This addendum adds the following note to the XLP Software Release Notes:

NOTE

Harris radios support Single Key AES **OR** Single Key DES; they do not support both simultaneously. Whichever key is loaded last is the key that works.

XLP Radio Software

14004-0185-01 R6F	14004-0228-01 R6F
14004-0231-01 R6F	14004-0236-01 R6F
14004-0229-01 R6F	14004-0232-01 R6F
14004-0234-01 R6F	14004-0230-01 R6F
14004-0233-01 R6F	14004-0235-01 R6F

HARRIS® TECHNOLOGY TO CONNECT, INFORM AND PROTECT™

MANUAL REVISION HISTORY

REV.	DATE	REASON FOR CHANGE
R	Nov/17	Updated for R5C release; TR resolution.
T	Jan/18	Updated for R5D release.
U	Feb/18	Updated for R5E release of 14004-0185-01.
V	Mar/18	Updated for R5F release of 14004-0185-01.
W	Apr/18	Updated for R6A release; new features/enhancements and TR resolution.
Y	Jun/18	Updated for R6D; TR resolution.
AA	Sep/18	Updated for R6E release; new features/enhancements and TR resolution.
AB	Nov/18	Updated for R6F release; new features/enhancements and TR resolution.

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221 Jefferson Ridge Parkway
Lynchburg, VA 24501

1.   INTRODUCTION

This document contains the Software Release Notes for the XLP radio software.

Software numbers, revisions, and related radios below:

- 14004-0185-01 R6F (XL Portable)
- 14004-0228-01 R6F (XG-100P)[1]
- 14004-0231-01 R6F (XG-75M ICI)
- 14004-0236-01 R6F (XG-15P)
- 14004-0229-01 R6F (XG-100M)
- 14004-0232-01 R6F (XG-25P)
- 14004-0234-01 R6F (XG-75P/XG-75Pe)
- 14004-0230-01 R6F (CH-100)
- 14004-0233-01 R6F (XG-25M)
- 14004-0235-01 R6F (M7300/XG-75M)

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[1] No new XLP R3A or later features are supported on XG-100P.

2.   COMPATIBILITY

CAUTION

Never downgrade BurnApp unless explicitly told to do so by TAC.

2.1   XL PORTABLE

NOTE

When upgrading XL Portable radios from versions prior to XLP R2A (R1A, B, C, etc.), the radio MUST first be loaded with R01D or R01E PRIOR to upgrading to any R2A version of the firmware.

NOTE

Downgrading XL Portable radios from R2A/R3A to R1A may cause the radio to power cycle until recovery mode is initiated and the R1A personality is loaded. To work around this, the R1A personality could be loaded prior to being downgraded (e.g., using RPM2 R1B).

PLATFORM	SOFTWARE VERSION(S)	MEDIA KIT PART NUMBER
Radio Personality Manager (RPM2)	R06F or later	14004-0206-01
ProFile Manager	R10A or later	LZY213771/1
DES-CFB XL Encryption Module	R05A01 (v5.01)	14004-0215-01
AES XL Encryption Module	R06A02 (v6.02)	14004-0214-01
NGLM Module (a.k.a., "LTE PEM")	R23A00_079 or later	14004-0167-01
Key Manager/Key Admin	R7A or later	SK102981V1 SK102979V1

NOTE

The Mandown feature introduced in XLP R3A requires specific Digital Hardware versions. The hardware versions that are compatible with Mandown are 14035-3000-02 R07 and any revision of 14035-3100-xx hardware. To view the hardware version from the radio menu, select **Utility → Maintenance → Radio Info**, and look for the "Digital HW" entry.

2.2 OMAP/UNITY® RADIOS

CAUTION

In OMAP radios, if loading DES KEKs and TEKs into the radio, be sure to load the DES TEKs first.

CAUTION

In **P25C-XCOV** Vehicular Repeater (VR) setup, the VR portables (operating in P25T mode) **must** have the **Emergency User Only Clr** check box enabled. The result is only the user can clear the emergency state (Tx Emer) of the VR portable that declared the emergency.

CAUTION

In **SOI** Vehicular Repeater setup, the VR portables (operating in P25T mode) **must** have the **Confirmed Tx** check box **disabled**. There is no access to a Harris system/dispatcher in SOI VR mode.

NOTE

Scan with Channel Guard options must be selected for Conventional Scanning.

NOTE

When using MDC Emergency, make sure the Encode Trigger for MDC options is not set to **None**. MDC Emergency is not reliable if **None** is selected.

NOTE

Voice Annunciation (VA) Notes:

- Voice Annunciation will not announce the System/Group changes when an EDACS®/EA Dynamic Regroup is active.
- On a P25T, EDACS, or EA system, Annunciation functionality can be indefinitely suspended if the user keys back on a received ECP1 scan call.

    To resolve this, go to the menu and select the VA menu twice. The first time will disable VA, the second will enable VA. Once this action is taken, Annunciation remains enabled.

NOTE

It is recommended to **not** have multiple covert operation features configured at the same time. In other words, if the radio-wide Stealth feature is enabled (**Options → Stealth Mode Options**), *do not* configure any of the following features:

- On P25T system screen, Emergency Display.
- On P25T system screen, Emergency Audio.
- Stealth Emergency (This is an analog feature configurable in **Options → Conventional Emergency/Home Channel Options**.)

