Operator's Manual

14221-1800-2000
Rev. Y, January 2024

XL Converge™ Series Portable Radios

XL-200P, XL-185P, and XL-150P

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MANUAL REVISION HISTORY

REV.	DATE	REASON FOR CHANGE
C	Jan/16	Updated Declaration of Conformity. Added EU regulatory approval information (standards) and EU RF exposure information.
D	Jul/16	Updated Table 1-1 and Tableau 2-1. Updated for XLP R2A. Added note to Section 4.3.1 regarding charging the battery before first use. Updated Appendix A. Updated Section 4.3.3.
E	Jan/17	Updated Sections 1.2, 4.1, 4.6, 5.9, 5.13, 10, included XLP R3A features, and added Sections 4.3.4, 5.38, and 5.7.
F	Apr/17	Updated to add XLP R4A features.
G	Nov/17	Added XL-185P, XLP R5A features, and C1D1 information, updated Table 4-1.
H	Jan/18	Updated Sections 6.4, 7.2, and Table 5-1.
J	Apr/18	Updated for XLP R6A and updated Section 4.3.4.
K	Jan/19	Updated for XLP R7, updated Table 4-1, and updated Section 3.1. Added Section 6.10.3.
L	Mar/19	Updated Section 6.10.3 and Table 4-1. Added Section 6.10.4.
M	Jan/20	Updated to add XLP R9A features. Updated Section 4.6.
N	May/20	Updated Section 5.40.1, added XLP R10A features, updated XL-150P Options/Accessories, and added Appendix B.
P	Dec/20	Updated Section 5.6.1, Section 5.18, Section 4.3.4, and Table 5-2. L3Harris rebranding.
R	May/21	Updated Section 4.7, Section 5.10, and Section 6.6. Added Section 7.1.
T	Aug/21	Added Appendix C, added Section 5.17.1, updated Section 7.5.2.
U	Nov/22	Added Section 6.23. Updated Options and Accessories and updated Section 5.18.
V	Jun/23	Added Caution to Section 1.4.1, updated Section 5.13, and added Section 5.15, added Section C.2.4, updated Section 7.5.1, updated Section 5.4, updated Section 5.12, added Section 5.38.
W	Sep/23	Updated Table 5-2 and Section 6.10.2.
Y	Jan/24	Updated Section 6.10.2 and updated Table 5-5. Added Section 5.38.

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.

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1. REGULATORY AND SAFETY INFORMATION

1.1 SAFETY CONVENTIONS

The following conventions are used throughout this manual to alert the user to general safety precautions that must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warning elsewhere in this manual 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 the equipment performance.

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

1.2 SAFETY TRAINING INFORMATION

The L3Harris XL portable radio generates RF electromagnetic energy during transmit mode. This radio is designed for and classified as "Occupational Use Only," meaning it must be used only during the course of employment by individuals aware of the hazards and the ways to minimize such hazards. This radio is NOT intended for use by the "General Population" in an uncontrolled environment.

The XL portable radio has been tested and complies with the FCC RF exposure limits for "Occupational Use Only." In addition, this L3Harris radio complies with the following Standards and Guidelines regarding RF energy and electromagnetic energy levels and evaluation of such levels for exposure to humans:

- FCC KDB Publication 447498 General RF Exposure Guidance
- American National Standards Institute (C95.1 – 1992[1]), IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
- American National Standards Institute (C95.3 – 1992), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave.
- IC Standard RSS-102. Radiofrequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands).
- European Council Directive 89/391/EEC.

[1] Tested to ANSI C95.1-1992 in compliance with 47 CFR 2.1093. Meets or exceeds safety requirements of ANSI C95.1-2005.

1.2.1 RF Exposure Guidelines

To ensure that exposure to RF electromagnetic energy is within the EU/AU/FCC/IC allowable limits for occupational use, always adhere to the following guidelines:

- DO NOT operate the radio without a proper antenna attached, as this may damage the radio and may also cause the FCC RF exposure limits to be exceeded. A proper antenna is the antenna supplied with this radio by L3Harris or an antenna specifically authorized by L3Harris for use with this radio. (Refer to Table 4-1.)
- DO NOT transmit for more than 50% of total radio use time ("50% duty cycle"). Transmitting more than 50% of the time can cause FCC RF exposure compliance requirements to be exceeded. The radio is transmitting when the "TX" indicator appears in the display. The radio will transmit by pressing the "PTT" (Push-To-Talk) button.
- ALWAYS transmit using low power when possible. In addition to conserving battery charge, low power can reduce RF exposure.
- ALWAYS use L3Harris authorized accessories (antennas, batteries, belt clips, speaker/mics, etc.). Use of unauthorized accessories may cause the FCC Occupational/Controlled Exposure RF compliance requirements to be exceeded. (Refer to Table 1-1.)
- As noted in Table 1-1, ALWAYS keep the housing of the transmitter ***AT LEAST*** 0.47 inches (1.2 cm) from the body and at least 0.98 in (2.5 cm) from the face when transmitting to ensure EU/AU/FCC/IC RF exposure compliance requirements are not exceeded. However, to provide the best sound quality to the recipients of your transmission, L3Harris recommends you hold the microphone at least 2 in (5 cm) from mouth, and slightly off to one side.
- Refer to Standard EN 62311:2008.

Table 1-1: RF Exposure Compliance Tested Distances (Worst Case Scenario)

RADIO FREQUENCY	Body[2]	Face
VHF (136 - 174 MHz)	0.47 in (1.2 cm)	0.98 in (2.5 cm)
UHF (378 - 522 MHz)	0.47 in (1.2 cm)	0.98 in (2.5 cm)
700/800 MHz (768 - 776 MHz) (798 - 806 MHz) (806 - 824 MHz) (851 - 870 MHz)	0.47 in (1.2 cm)	0.98 in (2.5 cm)
900 MHz (935-944 MHz) (896-902 MHz)	0.47 in (1.2 cm)	0.98 in (2.5 cm)
2400 MHz (2412 - 2472 MHz)	0.47 in (1.2 cm)	0.98 in (2.5 cm)
5 GHz (5.18 - 5.825 GHz)	0.47 in (1.2 cm)	0.98 in (2.5 cm)

[2] This is worst case based on the thinnest body mount accessory (belt clip).

NOTE

SAR Evaluation: 1g averaged, 50% PTT Duty Factor, Occupational/Controlled Exposure.

NOTE

LTE is not supported by XL Series portables with the C1D1 option.

The information in this section provides the information needed to make the user aware of RF exposure, and what to do to assure that this radio operates within the FCC RF exposure limits.

1.2.2 Electromagnetic Interference/Compatibility

During transmissions, this L3Harris radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the radio in areas where signs are posted to do so. DO NOT operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.

1.3 REGULATORY APPROVALS

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

1.3.1 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.

1.4 OPERATING TIPS

Antenna location and condition are important when operating a portable radio. Operating the radio in low-lying areas or terrain, under power lines or bridges, inside of a vehicle, or in a metal framed building can severely reduce the range of the unit. Mountains can also reduce the range of the unit.

In areas where transmission or reception is poor, some improvement may be obtained by ensuring that the antenna is vertical. Moving a few yards in another direction or moving to a higher elevation may also improve communications. Vehicular operation can be aided with the use of an externally mounted antenna.

Battery condition is another important factor in the trouble-free operation of a portable radio. Always properly charge the battery.

1.4.1 Efficient Radio Operation

Keep the antenna in a vertical position when receiving or transmitting a message.

Do NOT hold onto the antenna when the radio is powered on!

NEVER cover the air vent on the radio with any sticker or asset tag. Doing so could result in 100% loss of receive audio, low receive audio, distorted receive audio, etc.

1.4.2 Antenna Care and Replacement

Do not use the portable radio with a damaged or missing antenna. A minor burn may result if a damaged antenna comes into contact with the skin. Replace a damaged antenna immediately. Operating a portable radio with the antenna missing could cause personal injury, damage the radio, and may violate FCC regulations.

Use only the supplied or approved antenna. Unauthorized antennas, modifications, or attachments could cause damage to the radio unit and may violate FCC regulations. (Refer to Table 4-1.)

1.4.3 Electronic Devices

RF energy from portable radios may affect some electronic equipment. Most modern electronic equipment in cars, hospitals, homes, etc. is shielded from RF energy. However, in areas in which you are instructed to turn off two-way radio equipment, always observe the rules. If in doubt, turn it off!

1.4.4 Aircraft

- **Always turn off a portable radio before boarding any aircraft!**
- **Use it on the ground only with crew permission.**
- **DO NOT use while in-flight!!**

1.4.5 Electric Blasting Caps

To prevent accidental detonation of electric blasting caps, DO NOT use two-way radios within 1000 feet of blasting operations. Always obey the "Turn Off Two-Way Radios" signs posted where electric blasting caps are being used (OSHA Standard: 1926.900).

1.4.6 Potentially Explosive Atmospheres

Areas with potentially explosive atmospheres are often, but not always, clearly marked. These may be fueling areas, such as gas stations, fuel or chemical transfer or storage facilities, and areas where the air contains chemicals or particles, such as grain, dust, or metal powders.

Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death.

Turn off two-way radios when in any area with a potentially explosive atmosphere. It is rare, but possible that a radio or its accessories could generate sparks.

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.

MISE EN GARDE

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.

AVERTISSEMENT

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.

REMARQUE

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 RENSEIGNEMENTS SUR LA FORMATION SUR LA SÉCURITÉ

MISE EN GARDE

La radio portative L3Harris XL produit de l'énergie électromagnétique des RF lorsqu'en mode de transmission. Cette radio est conçue et classée pour une « Utilisation professionnelle seulement », ce qui signifie qu'elle ne doit être utilisée que dans le cadre d'un emploi par des individus conscients des risques et des moyens de limiter ceux-ci. Cette radio N'EST PAS conçue pour une utilisation par la « Population générale » dans un environnement non contrôlé.

La radio portative XL a été testée et est conforme aux limites d'exposition aux RF de la FCC pour une « Utilisation professionnelle seulement ». De plus, cette radio L3Harris est conforme aux normes et directives suivantes quant à l'énergie des RF et aux niveaux d'énergie électromagnétique, ainsi qu'à l'évaluation de ces niveaux pour l'exposition aux humains :

- FCC KDB 447498
- American National Standards Institute (C95.1 – 1992), norme de l'IEEE sur les niveaux sécuritaires d'exposition humaine aux champs électromagnétiques des radiofréquences, 3 kHz à 300 GHz.
- American National Standards Institute (C95.3 – 1992), pratique recommandée par l'IEEE pour la mesure des champs électromagnétiques potentiellement dangereux – RF et micro-ondes.

2.2.1 Directives sur l'exposition aux RF

Pour s'assurer que l'exposition à l'énergie électromagnétique des RF se situe dans les limites acceptables de la FCC pour l'utilisation professionnelle, respectez toujours les directives suivantes :

- N'utilisez PAS la radio sans qu'une antenne appropriée y soit connectée, car ceci peut endommager la radio et également causer un dépassement des limites d'exposition aux RF de la FCC. Une antenne appropriée est celle fournie par L3Harris avec cette radio, ou une antenne spécifiquement autorisée par L3Harris pour être utilisée avec cette radio. (Reportez-vous à Tableau 2-1.)
- Ne transmettez PAS pendant plus de 50 % de la durée d'utilisation totale de la radio (« cycle de service de 50 % »). La transmission pendant plus de 50 % du temps peut causer un dépassement des exigences de conformité de la FCC en matière d'exposition aux RF. La radio transmet lorsque l'indicateur « TX » apparaît sur l'affichage. La radio transmet lorsqu'on appuie sur le bouton « PTT » (bouton de microphone).
- Transmettez TOUJOURS en basse puissance lorsque possible. En plus de préserver la charge de la pile, une faible puissance réduit l'exposition aux RF.
- Utilisez TOUJOURS des accessoires autorisés L3Harris (antennes, piles, pinces de ceinture, 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. (Reportez-vous à Table 4-1.)
- Tel qu'indiqué dans Tableau 2-1, conservez TOUJOURS l'appareil et son antenne à ***AU MOINS*** 1,2 cm du corps, et à au moins 2,5 cm du visage pendant la transmission, pour vous assurer de ne pas dépasser les exigences de conformité de la FCC en matière d'exposition aux RF. Cependant, pour offrir la meilleure qualité sonore aux auditeurs de votre transmission, L3Harris recommande de tenir le microphone à au moins 5 cm (2 po) de votre bouche et légèrement déplacé sur un côté.

Tableau 2-1 : Distances de test de conformité des expositions aux RF (pire des scénarios)

RADIOFRÉQUENCES	CORPS[3]	VISAGE
VHF (136 - 174 MHz)	1,2 cm	2,5 cm
UHF (378 - 522 MHz)	1,2 cm	2,5 cm
700/800 MHz (768 - 776 MHz) (798 - 806 MHz) (806 - 824 MHz) (851 - 870 MHz)	1,2 cm	2,5 cm
900 MHz (935-944 MHz) (896-902 MHz)	1,2 cm	2,5 cm
2400 MHz (2412 - 2472 MHz)	1,2 cm	2,5 cm
5 GHz (5.18 - 5.825 GHz)	1,2 cm	2,5 cm

[3] Ce est le pire des cas basée sur le corps plus mince monter accessoire (clip ceinture).

Dans cette section figurent les renseignements nécessaires pour sensibiliser l'utilisateur à l'exposition aux RF et sur ce qu'il faut faire pour s'assurer que cette radio fonctionne dans les limites d'exposition aux RF de la FCC.

2.2.2 Interférence/Compatibilité Électromagnétique

Pendant les transmissions, cette radio L3Harris produit de l'énergie des RF qui peut causer de l'interférence avec d'autres appareils ou systèmes. Pour éviter de telles interférences, fermez la radio dans les zones où il est indiqué de le faire. N'utilisez PAS le transmetteur dans des zones sensibles aux radiations électromagnétiques, comme les hôpitaux, les avions et les sites de détonation.

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

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.

2.4 CONSEILS D'UTILISATION

L'emplacement et l'état de l'antenne sont importants pour l'utilisation d'une radio portative. L'utilisation de la radio dans des zones de faible élévation, sous des lignes électriques ou des ponts, à l'intérieur d'un véhicule ou dans un immeuble à ossature métallique, peut réduire la portée de l'appareil de manière considérable. Les montagnes peuvent également réduire la portée de l'unité.

Dans les zones où la transmission ou la réception est insatisfaisante, certaines améliorations peuvent être obtenues en s'assurant que l'antenne est verticale. Se déplacer de quelques mètres dans une autre direction ou à un emplacement plus élevé peut également améliorer les communications. L'utilisation d'une antenne fixée à l'extérieur peut faciliter le fonctionnement dans un véhicule.

L'état de la pile est un autre facteur important d'une utilisation sans tracas d'une radio portative. Chargez toujours correctement la pile.

2.5 UTILISATION EFFICACE DE LA RADIO

Gardez l'antenne dans une position verticale pendant la réception ou la transmission d'un message.

MISE EN GARDE

Ne tenez PAS l'antenne lorsque la radio est allumée !

2.5.1 Entretien Et Remplacement De L'antenne

MISE EN GARDE

N'utilisez pas la radio portative si son antenne est endommagée ou absente. Une brûlure légère peut se produire au contact d'une antenne endommagée avec la peau. Remplacez immédiatement une antenne endommagée. L'utilisation d'une radio portative alors que l'antenne est absente peut causer des blessures, endommager la radio et pourrait enfreindre la réglementation de la FCC.

AVERTISSEMENT

Utilisez seulement l'antenne fournie ou une antenne approuvée. Des antennes non autorisées, des modifications ou des ajouts à une antenne peuvent endommager la radio et enfreindre la réglementation de la FCC. (Reportez-vous à Table 4-1.)

2.5.2 Appareils Électroniques

AVERTISSEMENT

L'énergie des RF provenant de radios portatives peut affecter certains appareils électroniques. La majorité de l'équipement électronique moderne dans les voitures, les hôpitaux, les maisons, etc. est blindé contre l'énergie des RF. Cependant, dans les zones où l'on vous demande de fermer l'équipement de radio bidirectionnelle, respectez toujours les règles. En cas de doute, éteignez-le !

2.5.3 Avion

MISE EN GARDE

- **Éteignez toujours une radio portative avant d'embarquer à bord d'un avion !**
- **Ne l'utilisez au sol qu'avec la permission de l'équipage.**
- **NE l'utilisez PAS durant le vol !**

2.5.4 Détonateurs Électriques

MISE EN GARDE

Pour prévenir la détonation accidentelle des détonateurs électriques, n'utilisez PAS de radios bidirectionnelles à moins de 305 m (1 000 pi) des opérations de détonation. Respectez toujours les indications « Éteindre les radios bidirectionnelles » situées là où des détonateurs électriques sont utilisés. (Norme OSHA : 1926.900)

2.5.5 Atmosphère Potentiellement Explosive

MISE EN GARDE

Les zones ayant une atmosphère potentiellement explosive sont souvent, mais pas toujours, identifiées clairement comme telles. Il peut s'agir de zones d'alimentation en carburant, comme les postes d'essence, les installations de stockage ou de transfert de carburant ou de produits chimiques, ainsi que les zones dont l'air contient des produits chimiques ou des particules, comme des grains, de la poussière ou des poudres métalliques.

Des étincelles dans de telles zones peuvent provoquer une explosion ou un incendie, causant ainsi des blessures ou même la mort.

Éteignez les radios bidirectionnelles dans toute zone ayant une atmosphère potentiellement explosive. Il est rare, mais pas impossible qu'une radio ou ses accessoires produisent des étincelles.

3. HAZARDOUS LOCATIONS

3.1 CLASS 1, DIVISION 2 OPTION

Radios ordered with the Class 1, Division 2 option are suitable for use in Class 1, Division 2, Groups A, B, C, and D or non-hazardous (unclassified) locations only.

Les radios commandées avec l'option Classe 1, Division 2 sont adéquates pour utilisation en Classe 1, Division 2, Groupes A, B, C et D, ou en lieux non-hasardeux (non-classifiés) seulement

EXPLOSION HAZARD – REPLACE BATTERY PACK ONLY IN AN AREA KNOWN TO BE NON-HAZARDOUS, AND ONLY WITH L3HARRIS PART NO. or 14035-4010-05.

AVERTISSEMENT – RISQUE D'EXPLOSION – LES BATTERIES DOIVENT ÊTRE REMPLACÉES DANS UNE ZONE RECONNUE NON-HASARDEUSE SEULEMENT, ET SEULEMENT AVEC UNE BATTERIE L3HARRIS PORTANT LE NUMÉRO DE PIÈCE ou 14035-4010-05.

EXPLOSION HAZARD – Substitution of any component may impair suitability for Class 1, Division 2.

AVERTISSEMENT – RISQUE D'EXPLOSION – Une substitution de toute composante pourrait compromettre la convenance pour la Classe 1, Division 2.

EXPLOSION HAZARD – Do not exceed maximum battery charging current of 5.250 A or maximum charging voltage of 12.0 V DC at any time.

CAUTION - The battery used in this device may present a risk of fire or explosion when heated above 100°C (212°F) or incinerated. Replace battery with L3Harris Part No. 14035-4010-05 only. Use of another battery may present a risk of fire or explosion.

Battery replacement instructions: Remove battery by 1) depressing battery latches then 2) remove battery from radio chassis. Install replacement battery by inserting battery in radio chassis opening and depressing battery into chassis until both battery latches are engaged. Dispose of used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire.

WARNING

EXPLOSION HAZARD – In addition to any simple single-ended coil antenna and carrying case option, only the following L3Harris accessories may be used with this radio:

PART NUMBER	DESCRIPTION
14035-4700-01	Speaker Mic, Revo NC2. Can only be used with earphones LS103239V1 and LS103239V2.
12082-0600-01	Speaker Microphone (C1D1/C1D2)
12082-0600-02	Speaker Microphone, Emergency Button (C1D1/C1D2)
12082-0650-01	Microphone, Palm,2 Wire, Black
12082-0650-02	Microphone, Palm, 2 Wire, Beige
12082-0650-03	Microphone, Mini-Lapel,3 Wire, Black
12082-0650-04	Microphone, Mini-Lapel,3 Wire, Beige
12082-0650-05	Earphone Kit, Black
12082-0650-06	Earphone Kit, Beige
12082-0650-07	Headset, In-Ear, Boom Mic, In-Line PTT
12082-0650-08	Headset, Lightweight, Over-the-Head, Single Ear, In-Line PTT
12082-0650-09	Headset, Lightweight, Behind-the-Head, Dual Ear, In-Line PTT
12082-0650-10	Headset, Lightweight, Behind-the-Head, Dual Ear, Pigtail PTT
12082-0650-13	Headset, Heavy Duty, Behind-the-Head, w/PTT
12082-0650-14	Headset, Heavy Duty, Over-the-Head, w/PTT
12082-0650-15	Headset, Behind-the-Head, Boom Mic, Earpiece, w/PTT
12082-0650-16	Headset, Tactical, Boom Mic, Earpiece, w/PTT
12082-0650-17	Skull Mic, w/Body PTT and Earcup
12082-0650-18	Throat Mic, W/Acoustic Tube & Body PTT
12082-0650-19	Throat Mic, w/Acoustic Tube, Body and Ring PTT
LS103239V1	Earphone, Lapel Microphone, 2.5mm
LS103239V2	Earphone, Lapel Microphone, 2.5mm, RT Angle

3.2 CLASS 1, DIVISION 1 OPTION

APPLIES TO XL-200P C1D1 NON-REBANDED, XL-200P C1D1 REBANDED, XL-185 C1D1 NON-REBANDED, XL-185P C1D1 REBANDED, XL-185 C1D1 UHF, and XL-185 C1D1 VHF

Radios ordered with the Class 1, Division 1 option are considered “intrinsically safe apparatus.” These radios are intrinsically safe to U.S. standard ANSI/TIA 4950-A and are suitable for use in the following locations:

US:

Class I, Division 1, Groups C and D; Class II, Division 1, Groups E, F and G; Class III, Division 1 hazardous locations; Class 1, Division 2, Groups A, B, C and D or non-hazardous (unclassified) locations only.

Classe I, Division 1, Groupes C et D; Classe II, Division 1, Groupes E, F et G; Classe III, Division 1 emplacements dangereux; Classe 1, Division 2, Groupes A, B, C et D, ou en sites non-hasardeux (non-classifiés) seulement.

Canada:

Class 1, Division 2, Groups A, B, C, and D or non-hazardous (unclassified) locations only.

Classe 1, Division 2 sont adéquates pour utilisation en Classe 1, Division 2, Groupes A, B, C et D, ou en lieux non-hasardeux (non-classifiés) seulement.

EXPLOSION HAZARD – REPLACE BATTERY PACK ONLY IN AN AREA KNOWN TO BE NON-HAZARDOUS, AND ONLY WITH L3HARRIS PART NO. 14035-4045-01.

AVERTISSEMENT – RISQUE D'EXPLOSION – LES BATTERIES DOIVENT ÊTRE REMPLACÉES DANS UNE ZONE RECONNUE NON-HASARDEUSE SEULEMENT, ET SEULEMENT AVEC UNE BATTERIE L3HARRIS PORTANT LE NUMÉRO DE PIÈCE 14035-4045-01.

EXPLOSION HAZARD – Substitution of any component may impair suitability for Class I, Division 1; Class II, Division 1; Class III, Division 1; or Class 1, Division 2.

AVERTISSEMENT – RISQUE D'EXPLOSION – Une substitution de toute composante pourrait compromettre la convenance pour la Classe I, Division 1; Classe II, Division 1; Classe III, Division 1; ou Classe 1, Division 2.

EXPLOSION HAZARD – Do not exceed maximum battery charging current of 1.7 A or maximum charging voltage of 8.4 V DC at any time.

CAUTION - The battery used in this device may present a risk of fire or explosion when heated above 100°C (212°F) or incinerated. Replace battery with L3Harris Part No. 14035-4045-01 only. Use of another battery may present a risk of fire or explosion.

Battery replacement instructions: Remove battery by 1) depressing battery latches then 2) remove battery from radio chassis. Install replacement battery by inserting battery in radio chassis opening and depressing battery into chassis until both battery latches are engaged. Dispose of used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire.

WARNING

EXPLOSION HAZARD – In addition to any simple single-ended coil antenna and carrying case option, only the following L3Harris accessories may be used with this radio:

PART NUMBER	DESCRIPTION	APPROVED HAZARDOUS LOCATIONS
12082-0600-01	Standard Speaker Mic – Non-Antenna	US: Class I, Division 1, Groups C and D; Class II, Division 1, Groups E, F and G; Class III, Division 1 hazardous locations; Class 1, Division 2, Groups A, B, C and D Canada: Class 1, Division 2, Groups A, B, C and D hazardous locations
12082-0600-02	Speaker Microphone, Emergency Button	US: Class I, Division 1, Groups C and D; Class II, Division 1, Groups E, F and G; Class III, Division 1 hazardous locations; Class 1, Division 2, Groups A, B, C and D Canada: Class 1, Division 2, Groups A, B, C and D hazardous locations
12082-0600-03	Speaker Microphone, Emergency Button, Antenna, 18” – Not approved for XL-185P	US: Class 1, Division 2, Groups A, B, C and D hazardous locations Canada: Class 1, Division 2, Groups A, B, C and D hazardous locations
12082-0650-13	Headset, Heavy Duty, Behind-the-Head, w/PTT	US: Class 1, Division 2, Groups A, B, C and D hazardous locations Canada: Class 1, Division 2, Groups A, B, C and D hazardous locations
12082-0650-14	Headset, Heavy Duty, Over-the-Head, w/PTT	US: Class 1, Division 2, Groups A, B, C and D hazardous locations Canada: Class 1, Division 2, Groups A, B, C and D hazardous locations
LS103239V1	Earphone for speaker/mic	US: Class I, Division 1, Groups C and D; Class II, Division 1, Groups E, F and G; Class III, Division 1 hazardous locations; Class 1, Division 2, Groups A, B, C and D Canada: Class 1, Division 2, Groups A, B, C and D hazardous locations
LS103239V2	Earphone for speaker/mic, Right Angle	US: Class I, Division 1, Groups C and D; Class II, Division 1, Groups E, F and G; Class III, Division 1 hazardous locations; Class 1, Division 2, Groups A, B, C and D Canada: Class 1, Division 2, Groups A, B, C and D hazardous locations
12082-0600-04	Speaker Microphone, Emergency Button, Antenna, 25.6” - Not approved for XL-185P	US: Class 1, Division 2, Groups A, B, C and D hazardous locations Canada: Class 1, Division 2, Groups A, B, C and D hazardous locations
12082-0600-05	Speaker Microphone, Emergency Button, Antenna, 30” - Not approved for XL-185P	US: Class 1, Division 2, Groups A, B, C and D hazardous locations Canada: Class 1, Division 2, Groups A, B, C and D hazardous locations

4. INTRODUCTION

4.1 DESCRIPTION

XL Converge Series portable radios provide the advanced connectivity that first responders require while addressing evolving voice and data communications. They meet MIL-STD-810G for durability and are certified to more stringent MIL-STD parameters for contamination by fluids and explosive atmospheres. XL portable radios support P25 Trunking, P25 Conventional, Enhanced Digital Access Communications System (EDACS®), analog conventional, Mission Critical Push-to-Talk (MCPTT), and BeOn® operation over a Wi-Fi® or LTE network.


NOTE

EDACS operation is not supported in UHF or VHF.

Refer to the *BeOn Configuration and Use Feature Manual*, 14221-7200-6130, for details on configuring and using BeOn.

Refer to the *MCPTT Feature Manual*, 14221-7200-6210, for details on configuring and using MCPTT.

The XL-200P is a P25 converged, *multiband* Land Mobile Radio with LTE. Designed for anyone who needs to communicate with multiple agencies or across multiple bands, the XL-200P delivers mission-critical connectivity.

The XL-185P and XL-150P are P25 converged *single-band* Land Mobile Radios with LTE, available in VHF, UHF, 700/800, or 900 MHz frequencies. These premium portables deliver a powerful set of XL capabilities, making them the best value in their class.

Radio features include:

- Extremely Rugged – Exceeds the standards of other radios on the market.
- Multiband Operation – Supports any combination of VHF, UHF, and 700/800 MHz frequencies. Also allows different bands to be enabled for selected users.
- Single-key DES Encryption – Provides basic secure communications without having to buy the complete encryption option.
- Instant Recall of Received Audio – Allows user to replay the last transmission received to avoid unnecessary repetition.
- Active Noise Cancellation – With three internal microphones to transmit intelligible audio from users in loud environments.
- Built-in GPS – For location reporting and rapid response for emergencies.
- Integrated Bluetooth® – For wireless interface to selected accessories.
- Wi-Fi Connectivity – Permits simple and easy radio software and personality updates.
- Wi-Fi Access Point – Radios that include the LTE option can be configured via RPM2 to act as a Wi-Fi access point and/or router, providing access to broadband data for Wi-Fi devices.
- Covert Mode – Allows users to quickly configure the radio for operation in a covert environment.
- Fully Programmable Keypad – Each key can be programmed to a variety of functions.
- Four-position switch – Provides added configuration flexibility.

- Unique User Interface – Tools specially designed by first responders make radio operation simple and intuitive. An easy-to-read multi-color front display and a monochromatic top display with optional colored backlighting enhance communications for improved user safety.

Refer to Table 4-1 for the list of options and accessories. Additional accessories may have been added since publication of this manual; contact L3Harris for more information.

4.2 STORAGE GUIDELINES

Store your radio and batteries in a clean, cool [not exceeding 86 °F (+30 °C)], dry, and ventilated storage area.

4.3 BASIC SETUP

4.3.1 Assemble the Radio

Only use an L3Harris charger approved for the battery chemistry. Injury could occur from improper charger use.

Do not over-tighten the antenna as damage could result. Torque should not exceed 20 in-lbs. This torque is measured at a grip point one inch above the antenna's base.

Fully charge the battery before first use. Due to government regulations, batteries ship in a discharged state and may require up to two (2) minutes in a charger for successful initialization. During initialization, the charger does not show any charge indication. After this initialization period, charging resumes normally.

1. Make sure batteries are charged per the manual supplied with the charger.
2. To attach optional belt clip, remove the existing tab from the back of the radio above the battery compartment. Slide the belt clip into the groove.
3. Lift clip, if installed, and slide top of battery into top of battery compartment at the rear of the radio.
4. Press down on bottom side of battery until it snaps into place.

