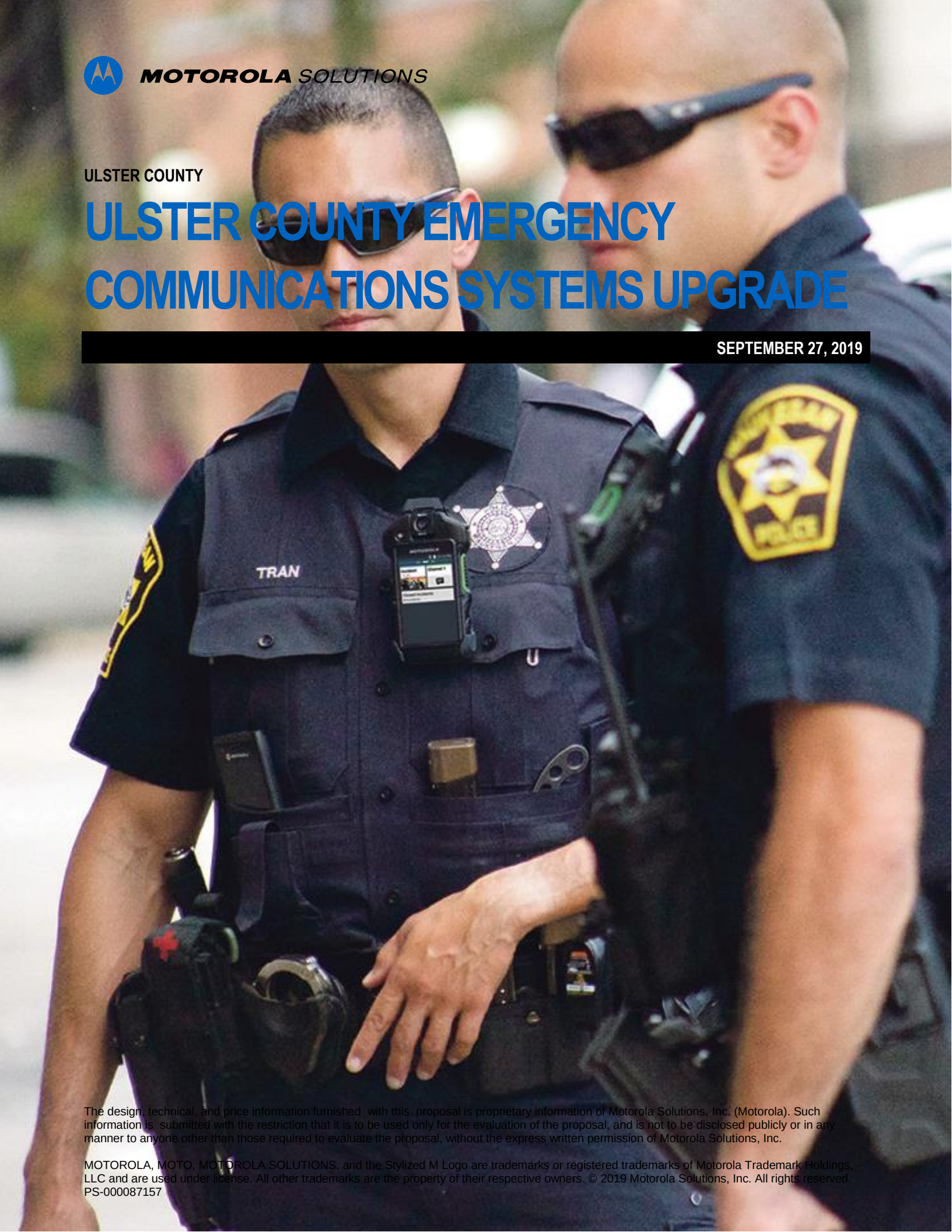
MOTOROLA SOLUTIONS

ULSTER COUNTY

ULSTER COUNTY EMERGENCY COMMUNICATIONS SYSTEMS UPGRADE

SEPTEMBER 27, 2019



PS-000087157

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September 27, 2019

Steven Peterson, Director
Ulster County Department of Emergency Services
238 Golden Hill Lane
Kingston, NY 12401

RE: Ulster County Emergency Communications

Dear Director Peterson:

Motorola Solutions, Inc. ("Motorola Solutions") is pleased to propose Ulster County with world-class communications solutions and equipment. The local Motorola Solutions' project team has taken great care to provide these solutions to meet your County's communications needs.

As this document indicates, Motorola Solutions is proposing to implement solutions including 12 positions of Vesta for 9-1-1 call handling with the geo-diverse option as well as 5 years of services ("Vesta Solution"), and 12 MCC7500 console positions, Nice Logging recorder, as well as a 10 site 2 channel VHF analog conventional radio system with 2000 mobile and portable radios ("Radio System").

The Proposal is subject to the following terms and conditions: (1) For the Radio System, the NYS-OGS Contract# PT 68722 will apply, and (2) for the Vesta Solution, the Communication System and Services Agreement will apply pending the NYS-OGS Contract award under Solicitation 23150. To the extent Motorola Solutions is awarded business under 23150, Motorola Solutions will negotiate with Ulster County in good faith to finalize an authorized user agreement under the state contract.

Any questions may be directed to your Motorola Solutions' Account Executive, Christopher Meyer at (518) 407-7131 or his email address at: christopher.meyer@motorolasolutions.com.

We thank you for the opportunity to furnish Ulster County with a proposal and "best in class" solutions, and the strengthening of our relationship with a successful project implementation. Our goal is to provide you with the best products and services available in the communications industry today.

Sincerely,

Roy Kirchner
MSSSI Vice President

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SECTION 1

RADIO SYSTEM

1.1 SYSTEM DESCRIPTION

1.1.1 Conventional Simulcast

A PLATFORM WITH UNPARALLELED FLEXIBILITY

Motorola Solutions, Inc. (Motorola Solutions) is pleased to present the Ulster County, NY (hereinafter Ulster) with an Analog IP Based Public Safety Land Mobile Radio System.

ASTRO® 25 is the most widely used Project 25; Mission-Critical communication network for public safety agencies in the U.S. Installed worldwide, ASTRO 25 solutions meets and exceeds requirements for day-to-day operations, as well as emergency response in the most demanding situations. ASTRO 25 is a wireless platform that combines uncompromising, real-world performance and the proven reliability of Motorola Solutions.

From single-site to nationwide deployments, ASTRO 25 is a flexible, modular network with advanced call processing capabilities designed to meet the needs of public safety. ASTRO 25 can adapt to accommodate additional users, increased geographic coverage, enhanced data applications, and connectivity to other networks—all to ensure an efficient and cost-effective solution for decades to come.

ASTRO 25 is optimized for the rigorous demands of public safety, providing reliable, always available communications. When an emergency involves multiple agencies, first responders can share voice and data communication among their teams. In addition, centralized command and control can deploy resources efficiently, maintain communication security, and track personnel effectively.

1.1.1.1 Basic System Configuration

The following proposal sections is intended to provide a general overview of the proposed VHF Analog simulcast system, console network and NYS Inter-Op design proposed for Ulster County NY.

The new VHF Analog conventional simulcast system will consist of one Simulcast cell; the Core and console equipment will be located at the Law Enforcement Center. The Prime Site equipment containing comparator network will also be located at the Kingston RF site.

The proposed Simulcast network consists of the following sites:

- Law Enforcement Center – Conventional Core with 12 Operator Console Positions. Management terminal, Voting display, NICE logger and conventional resources interface.
- Kingston – Prime Site Equipment consisting of 3-Channels Analog Simulcast system for Fire and Police, 3-GRV Comparators, network gear, GPS unit and antenna system. NYS Inter-Operational equipment to support VTAC11, VCALL10, UTAC41, UCALL40D, 7TAC56, 7CALL50D, 8TAC94 and 8CALL90D.
- Sams Point – RF Site Equipment consisting of 3-Channels Analog Simulcast system for Fire and Police with network gear, GPS unit and antenna system. NYS Inter-Operational equipment to support VTAC11, VCALL10, UTAC41, UCALL40D, 7TAC56, 7CALL50D, 8TAC94 and 8CALL90D.
- Overlook Mnt – RF Site Equipment consisting of 3-Channels Analog Simulcast system for Fire and Police with network gear, antenna system and GPS unit.
- Illinois – RF Site Equipment consisting of 3-Channels Analog Simulcast system for Fire and Police with network gear, antenna system and GPS unit.
- Belle Aire – RF Site Equipment consisting of 2-Channels Analog Simulcast system for Fire with network gear, antenna system and GPS unit.
- Shandaken – RF Site Equipment consisting of 2-Channels Analog Simulcast system for Fire with network gear, antenna system and GPS unit.
- Tonche – RF Site Equipment consisting of 2-Channels Analog Simulcast system for Fire with network gear, antenna system and GPS unit.
- Saugerties – RF Site Equipment consisting of 2-Channels Analog Simulcast system for Fire with network gear, antenna system and GPS unit.
- Suny Ulster – RF Site Equipment consisting of 2-Channels Analog Simulcast system for Fire with network gear, antenna system and GPS unit.
- Marlboro – RF Site Equipment consisting of 2-Channels Analog Simulcast system for Fire with network gear, antenna system and GPS unit.

It is important to mention that Motorola Solutions carefully reviewed the coverage with all the available sites that where offered. The 10-site constellation of Kingston, Sams Point, Overlook, Illinois, Belle Aire, Shandaken, Tonche, Saugerties, Suny Ulster and Marlboro meets the 95% painted area reliability coverage goal for a portable in swivel case with remote speaker microphone for in-street coverage.

The Motorola Solutions conventional simulcast system design included coverage simulations that Ulster County has reviewed. In addition, discussions with V-COMM Engineering will outline a concrete plan to assure the coverage simulations stayed within the licensed contours confirm the 10-site design for Ulster. The ERP's were chosen from the existing license and the coverage using all 10 simulcast sites stayed within the existing contours in order to meet the coverage goal.

The equipment for this new VHF Simulcast conventional system design requires Layer 3 IP Site connectivity to be Ulster County provided.

The Primary Dispatch Center will remain for the County, no changes or updates are included to the dispatch consoles and / or logging recorders.

Additionally, each radio site is equipped with 48 V DC batteries for 6-hour of continuous backup. The Law Enforcement Center and Core equipment will be backed-up by rack mounted UPS units provided.

Kingston and Sams Point will use 6 RF antennas total, three (3) for VHF, one (1) dual port for UHF and two (2) dual port for 7/800MHz system. Overlook and Illinois will use two (2) RF antennas and all other sites will use one (1) RF antenna.

Because Motorola Solutions' ASTRO 25 system is IP-based, the network does not depend on the frequency of the base stations. The same system platform can support systems in 700/800 MHz, UHF Range 1 or 2, and VHF high band; all bands could be supported simultaneously for different user groups and allow users full, transparent interoperability. Also the GTR stations and GRC Comparators can be flashed to operate in digital operation mode.

1.1.2 Conventional System Design

Voice communication is the basis of a conventional system. An analog conventional system simply rebroadcasts the user's analog voice out to the other subscribers, increasing the system's coverage area.

Conventional systems have several design considerations based on the customer's coverage and operational needs. Direct radio frequency (RF) communication – relying solely on the transmitter output power of a portable or mobile radio – is not always enough to successfully network a fleet of field radios throughout a system coverage area. When coverage is required over a large area or in a building, an infrastructure must be added to complete the network.

Conventional systems vary in both size and sophistication. Systems are often configured as single-site or multi-site depending on the coverage or "talk range" that is desired. A basic single site conventional system consists of a GTR 8000 repeater or base station. The system can be expanded to increase system wide coverage by adding equipment to make it a standalone multi-site, voting, simulcast or multicast system.

1.1.2.1 Architecture

1.1.2.1.1 Simulcast

When a wide geographical area requires communications throughout the system, simulcast provides a solution. Simulcast is the simultaneous broadcast of the same voice or message from multiple transmitter sites on the same frequency. Simulcast was developed by Motorola Solutions to meet the needs of users who were outgrowing their single-site radio systems. These systems provide consistent communications throughout a large city, metropolitan area, county, or even country.

Simulcast systems are a frequency efficient and user-friendly technique of providing wide-area coverage. Simulcast offers the following advantages:

- **Larger Coverage Area –** One radio site may not provide the coverage necessary for the application in question. Simulcast expands the coverage area by expanding the number of radio sites. A simulcast system delivers continuous coverage throughout a large geographic area.
- **Efficient Use of Frequencies –** Adding sites typically requires more frequencies. In a simulcast system, the same frequencies are reused at every site in the system. This makes very efficient use of the available spectrum.

- **Simple Radio Operation –** Field units must be easy to use. Because the simulcast architecture operates like a single-site system, operations are simplified and radios are easy to use.

1.1.2.2 Design Details

The proposed system will include two (2) dedicated VHF channels for Ulster FD and a single dedicated VHF channel for Ulster PD.

Connectivity to the Sam's Point Prime Site from each of the remote sites is through Ulster County provided layer 3 microwave backhaul.

The frequencies that will be present at all Ulster sites are below in **Table 1-1**:

Table 1-1: System Frequencies

Channel	Description	Base Station TX	Base Station RX	Type	Mode
1	Ulster FD	156.18	153.815	Analog	Narrowband Simulcast
2	Ulster FD	156.12	153.875	Analog	Narrowband Simulcast
3	Ulster PD	155.025	159.345	Analog	Narrowband Simulcast

1.1.2.2.1 Design Criteria

Using the advantages of simulcast technology, the Ulster system is designed to maximize radio performance throughout the intended coverage area. In this case, coverage must be limited to within the boundaries of Ulster to protect nearby co-channel operations.

The design criteria assumed the use of an on street APX portable radio with a Flex Whip antenna, speaker mic and belt clip with swivel case and a APX mobile with a ¼ wave Center Roof Mount antenna operating in an analog FM mode.

1.1.2.2.2 Linear Simulcast Sites

A simulcast land mobile radio system provides continuous coverage over a large geographic region using a single set of frequencies. Simulcast solutions extend a system's RF coverage, especially in areas where available frequencies are limited, and in areas where physical barriers (e.g., mountains and buildings) can cause reduced signal coverage.

Linear simulcast offers the following advantages:

- ***Improved Coverage*** – One radio site may not provide the coverage necessary for the application in question. Simulcast expands the coverage area by expanding the number of radio sites without adding additional frequencies.
- ***Efficient Use of Frequencies*** – Adding sites typically requires more frequencies. In a simulcast system, the same frequencies are used at every site in the system. This makes very efficient use of the available spectrum.

- ***Simplified Radio Operations*** – Because the simulcast architecture operates like a single-site system, operations are simplified and radios are easy to use.

1.1.2.2.3 Prime Site

The prime site acts as a control and digitized audio center for the simulcast subsystem. Audio is routed to the prime site from each simulcast remote site. To ensure that the best audio from the simulcast receivers is processed, a voting comparator selects the best signal. The TRAK GPS units are responsible for timing and use a GPS signal to train their oscillators and therefore do not typically require maintenance, such as adjustment of the oscillators.

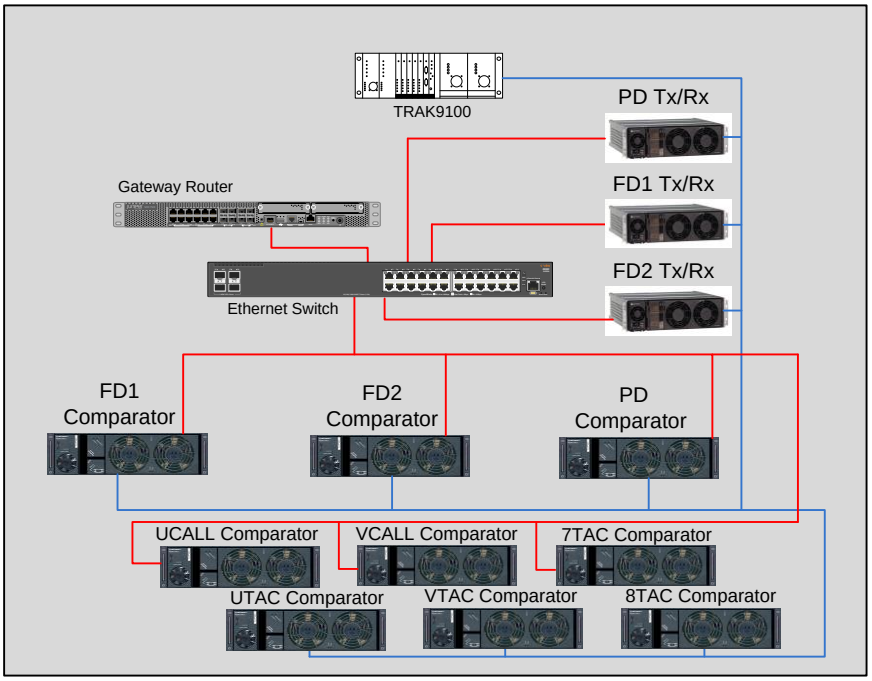


Figure 1-1: Basic Diagram of Ulster Analog Simulcast Prime Site

1.1.2.2.4 Remote Site

The RF transmitters and receivers are located at the simulcast remote sites. These sites simultaneously transmit identical information from each site to the radios. The receivers at these sites receive the audio from the user radios, and pass the audio back to the prime site for voting. Audio and site control comes from the prime and master sites. Equipment at a simulcast remote site includes simulcast base radios, fault management equipment, antenna systems, and networking equipment to interface to the prime site.

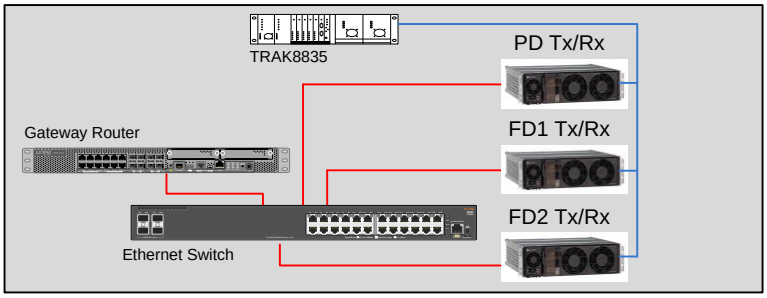


Figure 1-2: Basic Diagram of Ulster Analog Simulcast Remote Site with FD & PD Chanels

1.1.2.2.5 Provided Equipment

This section is intended to provide a general overview of the simulcast system equipment proposed for the Ulster simulcast project.

Law Enforcement Center – Master and Dispatch Center

The Master Site equipment will operate on AC power with rack mounted UPS units provided. The list of equipment for the Law Enforcement Center includes:

- Two (2) GCP Controllers.
- Two (2) LAN Switch.
- Two (2) Site Gateway.
- Two (2) Backhaul Switch.
- One (1) Voting Display Server.
- One (1) NIR NICE Logging Recorder.
- One (1) Configuration Manager PC.
- Four (4) Console Site Gateways.
- Four (4) Console LAN Switches.
- Eight (8) Conventional Channel Gateways (CCGW).
- Four (4) Racked Mounted UPS units.

The 10-RF sites equipment will operate solely on DC power; the AC only equipment such as the LAN Switches will be powered through an inverter. The list of equipment for the RF sites includes:

Kingston Prime & RF Site with Inter-Op

- Nine (9) GRV 8000 Comparators.
- One (1) LAN Switch for RF Site.
- One (1) Site Gateway.
- One (1) TRAK 9100 GPS Unit.
- Nine (9) GTR 8000 Repeaters.
- Two (2) APX Consolettes for 7/800MHz Inter-Op.
- One (1) SDM3000 RTU.
- Three (3) VHF Antennas with lines and connectors.
- One (1) UHF Dual Port Antenna with lines and connectors.
- Two (2) 7/800 Dual Port Antennas with lines and connectors
- One (1) 48 VDC Backup Power Equipment.

Sam's Point & RF Site with Inter-Op

- One (1) LAN Switch for RF Site.
- One (1) Site Gateway.
- One (1) TRAK 8835 GPS Unit.
- Nine (9) GTR 8000 Repeaters.
- Two (2) APX Consolettes for 7/800MHz Inter-Op.
- One (1) SDM3000 RTU.
- Three (3) VHF Antennas with lines and connectors.
- One (1) UHF Dual Port Antenna with lines and connectors.
- Two (2) 7/800 Dual Port Antennas with lines and connectors
- One (1) 48 VDC Backup Power Equipment.

Overlook – RF Site with FD1, FD2 and PD

- One (1) LAN Switch for RF Site.
- One (1) Site Gateway.
- One (1) TRAK 8835 GPS Unit.
- Three (3) GTR 8000 Repeaters.
- One (1) SDM3000 RTU.
- Two (2) VHF Antennas with lines and connectors.
- One (1) 48 VDC Backup Power Equipment.

Illinois – RF Site with FD1, FD2 and PD

- One (1) LAN Switch for RF Site.
- One (1) Site Gateway.
- One (1) TRAK 8835 GPS Unit.
- Three (3) GTR 8000 Repeaters.
- One (1) SDM3000 RTU.
- Two (2) VHF Antennas with lines and connectors.
- One (1) 48 VDC Backup Power Equipment.

Bell Aire – RF Site with FD1 and FD2

- One (1) LAN Switch for RF Site.
- One (1) Site Gateway.
- One (1) TRAK 8835 GPS Unit.
- Two (2) GTR 8000 Repeaters.
- One (1) SDM3000 RTU.
- One (1) VHF Antenna with lines and connectors.

Shandaken – RF Site with FD1 and FD2

- One (1) LAN Switch for RF Site.
- One (1) Site Gateway.
- One (1) TRAK 8835 GPS Unit.
- Two (2) GTR 8000 Repeaters.
- One (1) SDM3000 RTU.
- One (1) VHF Antenna with lines and connectors.

Tonche – RF Site with FD1 and FD2

- One (1) LAN Switch for RF Site.
- One (1) Site Gateway.

- One (1) TRAK 8835 GPS Unit.
- Two (2) GTR 8000 Repeaters.
- One (1) SDM3000 RTU.
- One (1) VHF Antenna with lines and connectors.

Saugerties – RF Site with FD1 and FD2

- One (1) LAN Switch for RF Site.
- One (1) Site Gateway.
- One (1) TRAK 8835 GPS Unit.
- Two (2) GTR 8000 Repeaters.
- One (1) SDM3000 RTU.
- One (1) VHF Antenna with lines and connectors.

Suny Ulster – RF Site with FD1 and FD2

- One (1) LAN Switch for RF Site.
- One (1) Site Gateway.
- One (1) TRAK 8835 GPS Unit.
- Two (2) GTR 8000 Repeaters.
- One (1) SDM3000 RTU.
- One (1) VHF Antenna with lines and connectors.

Marlboro – RF Site with FD1 and FD2

- One (1) LAN Switch for RF Site.
- One (1) Site Gateway.
- One (1) TRAK 8835 GPS Unit.
- Two (2) GTR 8000 Repeaters.
- One (1) SDM3000 RTU.
- One (1) VHF Antenna with lines and connectors.

1.1.3 VHF System Requirements for fire & police

Motorola Solutions' proposed solution for Ulster is our ASTRO 25 platform, the foundation of the Mission-Critical portfolio. ASTRO offers a Project 25, standards-based Internet Protocol (IP) modular solution, providing your first responders with:

- ***Interoperability*** – ASTRO 25 is compliant with APCO Project 25 standards, offering seamless interoperability with other compliant systems and radios, putting the highest level of interoperability in the end-users' hands.
- ***Reliability*** – Pre-release software and upgrade testing, third-party hardware and software certification process, fault-tolerant architecture with multiple fallback modes, multiple levels of redundancy, and real-time network and security monitoring provide Mission-Critical reliability.
- ***Enhanced Productivity*** – Easy and intuitive interfaces to critical, real-time information is delivered to users when and where they need it.

- ***Flexibility*** – Scalable, flexible design allows ASTRO 25 to dynamically adapt to the operational demands of any size organization. The IP-based design supports a unique mix of voice, data, and geographical requirements, permitting easy system enhancements as the users' needs evolve.
- ***Cost Savings*** – ASTRO 25 reduces costs by integrating your voice and data needs into a single solution.

1.1.4 Conventional System Components

The system designed for the Ulster County, NY consists of the following major components:

- GRV 8000 Comparators.
- GTR 8000 Transceiver.
- TRAK GPS and Frequency Standard.

This section of the system description contains descriptions of these components.

1.1.4.1 GRV 8000 Comparator

Figure 1-4: GCM Comparator Front View

The GRV 8000 is compatible with MCC 7500 dispatch consoles and ASTRO 25 core. This comparator is an IP based device that can processes analog audio using G.711 protocol to/from other networked components. The comparator receives analog audio in the form of IP packets containing the sampled analog audio and a Signal Quality Metric (SQM) associated with the voice, and votes on the best SQM. The GRV 8000 supports 'continuous voting' and 'vote and hold' voting algorithms.

The following parameters are supported:

- Voting Sample period (5-10000 ms, default 50 ms).
  - Interval over which analog signal quality is averaged.
- First vote hold time (5-10000 ms, default 250 ms).
  - Duration comparator waits before allowing the voted receiver to switch after the initial vote (used to avoid corrupting MDC preamble).
- Voting hold time (5-10000 ms, default 250 ms).
  - Duration comparator waits before allowing the voted receiver to switch after it has been selected as the voted receiver.
- Voting hysteresis (0.0-12.0 dB, default 1.0 dB).
  - Amount of signal quality improvement needed before voted receiver can change.
- Signal quality debounce time (5-10000 ms, default 150 ms).

- Amount of time the signal quality must be better before the voted receiver can change.

1.1.4.2 GTR 8000 Base Radio

The conventional GTR 8000 Base Radio provides the interface between mobile/subscriber radios that access the system on the APCO 25 FDMA Common Air Interface and the rest of the ASTRO 25 Conventional system. It can transmit and receive over the air in the 700/800 MHz, UHF R1, UHF R2, and VHF frequency bands. The GTR 8000 Base Radio transmits using configurable Compatible 4-level Frequency Modulation (C4FM) or Linear Simulcast Modulation (LSM) and receives Compatible 4-level Frequency Modulation (C4FM) for traffic channel communications.

The conventional GTR 8000 Base Radio supports an IP interface to carry payload (i.e. voice, data, and signaling) and control information as well as centralized Network Management fault and configuration information. It can be deployed as follows:

- Conventional Only Site (single repeater/base station/control station/receiver).
- NM/Dispatch Site (single repeater/base station/control station/receiver).
- ISR Site (single repeater/base station/control station/receiver).
- Voting/Multicast/Simulcast prime site or remote subsite.
- Conventional Hub Site (Defined by the Distributed Conventional Configuration).
- BR Site (Defined by the Distributed Conventional Configuration).
- Conventional Conduit Hub Site (Defined by the Distributed Conventional Configuration).

The conventional GTR 8000 Base Radio hardware consists of four major FRUs: the transceiver, the power amplifier, the power supply and the fan module. When deployed in a standalone configuration without an external frequency reference, then a transceiver with a SAC module is required to provide an internal frequency reference. The SAC module provides the frequency reference stability to allow the GTR 8000 to be a standalone base station. If the GTR 8000 is to be used in a simulcast topology, then a time reference is also needed to generate the 1 PPS signal for launch time determination. The time reference signal is obtained from the external frequency reference or a separate time reference input obtained from a device such as the TRAK 9100 & 8835.

GTR 8000 Base Radios support ASTRO 25 (IVD) systems. The GTR 8000 Base Radio is available for IVD systems in 700/800 MHz, UHF (435-524 MHz), and VHF (136-174 MHz).

G-series site equipment products are very flexible and designed to support today's robust site designs. G-series site equipment products provide the flexibility to upgrade to future functionality through software downloads.

Figure 1-6: GTR 8000 Base Radio

The GTR 8000 Base Radio includes features such as:

- Multisite Linear Simulcast offers industry-leading radio coverage with fewer sites.
- IP-based simulcast operation.
- Compact and integrated hardware utilizing three rack unit chassis enables efficient use of site space.
- Software Defined Radio allows for upgrades to future functionality through software update.
- Modular software design coupled with the Software Download Manager simplifies future upgrades and routine servicing.
- Functionally separate modules - Field Replacement Units (FRU) - are hot-swappable allowing servicing and replacement without system down-time while minimizing channel down-time.
- Designed for ease of service including significantly reduced alignment servicing.
- No initial field alignment or servicing required for Multisite (simulcast) systems.
- Standard battery revert and charging on the GTR 8000 Base Radio eliminates the need for an uninterruptible power supply (UPS) in many installations.

1.1.4.3 GPS / Frequency Standard

The equipment used to synchronize an ASTRO 25 simulcast system is the TRAK is a Global Positioning Satellite (GPS)-based frequency and time reference unit. Its purpose is to provide stable and accurate network time. Trak 9100 will be installed at the Kingston Prime site and a TRAK 8835 will be installed at each of the other RF sites.

TRAK Site Reference (SSR) unit provides the following outputs to meet the network time and network transport synchronization requirement of the ASTRO 25 system:

- UTC time for the network time synchronization through the 10Base-T NTP.
- T1/E1signals for the network transport synchronization (framed, RS422, and TTL) through Telecommunication modules (when using T1 circuits).
- 1 Pulse Per Second time reference (1PPS).

The modules installed in the TRAK are as follows (Located at Kingston Prime):

- GPS receiver with Rubidium oscillator.
- GPS receiver with double ovenized oscillator.
- Two AC power supplies.
- One Telecommunications modules (TEL).
- Fault Sensing Unit (FSU) module.

- Digital Distribution Modules (DDM).

The TRAK 9100 SSR is configured for redundant operation in order to meet system availability requirements. The redundant configuration consists of one GPS Rubidium oscillator module as the main frequency reference, another GPS double ovenized oscillator module as standby reference unit, and two power supplies.

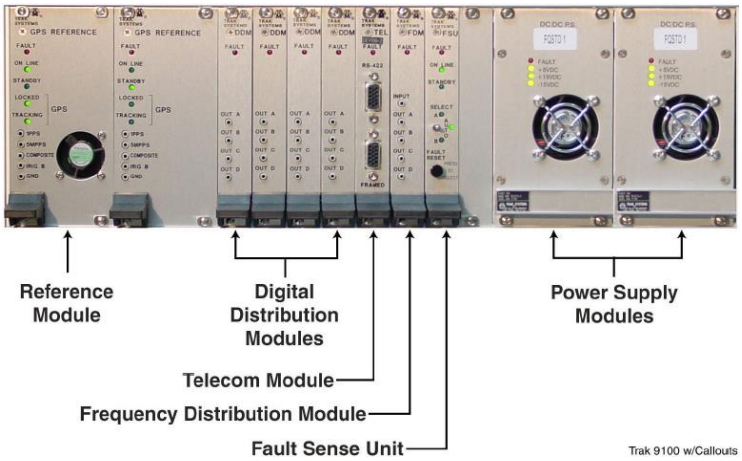


Figure 1-7: TRAK 9100

In a simulcast system, each remote site utilizes a Global Positioning Satellite (GPS) based reference standard, which includes both frequency and timing outputs. The GPS and Frequency Standards device in the simulcast system is the TRAK.

The TRAK provides a composite 1 pulse-per-second (pps) and 5 MHz frequency stability signal to the GTR 8000 and Comparators devices for simulcast transmission synchronization.

The TRAK 9100 is GPS disciplined, which provides time stamp information that is critical to setting precise transmission launch times in Simulcast.

The TRAK 8835 provides 1pps output, 10 MHz frequency reference, NTP server, and pulse rates.

1.1.5 Ethernet Critical Performance Requirements

With the implementation of the customer provided Microwave network and any future Ethernet backhaul if needed or required, there are additional jitter, latency, and packet loss constraints that need to be met to ensure fully functioning site links, as shown in **Table 1-**3 below.

Table 1-3: Backhaul Critical Performance Requirements

Parameter	Constraint
Latency	70 ms maximum, end-to-end
Jitter	20 ms Master to Prime 30 ms Prime to any RF site
Packet Loss	0.01%, end-to-end

At the Prime Site, all Remote RF links will terminate at the Prime Site's backhaul switches. The Remote site gateways provide the demarcation points for the Remote RF. The backhaul switches provide the demarcation points at the Prime site. Ethernet site links must be used between each site.

1.1.6 DC Systems

The power sub-systems have been sized to power the Motorola Solutions RF Infrastructure for six hours. Motorola Solutions has proposed the use of 100% direct current (DC) within all RF radio sites to power radio and other critical site equipment. At the Public Safety Building location, Motorola Solutions proposes the use of DC powered for the microwave equipment and Prime Site equipment. The equipment at the sites mentioned above will utilize battery backup as means to provide emergency power, should regular power service be disrupted. All equipment powered via DC will be supplied power through a rectifier from multiple 240 AC / 30 Amp circuits for each receiver.

1.1.7 Console

This proposal is in response to Ulster County's (hereinafter the County) request to add twelve new MCC 7500E Positions at the main dispatch center location tying into the new conventional core located at the Law Enforcement Center. Two (2) laptop based console operator positions has also been included for remote dispatching.

