



## STAFF REPORT

**Report To:** Board of Supervisors                      **Meeting Date:** December 5, 2019

**Staff Contact:** Carol Akers and Darren Schulz

**Agenda Title:** For Possible Action: Discussion and possible action regarding approval to purchase six dispatch consoles, six back-up base radios, interop gateway equipment, switching equipment, and associated services and support through joinder contract #P697-16-016, between Harris Corporation and Nevada Department of Transportation (NDOT) for a not-to-exceed amount of \$458,562.84. (Carol Akers, cakers@carson.org and James Jacklett, jjacklett@carson.org)

Staff Summary: The existing radio dispatch console system is beyond end-of-life and is no longer supported by the manufacturer. The console system recently experienced several major failures including a 50% failure and most recently a 33% failure. The system is in critical condition as it is still exhibiting anomalous behavior. The proposed replacement dispatch console solution will connect to the Statewide Public Safety Radio System's geographically redundant core network as recommended in the City's 2019 Public Safety Radio System Plan.

**Agenda Action:** Formal Action / Motion                      **Time Requested:** 5 minutes

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### **Proposed Motion**

I move to approve the purchase as proposed.

### **Board's Strategic Goal**

Safety

### **Previous Action**

The FY18 approved Capital Improvement Plan budget included \$600,000 for the Radio Console Replacement. On May 16, 2019, the item was brought to the Board of Supervisors and was pulled. Staff was directed to bring the item back with the interlocal agreement for use of the Statewide Public Safety Radio System.

### **Background/Issues & Analysis**

The new dispatch consoles will connect to the Statewide Public Safety Radio System's geographically redundant core network. If at some point the City determines that participation in the Statewide System is no longer desired the investment in this solution will not be lost. The City would be able to build upon this solution by acquiring a standalone core network from Harris Corporation. Additional servers, networking equipment, and licensing would be required. The City would also need to increase its support capability via contracted assistance or through staff additions to ensure the core network would be properly operated and maintained.

This purchase also includes six back-up radios that will be installed and configured to provide fallback communications capability to ensure that a disruption in connectivity to the Statewide System core will not prevent dispatchers from talking to City resources.

Contract being utilized: (Joinder)

Nevada Shared Radio System (NSRS) Service Agreement Number P697-16-016 through Nevada Department of Transportation (expires December 2028)

**Applicable Statute, Code, Policy, Rule or Regulation**

NRS 332.195

**Financial Information**

**Is there a fiscal impact?** Yes

**If yes, account name/number:** Fleet Fund - Radio Equipment Account / 5603055-507775, Project 091901

**Is it currently budgeted?** Yes

**Explanation of Fiscal Impact:** This initial purchase includes \$458,562.84 for equipment. The available budget in 5603055-507775 is \$600,000.00. Engineering, project management, installation and training are covered by contract #P697-16-016. The ongoing cost for support and services is anticipated at \$21,862.00 per year starting year three and will be paid from 5603055-500433. Each console will also require an annual radio unit fee to NDOT for operation on the statewide system estimated at \$705 each or \$4,230 for six consoles annually. The fee will be charged starting in FY21 and will be paid from 5603055-500544 -Subscription Fees.

**Alternatives**

Do not approve the purchase and provide alternative direction to staff.

**Attachments:**

[3-CC\\_Consoles\\_Proposal-x.pdf](#)

**Board Action Taken:**

Motion: \_\_\_\_\_

1) \_\_\_\_\_

2) \_\_\_\_\_

Aye/Nay

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
(Vote Recorded By)

# SYMPHONY DISPATCH CONSOLES

Carson City, Nevada



June 2019

## PROPRIETARY INFORMATION

Harris Corporation, through its Communication Systems segment (Harris Corporation), complies with all federal, state and local laws, ordinances, rules, and regulations regarding disclosure. However, Harris Corporation must still protect its trade secrets, intellectual property, and other confidential and competition sensitive business information. The enclosed proposal includes pricing, system design, trade secret and other confidential and competition sensitive information which is labeled as such in the proposal. Disclosure of any portion of this proposal shall be permitted only after the express written consent of Harris Corporation is provided. After award notification and upon official written request, Harris Corporation will disclose any proposal information that is no longer considered confidential or competition sensitive.

*Effective October 14, 2018 Harris Corporation and L3 Technologies, Inc. announced a definitive agreement to combine in an all stock merger of equals. The transaction is anticipated to close by mid-calendar year 2019. At this time, the business unit structures and associated legal entities of Harris Corporation will remain intact for bidding and performance purposes. We will provide updates as necessary.*



TECHNOLOGY TO CONNECT,  
INFORM AND PROTECT™

# Table of Contents

**Console Description**

**Statement of Work**

**Training**

**Warranty**

**Terms and Conditions**

**Attachment A – Functional Test Plan**

**Attachment B – Pricing**

**Attachment C – Warranty/Maintenance  
SOW**

## Table of Contents

Console Description.....	2
Introduction.....	2
Proposed Dispatch Console Equipment .....	2
Control Stations .....	4
Interoperability Gateway.....	6
VIDA Network WAN Requirements .....	6
Layer 2 Quality of Service Requirements.....	8
Layer 3 Quality of Service Requirements.....	8
Bandwidth Requirements .....	8
Summary .....	8
Statement of Work (SOW) .....	9
Console Installation .....	9
Harris Installation.....	10
Exclusions by Harris .....	10
Warranty.....	11
Warranty Support.....	11
Third-Party Warranties.....	11
Warranty Returns Process.....	11
Depot Level Repair and Return.....	12
Demand Services.....	12
Exclusions .....	12
Premium Warranty .....	13
Maintenance.....	13
Terms and Conditions.....	14
Functional Acceptance Test Plan .....	15
Pricing .....	16

# Console Description

## Introduction

Harris is pleased to provide a quote to Carson City for six Symphony dispatch consoles, back-up control stations, and interoperability gateway (IGW) add-ons as requested for use by the Public Works department. The Symphony consoles will be in Carson City, NV at a single dispatch facility. This quote provides the City with firm fixed pricing information to assist in procuring the dispatch consoles and interoperability gateways.



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**A completely solid-state design affords the high reliability needed for dependable communications in emergency situations.**

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This quote includes six consoles and associated licenses for existing Networking Switching Center upgrades, six back-up control stations, and one new interoperability gateway chassis and 16 total port additions. The Symphony consoles in Carson City will interface to the P25 VIDA switches in northern Nevada (Washoe County). This quote is firm fixed and includes services quoted separately. Harris looks forward to working collaboratively with Carson City and their Public Works representatives on this equipment purchase and installation.

The requested console is a Symphony Premier Win8.1 Bundle and includes the following pre-installed licenses on a per console basis:

- Local Baton
- Remote Baton
- Patch Activations (8)
- SimulSelect Definitions (16)
- Speaker Licenses (4)
- User Setups (4)
- Workspace Tabs (16)
- I-Calls
- Call Director
- Local Full Screen
- Flexpaths (12)

## Proposed Dispatch Console Equipment

The Symphony Dispatch Platform (SDP) is Harris' mission critical dispatch solution designed by dispatchers for dispatchers. Attached to the existing north Network Switching Center will be six dispatch consoles at a single dispatch facility. Because Carson City will purchase off the NDOT NSRS Contract, NDOT's base console & router configurations are listed below in Figure 1. The table in Figure 1 also lists the hardware and software features that will be added to the proposed consoles.

Figure 1. NDOT's NSRS Contract &amp; Carson City Console &amp; Router Configurations

	NDOT Contract Console Configuration	Additional Software Features for Carson City Public Works	Carson City Public Works Console Configuration
Paging Capability License		X	X
Remote Aux I/O License		X	X
Remote Baton Software	X		X
Console Bundle Win10	X		Console Bundle Win8
AES/DES Encryption License	X		X
Conventional Controls License	X		X
Marker Tone License	X		X
Base SIP License	X		X
SIP 4 Extensions	X		X
Speakers (2 per position)	X		4 per position
23" High Def Monitor	X		24" Touchscreen HD
Mouse	X		X
Keyboard	X		X
Single Foot Switch	X		Dual Foot Switch
Desk Microphone	X		X
Jackbox, 6-wire (2)	X		X
Jackbox to Headset Adapter (2)	X		X
Headset (over-the-head, solid boom) (2)	X		X
Vocoder License	X		X
UPS Power Supply	X		X
Router, ISR4221 – SEC/K9, 4 port NIM mode, Layer 2 GE (Qty. 2)	X		X
Cisco 2960 Plus Switch (Qty. 2)	X		X

The existing router/switch is routed to the North core through a T1 connection. The Network Requirements section outlines the minimum backhaul requirement specifications for the new consoles. The existing T1 connection is not sufficient for site connectivity to the new consoles and must be upgraded.