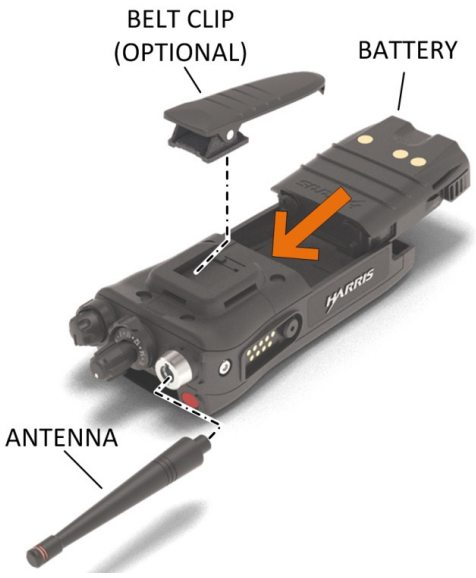


Figure 4-1: Radio Assembly

4.3.2 Removing the Battery

To remove, press and hold the two tabs at the bottom of the battery and then pull battery up and out of the radio.

Figure 4-2: Remove the Battery

4.3.3 Removing the Optional Belt Clip or D-Post

Remove the battery before removing the belt clip or D-Post. To remove the belt clip, pry up on the metal spring towards the top of the battery compartment using a flat head screwdriver and slide the belt clip or D-Post out of the groove in the back of the radio.

4.3.4 Install the SIM Card

To install the SIM card:

1. Remove the battery as shown in Figure 4-2.
2. Remove the SIM card door cover by loosening the two screws on the SIM door using a T6 driver.

3. Install the SIM card in the slot. Orient the SIM per the FCC label below the SIM opening.
4. Reinstall the SIM door using the two screws and T6 driver.
5. Reinstall the battery by inserting the battery in the radio chassis opening and pressing the battery into the chassis until both battery latches are engaged.

4.4 UNIVERSAL DEVICE CONNECTOR

The Universal Device Connector (UDC) provides connections for external accessories such as a headset, a speaker-microphone, audio test box, audio test cables, and programming cables. The UDC is located on the right side of the radio, opposite the PTT Button. The UDC facilitates programming and testing the radio. The UDC pins perform different functions depending on the accessory attached to the UDC.

Figure 4-3: Universal Device Connector

4.5 CLEANING

Keep the exterior of the radio, battery, antenna, and radio accessories clean.

Periodically clean using the following procedures:

1. To remove dust and dirt, clean using damp clean cloth (warm water and mild detergent soap or Simple Green).
2. Follow by wiping with damp (warm water) clean cloth. Wipe dry with clean cloth.
3. Remove the battery and wipe the battery and radio contacts using a soft dry cloth to remove dirt or grease. This will ensure efficient power transfer from the battery to the radio.
4. Remove any accessories and clean the UDC contacts using a clean dry cloth. When the UDC is not in use, cover the connector with the protective dust cap to prevent the build-up of dust or water particles.

5. After excessive environmental exposures (such as immersion, salt/fog, sand/dust, high humidity) with long duration (4 hours or more), the radio and battery must be cleaned. For marine environments, cleaning must be performed daily. Any observed corrosion on exposed metal contacts (battery contacts, radio contacts, exterior screws, antenna connectors) must be cleaned immediately.

For more rigorous cleaning, use the following procedure:

Do not use chemical cleaners, spray, or petroleum-based products. They may damage the radio housing. L3Harris recommends using Calla 1452 or equivalent.

1. Apply the cleaning solution to a clean damp cloth and clean the radio.

Do not spray cleaning solution directly on radio. To clean the radio in the speaker and microphone areas, carefully wipe these areas but prevent the cleaning solution from entering the speaker or microphone openings.

2. Wipe off the radio with clean damp cloth using mild warm soapy water.
3. Follow up by wiping off the radio with clean damp cloth using warm water only.
4. Wipe dry with clean cloth.

4.6 OPTIONS AND ACCESSORIES

Only use L3Harris approved accessories. Refer to L3Harris' Product and Services catalog for the complete list of options and accessories available. Contact L3Harris for requirements not contained in this list:

Always use the correct options and accessories (battery, antenna, speaker/mic, etc.) for the radio. Immersion rated options must be used with an immersion rated radio. Refer to Table 4-1.

Refer to Section 3 for radios with C1D2 or C1D1 options.

Table 4-1: Options and Accessories

DESCRIPTION	PART #	XL-200P OPTION #	XL-185P OPTION #	XL-150P OPTION #
ANTENNAS				
Full Spectrum Antenna	14035-4000-01	XL-NC5Z	XS-NC5Z	XV-NC5Z
Wideband Whip Antenna 378-520 MHz, 762-870 MHz	14035-4420-01	XL-NC8E	XS-NC8E	XV-NC8E
¼ Wave Whip Antenna, 762-870 MHz	14035-4440-02	XL-NC8F	XS-NC8F	XV-NC8F
½ Wave Whip Antenna, 762-870 MHz	14035-4440-01	XL-NC8D	XS-NC8D	XV-NC8D
¼ Wave Whip Antenna, 762-944 MHz XL-185P Only	14035-4450-02	NA	XS-NC8L	
½ Wave Whip Antenna, 762-944 MHz XL-185P Only	14035-4450-01	NA	XS-NC8K	
½ Wave Whip Antenna, 890-960 MHz XL-185P Only	E75-0286-001	NA	NA	N/A
½ Wave Whip Antenna (764 – 870 MHz)	KRE1011506/1	XL-NC5K	N/A	N/A
¼ Wave Stub Antenna (764 – 870 MHz)	KRE1011506/2	XL-NC5X	N/A	N/A

DESCRIPTION	PART #	XL-200P OPTION #	XL-185P OPTION #	XL-150P OPTION #
Helical VHF	KRE1011219/2	XL-NC1C	N/A	N/A
BATTERIES/CHARGERS				
Battery, Li-Ion, 3100 mAH, UL	14035-4010-05	XL-PA3X	XS-PA3X	N/A
Battery, Li-Ion, 7.2VDC, 3100 mAH C1D1	14035-4045-01	XL-PA4F	XS-PA4F	N/A
Battery, Li-Ion, 3100 mAH, LTE	14036-4020-01	XL-PA3V	XS-PA3V	XV-PA3V
Battery, Li-Ion,3100 mAH, LTE, UL C1D2	14036-4020-02	XL-PA2A XL-PA3X[4]	XS-PA2A XS-PA3X[4]	N/A
Battery, Li-Ion, Hi-Capacity, 4800 mAH	14035-5050-01	XL-PA4K	XS-PA4K	XV-PA4K
Battery, Li-Ion, Hi-Capacity, 4800 mAH, C1D2	14035-5050-02	XL-PA4L XL-PA4M[5]	XS-PA4L[5] XS-PA4M	N/A
Charger, Single Bay	14035-1800-01	XL-CH4X	XS-CH4X	XV-CH4X
Charger, Multi Bay	14035-1800-02	XL-CH5A	XS-CH5A	XV-CH5A
Charger, Vehicular	14035-4100-01	XL-CH4W	XS-CH4W	XV-CH4W
AUDIO ACCESSORIES				
Speaker Mic, 500F (C1D1/C1D2)	14035-4750-01	XL-AE2W	XS-AE2W	XV-AE2W
Speaker Mic, Revo NC2 (C1D1/C1D2). Can only be used with earphones LS103239V1 and LS103239V2	14035-4700-01	XL-AE2V	XS-AE2V	XV-AE2V
Speaker Microphone (C1D1/C1D2)	12082-0600-01	XL-AE9N	XS-AE9N	XV-AE9N
Speaker Microphone, Emergency Button (C1D1/C1D2)	12082-0600-02	XL-AE4B	XS-AE4B	XV-AE4B
Speaker Microphone, Emergency Button, Antenna, 18” (C1D2 Only)	12082-0600-03	XL-AE2K	XS-AE2K	XV-AE2K
Speaker Microphone, Emergency Button, Antenna, 25.6” (C1D2 Only)	12082-0600-04	XL-AE2J	XS-AE2J	XV-AE2J
Speaker Microphone, Emergency Button, Antenna, 30” (C1D2 Only)	12082-0600-05	XL-AE2L	XS-AE2L	XV-AE2L
Speaker Microphone, Wireless, Bluetooth	12082-0681-01	XL-AE6K	XS-AE6K	XV-AE6K
Microphone, Palm, 2-Wire, Black	12082-0650-01	XL-AE6G	XS-AE6G	XV-AE6G
Microphone, Palm, 2-Wire, Beige	12082-0650-02	XL-AE6M	XS-AE6M	XV-AE6M
Microphone, Mini-Lapel, 3-Wire, Black	12082-0650-03	XL-AE6H	XS-AE6H	XV-AE6H
Microphone, Mini-Lapel, 3-Wire, Beige	12082-0650-04	XL-AE6N	XS-AE6N	XV-AE6N
Earphone Kit, Black	12082-0650-05	NA	NA	NA
Earphone Kit, Beige	12082-0650-06	NA	NA	NA
Headset, Light Weight, Over-the-Head, Single Ear, In-Line PTT	12082-0650-08	XL-AE2B	XS-AE2B	XV-AE2B
Headset, Light Weight, Behind-the-Head, Dual Ear, In-Line PTT	12082-0650-09	XL-AE2C	XS-AE2C	XV-AE2C
Headset, Light Weight, Behind-the-Head, Dual Ear, Pig Tail PTT	12082-0650-10	XL-AE2D	XS-AE2D	XV-AE2D
Headset, Light Weight, Behind-the-Head, Dual In-Ear, In-Line PTT	12082-0650-11	XL-AE2E	XS-AE2E	XV-AE2E
Headset, Light Weight, Behind-the-Head, Dual In-Ear, Pig Tail PTT	12082-0650-12	XL-AE2F	XS-AE2F	XV-AE2F
Headset, Heavy Duty, Behind-the-Head, w/PTT	12082-0650-13	XL-AE1P	XS-AE1P	XV-AE1P
Headset, Heavy Duty, Over-the-Head, w/PTT	12082-0650-14	XL-AE1R	XS-AE1R	XV-AE1R
Headset, BTH Boom Mic, Earpiece, w/PTT	12082-0650-15	XL-AE2G	XS-AE2G	XV-AE2G
Skull Mic, w/Body PTT, Earcup	12082-0650-17	XL-AE1L	XS-AE1L	XV-AE1L
Throat Mic, w/Acoustic Tube, Body PTT	12082-0650-18	XL-AE1M	XS-AE1M	XV-AE1M
Throat Mic, w/Acoustic Tube, body and Ring PTT	12082-0650-19	XL-AE1N	XS-AE1N	XV-AE1N
Bluetooth, Covert, Earpiece/MIC/PTT, Radios	12082-0684-01	XL-AE1S	XS-AE1S	XV-AE1S
Earphone, Lapel Microphone	LS103239V1	XL-AE3Z	XS-AE3Z	XV-AE3Z
Earphone, Speaker Mic, Right Angle, 2.5 MM	LS103239V2	XL-AE1K	XS-AE1K	XV-AE1K

[4] For use as a spare battery with UL C1D2 radio option XL-PA2A or XS-PA2A.

[5] For use as a spare UL C1D2 high capacity battery with XL-PA4L or XS-PA4L.

DESCRIPTION	PART #	XL-200P OPTION #	XL-185P OPTION #	XL-150P OPTION #
Speaker Microphone, XL Extreme, XL-200P, Green[6]	14100-4700-22	XL-AE3H	XS-AE3H	XV-AE3H
Speaker Microphone, XL Extreme, XL-200P, Black[6]	14100-4700-25	XL-AE3J	XS-AE3J	XV-AE3J
Speaker Microphone, XL Extreme, XL-200P, Yellow[6]	14100-4700-28	XL-AE3K	XS-AE3K	XV-AE3K
MISCELLANEOUS ACCESSORIES				
Cable, Data Interface	12082-0445-A1	XL-CJ4A	XS-CJ4A	XV-CJ4A
Cable, MATQ-03424, Test	12082-0435-A1	NA	NA	NA
Cable, USB, Key Loading/Programming	12082-0410-A1	XL-CJ3A	XS-CJ3A	XV-CJ3A
Cable, KVL, Key Loading	12082-0400-A1	XL-CJ3B	XS-CJ3B	XV-CJ3B
Adapter, 6-Pin Hirose	14002-0197-01	XL-CJ4B	XS-CJ4B	XV-CJ4B
Holster, Leather, Radio, Premium	14035-4200-01	NA	NA	NA
Holster, Leather W/Rings, Radio, Premium	14035-4200-02	NA	NA	NA
Holster, Nylon, Black, Radio, Premium	14035-4200-03	NA	NA	NA
Holster, Ring, Leather, Radio, Premium	14035-4200-04	NA	NA	NA
Case, Leather, Premium, Belt Loop, D-swivel	14035-4201-01	XL-HC4K	XS-HC4K	XV-HC4K
Case, Leather, Premium, Shoulder Strap	14035-4201-02	XL-HC4L	XS-HC4L	XV-HC4L
Case, Leather, Premium, Shoulder Strap	14035-4202-01	NA	NA	NA
Holster, Leather W/Rings, Radio, Standard	14035-4202-02	NA	NA	NA
Holster, Nylon, Black, Radio, Standard	14035-4202-03	NA	NA	NA
Holster, Ring, Leather, Radio, Standard	14035-4202-04	NA	NA	NA
Belt Loop, Leather, Premium	14002-0218-01	XL-HC4A	XS-HC4A	XV-HC4A
D-Swivel	12082-3230-01	NA	NA	NA
Strap, Shoulder	CC103333V1	NA	NA	NA
Metal Belt Clip	12082-1290-01	XL-HC3L	XS-HC3L	XV-HC3L
Case, Leather, Premium, Shoulder Strap	14035-4201-02	XL-HC4L	XS-HC4L	XV-HC4L
Belt Loop, Leather	KRY1011609/1	NA	NA	NA
Holster, Leather, Premium	14036-4000-01	NA	NA	NA
Holster, Leather W/Rings, Premium	14036-4000-02	NA	NA	NA
Side Connector Cover	12082-1398-01	XL-ZN7V	XS-ZN7V	XV-ZN7V
Leather Case, 2.5" Belt Loop, D-Swivel	14036-4003-01	XL-HC4Z	XS-HC4Z	XV-HC4Z
Leather Case, 3" Belt Loop	14036-4003-02	XL-HC6A	XS-HC6A	XV-HC6A
Leather Case, 2.5” Belt Loop, D-Swivel, High Capacity Battery	14036-4003-03	XL-HC6Y	XS-HC6Y	XV-HC6Y
Leather Case, 3” Belt Loop, High Capacity Battery	14036-4003-04	XL-HC6Z	XS-HC6Z	XV-HC6Z

[6] Requires XLP R14A or later.

4.7 RELATED PUBLICATIONS

The following publications contain additional information about the radio and related products:

MANUAL NUMBER	DESCRIPTION
14221-1800-2010	XL Portable Radio Product Safety Manual
14221-1800-1000	XL Portable Radio Quick Guide
14221-1800-8010	XL Portable Radio Software Release Notes
MM1000019423	Key Manager and Key Admin Overview and Operation Manual
MM1000019424	Key Manager and Key Loader Overview and Operation Manual
14221-1600-2090	Single-Bay Desktop Charger Operator Manual
14221-1600-2110	VC4000 Vehicular Charger Operator Manual
14221-7200-6110	Voice Annunciation Feature Manual
14221-2100-3000	Advanced Access Control/Radio Personality Manager Overview Manual
14221-1100-8170	Radio Personality Manager 2 (RPM2) Software Release Notes
14221-1100-2060	RPM2 User's Manual
14221-7200-6130	BeOn Configuration and Use Feature Manual
14221-1800-4000	Nano SIM Card Install/Replacement Accessory Kit Installation Manual
14221-1800-8010	XLP Radio Software Release Notes
14221-1800-4010	Global Modem Upgrade Kit Installation Guide
14221-1800-8030	GPS NMEA Repeater for XL Radios Software Release Notes
14221-2100-2010	L3Harris Device Management User's Manual
14221-2100-8030	L3Harris Device Management Software Release Notes.
14221-7200-6210	Mission Critical Push-To-Talk Feature Manual
14221-1100-8270	Mission Critical Push-To-Talk Software Release Notes

The product safety manual and the quick guide are included with the radio equipment package when the radio ships from the factory. All publications listed above are available at www.pspc.harris.com via an Information Center login and Tech Link.

5. BASIC OPERATION

5.1 RADIO CONTROLS

Figure 5-1: Radio Controls

NOTE

Table 5-1 describes the default functions of buttons, knobs, and controls. Most can be programmed for different functions; see Section 7.5 for more information.

Table 5-1: Radio Controls, Indicators, and Connectors

CONTROL/INDICATOR	FUNCTION
Group/Channel Knob	Selects groups/channels. Can be programmed to select systems.
Power/Volume Knob	Turn clockwise to power on radio and increase volume of audio heard from speaker. Minimum volume levels may be programmed into the radio to prevent missed calls due to a low volume setting.
A/B (Ø/O) Switch	User-programmable switch (see Section 7.5.2).

CONTROL/INDICATOR	FUNCTION
Microphone (Secondary)	When noise cancellation is enabled, the secondary and primary microphones are used together to form a dual microphone system. Noise cancellation improves the quality of transmitted voice. When noise cancellation is disabled, only the primary microphone is used. See Section 5.19 for detailed information on using noise cancellation.
A/B/C/D Switch	User-programmable switch. By default, selects one of four channel banks (see Section 5.13).
User-Programmable Buttons	Used to select a commonly used function as an alternative to navigating menus. This is configured via programming using Radio Personality Manager 2 (RPM2). See Section 7.5.1 for the options that can be programmed to these buttons.
Push-To-Talk (PTT) Button	Press to transmit. Make sure Push-To-Talk (PTT) is enabled (Section 6.5).
Battery	Battery - Refer to Section 4.3 for battery connection and removal.
Antenna Connector	Antenna connector.
Emergency Button	Used to place radio in emergency mode (see Section 5.35). This button can be disabled via programming using RPM2. In addition, this button can be used in conjunction with a User-Programmable Button to clear emergencies if configured to do so.
Indicator Light Emitting Diode (LED)	Indicates radio status: • Red = actively transmitting. • Green = actively receiving. • Orange = actively transmitting encrypted. • Blue = Bluetooth connection active between the radio and an Extreme Speaker Microphone (ESM).
Top Display	Shows summary of radio operation, including channel/talkgroup (which can be color coded), as well as a variety of programmable icons. Display orientation can be configured for viewing from the front or rear of the radio. (Section 6.6).
Speaker	Radio speaker which can be muted (Section 6.5). Adjust volume using the Power/Volume knob.
Microphone (Primary)	When noise cancellation is enabled, the primary and secondary microphones are used together to form a dual microphone system. Noise cancellation improves the quality of transmitted voice. When noise cancellation is disabled, only the primary microphone is used. See Section 5.9 for detailed information on using noise cancellation.
Front Display	Front display shows complete status and radio menus.
User-Programmable Soft Keys	User-programmable dynamic keys that have their current function labeled on the radio display directly above each button. See Section 7.5.1 for the options that can be programmed to these buttons.
Menu/Select Button	From the Main Display, press this button to access the menu. Also, selects highlighted menu items.

CONTROL/INDICATOR	FUNCTION
Navigation Buttons	Navigates menu items. In addition: • Press the left navigation button while on the idle display to access Channel Information (see Section 6.4). By default, this feature is disabled by RPM2. • Press the down navigation button while on the idle display to display the functions assigned to programmable buttons (see Section 7.5). • Press the up navigation button to display Missed Call info. • Press the right navigation button to end or reject an I-Call.
Keypad	By default, used to enter text or numbers. Can be programmed for various functions (see Section 7.5).

5.2 SOFT DTMF KEYPAD

The partial keypad model of the radio supports a “soft” DTMF keypad. This allows the radio user to utilize a graphical DTMF keypad in place of a physical DTMF keypad.

On screens that require keypad entry, press the **KEYPAD** softkey to display the keypad. Use the navigation buttons to highlight the desired number, press the Menu/Select button to select highlighted digit, and then press the **ENTER** softkey.

For example, when placing an Individual Call to a numeric address, the soft DTMF keypad can be used to enter the address as shown:

Figure 5-2: Using the Soft DTMF Keypad

5.3 BEFORE FIRST USE

Make sure the radio has:

- Fully charged battery
- Antenna attached
- Personality and radio programmed using RPM2
- Encryption keys loaded if using encrypted channels
- Personality activated

5.4 POWER ON/OFF AND SET VOLUME

The power switch and volume control are the same knob on top of the radio (see Figure 5-1). Turn the Power/Volume Knob clockwise to power on radio and increase the volume. The radio can be programmed to play an audible tone when changing the volume.

NOTE

A minimum volume level can be programmed into the radio to prevent missed calls due to a low volume setting.

NOTE

The radio can be programmed to require the entry of a PIN 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.

The radio can be programmed for two action power off. When enabled, the radio will not power down when the power/volume knob is rotated fully counterclockwise until the button programmed for Two Action Power Off is pressed also. This prevents radio from being turned off unexpectedly.

5.5 VIDA ID

VIDA ID provides the capability to provision the VIDA User Personality configured in the UAS to radios operating on P25 networks via a User Login. Each personality can contain up to 16 profiles and each profile can contain up to sixteen Talk Groups.

Refer to Section 10.1 for a list of potential login and provisioning error messages and what to do if they occur.

5.5.1 User Login

User Login enables multiple radio users to pick a radio from a fleet pool and enter unique credentials to log into the P25 system. Upon successful login, the Alias associated with the radio user is displayed at various end points in the P25 system.

A user can login on up to three (3) devices simultaneously. For example, if the “same user” is logged into a portable radio and mobile radio, the P25 system can differentiate the subscribers while transparently displaying the alias to other users.

Login can be initiated by a menu option, a button programmed for user login, or by selecting a P25 system that requires login. To login manually:

1. From the **UTILITY** radio menu, select **USER LOGIN**, or press the button programmed for User Login.
2. Enter the **System ID**, **User ID**, and **Password**, as required.
3. Select **Login**.

5.5.2 Provisioning

If provisioning is enabled via radio programming and the user has successfully logged in, the VIDA User Personality configured in the UAS is provisioned to the radio. When no VIDA Provisioned database is available, the radio will operate using the RPM2-programmed personality.

5.6 RADIO DISPLAYS

5.6.1 Top Display

The top display (Figure 5-3) shows a summary of status, such as channel number/bank, channel short name, battery, scanning, and emergency mode. The display can be configured for viewing from the front or rear of the radio (see Section 6.6). The channel short name is programmed using RPM2.

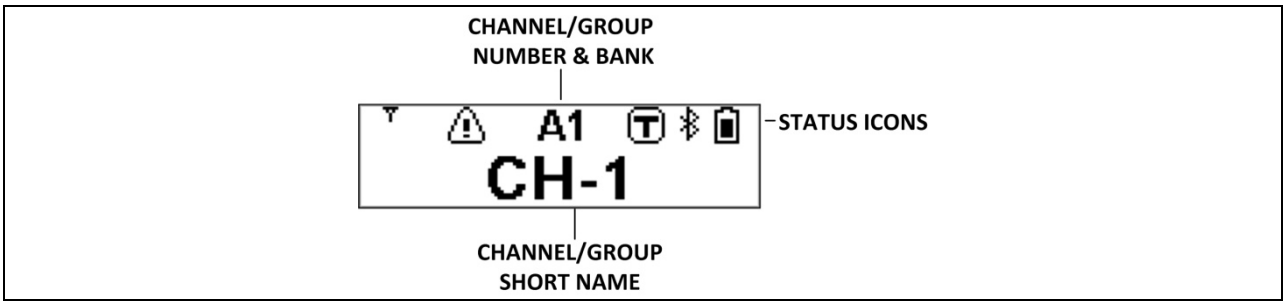


Figure 5-3: Top Display

The radio can be programmed to change the color of the top display backlight relative to the currently selected channel/group.

The top display backlight is Orange when actively receiving an emergency unless the backlight is off, either directly or via covert or stealth emergency configuration. This applies to an emergency condition in all modes of operation (P25, MDC, etc.).

The display backlight is Green when the radio is operating in RF Safe Mode (100 mW transmit power) unless the backlight is off, either directly or via covert configuration. Therefore, it is recommended that you do not use Green as talkgroup/channel color when the radio is configured to allow RF Safe Mode operation.

During an emergency, the emergency backlight color supersedes the RF Safe Mode color and any programmed talkgroup/channel color. After the emergency is cleared, the original backlight color (if any) is restored.

In RF Safe Mode, the RF Safe Mode backlight color supersedes any programmed talkgroup/channel color. The emergency backlight color supersedes the RF Safe Mode color. When the radio is no longer in RF Safe Mode, the original backlight color (if any) is restored.

5.6.2 Front Display

Figure 5-4 shows a sample front display while on the idle screen. The idle screen appears after power up or after exiting from the menus.

Figure 5-4: Sample Idle Front Display

NOTE

The radio can be programmed to display the User ID on the System line of the display.

Table 5-2 describes some of the icons that may be displayed by the radio. The radio menu also contains an icon glossary in the Utility Menu (see Section 5.9). Icons and their location can be customized using RPM2.

Table 5-2: Radio Icons

ICON	DESCRIPTION	ICON	DESCRIPTION	ICON	DESCRIPTION
	Analog Conventional System		P25 Conventional System		P25 Trunked System
	EDACS System		Zone		User Defined Zone
	(Blue) Trunked Signal Strength		Bluetooth Enabled		Monitor On
	(Red) TX Power		(Blue) Bluetooth Connected		VDOC
	(Green) Receive Signal Strength		Encryption Enabled		Receiving Data
	(No Color) Channel Idle		Global Encryption		Transmitting Data
	(Orange) Transmitting Encrypted		OTAR Disabled		Alert(s) Present
	Battery Fully Charged		OTAR Registered		Vote Scanning

ICON	DESCRIPTION	ICON	DESCRIPTION	ICON	DESCRIPTION
	Battery Level 100% Capacity		OTAR Registering		Scanning Enabled
	Battery Level 75% Capacity		OTAR Rekeying		Emergency
	Battery Level 50% Capacity		Transmit Power Level High		RX Mail
	Battery Level 25% Capacity[7]		Transmit Power Level Low		Noise Cancellation Enabled
	Battery Level 5% Capacity (Low Battery Audio Indicator)		Transmit Power RF Safe		Fire Speaker Mic Attached[8]
	Battery Level Battery Exhausted (RX-Only State)		RX Only		Nuisance Channel
	Battery Charging		Speaker Muted		Conventional Site Unregistered
	Talkaround Enabled		TX Disabled		Conventional Site Registered
	Failsoft		Tones Disabled		Type 99 Enabled
	LTE – Registered Foreign Network		PTT Disabled		GPS Tracking
	LTE – Registered Home		LTE – Denied or Unknown Registration Status		Wi-Fi Clients Connected
	Wi-Fi Signal Strength Indicator		LTE – No Signal		Add New Wi-Fi Client
	Wi-Fi Network Currently Connected		Wi-Fi Network in Process of Connecting		A wearable Bluetooth device is attached [e.g., Self-Contained Breathing Apparatus (SCBA)]
			Mandown		

[7] Battery capacity visual indicator will flash and the radio will play an audible alert every two minutes when battery capacity reaches 25% or less.

[8] For the Fire Speaker Mic Attached icon to display, first the Noise Cancellation icon must be programmed to the radio's front display via RPM2. When you attach the Fire Speaker Microphone (FSM) to the radio and Noise Cancellation is enabled, then the Fire Speaker Mic Attached icon is displayed, replacing the Noise Cancellation icon. This indicates that Noise Cancellation is now being used from the FSM rather than the radio.

5.7 MANDOWN

If enabled via radio programming, the following conditions can be configured to trigger a Mandown condition:

- MOTION - Mandown is declared with lack of motion.
- TILT - Mandown is declared when the radio is tilted.
- BOTH - Mandown is declared by radio tilting and lack of motion.

This can be useful if, for example, a radio user is in danger and has not moved for a certain amount of time. If the user's movement falls below the configured level, then a tone begins playing. An Emergency is declared on the channel/group based on the radio's Emergency configuration.

5.8 STATUS MESSSAGES

The radio may display various radio Status Messages during operation. These messages are described in Table 5-3.

Table 5-3: Status Messages

MESSAGE	DESCRIPTION
PTT DENIED	P25 Trunked and EDACS - The radio or talkgroup is not authorized to operate on the selected system and/or talkgroup.
CALL QUEUED	P25 Trunked and EDACS - The system has placed the call in a request queue.
SYSTEM BUSY	P25 Trunked and EDACS - 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.
SCANNING	The radio is scanning.
TX EMERGENCY	An emergency call is being transmitted.
RX EMERGENCY	An emergency call is being received. The radio displays the unit name or unit ID.
WIDE AREA SCAN	P25 Trunked and EDACS - The radio has entered the Wide Area Scan mode to search for a new system.
INVALID TALKGROUP	P25 Trunked and EDACS - The current talkgroup is not valid for the current system. This could happen if the site denies registration due to an unrecognized talkgroup ID.
INVALID UNIT	P25 Trunked and EDACS - The current unit is not valid for the current system.
REGISTERING	P25 Trunked only - Displayed when the radio is performing a registration/affiliation on a P25 trunking site.
CTRL CHANNEL SCAN	P25 Trunked and EDACS - The control channel is lost and the radio has entered the Control Channel Scan mode to search for the control channel (usually out of range indication).
BAND SCANNING	P25 Trunked - Only displayed if the 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 can perform a full spectrum frequency scan to find a new Control Channel.
MISSED CALL	P25 Modes and EDACS - Another user has tried to call or page this radio. The user can view who the caller was by pressing the up navigation button.
OTAR REKEY COMPLETE	OTAR Rekey operation completed successfully.
USER REGISTRATION FAILED	User Login failed. Change selected system/zone or re-enter credentials.

5.9 PREDEFINED MENU LAYOUTS

Depending on radio programming, some menu options described in this manual may not be available. The radio supports three predefined menu layouts: Full, Custom, and Restricted. Table 5-4 details what is available in each layout:

NOTE

The Custom predefined menu layout allows the administrator to customize the list of menu items that are available to the radio user. Table 5-4 lists the default settings.

