller.

Press the # button or (**-**) using to reject an incoming Selective Call.

A Selective Call is interrupted if an emergency is declared on a monitored talk group.

6.28.4 Terminate a Selective Call

Press the # button or (**-**) using to terminate an incoming Selective Call.

6.29 SELECTIVE ALERT

Selective alert messaging is an OTP feature allowing one of up to eight (8) pre-programmed text messages (refer to Section 6.29.3) to be sent from one radio to another. The user specifies a destination radio’s User ID, selects one of the pre-programmed text messages, and then transmits it to the destination radio. The message delivery system adds time-of-day information and forwards the message to the destination (receiving) radio. The sending radio receives a brief message noting the status of the transmission. Refer to Table 6-9 for a list of possible status messages.

The first few characters of a message are part of the message text entered when the message is programmed. This programming is performed by the system or network administration personnel.

Messages successfully received by the destination radio are stored until deleted or until the radio is power cycled.

6.29.1 Send Selective Alert Messages

The destination radio's User ID can be selected via the menu or via the keypad on the system model control head.

Menu Button Method:

1. Scroll through the menu until "AlertDest" (Alert Destination) appears in the bottom line of the display. The current speed dial number scrolls on the top line.
2. Use  to change to a different speed-dial number.
3. When the desired speed-dial number appears, press the **MENU** button to activate the selection.
4. Choose and send the message.

Keypad Method (System Model Control Head):

To select the destination radio's User ID using the keypad, perform the following:

1. Press *7 on the keypad. "AlertDest" appears in the display.
2. Enter the number of the destination radio (e.g., 027-001-0006) using the DTMF keypad. If the region number (first 3 digits; 027 in this example) is the same as this radio's region number, these digits do not need to be entered. Likewise, if the region and agency numbers (first 6 digits; 027-001 in this example) are the same as this radio's numbers, these digits do not need to be entered. Leading zeros can also be ignored. Refer to Section 6.14.
3. Press the # key to enter the number.

Choose and Send the Message

After specifying the destination radio's User ID (Section 6.29.1), the radio automatically allows you to choose a message. The current message scrolls across the top line of the display. To choose a message:

1. Scroll through the message list using  . The next available message in the list is displayed. Pause between each arrow button press to observe the entire message as it scrolls across the top line of the display.
2. To select and send the displayed message, press the **MENU** button, or press the # button on the keypad.
3. The status of the sent message is momentarily displayed (Table 6-9).

Table 6-9: Status of Selective Alert

STATUS MESSAGE	DEFINITION
Alert Sent	Alert message successfully sent to target.
Delivered	Alert message passed to network.
Delivering	Delivering alert message to target.
New alert	New alert message received.
No alerts	No alerts are available.
Busy	VNIC congested and cannot deliver message at the current time.
Dest Down	Destination home VNIC down.
Ignored	Destination is either non-responsive or does not care to respond.
Inv Option	Distribution option is invalid.

STATUS MESSAGE	DEFINITION
Not Reg	Destination is not registered.
Partial	Not all destination ESN instances reachable.
Unauth Alrt	Unauthorized service function; initiator is not authorized to send the selected service message.
Unknown Msg	Unknown status received from VNIC.
Unreachable	Alert destination cannot be reached.

6.29.2 Receive Messages

When a selective alert message is received by a radio, a four-beep tone (one low, two high, and one low) is heard and “New alert” flashes until the new message is read. Up to eight (8) received messages are stored. If another message is received, the first (oldest) message is automatically deleted to make room for new incoming messages.

Display Received Messages

1. Scroll through the menu until “AlertsRecvd” (Alerts Received) appears in the bottom line of the display. “No alerts” or the last received (newest) message appears in the display. It is preceded by the time the message was received, and the sender’s name/alias.
2. View other received messages using  .
3. To delete the message currently being viewed, press the **MENU** button.

Delete Received Messages

To delete a received message:

1. Display the message.
2. Delete the message by pressing the **MENU** button.
3. Confirm the deletion by pressing the **MENU** button again.

6.29.3 Define Pre-Programmed Messages

All selective alert messages are pre-defined by the radio system’s maintenance personnel. These messages are sometimes referred to as “canned” messages. Custom selective alert messages cannot be created by the radio user. The entire selective alert message can include up to 99 text characters.

6.30 TELEPHONE INTERCONNECT CALLS (SYSTEM MODEL CONTROL HEAD)

6.30.1 Place an Interconnect Call

If the radio system is equipped with Public Switched Telephone Network (PSTN) interconnect equipment, telephone calls can be made from the XG-75M/M7300 using this procedure:

1. Press the * 9 keys.
2. Enter the telephone number. Ignore dashes/spaces, and precede the number with any required access digits such as a 1 for long distance.
3. Press the # key.

4. Wait a few seconds and then press and release the mic's PTT button to initiate the call. An initial ring tone plays indicating call initiation. Once the gateway picks up the call, another ring tone sounds.
5. When the caller answers, press the PTT button when speaking and release it to listen to the caller.
6. To hang-up, press the # button or (**-**) using  .

6.30.2 Receive an Interconnect Call

When receiving an Interconnect Call, a ring sounds in the speaker and/or headset. Press up or down using  or any number key to accept an incoming Interconnect Call. Press the microphone's PTT button when speaking (transmitting) to the caller.

Press the # button or (**-**) using  to reject an incoming Interconnect Call.

6.31 EMERGENCY COMMUNICATIONS

The XG-75M/M7300 mobile radio can transmit both emergency voice calls and emergency alerts over the entire network. OpenSky handles emergency calls and alerts with the highest priority.

For critical voice communications, an emergency call can be raised on the default talk group or the currently selected talk group by "declaring" an emergency on the talk group. The exact talk group is determined by the currently active profile. After successfully declaring an emergency on a talk group, the declaring radio's microphone remains "hot" for a predetermined amount of time. In other words, the radio transmits audio for a period of time even when the microphone's PTT button is not pressed. An emergency talk group is provided greater priority and infinite hang-time by the radio system's infrastructure. Hang-time is the maximum duration of quiet time between transmissions on the talk group before the infrastructure assets are automatically taken away. Because an emergency call is handled on a talk group, it is received by all radios and consoles monitoring the talk group.

An emergency alert is a data message sent by the radio to the MIS console (or any console capable of receiving it). It identifies the radio declaring the emergency, and the radio's location (if the radio is equipped with a GPS receiver). Voice audio is not automatically transmitted during the emergency if the administrator configures the radio for alert notification only.

6.31.1 Declare an Emergency Call or Alert

1. Press the red emergency button on the radio to enter emergency mode. The emergency is raised after the emergency raise delay [default is one (1) second].
    - If the active profile of the unit initiating the emergency is configured for Emergency Alert, the emergency alert signal is sent to registered alert servers, such as the dispatcher console.
    - If the active profile of the unit initiating the emergency is configured for Emergency Call, the talkgroup is placed into emergency status notifying other radios and the emergency alert signal is sent to the dispatcher console.
    - If the emergency behavior of the active profile is Current, the active, selected voice group becomes the default emergency voice group.
    - If the emergency behavior of the active profile is Default, the radio moves to the default emergency voice group of the profile and this talk group becomes the select talk group.

2. The display alternates between “Emergency” and whatever option is selected for the 2nd line of the dwell display.

If the attempt is unsuccessful, “E-PEND” flashes periodically and a retry is queued for 10 seconds. If unsuccessful because of lost sync, retry occurs immediately upon reacquiring sync. On each retry attempt, radio temporarily displays “E-RETRY.” This process repeats until the emergency is successfully declared.

6.31.2 Silent Emergency

When this feature is enabled and an emergency call or alert is declared by pressing the emergency button, the radio does not play a tone and displays an abbreviated emergency message (default is EBA). This feature is enabled or disabled via programming or via the menu.


NOTE

If the Silent Emergency feature is enabled or disabled via programming, the setting survives power cycle. Enable/Disable selection via the menu does NOT survive power cycle and the enable/disable state reverts to the programmed setting at power up.

6.31.3 Clear an Emergency Call or Alert


NOTE

Check with the system administrator to ensure that the radio is programmed to allow an emergency to be cleared.

If enabled via programming, clear an emergency by:

1. Pressing and holding the **CLR/CLEAR** button and simultaneously pressing the emergency button.
2. After the Emergency Cleared Tone sounds, release both buttons.


NOTE

If the radio is in Stealth Mode, clearing the emergency takes the radio out of Stealth Mode.

6.31.4 Receive an Emergency Call

Upon receiving an emergency call declared by another radio:

- An emergency tone sounds in the radio’s speaker/headset (three short high-pitched beeps).
- “EMERGENCY” flashes in the display if the radio is not in stealth mode. When receiving voice in an active emergency, the flashing “EMERGENCY” is inhibited so that the alias of the sender can be seen.
- On receiving radios with the emergency talk group selected, the alias of the sending party is displayed for 5 seconds during the open-mic period, then the word “Emergency” flashes on the second line of the display and continues until the emergency state ends.
- If scan mode is set to “No Scan” and the emergency was declared on the selected talk group, audio on the emergency talk group is heard in the speaker/headset. See page 62 for additional information on “No Scan” operation.

- If scan mode is set to “No Scan” and the emergency was declared on a talk group **other than** the selected talk group, the emergency talk group (identified by an “*”) must be selected before audio on it is heard in the speaker/headset.
- If scan mode is set to “Normal” and the emergency was declared on the selected talk group, the selected/emergency talk group’s name remains in the top line of the display. Audio on the emergency talk group is heard in the speaker/headset.
- If scan mode is set to “Normal” and the emergency was declared on a talk group **other than** the selected talk group, the emergency talk group’s name appears in the bottom line of the display. Audio on the emergency talk group is heard in the speaker/headset.
- The declaring radio's alias appears in the bottom line of the display when the emergency talk group is selected.
- An emergency call can be dismissed as described in the following section.

NOTE

A radio declaring an emergency on a talk group has a “hot” mic time period of typically ten (10) seconds just after it declares the emergency. This time period may be adjusted by system or network administration personnel on a per radio basis.

6.31.5 Dismiss an Emergency Call

NOTE

An emergency is dismissed for a configurable amount of time only (default = 5 minutes).

To ignore an emergency call declared by another radio user:

1. Scroll through the menu until “EmgDismiss” appears in the display.
2. Press  until the talk group in the emergency state appears, as indicated by an asterisk (*) following the talk group’s name.
3. Press the **MENU** button.

NOTE

The emergency dismiss timer is cleared when the emergency is cleared.

6.32 ENCRYPTION

In the OpenSky network, both data and voice use a 128-bit or 256-bit key encryption standard published by the Federal Information Processing Service (FIPS), called Advanced Encryption Standard (AES). AES is approved by the U.S. Department of Commerce for encryption of classified materials.

When encryption is enabled on the network, data is encrypted from the MDIS to the Mobile End System (MES) (e.g., XG-75M/M7300 mobile radio). This form of encryption provides air-link security.

Voice encryption is handled either automatically or manually. Automatic encryption is initiated through the Unified Administration Server (UAS) for a specific talk group and requires nothing

from the user. Manual encryption is initiated by two or more radio users and requires system model control heads. Both methods of encryption are discussed in the following sections.

6.32.1 Automatic Encryption

For automatic encryption, a network administrator selects the talk group to be encrypted at the interface to the UAS. Once the talk groups have been selected and identified as secure, credentials for key generation are generated automatically by the system and provisioned to authorized users. This process requires that authorized users login to the network and be authenticated. Encryption keys require no manual handling and are never sent "in the clear" over any network interface or air-link.

1. "Pls Login" appears displayed in the bottom line of the dwell display.
2. Login normally using the keypad on a system model control head to enter User ID and Password.

If a user is engaged in a call on a talk group encrypted at the network administrator level, "Secure Call" appears in the bottom line of the dwell display if the user is logged in to that talk group.

If a secure call is in progress elsewhere and the user has not logged in, the bottom of the dwell display alternates between "No Access" and the alias of the radio that is currently engaged in the secure call.


NOTE

The radio can also be programmed to automatically login and enable encryption.

6.32.2 Manual Encryption (System Model)

Two or more users can manually encrypt a call, if enabled, without an established encrypted talk group. A pre-determined key is required at each radio.


NOTE

The key must be pre-determined by the users prior to making a manually encrypted call on a talk group and is entered into the radio using the keypad. For 128 bit encryption, this key is between 1 and 16 digits. For 256 bit encryption, this key is between 17 and 32 digits.
If two communicating radios have different (manually-defined) keys, receive audio at each radio sounds garbled.

With manual encryption enabled, unencrypted radio users on the talk group can still make standard voice (unencrypted) calls on the talk group. However, if an unencrypted user attempts to transmit on the talk group when one of the encrypted users is already transmitting on the talk group, the unencrypted radio sounds a deny tone and "No Access" appears in the display. Also, the encrypted user can hear standard unencrypted calls, but cannot respond while still manually encrypted.


CAUTION

Do *not* set a talk group for manual encryption if it has been set for encryption by the network administration personnel.

