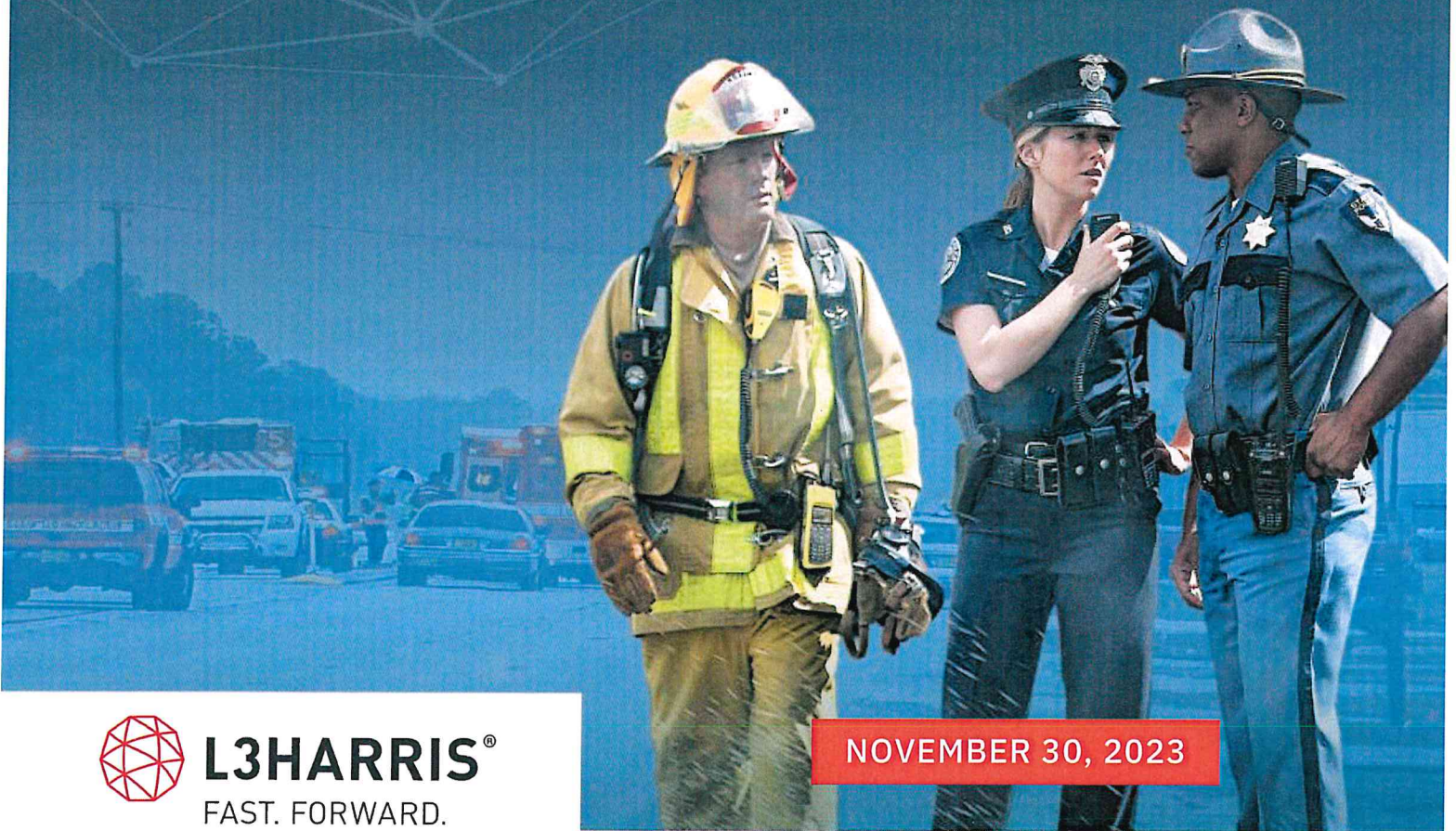# DESCHUTES COUNTY CONNECT CORE

DESCHUTES COUNTY, OREGON

L3HARRIS®
FAST. FORWARD.

NOVEMBER 30, 2023

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FAST. FORWARD.

L3HARRIS TECHNOLOGIES, INC.

Communication Systems
221 Jefferson Ridge Parkway
Lynchburg, VA USA 24501-6952
Phone 1-800-368-3277

L3Harris.com

November 30, 2023

Tim Beuschlein
PS Systems Supervisor/Radio System Admin
Deschutes County 9-1-1 Service District
20355 Poe Sholes Drive #300
Bend, OR 97703

Subject: Connect Core/2 sites/150 BeOn licenses

Dear Mr. Beuschlein:

L3Harris is pleased to provide Deschutes County 9-1-1 with the following Connect Core/2 sites/150 BeOn firm fixed price proposal. Pricing is valid until December 31, 2023. Upon expiration of the pricing validity, L3Harris reserves the right to provide an updated pricing proposal.

L3Harris looks forward to partnering with Deschutes County 9-1-1 on this critical communications project. Please contact me at 503-724-1273 or at the email address listed below if you have any questions.

Respectfully,

Jennine Weber
Sr. Sales Account Manager
L3Harris Technologies, Inc.
Jennine.Weber@L3Harris.com

SYSTEM DESCRIPTION

L3Harris excels in the multifaceted implementation of mission critical radio systems to fulfill the specific needs of our customers and support their vital public safety operations. L3Harris is pleased to partner with Deschutes County, Oregon in providing an equipment and design for a VIDA Connect core and two new simulcast RF sites that will be added to Deschutes County's existing radio communications system. As services are not part of the L3Harris responsibility, test plans, however, have been provided for the use of Deschutes County and/ or Deschutes Count third-party implementors.

Deschutes County's existing system is made up of two 800 MHz P25 Simulcast Cells, 5 Channels sites at Bend and Redmond locations. The three RF sites at Bend are site 111 (St. Charles), site 112 (Overturf) and site 113 (Awbry). The new RF site at Bend is site 114 (Road Department). The two RF sites at Redmond are site 100 (Cline Butte) and site 107 (Long Butte). The new RF site at Redmond is site 108 (Kingwood).

There are three 800 MHz P25 Multisite, 5 Channels sites at Redmond. They are site 104 (Hoodoo), site 103 (Pine Martin), and site 105 (Henkle). Henkle site already have P25 Trunked site common equipment, AC Power Plant and only requires RF Antenna System. There is one P25 Conventional 800 MHz, 3 channels at site 106 (Sisters Camp Sherman Fire Department). Two dispatch centers at the 911 Center and Hambry Road Fire Station, two interoperability gateways with 24 total talkpaths, one Eventide Logging Recorder, and BeOn server.

Figure 1. Deschutes County, Oregon Block Diagram
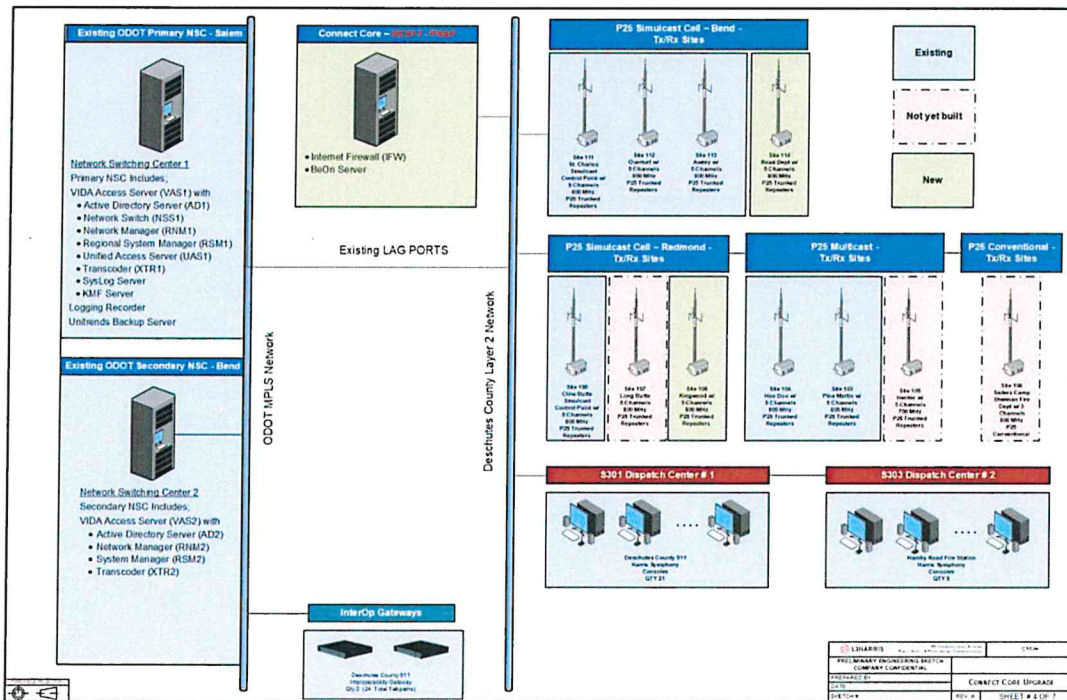
Deschutes County currently uses Oregon Department of Transportation (ODOT)'s VIDA Premier NSC High Availability (HA). The primary NSC 1 is located at Salem and the secondary NSC 2 is located at Bend. The new VIDA Connect core will be located at the Deschutes County DC 911 dispatch center and will connect to ODOT's primary and secondary NSCs. L3Harris shall provide the VIDA Unite Core with Connect core features and licenses. The VIDA Connect core will have a BeOn application that will support 150 users. Since this will be an addition to an existing system there are no special cybersecurity requirements and no third-party equipment upgrades.

THE L3HARRIS OFFERING

L3Harris will provide equipment and design information for Deschutes County to add two new RF simulcast sites and a VIDA Connect (Unite) core with BeOn.

1. Addition of two new RF simulcast sites at Bend (Road Department) and Redmond (Kingwood) locations.

> New P25 Trunked Site Common Equipment

> Deschutes County provided AC Power Plant

> RF Antenna System including:

    − 5-Channel Combiner (Qty 1)

    − Multicoupler/TAA (Qty 1)

    − Tx Antenna (Qty 1)

    − Rx Antenna (Qty 1)

    − Coax, Cables, and Connectors

2. Addition of VIDA Connect core (VIDA Unite core)

> Deschutes County requested that the VIDA Connect Core be equipped with the Key Management Facility (KMF), however, this is supported only on the NSC. This can be added once Deschutes County's VIDA Connect is converted/upgraded to a VIDA Unite Core since KMF requires its own UAS for key Management.

    − For the interim, L3Harris recommends that Deschutes County use the existing KMF from ODOT's VIDA Premier NSC.

    − Modification of the existing Deschutes County backhaul is not in the L3Harris design scope.

    − Backhaul bandwidth requirements for this design include addition of C1111-4P router sufficient for WAR and SARs

3. Addition of BeOn to the new VIDA Connect core.

> L3Harris shall provide the VIDA Unite core to process voice traffic and support BeOn for Deschutes County, however, NSC applications such as UAS, Enterprise Network Manager (ENM), Regional Network Manager (RNM) and KMF are still part of ODOT Premier core and share with Deschutes County.

    − The Unite Core will be configured to function as a VIDA Connect core with BeOn server.

   –   As requested, 150 mobile licenses for iOS/Android OS are provided.

Overview System Features

VIDA CONNECT CORE

Deschutes County's VIDA Unite core will be reconfigured to function as a VIDA Connect with Application High Availability and shall be connected to the State's (ODOT) VIDA Premier Core.

The VIDA Network Switching Center (NSC) is the heart of L3Harris' P25 packet-switched network. Deschutes County NSC is configured for geographically separated Location High Availability with geographically separated primary and secondary switching servers. L3Harris will provide a VIDA Connect core based on Deschutes County's system and infrastructure requirements. The VIDA Unite hardware platform is scalable to meet current (VIDA Connect) and future (VIDA Unite) Deschutes County system requirements.

The VIDA Unite NSC provides centralized administration services and activity log storage location for all VIDA system locations. VIDA Unite also supports traffic management, including trunked voice, console, and interoperability calls.

The desired availability and reliability determine the amount and type of redundancy designed within a mission critical system. L3Harris has devised multiple choices for system HA. The VIDA Unite supports Application HA and Location HA. Deschutes County prefers VIDA Connect (Unite) NSC with Application HA.

The maximum allowed for VIDA Unite core is 800 Talkpaths. Deschutes County has two dispatch centers, the first dispatch center S301 has 21 symphony consoles, and the second dispatch center Hamby Road Fire Station has 5 symphony consoles. L3Harris shall customize Deschutes County's VIDA Unite (Connect) to handle the 26 symphony consoles.

Deschutes County shall use ODOT's VIDA Premier Core Location HA and VIDA Unite Core Application HA.

Figure 2. VIDA Premier and Connect NSC HA Options and Subsystem Capacity

CONNECT

Enable distributed scalable networks; lowers backhaul costs (TCO); PSAP connect used for major dispatch centers; Used to add adjacent regional network.

Application HA
Location HA

Multi-region	Yes
Trunked sites	100
Conv channels	100
Consoles	60
Total talk paths (concurrent)	1600

PREMIER

Flagship offering for large, wide-area systems (statewide networks). Network can be extended by adding connect service extenders.

Location HA
Location Diversity HA

Multi-region	Yes
Trunked sites	254
Conv channels	150
Consoles	100
Total talk paths (concurrent)	2400

BeOn Group Communications Services

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 broadband capable third generation (3G) and 4G/LTE cellular networks and Wi-Fi.

BeOn® users can communicate using L3Harris BeOn® capable subscribers, smart phones (Android and Apple iOS), tablets, and PCs, providing secure PTT communications far beyond the boundaries of regional radio systems and opening affordable PTT communications to new user groups. This includes the ability to provide highly integrated interoperability services between BeOn® users on the cellular network and users of traditional Private Mobile Radio (PMR) networks.

L3Harris' Private Mobile Radio VIDA IP network switching technology is the foundation for the BeOn® application infrastructure. As a result, the application and product suite provide many advanced features not found in competing technologies and provides internetworking of those services between public and private communications networks.

BeOn Application Server

L3Harris offers BeOn Application on VIDA cores. BeOn server supports up to 5,000 users.
BeOn is available on Android™, Windows® PC, and iOS™ platforms and supports managed group and push-to-talk communications utilizing most consumer smart phones. All platforms support geographic mapping and use Google® Mapping data. The application identifies BeOn users who are talkgroup members of the LMR system and forwards transmissions to their BeOn device. Using a PTT function on the BeOn device, the application receives and sends transmissions to the server. The BeOn server can handle thousands of users and recognizes logical talkgroups established in the digital radio system, allowing designated users to communicate over managed channels, much like a traditional digital radio.

The BeOn Windows Client (BWC) allows any administrator to listen to LMR traffic from a PC at a desk, or in a command-and-control vehicle, as well as talk to BeOn and P25 radio users in the field. The administrator can participate in PTT traffic and view the location and presence state of users on a map with optional "Status Aware" and "Situational Awareness Mapping" functions.

Voice Network Interface Controller (VNIC)

The Voice Network Interface Controller (VNIC) is a voice controller application that runs on the VAS and performs routing functions for digital trunked voice messages through an IP backbone. The VNIC maintains a database of voice group files, it tracks the radio site location of voice group members to ensure delivery of voice messages only to those radio sites essential to reach identified radios. In addition, the VNIC supports a wide range of interfaces for third-party products, including dispatch consoles, logging recorders, and interoperability gateways.

Network Requirements

To guarantee the quality of voice through the VIDA network, all WAN links will need to strictly adhere to the requirements provided in the following sections. Conformance with these design requirements is a necessary condition for L3Harris to meet the overall performance needs of the VIDA system. All of these requirements are necessary to provide a guaranteed level of service for voice quality. Failure to adhere to these requirements could result in poor audio for which L3Harris cannot be held accountable. In the event of audio problems, L3Harris shall work with the customer to determine the source of the problem. If the problem is determined to be in the customer supplied backhaul, L3Harris shall be available on a contract basis to help resolve the issue.

Packet Loss Requirements

Due to the connectionless nature of UDP used in transmitting voice packets, minimal packet loss is tolerable in the VIDA network. However, any packet loss could result in degraded voice quality or loss of voice. L3Harris shall not be held responsible for degraded voice quality that comes from the result of packet loss in the customer provided transport network.

Performance testing to be measured based on the following:

> RFC 2544 standard to be used.

> Length of test per link shall be 24hrs.

> Frame loss shall be less than .01%

> Out-of-Order packets shall be less than .01%

Multisite Jitter (One-way)

Jitter is the variability of packet delays within the same voice packet stream (talk spurt).   The requirement is for the overall jitter to average near zero and to never build up to more than 60 msec one-way. Any streams with excessive jitter will be considered to have packet loss and L3Harris shall not be responsible for voice quality issues.

For example, if a voice packet were 60 milliseconds late, then it would be optimal for the next few voice packets to be early to get the average jitter back to zero. This will allow the voice buffer to build back to a stable point.

For allowable Simulcast Jitter, refer to the IP Simulcast Latency and Jitter section.

Latency Requirements (One way)

Some degree of latency, such as satellite links, can be supported within the VIDA network. L3Harris shall not be held responsible for voice latency requirements if the provided WAN connection has more latency than the requirement. Any latency within the system will need to stay constant to avoid jitter. Latency requirement differ based on the site type and traffic patterns. This section defines latency requirements for Multisite to NSC, NSC to NSC, Simulcast Site to Control Point, and Control Point to NSC. Latency is measured one-way. Asymmetric latency is permitted if one-way measurements meet specifications below.

Layer 2 Quality of Service Requirements

If Layer 2 WAN services are being provided, the layer 2 WAN should map our layer 3 DSCP markings into the appropriate layer 2 queues that meet the layer 3 requirements.

Layer 3 Quality of Service Requirements

At OSI Layer 3, the network will recognize and forward L3Harris voice traffic marked using the Differentiated Services Code Point (DSCP) byte and the network will also meet the following requirements:

> The Platinum (DSCP EF) queue should be treated as a strict priority queue for voice.

> All other queues should be treated as CBWFQ.

> All DSCP values should not be manipulated during transport.

Bandwidth Requirements

All of the links that are provided will need to meet or exceed the bandwidth requirements established by L3Harris.