Table 5-4: Predefined Menu Layouts

MENU	FULL	CUSTOM (Default Settings)	RESTRICTED
Call Menu	Yes	Yes	Yes
Exit Emergency Mode	Yes	Yes	Yes
Talkaround Mode	Yes	Yes	Yes
Individual Call	Yes	Yes	Yes
Change Talkgroup	Yes	Yes	Yes
Phone Call	Yes	Yes	Yes
Call Alert/Page	Yes	Yes	Yes
Channel Guard	Yes	Yes	Yes
Audio Playback	Yes	Yes	No
Tone Encode	Yes	Yes	Yes
T99 Toggle	Yes	Yes	Yes
Emergency Timer	Yes	Yes	No
Active Emergency Display	Yes	Yes	Yes
Audio Settings	Yes	No	No
Speaker	Yes	No	No
Noise Cancellation	Yes	No	No
PTT	Yes	No	No
Tones	Yes	No	No
Keypad Tones	Yes	No	No
Voice Annunciation	Yes	No	No
Display Settings	Yes	Yes	Yes
GPS Settings	Yes	No	No
Clock Settings	Yes	Yes	No
Display Format	Yes	Yes	No
Time Zone	Yes	Yes	No
Bluetooth Settings	Yes	Yes	No
Bluetooth Enable	Yes	Yes	No
Bluetooth Discoverable	Yes	Yes	No
Volume Control	Yes	Yes	No
Bluetooth Speaker	Yes	Yes	No
External Speaker	Yes	Yes	No
Bluetooth Pairing	Yes	Yes	No
Bluetooth Pairing Add	Yes	Yes	No
Bluetooth Pairing Delete	Yes	Yes	No

MENU	FULL	CUSTOM (Default Settings)	RESTRICTED
Scan Menu	Yes	Yes	Yes
Enable/Disable Scan	Yes	Yes	Yes
View Scan List	Yes	Yes	No
Edit Zone Scan List	Yes	No	No
View Custom Channels	Yes	Yes	No
Edit Custom Scan List	Yes	No	No
Custom Scan	Yes	Yes	No
Site Roam	Yes	Yes	No
Site Alias	Yes	Yes	No
Security Menu	Yes	Yes	Yes
Encryption Enable	Yes	Yes	Yes
Zeroize	Yes	No	No
Global CKR Enable	Yes	No	No
GCKR Key Select	Yes	No	No
Active Key Set	Yes	Yes	Yes
Key List	Yes	Yes	No
OTAR Enable	Yes	Yes	No
OTAR Rekey	Yes	Yes	Yes
KVL Mode	Yes	Yes	Yes
KVL Mode LLA	Yes	Yes	Yes
Message Menu	Yes	Yes	Yes
Radio Status	Yes	Yes	No
Radio Message	Yes	Yes	No
Textlink Messages	Yes	Yes	No
Textlink Forms	Yes	Yes	No
Textlink Mailbox	Yes	Yes	No
Faults	Yes	Yes	Yes
Program Menu	Yes	Yes	No
Activate Plan	Yes	Yes	No
Activate Profile	Yes	Yes	No
Maintenance Menu	Yes	Yes	Yes
Radio Info	Yes	Yes	No
Reset Overtemp Event	Yes	Yes	Yes
Battery	Yes	Yes	No
TCXO Tuning	Yes	No	No
P25 Tests	Yes	No	No
RSSI Display	Yes	Yes	Yes
Phase II Display	Yes	Yes	No
Feature Info	Yes	Yes	No
WiFi Client	Yes	Yes	No
WiFi Access Point	Yes	Yes	Yes
Change Language	Yes	No	No
Change PIN	Yes	Yes	Yes
LTE	Yes	Yes	No
Icon Glossary	Yes	Yes	Yes

MENU	FULL	CUSTOM (Default Settings)	RESTRICTED
User Login	Yes	Yes	Yes
System ID	Yes	Yes	Yes
Unit ID	Yes	Yes	Yes
Password	Yes	Yes	Yes
Device Management	Yes	Yes	Yes
Stealth Mode Settings	Yes	No	No
LCD Enabled	Yes	No	No
LED Enabled	Yes	No	No
Backlight Enabled	Yes	No	No
Side/Alert Tones Enabled	Yes	No	No
Mobile Main Audio Path Enabled	Yes	No	No
Voice Annunciation Enabled	Yes	No	No
Channel/Group Knob Enabled	Yes	No	No
Top Display Enabled	Yes	No	No
Top Display Minimum Brightness	Yes	No	No
Install GPP Software *x*	Yes	Yes	Yes
Zone	Yes	Yes	No

5.10 MENU

Press the Menu/Select button while on the idle display to access the menu. Press the left or right navigation buttons to scroll through the top-level menus and press the up or down navigation buttons to scroll through the sub-menus. Refer to Figure 5-1 for button location. While in a menu, press the Menu/Select button to choose, activate, or toggle the selected item; similar to an enter key. Table 5-5 provides a high-level overview of the menu layout. Menu options on your radio may vary depending on available features and radio programming.

Table 5-5: Menu Navigation

MENUS	DESCRIPTION
CALL MENU:	
EXIT EMERGENCY MODE	Exits emergency. See Section 5.35 for more information.
TALKAROUND MODE	Enable/disable talkaround. See Section 5.25 for more information.
INDIVIDUAL CALL	Allows you to select an individual for an individual call. See Section 5.17 for more information.
CHANGE TLKGRP	Change the selected talkgroup. See Section 5.15.
PHONE CALL	Allows the user to initiate a telephone interconnect call. See Section 5.28 for more information.
CALL ALERT	Select a group for Call Alert transmission. See Section 5.27.
CHANNEL GUARD	Select the Transmit and/or Receive Channel Guard tone. See Section 5.24.
AUDIO PLAYBACK	Replays the last recorded call. See Section 5.30 for more information.
TONE ENCODE	Analog conventional only - Transmits a programmed tone sequence on the current radio system and channel. See Section 6.19 for more information.
T99 TOGGLE	Enable/disable T99. See Section 5.26 for more information.
EMERGENCY TIMER	Enable/disable the Emergency Check In Timer. See Section 6.22 for more information.
ACTIVE EMERGENCY DISPLAY	Allow the radio user to see the units currently in emergency (up to 20) on the radio display. Only applicable for radios with the Extreme feature enabled.
SCAN MENU:	
START SCAN/STOP SCAN	Start or stop scan operation. See Sections 5.31 and 5.32.
SCAN LISTS	View/Edit available scan lists. See Section 6.14.

MENUS	DESCRIPTION
ASSIGNED CUSTOM LIST	Create, View, and Edit Custom Scan Lists. See Section 6.14.6.
SITE ROAMING	Enable/Disable Wide Area System Scan. See Section 6.14.7.
SITE ALIAS	Select an available site from this list to lock the radio to; i.e., prevent the radio from roaming. This is also known as Site Lock. See Section 6.14.8 for more information.
SECURITY MENU:	
ZEROIZE KEYS	Removes all encryption keys from the radio. See Section 6.20.1.
ENCRYPTION	Enable/Disable encryption. See Section 5.22.
GLOBAL ENCRYPTION	Enable/Disable Global Encryption. See Section 6.20.3.
GLOBAL KEY	Select the Global Key. Only available if Global Encryption is Enabled. See Section 6.20.3.
ACTIVE KEYSET	Select the Active Keyset. See Section 6.20.4.
KEY LIST	View available key lists. See Section 6.20.5.
OTAR	Enable/disable Over-the-Air Rekeying (OTAR). See Section 6.20.6.
OTAR REKEY	Request that the KMF updates the keys in the radio. See Section 6.20.6.
KVL MODE	Enables the radio to have keys loaded using the Motorola KVL. See Appendix C.2.3.
KVL MODE LLA	Puts the radio into KVL LLA Mode, allowing the user to load Link-Layer Authentication (LLA) Keys via a KVL-5000.
MESSAGES MENU:	
RADIO STATUS	Used to send a status condition to the site without making a voice call. See Section 6.14.8.
RADIO MESSAGE	Used to send a message to the site without making a voice call. See Section 6.16.
TEXTLINK MESSAGES	Allows the user to send a Radio TextLink message. See Section 6.17.
TEXTLINK FORMS	Allows the user to send a Radio TextLink form. See Section 6.17.
TEXTLINK MAILBOX	Contains received Radio TextLink messages. See Section 6.17.
FAULTS/ALERTS	Displays radio faults and alerts. See Section 6.18.
UTILITY MENU:	
AUDIO SETTINGS:	
• SPEAKER (MUTE/UNMUTE)	Mute or unmute the speaker audio.
• NOISE CANCELLATION	Enable or disable Noise Cancellation. See Section 5.19.
• PTT	Enable or disable Push-To-Talk (PTT). Disable PTT to prevent accidental keying, such as when radio is in the holster or you are getting into a car.
• TONES	Enable or disable radio side tones.
• KEYPAD TONES	Enable or disable tones that sound when the radio's keypad buttons are pressed.
• VOICE ANNUNCIATION	Enable or disable Voice Annunciation.
DISPLAY SETTINGS:	
• COLOR SCHEME	Press the Menu/Select button to toggle the front and top display's COLOR SCHEME for optimum visibility in day or night conditions (NORMAL or INVERTED).
• FRONT BACKLIGHT	Press the Menu/Select button to toggle the front display backlighting between ON/OFF/MOMENTARY/MOMENTARY (OFF).
• FRONT BRIGHTNESS	Press the left or right navigation buttons to dim or brighten the display.
• FRONT TIMEOUT	When the FRONT BACKLIGHT setting is MOMENTARY, this value specifies how long the radio needs to be inactive before the front display's backlight turns off. Press the left or right navigation buttons to change the time in 0.5 second increments.

MENUS	DESCRIPTION
• FRONT DISPLAY OFF	Turns the front display off completely. Press the Menu/Select button to turn the front display back on. When the front display is turned off, the only button functions that are allowed are: • PTT • Emergency • Toggle Profile • Flashlight • Toggle Stealth • Channel Up • Channel Down • Volume Up • Volume Down
• TOP BACKLIGHT	Press the Menu/Select button to toggle the top display backlighting ON/OFF/MOMENTARY.
• TOP BRIGHTNESS	Press the left or right navigation buttons to dim or brighten the display.
• TOP TIMEOUT	When the TOP BACKLIGHT setting is MOMENTARY, this value specifies how long the radio needs to be inactive before the top display's backlight turns off. Press the left or right navigation buttons to change the time in 0.5 second increments.
• TOP ORIENTATION	Set orientation of top display to be viewed from radio: FRONT, BACK, or AUTO. When AUTO is selected, the radio changes the top display to be viewed from the back if an external microphone or speaker is attached. Otherwise, the display can be viewed from the front.
• INDICATOR LED	Press the Menu/Select button to toggle the indicator LED ON or OFF.
BLUETOOTH:	
• ENABLED (YES/NO)	Enable/disable Bluetooth. See Section 6.10 for more information.
• DISCOVERABLE (YES/NO)	
• VOLUME CONTROL (YES/NO)	If YES, the radio knob can be used to adjust Bluetooth speaker volume (if the Bluetooth device supports it).
• BLUETOOTH SPEAKER	Mute/Unmute Bluetooth Speaker.
• EXTERNAL SPEAKER	Mute/Unmute External Speaker.
• PAIRING MGMT	Pair Bluetooth devices with the radio. See Section 6.10 for more information.
CLOCK SETTINGS:	
• TIME FORMAT	Select 12-hour, 12-hour with date toggle, 24-hour, or 24-hour with date toggle time display format.
• TIME ZONE	Set time zone relative to Universal Time Coordinated (UTC).
GPS SETTINGS:	
• GPS (ENABLED/DISABLED)	Enable/disable GPS.
• POSITION INFO	Displays GPS, Latitude, Longitude, and Altitude information. From this menu, click **NEXT** to access SA INFO (see Section 6.2).
• ANGULAR UNITS	Set unit of measurement of displayed angular units: CARDINAL, DEGREES, or MILS.
• LINEAR UNITS	Set unit of measurement of displayed linear units: STATUTE, METRIC, or NAUTICAL.
• POSITION FORMAT	Set format of displayed position information: Latitude/Longitude Decimal Degrees (LAT LONG DD), Latitude/Longitude Degrees Minutes Seconds (LAT/LONG DMS), LAT/LONG DM, Military Grid Reference System (MGRS), or Universal Transverse Mercator (UTM).
• SA OVER NETWORK	When Enabled, the radio sends GPS data to a L3Harris-supplied PC client using RNDIS networking.
PROGRAM:	
• ACTIVATE PLAN	View/Activate a personality. See Section 6.1.
• PROFILES	Change current profile. See Section 5.18.

MENUS	DESCRIPTION
MAINTENANCE:	
• BATTERY INFO	When a smart battery is attached, displays detailed battery status information. When a regular battery is attached, displays battery voltage.
• RADIO INFO	Displays radio information, i.e., ESN, software revisions, and firmware revisions.
• RESET OVERTEMP EVENT	Reset an overtemp event. Requires entering the Maintenance Password. This menu item **cannot** be disabled.
• TESTS	Allows service personnel to run radio tests.
• PH2 LC DISPLAY	For field service use only.
• DISPLAY RSSI	When enabled, RSSI is displayed on the RSSI screen and in the bottom of the idle display. -130 dBm is displayed when there is no received signal.
• TCXO TUNING	For field service personnel only. Improper adjustment will result in loss of communications.
• FEATURE INFO	Displays what features are enabled on your radio.
WIFI CLIENT:	Displays the list of available Wi-Fi clients and the status of Wi-Fi Connection (a question mark indicates the Wi-Fi network is in the process of connecting; a check mark indicates the Wi-Fi Network is connected).
• POWER ON	Turn Wi-Fi on/off.
• ADD NEW	Displays the list of Trusted Wi-Fi Networks and is populated when Wi-Fi is powered on. You can view, add, modify, and remove a Wi-Fi Network.
WIFI ACCESS POINT:	
• POWER	Power Wi-Fi On/Off.
• CLIENT COUNT	When the radio is configured as a Wi-Fi access point, displays the number of connected clients. Selecting CLIENT COUNT will display the MAC addresses of connected clients.
LTE:	
• PLMN (MCC/MNC)	Displays the Public Land Mobile Network (Mobile Country Code/Mobile Network Code).
• Signal Strength	Displays the LTE signal strength.
• Registration Status	Indicates if you are registered (connected) to the LTE network.
• NGLM	Displays the Next Generation LTE Module's software revision.
• IMEI	Displays the International Mobile Equipment Identity. The IMEI is used to identify devices on a network.
• IMSI	Displays the International Mobile Subscriber Identity. The IMSI is used to identify the user of a cellular network and is a unique identification associated with all cellular networks.
ICON GLOSSARY	Defines icons displayed by the radio.
USER LOGIN	Enables the radio user to login. See Section 5.5.1 for more information.
• SYSTEM ID	Allows the radio user to enter/change the System ID for user login.
• UNIT ID	Allows the radio user to enter/change the User ID for user login.
• PASSWORD	Allows the radio user to enter the login password for user login.
• COMPLETE	
DEVICE MANAGEMENT	Allows the user to check for and install updates from the L3Harris Device Management application over Wi-Fi and LTE.
STEALTH MODE SETTINGS	Allows the user to toggle features on/off when Stealth Mode is enabled.
• LCD ENABLED	Toggle LCD on/off when Stealth Mode is enabled.
• LED ENABLED	Toggle LED on/off when Stealth Mode is enabled.
• BACKLIGHT ENABLED	Toggle backlight on/off when Stealth Mode is enabled.
• SIDE/ALERT TONES ENABLED	Toggle side/alert tones on/off when Stealth Mode is enabled.
• VOICE ANNUNCIATION ENABLED	Toggle voice annunciation on/off when Stealth Mode is enabled.
• CHANNEL/GROUP KNOB ENABLED	Toggle channel/group knob enabled/disabled when Stealth Mode is enabled.
• TOP DISPLAY ENABLED	Toggle top display on/off when Stealth Mode is enabled.
• TOP DISPLAY MINIMUM BRIGHTNESS	Toggle top display to minimum brightness when Stealth Mode is enabled.
INSTALL GPP SOFTWARE	Select a GPP package to install.
CHANGE LANGUAGE	Press the up or down navigation buttons until the desired language is highlighted and then press Menu/Select button.
CHANGE PIN	Allows you to change your PIN.

MENUS	DESCRIPTION
ZONE MENU	View or change zones/systems (see Sections 5.12 and 6.3.1).

5.11 ALERT TONES

The radio provides audible Alert Tones or “beeps” to indicate various operating conditions. Some of the most common tones are described in Table 5-6.

Table 5-6: Alert Tones

TONE	DESCRIPTION	SOUND/DURATION
Ready to Talk Tone Unencrypted (Analog FM or P25 digital)	After a PTT is pressed, this is an audible indication (tone) for you to begin speaking into the microphone.	1000 Hz tone for 25 ms
Ready to Talk Tone Encrypted P25 digital	After a PTT is pressed, this is an audible indication (tone) for you to begin speaking into the microphone.	1200 Hz tone for 25 ms
PTT Denied	PTT not possible. Momentary tone is present: • Receive only • Key not found • PTT button disabled • Emergency button disabled • Emergency not supported for current channel • Clear transmit denied • Trunking Channel unavailable	544 Hz tone for 75 ms
Maximum transmit duration expires	Maximum transmit duration is exceeded.	5 beeps of 2400 Hz tone and then a 544 Hz tone for as long as PTT is pressed
Low Battery Alarm	Alarm sounds upon initial detection of low battery and every 30 seconds thereafter. Tone stops upon detection of a battery charging state.	Sequence of tones: • 937 Hz tone for 50 ms • Silence for 60 ms • 1300 Hz tone for 50 ms
Emergency Call Received	Radio is receiving an emergency call or priority call.	600 Hz tone for 250 ms and 1800 Hz tone for 250 ms
Alternate Emergency Tone	If enabled via programming, the radio plays an alternate emergency tone when declaring and receiving an emergency.	Sequence of tones: • 1000 Hz tone for 150 ms • Silence for 20 ms
Out of Range	Radio fails to find a local control channel.	Programmable via RPM2: • Disabled (no tone) • Slow (tone every 15 s) • Medium (tone every 10 s) • Fast (tone every 5 s) Tone is 544 Hz tone for 75 ms
Carrier Control Timeout	Sounds when Carrier Control Timer is exceeded. Approximately 5 seconds after the transmission warning tone, the radio stops transmitting.	544 Hz tone

5.12 SELECT ZONE/SYSTEM

A System is a group of channels or talkgroups that share a common set of parameters as programmed using RPM2. For example, a Trunking system defines the parameters needed to communicate on an infrastructure by agency or geographical region, such as WACN, System ID, Talkgroups, etc. A conventional system defines the channel set used and any specific signaling attributes (see RPM2 online help for more information on System attributes).

A Zone is an OPTIONAL *container* that can hold channels or talkgroups from a variety of systems (see Section 6.3). In other words, each member of a Zone belongs to an underlying system. Zones are always listed first in the Zone/System menu and are designated by the icon. A button on the radio can be programmed to scroll through available zones/systems (see Section 7.5).

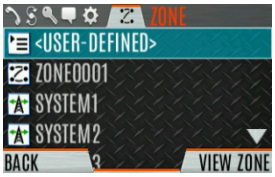
NOTE

If enabled via radio programming, systems are not displayed in the ZONE menu, only zones are displayed.

Or

To select a zone/system via the menu:

1. Press the Menu/Select button to access the menus.
2. Use the left or right navigation buttons to display the **ZONE** menu. The currently selected zone/system is highlighted. A personality can have up to 512 systems and up to 250 Zones, independent of banks or channels.
3. Use the up or down navigation buttons to highlight the desired zone/system. Press and hold the up or down button to scroll repetitively; the menu wraps to allow quick access to a zone/system.
4. Press the **VIEW ZONE** soft key to view channels in the zone/system or select the desired zone/system using the Menu/Select button.



The Group/Channel knob can be configured to select systems. When configured to select systems, use the Group/Channel knob to select systems 1 – 16. Use the A/B/C/D switch to select the system bank. The selected bank is indicated on the display.

- Bank A: System A1 - A16 (1-16)
- Bank B: System B1 - B16 (17-32)
- Bank C: System C1 - C16 (33-48)
- Bank D: System D1 - D16 (49-64)

When SYSTEM is configured for the channel knob function, the user cannot assign a system/zone to the A/B/C/D switch, assign a power-up system/zone, or use the system/zone Up/Down programmable buttons.

5.13 SELECT GROUP/CHANNEL AND BANK

The radio can be programmed with 1,250 talkgroups or 1000 channels per personality. Use the Group/Channel knob to select groups/channels 1 - 16. Use the A/B/C/D switch to set the bank. The selected bank is indicated on the display.

- Bank A: Channel A1 - A16 (1-16)
- Bank B: Channel B1 - B16 (17-32)
- Bank C: Channel C1 - C16 (33-48)
- Bank D: Channel D1 - D16 (49-64)

If your system has more than 64 groups/channels, a button on the radio can be programmed for the SEL CHAN/GRP option. This allows you to select a “super bank,” providing access to groups/channels beyond the first 64. ZONES have a limit of 64 entries per zone and cannot be “superbanked.”

Numeric Channel Entry

A button on the radio can be programmed for Numeric Channel Entry, which allows the user to enter the talkgroup/channel number directly from the keypad.

The radio can be programmed for one of the following Numeric Channel Entry options:

- When a Zone is selected on the radio, Numeric Channel Entry performs a lookup using the currently selected system’s group list

  Or

- When a Zone is selected on the radio, Numeric Channel Entry performs a lookup using the currently selected Zone’s system/group list.

While on a BeOn system and the ABCD switch is programmed for "System/Channel Bank," the ABCD switch can select BeOn Profiles by changing the ABCD switch. If the radio is provisioned with more than four (4) BeOn Profiles, then "Select Chan/Sys/Grp Bank" can be added to the keypad to allow the user to select banks of BeOn Profiles.

For example:

When "Select Chan/Sys/Grp Bank" button is set to 1-64:

- "A" = BeOn Profile #1
- "B" = BeOn Profile #2
- "C" = BeOn Profile #3
- “D” = BeOn Profile #4

When "Select Chan/Sys/Grp Bank" button is set to 65-128:

- "A" = BeOn Profile #5
- "B" = BeOn Profile #6
- "C" = BeOn Profile #7
- "D" = BeOn Profile #8

5.14 LOCK/UNLOCK KEYPAD

There are two levels of keypad lock available. Keypad lock and Radio lock. Keypad lock only locks the navigation keys (except for use in unlock), programmable softkeys, and DTMF keypad.

The A/B switch or a button on the radio can be programmed to lock the keypad. If the keypad was locked via a switch, moving the switch to another position will unlock the keypad. If locked via a button, the navigation keys must be used to enter the unlock sequence of Left, Right, Up, Down.

NOTE

See Section 7.5 for the various options that can be programmed to the radio buttons and switches.

5.15 RADIO LOCK

The ∅/○ Switch or ABCD switch can be programmed for Radio Lock. When Radio Lock is enabled, the radio will not respond to the following physical inputs:

- Volume Knob Change (power off is not prevented)
- ∅/○ Switch (unless radio lock is assigned)
- ABCD Switch (unless radio lock is assigned)
- Channel Knob
- Side User-Programmable Buttons and Keypad (DTMF, programmable, and navigation/soft keys)

The emergency button and any key programmed for Monitor/Clear are not disabled.

5.16 GROUP CALLS

5.16.1 Transmit a Group Call

A talkgroup is a group of radios that you want to have private conversations with. These groups can be divided into areas such as state, region, county, or large special events.

Turn the Channel/Group knob to select the desired group (see Figure 5-1). Press PTT to transmit.

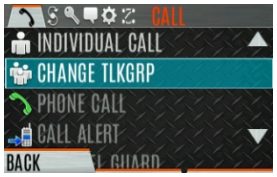
Or

A button on the radio can be programmed for **NUMERIC CHANNEL ENTRY** to allow the user to enter the talkgroup/channel number. Press PTT to transmit.

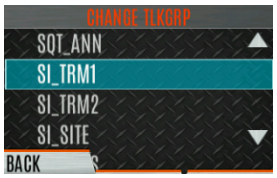
Or

To transmit a group call:

1. In P25 Conventional, the talkgroup for the selected channel may be overridden as follows: Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **CALL** menu.
3. Press the up or down navigation buttons to highlight **CHANGE TLKGRP** and press the Menu/Select button.



4. Press the up or down navigation buttons to highlight and the desired talkgroup and press the Menu/Select button. After selecting the new talkgroup, the radio returns to the main screen.



5. Press the PTT button to transmit.

5.16.2 Receive a Group Call

When receiving a group call, the status area of the idle display toggles between the Unit Name and the Group Name of the transmitting radio. If either of those names is not programmed, the corresponding ID number is displayed.

NOTE

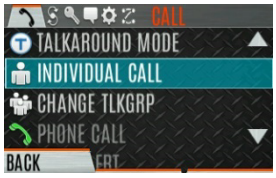
If an in-band alias for the transmitting radio/console is sent to the receiving radios, the receiving radios display that alias instead of the Unit ID or the I-CALL/Alias set contained in the receiving radio's personality, if any. The Alias alternates with the talkgroup name in the lower right display of the radio.

5.17 INDIVIDUAL CALLS

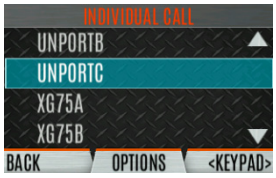
An individual call is used to make a call to one radio as opposed to a group of radios.

5.17.1 Add/Edit Contact from the Radio

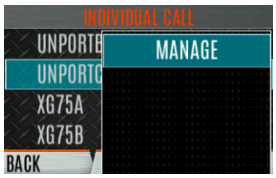
1. Press Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **CALL** menu**.**
3. Press the up or down navigation buttons to highlight **INDIVIDUAL CALL** and press the Menu/Select button.



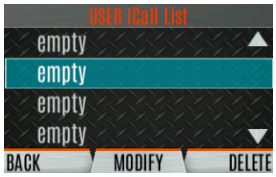
4. Press the **OPTIONS** softkey.



5. Press Menu/Select button to select **MANAGE**.

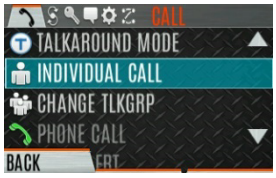


6. Select **MODIFY** to edit/create a User Contact, or select **DELETE** to remove a contact from the list.

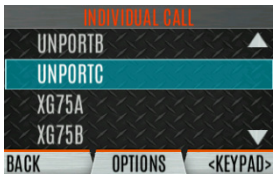


5.17.2 Transmit an Individual Call

1. Press Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **CALL** menu**.**
3. Press the up or down navigation buttons to highlight **INDIVIDUAL CALL** and press the Menu/Select button.



4. Use the up or down navigation buttons to highlight the unit to call and press the Menu/Select button, or select **KEYPAD** to enter the Unit ID.



5. Press PTT to make the call. When transmitting an Individual Call, the radio displays the called radio's name or Unit ID. If the radio is programmed for Acknowledged Individual Call, the radio displays **CALL QUEUED** until the callee answers or rejects the call.

6. After the callee answers, press PTT to respond.
7. Press the right navigation button to end the call.

How long the radio remains in Individual Call mode with no activity is programmable.

5.17.3 Receiving an Individual Call

1. When receiving an Individual Call, the radio displays the calling radio's name or Unit ID. The radio will also display **PRESS → TO END**.

2. Press the PTT button to respond or the right navigation button to END/REJECT the call. How long the radio remains in the Individual Call mode with no activity is programmable.
3. The radio rings and indicates a missed call if you do not respond. The ring sounds until you press PTT, view the missed call menu using the up navigation button, change channel/group/system, or power cycle the radio.

4. The radio can store up to ten (10) missed call entries. Select one of these entries to call the unit back or press the **DISMISS** soft key to clear the entry.

5.18 USER PROFILES

XL Series radios support User Profiles (also referred to as “My Profile”). A User Profile is a grouping of preset configurations that allow the user to change radio operation based on current activity/scenario. For example, the radio can be programmed with profiles named Noisy, Fire, etc., and the radio user can switch profiles on the radio depending on the environment they are entering. User Profile selection persists across system/group changes and power cycles. Up to 10 profiles can be programmed to the radio. When you activate a new personality, the selected Profile changes to None.

A "Covert" Profile is installed on the radio by default. This profile cannot be modified or deleted. The following attributes apply when the Covert profile is active:

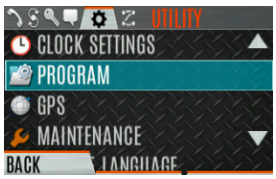
- The speaker is enabled.
- All tones are disabled.
- Keypad tones are disabled.
- Voice Annunciation is disabled.
- The front display backlight is disabled.
- The top backlight is turned off.
- The indicator LED is disabled.
- All other attributes remain at their current value.

When enabling a Profile, the radio adjusts all the appropriate settings to that of the Profile selected. When disabling the Profile, the radio returns to the None Profile, which again is the personality settings, not what had been modified by the user. You can enable/disable a Profile as needed; you cannot change between two different User Defined profiles.

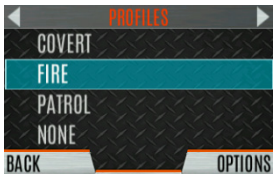
The radio keypad sequence LEFT-RIGHT-UP-DOWN can be used to exit Covert Mode.

To change the currently selected Profile:

1. Press the Menu/Select button to access the menu.
2. Press the left or right navigation buttons until the **UTILITY** menu is displayed**.**
3. Press the up or down navigation buttons to highlight **PROGRAM** and press the Menu/Select button.



4. Press the left or right navigation buttons until the **PROFILES** menu is displayed.



5. Press the up or down navigation buttons to select the desired Profile and press the Menu/Select button.

A profile change persists across system/channel changes and power cycles.

NOTE

A button on the radio keypad can be used to toggle profiles. See Section 7.5.1.

5.19 NOISE CANCELLATION

XL Series portable radios feature L3Harris' proprietary noise suppression capability to provide clear and crisp voice quality in high-noise environments. This can be used in any mode, including analog and digital communications.