The existing Carson City GWB site (#13) is connected to the region's Ethernet microwave ring and is the planned new console site. The site 104 router is the router that site 13 will route through to reach the North core. Harris will ensure that the site routers at the dispatch center and the site 104 router are configured properly to route the console and interop traffic to and from the core.



There are available ports on the existing 2911 router for the new console connections, but Harris is providing the latest 4K series Cisco routers in a redundant configuration so Carson City is positioned and ready for future enhancements. The redundant network connection optimizes the Symphony console’s redundant NIC ports. Additionally, the IGW UAC cards will be spread across the redundant routers, minimizing impact in the case of a potential hardware failure.

## Control Stations

### CS7000 DESKTOP STATION

The CS7000 desktop control station is configured with a multi-band XG-100M (Unity mobile) utilizing the CH-721 control head as pictured in Figure 2 below. A desktop microphone attaches to the front panel. A USB port and RS-232 serial connectors on the back panel allow external connections (e.g., auxiliary audio inputs, external PTT, etc.) to the desktop station. New coaxial cable will be run from the control stations in the radio equipment room to the multi-band antennas (VHF/UHF/800 MHz) on the roof.

Figure 2. Desktop Control Station with Local or Remote Control and Full Keypad



Figure 3. NDOT’s NSRS Control Station Configuration

	NDOT Contract Console Configuration	Carson City Public Works Console Configuration
P25 Phase 2	X	X
Link Layer Authentication (LLA)	X	X
AES Encryption	X	X
OTAP	X	X
OTAR	X	X
Desktop Microphone	X	X
Antenna System	X	X

### REMOTE CONTROL FLEXIBILITY

A local/remote control CS7000 control station is equipped with industry standard RJ-11 LINE input connector, standard CAN interface, and RJ-45 Ethernet Local Area Network (LAN) jacks to support multiple connectivity options, including:



- Tone Control – The CS7000 is configurable to support tone (two-wire or four-wire line) remote equipment connected via the remote interface module.
- Voice over Internet Protocol (VoIP) connection – Utilizing an existing Wide Area Network (WAN) or LAN, an IP remote controller can interface to the CS7000.

## MULTI-MODE OPERATION

As a multi-mode radio, the CS7000 can support a variety of protocols:

- FM analog conventional
- P25 Trunking, Phase 1
- P25 Trunking, Phase 2
- P25 Conventional CAI

The control stations will be installed in the radio equipment room with a SP721 remote control unit installed at the console position. The SP721 is shown in Figure 4 below.

Figure 4. SP721 Desktop Remote Controller



In addition, connectivity will be provided between the Symphony Dispatch Platform (SDP) and the back-up control station via the SDP's Backup Radio interface. The Backup Radio feature enables the dispatcher to connect the console to a mobile radio in the event the network connection goes down. The PTT and audio signals from the desk microphone, headset, speakers, and footswitch are summed and sent to the radio in backup mode. The three-position Backup Radio switch (Auto, Disable, or Manual) located on the front of the Symphony Dispatch platform enables or disables the backup radio mode.

Ted Collins will work with Carson City Public Works during the integration phase, and provide a working solution for a switch at the console operators position. This work will be funded through and coordinated by NDOT as part of the installation services that are being provided through the NDOT contract.

The Backup Radio Switch selects the Backup Radio mode from the following choices:

- Auto
- Disable
- Manual



With a Backup Radio installed:

- In the DISABLE mode, the Backup Radio connection is always disabled.
- In the MANUAL mode, the Backup Radio connection is in a “Bypass Only” state and stays enabled and activated until the mode is changed.
- In the AUTO mode, the Backup Radio connection is engaged when the console is shut down and automatically disengages when the console starts.

## Interoperability Gateway

The Interoperability Gateway interfaces to legacy conventional resources at the dispatch location via a wire line interface. Any source that provides analog audio can connect to an Interoperability Gateway. Each single source of analog audio connected to the Interoperability Gateway maps to a talkgroup within the radio system.

Each interoperability talkpath maps to a single source of audio (e.g., one base station, a channel on a conventional system, one talkgroup on a trunked system). Interoperability Gateway UAC modules offer a 4-wire balanced line level interface for the audio connection.

Harris will provide 16 interoperability talkpaths to interface to existing VHF equipment. They break down as follows:

- The existing IGW, that currently has 4 UAC ports (i.e. 1 UAC card), will be fully populated by adding 8 UAC ports (i.e. 2 additional UAC cards)
  - 12 total UAC ports will be available in the existing IGW chassis
- A new IGW chassis will be installed with 8 UAC ports (i.e. 2 UAC cards)
  - 8 new UAC ports will be available in a new IGW chassis

This brings the total number of UAC ports to 20 interfaces. The network LAN connection for the five UAC cards will be spread across the redundant network routers/switches.

Figure 5. Harris Interoperability Gateway Chassis



## VIDA Network WAN 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 Harris 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 Harris cannot be held accountable. In the event of audio problems, Harris will work with the customer to

determine the source of the problem. If the problem is determined to be in the customer supplied backhaul, Harris will 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. Harris will 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 12hrs
- Frame loss shall be less than .01%
- Out-of-Order packets shall be less than .01%

## CONSOLE OR MULTI-SITE 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 to 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 Harris will 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. Harris will 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 requirements differ based on the site type and traffic patterns. This section defines latency requirements for Console or 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. Satellite links can be supported after system timers are modified to account for satellite delay.

- NSC Latency
  - NSC to NSC latency must be less than *(150ms)*
- Console and Multisite Latency
  - Console or Multisite to NSC latency must be less than *(150ms - NSC Latency)*

## 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 Harris voice traffic marked using the Differentiated Services Code Point (DSCP) byte and the network will also meet the following requirements:

1. The Platinum (DSCP EF) queue should be treated as a strict priority queue for voice.
2. All other queues should be treated as CBWFQ.
3. All DSCP values should not be manipulated during transport.

Figure 6. QOS Level Summarization

Level	DSCP Marking	Bandwidth Reservation	Queuing Method	IP Services
Platinum Plus	CS6	5%	Class Based Weighted Fair Queue	EIGRP Traffic
Platinum	EF	50%	Priority Class Based Weighted Fair Queue	VNIC Voice Traffic, VNIC Management Traffic
Multicast	AF42	15%	Class Based Weighted Fair Queue	Site Multicast Traffic (Heartbeat)
Gold	AF41	10%	Class Based Weighted Fair Queue	HA Synchronization Traffic, P25 Data (OTAP, OTAR, ...)
Silver	AF31	10%	Class Based Weighted Fair Queue	RNM ICMP Traffic, Windows Remote Desktop (RDC), Secure Shell (SSH)
Bronze	AF11	5%	Class Based Weighted Fair Queue	SNMP Management Traffic, SysLog, ICMP
Best Effort (Default)	BE (0)	None	None	All Else

## Bandwidth Requirements

The link minimum bandwidth requirement for 6 Symphony consoles is 5.4 Mbps of bandwidth. Harris' recommendation is for the customer to install a Layer 2 Ethernet link that is 10 Mbps between the core location and the console site location.

## Summary

Harris is a leader in providing secure, mission-critical public safety voice and data networks in the State of Nevada, throughout the United States and worldwide. We look forward to the opportunity to collaborate with Carson City Public Works to provide dispatchers with high-performing and reliable consoles and interoperability equipment.

# Statement of Work (SOW)

## Console Installation

This SOW is subject to the Agreement Terms and Conditions in the following Terms and Conditions section. The Equipment covered by this SOW is located with the console pricing summary. The following responsibility matrices provides the project activities for which the Harris Team is responsible, and those activities that are Carson City's responsibility.