Perform the following to transmit or receive manually encrypted calls:

1. Press *32 on the keypad.
2. Enter the key (1 – 16 digits for 128 bit encryption; 17 – 32 digits for 256 bit encryption).
3. Press the # key.
4. To end manual encryption, press *33#.

If a user is engaged in a call on a talk group that has been manually encrypted at the radio level, the user sees “Secure Call” on the bottom of the dwell display.

If a secure (encrypted) call is in progress, and the user has not entered the key, the bottom of the dwell display alternates between “No Access” and the alias of the radio that is currently engaged in the secure call.

Once the user has terminated manual encryption, “UnSecure” appears temporarily in the bottom line of the dwell display.

6.33 PRESET BUTTONS

The front panel contains three buttons labeled A, B, and C. By holding one of these buttons down for approximately three (3) seconds, the following current information is saved to the function of that button:

- Currently selected Priority 1, Priority 2, and Priority 3 talk groups
- Currently selected profile
- Currently selected talk group
- Lock outs
- Scan state
- Intercom mode

After changing systems, groups, scan state, etc., simply press the preset button to restore the settings.

Presets are saved and restored to/from non-volatile memory. Changing the User ID (login in as a different user) clears the presets since they are stored on a per-user basis. Changing control heads does not recall presets for the previous control head.


NOTE

Preset button C can be configured via programming to reboot the radio into a particular application mode, toggle the external speaker OFF/ON, toggle the Public Address OFF/ONN or toggles the Selective Call Alert. Contact your system administrator to determine if this feature is enabled in your radio.

6.34 STATUS MESSAGES

If enabled via programming, the radio can transmit a pre-programmed status message. Section 8.30.1 describes how to send a status message via the keypad and Section 8.30.2 describes how to send a status message via the menu.

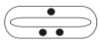
6.34.1 Send Status Message via the Keypad (System Model Only)

1. Press *2 <0…9> # on the keypad.
2. A Status message can be associated with each key (0 – 9). This text is displayed on the first line of the display when the key is pressed until another key is pressed.
   - If no messages have been configured, “No Messages” is displayed.
   - If a message is not assigned to a key, “No Entry” is displayed for the keypad sequence.
   - You can press multiple keys to select the desired Status message.
3. The # key terminates the keypad sequence and sends the currently selected status message. If no messages have been configured or no message is associated with the key, no message is sent and an error tone is played.

Press * to cancel the keypad sequence.

6.34.2 Send Status Message via the Menu

1. Scroll through the menu until “Status Msg” appears and press **MENU**. If no messages have been configured, “No Messages” is displayed.
2. Scroll through the available messages using  . The configured Status message is displayed on the 1st line of the display.
3. Press the **MENU** button to send the currently selected message. If no messages have been configured, no message is sent and an error tone sounds.

Press up or down with  to cancel status message selection.

6.35 REQUEST TO TALK (RTT) MESSAGES

If enabled via programming, the RTT message feature allows you to send either a short service message to the VNIC. Section 6.35.1 describes how to send an RTT message via the keypad and Section 6.35.2 describes how to send an RTT message via the menu. Note that only one RTT message can be programmed into the radio.

6.35.1 Send RTT Message via the Keypad (System Model Radios Only)

1. Press *5 <0…9> # on the keypad. The key associated with the RTT message (0-9) is configured via programming.
2. This message is displayed on the first line of the display when the key is pressed until another key is pressed.
   - If no message has been configured, “No Message” is displayed.
   - If a message is not assigned to the key, “No Entry” is displayed for the keypad sequence.
3. The # key terminates the keypad sequence and sends the currently selected RTT message. If no message has been configured or no message is associated with the key, no message is sent and an error tone is played.

Press * to cancel the keypad sequence.

6.35.2 Send RTT Message via the Menu

1. Scroll through the menu until “RTT Msg” appears and press **MENU**. If no message has been configured, “No Messages” is displayed.
2. Use  to select message. The configured RTT message is displayed on the 1st line of the display.
3. Press the **MENU** button to send the currently selected message. If no message has been configured, no message is sent and an error tone sounds.

Press  to cancel RTT message selection.

6.35.3 Send RTT Automatic Normal Message via the Quick Button

Press 7# buttons to send RTT Automatic Normal Message to the console.

6.35.4 Send RTT Automatic Priority Message via the Quick Button

Press 7# buttons to send RTT Automatic Priority Message to the console.

6.36 GPS COORDINATES

The radio’s current latitude and longitude coordinates may be displayed using the “GPS” menu. The following procedure assumes a GPS antenna is connected to the radio and it is receiving adequate signals from GPS satellites:

1. Scroll through the menu until the “GPS” menu appears in the bottom line of the display. Current GPS coordinate latitude and longitude data continuously scrolls in the top line of the display in a degrees:minutes:seconds format.
2. Use  to change to another menu.

If the internal GPS receiver’s data is expired (30 minutes or more) or unavailable, the radio uses the serving base station’s coordinates [GPS (Site) is displayed]. The GPS Menu also indicates if the data is aged (2 minutes or more) [GPS (Aged) is displayed].

6.37 SCENE-OF-INCIDENT MODE

The Scene-of-Incident mode (SOI) is user-selectable. The SOI mode provides a local repeater function (V-TAC) with no network connection.

When operating in the SOI mode, the radio is disconnected from the OpenSky network. Therefore, communications with radios and dispatch personnel on the network is not possible.

Enter SOI Mode Manually Entering the Channel:

1. Scroll through the menu until the Client Mode menu appears.
2. Using  , scroll until SOI is displayed.
3. Press the **MENU** button to confirm mode selection.

4. Using  , scroll until “Manual Select Chan” is displayed and press **MENU**.
5. Using  , scroll to edit the right-most digit and press **MENU** to advance to the next digit. Repeat until the desired channel is entered.
6. The radio then prompts the user to edit the band. Use  to edit the number assigned to the frequency band and press **MENU** to confirm and enter the SOI mode.

Use the Client Mode menu to return to normal operation (Network Mode). The personality and profile in use at the time the radio entered SOI mode is restored.

Enter SOI Mode Selecting Pre-Programmed Channel:

1. Scroll through the menu until the Client Mode menu appears.
2. Using  , scroll until SOI is displayed.
3. Press **MENU** to confirm mode selection.
4. Using  , scroll through a list of pre-programmed channels.
5. Press **MENU** to confirm channel and enter SOI mode.

Use the Client Mode menu to return to normal operation (Network Mode). The personality and profile in use at the time the radio entered SOI mode is restored.

Enter SOI Mode (System Model Only):

1. Press *4#.
2. The radio prompts for the channel. Enter the channel number and press # to confirm channel.
3. The radio prompts for the band. Enter the number assigned for the desired frequency band and press # to confirm.
4. The radio reverts to the dwell display.

   If accepted, you are switched off the network and communicate locally through the V-TAC.

Press *40# or use the Client Mode menu to return to normal operation (Network Mode). The personality and profile in use at the time the radio entered SOI mode is restored.

7. EDACS/CONVENTIONAL/P25 (ECP/XGP) OPERATION

7.1 TURN THE RADIO ON

Rotate the **POWER ON/OFF/VOLUME** knob clockwise, out of detent to turn the radio on. A short beep (if enabled through programming) indicates the radio is ready for operation. The display indicates, if programmed, the last selected system name on line one and the last selected group or channel name on line two.

NOTE

The radio can be programmed to require the entry of a PIN in order to operate the radio. Check with your System Administrator if you forget your PIN. As the PIN is entered, an asterisk is displayed for each digit. The actual value is not displayed.

NOTE

In the trunked environment, CC SCAN will be displayed if communication with the system's control channel cannot be established. This may occur if, for example, the radio is out of range of the trunking site. It may be necessary to move to another location or select another trunking system to re-establish the control channel link for trunked mode operations. CC SCAN is displayed on the group line until a control channel is accessed. The length of time before the radio enters CC Scan after losing communication with the Control Channel is configurable in RPM.

7.2 CH-721 FRONT PANEL COMPONENTS

The front panel of the control head includes a dot matrix display, controls for menu navigation, an emergency button, three pre-set buttons, a Power On/Off/Volume Control knob, and a microphone connector. In addition, the system model control head features a DTMF keypad.

Table 7-1 lists all default front panel controls and their functions. All functions and controls of the Scan radio operate the same as the corresponding functions and controls on the System radio.

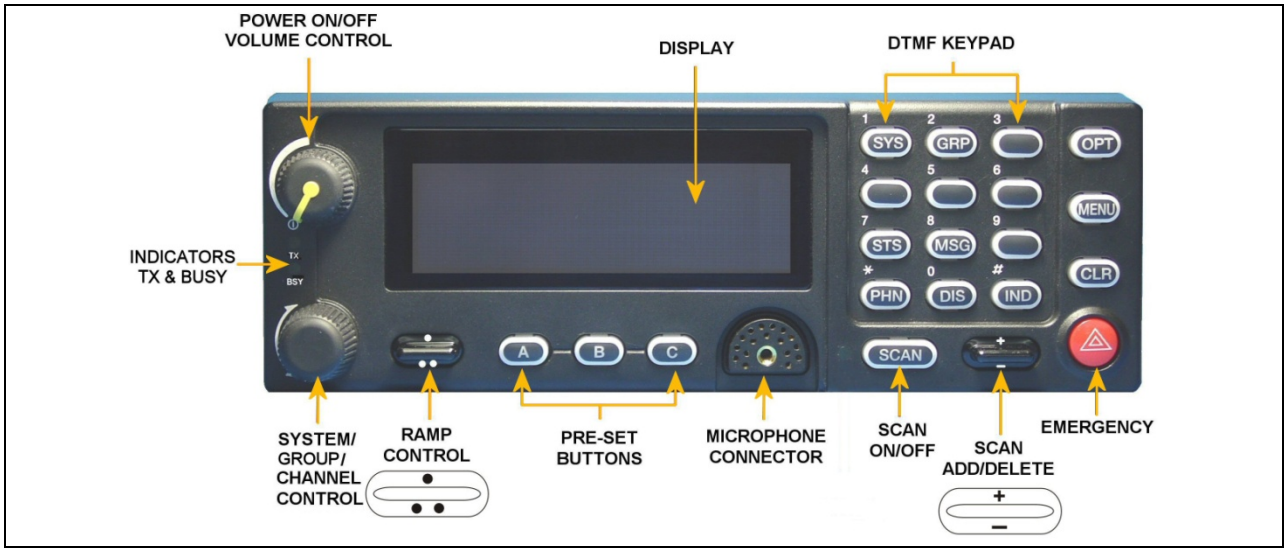


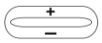
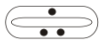
Figure 7-1: System Model

Figure 7-2: Scan Model

NOTE

Button function may vary depending upon radio programming. Complete the table in Section 10 if the keys have been remapped to provide new functions.

Table 7-1: Front Panel Default Controls and Functions

PART	FUNCTION
Power On-Off/Volume Control knob	Turn knob clockwise to power on the radio and increase volume. Turn counter-clockwise to decrease volume and power off the radio. NOTE: The radio can be programmed to require the entry of a PIN in order to operate the radio. Check with your System Administrator if you forget your PIN. As the PIN is entered, an asterisk is displayed for each digit. The actual value is not displayed.
Mic Connection	Connection for hand-held, hands-free, speaker-mic, headset, or programming cable.
	The Emergency button declares an emergency if enabled through programming.
	This rotary switch selects the systems or groups/channels, depending upon programming.
	This rocker type button is used to display the current SCAN status for a group/channel and then add or delete the group/channel from the system scan list.
	The primary function of this rocker type button is to scroll through the System list or the Group/Channel list depending upon programming. The secondary function is to increment or decrement items within a list (phone list for example).
OPT/OPTION	Toggle a PC programmable feature ON and OFF.
CLR/CLEAR	Exits the current operation or entry mode. In Conventional mode, pressing this button unmutes the receiver so activity on the selected channel can be monitored.
MENU	Primary function - access the menu list. This is a list of additional features that are not available directly from the keypad. Secondary function - activate a selected item within a list, similar to an enter key.
SCAN	Toggles scan operation ON and OFF.
Pre-Set buttons **A**, **B**, **C**	Used to store and recall user-selectable parameters.
SYS	Used to enter the System select mode.
GRP	Used to enter the Group select mode.

PART	FUNCTION
STS	Permits the transmission of a pre-programmed status message to an EDACS or P25 Trunked site.
MSG	Permits the transmission of a pre-programmed message to an EDACS or P25 Trunked site.
PHN	Used to place telephone calls through the radio by selecting the interconnect special call function.
DIS	Used to show the key ID and whether or not it is valid or available.
IND	Used to call an individual or make an all-call by selecting the individual call function.

7.3 KEYPAD LOCK/UNLOCK

1. Scroll through the menu until “KEY LOCK” is displayed.
2. Press **MENU**.

Press **MENU** and **OPTION** to unlock the keypad.

7.4 PRESET BUTTONS

Any button on the control head can be programmed as a preset button. When programmed as a preset button, press and hold that button for approximately three (3) seconds to store the following information to the function of that button:

- Currently selected Priority 1, Priority 2, and Priority 3 talk groups
- Currently selected talk group
- Scan state

After changing systems, groups, or scan state, simply press the preset button to restore these settings.