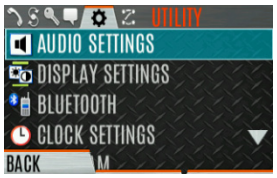
The radio has three microphones; two located at the top of the radio (primary) and one on the bottom (secondary). When noise cancellation is enabled, voice is picked up by the upper left microphone, and noise is picked up from the bottom microphone.

In the case where noise cancellation is enabled and a speaker microphone is attached to the radio, talk into the speaker microphone. In this mode, the radio's top left microphone is used to pick up the surrounding noise, and the other microphones are unused. See Section 5.19.4 for more information. If the bottom (secondary) microphone is blocked, the radio operates as though noise cancellation is turned off.

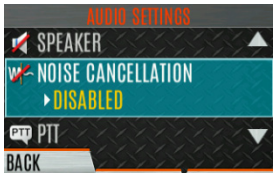
5.19.1 Enable Noise Cancellation

To enable Noise Cancellation:

1. Press the Menu/Select button to access the menu.
2. Press the left or right navigation buttons until the **UTILITY** menu is displayed.
3. Press the up or down navigation buttons to highlight **AUDIO SETTINGS** and press the Menu/Select button.



4. Press the up or down navigation buttons to highlight **NOISE CANCELLATION**. Toggle Noise Cancellation **ENABLED/DISABLED** using the Menu/Select button.



Refer to Section 6.5 for more information on the Audio Settings menu.

5.19.2 Using Noise Cancellation

When using the noise cancellation feature, observe the following:

- Verify **NOISE CANCELLATION** is enabled (see Section 5.19.1).
- Talk within two (2) inches of the primary microphone (see Figure 5-5).
- Ensure the primary and secondary microphones are not covered. See Section 5.19.4 for more information on the primary and secondary microphones.
- Speak clearly, loudly, and with authority.
- In very noisy environments, it is o.k. to yell into the radio. The radio can handle loud input levels.

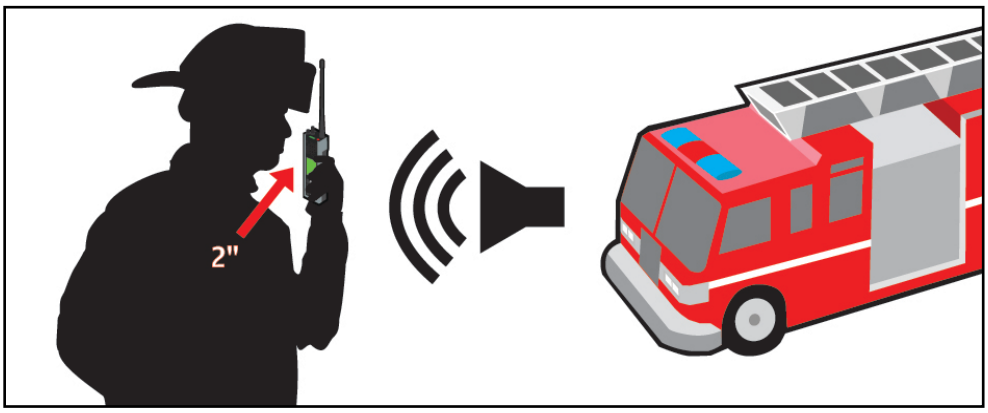


Figure 5-5: Using Noise Cancellation

5.19.3 The Effect of Distance from the Microphone

Unlike a normal microphone system, noise cancellation makes the level of your voice diminish quickly as you move away from the radio. The radio starts to see your voice as surrounding noise. Whereas you may be comfortable speaking up to a foot away under normal operation, noise cancellation requires that you hold the radio close.

5.19.4 Primary versus Secondary Microphone

5.19.4.1 Without a Speaker Microphone Attached

The primary microphone is located on top of the radio and the secondary is on the bottom of the radio (refer to Figure 5-1 for microphone locations).

5.19.4.2 With a Speaker Microphone Attached

When a speaker microphone is attached, the radio electronically switches over to use the radio's top left microphone as secondary. The microphone on the attached speaker microphone becomes primary.

5.19.5 When using a Self-Contained Breathing Apparatus (SCBA) Mask

When using an SCBA mask, the primary microphone can be held directly against the voice port. If the SCBA has a voice amplifier, the same rule applies. Ensure that the secondary microphone is uncovered. If possible, point the secondary microphone toward the noise source.

5.20 PTT OPTIONS

The radio can be programmed via RPM2 with one of the following PTT options:

- Radio and Accessory - In this mode, when the radio is PTTed the audio source will correspond with the PTT source.
  - If the source of PTT is radio, the audio is routed via the radio microphone.
  - If the source of PTT is an external microphone accessory, the audio is routed via the external microphone accessory.
- Accessory Only - Any PTT input will have the audio routed through the external microphone accessory.

NOTE

The Bluetooth Speaker Mic is unaffected by this setting. PTTing the Bluetooth Speaker Mic always results in audio being routed via the Bluetooth Speaker Mic.

5.21 VOICE ANNUNCIATION

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

- Zone changes
- Channel changes
- System changes
- Encryption On/Off
- Noise Cancellation On/Off
- Scan On/Off
- Talkaround On/Off
- Monitor Mode On/Off
- Two or Four Position switch change

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

5.22 ENABLE/DISABLE ENCRYPTION

A switch or a button on the radio can be programmed to enable/disable encryption.

NOTE

See Section 7.5 for the various options that can be programmed to the radio buttons and switches.

Or

Turn encryption on or off via the Security Menu:

1. Press the Menu/Select button to access the menus.
2. Use the left or right navigation buttons button to highlight and select the **SECURITY** menu.
3. Use the up or down navigation buttons button to highlight **ENCRYPTION**. Toggle encryption enabled/disabled using the Menu/Select button. This option is grayed out if any switch is programmed for encryption, or if Encryption Mode in the radio's personality is programmed "Forced On."

- If a channel is programmed to be encrypted, an optional key icon appears on the main display when encryption is enabled. The system must also be programmed for encryption.
- When encryption is enabled and you use any channel not configured for encryption, the radio allows PTT. The signal is transmitted unencrypted.
- Systems configured for Global Encryption (enabled in the Security menu) can display an optional Global Encryption icon in addition to or instead of a key icon (Section 6.20.2).

5.23 TRANSMIT ENABLE/DISABLE

When transmit is disabled, all forms of transmission from the radio are disabled, including Bluetooth. This is designed for use in explosive atmospheres.

If enabled via programming, use the A/B switch to enable or disable transmit.

NOTE

See Section 7.5 for the various options that can be programmed to the radio buttons and switches.

5.24 CHANNEL GUARD (ANALOG CONVENTIONAL ONLY)

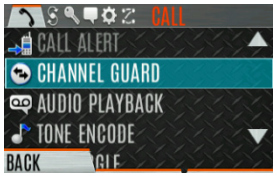
Channel Guard is L3Harris' trademark for CTCSS (tone squelch) and CDCSS (digital tone squelch).

NOTE

The Channel Guard menu is only accessible if the System is setup for CG SEL in the radio's personality.

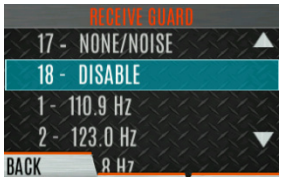
To select the Channel Guard tone:

1. Press Menu/Select button to access the main menu.
2. Use the left or right navigation buttons to display the **CALL** menu**.**
3. Use the up or down navigation buttons to highlight **CHANNEL GUARD** and press the Menu/Select button.



4. Use the up or down navigation buttons to highlight **RECEIVE GUARD** or **TRANSMIT GUARD** and press the Menu/Select button.

5. Use the up or down navigation buttons to highlight the desired option from the list and select using the Menu/Select button.



6. The Channel Guard frequency is displayed on the main display.

The Channel Info screen and Channel Edit screen will change depending on this selection. See Sections 6.4 and 7.3 for more information.

NOTE

A button on the radio can be programmed for Channel Guard Override (see Section 7.5).

5.25 USE TALKAROUND TO BYPASS REPEATER (ANALOG AND P25 CONVENTIONAL ONLY)

NOTE

Talkaround is not supported on 700 MHz in the following 700/800/900 MHz models of XL-185P:

XS-PFM9M	XS-PFM9Y-LTE	XS-PPM9P
XS-PFM9M-LTE	XS-PPM9M	XS-PPM9P-LTE
XS-PFM9P	XS-PPM9M-LTE	XS-PPM9Y
XS-PFM9Y	XS-PFM9P-LTE	XS-PPM9Y-LTE

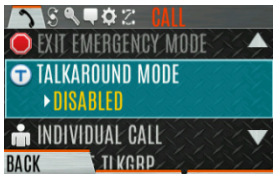
You can bypass the repeater system to communicate directly with other radios on your current channel's receive frequency. This is useful if you are out of range of a repeater or if a repeater is busy. You must be in range of the other radio.

NOTE

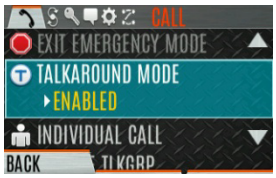
In XLP R4A and later, talkaround can be enabled/disabled on a per-channel basis. When talkaround is disabled, the ⌀ icon is shown on the front and top display. If talkaround is disabled for a channel (via the RPM2 personality), and the user tries to enable talkaround via the menus or knobs while on that channel, the radio emits a "boop" deny tone. Additionally, if talkaround is disabled on a channel, the talkaround programmable button becomes inoperable and the radio boops.

To enable talkaround:

1. Press Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **CALL** menu**.**
3. Press the up or down navigation buttons to highlight **TALKAROUND MODE**.



4. Press the Menu/Select button to toggle **TALKAROUND MODE** to **ENABLED**.



5. The optional talkaround icon appears. Calls are now made on the receive frequency until you disable talkaround mode via the **CALL** menu. Power cycling the radio does not disable talkaround.

Or

A button or switch can be programmed to toggle talkaround enable/disabled. See Section 7.5 for the various options that can be programmed to the radio buttons and switches.

If the talkaround Indication feature is enabled using RPM2, the radio will play a unique grant tone when a call is placed on a simplex channel or when talkaround has been enabled on a duplex channel. This feature applies to both Analog and P25 Conventional systems. It optionally allows the radio to also play the same tone when it receives a call while operating in simplex or talkaround. ***If configured, the radio plays the tone at the selected volume level.***

NOTE

The tone will not play on systems configured with MDC.

Talkaround Indication can be specified for each individual Analog and P25 Conventional system configured in personality. The following options can be selected, and apply only when the radio is on a simplex channel or when talkaround has been enabled by the user:

- Disabled: (This is the default option.) When this option is selected, the radio plays the standard grant tone when a call is placed. The radio does not play a tone when a call is received.
- Transmit Only: When this option is selected, the radio plays a different “talkaround” grant tone when a call is placed. The radio does not play a tone when a call is received.
- Transmit and Receive: When this option is selected, the radio plays a different “talkaround” grant tone when a call is placed, and at the beginning of a received call.

NOTE

In the radio personality, the “Alert Tone” parameter needs to be enabled for each channel on the Conventional Frequency Set. The “Ready to Talk Tone” parameter must also be enabled for the Talk Around Indication tone to be played when the radio is keyed.

5.26 TYPE 99 OPERATION

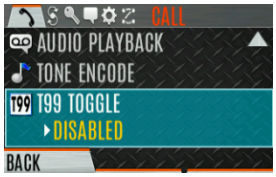
Type 99 is L3Harris' name for in-band, two-tone sequential signaling. It is a conventional signaling protocol used to control the muting and unmuting of a radio. This signaling is commonly used for selective calling of individual units or groups of units in a conventional system.

In Type 99 tone systems, calls are not heard until the radio detects the proper two-tone sequence. This, in conjunction with squelch, prevents the user from hearing noise or undesired conversations. When the radio detects the second tone, it sounds the appropriate Type 99 alert tone. After the second tone stops, the receiver audio path is opened for the user to receive messages.

5.26.1 Enable/Disable Type 99

To enable Type 99:

1. Press Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **CALL** menu.
3. Press the up or down navigation buttons to highlight **T99 TOGGLE**.



4. Press the Menu/Select button to change **T99 TOGGLE** between **ENABLED** and **DISABLED**. **T99** is displayed in the top of the radio display when Type 99 is enabled.

Or

A button or switch can be programmed to enable/disable Type 99 (see Section 7.5).

5.26.2 Disable After PTT

If this option is programmed using RPM2, Type 99 is disabled after the radio user activates the PTT. This allows the radio user to monitor traffic on the channel (after a PTT action) without pressing the monitor button.

Can be used in conjunction with the “Auto Reset” option (see Section 5.26.3) to disable Type 99 after a PTT and automatically reset, or enable, Type 99 after 30 seconds.

5.26.3 Auto Reset

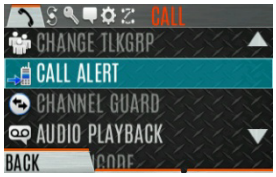
If this option is programmed using RPM2, Type 99 is automatically reset, or turned back on, after 30 seconds. Can be used in conjunction with the “Disable After PTT” option (see Section 5.26.2) to disable Type 99 after a PTT and automatically reset, or enable, Type 99 after 30 seconds.

5.27 CALL ALERT (PAGE)

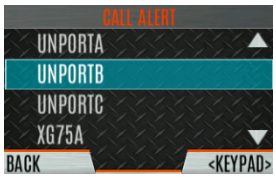
5.27.1 Send Alert

To send an alert:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **CALL** menu.
3. Press the up or down navigation buttons to highlight **CALL ALERT** and press the Menu/Select button.



4. Press the up or down navigation buttons to highlight the desired unit from the list and press the Menu/Select button, or select **KEYPAD** to enter the Unit ID.



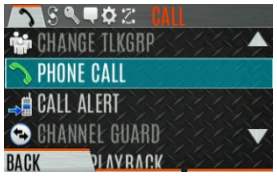
5. Press **PTT** to send the page.

5.27.2 Receive Alert

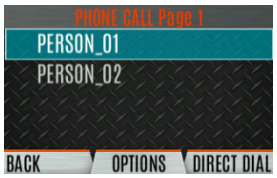
1. When receiving a Call Alert, the radio displays the calling radio's name or Unit ID.
2. The radio rings and indicates a missed call. The ring sounds continuously until you press PTT, press the **CLR MISSED** softkey, change group/system, or power cycle the radio.

5.28 TELEPHONE INTERCONNECT

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **CALL** menu.
3. Press the up or down navigation buttons to highlight **PHONE CALL** and press the Menu/Select button.



4. Select an entry from the list of pre-programmed entries or click **DIRECT DIAL** to enter the number directly. Direct Dial entries can have up to 31 characters (0-9, *, #, or a space; the space correlates to a pause.) Select **OPTIONS** to view details about the highlighted pre-programmed entry. The radio supports up to 255 pre-programmed entries.



5. Press PTT to initiate the phone call. Press the right navigation button to end the call.

The radio does not permit telephone interconnect calls during an emergency. While in a phone call, the radio ignores all types of calls EXCEPT a System All Call. If the radio receives a System All Call while in a phone call, it immediately drops the phone call and accepts the All Call.

5.29 DTMF

XL Series portables support the transmission of DTMF tones corresponding to the numbers/characters on the keypad. To overdial numbers/characters, press and hold the PTT button, and then press the corresponding keys one at a time on the keypad. Valid keys for DTMF tones are: 1, 2, 3, 4, 5, 6, 7, 8, 9, *, 0, and #.

NOTE

For conventional or P25 Conventional systems, DTMF tones only play if the current system is programmed for DTMF (part of general System configuration). DTMF tones are always enabled for P25 Trunking systems.

5.30 AUDIO PLAYBACK

The Audio Playback feature allows the user to playback a previously received call. Recordings are stored in the radio's RAM and are not persistent across power cycles. The radio stores the last five recorded calls up to one minute each.

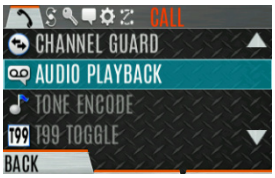
A button on the radio can be programmed to replay the last recorded call. To playback the last received call from a button:

1. Press the button programmed for audio playback. The last call received before the button was pressed is played each time the button is pressed.
2. Additional incoming calls will be recorded in the background, but pressing the button continues to replay the captured call until reset.
3. To reset the feature and allow a new call to be captured, press and hold the button until you hear a two-tone chirp. At this point, the button can be used to capture a new incoming call.

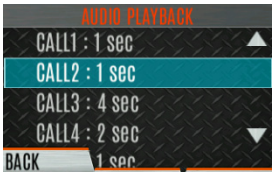
You can also playback one of the last five calls received via the menu.

To playback a previously received call from the menu:

1. Press the Menu/Select button.
2. Press the left or right navigation buttons to display the **CALL** menu.
3. Press the up or down navigation buttons to highlight **AUDIO PLAYBACK** and press the Menu/Select button.



4. Select the desired call from the list (the most recent call is at the top of the list) and press the select button. The selected call will be played.



- If a button is also programmed for Audio Playback, pressing the button replays the call selected in the menu. The feature must be reset as above to use the button to capture a new call.

- If a button is not programmed for Audio Playback, then you must navigate back to the menu to play the call again.

NOTE

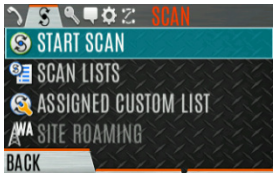
Any incoming call that occurs during playback preempts the playback.

5.31 START SCAN

This procedure assumes that the scan list has been added and the radio is not in active scan. Refer to Section 6.13 for scan setup or Section 5.32 for stopping scan. Refer to Section 6.14.1.1, Section 6.14.1.2, and Section 6.14.1.3 for home and priority channel descriptions.

To start scan:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SCAN** menu.
3. Press the up or down navigation buttons to highlight **START SCAN** and press the Menu/Select button. **START SCAN** text changes to **STOP SCAN**.

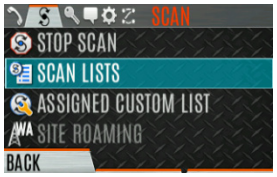


4. Press the **BACK** soft key to exit the scan menu.
5. The scan icon is displayed on the idle display when scanning is enabled.

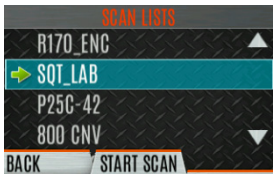
Or

To start scan:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SCAN** menu.
3. Press the up or down navigation buttons to highlight **SCAN LISTS** and press the Menu/Select button.



4. Press the up or down navigation buttons to highlight the desired **SCAN LIST** and press the **START SCAN** soft key.



Or

A switch or button on the radio can be programmed to start/stop scan.

NOTE

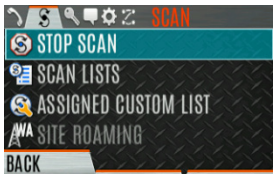
If a switch is programmed for start/stop scan, the menu for starting and stopping scan is disabled.

NOTE

See Section 7.5 for the various options that can be programmed to the radio buttons and switches.

5.32 STOP SCAN

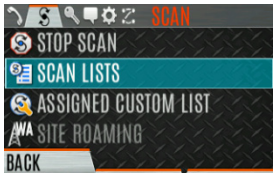
1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SCAN** menu.
3. Press the up or down navigation buttons to highlight **STOP SCAN** and press the Menu/Select button.



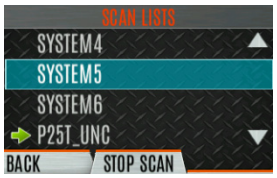
4. Press the **BACK** soft key to exit the scan menu.

Or

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SCAN** menu.
3. Press the up or down navigation buttons to highlight **SCAN LISTS** and press the Menu/Select button.



4. Press the **STOP SCAN** soft key.



Or

A switch or button on the radio can be programmed to start/stop scan.

NOTE

If a switch or button is programmed for start/stop scan, the menu for starting and stopping scan are disabled.

NOTE

See Section 7.5 for the various options that can be programmed to the radio buttons and switches.

5.33 MONITOR AND SQUELCH TYPES (CONVENTIONAL ONLY)

The monitor function allows you to temporarily turn off selected squelch to monitor for traffic that may not normally break squelch. The type of squelch used depends on an analog or digital channel. A button or switch on the radio can be programmed to start or stop Monitor (see Section 7.5 for the various options that can be programmed to the radio buttons and switches.).

For analog channels, there is:

- Noise squelch - any received signal breaks squelch.
- Continuous Tone Coded Squelch (CTCSS) - squelch is selective based on tone code.
- Continuous Digital Coded Squelch (CDCSS) - squelch is selective based on digital code.

For digital channels, there is:

- Monitor squelch - any received digital signal breaks squelch.
- Normal squelch - Received Network Access Code (NAC) must be correct to break squelch.
- Selective squelch - Received NAC and talkgroup Identification (ID) or unit ID must be correct to break squelch.

NOTE

During encrypted operations, the radio only unmutes when receiving with the same key.

5.34 NUISANCE DELETE

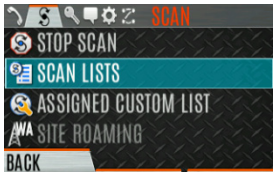
A channel can temporarily be deleted from the scan list. The selected channel, priority 1, and priority 2 channels cannot be nuisance deleted. A button or switch on the radio can be programmed for nuisance delete (see Section 7.5 for the various options that can be programmed to the radio buttons and switches).

NOTE

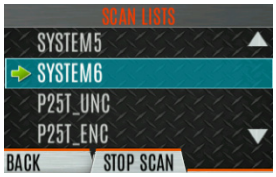
Nuisance delete can only be performed on the active scan list.

To perform a nuisance delete from the menu:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SCAN** menu.
3. Press the up or down navigation buttons to highlight **SCAN LISTS** and press the Menu/Select button.

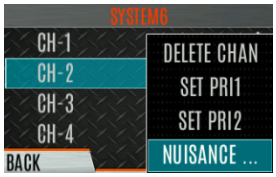


4. Press the up or down navigation buttons to highlight the scan list and press the Menu/Select button. When scanning is started, ➔ indicates the active scan list; when scanning is stopped, indicates the active scan list.



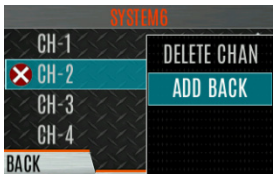
5. Press the up or down navigation buttons to highlight the desired channel.
6. Press the **OPTIONS** soft key.

7. Press the up or down navigation buttons to highlight **NUISANCE** and press the Menu/Select button.



8. The ⊗ icon appears next to the channel and it will not be scanned.

9. Highlight the channel, press the **OPTIONS** soft key, and select **ADD BACK** to add channel back to scan list. If you do not add the channel back to the list, the channel will return to the scan list when you cycle radio power or activate a personality.



10. Press the **BACK** soft key to exit the channel list.
11. Press the **BACK** soft key to exit the scan list display.

5.35 FAILSOFT

5.35.1 Conventional Failsoft (EDACS Only)

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. 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 automatically returns to normal operation.

NOTE

Emergency and special calls are not operational during Conventional Failsoft.

5.35.2 Failsoft (P25 Trunked)

When the site-link to the VNIC is down, the site is operating in Failsoft mode. Radios operating on that site can still communicate with each other, but not with the rest of the system. The radio provides a visual indicator (icon) on the display and plays a tone for a configured interval to indicate that the site is in Failsoft. This tone interval range is 0 to 120 seconds. This tone is not played during incoming voice or PTT.

5.36 EMERGENCY OPERATION

The radio can be programmed to enable emergency mode. Unit name displays on dispatcher console if an emergency signal is received from another radio on a digital channel.

5.36.1 Declaring an Emergency Call

To declare an emergency:

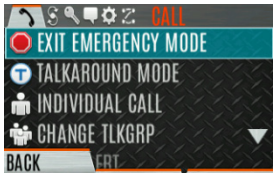
1. Press and hold the emergency button on the radio or the speaker microphone. The length of time you need to hold the button is configured using RPM2.
2. The emergency icon is displayed on the idle display.

   - For digital channels, the radio transmits the talkgroup or radio ID to the dispatch console and receiving radio.
   - The radio can be programmed to have a dedicated emergency channel, which can be activated from analog or digital channels.
   - The radio can also be programmed to send an Emergency Alarm in addition to or in place of the emergency call (P25 modes).

   The radio goes through transmit and receive cycles if so configured. Speak into the microphone while the radio is transmitting or press PTT to talk.

3. To exit emergency, power cycle the radio or select **EXIT EMERGENCY** from the CALL menu.

   If enabled via programming, you can clear an emergency by pressing the button programmed for the Monitor/Clear function and then the emergency button.



5.36.2 Receiving an Emergency Call

When receiving an Emergency Call, an alert tone sounds (if tones are enabled) and an emergency indication is displayed. The unit ID and/or unit name of the unit in emergency is displayed. While the emergency display is active, press PTT to respond to the emergency caller.

5.36.3 Stealth Emergency

The radio can be programmed with the following emergency behavior:

- No audio indications when declaring an emergency.

  Or

- No visual indications when declaring an emergency.

Or

- No audio *and* no visual indications when declaring an emergency.

During stealth mode, the radio will not receive any type of call. Once the user presses the PTT button, the radio display and audio return to normal.

5.37 MDC-1200 (ANALOG CONVENTIONAL ONLY)

MDC-1200 is a legacy in-band signaling protocol that provides the radio with the ability to transmit and receive a unique PTT ID. This PTT ID can be decoded by receiving radios and displayed as a hexadecimal number or an alias string. In addition, MDC-1200 provides radios with the ability to transmit emergency status to a console. Refer to the *MDC-1200 Feature Manual,* 14221-7200-6000, for complete instructions on configuring and using this feature.

5.37.1 Normal PTT Operation

If MDC signaling on PTT press is enabled using RPM2, the radio transmits an MDC PTT ID message when PTT is pressed. If the Sidetone option is enabled using RPM2, the radio plays a Ready-to-Talk (RTT) tone after the MDC pre-signaling has been transmitted.

If MDC signaling on PTT release is enabled (using RPM2), the radio transmits post-call MDC signaling when PTT is released.

- IF STE is enabled (using RPM2), the MDC post-call signaling is transmitted after STE is sent on PTT release only.
- MDC post-call signaling is also sent when there is a radio unkey due to Carrier Control Timeout (CCT). Normal CCT alert tones occur prior to unkey.

5.37.2 MDC PTT ID Receive Handling

When the radio receives an MDC PTT ID, it searches the MDC ID Alias List for an alias associated with the ID. If one is found, it displays the alias. If none is found, the radio displays the ID in hexadecimal.

5.37.3 Emergency Declaration

Emergency declaration is accomplished by the radio generating an MDC Emergency PTT message. An Emergency is considered acknowledged when the radio receives an “Ack To Emergency” PTT message with an ID which matches its own ID. If Emergency Audio is enabled and the PTT Sidetone option is enabled, the radio plays the Ready-to-Talk tone after the MDC Emergency PTT signaling is transmitted.

- If an MDC Alert on ACK is enabled, the radio plays an ACK tone when the MDC emergency is acknowledged.
- If audio tones are enabled, the radio plays an ACK tone if the emergency is not acknowledged within the programmed number of retries.

5.38 MULTIGROUP (P25 TRUNKING ONLY)

Multigroup is an implementation of announcement call functionality for P25 Trunking. There are two aspects to this: the multigroup itself and subgroups of the multigroup. Both the multigroup and its subgroups are talkgroups within a P25 group set. For any given P25 group set, a single multigroup and up to 32 sub-groups can be defined.

When tuned to the multigroup, the radio will:

- Transmit calls across the multigroup and its subgroups. This is commonly referred to as multigroup call.
- Receive all transmissions made on the multigroup and its subgroups.
- Halt any ongoing scan operation.

When tuned to a subgroup, the radio will:

- Transmit calls across the currently selected subgroup.
- Transmit calls across the multigroup if a multigroup call is received and PTTs during the hang time. For this to happen, the system must be configured to allow keyback on the multigroup. If keyback is not configured the radio will always transmit across the subgroup.
- Receive all transmissions made on the multigroup and the currently selected subgroup.

5.39 MISSION CRITICAL PUSH-TO-TALK (MCPTT) OPERATION

5.39.1 Overview

MCPTT is a global standard for Push-To-Talk (PTT) over broadband created by the Third Generation Partnership Program (3GPP). MCPTT provides a dedicated fast lane to Push-To-Talk over broadband in even the most congested coverage areas. L3Harris works with LTE infrastructure and MCPTT server manufacturers to coordinate development of the MCPTT client.

Refer to the following when configuring and using MCPTT on the XL Converge Series Portable:

- *Mission Critical Push-To-Talk Feature Manual* – 14221-7200-6210
- *Mission Critical Push-To-Talk Software Release Notes* – 14221-1100-8270
- RPM2 Online Help

5.39.2 Supported MCPTT Feature Set

XL radios support the following features when an MCPTT system is selected:

FEATURE	MCPTT SUPPORT
VOICE FEATURES	
Supports Group Calls	YES
Supports Talk Group Scanning with Multiple Levels of Priority	NO
Supports In-Call Location Reporting	NO
Supports Caller ID Display	YES
Supports Supervisor and Dispatcher Override	NO
Supports Individual Calls	YES
Supports Emergency Group Calls	NO

FEATURE	MCPTT SUPPORT
Supports Programmable Emergency Auto-Key	NO
Supports Priority Preemption for Emergency Calls	NO
Supports Encrypted Calls with AES encryption	YES
Supports Encrypted Calls with DES encryption	NO
Supports Announcement Group Calls	NO
Supports System All Calls	NO
Supports Group PSTN Calls	NO
Supports Individual PSTN Calls	NO
Supports IP and RF Dispatch	YES
DISPATCH AND SYSTEM MANAGEMENT FEATURES	
Supports Patch/Simulselect	NO
Supports Emergency Alert	NO
Supports Status and Message	NO
Supports xRTT Workflow for Dispatch Consoles	NO
Supports Radio Unit Disable and Re-enable	NO
Supports Dynamic Regroup	NO
Supports Call Alert	NO
Supports Radio Check	NO
Supports Radio Status Query	NO
Supports Radio Detach	NO
Supports Radio Unit Monitor	NO
PACKET DATA FEATURES	
Supports Individual OTAR Operations	NO
Supports ProFile and Radio TextLink	NO
Supports GPS Updates using Radio to FNE data	NO
Supports Radio-to-Radio GPS Updates using P25 Tier 1 Location Services	NO
OTHER MCPTT FEATURES	
User Presence for MCPTT users	YES
Group Presence	YES
User Location	NO
Peer Location Request	NO
INTEROPERABILITY	
Supports Interop with Legacy Systems via NetworkFirst UAC-GWB	NO
Supports Interop with ISSI and CSSI connected systems	NO

5.39.3 User Operation

The operation of the MCPTT feature set is similar to the XL radio's P25 LMR operation. Changing Talk Group Profiles is a unique operation for MCPTT. In XL radios, the list of available Profiles can be observed by selecting "Change Talkgrp" in the Call menu. The active Profile is highlighted. The Profile can be changed by selecting with the arrow keys and pressing the center navigation button.