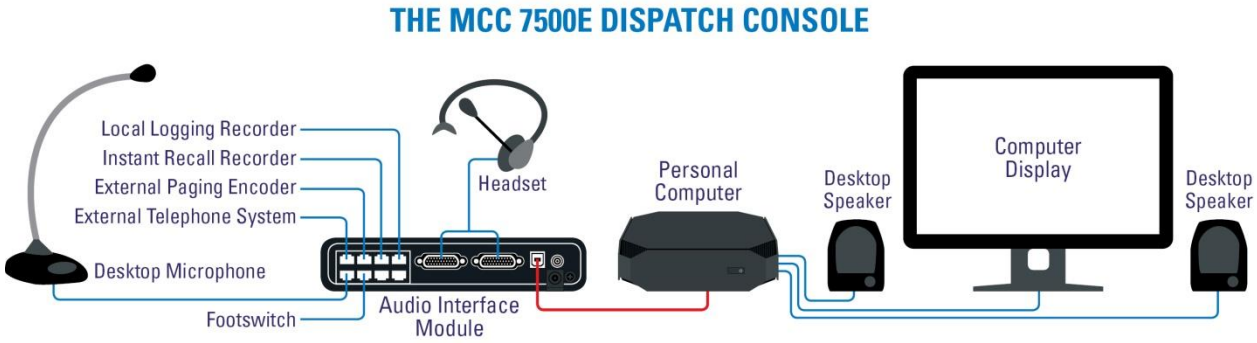


Figure 1-2: Motorola MCC 7500E Dispatch Console Hardware Architecture
Diagram is for illustration purposes only – see section 1.2 for list of components

Audio Interface Module (AIM)

The USB Audio Interface Module (AIM) acts as an interface between analog devices and the dispatch position and as a general purpose input/output module. The USB AIM supports audio routing between the dispatcher and Motorola Solutions standard peripherals. The USB AIM connects to the MCC 7500E dispatch position with a USB cable.

Personal Computer (PC)

The personal computer included with the dispatch position is Windows-based and certified by Motorola Solutions.

Computer Display

The dispatch position will use a 22” Computer Display Non-touch screen.

Desktop Speakers

Audio speakers have been included with each dispatch position and can be configured to transmit audio from a specific talkgroup or set of talkgroups. Each speaker is a self-contained unit, with individual volume controls, and can be placed on a desktop.

The two (2) speakers are intended for Select, Unselect, and Instant Recall Audio.

Headset Jack

The dispatch position supports up to two headset jacks, both push-to-talk (PTT) and non-PTT-enabled, for simultaneous use by the dispatcher and a supervisor. The headset jack contains two volume controls for the separate adjustment of received radio and telephone audio.

The proposal includes two (2) headset jacks per position.

Headset

The proposed headset consists of two elements. The headset base includes an audio amplifier, a Push-to-Talk switch, and a long cord that connects to the dispatch position. The headset top consists of the earpiece and microphone as well as a short cable that connects to the headset base.

One (1) Headsets have been included with this proposal along with 15ft headset base with PTT and single muff headsets per position.

Gooseneck Microphone

The microphone controls the dispatch position's general transmit and monitor features through two buttons on its base. The microphone can be fastened down or left loose. It can be used alone or in conjunction with a headset.

The gooseneck microphone hasn’t been included with this proposal. A USB microphone has been quoted instead.

Footswitch

Each dispatch position includes a dual pedal footswitch that controls general transmit and monitor functions.

1.1.8 NICE Recording

Motorola has included a NICE logging recorder solution for Ulster County. NICE Inform Recorder (NIR) logger with 48 analog channels to record up to 48 analog, 2-wire audio

Resources (mix of call taker phones/positions and analog radio). All resources to be recorded must be presented on a punch block within 30 cable feet of the rear of the recorder.

ANI/ALI for 9-1-1 calls will be delivered to the MOXA serial to IP converter before being connected to the recorder to allow the recorder to capture ANI/ALI call metadata for the recorded 9-1-1 calls.

The NIR Logger is deployed on the customer network or CEN and also hosts the Inform software.

Inform is licensed with the following applications:

- Reconstruction
- Monitor
- Verify

Inform client applications are run on customer-supplied workstations on the customer network.

The NIR Logger server has 2 x 2TB Hard Drives for extended on-line audio storage and also supports archiving of recordings to a networked storage device/location supplied by the customer. Unless otherwise stated by the customer prior to system installation, the retention of recordings wil be set to 1 year.

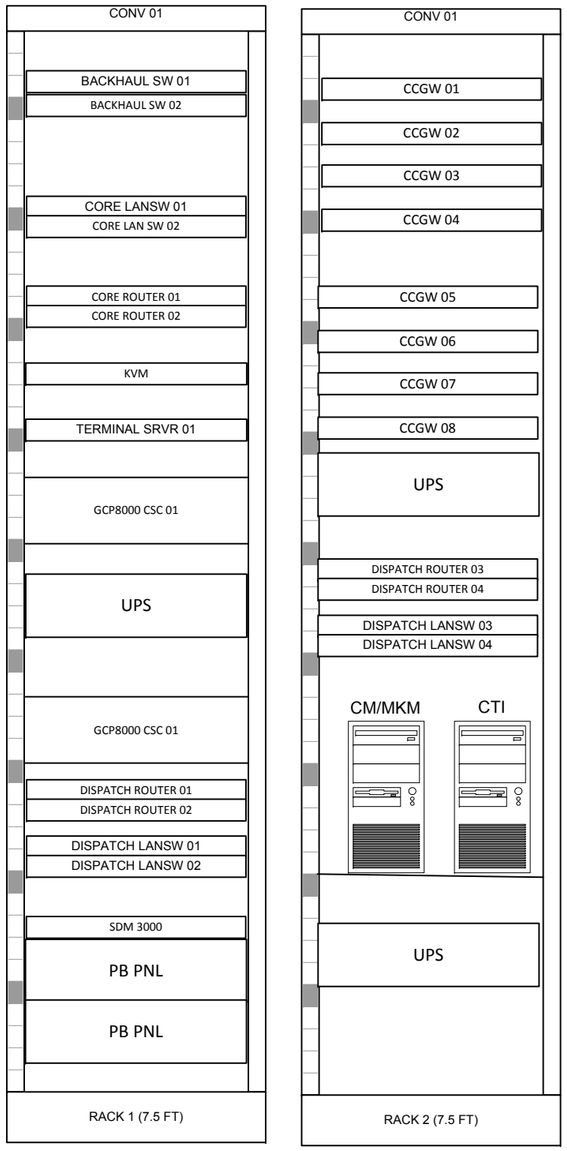
Castle Rock provides monitoring of the NIR Logger for SNMP traps for alarm notification. Castle Rock needs to be deployed on a customer-supplied workstation or server.

1.2 SYSTEM DIAGRAMS

The following pages include the drawings for the proposed system:

- System Block Drawings
- System Rack Drawings

Law Enforcement Center: Preliminary

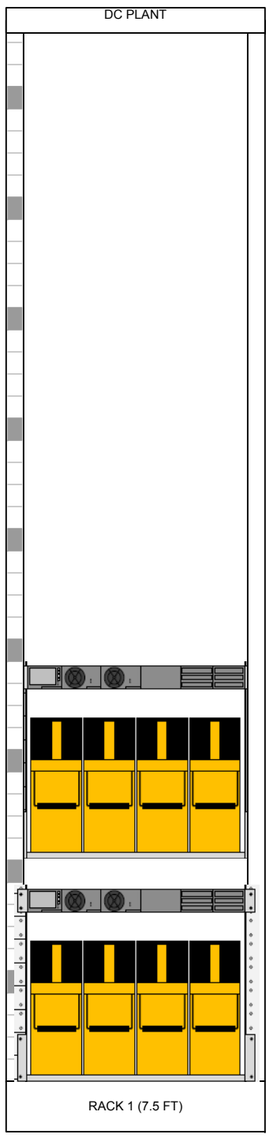


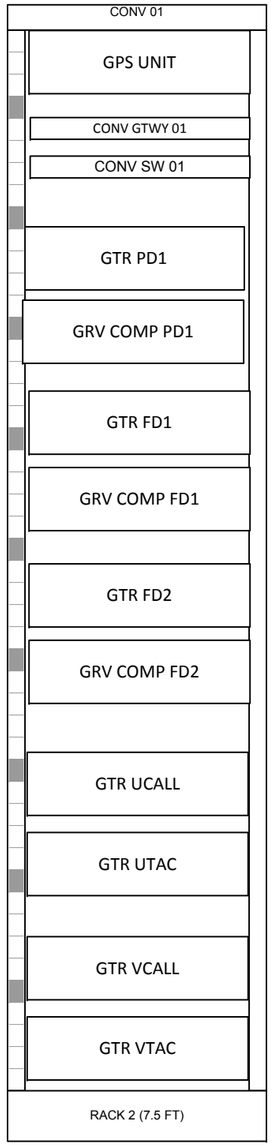
MOTOROLA

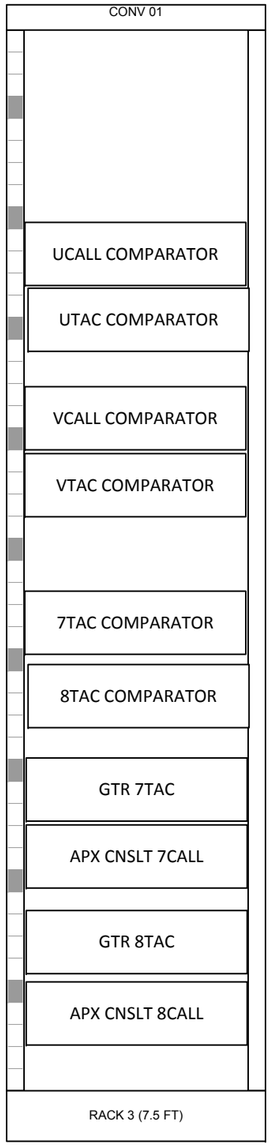
PROJECT:	ULSTER COUNTY NY
TITLE:	CORE AND DISPATCH
DESIGNED BY: F. PAULINO	DATE: 8/16/2019

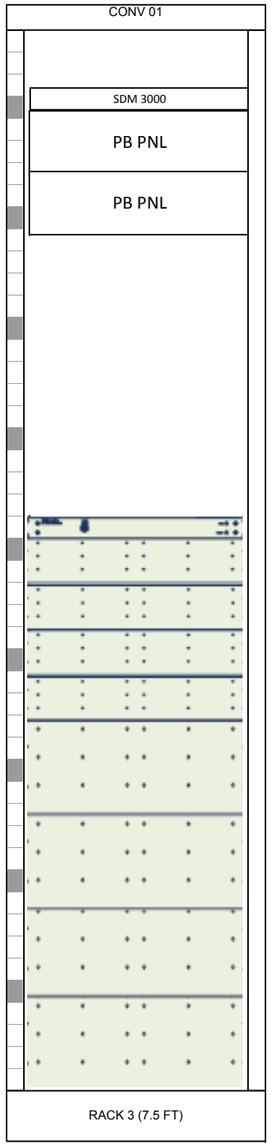
ORIGINAL DOCUMENT SIZE IS 11X17, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

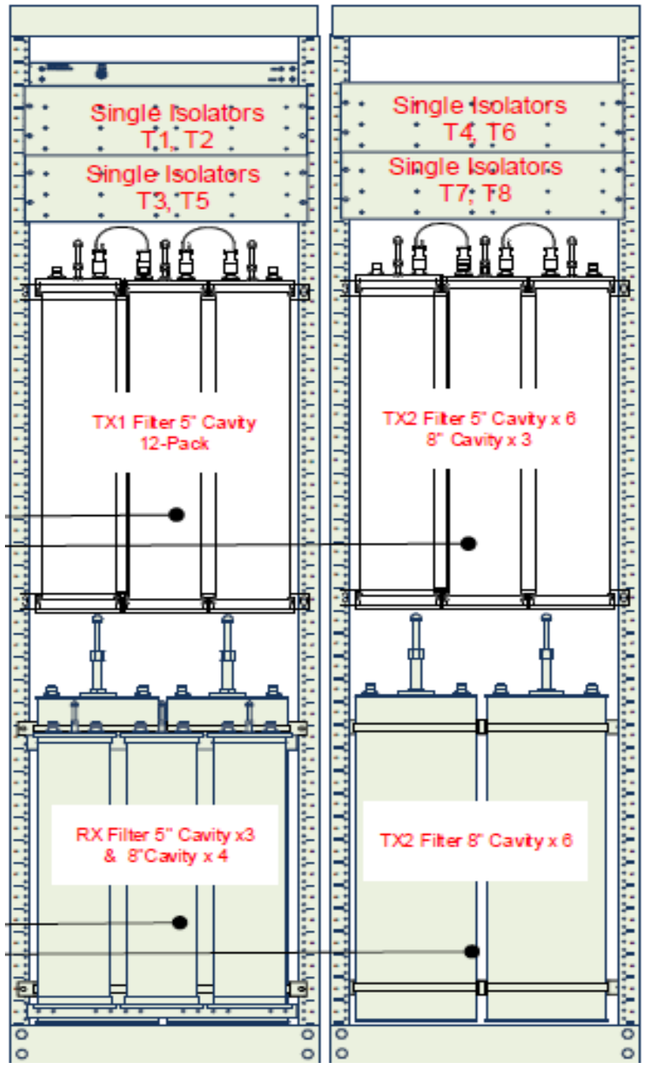
Kingston Prime & RF w/ Inter Op: Preliminary











MOTOROLA

PROJECT: ULSTER COUNTY KINGSTON

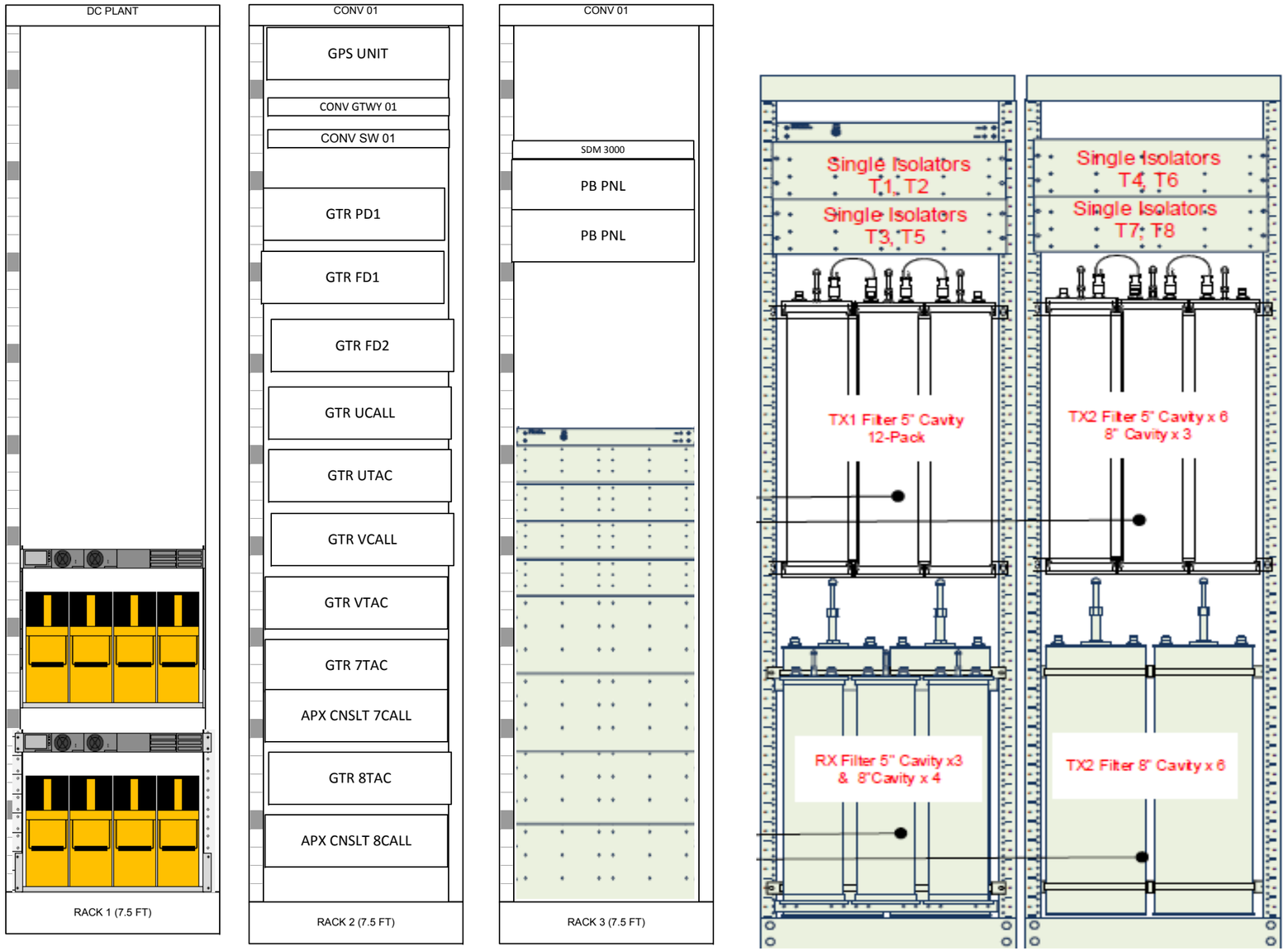
TITLE: PRIME AND RF SITE W INTEROP

DESIGNED BY: F. PAULINO

DATE: 8/16/2019

ORIGINAL DOCUMENT SIZE IS 11X17, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

Sam’s Point & RF w/ Inter Op: Preliminary

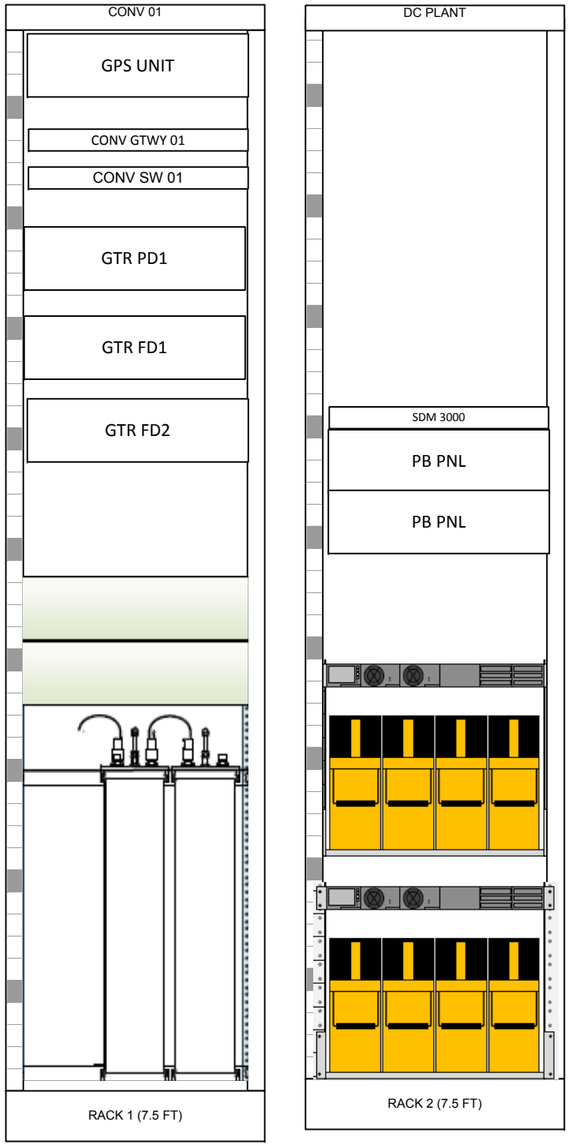


MOTOROLA

PROJECT:	ULSTER COUNTY NY
TITLE:	RF SITE W INTEROP
DESIGNED BY: F. PAULINO	DATE: 8/16/2019

ORIGINAL DOCUMENT SIZE IS 11X17, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

Overlook & Illinois RF: Preliminary



MOTOROLA

PROJECT: ULSTER COUNTY NY

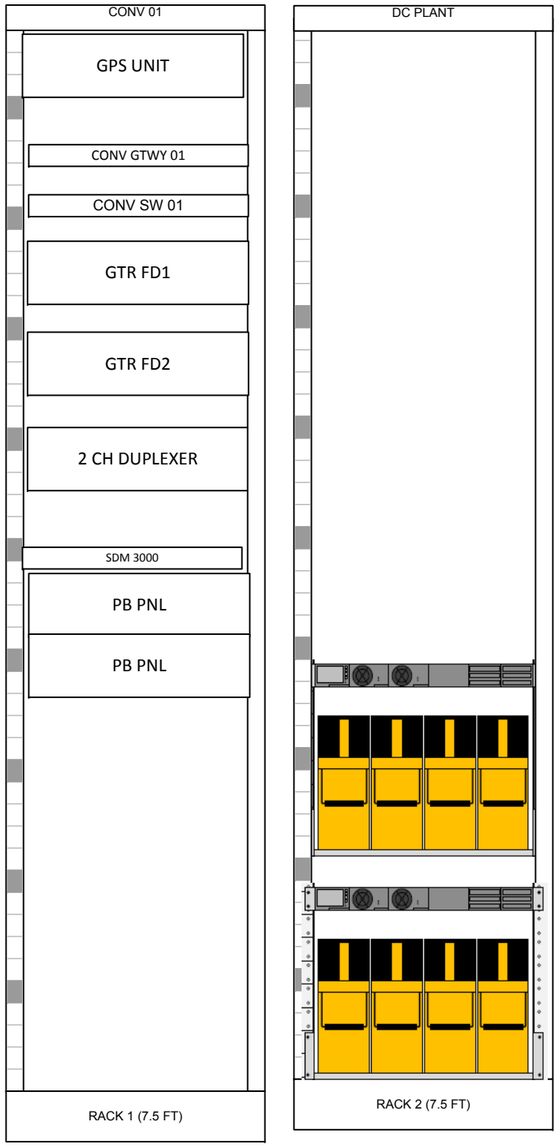
TITLE: TYPICAL RF SITE

DESIGNED BY: F. PAULINO

DATE: 8/16/2019

ORIGINAL DOCUMENT SIZE IS 11X17, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

Bell Aire, Shandaken, Sunny, Marlborough. Tonchy & Saugerties: Preliminary



MOTOROLA

PROJECT: ULSTER COUNTY NY

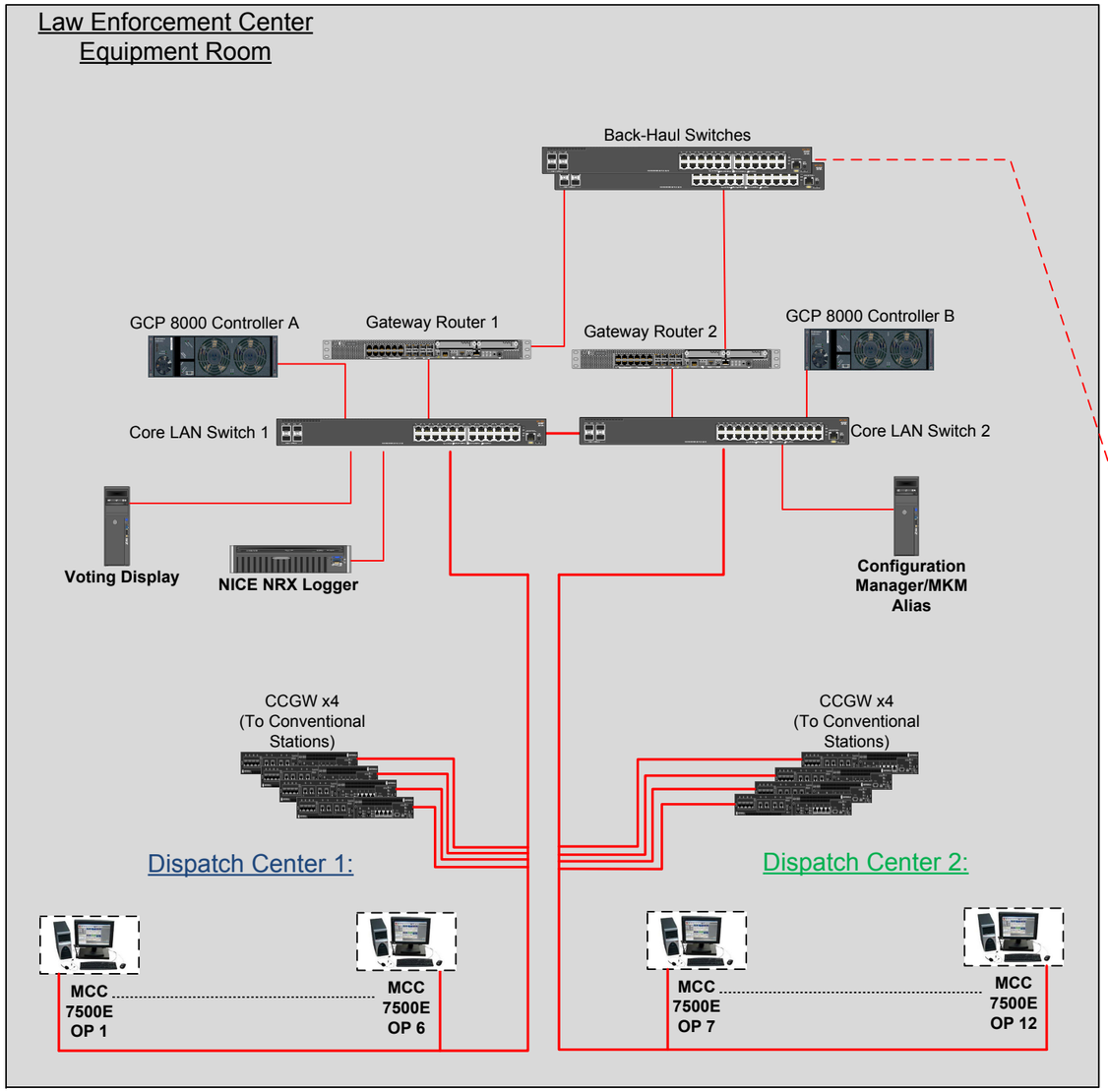
TITLE: TYPICAL RF SITE

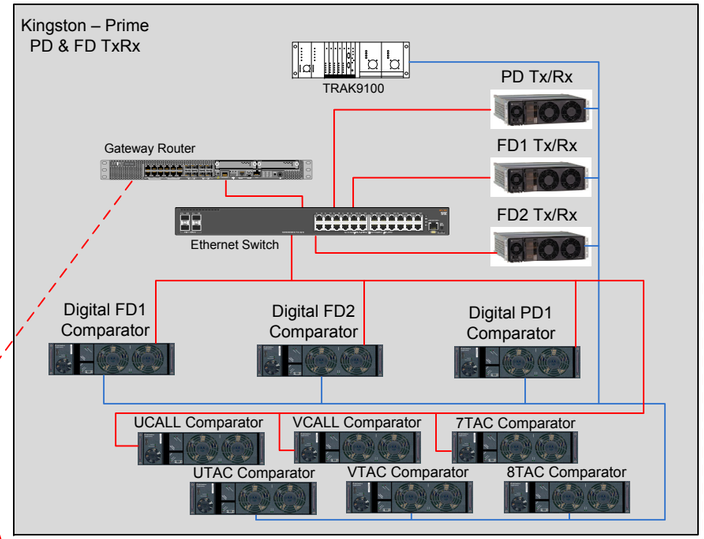
DESIGNED BY: F. PAULINO

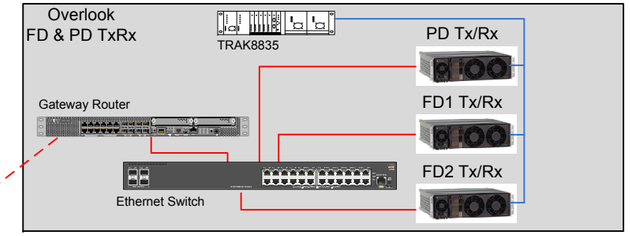
DATE: 8/16/19

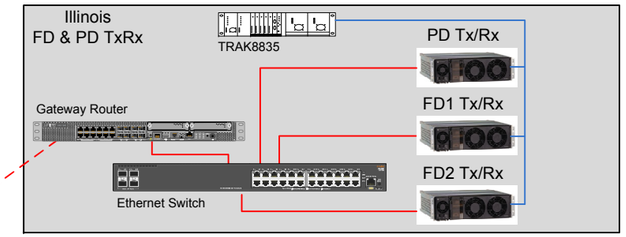
ORIGINAL DOCUMENT SIZE IS 11X17, CORRECT SCALE IS NOT GUARANTEED IF REDUCED OR ENLARGED

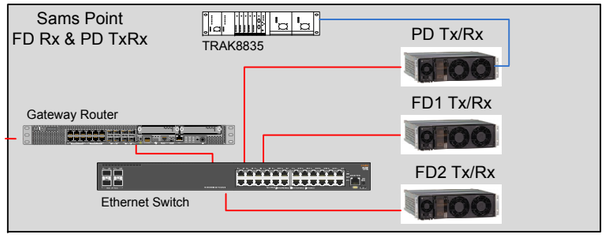
Ulster NY Public Safety Radio System and Dispatch Console High Level Diagram:



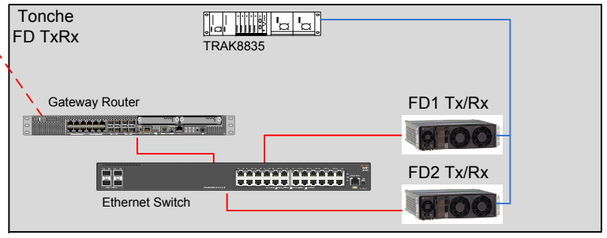


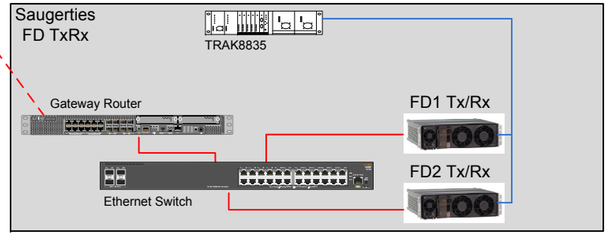


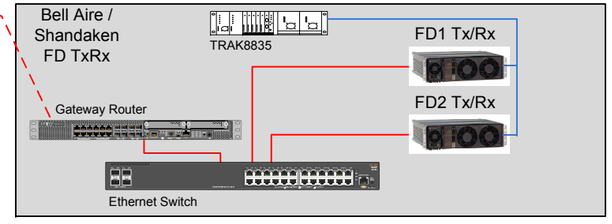


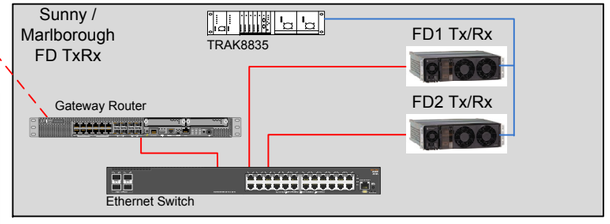


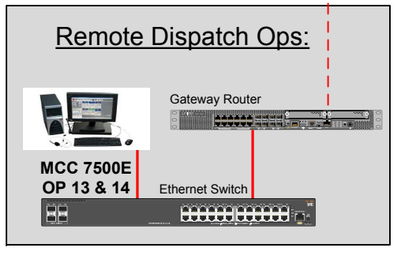
Existing / New Microwave Network Ulster County Provided