Figure 3. Bandwidth Requirements

System Name	Type	Site Channels	Consoles	Talkpaths	Total VNIC Talkpaths	VIP Consoles	Number of Sites	Logging Recorder BW (kbps)	BW per Symphony (kbps)	Simulcast and Site Aggregated Traffic (kbps)	Core to Core Bandwidth (kbps)	Minimum Recommended Ring Requirement (kbps)
Bend DCP Cell	DCP Simulcast	5		10	10		4			1,621	430	3,242
Redmond DCP Cell	DCP Simulcast	5		10	10		3			1,153	370	2,306
Primary Dispatch	Dispatch		20	12	240		1		514	10,280	10,280	20,560
Secondary Dispatch	Dispatch		6	12	72		1		514	3,084	3,084	6,168
Pine Marten	Multisite	5		10	10					1,536	1,536	3,072
Hoo Doo	Multisite	5		10	10					1,536	1,536	3,072
Henkle	Multisite	5		10	10					1,536	1,536	3,072
Sister Camp	Multisite	5		10	10					1,536	1,536	3,072
ISSI	Interoperability				0					0	0	0
IOGWY	Interoperability			24	24		2			1,472	1,472	2,944
Logging Recorder	NSC				44		1	1534		1,534	1,534	3,068
Aggregation Total					440					25,288	23,314	50,576

Figure 4. MASTR V Simulcast Rack 1
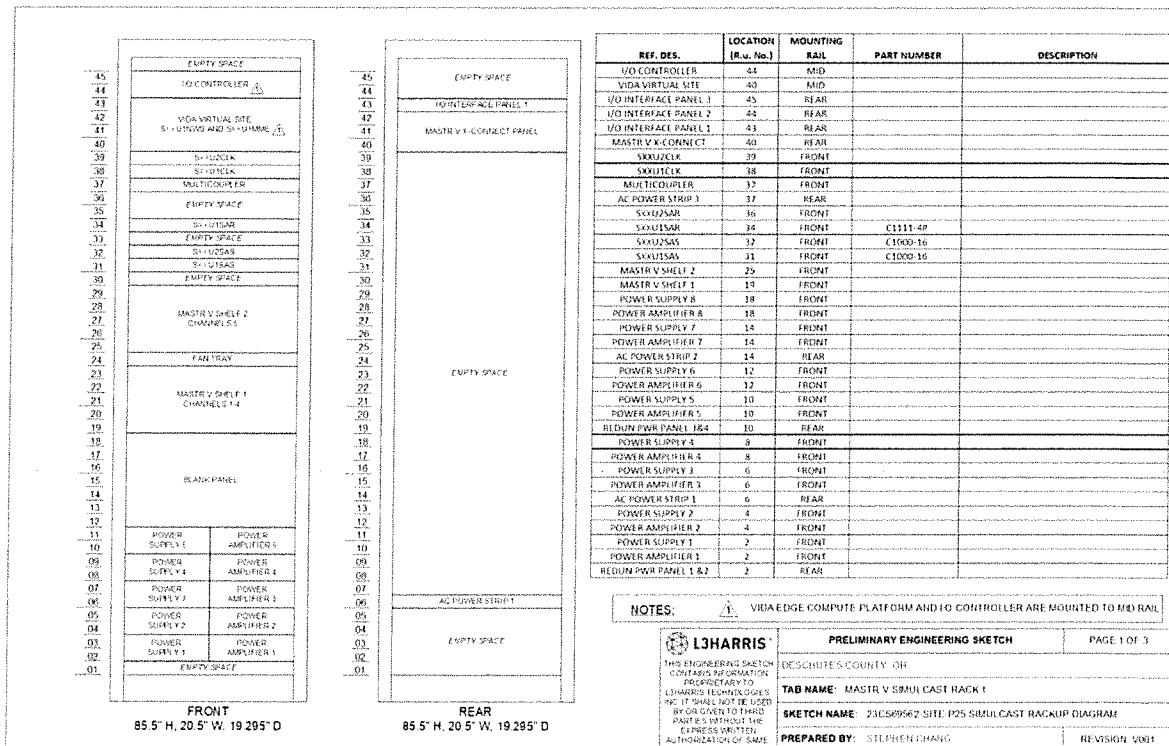
Power Requirements

New DC-powered RF sites for Road Department and Kingwood. The figure below shows power load calculations per site.
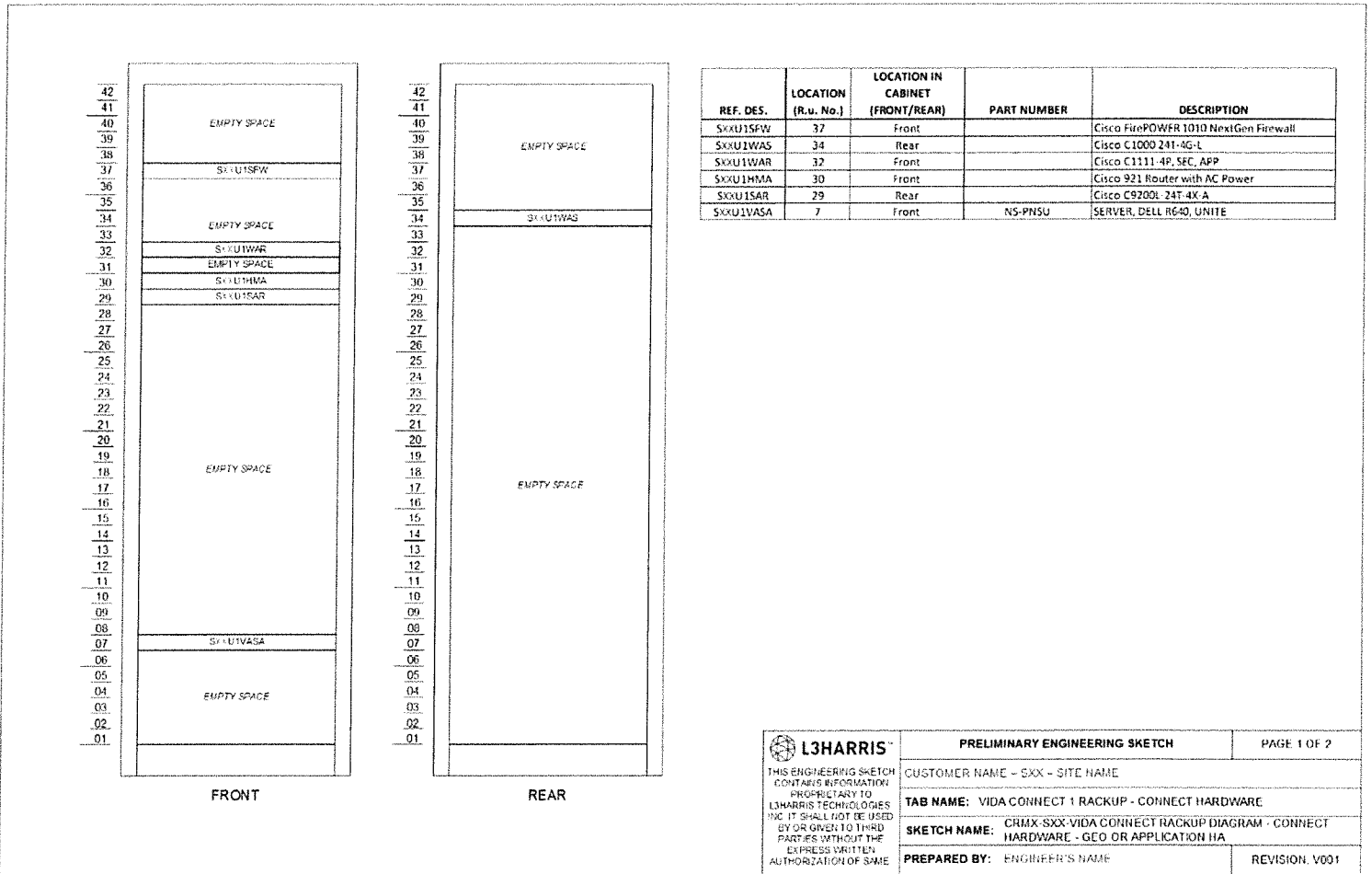
Figure 5. New DC-powered RF Sites

Site Name(s) RF Site		
Equipment load when all Stations TX (Maximum Plant)	Peak 48 VDC equipment Load	68.14 Amps
Average current during battery run time	Average 48 V equipment Load	32.93 Amps
Desired run time on Batteries	Hours run time	8 Hours
Inverter and	120 VAC Load	0.70 Amps
Converter Load	24 VDC Load	0.00 Amps
in addition to 48 VDC load	12 VDC Load	0.00 Amps
	48 VDC Battery voltage range	43-56 Volts
	Battery Recharge time	24 Hours
	Growth required	5 %
Note: Battery recharge current is NOT included in these.	Est 48 VDC Total Peak Load	73.6 Amps	Inc Converters & Growth
	Est 48 V Total Avg Load	36.6 Amps	Inc Converters & Growth

New Connect Core (Unite Core) UPS backup power design is listed in the figure below.

Figure 6. UPS Backup Power Design

UPS Vendor SOW SnapShot	
Site Name(s): Road Department	
Peak	1.36 KW
Average Load	1.36 KW
Hours run time	1 hours

Figure 7. VIDA Connect Core with Application HA Rack-up, Typical.

REF. DES.	LOCATION (R.u. No.)	LOCATION IN CABINET (FRONT/REAR)	PART NUMBER	DESCRIPTION
SxxU1SFW	37	Front		Cisco FirePOWER 1010 NextGen Firewall
SxxU1WAS	34	Rear		Cisco C1000 24T-4G-L
SxxU1WAR	32	Front		Cisco C1111-4P, SEC, APP
SxxU1HMA	30	Front		Cisco 921 Router with AC Power
SxxU1SAR	29	Rear		Cisco C9200L-24T-4X-A
SxxU1VASA	7	Front	NS-PNSU	SERVER, DELL R640, UNITE

FRONT

REAR

⊕ L3HARRIS™	PRELIMINARY ENGINEERING SKETCH		PAGE 1 OF 2
THIS ENGINEERING SKETCH CONTAINS INFORMATION PROPRIETARY TO L3HARRIS TECHNOLOGIES INC. IT SHALL NOT BE USED BY OR GIVEN TO THIRD PARTIES WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF SAME	CUSTOMER NAME – SXX – SITE NAME		
	TAB NAME: VIDA CONNECT 1 RACKUP - CONNECT HARDWARE		
	SKETCH NAME: CRMX-SXX-VIDA CONNECT RACKUP DIAGRAM - CONNECT HARDWARE - GEO OR APPLICATION HA		
	PREPARED BY: ENGINEER'S NAME		REVISION. V001

STANDARD WARRANTY

WARRANTY SUPPORT

L3Harris offers a standard one-year warranty on all proposed infrastructure equipment as outlined in the Standard Conditions of Sale.

Equipment

Warranty provides that the hardware furnished by L3Harris shall be free from defects in material and workmanship.

During the Warranty if any Hardware component fails to meet the warranty, L3Harris will remedy by: (1) repairing any defective component of the Hardware, or (2) by furnishing any necessary repaired, refurbished, or replacement parts.

L3Harris will perform, at its discretion, all warranty labor at a L3Harris location. Where L3Harris has determined it is not feasible to ship fixed equipment for repair, L3Harris will repair on premise. Standard warranty response times are standard business days, 8:00 a.m. to 5:00 p.m. Eastern. For additional levels of support, premium services are available.

Software

During the Warranty, if the L3Harris licensed software does not successfully operate, the error or defect will be corrected free of charge or make available a substitute program.

Warranty provides corrections to software defects and known errors reported to L3Harris' Technical Assistance Center (TAC) during the warranty period at no additional cost to the Customer. Installation of corrections to software defects reported to TAC during the warranty period is not included in the Warranty.

Third-Party Warranties

L3Harris will ensure that warranty on any third-party Original Equipment Manufacturer (OEM) equipment and services sold by L3Harris meets the same warranty requirements and we will act on behalf of the Customer to coordinate and settle all warranty issues with any integrated third-party equipment or software companies throughout the warranty period.

L3Harris will transfer third-party warranties provided directly from equipment manufacturers to the Customer as part of the final acceptance.

Warranty Returns Process

The following procedure describes the returns process for equipment under warranty:

1. L3Harris creates a support case number, verifies product part numbers, serial numbers, reasons for return and then forwards the approved request for processing.

2. L3Harris reviews the request and provides a return merchandise authorization number (RMA) to the County, along with instructions for return of the equipment.

3. The County ships the equipment back to L3Harris Depot Repair and Return.

4. L3Harris repairs or replaces any equipment free of charge unless there is evidence of abuse or damage beyond the terms of the service

5. L3Harris ships the repaired or replacement unit back to the County.

6. L3Harris closes the RMA and updates the tracking database.

Requests for repairs out of warranty will require a purchase order unless a service agreement exists. Any repairs out of warranty are subject to a flat rate, per-unit fee, regardless of fault found with the equipment. If the item for repair does not have a flat rate fee listed, a time and material charge will apply. The turn-around time for equipment repair or replacement is typically ten business days.

Depot Level Repair and Return

The Depot Repair and Return service covers the cost to fix covered equipment at L3Harris or other third-party manufacturer's factories. This service is part of our standard warranty and is a premium service during the maintenance periods. The L3Harris Depot Repair and Return facility is ISO 9001:2015, UL, and Factory Mutual certified. Master technicians using state-of-the-art test equipment verify that all repairs meet or exceed prescribed specifications.

The Depot Repair and Return Facility utilize a stockroom of common repair parts to reduce repair time. Our technicians can repair over 95% of radio and infrastructure equipment on-site, decreasing turn-around time. Customers are encouraged to call in advance regarding equipment returns to verify inventory and serviceability.

Demand Services

Demand services are available when an unexpected event or situation occurs outside the scope of work and requires repairs from L3Harris, its agents, or partners. For demand services, the County will receive an invoice on a time and materials basis. Examples may include the following:

> Installation, updating, upgrading, maintaining, or removing software, hardware, or non-L3Harris infrastructure after initial installation.

> Repair of equipment damaged by vandalism, abuse, neglect, or noncompliance to L3Harris recommended practices, to the extent such equipment damage is not caused by L3Harris or any of its agents.

> Damages due to acts of God or other uncontrollable events

> Any other repair or service not outlined in the Scope of Work

Exclusions

Standard exclusions apply as referenced in the following documents:

> Standard Conditions of Sale

> Equipment Warranty

L3HARRIS™

TEST PLAN FOR
SYSTEM ACCEPTANCE

Customer:

Deschutes County, OR

Prepared by:

S. Chang and B. Opee

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TEST PLAN

INTRODUCTION

This is a design-only effort on the part of L3Harris and test plans are intended for the use by Deschutes County implementation team(s).

L3Harris designed this System Test Plan to validate the installation and functionality of our P25 Phase 2 Trunking system at the SR10A.7 release. It defines the plan for conducting tests and analyzing test results, to confirm that the system satisfies design objectives.

The Test Team will perform these tests in the order they appear in the plan and test procedures, or as required by the L3Harris systems engineer. The team will record test results in the appropriate test procedure referenced by this document. The prescribed test procedures have been developed and rigorously vetted by L3Harris engineering to provide extensive functional verification of the system features under test.

ROLES AND RESPONSIBILITIES

A Test Team consisting of at least one L3Harris system engineer and one Deschutes County representative to act as a witness to the testing is required to execute the test plan. It may be necessary for a secondary team, consisting of an additional L3Harris employee and a Deschutes County witness, to be present at another location to test certain features, such as multisite calls or for the secondary team to initiate site alarms so that the primary team can observe them from a system management terminal (SMT).

An L3Harris employee shall execute the test steps outlined in the test procedure using the required equipment and with optional assistance from the DESCHUTES COUNTY 911 representatives. Additional personnel may attend as desired, or as required, to provide access or escort others to certain locations, such as RF shelters or other restricted access areas. Deschutes County shall provide access for the entire team to its facilities, including, the Network Switching Center (NSC) locations, RF site shelters, and dispatch locations. For secure facilities, appropriate access permissions must be granted prior to the testing events.

ACCEPTANCE TESTING CLARIFICATION

Final acceptance testing shall occur in two separate phases. The first phase of testing begins with functional testing performed in the L3Harris staging facility immediately after initial factory configuration is completed. During this first phase, the DESCHUTES COUNTY 911 representatives will be on-site to witness the testing. The second phase occurs after final installation at customer facilities.

Staging tests, as detailed in the identified test procedures, verify equipment functionality that L3Harris can reasonably perform in a factory environment. L3Harris will perform all identified functional testing in the field after final install and commissioning of the system.

Factory staging tests shall be virtually conducted via a remote video conferencing session. The virtual testing allows for a greater number of participants than typically allowed for during an on-site visit.

Once acceptance testing begins, L3Harris will lock system configurations, hardware platforms, and software versions, except to correct software defects affecting system performance. Prior to conducting the factory tests, L3Harris will perform a system audit to verify installation of the appropriate software system release version on each platform.

ELECTRICAL SPECIFICATIONS

If requested, L3Harris will provide raw test data and site alignment measurements from the factory Automated Manufacturing Test Station (AMTS) for the L3Harris provided transceiver equipment.

BASELINE CONFIGURATION

L3Harris systems include a baseline configuration with a predefined test agency and group structure to support the defined test procedures. L3Harris system engineering shall determine the hardware and software revisions during program planning and check the system conforms to that baseline prior to the start of testing.

A complete set of as-built system schematics will be available during testing and includes:

> System block diagrams
> Network schematics
> Connection diagrams
> Wiring and cabling schematics
> Rack up drawings.
> Alarm punch down drawings
> Grounding and power schematics

TESTING PREREQUISITES

Following installation and commissioning of the applicable hardware and software, L3Harris will verify the system readiness for test. If the testing includes RF sites, L3Harris will complete site alignment and optimization by setting site configurations, aligning stations, and optimizing system timing parameters. As part of the standard installation practices, we measure equipment settings and record levels. L3Harris will provide these site measurements as part of the final documentation package. These parameters include:

> Transmit frequency and deviation.
> Output and reflected power.
> Receiver sensitivity
> Receiver multicoupler gain (if applicable)
> Receiver preamplifier gain (if applicable)
> Time domain reflectometry of transmission line
> Combiner loss (if applicable)
> Audio line out
> Audio line in

Prior to conducting installation testing, L3Harris shall perform a system audit to verify installation of the appropriate system release version of software on each platform.

L3HARRIS™

Finally, prior to conducting the testing procedures detailed in this document, L3Harris and Deschutes County representatives will agree upon the dates and times of the test.

SYSTEMS AND SITES TO BE TESTED

L3Harris will test the P25 Phase 2 Trunking system installed at each of Deschutes County's locations. Functional testing is expected to take up to two to three days per site but may be completed sooner.

Final system acceptance testing will take place at each of the RF site locations. A site will be chosen to initiate the testing, and all test procedures appropriate to the site will be executed and recorded. Once a site has completed the test cycle, the team will move on to the next site. This approach will be repeated until all sites have been tested.

Equipment is located at various locations across the facilities and is identified as the following:

System/Site Location	Address or Building Number	System/Equipment Description
Deschutes County 911	20355 Poe Sholes Dr, Bend, OR 97701	Connect Core
Kingwood	44-17-13.18N 121-10-13.69W	RF Site
Road Department	44-1-17.38N 121-15-41.07W	RF Site

PASS/FAIL CRITERIA

Criteria for Pass / Fail is determined by execution of the test procedures in the Acceptance Test Plan. If a feature test is successfully executed, that feature is deemed to be compliant and results in a PASS. If a failure occurs, the failed test may be repeated to address missed steps or configuration requirements overlooked during execution.

If a certain piece of equipment is deemed to be malfunctioning and duplicate spare equipment is available to replace it, the test may be executed using the spare equipment. If the feature test is successfully executed on the spare equipment, the feature will be deemed compliant and result in a PASS. When the original piece of equipment is repaired or replaced and can function as designed, the original equipment will be returned to service and tested to ensure functionality.

If a feature is found to be non-compliant, L3Harris will address the non-compliance and retest. Until a successful retest, the feature is deemed to be non-compliant and results in a FAIL.

If it is necessary to defer a test for any reason, it will be marked as Not Yet Evaluated (NYE). The test will be executed, with appropriate witnessing, at any time afterward to change the result to a PASS.

A Deschutes County designated representative will provide a signature on the approval documentation of the completed FAT as a prerequisite to shipping the equipment.

TROUBLE REPORTING

Any issues found during testing will first be recorded on the comment page at the end of the feature set, and then they will be reported directly to the L3Harris program manager to be logged in the project issues log for corrective action.

Failures must be appropriately addressed. For hardware failures occurring during test events, failed hardware will be removed from the system being tested and turned over to L3Harris' quality organization for repair or replacement.

Test Procedures

FEATURES TO BE TESTED

The following list of acceptance procedures will be used to validate system performance:

> Network Switching Center
> Symphony Dispatch Consoles

TOOLS / TEST EQUIPMENT

Unless otherwise specified, L3Harris will supply all special tools necessary to test the product.

Equipment list TBD during program planning.

EQUIPMENT MODEL NUMBER	DESCRIPTION	SERIAL NUMBER
TBD	TBD	TBD

RADIO MODEL NUMBER	DESCRIPTION	SERIAL NUMBER
TBD	TBD	TBD

Safety

L3Harris will take reasonable safety precautions to ensure personnel against harm while operating within and traversing the installations.

General safety guidelines for portable radios:

> Do not hold onto the antenna when the radio is powered on.
> To ensure you do not exceed FCC RF exposure compliance requirements, always keep the antenna at least 0.43 inches (1.1 cm) away from the body and 0.98 inches (2.5 cm) from the face when transmitting.
> Do not use the portable radio with a damaged or missing antenna. A minor burn may result if skin comes into contact with a damaged antenna. 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 manufacturer-approved antennas. Use of unauthorized antennas, modifications, or attachments could cause damage to the radio unit and may violate FCC regulations.
> 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!