5.39.4 Select Group/Channel and Bank

Use the Group/Channel knob to select groups/channels 1 - 16. Use the A/B/C/D switch to set the bank. The selected bank is indicated on the display.

- Bank A: Channel A1 - A16 (1-16)
- Bank B: Channel B1 - B16 (17-32)
- Bank C: Channel C1 - C16 (33-48)
- Bank D: Channel D1 - D16 (49-64)

If your system has more than 64 groups/channels, a button on the radio can be programmed for the SEL CHAN/GRP option. This allows you to select a “super bank,” providing access to groups/channels beyond the first 64.

5.39.5 MCPTT Group Calls

5.39.5.1 Transmit an MCPTT Group Call

A talkgroup is a group of radios with which you want to have private conversations. These groups can be divided into areas such as state, region, county, or large special events.

Turn the Channel/Group knob to select the desired group. Press PTT to transmit.

Or

A button on the radio can be programmed for NUMERIC CHANNEL ENTRY to allow the user to enter the talkgroup/channel number. Press PTT to transmit.

5.39.5.2 Receive an MCPTT Group Call

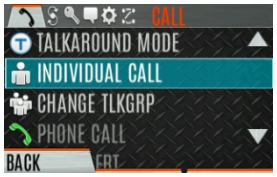
When receiving a group call, the status area of the idle display toggles between the Unit Name and the Group Name of the transmitting radio. If either of those names is not programmed, the corresponding ID number is displayed.

5.39.6 MCPTT Individual Calls

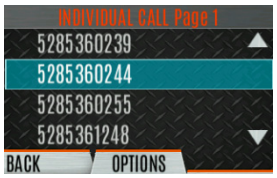
An individual call is used to make a call to one radio as opposed to a group of radios.

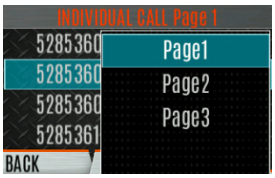
5.39.6.1 View MCPTT Contacts in the Radio

1. Press Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the CALL menu.
3. Press the up or down navigation buttons to highlight **INDIVIDUAL CALL** and press the Menu/Select button.



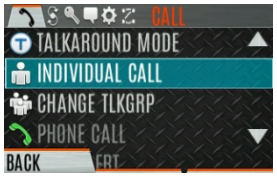
4. Scroll through the contacts in the radio. Press the **OPTIONS** softkey to change pages as necessary.



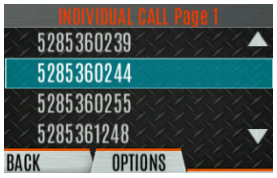


5.39.6.2 Transmit an MCPTT Individual Call

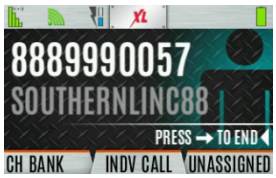
1. Press Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **CALL** menu**.**
3. Press the up or down navigation buttons to highlight **INDIVIDUAL CALL** and press the Menu/Select button.



4. Use the up or down navigation buttons to highlight the unit to call and press the Menu/Select button.



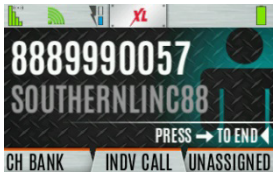
5. Press PTT to make the call. When transmitting an Individual Call, the radio displays the called radio's name or Unit ID.



6. After the callee answers, press PTT to respond.
7. Press the right navigation button to end the call.

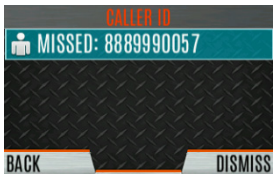
5.39.6.3 Receiving an Individual Call

1. When receiving an Individual Call, the radio displays the calling radio's name or Unit ID. The radio will also display "Press → to END."



2. Press the PTT button to respond or the right navigation button to END/REJECT the call. How long the radio remains in the Individual Call mode with no activity is programmable.
3. The radio rings and indicates a missed call if you do not respond. The ring sounds until you press PTT, view the missed call menu using the up navigation button, change channel/group/system, or power cycle the radio.

4. The radio can store up to ten (10) missed call entries. Select one of these entries to call the unit back or press the **DISMISS** soft key to clear the entry.



5.39.7 MCPTT Connectivity Errors

The following error message may be displayed on the front screen banner when connectivity errors occur:

MESSAGE	CAUSE FOR ERROR
LTE POWER ON FAILED	Radio failed to start LTE
REG FAIL: CONNECTION TIMEDOUT	Radio failed to contact the MCPTT server.
INITIALIZATION FAILED	Radio was unable to start the MCPTT application.
REG FAIL: INVALID CREDENTIALS	Radio failed to register with the MCPTT server.
PROVISIONING FAILED	Radio was unable to complete provisioning from the server.
GROUP SELECTION FAILED	Radio was not able to affiliate with the selected group.

5.40 BEON OPERATION

5.40.1 Overview

The BeOn solution is a Voice over IP (VoIP) based, Push-to-Talk (PTT) communications system operating over public or private wireless networks. The solution extends traditional Land Mobile Radio (LMR) services onto the broadband capable third generation (3G) and 4G/LTE cellular networks. This includes the ability to provide highly integrated interoperability services between BeOn users on the cellular network and users of traditional LMR networks. L3Harris' VIDA® IP core network switching technology is the foundation for the BeOn application infrastructure. Thus, the application and product suite provide many advanced features not found in competing technologies and provide internetworking of those services between public and private communications networks.


NOTE

XL portables support BeOn operation over Wi-Fi or LTE.

Consult one or more of the following as necessary when configuring and using BeOn:

- *BeOn Configuration and Use Feature Manual*: 14221-7200-6130
- *BeOn LAS/LAP Installation and Configuration Manual*: 14221-710-3010
- *Unified Administration System User's Manual*: MM24374
- RPM2 online help

The following table provides a comparison of available BeOn features versus P25 features:

Table 5-7: P25 Feature Support versus BeOn Feature Support

FEATURE	XLP P25 SUPPORT	XLP BEON SUPPORT
DES encryption	Yes	No
All calls	Yes	No
PSTN calls	Yes	No
Status and Message	Yes	No
xRTT for dispatch consoles	Yes	No
Radio Unit Disable and Re-enable	Yes	No

FEATURE	XLP P25 SUPPORT	XLP BEON SUPPORT
Dynamic Regroup	Yes	No
Call Alert	Yes	No
Radio Check	Yes	No
Radio Status Query	Yes	No
Radio Detach	Yes	No
Radio Unit Monitor	Yes	No
ProFile and Radio TextLink	Yes	No
Radio-to-Radio GPS	Yes	No
Color coded Channels	Yes	No

The following table lists the Programmable Button options supported in P25 versus BeOn:

Table 5-8: Supported Programmable Buttons

FEATURE	XLP P25 SUPPORT	XLP BEON SUPPORT
Audio Playback	Yes	Yes
Direct System/ Zone Entry	Yes	Yes
Fixed Preset	Yes	Yes
Flashlight Mode	Yes	Yes
Flip Top Display Orientation	Yes	Yes
Initiate OTAR Rekey	Yes	Yes
Lock Keypad	Yes	Yes
Scan Enable/Disable	Yes	Yes
Secure/Clear Toggle	Yes	Yes
Speaker Mute Toggle	Yes	Yes
Select Channel Group Bank	Yes	Yes
Stealth Mode	Yes	Yes
System Up/ Down	Yes	Yes
Zone Up/ Down	Yes	Yes
Drop Call	Yes	No
Editable Preset	Yes	No
Home Channel	Yes	No
Initiate Individual Call	Yes	No
Numeric Channel Entry	Yes	No
Nuisance Delete	Yes	No

5.40.2 Wi-Fi Client Selection

XL portable radios support up to 24 different Wi-Fi networks configurable via programming, with an option to select one of the configured networks as default.

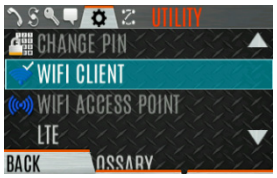
NOTE

These 24 Wi-Fi networks are considered radio administrator approved and Trusted Wi-Fi Networks (TWiN) on which the radio can operate.

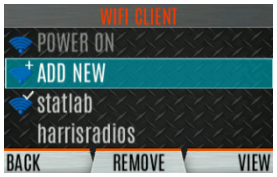
The radio will always join the network configured as the highest priority in the personality when multiple TWiNs are available.

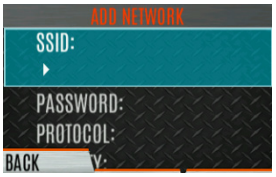
To change the selected Wi-Fi network:

1. From the **UTILITY** menu, select **Wi-Fi Client**.



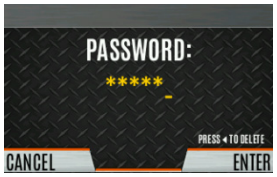
2. Select a network from the list, add a network, view details about the selected network, or remove the selected network.
3. Select **ADD NEW** to add a new network.



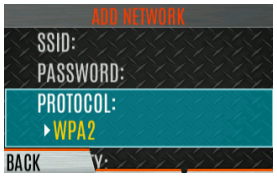


4. Highlight and select SSID. Use the keypad on the radio to enter the SSID and press the **ENTER** softkey.

5. Highlight and select **PASSWORD**. Use the keypad on the radio to enter the password.



6. Press the Menu/Select button to cycle through available Protocol selections (None, WPA, or WPA2-PSK).



7. Press the Menu/Select button to cycle through available Priority selections (Low, Medium, or High).

5.41 STEALTH MODE

For some users, it is important to be able to turn off the radio's display lights and side tones, but not the 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 lights, indicator lights, audible alert, and 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. A button or the two-position switch can be programmed via RPM2 to enable/disable Stealth Mode.

The following Stealth Mode options are configurable via RPM2:

- Persistence Enabled – Specify whether or not Stealth Mode persists after the radio is powered down.
- LCD Enabled – Specify if the LCD is enabled or disabled for Stealth Mode.
- LED Enabled – Specify if the LED is enabled or disabled for Stealth Mode.
- Backlight Enabled – Specify if the Backlight is enabled or disabled for Stealth Mode.
- Side/Alert Tones Enabled – Specify if side tones and alert tones are enabled or disabled for Stealth Mode.
- Voice Annunciation Enabled – Specify if Voice Annunciation is enabled or disabled for Stealth Mode.
- Channel/Group Knob Enabled – Specify if the Channel/Group Knob is enabled or disabled for Stealth Mode.
- Top Display Enabled – Specify if the Top Display is enabled or disabled for Stealth Mode.
- Top Display Minimum Brightness – When this option is enabled, the top display is enabled at the minimum brightness when the radio is in Stealth Mode.

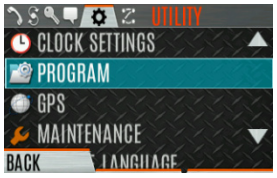
6. ADVANCED OPERATIONS

6.1 VIEW/CHANGE PERSONALITIES

Personalities contain radio programming information such as frequencies, channels, stations, and talk groups. Up to ten different personalities can be stored in the radio, but only one can be active at a time.

6.1.1 View Personalities

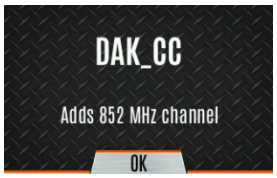
1. At main display, press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **UTILITY** menu.
3. Press the up or down navigation buttons to highlight **PROGRAM** and press the Menu/Select button. An arrow indicates the currently active personality.



4. Press the **OPTIONS** soft key.

5. Select **VIEW PLAN INFO** to view.

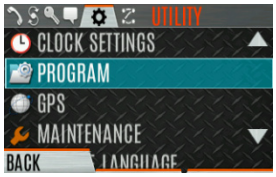
6. The radio displays the plan's filename. Personality information appears if the field was filled out using RPM2.



6.1.2 Change Active Personality

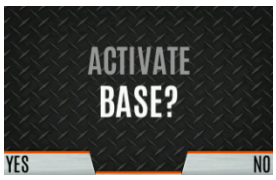
To change the active personality:

1. At main display, press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **UTILITY** menu.
3. Press the up or down navigation buttons to highlight **PROGRAM** and press the Menu/Select button.



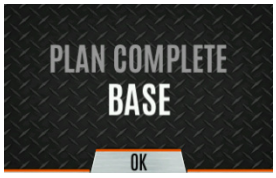
4. Press the up or down navigation buttons to highlight the desired personality and press the Menu/Select button. ➔ indicates the currently active personality.

5. Press the **YES** soft key to confirm personality activation. If the personality has a power-up PIN, you are prompted to enter the PIN before activation continues.



6. The **IN PROGRESS** screen is displayed while plan activation is in progress.

7. If personality is activated, the radio displays **PLAN COMPLETE** followed by the name of the personality. Press the **OK** soft key.



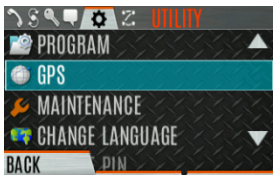
- You cannot activate a personality when the radio is transmitting an emergency.
- A **FAILED** message may be displayed for errors such as invalid syntax in the fill or some other invalid parameter.

6.2 SITUATIONAL AWARENESS (SA) – P25 CONVENTIONAL ONLY

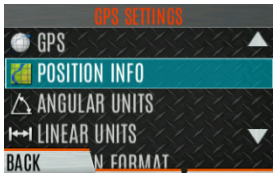
Situational Awareness is a feature in which the radio receives SA position from other units configured to send the SA packets. The SA display shows the positions of the other radios (units) relative to the radio. To make use of SA, all radios need to have a uniquely programmed Unit ID.

To display Situational Awareness Info:

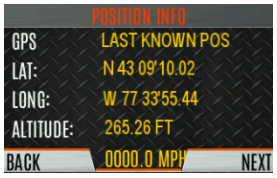
1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **UTILITY** menu.
3. Press the up or down navigation buttons to select **GPS** and press the Menu/Select button.



4. Press the up or down navigation buttons to select **POSITION INFO** and press the Menu/Select button.

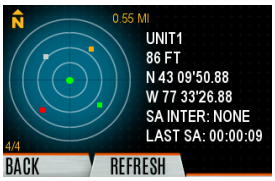


5. Press the **NEXT** soft key.



6. Press the left or right navigation buttons to view the location of each unit. The color of each unit indicates its status as follows. Only one status can be shown at a time and are listed in priority order:
   - Grey – Unselected, no status
   - Red – Unselected, In Emergency
   - Orange – Unselected, Low Battery
   - Blue – Unselected, Scanning
   - Green – Selected, no status
   - Green/Red – Selected, In Emergency
   - Green/Orange – Selected, Low Battery
   - Green/Blue – Selected, Scanning
7. GPS of this radio is shown by the center dot as follows:
   - Green – Tracking
   - Orange – Last known position
   - Red – Searching

8. Press the up or down navigation buttons to zoom the display distance of current unit.



9. Press the **OPTIONS** soft key**.** From here, select **UNIT INFO** to display details about the selected unit, select **REFRESH** to update information, or select **EXIT**.

6.3 USER-DEFINED ZONES/SYSTEMS

6.3.1 Command Tactical Zone

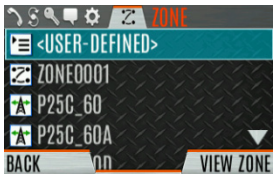
A Command Tactical Zone is defined at the radio.

NOTE

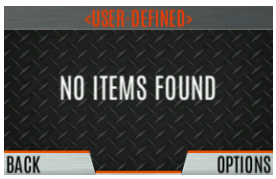
A Command Tactical Zone is reset when a Personality is activated.

To create a Command Tactical Zone:

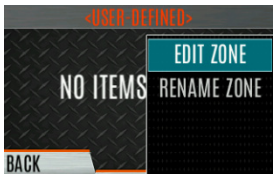
1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **ZONE** menu**.**
3. Press the up or down navigation buttons to highlight **<USER-DEFINED>** and press the **VIEW ZONE** soft key.



4. Press the **OPTIONS** soft key.



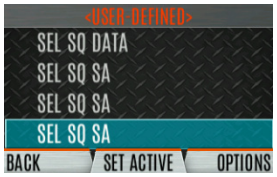
5. Press the up or down navigation buttons to select **EDIT ZONE** to create a zone or select **RENAME ZONE** to rename the Command Tactical Zone (up to 16 characters are allowed).



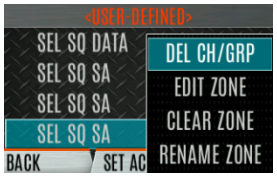
6. Press the left or right navigation buttons to scroll through existing systems. Press the up or down navigation buttons to highlight desired channel/group.
7. Press the Menu/Select button to add or remove channel/group.

8. After adding all desired channels/groups, press the **BACK** soft key.

9. Activate the Command Tactical Zone by selecting the **SET ACTIVE** soft key on the **USER DEFINED** screen, or by pressing the Menu/Select button when **<USER DEFINED>** is highlighted on the Zone menu.



10. After creating a Command Tactical Zone, select **OPTIONS** to edit the Command Tactical Zone, delete channels/groups, clear the zone, and rename the zone.

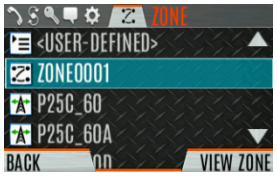


6.3.2 Mixed System Zone

Mixed System Zones are defined using RPM2 and cannot be edited on the radio. If a Mixed System Zone is not configured using RPM2, it will not appear on the radio. Up to 250 Mixed System Zones can be defined. You can view details about each channel/group. A user programmable button can be defined to scroll through just the mixed system zones.

To view Mixed System Zones:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **ZONE** menu.
3. Press the up or down navigation buttons to highlight the desired zone (Zones are indicated by the icon) and select **VIEW ZONE** to view the groups/channels in the zone list.

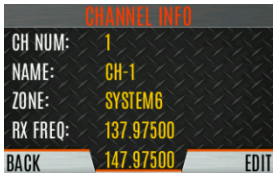


6.4 CH INFO MENU

The Channel Information (CH INFO) menu displays information about the currently selected channel. The information displayed varies between conventional and trunked systems. The Channel Information (CH INFO) menu display is only available if a Channel Edit Password has been programmed via RPM2.

To display channel information:

1. Press ◂ while on the idle display.
2. Press the up or down navigation buttons to scroll through the programmed channel settings.



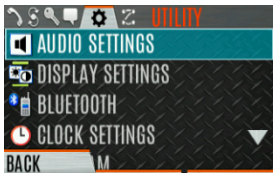
CONVENTIONAL OR P25 CHANNELS ONLY:

3. Press the **EDIT** soft key.
4. Enter the password. You may now select and change the values of the displayed channel parameters. The password remains active until power cycle. Refer to Section 7.3 for more information.

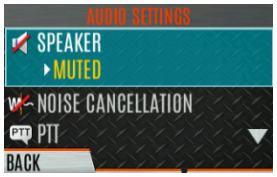
6.5 AUDIO SETTINGS

From this menu, you can set audio settings such as speaker mute, noise cancellation, PTT, and tones.

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **UTILITY** menu.
3. Press the up or down navigation buttons highlight **AUDIO SETTINGS** and press the Menu/Select button.



4. Press the up or down navigation buttons to scroll through available audio settings. Press the Select/Menu button to change settings as desired:



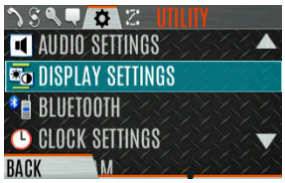
- **SPEAKER** - Mute or Unmute the speaker audio.
- **NOISE CANCELLATION** - Enable or disable noise cancellation. Noise cancellation reduces background noise during transmit.
- **PTT** - Enable or disable Push-To-Talk (PTT). Disable PTT to prevent accidental keying, such as when the radio is in a holster or you are getting into a car.
- **TONES** - Enable or disable alert tones (see Table 5-6).
- **KEYPAD TONES** - Enable or disable keypad tones. When enabled, the radio plays a tone when a button on the keypad is pressed.

5. Press the **BACK** soft key to exit menu.

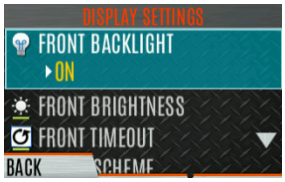
6.6 DISPLAY SETTINGS

To change display settings:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **UTILITY** Menu.
3. Press the up or down navigation buttons to highlight **DISPLAY SETTINGS** and press the Menu/Select button.



4. Press the up or down navigation buttons and the Select/Menu button to change settings as desired:



- COLOR SCHEME - Change the color scheme of the top and front displays for optimum viewing in day/night conditions.
- FRONT BACKLIGHT - Turn front display backlight on, off, momentary, or momentary (off). Momentary (off) is similar to momentary, but the backlight turns off completely and only comes on when the center navigation button is pressed.
- FRONT BRIGHTNESS - Set brightness level of front display. A level of 0 has same effect as turning off backlight.

- FRONT TIMEOUT - Specify how long the radio needs to be inactive before the front display's backlight turns off.
- TOP BACKLIGHT - Specify how long the top display's backlight will remain lit: MOMENTARY, ON, or OFF.
- TOP BRIGHTNESS - Set the brightness level of the top display. A level of 0 turns off top display and indicator (TX/RX) LED.
- TOP TIMEOUT - Specify how long the radio needs to be inactive before the top display's backlight turns off.
- FRONT DISPLAY OFF - Turns the front display off completely. Press the Menu/Select button to turn the front display back on. When the front display is turned off, the only button functions that are allowed are:
  - PTT
  - Emergency
  - Toggle Profile
  - Flashlight
  - Toggle Stealth
  - Channel Up
  - Channel Down
  - Volume Up
  - Volume Down

  Press the Menu/Select button to disable this feature and turn the front display back on.
- TOP ORIENTATION - Set orientation of top display to be viewed from radio: FRONT, BACK, or AUTO.

  When AUTO is selected, the radio changes the top display to be viewed from back if an external microphone or speaker is attached. Otherwise, the display can be viewed from the front.
- INDICATOR LED - Toggle the indicator LED ON/OFF.

5. Press the **BACK** soft key to exit the menu.

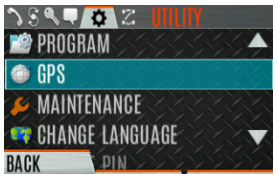
6.7 GPS SETTINGS

NOTE

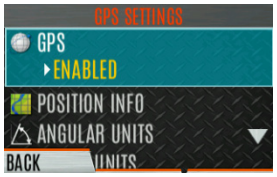
The **GPS SETTINGS** menu item only appears if enabled using RPM2 and the feature is installed.

To access GPS settings:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the UTILITY menu.
3. Press the up or down navigation buttons to highlight GPS and press the Menu/Select button.



4. Use the up or down navigation buttons and the Select/Menu button to change settings as desired:



- **GPS** - Enable or disable internal GPS.
- **POSITION INFO** - See Section 6.8.
- **ANGULAR UNITS** - Set unit of measurement of displayed angular units: **CARDINAL**, **DEGREES**, or **MILS**.
- **LINEAR UNITS** - Set unit of measurement of displayed linear units: **STATUTE**, **METRIC**, or **NAUTICAL**.
- **POSITION FORMAT**- Set format of displayed position information: Latitude/Longitude Decimal Degrees (LAT LONG DD), Latitude/Longitude Degrees Minutes Seconds (**LAT/LONG DMS**), **LAT/LONG DM**, Military Grid Reference System (**MGRS**), or Universal Transverse Mercator (**UTM**).
- **SA OVER NETWORK** - When Enabled, the radio sends GPS data to an L3Harris-supplied PC client using RNDIS networking.

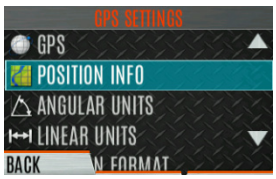
5. Press the **BACK** soft key to exit the menu.

6.8 POSITION INFO

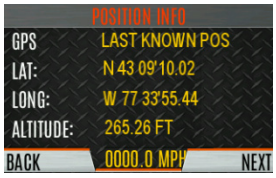
The Position Info screen displays the radio user's location information. GPS must be enabled in the GPS Settings (see Section 6.7).

To display position info:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **UTILITY** menu.
3. Press the up or down navigation buttons to highlight **POSITION INFO** and press the Menu/Select button.



4. Press the up or down navigation buttons to scroll through available location information.



6.9 WI-FI

The XL portable supports programming via Wi-Fi. Refer to Appendix A for information on configuring Wi-Fi.

To enable Wi-Fi programming mode on the radio:

1. Ensure the radio is powered off.
2. Press and hold the bottom side button and PTT button (see Figure 4-1).

Figure 6-1: Enabling Wi-Fi

3. Power on the radio.
4. The WIFI INSTALL ACTIVE screen is displayed (Figure 6-2). The radio displays **DISCONNECTED** if not connected to a wireless network or **CONNECTED** if connected to a wireless network.

Figure 6-2: Wi-Fi Install Active

NOTE

Refer to Section 5.40.2 for more information about Wi-Fi Client selection.

6.10 BLUETOOTH

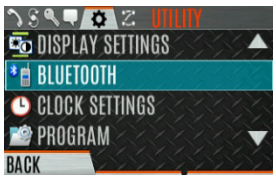
NOTE

The **BLUETOOTH** menu item only appears if enabled using RPM2 and if the feature is installed.

6.10.1 Enable Bluetooth

To enable Bluetooth:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **UTILITY** menu.
3. Press the up or down navigation buttons to highlight **BLUETOOTH** and press the Menu/Select button.



4. Press the up or down navigation buttons to highlight **ENABLED** and press the Menu/Select button to toggle **YES/NO**.

Or

A button or switch can be programmed to enable/disable Bluetooth.

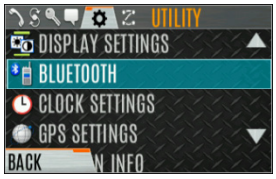
6.10.2 Pair Devices

NOTE

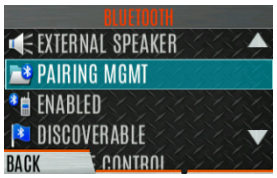
Up to 10 pre-paired Bluetooth RSMs with unique IDs can be saved/stored in the radio's memory for automatic reconnection.

To pair devices:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **UTILITY** menu.
3. Press the up or down navigation buttons to highlight **BLUETOOTH** and press the Menu/Select button.

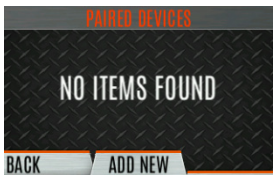


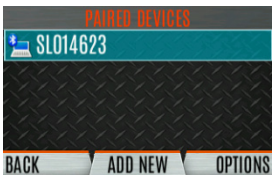
4. Press the up or down navigation buttons to highlight **PAIRING MGMT** and press the Menu/Select button**.**



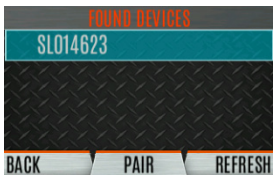
5. Make sure device being paired is powered on and has discovery mode enabled to pair with the radio.

   If no devices are found and Bluetooth is enabled, only the **ADD NEW** soft key is available. If devices are paired, the **OPTIONS** soft key appears.





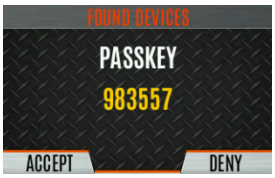
6. Press the **ADD NEW** soft key to select a device to pair.
7. A list of available Bluetooth devices appears.



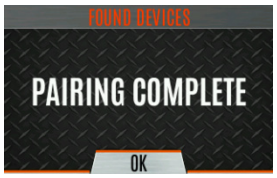
8. Press the **REFRESH** soft key to refresh the device list if the desired device does not appear.
9. Press the up or down navigation buttons highlight the desired device and press the **PAIR** softkey.
10. Pairing progress is displayed.
    - For Bluetooth 2.0 devices, a pin code screen appears.

      Enter the pin code and select **OK**.
    - For Bluetooth 2.1 devices, a PASSKEY accept/deny screen appears. Select **ACCEPT**.

      Accept the passkey on the Bluetooth 2.1 device as well.



11. A **PAIRING COMPLETE** message appears when pairing is complete. Select **OK**. The paired device is then displayed in the **PAIRED DEVICES** list.



6.10.3 Reconnecting to Covert Bluetooth Microphone 12082-0684-01

When powering down, the radio and the microphone should be turned off one at a time, allowing the first device to completely shut down before turning off the second device.

Power Up Sequence:

1. Power up the XL radio. Wait for power up to complete.
2. Power up covert microphone 12082-0684-01.
3. Wait for Bluetooth connection as indicated by the LED. When connected, the LED is on and blue.
4. If the microphone LED indicates Idle or does not connect, press and release the PTT button.

6.10.4 Pair with the SCOTT EPIC 3 Radio Direct Interface (RDI) Voice Amplifier

The RDI Voice Amplifier enhances SCBA voice intelligibility when connected to the XL Portable via Bluetooth.

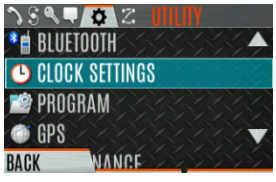
To turn the amplifier on and place into pairing mode:

1. Press and hold the power button until the LED changes from green to red. This happens in about four (4) seconds.
2. Release the power button.
3. The LED starts blinking indicating the amp is in pairing mode.
4. Ensure the LED is the same color blinking on and off indicating pairing mode. The amp will timeout of pairing mode quickly and the blinking will stop. If this happens before successful pairing, power off and restart from Step 1.
5. If the LED is blinking between light red and dark red, then the amp is in programming mode. If you try to pair with the amplifier in this mode, it will identify itself as an RI version. Turn off power and restart from step 1.