NOTE

Channel (RX CG) guard MUST be used with conventional scanning on the Unity radios.

NOTE

IMPORTANT NOTE regarding Vehicular Repeater SOI mode: When using an M7300/XG-75M connected to a VR using Scene of Incident mode, it is recommended to disable Data on the P25C channel that will be used for VR operation. For P25T, no change is necessary.

NOTE

Unity Portable XG-100P radios require RPM version R14C or later for this release. OMAP and Unity XG-100M radios require RPM2 R6F or later.

NOTE

IMPORTANT NOTE regarding Noise Cancellation on XG-100M with CH-100: Enabling NC on the XG-100M w/CH-100 is not recommended if the user will be directly facing the CH-100 while operating the radio.

NOTE

Mixed encryption OTAR on P25C systems is not supported on OMAP radios which do not have mixed key encryption support. No restrictions on Unity Radios.

NOTE

Analog Conventional Priority override does not work when P1/P2 scan rate is set to the value of 2000.

NOTE	Selective Squelch Mode must be set to P25C channels where Unit Registration and Packet Data Registration (PDR) are enabled.

The following tables show the minimum software revision required for this version of software:

Table 2-1: XG-75P/XG-75Pe Compatibility Matrix

PLATFORM	SOFTWARE VERSION(S)
Radio Personality Manager 2 (RPM2)	R6F or later
DES Load Module	des_module_R02B08.dsp (SK-015085-001 V02.08)
AES Load Module	HALM_Module_R04A01.ess (SK-015086-001 V04.01)
Non FIPS AES Module	HALM_NonFIPS_R05A01.ess (SK-015086-002 V05.01)
BootApp	R12A00 (SK-011365-001)
BurnApp	Recommended: PBAPP R13D04 or later (SK-011364-001) Minimum: PBAPP R13C03
Loadapp	R12B or later
Key Manager/Key Admin	R7A or later

Table 2-2: M7300/XG-75M Compatibility Matrix

PLATFORM	SOFTWARE VERSIONS
Radio Personality Manager 2 (RPM2)	R6F or later
DES Load Module	des_module_R02B08.dsp (SK-015085-001 V02.08)
AES Load Module	HALM_Module_R04A01.ess (SK-015086-001 V04.01)
Non FIPS AES Module	HALM_NonFIPS_R05A01.ess (SK-015086-002 V05.01)
BootApp	R12A00 (SK-011360-001)*
BurnApp	Recommended: MBAPP R13E05 or later (SK-011358-001) Minimum: MBAPP R13C03
Loadapp	R12B or later
MCU	02.15.00 for M7200 (SK-018180-001) 06.03.00 for other radios (SK-018180-002)
CH721	R07B05 or later
RHHC	R03A02 or later
Key Manager/Key Admin	R07A03 or later

* Verify which Radio Type this BOOT APP Image is meant for! Incorrect selection could result in disabling the radio completely, requiring service by Harris to resume usage. This is important because there is another radio model called the XG-75M ICI. See Table 2-7.

M7300 700/800 MHz Feature Encryption information

For an M7300 700/800 MHz radio, bit 29 (Feature 30) must remain clear. This is identified as LPE_50 in the features program.

Table 2-3: XG-25P^2 Compatibility Matrix

PLATFORM	SOFTWARE VERSION(S)
Radio Personality Manager 2 (RPM2)	R6F or later
DES Load Module	des_module_R02B08.dsp (SK-015085-001 V02.08)
AES Load Module	HALM_Module_R04A01.ess (SK-015086-001 V04.01)
Non FIPS AES Module	HALM_NonFIPS_R05A01.ess (SK-015086-002 V05.01)
BootApp	R12A00 (SK-011365-001)

---

[2] XG-25P Rev. A hardware is NOT backwards compatible with XLP versions earlier than R3A and BurnApp versions earlier than R13D. See Section 5.1 for more information.

PLATFORM	SOFTWARE VERSION(S)
BurnApp	Minimum: PBAPP R13D04 or later (SK-011364-001)
Loadapp	R12B or later
Key Manager/Key Admin	R07A03 or later

Table 2-4: XG-25M Compatibility Matrix

PLATFORM	SOFTWARE VERSIONS
Radio Personality Manager 2 (RPM2)	R6F or later
DES Load Module	des_module_R02B08.dsp (SK-015085-001 V02.08)
AES Load Module	HALM_Module_R04A01.ess (SK-015086-001 V04.01)
Non FIPS AES Module	HALM_NonFIPS_R05A01.ess (SK-015086-002 V05.01)
BootApp	R01A00 (14004-0222-01)
BurnApp	Recommended: XBAPP R13D04 or later (14004-0146-01) Minimum: XBAPP R13C03
Loadapp	R12B or later
CH-25	R01.01.0000 (R01A01) (14004-0157-01)
Key Manager/Key Admin	R07A03 or later

Table 2-5: Unity XG-100P Compatibility Matrix

PLATFORM	SOFTWARE VERSIONS
Radio Personality Manager (RPM)	R14C or later
Radio Personality Manager 2 (RPM2)	Unity XG-100P NOT SUPPORTED in RPM2.
DES Load Module	des_module_R04B03.ess (SK-019046-001 V04.03)
AES Load Module	HALM_Module_R04A01.ess (SK-015086-001 V04.01)
Key Manager/Key Admin	R07A03 or later