L3Harris engineering will identify environmental detriments prior to testing, if deemed applicable. L3Harris will make adjustments to the extent required to address any such deficiencies deemed to present a danger to either system performance or personnel safety; examples include excessive temperature variations, contaminants, hazardous materials, or obstructions to LMR equipment.

TEST PROCEDURES

SYSTEM FEATURE SET

P25 TDMA Phase 2 Functionality (Single site / Simulcast Single Site)

Purpose: Demonstrate P25 TDMA Phase 2 implementation provides the additional traffic channel capacity and features of P25 TDMA Phase 2 while allowing backwards compatibility with FDMA Phase 1 radios and talkgroups.

Expected Results: Verify that a P25 FDMA call will work on a TDMA system.

Setup: In the following tests, Radios 1 and 2 will be set up as FDMA only. Radios 3 and 4 will be set up as TDMA and FDMA capable, depending upon TG.

FDMA refers to Phase 1 and TDMA refers to Phase 2.

Log into RNM, Realtime Tab, start RSM Site Activity or VNIC site calls to monitor system channel assignment and call type during active calls.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID	SYSTEM
Radio 1	9980001	TG 64051 P25	64051	Phase 1
Radio 2	9980002	TG 64051 P25	64051	Phase 1
Radio 3	9980003	TG 64051 P25	64051	Phase 2
Radio 4	9980004	TG 64051 P25	64051	Phase 2

MIXED MODE SITE TO MIXED MODE SITE CALL — FDMA TO FDMA

Purpose: Demonstrates that an FDMA call will work on a FDMA system.

Expected Results: Verify that a P25 FDMA call will work on the system.

Setup: Turn off Radios 3 and 4.

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1.
   > Verify that the call is assigned as an FDMA by viewing the real time viewer site activity on the RNM.
   > Verify Radio 2 can hear Radio 1.

TEST RESULTS
Tester:

Date:				
Result:	☐	Pass	☐	Fail

MIXED MODE SITE TO MIXED MODE SITE CALL — FDMA AND TDMA

Purpose: Demonstrates that a mixed mode call can function on a TDMA system.

Expected Results: Verify that a TDMA radio will hear a call from a FDMA radio.

Setup: Turn on Radios 1, 2, 3, and 4.

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1.
   > Verify that the call is assigned as an FDMA by viewing the real time viewer site activity on the RNM.
   > Verify Radios 2, 3, and 4 can hear Radio 1.

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

MIXED MODE SITE TO MIXED MODE SITE CALL — FDMA.

Purpose: Demonstrates that a mixed mode call can function on a TDMA system.

Expected Results: Verify that an FDMA radio will hear a call from a TDMA radio.

Setup: Turn on Radios 1, 2, 3, and 4.

Execution:

1. PTT Radio 3 and talk. The transmit (TX) indicators should turn on at Radio 3.
    > Verify that the call is assigned as an FDMA by viewing the real time viewer site activity on the RNM.
    > Verify Radios 1, 2, and 4 can hear Radio 3.

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

TDMA SITE CALL

Purpose: Demonstrates that a TDMA call will work on a TDMA system.

Expected Results: Verify that a P25 TDMA call will work on a TDMA system.

Setup: Turn off Radios 1 and 2.

Execution:

1. PTT Radio 3 and talk. The transmit (TX) indicators should turn on at Radio 3.
   > Verify that the call is assigned as an TDMA by viewing the real time viewer site activity on the RNM.
   > Verify Radio 4 can hear Radio 3.

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

TRANSMISSION TRUNKING

Purpose: Test will demonstrate that the system is working as a transmission trunking system.

Expected Results: Verify the control channel will assign a working channel to the radio and that the radio and site will work as a trunking set by dropping radio transmission upon PTT release.

Setup: Radios 1, 2, and 3 should be the only radios on the system.

Use RNM real time viewers to monitor system channel assignment.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID	SITE
Radio 1	9980001	TG 64001 P25	64001	1
Radio 2	9980002	TG 64001 P25	64001	1
Radio 3	9980003	TG 64001 P25	64001	1

Execution:

1. Log into RNM, Realtime Tab, start RSM Site Activity, to monitor system channel assignment. Observe all channels on Site 1.
2. PTT Radio 1 and talk.
    > The transmit (TX) indicators should turn on at Radio 1.
    > Verify the number of the channel assigned.
    > Un-PTT Radio 1.
3. PTT Radio 2 and talk.
    > The transmit (TX) indicators should turn on at Radio 2.
    > Verify the next channel is assigned.
    > Un-PTT Radio 2.
4. PTT Radio 3 and talk.
    > The transmit (TX) indicators should turn on at Radio 3.
    > Verify the next channel is assigned.
    > Un-PTT Radio 3.
    > Verify the channel immediately drops, or as configured by station hang timers.

TEST RESULTS			
Tester:			
Date:			
Result:	☐ Pass	☐ Fail	

BeOn Features

Purpose: Demonstrate the BeOn features.

Expected Results: Following tests will demonstrate that BeOn works as designed.

Setup: Tests will show that the BeOn system allows a smartphone to communicate with the radio system.

TRANSMIT GRANT TONE

Purpose: Demonstrate the grant tone on BeOn.

Expected Results: When the smartphone PTTs on the BeOn app, it will play a grant tone.

Setup: Grant tone (Ready to Talk tone) enabled in smartphone radio personality.

DESCRIPTION	TG DESCRIPTION
BeOn Phone 1	TG A
BeOn Phone 2	TG A
BeOn Phone 3	TG A

Execution:

1. Press PTT button on smartphone with valid group selected.
    > Verify grant tone is heard at smartphone when working channel access is granted.

    Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

TEST RESULTS			
Tester:			
Date:			
Result:	☐ Pass	☐	Fail

GROUP CALL

Purpose: Confirms BeOn can make group calls.

Expected Results: Selected talkgroup call audio is heard.

Setup: Set Smartphones 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF.

DESCRIPTION	TG DESCRIPTION
BeOn Phone 1	TG A
BeOn Phone 2	TG A
BeOn Phone 3	TG A

Execution:

1. PTT on BeOn Phone 1 and talk.
   > The transmit (TX) indicators should turn on at BeOn Phone 1.
   > Audio should be heard in BeOn Phone 2 and BeOn Phone 3.
   > The ID of BeOn Phone 1 should be seen at BeOn Phone 2 and BeOn Phone 3.
2. Set BeOn Phone 3 to TG B. PTT on BeOn Phone 1 and talk.
   > The transmit (TX) indicators should turn on at BeOn Phone 1.
   > Audio should be heard in BeOn Phone 2 only.
   > The ID of BeOn Phone 1 should be seen at BeOn Phone 2 only.

TEST RESULTS			
Tester:			
Date:			
Result:	☐ Pass	☐ Fail	

INDIVIDUAL (PRIVATE) CALL

Purpose: Confirms individual calls can be initiated using BeOn enabled smartphones.

Expected Results: Individual calls are confirmed.

Setup:

DESCRIPTION	TG DESCRIPTION
BeOn Phone 1	TG A
BeOn Phone 2	TG A
BeOn Phone 3	TG A

Execution:

1. Using the BeOn Phone 1, select the pre-stored ID of BeOn Phone 2 or enter the BeOn Phone 2 ID directly from the keypad, and PTT Smartphone 1.
   > Verify that BeOn Phone 2 receives the call and displays the ID of Smartphone 1.
   > Verify that BeOn Phone 3 remains idle.

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

GROUP SCAN

Purpose: Confirms the scan function which allows a smartphone to hear audio on selected talkgroups other than the current talkgroup.

Expected Results: Selected talkgroup call audio is heard.

Setup: BeOn Phone 1 set up with Talkgroup A P25 and B P25 in the scan list, Talkgroup A P25 selected, and group scan initially disabled.

DESCRIPTION	TG DESCRIPTION
BeOn Phone 1	TG B
BeOn Phone 2	TG A

Execution:

1. Place a call from BeOn Phone 2 on Talkgroup A P25.
   > Verify the call is not received by BeOn Phone 1.
2. Enable group scan on BeOn Phone 1.
3. Place another call from BeOn Phone 2 on Talkgroup A P25.
   > Verify that the call is now received, and audio is heard on BeOn Phone 1.

TEST RESULTS			
Tester:			
Date:			
Result:	☐ Pass	☐ Fail	

EMERGENCY GROUP CALL

Purpose: Confirms an emergency can be declared, recognized, and cleared by a smartphone.

Expected Results: The emergency is declared, recognized, and cleared.

Setup:

DESCRIPTION	TG DESCRIPTION
BeOn Phone 1	TG A
BeOn Phone 2	TG B
BeOn Phone 3	Talkgroup C

Execution:

1. Press the emergency call button on BeOn Phone 3 and then PTT BeOn Phone 3.
   > Verify that BeOn Phone 3 indicates the "TX EMER" declaration and that it reverts to the home group.
   > Verify that BeOn Phone 1 and BeOn Phone 2 indicate a "RX EMER" and hear audio on the emergency home group.
2. Clear the emergency with supervisor phone or console.

TEST RESULTS			
Tester:			
Date:			
Result:	☐ Pass	☐	Fail

SYMPHONY CONSOLE FEATURE SET

TRANSMITTING WITH A MICROPHONE

Purpose: Demonstrate Symphony operator can initiate communication with a radio using Symphony select functions and foot pedal.

Expected Results: Confirms Symphony communication with radio.

Setup: Radio set to same TG as console

Execution:

1. Press INSTANT TX function (right mouse button) on module with test group.
   > Verify call is heard on radio.
   > Verify a ripple effect on 'TX' indicator is displayed.
   > Verify a channel access tone is heard.
   > Release the Instant TX key.
2. Click the 'Select' button on the module to make the TG the selected talkgroup.
   > Verify module for TG is highlighted, indicating it is selected talkgroup.
3. Make a call on TG by pressing PTT foot pedal.
   > Verify a channel access tone is heard.
   > Verify halo around the 'TX' indicator is displayed.
   > Verify call is heard on radio.
   > Verify audio is heard at radio on talkgroup.
   > Release foot pedal to end call.
4. Make a call on TG by pressing headset button.
   > Verify a channel access tone is heard.
   > Verify halo around 'TX' indicator is displayed.
   > Verify call is heard on radio.
   > Verify audio is heard at radio on talkgroup.
   > Release headset button to end call.
5. Make a call on TG by selecting it with a mouse.
   > Verify a channel access tone is heard.
   > Verify halo around 'TX' indicator is displayed.
   > Verify call is heard on radio.
   > Verify audio is heard at radio on talkgroup.
   > Release mouse button to end call.

TEST RESULTS

Tester:				
Date:				
Result:	☐	Pass	☐	Fail

RECEIVING CALLS (UNIT ID DISPLAY, TALKGROUP ID DISPLAY, ALIASING)

Purpose: Confirm Symphony operator can receive communications from a radio, using both TG A and individual calling.

Expected Results: Communications are initiated and received on appropriate speaker (select or unselect) and radio's ID is displayed.

Setup: Symphony has talkgroups A, B, and C configured with TG B selected.

Talkgroup Call

Execution:

1. Key radio and verify.
   > That call is heard at unselect speaker.
   > Calling radio ID is displayed on module for TG.
   > A green light ID displayed indicating an incoming call on module TG A.
2. Switch radios talkgroup to TG B and key radio.
   > Verify call is heard at select speaker.
   > Verify calling radio ID is displayed on TG B module.
   > Verify a green light ID displayed indicating an incoming call on module for TG B.

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

Symphony Console Test Notes / Issues
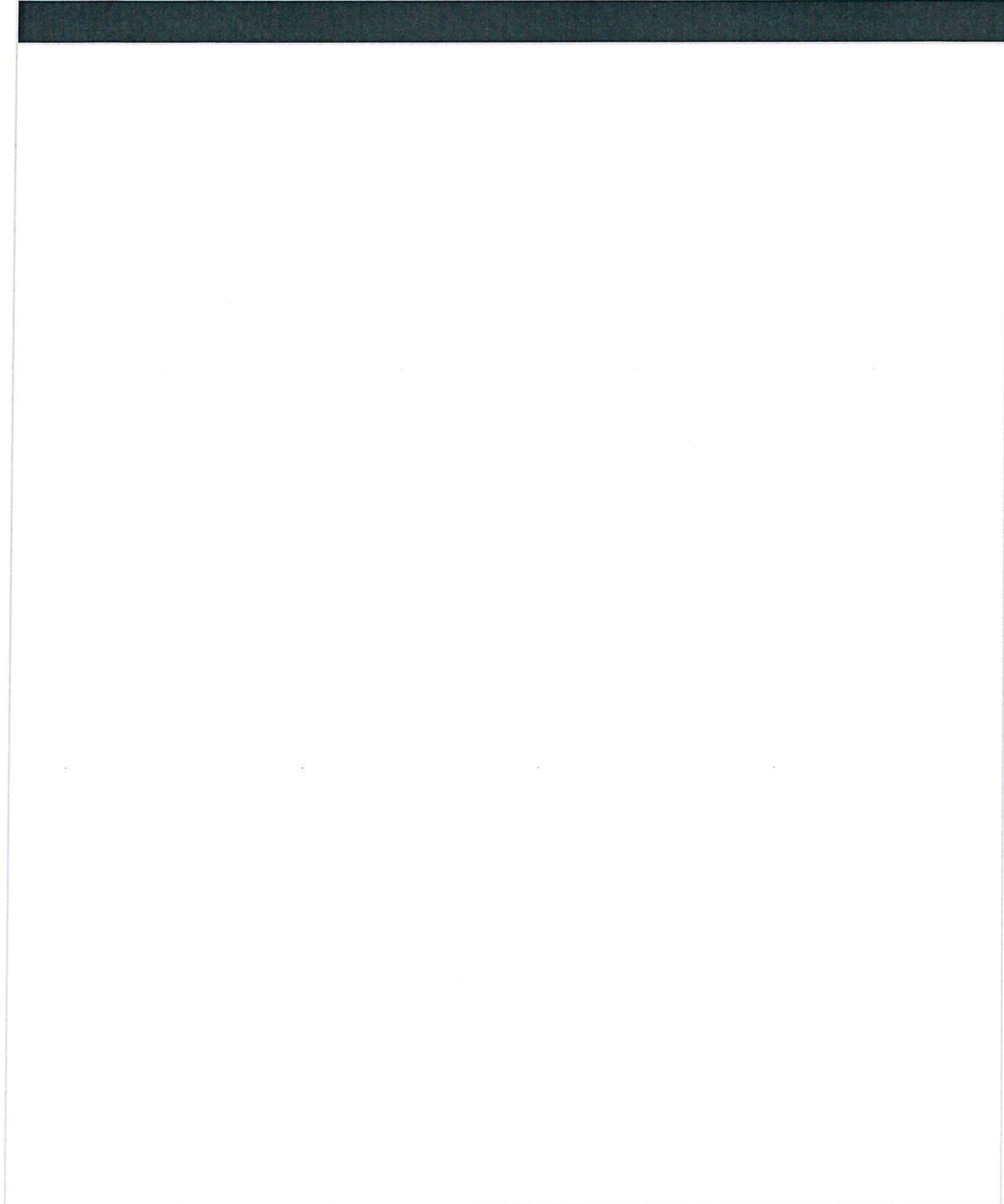
Symphony Console Test Acceptance

This Functional Test Acceptance Procedure has been fully and successfully completed with all action items resolved.

Deschutes County Representative   L3Harris Technologies Representative

_____   _____
Signature   Signature

_____   _____
Printed Name and Title   Printed Name and Title

_____   _____
Date   Date

APPENDIX A – ACRONYMS AND DEFINITIONS

ACRONYM	DEFINITION
AD	Active Directory
AES	Advanced Encryption Standard
ATP	Acceptance Test Procedure
CAI	Common Air Interface (usually in reference to P25)
CME	Cisco Mobility Exchange (Telco Interconnect)
CNM	Central Network Manager, a L3Harris product
Confirmed Call	A confirmed call is a special type of call where the call is queued until all sites have resources available, or until the confirmed call timer expires (configurable, typically one or two seconds)
COTS	Commercial-off-the-Shelf
CPC	Channel Performance Criterion
DAQ	Delivered Audio Quality
DES	Digital Encryption Standard
LMR	Enterprise Land Mobile Radio
ESN	Electronic Serial Number (64 bits)
FDMA	Frequency Division Multiple Access
GID	Group ID (16 bit). This corresponds to a talkgroup. The group ID is unique within a VNIC and can be reused on other VNICs within the same WACN. Some of the older P25 documents refer to the GID as a talkgroup ID (TGID)
HA	High Availability
Individual Call	An individual call is a private call between one user and another. It can be between two radios, or between one radio and a dispatch console
KEK	Key Encryption Key
KID	16-bit encryption key ID
KMF	Key Management Facility
KMM	Key Management Message
LAN	Local Area Network
MASTR V	An L3Harris base station product
MES	Mobile End System, a subscriber radio
MME	Miniature mobility exchange, which consists of L3Harris software running on a SitePro card at the base site. The MME runs the SNDCP layer of the data protocol and is the equivalent of the P25 RFG (RF Gateway)

ACRONYM	DEFINITION
N(S)	A 3-bit sequence number for the packet data unit
NSC	Network Switching Center
NSS	Network Switching Server
NWS	Network Sentry
OTAP	Over-the-air-programming
OTAR	Over-the-air-rekeying
P25	Project 25, a suite of standards for digital radio communications, developed by the Association of Public Safety Communications Officials (APCO) under the TIA TR-8 engineering committee, and published as the TIA-102 set of documents
Priority Talkgroup	The priority talkgroup selected on the subscriber device. Usually this is the talkgroup that the radio will transmit on when the user presses PTT
ProFile	An L3Harris product used for configuring radios over the P25 radio channel
ProScan	An L3Harris software algorithm used for radio roaming
PTT	Push-to-Talk
RAR	Regional Access Router
RF	Radio Frequency
RNM	Regional Network Manager
RSM	Regional Site Manager, a server that runs the RSM, Activity Warehouse and Device Manager applications
RSSI	Received Signal Strength Indicator
RVM	Regional VIDA Manager, a server that runs the UAS and RNM applications
SAN	Storage area network
SMT	System management terminal.
SU	Subscriber unit. In the P25 world, an SU is a mobile or portable radio
SUT	System Under Test
SUMS	Security Update Management Service (an L3Harris product)
SUMSplus	Version of SUMS
TAC	Technical Assistance Center, an L3Harris service
TDMA	Time Division Multiple Access
TEK	Traffic Encryption Key
TGID	Talkgroup ID (16-bit, equivalent to GID). The P25 documents usually use GID but some of the older documents use TGID
Traffic Controller	Software entity that resides in a base station at the site and generates the P25 control channel
Tx	Transmit

ACRONYM	DEFINITION
UAC	Unified Audio Card
UAS	Unified Administration System
UKEK	User Key Encryption Key
UPS	Uninterrupted Power Supply
VAS	VIDA Application Server
VIDA	Voice, Interoperability, Data, Access (an L3Harris system product)
VLAN	Virtual Local Area Network
VM	Virtual Machine
VNIC	Voice Network Interface Controller, the L3Harris voice switch
VPN	Virtual Private Network
VTI	VIDA Telephone Interconnect
WACN	Wide area communication network (20-bit network ID, part of SUID). This is a customer network that can include many VNICs
WAR	Wide Area Router
Zeroize	A P25 control channel command which causes the mobile radio to erase its encryption keys (but then requires manual loading to restore encryption keys)

PRICING SUMMARY

L3Harris is pleased to provide Deschutes County with the following firm fixed price proposal. Pricing is valid through December 31, 2023. Upon expiration of the pricing validity, L3Harris reserves the right to provide an updated pricing proposal.