6.11 CLOCK SETTINGS

To view/change clock settings:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **UTILITY** menu.
3. Press the up or down navigation buttons to highlight **CLOCK SETTINGS** and press the Menu/Select button.



4. Use the up or down navigation buttons and Menu/Select button to change settings as desired:

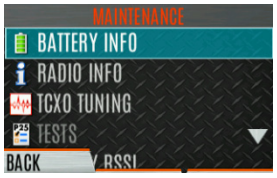
- **TIME FORMAT**- Set 12 or 24-hour time display format.
- **TIME ZONE** - Set time zone relative to Universal Time Coordinated (UTC).

5. Press the **BACK** soft key to exit.

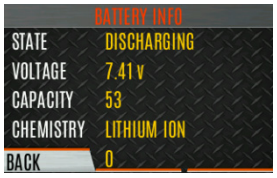
6.12 BATTERY INFO

To display battery information:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **UTILITY** menu.
3. Press the up or down navigation buttons to highlight **MAINTENANCE** and press the Menu/Select button.
4. Press the up or down navigation buttons to highlight **BATTERY INFO** and press the Menu/Select button.



5. Battery information is displayed (state, voltage, capacity, chemistry, etc.).

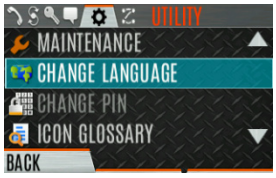


Use only L3Harris approved batteries. Injury could occur from using an incorrect battery.

6.13 SELECT LANGUAGE

To change the language displayed by the radio:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **UTILITY** menu.
3. Press the up or down navigation buttons to highlight **CHANGE LANGUAGE** and press the Menu/Select button.



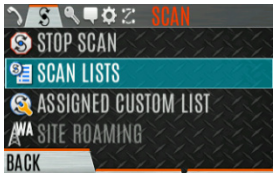
4. Press the up or down navigation buttons to highlight the desired language and press the Menu/Select button.

6.14 SET UP SCAN

These procedures are used to set up the scan list, home channels, and priority channels.

To access the scan lists:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SCAN** menu.
3. Press the up or down navigation buttons to highlight **SCAN LISTS** and press the Menu/Select button. Refer to the following sections.



NOTE

When using Preemptive Priority Scan, the frequencies in the list need to be unique.

6.14.1 Default, Priority 1, and Priority 2 Channels

6.14.1.1 Default Channel

This is the currently selected channel and is the channel you transmit on by default when you press PTT while the radio is actively scanning and is not responding to a just received call. Responding to a call the radio just received while scanning is called hang time. If hang time is set to 0 using RPM2, the radio always transmits on the default channel in scan.

6.14.1.2 Priority 1 Channel

This channel will be scanned more often than other channels in the list and will be scanned in between every other channel in the scan list. An example scan sequence would be P1 (priority 1), C2, P1, C3, P1, C4, etc. In addition, the priority channel is scanned even while actively receiving on a non-priority channel. For example, if the radio is actively receiving on C3 and activity is detected on P1, the radio drops C3 and switches to P1.

6.14.1.3 Priority 2 Channel

This channel is also scanned more often than others. An example scan sequence is P1, C2, P1, C3, P1, C4, P2, C5, P1, C6, P1, C7, P1, C8, P2, C9, etc. In addition, this channel is scanned even while actively receiving on a non-priority channel. For example, if the radio is actively receiving on C3 and activity is detected on P2, the radio drops C3 and switches to P2. Additionally, activity on P1 can also preempt P2, but P2 cannot preempt P1.

6.14.2 Trunked/Conventional Scanning

Trunked/conventional scanning adds the ability to scan multiple conventional and P25 conventional channels while still maintaining trunked radio operation. The radio can scan a conventional scan list while still receiving a trunked control channel and receiving trunked calls. Selection of which conventional scan list is associated with a given trunked system is done using RPM2 and cannot be changed on the radio. However, a user with access to the necessary menu layout (see Section 5.9) can edit the scan list members (both trunked groups and conventional channels on the selected Conventional Priority System). As the number of conventional channels being scanned increases, the time between scanning each channel increases (roughly 250 milliseconds per channel), with the consequent increase in the number of calls that will late-enter. To avoid missing calls, it is recommended to keep the number of conventional channels being scanned to eight (8) or fewer.

NOTE

The trunking site must have roaming set to Enhanced CC.

6.14.3 Vote Scan (Analog and P25 Conventional Only)

If vote scan is enabled via RPM2, the radio automatically selects the strongest signal ensuring that the best audio quality is delivered to the user. If vote scan is enabled, the radio is always scanning. You cannot stop scanning, start normal scanning, or monitor the channel. The scanning icon on the idle screen indicates that the radio is vote scanning versus, regular scanning.

NOTE

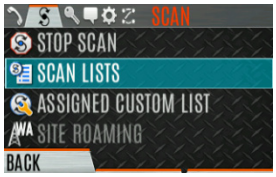
If talkaround is enabled, Vote Scan is disabled until talkaround is disabled again.

6.14.4 Edit Scan List

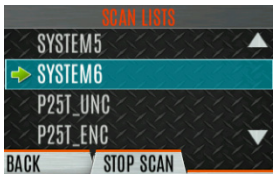
Depending on the scan list options selected via RPM2, you may be able to add or remove channels/groups from the scan list.

To edit the scan list:

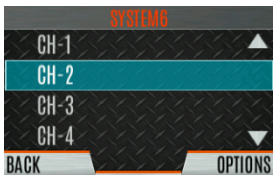
1. Press the Menu/Select button.
2. Press the left or right navigation buttons to display the **SCAN** menu.
3. Press the up or down navigation buttons to select **SCAN LISTS**.



4. Press the up or down navigation buttons to highlight the scan list and press the Menu/Select button.

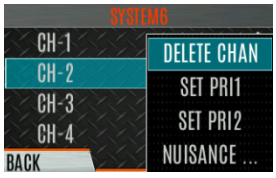


5. Press the up or down navigation buttons to highlight channel/group.
6. Select **OPTIONS**.



7. Press the up or down navigation buttons to select ADD CHAN/DELETE CHAN, SET PRI1, SET PRI2, REMOVE PRI, or NUISANCE/ADD BACK.

   When a channel is not grayed out in the list, **DELETE CHAN** appears. When a channel/group is grayed out (not in list), **ADD CHAN** appears.



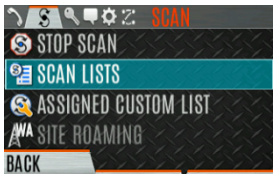
8. Press the Menu/Select button to toggle selection.

6.14.5 Set or Remove Priority 1 and Priority 2 Channels

Priority channels are scanned more often than non-priority channels. Note that P1 and P2 can only be set if configured as “Keypad” and the scan list is not set to “Fixed” using RPM2.

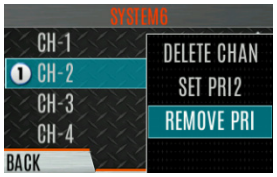
To set or remove priority 1 and priority 2 channels:

1. Press the Menu/Select button.
2. Press the left or right navigation buttons to display the **SCAN** menu.
3. Press the up or down navigation buttons to highlight **SCAN LISTS** and press the Menu/Select button.



4. Press the up or down navigation buttons to highlight the desired scan list and press the Menu/Select button.
5. Press the up or down navigation buttons to highlight the desired channel/group.

6. Select **OPTIONS**.
7. Press the up or down navigation buttons to highlight **SET PRI1** or **SET PRI2** and press the Menu/Select button. A Priority 1 channel appears with P1; a Priority 2 channel appears with P2.
8. Select **REMOVE PRI** to remove priority.



6.14.6 Custom Scan Lists

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 Trunked, P25 Conventional, and Analog Systems. When a Custom Scan List is assigned to a P25T system, the radio can scan P25T, P25C and Analog systems. When assigned to 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 can 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. If P25C and/or analog channels are added to the custom scan list, the radio will scan them using the Trunked/Conventional scan feature described in section 6.14.2, and will override any other conventional scan list that may have been programmed using RPM2.

- P25C and Analog Scan:

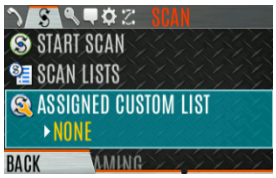
  When a custom scan list is assigned to a P25C or Analog System, the user can scan P25C and Analog channels. P25T systems are ignored.

Custom scan list can be created using RPM2 or at the radio. The radio supports up to 10 Custom Scan lists, with up to 100 channels/groups in each.

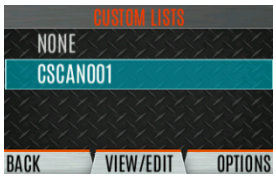
6.14.6.1 Create Custom Scan List

To create a custom scan list at the radio:

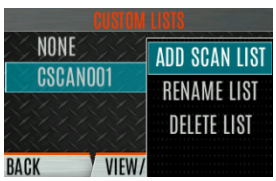
1. Press the Menu/Select button.
2. Press the left or right navigation buttons to display the **SCAN** menu.
3. Press the up or down navigation buttons to highlight **ASSIGNED CUSTOM LIST** and press the Menu/Select button.



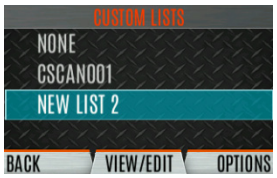
4. Press the **OPTIONS** softkey.



5. Select **ADD SCAN LIST**.

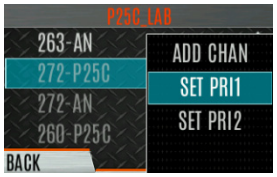


6. Press the up or down navigation buttons to highlight the newly added scan list and press the **VIEW/EDIT** soft key.



7. Press the left or right navigation buttons to display the desired system.

8. Press the up or down navigation buttons to highlight the desired group/channel and press the **OPTIONS** softkey. From here, you can add/delete channels from the scan list and set/remove Priority 1 and Priority 2 channels.



NOTE

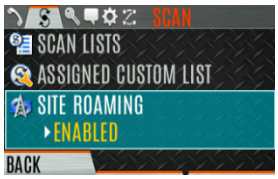
When a custom scan list is selected, that list is scanned any time scanning is enabled for any Trunked, conventional, or P25 Conventional system. To scan only the channels assigned to a system, custom scanning must be turned off.

6.14.7 Wide Area System Scan (P25 Trunked and EDACS)

Wide Area System Scan (WASCAN) causes the radio to roam across mobile systems when the currently selected system's control channel is lost. The radio will scan the control channels of other systems.

To enable/disable Wide Area System Scan:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SCAN** menu.
3. Press the up or down navigation buttons to highlight **SITE ROAMING** and press the Menu/Select button to toggle Wide Area System Scan **ENABLED/DISABLED**.



4. Select **BACK** to exit the scan menu.

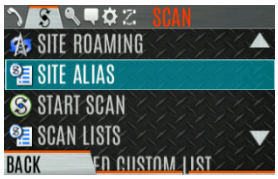
6.14.8 Site Lock

The Site Lock feature provides a list of available, adjacent sites that the user can lock the radio to. This restricts the radio from roaming between sites. Up to 512 sites can be programmed to the radio.

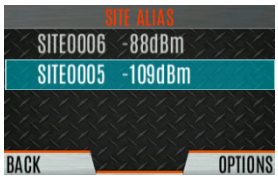
NOTE

Site Lock is only supported on P25 Trunked Systems with Enhanced CC Scan enabled.
A button on the radio can be programmed to access the Site Alias list (see Section 7.5).

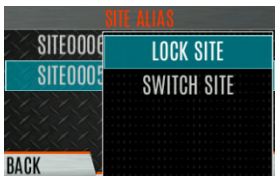
1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the SCAN menu.
3. Press the up or down navigation buttons to highlight **SITE ALIAS**.



4. Press the Menu/Select button to display the list of available sites. If a Site Alias is programmed for the available site(s), it is displayed here. Otherwise, the system name is displayed.



5. From the **OPTIONS** menu, select **LOCK SITE** or **SWITCH SITE**.



6.15 RADIO STATUS

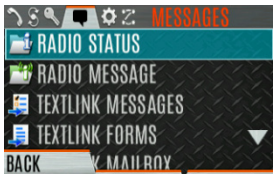
The status feature allows the radio user to send a status condition to the site without making a voice call. There can be up to 10 status conditions programmed into the radio. For each status defined, there is an ID and an alphanumeric name. The ID is sent to the site and the alphanumeric name appears on the radio display when the ID corresponds with the information programmed at the site.

NOTE

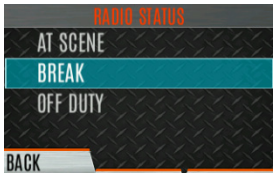
A button on the radio can be programmed to send a radio status (see Section 7.5).

To send a radio status:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **MESSAGES** menu.
3. Press the up or down navigation buttons to highlight **RADIO STATUS** and press the Menu/Select button.



4. Use the up or down navigation buttons and the Menu/Select button to highlight and select desired status.



6.16 RADIO MESSAGE

The message feature is used to send a message to the site without making a voice call. There can be up to 10 messages programmed into the radio. For each message defined, there is an ID and an alphanumeric name. The ID is sent to the site and the alphanumeric name appears on the radio display when the ID corresponds with the information programmed at the site.

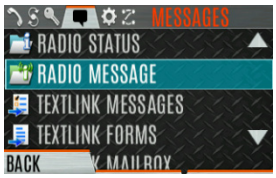
NOTE

A button on the radio can be programmed to send a radio message (see Section 7.5).

To send a radio message:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **MESSAGES** menu.

3. Press the up or down navigation buttons to highlight **RADIO MESSAGE** and press the Menu/Select button.



4. Use the up or down navigation buttons and the Menu/Select button to highlight and select the desired message.

6.17 RADIO TEXTLINK

Radio TextLink provides short text messaging functionality for radios. Due to the difficulty of entering text messages on a radio, predefined "canned" messages and predefined replies can be stored in the radio. To facilitate sending messages where information must be provided at send time, text message forms can also be stored in the radio. A form can contain up to four (4) text prompts, for which the operator enters alphanumeric values before sending the message.

6.17.1 Radio TextLink Messages

To send a canned Radio TextLink message:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **MESSAGES** menu.
3. Press the up or down navigation buttons to highlight **TEXTLINK MESSAGES** and press the Menu/Select button.

4. Press the left or right navigation buttons to display the desired message.
   - Press the Menu/Select button to send the message.
   - Select **CHG CALLEE** to change the destination for the message.
   - Select **TOD QUERY** to get the time of day.

6.17.2 Radio TextLink Forms

Form messages are displayed and stored in the radio as a message in which each field to be filled is indicated by a question mark (?) followed by one or more asterisks (*). The number of asterisks indicates the maximum number of alphanumeric characters allowed for that field.

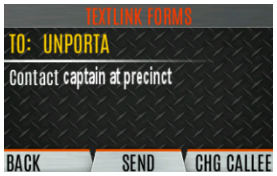
To send a Radio TextLink form:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **MESSAGES** menu.
3. Press the up or down navigation buttons to highlight **TEXTLINK FORMS** and press the Menu/Select button.

4. Press the left or right navigation buttons to display the desired message and press the Menu/Select button.

5. Enter text into blank field(s) (up to eight alphanumeric characters) and press the **NEXT** soft key.

6. Select **SEND** to send the message. Select **CHG CALLEE** to change the destination for the message. Select **TOD QUERY** to get the time of day.



6.17.3 View Received Messages

When the ✉ icon appears on the idle display, there are Radio TextLink messages waiting to be read.

To view received Radio TextLink messages:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the MESSAGES menu.

3. Press the up or down navigation buttons to highlight **TEXTLINK MAILBOX** and press the Menu/Select button. From the mailbox, select **OPTIONS** to delete messages, view details of messages, and reply to messages.

6.18 FAULTS/ALERTS

is displayed on the idle display when there is a fault.

To view and clear faults/alerts:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **MESSAGES** menu.
3. Press the up or down navigation buttons to highlight **FAULTS/ALERTS** and press the Menu/Select button.

4. Fault messages are displayed. Press the up or down navigation buttons to highlight the desired fault. Press the **OPTIONS** soft key delete faults. Press the **DETAILS** soft key to view details for the highlighted fault.

Possible faults include:

- **BATTERY FAULT**- Replace battery.
- **EEPROM FAULT** - Contact L3Harris.
- **RF FAULT -** Contact L3Harris.
- **OVERCURRENT** - Check antenna and antenna connection. Try replacing antenna.
- **INVALID SYSTEM -** Feature not installed.
- **CHANNEL FAULT -** Channel frequency programmed is not valid for this radio.

5. If you view but do not delete the fault, the alert icon goes away on the idle display.
6. Contact L3Harris for assistance with diagnosing a fault.

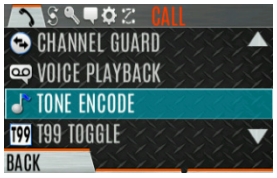
6.19 TONE ENCODE

Tone Encode is a generic tone encoding scheme for call identification when transmitting on a conventional system. It supports generic user-definable tone encode (up to 15 tones), Type 99 (up to 2 tones) and 5/1 Tone (up to 5 tones) encoding formats.

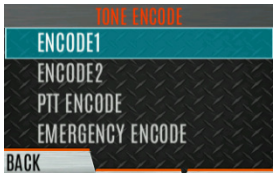
Tone encoding schemes are used to transmit calls to one or more target radios that have been programmed with the correct tone decode sequence. When the receiving radio detects its tone decode sequence, it unmutes on the call.

To select a Tone Encode option:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **CALL** menu.
3. Press the up or down navigation buttons to highlight **TONE ENCODE** and press the Menu/Select button.



4. Select the desired Tone Encode option from the list.



6.20 ENCRYPTION

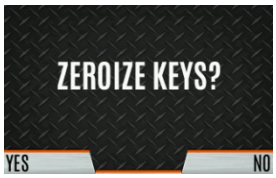
6.20.1 Zeroize Keys from Radio

It may be necessary to remove keys because of compromise or expiration.

To zeroize keys from the radio:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SECURITY** menu.
3. Press the up or down navigation buttons highlight **ZEROIZE KEYS** and press the Menu/Select button.

4. Press the **YES** softkey to remove the keys. This will also remove the keysets.



6.20.2 Protected Keys

The Protected Keys feature transfers P25 Voice Keys, from L3Harris 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 are used to unwrap (AES) or decrypt (DES) the Protected Keys.

6.20.3 Global Encryption

Global Encryption can be enabled when encryption keys are loaded on the radio and the selected Zone/System is encrypted. When Global Encryption is enabled on the radio, a Global Key is used for all encrypted transmissions until:

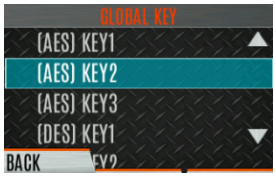
- Global Encryption is disabled.
- A new personality is activated.
- The active keyset is changed.
- The system is changed.

Global Encryption behavior is available on all channels that support encrypted communications.

To enable Global Encryption and/or change Global Encryption Key:

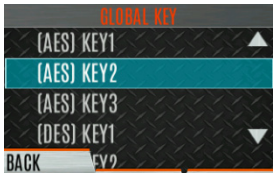
1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SECURITY** menu.
3. Press the up or down navigation buttons to highlight **GLOBAL ENCRYPTION.** Press the Menu/Select button.

4. Press the up or down navigation buttons to highlight the desired Global Key and press the Menu/Select button to enable Global Encryption.



5. To change the selected global key, press the up or down navigation buttons to highlight **GLOBAL KEY** on the **SECURITY** menu. Press the Menu/Select key.

6. Press the up or down navigation buttons to highlight the global key and press the Menu/Select button.

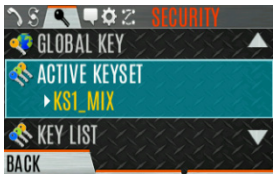


7. RPM2 allows Key Numbers to be given Key Names.
8. The optional global key icon is displayed on the main display.

6.20.4 Select Keyset

To select a keyset:

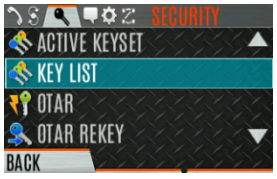
1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SECURITY** menu.
3. Press the up or down navigation buttons to select **ACTIVE KEYSET**. Press the Menu/Select button to toggle to the inactive keyset.



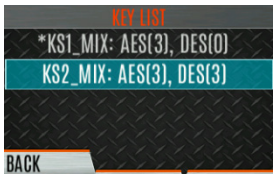
6.20.5 View Key List

To view the key list:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SECURITY** menu.
3. Press the up or down navigation buttons to select **KEY LIST** and press the Menu/Select button.



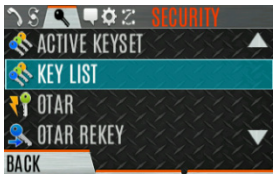
4. The available key lists are displayed.



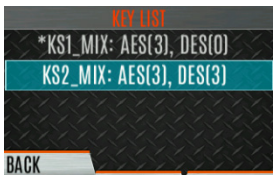
6.20.6 Delete Individual Keys

To delete individual keys from a keyset:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SECURITY** menu.
3. Press the up or down navigation buttons to select **KEY LIST** and press the Menu/Select button.



4. The available key lists are displayed.



5. Select the desired keyset and press the Menu/Select button to display the individual keys. Highlight the desired key and press the **DELETE** softkey.

6.20.7 OTAR Configuration

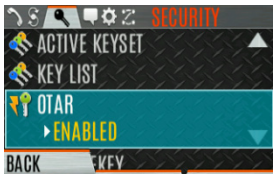
OTAR is the over-the-air-rekeying from a KMF and must be enabled for the digital only channel using RPM2. For OTAR operation, the appropriate KEKs must be loaded into the radio using the L3Harris Key Loader or a KVL device.

The KMF Configuration must include the RSI of the KMF and the appropriate Message Number Period.

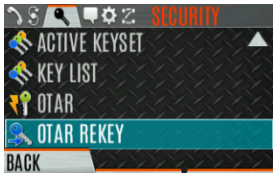
To enable OTAR and request rekey:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **SECURITY** menu.

3. Press the up or down navigation buttons to highlight **OTAR** and press the Menu/Select button to toggle **ENABLED**/**DISABLED**.



4. Press the up or down navigation buttons to select **OTAR REKEY** and press the Menu/Select button to request that the KMF updates the keys in the radio. **OTAR REKEY** is only enabled if the radio has successfully registered for data operations. If enabled via programming, the radio plays an audible confirmation tone to indicate successful OTAR rekey.



6.21 P25 CONVENTIONAL FALLBACK

When P25 Conventional Fallback is enabled, a P25 trunking site responds to failures by allowing one or more channels to operate as conventional repeaters. Terminals which are properly configured can then communicate using the conventional P25 channel(s).

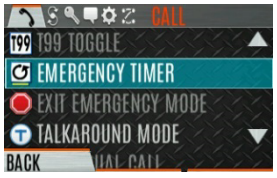
The radio provides an audible and visual indication when operating in P25 Conventional Fallback.

6.22 EMERGENCY CHECK-IN TIMER

The Emergency Check In Timer is an added safety feature for a radio user who may be in a dangerous environment. If this timer expires before being cancelled by the radio operator, an emergency is declared.

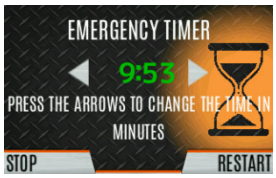
To enable the Emergency-Check In Timer via the radio menu:

1. Press the Menu/Select button to access the main menu.
2. Press the left or right navigation buttons to display the **CALL** menu.
3. Press the up or down navigation buttons to highlight **EMERGENCY TIMER** and press the Menu/Select button.



4. Set the Emergency Check-In Timer using the left or right navigation buttons. The minimum and maximum allowable values are programmed via RPM2. Default is 10 minutes.

5. Press **RESTART** to restart the timer or **STOP** to stop the timer and return to the **CALL** menu. If enabled via RPM2, pressing the PTT button will also restart the timer.



NOTE

Power cycling the radio stops the Emergency Check-In Timer.

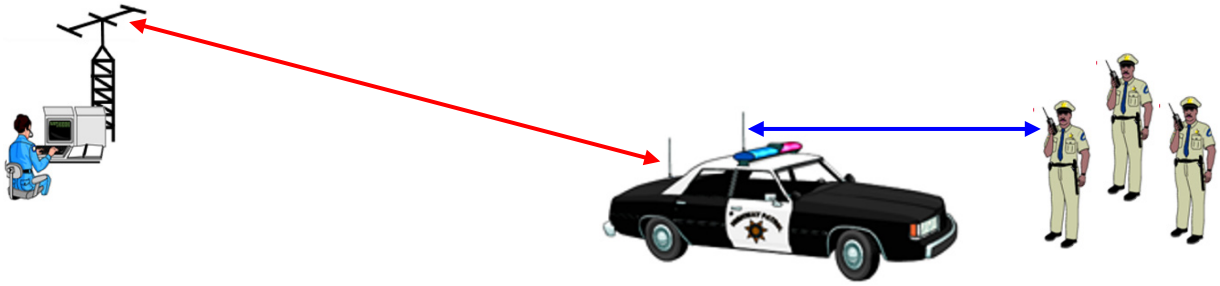
If the **EMERGENCY TIMER** menu is not available to the radio user, a button can be programmed to enable/disable the Emergency Check-In Timer. In this case, the timer value is set in RPM2 and cannot be changed at the radio.

6.23 VEHICULAR REPEATER (VR) OPERATION THROUGH A PYRAMID VR

6.23.1 VR System Overview

An XL portable radio can operate through a Vehicular Repeater (VR) System which consists of a Vehicular Repeater Radio connected to an XL Mobile Radio in a vehicle. A portable radio using the VR System is called a VR Client Radio.

VR Client Radio transmissions are received by the VR System's VR radio and retransmitted on the VR System's XL Mobile. This is called "Portable To Base" operation. Likewise, the VR System's VR Radio retransmits transmissions received by the VR System's XL Mobile to the VR Client Radios. This is called "Base To Portable" operation.



VR System Equipped Vehicle

A VR System can extend the coverage of a Portable Radio. A VR Client Radio communicating through a VR System, utilizing a higher power mobile and a more efficient mobile radio antenna, allows the VR Client Radio to access a Radio Network through the VR System's XL Mobile Radio that the VR Client Radio may not be able to access directly.

VR operation is supported with the XL Mobile when set to a P25 Trunked, a P25 Conventional, or an Analog Conventional System.

6.23.2 VR Modes of Operation

A VR System supports System Repeat Mode and Local Repeat Mode.

- System Repeat Mode (Extended Coverage) provides network extension that enables nearby VR Client Portable Radios operating on a vehicular repeater radio frequency channel to access a radio network through the XL Mobile radio. Portable radio coverage is extended due to the XL Mobile's high-performance mobile antenna system and higher transmitter output power used to access the radio network. In this mode, the Vehicular Repeater can significantly enhance in-building penetration for portable radios that can operate on the same radio frequency band as the vehicular repeater. Typical operational scenarios include in-building tactical operations, joint training exercises, and search-and-rescue operations in remote (i.e., RF-fringe-area) areas.
- Local Repeat Mode (Scene Of Incident) enables nearby radios operating on a vehicular repeater radio frequency channel to communicate with each other using the Vehicular Repeater as a base station repeater. This mode is advantageous for use during any operational scenario where network communications (including communications with console dispatchers) is not required and/or not possible. This mode does not provide access to any of the XL Mobile Radio's radio systems.

6.23.3 Software Requirements

- XLP R12K or later
- RPM2 R12D or later

6.23.4 Selecting a VR System

Select the desired VR System. See Section 5.12. If necessary, consult with your radio system's network administration personnel as necessary and obtain the name of the required system.

After the VR System is selected, the radio shows the VR Display. This is indicated by the Display's VR Backdrop. In the following image, the System is "VR SYSTEM" and the P25C Channel is "BATTALION 2 VR."

6.23.5 VR Availability Indications

When the VR System is selected, the VR Client Radio waits up to 12 seconds to determine if a VR is available. A VR transmits periodic Beacon Transmissions to announce its presence. A VR Client goes into its normal Operational Mode after hearing one of these Beacon Transmissions.

NOTE

Attempting a transmission during this initial twelve second period immediately sets the VR Client Radio in its Normal Operating Mode and the VR Client Radio will attempt to transmit through the VR.

Receiving a transmission from the VR during this initial twelve Second Period also sets the VR Client Radio in its Normal Operating Mode.

If the VR Client Radio does not hear a VR Beacon Transmissions within this 12 seconds period, the VR Client indicates a VR is not available with its "VRS OOR" (VR Out Of Range") Display. This is shown below. The VR Client Radio is now in its "VRS OOR" Mode.

A "VRS OOR" VR Client Radio continues to listen for VR Beacon Transmissions. When it receives a VR Beacon Transmission, the VR Client Radio returns to its Normal Operating Mode and replaces its "VRS OOR" display with its Normal VR display.

Likewise, if a VR Client Radio in Normal VR Operating Mode goes over 12 seconds without hearing a VR Beacon Transmission, the VR Client will go into its "VRS OOR" Mode. The VR Client concludes that the VR is no longer available and displays "VRS OOR."

A VR Client Radio can go into "VRS OOR" Mode when a VR is not on the scene or has left the scene. A VR Client Radio can go into "VRS OOR" Mode when the VR Client Radio too far away from and out of range of the VR.

A VR Client Radio cannot transmit while it is in its "VRS OOR" Mode. PTT attempts are denied by the VR Client Radio.

If so programmed, a "VR Client in its "VRS OOR" Mode will play its "Out Of Range" Alert Tone.

6.23.6 VR Client Transmit operation

6.23.6.1 Local Repeat Mode

1. Press and hold PTT to initiate a transmission.
2. The VR Client transmits a "Request To Transmit" to the VR.
3. The VR transmits a Grant or Denied Response to the VR Client.