Presets are saved and restored to/from non-volatile memory. Changing control heads does not recall presets for the previous control head.

7.5 RADIO STATUS ICONS

Status icons are indicators that show the various operating characteristics of the radio.

Figure 7-3: Typical Display

Table 7-2: Icons and Descriptions

ICON	DESCRIPTION
	Indicates the EDACS system is in Failsoft™ mode (if enabled through programming).
	Indicates selected group or channel is in the scan list.
	Indicates selected group or channel is programmed as Priority 1 in scan list.
	Indicates selected group or channel is programmed as Priority 2 in scan list.
	Indicates scan mode enabled.
	Volume bars – indicate relative volume level.
	Indicates the current channel is set up as an analog channel.
	Indicates the current channel is set up as a ProVoice channel.
	Indicates the current channel is set up as a Project 25 (P25) channel.
	Indicates receiving or transmitting encrypted calls.
	Indicates a conventional channel enabled with Channel Guard Function.

7.6 MESSAGES

During radio operation, various messages are displayed on either line 1 or line 2. Typical messages include control channel status information, such as system busy or call denied, or messages associated with the radio's operation, (i.e., volume adjust). These messages are described as follows:

Table 7-3: Radio Messages

MESSAGE	NAME	DESCRIPTION
QUEUED	Call Queued	Indicates the system has placed the call in a request queue.
SYS BUSY	System Busy	Indicates the system is busy, no channels are currently available, the queue is full or an individual call is being attempted to a radio that is currently transmitting.
DENIED	Call Denied	Indicates the radio is not authorized to operate on the selected system.
CC SCAN	Control Channel Scan	Indicates the control channel is lost and the radio has entered the Control Channel Scan mode to search for the control channel.
WA SCAN	Wide Area Scan	Indicates the control channel is lost and the radio has entered the Wide Area Scan mode to search for a new system (if enabled through programming).
T99 ON	Type 99 Decode ON	Indicates the Type 99 Decode feature is enabled.
T99 OFF	Type 99 Decode OFF	Indicates the Type 99 Decode feature is disabled.
RXEMER	Receive Emergency	Indicates an emergency call is being received. This message is flashing on line 2.

MESSAGE	NAME	DESCRIPTION
TXEMER	Transmit Emergency	Indicates an emergency call has been transmitted. This message is flashing on line 2.
VOL=31	Volume Level	Indicates the current volume level. The volume level display ranges from OFF (silent) to 40 (loudest).
UNKNOWN	Caller's ID Not Received	Indicates that an individual call is being received, but the caller's ID was not received.
DATA T/R	Transmit/Receive Data	Indicates the radio is transmitting/receiving a data call.
DATA OFF	Data OFF	Indicates the radio is in the data disabled state. Displayed on line 1.
DATA ON	Data ON	Indicates the radio has been toggled to the data enable state. Displayed for two seconds on line 1 when toggled to enable state.
SYSC ON	System Scan Features ON	Indicates the System Scan features are enabled.
SYSC OFF	System Scan Features OFF	Indicates the System Scan features are disabled.
PA ON	Public Address ON	Indicates that the public address function of the radio is enabled.
PA OFF	Public Address OFF	Momentary (2 seconds) - indicates that public address function of the radio was disabled.
ALRM ON	External Alarm Enabled	Indicates that the external alarm function of the radio is enabled.
ALRM OFF	External Alarm Disabled	Momentary (2 seconds) - indicates that the external alarm function of the radio was disabled.
PVT DIS	Private Mode Disabled	Indicates that private mode is disabled or no encryption key has been programmed for the selected group/channel or special call.
FRCD PVT	Forced Private Operation	Indicates that forced private operation has been pre-programmed into radio.
NO KEY #	Encryption Key Missing	Flashing - indicates that no encryption key or an incorrect encryption key is programmed into the radio.
BCKL=1-6	Backlight	Indicates the display intensity and keypad backlight level.
GR	Group ID	Indicates that the call is a group call and is followed by the GID of the caller.
ID	Individual ID	Indicates the call is an individual call and the ID number of the caller, example "ID 2725."
WHC=1	Who Has Called	This display indicates the number from the *Who Has Called* list. Individual calls received but not responded to are stored in a *Who Has Called* list. This list is accessible by pressing the # key and then the INDV key after the Individual call has timed out or the Clear button is pressed. This display is on line 2 and the LID of the caller is displayed on the top line. Currently the list is not implemented and the display is always WHC=1.
PHONE	Phone Call	Displayed when a phone call is received from the site. It is displayed in line 1 of the display. Line 2 of the display contains the display *INDV* when line 1 contains this message. The radio interprets a received phone call as an individual call.
CONV FS	Conventional Failsoft	Displayed when a failure of the EDACS system occurs. All communication is in conventional mode.
MENU		Displayed when the menu key is pressed and remains displayed in line 1 until a menu item is selected.
SYS=1-64	System = 1 - 64	The system number for the current base station of the system displayed in line 1. It is displayed in line 2 of the display. Press the system key to obtain this display.
GRP=1-64	Group = 1 - 64	The group number of the group displayed in line 2 of display. It is displayed in line 1 of the display. Press the group key to obtain this display. There are up to 48 groups available (i.e., 3 banks of 16). The maximum number of groups programmed in a radio is determined by the personality.
INDV=1-99	Individual = 1 - 99	Indicates which item in the individual call list is being displayed. It is displayed in line 2 of the display. The name or ID of the item in the list is displayed in line 1 of the display.
PHN=1-99	Phone = 1 - 99	Indicates which item in the phone list is being displayed. It is displayed in line 2 of the display. Line 1 of the display is the last 3 characters of the list item contents.
SEL PHN	Select Phone	After pressing the PHN key, selecting an entry from the phone list by typing the entry number displays this message on Line 1.
SEL INDV	Select Individual ID	Displayed on line 1 when an entry from the individual ID list is selected after pressing the INDV key. The entry is a number between 1 and 32 inclusive.

MESSAGE	NAME	DESCRIPTION
SYS ALL	System All Call	Displayed on line 1 to indicate a system all-call has been received.
Ggg-v.vv	Code Group and Revision Number	This is code group and revision number that is displayed in line 2 when the menu item "REVISION" is selected. The 'gg' is the group number of the software. The first 'v' is the hardware version and 'vv' is the revision of the software.
PHONE	Phone Call	Displayed when an initiated phone call is in progress. This is displayed on line 2 of the display.
NO ENTRY		Indicates that there is no data stored in one of the programmable items in either the phone list or individual call list. The user programmable items are items 1 through 10 in each list.
INV SYS	Invalid System	Displayed when the current system is an invalid type.
CHN=1-99	Channel = 1 - 99	Displayed on line 1 of the display. This is a conventional channel index displayed when the group key is pressed.
FIX LIST	Fixed List	The Priority scan list is fixed and cannot be changed using the add or delete keys.
FIXED P1	Fixed Priority 1	The Priority 1 scan channel is fixed and cannot be changed using the add or delete keys.
EM	Emergency	Indicates an emergency has been declared by the LID that follows the display, "EM." An example of this is "EM 01201."
INDV	Individual Call	Displayed in line 2 of the display when an individual call is in progress.
GROUP	Group Call	Indicates a group call is in progress and is displayed on line 1 of the display.
SPKR ON	External Speaker ON	Displayed when the external speaker is enabled.
SPKR OFF	External Speaker OFF	Displayed when the external speaker is disabled.
BANK=1-8		The bank of keys that are going to be loaded when the keyloader loads encryption keys. This is only valid for radios that support VGS, VGE, or DES encryption. It is displayed on line 2 of the display when the encryption keyloader is connected.
REGR_0x	Dynamic Regroup	Indicates which group in the dynamic regroup operation has been enabled, where "x" is a digit of 1 to 8.
KEY LOAD		Displayed on line 1 of the display when the encryption keyloader is connected.
KEY ZERO		Displayed on line 2 of the display when the reset and option buttons are pressed simultaneously for approximately two seconds. The encryption keys are zeroed.
SYS KEY	System Key	Displayed on line 1 of the display in the display key mode of the menu. It is followed in the second line with a key number "KEY = <1..7>."
GRP KEY	Group Key	Displayed on line 1 of the display in the display key mode of the menu for trunked systems only. It is followed in the second line with a key number "KEY = <1..7>."
KEY=1-7		Displayed on line 2 of the display in the display key mode of the menu for conventional systems when the "SYS KEY" or "CHN KEY" is displayed in line 1 and for trunked systems when the "SYS KEY" or "GRP KEY" is displayed in line 1.
PRIMARY		Displayed on line 1 of the display when the primary keys are enabled.
PRS NAME	Personality Name	Displayed on line 1 of the display under the revision selection of the menu. The personality name is displayed on line 2 at the same time.
BND SCAN	Band Scan	**Only displayed if the P25T system is configured for "EnhancedCC" mode of operation.** When the radio cannot find a Control Channel in either the trunked frequency set or the list of discovered adjacencies, the radio is able to perform a full spectrum frequency scan to find a new Control Channel.
REGISTER		Displayed when the radio is performing a registration/affiliation on a P25 trunking site.

7.7 ALERT TONES

The XG-75M/M7300 series mobile radio provides audible alert tones to indicate the various operating conditions. These alert tones can be enabled or disabled through programming.

Table 7-4: Alert Tones

NAME	TONE	DESCRIPTION
Call Originate	One short mid-pitched tone	Sounds after the PTT button is pressed. Indicates the radio has been assigned a working channel.
Autokey	One mid-pitched tone	After being placed in a queue or releasing the PTT button prior to a working channel assignment, the site calls the radio when a channel becomes available. At this point, the radio automatically keys the transmitter (autokey) for a short period to hold the channel. The radio sounds a mid-pitched tone when it is clear to talk. Immediately press the PTT button to keep the assigned channel.
Call Queued	One high-pitched tone	Sounds after pressing the PTT button indicating the system has placed the call request in the queue. The receiving unit(s) also sound(s) the tone to indicate they will receive a call shortly.
System Busy	Three low-pitched tones	Sounds if the radio is keyed when the system is busy, if no channels are available for sending the message, if the call queue is full, or if an individual call is being attempted to a radio that is transmitting.
Call Denied	One low-pitched tone	Indicates the radio is not authorized on the system that has been selected.
Carrier Control Timer	Five short high-pitched tones followed by a long low-pitched tone	Sounds if the programmed time for continuous transmission is exceeded. The transmitter shuts down shortly after the alert, interrupting communications. Release and re-key the PTT button to maintain communications. This resets the carrier control timer and turns the transmitter back on.
Key Press Alert	A short tone	Indicates a key has been pressed. A short low-pitched tone indicates no action was taken because the key is not active in the current mode.
Page (P25T Only)	Three high-pitched tones	In P25 trunked mode, if the receiving radio accepts a page, both the receiving and transmitting radios emit three high-pitched tones.
Out of Range	One low pitched tone	Indicates the radio is in Wide Area Scan. The radio periodically beeps when in Wide Area Scan.

7.8 MENU


NOTE

To directly access a menu, press the corresponding button on the control head. For example, press the **SYS** button to enter the System select mode. Button configuration may vary depending on radio programming.

The order and specific number of menu items available is configurable through programming. Upon radio power up, the menu item at the beginning of the menu list is always displayed first. Subsequent access to the menu function returns the last menu item shown in the display. To enter the menu mode, press **MENU**.  and **CLR** are used during the selection process. The radio continues to receive and transmit normally while in the menu function.

A new item is displayed by using the  ramp control to scroll through the list in increasing and decreasing order. The displayed menu item is made active by pressing **MENU**.

After entering the menu, the following generic display format appears.

M E N U
Y Y Y Y Y Y Y Y

Line 1 indicates the radio is in the menu. Line 2 indicates the menu item (YYYYYYYY) that is to be viewed or changed (some menu items provide radio information and do not have changeable parameters).

An example of the menu item selection process and menu item parameter change is detailed below for the brightness menu item.

1. Press **MENU** to enter the menu mode.
2. Press the  ramp control until the display shows:

M E N U
BACKLGHT

3. Press **MENU.**
4. Use the  ramp control to increase or decrease backlight brightness. Once the desired setting is reached, press **MENU** to store the value and return to the normal display.
5. For menu items that display radio information, use  to scroll through a list of informational displays.

The menu items are listed in Table 7-5.