P25 TRUNKED LMR SYSTEM	Qty	PRICE (USD $)
VIDA Premier Core Licenses	Lot	$66,624.32
Unite Connect Core	Lot	$302,153.15
Kingwood - P25 Simulcast TX Site Equipment & Antenna Network	Lot	$209,616.73
Road Dept. - P25 Simulcast TX Site Equipment & Antenna Network	Lot	$209,521.73
P25 TRUNKED SYSTEM SUBTOTAL		**$787,915.93**
PROFESSIONAL SERVICES	**Qty**	**PRICE (USD $)**
Engineering Services	Lot	$16,040.00
Staging & Freight	Lot	$1,575.00
PROFESSIONAL SERVICES SUBTOTAL		**$17,615.00**
PROJECT TOTAL		**$805,530.93**

State and Local taxes not included

Milestone Payments	%
Projected invoice/ship date of July 1, 2024	100%

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L3HARRIS TECHNOLOGIES, INC.
GOODS AND SERVICES TERMS AND CONDITIONS OF SALE

The following terms and conditions of sale shall apply to the Equipment and Services to be provided by L3Harris Technologies, Inc., through its Communication Systems Segment (hereinafter "Seller") to DESCHUTES COUNTY 9-1-1 SERVICE DISTRICT (hereinafter "Buyer") as set forth in the Statement of Work ("Agreement"). The agreement between Buyer and Seller shall be formed upon execution of this Agreement ("Effective Date") and shall terminate upon completion of the warranty period.

WHEREAS THIS CONTRACT IS PLACED AGAINST PRICE AGREEMENT #0491. THE PRICE AGREEMENT TERMS AND CONDITIONS APPLY TO THIS CONTRACT AND TAKE PRECEDENCE OVER ALL CONFLICTING TERMS AND CONDITIONS.

1. STATEMENT OF WORK.

Buyer now desires to contract with Seller to provide Buyer with the radio communications system equipment ("Equipment") and services ("Services") set forth in **Exhibit A** – Statement of Work (SOW) referenced as Seller's Proposal dated November 30, 2023. The SOW describes the work to be performed by Seller to deliver and install the Equipment and provide the other Services under this agreement. Seller shall furnish, deliver and install the Equipment and Software and provide the documentation deliverables and Services in accordance with the terms of the SOW. Buyer and Seller each agree to perform their respective tasks and obligations as set forth in the SOW.

2. WARRANTY.

A. Seller warrants to Buyer that Equipment manufactured by or for the Seller shall be free from defects in material and workmanship and shall conform to its published specifications. With respect to all non-Seller Equipment, Seller gives no warranty, and only the warranty, if any, given by the manufacturer shall apply. Seller warrants the installation services furnished by Seller ("Installation Services") hereunder shall be free from defects in and workmanship for one (1) year.

B. Seller's obligations set forth in Paragraph C below shall apply only to failures to meet the above warranties occurring within one (1) year following acceptance and are conditioned on Buyer's giving written notice to Seller within thirty (30) days of Buyer's awareness of such occurrence.

C. During the Warranty Period, if Equipment or Installation Services fails to meet the foregoing warranties, Seller shall, at its option, correct the failure by : (i) repairing defective or damaged parts or Equipment, or (ii) making available any necessary repaired or replacement parts, or (iii) by correcting the faulty Installation Service(s) (iv) providing new or refurbished parts or new or refurbished equipment. Seller will be responsible for all shipping charges incurred in returning defective parts to Seller's plant and shipping repaired or replacement parts to Buyer. All warranty repairs must be conducted during normal business hours at Seller's place of business. Any repaired or replacement parts or Equipment furnished hereunder shall be warranted for the remaining unexpired portion the original Warranty Period of that part or Equipment. The original Warranty Period shall not be extended. Where such failure cannot be corrected by Seller's commercially reasonable efforts, Seller will refund to Buyer the fees paid for the parts or Equipment less depreciation.

D. Seller's obligations under Paragraph C shall not apply to any Equipment, or part thereof, which (i) has been modified or otherwise altered other than pursuant to Seller's written instructions or written approval or, (ii) is normally consumed in operation or, (iii) has a normal life inherently shorter than the warranty periods specified in Paragraph B, or (iv) is not properly stored, installed, used, maintained or repaired, or, (v) has been subjected to any other kind of misuse or detrimental exposure, or has been involved in an accident.

E. The preceding paragraphs set forth the exclusive remedies for claims based upon defects in or nonconformity of the Equipment, whether the claim is in contract, warranty, tort (including negligence), strict liability or otherwise, and however instituted. Upon the expiration of the warranty period, all such liability shall terminate. The foregoing warranties are exclusive and in lieu of all other warranties, whether oral, written, expressed, implied or statutory. NO IMPLIED OR STATUTORY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, INDIRECT OR EXEMPLARY DAMAGES.

3. LIMITATIONS OF LIABILITY.

A. THE TOTAL LIABILITY OF SELLER, INCLUDING ITS SUBCONTRACTORS OR SUPPLIERS, ON ANY AND ALL CLAIMS WHETHER IN CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE OR PATENT INFRINGEMENT) OR OTHERWISE, ARISING OUT OF, CONNECTED WITH, OR RESULTING FROM THE PERFORMANCE OR NON-PERFORMANCE OF ANY OBLIGATION UNDER THIS AGREEMENT RESULTING HERE FROM OR FROM THE MANUFACTURE, SALE, DELIVERY, RESALE, REPAIR, REPLACEMENT OR USE OF ANY EQUIPMENT OR THE FURNISHING OF ANY SERVICE, SHALL NOT EXCEED THE PRICE ALLOCABLE TO THE EQUIPMENT OR SERVICE WHICH GIVES RISE TO THE CLAIM. EXCEPT AS TO TITLE ANY SUCH LIABILITY SHALL TERMINATE UPON THE EXPIRATION OF THE APPLICABLE WARRANTY PERIOD SPECIFIED IN THE ARTICLE ENTITLED "WARRANTY".

B. IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE OR PATENT INFRINGEMENT) OR OTHERWISE, SHALL SELLER, OR ITS SUBCONTRACTORS OR SUPPLIERS, BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT OR EXEMPLARY

DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFIT OR REVENUES, LOSS OF USE OF THE EQUIPMENT OR ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF SUBSTITUTE GOODS, FACILITIES, SERVICES OR REPLACEMENT POWER, DOWNTIME COSTS OR CLAIMS OF BUYERS CUSTOMERS FOR SUCH DAMAGES. IF BUYER TRANSFERS TITLE TO, OR LEASES THE EQUIPMENT SOLD HEREUNDER TO, OR OTHERWISE PERMITS OR SUFFERS USE BY, ANY THIRD PARTY, BUYER SHALL OBTAIN FROM SUCH THIRD PARTY A PROVISION AFFORDING SELLER AND ITS SUBCONTRACTORS AND SUPPLIERS THE PROTECTION OF THE PRECEDING SENTENCE.

4. PATENTS.

A. Seller warrants that the Equipment furnished hereunder, and any part thereof, shall be delivered free of a rightful claim of any third party for infringement of any United States patent. If notified promptly (within 30 days of notice to Buyer) in writing and given authority, information and assistance, Seller at its expense shall defend, or may settle, any suit or proceeding against Buyer so far as based on a claimed infringement which breaches this warranty. In case any such Equipment, or any part thereof, is in such suit held to constitute such an infringement and if the use of said Equipment or part is enjoined, Seller shall, at its expense and option, either procure for Buyer the right to continue using said Equipment or part, or replace same with any functionally equivalent, non-infringing equipment, or modify same so it becomes non-infringing, or remove said Equipment and refund the purchase price (less reasonable depreciation for use and any transportation costs separately paid by Buyer). The foregoing states the entire liability of Seller for patent infringement by said Equipment or any part thereof, and is subject to the limitations of liability set forth in the article entitled "Limitation of Liability".

B. The preceding paragraph shall not apply to any Equipment or part manufactured to Buyer's design, or to the use of any Equipment or part furnished hereunder in conjunction with any other equipment, in a combination not furnished by Seller as a part of this transaction. As to any such Equipment, part, use or combination, Seller assumes no liability whatsoever for patent infringement.

5. COVERAGE, INTERFERENCE, AND THIRD-PARTY FACILITIES.

Representations concerning the distance at which usable radio signals will be transmitted and received by the Equipment supplied hereunder shall not be binding upon the Seller unless reduced to a writing signed by an official of Seller in Lynchburg, Virginia and made a part of this instrument. Radio systems are subject to degradation of service from natural phenomena and other causes beyond the reasonable control of the Seller such as motor ignition and other electrical noises, and interference from other users assigned to the same or adjacent frequencies. The Seller cannot be responsible for interference or disruption of service caused by operation of other radio systems or by natural phenomena or by motor ignition or other

interference over which there is no reasonable control. Such interference and noise can be minimized by addition (at Buyer's expense) of corrective devices adapted for particular locations and installations. Seller will make recommendations as to the use of such devices; however, total freedom from noise and interference cannot be guaranteed. In the event Buyer utilizes facilities or services supplied by others such as Common Carrier Services or shared services, Seller shall have no responsibility for the availability or adequacy of any such facilities or services.

6. DELAYS.

Seller shall not be liable for delays in delivery or performance or for failure to manufacture or deliver or perform due to (i) causes beyond its reasonable control, or (ii) acts of God, acts of Buyer, acts of civil or military authority, governmental priorities, strikes or other labor disturbances, floods, epidemics, war, riot, delays in transportation or car shortages, or (iii) inability on account of causes beyond the reasonable control of Seller or its suppliers to obtain necessary materials, components, services, or facilities. In the event of any such delay, the date of delivery or of performance shall be extended for a period equal to the time lost by reason of the delay.

7. DELIVERY, ACCEPTANCE, TITLE, AND RISK OF LOSS.

Services shall be accepted upon completion by Seller and reasonable inspection of services by Buyer, if applicable. Shipping dates are approximate and are based upon prompt receipt of all necessary information. Delivery will be made F.O.B. destination to Buyer. Equipment shall be accepted by Buyer upon delivery to Buyer or approved Buyer storage location. Partial deliveries are allowed. Title and all risk of loss or damages for Equipment shall pass to Buyer upon delivery to Buyer or approved Buyer storage location.

8. PRICE, TERMS OF PAYMENT, and LATE CHARGES.

The total selling price of the Equipment and services shall be $805,530.93, which is further described in the Exhibit A.2 section of the SOW. Equipment shall be invoiced when delivered, and payment is due 30 days from the date of each invoice. Seller shall provide monthly invoices for services completed, and payment shall be due 30 days from the date of each invoice. If manufacture or shipment is delayed by the Buyer, payment, based on the contract price and the percentage of completion, shall become immediately due. Equipment held for the Buyer shall be at its risk and expense. All amounts past due over thirty (30) days shall accrue interest from their due date at the rate of one and one-half percent (1-1/2%) per month (or such lesser rate as may be the maximum permissible rate under applicable law). If after default, this contract is placed with an attorney for collection, Buyer agrees to pay reasonable attorney's fees

9. TAXES.

In addition to any price specified herein, and excepting taxes imposed by any state or local jurisdiction outside of Oregon, Buyer shall pay the gross amount of any present or future sales, use, excise, value-added, or other similar tax applicable to the price, sale of any

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products or services furnished hereunder or to their use by Seller or Buyer, or Buyer shall furnish Seller with a tax-exemption certificate acceptable to the taxing authorities.

10. SOFTWARE LICENSE.

Buyer is granted hereunder a perpetual, nonexclusive, non-transferable, fully paid license subject to the terms and conditions of the Software License Agreement, which is attached hereto and incorporated herein as **Exhibit B**, which gives the Buyer the right to use the software embedded in the products manufactured by the Seller, and any modifications thereof, only for Buyer's own use. The license granted hereunder may not be assigned or transferred without the prior written consent of the Seller.

11. Insurance

In order to protect itself and Buyer, its officers, boards, commissions, agencies, employees and representatives under the indemnity and other provisions of this contract, Seller shall obtain and at all times during the term of this contract keep in full force and effect comprehensive general liability and auto liability insurance policies issued by a company or companies authorized to do business in the State of Oregon and licensed by the Insurance Department, with liability coverage provided for therein in the amounts of at least $2,000,000.00 CSL (Combined Single Limits). Coverage afforded shall apply as primary. Within ten (10) days after execution of this Agreement, Seller shall furnish Buyer with a Certificate of Insurance listing Buyer as an additional insured. Seller shall maintain coverage for the duration of this contract. Seller shall furnish Buyer, annually on the policy renewal date, a Certificate of Insurance as evidence of coverage. It is further agreed that Seller shall furnish the Buyer with a 30-day notice of cancellation or renewal. Seller shall furnish evidence of adequate Worker's Compensation Insurance.

12. Termination.

A. In the event of a material breach of this Agreement by Seller which shall continue for one hundred twenty (120) or more days after written notice of such breach (including a reasonably detailed statement of the nature of such breach) shall have been given to Seller by Buyer, Buyer shall be entitled to avail itself cumulatively of any and all remedies available at law or in equity (provided such remedies are not otherwise limited under the terms of this Agreement) and either: (i) suspend performance of its payment obligations under the Agreement for as long as the breach continues uncorrected; or (ii) terminate this Agreement by written notice to Seller if the breach remains uncorrected. The following shall constitute material breaches of this Agreement: (i) violation by Seller of any State, Federal or local law, or failure by Seller to comply with any applicable States and Federal service standards, as expressed by applicable statutes, rules and regulations, (ii) failure by Seller to carry applicable licenses or certifications as required by law, (iii) failure of Seller to comply with reporting requirements contained herein, or (iv) inability of Seller to perform the Work provided for herein.

B. In the event of: (i) any failure by Buyer for sixty (60) or more days to make any payment when due, or (ii) any other material breach of this Agreement by Buyer which shall continue for one hundred twenty (120) or more days after written notice of such breach (including a reasonably detailed statement of the nature of such breach) shall have been given to Buyer by Seller, Seller shall be entitled to avail itself cumulatively of any and all remedies available at law or in equity (provided such remedies are not otherwise limited under the terms of this Agreement) and either: (i) suspend performance of its obligations under this Agreement for as long as the breach remains uncorrected; or (ii) terminate this Agreement by written notice to Buyer if the breach remains uncorrected.

C. In the event of a termination under this Agreement as provided herein, all Services performed and finished and unfinished Equipment and documentation deliverables produced or made by Seller for Buyer, up to and including the date of termination, shall become the property of Buyer and Seller shall be entitled to receive full price accrued up to the point of termination, for any such Services performed and finished and unfinished Equipment and documentation deliverables.

13. GENERAL.

A. Buyer is solely responsible for obtaining and complying with any necessary permits and licenses from the Federal Communications Commission, or any other Federal, State or local governmental authority, related to the purchase, installation, erection and operation of any Equipment purchased hereunder.

B. The provisions of these conditions of sale are for the benefit of the parties hereto and not for any other person. The delegation or assignment by Buyer of any or all of its duties or rights hereunder without Seller's prior written consent shall be void.

C. Seller will comply with applicable Federal, State and local laws and regulations as of the date of Seller's acceptance of Buyer's Order which relate to equal employment opportunity (including applicable provisions of Executive Order 11246, as amended), workmen's compensation, and the manufacture in Seller's facilities of the Equipment delivered hereunder (including applicable provisions of the Fair Labor Standards Act of 1938, as amended). The price and, if necessary, delivery of any Equipment will be equitably adjusted to compensate Seller for the cost of compliance with laws or regulations except as specified above.

D. The invalidity, in whole or in part, of any Article or paragraph hereof shall not affect the validity of the remainder of such Article or paragraph.

E. The validity, performance and all matters relating to the interpretation and effect of these conditions of sale and any amendment hereto shall be governed by the laws of the State of Oregon.

F. These conditions of sale constitute the entire understanding between the Buyer and Seller concerning the subject hereof, and any representation, promise, understanding, proposal, agreement, warranty, course of dealing or trade usage not expressly contained or referenced herein shall not be

binding on Seller. No modification, amendment, rescission, waiver or other change of these terms and conditions shall be binding on Seller unless specifically agreed upon in writing by Seller. ANY ADDITIONAL OR CONFLICTING TERMS AND CONDITIONS PROPOSED BY ONE PARTY MUST BE SPECIFICALLY AGREED UPON BY THE OTHER PARTY IN WRITING OTHERWISE THE ADDITIONAL OR CONFLICTING TERMS AND CONDITIONS PROPOSED BY ONE PARTY ARE DEEMED REJECTED BY THE OTHER PARTY. SELLER DOES NOT ASSUME ANY OBLIGATIONS OR LIABILITIES IN CONNECTION WITH THE SALE OF ITS EQUIPMENT OTHER THAN THOSE EXPRESSLY STATED IN THIS INSTRUMENT, AND DOES NOT AUTHORIZE ANY PERSON (INCLUDING SELLER'S MANUFACTURER'S REPRESENTATIVES AND SALES AGENTS) TO ASSUME FOR SELLER ANY OTHER OBLIGATIONS OR LIABILITIES.

[*Signatures Next Page*]

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IN WITNESS WHEREOF, Buyer and Seller have executed this Contract.

BUYER

Deschutes County 9-1-1 Service District
20355 Poe Sholes Road, #300
Bend, OR 97708

By:_____

Name: _____

Title:_____

Date:_____

SELLER

L3Harris Technologies, Inc.
221 Jefferson Ridge Parkway
Lynchburg, Virginia 24501

By:_____

Name: _____

Title:_____

Date:_____

EXHIBIT A
STATEMENT OF WORK
Seller's Proposal Dated November 30, 2023

L3HARRIS™

EXHIBIT B
SOFTWARE LICENSE AGREEMENT

This License Agreement ("Agreement") is made on November 30th, 2023 (the "Effective Date") between L3Harris Technologies, Inc., a Delaware Corporation, through its Communication Systems Segment, ("LICENSOR" or "L3Harris") with offices at 221 Jefferson Ridge Parkway, Lynchburg, VA 24501 and DESCHUTES COUNTY 9-1-1 SERVICE DISTRICT ("LICENSEE"). LICENSOR is the owner of certain wireless communications software programs and LICENSEE desires to obtain a license from LICENSOR to use such wireless communications programs.

1.0 Definitions.

1.1 "Designated Systems": Means the L3Harris system(s), products, and Designated Terminals purchased by Buyer and identified in the Primary Agreement for which the Licensed Programs and documentation are intended to be used.

1.2 "Designated Terminals": Means the LICENSOR'S Terminals purchased by LICENSEE.

1.3 "Licensed Programs": The term Licensed Programs shall mean the wireless communications computer programs in software or firmware supplied under this Agreement by LICENSOR in binary object code format to the LICENSEE (stand alone or in conjunction with the purchase of a LICENSOR wireless communications system.) Licensed Programs shall also include all other material related to the Licensed Programs supplied by LICENSOR to LICENSEE hereunder, and which may be in machine readable or printed form, including but not limited to user documentation and/or manuals.

1.4 "Open Source Software": Means software with either freely obtainable source code, license for modification, or permission for free distribution.

1.5 "Open Source Software License": The terms or conditions under which the Open Source Software is licensed.

1.6 "Primary Agreement": The agreement to which this exhibit is attached.

1.7 "Third Party Software Products": Shall mean programs that are not developed by LICENSOR which are licensed/purchased by LICENSOR for inclusion in its products.

2.0 License Grant for Licensed Programs.

2.1 Subject to the terms of this License Agreement and the performance by Licensee of its obligations hereunder, LICENSOR hereby grants to Licensee, and Licensee hereby accepts from LICENSOR, (a) a personal, non-transferable, non-exclusive, perpetual, limited license to use the Licensed Programs in object code format only and (b) install and execute such Licensed Programs on Licensee's equipment and (c) which are to be used for internal business purposes only. All licensed programs under this License Agreement shall only be used in conjunction with the Designated System. This license does not transfer any right, title, or interest in the Licensed Programs. The license granted authorizes Licensee to use the Licensed Programs in object code format and does not grant any rights to source code.

2.2 LICENSEE will not reproduce, modify, or make derivative works of the Licensed Programs, except that LICENSEE may make one archival, and one inactive backup, copy of the Licensed Programs. In addition, LICENSEE, its agents, consultants and/or its subcontractors will not attempt to reverse engineer, decompile, or reverse-compile any software contained in the Licensed Programs and any attempt to do so shall be a material breach of this License Agreement. With respect to the Licensed Programs, LICENSEE will not alter, deface, discard, or erase any media, documentation, or LICENSOR or Third Party Licensor's trademarks or proprietary rights notices.

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2.3   Third Party Software Products may be subject to additional license terms, which, if applicable, are set out in Product Specific License Terms delivered with each product. Additional To the extent applicable, LICENSEE shall comply with any additional Third Party Software Product license terms.