   If the VR Client does not receive a response from the VR, the VR Client retries its Request Transmission.
4. If VR Client's Request is granted:
   - The VR Client starts transmitting with its Mic Audio.
   - The VR repeats the transmitting VR Client Radio's Mic Audio to other VR Client Radios.
   - Other VR Client Radios display the transmitting Radio's Caller ID Information and the VR's Group Information.
5. If VR Client's Request is denied:

   The VR Client plays the Denied Alert Tone. The VR Client displays the "Call Denied" Display.
6. Release PTT to end the transmission.

6.23.6.2 System Repeat Mode

A VR Client initiated transmission is called a VR "Portable To Base" Transmission.

1. Press and hold PTT to initiate a transmission.
2. The VR Client transmits a "Request To Transmit" to the VR.

   If the VR Client does not receive a response from the VR, the VR Client retries its transmission.
3. The VR initiates a transmission on its XL Mobile Radio on the XL Mobile Radio's Selected System and Group.
4. If the XL Mobile's Transmission is granted, the VR sends a Grant Response to the VR Client.
   - The VR Client starts transmitting with its Mic Audio.
   - The VR repeats the transmitting VR Client Radio's Mic Audio to other VR Client Radios.
   - Other VR Client Radios display the transmitting Radio's Caller ID Information and the VR's Group Information.
   - The XL-Mobile transmits VR Client Radio's Mic Audio from the VR.
   - In an EVRS VR System, XL Mobile Network Side Radios sees the XL-Mobile Radio's Caller ID Information. In an EVRS+ VR System, XL Mobile Network Side Radios see the Transmitting VR Client Radio's Caller ID Information.
5. If the XL-Mobile's Transmission is denied, the VR sends a denied Response to the VR Client.

   The VR Client plays a Denied Alert Tone. The VR Client displays "Call Denied."
6. Release PTT to end the transmission.

6.23.6.3 VR Denied Transmissions

A VR Client transmission attempt may be denied when the VR or the XL-Mobile is not available to transmit. These situations can include:

- The VR Client Radio is out of range of the VR. A VR Client Radio denies a transmission attempt while the VR Client Radio is in its "VRS OOR" Mode.
- The XL-Mobile is transmitting from its Control Unit.
- All Channels on a P25T Site are in use and the Site cannot assign a Channel for the XL Mobile's transmission.

When a VR Client transmission attempt is denied, the VR Client plays its Denied Alert Tone. The VR Client displays its "Call Denied" Display. This is shown below:

After a VR Client transmission attempt has been denied, the VR Client Radio's PTT must be released before the VR Client Radio will allow another transmission attempt. Pressing the VR Client Radio's PTT again causes a new transmission attempt.

6.23.6.4 VR Client Radio and XL-Mobile Control Unit Transmit Conflicts

The XL-Mobile is a fully functional Mobile Radio while the VR is in System Repeat Mode. Consequently, it is possible for a VR Client Radio and the XL Mobile's Control Unit to conflict with one another when attempting to transmit.

Normally, access to the XL-Mobile is on a "first come, first served" basis. If the XL-Mobile is currently transmitting locally from its Control Unit, VR Client Radio transmit attempts are denied. Likewise, if the XL-Mobile is transmitting from a VR Client Radio, attempts to transmit from the XL Mobile's Control Unit are denied.

On an EVRS+ VR, a local Control Unit XL Mobile Transmission appear to a VR Client Radio as an XL Mobile Receive "Base To Portable" Transmission. In this case, the VR Client Radios display the VR's Caller ID Information.

6.23.6.5 Courtesy Beeps

The VR can be programmed to transmit a "Courtesy Beep" after a VR Client Transmission. A "Courtesy Beep" serves three purposes:

- Indicates to the transmitting VR Client Radio that its transmission has been transmitted.
- Informs other VR Client Radios that the transmission is over and that the VR is now available for other activity.
- Indicates the current VR Mode:
  - System Repeat Mode - One Beep.
  - Local Repeat Mode - Two Beeps.

6.23.7 VR Client Receive operation

6.23.7.1 Local Repeat Mode

- The VR repeats the transmitting VR Client's transmission to other VR Client Radios.
- The Display on Receive VR Client Radios is the standard XL Portable Receive Display.

  The Radio displays its Receive Backdrop. The Second Display Line may be the transmitting VR Client's Caller ID Information. The Banner Line alternates the transmitting VR Client's Caller ID Information and the VR Group Information. In Figure 6-3 and Figure 6-4, Radio "UNIT 715-1905" is the transmitting VR Client Radio.

Figure 6-3: VR Client Display

Figure 6-4: VR Client Display

6.23.7.2 System Repeat Mode

VR Client Receive Operation is different between an EVRS Mode VR and an EVRS+ Mode VR. The main difference in operation is in the display of Caller ID Information.

EVRS VR:

- The Display on Receive VR Client Radios is the standard XL Portable Receive Display.

  The Radio displays its Receive Backdrop. The Second Display Line can be the transmitting VR's Caller ID Information. The Banner Line alternates the transmitting VR's Caller ID Information and the VR Group Information. A Receive Call with the VR's "BATTALION 2 VR" Caller ID information is shown below:

Figure 6-5: VR Client Display

Figure 6-6: VR Client Display

EVRS+ VR:

- The Display on Receive VR Client Radios is the standard XL Portable Receive Display.

  The Radio displays its Receive Backdrop. The Second Display Line can be the transmitting XL-Mobile Side Radio's Caller ID Information. The Banner Line alternates the transmitting XL-Mobile Side Radio's Caller ID Information and the VR Group Information. In the following displays, "CONSOLE 10" is the Caller ID Information for a P25 Trunked System Radio Transmission being received by the XL Mobile.

Figure 6-7: VR Client Display

Figure 6-8: VR Client Display

6.23.8 VR Client Declare Emergency Operation

A VR Client Radio can be programmed to declare an Emergency. This is done by using the XL Portable Radio's methods for declaring an Emergency (see Section 5.36.1). One method for declaring an Emergency is to press the radio's top Emergency Button.

NOTE

The Emergency Button can be programmed with a "Key Down" period to prevent inadvertent Emergencies. This requires the Emergency Button to be pressed and held for this period before the radio declares an Emergency.

An Emergency declaring VR Client displays its Emergency Display. This is shown below:

Subsequent transmissions from the Emergency declaring VR Client Radio from its PTT will be Emergency Transmissions.

The VR receives Client Radio Emergency Transmission. However, the VR repeats the Emergency declaring VR Client's Transmission as a Non-Emergency Transmission. Other VRS Client Radios in the VR's area receiving the VR's transmission do not display "RX EMERGENCY" and are not aware that the Emergency declaring VR Client Radio has declared an Emergency.

The VR's further actions when a VR Client Radio declares an Emergency depends on the VR's Mode and whether the VR is an EVRS or EVRS+ VR.

6.23.8.1 Local Repeat Mode

EVRS Operation:

The VR declares an Emergency on the XL Mobile and retransmits the VR Client Radio's transmission on the XL Mobile. The XL Mobile transmits as long as the VR Client Radio is transmitting. The XL Mobile does not transmit a "Hot Mic" Transmission when a VR Client Radio declares an Emergency.

Users on the XL Mobile's Radio System cannot respond to the VRS Client Radio's Emergency. The XL Mobile continues to hold the VR "Disabled" and the VR continues to be in Local Repeat Mode.

The VR cannot change into System Repeat Mode in response to a VR Client Radio Emergency.

VR Client Radios do not indicate that the XL Mobile has received an Emergency Call. The VR does not retransmit an XL Mobile received Emergency transmission when the VR is in Local Repeat Mode.

EVRS+ Operation:

The VR does not declare an Emergency on the XL Mobile in response to a VR Client Emergency.

The VR cannot change into System Repeat Mode in response to a VR Client Radio Emergency.

VR Client Radios do not indicate that the XL Mobile has received an Emergency Call. The VR does not retransmit an XL Mobile received Emergency transmission when the VR is in Local Repeat Mode.

6.23.8.2 System Repeat Mode

EVRS Operation:

The VR declares an Emergency on the XL-Mobile and retransmits the VR Client Radio's transmission on the XL Mobile. The XL Mobile transmits as long as the VR Client Radio is transmitting. The XL-Mobile does not transmit a "Hot Mic" Transmission when a VR Client Radio declares an Emergency.

The XL Mobile transmits its Emergency Call with its Caller ID Information.

The XL Mobile displays "TX Emergency."

When the XL Mobile receives an Emergency Call, the VR retransmits the XL-Mobile's Emergency Transmission to the VR Client Radios. However, the VR retransmits the XL Mobile's Transmission as a non-Emergency Call. VR Client Radios are not aware the that XL Mobile is in its RX Emergency Mode.

EVRS+ Operation:

The VR declares an Emergency on the XL-Mobile and retransmits the VR Client Radio's transmission on the XL-Mobile. The XL-Mobile transmits as long as the VR Client Radio is transmitting. The XL-Mobile does not transmit a "Hot Mic" Transmission when a VR Client Radio declares an Emergency.

The XL Mobile transmits its Emergency Call with transmitting VR Client Radio's Caller ID Information.

The XL Mobile displays "RX Emergency," since it is the VR Client Radio declaring the Emergency.

When the XL Mobile receives an Emergency Call, the VR retransmits the XL Mobile's Emergency Transmission. However, the VR retransmits the XL Mobile's Transmission as a non-Emergency Call. VR Client Radios are not aware that the XL Mobile is in its RX Emergency Mode.

6.23.9 VR Client Clear Emergency operation

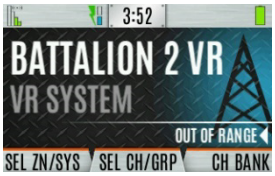
A VR Client Radio can be programmed to clear its Emergency. See Section 5.36.

Clearing an Emergency on a VR Client Radio does not clear the Emergency on the XL-Mobile Radio when the VR is in System Repeat Mode.

Clearing an Emergency on the XL Mobile or clearing the Emergency on another Radio on the XL Mobile's System does not clear an Emergency on a VR Client Radio.

6.23.10 XL Mobile P25T "Out Of Range" Operation

A VR can report a P25 Trunked System XL Mobile's Registration Status to the VR Client Radios. An XL Mobile reports to the VR when it goes out of range and begins CCSCANNING. The VR, in turn, reports this status to the VR Client Radios. The VR Client Radios then Display "OUT OF RANGE" on their Banner Line. This is shown below:



If so programmed, a VR Client in its "OUT OF RANGE" Mode plays its "Out Of Range" Alert Tone. The VR automatically changes to Local Repeat Mode while the XL Mobile is out of range. VR Client Radios can communicate among themselves through the VR, but do not have access to the XL Mobile's System.

An Out Of Range XL Mobile also reports to the VR when it stops CCSCANNING and reregisters on its P25 Trunked System. The VR, in turn, reports this status to the VR Client Radios. The VR Client Radios then return to Normal Operation.

The VR automatically reverts to System Repeat Mode after the XL Mobile comes back in range. VR Client Radios can now communicate through the XL Mobile through the VR. The VR only reports "OUT OF RANGE" when the XL Mobile is on a P25T System. The VR is not capable of reporting "OUT OF RANGE" when the XL Mobile is on a P25 Convectional System nor when the XL Mobile is on an Analog Conventional System.

7. PROGRAMMING

This section provides information on front panel programming. Programming can also be accomplished by creating a plan using a computer with RPM2 installed.

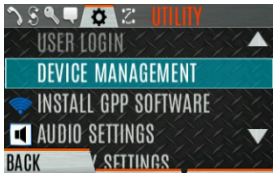
7.1 L3HARRIS DEVICE MANAGEMENT

L3Harris Device Management is a web-based application that allows the user to collect basic status and version information, read and program personalities, and program firmware in XL radios over LTE or secure Wi-Fi. Refer to L3Harris Device Management User's Manual 14221-2100-2010 for information about using the application.

To initiate Device Management Actions from the radio:

The radio only communicates with L3Harris Device Management when initiated by the user as shown in the following steps:

1. From the radio menu select **UTILITY → DEVICE MANAGEMENT**.



2. Verify the **CONNECTION STATUS** is **CONNECTED**.

3. Highlight and select **DM ACTIONS** to check for available updates.

4. The **DM ACTIONS** menu displays **CHECKING** while searching for updates. This will change to **UPDATE AVAILABLE** if there are available updates.

5. Select **DOWNLOAD & INSTALL** to install available updates.

7.2 PROGRAMMING VIA RPM2

Radio Personality Manager2 (RPM2) is used to program the XL portable. With RPM2, you can fully program the radio using cable 12082-0410-A1.

CAUTION

Removing power during radio programming or programming the radio with low battery power could corrupt installation of firmware.

NOTE

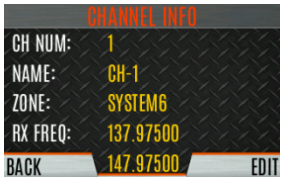
Ensure that the radio is turned off before connecting the programming cable. After the cable is connected, then power on the radio.

7.3 EDIT CHANNEL (ANALOG AND P25 CONVENTIONAL ONLY)

Channels can be edited from the Channel Information (CH INFO) menu display. Most of the displayed channel parameters can be modified here. Channel edits persist across a power cycle. Loading a personality clears any channel edits. Available parameters vary depending on whether the channel is a P25 or analog channel. The Channel Information (CH INFO) menu display is only available if a Channel Edit Password has been programmed via RPM2.

To edit a channel:

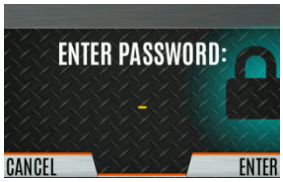
1. From the main display, press ◄ to access the **CH INFO** screen.
2. Press the up or down navigation buttons to scroll through the programmed channel settings.
3. Press the **EDIT** soft key.



CAUTION

Only authorized users should attempt channel editing.

4. Enter the password programmed via RPM2. You do not have to re-enter the password until you power cycle the radio.
5. Press the **ENTER** soft key.



6. Highlight and select the parameter to edit. For P25 channels, modify remaining channel settings:
   - **CHANNEL NAME** - The Channel Name cannot be changed from this screen; RPM2 is required to change the Channel Name.
   - **RX FREQUENCY** - Receive frequency. Note that if the new frequency is invalid, the display reverts to the old frequency (Table 7-1).
   - **TX FREQUENCY** - Transmit frequency.
   - **TX POWER** - Transmit power. Toggle between LOW and HIGH.
   - **TALKGROUP** - Select a talkgroup for the channel. Talkgroup name cannot be set here.
   - **RX NAC** - Network Access Code (NAC) radio uses for Normal squelch in receive.
   - **TX NAC** - NAC radio transmits to break Normal squelch on receiving radio.
   - **P25 SQUELCH** - Select type the radio uses in receive. Select NORMAL, SELECTIVE, or MONITOR.
   - **RX CHAN GUARD** – Squelch type radio uses in receive. Select Noise, CTCSS, or CDCSS. For a digital channel, the RX CHAN GUARD is used to receive from a Conventional analog channel that is on the same frequency and uses the selected Channel Guard.
     - **RX CODE** - Code radio looks to unmute the speaker on the receiving radio when CDCSS squelch is used in conventional mode.
     - **RX TONE** - Tone radio looks to unmute the speaker on the receiving radio when CTCSS squelch is used in conventional mode.
7. For analog channel, modify remaining channel settings:
   - **CHANNEL NAME** - The Channel Name cannot be changed from this screen; RPM2 is required to change the Channel Name.
   - **TX FREQUENCY** - Transmit frequency.
   - **TX POWER** - Transmit power. Toggle between HIGH and LOW.
   - **RX CHAN GUARD** - Squelch type radio uses in receive. Select Noise, CTCSS, or CDCSS.
     - **RX TONE** - Tone radio uses to break selective squelch on receiving radio. This is available when RX squelch is set to CTCSS.
     - **RX CODE** - Code radio uses to break selective squelch on receiving radio. This is available when RX squelch is set to CDCSS.


NOTE

RX CHAN GUARD is not available on this screen if it was enabled from the CALL menu as per Section 5.24.

- **TX CHAN GUARD** - Squelch type radio uses in transmit. Select None, CTCSS, or CDCSS.
  - **TX TONE** - Tone sent by transmitting radio to allow receiving radio to unmute when CTCSS squelch is used in conventional mode.
  - **TX CODE** - Code sent by transmitting radio to allow receiving radio to unmute when CDCSS squelch is used in conventional mode.

NOTE

TX CHAN GUARD is not available on this screen if it was enabled from the CALL menu as per Section 5.24.

8. An asterisk is displayed in front of the **CHANNEL** label on the main display when a channel has been edited. The asterisk is NOT shown for TX Power or Talkgroup changes.

NOTE

When the only item edited is the TX or **RX CHAN GUARD** values, and then **CHAN GUARD** edit is Disabled, the asterisk goes away and the channel is no longer considered edited. This is the only editable item for which this is true.

Table 7-1: Valid Frequency Ranges

INTERNATIONAL (NON-REBANDED)	US (REBANDED)	FREQUENCY RESOLUTION
136 - 174 MHz	136 - 174 MHz	2500, 5000, or 6250 Hz
378 - 522 MHz	378-522 MHz	2500, 5000, or 6250 Hz
763 - 776 MHz	768 - 776 MHz	6250 kHz
793 - 806 MHz	798 - 806 MHz	6250 kHz
806 - 825 MHz	806 -816 MHz	6250 kHz
851 - 870 MHz	851 - 861 MHz	6250 kHz

7.4 OTAP

The radio supports Over-the-Air-Programming (OTAP) via ProFile Manager. RPM2 creates, modifies and stores personality information while ProFile Manager delivers the personality over the network to the desired radios. ProFile Manager also contains the ability to read personality information over-the-air and save the files, so that RPM2 can modify the information if necessary.

You can interrupt the programming process, if necessary, by depressing the Push-to-Talk (PTT) button or declaring an emergency. Once a radio personality update is successfully completed, the radio automatically resets itself, switches to the new personality, and returns to normal operation. For more information on using ProFile Manager, refer to *Software Release Notes* 14221-1100-8250.

7.5 PROGRAMMABLE BUTTONS AND SWITCHES

7.5.1 Programmable Buttons

Press the down navigation button while on the main display to view the functions assigned to the programmable buttons. The programmable buttons are programmed using RPM2. A delay of 0 to 10 seconds can be defined using RPM2 for the programmable buttons. Table 7-2 lists and describes the functions that can be programmed to the buttons:

Table 7-2: Programmable Button Options

FUNCTION	DESCRIPTION
No Operation	
Active Emergency Display	The radio can display up to 20 active emergency alerts. This functionality is only available if the Extreme Radio Feature is enabled.
Adjust Squelch	Allows the user to adjust the analog squelch level.
Advanced P25 User Login	Allows the user to login. This is only enabled on P25 Trunked systems that support Advanced P25 User Login. See Section 5.5.1.
Audio Playback	Accesses the AUDIO PLAYBACK menu. See Section 5.30.
Bluetooth Enable/Disable	Enable/disable Bluetooth. See Section 6.10.
Button Info	Opens the Programmable Button Info Menu. Button Info is assigned to the Key Down button by default.
Caller ID	Opens the Caller ID menu. When a Missed Call Alert is shown on the radio display, pressing the Key Up button on the radio opens the CALLER ID menu irrespective of the functionality assigned to the Key Up button.
Channel Guard Override	Allow user to pick a different Channel Guard setting for the current channel.
CMD Mute	Mutes all audio. Audio remains muted until this button is pushed again or until an I-Call is received by the radio.
Direct System/Zone Entry	Allow user to select system/zone.
Drop Call	Drop or terminate any group call that the radio receives.
Echo Reduction	Toggles Echo Reduction On/Off.
Editable Preset	When this button is pressed and held for four (4) seconds, the radio saves the currently selected system/group or zone/channel to this button. When this button is pressed and released in less than four (4) seconds, the radio changes to the user-saved system/group or zone/channel if already saved by the user. If system/group or zone/channel is not configured for this button, when user defined preset button is pressed and released in less than four (4) seconds, the radio displays “Preset Empty.”
Emergency Check In Timer	When this button is pressed, the Emergency Check In Timer is activated. See Section 6.22 for more information.
Fixed Preset	When this button is pressed and released, the radio changes to the system/group or zone/channel specified in RPM2.
Flashlight Mode	Press and hold to turn on the front and top display backlights. Release the button to turn off both displays.
Flip Top Display Orientation	Toggles the top display Front/Back.
Front Backlight	Toggles front display’s backlight On/Off/Momentary.
Group/Channel Down	Scrolls down through the list of available groups/channels.

FUNCTION	DESCRIPTION
Group/Channel Up	Scrolls up through the list of available groups/channels.
Home	Goes to home channel.
Individual Call	Initiate an Individual Call.
Lock Keypad	Locks the DTMF keypad, programmable function keys and navigation keys.
Monitor Toggle	Toggles Monitor On/Off.
Monitor/Clear	Temporarily turn off selected squelch to monitor for traffic that may not normally break squelch. Also, press this button followed by the emergency button to clear an emergency.
Noise Cancellation Toggle	Toggles Nose Cancellation On/Off on XL Portables.
Nuisance Delete	Performs a Nuisance Delete. See Section 5.34 for more information.
Numeric Channel Entry	Allows number channel entry.
Option 1	Defines this button as Portable Radio Option 1. The option buttons are used to toggle a feature ON and OFF and are defined on a per system basis.
Option 2	Defines this button as Portable Radio Option 2. The option buttons are used to toggle a feature ON and OFF and are defined on a per system basis.
OTAR Rekey	Initiate an OTAR rekey. See Section 6.20.6.
PAR Response	Activates a response from a PAR when used with Incident Command Features.
Phone Call	Initiate a telephone interconnect call. See Section 5.28.
Profile Toggle	Toggles between the currently active profile (if one has been selected) and no profile.
Program Menu	Puts the radio into a program mode.
Priority Talk Group	Assigns Priority Talk Group functionality in trunked systems. Assigns the button to UNASSIGNED and plays boop tone in Conventional systems.
Scan Enable	Enable/disable scan.
Secure Enable Toggle	Toggles Encryption Mode On/Off. See Sections 5.22 and 6.20 for information on Encryption.
Send Message	Sends a preconfigured message. See Section 6.16 for more information.
Send Status	Sends a preconfigured status. See Section 6.15 for more information.
Site Alias	Accesses the Site Alias list. See Section 6.14.8 for more information.
Site Roaming	Enable/disable Site roaming. Site Roaming allows the radio to roam to another site.
Speaker Mute Toggle	Toggles Speaker Muted/Unmuted.
Stealth Mode	Enable/disable Stealth Mode. See Section 5.41.
System Down	Scrolls down through the list of available systems, stopping when the end of the list is reached.
System Down Wrap	Scrolls down through the list of available systems, wrapping to the top when the bottom of the list is reached.
System Up	Scrolls up through the list of available systems, stopping at the top of the list.
System Up Wrap	Scrolls up through the list of available systems, wrapping to the end when the beginning of the list is reached.
Talkaround/Repeater Toggle	Toggles talkaround On/Off in conventional systems. Assigns the button to UNASSIGNED and plays boop tone in Trunked systems. See Section 5.25.
Top Backlight	Toggles the top display's backlight On/Off/Momentary.
Two Action Power Off	When Two Action Power Off is enabled, this button must be pressed while the Power/Volume Knob is rotated to power off the radio. See Section 5.4 for more information.
TX Power High/Low	Toggle TX Power between LOW and HIGH.

FUNCTION	DESCRIPTION
View SA Display	Displays the Situational Awareness (SA) Screen. See Section 6.2.
Voice Announce	Enable/disable Voice Annunciation. See Section 5.21.
Zone Down	Scrolls down through the list of available mixed system zones, stopping when the end of the list is reached. If no mixed system zones are defined, or there is only one, the user will hear a deny tone when the button is pressed.
Zone Down Wrap	Scrolls down through the list of available mixed system zones, wrapping to the top when the bottom of the list is reached. If no mixed system zones are defined, or there is only one, the user will hear a deny tone when the button is pressed.
Zone Up	Scrolls up through the list of available mixed system zones, stopping at the top of the list. If no mixed system zones are defined, or there is only one, the user will hear a deny tone when the button is pressed.
Zone Up Wrap	Scrolls up through the list of available mixed system zones, wrapping to the end when the beginning of the list is reached. If no mixed system zones are defined, or there is only one, the user will hear a deny tone when the button is pressed.

7.5.2 Programmable A/B (Ø/O) Switch

The programmable A/B switch can be programmed for multiple functions, including:

Table 7-3: Programmable Ø/O Switch Options

FUNCTION	DESCRIPTION
Clear/Secure	Enable/disable encryption.
Scan	Turn scan operation on/off.
Stealth Mode	Enable/disable Stealth Mode.
Talkaround	Enable/disable talkaround.
Keypad Lock/Unlock	Locks/unlocks the keypad.
TX Enable/Disable	Enable/disable transmit.
Bluetooth	Enable/disable Bluetooth.
Emergency Check In Timer	Activates the Emergency Check In Timer. See Section 6.22.

NOTE

Switch position Ø is ON. Switch position O is OFF.

7.5.3 Programmable A/B/C/D Switch

Sections 7.5.3.1 and 7.5.3.2 describe the various functions that can be programmed to the A/B/C/D switch.

7.5.3.1 Single-Instance Features

Single-instance features can only be assigned to one switch position at a time. If one of these features is programmed to the A/B/C/D switch, other means of accessing that feature are disabled (i.e., two-position switch, programmable buttons, call menu, etc.).

Table 7-4: Single-Instance Features

FUNCTION	DESCRIPTION
No Function	No function programmed to switch.
Talkaround	See Section 5.25.
Scan	Enables scanning.
Bluetooth	Enable Bluetooth.
TX Power High	Sets transmission power level to High. • Changing to a Tx Power High position overrides the current personality or user setting for TX Power. • Changing from a Tx Power High position restores the personality-configured Tx Power Level.
TX Power Low	Sets transmission power level to Low. • Changing to a Tx Power Low position overrides the current personality or user setting for TX Power. • Changing **from** a Tx Power Low position restores the personality-configured Tx Power Level.
Keypad Lock	Locks DTMF, programmable, and navigation soft keys.
Radio Lock	When set, prevents the radio software from responding to the following physical inputs on the radio: • Volume Knob Change (power off is **not** prevented) • 2-Position Switch • Channel Knob • Side User-Programmable Buttons and Keypad (DTMF, programmable, and navigation/soft keys) Exception is the emergency button and if any key is programmed for Monitor/Clear, it can be used with the emergency button to clear emergency, if so programmed.
Channel Bank	Selects channels 1-16 in position A; 17-32 in position B; 33-48 in position C; and 49-64 in position D. If Channel Bank is selected for any single position, all 4 positions (A, B, C, and D) will be set to Channel Bank.

7.5.3.2 Indexed Features

These features can be assigned to any number of positions if each index value selected for it is unique across multiple assignments of the same feature; for example, you cannot assign a Zone with an index (e.g., “ZONE A”) to both positions A and B.

Table 7-5: Indexed Features

FUNCTION	DESCRIPTION
Zone Selection	Sets to the Zone index value. • When setting the A/B/C/D switch to an indexed zone assigned position, the radio sets, but does not “hold,” that zone. This has the resulting effects: ➢ This sets the channel knob to be zone-based system/channel selection just like selecting a zone from the main “Zone” menu or ramping up/down using the side user-programmable buttons. ➢ If a user then changes to a different system or zone via another method (menu, button, etc.), it will override the Zone selection switch setting accordingly and not require it to remain in the zone where the switch assignment is set. • When changing away from a Zone assigned position, no actions/changes will be taken by the radio.
System Selection	Sets to the System index value. • When setting the A/B/C/D switch to an indexed System assigned position, the radio sets, but does not “hold,” that System. This has the resulting effects: ➢ This sets the channel knob to be system-based channel selection, just like selecting a system from the main “Zone” menu or ramping up/down using the side user-programmable buttons. ➢ If a user then changes to a different system or zone via another method (menu, button, etc.), it will override the System selection switch setting accordingly and not require it to remain in the system where the switch assignment is set. • When changing away from a System assigned position, no actions/changes will be taken by the radio.

7.6 PROGRAMMABLE ICONS

7.6.1 Top Display

The top display has space for up to seven configurable icons, which can be programmed to display any of the following:

- Blank
- Signal Strength
- Battery Status
- Bluetooth enabled
- Encryption enabled
- Scan/Vote Scan enabled
- Talkaround enabled
- Emergency mode active
- Wi-Fi

7.6.2 Front Display

The front display has space for up to 10 configurable icons, which can be programmed to display any of the following:

- Blank
- Signal Strength
- Battery Status
- Bluetooth enabled
- Encryption enabled
- Global Encryption
- Talkaround enabled
- TX Disabled
- Tones Disabled
- PTT Disabled
- Speaker Muted
- Monitor
- OTAR Status (Disabled, Registering, Registered, Rekeying)
- TX Power level (Low/High/RX Only)
- GPS Status
- VDOC
- Failsoft
- Data Status (TX/RX)
- Alert(s)
- RX Mail
- Noise Cancellation Enabled
- Type 99 Enabled
- Conventional Site Status (Unregistered/Registered)
- Wi-Fi
- Wi-Fi AP

8. REFERENCE

8.1 MARINE FREQUENCIES

Refer to Table 8-1 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 8-1: Marine Frequencies

US CH.	INTL CH.	CA CH.	SHIP (MHZ)	SHORE (MHZ)	CHANNEL USAGE
	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.

US CH.	INTL CH.	CA CH.	SHIP (MHZ)	SHORE (MHZ)	CHANNEL USAGE
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.

US CH.	INTL CH.	CA CH.	SHIP (MHZ)	SHORE (MHZ)	CHANNEL USAGE
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.
	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

US CH.	INTL CH.	CA CH.	SHIP (MHZ)	SHORE (MHZ)	CHANNEL USAGE
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.
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

US CH.	INTL CH.	CA CH.	SHIP (MHZ)	SHORE (MHZ)	CHANNEL USAGE
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.
	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	

US CH.	INTL CH.	CA CH.	SHIP (MHZ)	SHORE (MHZ)	CHANNEL USAGE
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	

8.2 NARROWBANDING

The FCC has mandated that all public safety radios manufactured after January 1, 2013 comply with narrowbanding restrictions. Radios manufactured after the above date will comply with these restrictions. Existing radio personalities that contain frequencies that violate these FCC rules will cause an invalid channel error indication on the radio display. The user will need to change the radio personality to comply with the new rules. Note that there are multiple exceptions to the narrowbanding mandate, including the Marine Frequencies listed in Section 8.1.