Table 7-5: Menu Item Information

FEATURE	DISPLAY	PARAMETER SETTINGS	COMMENT
Backlight Adjust	Menu Item: **BACKLGHT**		Sets the backlight level.
Radio Revision Information	Menu item: **REVISION**	Informational displays only; no user selectable settings.	Selects the information display to view.
Phone Call	Menu item: **PHONE**		Allows access to the Phone Call Feature.
Individual Call	Menu Item: **INDV**		Allows access to the Individual Call Feature.
External Alarm	Menu Item: **EXTALARM**	ON, OFF	EXTALARM replaces the system name on the display as long as the external alarm feature is enabled.
Public Address	Menu item: **PUB ADDR**	ON, OFF	Public Address is toggled ON and OFF.
External Speaker	Menu item: **EXT SPKR**	ON, OFF	External Speaker is toggled ON and OFF.
Encryption Key Loading	Menu item: **KEYLOAD**	Up to 8 banks of 7 keys	Enables the radio to accept the loading of encryption keys.
Display Current Encryption Key(s)	Menu item: **DISP KEY**		Displays current encryption key number.
Scan	Menu item: **SCAN**	ON, OFF	Toggles scan function ON or OFF.
Private Mode	Menu Item: **PRIVATE**	ON, OFF	Toggles private function ON or OFF.
Scan Add	Menu item: **SCAN ADD**	III, II, I	Adds group or channel to scan list.
Scan Delete	Menu item: **SCAN DEL**		Deletes group or channel from scan list.
Scan Add/Delete	Menu item: **SCAN A/D**	Toggle sequence III, II, I	Changes present group or channel to next scan choice in scan list.
Last Scanned Channel Recall	Menu Item: **SCAN ADD**		Changes the selected channel to the last scanned channel.
Home group or channel selection	Menu item: **HOME**		Changes to the group or channel defined for Home function.
System select	Menu item: **SYS**		Displays the system selected.

FEATURE	DISPLAY	PARAMETER SETTINGS	COMMENT
System and group selection	Menu item: **S/G 1 – S/G 16**		Changes to the System & Group/Channel programmed for SYSGRP 1-16.
Mute	Menu item: **MUTE**	ON, OFF	Toggles the mute function ON or OFF to control the audio output from the selected radio.
No Data	Menu item: **NO DATA**	ON, OFF	Toggles data feature ON or OFF.
EDACS Conventional Priority 1 Scan	Menu item: **ECP1 SCN**	ON, OFF	Toggles this feature ON or OFF.
Group selection	Menu item: **GRP**		Displays the group selected.
Status Condition	Menu item: **STATUS**	0-9 = (n)umber of pre-programmed status	Transmits the pre-programmed status message.
Message Condition	Menu item: **MESSAGE**	0-9 = (n)umber of pre-programmed messages	Transmits the pre-programmed message.
Feature Encryption Display	Menu Item: **FEATURES**	Informational displays only; no user selectable settings	Indicates current features programmed into the radio as well as certain information required to add features to the radio.
System Scan Enable	Menu Item: **SYS SCAN**	ON, OFF	System Scan features like ProScan are toggled ON and OFF.
Talkaround feature	Menu item: **TALK**	ON, OFF	Toggles Talkaround ON or OFF (transmit frequency changed to receive frequency).
Type 99 Decode Enable	Menu Item: **T99 EN**	ON, OFF	Type 99 Decode is toggled ON and OFF.
Display GPS information	Menu Item: **GPS**	Informational displays only; no user selectable settings	Displays GPS Status (On/Off), Latitude, Longitude, Speed/Direction, and time. See Section 7.38.
Select Mixed System/Zone	Menu Item: **ZONE**		Select a Mixed System Zone. See Section 7.19.
Display Caller ID	Menu Item: **CALL ID**	Informational displays only; no user selectable settings	Displays the Radio IDs or alias names for the last 10 received calls. See Section 7.20.
View/Modify Custom Scan List	Menu Item: **CUSTSCAN**		Allows you to view and edit a Custom Scan list. See Section 7.23.7 for more information.

7.9 FEATURE ENCRYPTION DISPLAY

Feature Encryption Display is available through the menu function and, if programmed, appears in the menu as "**FEATURES**." This data indicates current features programmed into the radio as well as information required to add features to the radio.

Once the feature has been accessed, all normal menu functions work. The user can scroll up or down through all of the entries.

Feature Encryption Display provides the ability to view, in the order displayed, the following:

- Serial number ROM data - serial number of the ROM
- Feature encryption data stream - used to enable features
- Number Fields - defines limits
- Features enabled - displays bit fields of enabled features

7.9.1 Serial Number ROM (12 Hex Digits)

Example:

To enable a feature in a radio, call L3Harris and provide them with the ROM serial number. The serial number shown here is for example only.

7.9.2 Feature Encryption Data Stream

Example:

These data streams define the features the user has enabled in his radio and are required by L3Harris to enable other features. The data streams shown here are for example only. There are three displays: FD1, FD2, and FD3. All three are required.

Number Fields

Example:

These number fields show the set limits of the user's radio as:

- SG# XXX - Maximum number of system/groups combination available
- SY# XXX - Maximum trunked system limit
- CH# XXX - Maximum number of conventional channels available

The user needs to know the limits of the radio before attempting to enable other features. The numbers shown here are for example only.

7.9.3 Features Enabled

These numbers indicate which features are enabled.

Example:

Table 7-6 lists possible features available in the user's radio.

Table 7-6: Available Feature Numbers

FEATURE NUMBER	POSSIBLE FEATURES	STANDARD OR OPTIONAL
01	Conventional Priority Scan	Standard
04	Group Scan (EDACS and P25 Trunked)	Standard
05	Priority System Scan (EDACS and P25 Trunked)	Optional
06	WAscan/ProScan (EDACS and P25 Trunked)	Optional
07	Dynamic Regroup	Standard
08	EDACS Emergency	Standard
09	Type 99 Encode	Standard
10	Conventional Emergency	Standard
14	DES Encryption	Optional
16	Mobile Data	Optional
17	Status/Message (EDACS and P25 Trunked)	Optional
21	EDACS Security Key (ESK)	Optional
22	ProFile™ (EDACS and P25 Trunked)	Optional
23	Narrowband	Standard
29	ProVoice™	Optional
32	FIPS-140-2	Optional
33	P25 Common Air Interface	Optional
34	Direct Frequency Entry	Optional
38	Radio TextLink	Optional

7.10 VOICE ANNUNCIATION

When enabled via programming, the Voice Annunciation feature provides audible feedback for various radio operations. The radio can be programmed to play an audio message for any or all of the following. This message can be a pre-recorded (canned) message or a user-recorded message.

- Channel changes
- System changes
- Encryption On/Off
- Noise Cancellation On/Off
- Scan On/Off
- Talkaround On/Off

For more information on configuring the radio for Voice Annunciation, refer to the Voice Annunciation Feature manual 14221-7200-6110.

7.11 SYSTEM/GROUP/CHANNEL SELECTION

The XG-75M/M7300 **SYSTEM/GROUP/CHANNEL** knob and the  ramp control are programmable for maximum flexibility. If the SYSTEM/GROUP/CHANNEL knob is assigned to select groups or channels, then the  ramp control is assigned to select systems. If the SYSTEM/GROUP/CHANNEL knob is assigned to select systems, then the  ramp control is assigned to select groups or channels. System, group, and channel selection is the primary function for these controls.

Systems or groups can also be selected by pressing **SYS** or **GRP** and using the  ramp control to scroll through the available options.

7.11.1 System Selection

Several methods, some of which depend on programming, can be used to select a new system. These procedures are presumed to be starting from the normal receive display.

METHOD 1: If system selection is programmed to the SYSTEM/GROUP/CHANNEL knob, select a system by turning the SYSTEM/GROUP/CHANNEL knob to the desired system position. The display registers the new system name on line 1. If the wrap option is OFF and the knob is moved to a position greater than the number of programmed systems, the highest programmed system remains selected.

METHOD 2: If system selection is programmed as the primary function of the  ramp control, select a system by pressing up or down to scroll through the system list. The display registers the new system name on line 1.

METHOD 3: Press **SYS** to enter the system select mode and use the  ramp control to scroll through the systems.

7.11.2 Group and Channel Selection

Several methods, some of which depend on programming, can be used to select a new group or channel. These procedures assume starting from the normal receive display.

METHOD 1: If group selection is programmed to the SYSTEM/GROUP/CHANNEL knob, select a group by turning the SYSTEM/GROUP/CHANNEL knob to the desired group. The display registers the new group name on line 2. If the wrap option is OFF and the knob is moved to a position greater than the number of programmed groups, the highest programmed group remains selected.

METHOD 2: If group selection is programmed as the primary function of the  ramp control, select a group by pressing up or down, to scroll through the group list. The display registers the new group name on line 2.

METHOD 3: Press **GRP** to enter the group select mode and use the  ramp control to scroll through different groups.

METHOD 4: Press the key programmed for Channel Entry (must be programmed to a button using RPM R10B or later). Enter the channel number. Entering a number greater than the maximum number of entries will select the last channel. Channel changes made with the knob are made with respect to the manually entered channel.

7.12 LAST SYSTEM/GROUP/CHANNEL RECALL

This feature, enabled through programming, allows the user to recall the last selected system/group after an emergency or home function or system/group key function. For example, if the Home button (pre-programmed) is pressed, the radio goes to the designated Home system/group or channel. If the Home button is pressed again, the radio returns to the previous system/group or channel. At this time, the user can toggle between the Home system/group or channel and the previous system/group or channel. The operation is the same for the SG1-SG16 buttons.

7.13 ENCRYPTION

The XG-75M/M7300 mobile radio supports AES and DES encryption. When operating on a group or channel programmed for encryption, all transmissions are private and the radio receives clear and private signals.  is displayed when encryption is enabled. If the selected group or channel is programmed for auto-select capability, the mode may be toggled between encrypted and unencrypted by pressing the **MENU** key, and then selecting the **PRIVATE** menu option. Radios programmed for forced encryption do not allow a change of the transmit mode.

7.13.1 Displaying the Currently Used Cryptographic Key Number

To display the cryptographic key currently in use for either the system encryption key (for special call such as individual, phone, all, agency or fleet) or the group/channel key (for group or conventional calls), perform the following procedure (Not Available on Conventional radios):

1. Press the **MENU** button.
2. Use  to select **DISP KEY**. Then press the **MENU** button.
3. Then use  to toggle between displaying the system key or the group/channel key.

Table 7-7: Current Cryptographic Key Display

ENCRYPTION KEY DISPLAYED	MESSAGE DISPLAYED
System	"SYS KEY" "KEY = 1"
Group/Channel	"GRP KEY"/"CHN KEY" "KEY = 2"/KEY = 2"

7.13.2 Key Zero

All cryptographic keys can be zeroized (erased from radio memory) by pressing and holding the **CLR/CLEAR** button, and while still pressing this button, press and hold the **OPT/OPTION** button. Press both buttons for 2 seconds. A series of warning beeps begins at the start of this 2-second period and then switches to a solid tone after the keys have been zeroized. The display indicates **KEY ZERO**.

If the cryptographic key(s) are zeroized, one or more keys must be transferred from the Key Loader into the radio before private communications can continue. Refer to Key Manager TQS3416 Administration and Software Release Notes for further information.

7.13.3 Receive an Encrypted Call

When receiving, the radio automatically switches between clear or encrypted operation. If the transmission being received is an encrypted transmission, it is decrypted, the receiver unsquelches, and the message is heard in the speaker. The selected group or channel must be programmed for encryption and the correct cryptographic key must be loaded into the radio for this to occur.

7.13.4 Transmit an Encrypted Call

1. Select the desired group or channel.
2. Enable encryption by pressing the **MENU** button and then selecting the **PRIVATE** menu option, or press the button on the control head that has been programmed for **PRIVATE**.
    - If the last state of the radio was encryption enabled, then encryption is enabled on power up. In addition, encryption is enabled if forced operation has been programmed in the radio
    - If a group or channel is not programmed for encryption, **PVT DIS** is displayed if an attempt is made to enable encryption. It is not possible to operate on this group/channel in encrypted mode.
    - If the radio is programmed for forced encryption mode, **FRCD PVT** is displayed if an attempt is made to disable encryption. It is not possible to transmit on this group/channel in clear mode.
    - If the radio does not have the correct encryption key loaded, **NO KEY #** is displayed and the call does not transmit.
3. Continue with standard transmission procedures. An access tone is heard when the PTT button is pressed.

7.13.5 Emergencies on Encrypted Group

The radio can be programmed to allow emergency calls to be transmitted in the clear when the radio does not have the key, or has an invalid key for the encrypted group in emergency.

7.14 MACRO KEY OPERATION

Macro key operation permits the user to accomplish a series of keystrokes with a single "macro" keystroke. Up to ten (10) macro keys can be defined, each capable of executing up to twenty (20) keystrokes, to any pushbutton input (i.e., keypad keys, buttons, etc.). Each macro key can be pre-programmed to activate when pressed or when released. A macro key can also be pre-programmed to change the keystroke sequence the next time the macro key is activated. For detail operation and assignment of macro keys, contact your system administrator.

7.15 RECEIVE A CALL

1. Turn the radio on by rotating the POWER ON-OFF/VOLUME knob clockwise (out of detent). A short alert signal (if enabled through programming) indicates the radio is ready to use.
2. The display shows the last selected or the power up (depending on programming) system and group/channel names. If the radio is unable to obtain a control channel, line 2 shows **CC SCAN**.
3. Adjust the volume to the desired level.
4. Select the desired system and group/channel.
5. The radio is now ready to receive calls.
6. When the radio receives a call, it unmutes on the assigned working channel and the **BSY** indicator comes on. Line 1 shows **GR** followed by the logical ID number (if received) of the unit sending the message, or the associated name if the ID number is found in the individual call list.