2.4   If the Software licensed under this License Agreement contains or is derived from Open Source Software, the terms and conditions governing the use of such Open Source Software are in the Open Source Software Licenses of the copyright owner and not this License Agreement and, to the extent applicable, and provided LICENSOR timely provide LICENSEE with a full copy of all such Open Source Software License(s), LICENSEE will comply with the Open Source Software License terms. If there is a conflict between the terms and conditions of this License Agreement and the terms and conditions of the Open Source Software Licenses governing Licensee's use of the Open Source Software, the terms and conditions of the license grant of the applicable Open Source Software Licenses will take precedence over the license grants in this License Agreement. If requested by Licensee, L3Harris will use commercially reasonable efforts to: (i) determine whether any Open Source Software is provided under this License Agreement; (ii) identify the Open Source Software and provide Licensee a copy of the applicable Open Source Software License (or specify where that license may be found).

3.0   Protection and Security of Licensed Programs.

LICENSEE acknowledges and agrees that the Licensed Programs and any materials and/or documentation related thereto, and any portion thereof, supplied by LICENSOR hereunder are proprietary and confidential to LICENSOR or applicable third party licensors and are a valuable commercial asset of LICENSOR or their third party owners. LICENSEE also acknowledges and agrees that LICENSOR and/or the third party licensors have and shall retain all proprietary rights in their respective portions of the Licensed Programs and any materials and/or documentation related thereto. LICENSEE (i) shall respect such proprietary rights, (ii) shall protect LICENSOR and any third party licensor's proprietary rights at least to the extent that it protects its own proprietary information, or such (iii) shall not use the Licensed Programs nor any materials or documentation related thereto except for the purposes for which they are being made available as set forth in this Agreement and (iv) shall not reproduce, print, disclose, or otherwise make said Licensed Programs or materials and/or documentation related thereto available to any third party, in whole or in part, in whatever form, except as permitted in the terms of this Agreement.

4.0   Warranty

Seller warrants, for the greater of a period of one year or, if a longer warranty period for the product containing the Licensed Program is set forth in a Primary Agreement, the longer warranty period shall apply commencing with the date of Licensee's acceptance of their Designated System, that any Licensed Program furnished to Licensee under this License Agreement shall be capable of successfully operating on the Designated System in accordance with the logic defined in the operator's manuals when the system is supplied with correct input data. If, on the basis of evidence submitted to LICENSOR within the term of this warranty, it is shown that any Licensed Program does not meet this warranty, LICENSOR will, at its option, either correct the defect or error in the Licensed Program, free of charge, or make available to Licensee a substitute program. The foregoing warranty is exclusive and in lieu of all other warranties whether written, oral, implied or statutory. **NO IMPLIED OR STATUTORY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT, SHALL APPLY, ALL OF WHICH ARE EXPRESSLY DISCLAIMED BY LICENSOR.**

Licensed Programs which have been developed or are owned by a third party licensor and which are sublicensed by LICENSOR to LICENSEE hereunder shall be warranted to LICENSEE only to the extent that the licensor of such sublicensed programs warrants such sublicensed programs to LICENSOR.

In the event that the Licensed Programs do not conform to the representation above, LICENSEE's sole remedy and LICENSOR's sole and exclusive liability shall be to replace such Licensed Programs with the then current released version of such Licensed Programs.

5.0   Limitation of Liability.

5.1   THE LIMITATION OF LIABILITY PROVISION IN THE PRIMARY AGREEMENT SHALL GOVERN THIS LICENSE AGREEMENT AND SECTION 5.2 SHALL NOT APPLY. IF THERE IS NO LIMITATION OF LIABILITY PROVISION IN THE PRIMARY AGREEMENT, SECTION 5.2 SHALL APPLY.

5.2   IN NO EVENT WILL LICENSOR AND/OR ANY THIRD PARTY LICENSOR(S) BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY DAMAGES RESULTING FROM LOSS OF USE, LOSS OF DATA, LOSS OF PROFITS OR LOSS OF BUSINESS, WHETHER BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER THEORY OR FORM OF ACTION, EVEN IF LICENSOR AND/OR ITS THIRD PARTY LICENSOR(S) HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. LICENSOR'S AND THIRD PARTY LICENSORS', LIABILITY IN CONTRACT, TORT OR OTHERWISE ARISING OUT OF OR IN CONNECTION WITH THIS LICENSE AGREEMENT OR THE USE OF THE LICENSED PROGRAMS SHALL NOT EXCEED THE TOTAL COMPENSATION PAID TO LICENSOR BY LICENSEE FOR THE PRODUCTS CONTAINING THE LICENSED PROGRAMS.

6.0   Term and Termination.

6.1   LICENSOR reserves the right, in addition to any other remedies it may retain in this License Agreement or may be entitled to in law or equity (including immediate injunctive relief and repossession of all non-embedded Licensed Programs and documentation), to terminate this License Agreement at any time prior to the expiration of any Term in the event LICENSEE breaches any material term or condition or fails to perform or observe any obligations or covenants of this License Agreement and such failure and/or breach is not remedied within sixty(60) days of written notice from LICENSOR.

6.2   Within thirty (30) days after termination or expiration of this License Agreement, LICENSEE will return to LICENSOR all confidential material including but not limited to all copies, partial copies, and/or modified copies (if any) of Licensed Programs and any equipment owned by LICENSOR in LICENSEE's possession.

7.0   Assignment/Transfer.

This License Agreement, the licenses granted hereunder and the Licensed Programs provided to LICENSEE under this License Agreement may not be assigned, sub-licensed, or otherwise transferred by LICENSEE to any third party without LICENSOR's prior written consent which was not to be unreasonably withheld, except that this license may be assigned if the Products containing the Licensed Programs are transferred but the new owner or user of the Products may only use the Licensed Programs in accordance with terms of this License Agreement. Subject to the foregoing, any assignee hereunder shall be subject to all of the terms, conditions and provisions of this License Agreement. Any attempt by LICENSEE to assign, sub-license, or transfer the Licensed Programs, or any of the rights or duties contained in this Agreement, without LICENSOR's prior written consent shall be void.

8.0   Severability.

If any term or provision of the License Agreement is determined by a court or government agency of competent jurisdiction to be invalid under any applicable statute or rule of law, such provision(s) are, to that extent, deemed omitted, but this License Agreement and the remainder of its provision shall otherwise remain in full force and effect.

9.0   Waiver.

No waiver will be implied from conduct or failure to enforce rights. No waiver will be effective unless in writing signed on behalf of the party against whom the waiver is asserted.

10.0   Compliance with Laws.

L3HARRIS™

Licensee acknowledges that the Licensed Programs are subject to the laws and regulations of the United States and Licensee will comply with all applicable laws and regulations, including export laws and regulations of the United States. Licensee will not, without the prior authorization of L3Harris and the appropriate governmental authority of the United States, in any form export or re-export, sell or resell, ship or reship, or divert, through direct or indirect means, any item or technical data or direct or indirect products sold or otherwise furnished to any person within any territory for which the United States Government or any of its agencies at the time of the action, requires an export license or other governmental approval. Violation of this provision is a material breach of this Agreement.

11.0   Governing Law.

This License Agreement will be governed by the laws of the Unites States to extent that they apply and otherwise to the laws of the State of New York. The terms of the U.N. Convention on Contracts for the International Sale of Goods do not apply. The parties expressly agree that the Uniform Computer Information Transactions Act ("UCITA") applicable in any jurisdiction shall not apply to this Agreement.

12.0   U.S. Government.

If Licensee is the U.S. Government, the Licensed Programs and documentation qualify as "commercial items," as that term is defined at Federal Acquisition Regulation ("FAR") (48 C.F.R.) 2.101, consisting of "commercial computer software" and "commercial computer software documentation" as such terms are used in FAR 12.212. Consistent with FAR 12.212, and notwithstanding any other FAR or other contractual clause to the contrary in any agreement into which the Agreement may be incorporated, Customer may provide to Government end user or, if the Agreement is direct, Government end user will acquire, the software and documentation with only those rights set forth in the Agreement. Use of either the software or documentation or both constitutes agreement by the Government that the software and documentation are "commercial computer software" and "commercial computer software documentation," and constitutes acceptance of the rights and restrictions herein.

13.0   Agreement.

This License Agreement may be part of a Primary Agreement between LICENSOR and LICENSEE for the purchased products by LICENSEE from LICENSOR. The Primary Agreement and this License Agreement contain the full understanding of the parties with respect to the subject matter hereof and which supersede all prior understandings and writings relating thereto and which shall become binding on the Effective Date of this License Agreement. No waiver, consent, modification, amendment, or change to the terms of this License Agreement shall be binding unless agreed to in a writing signed by LICENSEE and LICENSOR. If there is any conflict between the terms of the Primary Agreement and this License Agreement as to the Licensed Programs, the terms of this License Agreement will prevail.

14.0   Notices.

Notices shall be provided as set forth in the Primary Agreement. In the event there is no notice provision in the Primary Agreement, notices and other communications between the parties shall be transmitted in writing by certified mail or nationally recognized overnight courier service.

15.0   Survival.

Sections 2.2, 3, 5, 6, 8, 9, 11, and 13 of this License Agreement shall survive termination of this License Agreement.
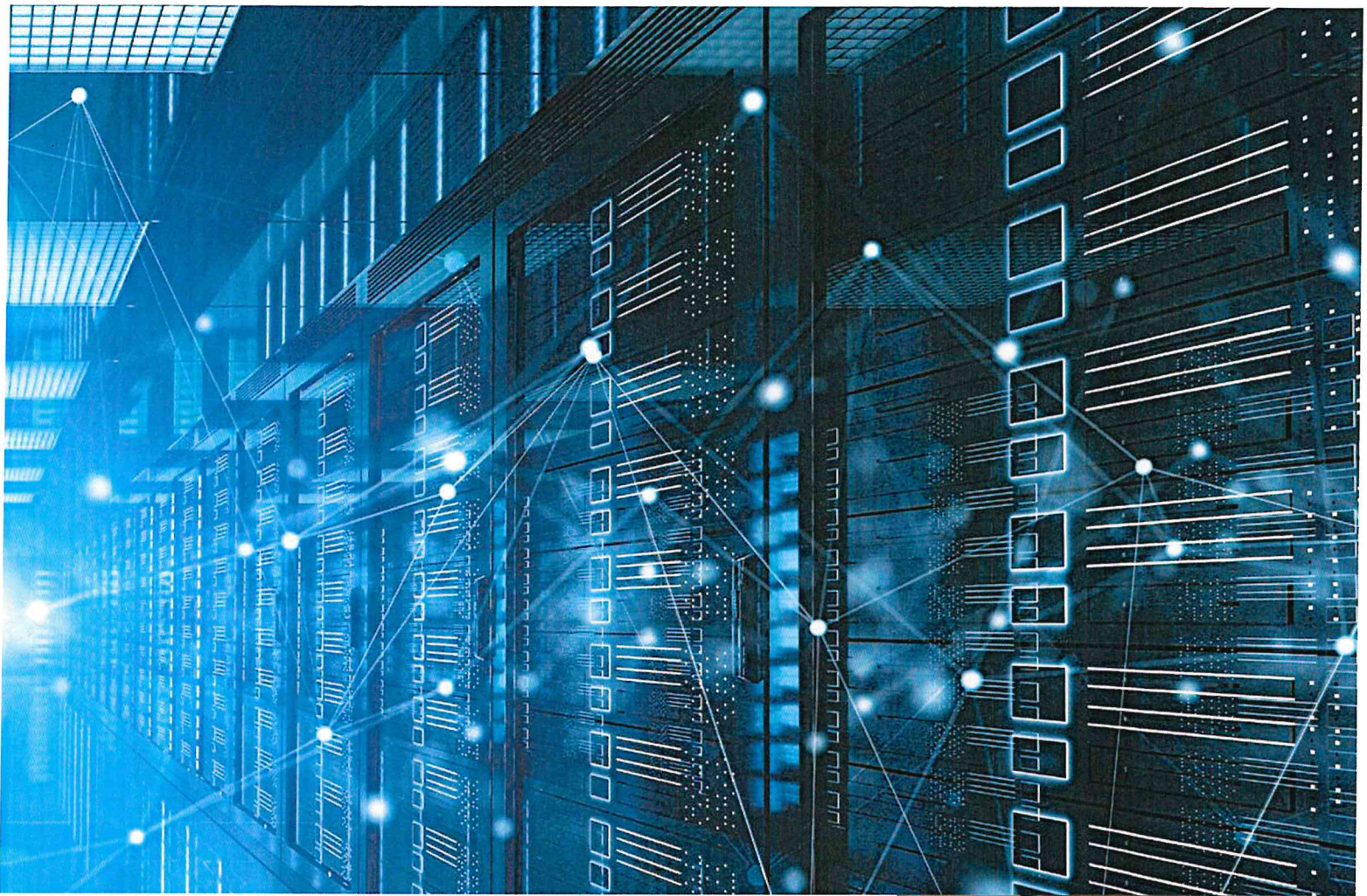
[End of Document]

L3HARRIS™
FAST. FORWARD.

VIDA® NETWORK SOLUTIONS

Unified End-to-End Connectivity

VIDA NETWORK SOLUTIONS

We understand the importance of your mission and have built a network that delivers critical communications to the right resources whenever and wherever needed. Designed for those on the front lines, the L3Harris VIDA (Voice, Interoperability, Data and Access) network solutions are ready to handle the diverse needs of any environment. **We're ALL-IN.**

READY AND RELIABLE

The industry's most reliable P25 Land Mobile Radio system delivers voice and data over LMR, LTE and Wi-Fi® with leading High-Availability failover solutions, so you stay connected when it matters most.

BUILT FOR INTEROPERABILITY

Open standards-based architecture and flexible solutions offer greater choice of carriers, devices and applications.

TRUSTED SECURITY

A comprehensive portfolio of cybersecurity services engineered to evolve with emerging security threats.

POWERFUL NETWORK COVERAGE

Unified end-to-end connectivity is the foundation of our VIDA network. This means solid communications anytime, anywhere, no matter how you choose to communicate.
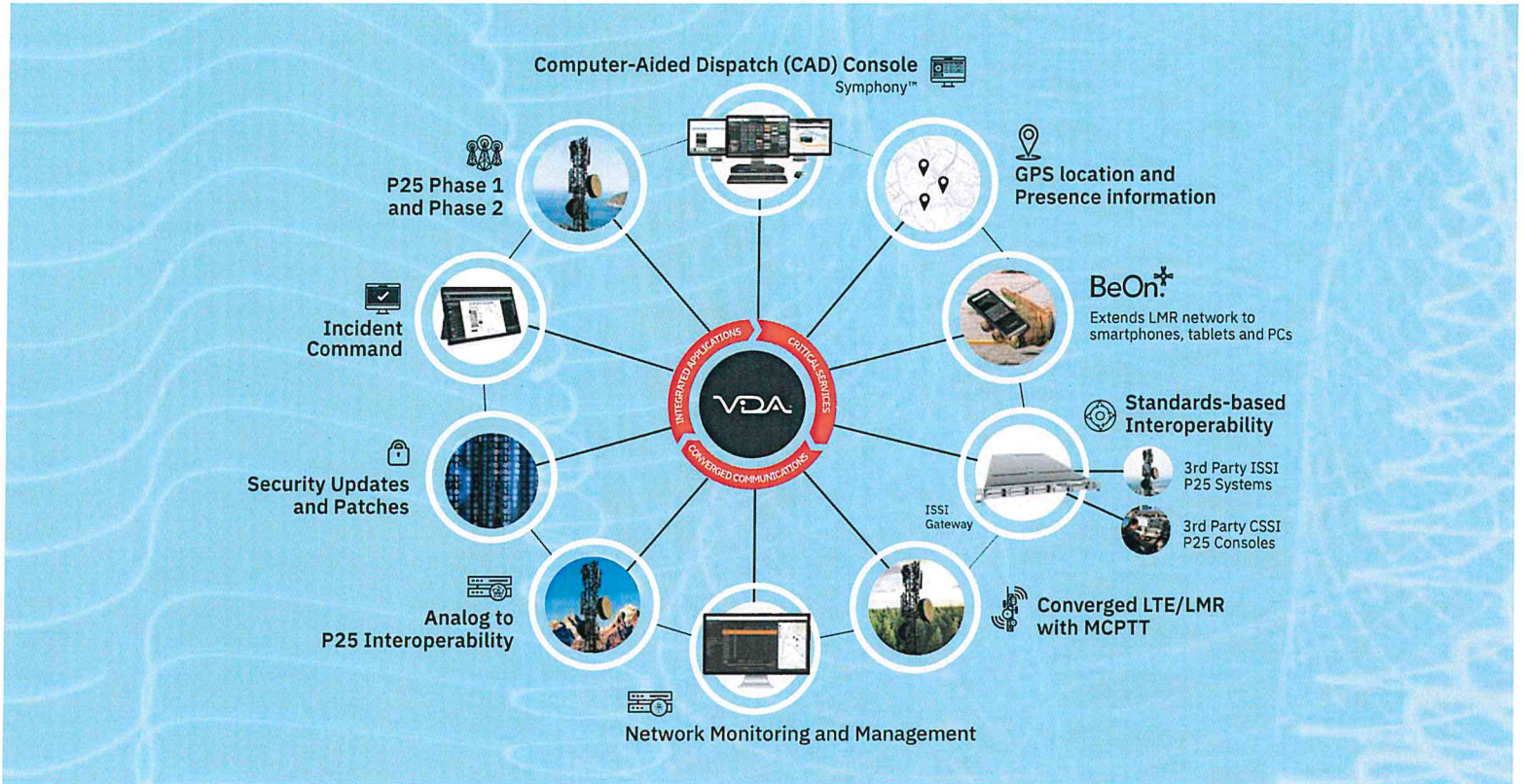
UNRIVALED NETWORK CAPABILITIES

STAY CONNECTED

Leverage LMR, LTE, and Wi-Fi to enhance your communication footprint, or turn your smartphone, tablet, or PC into an encrypted push-to-talk (PTT) communications device using our BeOn® solution.

L3Harris BeOn Mobile Application extends your LMR network to approved devices delivering secure, PTT communications to teams within or beyond your regional network.

FUTURE READY

The fully virtualized core keeps your system future ready and supports painless updates and system expansion while maintaining your system's compatibility with future technologies. VIDA's flexible design supports adding applications to your system during installation or later, as needs change.

OPERATIONAL AWARENESS

Real-time tracking of personnel, vehicles and other mobile assets delivers a clear view of your resources. Our situational awareness solutions help you drive faster response times, increasing efficiency and enhancing the safety of everyone.

GREATER CHOICE

We partner with the best in the industry to give you more control of your system with more technology options to fit your unique needs.

ROBUST, HIGH AVAILABILITY AND REDUNDANCY

Reliable communications is a daily lifeline, more so during emergency operations. VIDA High Availability (HA) technologies reduce downtime by keeping on-scene workers connected to dispatch.