Tasks	Harris	Carson City
<b>Equipment Installation</b>		
Assemble project team and travel to the Carson City's location	X	
Assemble customer team for kick-off meeting		X
Provide location in appropriate conference room or training facility		X
Present preliminary information on sites and design	X	
Provide information and status on sites		X
Install 2 routers and 2 switches in the dispatch facility	X	
Configure the Remote Network Manager	X	
Install ethernet interface cables for connectivity between the equipment room and dispatch center	X	
Install 5 Symphony Consoles in the main dispatch area	X	
Install 1 Symphony Console in the training room	X	
Configure Symphony Consoles for call director operation	X	
Install 6 backup control radios and SP721 units	X	
Install UAC cards in existing and new Network First Gateway shelves for control of existing conventional stations	X	
Install demarcation blocks for station control and cross connects	X	
Configure UAS for conventional dispatch channels	X	
Perform Functional Acceptance Testing	X	
Provide space in existing equipment for new equipment		X
Approve acceptance test results (within 5 business days)		X
Provide temporary storage locations at installation sites		X
Provide console location for installation that is clear and free of all obstructions, and has mountable hardware areas for Harris equipment, with 120VAC power sockets at plug distance from Equipment		X
Provide a ground point for grounding of equipment		X

## Harris Installation

The following installation standards shall be adhered to:

- The National Electrical Code and any other pertinent electrical codes or construction codes shall be rigidly adhered to.
- All grounding shall be performed utilizing the proper wire size per the Contractor Standards. It shall be GREEN colored insulated wire and used at all install location (except for manufacture pre-built power cables which may have black ground wires). Proper size split bolts, c-taps and/or Cad-Weld shall be used, as determined by the application. This applies to all racks and each console position as well.
- All work shall be performed in a neat and professional workmanship-like manner with safety measures adhered to.
- All trash generated by Harris associated with the installation of assigned work scope shall be removed from the work site daily by Harris and disposed of properly and legally.
- No transmission lines will be relocated or spliced on any site.
- If applicable, all outside hardware supplied by the Harris shall be made of galvanized steel or other acceptable non-rusting material and comply with Harris installation standards.
- All cables, Signal (data, where applicable), shall be tagged and permanently labeled by Harris in accordance with Harris installation standards.
- Harris is to identify and record all wiring terminations made to each punch block. A copy of this information is to be provided to the Customer at the end of the installation

## Exclusions by Harris

The following are excluded from this Statement of Work and therefore not included in the Harris quotation.

- Site Civils equipment and Installation
- Antenna System Installation
- Site Management
- Site Development Support
- Console Configuration Planning
- Fleetmap/ Talkgroup/ Personality Planning
- Development of all radio programming Personalities
- Application Training and Support

# Warranty

## Warranty Support

Harris provides a one-year warranty on all infrastructure equipment sold by Harris, and a two-year warranty on subscriber terminal equipment.

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

During the Warranty if any Hardware component or portion of the installation Services fails to meet the warranty, Harris will remedy by: (1) repairing any defective component of the Hardware, or (2) by furnishing any necessary repaired or replacement parts, or (3) by correcting the faulty installation at no additional cost to the Customer.

All warranty labor will be performed by Harris at our facility, for mobile or portable equipment.

## Third-Party Warranties

Harris will ensure that warranty on any third-party Original Equipment Manufacturer (OEM) equipment and services sold by Harris 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.

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

## Warranty Returns Process

Once the determination is made that equipment needs repair or replacement, we will follow these steps:

1. Technical Support creates a support case and will verify product part numbers, serial numbers and reasons for return and forward the approved request for processing.
2. A Customer Care Representative reviews all requests. We will provide an RMA number, required prior to return, along with a warranty replacement sales order number and instructions for return of the equipment.
3. Defective equipment ships back to Harris Depot Repair and Return.
4. We will repair or replace any equipment under warranty free of charge unless there is evidence of abuse or damage beyond the terms of the warranty.
5. Repaired or replaced unit ships back to the Customer.
6. We will close the RMA and update the tracking database

Requests for out of warranty repairs will require a purchase order. Out of warranty repairs are subject to a flat rate per unit fee regardless of fault found with the equipment. Turn-around time for equipment repair or replacement is generally 10 business days.



## Depot Level Repair and Return

The Depot Repair and Return Facility in Lynchburg, Virginia maintains a staff of certified master technicians and support personnel who have over four decades of experience providing high quality repairs and fast turnaround times for public safety and commercial customers. This facility is ISO 9001: 2008 certified and UL Listed. 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 consists of those services not included in our Scope of Work and shall be invoiced directly to the Customer on a time and materials basis. Such Demand Services include, but are not limited to the following:

- Installation or removal of mobile radio equipment after initial installation.
- Repair of equipment damaged by vandalism to the extent such equipment damage is not caused by Harris or any of its agents.
- Repair of equipment damaged by abuse or physical neglect to the extent such abuse or physical neglect is not caused by Harris or any of its agents.
- Damages due to acts of God or other uncontrollable events.

## Exclusions

Standard exclusions apply as referenced in the following documents:

- Standard Conditions of Sale
- U.S. Equipment Warranty
- U.S. Battery Warranty

## Premium Warranty

The following Premium Warranty services are provided during the one-year warranty period:

- On-site Corrective Maintenance with a 30-minute telephone response and a next business day on-site response, if needed.

## Maintenance

A one-year maintenance agreement is proposed following the warranty period. The following services are provided during the one-year warranty period:

- Depot Repair and Return
- On-site Corrective Maintenance with a 30-minute telephone response and a next business day on-site response, if needed.

Please see Attachment C – Warranty/Maintenance - Statement of Work.

# Terms and Conditions

Unless noted otherwise, terms and conditions are governed by the Service Agreement Number P697-16-016 between Harris Corporation and Nevada of Department of Transportation dated 9/13/2018.

# Functional Acceptance Test Plan

Please see Attachment A- Functional Acceptance Test Plan.

# Pricing

Harris is pleased to provide Carson City with a firm-fixed price proposal. Please see Attachment B – Pricing. This offer is based upon the referenced Terms and Conditions.



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Functional Test Procedures  
For  
Carson City, NV  
SR10A.4 Symphony Functional Testing

Rev –

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## Contents

1. FUNCTIONAL TEST ACCEPTANCE .....	3
2. SYMPHONY DISPATCH FEATURE SET .....	5
2.1 Transmitting with a Microphone (Group Calls).....	5
2.2 Receiving Calls (Unit ID Display, Talk Group ID Display, Aliasing) .....	6
2.2.1 Talk Group Call .....	6
2.3 Alert Tones .....	7
2.4 Console Pre-empt .....	8
2.5 Simulselect .....	9
2.6 Patch .....	10
2.7 Console to Console Cross-mute .....	11
2.8 Call History .....	12
3. VIDA INTER-OPERABILITY GATEWAY TEST .....	13
3.1 Local Interoperability .....	13



## ABOUT THIS DOCUMENT

This document was specifically prepared for the customer shown below. Each section of this document is individually maintained in the Harris Document Control System.

Customer: N/A

Prepared By: **L. Dobbins**

## DOCUMENT USAGE

Many of the tests in this document will need to be run on multiple pieces of equipment. For tests that need to be run multiple times, log in the comment section of the result box the identifier of the equipment tested. Although specific tests are not included relating to electrical measurements or timing parameters of equipment, these tests and levels are conducted and recorded as part of Harris' standard production and/or installation practices. These parameters include but are not limited to:

- Transmit Frequency and Deviation
- Output and Reflected Power
- Receiver Sensitivity
- Receiver Multicoupler Gain (if applicable)
- Receiver Preamplifier Gain (if applicable)
- Combiner Loss (if applicable)
- Audio line out
- Audio line in

## SUBSCRIBER UNIT USAGE

All tests for Subscriber (Terminal) Units in this document will be performed with Harris Subscriber Units unless the test setup identifies another Vendor's Subscriber Unit to be used.

# 1. FUNCTIONAL TEST ACCEPTANCE

This Functional Test Acceptance Procedure has been fully and successfully completed with all Action Items resolved.

## Customer Representative

## Harris Corporation Representative

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name and Title

\_\_\_\_\_  
Printed Name and Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

## **FUNCTIONAL TESTING CLARIFICATION**

Equipment Inspection and Testing in addition to Staging Acceptance Testing is performed at the Harris Staging Facility. Staging tests as detailed in this matrix verify basic equipment functionality in addition to its functionality as part of an overall system. Equipment as received from Harris and Third-Party Manufacturing Suppliers is supplied with Manufacturer Test Results, as applicable. Test results Documentation will be that from the Staging Functional Acceptance Tests. Equipment tests will be performed in the field after installation, both as part of equipment commissioning and overall Final Functional Acceptance Testing. Test results documentation will be from the Final Functional Acceptance Tests.