Table 2-6: Unity XG-100M Compatibility Matrix

PLATFORM	SOFTWARE VERSIONS
Radio Personality Manager 2 (RPM2)	R6F or later
DES Load Module (P25T DES operation Only[3])	des_module_R04B03.ess (SK-019046-001 V04.03)
DES Load Module (EDACS DES operation Only[4])	des_module_R02A06.dsp (SK-015085-001 V02.06)
DES Load Module (P25T DES + EDACS DES operation[5])	des_module_R02A06.dsp (SK-015085-001 V02.06)
AES Load Module	HALM_Module_R04A01.ess (SK-015086-001 V04.01)
BootApp	R13A01 or later (14004-0021-01)
BurnApp	MBAPP R13C03 or later (14004-0020-01)
Loadapp	R12B or later
Key Manager/Key Admin	R07A03 or later
CH-721	R07B or later
RHHC	R03A or later
CH-100	R03B or later

> **NOTE**
> DES module R02B08 should never be used (and will not work) on the Unity mobile radio.

Table 2-7: XG-75M ICI Compatibility Matrix

PLATFORM	SOFTWARE VERSIONS
Radio Personality Manager 2 (RPM2)	R6F or later
DES Load Module	des_module_R02B08.dsp (SK-015085-001 V02.08)
AES Load Module	HALM_Module_R04A01.ess (SK-015086-001 V04.01)
Non-FIPS AES Module	HALM_NonFIPS_R05A01.ess (SK-015086-002 V05.01)
BootApp	R01A00 (14004-0222-01)*
BurnApp	Recommended: MBAPP R13E05 or later (SK-011358-001) Minimum: MBAPP R13C03

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[3] P25 Trunking Only - ProVoice feature bit NOT enabled.

[4] EDACS Only - P25 Trunking feature bit NOT enabled, ProVoice enabled.

[5] P25 Trunking and EDACS - P25 Trunking, and ProVoice feature bits enabled.

PLATFORM	SOFTWARE VERSIONS
Loadapp	R12B or later
MCU	700/800MHz: R01A01 (14004-0209-01) [v01.01.0001]
CH-721	R07B05 or later
RHHC	R03A02 or later
Key Manager/Key Admin	R07A03 or later

* Verify which Radio Type this BOOT APP Image is meant for! Incorrect selection could result in disabling the radio completely, requiring service by Harris to resume usage.

Table 2-8: XG-15P Compatibility Matrix

PLATFORM	SOFTWARE VERSIONS
Radio Personality Manager 2 (RPM2)	R6F or later
DES Load Module	des_module_R02B08.dsp (SK-015085-001 V02.08)
AES Load Module[6]	HALM_Module_R04A01.ess (SK-015086-001 V04.01)
Non-FIPS AES Module	NOT Supported for XG-15
BootApp	R12A00 (SK-011365-001)
BurnApp	Recommended: PBAPP R13D04 or later (SK-011364-001) Minimum: PBAPP R13C03
Loadapp	R12B or later
Key Manager/Key Admin	R07A03 or later

---

[6] XG-15P supports Single-Key AES in XLP R6A and later.

Hardware Revision Support for Voice Annunciation

To support Voice Annunciation, radio hardware must have at least 32 MB flash available. If the necessary flash size is not present, the radio displays "VA HW ERR" message. The following table lists radios that have hardware restrictions for Voice Annunciation support. If a radio is not listed, all revisions of that radio's hardware support voice annunciation.

FAMILY	BAND SPLIT	TYPE	PART NUMBER	REVISION SUPPORTED
M7300 Or XG-75M	UHF-L	N/A	RU-144750-021	Rev. C or later
	UHF-H		RU-144750-031	Rev. D or later
	VHF		RU-144750-041	Rev. D or later
	VHF (110 W)		RU-144750-051	Rev. A or later
	700/800 MHz		RU-144750-061	Rev. J or later
M5300	700/800 MHz	N/A	RU-144750-061	Rev. J or later
	900 MHz		RU-144750-181	Rev. P or later
XG-75P	All Bands	N/A	All Models	No Restrictions
XG-25P Or XG-25M	All Bands	N/A	All Models	No Restrictions
XG100P Or XG100M	All Bands	N/A	All Models	No Restrictions
XG-15P	All Bands	Sys	All Models	No Restrictions

3. FEATURES AND ENHANCEMENTS

The following features are available in the software:

3.1 XL PORTABLE

3.1.1 <u>New Features</u>

Bluetooth® update requiring Man in the Middle (MITM) Protection if configured in RPM2. When enabled, blocks the "Just Works" mode of operation.