APPLICATION HA
(VIDA Unite and Connect)
A virtual backup instance for applications on the primary server

Internet — Firewall — Wide-Area Router — Regional Firewall (Optional IA) — VIDA
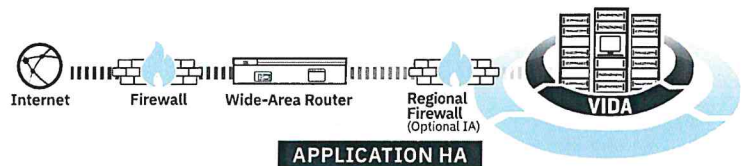
APPLICATION HA

VOICE HA
(VIDA Essentials only)
Redundant real-time voice applications on separate servers
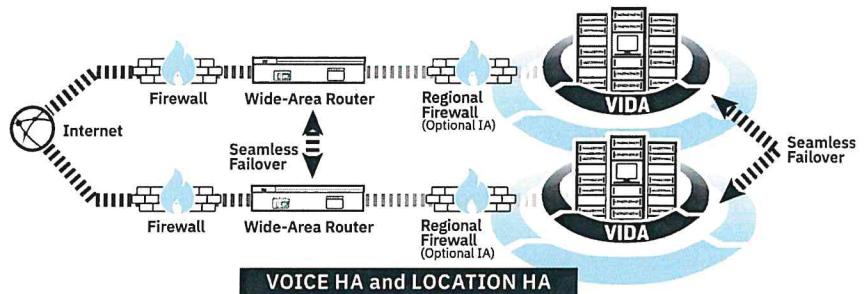
LOCATION HA
(VIDA Premier, Unite and Connect)
Separate primary and secondary servers that can be geographically separated

Internet — Firewall — Wide-Area Router — Regional Firewall (Optional IA) — VIDA

Seamless Failover

Seamless Failover

VOICE HA and LOCATION HA

LOCATION DIVERSITY HA
(VIDA Premier only)
Hardware and application redundancy in both primary and secondary locations

Internet — Firewall — Wide-Area Router — Regional Firewall (Optional IA) — VIDA

Seamless Failover

Seamless Failover

LOCATION DIVERSITY HA
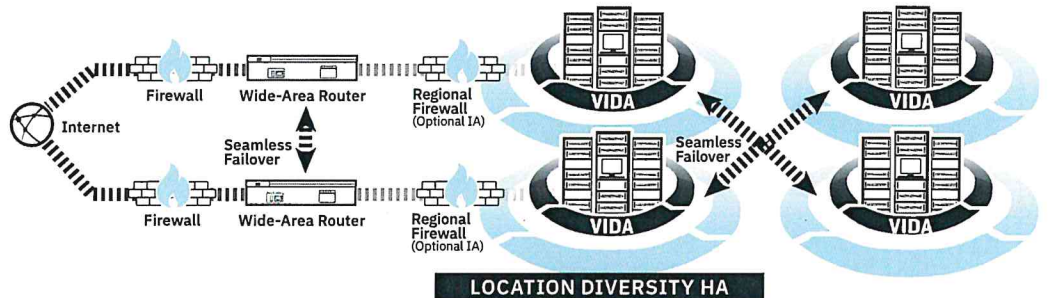
FLORIDA STATEWIDE LAW ENFORCEMENT RADIO SYSTEM (SLERS)

Over the last two decades, the State of Florida and L3Harris Technologies have worked together to ensure the effectiveness of communications, not only for First Responders, but also the citizens they serve.

In the face of 15 hurricanes, 10 named tropical storms and numerous large-venue events, the system has maintained a 99.96 percent uptime rate in some of the region's most-treacherous conditions. "We have a proven track record showing we can provide the State of Florida's emergency personnel uninterrupted connectivity during critical operations," Steve Williams, L3Harris SLERS Director, said. "The technology we can provide into SLERS would be light years ahead of other companies. When you talk about resiliency and redundancy, our technological investments are focused on assuring communications for the network, so you can lose a control site and other sites can take over that role. That, in itself, is a solution you need in Florida, given its nature as a hot bed of hurricane targets."

Scan to learn more about the SLERS system
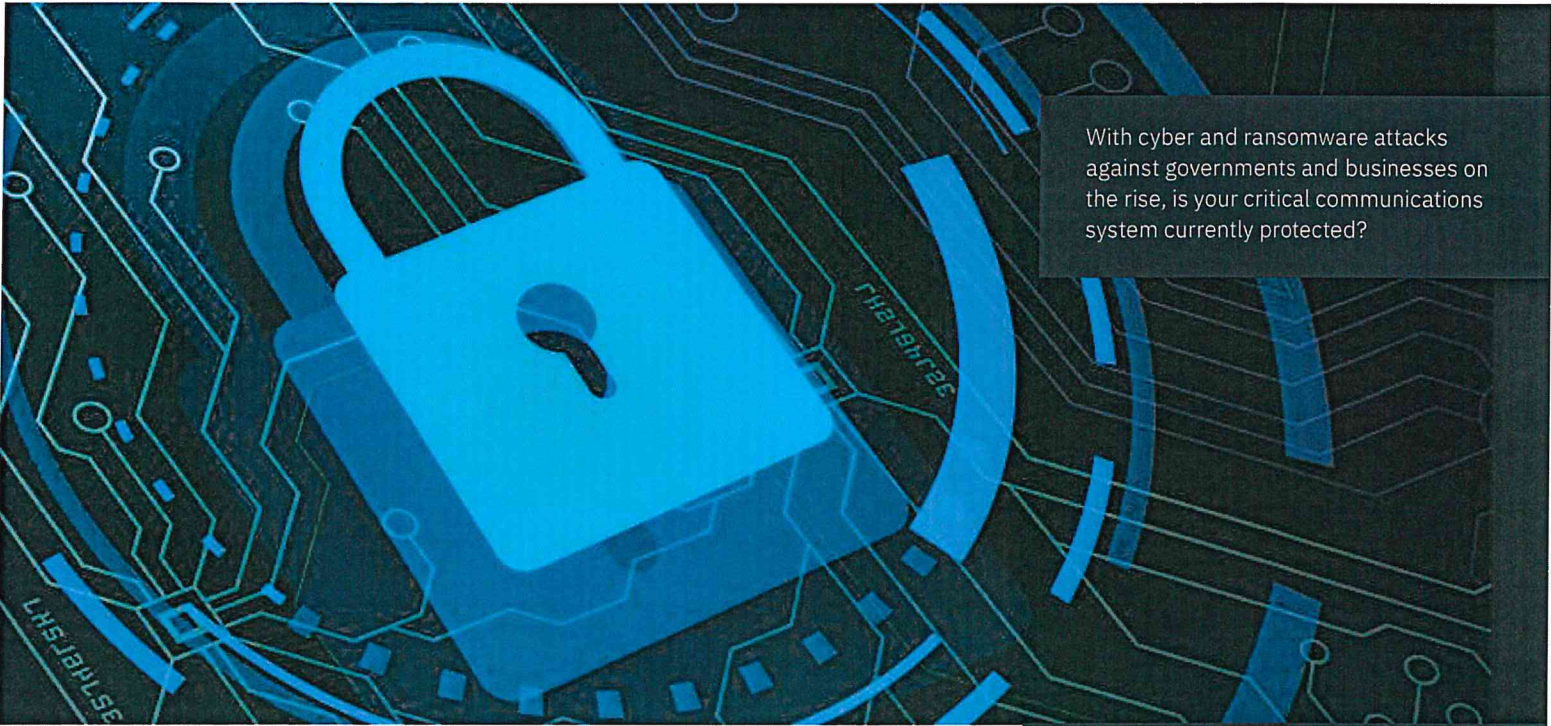
PEACE OF MIND

Protecting mission-critical communications from cyber threats has never been more important. With cybersecurity a fundamental part of system design, our network solutions are engineered to operate so you can rest easy. We address evolving and ongoing challenges with a comprehensive portfolio of security products and services for VIDA, including access control, boundary control & network segmentation, host & network intrusion detection, system auditing and accounting, communication protection, session auditing, scanning and disaster recovery. These cyber applications, along with services that provide scheduled policy, configuration, and patch updates to your system and customer processes and training provide a layered defense to help protect against the next attack.

UNCOMPROMISING DEFENSE

VIDA's cybersecurity solutions for wireless communication systems are designed around U.S. federal and industry standards, and best practices including NIST 800-53, DHS-4300, CNSS 1253 and STIG compliance.

CONSTANT VIGILANCE

Ongoing system evaluations by cybersecurity engineers identify vulnerabilities for quick response and action. We follow industry best practices for advanced security enhancements.

ENCRYPTED VOICE AND DATA

End-to-end encryption from the moment you push-to-talk to when your message is received.
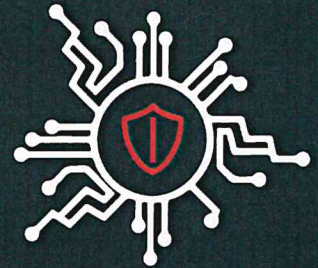
END-TO-END PROTECTION

Our Cybersecurity Solutions deliver the latest technologies, maintenance and processes to keep organizations effective and vigilant against cyber threats.

> Probing and scanning for network vulnerabilities
> Sniffing and eavesdropping
> Malicious coding and malware
> Denial of service
> Spoofing
> Password cracking
> Man-in-the-middle

ADVANCED NETWORK MANAGEMENT SOLUTIONS

VIDA Network Solutions consolidate the management of your network into a single, unified platform. A convenient approach that allows you to manage your network and devices with ease while reducing operational costs and total cost of ownership.

ACTIVE MONITORING

Monitor your network with ease using our real-time network management and monitoring tools. Receive information and alerts regarding the current state of the network, applications and hardware through simplified web browser interfaces. Understand and visualize who is operating on your network and what data is being passed.
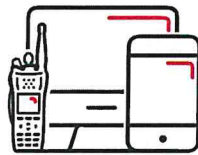
DEVICE MANAGEMENT

Remotely program LTE or Wi-Fi enabled devices on your network using Device Management. This simple-to-use, cloud-based application cuts programming time in half by reducing field technician time, resulting in an increased Total Cost of Ownership (TCO) savings.

MANAGED ENCRYPTION

Centralized management of your voice encryption keys for all supported network devices including subscriber devices. This allows you to seamlessly generate and distributes encryption keys to your devices via Over-The-Air-Rekeying (OTAR).

24/7 NETWORK MONITORING

Allow us to help maintain your network through 24/7 remote monitoring by dedicated L3Harris technicians who are trained to quickly resolve issues and minimize downtime.
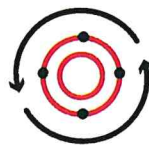
LIFECYCLE MANAGEMENT

Comprehensive, long-term infrastructure lifecycle management of system hardware and software to keep your network updated, running at peak performance and to protect against security threats.
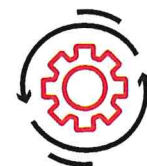
PREVENTIVE MAINTENANCE

Give yourself the tools you need to ensure that your system functions when it needs to with support from L3Harris technical experts. This includes regularly scheduled tests, checks and routine alignment of your equipment to optimize your system's performance and ensure it meets factory and FCC specifications.

FLEXIBLE BY DESIGN

The VIDA platform is offered in various configurations so you can choose which option best fits your current demands and future growth.

VIDA PREMIER

LARGE-SCALE DEPLOYMENTS

Designed for large state or country-wide communications systems in single or multi-regional configurations. Premier employs Virtual Machine (VM) technology to streamline the addition of public safety and utility applications into its voice, system management and administration services.

VIDA UNITE

MEDIUM-SIZED DEPLOYMENTS

Supports larger city or county-wide agency communications. Value-engineered to retain critical features and system redundancy. Offers the same voice, system management and administration services as Premier with the same choice of applications.

VIDA ESSENTIALS

SMALLER DEPLOYMENTS

Cost-effective and ideal for smaller county, town or rural utility needs. Essentials features LTE and robust cybersecurity options. Also includes Voice High Availability (HA) for real-time applications and Symphony™/ BeOn only configurations.

VIDA CONNECT

EXTEND YOUR COVERAGE

Interfaces with RF sites, consoles and gateways to extend service from larger, regional systems to remote locations and dispatch centers. Add other VIDA systems and any combination of P25 Trunked, Conventional and Simulcast RF sites to a Connect region for outstanding reach.

CONTACT US

Speak with one of our experts about the complexities and challenges you are facing with your critical communications system and a tailored solution to meet your needs.

PSPC_custfocus@L3Harris.com
(800) 368-3277

	Premier	Unite	Essentials	Connect
Designed for	Large wide-area systems (State-wide, Large Investor Owned Utility / Transportation)	Medium-size systems (County-wide or municipal utilities)	Entry-level offering/ smaller systems (Rural public safety, Co-op utilities)	Enables distributed scalable networks
Capacity (Sites)	254	16	9	100
Consoles (Max)	100	20	12	60
Simultaneous talk paths	2400	800	300	1600
Cybersecurity support	Premier Cybersecurity Package	Unite Cybersecurity Package	Essentials Cybersecurity Package	Connect Cybersecurity Package
High Availability for management applications	Location HA or Location Diversity HA	Application HA or Location HA	Voice HA	Location HA (part of Premier Core)
BeOn (Broadband PTT) server	Standard			
Link Layer Authentication	Optional			
High Velocity Data	Optional			
StatusAware™ for Location services	Optional			
P25 Inter-agency interoperability via ISSI/CSSI	Optional			
P25 Conventional Interoperability (DFSI)	Optional			
Infrastructure Managed Services	Optional services including regular patch and cybersecurity updates			

FAST. FORWARD.

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L3HARRIS™
FAST. FORWARD.

BeOn® MOBILE APPLICATION

Public Safety's Most Advanced P25
Push-To-Talk Application

CONNECT EASILY AND AFFORDABLY

Public safety's most advanced P25 Push-To-Talk application

Public safety agencies and utility companies rely on the Land Mobile Radio's Push-To-Talk (PTT) capabilities as a primary means for transmitting voice communications. BeOn is an application that extends the capabilities of your LMR network to smartphones, tablets and PCs—providing PTT communications far beyond the boundaries of regional radio systems, and opening up affordable PTT communications to new user groups.

BeOn keeps you connected to your LMR system anywhere you have a cellular data signal, Wi-Fi® or other data connectivity, and provides a direct connection to the backbone of your LMR system—fully supporting the features of a P25 radio network. This enables BeOn to have the same PTT user experience, fleet management and security experience as the P25 system—simplifying management with only a single system to maintain.


Tablet PC
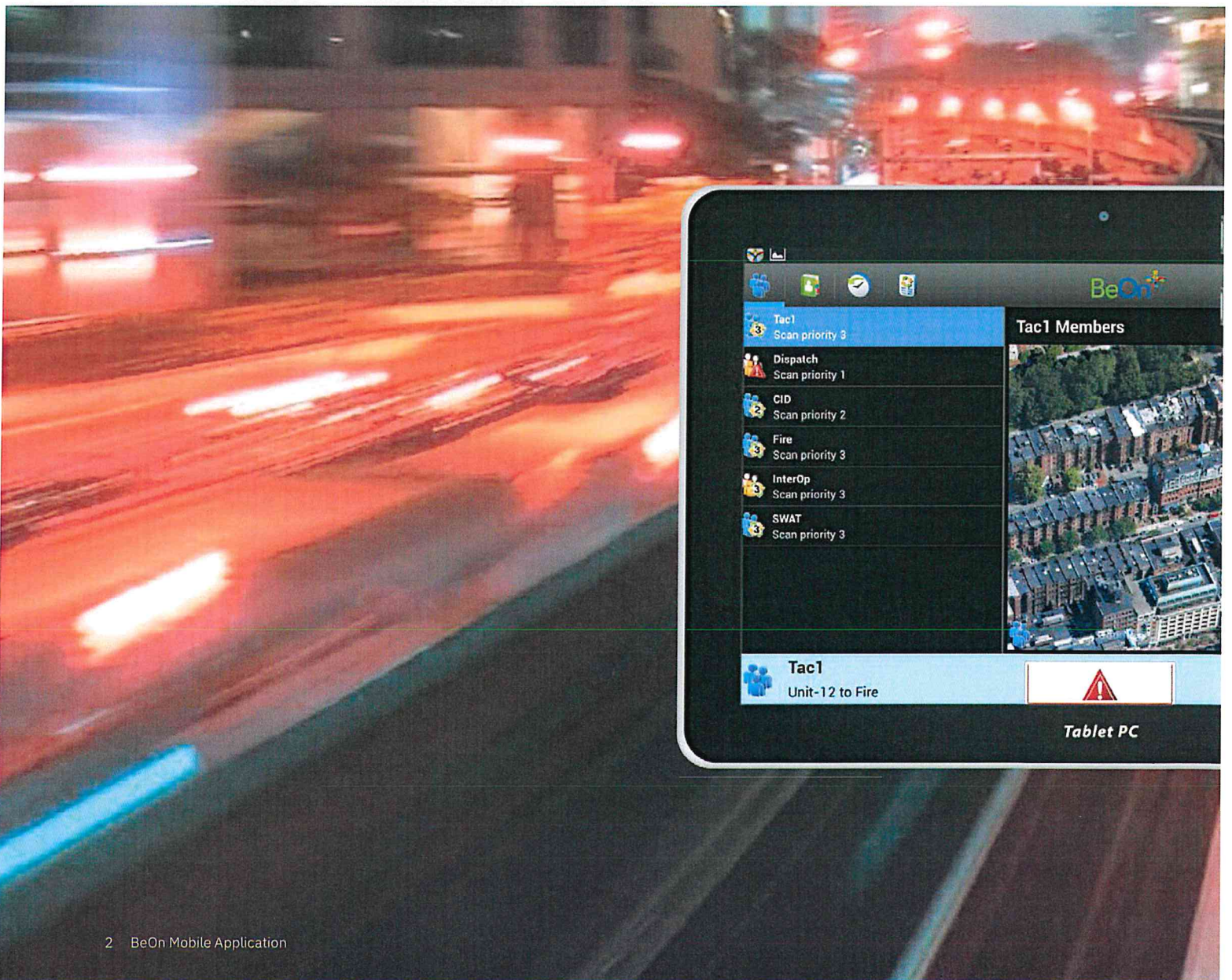
BeOn®

FAST, INTUITIVE ACCESS TO KEY FEATURES

MOST ADVANCED FEATURE SET ON THE MARKET

> Display location of LMR radios
> Full AES end-to-end encryption
> Group voice call
> Individual voice call
> Distress indication
> Announcement group calls
> Instant recall / call logging
> Console / supervisory override
> Talkgroup scanning
> Late call entry
> P25 confirmed call
> Priority / preemptive support
> P25 OTAR key management
> Console patch / simulselect
> Group location
> User presence indication
> Location privacy
> BeOn text messaging
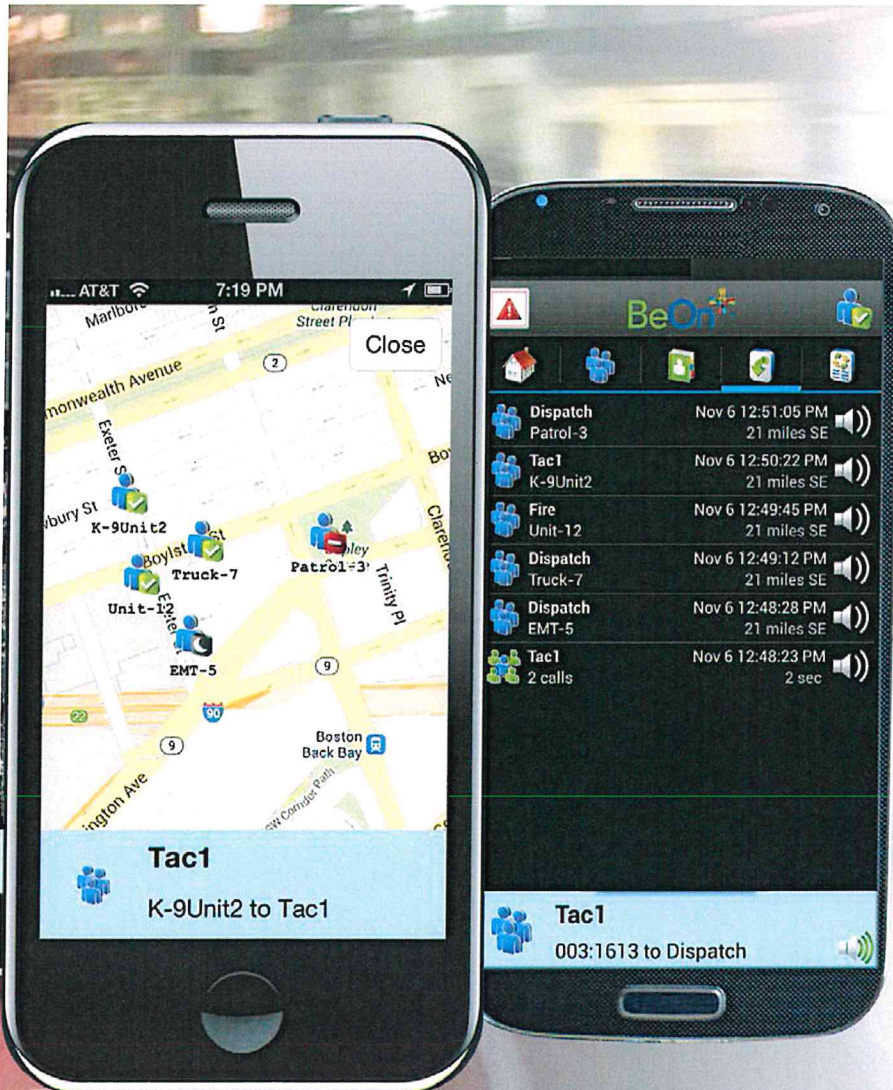
EXTEND LMR COVERAGE
BEYOND REGIONAL BOUNDARIES

BeOn offers an economical path to P25 through
the use of legacy system gateways.