## 2. SYMPHONY DISPATCH FEATURE SET

### 2.1 Transmitting with a Microphone (Group Calls)

**Purpose:** Demonstrate Symphony operator can initiate communication using Symphony select functions and foot pedal.

**Expected Results:** Confirms Symphony communication with Radio

**Setup:** Radio set to TG64001 P25 and console programmed with TG64001 P25

**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. Right click on gear symbol for TG64002, and select 'Select' to make TG64002 the selected talk group.
  - Verify module for TG64002 is highlighted, indicating it is selected talk group.
  
3. Make a call on TG64002 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 talk group TG64002.
  - Release foot pedal to end call.
  
4. Make a call on TG64002 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 talk group TG64002.
  - Release headset button to end call.
  
5. Make a call on TG64002 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 talk group TG64002.
  - Release mouse button to end call.

<b>Results</b>	(Pass/Fail)	_____
Tester:	_____	Date: _____
Comments:	_____ _____	

## 2.2 Receiving Calls (Unit ID Display, Talk Group ID Display, Aliasing)

**Purpose:** Confirm Symphony operator can receive communications from a Radio, using both talkgroup 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 talk groups 64001 and 64002, programmed with 64002 selected, and Radio set to TG64001 P25

### 2.2.1 Talk Group Call

**Execution:**

1. Key radio and verify
  - That call is heard at unselect speaker.
  - Calling radio ID is displayed on module for TG64001.
  - A green light ID displayed indicating an incoming call on module TG64001.
  
2. Switch radios talk group to TG64002 and key radio.
  - Verify call is heard at select speaker.
  - Verify calling radio ID is displayed on TG64002 module.
  - Verify a green light ID displayed indicating an incoming call on module TG64002.

<b>Results</b>	(Pass/Fail)	_____
Tester:	_____	Date: _____
Comments:	_____ _____ _____	

## 2.3 Alert Tones

**Purpose:** Confirm Symphony can initiate alert tones which can be heard at Radio.

**Expected Results:** Tones can be initiated and heard.

**Setup:** Symphony programmed with TG64002 and TG64001 selected.

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002

**Execution:**

1. Make TG64001 P25 selected talk group.
2. Select tones tab on talk group module.
3. Select one of three ALERT TONE keys by selecting drop-down list next to orange button, using Symphony with a method other than the mouse.
4. Radio 1 will receive call.
5. Test all three alert tones to ensure all alert tones can be heard on radio.
  - Verify ALERT TONE is received by Radio 1, and is also heard on Symphony. (To hear tones on Symphony, press and hold foot pedal and listen for tone on SELECT speaker).
6. When ALERT TONE key is released.
  - Verify call on Radio 1 drops.

<b>Results</b>	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

## 2.4 Console Pre-empt

**Purpose:** Confirm Symphony can pre-empt an ongoing call between Radios.

**Expected Results:** Call started by the radio will be interrupted by the console.

**Setup:** Symphony programmed with TG: TG64001 P25

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001

### Execution:

1. Key Radio 1 on TG64001 and hold call up. Verify that audio is heard at Radio 2 and Symphony.
2. Key Symphony on TG64001 and hold, while continuing to hold call up on Radio 1
  - Verify console pre-empts.
  - Verify transmit indicator is displayed along with pre-empted caller LID and CALL indicator.
  - Verify second radio begins to hear Symphony audio and not first radio call.
  - Verify pre-empted radio audio is still heard on pre-empting console.
3. Un-key first Radio.
  - Verify pre-empted caller LID and CALL indicators are removed, and pre-empted radio audio is no longer heard on pre-empting Symphony.
4. Un-key Symphony.

<b>Results</b>	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	



## 2.5 Simulselect

**Purpose:** Confirms operation of Symphony Simulselect feature, which allows multiple talk groups to be selected for communication simultaneously.

**Expected Results:** Symphony can select multiple talk groups and communication is allowed.

**Setup** Symphony programmed with TGs: TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64051 P25	64051
Radio 2	9980002	TG 64052 P25	64052
Radio 3	9980003	TG 64053 P25	64053
Radio 4	9980004	TG 64054 P25	64054

### Execution:

1. Create Simulselect group on 4 test group modules.
2. Place a call from Symphony on Simulselect group.
  - Verify call is heard at all four radios.
3. Place a call from each radio.
  - Verify only Symphony hears calls.
  - Verify only radios on similar talk groups here call.
4. Deactivate Simulselect group.

<b>Results</b>	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

## 2.6 Patch

**Purpose:** Confirms Symphony patch feature creates shared communication between multiple selected talk groups.

**Expected Results:** Patched talk groups can communicate.

**Setup** Console 1 programmed with TGs: TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64051 P25	64051
Radio 2	9980002	TG 64052 P25	64052
Radio 3	9980003	TG 64053 P25	64053
Radio 4	9980004	TG 64054 P25	64054

### Execution:

1. Create patch on PATCH 1 with all four groups above.
2. Place a call from newly created patch.
  - Verify call is heard on all radios.
3. Place a call from each radio.
  - Verify call is heard on Symphony and each radio.
4. Deactivate patch.

<b>Results</b>	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

## 2.7 Console to Console Cross-mute

**Purpose:** Confirm creation of a cross-mute of another console to quiet the muted consoles audio on the local console.

**Expected Results:** Cross-muted console's audio cannot be heard on local console.

**Setup:** Establish two Symphony consoles, (A and B) to test Cross Mute function. Both Symphony consoles must be on same NSC. Program and select a test group on both consoles.

**Execution:**

1. Place a call on console A on test group.  
 Verify console B can hear console A.
2. Open Symphony Configuration Utility for console B, in 'General' section, add ID for console A to 'Cross Mute' list.
3. Select 'Apply' to save changes.
4. Place a call on console A on test group.  
 Verify call can't be heard at console B.
5. Restore desired cross mute setup.

<b>Results</b>	(Pass/Fail)	_____
Tester:	_____	Date: _____
Comments:	_____ _____ _____	

## 2.8 Call History

**Purpose:** Confirms a history of calls processed at the Symphony.

**Expected Results:** History is accessible and valid.

**Setup:** Test compares programmed module call activity to history scroll lists.

Utility page, dispatch menu will be selected. Select either “Select History” or “Unselect History”.

**Execution:**

1. Press ‘Scroll Up’ and ‘Scroll Down’ buttons to scroll through Unselect Call History list. Compare these calls with known activity.
2. Press ‘Scroll Up’ and ‘Scroll Down’ buttons to scroll through Selected Call History list.  
 Compare these calls with known activity.
3. Press ‘Esc’ button to exit history scroll mode.
4. To monitor call history on a single group, use ‘module history’ button on ‘module modify’ menu.
5. Use ‘scroll up’ and ‘scroll down’ buttons to scroll through calls for picked module.  
 Compare these calls with known activity.

<b>Results</b>	(Pass/Fail)	_____
Tester:	_____	Date: _____
Comments:	_____ _____ _____	

### 3. VIDA INTER-OPERABILITY GATEWAY TEST

#### 3.1 Local Interoperability

**Purpose:** The purpose of this test is to verify correct functionality of the Interoperability Gateway.

**Expected Results:** Verify that the Interoperability Gateway connects via 4-wire audio connections in its Universal Access Cards(UAC) cards to interoperability radio units (mobile or desktop). The Gateway also connects to a router and the Network Switching Center (NSC) to provide call functionality across the network.

**Setup:**

**Execution:**

1. Select Inter-op group 1 on the radio.
2. Initiate a call from the radio to group 1
  - Verify that audio is heard on inter-op group 1 radio.
3. Initiate a call from the inter-op group 1 radio to group 1
  - Verify that audio is heard on the radio.