7.16 TRANSMIT A CALL

1. Turn the radio on and set the POWER ON-OFF/VOLUME knob to the desired volume level. Select the desired system and group/channel.
2. Ensure that conventional channels are not busy by pressing the **CLR** button to briefly disable any channel decoding and unmute the receiver, or observe the unlit **BSY** indicator. If the Channel Busy Lockout feature is programmed for the selected channel, the radio does not transmit when the channel is busy.
3. Press and hold the PTT button.
4. When the working channel is assigned, **TX** and **BSY** indicators are turned ON and a short beep is sounded indicating communication can begin.


NOTE

If two or more tones, or a high-pitched tone, are heard the system may be busy and the call request has been placed in queue or the request has been denied for some reason. Refer to the Section 7.7 for more details.

5. Hold the microphone approximately 2 inches from the mouth and speak in a normal voice.
6. Release the PTT button when the transmission is complete and listen for a reply.

7.17 CONVENTIONAL FAILSOFT (EDACS)

In the unlikely event of an EDACS system failure, communications can take place in conventional failsoft mode. The radio is automatically directed to a communications channel set up for this purpose. During this mode of operation, the control unit displays **CONV FS** in the alphanumeric display. An increase in activity on the channel during conventional failsoft operation may be noticed, so be careful not to transmit until the channel is clear.

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

NOTE

Emergency and Special Call are not operational during conventional failsoft. In addition, the **GRP** control does not operate.

7.18 EMERGENCY OPERATION

The radio's emergency behavior varies depending on programming. When an emergency is declared, scanning stops and only restarts after the emergency is cleared.

7.18.1 Receive an Emergency Call

When receiving an emergency call from the selected group and system, an alert beep sounds and the **BSY** indicator illuminates. The message ***RXEMER*** flashes in the display on line 2 until the emergency condition is cleared. Follow standard emergency procedures.

7.18.2 Declare an Emergency

To send an emergency call to the selected system and group (or on an optionally pre-programmed emergency group), proceed as follows:

1. Press and hold the red emergency button for approximately one second. (This time is programmable and could be longer or shorter. Check with the system administrator.) The radio transmits an emergency call request with the radio ID until an emergency channel assignment is received.
2. When the working channel assignment is received, the radio sounds a single beep (Autokey alert tone) indicating it is ready for voice transmission. *TXEMER* flashes on line 2 in the display until the emergency is cleared.
3. Press PTT and speak into the microphone in a normal voice.
4. Release PTT when the transmission is complete and listen for a reply.
5. The emergency can be cleared by pressing and holding the **CLR** button followed by pressing the red emergency button then releasing both buttons.

7.19 MIXED SYSTEM ZONES

A Zone is a grouping of analog conventional channels, P25 conventional channels, and/or P25T or P25C talkgroups. Mixed System Zones are defined in RPM and can be comprised of any combination of channels/groups from multiple systems as long as the system definitions share the same WACN/System ID. If a Mixed System Zone is not configured in RPM, it will not appear on the radio. Up to 50 Mixed System Zones can be defined.

To select a Mixed System Zone:

1. Press **MENU**.
2. Scroll through menu and select **ZONE**.
3. Select the desired Mixed System Zone.

Alternately, the System/Group/Channel knob or a button on the radio can be programmed to scroll through available Mixed System Zones.

When scan is enabled on a system in a Mixed System Zone, the radio continues to display the zone name or system name per the current radio mode (system/zone). When toggling scan ON/OFF, there is no change to the first line of the radio display. If it is showing system name, it continues to show system name; if it is showing zone name, it continues to show the zone name during scanning.

7.20 CALLER ID

This feature allows you to view the caller ID or alias for up to the last 10 received calls. Received calls include Group, Announcement, Phone, Patch, SimulSelect, Agency, Fleet, and MDC.

1. Press **MENU** and scroll through menu to select **CALL ID.** Alternately, a button can be programmed to access the **CALL ID** list.
2. Scroll through available entries. The most recent call is displayed at the top of the list. “NO ENTRY” is displayed if there are no entries.
3. Caller ID or “NO ENTRY” is displayed for 10 seconds. Press the Clear button to exit the Caller ID list.

The Caller ID list is cleared when power is cycled on the radio.

7.21 STEALTH MODE

Press the button programmed for Stealth Mode operation to toggle Stealth Mode on or off. During Stealth Mode, all buttons are disabled except PTT, the button programmed for Stealth operation, Emergency, and Nuisance delete. The radio will receive and transmit when Stealth Mode is enabled.

The radio can be configured to disable any or all of the following during Stealth Mode:

- LCD display
- LED
- Backlight
- Side/alert tones

Stealth Mode can be configured to persist through a power cycle.

7.22 SYSTEM SCAN OPERATION (EDACS AND P25 TRUNKED)

The radio can be programmed with the following System Scan features. These features are automatically enabled upon radio power up. A key or menu option is also defined to allow the System Scan features to be toggled during radio operation. This is covered in the Menu Selection and Pre-Programmed Keypad Key sections. The System Scan state is maintained through system changes but defaults to ON at power up.

7.22.1 Wide Area System Scan (WA Scan)

The XG-75M/M7300 Series mobile radio can be programmed for Wide Area System Scan operation for multi-site applications. Upon the loss of the currently selected system's control channel, radios can be programmed to automatically scan the control channels of other systems. If a new control channel is found, the radio switches to the new system and sounds an alert tone. The amount of time before the radio enters Control Channel Scan after losing the control channel is configurable in RPM.

7.22.2 ProScan™

The radio can be programmed for ProScan™ system scan operation for multi-site applications depending on the version of radio flash code. ProScan provides the radio with the ability to select a new system for the radio to communicate on, when the selected system drops below a predefined level. This is accomplished by enabling each radio to analyze the signal quality of its current control channel and compare it with the signal quality of the control channel for each site in its adjacency scan list. The signal quality metric used for the ProScan algorithm is based on a combination of both Received Signal Strength Indicator [RSSI] and Control Channel Verification [CCV] measurements. When the selected system's signal quality level degrades below a pre-programmed level, the radio begins to look for a better control channel. Once a control channel that exceeds the pre-programmed parameters is found, the radio changes to the new system and emits a tone. If the control channel is completely lost, the radio enters Wide Area System Scanning and searches the programmed adjacent systems until a suitable control channel is found.

7.22.3 Priority System Scan

The radio can also be programmed for Priority System Scan. (To ensure that this feature operates correctly, the control channel of the priority system must be located on channel one unless you are using the ProScan algorithm.) The priority system is the desired or preferred system. While receiving the control channel of the selected system, the radio periodically leaves the selected system and searches for the control channel of the priority system at a programmable rate. The programmable rate is defined by the value in the Priority Scan Time control, unless the ProScan algorithm is enabled as explained below. This priority scan timer is reset each time the PTT button is pressed or when a call is received. If the priority system control channel is found, or meets the predefined ProScan criteria, the radio automatically switches to the priority system.

7.22.4 When Wide Area System Scan is Enabled

If the radio cannot find the control channel of the selected system and begins Wide Area System Scan, the radio only scans for the priority system control channel if the priority system is in the WA Scan list.

7.22.5 When ProScan Is Enabled

The radio monitors the priority system and switches to the priority system if the priority system meets the criteria defined in the “ProScan Options” dialog box. If ProScan is enabled, the rate at which the radio scans for the priority system is defined by the System Sample Time control.

7.22.6 Menu Selection

Press **MENU** and then use the  ramp control to scroll through the selections until **SYS SCAN** is displayed. Then press **MENU** to toggle the System Scan state. The **SYSC ON** or **SYSC OFF** display message is displayed for two seconds to show the new state.

7.22.7 Pre-Programmed Keypad Key

Press the pre-programmed key and the **SYSC ON** or **SYSC OFF** display message is displayed for two seconds to show the new state.

7.23 SCAN OPERATION

Only groups or channels that are part of the radio's scan list are scanned. Groups/channels are added to the scan list on a per system basis through programming, the radio keypad, or both, dependent upon programming. This scan list can be changed by the user from the keypad, unless programmed otherwise. Each system's scan list is retained in memory when the radio is turned off. The XG-75M/M7300 Series mobile radio can also be programmed to provide Trunked Priority Group Scan capability, which operates similar to priority scan in Conventional mode.

The following is a description of programmable scan features that should be helpful in understanding the scan operation of the radio:

Scan Hang Time - the delay time the radio waits before resuming scan after the push-to-talk is released or after the carrier has dropped a channel. This can be set to different values for trunked groups and conventional channels.

TX Select - the group the radio transmits on while scanning. The radio is programmed to transmit on either the scanned group or the selected group.

Scan List (privileges) - this feature allows or prohibits scan list changes by the user.

P1 Programming - priority group programming is accomplished by one (and only one) of three methods:

- From the keypad, where the Priority programming is not fixed and does not follow the selected channel.
- Priority 1 group programming follows the selected channel.
- Priority 1 group programming is fixed during PC programming and cannot be changed by the user.

P1 Always Scan - determines if the Priority 1 Group is always scanned, regardless of the scan state set by the user.

7.23.1 Add Groups or Channels to a Scan List

1. With scan operation turned off, select the desired group channel to add to the selected scan list.

2. Press (+) or (-) with  to display the current priority status of the group on line 1 for a time-out period.

3. While the status is displayed, press (**+**) with  to add the group/channel to the scan list.  is displayed.

4. Press (+) with  a second time to set the group/channel to Priority 2.  is displayed.

5. Press (**+**) with  a third time to set the group/channel to Priority 1.  is displayed in column 1, line 1.

The priority level selection sequence only advances the group to the next higher priority level and stops at priority level 1. To select a lower priority level, the group/channel must be deleted from the scan list and then added back to the scan list. Each new group/channel added to the scan list starts at the lowest priority. If the Priority 1 and Priority 2 group/channel are already set and a new group/channel is assigned as Priority 1 or Priority 2, the previously assigned group/channel changes to non-priority scanning.

7.23.2 Delete Groups or Channels from a Scan List

1. With scan operation turned off, select the desired group/channel to delete from the selected scan list.

2. Press (+) or (-) with  . The current scan status of the group/channel is displayed for a time-out period.

3. Press (**-**) with  to delete the group from the scan list.  ,  or  turns off. Any group/channel that is not in a scan list shows a "**blank**" when it is the selected group/channel.

7.23.3 Nuisance Delete

A group/channel can also be deleted from the scan list, if it is not the currently selected group/channel. pressing (-) with  during scan operation while the radio is displaying the unwanted group/channel. The group/channel is deleted from the scan list in the same manner as if using the steps above. Deletions performed in this manner do not remain deleted if the radio is turned off and back on or the system is changed.


NOTE

Press (**-**) once to nuisance delete a conventional channel; press (**-**) twice to nuisance delete a trunked talkgroup.

7.23.4 Turn Scan On

1. Toggle scan operation by pressing **SCAN**. The SCAN indicator turns on when the radio is scanning.


NOTE

Scanning stops while the microphone is off-hook if the hookswitch feature is enabled through programming.

2. When a group on the scan list receives a channel assignment, the radio unmutes on the assigned channel, the **BSY** indicator comes on and the received scan group is displayed.
   - The radio continues scanning if a new group/channel is selected when scan is on.
   - Pressing the PTT button when scan is on causes the radio to transmit on the displayed group/channel or on the currently selected group depending on programming.
   - Pressing up with  when scan is on causes the radio to recall the scanned group/channel that was last received. This group/channel is recalled for a period equal to the scan hang time.

7.23.5 Priority Group/Channel Scanning

When scan is enabled and the Priority 1 and Priority 2 groups/channels have been identified, the radio listens to calls on those groups/channels and the selected group/channel. While receiving a scanned call, the radio continues to monitor the selected Priority 1 and Priority 2 group/channel and drops the call if the selected group/channel or other higher priority call becomes active. During a Priority 2 call, the radio continues to monitor for a Priority 1 group call.

The radio monitors for Agency and Fleet calls that correspond to the Agency and Fleet associated with the Priority 1 and Priority 2 groups. Priority Agency and Fleet calls are indicated by displaying **AGENCY** or **FLEET** on the System line of the display and associated Priority 1 or 2 group on the Group line of the display.

7.23.6 Turn Scan Off

Turn scan operation off by pressing **SCAN**. The radio resumes operation on the selected group/channel.

7.23.7 Mixed Zone Scan


NOTE

The radio does not listen to trunked groups while actively listening to a Conventional call.

The Mixed Zone Scan (MZS) feature gives the user the capability to scan based on a custom scan list that is assigned at the system level. The Custom Scan (CS) list can contain System and Channel/Group configurations across P25 Trunk, P25 Conventional, and Analog Systems. When a Custom Scan List is defined on a P25T system, the radio can scan P25T, P25C, and Analog systems. When defined on a P25C or Analog system, the radio only scans conventional channels. MZS also gives the user the capability to scan beyond the selected system group set.