LEGEND

- 4-Wire
- Ethernet
- GPS Signal
- MW Cust Provided

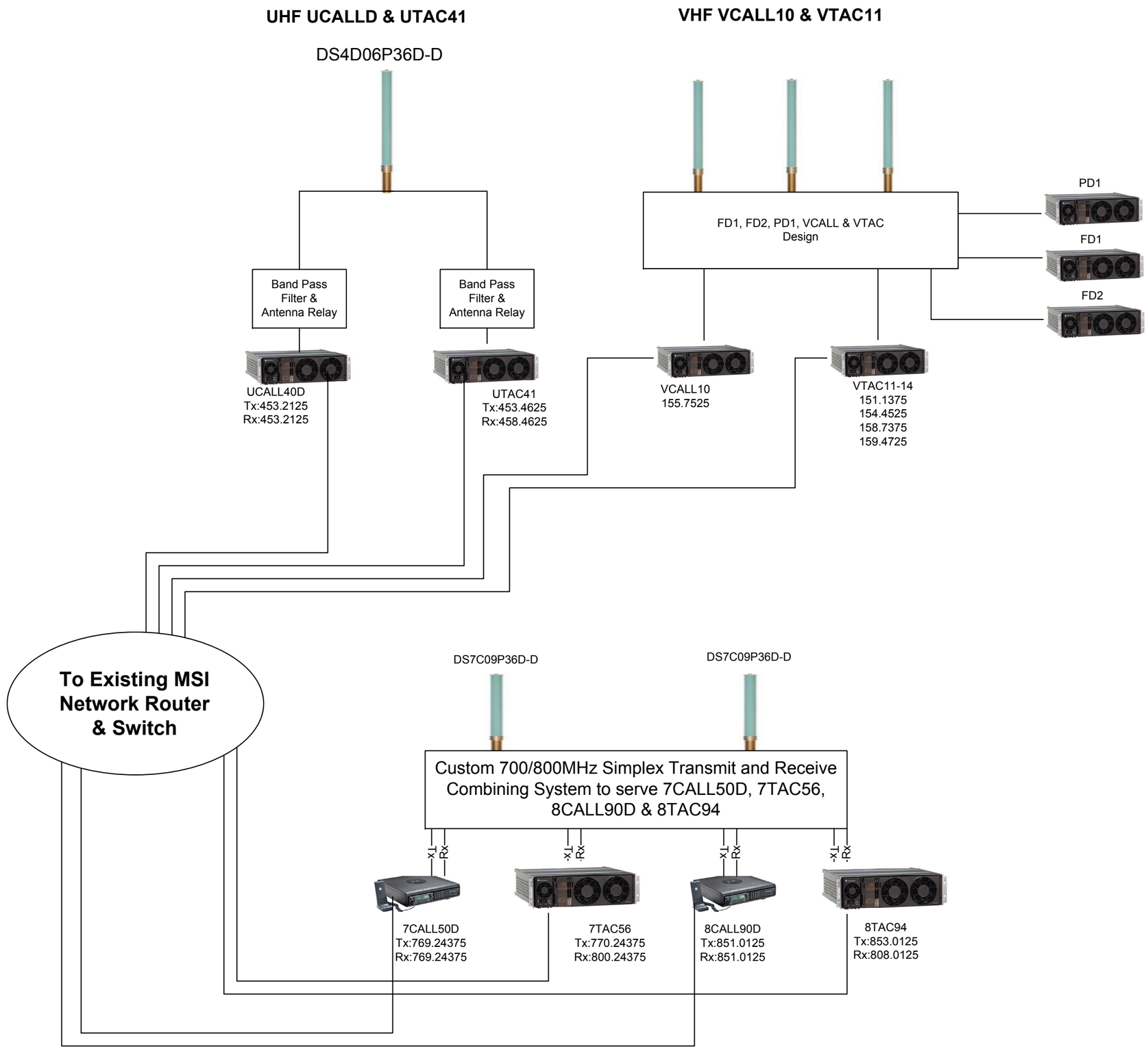
PRELIMINARY Version 1

MOTOROLA SOLUTIONS

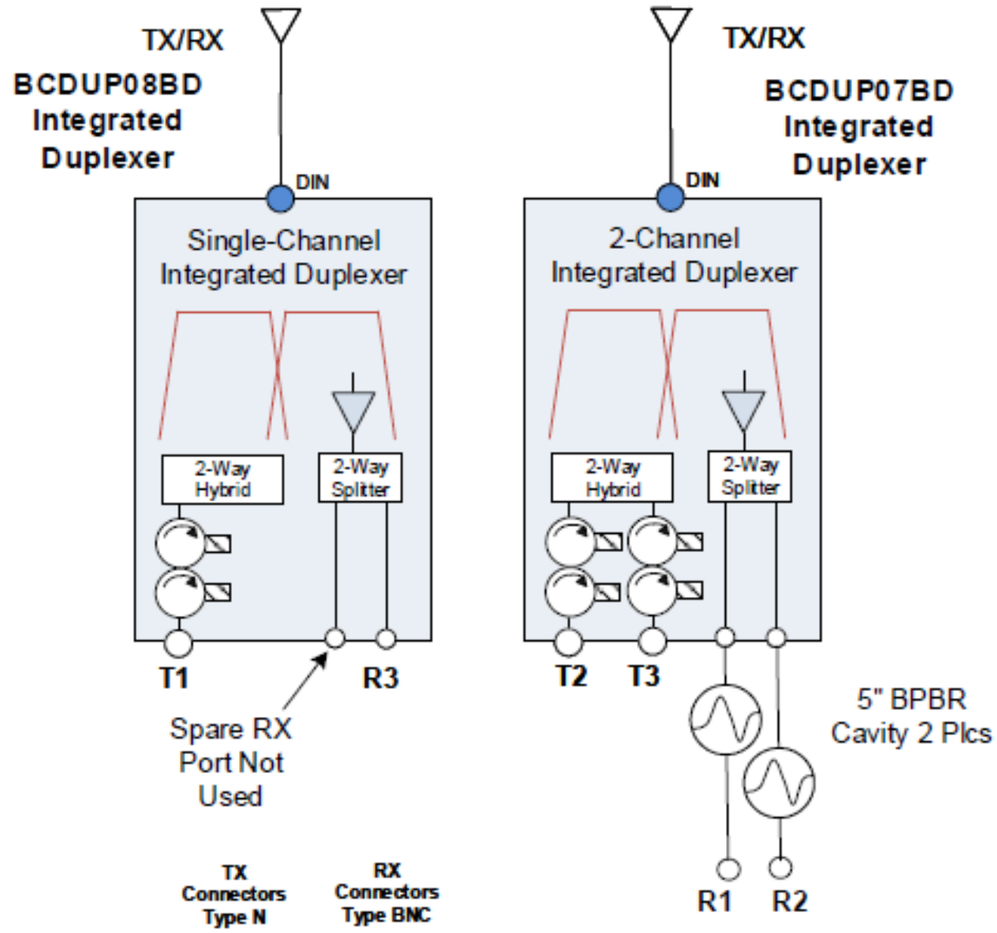
Territory 2
Systems Engineering
Woodcliff Lakes

PROJECT: ULSTER NY RADIO SYSTEM			
TITLE: *Ulster High Level System Diagram*			
CONTRACT	ENGINEER F. Paulino		SCALE NONE
	DATE 6-20-2019	Ver.1	

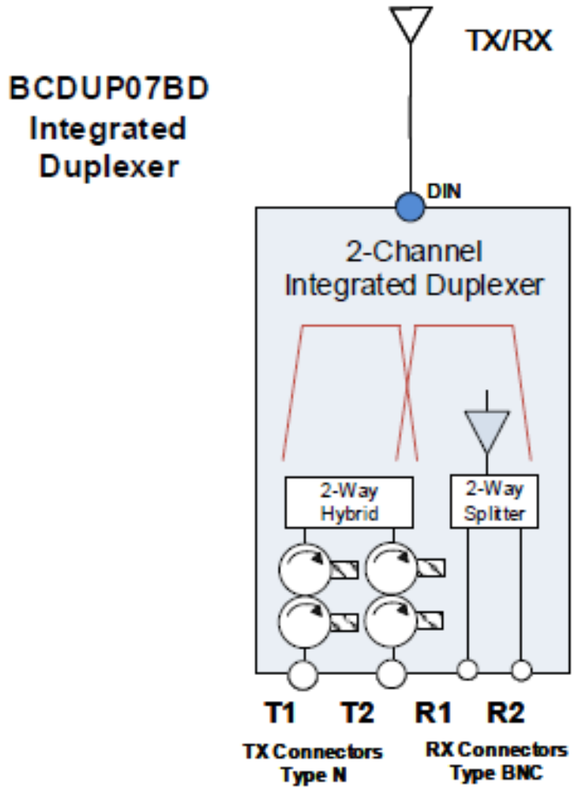
Kingston & Sams Point
NYS Interop Channels with UHF, VHF & 7/800:



Illinois Mnt and Overlook Mnt VHF Channels:



Tonche Mnt, Belle Aire, Shandaken and Saugerties VHF Channels:



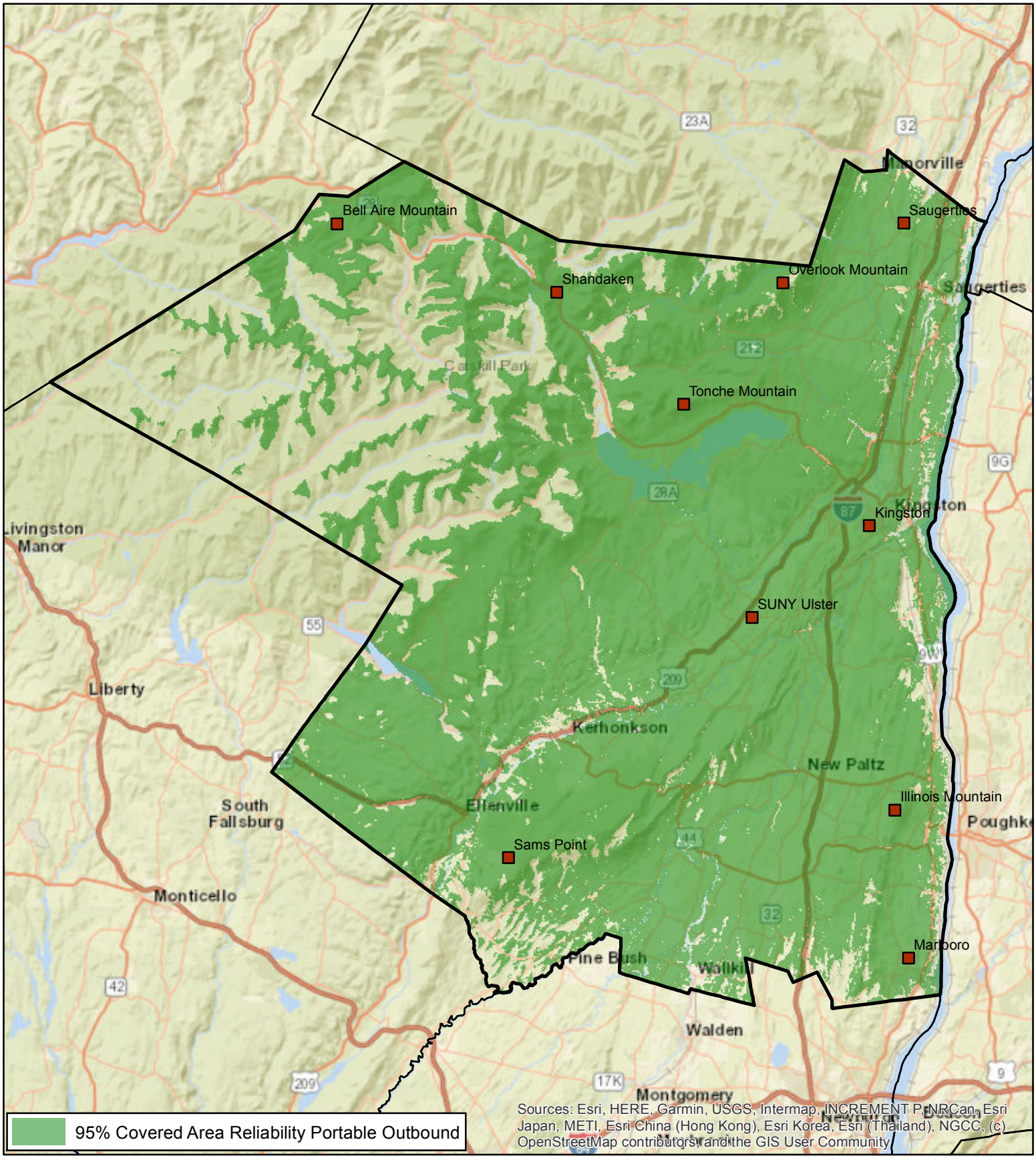
1.3 COVERAGE MAPS

Coverage maps are attached in the following pages.

MOTOROLA SOLUTIONS

Ulster County
Analog VHF Simulcast

For Informational Purposes Only
Motorola Confidential Property



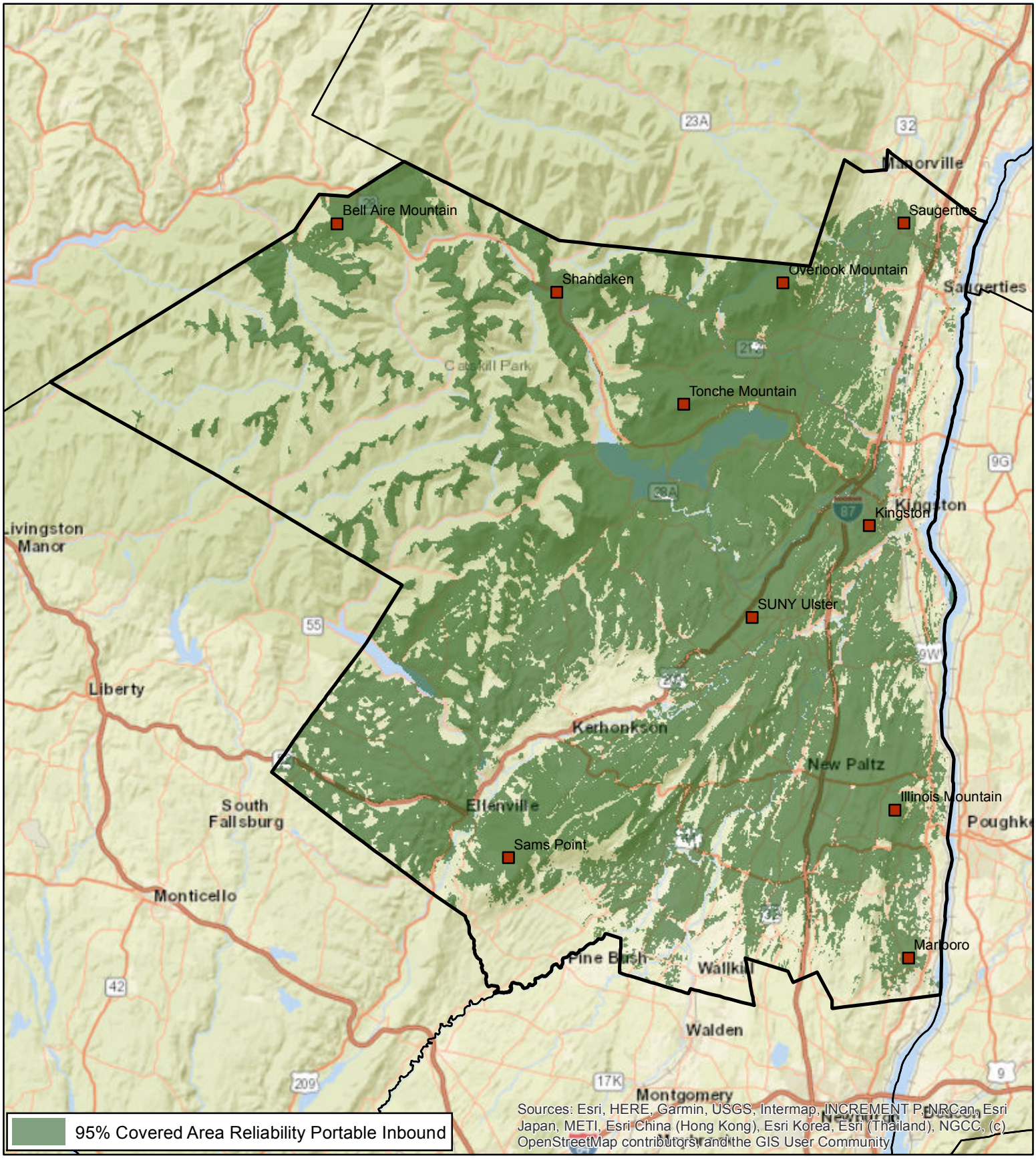
DAQ-3.0 Coverage shown for APX 4000
in Belt Clip with Swivel Case

NY_Ulster County
CCDTLAB-354
WDQ687

MOTOROLA SOLUTIONS

Ulster County
Analog VHF Simulcast

For Informational Purposes Only
Motorola Confidential Property



0 2.5 5 10 Miles

1 inch = 6.87 miles

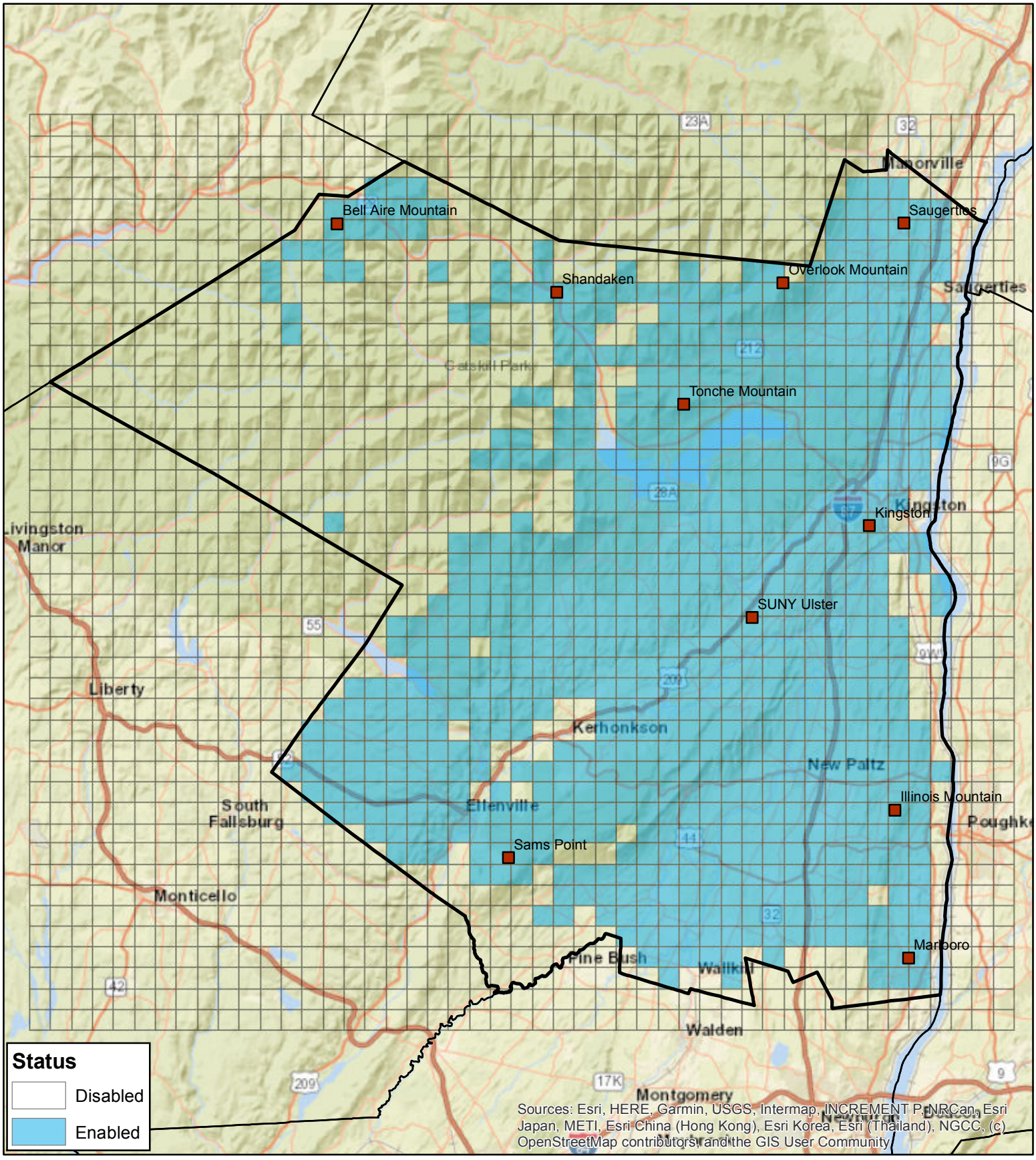
DAQ-3.0 Coverage shown for APX 4000
in Belt Clip with Swivel Case

NY_Ulster County
CCDTLAB-354
WDQ687

MOTOROLA SOLUTIONS

Ulster County

Portable Outbound Test Grid



0 2.5 5 10 Miles

1 inch = 6.87 miles

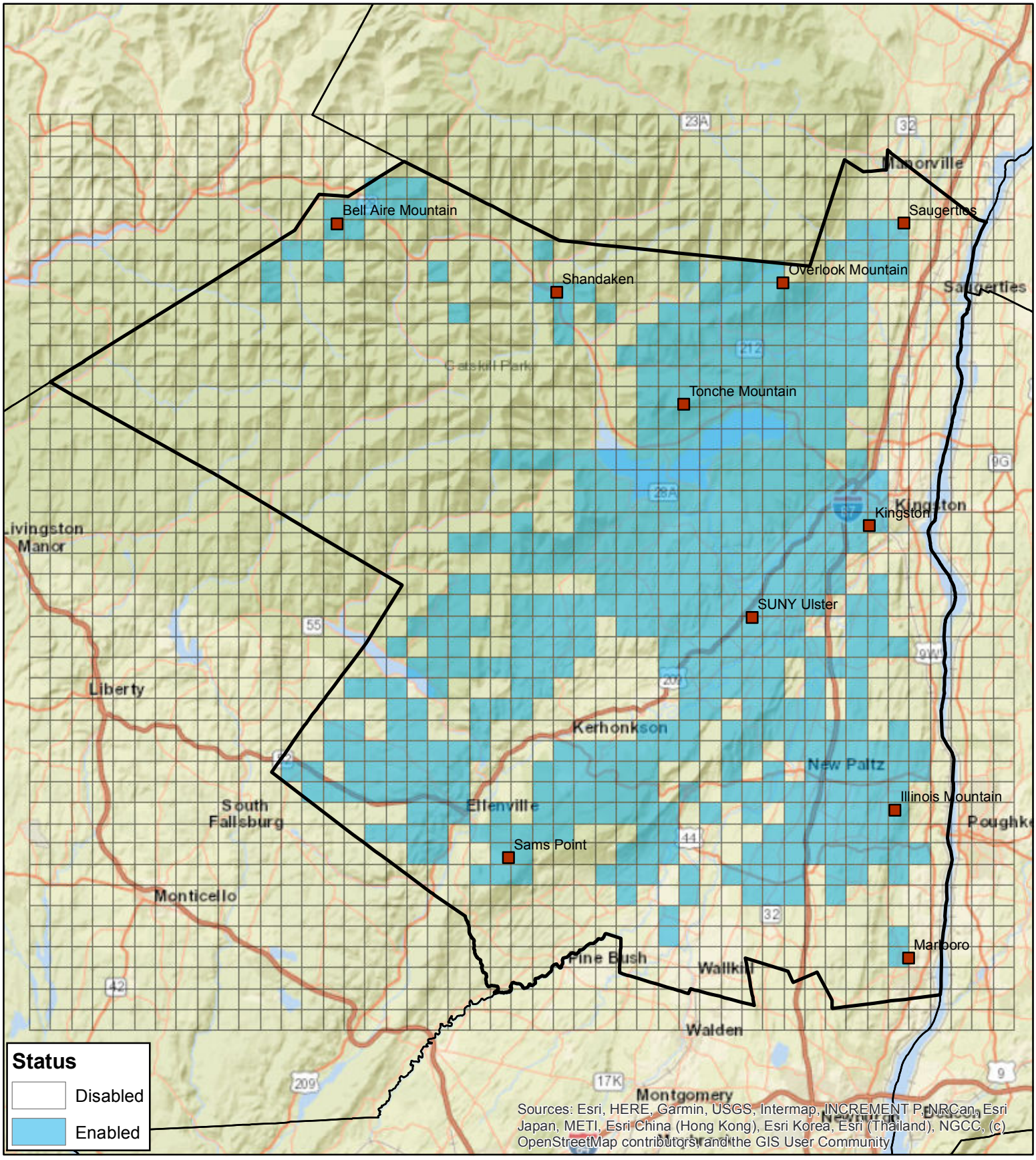
770 Enabled 1.0 x 1.0 mile Test Tiles

NY_Ulster County
CCDTLAB-354
WDQ687

MOTOROLA SOLUTIONS

Ulster County

Portable Inbound Test Grid



0 2.5 5 10 Miles

1 inch = 6.87 miles

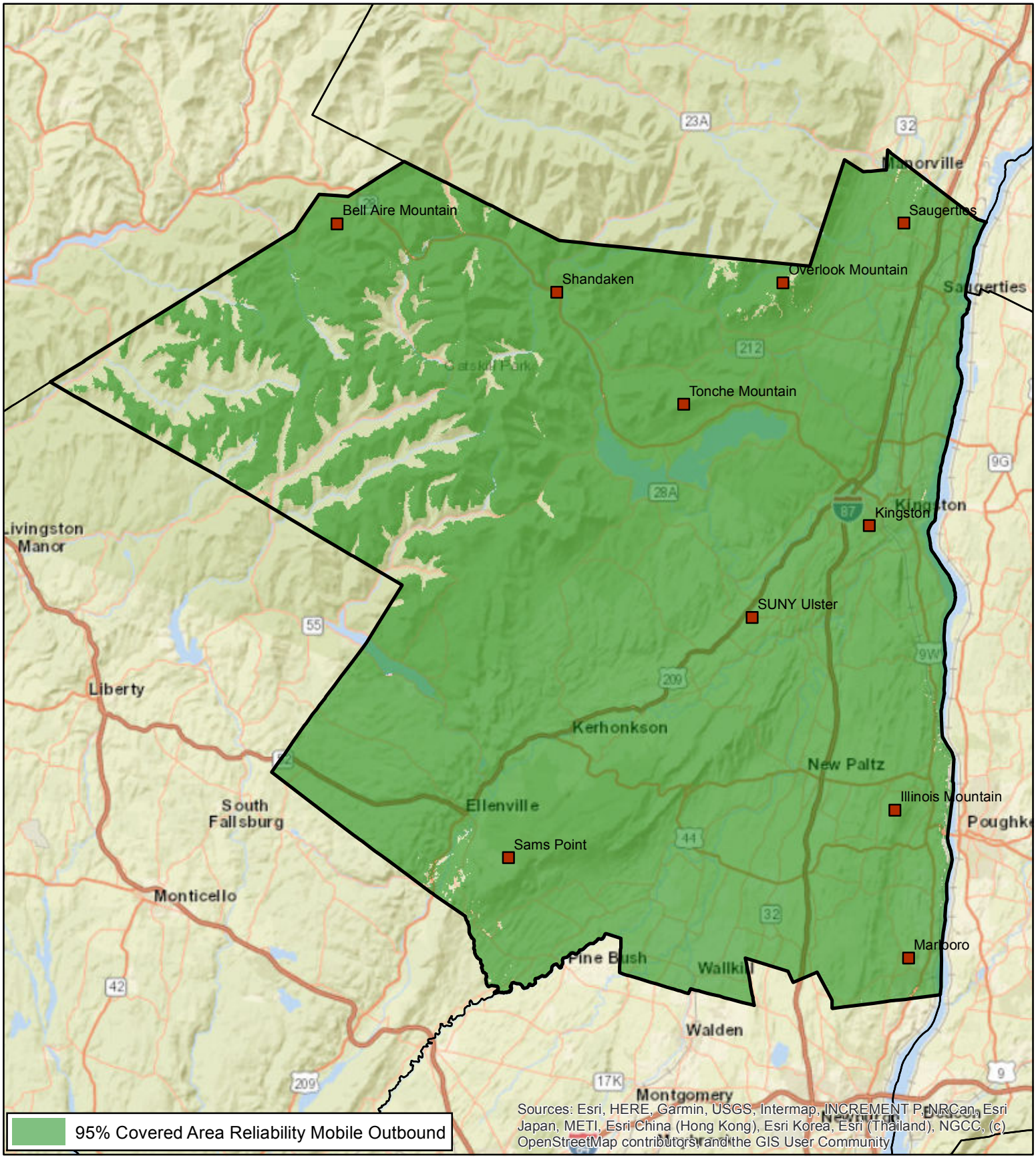
496 Enabled 1.0 x 1.0 mile Test Tiles

NY_Ulster County
CCDTLAB-354
WDQ687

MOTOROLA SOLUTIONS

Ulster County
Analog VHF Simulcast

For Informational Purposes Only
Motorola Confidential Property



0 2.5 5 10 Miles

1 inch = 6.87 miles

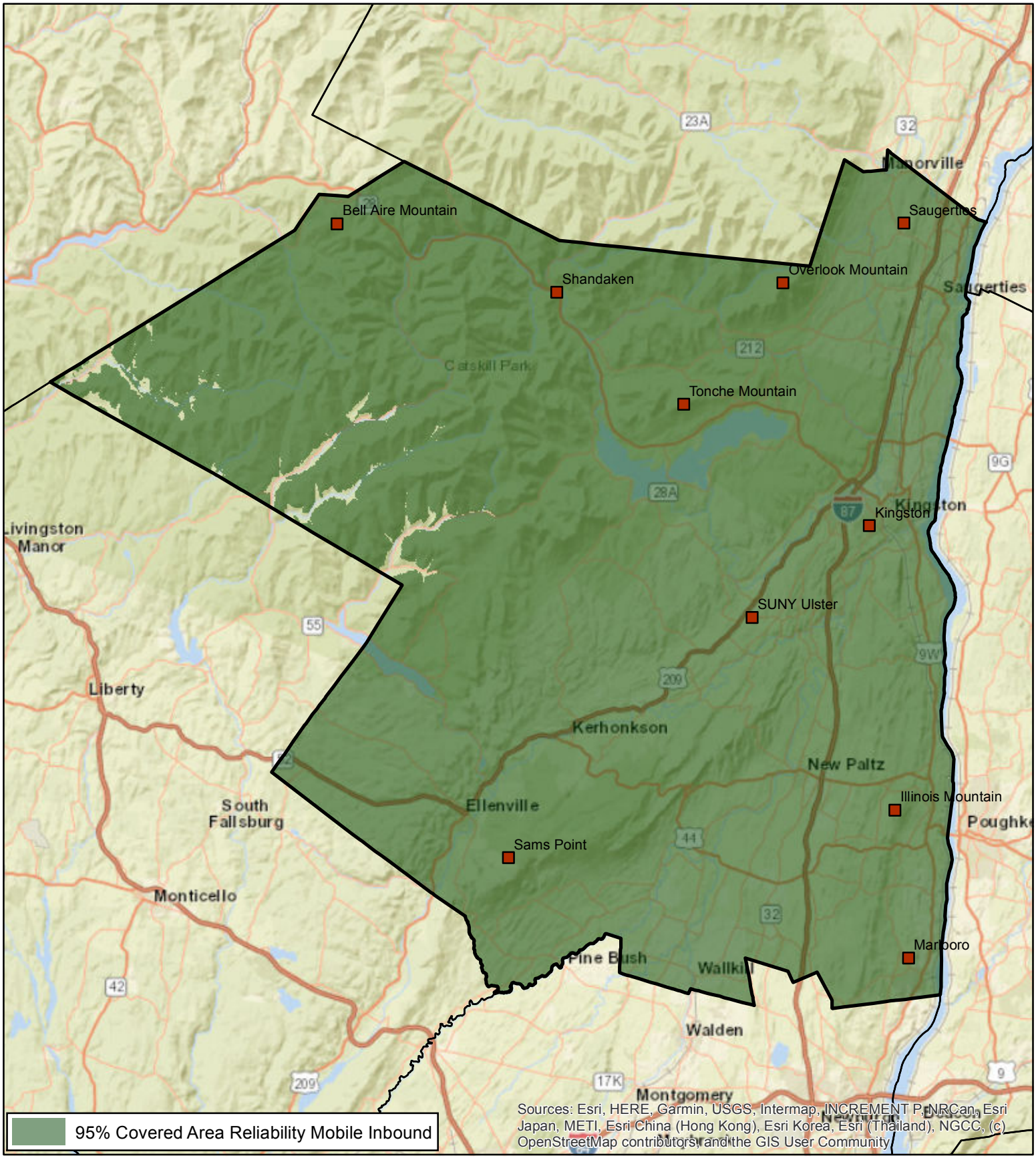
DAQ-3.0 Coverage shown for APX 4500
Center-roof mounted 1/4 wave Antenna

NY_Ulster County
CCDTLAB-354
WDQ687

MOTOROLA SOLUTIONS

Ulster County
Analog VHF Simulcast

For Informational Purposes Only
Motorola Confidential Property



0 2.5 5 10 Miles

1 inch = 6.87 miles

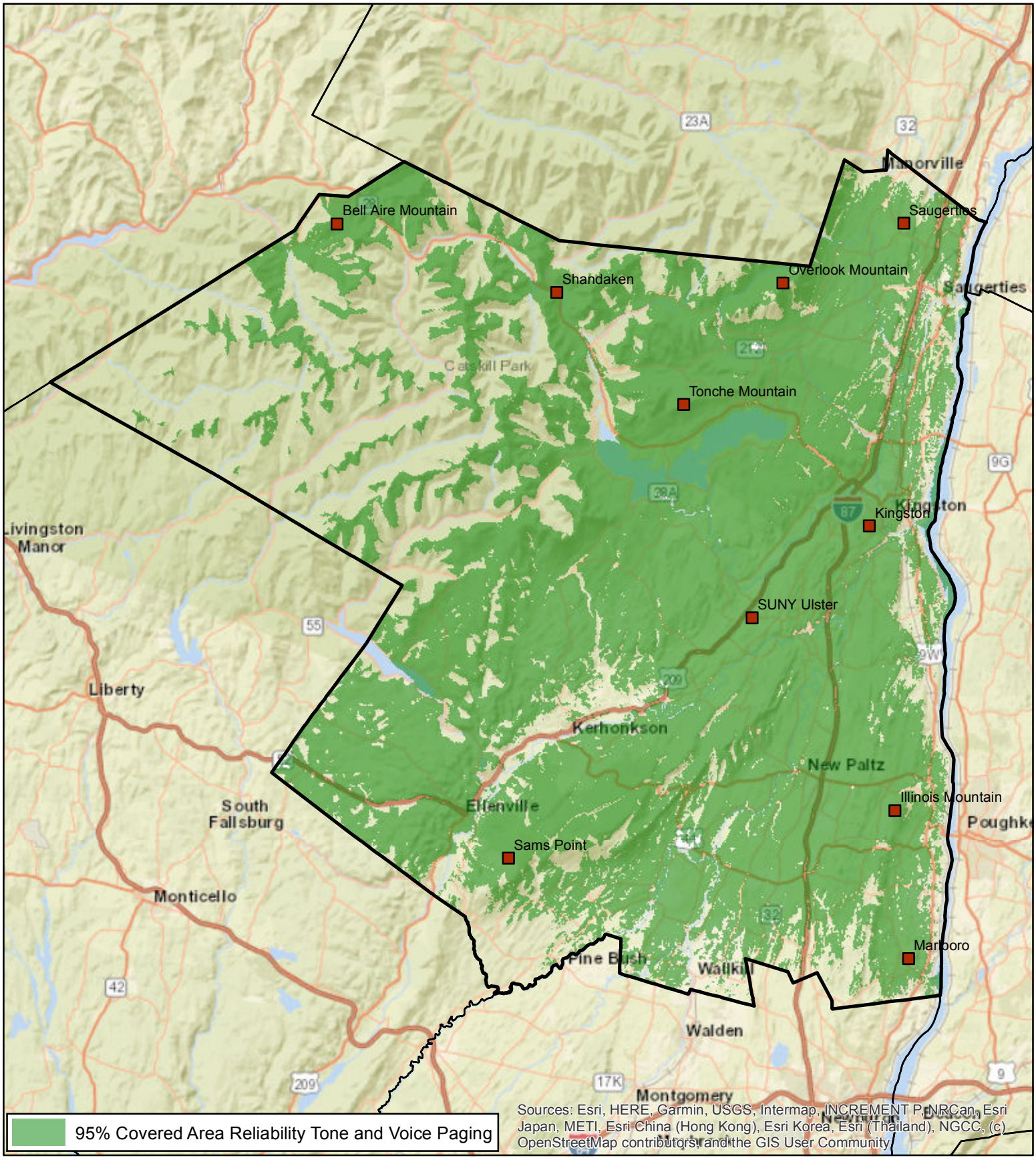
DAQ-3.0 Coverage shown for APX 4500
Center-roof mounted 1/4 wave Antenna