<b>Results</b>	(Pass/Fail)	_____
Tester: _____	Date:	_____
Comments:	_____ _____ _____	

# Carson City Symphony Console Hardware Price List

Item Number	Part Number	Description	Quantity	Unit List	Unit Sale	Discount %	Ext List	Ext Sale
10	VS-CR1G	ROUTER,ISR4221-SEC/K9	1	\$ 2,900.00	\$ 2,610.00	10	\$ 2,900.00	\$ 2,610.00
20	VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	1	\$ 59.00	\$ 53.10	10	\$ 59.00	\$ 53.10
30	VS-CU7Z	MODULE,NIM 4PORT LAYER2 GE	2	\$ 567.00	\$ 510.30	10	\$ 1,134.00	\$ 1,020.60
40	VSCU3H	SWITCH,CISCO 2960 PLUS	1	\$ 1,454.57	\$ 1,309.11	10	\$ 1,454.57	\$ 1,309.11
50	VSMA6N	KIT,MTG HDWR,CISCO 2960 MASTR III/V CAB	1	\$ 69.88	\$ 62.89	10	\$ 69.88	\$ 62.89
60	VS-CR1G	ROUTER,ISR4221-SEC/K9	1	\$ 2,900.00	\$ 2,610.00	10	\$ 2,900.00	\$ 2,610.00
70	VS-MN3T	KIT, CISCO 4221 ROUTER, SITE MTG	1	\$ 59.00	\$ 53.10	10	\$ 59.00	\$ 53.10
80	VSCU3H	SWITCH,CISCO 2960 PLUS	1	\$ 1,454.57	\$ 1,309.11	10	\$ 1,454.57	\$ 1,309.11
90	VSMA6N	KIT,MTG HDWR,CISCO 2960 MASTR III/V CAB	1	\$ 69.88	\$ 62.89	10	\$ 69.88	\$ 62.89
100	UD-SW1B	SW,SYMPHONY PC APP & WIN 8 IMAGE	1	\$ 220.00	\$ 162.80	26	\$ 220.00	\$ 162.80
110	UD-SG1F	SOFTWARE,REMOTE BATON	1	\$ 110.00	\$ 81.40	26	\$ 110.00	\$ 81.40
120	UD-ZN4Z	CONSOLE, BUNDLE, PREMIER, WIN8.1	6	\$ 39,895.00	\$ 29,522.30	26	\$ 239,370.00	\$ 177,133.80
130	UD-SG4W	LICENSE,AES AND DES LEVEL ENCRYPTION	6	\$ 8,500.00	\$ 6,290.00	26	\$ 51,000.00	\$ 37,740.00
140	UD-SG4T	LICENSE,CONVENTIONAL CONTROLS	6	\$ 1,250.00	\$ 925.00	26	\$ 7,500.00	\$ 5,550.00
150	UD-SG4U	LICENSE,PAGING CAPABILITY	6	\$ 750.00	\$ 555.00	26	\$ 4,500.00	\$ 3,330.00
160	UD-SG4Y	LICENSE,REMOTE AUX I/O	6	\$ 750.00	\$ 555.00	26	\$ 4,500.00	\$ 3,330.00
170	UD-SH2L	LICENSE,MARKER TONE	6	\$ 450.00	\$ 333.00	26	\$ 2,700.00	\$ 1,998.00
180	UD-SH5B	LICENSE,BASE SIP,ADD TO ENT/PREM BUNDLE	6	\$ 2,000.00	\$ 1,480.00	26	\$ 12,000.00	\$ 8,880.00
190	UD-SH4W	LICENSE,SIP,ADD 4 EXTENSIONS,8 CALLS	6	\$ 1,500.00	\$ 1,110.00	26	\$ 9,000.00	\$ 6,660.00
200	UD-AB1A	SPEAKER, NANO, SYMPHONY	24	\$ 295.00	\$ 265.50	10	\$ 7,080.00	\$ 6,372.00
240	UD-CU8T	MONITOR, 24" CLASS, TOUCHSCREEN, HD	6	\$ 2,750.00	\$ 2,475.00	10	\$ 16,500.00	\$ 14,850.00
250	UD-AB1K	CABLE,DISPLAYPORT TO DVI-D,10FT	6	\$ 40.00	\$ 36.00	10	\$ 240.00	\$ 216.00
260	UD-AB1F	MOUSE, OPTICAL, USB, SCROLL WHEEL	6	\$ 15.00	\$ 13.50	10	\$ 90.00	\$ 81.00
270	UD-AB1G	KEYBOARD, 104 KEY, USB	6	\$ 185.00	\$ 166.50	10	\$ 1,110.00	\$ 999.00
280	UD-AB1E	DUAL FOOTSWITCH, USB, SYMPHONY	6	\$ 495.00	\$ 445.50	10	\$ 2,970.00	\$ 2,673.00
290	UD-AB1M	DESK MIC, DB9	6	\$ 245.00	\$ 220.50	10	\$ 1,470.00	\$ 1,323.00
300	UD-AB1B	JACK BOX, 6 WIRE	12	\$ 450.00	\$ 405.00	10	\$ 5,400.00	\$ 4,860.00
320	CM-022218-3006WJ	Adapter,6 Wire Jackbox to Headset	12	\$ 550.00	\$ 495.00	10	\$ 6,600.00	\$ 5,940.00
330	2C-CM22218-0604	Power Supply,Ext UPS,60 Hz	6	\$ 3,020.00	\$ -	100	\$ -	\$ -
340	2C-CM22218-0305	HEADSET, OVER-THE HEAD SOLID BOOM	12	\$ 280.00	\$ 252.00	10	\$ 3,360.00	\$ 3,024.00
350	CM-022218-001101	License,Vocoder	12	\$ 100.00	\$ 90.00	10	\$ 1,200.00	\$ 1,080.00
360	MM100UD	MANUAL,OP/INSTA/CONFIG,SYMPHONY,CD	6	\$ 25.00	\$ 18.50	26	\$ 150.00	\$ 111.00
<b>Subtotal: Symphony Consoles</b>							<b>\$ 405,290.90</b>	<b>\$ 311,793.80</b>
370	VSSD03	LICENSE,SUMS,ENDPOINT	6	\$ 85.00	\$ 76.50	10	\$ 510.00	\$ 459.00
380	VS-SG3T	LICENSE,HOST SECURITY,AV,EPO,QTY 26-50	6	\$ 123.84	\$ 111.46	10	\$ 743.04	\$ 668.76
390	NS-SG2F	LICENSE,NETWORK FIRST APPLICATION	1	\$ 10,000.00	\$ 7,400.00	26	\$ 10,000.00	\$ 7,400.00
400	NS-SG2B	LICENSE,CONSOLE	6	\$ 1,000.00	\$ 740.00	26	\$ 6,000.00	\$ 4,440.00
410	NS-SG2C	LICENSE,CONSOLE TALKPATH	72	\$ 250.00	\$ 185.00	26	\$ 18,000.00	\$ 13,320.00
420	NS-SG2G	LICENSE,NETWORK FIRST SITE	1	\$ 2,500.00	\$ 1,850.00	26	\$ 2,500.00	\$ 1,850.00
430	NS-SG2H	LICENSE,NETWORK FIRST TALKPATH	16	\$ 500.00	\$ 370.00	26	\$ 8,000.00	\$ 5,920.00
440	NS-SG7R	LICENSE,NSS,IP LOGGING RECORDER	2	\$ 2,100.00	\$ 1,554.00	26	\$ 4,200.00	\$ 3,108.00
450	NS-SG7S	LICENSE,NSS,IP LOGGING RECORDER TALKPATH	40	\$ 1,000.00	\$ 740.00	26	\$ 40,000.00	\$ 29,600.00
<b>Subtotal: LICENSES</b>							<b>\$ 89,953.04</b>	<b>\$ 66,765.76</b>