3.1.2 <u>User Interface</u>

Covert/stealth mode	Configurable Menus
DTMF Keypad	Soft DTMF Keypad
Voice annunciation	Navigation Keys
User configurable soft buttons	Flexible key/button assignment
User configurable 2-position switch	User configurable 4-position switch
Keypad lock	Radio lock
Tri-color LED alerts	Top display backlight alerts
Hebrew Language support	French Language Support
Portuguese Language support	LTE Power Management – 6 hours more battery life
Caller ID list numbering	Direct Channel Entry (uses System Channel List rather than Zone)
Rover ID	GPS Decimal Degrees format
My Profile	RF Safe Mode (Very low output power mode.)
Multiple Wi-Fi® SSIDs (Up to 24 Wi-Fi SSIDs can be programmed via RPM2, plus 8 more via the radio UI. Used for Wi-Fi Programming and BeOn®.)	Time and Date Toggle for Front Display
Key List Sort in SLN/Key Number ascending order.	Backlight on Receive (Requires SC5 file to enable with RPM2 R6.)

3.1.3 Radio Provisioning

Firmware programming - USB	Firmware programming - Wi-Fi push
Personality management - P25 OTAP	Personality management - front panel
Personality management - USB	Personality management - Wi-Fi push
Keyloading - USB from Harris Key Loader	Keyloading - KVL
Encrypted (Black) Key Loading (HKL)	Zeroize from Harris Keyloader (HKL)
Rekeying - P25 Conventional OTAR - DES	Rekeying - P25 Conventional OTAR - AES
Rekeying - P25 Trunking OTAR - DES	Rekeying - P25 Trunking OTAR - AES
Individual Key Delete (New in XLP R04A)	OTAR Keyset Names (New in XLP R04A)
Audible OTAR Confirmation	ARC4 Feature Bit (This feature bit/capability must be enabled for ARC4 encryption to work.)
Provide an Alias list of up to 3,000 entries	P25 OTAP Accept/Reject (Requires an SC5 file to enable with RPM2 R6.)

3.1.4 LMR Functionality

3.1.4.1 Frequency Ranges Supported

UHF
VHF
700 MHz
800 MHz
900 MHz

3.1.4.2 User Interface

Channel Selection	Command/Tactical Zone
Home Channel	Mixed System Zones
Zone Selection	

3.1.4.3 Analog FM

Transmit/Receive 12.5, 20, 25 kHz FM	DTMF
Talkaround/Repeater	MDC-1200
Wideband Enable	Enhanced ID (Analog TSBK)
Noise Squelch	Type 99
CTCSS Squelch	Squelch Tail Elimination
CDCSS Squelch	Knox Tones Receive
Squelch Monitor/Toggle	Adjustable Squelch
Operator Selectable Squelch Tones	Enhanced ID
Transmit Inhibit on Carrier	DES-CFB
Per-channel Talkaround	Emergency Wail Tone

3.1.4.4 Conventional P25

Unaddressed Voice Call	Packet Data Registration/Deregistration
Group Voice Call	P25 MSG
Individual Voice Call	Request to Talk (RTT)
Late Entry	P25 STS
Selectable Talkgroups	Radio Disable/Enable Rx
Talkaround/Repeater	Situation Awareness
Talking Party Identification	Profile
Emergency Operation	Radio TextLink
Rx Only Channel Support	GPS Reporting
Monitor/Normal/Selective Squelch	SCEP Data
Digital Squelch/Monitor Toggle	DTMF
Transmit Inhibit on Status Symbols	Encryption Lite (ARC4)
Registration/Deregistration/Affiliation	DES-CFB Encryption
Per-channel Talkaround	Mute on Wrong Encryption Key
Channel strapping (for encryption)	Emergency Wail Tone
P25C Call Alert	Tier 2 GPS Location Services (PTT trigger)

3.1.4.5 Trunked P25

P25 Trunking Phase 1	Affiliation
P25 Trunking Phase 2	Authentication (Link Layer)
Group Voice Call	Late Entry
Individual Voice Call	Call Alert/Page
Broadcast Voice Call	P25 MSG
Announcement Group Call	Request to Talk (RTT)
System Call	P25 STS
Talking Party Identification (Caller ID)	Radio Disable/Enable
Emergency Operation	Dynamic Regroup
Local and Wide-area Trunking Indication	VDOC
Out of Range Indication	SCEP Data
Wide Area Scan	SNDCP Data
Multi-site Roaming – Fixed	Radio TextLink
Multi-site Roaming – Dynamic	Profile
Multi-site Roaming – Enhanced CC	In-Band GPS Reporting
Multi-site Roaming – Preferred Systems	Encryption Lite (ARC4)
Patch and Simulselect	TG0 on Inhibit / No Zeroize on Inhibit
Registration/Deregistration*	Priority Talk Group
Radio Unit Monitor	Mute on Wrong Encryption Key
Channel strapping (for encryption)	Vehicular Repeater Attach Tone
HVD-FDMA (P25 Trunked Autonomous Data Channel) Support	ISSI Group Calls
ISSI roaming (Intra-WACN roaming, Inter-WACN roaming, uncoordinated band plans supported)	Site Alias / Site Lock for Enhanced CC Scan
Telephone Interconnect	P25C Conventional Fallback (P25C channels can be used if P25 Trunked site fails)
Audible Failsoft Indication	PPP/SLIP (with CTS toggle)
Tier 2 GPS Location Services (PTT trigger)	

* When using XLP R2A (or later) with the P25T Registration Feature on PR9D (or earlier) Harris Systems along with having Phase 2 enabled on the radio, sometimes there will be brief periods of CC Scanning reported by the radio when registering with a new site before it self-adjusts. This is because the older site software does not support the newer extended format Location Registration message and the radio must recognize the lack of a response and revert to Full Registration, which will succeed and validate the radio and move to a CC Idle state.