NY_Ulster County
CCDTLAB-354
WDQ687

MOTOROLA SOLUTIONS

Ulster County
Analog VHF Simulcast Paging

For Informational Purposes Only
Motorola Confidential Property



95% Covered Area Reliability Tone and Voice Paging

0 2.5 5 10 Miles

1 inch = 6.87 miles

Tone and Voice Coverage shown for Minitor V
Worn at Hip Level on Belt Clip

NY_Ulster County
CCDTLAB-354
WDQ687

1.4 EQUIPMENT LIST

QTY	NOMENCLATURE	DESCRIPTION
1	SQM01SUM0237	SINGLE ZONE CONV NON-RED CORE
1	CA02259AA	ADD: Redundancy
1	CA01896AB	ADD: BACKHAUL SWITCH
1	CA01663AB	ADD: RACK
1	UA00240AA	ADD: UEM LITE ENHANCED NAVIGATION
1	CA02258AD	ADD: APPLICATION SERVER
1	CA01751AA	ADD: FIREWALL
1	UA00247AA	ADD: UEM LITE SESSION
1	DSCL5808NCKIT	8 PORT LCD KVM 8 USB-PS 2 COMBO CABLES
1	TT3492	Z2 G4 MINI WORKSTATION NON RETURNAB
1	BVN1013	MKM 7000 Console Alias Manager Software
1	B1949	MCC 7500E SOFTWARE DVD
1	B1948	MCC 7500E DISPATCH POSITION LICENSES
12	UA00249AA	ADD: 15 RADIO RESOURCES LICENSE
12	UA00653AA	ADD: BASIC CONSOLE OPERATION
12	UA00655AA	ADD: ADVANCED CONVENTIONAL OPERATION
12	UA00661AA	ADD: ENHANCED IRR
12	DSTG221B	TECH GLOBAL EVOLUTION SERIES 22INCH NON TOUCH
12	TT3492	Z2 G4 MINI WORKSTATION NON RETURNAB
12	DSY7B61AA	HP Z2 MINI ARM WALL VESA MOUNT
2	DSF2B56AA	USB EXTERNAL DVD DRIVE
12	DSST7300U3M	STARTECH 7 PORT USB 3.0 HUB
12	DSTWIN6328A	PROVIDES ONE DUAL PEDAL FOOTSWITCH FOR USE WITH MOTOROLA MCC 7500 DISP
12	T7449	WINDOWS SUPPLEMENTAL TRANS CONFIG

QTY	NOMENCLATURE	DESCRIPTION
12	RLN6098	HDST MODULE BASE W/PTT, 15 FT CBL
12	T7885	MCAFEE WINDOWS AV CLIENT
12	B1941	USB AUDIO INTERFACE MODULE
12	B1913	MCC SERIES HEADSET JACK
12	B1951	MICROPHONE, DESKTOP, USB
24	B1952	SPEAKER, DESKTOP, USB
24	CA03405AA	ADD: POWER SUPPLY WITH DC CORD
24	CA03406AA	ADD: AC LINE CORD, NORTH AMERICA
24	CA03413AA	ADD: USB CABLE, TYPE A TO TYPE C, 4.5M
12	RMN5078B	SUPRAPLUS NC SINGLE MUFF HEADSET
12	DSGXTT0450N017	UPS, GXT TOWER 500VA/450W,17 MINUTE RUNTIME 120/120V SOFTWIRED
4	T8492	SITE AND HUB ROUTER AND FIREWALL-AC
4	CA03445AA	ADD: MISSION CRITICAL HARDENING
4	CA03448AA	ADD: STATEFUL FIREWALL
4	CA03450AA	ADD: DC-DC POWER SUPPLY
4	CLN1868	2930F 24-PORT SWITCH
1	F4544	SITE MANAGER ADVANCED
1	V266	ADD: 90VAC TO 260VAC PS TO SM
3	V592	AAD TERM BLCK & CONN WI
1	VA00872	ADD: SDM ASTRO RTU FW CURR ASTRO REL
1	DDN1289	MCN SERVER 8000 SW LIC FOR 4 MOTOROLA IP COMPARATORS & 4 CLIENTS
2	DDN1295	MCN SW LIC OPT CLIENT EXPANSION FOR 4 ADD'L CLIENTS
4	SQM01SUM0205	GGM 8000 GATEWAY
4	CA01616AA	ADD: AC POWER
4	CA02086AA	ADD: HIGH DENSITY ENH CONV GATEWAY
4	SQM01SUM0205	GGM 8000 GATEWAY

QTY	NOMENCLATURE	DESCRIPTION
4	CA01616AA	ADD: AC POWER
4	CA02086AA	ADD: HIGH DENSITY ENH CONV GATEWAY
2	T7885	MCAFEE WINDOWS AV CLIENT
2	T8597	ASTRO 2019.1 CLIENT
2	TT3492	Z2 G4 MINI WORKSTATION NON RETURNAB
2	DQHP19LEDMONITOR	HP PRODISPLAY P19A 19-IN LED MONITOR US
2	TRN7343	SEVEN AND A HALF FOOT RACK
2	DSTSJADP	RACK MOUNT GROUND BAR, 19 IN FOR TSJ AND WPH SERIES DATA SPDS
2	DSRMP615A	SPD, TYPE 3, 120V RACK MOUNT, 15A PLUG-IN W/ (6) 15A NEMA 5-15 OUTLETS
4	DSGXTR27001021	UPS, GXT RACKMOUNT 3KVA/2.7KW, 21 MIN RUNTIME, 120V SOFTWIRED
1	B1949	MCC 7500E SOFTWARE DVD
1	B1948	MCC 7500E DISPATCH POSITION LICENSES
1	UA00249AA	ADD: 15 RADIO RESOURCES LICENSE
2	UA00653AA	ADD: BASIC CONSOLE OPERATION
2	UA00654AA	ADD: ASTRO 25 TRUNKING OPERATION
2	UA00655AA	ADD: ADVANCED CONVENTIONAL OPERATION
2	UA00658AA	ADD: SECURE OPERATION
2	UA00659AA	ADD: ADP/AES/DES-OFB ENCRYPTION
2	UA00661AA	ADD: ENHANCED IRR
2	TT3493	ZBOOK 15 G5 NON RETURNABLE
1	DSF2B56AA	USB EXTERNAL DVD DRIVE
2	DSST7300U3M	STARTECH 7 PORT USB 3.0 HUB
2	DSTWIN6328A	PROVIDES ONE DUAL PEDAL FOOTSWITCH FOR USE WITH MOTOROLA MCC 7500 DISP
2	T7449	WINDOWS SUPPLEMENTAL TRANS CONFIG

QTY	NOMENCLATURE	DESCRIPTION
2	RLN6098	HDST MODULE BASE W/PTT, 15 FT CBL
2	T7885	MCAFEE WINDOWS AV CLIENT
2	B1941	USB AUDIO INTERFACE MODULE
2	B1913	MCC SERIES HEADSET JACK
2	B1951	MICROPHONE, DESKTOP, USB
8	B1952	SPEAKER, DESKTOP, USB
8	CA03405AA	ADD: POWER SUPPLY WITH DC CORD
8	CA03406AA	ADD: AC LINE CORD, NORTH AMERICA
8	CA03413AA	ADD: USB CABLE, TYPE A TO TYPE C, 4.5M
2	RMN5078B	SUPRAPLUS NC SINGLE MUFF HEADSET
1	TT3492	Z2 G4 MINI WORKSTATION NON RETURNAB
1	T7885	MCAFEE WINDOWS AV CLIENT
1	BVN6079	PRX 7000 Proxy Application SW DVD
1	UA00254AA	ADD: PRX 7000 PROXY SW LICENSE (1-10 CONNECTIONS)
1	T8126	FORTINET FIREWALL APPLIANCE
1	DSTRAK91009EDC	REMOTE SITE REDUNDANT MODULAR FREQUENCY TIMING SYSTEM DC
3	DSTRAK91061	FOUR PORT DDM
50	L1700	FSJ1-50A CABLE: 1/4" SUPERFLEX POLY JKT PER FOOT
4	DDN9769	F1PNM-HC 1/4" TYPE N MALE CONNECTOR FOR FSJ1-50A CABLE
1	CLN1868	2930F 24-PORT SWITCH
1	SQM01SUM0205	GGM 8000 GATEWAY
1	CA01619AA	ADD: DC POWER
1	CA02141AA	ADD: LOW DENSITY ENH CONV GATEWAY
1	F4544	SITE MANAGER ADVANCED
1	V266	ADD: 90VAC TO 260VAC PS TO SM
1	VA00872	ADD: SDM ASTRO RTU FW CURR ASTRO REL
3	V592	AAD TERM BLCK & CONN WI

QTY	NOMENCLATURE	DESCRIPTION
3	T7039	GTR 8000 Base Radio
3	X530BG	ADD: VHF (136-174 MHZ)
3	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
3	CA01504AA	ADD: ANTENNA RELAY
3	X153AW	ADD: RACK MOUNT HARDWARE
3	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
3	CA01400AA	ADD: POWER CABLE, DC
4	T8341	GRV 8000 COMPARATOR
4	CA03084AA	ADD: COMPARATOR
4	CA03317AA	ADD: DIGITAL CONV SIMULCAST SOFTWARE
4	X153AW	ADD: RACK MOUNT HARDWARE
4	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
4	CA01400AA	ADD: POWER CABLE, DC
4	CA03320AA	ADD: ASTRO 25 CONVENTIONAL SOFTWARE
5	T8341	GRV 8000 COMPARATOR
5	CA03084AA	ADD: COMPARATOR
5	X153AW	ADD: RACK MOUNT HARDWARE
5	CA01400AA	ADD: POWER CABLE, DC
5	CA03320AA	ADD: ASTRO 25 CONVENTIONAL SOFTWARE
5	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
5	CA03317AA	ADD: DIGITAL CONV SIMULCAST SOFTWARE
2	TRN7343	SEVEN AND A HALF FOOT RACK
1	T7039	GTR 8000 Base Radio
1	X530BG	ADD: VHF (136-174 MHZ)
1	CA01952AA	ADD: ANALOG CONVENTIONAL SIMULCAST SOFTWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
1	X265AM	BR PRESELCTOR, 150-174 MHZ

QTY	NOMENCLATURE	DESCRIPTION
1	CA01504AA	ADD: ANTENNA RELAY
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
1	CA01400AA	ADD: POWER CABLE, DC
1	T7039	GTR 8000 Base Radio
1	X530BG	ADD: VHF (136-174 MHZ)
1	CA01952AA	ADD: ANALOG CONVENTIONAL SIMULCAST SOFTWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
1	X265AM	BR PRESELCTOR, 150-174 MHZ
1	CA01504AA	ADD: ANTENNA RELAY
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
1	CA01400AA	ADD: POWER CABLE, DC
1	T7039	GTR 8000 Base Radio
1	X640AL	ADD: UHF R2 (435-524 MHZ)
1	CA01952AA	ADD: ANALOG CONVENTIONAL SIMULCAST SOFTWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
1	X265AP	ADD: BR PRESELECTOR 380-512 MHZ
1	CA01504AA	ADD: ANTENNA RELAY
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
1	CA01400AA	ADD: POWER CABLE, DC
1	T7039	GTR 8000 Base Radio
1	X640AL	ADD: UHF R2 (435-524 MHZ)
1	CA01952AA	ADD: ANALOG CONVENTIONAL SIMULCAST SOFTWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
1	X265AP	ADD: BR PRESELECTOR 380-512 MHZ
1	CA01504AA	ADD: ANTENNA RELAY
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19

QTY	NOMENCLATURE	DESCRIPTION
1	CA01400AA	ADD: POWER CABLE, DC
1	L30URS9PW1 N	APX CONSOLETTE 7/800
1	G806	ADD: ASTRO DIGITAL CAI OPERATION
1	G48	ENH: CONVENTIONAL OPERATION
1	GA09000	ADD: DIGITAL TONE SIGNALING
1	CA01598	ADD: AC LINE CORD US
1	G78	ADD: 3Y ESSENTIAL SERVICE
1	GA00469	ENH: EXTENDED DISPATCH APX CONSOLETTE
1	W382	ADD: CONTROL STATION DESK GCAI MIC
1	L999	ADD: FULL FP W/05/KEYPAD/CLOCK/VU
1	HKN6233C	APX CONSOLETTE RACK MOUNT KIT
1	T7039	GTR 8000 Base Radio
1	CA00855AA	ADD: 700/800 MHZ
1	CA01193AA	ADD: IP BASED MULTISITE BASE RADIO SOFTWARE
1	X265AJ	ADD: BASE RADIO PRESELECTOR, 700 MHZ
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
1	CA01400AA	ADD: POWER CABLE, DC
1	L30URS9PW1 N	APX CONSOLETTE 7/800
1	G806	ADD: ASTRO DIGITAL CAI OPERATION
1	G48	ENH: CONVENTIONAL OPERATION
1	L999	ADD: FULL FP W/05/KEYPAD/CLOCK/VU
1	GA09000	ADD: DIGITAL TONE SIGNALING
1	CA01598	ADD: AC LINE CORD US
1	G78	ADD: 3Y ESSENTIAL SERVICE
1	GA00469	ENH: EXTENDED DISPATCH APX CONSOLETTE
1	W382	ADD: CONTROL STATION DESK GCAI MIC
1	HKN6233C	APX CONSOLETTE RACK MOUNT KIT

QTY	NOMENCLATURE	DESCRIPTION
1	T7039	GTR 8000 Base Radio
1	CA00855AA	ADD: 700/800 MHZ
1	CA01952AA	ADD: ANALOG CONVENTIONAL SIMULCAST SOFTWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
1	X265AH	ADD: BR PRESELECTOR, 800 MHZ
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
1	CA01400AA	ADD: POWER CABLE, DC
3	DSFSA2041DIN	DIRECTIONAL DIPOLE ARRAY 7DBD, 108 DEG BW, 148-174 MHZ, PIM RATED
1	DSDS4D06P36DD	480-512MHZ 6DB GAIN DUAL FEED OMNI ANT, LOW PIM, HI PIP ANT
2	DSDS7C09P36DD	DS7C09P36D-D, 764-869MHZ DUAL 9DB GAIN OMNI WITH DIN
11	DDN1090	L4TDM-PSA 7-16 DIN MALE PS FOR 1/2 IN CABLE
11	TDN9289	221213 CABLE WRAP WEATHERPROOFING
11	DDN1077	7-16IN DIN FEMALE CONNECTOR EZ-FIT FOR 7/8IN CABLE (MOTOROLA SPECIFIC)
24	DSSG7806B2A	SG78-06B2A GROUNDING KIT FOR 7/8 IN COAXIAL CABLE
11	DSL5SGRIP	L5SGRIP 7/8" SUPPORT HOIST GRIP
1850	DSAVA550	AVA5-50, COAXIAL CABLE, CORRUGATED COPPER,7/8 IN, BLACK PE JACKET
3	DSISB50LNC2MA	RF SPD, 125-1000MHZ DC BLOCK BROADBAND BULKHEAD MT, NM ANT, NF EQUIP
6	DSTUSXDFM	RF SPD, 300-1200MHZ DC BLOCK HIGH PWR, DIN MALE/FEMALE BI-DIRECTIONAL
1	DSBFD	BULKHEAD FLANGE MOUNT ADAPTER
11	DSGSAKITD	GROUND STRAP KIT - DIN
330	L1702	FSJ4-50B CABLE: 1/2" SUPERFLEX POLY JKT PER FOOT
11	DSF4PDMV2C	F4PDMV2-C 1/2" 7-16 DIN MALE CONNECTOR

QTY	NOMENCLATURE	DESCRIPTION
11	DDN9682	F4PNMV2-HC 1/2" TYPE N MALE PLATED CONNECTOR
1	DSSPD34531	KINGSTON COMBINER/MULTICOUPLER NETW
1	DQSPD2427V1	7/800MHZ SIMPLEX TRANSMIT AND RECEI
2	DSMWF1BUD	MILLED WINDOR FILTER, DIN, 45 DB>1.5 MHZ, 1.5 DB LOSS
2	DSMWF4CUN	380-470MHZ WINDOW MILLED FILTER, 65DB ISO, 2-5 MHZ PB, 450W N CONN
1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 100' COAX W/DONGLE SNMPV3
1	CLN1868	2930F 24-PORT SWITCH
1	SQM01SUM0205	GGM 8000 GATEWAY
1	CA01619AA	ADD: DC POWER
1	CA02141AA	ADD: LOW DENSITY ENH CONV GATEWAY
1	F4544	SITE MANAGER ADVANCED
1	V266	ADD: 90VAC TO 260VAC PS TO SM
1	VA00872	ADD: SDM ASTRO RTU FW CURR ASTRO REL
3	V592	AAD TERM BLCK & CONN WI
1	TRN7343	SEVEN AND A HALF FOOT RACK
3	T7039	GTR 8000 Base Radio
3	X530BG	ADD: VHF (136-174 MHZ)
3	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
3	CA01504AA	ADD: ANTENNA RELAY
3	X153AW	ADD: RACK MOUNT HARDWARE
3	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
3	CA01400AA	ADD: POWER CABLE, DC
1	T7039	GTR 8000 Base Radio
1	X530BG	ADD: VHF (136-174 MHZ)
1	CA01952AA	ADD: ANALOG CONVENTIONAL SIMULCAST SOFTWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL

QTY	NOMENCLATURE	DESCRIPTION
1	X265AM	BR PRESELCTOR, 150-174 MHZ
1	CA01504AA	ADD: ANTENNA RELAY
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
1	CA01400AA	ADD: POWER CABLE, DC
1	T7039	GTR 8000 Base Radio
1	X530BG	ADD: VHF (136-174 MHZ)
1	CA01952AA	ADD: ANALOG CONVENTIONAL SIMULCAST SOFTWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
1	X265AM	BR PRESELCTOR, 150-174 MHZ
1	CA01504AA	ADD: ANTENNA RELAY
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
1	CA01400AA	ADD: POWER CABLE, DC
1	T7039	GTR 8000 Base Radio
1	X640AL	ADD: UHF R2 (435-524 MHZ)
1	CA01952AA	ADD: ANALOG CONVENTIONAL SIMULCAST SOFTWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
1	X265AP	ADD: BR PRESELECTOR 380-512 MHZ
1	CA01504AA	ADD: ANTENNA RELAY
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
1	CA01400AA	ADD: POWER CABLE, DC
1	T7039	GTR 8000 Base Radio
1	X640AL	ADD: UHF R2 (435-524 MHZ)
1	CA01952AA	ADD: ANALOG CONVENTIONAL SIMULCAST SOFTWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
1	X265AP	ADD: BR PRESELECTOR 380-512 MHZ
1	CA01504AA	ADD: ANTENNA RELAY

QTY	NOMENCLATURE	DESCRIPTION
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
1	L30URS9PW1 N	APX CONSOLETTE 7/800
1	G806	ADD: ASTRO DIGITAL CAI OPERATION
1	G48	ENH: CONVENTIONAL OPERATION
1	GA09000	ADD: DIGITAL TONE SIGNALING
1	CA01598	ADD: AC LINE CORD US
1	G78	ADD: 3Y ESSENTIAL SERVICE
1	GA00469	ENH: EXTENDED DISPATCH APX CONSOLETTE
1	W382	ADD: CONTROL STATION DESK GCAI MIC
1	L999	ADD: FULL FP W/05/KEYPAD/CLOCK/VU
1	HKN6233C	APX CONSOLETTE RACK MOUNT KIT
1	T7039	GTR 8000 Base Radio
1	CA00855AA	ADD: 700/800 MHZ
1	CA01193AA	ADD: IP BASED MULTISITE BASE RADIO SOFTWARE
1	X265AJ	ADD: BASE RADIO PRESELECTOR, 700 MHZ
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
1	CA01400AA	ADD: POWER CABLE, DC
1	L30URS9PW1 N	APX CONSOLETTE 7/800
1	G806	ADD: ASTRO DIGITAL CAI OPERATION
1	G48	ENH: CONVENTIONAL OPERATION
1	L999	ADD: FULL FP W/05/KEYPAD/CLOCK/VU
1	GA09000	ADD: DIGITAL TONE SIGNALING
1	CA01598	ADD: AC LINE CORD US
1	G78	ADD: 3Y ESSENTIAL SERVICE
1	GA00469	ENH: EXTENDED DISPATCH APX CONSOLETTE
1	W382	ADD: CONTROL STATION DESK GCAI MIC
1	HKN6233C	APX CONSOLETTE RACK MOUNT KIT

QTY	NOMENCLATURE	DESCRIPTION
1	T7039	GTR 8000 Base Radio
1	CA00855AA	ADD: 700/800 MHZ
1	CA01952AA	ADD: ANALOG CONVENTIONAL SIMULCAST SOFTWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
1	X265AH	ADD: BR PRESELECTOR, 800 MHZ
1	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
1	CA01400AA	ADD: POWER CABLE, DC
3	DSFSA2041DIN	DIRECTIONAL DIPOLE ARRAY 7DBD, 108 DEG BW, 148-174 MHZ, PIM RATED
1	DSDS4D06P36DD	480-512MHZ 6DB GAIN DUAL FEED OMNI ANT, LOW PIM, HI PIP ANT
2	DSDS7C09P36DD	DS7C09P36D-D, 764-869MHZ DUAL 9DB GAIN OMNI WITH DIN
11	DDN1090	L4TDM-PSA 7-16 DIN MALE PS FOR 1/2 IN CABLE
11	TDN9289	221213 CABLE WRAP WEATHERPROOFING
11	DDN1077	7-16IN DIN FEMALE CONNECTOR EZ-FIT FOR 7/8IN CABLE (MOTOROLA SPECIFIC)
24	DSSG7806B2A	SG78-06B2A GROUNDING KIT FOR 7/8 IN COAXIAL CABLE
11	DSL5SGRIP	L5SGRIP 7/8" SUPPORT HOIST GRIP
1450	DSAVA550	AVA5-50, COAXIAL CABLE, CORRUGATED COPPER,7/8 IN, BLACK PE JACKET
6	DSTUSXDFM	RF SPD, 300-1200MHZ DC BLOCK HIGH PWR, DIN MALE/FEMALE BI-DIRECTIONAL
3	DSISB50LNC2MA	RF SPD, 125-1000MHZ DC BLOCK BROADBAND BULKHEAD MT, NM ANT, NF EQUIP
11	DSBFD	BULKHEAD FLANGE MOUNT ADAPTER
11	DSGSAKITD	GROUND STRAP KIT - DIN
330	L1702	FSJ4-50B CABLE: 1/2" SUPERFLEX POLY JKT PER FOOT
12	DSF4PDMV2C	F4PDMV2-C 1/2" 7-16 DIN MALE CONNECTOR

QTY	NOMENCLATURE	DESCRIPTION
12	DDN9682	F4PNMV2-HC 1/2" TYPE N MALE PLATED CONNECTOR
1	DSSPD34531	KINGSTON COMBINER/MULTICOUPLER NETW
2	DSMWF1BUD	MILLED WINDOR FILTER, DIN, 45 DB>1.5 MHZ, 1.5 DB LOSS
2	DSMWF4CUN	380-470MHZ WINDOW MILLED FILTER, 65DB ISO, 2-5 MHZ PB, 450W N CONN
1	DQSPD2427V1	7/800MHZ SIMPLEX TRANSMIT AND RECEI
1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 100' COAX W/DONGLE SNMPV3
1	CLN1868	2930F 24-PORT SWITCH
1	T8492	SITE AND HUB ROUTER AND FIREWALL-AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	CA03450AA	ADD: DC-DC POWER SUPPLY
1	F4544	SITE MANAGER ADVANCED
1	V266	ADD: 90VAC TO 260VAC PS TO SM
1	VA00872	ADD: SDM ASTRO RTU FW CURR ASTRO REL
3	V592	AAD TERM BLCK & CONN WI
1	TRN7343	SEVEN AND A HALF FOOT RACK
3	T7039	GTR 8000 Base Radio
3	X530BG	ADD: VHF (136-174 MHZ)
3	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
3	CA01504AA	ADD: ANTENNA RELAY
3	X153AW	ADD: RACK MOUNT HARDWARE
3	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
3	CA01400AA	ADD: POWER CABLE, DC
2	DSCSA1041DIN	DIRECTIONAL DIPOLE ARRAY, 7DBD, 64 DEG BW, 148-174 MHZ, PIM RATED
2	DDN1090	L4TDM-PSA 7-16 DIN MALE PS FOR 1/2 IN CABLE

QTY	NOMENCLATURE	DESCRIPTION
4	TDN9289	221213 CABLE WRAP WEATHERPROOFING
2	DDN1077	7-16IN DIN FEMALE CONNECTOR EZ-FIT FOR 7/8IN CABLE (MOTOROLA SPECIFIC)
8	DSSG7806B2A	SG78-06B2A GROUNDING KIT FOR 7/8 IN COAXIAL CABLE
4	DSL5SGRIP	L5SGRIP 7/8" SUPPORT HOIST GRIP
680	DSAVA550	AVA5-50, COAXIAL CABLE, CORRUGATED COPPER,7/8 IN, BLACK PE JACKET
2	DSISB50LNC2MA	RF SPD, 125-1000MHZ DC BLOCK BROADBAND BULKHEAD MT, NM ANT, NF EQUIP
2	DSBFD	BULKHEAD FLANGE MOUNT ADAPTER
2	DSGSAKITD	GROUND STRAP KIT - DIN
60	L1702	FSJ4-50B CABLE: 1/2" SUPERFLEX POLY JKT PER FOOT
2	DSF4PDMV2C	F4PDMV2-C 1/2" 7-16 DIN MALE CONNECTOR
2	DDN9682	F4PNMV2-HC 1/2" TYPE N MALE PLATED CONNECTOR
1	DSSPD34534_2	OVERLOOK MNT COMBINER/MULTICOUPLER
1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 100' COAX W/DONGLE SNMPV3
1	CLN1868	2930F 24-PORT SWITCH
1	T8492	SITE AND HUB ROUTER AND FIREWALL-AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	CA03450AA	ADD: DC-DC POWER SUPPLY
1	F4544	SITE MANAGER ADVANCED
1	V266	ADD: 90VAC TO 260VAC PS TO SM
1	VA00872	ADD: SDM ASTRO RTU FW CURR ASTRO REL
3	V592	AAD TERM BLCK & CONN WI
1	TRN7343	SEVEN AND A HALF FOOT RACK

QTY	NOMENCLATURE	DESCRIPTION
3	T7039	GTR 8000 Base Radio
3	X530BG	ADD: VHF (136-174 MHZ)
3	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
3	CA01504AA	ADD: ANTENNA RELAY
3	X153AW	ADD: RACK MOUNT HARDWARE
3	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
3	CA01400AA	ADD: POWER CABLE, DC
2	DSFSA2041DIN	DIRECTIONAL DIPOLE ARRAY 7DBD, 108 DEG BW, 148-174 MHZ, PIM RATED
2	DDN1090	L4TDM-PSA 7-16 DIN MALE PS FOR 1/2 IN CABLE
4	TDN9289	221213 CABLE WRAP WEATHERPROOFING
2	DDN1077	7-16IN DIN FEMALE CONNECTOR EZ-FIT FOR 7/8IN CABLE (MOTOROLA SPECIFIC)
4	DSSG7806B2A	SG78-06B2A GROUNDING KIT FOR 7/8 IN COAXIAL CABLE
4	DSL5SGRIP	L5SGRIP 7/8" SUPPORT HOIST GRIP
460	DSAVA550	AVA5-50, COAXIAL CABLE, CORRUGATED COPPER,7/8 IN, BLACK PE JACKET
2	DSISB50LNC2MA	RF SPD, 125-1000MHZ DC BLOCK BROADBAND BULKHEAD MT, NM ANT, NF EQUIP
2	DSBFD	BULKHEAD FLANGE MOUNT ADAPTER
4	DSGSAKITD	GROUND STRAP KIT - DIN
60	L1702	FSJ4-50B CABLE: 1/2" SUPERFLEX POLY JKT PER FOOT
2	DSF4PDMV2C	F4PDMV2-C 1/2" 7-16 DIN MALE CONNECTOR
2	DDN9682	F4PNMV2-HC 1/2" TYPE N MALE PLATED CONNECTOR
1	DSSPD34534_1	ILLINOIS MNT COMBINER/MULTICOUPLER
1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 100' COAX W/DONGLE SNMPV3
1	CLN1868	2930F 24-PORT SWITCH

QTY	NOMENCLATURE	DESCRIPTION
1	T8492	SITE AND HUB ROUTER AND FIREWALL-AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	CA03450AA	ADD: DC-DC POWER SUPPLY
1	F4544	SITE MANAGER ADVANCED
1	V266	ADD: 90VAC TO 260VAC PS TO SM
1	VA00872	ADD: SDM ASTRO RTU FW CURR ASTRO REL
3	V592	AAD TERM BLCK & CONN WI
1	TRN7343	SEVEN AND A HALF FOOT RACK
2	T7039	GTR 8000 Base Radio
2	X530BG	ADD: VHF (136-174 MHZ)
2	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
2	CA01504AA	ADD: ANTENNA RELAY
2	X153AW	ADD: RACK MOUNT HARDWARE
2	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
2	CA01400AA	ADD: POWER CABLE, DC
1	DSFSA2041DIN	DIRECTIONAL DIPOLE ARRAY 7DBD, 108 DEG BW, 148-174 MHZ, PIM RATED
2	DDN1090	L4TDM-PSA 7-16 DIN MALE PS FOR 1/2 IN CABLE
2	TDN9289	221213 CABLE WRAP WEATHERPROOFING
2	DDN1077	7-16IN DIN FEMALE CONNECTOR EZ-FIT FOR 7/8IN CABLE (MOTOROLA SPECIFIC)
2	DSSG7806B2A	SG78-06B2A GROUNDING KIT FOR 7/8 IN COAXIAL CABLE
2	DSL5SGRIP	L5SGRIP 7/8" SUPPORT HOIST GRIP
130	DSAVA550	AVA5-50, COAXIAL CABLE, CORRUGATED COPPER,7/8 IN, BLACK PE JACKET
1	DSISB50LNC2MA	RF SPD, 125-1000MHZ DC BLOCK BROADBAND BULKHEAD MT, NM ANT, NF EQUIP
2	DSBFD	BULKHEAD FLANGE MOUNT ADAPTER

QTY	NOMENCLATURE	DESCRIPTION
2	DSGSAKITD	GROUND STRAP KIT - DIN
30	L1702	FSJ4-50B CABLE: 1/2" SUPERFLEX POLY JKT PER FOOT
2	DSF4PDMV2C	F4PDMV2-C 1/2" 7-16 DIN MALE CONNECTOR
2	DDN9682	F4PNMV2-HC 1/2" TYPE N MALE PLATED CONNECTOR
1	DSSPD34533_1	TONCHE MNT COMBINER/MULTICOUPLER NE
1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 100' COAX W/DONGLE SNMPV3
1	CLN1868	2930F 24-PORT SWITCH
1	T8492	SITE AND HUB ROUTER AND FIREWALL-AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	CA03450AA	ADD: DC-DC POWER SUPPLY
1	TRN7343	SEVEN AND A HALF FOOT RACK
2	T7039	GTR 8000 Base Radio
2	X530BG	ADD: VHF (136-174 MHZ)
2	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
2	CA01504AA	ADD: ANTENNA RELAY
2	X153AW	ADD: RACK MOUNT HARDWARE
2	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
2	CA01400AA	ADD: POWER CABLE, DC
1	DSCSA1041DIN	DIRECTIONAL DIPOLE ARRAY, 7DBD, 64 DEG BW, 148-174 MHZ, PIM RATED
2	DDN1090	L4TDM-PSA 7-16 DIN MALE PS FOR 1/2 IN CABLE
2	TDN9289	221213 CABLE WRAP WEATHERPROOFING
2	DDN1077	7-16IN DIN FEMALE CONNECTOR EZ-FIT FOR 7/8IN CABLE (MOTOROLA SPECIFIC)
12	DSSG7806B2A	SG78-06B2A GROUNDING KIT FOR 7/8 IN COAXIAL CABLE