Item Number	Part Number	Description	Quantity	Unit List	Unit Sale	Discount %	Ext List	Ext Sale
460	XM-100F	Mobile,XG-100M,136-870MHz,Unencrypted	6	\$ 4,010.00	\$ 1,114.78	72.2	\$ 24,060.00	\$ 6,688.68
470	XMPL5K	FEATURE,P25 OTAP PROFILE	6	\$ 265.00	\$ 73.67	72.2	\$ 1,590.00	\$ 442.02
480	XMPL5L	Feature,OTAR	6	\$ 695.00	\$ 193.21	72.2	\$ 4,170.00	\$ 1,159.26
490	XMPL4E	FEATURE, CONVENTIONAL VOTE SCAN	6	\$ 240.00	\$ 66.72	72.2	\$ 1,440.00	\$ 400.32
500	XMPL4F	Feature,Phase II TDMA	6	\$ 250.00	\$ 69.50	72.2	\$ 1,500.00	\$ 417.00
510	XM-PL8Y	FEATURE, ENCRYPTION LITE	6	\$ 0.01	\$ -	72.2	\$ 0.06	\$ -
520	XMPL4C	Feature Package,P25 Encryption	6	\$ 695.00	\$ 193.21	72.2	\$ 4,170.00	\$ 1,159.26
530	XMPL3X	FEATURE, EDACS DATA	6	\$ 215.00	\$ -	100	\$ 1,290.00	\$ -
540	XMPRO	FEATURE, PROVOICE	6	\$ 250.00	\$ 69.50	72.2	\$ 1,500.00	\$ 417.00
550	XM-LLA	FEATURE, LINK LAYER AUTHENTICATION	6	\$ 100.00	\$ 27.80	72.2	\$ 600.00	\$ 166.80
560	XM-PKGP	FEATURE PACKAGE,P25 DATA	6	\$ 330.00	\$ -	100	\$ 1,980.00	\$ -
570	XM-P25ED	FEATURE PACKAGE,P25 TRUNKING & EDACS	6	\$ 2,000.00	\$ 556.00	72.2	\$ 12,000.00	\$ 3,336.00
580	XMZN8L	Desktop Station,CS-7000,Local/Remote	6	\$ 5,675.00	\$ 1,577.65	72.2	\$ 34,050.00	\$ 9,465.90
590	XMCP9G	Control Unit,CH721,Scan,Front Mount	6	\$ 685.00	\$ 190.43	72.2	\$ 4,110.00	\$ 1,142.58
600	XMMA6P	Bracket Kit,Rack Mount,CS7000	6	\$ 160.00	\$ 44.48	72.2	\$ 960.00	\$ 266.88
610	MAMW-ZN9B	Remote Controller, SP721, Digital, CAN	6	\$ 2,140.00	\$ 594.92	72.2	\$ 12,840.00	\$ 3,569.52
620	MAMW-ZN9D	Cable,Can 90'	6	\$ 265.00	\$ 73.67	72.2	\$ 1,590.00	\$ 442.02
630	MAMW-ZN9F	Microphone,Desktop	6	\$ 195.00	\$ 54.21	72.2	\$ 1,170.00	\$ 325.26
640	14017-0104-01	CABLE,SYPHONY,BACKUP RADIO INTERFACE	6	\$ 95.00	\$ 70.30	26	\$ 570.00	\$ 421.80
650	CA-013671-020	Cable,Serial Data,20 ft	6	\$ 185.00	\$ 51.43	72.2	\$ 1,110.00	\$ 308.58
<b>Subtotal: Control Stations</b>							<b>\$ 110,700.06</b>	<b>\$ 30,128.88</b>
660	CA-015466-001	Cable,Coaxial,1/2in Superflex	900	\$ 2.75	\$ 0.76	72.2	\$ 2,475.00	\$ 684.00
670	XMAN6J	Antenna,Flex,Multi-Band,136-870MHz 0dB	6	\$ 225.00	\$ 62.55	72.2	\$ 1,350.00	\$ 375.30
680	NM-SCF12-070	Connector,Rapid Fit,SCF12-50 NM	6	\$ 40.00	\$ 11.12	72.2	\$ 240.00	\$ 66.72
690	CN-014877-001	Connector,N Female,For 1/2in Coax	6	\$ 30.00	\$ 8.34	72.2	\$ 180.00	\$ 50.04
700	KT-014860-001	Kit,Cable Boot,4 in,3 Holes,1/2 in Cable	2	\$ 55.00	\$ 15.29	72.2	\$ 110.00	\$ 30.58
710	KT-018357-002	Kit,Grounding For 1/2in Coaxial	12	\$ 20.00	\$ 5.56	72.2	\$ 240.00	\$ 66.72
720	KT-014875-001	Kit,Hanger,1/2 in Cable	12	\$ 30.00	\$ 8.34	72.2	\$ 360.00	\$ 100.08
730	MBCN (MISC-MTRL-PO-REF)	Base Station Adapter/Mobile	6	\$ 31.61	\$ 31.61	0	\$ 189.66	\$ 189.66
740	IS-B50LN-C2-MA (MISC-MTRL-PO-REF)	125-1000MHz Bulkhead Arrestor	6	\$ 71.85	\$ 71.85	0	\$ 431.10	\$ 431.10
750	416179 (MISC-MTRL-PO-REF)	Rohn Products LLC - 4" Clearance Wall Mount	6	\$ 29.98	\$ 29.98	0	\$ 179.88	\$ 179.88
760	88229 (MISC-MTRL-PO-REF)	Rohn Products LLC - 1-1/4" OD x 60" 16 Gauge Pre-Galvanized Mast	6	\$ 18.61	\$ 18.61	0	\$ 111.66	\$ 111.66
<b>Subtotal: Control Station Antennas</b>							<b>\$ 5,867.30</b>	<b>\$ 2,285.74</b>
770	MANG-GTWY	System Equipment,Interop Gateway	1	\$ 3,200.00	\$ 2,368.00	26	\$ 3,200.00	\$ 2,368.00
780	MANG-SN5M	SERVICE,QUAD MODE VOCODER LICENSE	16	\$ 30.00	\$ 22.20	26	\$ 480.00	\$ 355.20
940	MANG-NSN6N	License,DVU OTAR	16	\$ 1,000.00	\$ 740.00	26	\$ 16,000.00	\$ 11,840.00
1100	MANG-4DVUS	Chassis,4-Slot Interoperability Gateway	1	\$ 15,750.00	\$ 11,655.00	26	\$ 15,750.00	\$ 11,655.00
1110	MANG-NMN2U	Bracket Kit, Interoperability Gateway	1	\$ 82.00	\$ 60.68	26	\$ 82.00	\$ 60.68
1120	MANG-NPS2J	Power Supply,AC,4-Slot Gateway Chassis	2	\$ 2,050.00	\$ 1,517.00	26	\$ 4,100.00	\$ 3,034.00
1140	MANG-NAA3E	Module,DVU,UAC,Interoperability Gateway	2	\$ 11,500.00	\$ 8,510.00	26	\$ 23,000.00	\$ 17,020.00
1160	MANG-NCL8S	Cable,Ethernet,6ft	4	\$ 27.00	\$ 19.98	26	\$ 108.00	\$ 79.92
1200	MANG-NCA3L	Cable,Audio,4-Slot Chassis GWB,10ft	16	\$ 49.00	\$ 36.26	26	\$ 784.00	\$ 580.16
1360	MANG-MN2A	Panel,Filler	2	\$ 155.00	\$ 114.70	26	\$ 310.00	\$ 229.40
1380	MANG-NFW2C	SOFTWARE,UAC GWB,AES	1	\$ 495.00	\$ 366.30	26	\$ 495.00	\$ 366.30
<b>Subtotal: Interop Gateway</b>							<b>\$ 64,309.00</b>	<b>\$ 47,588.66</b>

Company Confidential

# Carson City Dispatch Equipment

Services to be provided through Service Agreement Number P697-16-016 between Harris Corporation and Nevada of Department of Transportation dated 9/13/2018 at no cost to Carson City.

Item Number	Part Number	Description	Ext List	Ext Sale
10	N/A	Installation and Programming		No Charge
20	N/A	Engineering		No Charge
30	N/A	Proj Mgmt		No Charge
40	N/A	Maintenance/Extended Warranty - Year 2		No Charge
50	N/A	Software Managed Service/Priority TAC - Year 1		No Charge
60	N/A	Software Managed Service/Priority TAC - Year 2		No Charge
70	N/A	Training - Console Configuration - On-site Two day class		No Charge
80	N/A	Training - Console Operator - On-site three day class (Six 4 hour sessions)		No Charge
90	N/A	Training - Web Based (unlimited access to web-based course for 10 students)		No Charge
100	N/A	Training - Web-Based (one-year unlimited access for two System Administrators/Managers)		No Charge
110	N/A	Training – NetworkFirst Operation & Administration (three-day on-site course for up to ten students)		No Charge
120	N/A	Removal of old equipment included in Install and Programming Price		No Charge
<b>Total</b>			<b>\$ 676,120.30</b>	<b>\$ 458,562.84</b>

Company Confidential

## Pricing Assumptions

The pricing provided is based on the following assumptions:

- Installing six Symphony consoles
- The existing T1 backhaul connectivity will be replaced with an Ethernet connection to support the proposed equipment
- The consoles have been configured to connect to the existing P25 VIDA switches.
- Each backup control station will have its own multi-band antenna installed on the roof top of the dispatch facility building.
- The control station transmission line length for antenna installation is between 125 feet to 150 feet.
- No hazardous material will be found at the sites.
- Site access roads are adequate for the delivery trucks that will travel to site.
- No prevailing wages, mandatory union workers, or mandatory minority business are required for the project.
- All work is priced based on normal working hours, 7:30 AM to 5:00 PM.
  