3.1.4.6 Analog and P25 Scan Modes

Analog Scan	Custom Scan
Conventional P25 Scan	Priority 1 Scanning
Trunked P25 Scan	Priority 2 Scanning
Trunked/Conventional Scan	Preemptive Priority Scan
Scan List Configuration	Vote Scan
Nested Scanning	

3.1.4.7 Audio

Manual volume control	AGC
Minimum volume	Adjustable Mic gain
Speaker mute	Voice Playback
Selectable Audible tones and alerts	Voice Annunciation
Assignable PTT	Vocoder TX Audio Bandpass Prefilter
Noise Cancellation	Bluetooth microphone gain control via RPM2
Bluetooth Volume Control via the radio knob	Support for Bluetooth SCBA masks
Audible tone when changing volume (Requires an SC5 file to enable with RPM2 R6.)	Man in the Middle (MITM) Protection. If enabled in RPM2, blocks the "Just Works" mode of operation.

3.1.4.8 Other

Bluetooth 4.0	Single-key DES
GPS	AES encryption of P25 Voice (Up to 128 keys; 64 keys per keyset)
FIPS 140-2 Level 1	Radio Access via PIN
Clear/Secure Selection	CCT
Global Key Override	eData
Radio Access via PIN	Mandown (Tilt and Motion)
DES encryption of P25 Voice (Up to 64 keys; 32 keys per keyset)	Aeroflex support
BF707EZ development kit binary	Single-Key AES Support (*see note below)

* AES keys for the Single-Key AES feature are NOT entered in RPM2. All AES keys are loaded via the Harris Key Loader or via a Motorola KVL device.

3.1.4.9 TDMA Feature Support

The XL Portable supports TDMA Phase 2 functionality.

3.1.4.10 EDACS Modes

EDACS Single Site/Multi-Site/Simulcast/Voted/SCAT

Analog Voice
• Group Call
   ➢ Agency/Fleet/Sub-Fleet
   ➢ Emergency
      ○ Declare
      ○ Autokey
      ○ AutoCycle
      ○ Lock
      ○ Cancel
   ➢ Patch/Simulselect
   ➢ Scan (P1/P2/P3)
   ➢ Priority Talk Group
   ➢ Radio Drop
• Individual Call
   ➢ Direct Entry
   ➢ RPM2 Programmed list
• System All Call
• Transmission Trunked
• Message Trunked
• DTMF/Knox Tone
• Late Enter
• All XLP Audio sources (Speaker Mic, Bluetooth)

System Scan • CCSCAN • Wide Area Scan • ProScan
Radio Inhibit/Un-Inhibit
Alert Tone • Grant, Deny, Busy, Emergency (No Receive Tone) • Out of Range • Enable/Disable
Auto Login
Power up System
Feature Encryption
Max System/Groups
Max Personality Sizes

3.2   OMAP/UNITY RADIOS

3.2.1   <u>New Features</u>

- Multi-Region P25T I-Call entry via keypad (OMAP only; requires RPM2 R6F or later.

- Added the ability to disable CH-721 keypad backlight using the Contrast menu.

3.2.2   <u>Common Features</u>

These are the features that are supported regardless of operating mode:

Siren and Lights	Mode Menu to Switch to OpenSky®
PA (Remote mount CH-721 connection only)	Deluxe Vehicular Charger (without control head support)
Hot Mic Emergency	DVSI quad-mode vocoder
External Speaker (Remote mount CH721 connection only)	Dual Control Head for Mobiles
Noise Cancellation (XG-75, XG-100P, & XG-100M w/CH-100 noise cancellation speaker mic.)	80 Bit Feature Data
Single Key DES	GPS Display
Audio Playback	Control & Status Services
Pin Entry	Display invert on XG-25P/XG-75P
Preset keys	Test Unit on M7300
Assignable control of PTT on Unity Portable	Voice Annunciation
Caller ID	Zones
GPS Dongle	eData*
In-Band GPS	Encryption Lite (ARC4)**
Automatic Gain Control (AGC)	XG-75Pe A/B/C Switch enhancements
Direct Dial I-Call on CH-100	ARC4 Feature Bit (This feature bit/capability must be enabled for ARC4 encryption to work.)
Logging Recorder Output (XG-100M + CH-100 only; all audio is sent to the 44-pin connector on the back of the MRU)	Single-Key AES Support (See note below.)***

*   eData requires the FIPS compliant AES module for operational use: AES Module Version 4.01 is the current version supported. DES is NOT supported with eData system configurations.

**   Encryption Lite is an ARC4 encryption feature that enables radio-to-radio encrypted calls for P25T and P25C calls. Unity XG-100P does **not** support Encryption Lite.

*** NOTE that AES keys for the Single-Key AES feature are NOT entered in RPM2. All AES keys are loaded using the Harris Key Loader or using a Motorola KVL device.