QTY	NOMENCLATURE	DESCRIPTION
2	DSL5SGRIP	L5SGRIP 7/8" SUPPORT HOIST GRIP
230	DSAVA550	AVA5-50, COAXIAL CABLE, CORRUGATED COPPER,7/8 IN, BLACK PE JACKET
1	DSISB50LNC2MA	RF SPD, 125-1000MHZ DC BLOCK BROADBAND BULKHEAD MT, NM ANT, NF EQUIP
2	DSBFD	BULKHEAD FLANGE MOUNT ADAPTER
2	DSGSAKITD	GROUND STRAP KIT - DIN
30	L1702	FSJ4-50B CABLE: 1/2" SUPERFLEX POLY JKT PER FOOT
2	DSF4PDMV2C	F4PDMV2-C 1/2" 7-16 DIN MALE CONNECTOR
2	DDN9682	F4PNMV2-HC 1/2" TYPE N MALE PLATED CONNECTOR
1	DSSPD34533_4	SAUGERTIES COMBINER/MULTICOUPLER NE
1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 100' COAX W/DONGLE SNMPV3
1	CLN1868	2930F 24-PORT SWITCH
1	T8492	SITE AND HUB ROUTER AND FIREWALL-AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	CA03450AA	ADD: DC-DC POWER SUPPLY
1	F4544	SITE MANAGER ADVANCED
1	V266	ADD: 90VAC TO 260VAC PS TO SM
1	VA00872	ADD: SDM ASTRO RTU FW CURR ASTRO REL
3	V592	AAD TERM BLCK & CONN WI
1	TRN7343	SEVEN AND A HALF FOOT RACK
2	T7039	GTR 8000 Base Radio
2	X530BG	ADD: VHF (136-174 MHZ)
2	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
2	CA01504AA	ADD: ANTENNA RELAY
2	X153AW	ADD: RACK MOUNT HARDWARE

QTY	NOMENCLATURE	DESCRIPTION
2	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
2	CA01400AA	ADD: POWER CABLE, DC
1	DSBA8041DINT3	ANTENNA, SINGLE OMNI, EXPOSED DIPOLE, 136-174 MHZ, 6/6 DBD GAIN
2	DDN1090	L4TDM-PSA 7-16 DIN MALE PS FOR 1/2 IN CABLE
2	TDN9289	221213 CABLE WRAP WEATHERPROOFING
2	DDN1077	7-16IN DIN FEMALE CONNECTOR EZ-FIT FOR 7/8IN CABLE (MOTOROLA SPECIFIC)
2	DSSG7806B2A	SG78-06B2A GROUNDING KIT FOR 7/8 IN COAXIAL CABLE
2	DSL5SGRIP	L5SGRIP 7/8" SUPPORT HOIST GRIP
80	DSAVA550	AVA5-50, COAXIAL CABLE, CORRUGATED COPPER,7/8 IN, BLACK PE JACKET
1	DSISB50LNC2MA	RF SPD, 125-1000MHZ DC BLOCK BROADBAND BULKHEAD MT, NM ANT, NF EQUIP
2	DSBFD	BULKHEAD FLANGE MOUNT ADAPTER
2	DSGSAKITD	GROUND STRAP KIT - DIN
30	L1702	FSJ4-50B CABLE: 1/2" SUPERFLEX POLY JKT PER FOOT
2	DSF4PDMV2C	F4PDMV2-C 1/2" 7-16 DIN MALE CONNECTOR
2	DDN9682	F4PNMV2-HC 1/2" TYPE N MALE PLATED CONNECTOR
1	DSSPD34533_2	BELLE AIRE COMBINER/MULTICOUPLER NE
1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 100' COAX W/DONGLE SNMPV3
1	CLN1868	2930F 24-PORT SWITCH
1	T8492	SITE AND HUB ROUTER AND FIREWALL-AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	CA03450AA	ADD: DC-DC POWER SUPPLY
1	F4544	SITE MANAGER ADVANCED

QTY	NOMENCLATURE	DESCRIPTION
1	V266	ADD: 90VAC TO 260VAC PS TO SM
1	VA00872	ADD: SDM ASTRO RTU FW CURR ASTRO REL
3	V592	AAD TERM BLCK & CONN WI
1	TRN7343	SEVEN AND A HALF FOOT RACK
2	T7039	GTR 8000 Base Radio
2	X530BG	ADD: VHF (136-174 MHZ)
2	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
2	CA01504AA	ADD: ANTENNA RELAY
2	X153AW	ADD: RACK MOUNT HARDWARE
2	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
2	CA01400AA	ADD: POWER CABLE, DC
1	DSBA8041DIN	OMNI, EXPOSED DIPOLE ARRAY, 6 DBD, 136-174 MHZ, PIM RATED
2	DDN1090	L4TDM-PSA 7-16 DIN MALE PS FOR 1/2 IN CABLE
2	TDN9289	221213 CABLE WRAP WEATHERPROOFING
2	DDN1077	7-16IN DIN FEMALE CONNECTOR EZ-FIT FOR 7/8IN CABLE (MOTOROLA SPECIFIC)
12	DSSG7806B2A	SG78-06B2A GROUNDING KIT FOR 7/8 IN COAXIAL CABLE
2	DSL5SGRIP	L5SGRIP 7/8" SUPPORT HOIST GRIP
230	DSAVA550	AVA5-50, COAXIAL CABLE, CORRUGATED COPPER,7/8 IN, BLACK PE JACKET
1	DSISB50LNC2MA	RF SPD, 125-1000MHZ DC BLOCK BROADBAND BULKHEAD MT, NM ANT, NF EQUIP
2	DSBFD	BULKHEAD FLANGE MOUNT ADAPTER
2	DSGSAKITD	GROUND STRAP KIT - DIN
30	L1702	FSJ4-50B CABLE: 1/2" SUPERFLEX POLY JKT PER FOOT
2	DSF4PDMV2C	F4PDMV2-C 1/2" 7-16 DIN MALE CONNECTOR
2	DDN9682	F4PNMV2-HC 1/2" TYPE N MALE PLATED CONNECTOR

QTY	NOMENCLATURE	DESCRIPTION
1	DSSPD34533_3	SHANDAKEN COMBINER/MULTICOUPLER NET
1	DSTPS2124500000	DC POWER SYS, FP216 -48/500 2-BC32 R3, SP2 TRILOGY RELAY RACK, BATT TR
5	DS241115105	RECTIFIER, FLATPACK 2 48/2000 HE
7	DS331E23640800	BLIND PANEL FP2 HE BLACK G1
1	DS338029	MPC-1-6-00-04 WITH CANDIS DISPLAY 6KVA MAX; 1.5KVA MIN; 8RU
3	DS275843	INVERTER, 1.5KVA, 120VAC, 48VDC INVERTER MOD
1	DS5041056200	INVERTER BLANK PANEL TSI MEDIA
2	DS264814	BATT KIT ENERSYS 12V190F 48V 1BANK
12	DS0831062204	CIRCUIT BREAKER 15A SINGLE POLE
1	DSTPS2124500000	DC POWER SYS, FP216 -48/500 2-BC32 R3, SP2 TRILOGY RELAY RACK, BATT TR
5	DS241115105	RECTIFIER, FLATPACK 2 48/2000 HE
7	DS331E23640800	BLIND PANEL FP2 HE BLACK G1
1	DS338029	MPC-1-6-00-04 WITH CANDIS DISPLAY 6KVA MAX; 1.5KVA MIN; 8RU
3	DS275843	INVERTER, 1.5KVA, 120VAC, 48VDC INVERTER MOD
1	DS5041056200	INVERTER BLANK PANEL TSI MEDIA
1	DS305467	BATTERY, 48V/170AH 12V170FS
12	DS0831062204	CIRCUIT BREAKER 15A SINGLE POLE
1	DSTPS2124500000	DC POWER SYS, FP216 -48/500 2-BC32 R3, SP2 TRILOGY RELAY RACK, BATT TR
5	DS241115105	RECTIFIER, FLATPACK 2 48/2000 HE
7	DS331E23640800	BLIND PANEL FP2 HE BLACK G1
1	DS338029	MPC-1-6-00-04 WITH CANDIS DISPLAY 6KVA MAX; 1.5KVA MIN; 8RU
3	DS275843	INVERTER, 1.5KVA, 120VAC, 48VDC INVERTER MOD
1	DS5041056200	INVERTER BLANK PANEL TSI MEDIA
2	DS264814	BATT KIT ENERSYS 12V190F 48V 1BANK
6	DS0831062204	CIRCUIT BREAKER 15A SINGLE POLE

QTY	NOMENCLATURE	DESCRIPTION
1	DSTPS2124500000	DC POWER SYS, FP216 -48/500 2-BC32 R3, SP2 TRILOGY RELAY RACK, BATT TR
4	DS241115105	RECTIFIER, FLATPACK 2 48/2000 HE
8	DS331E23640800	BLIND PANEL FP2 HE BLACK G1
1	DS338029	MPC-1-6-00-04 WITH CANDIS DISPLAY 6KVA MAX; 1.5KVA MIN; 8RU
3	DS275843	INVERTER, 1.5KVA, 120VAC, 48VDC INVERTER MOD
1	DS5041056200	INVERTER BLANK PANEL TSI MEDIA
2	DS506574	48V 155AH 12V155FS ENERSYS BATT SET
6	DS0831062204	CIRCUIT BREAKER 15A SINGLE POLE
1	DSTPS2124500000	DC POWER SYS, FP216 -48/500 2-BC32 R3, SP2 TRILOGY RELAY RACK, BATT TR
5	DS241115105	RECTIFIER, FLATPACK 2 48/2000 HE
7	DS331E23640800	BLIND PANEL FP2 HE BLACK G1
1	DS338029	MPC-1-6-00-04 WITH CANDIS DISPLAY 6KVA MAX; 1.5KVA MIN; 8RU
3	DS275843	INVERTER, 1.5KVA, 120VAC, 48VDC INVERTER MOD
1	DS5041056200	INVERTER BLANK PANEL TSI MEDIA
2	DS264814	BATT KIT ENERSYS 12V190F 48V 1BANK
5	DS0831062204	CIRCUIT BREAKER 15A SINGLE POLE
1	DSTPS2124500000	DC POWER SYS, FP216 -48/500 2-BC32 R3, SP2 TRILOGY RELAY RACK, BATT TR
5	DS241115105	RECTIFIER, FLATPACK 2 48/2000 HE
7	DS331E23640800	BLIND PANEL FP2 HE BLACK G1
1	DS338029	MPC-1-6-00-04 WITH CANDIS DISPLAY 6KVA MAX; 1.5KVA MIN; 8RU
3	DS275843	INVERTER, 1.5KVA, 120VAC, 48VDC INVERTER MOD
1	DS5041056200	INVERTER BLANK PANEL TSI MEDIA
1	DS305467	BATTERY, 48V/170AH 12V170FS
5	DS0831062204	CIRCUIT BREAKER 15A SINGLE POLE
1	DSTPS2124500000	DC POWER SYS, FP216 -48/500 2-BC32 R3, SP2 TRILOGY RELAY RACK, BATT TR

QTY	NOMENCLATURE	DESCRIPTION
5	DS241115105	RECTIFIER, FLATPACK 2 48/2000 HE
7	DS331E23640800	BLIND PANEL FP2 HE BLACK G1
1	DS338029	MPC-1-6-00-04 WITH CANDIS DISPLAY 6KVA MAX; 1.5KVA MIN; 8RU
3	DS275843	INVERTER, 1.5KVA, 120VAC, 48VDC INVERTER MOD
1	DS5041056200	INVERTER BLANK PANEL TSI MEDIA
2	DS264814	BATT KIT ENERSYS 12V190F 48V 1BANK
5	DS0831062204	CIRCUIT BREAKER 15A SINGLE POLE
1	DSTPS2124500000	DC POWER SYS, FP216 -48/500 2-BC32 R3, SP2 TRILOGY RELAY RACK, BATT TR
4	DS241115105	RECTIFIER, FLATPACK 2 48/2000 HE
8	DS331E23640800	BLIND PANEL FP2 HE BLACK G1
1	DS338029	MPC-1-6-00-04 WITH CANDIS DISPLAY 6KVA MAX; 1.5KVA MIN; 8RU
3	DS275843	INVERTER, 1.5KVA, 120VAC, 48VDC INVERTER MOD
1	DS5041056200	INVERTER BLANK PANEL TSI MEDIA
2	DS506574	48V 155AH 12V155FS ENERSYS BATT SET
5	DS0831062204	CIRCUIT BREAKER 15A SINGLE POLE
1	TT3290	SINGLE TELEPHONY RECORDER BASE BUNDLE
48	TT06303AA	ADD: PROFESSIONAL RECORDING CHANNEL
1	DDN2663	NICE INFORM 9 CHANNEL FLAG
2	DDN2681	HP 2TB 6G SAS HDD FOR GEN10 ML350 OR DL380
1	DDN7532	SNMP MANAGEMENT APPLICATION
1	DDN2521	MS SQL 2016 64 BIT SERVER CLIENT ACCESS LICENSE
5	DDN2522	MS SQL 2016 64 BIT USER CLIENT ACCESS LICENSE
1	DDN2523	MYSQL SERVER LICENSE STANDARD EDITION

QTY	NOMENCLATURE	DESCRIPTION
2	DDN2487	ANALOG DIGITAL TRUNK FULL LENGTH PCI E INTERFACE BOARD WITH NO CABLE
2	DDN2502	CONNECTION CABLE 10M FOR ANALOG DIGITAL CARDS
1	DDN2509	MOXA NPORT 1 PORT DEVICE SVR 1 DB9M RS232 PORT 1 10 100 NETWORK PORT
1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 100' COAX W/DONGLE SNMPV3
1	CLN1868	2930F 24-PORT SWITCH
1	T8492	SITE AND HUB ROUTER AND FIREWALL-AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	CA03450AA	ADD: DC-DC POWER SUPPLY
1	F4544	SITE MANAGER ADVANCED
1	V266	ADD: 90VAC TO 260VAC PS TO SM
1	VA00872	ADD: SDM ASTRO RTU FW CURR ASTRO REL
3	V592	AAD TERM BLCK & CONN WI
1	TRN7343	SEVEN AND A HALF FOOT RACK
2	T7039	GTR 8000 Base Radio
2	X530BG	ADD: VHF (136-174 MHZ)
2	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
2	CA01504AA	ADD: ANTENNA RELAY
2	X153AW	ADD: RACK MOUNT HARDWARE
2	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
2	CA01400AA	ADD: POWER CABLE, DC
1	DSBA8041DIN	OMNI, EXPOSED DIPOLE ARRAY, 6 DBD, 136-174 MHZ, PIM RATED
2	DDN1090	L4TDM-PSA 7-16 DIN MALE PS FOR 1/2 IN CABLE
2	TDN9289	221213 CABLE WRAP WEATHERPROOFING

QTY	NOMENCLATURE	DESCRIPTION
2	DDN1077	7-16IN DIN FEMALE CONNECTOR EZ-FIT FOR 7/8IN CABLE (MOTOROLA SPECIFIC)
2	DSSG7806B2A	SG78-06B2A GROUNDING KIT FOR 7/8 IN COAXIAL CABLE
2	DSL5SGRIP	L5SGRIP 7/8" SUPPORT HOIST GRIP
220	DSAVA550	AVA5-50, COAXIAL CABLE, CORRUGATED COPPER,7/8 IN, BLACK PE JACKET
1	DSISB50LNC2MA	RF SPD, 125-1000MHZ DC BLOCK BROADBAND BULKHEAD MT, NM ANT, NF EQUIP
2	DSBFD	BULKHEAD FLANGE MOUNT ADAPTER
2	DSGSAKITD	GROUND STRAP KIT - DIN
30	L1702	FSJ4-50B CABLE: 1/2" SUPERFLEX POLY JKT PER FOOT
2	DSF4PDMV2C	F4PDMV2-C 1/2" 7-16 DIN MALE CONNECTOR
2	DDN9682	F4PNMV2-HC 1/2" TYPE N MALE PLATED CONNECTOR
1	DSSPD34533_2	BELLE AIRE COMBINER/MULTICOUPLER NE
1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 100' COAX W/DONGLE SNMPV3
1	CLN1868	2930F 24-PORT SWITCH
1	T8492	SITE AND HUB ROUTER AND FIREWALL-AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	CA03450AA	ADD: DC-DC POWER SUPPLY
1	F4544	SITE MANAGER ADVANCED
1	V266	ADD: 90VAC TO 260VAC PS TO SM
1	VA00872	ADD: SDM ASTRO RTU FW CURR ASTRO REL
3	V592	AAD TERM BLCK & CONN WI
1	TRN7343	SEVEN AND A HALF FOOT RACK
2	T7039	GTR 8000 Base Radio
2	X530BG	ADD: VHF (136-174 MHZ)

QTY	NOMENCLATURE	DESCRIPTION
2	CA03089AA	ADD: ANALOG CONV IP VOTING/SIMUL
2	CA01504AA	ADD: ANTENNA RELAY
2	X153AW	ADD: RACK MOUNT HARDWARE
2	CA00719AA	ADD: ASTRO SYSTEM RELEASE 7.19
2	CA01400AA	ADD: POWER CABLE, DC
1	DSBA8041DIN	OMNI, EXPOSED DIPOLE ARRAY, 6 DBD, 136-174 MHZ, PIM RATED
2	DDN1090	L4TDM-PSA 7-16 DIN MALE PS FOR 1/2 IN CABLE
2	TDN9289	221213 CABLE WRAP WEATHERPROOFING
2	DDN1077	7-16IN DIN FEMALE CONNECTOR EZ-FIT FOR 7/8IN CABLE (MOTOROLA SPECIFIC)
12	DSSG7806B2A	SG78-06B2A GROUNDING KIT FOR 7/8 IN COAXIAL CABLE
2	DSL5SGRIP	L5SGRIP 7/8" SUPPORT HOIST GRIP
200	DSAVA550	AVA5-50, COAXIAL CABLE, CORRUGATED COPPER,7/8 IN, BLACK PE JACKET
1	DSISB50LNC2MA	RF SPD, 125-1000MHZ DC BLOCK BROADBAND BULKHEAD MT, NM ANT, NF EQUIP
2	DSBFD	BULKHEAD FLANGE MOUNT ADAPTER
2	DSGSAKITD	GROUND STRAP KIT - DIN
30	L1702	FSJ4-50B CABLE: 1/2" SUPERFLEX POLY JKT PER FOOT
2	DSF4PDMV2C	F4PDMV2-C 1/2" 7-16 DIN MALE CONNECTOR
2	DDN9682	F4PNMV2-HC 1/2" TYPE N MALE PLATED CONNECTOR
1	DSSPD34533_3	SHANDAKEN COMBINER/MULTICOUPLER NET
250	M22KSS9PW1 N	APX4500 VHF
250	G67	ADD: REMOTE MOUNT O2 WWM
250	GA00804	ADD: APX O2 CONTROL HEAD
250	G301	ADD: 3BD ANT 136-174MHZ
250	Q811	ADD: SOFTWARE P25 CONVENTIONAL

QTY	NOMENCLATURE	DESCRIPTION
250	GA00235	ADD: NO GPS ANTENNA NEEDED
250	G610	ADD: REMOTE MOUNT CBL 30 FEET
250	W22	ADD: STD PALM MICROPHONE APX
250	B18	ADD: AUXILARY SPKR 7.5 WATT
250	G24	ADD: 3Y ESSENTIAL SERVICE
250	G444	ADD: APX CONTROL HEAD SOFTWARE
250	M22KSS9PW1 N	APX4500 VHF
250	G67	ADD: REMOTE MOUNT O2 WWM
250	GA00092	ADD: APX DUAL-CONTRL HD HARDWARE
250	G301	ADD: 3BD ANT 136-174MHZ
250	Q811	ADD: SOFTWARE P25 CONVENTIONAL
250	GA00235	ADD: NO GPS ANTENNA NEEDED
500	G610	ADD: REMOTE MOUNT CBL 30 FEET
500	W22	ADD: STD PALM MICROPHONE APX
500	B18	ADD: AUXILARY SPKR 7.5 WATT
250	G24	ADD: 3Y ESSENTIAL SERVICE
250	G442	ADD: O5 CONTROL HEAD
250	G444	ADD: APX CONTROL HEAD SOFTWARE
1500	H51KDF9PW6 N	APX 4000 VHF MHZ MODEL 2 PORTABLE
1500	Q811	ENH: SOFTWARE P25 CONVENTIONAL
1500	H885BK	ADD: 3Y ESSENTIAL SERVICE
1500	PMMN4065A	APX IMPRES RSM W/VOL, IP57
1500	4202006A01	CLIP BELT
1500	WPLN4111AR	IMPRES CHARGER
50	WPLN4108 R	IMPRES MULTI UNIT CHARGER - 110V US PLUG NON-DISPLAY
1	TT3492	Z2 G4 MINI WORKSTATION NON RETURNAB
1	DSF2B56AA	USB EXTERNAL DVD DRIVE
1	DSST7300U3M	STARTECH 7 PORT USB 3.0 HUB

QTY	NOMENCLATURE	DESCRIPTION
1	DSTWIN6328A	PROVIDES ONE DUAL PEDAL FOOTSWITCH FOR USE WITH MOTOROLA MCC 7500 DISP
1	RLN6098	HDST MODULE BASE W/PTT, 15 FT CBL
1	B1941	USB AUDIO INTERFACE MODULE
1	B1913	MCC SERIES HEADSET JACK
1	B1951	MICROPHONE, DESKTOP, USB
1	B1952	SPEAKER, DESKTOP, USB
1	CA03405AA	ADD: POWER SUPPLY WITH DC CORD
1	CA03406AA	ADD: AC LINE CORD, NORTH AMERICA
1	CA03413AA	ADD: USB CABLE, TYPE A TO TYPE C, 4.5M
1	RMN5078B	SUPRAPLUS NC SINGLE MUFF HEADSET
1	T8492	SITE AND HUB ROUTER AND FIREWALL-AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	CA03450AA	ADD: DC-DC POWER SUPPLY
1	CLN1868	2930F 24-PORT SWITCH
2	DLN6892	FRU: XCVR VHF V2
2	DLN6897	FRU: PA VHF
2	DLN6898	FRU: FAN MODULE
2	DLN6966	FRU: GCP 8000/GCM 8000/GPB 8000
2	DLN6781	FRU: POWER SUPPLY
1	SQM01SUM0205	GGM 8000 GATEWAY
1	CA01616AA	ADD: AC POWER
1	CA02086AA	ADD: HIGH DENSITY ENH CONV GATEWAY
2	DS241115105	RECTIFIER, FLATPACK 2 48/2000 HE
1	DSTPS2124500000	DC POWER SYS, FP216 -48/500 2-BC32 R3, SP2 TRILOGY RELAY RACK, BATT TR
5	DS241115105	RECTIFIER, FLATPACK 2 48/2000 HE
7	DS331E23640800	BLIND PANEL FP2 HE BLACK G1

QTY	NOMENCLATURE	DESCRIPTION
1	DS338029	MPC-1-6-00-04 WITH CANDIS DISPLAY 6KVA MAX; 1.5KVA MIN; 8RU
3	DS275843	INVERTER, 1.5KVA, 120VAC, 48VDC INVERTER MOD
1	DS5041056200	INVERTER BLANK PANEL TSI MEDIA
2	DS264814	BATT KIT ENERSYS 12V190F 48V 1BANK
5	DS0831062204	CIRCUIT BREAKER 15A SINGLE POLE
1	DSTPS2124500000	DC POWER SYS, FP216 -48/500 2-BC32 R3, SP2 TRILOGY RELAY RACK, BATT TR
4	DS241115105	RECTIFIER, FLATPACK 2 48/2000 HE
8	DS331E23640800	BLIND PANEL FP2 HE BLACK G1
1	DS338029	MPC-1-6-00-04 WITH CANDIS DISPLAY 6KVA MAX; 1.5KVA MIN; 8RU
3	DS275843	INVERTER, 1.5KVA, 120VAC, 48VDC INVERTER MOD
1	DS5041056200	INVERTER BLANK PANEL TSI MEDIA
2	DS506574	48V 155AH 12V155FS ENERSYS BATT SET
5	DS0831062204	CIRCUIT BREAKER 15A SINGLE POLE

1.5 STATEMENT OF WORK

This Statement of Work (SOW) describes the deliverables to be furnished to Ulster County, NY. The tasks described herein will be performed by Motorola, its subcontractors, and Ulster County to implement the solution described in the System Description. It describes the actual work involved in installation, identifies the installation standards to be followed, and clarifies the responsibilities for both Motorola and Ulster County during the project implementation. Specifically, this SOW provides:

- A summary of the phases and tasks to be completed within the project lifecycle.
- A list of the deliverables associated with the project.
- A description of the responsibilities for both Motorola and Ulster County.
- The qualifications and assumptions taken into consideration during the development of this project.

This SOW provides the most current understanding of the work required by both parties to ensure a successful project implementation. In particular, Motorola has made assumptions of the sites to be used for the new system. Should any of the sites change, a revision to the SOW and associated pricing will be required. It is understood that this SOW is a working document, and that it will be revised as needed to incorporate any changes associated with contract negotiations, and any other change orders that may occur during the execution of the project.

1.5.1 Assumptions

Motorola has based the system design on information provided by Ulster County and an analysis of their system requirements. All assumptions have been listed below for review. Should Motorola's assumptions be deemed incorrect or not agreeable to Ulster County, a revised proposal with the necessary changes and adjusted costs may be required. Changes to the equipment or scope of the project after contract may require a change order

- All work is to be performed during normal work hours, Monday through Friday 8:00 a.m. to 5:00 p.m.
- Motorola is not responsible for interference caused or received by the Motorola-provided equipment except for interference that is directly caused by the Motorola-provided transmitter(s) to the Motorola-provided receiver(s). Should Ulster County system experience interference, Motorola can be contracted to investigate the source and recommend solutions to mitigate the issue.
- Motorola will make every effort to minimize but will not be responsible for any external interference, nor for interference between the Motorola-provided equipment and other County equipment. Should the system experience interference, Motorola can be contracted to investigate the source and recommend solutions to mitigate the issue.
- Motorola assumes that there will be a suitable ground nearby to the all the equipment installation locations.
- Ulster County will be responsible for providing existing and/or new backhaul links (Ethernet Layer 3) from all sites to the Master site.
- The proposed equipment will reuse the frequencies as provided by Ulster County.

- No simulcast optimization receiver equipment has been included.
- Equipment will ship to Local shop for inventory and delivery to the sites prior to installation.
- If Ulster County requires specific subcontractors to be used on this project, other than Motorola approved or certified subcontractors, additional costs may apply.
- Depending on contract execution, equipment software and hardware will be at the current shipping version.
- The sites have adequate utility service and adequate HVAC to support the proposed equipment.
- The sites have adequate space for new equipment and antennas install on the tower.
- Any required system interconnections not specifically outlined here will be provided by Ulster County. These may include dedicated phone circuits, fiber or microwave links.
- Flashing or reprogramming of existing subscribers have not been included with this proposal.
- Motorola has included cost to reprogram existing ten (10) base stations and forty-two portable radios for the Ski Resort. If the base stations/duplexers cannot be re-tuned to the new frequency, cost for new equipment is not included with this proposal. All portables to be located at one location prior to the arrival of the technician for reprogramming.
- Removal the existing mobiles from the vehicle not included. All existing vehicles have room to install the new radios in conjunction with existing radios.

Motorola Solutions will install and configure the proposed equipment. The following table describes the tasks involved with installation and configuration.

Tasks	Motorola Solutions	Ulster County, NY
PROJECT INITIATION		
Contract Finalization and Team Creation		
Execute contract and distribute contract documents.	X	X
Assign a Project Manager as a single point of contact.	X	X
Assign resources.	X	X
Schedule project kickoff meeting.	X	X
Deliverable: Signed contract, defined project team, and scheduled project kickoff meeting.		
Project Administration		
Ensure that project team members attend all meetings relevant to their role on the project.	X	X
Set up the project in the Motorola Solutions information system.	X	
Record and distribute project status meeting minutes.	X	
Maintain responsibility for third-party services contracted by Motorola Solutions.	X	
Complete assigned project tasks according to the project schedule.	X	X
Submit project milestone completion documents.	X	
Upon completion of tasks, approve project milestone completion documents.		X
Conduct all project work Monday thru Friday 8:00 a.m. to 5:00 p.m.).	X	
Deliverable: Completed and approved project milestones throughout the project.		
Project Kickoff		
Introduce team, review roles, and decision authority.	X	X
Present project scope and objectives.	X	
Review SOW responsibilities and project schedule.	X	X
Schedule Design Review.	X	X
Deliverable: Completed project kickoff and scheduled Design Review.		
Design Review		
Review the Customer's operational requirements.	X	X
Present the system design and operational requirements for the solution.	X	

Tasks	Motorola Solutions	Ulster County, NY
Present configuration and details of sites required by system design.	X	
Validate that Customer sites can accommodate proposed equipment.	X	X
Provide approvals required to add equipment to proposed existing sites.		X
Review safety, security, and site access procedures.	X	
Finalize site acquisition and development plan.		X
Present equipment layout plans and system design drawings.	X	
Provide backhaul performance specifications and demarcation points.	X	
Provide heat load and power requirements for new equipment.	X	
Provide information on existing system interfaces.		X
Provide frequency and radio information for each site.		X
Assume liability and responsibility for providing all information necessary for complete installation.		X
Assume responsibility for issues outside of Motorola Solutions' control.		X
Complete the required forms required for frequency coordination and licensing. ▪ The County will be solely responsible for obtaining all licenses for complying with local regulatory requirements. Motorola Solutions may assist the County, but in no event will Motorola Solutions or any of its employees be an agent or representative of the County. If, for any reason, any of the proposed sites or frequencies cannot be used due to reasons beyond Motorola Solutions' control, the costs associated with site changes or delays, frequency searches and coordination, etc. including, but not limited to, re-engineering, frequency re-licensing, schedule delays, re-mobilization, etc., will be addressed through the change order process.		X
Review and update design documents, including System Description, Statement of Work, Project Schedule, and Acceptance Test Plan, based on Design Review agreements.	X	
Execute Change Order in accordance with all material changes to the Contract resulting from the Design Review.	X	
Deliverable: Finalized design documentation based upon "frozen" design, along with any relevant Change Order documentation.		
SYSTEM INSTALLATION		
Equipment Order and Manufacturing		
Create equipment order and reconcile to contract.	X	
Manufacture Motorola Solutions-provided equipment necessary for system based on equipment order.	X	

Tasks	Motorola Solutions	Ulster County, NY
Procure non-Motorola Solutions equipment necessary for the system.	X	
Deliverable: Equipment procured and ready for shipment.		
System Staging		
Ship all equipment needed for staging to Motorola Solutions' Customer Center for Solutions Integration (CCSi).	X	
Provide information on existing system interfaces, room layouts, or other information necessary for the assembly to meet field conditions.		X
Set up and rack the solution equipment on a site-by-site basis, as it will be configured in the field at each of the sites.	X	
Cut and label the cables with to/from information to specify interconnection for field installation and future servicing needs.	X	
Complete the cabling/connecting of the subsystems to each other ("connectorization" of the subsystems).	X	
Assemble required subsystems to assure system functionality.	X	
Power up, load application parameters, program, and test all staged equipment.	X	
Confirm system configuration and software compatibility with the existing system.	X	
Inventory the equipment with serial numbers and installation references.	X	
Review and approve proposed Factory Acceptance Test Plan.		X
Pay for travel, lodging, meals, and all incidental expenses for Customer personnel and representatives to witness the Factory Acceptance Testing.		X
Perform factory functional acceptance tests of system features	X	
Conduct site and system level testing.	X	
Perform system burn-in 24 hours a day during staging to isolate and capture any defects.	X	
Deliverable: System staged and ready for shipment.		
Equipment Shipment and Storage		
Provide secure location for solution equipment (for up to 3 months).	X	
Pack and ship solution equipment to the identified, or site locations.	X	
Receive solution equipment.	X	
Inventory solution equipment.	X	
Deliverable: Solution equipment received and ready for installation		
General Installation		
Deliver solution equipment to installation location.	X	

Tasks	Motorola Solutions	Ulster County, NY
Coordinate receipt of and inventory solution equipment with designated contact.	X	
Install all proposed fixed equipment as outlined in the System Description based upon the agreed-upon floor plans, connecting audio, control, and radio transmission cables to connect equipment to the power panels or receptacles, and audio/control line connection points. Installation performed in accordance with R56 standards and state/local codes.	X	
Provide system interconnections that are not specifically outlined in the system design, including dedicated fiber links, microwave links, or other types of connectivity.		X
Install and terminate all network cables between site routers and network demarcation points, including microwave, leased lines, and Ethernet per system description provided by the County.	X	
Label equipment, racks, and cables.	X	
Note any required changes to the installation for inclusion in the “as-built” system documentation.	X	
Remove, transport of old equipment		X
Dispose of old equipment		X
Deliverable: Equipment installed.		
Core and Remote Site Installation and Configuration		
Install fixed equipment contained in the equipment list and system description.	X	
Provide backhaul connectivity and associated equipment for all sites to meet latency, jitter and capacity requirements.		X
Configure Core to support the new RF sites.	X	
Verify site link performance, prior to the interconnection of the solution equipment to the link equipment.	X	
Integrate the RF sites into the system to ensure proper operation.	X	
Deliverable: ASTRO 25 core and remote site equipment installation completed.		
Console Installation and Configuration		
Identify outlets for connection to console and a demarcation point located within 5 feet of the console interface.		X
Connect console to outlet demarcation points.	X	
Install PC workstation w/ keyboard and mouse, and monitor.	X	
Install a Audio Interface Module (AIM) and purchased peripheral console equipment in accordance with R56 standards and state/local codes.	X	
Develop templates for console programming.	X	
Perform console one time programming and configuration.	X	