The BeOn application can be an essential enhancement to P25 and legacy network systems.

BeOn allows users to maintain a full set of advanced LMR features on an ordinary smartphone, and will work anywhere in the world where Wi-Fi® or cellular data service is available—regardless of the carrier.

This advanced Push-To-Talk application is supported on iOS™, Android™ and Windows®, and is integrated into the L3Harris XL-185P and XL-200P LTE Land Mobile Radios. This extends the range of the XL portables' coverage and allows users to leverage broadband to improve situational awareness.

BeOn can quickly be added to existing L3Harris VIDA® networks as a core service, or deployed on legacy and non-L3Harris LMR networks via gateways.

By utilizing the capacity of broadband networks, BeOn helps divert traffic from narrowband communications, providing an additional level of redundancy for those systems while reducing traffic load on the LMR system.
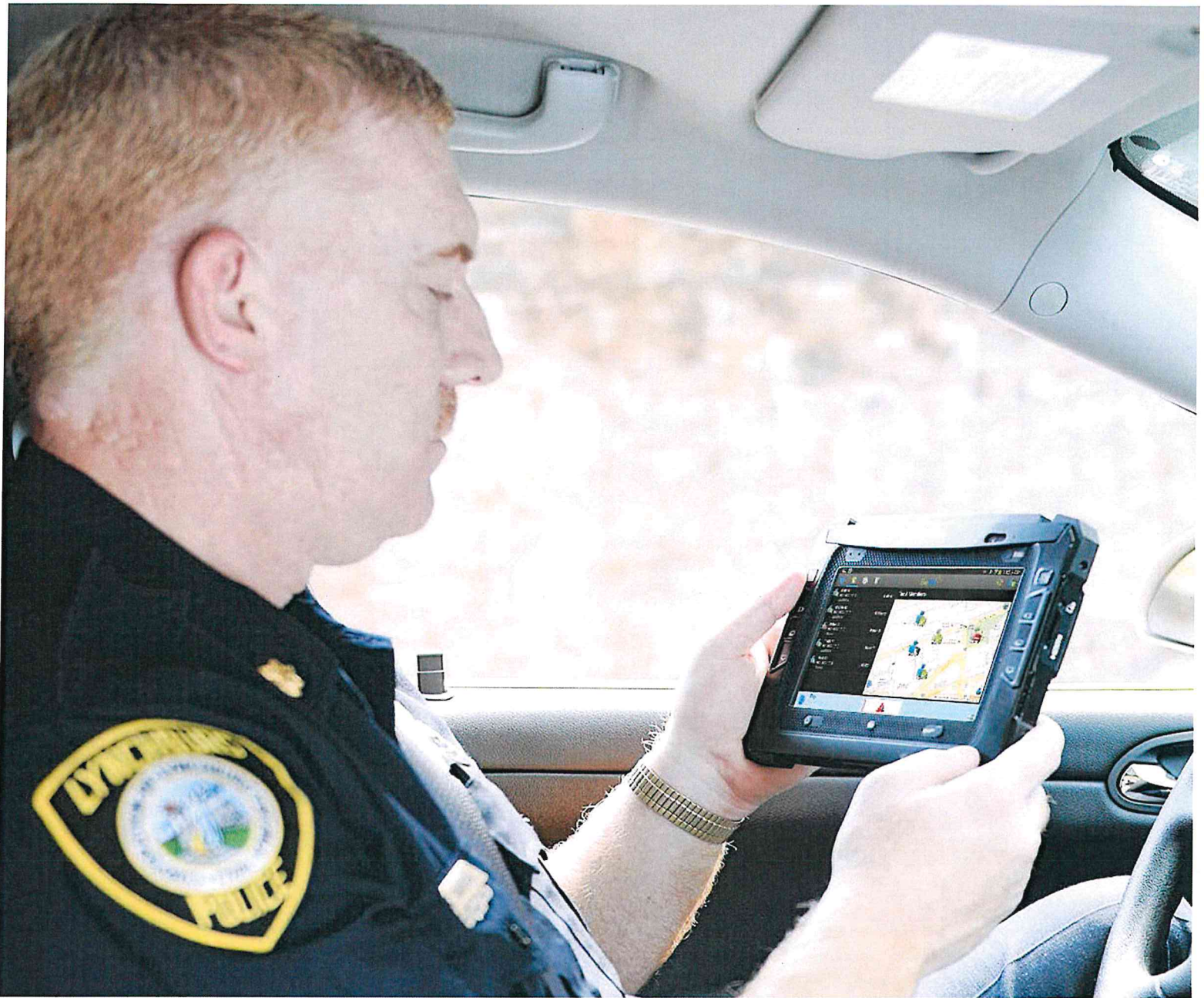
lte™ PUBLIC SAFETY LTE
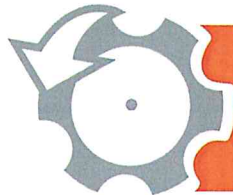
LEGACY DEVICES AND SYSTEMS

BeOn ENABLED DEVICES

P25 DEVICES AND SYSTEMS

STAY CONNECTED
WITHOUT BREAKING THE BANK

Command staff and administrators can stay in touch with LMR network activities using PCs and mobile devices.

Behind a desk or behind a screen at incident command, BeOn Windows Client allows users to stay in full, direct contact with their LMR system without investing in additional, more-costly equipment. BeOn runs as an application on PCs and smartphones, but it looks like an LMR radio to your system.

This makes BeOn the perfect solution for administrators needing to communicate or track location of team members, without adding the expense of an additional LMR radio.

BeOn is a broadband PTT tool built from the ground up to support the P25 LMR feature set.
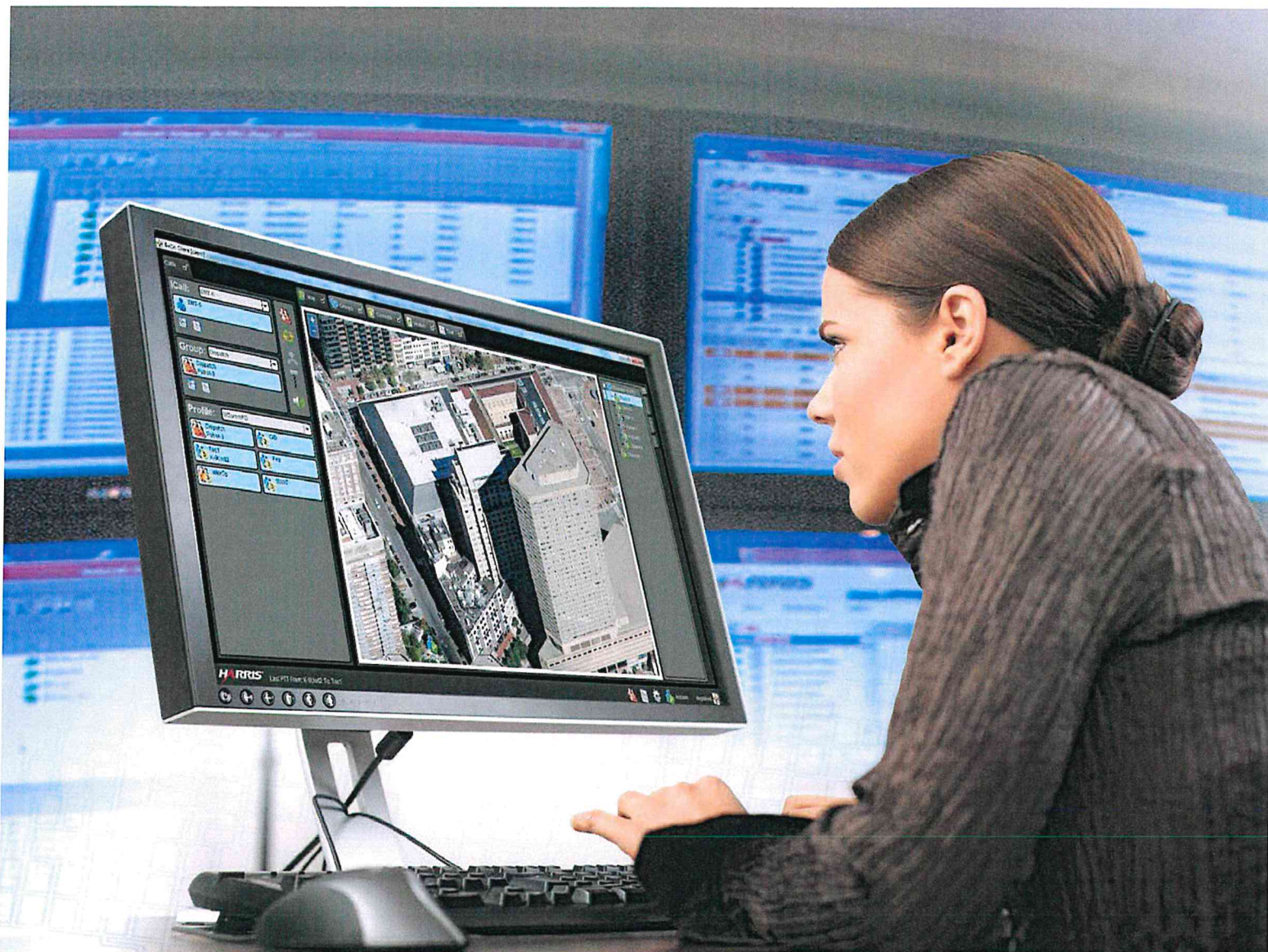
TRULY INTEGRATED P25 EXPERIENCE
Most advanced P25 PTT application on the market

THIS FEATURE-RICH APPLICATION DELIVERS FAR MORE THAN JUST PUSH-TO-TALK CAPABILITY.

BeOn is an integrated part of the L3Harris solution. BeOn is more secure, using the same encryption keys for radios and smartphones, making it easier to manage and maintain—only one database of users and one console to access both radios and smartphones.

BeOn harnesses converged LMR and LTE technologies to connect group communications between P25 systems and broadband networks.

BeOn users can exchange text messages and pass real-time location and presence information between connected team members. The application also enhances security by sharing same encryption keys between radios and smartphones.

Feature		
P25 AMBE VOCODER	✓	✓
Group, individual and confirmed calls	✓	✓
Distress calls	✓	✓
Priority and preemption	✓	✓
256-bit AES encryption	✓	✓
Late call entry	✓	✓
Featured dispatch capabilities	✓	✓
Patch and Simulselect	✓	✓

FAST. FORWARD.
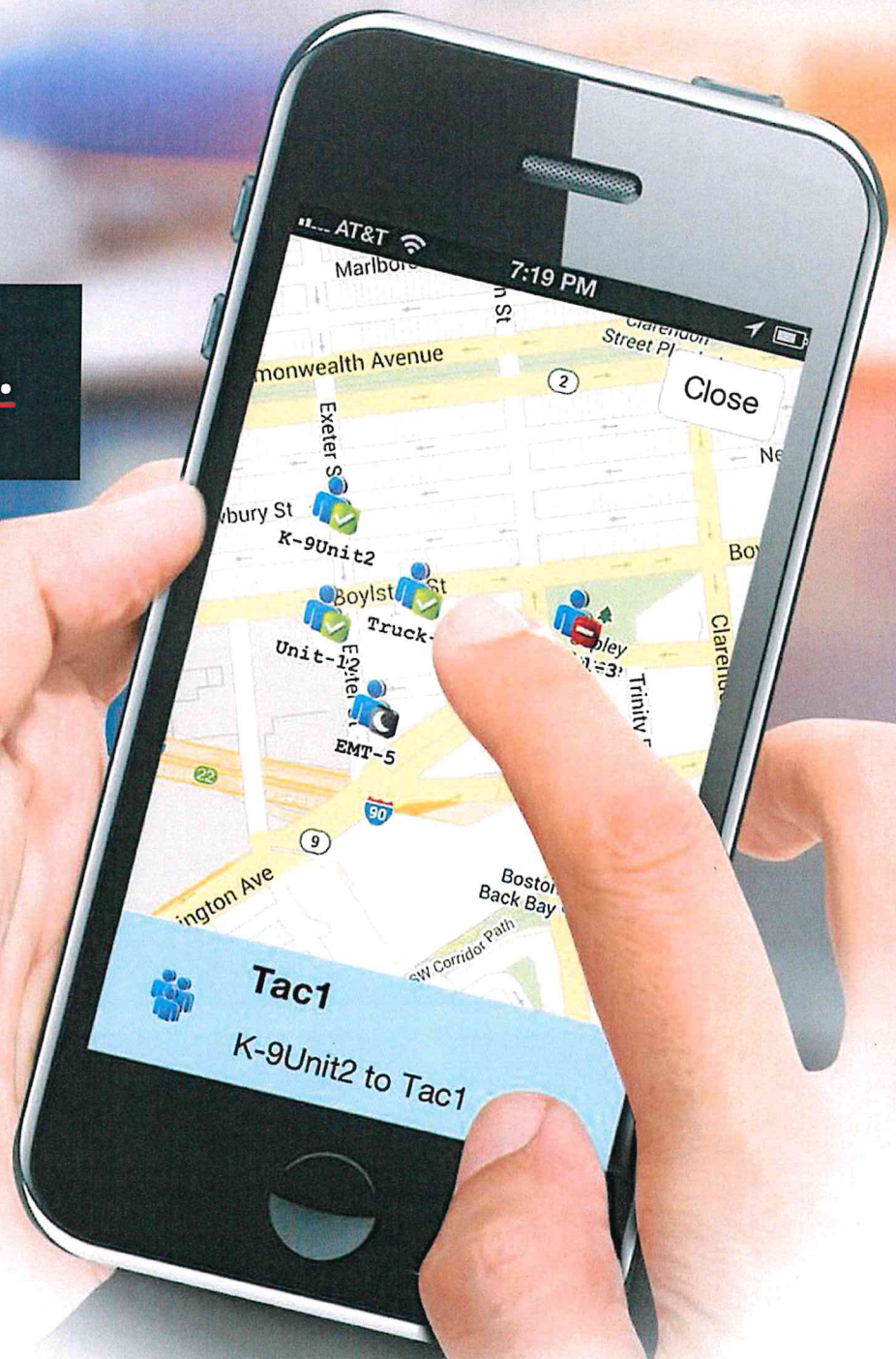
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PSPC CUSTOMER CARE CENTER

The L3Harris Public Safety and Professional Communications (PSPC) Customer Care Center (CCC) is a dedicated team accessible by phone, e-mail, web and fax.

The CCC offers support for order processing, quoting, return material authorizations (i.e., replacements, returns and repairs), warranty, contract administration and general inquiries.

Our CCC representatives recognize the importance of proactive communications and vigorously promote a positive relationship between field, factory and customer.

Our team provides a wide variety of services, including efficient order processing and status updates. Representatives also handle inquiries related to pricing quotes, products, shipping and billing status.

Our team further enhances customer support by facilitating communication between customers and internal departments to ensure an open channel of communication is maintained.

COMMUNICATION
ACCOUNTABILITY
RESPONSIVENESS
EXECUTION

KEY BENEFITS

> **Product and accessories quotes**
> **Return material authorizations**
> **Warranty information**
> **Contract administration**

TELEPHONE SUPPORT

The CCC in Lynchburg, Virginia provides telephone support from 8 a.m. to 5 p.m. (Eastern Time), Monday through Friday, excluding holidays and alternate Friday closures.

Telephone

U.S. and Canada 1-800-368-3277
International +1-434-385-2857

E-mail

U.S. PSPC_CustFocus@L3Harris.com

Federal PSPC_FedCustFocus@L3Harris.com

International PSPC_IntCustFocus@L3Harris.com

PSPC INFO CENTER

The PSPC Info Center website (https://premier.pspc.harris.com/infocenter/default.jsp) provides increased self-service capabilities which accommodate our customers by improving accessibility to our products and services. We offer web ordering for service parts and accessories, which provides flexibility and automation to ease order placement. Links on our website provide access to many useful functions:

> e-Catalog

> Material Availability Inquiry

> Pricing Inquiry

> Service Parts/ Accessories Order Placement

> Order Status/ Order Tracking

> Tech-Link (paid subscription)

Contact your CCC representative for further information about this valuable web feature.

PSPC CUSTOMER SERVICE WEBSITE

Visit our Customer Service website to find the information below:

> Literature – Warranty, Terms and Conditions, Repair Rates

> Forms – Equipment, Service Parts, U.S. Return Request

> Product Registration

> Track Shipment Status

> Contact Information

AUTOMATED ORDER ACKNOWLEDGMENT AND SHIPMENT CONFIRMATION

In addition to dedicated customer service representatives, automated order acknowledgments and shipment confirmations, we provide an extra layer of efficiency to the services currently available to our customers On the Web: https://www.l3harris.com/all-capabilities/pspc-customer-care.

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PSPC TECHNICAL ASSISTANCE CENTER

When critical communication systems malfunction, customers need fast, responsive support to get equipment back up and running. The L3Harris Public Safety and Professional Communications (PSPC) Technical Assistance Center (TAC) provides industry-leading expertise and critical product support.

With their choice of Priority or Preferred TAC support, customers get real-time maintenance, programming and troubleshooting guidance from L3Harris product specialists and engineers.

Priority TAC services are available around-the-clock and all-year-round. Coverage includes fixed-site equipment, mobiles and portables. Preferred TAC customers are provided with toll-free assistance for all PSPC equipment during regular business hours, with a commitment for return call or email within 24 hours.

A variety of technical online products are available to enhance Priority and Preferred support, giving customers access to product information, technical knowledge bases and latest software upgrades.

TECHNICAL EXPERTS AVAILABLE AROUND-THE-CLOCK

KEY BENEFITS

> Technical assistance available 24/7, 365 days a year

> On-call experts help customers rapidly resolve issues

> Easy online access to product knowledge base and technical information

> Variety of service options tailored to business needs

L3Harris.com

PSPC TECHNICAL ASSISTANCE CENTER

Priority TAC Support

Priority TAC Support links customers access with technical experts 24 hours per day, 7 days a week, including holidays. If on-site support is needed, TAC will coordinate the effort with L3Harris personnel.

Priority TAC support services

> Guaranteed callback within 2 hours, or 1 hour for system off-the-air emergencies

> Coverage for L3Harris PSPC mobiles, portables and system configurations including OpenSky®, P25 and EDACS®

> Level 3 and Level 4 support for resolution of complex issues

> Pricing options are based on system complexity, with annual and multi-year agreements available

> Subscriptions to Tech-Link support services are included

Call or email the PSPC Technical Assistance Center for priority TAC support pricing.

Preferred TAC Support

Preferred TAC Support is accessible to all L3Harris customers from 8 a.m. to 5 p.m. EST, Monday through Friday, excluding holidays. Specialists provide Level 1 and Level 2 Help Desk guidance and troubleshooting for product operations, programming and maintenance.

Each customer issue and its resolution is logged, stored and categorized within a state-of-the-art tracking and knowledge system, giving TAC specialists a dynamic search tool for quick, efficient issue resolution.

Preferred TAC support services

> Technical assistance for L3Harris PSPC mobiles, portables, accessories, trunked and conventional system

> First-in, first-out service with commitment to contact customers by phone or email by the next business day

> Toll-free service throughout all North American time zones

> State-of-the-art tracking system gives customers easy access to call status

Telephone:
1-800-528-7711 in the U.S. and Canada
+1-434-385-2400 Worldwide

Email: PSPC_TAC@L3Harris.com

Enhanced Technical Service Options

Customers can choose from the following digital services to tailor Priority and Preferred coverage for more specific needs:

Tech-Link support services

This website service offers electronic retrieval and exchange of technical information, along with rapid access to product information and expert assistance. Subscribers can use this service to:

> Access and search technical libraries

> Read current software release notes

> Request technical assistance from TAC

Technical service memos and important product notifications

This time-critical solution provides subscribers with email updates on use, maintenance and service of L3Harris PSPC products. Customers are also alerted to new downloads available on Tech-Link. Email notifications are sent to subscribers announcing materials available for download from the Tech-Link website.