9. GLOSSARY

-A-

AES	Advanced Encryption Standard
AES-256	Advanced Encryption Standard, 256-bit
AMBE+2	Advanced Multi-Band Excitation implementation 2
ANSI	American National Standards Institute
ASCII	American Standard Code for Information Interchange

-B-

-C-

C	Celsius
CA	Canada
CDCSS	Continuous Digital Coded Squelch System
CH INFO	Channel Information
CKR	Common Key References
CMB	Continuous Marine Broadcast
CTCSS	Continuous Tone Coded Squelch System

-D-

DES	Digital Encryption Standard
DES-OFB	Digital Encryption Standard Output Feedback
DFO	Department Fisheries Ocean
DMS	Degrees Minutes Seconds

-E-

EPIRB	Emergency Position-Indicating Radio Beacons

-F-

F	Fahrenheit
FCC	Federal Communications Commission
FM	Frequency Modulation

-G-

GHz	Giga (10^9) Hertz
GEOTRANS	Geographic Translator
GPS	Global Positioning System

-H-

Hz	Hertz
HKL	Harris Key Loader

-I-

ID	Identification
IEEE	Institute of Electrical & Electronics Engineers
INTL	International

-J-

-K-

KEK	Key Encryption Key
kHz	kilo (10^3) Hertz
KID	Key Identification
KMF	Key Management Facility
KMS	Key Management System
KS	Key Set
KVL	Key Variable Loader (Motorola KVL Device)

-L-

LAT/LONG DMS	Latitude/Longitude Degrees Minutes Seconds
LAT LONG DD	Latitude/Longitude Decimal Degrees
LED	Light Emitting Diode
Li-ION	Lithium-ION

-M-

MHz	Megahertz
mm	Millimeter
MR	Mobile Radio
ms	milli (10^{-3}) seconds

-N-

NAC	Network Access Code
Ni-MH	Nickel Metal Hydride
NOAA	National Oceanic and Atmospheric Administration

-O-

OET	Office of Engineering and Technology
OTAR	Over-The-Air Rekey

-P-

P25	Project 25
POS	Position
PRI	Priority (Channel)
PTT	Push-to-Talk

-Q-

-R-

RF	Radio Frequency
RPM2	Radio Personality Manager 2
RSI	Radio Set Identifier
RSM	Remote Speaker Microphone
RX	Receive

-S-

SA	Situational Awareness
SMA	Subminiature Version A

-T-

TIA	Telecommunications Industry Association
TX	Transmit

-U-

UHF	Ultra High Frequency
UKEK	Unique Key Encryption Key
US	United States
USCG	United States Coast Guard
UTC	Universal Time Coordinated
UTM	Universal Transverse Mercator

-V-

VDC	Volts, Direct Current
VHF	Very High Frequency
VIDA	Voice Interoperability Data Access
VTS	Vessel Traffic Service

-W-

WEEE	Waste from Electric and Electronic Equipment

-X-

-Y-

-Z-

10. BASIC TROUBLESHOOTING

When upgrading from XLP R1A/C to R1D/E, the radio displays  . XLP R1D installs an image that can install future software releases and is required prior to upgrading to R2. **Do not power cycle when this screen is displayed on the radio or R1D must be reinstalled prior to upgrading to R2**.

When installing XLP R2A and later, if the upgrade is interrupted by a power cycle, the radio displays  . This indicates a partial install occurred and a reinstall is required. The radio should be connected via USB and the software should be installed again.

For radios with XLP R3A and later, if  is displayed, the radio has lost its factory information and needs to be returned for updating.

10.1 ERROR MESSAGES

This section provides a list of error messages, as well as possible causes and solutions.

Table 10-1: Displayed Error Messages, Reasons, and Resolutions

SCREEN/ MENU	DISPLAYED ERROR MESSAGE	REASON	RESOLUTION
Top-Level Screen	**INVALID KEYSTORE ZEROIZE NEEDED**	Corrupt key database or incorrect database configuration.	Zeroize database.
Bluetooth Pairing Screen	**PAIRING FAILED**	Bluetooth pairing failed.	Ensure device is discoverable and attempt to re-pair the device.
Channel Edit Screen	**EDIT FAILED**	Unable to modify P25 Channel.	Power cycle and try again--contact L3Harris if problem persists.
Channel Edit Screen	**INVALID RX FREQUENCY**	Entered Rx frequency is invalid.	Ensure frequency follows band spacing rules.
Channel Edit Screen	**INVALID TX FREQUENCY**	Entered Tx frequency is invalid.	Ensure frequency follows band spacing rules.
Install Operations	**INSTALL FAILED**	Error during install process.	Transfer file again and reattempt install. Contact L3Harris if problem persists.
Install Operations	**INSTALL FAILED**	Extraction of compressed file failed.	Transfer file again and reattempt install. Contact L3Harris if problem persists.
Install Operations	**INSTALL FAILED**	Removal of existing SW failed.	Attempt install again and contact L3Harris if problem persists.
Mission Plan In Progress Screen		Mission plan activation failed.	Use RPM2 to ensure plan validity. Contact L3Harris if failures persist.
Security Menu	**ZEROIZE FAILED**	Radio could not zeroize.	Radio problem—power cycle and contact L3Harris if problem persists.
Security Menu	**NO KEYS TO ZEROIZE**	Key database empty.	Nothing to zeroize.
Utilities Menu	**INCORRECT PASSWORD**	Maintenance password invalid.	Enter valid maintenance password.
Channel Info Screen	**INCORRECT PASSWORD**	Channel edit password invalid.	Enter valid channel edit password.

SCREEN/ MENU	DISPLAYED ERROR MESSAGE	REASON	RESOLUTION
Top-Level Screen	**USER REGISTRATION FAILED FOR…**	The user has either entered the wrong values or the user is not in the UAS database.	Check the System ID and User ID. If they are correct, contact your network administrator.
Top-Level Screen	**USER PASSWORD FAILED FOR…**	The user has entered a different password then what is in the UAS when password is required.	Re-enter the password. If the error persists, contact your network administrator.
Top-Level Screen	**RADIO ESN INVALID FOR…**		Contact your network administrator.
Top-Level Screen	**EXCEED ALLOWED USERS FOR…**	There are already three radios registered with the same User ID.	Turn off one of these radios or register with a different ID.
Top-Level Screen	**PROVISIONING FAILED**	This failure could be due to bad password or a network issue.	Re-enter the password. If the error persists, contact your network administrator.
Top-Level Screen	**OVER TMP**	With an Extreme Speaker Mic (ESM) attached, the ESM detects when the internal ESM temperature exceeds the hardware temperature threshold for 30 seconds. The radio also displays “OVER TMP” and plays a voice annunciation alert “Over Temp” at max volume.	

10.2 OTAR ERRORS/INFORMATION

WORKAROUNDS:

1. Zeroize.
2. Load proper KEK from the L3Harris Key Loader or Motorola KVL.

IF RADIO INDICATES:

1. INVALID KEYSTORE ZEROIZE NEEDED - This occurs if the radio's keys were loaded by the L3Harris Key Loader followed by an attempt to load UKEKs with the Key Loader or keys with the Motorola KVL.
   - Fix by performing workaround 1, followed by 2.
2. NO UKEK – Displayed during a zeroize performed from the radio or a zeroize initiated from the KMF.
   - Fix by performing workaround 2.
3. Zeroize Complete – KMF has zeroized the radio.
   - Fix by performing workaround 2.
4. Disabled OTAR Icon (red slash) – OTAR is disabled while in scan, talkaround, emergency, and monitor.
   - Fix by disabling these features. Icon will be corrected (no red slash).
5. Gray OTAR Icon (no red slash) – OTAR has not registered with tower (Conventional or Trunked system).
   - Fix by verifying proper frequencies.
   - If the radio is turned to the OTAR channel out of range of a conventional tower, and then comes in range after 3 minutes, fix by issuing an OTAR. Rekey, leaving and re-enter the OTAR channel.
6. Green OTAR Icon – OTAR is registered, all is well.
   - If update fails, verify you are in range of the tower and the KEK is correct.
7. Blue OTAR Icon – OTAR is attempting to rekey.
   - If rekey fails, verify you are in range of the tower and the KEK is correct.

11. 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 contact the Technical Assistance Center directly:

North America:	1-800-528-7711
International:	1-434-385-2400
Fax:	1-434-455-6712
E-mail:	PSPC_tac@l3harris.com

12. WARRANTY

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.

Register on-line at the Customer Care center webpage https://www.l3harris.com/all-capabilities/pspc-customer-care. While on the webpage, review the applicable battery and/or product warranty literature.

APPENDIX A WI-FI PROGRAMMING

Due to numerous issues with discovering and programming radios connected to Enterprise Wireless networks, it is **strongly** suggested that a single Access Point Wireless network be used for programming radios with RPM2. See Section A.7 for more information.

These instructions assume the user has a basic familiarity with Wireless (Wi-Fi) networks, their configuration, and how to connect devices. If you are unfamiliar with the terms and/or procedures mentioned in these instructions, please contact your IT department for help before attempting to configure Wi-Fi programming.

For radios to be discoverable on the Wi-Fi network, your wireless router must be configured to allow Multicast (mDNS). This varies by router manufacturer; refer to your router's documentation for specific settings needed to enable Multicast (mDNS).

A.1 OVERVIEW

Perform the following to program a radio over Wi-Fi. For first time setup, see Section A.8.1.

1. Configure the Access Point (Section A.2).
2. Configure the personality (Section A.3).
3. Configure the RPM2 application (Section A.4).
4. Put the radio in Wi-Fi Programming Mode (Section A.5).
5. Discovery and programming in the RPM2 application (Section A.6).
6. Support for Enterprise Wireless Networks (Section A.7).
7. Helpful Hints (Section A.8).

A.2 CONFIGURE THE ACCESS POINT

- Setup an Access Point (wireless router) as follows. The **bold** values provided below are the default values in the personality.
  - Wireless Networking Name (SSID): **harrisradios**
  - Shared Key (Network Password): **password**
  - Wireless Authentication/Security Mode (Encryption Type): **WPA**

    WPA and **WPA2-PSK** are the available Encryption Types in the RPM2 application
- Ensure that the Access Point has Multicast (mDNS) enabled. See the second note at the top of Appendix A for more information.

A.3 CONFIGURE THE PERSONALITY

For a radio to be programmed over Wi-Fi, the active personality on the radio must be configured for connecting with the values that were set in Section A.2. The following steps detail how to configure an existing radio personality.

1. In the personality, navigate to **OPTIONS → Network Configuration**.

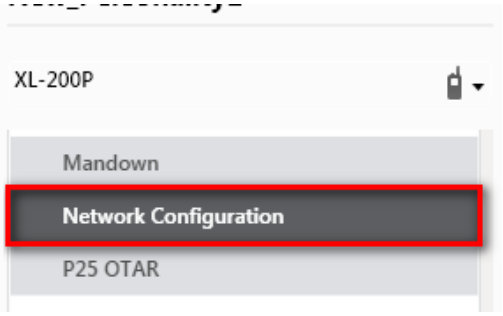


Figure 12-1: Options → Network Configuration

2. Under the Wi-Fi Configuration section, set the Encryption Type, Network (SSID), and Network Password.

NOTE

XL radios support up to 24 different Wi-Fi networks (SSIDs). These 24 Wi-Fi networks are considered radio administrator approved and Trusted Wi-Fi Networks (TWiN) on which the radios can operate.

Figure 12-2: Wi-Fi Configuration

3. Under Network Service Configuration, the default values can remain the same. If the wireless network is managed by another department, please coordinate with them to get it setup correctly.

   The **Network Discovery Configuration → Service Name** is a Unique name used by RPM2 and radios to communicate with each other. There is more information about this in Section A.8.2.

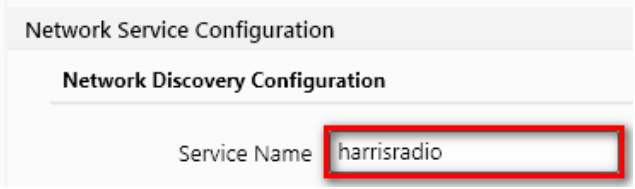


Figure 12-3: Service Name

4. After the personality is configured and saved, write it to the radio over USB and then activate it.

A.4 CONFIGURE THE RPM2 APPLICATION

To ensure that RPM2 can discover radios over Wi-Fi, ensure that the **Enable Wi-Fi** checkbox is checked on the RPM2 Preferences screen as shown in Figure 12-4. This checkbox is unchecked by default.

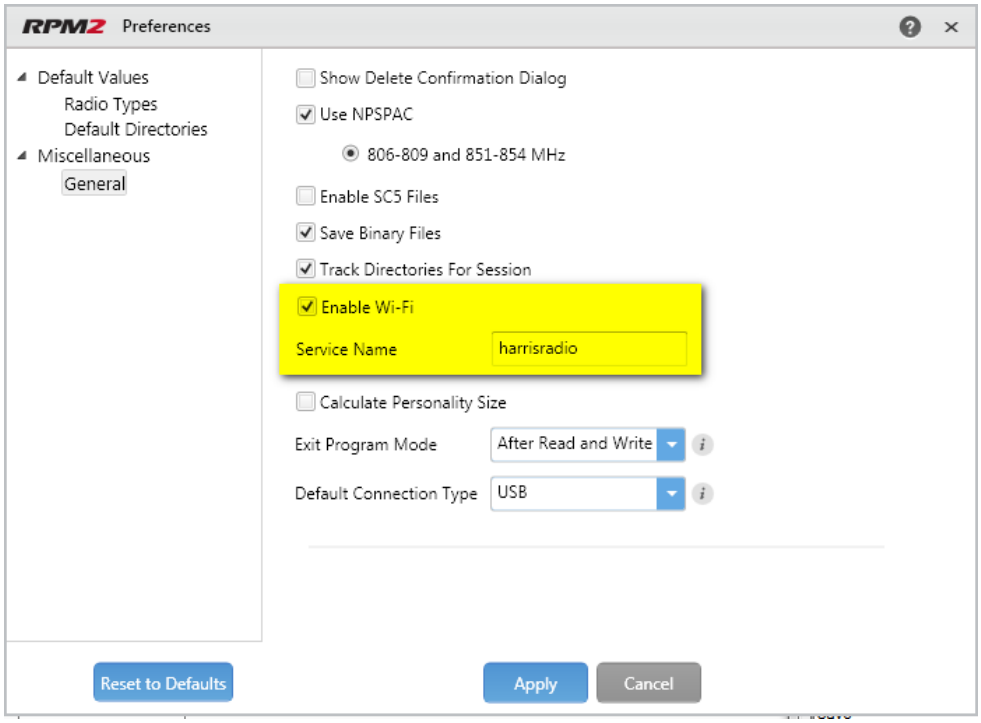


Figure 12-4: Enable Wi-Fi in RPM2

Also, as shown in Figure 12-4, the **Service Name** must be updated to reference the value in the active personalities for the radios you need to discover. See #3 in Section A.3 and Section A.8.2 for more information.

For default operation using the network as described in Section A.2, no other configuration of the radio or RPM2 is required.

A.5 PUT THE RADIO IN WI-FI PROGRAMMING MODE

To put the radio in Wi-Fi programming mode:

1. Turn the radio off and remove the USB cable (optional).
2. Press and hold the bottom side and PTT buttons.
3. Power on the radio while continuing to hold the buttons.
4. Release the buttons when the WIFI INSTALL ACTIVE screen appears on the radio.
5. Initially, the radio displays DISCONNECTED. When the IP address is displayed, the radio is available to be programmed.

Figure 12-5: Enable Wi-Fi Programming Mode on Radio

NOTE

Refer to Section 5.40.2 for Wi-Fi Client selection information.

A.6 DISCOVERY AND PROGRAMMING IN THE RPM2 APPLICATION

1. Start RPM2.
2. Disconnect the radio from the programming cable.
3. Select the Radio tab and click the Wi-Fi connection button .
4. When the Wi-Fi connection button is pressed, a “Discovering Wi-Fi Radios” message is displayed for several seconds and the radios connected to that access point with that Service Name populate the connection list.

NOTE

To connect over Wi-Fi, the currently active personality MUST have the correct Wi-Fi parameters. Therefore, care must be taken that all personalities on a given radio have the correct Wi-Fi parameters for the desired network. Otherwise, activation of another personality on the radio will result in the inability to establish a Wi-Fi connection.

5. Select a radio or radios and perform the desired action. Only Read Personality, Write Personality, and Load Code are supported over Wi-Fi. See the table below for the supported combinations.

Table 12-1: Wi-Fi Feature Support

	SINGLE RADIO	MULTIPLE RADIOS (UP TO 16)
Read Single Personality	Yes	No
Read Multiple Personalities	Yes	No
Write Single Personality	Yes	Yes
Write Multiple Personalities	No	No
Load Single Code File	Yes	Yes
Load Multiple Code Files	Yes	Yes
Voice Annunciation	No	No
Feature Data	Yes	Yes
Radio Name	Yes	No
Install Splash Screen	Yes	Yes

6. In the Status Panel, all Wi-Fi related actions will have the prefix of “WIFI.”

To help in displaying the radios, the “Connection” and “IP Address” columns are sortable.

NOTE

If the Access Point is not configured to the default values from Section A.2 and the active personality in the radio is removed, the radio loses connection to the Access Point and must be connected over USB to write/activate a personality to reconnect to the Access Point.

A.7 RPM2 WI-FI SUPPORT FOR ENTERPRISE NETWORKS.

Enterprise Networks have certain limitations when it comes to Discovering/Programming Radios in RPM2. There is a 4500 second (75 minute) caching affect inherent to implementation with the Cisco® Wi-Fi solution that utilizes the Access Point (AP)/Wireless LAN Controller (WLC) components. Radios remain 'seen' in RPM2 even after the radio leaves Wi-Fi or is turned off. It is cached in RPM2 for 4500 seconds. This issue has only been observed with the Cisco AP and WLC solution; however, other enterprise wireless solutions may observe this caching affect. Operation with a lower tiered Wi-Fi router that does not operate with a WLC will likely not observe this behavior. Please see the Software Release Notes for Media Kit SK-019007-001 (14221-3100-8110) for more information.

A.8 HELPFUL HINTS

A.8.1 Initial Setup and Configuration

Since radio discovery is dependent on if Multicast (mDNS) messages are being received by RPM2, it is best to keep things as simple as possible. Here are the suggested steps if this is being setup and configured for the first time.

1. Configure the Access Point with the default personality values provided in Section A.2.
2. Create a basic personality with a single system, set and channel, write it to the radio and activate it over USB.
3. Complete Sections A.4 through A.6.

If the radio was not discovered in RPM2 but an IP address is displayed on the radio screen as seen in Figure 12-5, this may mean that the Multicast (mDNS) messages are not making it through the Access Point. Consult the Access Point's manual and make sure that those messages are not being filtered out.

A.8.2 Grouping Radios by Service Name

One benefit of using a unique **Service Name** is that it allows the user to create logical groupings of radios to reduce the number of radios discovered in RPM2 and help reduce the overhead of keeping track of which radios have been configured.

For example, if there are 100 radios in Wi-Fi programming mode (see Section A.5) with the same **Service Name**, all 100 radios are displayed in the Radio tab after discovery has been completed. This makes it difficult to select and program multiple radios simultaneously. However, if the **Service Name** in the active personality on 16 of the radios are set to something unique like "fire1" and the RPM2 application **Service Name** (see Section A.4) is also updated to "fire1," only those radios with a **Service Name** of "fire1" are discovered and displayed in the Radio tab.

APPENDIX B SCBA BLUETOOTH CONFIGURATION

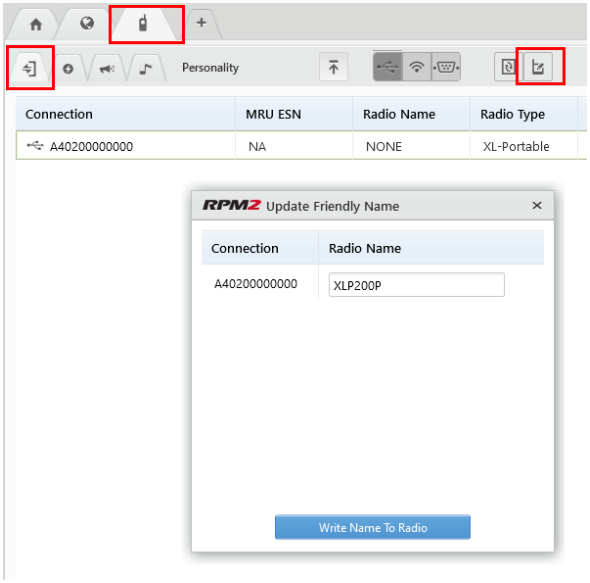
NOTE

Refer to the vendor documentation for your SCBA for device-specific programming and configuration instructions.

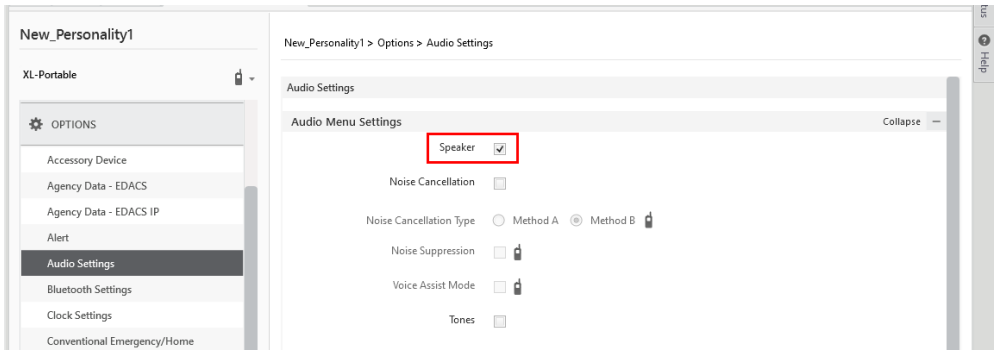
This appendix provides radio configuration instructions to enable Bluetooth pairing with SCBA.

Refer to *RPM2 User's Manual* 14221-1100-2060 as necessary when performing the steps in this section.

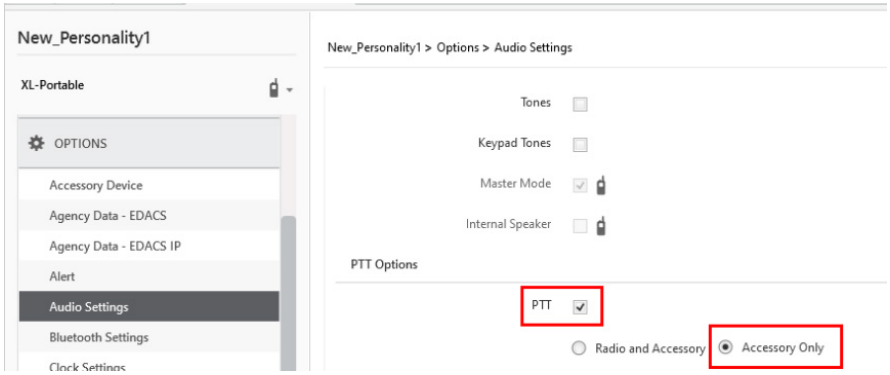
1. Open RPM2.
2. Ensure a Radio Name is programmed.
   a. Select the Radio Tab → Personality Tab.
   b. Click the button and enter the radio name. The radio name can be up to 16 characters long.



3. Select **Audio Settings** from the Personality Rail.
4. Under **Audio Menu Settings**, ensure **Speaker** is checked.



5. Under **OPTIONS → Audio Settings → PTT Options**, check **PTT** and select **Accessory Only**.



6. (Optional) Configure Automatic Level Control (ALC). Enabling ALC uses proprietary L3Harris algorithms to adjust and level audio to compensate for users who speak loudly or speak softly to be heard at nearly the same level.

NOTE

Requires RPM2 R6A or later and XLP R6A or later. Consult with your L3Harris radio technician before adjusting any of these settings.

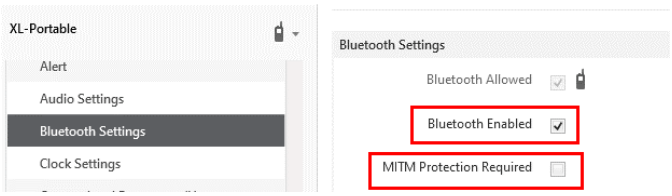
   a. Select **OPTIONS → Audio Settings → Bluetooth Microphone**.

   b. Check (enable) **ALC**.

   c. Set ALC Max Gain to desired level (Default = 6 dB; Range = 0 dB to +12 dB in 1 dB increments). This setting allows the user to set the maximum gain applied by the ALC feature for transmitted voice. Higher gain settings increase the chance for acoustic feedback.

   d. Set Mic Gain to desired level (Default = 16 dB; Range = -16 dB to +16 dB in 1 dB increments). This setting allows the user to set the Mic Gain for the Bluetooth External Microphone (baseline before ALC).

7. Select **OPTIONS → Bluetooth Settings** and check **Bluetooth Enabled**. Ensure **MITM Protection Required** is unchecked.



8. Program a radio button or switch for Bluetooth Enable/Disable:

   a. Select **OPTIONS → Portable Programmable Buttons or Programmable Switches**.

   b. Select Bluetooth Enable/Disable from the drop-down of the desired button/switch.

9. Write the personality to the radio.

APPENDIX C CONFIGURING ENCRYPTION

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

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

C.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 → 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 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.

C.2 LOAD ENCRYPTION KEYS

C.2.1 Load UKEKS with Key Loader and RPM2 (for OTAR-Enabled Systems)

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

To load encryption keys:

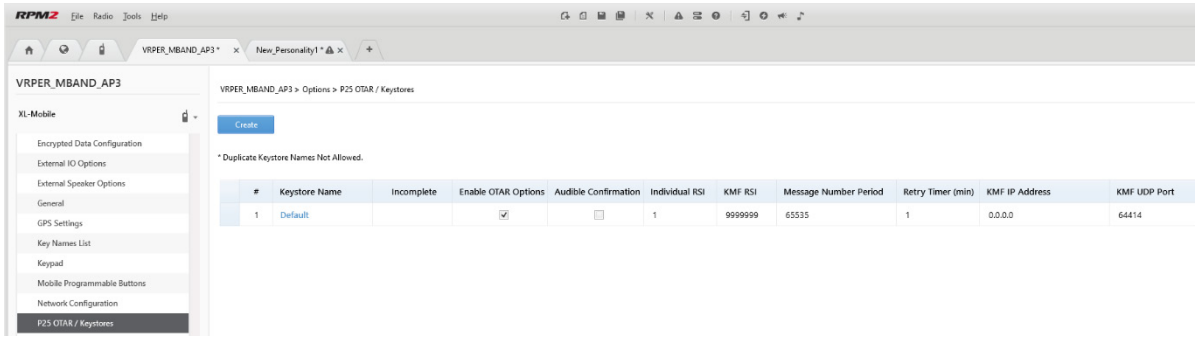
1. Obtain the UKEK file and Storage Location Number (SLN) Binding Report information from the Crypto Officer (CO).


NOTE

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

2. If not already on, power-up the PC on which RPM2 and Key Loader are installed.
3. Connect the radio to the PC using the USB programming cable.
4. Load the UKEK file from the Crypto Officer onto the PC.
5. Run the RPM2 application and setup the radio's Personality according the SLN Binding Report information.
6. 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.).

7. In RPM2, select **P25 OPTIONS → P25 OTAR/Keystores** and set the following, referring to the RPM2 online help as necessary:
   a. Click **Create** to add a Keystore or edit the Default Keystore.
   b. Check **Enable OTAR Options**.
   c. Enter the OTAR Message Number Period (MNP) as defined by the System Administrator.
   d. Enter the radio's Individual RSI (from the SLN Bindings Report).
   e. Enter the KMF's RSI (from the SLN Bindings Report).



8. Program the Personality to the radio.
9. Run the Key Loader application.
10. Open the UKEK file loaded in step 4.
11. Select the Target Device type and click the **Load** button.
12. 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.
13. Click the button to exit the Key Loader application. New UKEKs are loaded and the radio is now ready to accept TEKs via OTAR with the trunked radio network.

C.2.2 Load Keys Using Key Loader

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

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

1. Connect the radio to the PC using the USB programming cable.
2. Power on the radio, if not already.
3. Select **Start → 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. Ensure USB is selected in the drop-down and click **Next**.
10. Select the radio from the drop-down and click **Load**.
11. Click **Finish**.

C.2.3 Load Keys with Motorola KVL

1. Connect the KVL cable to the UDC Connector.
2. The radio automatically goes into key fill mode.

3. Success and failure messages are shown on the KVL device's screen.
4. Disconnect the KVL cable. The XL portable will automatically exit keyload mode when the KVL is disconnected.

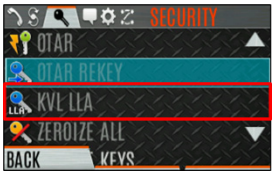
C.2.4 Link-Layer Authentication (LLA) Keyloading

NOTE

LLA keyloading and ARC4 keyloading via a KVL-4000 or KVL-5000 requires XLP R16A or later.

In XLP R16A and later, LLA Keys (i.e., Radio Authentication Keys) can be loaded using a KVL-5000 or KVL-4000. The LLA feature must be enabled to utilize this feature.

1. Connect the radio to the KVL device using cable 12082-0400-A1.
2. Put the radio into KVL LLA Mode:
   a. Press the Menu/Select button to access the main menu.
   b. Press the left or right navigation buttons to display the SECURITY menu.
   c. Press the up or down navigation buttons to highlight **KVL LLA** and press the Menu/Select button.



   or

   Press the button programmed for KVL LLA.

3. The Radio will indicate that KVL LLA Mode is active.

4. Once KVL LLA Mode is activated, the KVL-5000 can be used to provision the radio with LLA keys. The radio will remain in KVL LLA Mode until the user exits this state.

C.3 PROTECTED KEYS

The Protected Keys feature transfers P25 Voice Keys, from Key Loader to the radio, that have been wrapped (AES) or encrypted (DES) with Key Protection Keys (KPKs). KPKs are 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 are used to unwrap (AES) or decrypt (DES) the Protected Keys.

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

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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.