Tasks	Motorola Solutions	Ulster County, NY
Deliverable: Console equipment installation completed.		
Logging Equipment Installation and Configuration		
Supply Analog logging equipment.	X	
Provide interface to logging equipment (demarcation will be provided within 5 ft of Motorola's comparators).	X	
Deliverable: Logging equipment installation completed.		
Mobile Radio Installation and Programming		
Develop and approve prototypes for each type of mobile installation.	X	
Provide up to ten (10) codeplugs for mobiles.	X	
Test features and functionalities of the mobile templates.	X	
Program the mobile radios identified in the equipment list in accordance with the programming templates, client software, and fleetmap. A "one-time only" programming is included in the project pricing.	X	
Provide at least 24 vehicles per day for installations according to the project/installation schedule.		X
Install all the mobiles in the vehicles, as identified in the equipment list, and according to the installation schedule.	X	
Permanently mount the antennas on each vehicle according to the approved prototype, appropriate for the vehicle type.	X	
Install the antennas on the roof, where practical, on the new antenna installations. If mobile antenna cannot be installed on the roof, determine an alternative location.	X	X
	X	
Deliverable: Mobile radios installed and accepted		
Portable Radio Programming and Distribution		
Pass all features and functionalities of the portable radio template.	X	
Program test portable radios with each template version and activate them on the system.	X	
Provide up to twenty (20) codeplugs for mobiles.	X	
Program the portable radios identified in the equipment list in accordance with the programming templates, client software, and fleetmap. A "one-time only" programming is included in the project pricing.	X	
Deliver portable radios to authorized Customer personnel and inventory upon receipt.	X	
Acknowledge receipt of portable radios and accessories and verify proper operation of a sampling of delivered portable radios.		X
Distribute portable radios to end users.	X	

Tasks	Motorola Solutions	Ulster County, NY
Deliverable: Portable radios accepted and distributed.		
SYSTEM OPTIMIZATION AND TESTING		
R56 Site Audit		
Perform R56 site-installation quality-audits, verifying proper physical installation and operational configurations.	X	
Create site evaluation report to verify site meets or exceeds requirements, as defined in Motorola Solutions' R56 Standards and Guidelines for Communication Sites.	X	
Deliverable: R56 Standards and Guidelines for Communication Sites audits completed successfully.		
Electromagnetic Interference (EMI) Analysis		
Perform EMI analysis for the Motorola Solutions-supplied equipment. Note: Motorola Solutions is only responsible for interference caused by Motorola Solutions-provided transmitters to the Motorola Solutions-provided receivers. Should the proposed equipment experience interference, Motorola Solutions can be contracted to investigate the source and recommend solutions to mitigate the issue.		X
Resolve any interference caused by equipment not supplied by Motorola Solutions.		X
Deliverable: EMI analysis completed.		
Solution Optimization		
Verify that all equipment is operating properly and that all electrical and signal levels are set accurately.	X	
Verify that all audio and data levels are at factory settings.	X	
Verify communication interfaces between devices for proper operation.	X	
Ensure that functionality meets manufacturers' specifications and complies with the final configuration established during design review or system staging.	X	
Deliverable: Completion of System Optimization.		
Functional Acceptance Testing		
Verify the operational functionality and features of the solution supplied by Motorola Solutions, as contracted.	X	
Witness the functional testing.		X
Document all issues that arise during the acceptance tests.	X	
If any major task for the system as contractually described fails during the Customer acceptance testing or beneficial use, repeat that particular task after Motorola Solutions determines that corrective action has been taken.	X	
Resolve any minor task failures before Final System Acceptance.	X	

Tasks	Motorola Solutions	Ulster County, NY
Document the results of the acceptance tests and present for review.	X	
Review and approve final acceptance test results.		X
Deliverable: Completion of functional testing and approval by Customer.		
Coverage Testing		
Determine the required number of test vehicles for simultaneous testing of multiple service areas.	X	X
Perform coverage testing according to the Coverage Acceptance Test Plan (CATP), Submit test reports within the agreed period.	X	
For any area that fails, take corrective action.	X	
Retest any areas for which corrective action has been taken.	X	
Document all issues that arise during the coverage testing.	X	
Submit final test reports, according to the agreed period.	X	
Provide the required number of test vehicles, drivers, and resources to witness the coverage testing.		X
Review and approve test results.		X
Deliverable: Completion of coverage testing and approval by Customer.		
PROJECT TRANSITION		
Cutover		
Finalize Cutover Plan.	X	X
Conduct cutover meeting with relevant personnel to address both how to mitigate technical and communication problem impacts to the users during cutover and during the general operation of the system.	X	
Notify the personnel affected by the cutover of the date and time planned for cutover.		X
Provide ongoing communication with users regarding the project and schedule.	X	X
Cut over users and ensure that user radios are operating on system.		X
Resolve punchlist items, documented during the Acceptance Testing phase, in order to meet all the criteria for final system acceptance.	X	
Assist Motorola Solutions with resolution of identified punchlist items by providing support, such as access to the sites, equipment and system, and approval of the resolved punchlist items.		X
Deliverable: Migration to new system completed, and punchlist items resolved.		
Transition to Warranty		

Tasks	Motorola Solutions	Ulster County, NY
Review the items necessary for transitioning the project to warranty support and service.	X	
Motorola Solutions to provide services during year 1 warranty which align with the proposed services.	X	
Provide a Customer Support Plan detailing the warranty support associated with the contract equipment.	X	
Participate in the Transition Service/Project Transition Certificate (PTC) process.		X
Deliverable: Service information delivered and approved by Customer		
Finalize Documentation and System Acceptance		
Provide manufacturer's installation material, part list and other related material to Customer upon project completion.	X	
Provide an electronic as-built system manual on CD or other Customer preferred electronic media. The documentation will include the following: - Site Block Diagrams. - Site Floor Plans. - Site Equipment Rack Configurations. - Antenna Network Drawings for RF Sites (where applicable). - ATP Test Checklists. - Functional Acceptance Test Plan Test Sheets and Results. - Equipment Inventory List. Drawings will be delivered in Adobe PDF format.	X	
Receive and approve documentation.		X
Execute Final Project Acceptance.	X	X
Deliverable: All required documents are provided and approved. Final Project Acceptance.		

1.5.2 Civil Work

1.5.2.1 Site Development at Kingston Site

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- Existing tower to be used for antennas – 190 ' Self supported Tower.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, limited to 2 revisions, showing the layout of various new and existing site components.

- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.
- Perform National Environmental Policy Act (NEPA) Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 Code of Federal Regulations (CFR) Chapter 1, subsection 1.1307 that may be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant environmental impact” and thus require additional documentation, submittals, or work.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Ulster County NY. NOTE: This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Provide tower climbing and tower mapping services for towers up to 350 feet to collect information about structural members and existing equipment.
- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Site Components Installation

- Conduct (1) clamp on ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Ulster County NY.

Antenna and Transmission Line Installation

- Supply and install (6) bognar type antenna(s) for the RF system.
- Supply and install (6) heavy duty mount(s) for Bogner antennas.
- Supply and install (2) GPS antenna(s).
- Supply and install up to 1670 linear feet of 7/8-inch transmission line.
- Perform sweep tests on transmission lines.
- Provide and install attachment hardware for supporting transmission lines on the antenna support structure every three feet.
- Supply and install (1) ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Existing Facility Improvement Work

- Supply and install (1) 20-amp breakers in the distribution panel and wire to DC plant inverter located on an average within 35 cable feet.
- Supply and install (7) 30-amp dual pole breakers in the distribution panel and wire to DC plant rectifier located on an average within 35 cable feet.

Miscellaneous Work

- Supply labor to bolt down, install DC Plant rack, install batteries, connect to rectifiers, and test system.
- Provide RF materials to include hoist grips, ground kits, clamps, etc.

1.5.2.2 Site Development at Sams Point Site

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- Existing tower to be used for antennas – 180 ' Self supported Tower.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, limited to 2 revisions, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.
- Perform National Environmental Policy Act (NEPA) Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 Code of Federal Regulations (CFR) Chapter 1, subsection 1.1307 that may be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant environmental impact” and thus require additional documentation, submittals, or work.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Ulster County NY. NOTE: This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Provide tower climbing and tower mapping services for towers up to 350 feet to collect information about structural members and existing equipment.

- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Site Components Installation

- Conduct (1) clamp on ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Ulster County NY.

Antenna and Transmission Line Installation

- Supply and install (6) bognar type antenna(s) for the RF system.
- Supply and install (6) heavy duty mount(s) for Bogner antennas.
- Supply and install (2) GPS antenna(s).
- Supply and install up to 1245 linear feet of 7/8-inch transmission line.
- Perform sweep tests on transmission lines.
- Provide and install attachment hardware for supporting transmission lines on the antenna support structure every three feet.
- Supply and install (1) ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Existing Facility Improvement Work

- Supply and install (1) 20-amp breakers in the distribution panel and wire to DC plant inverter located on an average within 35 cable feet.
- Supply and install (7) 30-amp breakers in the distribution panel and wire to DC plant rectifiers located on an average within 35 cable feet.

Miscellaneous Work

- Supply labor to bolt down, install DC Plant rack, install batteries, connect to rectifiers, and test system.
- Provide RF materials to include hoist grips, ground kits, clamps, etc.

1.5.2.3 Site Development at Overlook Site

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- Existing tower to be used for antennas – 300 ' Self supported Tower.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, limited to 2 revisions, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.

- Prepare record drawings of the site showing the as-built information.
- Perform National Environmental Policy Act (NEPA) Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 Code of Federal Regulations (CFR) Chapter 1, subsection 1.1307 that may be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant environmental impact” and thus require additional documentation, submittals, or work.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Ulster County NY. NOTE: This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Provide tower climbing and tower mapping services for towers up to 350 feet to collect information about structural members and existing equipment.
- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Site Components Installation

- Conduct (1) clamp on ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Ulster County NY.

Antenna and Transmission Line Installation

- Supply and install (2) antenna(s) for the RF system.
- Supply and install (2) 6-foot side arm(s) for antenna mounts.
- Supply and install (2) GPS antenna(s).
- Supply and install up to 680 linear feet of 1-1/4-inch transmission line.
- Perform sweep tests on transmission lines.
- Provide and install attachment hardware for supporting transmission lines on the antenna support structure every three feet.
- Supply and install (1) ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Existing Facility Improvement Work

- Supply and install (1) 20-amp breakers in the distribution panel and wire to DC Plant inverter located on an average within 35 cable feet.
- Supply and install (4) 30-amp breakers in the distribution panel and wire to DC Plant rectifiers located on an average within 35 cable feet.

Miscellaneous Work

- Supply labor to bolt down, install DC Plant rack, install batteries, connect to rectifiers, and test system.

- Provide RF materials to include hoist grips, ground kits, clamps, etc.

1.5.2.4 Site Development at Illinois Site

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- Existing tower to be used for antennas – 180 ' Self supported Tower.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, limited to 2 revisions, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.
- Perform National Environmental Policy Act (NEPA) Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 Code of Federal Regulations (CFR) Chapter 1, subsection 1.1307 that may be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant environmental impact” and thus require additional documentation, submittals, or work.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Ulster County NY. NOTE: This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Provide tower climbing and tower mapping services for towers up to 350 feet to collect information about structural members and existing equipment.
- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Site Components Installation

- Conduct (1) clamp on ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Ulster County NY.

Antenna and Transmission Line Installation

- Supply and install (2) antenna(s) for the RF system.
- Supply and install (2) heavy duty mount(s) for Bogner antennas.
- Supply and install (2) GPS antenna(s).
- Supply and install up to 460 linear feet of 7/8-inch transmission line.
- Perform sweep tests on transmission lines.
- Provide and install attachment hardware for supporting transmission lines on the antenna support structure every three feet.
- Supply and install (1) ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Existing Facility Improvement Work

- Supply and install (1) 20-amp breakers in the distribution panel and wire to DC Plant Inverter located on an average within 35 cable feet.
- Supply and install (4) 30-amp breakers in the distribution panel and wire to DC Plant rectifiers located on an average within 35 cable feet.

Miscellaneous Work

- Supply labor to bolt down, install DC Plant rack, install batteries, connect to rectifiers, and test system.
- Provide RF materials to include hoist grips, ground kits, clamps, etc.

1.5.2.5 Site Development at Shandaken Site

New communications site with shelter and SST to be built by Ulster County. Proposing to install new antennas, DC plant, and associated electrical.

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- Existing tower to be used for antennas – 200 ' Self supported Tower.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, limited to 2 revisions, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.
- Perform National Environmental Policy Act (NEPA) Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 Code of Federal Regulations (CFR) Chapter 1, subsection 1.1307 that may

be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant environmental impact” and thus require additional documentation, submittals, or work.

- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Ulster County NY. NOTE: This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Site Components Installation

- Conduct (1) clamp on ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Ulster County NY.

Antenna and Transmission Line Installation

- Supply and install (1) antenna(s) for the RF system.
- Supply and install (1) heavy duty mount(s) for Bogner antennas.
- Supply and install (2) GPS antenna(s).
- Supply and install up to 230 linear feet of 7/8-inch transmission line.
- Perform sweep tests on transmission lines.
- Provide and install attachment hardware for supporting transmission lines on the antenna support structure every three feet.
- Supply and install (1) ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Existing Facility Improvement Work

- Supply and install (1) 20-amp breakers in the distribution panel and wire to DC Plant inverter located on an average within 35 cable feet.
- Supply and install (4) 30-amp breakers in the distribution panel and wire to DC Plant rectifiers located on an average within 35 cable feet.

Miscellaneous Work

- Supply labor to bolt down, install DC Plant rack, install batteries, connect to rectifiers, and test system.
- Provide RF materials to include hoist grips, ground kits, clamps, etc.

1.5.2.6 Site Development at Tonche Site

New communications site with shelter and SST to be built by Ulster County. Proposing to install new antennas, DC plant, and associated electrical.

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- Existing tower to be used for antennas – 150 ' Self supported Tower.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, limited to 2 revisions, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.
- Perform National Environmental Policy Act (NEPA) Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 Code of Federal Regulations (CFR) Chapter 1, subsection 1.1307 that may be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant environmental impact” and thus require additional documentation, submittals, or work.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Ulster County NY. NOTE: This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Site Components Installation

- Conduct (1) clamp on ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Ulster County NY.

Antenna and Transmission Line Installation

- Supply and install (1) antenna(s) for the RF system.
- Supply and install (1) heavy duty mount(s) for Bogner antennas.
- Supply and install (2) GPS antenna(s).
- Supply and install up to 130 linear feet of 7/8-inch transmission line.
- Perform sweep tests on transmission lines.
- Provide and install attachment hardware for supporting transmission lines on the antenna support structure every three feet.
- Supply and install (1) ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Existing Facility Improvement Work

- Supply and install (1) 20-amp breakers in the distribution panel and wire to DC Plant inverter located on an average within 35 cable feet.
- Supply and install (4) 30-amp breakers in the distribution panel and wire to DC Plant rectifiers located on an average within 35 cable feet.

Miscellaneous Work

- Supply labor to bolt down, install DC Plant rack, install batteries, connect to rectifiers, and test system.
- Provide RF materials to include hoist grips, ground kits, clamps, etc.

1.5.2.7 Site Development at Saugerties Site

New communications site with shelter and SST to be built by Ulster County. Proposing to install new antennas, DC plant, and associated electrical.

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- Existing tower to be used for antennas – 200 ' Self supported Tower.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, limited to 2 revisions, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.
- Perform National Environmental Policy Act (NEPA) Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 Code of Federal Regulations (CFR) Chapter 1, subsection 1.1307 that may be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant

environmental impact" and thus require additional documentation, submittals, or work.

- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Ulster County NY. NOTE:This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Site Components Installation

- Conduct (1) clamp on ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Ulster County NY.

Antenna and Transmission Line Installation

- Supply and install (1) antenna(s) for the RF system.
- Supply and install (1) 6-foot side arm(s) for antenna mounts.
- Supply and install (2) GPS antenna(s).
- Supply and install up to 230 linear feet of 7/8-inch transmission line.
- Perform sweep tests on transmission lines.
- Provide and install attachment hardware for supporting transmission lines on the antenna support structure every three feet.
- Supply and install (1) ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Existing Facility Improvement Work

- Supply and install (1) 20-amp breakers in the distribution panel and wire to DC Plant inverter located on an average within 35 cable feet.
- Supply and install (4) 30-amp breakers in the distribution panel and wire to DC Plant rectifiers located on an average within 35 cable feet.

Miscellaneous Work

- Supply labor to bolt down, install DC Plant rack, install batteries, connect to rectifiers, and test system.
- Provide RF materials to include hoist grips, ground kits, clamps, etc.

1.5.2.8 Site Development at Bell Aire Site

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- Existing tower to be used for antennas – 100 ' Self supported Tower.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, limited to 2 revisions, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.
- Perform National Environmental Policy Act (NEPA) Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 Code of Federal Regulations (CFR) Chapter 1, subsection 1.1307 that may be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant environmental impact” and thus require additional documentation, submittals, or work.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Ulster County NY. NOTE: This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Provide tower climbing and tower mapping services for towers up to 350 feet to collect information about structural members and existing equipment.
- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Site Components Installation

- Conduct (1) clamp on ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Ulster County NY.

Antenna and Transmission Line Installation

- Supply and install (1) antenna(s) for the RF system.
- Supply and install (1) heavy duty mount(s) for Bogner antennas.
- Supply and install (2) GPS antenna(s).
- Supply and install up to 75 linear feet of 7/8-inch transmission line.
- Perform sweep tests on transmission lines.
- Provide and install attachment hardware for supporting transmission lines on the antenna support structure every three feet.

- Supply and install (1) ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Existing Facility Improvement Work

- Supply and install (1) 20-amp breakers in the distribution panel and wire to DC Plant inverter located on an average within 35 cable feet.
- Supply and install (4) 30-amp breakers in the distribution panel and wire to DC Plant rectifiers located on an average within 35 cable feet.

Miscellaneous Work

- Supply labor to bolt down, install DC Plant rack, install batteries, connect to rectifiers, and test system.
- Provide RF materials to include hoist grips, ground kits, clamps, etc.

1.5.2.9 Site Development at SUNY Site

New communications site with shelter and SST to be built by Ulster County. Proposing to install new antennas, DC plant, and associated electrical.

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- Existing tower to be used for antennas – 200 ' Self supported Tower.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, limited to 2 revisions, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.
- Perform National Environmental Policy Act (NEPA) Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 Code of Federal Regulations (CFR) Chapter 1, subsection 1.1307 that may be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant environmental impact” and thus require additional documentation, submittals, or work.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Ulster County NY. NOTE:This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or

other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.

- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Site Components Installation

- Conduct (1) clamp on ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Ulster County NY.

Antenna and Transmission Line Installation

- Supply and install (1) antenna(s) for the RF system.
- Supply and install (1) heavy duty mount(s) for Bogner antennas.
- Supply and install (2) GPS antenna(s).
- Supply and install up to 220 linear feet of 7/8-inch transmission line.
- Perform sweep tests on transmission lines.
- Provide and install attachment hardware for supporting transmission lines on the antenna support structure every three feet.
- Supply and install (1) ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Existing Facility Improvement Work

- Supply and install (1) 20-amp breakers in the distribution panel and wire to DC Plant inverter located on an average within 35 cable feet.
- Supply and install (4) 30-amp breakers in the distribution panel and wire to DC Plant rectifiers located on an average within 35 cable feet.

Miscellaneous Work

- Supply labor to bolt down, install DC Plant rack, install batteries, connect to rectifiers, and test system.
- Provide RF materials to include hoist grips, ground kits, clamps, etc.

1.5.2.10 Site Development at Marlborough Site

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- Existing tower to be used for antennas – 180 ' Monopole Tower.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, limited to 2 revisions, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).

- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.
- Perform National Environmental Policy Act (NEPA) Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 Code of Federal Regulations (CFR) Chapter 1, subsection 1.1307 that may be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant environmental impact” and thus require additional documentation, submittals, or work.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Ulster County NY. NOTE: This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Provide tower climbing and tower mapping services for towers up to 350 feet to collect information about structural members and existing equipment.
- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Site Components Installation

- Conduct (1) clamp on ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Ulster County NY.

Antenna and Transmission Line Installation

- Supply and install (1) antenna(s) for the RF system.
- Supply and install (1) heavy duty mount(s) for Bogner antennas.
- Supply and install (2) GPS antenna(s).
- Supply and install up to 200 linear feet of 7/8-inch transmission line.
- Perform sweep tests on transmission lines.
- Provide and install attachment hardware for supporting transmission lines on the antenna support structure every three feet.
- Supply and install (1) ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Existing Facility Improvement Work

- Supply and install (1) 20-amp breakers in the distribution panel and wire to DC Plant inverter located on an average within 35 cable feet.
- Supply and install (4) 30-amp breakers in the distribution panel and wire to DC Plant rectifiers located on an average within 35 cable feet.

Miscellaneous Work

- Furnish materials and labor to install (1) monopole collar for mounting of standoffs.
- Furnish crane and man basket for installation of antenna.
- Supply labor to bolt down, install DC Plant rack, install batteries, connect to rectifiers, and test system.
- Provide RF materials to include hoist grips, ground kits, clamps, etc.

1.5.2.11 Site Development at Law Enforcement Center Site

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- Existing tower to be used for antennas – 30 ' Rooftop.

Motorola Responsibilities:

Site Engineering

- Prepare limited site construction drawings, up to 2 revisions, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.

Site Preparation

- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Site Components Installation

- Conduct (1) clamp on ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Ulster County NY.

Existing Facility Improvement Work

- Supply and install (4) 20-amp breakers in the distribution panel and wire to proposed rack mounted UPS units located on an average within 35 cable feet.

Customer Responsibilities (Project Wide):

- If required, prepare and submit Electromagnetic Energy (EME) plans for the site (as a licensee) to demonstrate compliance with FCC RF Exposure guidelines.
- Review and approve site design drawings within 7 calendar days of submission by Motorola or its subcontractor(s). Should a re-submission be required, the Customer shall review and approve the re-submitted plans within 7 calendar days from the date of submittal.

- Pay for application fees, taxes and recurring payments for lease/ownership of the property.
- As applicable (based on local jurisdictional authority), the Customer will be responsible for any installation or up-grades of the electrical system in order to comply with NFPA 70, Article 708
- Provide property existing as-built drawings of the site and site components to Motorola for conducting site engineering.
- Provide a right of entry letter from the site owner for Motorola to conduct field investigations.
- Maintain existing access road in order to provide clear and stable entry to the site for heavy-duty construction vehicles, cement trucks and cranes. Sufficient space must be available at the site for these vehicles to maneuver under their own power, without assistance from other equipment.
- Arrange for space on the structure for installation of new antennas at the proposed heights on designated existing antenna-mounting structures.
- Provide as-built structural and foundation drawings of the structure and site location(s) along with geotechnical report(s) for Motorola to conduct a structural analysis.
- Provide support facilities for the antenna cables (cable ladder, entry ports, Waveguide Bridge) from the antenna to the equipment room.
- Provide space, HVAC, backup power (UPS, generator), grounding, surge suppression, lighting, and cabling facilities for the equipment room per Motorola's R56 specifications. Ceiling and cable tray heights in the equipment rooms should be such as to accommodate 7-1/2-foot equipment racks, and the ceiling should be 9 feet or greater.
- Confirm that there is adequate utility service to support the new equipment and ancillary equipment.
- Confirm that the existing generator is sufficient to support the new equipment and ancillary equipment loads.
- If required, remove or relocate any existing facilities, equipment, and utilities to create space for new site facilities and equipment.
- If required, provide any physical improvements (walls, roofing, flooring, painting, etc.) necessary to house the equipment in the existing room.
- Upgrade the existing grounding and transient voltage suppression systems to Motorola's current R56 Standards, and supply a single point system ground, of ten (10) ohms or less, to be used on all fixed equipment supplied under this proposal. Supply a grounding tie point within ten (10) feet of the-Motorola-supplied equipment.
- Provide cable management systems for proposed coax installations.

Assumptions: All clarifications and exceptions contained in this Section (General Site Development Assumptions) take precedence over any other section of this Contract.

- All work is assumed to be done during normal business hours as dictated by time zone (Monday thru Friday, 7:30 a.m. to 5:00 p.m.).
- Prevailing Wages are included.
- Quote is valid for 180 days.
- All recurring and non-recurring utility costs [including, but not limited to, generator fuel (except first fill), electrical, Telco] will be borne by the Customer or site owner.

- All utility installations shall be coordinated and paid for by the site owner and located at jointly agreed to location within or around the new communications shelter or equipment room.
- Hazardous materials are not present at the work location. Testing and removal of hazardous materials, found during site investigations, construction or equipment installation will be the responsibility of the customer.
- A maximum of 30 days will be required for obtaining approved building permits from time of submission, and a maximum of 60 days will be required for zoning approvals from time of submittal.
- If extremely harsh or difficult weather conditions delay the site work for more than a week, Motorola will seek excusable delays rather than risk job site safety.
- The existing ground system and soil resistivity at the site is sufficient to achieve resistance of 10 ohms or less. Communication site grounding will be designed and installed per Motorola's R56 standards.
- AM detuning or electromagnetic emission studies will not be required.
- Structural and foundation drawings of the antenna support structure will be made available to preclude the need for ultrasonic testing, geotechnical borings or mapping of existing tower structural members.
- Lead paint testing of existing painted towers has not been included.
- On the existing tower, the antenna locations for the proposed antenna system design will be available at the time of installation.
- The site has adequate utility service to support the proposed equipment loading. Utility transformer upgrades or step-up or down transformers will not be required.
- The existing antenna support structure is structurally capable of supporting the new antenna, cables, and ancillary equipment proposed and will not need to be removed or rebuilt at the existing site. The tower or supporting structure meets all applicable EIA/TIA-222 structural, foundation, ice, wind, and twist and sway requirements. Motorola has not included any cost for structural or foundation upgrades to the antenna support structure.
- The existing cable support facilities from the antenna to the cable entry port can be used for supporting the new antenna cables.
- Structural analyses for towers or other structures that have not been performed by Motorola will relinquish Motorola from any responsibility for the analysis report contents and/or recommendation therein.
- Alarming at existing sites will be limited to new component installations and will have to be discussed and agreed to on a site-by-site basis.
- The site will have adequate room for installation of proposed equipment, based on applicable codes and Motorola's R56 standards.
- The existing utility service and backup power facilities (generators) have sufficient extra capacity to support the proposed new equipment load.
- A clear obstruction-free access exists from the antenna location to the equipment room.
- The Customer does not desire upgrade of the existing site to meet Motorola's R56 standards.
- The floor can support the proposed new loading. Physical or structural improvements to the existing room will not be required.

Completion Criteria

- Site development completed per issued for construction (IFC) construction drawings, project requirements, contractual obligations (including any customer/Motorola approved changes) and approved by Ulster County NY.

1.5.3 Change Order Process

- Either Party may request changes within the general scope of this Agreement. If a requested change causes an increase or decrease in the cost, change in system configuration or adds time to the project's timeline required to perform this Agreement, the Parties will agree to an equitable adjustment of the Contract Price, Performance Schedule, or both, and will reflect the adjustment in a change order. Neither Party is obligated to perform requested changes unless both Parties execute a written change order.

1.5.3.1 Example – Change Order Form

MOTOROLA SOLUTIONS

CHANGE ORDER

[type co# here]

Change Order No. _____

Date: _____

Project Name: _____

Customer Name: _____

Customer Project Mgr: _____

The purpose of this Change Order is to: *(highlight the key reasons for this Change Order)*

Contract # REQUIRED _____ **Contract Date:** _____

In accordance with the terms and conditions of the contract identified above between [enter customer name] and Motorola Solutions, Inc., the following changes are approved:

Contract Price Adjustments

Original Contract Value:	$
Previous Change Order amounts for Change Order numbers [ ] through [ ]	$
This Change Order:	$
New Contract Value:	$

Completion Date Adjustments

Original Completion Date:	
Current Completion Date prior to this Change Order:	
New Completion Date:	

Changes in Equipment: *(additions, deletions or modifications)* Include attachments if needed
Changes in Services: *(additions, deletions or modifications)* Include attachments if needed
Schedule Changes: *(describe change or N/A)*
Pricing Changes: *(describe change or N/A)*
Customer Responsibilities: *(describe change or N/A)*

Payment Schedule for this Change Order: **(describe new payment terms applicable to this change order)**

Unless amended above, all other terms and conditions of the Contract shall remain in full force. If there are any inconsistencies between the provisions of this Change Order and the provisions of the Contract, the provisions of this Change Order will prevail.

IN WITNESS WHEREOF the parties have executed this Change Order as of the last date signed below.

Motorola Solutions, Inc.		**Customer**	
By:	_____	By:	_____
Printed Name:	_____	Printed Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

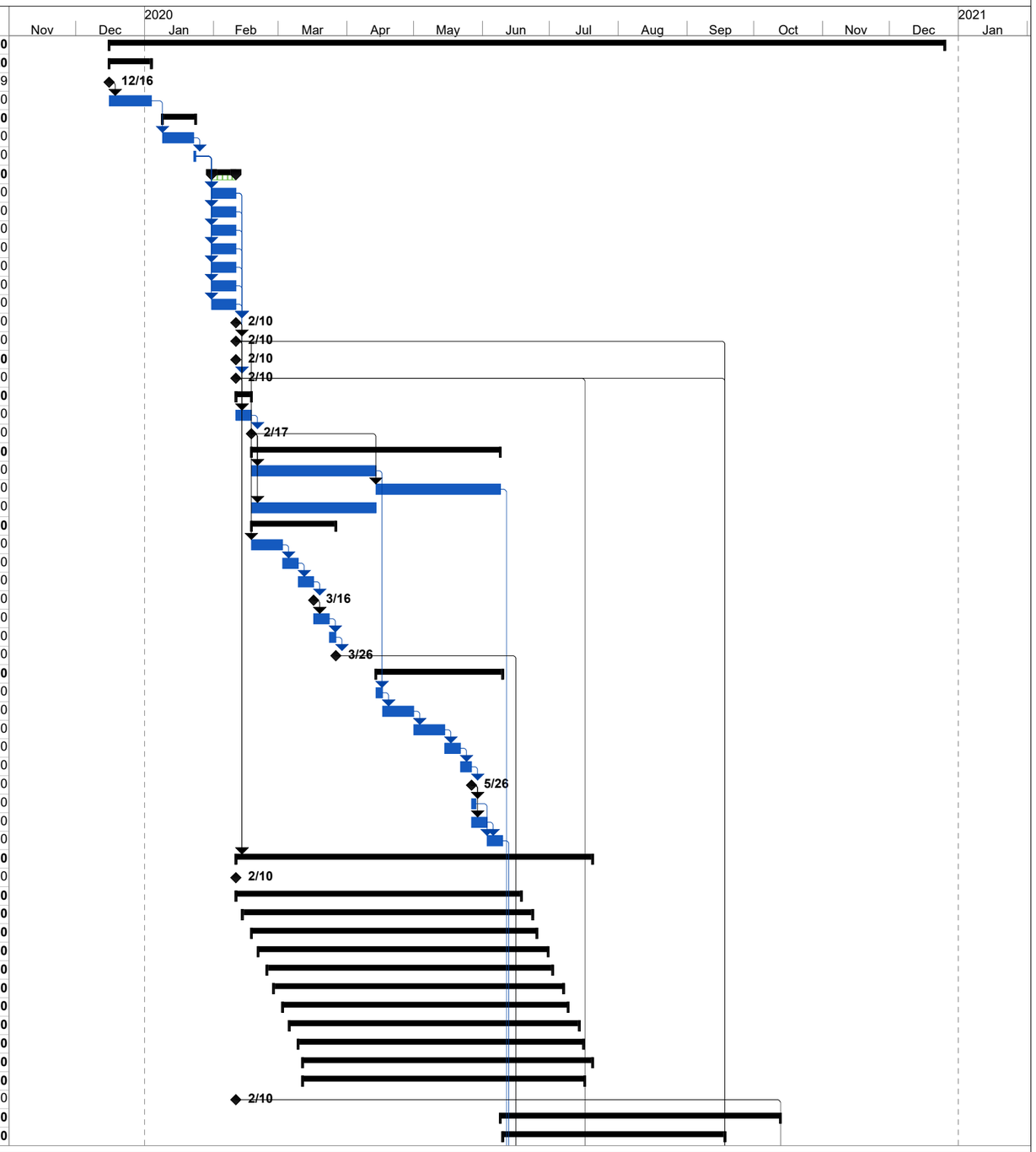
Reviewed by: _____ Date: _____
Motorola Solutions Project Manager

1.6 PROJECT SCHEDULE

Motorola's preliminary schedule indicates total project implementation to be approximately twelve months pending frequency approval and civil portion (towers/shelters) for the RF Subsystem. This preliminary schedule is included for informational purposes only and assumes that all Ulster County responsibilities as defined above are completed, as required. After contract award, an Implementation Schedule will be updated and will be submitted to Ulster County for review during CDR.