Field feature encryption upgrades

As customer needs and requirements grow, L3Harris radio capabilities can also expand. Field Feature Encryption allows users to selectively upgrade terminals to better match latest operational and budgetary demands.

Non-Export Controlled Information

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.

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MASTR® V BASE STATION

VHF, UHF, 700, 800, 900 MHz

The L3Harris MASTR V Base Station features an IP-based architecture engineered to scale with each organization's critical communication needs as they change over time.

The MASTR V Base Station provides trunked communications to incorporate P25 digital voice and data. Compliant with the P25 CAI, this linear simulcast solution employs an on-board voice encoder/decoder to translate digital voice for immediate access through a user's existing network.

MASTR V delivers significant IP-based enhancements including seamless integration of COTS data applications and devices. It supports more economical routing and backhaul of network information and critical data redundancy.

The L3Harris MASTR V Base Station has a user-friendly software interface for easy setup, field upgrades and remote programming. Its compact, integrated hardware design allows up to eight channels per cabinet and simplifies maintenance and servicing.
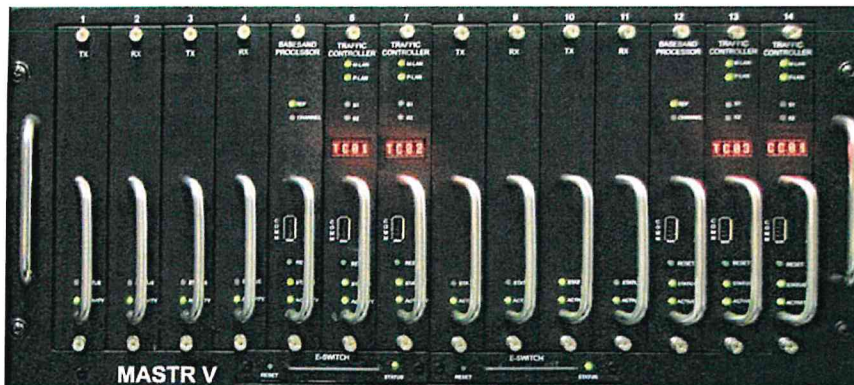
PROVEN, FUTURE-PROOF P25 PLATFORM

KEY BENEFITS

> Scalable Internet Protocol (IP) network

> Secure digital trunked voice and data

> Supports Project 25 Common Air Inter-face (P25 CAI)

> Seamless integration of Commercial-Off-The-Shelf (COTS) applications and equipment

> Simplified user interface with compact and integrated hardware footprint

GENERAL

Size (Base Station)	4 Channels per 5 Rack Unit Shelf
Open Rack Dimensions	86.0 H x 20.5 W x 19.295 D in (218 H x 52 W x 49 D cm)
Cabinet Dimensions	86.0 H x 23.0 W x 31.5 D in (218 H x 58 W x 80 D cm)
Power	100-240 VAC (47-63 Hz) or -48 VDC
Ambient Temperature Range	-22° to +140°F (-30° to +60°C)
Humidity	90% @ 122° F (+50°C)
Altitude	Operational: Up to 15,000 ft (4,572 m) Shippable: Up to 50,000 ft (15,240 m)

TRANSMITTER

	VHF	UHF	700	800	900
Frequency Range (MHz)	150-174	380-400 403-430 450-470 470-494 494-520	764-776	851-870	935-941
Rated Power Output (W)	100	100	100	100	100
RF Output Impedance (ohm)	50	50	50	50	50
Conducted Spurious and Harmonic Emissions (dBc)	<-86	<-86	<-70	<-70	<-70
Frequency Stability (ppm)	<0.1	<0.1	<0.1	<0.1	<0.1
Channel Spacing (kHz)	12.5	12.5	12.5	12.5	12.5
Synthesizer Step Size (kHz)	1.25	1.25	6.25	6.25	6.25

REGULATORY DATA

Frequency Range (MHz)	Power Output (Adjustable) (W)	FCC Type Acceptance Number	Applicable FCC Rules	Industry Canada Certification Number	Applicable Industry Canada Rules	NTIA Certification Number
150-174	10-100	OWDTR-0065-E	22, 80, 90	3636B-0065	RSS-119	J/F 12/09628
380-400	10-100	N/A	N/A	N/A	N/A	J/F 12/09628
406.1-420	10-100	N/A	N/A	N/A	N/A	J/F 12/09628
420-430	10-100	OWDTR-0129-E	90	3636B-0129	RSS-119	N/A
450-470	10-100	OWDTR-0130-E	22, 80, 90	3636B-0130	RSS-119	N/A
470-494	10-100	OWDTR-0100-E	90	N/A	N/A	N/A
494-512	10-100	OWDTR-0101-E	90	N/A	N/A	N/A
769-775	10-100	OWDTR-0159-E	90	36368-0159	RSS-119	N/A
851-869	10-100	OWDTR-0158-E	90	36368-0158	RSS-119	N/A
935-940	10-100	OWDTR-0156-E	90	3636B-0156	RSS-119	N/A

*VHF: 420-430, 450-470, 935-940

RECEIVER

	VHF	UHF	700	800	900
Frequency Range (MHz)	150-174	380-400 403-430 450-470 470-494 494-520	799-817	806-824	896-902
Sensitivity, TIA-P25 (dBm)	<-118	<-118	<-119	<-119	<-119
RF Output Impedance (ohm)	50	50	50	50	50
Intermodulation Rejection, TIA-P25 (dB)	>80	>80	>80	>80	>80
Spurious and Image Rejection (dB)	≥90	≥90	≥90	≥90	≥90
Frequency Stability (ppm)	<0.1	<0.1	<0.1	<0.1	<0.1
Channel Spacing (kHz)	12.5	12.5	12.5	12.5	12.5
Synthesizer Step Size (kHz)	1.25	1.25	6.25	6.25	6.25

OPERATIONAL MODES

Mode	Modulation	Bit Rate (kbps)	Emission Designator
P25 Phase 1	C4FM	9.6	8K00F1D/8K00F1E*
P25 Phase 1 Simulcast HVD-FDMA	WCQPSK	9.6	9K70D1W
P25 Phase 2	H-DQPSK	12	9K80D7W
HVD-TDMA	DQPSK	19.2	18KD1W, 12K5D1W

Technical specifications are subject to change without notice.
Product sales are subject to applicable U.S. export control laws.

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MASTR® V DCP SIMULCAST SYSTEM

VHF, UHF, 700, 800, 900 MHz

The L3Harris MASTR V Distributed Control Point (DCP) Simulcast System provides unmatched flexibility for large-scale, multi-agency connectivity in coverage areas too large for a single, centralized transmitter.

WIDE-AREA COVERAGE

MASTR V Simulcast Systems provide a reliable solution for wide-area coverage demands in frequency-constrained systems. Where there is a need to extend coverage to multiple agencies in a common territory, the MASTR V DCP Simulcast System provides a flexible, proven solution that delivers increased capacity for critical communication needs.

STANDARDIZED PLATFORM

> VIDA® Network Sentry for status and alarming

> Mini-mobility Exchange (MME) data handling

> Redundant GPS time base receivers

> Optional Intrusion Detection System

> Redundant ethernet switches

> Router connectivity to VIDA network

> MASTR V Control Shelf and Modules

> Power supply units: 115 VAC or -48 VDC

> Linear Mode Transmitters for improved RF system performance
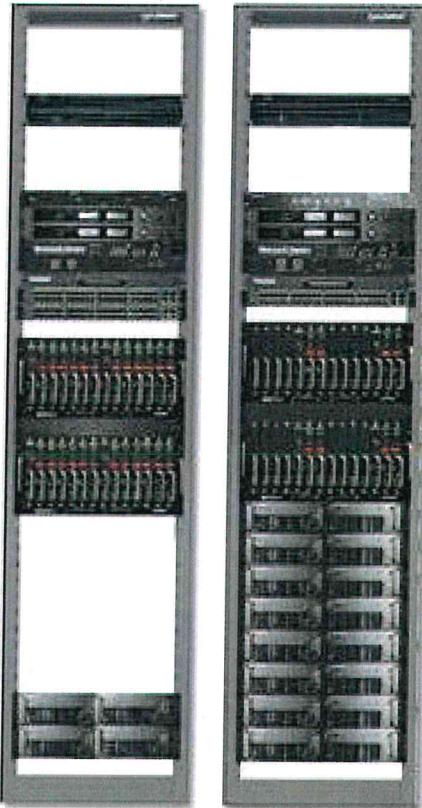
COST-EFFECTIVE WIDE-AREA COVERAGE

KEY BENEFITS

> Cost-effective way to increase coverage for systems with limited available frequencies

> Continuous overlapping coverage enhances user-mobility

> P25 Phase 1 and Phase 2 operations. Software upgradeable to P25 Phase 2

> Remote capabilities for timing, setup, status, alignment verification and alarms

GENERAL

Size (Base Station)	4 channels per 5 Rack Unit Shelf
Open Rack Dimensions	86.0 H x 20.5 W x 19.295 D in (218 H x 52 W x 49 D cm)
Cabinet Dimensions	86.0 H x 23.0 W x 31.5 D in (218 H x 58 W x 80 D cm)
Power	90-230 VAC or -48 VDC
Ambient Temperature Range	-22° to +140°F (-30° to +60°C)
Humidity	90% @ 122° F (+50°C)
Altitude	Operational: Up to 15,000 ft (4,572 m) Shippable: Up to 50,000 ft (15, 240 m)

REGULATORY DATA

Frequency Range (MHz)	Power Output (Adjustable) (W)	FCC Type Acceptance Number	Applicable FCC Rules	Industry Canada Certification Number	Applicable Industry Canada Rules	NTIA Certification Number
150-174	10-100	OWDTR-0065-E	22, 80, 90	3636B-0065	RSS-119	J/F 12/09628
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406.1-420	10-100	N/A	N/A	N/A	N/A	J/F 12/09628
420-430	10-100	OWDTR-0129-E	90	3636B-0129	RSS-119	N/A
450-470	10-100	OWDTR-0130-E	22, 80, 90	3636B-0130	RSS-119	N/A
470-494	10-100	OWDTR-0100-E	90	N/A	N/A	N/A
494-512	10-100	OWDTR-0101-E	90	N/A	N/A	N/A
764-776	10-100	OWDTR-0057-E	90	3636B-0057	RSS-119	N/A
851-869	10-100	OWDTR-0053-E	90	3636B-0053	RSS-119	N/A
935-940	10-100	OWDTR-0156-E	90	3636B-0156	RSS-119	N/A

*VHF, 420-430, 450-470, 935-940

TRANSMITTER

	VHF	UHF	700	800	900
Frequency Range (MHz)	150-174	380-400 403-430 450-470 470-494 494-520	764-776	851-870	935-941
Rated Power Output (W)	100	100	100	100	100
RF Output Impedance (ohm)	50	50	50	50	50
Conducted Spurious and Harmonic Emissions (dBc)	<-86	<-86	<-70	<-70	<-70
Frequency Stability (ppm)	<0.1	<0.1	<0.1	<0.1	<0.1
Channel Spacing (kHz)	12.5	12.5	12.5	12.5	12.5
Synthesizer Step Size (kHz)	1.25	1.25	6.25	6.25	6.25

RECEIVER

	VHF	UHF	700	800	900
Frequency Range (MHz)	150-174	380-400 403-430 450-470 470-494 494-520	799-817	806-824	896-902
Sensitivity, TIA-P25 (dBm)	<-118	<-118	<-119	<-119	<-119
RF Output Impedance (ohm)	50	50	50	50	50
Intermodulation Rejection, TIA-P25 (dB)	>80	>80	>80	>80	>80
Spurious and Image Rejection (dB)	≥90	≥90	≥90	≥90	≥90
Frequency Stability (ppm)	<0.1	<0.1	<0.1	<0.1	<0.1
Channel Spacing (kHz)	12.5	12.5	12.5	12.5	12.5
Synthesizer Step Size (kHz)	1.25	1.25	6.25	6.25	6.25

OPERATIONAL MODES

Mode	Modulation	Bit Rate (kbps)	Emission Designator
P25 Phase 1	C4FM	9.6	8K00F2D/8K00F1E*
P25 Phase 1 Simulcast, HVD-FDMA	WCQPSK	9.6	9K70D1W
P25 Phase 2	HDQPSK	12	9K80D7W
HVD-TDMA	DQPSK	19.2	18KD1W, 12K5D1W

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L3Harris MASTR® V DCP Simulcast System

Non-Export Controlled Information

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.

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HINDSIGHT™ LOGGING RECORDER

MISSION CRITICAL
ALLIANCE™
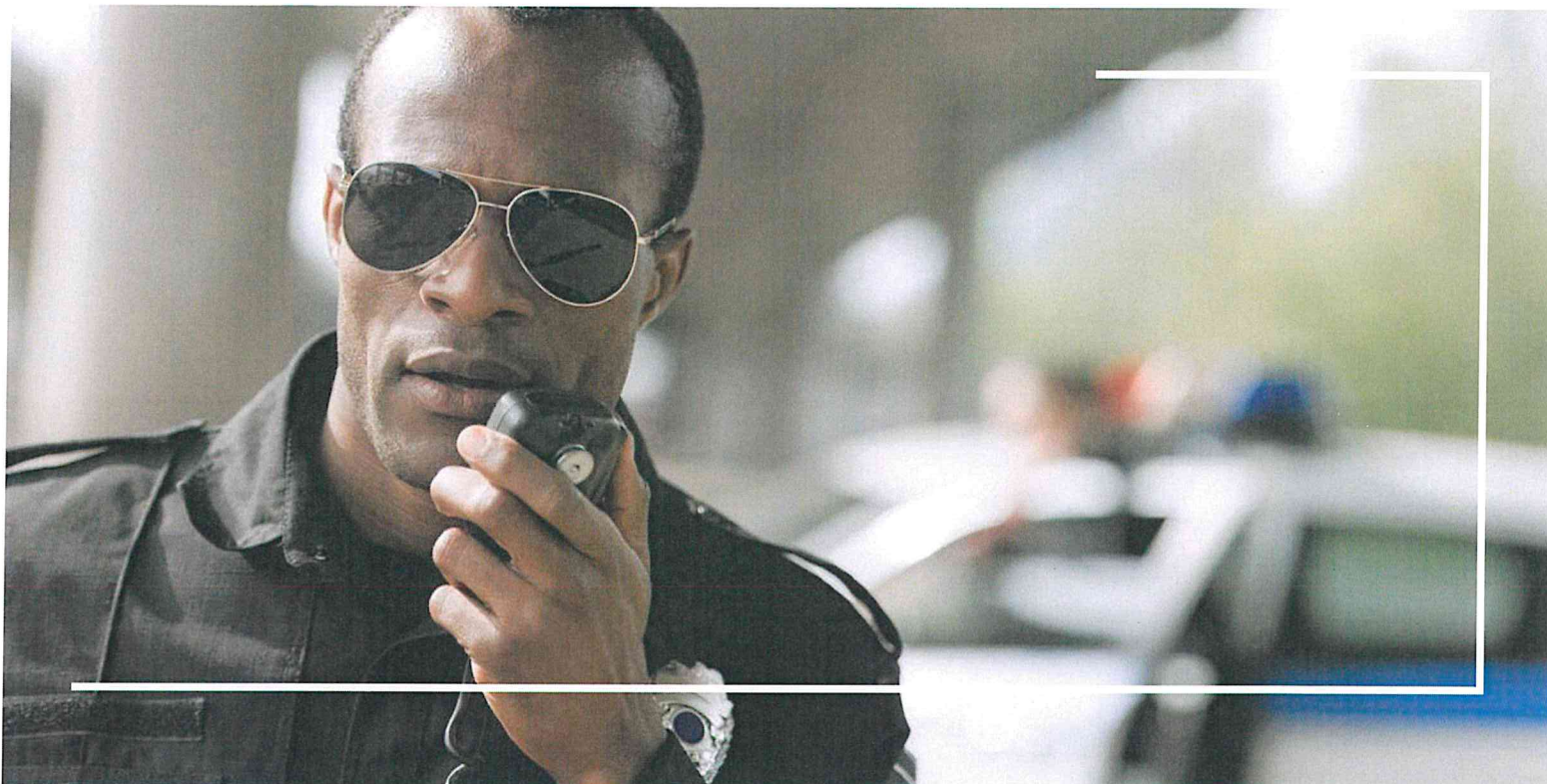
Designed For Your Organization

Find and leverage recordings easier than ever.

- 14 ways to search & filter recordings
- HTML 5 web client access (web, tablet, mobile)
- Multi-organizational shared resource access & security
- Quality assurance & screen capture options
- Powerful out-of-the-box reports & dashboards

Aligned with L3Harris

- Aligned with L3Harris cybersecurity policies & requirements
- Secure & compatible with L3Harris now and into the future
- Software updates & patches provided by L3Harris via SUMS

RECORD & REVIEW ALL COMMUNICATIONS IN A SINGLE PLATFORM

HindSight 4

Intuitive & Secure Recording Solutions

Exacom's robust logging recorder platform, HindSight, addresses the challenges within mission-critical environments. This multimedia logging recorder is field-proven with installations ranging from single sites to complex multisite configurations.

- 📞 PHONE & VOIP
- 📱 TEXT/SMS
- ᴬ RADIO & ROIP
- 🖥 SCREEN VIDEO
- 🔔 EVENT LOGGING
- 📄 METADATA

L3HARRIS   **EXACOM**

A Focus on Cybersecurity

Exacom is aligned with L3Harris cyber-security measures. Additionally, Exacom is doing our part to actively invest in company- and product-level security measures and enhancements to mitigate customer risks. These efforts make Exacom's HindSight offering the most secure recording solution on the market.

Share the Recorders, Manage the Access

Restrict access to records by user, team, department, agency, or organization.

A single recorder (and associated costs) can be shared across multiple departments or organizations while only allowing appropriate access to recordings.

Tools You Need, At Your Fingertips

Find a record, tag, bookmark, export or download it, and redact sensitive information—within the same software window. Visualize GPS data, as provided on your L3Harris system (if available), on a map using Esri®, Google Maps, or Bing Maps. Plus, powerful playback features make examination seamless.

Never Miss A Recording

Recordings are automatically backed up to a secondary storage location. Recorders can be set up in redundant configurations, for a single location or a geo-diverse configurations.

IT-Friendly Recording

Recording is 100% software-based, so it's highly scalable and easily maintained. Recordings are accessed via web browser—no clunky software upgrades. All hardware is industry-tested Dell commercial/consumer off-the-shelf (COTS) equipment.

Designed For Your Communications

HindSight is integrated with the L3Harris VIDA® core to capture audio and metadata from P25, EDACS®, and OpenSky® systems. Supports StatusAware™ Information, Information Assurance/Hardening, and L3Harris Cybersecurity measures.

Telephony & VoIP
- Analog
- Avaya SIP/H.323
- Cisco SIP
- IPC
- Mitel®
- Nortel
- Shoretel
- Siemens
- SIP

NG 9-1-1 PSAPs
- Compunetix
- Emergency Call Worx
- Motorola Solutions™ Vesta (formerly Airbus)
- Solacom
- Intrado (formerly West)

Monitoring Platforms
- Centerity AIOps
- L3Harris Enhanced Network Manager (ENM)

Dispatch Consoles
- Avtec Scout
- Catalyst
- L3Harris Maestro and Symphony
- Telex Vega
- Zetron® ACOM & MAX Dispatch

... and many more!

Integrated L3Harris P25 Radio Recording Aligned at Every Level

Product Development

Testing & QA

Sales & Installation

Customer Support

The Mission Critical Alliance is a partner program for best-of-breed technology solution providers to openly collaborate to advance the capabilities, compatibility and security of mission critical solutions.

EXACOM

salesinfo@exacom.com
Exacom.com

L3HARRIS

MCA@L3Harris.com
L3Harris.com

MISSION CRITICAL
ALLIANCE