- P25T Scan

  When a custom scan list is assigned to a P25T system, the user has the ability to scan P25T, P25C, and Analog groups/channels. All P25T systems must have the same WACN, System ID, and Unit ID to be added to the custom scan list.

- P25C and Analog Scan

  When a custom scan lists is assigned to a P25C or Analog System, the user has the ability to scan P25C and Analog channels. P25T systems are ignored.

7.23.7.1 Custom Scan List Selection

The Custom Scan List is assigned at the System level. Scanning protocols (Custom Scan, System Scan, and Conventional Priority Scan) are mutually exclusive. Once a custom scan list is assigned to a system, when you enable scan, you are scanning the channel/groups defined in the custom scan list. A Custom Scan List can be assigned to a system through RPM only. The radio supports up to 10 Custom Scan lists, with up to 50 channels/groups in each.

7.23.7.2 View Custom Scan Lists

NOTE

Scan must be off to view a Custom Scan List.

1. Press the button programmed for Custom Scan or select **CUSTSCAN** from the radio menu.
2. Press up or down using  to view the channels/groups assigned to the custom scan list.
3. Press **MENU** when the desired group/channel is displayed. Press up or down using  to view options available for each channel/group.
   - View the channel's/group's scan priority.
   - Delete the channel/group from the scan list.
   - Nuisance delete or Restore the channel/group.
4. Press the **OPTION/OPT** button to back up one display; press the **CLEAR/CLR** button to return to the home screen.

7.23.7.3 Edit Custom Scan Lists

NOTE

Scan must be off to edit a Custom Scan List.

1. Press the button programmed for Custom Scan or select **CUSTSCAN** from the radio menu.
2. Press up or down using  until EDIT LST is displayed and press **MENU**.
3. Press up or down using  to select the desired system list from the list and press **MENU**.
4. Press up or down using  until the desired channel/group is displayed and press **MENU**.
5. Press up or down using  until the desired priority level is displayed and press **MENU**.
6. Repeat steps 4 and 5 until all desired channels/groups are added.
7. Press the **OPTION/OPT** button to back up one display; press the **CLEAR/CLR** button to return to the home screen.

7.24 INDIVIDUAL CALLS (EDACS AND P25 MODES)

7.24.1 Receive and Respond to an Individual Call

When the radio receives an individual call, it unmutes on the assigned working channel and turns on the **BSY** indicator. Line 1 shows “ID” followed by the logical ID number of the radio sending the message, or the associated name if the ID number is found in the individual call list. The individual call indicator displays ***INDV*** on line 2. The radio can be programmed to ring when an individual call is received. If enabled, the ring begins five seconds after the caller unkeys and continues until the PTT button, the **CLR** button, or **IND** is pressed.

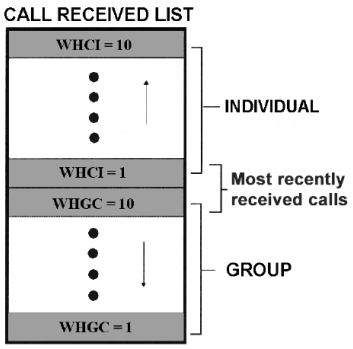
NOTE

Hookswitch functions the same as **CLR** key in I-CALL, phone call, and menu modes.

If a response is made to the call prior to the programmed call-back time-out, the call is directed to the originating unit. If a response is not made before the call-back time-out, the radio returns to normal receive mode, but *** WHC *** is displayed. If the caller's ID is not received, **UNKNOWN** displays for the duration of the call and there is no call-back hang time.

To respond after the call-back time-out, press the **IND** key. The radio's display shows the callers ID on the first line and **WHCI=1** on the second line. Pressing the PTT button at this point initiates an individual call back to the original caller. (If the last call was a group call, the display shows **WHCG=1**. Pressing the PTT button places the call as an individual call.)

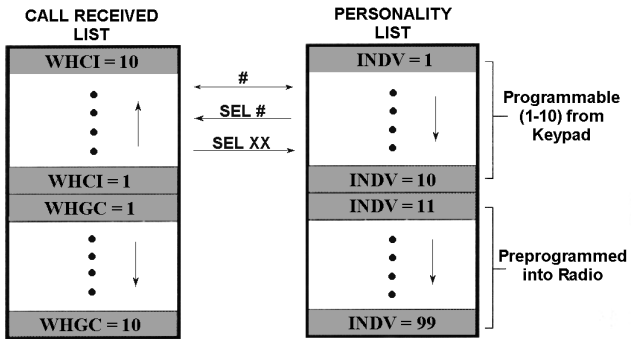
The radio stores the IDs of the last 10 callers in the Calls Received List as shown. Individual calls are stored in the top half of the list (1-10) and group calls are stored in the bottom half of the list (1-10). The most recent call is stored in position 1, the second most recent call is stored in position 2, etc.



To access the list, press the **IND** key twice. Use  to scroll through the list. Press the **MENU** key to display the time elapsed since the call was received.

7.24.2 Call Storage Lists

There are two lists available for call storage in the radio; the calls received list (1-10) and the personality list (1-99 as defined by the user). When the individual call mode is entered by pressing **IND**, the calls received list is available. The user can toggle to the personality list by selecting any key other than **DIS** or toggle between the two lists by pressing the **IND** key. If wrap is enabled, the calls received list wraps on itself and not into the other list.



The saved call list shows all ten storage locations. If no calls have been received, the saved call list is empty and the pre-stored list is available upon entering the individual call mode.

When in the saved call list, pressing **MENU** toggles the time stamp ON and OFF. The time stamp indicates how long ago the call was received. The display indicates this information as HH:MM:SS where HH = hours, MM = minutes, and SS = seconds.

When in the pre-stored list, pressing **MENU** toggles the logical identification (LID) ON and OFF.

7.24.3 Send an Individual Call

The following procedures describe how to initiate and complete an individual call:

1. To select a previously stored individual, select the I-Call mode from the menu or press **IND** followed by the ramp control to scroll through the list of stored individuals. While in the individual call list, the **MENU** key toggles the display between the call name and the unit ID number. If the individual is not stored in this list but the individual's unit ID is known, it can be entered directly from the keypad.
2. Press the PTT button. The radio performs the necessary signaling to obtain a communication channel. When the signaling is complete and the radio is clear to transmit, the **TX** indicator turns ON and the channel access tone sounds. Line 1 shows the called individual's name if found in the list of stored individuals or ID followed by the logical ID number of the unit being called. The message ***INDV*** displays on line 2. Proceed with the message.

7.25 SCAT™ OPERATION

A SCAT (Single Channel Autonomous Trunking) System operates with the same set of features as a standard EDACS system. The only significant user change relates to the **BSY** indicator. Since only one channel, operating as both control and working channel, exists in a SCAT System, the **BSY** indicator is ON when the SCAT channel is in the working channel mode. When the transmission on the channel is completed, the indicator turns OFF and indicates the return of SCAT control channel signaling.

7.26 TELEPHONE INTERCONNECT CALLS (EDACS AND P25)

7.26.1 Receive a Telephone Interconnect Call

Receiving a telephone interconnect call is identical to receiving an individual call. See the DTMF Overdial Operation section if access to services requiring "over-dial" is needed. Overdial operations are available for any special call whether it is an individual call or a telephone interconnect call.

7.26.2 Send a Telephone Interconnect Call

Use the following procedures to initiate and complete a Telephone Interconnect call:

1. To select a previously stored phone number, select phone call mode from the menu, press **PHN** and use the  ramp control to scroll through the list of stored phone numbers. While in the phone call list, the **MENU** key toggles the display between the phone call name and the phone call number. If the phone number is not stored in this list but the phone number is known, it can be entered directly from the keypad. If necessary, a pause can be entered by pressing and holding **0**-**9**, **(*)**, or **(#)** until an underscore appears in the display.
2. Press and release the PTT button; the radio performs the necessary signaling to obtain a communication channel. When the signaling is complete and the radio is clear to transmit, the **TX** indicator turns on and the channel access tone sounds. Line 1 shows the accompanying name if selected from the list of stored numbers or the phone number if entered directly. The message ***PHONE*** is displayed on line 2. The radio then automatically transmits the programmed number stored in the special call queue.
3. Telephone ringing is heard. When someone answers the phone, press the PTT button and speak into the microphone. Release the PTT button to listen to the caller. Unsuccessful interconnect signaling returns the radio to the normal receive mode and the number remains displayed until the special call is cleared by pressing the **CLR** button or the time-out expires or another group or system is selected.
4. To terminate the call, momentarily press the **CLR** button.


NOTE

The XG-75M/M7300 Series mobile radio is capable of half-duplex conversation only. The caller's message can only be sent if the PTT button is pressed (the radio is transmitting) and the caller can only be heard by the person being called when the PTT is released (the radio is receiving).

7.26.3 DTMF Overdial/Conventional Mode Telephone Interconnect

Once the radio has established a connection to the public telephone system, it may be necessary to "over-dial" more digits to access banking services, answering machines, credit card calls, or other types of systems that require DTMF (Dual-Tone Multi-Frequency) access digits. Overdial operation can also be used to initiate a telephone interconnect call via DTMF signaling if a dial tone has already been accessed on the system. This is the method that is used for making a telephone interconnect call while operating in the conventional mode but also functions in trunked mode if a dial tone is directly accessible. Telephone numbers and other number sequences for overdialing can be stored in the phone list when programming the radio or stored by the operator in the first ten phone list entries. These numbers are accessed by pressing **PHN**.

The following steps are required to dial these numbers:

1. Follow the procedure in Section 7.26.2 to establish a connection to the telephone system or consult the system administrator for the procedure to access a dial tone on the trunked or conventional system.
2. Overdial numbers are transmitted using either method as follows:

   METHOD 1: Press and hold PTT while entering the overdial number sequence from the keypad. This method sends DTMF tones during individual, telephone interconnect, trunked group, or conventional channel calls. Anytime the PTT button is pressed and held, the keypad is enabled for DTMF entry.

METHOD 2: Press **PHN** to access a stored number from the phone list or to directly enter the overdial digits. Press PTT to send the overdial sequence once. If the number needs to be transmitted again it must be selected or entered again (this prevents unwanted numbers from being sent the next time the PTT button is pressed during the call).

This overdial select/entry mode remains active until the call is dropped, cleared, or **MENU** is pressed. The overdial select/entry mode can be re-entered if the call is still active by pressing **PHN**.

7.26.4 Programmable Entries

Individual call ID numbers, telephone numbers and other number sequences for overdialing are stored in the special call lists when programming the radio. The first ten entry locations of these lists can be changed by the radio operator. The keypad is used when adding, changing, and storing numbers in these entry locations.

Use the following procedure to store a number in one of the first ten entries of a special call list:

1. Press **IND** or **PHN** to enter the individual call list or the phone call list.
2. Scroll through the list using the  ramp control until one of the first ten (10) entries is reached. **NO ENTRY** is displayed if the location is empty.
3. Enter the desired number. If necessary, a pause can be entered by pressing and holding **0-9**, (*****), or (#) until an underscore appears in the display. The individual call list entries accept up to 5 digits. The phone call list entries accept a combination of up to 31 digits and pauses.
4. Press and hold **MENU** until the display changes indicating that the number has been stored.
5. Repeat the steps above if the number stored in an entry location needs to be changed.

7.27 MOBILE DATA (EDACS AND P25 TRUNKED)

The XG-75M/M7300 Series mobile radios, when operating in the EDACS or P25 Trunked configuration, permit either voice or data calls to be transmitted or received. The radio can handle only one type of call at a time; however, selection of either data or voice is transparent to the operator. Data communications is not supported in the conventional mode.

The radio can be connected to a Mobile Data Terminal (MDT) or to a host computer. Any RS-232 compatible device that supports the Radio Data Interface (RDI) protocol (Version 1.91 or greater) can be connected to the mobile radio. Support for MDTs or host computers is a programmable option per radio. Additionally, radios programmed for host computers can also be programmed for data only operation (no voice calls transmitted or received).


NOTE

Turn power to the radio OFF before connecting or disconnecting any cables, including the data cable. Also, turn power to the radio OFF when docking or undocking a connected laptop computer. Failure to turn the power OFF can damage the radio, requiring service by an L3Harris approved service center.

7.27.1 Displays

The following is displayed on the control unit during the various states of data mode of operation.

DATA T/R Displayed on bottom line of display when the radio is transmitting/receiving a data call.

DATA OFF Displayed on top line of display when the radio is in the data disabled state.

DATA ON Displayed for two seconds on top line of display when the radio is toggled to the data enabled state.

7.27.2 Data Off Operation

The radio can be placed in the data disabled state by any of the following methods. When the data state is disabled, the control unit displays **"DATA OFF"** on the top line. An ongoing data call is allowed to complete except when an emergency is declared.

- Removing the microphone from the hookswitch (hookswitch option must be enabled by pre-programming).
- Declaring an emergency (not to be used unless an actual emergency condition exists). Alert tone sounds.
- Pressing **OPT**/**OPTION** (pre-programmed). Alert tone sounds.
- Selecting the function using the **MENU** button (pre-programmed).