Ulster County, NY
Radio Communications System
Preliminary Project Schedule

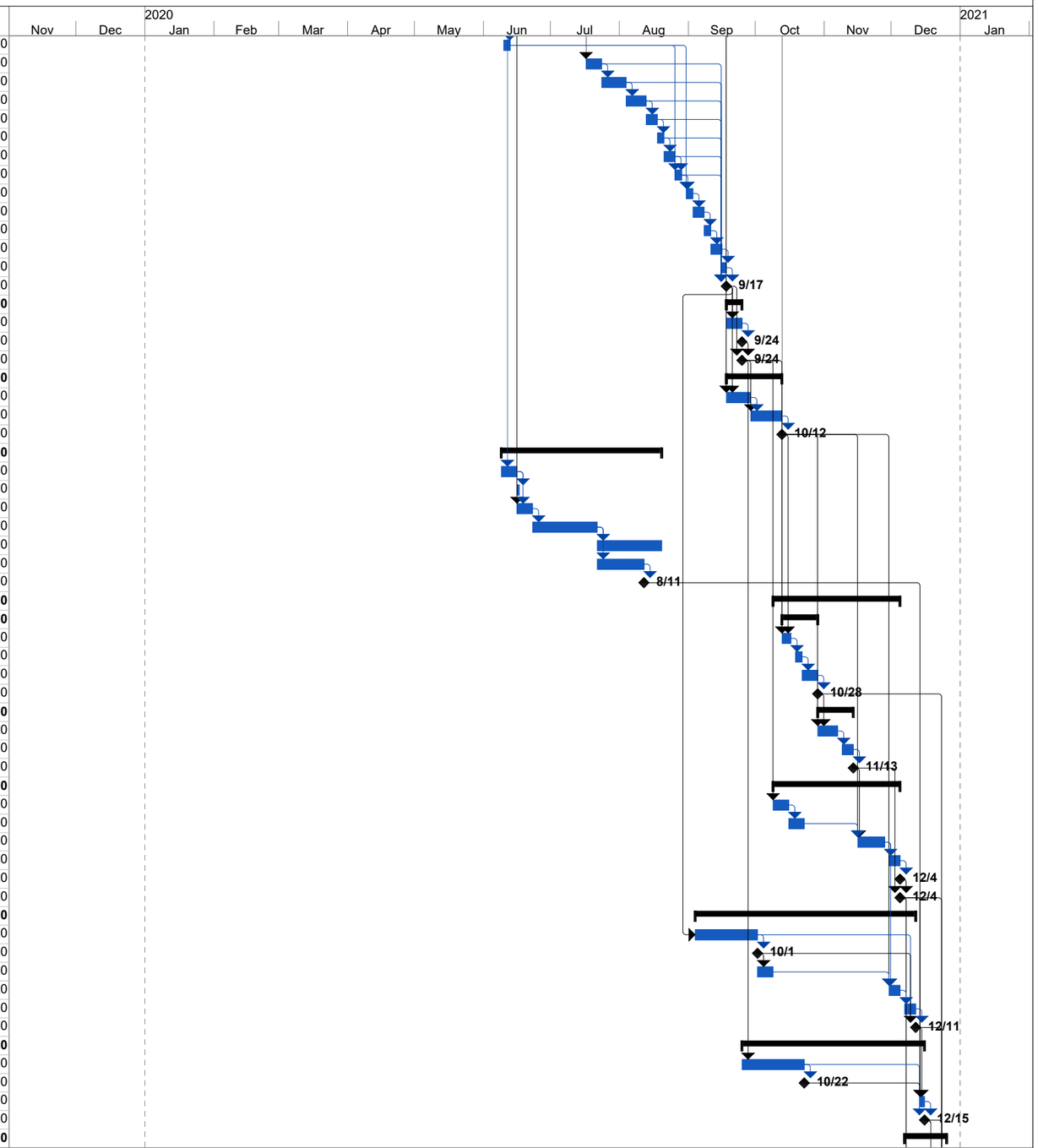
ID	Task Name	Duration	Start	Finish
1	**Ulster County Preliminary Project Schedule**	**270d**	**Mon 12/16/19**	**Fri 12/25/20**
2	**Contract**	**15d**	**Mon 12/16/19**	**Fri 1/3/20**
3	***Contract Award***	0d	Mon 12/16/19	Mon 12/16/19
4	Contract Administration	15d	Mon 12/16/19	Fri 1/3/20
5	**Project Kick-Off**	**11d**	**Thu 1/9/20**	**Thu 1/23/20**
6	Kickoff Meeting Preparation	10d	Thu 1/9/20	Wed 1/22/20
7	Project Kickoff Meeting	1d	Thu 1/23/20	Thu 1/23/20
8	**Contract Design Review**	**7d**	**Fri 1/31/20**	**Mon 2/10/20**
9	Finalize Coverage/Site Design	7d	Fri 1/31/20	Mon 2/10/20
10	Project Schedule	7d	Fri 1/31/20	Mon 2/10/20
11	Drawings/Diagrams	7d	Fri 1/31/20	Mon 2/10/20
12	Acceptance Test Plans	7d	Fri 1/31/20	Mon 2/10/20
13	Cutover Plan	7d	Fri 1/31/20	Mon 2/10/20
14	Staging Acceptance Test Plan	7d	Fri 1/31/20	Mon 2/10/20
15	Updates to Design	7d	Fri 1/31/20	Mon 2/10/20
16	***Final Design Complete***	0d	Mon 2/10/20	Mon 2/10/20
17	***Final CDR Approval by Ulster County (Design and Implementation Plan Frozen)***	0d	Mon 2/10/20	Mon 2/10/20
18	**FCC Licensing**	**0d**	**Mon 2/10/20**	**Mon 2/10/20**
19	***Licenses Granted (County Responsibility)***	0d	Mon 2/10/20	Mon 2/10/20
20	**Order Processing**	**5d**	**Tue 2/11/20**	**Mon 2/17/20**
21	Process Equipment lists	5d	Tue 2/11/20	Mon 2/17/20
22	***Orders placed to the factories***	0d	Mon 2/17/20	Mon 2/17/20
23	**Equipment Manufacturing**	**80d**	**Tue 2/18/20**	**Mon 6/8/20**
24	Manufacture Staged Equipment	40d	Tue 2/18/20	Mon 4/13/20
25	Manufacture Motorola Subscriber	40d	Tue 4/14/20	Mon 6/8/20
26	Manufacture Non-Staged (Field) Equipment	40d	Tue 2/18/20	Mon 4/13/20
27	**Fleetmapping**	**28d**	**Tue 2/18/20**	**Thu 3/26/20**
28	Review features and functionality	10d	Tue 2/18/20	Mon 3/2/20
29	Develop fleetmap	5d	Tue 3/3/20	Mon 3/9/20
30	Review fleetmap	5d	Tue 3/10/20	Mon 3/16/20
31	***Approval of Fleetmap by Ulster County***	0d	Mon 3/16/20	Mon 3/16/20
32	Create codeplugs	5d	Tue 3/17/20	Mon 3/23/20
33	Prototype codeplugs	3d	Tue 3/24/20	Thu 3/26/20
34	***Approval of codeplugs by Ulster County***	0d	Thu 3/26/20	Thu 3/26/20
35	**Staging**	**41d**	**Tue 4/14/20**	**Tue 6/9/20**
36	Receive and Inventory	3d	Tue 4/14/20	Thu 4/16/20
37	Assemble Equipment	10d	Fri 4/17/20	Thu 4/30/20
38	Program Equipment	10d	Fri 5/1/20	Thu 5/14/20
39	Perform Pre-Staging ATP	5d	Fri 5/15/20	Thu 5/21/20
40	Perform Staging ATP	3d	Fri 5/22/20	Tue 5/26/20
41	***CCSI Acceptance by Ulster County***	0d	Tue 5/26/20	Tue 5/26/20
42	Repackage Equipment	2d	Wed 5/27/20	Thu 5/28/20
43	Complete Standard System Documentation	5d	Wed 5/27/20	Tue 6/2/20
44	Ship Equipment to Field	5d	Wed 6/3/20	Tue 6/9/20
45	**Civil and Site Development Work**	**114.5d**	**Mon 2/10/20**	**Mon 7/20/20**
46	COVERAGE DESIGN AND SITE LOCATION FINALIZED	0d	Mon 2/10/20	Mon 2/10/20
47	**KINGSTON SITE DEVELOPMENT**	**92.5d**	**Mon 2/10/20**	**Thu 6/18/20**
78	**SAMS POINT SITE DEVELOPMENT**	**92.5d**	**Thu 2/13/20**	**Tue 6/23/20**
109	**OVERLOOK SITE DEVELOPMENT**	**92.5d**	**Mon 2/17/20**	**Thu 6/25/20**
140	**ILLINOIS SITE DEVELOPMENT**	**92.5d**	**Thu 2/20/20**	**Tue 6/30/20**
171	**SHANDAKEN SITE DEVELOPMENT**	**92.5d**	**Mon 2/24/20**	**Thu 7/2/20**
201	**TONCHE SITE DEVELOPMENT**	**92.5d**	**Thu 2/27/20**	**Tue 7/7/20**
231	**SAUGERTIES SITE DEVELOPMENT**	**92.5d**	**Mon 3/2/20**	**Thu 7/9/20**
261	**BELL AIRE SITE DEVELOPMENT**	**92.5d**	**Thu 3/5/20**	**Tue 7/14/20**
292	**SUNY SITE DEVELOPMENT**	**92.5d**	**Mon 3/9/20**	**Thu 7/16/20**
322	**MARLBOROUGH SITE DEVELOPMENT**	**92.5d**	**Wed 3/11/20**	**Mon 7/20/20**
353	**LAW ENFORCEMENT CENTER SITE DEVELOPMENT**	**91d**	**Wed 3/11/20**	**Thu 7/16/20**
379	***All Site Development Complete***	0d	Mon 2/10/20	Mon 2/10/20
380	**INSTALLATION**	**90d**	**Tue 6/9/20**	**Mon 10/12/20**
381	**Site Equipment Installation (FNE)**	**72d**	**Wed 6/10/20**	**Thu 9/17/20**



Milestone: Blue Italic
Ulster County Responsibility: Shaded Blue

Ulster County, NY
Radio Communications System
Preliminary Project Schedule

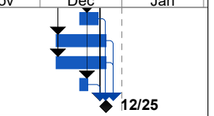
ID	Task Name	Duration	Start	Finish
382	Receive and Inventory	3d	Wed 6/10/20	Fri 6/12/20
383	Install Master - Law Enforcement Radio Room	5d	Fri 7/17/20	Thu 7/23/20
384	Install Prime/Remote Site 1 - Kingston	7d	Fri 7/24/20	Mon 8/3/20
385	Install Remote Site 2 - Sams Point	7d	Tue 8/4/20	Wed 8/12/20
386	Install Remote Site 3 - Overlook	3d	Thu 8/13/20	Mon 8/17/20
387	Install Remote Site 4 - Illinois	3d	Tue 8/18/20	Thu 8/20/20
388	Install Remote Site 5 - Bell Aire	3d	Fri 8/21/20	Tue 8/25/20
389	Install Remote Site 6 - Shandaken	3d	Wed 8/26/20	Fri 8/28/20
390	Install Remote Site 7 - Suny	3d	Mon 8/31/20	Wed 9/2/20
391	Install Remote Site 8 - Tonche	3d	Thu 9/3/20	Mon 9/7/20
392	Install Remote Site 9 - Marlborough	3d	Tue 9/8/20	Thu 9/10/20
393	Install Remote Site 10 - Saugerties	3d	Fri 9/11/20	Tue 9/15/20
394	Reprogram Resort Stations (10)	2d	Wed 9/16/20	Thu 9/17/20
395	***Site Equipment Installation Complete***	0d	Thu 9/17/20	Thu 9/17/20
396	**Console Installation**	**5d**	**Fri 9/18/20**	**Thu 9/24/20**
397	Install Consoles at Law Enforcement	5d	Fri 9/18/20	Thu 9/24/20
398	***Console Installation Complete***	0d	Thu 9/24/20	Thu 9/24/20
399	***Installation Acceptance***	0d	Thu 9/24/20	Thu 9/24/20
400	**System Optimization**	**17d**	**Fri 9/18/20**	**Mon 10/12/20**
401	Link Verification	7d	Fri 9/18/20	Mon 9/28/20
402	Program and Optimize RF System	10d	Tue 9/29/20	Mon 10/12/20
403	***Optimization Complete***	0d	Mon 10/12/20	Mon 10/12/20
404	**Subscriber Installation**	**52d**	**Tue 6/9/20**	**Wed 8/19/20**
405	Receive and Inventory Subscribers	5d	Tue 6/9/20	Mon 6/15/20
406	Reprogram Resort Subs (42 - All available at same time)	1d	Tue 6/16/20	Tue 6/16/20
407	Program New Mobiles (150 per day at shop)	5d	Tue 6/16/20	Mon 6/22/20
408	Install New Mobiles (12 per day - Single Head)	21d	Tue 6/23/20	Tue 7/21/20
409	Install New Mobiles (6 per day - Dual Head: 2 Teams)	21d	Wed 7/22/20	Wed 8/19/20
410	Program New Portables (150 per day at shop)	15d	Wed 7/22/20	Tue 8/11/20
411	***Subscribers Complete***	0d	Tue 8/11/20	Tue 8/11/20
412	**Audit and Acceptance Testing**	**41d**	**Fri 10/9/20**	**Fri 12/4/20**
413	**R-56 Audit**	**12d**	**Tue 10/13/20**	**Wed 10/28/20**
414	Perform R-56 Audit	4d	Tue 10/13/20	Fri 10/16/20
415	Document Results	3d	Mon 10/19/20	Wed 10/21/20
416	Perform R-56 Punch list Resolution	5d	Thu 10/22/20	Wed 10/28/20
417	***R-56 Audit Complete***	0d	Wed 10/28/20	Wed 10/28/20
418	**Functional Testing**	**12d**	**Thu 10/29/20**	**Fri 11/13/20**
419	Perform System ATP	7d	Thu 10/29/20	Fri 11/6/20
420	Document Test Results	5d	Mon 11/9/20	Fri 11/13/20
421	***Functional Testing Acceptance***	0d	Fri 11/13/20	Fri 11/13/20
422	**Coverage Testing**	**41d**	**Fri 10/9/20**	**Fri 12/4/20**
423	Generate Grid Maps	5d	Fri 10/9/20	Thu 10/15/20
424	Secure and Configure Test Sets	5d	Fri 10/16/20	Thu 10/22/20
425	Perform Coverage Testing	10d	Mon 11/16/20	Fri 11/27/20
426	Document CATP Results	5d	Mon 11/30/20	Fri 12/4/20
427	***CATP Acceptance***	0d	Fri 12/4/20	Fri 12/4/20
428	***SATP Acceptance***	0d	Fri 12/4/20	Fri 12/4/20
429	**Training**	**71d**	**Fri 9/4/20**	**Fri 12/11/20**
430	Finalize Training Plan	20d	Fri 9/4/20	Thu 10/1/20
431	***Training Plan Approval by Ulster County***	0d	Thu 10/1/20	Thu 10/1/20
432	Develop Training Materials	5d	Fri 10/2/20	Thu 10/8/20
433	Conduct Training (Tech, Console T-T-T, and End User T-T-T) according to Training Plan	5d	Mon 11/30/20	Fri 12/4/20
434	Ulster County to train end users	5d	Mon 12/7/20	Fri 12/11/20
435	***Training Complete***	0d	Fri 12/11/20	Fri 12/11/20
436	**Cutover**	**58d**	**Fri 9/25/20**	**Tue 12/15/20**
437	Cutover Planning	20d	Fri 9/25/20	Thu 10/22/20
438	***Cutover Plan approved by Ulster***	0d	Thu 10/22/20	Thu 10/22/20
439	Cutover System	2d	Mon 12/14/20	Tue 12/15/20
440	***Cutover Complete***	0d	Tue 12/15/20	Tue 12/15/20
441	**Finalize**	**15d**	**Mon 12/7/20**	**Fri 12/25/20**



Milestone: Blue Italic
Ulster County Responsibility: Shaded Blue

Ulster County, NY
Radio Communications System
Preliminary Project Schedule

ID	Task Name	Duration	Start	Finish
442	Final Inspection w/Customer	5d	Wed 12/16/20	Tue 12/22/20
443	Punchlist Resolution	15d	Mon 12/7/20	Fri 12/25/20
444	Finalize Documentation	15d	Mon 12/7/20	Fri 12/25/20
445	Transition to Service/PTC	3d	Wed 12/16/20	Fri 12/18/20
446	***Final Acceptance***	0d	Fri 12/25/20	Fri 12/25/20



Milestone: Blue Italic
Ulster County Responsibility: Shaded Blue

1.7 ACCEPTANCE TEST PLAN

1.7.1 Radio to Radio Features

1.7.1.1 Conventional Radio Resource Call - Clear Mode

1. DESCRIPTION

Subscribers can communicate to each other through a repeater that is selected via the channel selector on the individual radio.

The signals that are received from the subscriber radio are repeated so that other radios on that channel will be able to hear and participate in the conversation.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1
RADIO-1 - CONVSITE 1
RADIO-2 - CONVENTIONAL CHANNEL 1
RADIO-2 - CONVSITE 1

VERSION #1.050

2. TEST

Step 1. Initiate a CONVENTIONAL CHANNEL 1 call on RADIO-1.

Step 2. Verify RADIO-2 can monitor and respond to the call on CONVENTIONAL CHANNEL 1.

Step 3. Initiate a CONVENTIONAL CHANNEL 1 call on RADIO-2.

Step 4. Verify RADIO-1 can monitor and respond to the call on CONVENTIONAL CHANNEL 1.

Step 5. Repeat above tests for each repeater channel.

Pass____ Fail____

Radio to Radio Features

1.7.1.2 Conventional Radio Resource Via Comparator

1. DESCRIPTION

A comparator will vote all receive capable sites and transmit on specified transmit capable sites. Because a comparator will construct a signal from multiple sites, it is necessary to test each site individually.

SETUP

RADIO-1 - SITE 1
RADIO-2 - SITE 1

VERSION #1.040

2. TEST

Step 1. Disable all sites on the comparator except SITE 1.

Step 2. Verify communications between RADIO-1 and RADIO-2.

Step 3. Disable SITE 1 and enable the next site. Change the channel on the subscriber if necessary.

Step 4. Verify communications between RADIO-1 and RADIO-2.

Step 5. Repeat steps 3 & 4 until all sites on the comparator have been individually tested.

Step 6. Enable all sites on the comparator.

Step 7. Verify communications between RADIO-1 and RADIO-2 with all sites enabled.

Pass____ Fail____

1.7.2 System Reliability Features

1.7.2.1 Redundant Site Controller Switching - Automatic Switchover

1. DESCRIPTION

The Site Controller subsystem uses two Site Controllers in a redundant configuration. The backup Site Controller is made active either upon the loss of communication to the active Site Controller or upon a user initiated command from the Site Control Manager.

SETUP

RADIO-1 – TALKGROUP 1
RADIO-1 – SITE – SITE 1
RADIO-2 – TALKGROUP 1
RADIO-2 – SITE – SITE 1
RADIO-3 – TALKGROUP 1
RADIO-3 – SITE – SITE 1

All Radios should be "Site Locked".

VERSION #1.090

2. TEST

Step 1. Verify both Site Controllers are available and in the Normal state.

Step 2. Power off the active Site Controller (or in the ESS configuration connect to the Active Site controller using CSS and perform a "reset") and verify the backup becomes the new active Site Controller (note events in the event viewer).

Step 3. Key RADIO-1 and verify that the other 2 subscribers hear the audio.

Step 4. End the call from Radio 1.

Step 5. Power up the Site Controller (if it was powered off). Verify the Site Controller returns to the normal state.

Pass____ Fail____

System Reliability Features

1.7.2.2 Comparator Site Link Failure

1. DESCRIPTION

The purpose of this test is to show that if a Conventional site fails, that the rest of the system continues to operate.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1
RADIO-1 - SITE - CONVSITE 1
RADIO-2 - CONVENTIONAL CHANNEL 1
RADIO-2 - SITE - CONVSITE 2
In order to reduce the amount of wait time for the alarm to report, set the Status Tone Timeout timer from 60 seconds to 15 seconds in the Comparator.

VERSION #1.000

2. TEST

Step 1. Remove CONVSITE 3 link to the Comparator.

Step 2. After the Status Tone Timeout timer has been exceeded, verify that an alarm is given on the Comparator.

Step 3. Using RADIO-1 and RADIO-2 verify that the system continues to operate at the remaining sites.

Pass____ Fail____

System Reliability Features

1.7.2.3 Simulcast Transmitter Power Failure Shutdown

1. DESCRIPTION

The repeaters can detect a loss or decrease in transmitter output power. Each repeater contains an internal wattmeter element. Once the forward power has decreased past the threshold set, the repeater reports an error.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1

VERSION #1.100

2. TEST

Step 1. Disconnect the transmit antenna connection to the SITE 1 repeater. (This will cause a high VSWR condition)

Step 2. Key RADIO 1 so that CONVENTIONAL CHANNEL 1 is repeating, and verify that the station alarms and reduces power.

Step 3. Restore the transmit antenna connection to the repeater.

Step 4. Verify that the channel is put back into full service.

- **Pass____ Fail____**

1.7.3 MKM 7000 Console Alias Manager (CAM)

1.7.3.1 Alias Display When Using the MKM 7000

1. DESCRIPTION

This test will demonstrate that a Provisioning Manager (PM) defined alias still works on incoming calls when MKM 7000 solution is installed, although the locally defined ones take precedence, i.e. centrally defined ones will only be used if there is no locally defined alias for the radio that is making an incoming call.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1

CONSOLE-1 - TALKGROUP 1

A standalone or cohab'ed MKM 7000 server is connected and communicating normally with an MCC 7100/7500 Console.

CONSOLE-1 user is configured to use local alias service.

VERSION #1.030

2. TEST

Step 1. Log into MKM 7000 GUI and configure an alias for RADIO-1.

Step 2. Verify that RADIO-2 does not have any alias defined in MKM 7000.

Step 3. Verify both RADIO-1 and RADIO-2 have their own PM defined aliases. Also verify the PM defined alias for RADIO-1 is different from the one defined by MKM 7000.

Step 4. Key up RADIO-1 and verify that its locally defined alias shows up on CONSOLE-1, not the PM defined alias.

Step 5. Key up RADIO-2 and verify that its PM defined alias shows up.

Pass____ Fail____

MKM 7000 Console Alias Manager (CAM)

1.7.3.2 Create a new Subscriber Unit ID to Subscriber Unit Alias Mapping - Conventional

1. DESCRIPTION

This test will demonstrate the capability to create a Subscriber Unit (SU) alias for an SU ID via the MKM 7000 GUI and have it show up on MCC 7100/7500 Console automatically.
The test will work on either a trunked or conventional system. This test will also demonstrate the capability to monitor connection status between MKM 7000 and MCC 7100/7500 Console.

SETUP

A standalone (not cohab) MKM 7000 server is connected and communicating normally with CONSOLE-1.
RADIO-1 - CONVENTIONAL CHANNEL 1

CONSOLE-1 - CONVENTIONAL CHANNEL 1
CONSOLE-1 user is configured to use the local alias service.

VERSION #1.010

2. TEST

Step 1. CONSOLE-1 user logs into the MCC 7100/7500 console and verifies that the consoles synchronization status with Localized Aliasing is OK, as indicated by a green check mark on the “status screen”.

Step 2. Local Alias Admin logs into MKM 7000 GUI, verify under the Connected Consoles tab that MCC 7100/7500 console is connected to MKM7000.

Step 3. Create a new SU ID that matches RADIO-1 to be used for this test.

Step 4. Create a new SU Alias for the SU ID (new mapping between SU ID and SU Alias).

Step 5. Submit the change.

Step 6. Wait (up to) 30 seconds, initiate a call using RADIO-1 ON CONVENTIONAL CHANNEL 1, verify the defined SU Alias shows up on CONSOLE-1's CONVENTIONAL CHANNEL 1 resource.

Pass____ Fail____

1.7.4 MOSCAD Fault Management System

1.7.4.1 Screen Navigation

1. DESCRIPTION

MOSCAD alarming tests shall be conducted from the MOSCAD server and clients if applicable. The alarms demonstrated are to be made on the actual equipment or punch block interface, with an exception made for cases where it is not practical to create an actual alarm. The following will provide a brief introduction and description of the main display screens encountered when navigating the MOSCAD GUI (Graphic User Interface).

SETUP

No prior setup is required.

VERSION #1.010

2. TEST

Step 1. Login and Password Screen -
This is the first screen displayed after a system startup. It allows a user with the proper login and password to access the MOSCAD alarm system. Login to MOSCAD using the appropriate user name and password.

Step 2. System Overview Screen -
The "System Overview" screen contains site names adjacent to color status pushpins. Details of a particular site can be viewed by selecting the site name pushpin of interest. Depending on alarm status, the color bullet will flash

Step 3. Alarm Summary Screen -
Proceed to the "Alarm Summary" screen from the "System Overview" screen. The "Alarm Summary" screen provides a text display of all alarms currently in the system. On this screen, you can choose between alarm summary and alarm history by selecting the "Alarm Summary / Alarm History" button. Also, the display can be filtered to show alarms based on site name or acknowledgement status.

Step 4. Comm Screen -
From the "Alarm Summary" screen access the "Site Comm" screen. The "Site Comm" screen displays a combined communication status for each site. To view all the SDM3000s within a site, select the icon next to the site comm. Should the communications path between the IP Gateway and any SDM3000 in the system be interrupted, it will be indicated by an alarm present on this screen.

Step 5. Device Monitoring
From the "System Overview" screen, navigate to each site monitored by MOSCAD in the system. Once a particular site pushpin has been selected, a site overview screen will appear that indicates the types and quantities of devices monitored by MOSCAD at that site.

- **Pass____ Fail____**

MOSCAD Fault Management System

1.7.4.2 Unified Event Manager - MOSCAD Management

1. DESCRIPTION

MOSCAD SDM3000s report alarms to the Unified Event Manager (UEM) via SNMP traps. The purpose of this test is to demonstrate that all MOSCAD site objects are being managed effectively from UEM.

SETUP

NMClient01 - UEM client session running

VERSION #1.010

2. TEST

Step 1. Navigate through the UEM application to view a site with the MOSCAD SDM3000.

Step 2. Verify all MOSCAD devices for the specific site have been discovered and indicative of any failures that they have in the active alarms view.

- **Pass____ Fail____**

MOSCAD Fault Management System

1.7.4.3 TRAK GPS - GPS Fault

1. DESCRIPTION

The MOSCAD system connects to a TRAK 9100 GPS Standard via the RS-232 port 9 pin D connector. This interface requires a dedicated MOSCAD RS-232 port. The MOSCAD will periodically solicit the TRAK for its status and response messages are sent back to the MOSCAD SDM3000. New alarm messages, with respect to the last received status held in the SDM3000, are then converted to native MOSCAD data format for transmission to the MOSCAD Server. Alarm messages are also sent as SNMP traps from the SDM3000's IP Interface to the Unified Event Manager (UEM) application.

SETUP

NMclient01 - UEM session up and running.

VERSION #1.010

2. TEST

Step 1. Choose the site to perform the test.

Step 2. Verify there are no current alarms for the chosen TRAK GPS on the MOSCAD server and UEM active alarms view.

Step 3. Disconnect the antenna cable from the TRAK GPS.

Step 4. Verify that the alarm is received at the MOSCAD server and/or client.

Step 5. Acknowledge the alarm on either the MOSCAD server or client.

Step 6. Reconnect the antenna cable to the TRAK GPS standard.

Step 7. Verify that the TRAK GPS status returns to normal.

Pass____ Fail____

1.7.5 MOSCAD UEM Integration

1.7.5.1 Repeater Site Base Radio / Multisite Base Radio on Quantar Diagnostics - PA Fail Alarm

1. DESCRIPTION

The MOSCAD monitors alarms from the base stations via an IP based FSP and SNMP interface. The MOSCAD will report changes reported by the base radio to the Unified Event Manager (UEM) Fault Manager.

SETUP

No prior setup is required.

VERSION #1.040

2. TEST

Step 1. Choose the channel and site to perform test.

Step 2. At the UEM Client, Open Network Element View for selected Quantar Base Radio (reported on UEM as type Motorola Base Radio -RS/MS (Moscad)).

Step 3. Verify that there are no current alarms for the chosen base radio.

Step 4. Disconnect the cable between the Exciter FRU and the PA FRU at the chosen station and key-up the station.

Step 5. Verify that the alarm is received and displayed on the UEM Client view.

Step 6. Acknowledge the alarm.

Step 7. Reconnect the cable at the station.

Step 8. Verify that the station returns to normal.

Pass____ Fail____

MOSCAD UEM Integration

1.7.5.2 Repeater Site Base Radio) / Multisite Base Radio Diagnostics - Reset Station

1. DESCRIPTION

The MOSCAD system will connect to each repeater site base radio (RSBR) or a multisite base radio (MSBR) using the site's Ethernet switch(es). The MOSCAD will receive SNMP traps from the base radio (BR) as well as solicit the BR for status. The MOSCAD will continuously poll for any alarm messages present in the BR. New alarm messages, with respect to the last received status held in the SDM3000, are then converted to native MOSCAD data format for transmission to Unified Event Manager (UEM) Fault Manager.

SETUP

No prior setup is required.

VERSION #1.030

2. TEST

Step 1. Choose the channel and site to perform the test.

Step 2. At the UEM Client, Open Network Element View for selected GTR8000 Base Radio (reported on UEM as type Motorola Base Radio -RS/MS (Moscad)).

Step 3. Verify that there are no current alarms for the chosen base radio.

Step 4. Go to Commands and Metering Information section in the Network Element view.

Step 5. Select "Base Station Reset" button.

Step 6. Verify that the station is reset by observing the LED's on the face of the respective base radio.

Step 7. Verify that the applicable alarms report to UEM Client for the station reset.

Pass____ Fail____

MOSCAD UEM Integration

1.7.5.3 TRAK Communication Status Fault (UEM)

1. DESCRIPTION

The MOSCAD system connects to a TRAK 9100 GPS Standard via the RS-232 port 9 pin D connector. This interface requires a dedicated MOSCAD SDM3000 RS-232 port. The MOSCAD will periodically solicit the TRAK for its status and response messages are sent back to the MOSCAD SDM3000. New alarm messages, with respect to the last received status held in the SDM3000, are then converted to native MOSCAD data format for transmission to the Unified Event Manager (UEM) Fault Manager.

SETUP

No Setup Required.

VERSION #1.030

2. TEST

Step 1. Choose the site to perform the test.

Step 2. At the UEM Client, Open Network Element View for selected TRAK unit.

Step 3. Verify that there are no current alarms for the chosen TRAK unit.

Step 4. Disconnect the RJ45 communication cable (which ultimately connects to the TRAK 9100 RS232 port) from the rear of the GPS.

Step 5. Verify that the communication alarms are received and displayed on the UEM Client view.

Step 6. Acknowledge the alarm.

Step 7. Reconnect the communication cable to the TRAK 9100 GPS.

Step 8. Verify that the GPS communication status returns to normal on the alarm managers.

Pass____ Fail____

MOSCAD UEM Integration

1.7.5.4 Screen Navigation

1. DESCRIPTION

MOSCAD alarming tests shall be conducted from Unified Event Manager (UEM) clients if applicable. The alarms demonstrated are to be made on the actual equipment or punch block interface, with an exception made for cases where it is not practical to create an actual alarm. The following will provide a brief introduction and description of the main display screens encountered when navigating the UEM Client presenting information from MOSCAD RTU.

SETUP

UEM Enhanced Navigation and Microwave UI license has to be installed.
MOSCAD infrastructure has to be configured.

VERSION #1.030

2. TEST

Step 1. Login to the UEM Client using the appropriate user name and password.

Step 2. From the navigation tree select Network Database. In the view that is opened locate
Network Elements of type “Motorola MOSCAD - SDM3000 - Remote Terminal Unit”. Right-click on a few RTU devices and use option “View associated Managed Resources” to display list of resources connected to each RTU.

Step 3. From the Navigation tree select site under Site View branch which has MOSCAD RTU(s). Verify that Objects section contains Environmental section listing all managed Digital Inputs/ Digital Outputs and Analog Inputs. The view, in the Equipment section contains list of all the network elements grouped into categories including category for MOSCAD RTU. Overall state of each managed element is visible in the Objects section.

Step 4. From Site View or from Network Database double-click on selected managed resource reported by MOSCAD RTU. As a result Network Element view for the managed resource and associated key resources are displayed.

Step 5. The Objects section displays status of all objects reported for each managed resource with their current state. Object Section has additional visualization for Digital Inputs/Outputs and Analog Inputs. Commands and Metering Information section contains additional metering information (if available – depending on device type), controls and commands (if available – depending on device type).

Step 6. From navigation tree select Microwave Map which displays status and user-configured location of all managed microwave radios.