3.2.3 Conventional Features

Rx and Tx Analog Voice	Priority Scan in all Voice Modes
Rx and Tx TCG including STE	800 MHz Wideband/NPSPAC
Rx and Tx DCG including STE	700 MHz Narrowband
GSTAR and GSTAR Emergencies	900 MHz Narrowband
DTMF	UHF-H/T Wideband/Narrowband
Tone Encode	UHF-L Wideband/Narrowband
Type 99	VHF Wideband/Narrowband
Squelch Adjustment	Monitor Mode
MDC1200	CG Select
Vote Scan	Custom Audio Scalars
Mixed Zone Scan	Emergency Wail Tone

3.2.4 P25 Conventional Features

Rx and Tx Digital Voice	Interoperability with Analog
Group Calls	Late Entry
Emergency Calls	700/800 MHz
All Calls	UHF-H/T
Unit to Unit Calls	UHF-L
Squelch Modes	VHF
DES Encryption*	Priority Scan in all Voice Modes
AES Encryption*	Custom Channels
Status Messaging	Radio Check
Unit Enable/Disable	Squelch Adjustment
DTMF	Status Query
Segmented NAC	RTT\ERTT
TSBK on Analog	P25C Data (SCEP)
Vote Scan	OTAR*/Radio TextLink/GPS/ProFile
Vehicular Repeater	Mixed Zone Scan*
DES CFB Encryption**	Emergency Wail Tone

* XG-15P - AES Encryption is ONLY allowed for Single Key AES. DES Encryption is ONLY allowed for Single Key DES.

** DES-CFB Encryption is ONLY supported on Unity Portable XG-100P, Unity Mobile XG-100M/CH-721, Unity Mobile XG-100M/CH-100, and XL Portable.

3.2.5   P25 Trunking Features

System All Call	ProScan™ roaming
Group Calls	Enhanced CC/Band Scan operation
Emergency Calls	Interconnect (phone) operation
Emergency Alarm	Site Trunking Avoidance
All Calls	Logoff / Deregistration on system change and power down
Unit to Unit Calls	700/800 MHz
Late Entry	UHF-H/T
Transmission and Message Trunked	UHF-L
Group Scan	VHF
Priority Scan	ProFile™
Time of Day	ProFile Compression
DES Encryption	Data
AES Encryption	Radio TextLink
ISSI group calls	Digital Voice AGC
Vehicular Repeater Attach Tone	SCEP OTAR*
SCCB	VDOC
Vehicular Repeater (Extended coverage, Scene of Incidence)	Emergency Declare in Clear on Encrypted System
FIPS 140-2 Level 1	Conventional Scan
DTMF	Knox Tones
RTT\ERTT on VR	KVL
PPP\SLIP	GPS Services
Stealth	Multigroup
Motorola Style Patch Scanning	Harris Style Patch Scanning
TDMA Phase 2 (see Section 3.2.6)	Individual/Dynamic Regroup
Test unit operation for mobile radios	SNDCP Data Conveyance (Version 2)
CC Scan Delay	Mixed Zone Scan
ISSI Emergency Alarm Cancel***	OTAR DES*
LLA*/**	TG0 on Inhibit / No Zeroize on Inhibit
Remote Unit Monitor (not supported in XG-100P)	Priority Talk Group (not supported in XG-100P)
HVD-FDMA (P25 Trunked Autonomous Data Channel) Support	Site Alias / Site Lock for Enhanced CC Scan****
ISSI roaming (Intra-WACN roaming, inter-WACN roaming, and uncoordinated band plans are now supported.)	Multi-Region P25T I-Call entry via keypad (OMAP only; requires RPM2 R6F).

*   XG-15P - AES Encryption is ONLY allowed for Single Key AES. DES Encryption is ONLY allowed for Single Key DES.

**   LLA with Harris sites may need a special SC5 file for older System releases.

***   ISSI Emergency Alarm Cancel requires Harris Site code version R14A48.04 or later to function properly in an integrated XGP/System solution.

****XG-75M and XG-100M only.

3.2.6   TDMA Feature Support

The following radios support P25T TDMA Phase 2 functionality:

- XG-75P/XG-75Pe (700/800 MHz)

- M7300 (except for and UHF-LL) and XG-75M

- XG-25P

- XG-25M

- XG-100P

- XG-100M

- XG-15P

3.2.7   EDACS Trunking Features

Analog Voice and ProVoice™	ProScan roaming
Group Calls	Interconnect (phone) operation
Unit to Unit Calls	4800 Baud EDACS
Emergency Calls	SCAT
System All Call	800 MHz Wideband
Transmission and Message Trunked	900 MHz Narrowband
Late Entry	UHF-H/T Wideband/Narrowband
Group Scan	UHF-L Wideband/Narrowband
Priority Scan	VHF Wideband/Narrowband
Conventional Priority Scan (ECP1 Scan)	ProFile
Auto Login	ProFile Compression
Digital Voice AGC for ProVoice	DCS Data (9600 and 4800 baud)
Feature Encryption Support	DCS+ Data (9600 and 4800 baud)
Test unit operation for mobile radios	Radio TextLink
EDACS Security Key (ESK)	Time of Day
ProVoice DES encryption	Squelch Adjustment for Analog Rx
DTMF	ProVoice/AES

NOTE

EDACS is NOT supported in the XG-15P, XG-100P, or XG-100M with CH-100.