7.27.3 Data On Operation

The data state is enabled by one of the following (depending on how it was disabled). **"DATA ON"** is displayed top line of display for 2 seconds then the display returns to normal.

- Replacing the microphone into the hookswitch (going on-hook). Only valid if the **"DATA OFF"** operation was entered by removing the microphone from the hookswitch (going off-hook).
- Clearing an emergency, but valid only if an emergency caused **"DATA OFF"** operation.

7.27.4 Exiting Data Calls

Under normal conditions, the radio enters the scan lockout mode and returns to the control channel after completion of a data call (transmit or receive). If, during a data call, one of the following conditions occurs, the data call is immediately terminated and the radio performs the desired function:

- PTT is activated.
- The PTT is in Public Address Mode.
- An emergency is declared by pressing the pre-programmed emergency button.
- A group or system change is made.

7.27.5 Scan Lockout Mode

Following the transmission or reception of a data call, if scan is enabled, scanning stops temporarily (duration pre-programmed). During this time the scan LED flashes to indicate that scan is enabled but temporarily suspended. This mode is normally exited when the pre-programmed time expires; however, the following actions terminate the scan lockout mode before the timeout is completed.

- The **CLR**/**CLEAR** button is pressed.
- PTT is pressed.
- A group or system change is made.
- Enter phone call mode.
- Enter individual call mode.

- A new emergency assignment has been received.
- PTT is pressed in Public Address Mode.
- An emergency is declared or cleared.
- Microphone is removed from hookswitch (off-hook).
- Receiving an individual or phone call.
- Receiving an Agency, Fleet or System All Call.
- Pressing the **SCAN** button to turn scan ON or OFF.

7.27.6 Data Lockout Mode

The data lockout mode is a pre-programmed mode when the radio does not respond to any data channel assignments and prevents receive data calls from interrupting voice calls. Transmit data calls are still initiated when needed by the operator. After a pre-programmed time, the radio responds to receive data calls; however, the following conditions clear the data lockout mode:

- The **CLR**/**CLEAR** button is pressed.
- Transmitting a data call.
- Changing a system.
- An emergency is declared.
- Pressing PTT while in Public Address Mode.
- Turning scan ON with the **SCAN** button.

7.28 STATUS/MESSAGE OPERATION (EDACS AND P25 TRUNKED)

Status and message operation is possible with either the Scan or System version of the XG-75M/M7300 Series mobile radio unit. The following procedure is applicable for the System version. For operation with the Scan version, the four primary keycaps must be reconfigured and pre-programmed for status/message operation.

7.28.1 Status Operation

Status operation permits the transmission of a pre-programmed status condition to an EDACS or P25 Trunked site.

To send a status condition, press the **STS** button and then press one of the number buttons (**0-9**) to select the pre-programmed status. If no status has been programmed for the selected number button, the radio displays **NO ENTRY** and the radio sounds a low tone. A valid selection permits the status text to appear in the display for a pre-programmed time. After the time-out expires or the **MENU** button has been pressed (the **MENU** button overrides the time-out period), the status is selected and is transmitted to the site or stored in the radio memory where it can be polled by the site at a future time. If the site receives the status properly, when transmitted or polled by the site, a high-pitched tone sounds and the keylight associated with that status remains lit. If the site does not receive the status properly, a low-pitched tone sounds and the keylight associated with the status blinks.

If an incorrect status is selected or the incorrect number button is pressed, the status can be changed during the pre-programmed time-out period by pressing another number button. The status selection can also be cancelled by pressing the **CLR** button prior to the time-out period.

To view the currently selected status after it has been transmitted, press the **STS** button. If the status was not sent successfully to the site, the text associated with the status flashes in the display.

The radio can also be pre-programmed to re-designate the keypad buttons for **ST0** thru **ST9** to send status condition. In this configuration the radio status operation operates as previously described except the **STS** button is not required. The keylight associated with **ST0** thru **ST9** indicates which status is selected.

7.28.2 Message Operation

Message operation permits the transmission of a pre-programmed message text to an EDACS or P25 Trunked site.

To send a message, press the **MSG** button and then press one of the number buttons (**0-9**) to select the pre-programmed message text. If no message text has been programmed for the selected number button, the radio displays **NO ENTRY** and a low-pitched tone sounds. A valid selection permits the message text to appear in the display for a pre-programmed time. After the time-out expires or the **MENU** button has been pressed (the **MENU** button overrides the time-out period), the message text is selected and is transmitted to the site. If the site receives the message properly when transmitted, a high pitched tone sounds and the **MSG** keylight remains lit. If the site does not receive the message properly, a low-pitched tone sounds and the **MSG** keylight blinks.

If an incorrect message text is selected or the incorrect number button is pressed, the message text can be changed during the pre-programmed time-out period by pressing another number button. The message text selection can also be cancelled by pressing the **CLR** button prior to the time-out period.

To view the currently selected message text after it has been transmitted, press the **MSG** button and then the **CLR** button prior to the time-out period. If the message text was not sent successfully to the site, the text associated with the message flashes in the display.

7.29 EDACS CONVENTIONAL P1 SCAN

This feature permits the radio user to scan a pre-programmed conventional system and channel as a Priority 1 (P1) channel while the radio is selected for EDACS trunked system. If activity is detected on the conventional P1 channel, the radio unmutes and remains on this conventional channel for the programmable hang time. The radio must be pre-programmed to designate a button for scan ON/OFF operation.

7.30 DYNAMIC REGROUP OPERATION (EDACS)

Dynamic regroup operation permits multiple talk groups (up to eight) to be added to a radio via the Communications Systems Director (CSD). The radio must be pre-programmed to respond to regrouping. Dynamic regrouping is not activated in a radio until an activation message is sent by the system manager. Each radio that receives and acknowledges regrouping instructions is successfully regrouped.

Pressing and holding **CLEAR**/**CLR** for 2.5 seconds toggles the user into and out of the dynamic regroup group set. A double beep sounds for entry or exit. The display indicates **REGR_0x** where "x" is a digit of 1 to 8 indicating the group when dynamic regroup has been enabled by the user. If the radio is in dynamic regroup and the user selects a group that has not been regrouped, the display shows **NO ENTRY**. The radio is prevented from transmitting and receiving calls in this condition except for scanned groups.

If the pre-programmed group set on the currently selected system contains an EMER/HOME group and the radio is in dynamic regroup, the radio exits dynamic regroup and declares the emergency on the HOME group. If no EMER/HOME group is present, the radio declares the emergency on the currently selected dynamic regroup group.

7.31 PAGE (P25 TRUNKED ONLY)

Page sends a PING message to a radio and functions similar to Individual Call. The following procedures describe how to initiate and complete a Page.

1. To select a previously stored individual, select **PAGE** from the menu followed by the ramp control to scroll through the list of stored individuals. While in the individual call list, the **MENU** key toggles the display between the call name and the unit ID number. On System model radios, the individual's unit ID can also be entered directly from the keypad.
2. Press the PTT button; the radio performs the necessary signaling on the control channel. On the calling radio, line 1 shows the called individual's name if found in the list of stored individuals or ID followed by the logical ID number of the unit being called. If the receiving radio receives the Page and responds, both radios emits three high-pitched tones. The receiving radio also displays PAGE and the ID of the calling radio.

7.32 SQUELCH ADJUST (CONVENTIONAL)

In the conventional mode of operation, the squelch can be re-adjusted in the MENU or from a front panel key on the keypad that has been pre-programmed. A default value of 9, or any user level between 1 and 16, can be selected using programming software. The user can change this setting either of two ways from the front panel keys.

NOTE

A value of 16 requires a strong signal to open squelch, a value of 2 requires a very weak signal to open squelch, and a value of 1 is open squelch.

NOTE

When the squelch adjust feature is activated, Channel Guard, T99 decode, and Scan are disabled. When the squelch adjust feature is exited, Channel Guard, T99 decode, and Scan are restored to their previous states.

7.32.1 Menu Selection

1. Press the **MENU** key and then use the ramp control to scroll through the selections until **SQUELCH** is displayed. Then press **MENU** again.
2. The display shows **SQLCH=xx**, where "xx" is the value between 1 and 16.
3. Use the ramp control to scroll through the values. Then press **MENU** to save the new value after the display time-out (2 seconds). The displayed value is selected and saved.
4. If the **MENU** or **CLR** key is pressed before the time-out, the menu feature exits and the squelch level is not updated. The original value is restored.

7.32.2 Pre-Programmed Keypad Key

1. Press the pre-programmed key and the display indicates **SQLCH=xx**, where "xx" is the value between 1 and 16.

2. Use the ramp control  to scroll through the values. Then press **MENU** to save the new value or wait for the display time-out (2 seconds). The displayed value is selected and saved.
3. If the **CLR** key is pressed before the time-out, the squelch level is not updated and the original value is restored.

7.33 TYPE 99 DECODE (ANALOG CONVENTIONAL)

If the Type 99 Decode Option has been pre-programmed, individual Selective Calling is possible. The radio can now decode individual, group, or supergroup paging calls. Two sets of Type 99 paging codes must be pre-programmed into the radio. When the radio decodes an appropriate Type 99 code sequence, an alert tone and visual indicator is provided to the user. The receiver then operates as a noise squelched unit until Type 99 is reset. Type 99 decode continues to operate during this noise squelched period. The appropriate Type 99 alert tone sounds again if it detects a valid two-tone sequence.

Type 99 operation can be reset manually or automatically (pre-programmed). Manual reset is achieved by briefly pressing **CLR**, if programmed. Automatic reset, if enabled, occurs after a 30 second interval following the most recent decode of a Type 99 tone sequence. Hookswitch (pre-programmed) can also enable or disable Type 99 decode. The pre-programmed key light blinks when Type 99 is disabled by the hookswitch.

Type 99 decode continues to be active while the radio's **CLR** button is pressed. This allows the user to monitor calls and still be alerted when a call is directed to the user. While the user continues to press **CLR**, the user hears both calls and all Type 99 tone signals. If **CLR** is pressed for longer than two (2) seconds, Type 99 decode is either disabled or re-enabled depending upon its present state.

To check the Type 99 enable status, press the Scan Add/Delete  ramp control. The current status of Type 99 decode is displayed for a time-out period.

If a Horn Alert Option is installed and enabled with the Type 99 Decode Option, the radio can beep the vehicle horn when a Type 99 call is received. This option permits alerting persons out of the vehicle when a call is received.


NOTE

Type 99 is automatically disabled when Scan is enabled.

7.33.1 Menu Selection

Press **MENU** and then use the  ramp control to scroll through the selections until **T99 ENAB** is displayed. Then press **MENU** to toggle the Type 99 decode state. The **T99 ON** or **T99 OFF** display message is displayed for two seconds to show the new state.

7.33.2 Pre-Programmed Keypad Key

Press the pre-programmed key and the **T99 ON** or **T99 OFF** display message is displayed for two seconds to show the new state.

7.34 TALK-AROUND (ANALOG CONVENTIONAL)

Talk-around provides short range, line of sight communications.

1. Make sure the radio is ON and then select the desired conventional system and channel.
2. Press the pre-programmed button to toggle talk-around ON.
3. Ensure that the channel is not busy by pressing **CLR**/**CLEAR** to briefly disable any channel decoding and unmute the receiver or observe the unlit **BSY** indicator. If the Channel Busy Lockout feature is programmed for the selected channel, the radio does not transmit when the channel is busy.
4. Press and hold the PTT button. The **TX** indicator illuminates and a short beep sounds (if pre-programmed) indicating that communication can begin.
5. Release the PTT button when the transmission is complete and listen for a reply.
6. When the communication is completed, press the pre-programmed button to toggle talk-around OFF.

Or

1. Make sure the radio is ON and then select the desired conventional system and channel.
2. Select **TALKARND** from the menu to toggle talk-around on and off.

7.35 CONTROL AND STATUS SERVICE

The XG-75M/M7300 supports Control and Status services. These services allow the computer application to monitor and control a radio. The Control and Status Services can be used from a locally-connected Mobile Data Terminal (MDT) or a network MDT. In some cases, the radio can support both MDTs simultaneously. However, priority is given to the local MDT.

The Radio Status Service allows an MDT or Fixed End System (FES) to receive real-time status updates from a radio. An MDT sends Host Attach/Detach messages to the radio as UDP datagrams destined for the UDP Service Address and Service UDP Port of the radio. All responses and asynchronous reports are returned to the address and port of the requesting host. Refer to *ECP Control and Status Services Feature Manual, 14221-7200-6040,* for more information on this feature.

7.36 AUDIO PLAYBACK

Every call received by the radio is recorded in internal memory, overwriting the last recorded call. When the PLAYBACK key is pressed, the last recording is replayed **and any future recordings are stopped.** Pressing PLAYBACK again repeats the **same** recorded call. Pressing and holding the PLAYBACK key until the tone sounds erases the recording and starts the recording of incoming calls again. If a call is received while the recorded call is playing, the recorded call continues to play, rather than the received audio. However, if a call is received and the recorded call is played back in close succession, received audio could mute call playback. This feature requires RPM R8A and later, and ECP R15A and later.