- At existing dispatch location, Carson City Public Works will:
  - Provide adequate desk space for the new consoles
  - Provide adequate electrical power and receptacles for the console equipment



## Depot Repair, Onsite Corrective Maintenance, and 24x7 Response on Harris Infrastructure

This SOW is subject to the Agreement Terms and Conditions to which it is attached. The Services under this SOW are for the Equipment listed in the attached Equipment List.

### Depot Repair and Return Harris Infrastructure

#### 1.0 Harris Responsibilities:

- 1.1 Provide a Return Material Authorization (“RMA”) within two (2) business days from the date of receipt of Customer’s request.
- 1.2 Depot Repair and Return receipt and inspection.
  - 1.2.1 Receive Infrastructure Equipment from Customer.
  - 1.2.2 Verify against Customer submitted RMA.
  - 1.2.3 Perform a visual inspection.
  - 1.2.4 Perform an operational check to determine the nature of the problem and repairs required.
- 1.3 Standard Repair
  - 1.3.1 Schedule the standard repairs to be made to the Equipment.
  - 1.3.2 Make the required repairs and test the functionality of the repaired Equipment.
  - 1.3.3 Package, ship, and return the repaired Equipment to Customer at Harris expense.
  - 1.3.4 Provide a Summary Report, per repair as exemplified below, or another format as determined by Harris:

Repair Order	Date	Problem	Resolution	Resolution Date
123456	7/4/2017	No card communication.	Corrupt software. Reloaded. Passed communication tests.	7/4/2017

- 1.4 Standard Third-Party Original Equipment Manufacturer (“OEM”) Equipment
  - 1.4.1 Provide proper method for processing RMA against third party Equipment.
  - 1.4.2 Track Equipment sent to the OEM.
  - 1.4.3 Provide status updates to Customer.
  - 1.4.4 Package, ship, and return the repaired Equipment to Customer at Harris expense.
- 1.5 Non-standard Repair
  - 1.5.1 Harris may determine, in its sole discretion, that the repair of Equipment is not within the scope of Services of this SOW due to:
    - 1.5.1.1 The unavailability of parts does not apply during warranty).
    - 1.5.1.2 Equipment or part obsolescence (does not apply during warranty).
    - 1.5.1.3 Extraordinary physical and other damages.
    - 1.5.1.4 Equipment misuse, mishandling, improper storage, unauthorized Equipment modifications, detrimental exposure, or involvement in an accident (including without limitation liquid intrusions), Acts of God, including, without limitation, lightning damages.
    - 1.5.1.5 Uneconomical cost to repair Equipment (does not apply during warranty).
  - 1.5.2 If Harris determines, for the reasons set forth above, that the Equipment is not within the scope of Services of this SOW, Harris shall either:
    - 1.5.2.1 Determine and provide to Customer an estimate of all additional charges required to perform repairs on the Equipment; or
    - 1.5.2.2 Determine and provide to Customer an estimate of all additional charges for replacement equipment.
  - 1.5.3 If Customer approves the additional charges, the repaired or replacement

Equipment shall be shipped to Customer.

- 1.5.4 If Customer disapproves the additional charges, Harris will charge a Diagnostic Fee and return the unrepaired Equipment to Customer.

#### 1.6 Schedule

- 1.6.1 Standard Repairs – The time for completion for standard repairs is approximately ten (10) business days from the date of receipt of the Equipment to the date of shipment of the repaired Equipment to Customer.
- 1.6.2 Standard Third-Party Original Equipment Manufacturer (“OEM”) Equipment Repairs- The time for completion for standard Third-Party OEM Equipment repairs is approximately thirty (30) business days from the date of receipt of the Equipment to the date of shipment of the repaired Equipment to Customer.
- 1.6.3 Non-standard Repairs –Non-standard repairs may take longer than standard repairs. Harris will notify Customer of any repairs that take longer than ten (10) business days.

#### 1.7 Return Shipments to Customer

- 1.7.1 Equipment shipments shall occur as the individual RMA Equipment is repaired.
- 1.7.2 Multiple Equipment listed on a single RMA shall be shipped together to Customer if complete shipment is specifically requested by Customer.
- 1.7.3 Harris will properly pack outbound shipments and bears the responsibility for damage that occurs prior to delivery to Customer.

#### 1.8 Depot Repair Warranty

- 1.8.1 Harris warrants that Equipment specifically repaired by Harris Depot shall be free from defects in materials and workmanship for a period of ninety (90) days from the date it is shipped back to Customer. If any repaired Equipment fails to meet the foregoing warranty, Harris at its option and expense (including the cost of any associated shipping) will correct the failure by (i) repairing any defective or failed part or parts thereof, or (ii) replacing the failed Equipment with an equivalent new or refurbished Equipment, or (iii) provide an equitable adjustment. The remedies under this Warranty section are Customer’s sole remedies for any breach of warranty claims based upon defects in the equipment, whether the claim is in contract, warranty, tort (including negligence), and strict liability or otherwise, and however instituted. The foregoing warranties are exclusive and in lieu of all other warranties for the repairs, whether oral, written, expressed, implied or statutory. **NO IMPLIED OR STATUTORY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY.**

#### 1.9 Harris Corrective Maintenance Responsibilities for Depot SOW

- 1.9.1 Request RMA using Harris provided process.
- 1.9.2 Follow the current RMA instructions, which may require Harris to include a copy of the RMA form inside the box, with clearly displayed RMA number on the outside of the box containing the Equipment being returned.
- 1.9.3 Pack Equipment adequately to prevent damages during transit.
- 1.9.4 Ship, at Harris expense, the Equipment listed in the RMA either to Harris’ Depot Repair and Return or another mutually agreed facility.
- 1.9.5 If Harris technician wants multiple items listed on a single RMA to be returned together, Harris technician shall request complete shipment.

#### 2.0 Customer Responsibilities:

- 2.1 Approve or disapprove additional charges within five (5) business days.
- 2.2 Pay a Diagnostic Fee if Customer disapproves the additional charges.
- 2.3 Contact Harris and arrange for advanced replacement at additional cost if the schedule is unacceptable.

- 2.4 Perform preventive maintenance, hardware, and software updates as recommended in the Equipment manuals.

## Onsite Corrective Maintenance with Dispatch Harris Infrastructure

### 1.0 Harris Responsibilities:

#### 1.1 For Harris and Third Party Equipment:

##### 1.1.1 On-Site Troubleshooting:

- 1.1.1.1 Dispatching Harris personnel to investigate problem at Customer’s location after remote diagnostics are made.
- 1.1.1.2 Perform pre-diagnostics to confirm malfunction.

##### 1.1.2 Repair or replacement of failed Equipment per Harris determination:

- 1.1.2.1 If repairable, repair and perform testing to verify proper operation.
- 1.1.2.2 If replaceable, replace with Customer purchased Spare Part and perform testing to verify proper operation.

##### 1.1.3 Shipment of failed Equipment to Harris or Third Party Depot Repair and Return (“Depot”) for repair:

- 1.1.3.1 Obtain a Return Material Authorization (“RMA”) from the applicable Harris or Third Party repair center.
- 1.1.3.2 Ship (at Harris’ expense) Equipment to the Depot.
- 1.1.3.3 Manage and track repair status through the Depot process.
- 1.1.3.4 Receive and bench diagnose (where possible) repaired Equipment to meet original specifications.

##### 1.1.4 Return of repaired Equipment:

- 1.1.4.1 Return repaired Equipment to original Customer location, install, and perform testing to verify proper operation.
- 1.1.4.2 If a Spare Part was used, return the repaired Equipment to the Spare Parts inventory.