3.2.8   EA Trunking Features

Analog Voice and ProVoice	ProScan roaming
Group Calls	Interconnect (phone) operation
Unit to Unit Calls	800 MHz Wideband
Emergency Calls	DCS+4 Data
System All Call	ProFile
Transmission and Message Trunked	ProFile Compression
Late Entry	Radio TextLink
Group Scan	Time of Day
Priority Scan	Test unit operation for mobile radios
Auto Login	EDACS Security Key (ESK)
Digital Voice AGC for ProVoice	ProVoice DES encryption
Feature Encryption Support	Squelch Adjustment for Analog Rx
DTMF	

NOTE	EA is NOT supported in the XG-15P, XG-100P, or XG-100M with CH-100.

3.2.9   Control and Status Services Feature Support

FUNCTIONALITY
STATUS
Status/Event Report Request
System List Report Request
System List Report
EDACS/P25 Status Options Report Request
EDACS/P25 Status Options Report
EDACS/P25 Message Options Report
Group Set Report Request
Group Set Report
Conventional Frequency Report Request
Conventional Frequency Set Report
Individual Call Set Report Request
Individual Call Set Report
Phone Call Set Report Request
Phone Call Set Report
Trunked System Event Report
Heartbeat Status Report

FUNCTIONALITY
Volume Setting Report
Power down/shutdown support
Voice Call Event Report
ECP SW/HW Version Number
CONTROL
Press PTT
Release PTT
Set Volume Level
Set ECP System
Set ECP Talk Group
Set Conventional Channel
Power Down/Shut Down Support
Application Change
Trunked Group Call Transmit
Trunked Group/Conventional Channel Call Receive
Conventional Transmit
ECP Emergency (declare and cancel)
I-Call Transmit and Receive
Status Option Transmit
Message Option Transmit
Enable / Disable Channel Scan
CONNECTION MANAGER
Connection Request
Terminate Request
Power Down/Shut Down Support
Application Change Request
Application Query
Application Response

4. INSTALLATION

XLP R05x or XLP R06x OMAP and Unity Mobile radios can be upgraded by loading XLP R06F compressed code via RPM2 R6F or later. XLP R05x or XLP R06x Unity Portable radios can be upgraded using **Unity Product Management → Code Modules** in RPM R14B and later.

NOTE	RPM2 only supports one connection per radio at a time for radios that have multiple connections (e.g., serial on back of MRU, serial on back of Control Head, front-mic jack or USB on front of Control Head).

NOTE	If it is necessary to revert to a code version prior to R6, you must perform a zeroize before and after the pre-R6 code is loaded.

4.1 USING RPM2

NOTE	The XG-100P cannot be programmed using RPM2.

1. Connect the radio to the PC on which RPM2 is installed using the appropriate programming cable and power on the radio.

2. Start RPM2. Refer to RPM2's online help for detailed descriptions of the user interface and instructions on using the application.

3. In RPM2, display the **Load Code** tab (click **Radio → Load Code** or click ⊘ Code in the toolbar).

4. Select the radio from the list of connected radios on the Radio Tab.

5. Select **Radio Firmware** from the Radio Code drop-down.

6. Click **Add** to browse to the file.

7. Select (check) the file and click the **Load Code** button.

NOTE	Refer to RPM2's online help or the *RPM2 User's Manual,* 14221-1100-2060, for more information.

4.2 USING RPM

NOTE	The XL Portable cannot be programmed using RPM.

4.2.1 <u>Serial Connection</u>

1. Connect the radio to the PC on which RPM is installed using the appropriate programming cable.

2. Start RPM.

3. From the Radio menu, click **Standard Serial Connection → Load Compressed Code**.

4. Select ECP/XGP.

5. Browse to the Code File.

6. Click **Load**.

Refer to RPM's on-line help for more information.

4.2.2 <u>USB/Bluetooth Connection (XG-100P and XG-100M/CH-100)</u>

1. Connect the radio to the PC on which RPM is installed using the appropriate programming cable.

2. Start RPM.

3. From the Radio menu, click **USB/Bluetooth Connection → Unity Product Management**.

4. Select the Code Modules tab.

5. Click **Radio Firmware**.

6. Browse to the Code File.

7. Click **Program**.

5.   NOTES ON THIS RELEASE

5.1   XG-25P

IMPORTANT NOTE regarding upgrade/downgrade of the newer XG-25P OBS hardware: The newer hardware XG-25P OBS cannot boot up or go into Program mode if it has been downgraded to a pre-XLP R3A firmware. If that has occurred, the radio will likely be stuck in BurnApp mode, and it cannot be upgraded using RPM2. To correct this, load XLP R3A into the radio using the older RPM R14 code, and then the radio will boot up normally. It can then be programmed as normal with RPM2.

The XG-25P OBS radios can be identified as an XG-25P with HW Rev A or later. Specifically, here is the Product, Model, and EID information to fully identify XG-25P OBS radios:

BAND & TYPE	PRODUCT NUMBER	MODEL NUMBER	S/N
7/800 Scan	14011-0020-02 Rev A (or later)	DPXG-PB78B-e1	A4014Assssss
7/800 System	14011-0020-01 Rev A (or later)	DPXG-PF78B-e1	A4014Bssssss
UHF Scan	14011-0030-02 Rev A (or later)	DPXG-PBU1B-e1	A4014Cssssss
UHF System	14011-0030-01 Rev A (or later)	DPXG-PFU1B-e1	A4014Dssssss
VHF Scan	14011-0010-02 Rev A (or later)	DPXG-PBV1B-e1	A4014Essssss
VHF System	14011-0010-01 Rev A (or later)	DPXG-PFV1B-e1	A4014Fssssss

5.2   XL PORTABLE

5.2.1   Notes Regarding Upgrade Icons

When upgrading from R1A/C to R1D/E, the radio displays . 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 will have to be reinstalled prior to upgrading to R2**.