NOTE

The PLAYBACK function must be programmed to a button on the control head or hand-held controller via RPM.

NOTE

Front mount XG-75M/M7300 radios do not support audio playback.

7.37 RADIO TEXTLINK OPERATION

Radio TextLink provides a simple means of exchanging pre-defined, or "canned," text messages. This section describes how to send messages if the Radio TextLink feature is enabled.

7.37.1 Send TextLink Messages

1. Press **MENU** to access the menu.
2. Scroll through menu until **SND MAIL** is displayed. Press **MENU** to select.
3. Scroll through the pre-defined messages and press **MENU** to select to select the desired message.
4. Scroll through the list of available destination IDs and select the desired ID with **MENU**.

7.37.2 Receive TextLink Messages

Received Messages are listed in the order in which they are received (newest at the top). All messages include the user LID along with the date and time stored/displayed. The mailbox can hold 16 messages at a time. If a new Message arrives after the limit is reached, the new message overwrites the oldest message.

1. After receiving the "You have mail" message, press **MENU** to access the menu.
2. Scroll through menu until **RD MAIL** is displayed. Press **MENU** to select.
3. Scroll through the list of received messages.
4. Selecting a received message with the **MENU** key will bring up a reply to sender option.

7.37.3 Delete TextLink Messages

Select **DEL MAIL** with the **MENU** key to delete ALL messages in the inbox.

7.37.4 Display Current Time

Select **TIME** with the **MENU** key to retrieve the current date and time.

7.38 VIEW GPS INFORMATION

If the M7300 is equipped with the optional GPS receiver module, you can view your position and satellite information via the GPS Menu. GPS requires an unobstructed view of the sky and the signal is greatly diminished inside buildings, tunnels, heavily forested areas, etc. GPS may not work at all under some conditions, especially in metal enclosures or buildings.

1. Press **MENU** to access the menu.
2. Scroll through menu until **GPS** is displayed and press **MENU** to select.
3. Scroll through available information screens.

8. BASIC TROUBLESHOOTING

If the radio is not operating properly, check Table 8-1 for likely causes. For additional assistance, contact a qualified service technician.

Table 8-1: Basic Troubleshooting

SYMPTOM	CAUSE	SOLUTION
Radio will not turn on.	No power.	Test the connection to the vehicle power supply.
Radio will not turn off.	If in multiple control head configuration, one of the attached control heads is still powered up.	Power off all control heads.
Radio will not register or does not receive provisioning data.	Bad logon credentials.	Check logon and password.
No audio.	Speaker volume is muted.	Increase the volume level.
Poor audio.	Transmitting or receiving in a poor coverage area or subject to interference.	Check network connectivity and move to a better coverage area if possible. Report the area without coverage to an authorized network technician.
No network connectivity icon in display.	Radio is out-of-range or cannot connect with the OpenSky network. Base station network connection has failed.	Return to coverage area if possible and wait for condition to clear. Use single-site trunking or switch to an alternate channel.
Radio will not transmit.	Radio may be out of coverage area or may be overheated.	Return to coverage area if possible. If overheated, let radio cool before retrying transmission. Report this failure to an authorized technician.
“Warning: No MRU” Message.	Radio control head is unable to communicate with mobile radio unit (radio transceiver).	Have the radio connections checked by an authorized technician.
Control head randomly changes display.	In multiple control head configurations, another user is operating the radio from another control head.	None
Encrypted calls cannot be made.	Not authorized to use.	Contact system administrator to request encryption privileges.
Screen displays: UNAUTH3	The radio network ID has not been added to the network.	Contact system administrator.
Screen displays: NOAUTHV	Radio authentication of the VNIC failed.	Contact system administrator.
Screen displays: NOAUTHM	VNIC authentication of the radio failed.	Contact system administrator.
Screen displays: NOSUPRT	The voice authentication security policy is set to only allow authenticated users.	Contact system administrator.
Encrypted calls cannot be made.	User not logged in.	Log in (refer to Section 6.15.2).

9. CUSTOMER SERVICE

9.1 CUSTOMER CARE

If any part of the system equipment is damaged on arrival, contact the shipper to conduct an inspection and prepare a damage report. Save the shipping container and all packing materials until the inspection and the damage report are completed. In addition, contact the Customer Care center to make arrangements for replacement equipment. Do not return any part of the shipment until you receive detailed instructions from an L3Harris representative.

Contact the Customer Care center at https://www.harris.com/solution/pspc-customer-service or:

North America:

Phone Number: 1-800-368-3277

Fax Number: 1-321-409-4393

E-mail: PSPC_CustomerFocus@l3harris.com

International:

Phone Number: 1-434-455-6403

Fax Number: 1-321-409-4394

E-mail: PSPC_InternationalCustomerFocus@l3harris.com

9.2 TECHNICAL ASSISTANCE

The Technical Assistance Center's (TAC) resources are available to help with overall system operation, maintenance, upgrades and product support. TAC is the point of contact when answers are needed to technical questions.

Product specialists, with detailed knowledge of product operation, maintenance and repair provide technical support via a toll-free (in North America) telephone number. Support is also available through mail, fax and e-mail.

For more information about technical assistance services, contact your sales representative, or call the Technical Assistance Center at:

North America: 1-800-528-7711

International: 1-434-385-2400

Fax: 1-434-455-6712

E-mail: PSPC_tac@l3harris.com

10. KEYPAD REMAPPING

If the keys have been remapped to provide new functions, fill in the following template for future reference.

BUTTON	FUNCTION	BUTTON	FUNCTION
Emergency		1	
Preset A		2	
Preset B		3	
Preset C		4	
Rocker •		5	
Rocker ••		6	
Rocker **+**		7	
Rocker **-**		8	
MENU		9	
OPT/OPTION		*	
CLR/CLEAR		0	
SCAN		#	

11. RADIO SETUP

RADIO TYPE:

FREQUENCY BAND:

OPERATOR'S NAME:

EMERGENCY GROUP:

SYSTEM NUMBER	SYSTEM NAME	TRK/CNV	GRP/CHN NUMBER	GRP/CHN NAME	USE

SYSTEM NUMBER	SYSTEM NAME	TRK/CNV	GRP/CHN NUMBER	GRP/CHN NAME	USE

SYSTEM NUMBER	SYSTEM NAME	TRK/CNV	GRP/CHN NUMBER	GRP/CHN NAME	USE

SYSTEM NUMBER	SYSTEM NAME	TRK/CNV	GRP/CHN NUMBER	GRP/CHN NAME	USE

12. WARRANTY

Please register this product within 10 days of purchase. Registration validates the warranty coverage, and enables L3Harris to contact you in case of any safety notifications issued for this product.

Registration can be made on-line at the Customer Care Center webpage:

https://www.harris.com/solution/pspc-customer-service

While on the webpage, please review the applicable battery and/or product warranty literature.

APPENDIX A CONFIGURING ENCRYPTION

Refer to the following documentation for advanced programming and setup instructions:

- L3Harris OTAR Overview Manual - MM-008069-001
- Network Key Manager Installation and Configuration Manual - MM-008070-001
- L3Harris UAS Key Management Application Manual - MM-008068-001
- L3Harris Key Manager Key Admin Overview and Operation Manual - MM1000019423
- L3Harris Key Manager Key Loader Overview and Operation Manual - MM1000019424
- Motorola® Key Variable Loader (KVL) Device User's Guide

A.1 CREATE KEYS USING L3HARRIS KEY ADMIN

L3Harris Key Admin is part of the L3Harris Key Manager and is used by the Crypto Officer (CO). The CO creates a Master Set of keys from which a Distribution Set is produced. Using the Key Admin software, the CO can save keys into Distribution key files for technicians to use in radios.

1. Select **Start → Programs → Harris Key Manager → Harris Key Admin**.
2. Select **New Master Set, Open**, or **Import from Security Device**. Refer to the Key Admin online help for more information on creating keys.
3. When finished, create a Distribution Key File. A Distribution Key File is used with the Key Loader to load key sets into the radio and cannot be edited. Refer to the Key Admin online help for more information on creating the Distribution Key File.

A.2 LOAD ENCRYPTION KEYS

A.2.1 Load UKEKS with Key Loader and RPM (for OTAR-Enabled Systems)

UKEKs are loaded into L3Harris OTAR radios using the Key Loader application. Key Loader is a part of Key Manager.

To load encryption keys:

1. Obtain the UKEK file and Storage Location Number (SLN) Binding Report information from the Crypto Officer (CO).


NOTE

Both AES and DES UKEKs can be contained within the same UKEK file.

2. If not already on, power-up the PC that has RPM and the Key Loader applications installed on it, and start Windows®.
3. Connect the radio to the PC using a serial cable (14002-0143-01).
4. Enter into the L3Harris Keyload Mode (HKL).
   a. Press the radio's **MENU** button.
   b. Scroll through the menu to select the **KEYLOAD** option and press the **MENU** button to activate.

c. Scroll through and select the **HKL** option and press the **MENU** button. The radio can now accept keys from the L3Harris Keyloader.

5. Load the UKEK file from the Crypto Officer onto the PC.
6. Run the RPM application and setup the radio's Personality according the SLN Binding Report information.
7. Setup the talk groups and the SLN mappings (Talk Group ID to SLN). This includes mapping SLNs to the "System" keys (PSTN, All Call, etc.).
8. Select **Options → P25 OTAR Options** and set the following:
   a. The OTAR Message Number Period (MNP) as defined by the System Administrator.
   b. The radio's Individual RSI (from the SLN Bindings Report).
   c. The KMF's RSI (from the SLN Bindings Report).
9. Program the Personality to the radio.
10. Run the Key Loader application.
11. Open the UKEK file loaded in step 5.
12. Select the Target Device type and click the **Load** button.
13. The Key Loader reads the target device's identifying information, retrieves a UKEK of the proper algorithm type from the UKEK file, and downloads the UKEK to the target device at the proper SLN and keyset with the proper key ID.
14. Click the **Finish** button to exit the Key Loader application. New UKEKs have are loaded and the radio is now ready to accept TEKs via OTAR with the trunked radio network.

A.2.2 Load Keys Using Harris Key Loader

Harris Key Loader is part of Harris Key Manager and can be used by the Crypto Officer or Technician to load the keys into the radio.

Refer to the Harris Key Loader online help if additional information is required when performing this procedure.

1. Connect the radio to the PC using a serial cable.
2. Power on the radio, if not already.
3. Select **Start → Programs → Harris Key Manager → Harris Key Loader**.
4. At the Key Loader Welcome screen, click **Next**.
5. Select **Load a Distribution Set into one or more devices**.
6. Click **Next.**
7. Browse to the Key File and enter the password.
8. Click **Next** to validate the password and continue. If the password is incorrect, the screen will display an error message.
9. Select communication port from the drop-down and click **Next**.
10. Select the serial port that you have connected to the radio.
11. Enter into Harris Keyload Mode (HKL).

a. Press the radio's **MENU** button.

b. Scroll through the menu to select the **KEYLOAD** option and press the **MENU** button to activate.

c. Scroll through and select the **HKL** option and press the **MENU** button. The radio can now accept keys from the Harris Keyloader.

12. Select **Radio** from the drop-down and click **Load**.

13. Click **Finish**.

A.2.3 Power on the Motorola KVL Device

1. Connect KVL Device to the radio using cable 14002-0143-10.


NOTE

Once the KVL Device is connected, a keyset is established whether the keys are loaded or not. You will need to zeroize to bring the radio to a fully zeroized state.

2. Press the radio's **MENU** button.

3. Scroll through the menu to select the **KEYLOAD** option and press the **MENU** button to activate.

4. Scroll through and select the **KVL** option and press the **MENU** button. The radio can now accept keys from the KVL Device.

A.2.4 Load Keys Using Motorola KVL Device

Type 3 Digital Encryption Standard Output Feedback (DES-OFB) and Advanced Encryption Standard, 256-bit (AES-256), encryption methods are supported. The Type 3 Encryption keys are loaded via a Motorola Device using Telecommunications Industry Association (TIA)/Project 25 (P25) key fill device protocol. Make sure that valid keys have been created and stored in the KVL Device before proceeding.

A.3 PROTECTED KEYS

The Protected Keys feature transfers P25 Voice Keys, from Harris Key Loader to the radio, that have been wrapped (AES) or encrypted (DES) with Key Protection Keys (KPKs). KPKs are nothing more than unprotected Key Encryption Keys (KEKs). The KPKs need to be loaded into the radio before the Protected Keys are loaded. Once loaded into the radio, the KPKs will be used to unwrap (AES) or decrypt (DES) the Protected Keys.

The radio must be placed into the key loading mode (see Section A.2.2) in order to accept the KPKs and P25 Voice Keys.

This page intentionally left blank.

About L3Harris Technologies

L3Harris Technologies is an agile global aerospace and defense technology innovator, delivering end-to-end solutions that meet customers' mission-critical needs. The company provides advanced defense and commercial technologies across air, land, sea, space and cyber domains.