### 2.0 Other Harris Responsibilities:

- 2.1 Purchase the replacement of the failed Equipment when not repairable.
- 2.2 Provide Customer with a Summary Report as part of a monthly reporting cycle as exemplified below, or another format as determined by Harris:

WO No.	Date	Problem	Resolution	Resolution Date
123456	7/4/2017	Router failed ping test at Ravens Rock.	Reset. Passed Ping.	7/4/2017

- 2.3 Provide quote to Customer for Demand Services repairs, if applicable.
- 2.4 Provide for repaired and returned equipment (i) a ninety (90) days warranty, or (ii) the remainder of the original warranty, or (iii) the third party warranty, whichever is greater.
- 2.5 Trained, experienced, and qualified technicians to provide Services on the Equipment.
- 2.6 Technicians will be equipped with the required tools, test, network, and computer equipment needed to troubleshoot and repair the Equipment. Test equipment requiring annual calibration will have affixed at all times, calibration stickers showing the expiration date of the calibration or the date next calibration is due.

### 3.0 Customer Responsibilities:

- 3.1 Provide Harris with a single point of contact for issues to which Harris responds.

- 3.2 Customer users experiencing an issue will notify Customer's single point of contact for issues. Customer's single point of contact will contact Harris.
- 3.3 Provide Harris unlimited, safe, physical and remote access to Customer sites and equipment to support delivery of service.
- 3.4 Notify Harris when there is any activity that impacts the system, Equipment, or Services.
- 3.5 Perform hardware and software updates as recommended in the Equipment manuals.
- 3.6 Within five (5) business days from receipt of Demand Services quote, approve additional charges for Demand Services repairs or disapprove Demand Services repairs and pay the diagnostic fee of the repair facility used.
- 3.7 Maintain Spare Parts in an environmentally controlled and easily accessible location.
- 3.8 Supply sufficient Spare Parts for Harris to provide Services.
- 3.9 In the event, Customer does not maintain sufficient Spare Parts to replace the failed Equipment while the failed Equipment is under repair and Customer desires a more rapid repair, Customer is to provide Harris a method to pay for expedited repair service or the procurement of an additional spare part.
- 3.10 Cooperate with Harris to provide the Services described in this SOW.

## 24x7x365, 30 Minute Response Harris Infrastructure

### 1.0 Harris Responsibilities:

- 1.1 Provide 24x7x365 on-call system technicians that are trained, experienced and qualified to provide Services on the Equipment.
- 1.2 Technicians will be equipped with the required tools, test, network, and computer equipment needed to troubleshoot and repair the Equipment. Test equipment requiring annual calibration will have affixed at all times, calibration stickers showing the expiration date of the calibration or the date next calibration is due.
- 1.3 Technicians will have transportation in good working order to reach the required locations.
- 1.4 On-call technician will receive notification of system issues by one of the following: System Notification, Self-Notification, or Customer Notification.
  - 1.4.1 System Notification: Equipment may directly, or through an alarm monitoring system, determine there is an active alarm that requires immediate attention and notifies a Harris technician. Harris technician will self-dispatch or will notify the on-call technician of the issue. Harris technician will notify Customer's single point of contact of the issue and will advise time of call initiation and estimated next steps to resolution.
  - 1.4.2 Self-Notification: Harris technician aware of an issue through use or other activities related to the Equipment will self-dispatch or will notify the on-call technician of the issue. Harris technician will notify Customer's single point of contact of the issue and will advise time of call initiation and estimated next steps to resolution.
  - 1.4.3 Customer Notification: Customer's single point of contact will contact Harris per the Escalation Plan and Response Matrix.

### 1.5 The Escalation Plan:

#### 1.5.1 Step 1

1.5.1.1 Technician: Customer's single point of contact will notify Harris on-call technician by placing a call to one of the following dependent on how local service personnel are notified:

1.5.1.1.1 Customer will call a defined local number that alerts the on-call technician via their cell phone or pager. The number that the Customer calls will remain constant and will be forwarded to the on-call technician. OR

- 1.5.1.1.2 Customer will call a defined local number for an answering service. The answering service will take Customer's name, number and reason for the call. The answering service will then contact the Harris on-call technician and will escalate until Harris personnel respond back to Customer.
- 1.5.1.2 If after ten (10) minutes the Harris on-call technician has not responded to the Customer's call, Customer will re-initiate the call to the Step 1 number again.
- 1.5.1.3 If after five (5) more minutes the Harris on-call technician has not responded to the Customer's call, Customer will proceed to Step 2.
- 1.5.2 Step 2
  - 1.5.2.1 Supervisor: Customer will call a designated phone number for the Supervisor.
  - 1.5.2.2 If after fifteen (15) minutes the Supervisor has not responded to the Customer's call, Customer will proceed to Step 3.
- 1.5.3 Step 3
  - 1.5.3.1 Regional Service Manager: Customer will call a designated phone number for the Regional Service Manager.
  - 1.5.3.2 If after fifteen (15) minutes the Regional Service Manager has not responded to Customer's call, Customer will proceed to Step 4.
- 1.5.4 Step 4
  - 1.5.4.1 National Service Manager: Customer will call a designated phone number for the National Service Manager.

1.6 Provide Customer with a Summary Report as part of a monthly reporting cycle as exemplified below, or another format as determined by Harris:

WO No.	Date	Problem	Resolution	Resolution Date
123456	7/4/2017	Router failed ping test at Ravens Rock.	Responded per escalation process.	7/4/2017

### 24x7x365 Response Matrix

SEVERITY LEVEL	TYPE OF EQUIPMENT	RESPONSE TIME
Severity Level 1 (Major Failures)	<ul style="list-style-type: none"> <li>➤ 25% of dispatching capability is inoperable</li> <li>➤ Any major alarm that is leading to an inoperable state of 25%.</li> </ul>	<u>24x7x365</u> Within thirty (30) minutes to remotely respond to the problem. Arrive on site the next business day, if necessary.
Severity Level 2 (Moderate Failures)	<ul style="list-style-type: none"> <li>➤ Moderate issues that prevent Customer's normal use of Equipment.</li> <li>➤ Individual dispatch console inoperable</li> </ul>	<u>24x7x365</u> Within thirty (30) minutes to remotely respond to the problem. Arrive on site the next business day, if necessary.

SEVERITY LEVEL	TYPE OF EQUIPMENT	RESPONSE TIME
Severity Level 3 (Non-Emergency)	<ul style="list-style-type: none"> <li>➤ Minor alarms that do not prevent or prohibit use of Equipment</li> <li>➤ Operational, parts, and configuration questions</li> <li>➤ Site environmental alarms</li> <li>➤ Intermittent problems being reviewed or monitored that are not resulting in a Severity Level 1 or Level 2 issue</li> <li>➤ Administrative issues</li> </ul>	<p><u>Next Business Day</u> Within the next business day, begin to remotely interrogate the problem and arrive on site the second business day, if necessary.</p>

2.0 Customer Responsibilities:

- 2.1 Provide Harris with a single point of contact to notify of issues to which Harris responds.
- 2.2 Customer users experiencing an issue will notify Customer’s single point of contact for issues. The Customer’s single point of contact will contact Harris per the Escalation Plan and Response Matrix.
- 2.3 Provide Harris unlimited, safe, physical and remote access to Customer sites and Equipment to support delivery of Services.
- 2.4 Provide the following information when initiating a service request:
  - 2.4.1 Severity Level as per the Response Matrix.
  - 2.4.2 Problem description and site location.
  - 2.4.3 Information regarding Group ID, Unit ID and functionality impacted.
  - 2.4.4 Provide contact information on user reporting issue, location of user reporting issue, and time experienced.
  - 2.4.5 Other pertinent information requested by Harris.
- 2.5 Notify Harris when there is any activity that impacts the system, Equipment or Services.
- 2.6 Cooperate with Harris and perform all efforts that are necessary to enable Harris to provide the Services to Customer.

3.0 Additional Conditions Regarding Site Access and Response Times:

- 3.1 On-site Response Times are based on the assumption that the site is accessible by normal transportation methods and vehicles. On-site Response Time requirements exclude site locations that require extensive drive time due to traffic conditions or site locations where specialized vehicles are required.
- 3.2 Customer is responsible to ensure that all necessary clearances, escorts, ID cards, network access requirements including custom software or security credentials, or other special requirements have been provided to Harris in advance to allow technicians prompt access to any Equipment requiring service that may be located in a secured or limited access area under Customer’s control.
- 3.3 Customer agrees to provide Harris an appropriate work environment and unlimited access, working space including heat, light ventilation, electric current and outlets, and local wireless and telephone access for the use of Harris' service personnel in the Equipment's physical location.
- 3.4 Customer shall be billed at Demand Services rates for time lost or changes due to any delay caused by Customer in the provision or execution of the Services.