When installing 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 R3A and later, if is displayed, the radio has lost its factory information and needs to be returned for updating.

Enabling keypad lock and Power On PIN:

On radio boot, the radio keypad is locked but does not show that it's locked. The unlock key sequence needs to be entered before you can input the power on PIN.

Only the following Wi-Fi Channels can be used with the XL Portable:

- 2.4 GHz

  1, 3, 4, 5, 6, 7, 8, 9, 10, 11

- 5 GHz

  36, 38, 40, 42, 44, 46, 48, 149, 151, 153, 155, 157, 159, 161, 165

5.2.2 <u>Downgrade Information</u>

If downgrading a radio from XLP R6A or later to a version earlier than XLP R6A, ZEROIZE all encryption keys on the radio before downgrading the radio. Next, install the older software. After installing the pre-R6 software, run a ZEROIZE operation again, re-load all encryption keys, and use the radio as normal.

If upgrading from pre-R6 software to XLP R6A or later, no zeroize is required.

6. PROBLEM RESOLUTION

The following issues were resolved with this release:

REFERENCE NUMBER	DESCRIPTION
PROD00162997	XG-25P displays system and group names within the REVISION menu in XLP R05D. Exiting REVISION menu causes display issues.
PROD00165894	XL-200P with R06A23-R06E06 - After powerup to an EDACS system, XL-200P PTTs on an encrypted talkgroup and displays "NO KEY." Works correctly in R05D05.
PROD00164343	UHF-Only XL-200P with R05D displaying "INVALID SYSTEM: Feature not installed" when programmed with UHF-Only personality file.
PROD00171607	Encryption icon appears on an unencrypted channel at first power up after programming.
PROD00163038	XL-200P with XLP R05D05 - using Visual Channel Identification Color and in Scan mode, RX a call does not change color to match a scanned channel without RX CG.
PROD00167278	XL-200P with R06A23 - Encryption Indicator (key icon on the front display) while on EDACS no longer functions on received AES calls using AutoSelect mode.
PROD00165452	P25T: Intermittently Unencrypted-only XL-200P will display encrypted key icon and if PTTed, will say "NO KEY ZERO" when encryption mode is set to FORCED ON.
PROD00158959	XG-25P/M first PTT unsuccessful after unit re-enable.
PROD00171342	XL-200P with R06E06 - Once a Bluetooth Speaker Mic has been deleted from an XL-200P, the XL-200P will not find any Bluetooth devices.
PROD00169704	M5300 with XLP R06A-R06D stops processing EDACS data over serial port, requiring a power cycle to restart all data processes.
PROD00159996	XG-75Pe with XLP R05A27-R06D03 will not OTAR on first UKEK load. Works on UKEK reload and then radio authenticates to P25 System.
PROD00161263	XG-25M/P, XG-75P/Pe and XL-200P with XLP R05C04 - Intermittent No Deny Tone when PTT Pressed in CC/WA Scan.
PROD00170678	XL-series radios with XLP R06E lock-up after switching to a BeOn over Wi-Fi system if radio sees a Wi-Fi AP transmitting no SSID. Radio becomes inoperable.

REFERENCE NUMBER	DESCRIPTION
PROD00163367	XL-200P/XL-185P with R06A23-R06D03 - A custom splash screen does not replace the default splash screen. It appears for a second and then goes away.
PROD00169080	XL-200P with XLP R06D03 - Top Display displays incorrect talkgroup and does not match the front display in P25 Conventional mode while using Custom Scan.
PROD00167317	XG-100M with CH-721 - Power-up late entry into a scanned call, when the call drops, the radio stays on the scanned group and does not return to the power-up group.
PROD00166679	XL-200P with R06A23 - DOWN ARROW Programmable Button Info list shows EMERGENCY and HOME CHANNEL all the time plus numerous "unassigned" settings in list.
PROD00164684	XL-200P with XLP R05D05 - Scanning an EDACS talkgroup, the display shows the wrong talkgroup, but the audio heard is the correct talkgroup.
PROD00158868	Unity Mobile with XLP R04A24 through R04D03 - Scan list cannot be modified when RF carrier is present.

7. TECHNICAL SUPPORT

Harris' Technical Assistance Center (TAC) resources are available to help you with overall system operation, maintenance, upgrades, and product support. TAC is your point of contact when you need technical questions answered.

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

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

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

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A.4   MD5 HASHING ALGORITHM

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A.5   SHA1 ENCRYPTION

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SHA-1 in C modifications and respective license:

MODIFIED/RELEASED BY	MODIFIED YEAR	PUBLIC DOMAIN
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James H. Brown	7/98	Yes
Saul Kravitz	4/01	Yes
Ralph Giles	07/2002	Yes

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A.8 WEBRTC

License:

A.9   OPENSSL

(Nucleus Radio Compiled Library is planned for this module.)

License:

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```
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===

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

NOTES

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