Pass____ Fail____

MOSCAD UEM Integration

1.7.5.5 UEM Enhanced Navigation functionality - Views

1. DESCRIPTION

The Enhanced Navigation feature extends Unified Event Manager (UEM) Client presentation capabilities with additional views and operations to improve visualization of fault management information.

Note System Map functionality is useful in case of systems with multiple zones or using DSR feature.

SETUP

UEM Enhanced Navigation licenses installed.

VERSION #1.050

2. TEST

Step 1. Login to UEM Client application with appropriate user and password.

Step 2. Verify the navigation tree is displaying System Map under System Views and Site Views under Zone Views.

Step 3. Select System Map from navigation tree. An internal window will be opened displaying overall status of current zone. In the right corner of the map click Zones Visibility button (icon) to open window where other zones visibility can be configured. Select zones and zone cores that shall be visible. Save change and verify that configured zone symbols are added on the map.

Step 4. Site Views on the navigation tree Expand Site Views in the navigation tree to see all site types that can be displayed. Expand site type to see what sites of that type are discovered. Select specific site and verify that Site View window is displayed.

Step 5. On Site view (opened from navigation tree or from Zone Map) expand and review all elements displayed in the Objects section. Verify the quantity and overall state of managed devices displayed on the view.

Step 6. Network element view can be opened from Network Database for selected resource, which is not representing a site or network, or from Site View. Verify that network element view has been loaded and review Objects section for details on list of directly related managed resources representing given device, type and quantity of objects for a given resource as well as current state of each object.

Pass____ Fail____

1.7.6 MCC 7100/7500 Conventional Resources

1.7.6.1 Conventional Subscriber Alias

1. DESCRIPTION

The purpose of this section is to verify that the alias for a radio can be added using the Provisioning Manager.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1

CONSOLE-1 - CONVENTIONAL CHANNEL 1

Provisioning Manager – no alias for RADIO-1

VERSION #1.010

2. TEST

Step 1. Initiate a voice call from RADIO-1 to CONSOLE-1 on CONVENTIONAL CHANNEL 1

Step 2. Verify the radio's ID is displayed at CONSOLE-1

Step 3. From the Provisioning Manager, change RADIO-1's alias to "Robert" and download the configuration, then restart the Console application.

Step 4. When the Console is operational, verify communications between CONSOLE-1 and RADIO-1 on CONVENTIONAL CHANNEL 1.

Step 5. Initiate a voice call from RADIO-1 to CONSOLE-1 on CONVENTIONAL CHANNEL 1.

Step 6. Verify the RADIO-1 alias "Robert" is displayed at the CONSOLE-1 operator position.

- **Pass____ Fail____**

MCC 7100/7500 Conventional Resources

1.7.6.2 Console Priority

1. DESCRIPTION

Console Operator Positions have ultimate control of transmitted audio on an assigned resource. The Console Position has the capability to take control of an assigned voice channel for a channel/talkgroup call so that the operator's audio overrides any subscriber audio. Console priority is a feature that enables dispatchers to gain immediate access to an assigned voice channel so that a central point of audio control exists.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1
RADIO-2 - CONVENTIONAL CHANNEL 1

CONSOLE-1 - CONVENTIONAL CHANNEL 1

2. TEST

Step 1. Initiate a call from RADIO-1 on CONVENTIONAL CHANNEL 1. Keep this call in progress until the test has completed.

Step 2. Observe that RADIO-2 receives the call.

Step 3. While the call is in progress, key up CONSOLE-1 on CONVENTIONAL CHANNEL 1.

Step 4. Observe that RADIO-2 is now receiving audio from CONSOLE-1 on CONVENTIONAL CHANNEL 1

Step 5. De-key CONSOLE-1.

Step 6. Verify RADIO-2 now receives RADIO-1 audio.

Step 7. End the CONVENTIONAL CHANNEL 1 call from RADIO-1.

VERSION #1.040

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.3 Call Alert Page - Conventional

1. DESCRIPTION

This test will demonstrate that an MCC7100/7500 console using a Conventional Channel is able to transmit Call Alert pages. Call Alert Page allows a dispatcher to selectively alert another radio unit. The initiating console will receive notification as to whether or not the call alert was received. Units receiving a Call Alert will sound an alert tone and show a visual alert indication. The display will also show the individual ID of the initiating console.

This test can be run using Mixed Mode or MDC1200 Channels.

SETUP

RADIO-1 - SITE 1 - CONVENTIONAL CHANNEL 1
RADIO-2 - SITE 1 - CONVENTIONAL CHANNEL 1
RADIO-3 - SITE 1 - CONVENTIONAL CHANNEL 1

CONSOLE-1 - CONVENTIONAL CHANNEL 1

VERSION #1.040

2. TEST

Step 1. From CONSOLE-1 create a paging queue containing Call Alerts to RADIO-1, RADIO-2 and RADIO-3.

Step 2. From CONSOLE-1 start the pages on CONVENTIONAL CHANNEL 1

Step 3. Verify that RADIO-1, RADIO-2 and RADIO-3 receive the Call Alerts.

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.4 Patch Operation - Conventional

1. DESCRIPTION

The Patch feature allows more than one Radio Resource to be grouped simultaneously. This can be used for temporarily merging two or more channels/frequencies together to act as one larger group. Telephones and radio resources can be patched together. In a patch group, the members can receive messages from the console and they can transmit to all other members of the patch group.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1
RADIO-2 - CONVENTIONAL CHANNEL 2
CONSOLE-1 - CONVENTIONAL CHANNEL 1 and CONVENTIONAL CHANNEL 2

VERSION #1.020

2. TEST

Step 1. Select the tab for patch 1, 2 or 3. Verify that the patch edit button and patch transmit button appear.

Step 2. Select the "Patch Edit" icon. The selected patch will turn blue.

Step 3. Select the CONVENTIONAL CHANNEL 1 and CONVENTIONAL CHANNEL 2 Radio Resource by moving the cursor over the Radio Resources' names and selecting them.

Step 4. Verify that the selected Radio Resources display a "Patch Edit" icon.

Step 5. Press and hold the "Patch Transmit" icon to initiate the patch transmission.

Step 6. Verify that the RADIO-1 and RADIO-2 monitor the console outbound audio.

Step 7. Verify that RADIO-1 can communicate with RADIO-2 even though they are on separate channels.

Step 8. To knock down the patch, select the Radio Resources by moving the mouse cursor over the resource window and clicking over the patch icon. Repeat this process until all the resources have been removed from the Patch window.

Step 9. Select the Patch Edit icon and idle the current patch.

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.5 Multi-Select Operation in Secure Mode

1. DESCRIPTION

Multi-Select (Msel) allows the console operator to group a number of channels/talkgroups together such that when the general transmit bar is depressed, all of the multi-selected channels/talkgroups will transmit at the same time with the same information.
Multi-Select is one way communication call. If a radio user responds to a Multi-Select call the talkgroup the user is affiliated to will be the only one to hear the call.
There is no super-group formed, so radio communication is still at the single channel level.
Multi-Select is utilized to send an APB to several channels/talkgroups. A Multi-Select has a limit of twenty (20) trunking/conventional resources.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1 (Secure TX Mode)
RADIO-2 - CONVENTIONAL CHANNEL 2(Secure TX Mode)
RADIO-3 - CONVENTIONAL CHANNEL 1 (No Key)
RADIO-4 - CONVENTIONAL CHANNEL 2 (Secure Key Loaded, but in Clear TX mode)
CONSOLE-1 - CONVENTIONAL CHANNEL 1, CONVENTIONAL CHANNEL 2 (Secure TX Mode)

VERSION #1.020

2. TEST

Step 1. From CONSOLE-1, create an Msel group with CONVENTIONAL CHANNEL 1 and CONVENTIONAL CHANNEL 2.

Step 2. Transmit on the Msel using the Msel instant transmit button.

Step 3. Verify that RADIO-1, RADIO-2 and RADIO-4 hear the call and RADIO-3 cannot hear the call.

Step 4. Initiate a call with RADIO-1.

Step 5. Verify the call is heard on CONSOLE-1 but not on RADIO-2.

Step 6. Initiate a call with RADIO-2.

Step 7. Verify the call is heard on CONSOLE-1 but not on RADIO-1.

Step 8. On CONSOLE-1 dissolve the Msel.

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.6 Alert Tones - Conventional Channel

1. DESCRIPTION

Pre-defined alert tones can be transmitted on the selected Radio Resource to subscribers which can alert members of a channel / talkgroup to a particular event or signify to radio users special instructions are to follow. The Console has the ability to send an Alert-Tone signal on selected conventional or talkgroup resources.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1
RADIO-2 - CONVENTIONAL CHANNEL 1
CONSOLE-1 - CONVENTIONAL CHANNEL 1

VERSION #1.030

2. TEST

Step 1. Select CONVENTIONAL CHANNEL 1 on CONSOLE-1.

Step 2. Select Alert Tone 1 and depress the Alert Tone button.

Step 3. Verify that RADIO-1 and RADIO-2 hear Alert Tone 1.

Step 4. Repeat Steps 2-3 for Alert Tone 2 and 3.

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.7 Activity Log - Conventional

1. DESCRIPTION

The MCC7100/7500 Console activity log will show all traffic for the resource assigned to that console to include the time, radio alias, Channel, PTT ID and Emergency Call.
The dispatcher has the capability of selecting a logged call within in the "Activity Log Window" for instant transmit on the corresponding logged resource.
This activity log can be logged to a text file for archival purposes.

Note: The log file in the ops will only be seen if you first check Log Activity in Elite Admin application then in folder options uncheck hide hidden system files. The location will be c:\Program Data\MCC7500\MessageMonitorLogs.

SETUP

RADIO-1 – CONVENTIONAL CHANNEL 1
RADIO-2 – CONVENTIONAL CHANNEL 2
RADIO-3 – CONVENTIONAL CHANNEL 3
RADIO-4 – CONVENTIONAL CHANNEL 4

CONSOLE-1 – CONVENTIONAL CHANNEL 1, CONVENTIONAL CHANNEL 2, CONVENTIONAL CHANNEL 3, CONVENTIONAL CHANNEL 4

VERSION #1.060

2. TEST

Step 1. On CONSOLE-1 select the "Show Activity Log" button on the tool bar to open the Activity Log Window.

Step 2. Initiate calls on RADIO-1, RADIO-2, RADIO-3 and RADIO-4 to log call information and verify calls are displayed in the activity log window.

Step 3. Select a logged call in the Activity Log Window and verify that the Channel Control Window (CCW) at the top of the Activity log window changes to the corresponding resource. Verify the dispatcher is capable of responding via the instant transmit button.

Step 4. Open the text file created by the Activity Log and verify call traffic has been archived to the document file.

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.8 Conventional Comparator Force Vote

1. DESCRIPTION

The console user has the ability to send a “Force Vote” command to a Conventional Comparator. Force voting allows the user to customize the audio of the system.

SETUP

RADIO-1 – CONVENTIONAL CHANNEL 1

CONSOLE-1 - CONVENTIONAL CHANNEL 1
CONSOLE-1 - Configured with Voting Display and Control

VERSION #1.040

2. TEST

Step 1. On CONSOLE-1, enable the “Force Vote” command on one site and verify the “Force Vote” on CONSOLE-1 is active.

Step 2. Initiate a call on CONVENTIONAL CHANNEL 1 using RADIO-1 and verify the audio is received from the force-voted site.

Step 3. From CONSOLE-1, disable the “Force Vote” command on the site and verify the “Force Vote” on the console is deactivated.

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.9 Emergency Alarm - MDC 1200

1. DESCRIPTION

This test will demonstrate that a radio user using an MDC1200 analog conventional channel is able to transmit Emergency Alarms.

SETUP

RADIO-1 – CONVENTIONAL CHANNEL 1
RADIO-2 - CONVENTIONAL CHANNEL 1

CONVENTIONAL CHANNEL 1 - MDC1200 CHANNEL
CONSOLE-1 CONVENTIONAL CHANNEL 1

Note:
Configure RADIO-2 to support Emergency Alarm.

VERSION #1.020

2. TEST

Step 1. Initiate an inbound Emergency Alarm from RADIO-2 using CONVENTIONAL CHANNEL 1.

Step 2. Verify that the Emergency Alarm is received at CONSOLE-1

Step 3. Verify that RADIO-1 receives the Emergency Acknowledgement tones.

Step 4. Acknowledge the Emergency Alarm from CONSOLE-1. The Emergency Alarm will be terminated after the radio receives the Ack.

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.10 Multi-Select Operation

1. DESCRIPTION

Multi-Select (Msel) allows the console operator to group a number of channels/talkgroups together such that when the general transmit bar is depressed, all of the multi-selected channels/talkgroups will transmit at the same time with the same information. Multi-Select is one way communication call. If a radio user responds to a Multi-Select call the talkgroup the user is affiliated to will be the only one to hear the call. There is no super-group formed, so radio communication is still at the single channel level. Multi-Select is utilized to send an APB to several channels/talkgroups. A Multi-Select has a limit of twenty (20) trunking/conventional resources

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1
RADIO-2 - CONVENTIONAL CHANNEL 2

CONSOLE-1 - CONVENTIONAL CHANNEL 1, CONVENTIONAL CHANNEL 2

VERSION #1.030

2. TEST

Step 1. From CONSOLE-1, create an Msel group with CONVENTIONAL CHANNEL 1 and CONVENTIONAL CHANNEL 2.

Step 2. Transmit on the Msel using the Msel instant transmit button.

Step 3. Verify that RADIO-1 and RADIO-2 hear the call.

Step 4. Initiate a call with RADIO-1.

Step 5. Verify the call is heard on CONSOLE-1 but not on RADIO-2.

Step 6. Initiate a call with RADIO-2.

Step 7. Verify the call is heard on CONSOLE-1 but not on RADIO-1.

Step 8. On CONSOLE-1 dissolve the Msel.

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.11 Radio Check

1. DESCRIPTION

Radio Check allows the console operator to determine if a subscriber is operational or within range. The subscriber sends the acknowledgment that it has received the Radio Check.

NOTE: The status/message line must be added to the Channel Control Window (CCW) of the resource in order for the "ACKNOWLEDGED" indication to be visible.

This test can be run using Digital Conventional or MDC1200 Channels.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1

CONSOLE-1 - CONVENTIONAL CHANNEL 1

VERSION #1.030

2. TEST

Step 1. Using CONSOLE-1 select the CONVENTIONAL CHANNEL 1 Radio Resource.

Step 2. From the active Radio Resource select the Radio Check button. Enter the ID or alias of RADIO-1 in the Radio Check window.

Step 3. Click the "Send" button from the Radio Check window to initiate the Radio Check.

Step 4. Verify that "ACKNOWLEDGED" is shown on CONVENTIONAL CHANNEL 1's Channel Control Window.

Step 5. Turn off RADIO-1.

Step 6. Click the "Send" button from the Radio Check window to initiate the Radio Check on RADIO-1.

Step 7. Verify that an error message is logged: "Send Radio Check failed: Target not found."

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.12 Radio Disable/Enable

1. DESCRIPTION

This test will demonstrate the Radio Disable/Enable service is supported from an MCC7100/7500 console using a Conventional channel. Once the radio is inhibited/disabled, the radio cannot be used to monitor voice channels or for any other radio user initiated activity. This test can be run using Digital Conventional or MDC1200 Channels

SETUP

RADIO-1 - CONVCH 1

CONSOLE-1 - CONVCH 1

VERSION #1.030

2. TEST

Step 1. Verify that RADIO-1 can transmit and receive audio.

Step 2. From the active Radio Resource on the console select the RADIO INHIBIT/DISABLE icon. Enter the ID or alias of RADIO-1. Click the "Send" button to initiate the RADIO INHIBIT/DISABLE.

Step 3. Verify that RADIO-1 appears to be powered-down and unable to transmit or receive audio.

Step 4. Send a Radio Check/Remote Monitor to RADIO-1 and verify that it can still receive and respond to a Radio Check/Remote Monitor but without providing any indication to the radio user.

Step 5. From the active Radio Resource on the console select the RADIO UNINHIBIT/ENABLE icon. Enter the ID or alias of RADIO-1. Click the "Send" button to initiate the RADIO UNINHIBIT/ENABLE.

Step 6. Verify that RADIO-1 appears to be powered-up and is able to transmit or receive audio.

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.13 Enhanced CCGW 4-wire Analog Interface Muting

1. DESCRIPTION

This test will demonstrate muting the analog interface of a 4-wire analog or MDC 1200 channel using the external mute input on the conventional channel gateway (CCGW).

Mute is indicated when pin 4 is shorted to pin 5 on the second analog connector (9A to 9D or 13A to 13D) of the analog or MDC 1200 conventional channel.

SETUP

The CCGW is either a Low Density Enhanced Conventional Gateway or a High Density Enhanced Conventional Gateway.

A 4-wire analog or MDC 1200 conventional channel, CONVCH -1, has been configured to mute the 4-wire interface. An external mute input has been set up on pins 4 and 5 of the second connector on the analog or MDC 1200 channel.

Conventional RADIO-1 - CONVCH-1

CONSOLE-1 - CONVCH-1

VERSION #1.020

2. TEST

Step 1. Key RADIO-1 on CONVCH-1. Communicate with CONSOLE-1.

Step 2. While RADIO-1 is transmitting, trigger the mute input on CONVCH-1.

Step 3. Verify that RADIO-1's audio is no longer heard on CONSOLE-1.

Step 4. Untrigger the mute input on CONVCH-1.

Step 5. Verify RADIO-1's audio on CONSOLE-1.

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.14 Alarm Input / Outputs (Aux I/O Option)

1. DESCRIPTION

The alarm inputs of the Aux I/O can be connected to almost any device that requires or can detect a relay closure. These signals can be simulated and monitored in the factory.

SETUP

Connect a multi-meter capable of monitoring closures to the proper pins of the punch block cabled to the Aux I/O. One momentary input and one momentary output should be configured on at least one MCC 7100/7500 console.
CONSOLE-1 - TALKGROUP 1
CONSOLE-1 - SITE - CONSITE 1
Aux I/O punch block pinout:

Aux I/O 1 - pins 26,1
Aux I/O 2 - pins 27,2
Aux I/O 3 - pins 28,3
Aux I/O 4 - pins 29,4

VERSION #1.010

2. TEST

Step 1. Using a shorting wire, simulate a relay closure on an input via the punch block.

Step 2. Verify that CONSOLE-1 momentary input displays the icon designated for an ON_STATE.

Step 3. Remove the shorting wire and verify that CONSOLE-1 displays the icon designated for an OFF_STATE.

Step 4. Connect the meter to the pins to monitor a relay output.

Step 5. Verify that the meter reads an open circuit.

Step 6. Press the output button on the console to initiate a relay closure.

Step 7. Verify that the meter displays a closed circuit.

Pass____ Fail____

MCC 7100/7500 Conventional Resources

1.7.6.15 Console Transmits Conventional Talkgroup

1. DESCRIPTION

This test will demonstrate the capability of the console to transmit a conventional talkgroup call to a subscriber and another console. A console operator will see a cross busy due to console on other talkgroups on that conventional talkgroup channel. The cross busy due to console indicates that the other talkgroup's console operator cannot currently transmit and will be busy/queued if they attempt to transmit. While the console is transmitting, subscribers using a different talkgroup on the conventional talkgroup channel will see LED light indicating channel busy.

SETUP

RADIO-1 - TALKGROUP A
RADIO-1 – CHANNEL 1
RADIO-2 – TALKGROUP B
RADIO-2 – CHANNEL 1
CONSOLE-1 – TALKGROUP A
CONSOLE-2 – TALKGROUP A
CONSOLE-2 – TALKGROUP B

Radios use Selective Squelch. Channel 1 is an infrastructure configured Conventional Talkgroup channel that has Talkgroup A and Talkgroup B.

VERSION #1.010

2. TEST

Step 1. Using CONSOLE-1 transmit on TALKGROUP A

Step 2. Will demonstrate RADIO-1 and CONSOLE-2 hear TALKGROUP A and see that it is CONSOLE-1 transmitting. Will demonstrate RADIO-2 sees channel busy and CONSOLE-2 sees cross busy due to console on TALKGROUP B.

Step 3. Using CONSOLE-2 attempt transmit on TALKGROUP B and release PTT

Step 4. Will demonstrate CONSOLE-2 displays busy/queued on TALKGROUP B.

Step 5. Using CONSOLE-1 dekey TALKGROUP A.

Step 6. Will demonstrate CONSOLE-2 displays callback on TALKGROUP B.

Step 7. Using CONSOLE-2 transmit on TALKGROUP B.

Step 8. Will demonstrate RADIO-2 hears TALKGROUP B and sees that it is CONSOLE-2 transmitting. Will demonstrate CONSOLE-1 sees cross busy due to console on TALKGROUP A and RADIO-1 sees channel busy.

Step 9. Using CONSOLE-2 dekey TALKGROUP B.

Step 10. Will demonstrate the channel is available at radios and consoles.

Pass____ Fail____

1.7.7 Signoff Certificate

By their signatures below, the following witnesses certify they have observed the system Acceptance Test Procedures.

Signatures

WITNESS: _____Date:

Please Print Name: _____ _____

Initials:

Please Print Title: _____

WITNESS: _____Date:

Please Print Name: _____ _____

Initials:

Please Print Title: _____

WITNESS: _____Date:

Please Print Name: _____ _____

Initials:

Please Print Title: _____

1.8 COVERAGE ACCEPTANCE TEST PLAN

1.8.1 CATP Overview

This Coverage Acceptance Test Plan (CATP) is designed to verify that the voice radio system implemented by Motorola for Ulster County, NY meets or exceeds the required reliability as shown on Motorola's maps. The CATP defines the coverage testing method and procedure, the coverage acceptance criterion, the test documentation, and the responsibilities of both Motorola and Ulster County, NY.

Coverage Acceptance Testing is based upon a coverage prediction that accurately represents the implemented infrastructure and parameters that are consistent with the contract agreements. To characterize system performance accurately, the APX equipment radio series will be used to conduct the coverage test.

Subsequent sections define the coverage acceptance test configuration and test criteria.

1.8.2 CATP Definitions

Several definitions are needed to accurately describe the coverage acceptance test method and criteria. Where cited, these terms or methods are defined in TIA TSB-88.1-D1 or TSB-88.3-D2.

1.8.2.1 Defined Test Area

The defined test area is the geographical area in which communications will be provided that meet or exceed the specified Channel Performance Criterion (CPC) at the specified reliability for the specified equipment configuration. The defined test area is listed in **Table 1-3** Coverage Acceptance Test Summary, along with name of the corresponding Motorola map which shows the defined test area. Please see the CATP grid coverage map provided.

For coverage testing, each defined test area will be divided into a grid pattern by Motorola to produce at least the number of uniformly sized test locations (or tiles) required by the Estimate of Proportions formula. {TSB-88.3-D, §5.2.1, equation 2} The minimum number of test tiles required varies, from a hundred to many thousands, depending on the size of the defined test area, desired confidence in results, type of coverage test, and the predicted versus required reliability.

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[1] *Wireless Communications Systems --- Performance in Noise- and Interference-Limited Situations --- Part 1: Recommended Methods for Technology Independent Performance Modeling* Technical Service Bulletin TSB-88.1-D, Telecommunications Industry Association (TIA), Arlington VA, 2012.

[2] *Wireless Communications Systems --- Performance in Noise- and Interference-Limited Situations --- Part 3: Recommended Methods for Technology Independent Performance Verification*, Technical Service Bulletin TSB-88.3-D, Telecommunications Industry Association (TIA), Arlington VA, 2013.

1.8.2.2 Channel Performance Criterion (CPC)

The CPC is the specified minimum design performance level in a faded channel. {TSB-88.1-D, §5.2} For this system, the CPC is the Delivered Audio Quality (DAQ) as stated in **Table 1-3** Coverage Acceptance Test Summary. The DAQ definitions are provided in Table 1-2 {TSB-88.1-D, §5.4.2, Table 3}.

Table 1-2: DAQ Definitions

DAQ	Subjective Performance Description
1	Unusable, speech present but unreadable.
2	Understandable with considerable effort. Frequent repetition due to noise/distortion.
3	Speech understandable with slight effort. Occasional repetition required due to noise/distortion.
3.4	Speech understandable with repetition only rarely required. Some noise/distortion.
4	Speech easily understood. Occasional noise/distortion.
4.5	Speech easily understood. Infrequent noise/distortion.
5	Speech easily understood.

The CPC pass/fail criterion is the faded performance threshold, plus any adjustments for antenna performance, external noise, and in-building or in-vehicle losses. {TSB-88.1-D, §5.4.2, Figure 5} The faded performance threshold for the specified CPC is determined using the receiver's static reference sensitivity adjusted by the projected CPC parameters for the applicable Modulation Type and DAQ as listed in the current version of TSB-88.1, Annex A, Table A-1. For coverage testing of digital voice radio systems, the faded performance threshold is the applicable Bit Error Rate (BER) from the projected CPC parameters.

1.8.2.3 Reliability

The Covered Area reliability is the percentage of locations within the defined test area that are predicted to meet or exceed the specified CPC. The Motorola map indicates the Covered Area within which this system is predicted to provide at least the reliability of meeting or exceeding the CPC as stated in **Table 1-3** Coverage Acceptance Test Summary.

For the defined test area guaranteed for Covered Area reliability, only the *painted* covered area on Motorola's maps will be tested for coverage acceptance ***for one channel only***. No acceptance testing will be performed in locations predicted on Motorola's maps to be below the required Covered Area reliability.

After all accessible tiles in the defined test area have been tested, the Covered Area reliability will be determined by dividing the number of tiles tested that meet or exceed the CPC pass/fail criterion by the total number of tiles tested. {TSB-88.3-D, §5.1, equation 1}

1.8.2.4 Direction(s) of Test

The direction(s) of test in **Table 1-3** Coverage Acceptance Test Summary defines the direction(s) which will be tested for coverage acceptance. Outbound (also called forward link, downlink, or talk-out) is the path from the fixed equipment outward to the mobile or portable radios. Inbound (also called reverse link, uplink, or talk-in) is the path from the mobile or portable radios inward to the fixed equipment.

1.8.2.5 Equipment Configurations

This section defines the equipment configurations and infrastructure design parameters upon which the coverage guarantee and the coverage acceptance test are based. The equipment configurations are defined in **Table 1-3** Coverage Acceptance Test Summary, and include user equipment, outdoor/in-building definition, defined test area, number of test tiles, reliability, CPC, CPC pass/fail, and direction of test. The infrastructure design parameters are defined in Table 1-4 Infrastructure Design Parameters, and include site names, site locations, and antenna system parameters. If the implemented system equipment configuration and/or infrastructure design parameters vary from these configurations and/or parameters, a revised coverage map will be used to define the test configuration and potential areas from which test tiles will be included in the revised coverage acceptance test.

Coverage testing will be conducted with equipment installed per the configurations in **Table 1-3** Coverage Acceptance Test Summary, and with the mobile antennas in unobstructed locations that are not adjacent to other large objects or metallic items which would distort the antenna patterns.

Table 1-3: Ulster County, NY Coverage Acceptance Test Summary

User Equipment	Outdoor / In-Building	Defined Test Area & Map Name	Number of Test Tiles	Reliability	CPC	CPC Pass/Fail	Direction(s) of Test
VHF Analog Narrowband Simulcast							
APX Portable worn at hip level in a belt clip with remote speaker microphone	Outdoor – Drive tests to be conducted with appropriate attenuation to reflect portable antenna belt clip with speaker mic for outbound and inbound	Reference 1: Portable Outbound Test Grid. Reference 2: Portable Inbound Test Grid. Maps showing Painted Covered Area within Ulster County Boundary that will be enabled for testing	770 Talk Out and 496 Talk Back (1m x 1m grids) accessible via roads	95.0%	DAQ-3.0	Subjective DAQ	Talk Out & Talk Back

Table 1-4: Ulster County, NY Infrastructure Design Parameters

Site Name	Latitude	Longitude	Transmit Antenna System			Receive Antenna System			
			TX ERP	Mount Height	Antenna Model	Mount Height	Antenna Model	RX EFS	External Noise assumed (relative to KToB)
Zone MSE1 - MSE1									
MSE1 - Cell1-Prime									
Kingston	41°54'59.5" N	74°1'10.6" W	50W	160 ft	FSA20-41-DIN (Qty 2)	180 ft	FSA20-41-DIN	-103.97 dBm	12.6 dB
Sams Point	41°41'8" N	74°21'19" W	10W	155 ft	FSA20-41-DIN (Qty 2)	155 ft	FSA20-41-DIN	-104.01 dBm	12.6 dB
Overlook	42°5'6" N	74°5'60" W	5W	290 ft	CSA10-41-DIN	290 ft	CSA10-41-DIN	-103.86 dBm	12.6 dB
Illinois	41°43'7.5" N	73°59'45.4" W	10W	180 ft	FSA20-41-DIN	180 ft	FSA20-41-DIN	-104.12 dBm	12.6 dB
Bell Aire	42°7'33.5" N	74°30'51.9" W	5W	25 ft	BA80-41-DIN-T3 (Tx & Rx)			-103.36 dBm	12.6 dB
Shandaken	42°4'43" N	74°18'37" W	20W	180 ft	BA80-41-DIN (Tx & Rx)			-100.07 dBm	12.6 dB
Tonche	42°0'3.1" N	74°11'32.5" W	10W	78 ft	FSA20-41-DIN (Tx & Rx)			-104.28 dBm	12.6 dB
Saugerties	42°7'35" N	73°59'16" W	40W	180 ft	CSA10-41-DIN (Tx & Rx)			-104.07 dBm	12.6 dB
Sunny Ulster	41°51'10.68" N	74°7'43.27" W	37W	170 ft	BA80-41-DIN (Tx & Rx)			-103.12 dBm	12.6 dB
Marlboro	41°36'55.89" N	73°58'59.74" W	93W	80 ft	FSA20-41-DIN			-104.28 dBm	12.6 dB

1.8.2.6 Outdoor Only Coverage

Motorola's portable coverage prediction is for outdoor locations only. Portable coverage inside buildings and vehicles is not a design requirement of this system and is, therefore, not guaranteed.

1.8.2.7 CPC Pass/Fail Criterion for a Test Tile

For each equipment configuration, the CPC pass/fail criterion for a test tile is stated in Table 1-3 Coverage Acceptance Test Summary. Each equipment configuration will have only one CPC pass/fail criterion for a test tile.

Coverage for the portable outdoor equipment configuration will be verified for acceptance by attenuation of two test radios, one for outbound to portable and another for inbound from portable, for the Subjective DAQ tests. The attenuation will be the difference between the test radio's antenna system and the additional loss used in Motorola's coverage prediction to account for portable head level antenna performance, and portable hip level antenna performance.

This provides a method of verifying that the radio system provides the required Subjective DAQ for the specified CPC for each of the defined equipment configurations.

The methodology to determine the attenuator value is demonstrated in TSB-88.1-D §5.4.2, Figure 5. The attenuator value includes the proper values for the equipment configuration requirement plus adjustments for the test equipment setup. Should the test equipment setup losses (e.g. cable length) vary, an adjustment to the attenuator value may be required to represent the required equipment configuration accurately. The attenuator values will be provided during the detailed design review phase of the project.

1.8.2.8 Required Number of Test Tiles in the Defined Test Area

The method used to test coverage is a statistical sampling of the defined test area to verify that the CPC is met or exceeded at the required reliability for each of the defined equipment configurations. It is impossible to verify every point within a defined test area, because there are infinite points; therefore, coverage reliability will be verified by sampling a statistically significant number of randomly selected locations, quasi-uniformly distributed throughout the defined test area. There is one test sample per test tile, where a sample consists of multiple sub-samples.

Coverage acceptance testing will be performed in the defined test area as indicated on Motorola-provided maps. To verify that the reliability requirement is met, the defined test area indicated on Motorola's maps will be divided into uniformly sized test tiles, with at least the number of test tiles indicated in Table 1-2Coverage Acceptance Test Summary. The number of test tiles indicated in Table 1-2 is at least the minimum required by the Estimate of Proportions formula as stated in section 1.2.1 (Defined Test Area) of this document.

Per TSB-88.3-D, the stated minimum outdoor tile size is 100 by 100 wavelengths; however, the minimum practical test tile size is typically about 400 by 400 meters

(about 0.25 by 0.25 miles). The minimum practical tile size for any system is determined by the distance traveled at the speed of the test vehicle while sampling, GPS error margin, and availability of road access within very small test tiles. A related consideration is the time, resources, and cost involved in testing very large numbers of very small tiles. For a given defined test area, all test tiles must be of equal size. The maximum test tile size is 2 by 2 km (1.24 by 1.24 miles) {TSB-88.3-D, §5.5.1}. In some wide-area systems, this constraint on maximum tile size may dictate a greater number of test tiles than the minimum number required by the Estimate of Proportions formula.

No acceptance testing will be performed in locations outside the defined test area as indicated on the Motorola-provided maps. Motorola and Ulster County, NY may agree to perform “information only” tests in locations outside the defined test area; however, these “information only” test results will not be used for coverage acceptance. Any “information only” test locations must be defined before starting the test. If the added locations require significant additional time and resources to test, a change order will be required and Motorola may charge Ulster County, NY on a time-and-materials basis.

1.8.2.9 Accessibility to Test Tiles

Prior to testing, Motorola and Ulster County, NY will plan the route for the test vehicle(s) through the defined test area, to ensure that at least the minimum required number of tiles is tested. While planning the route (if possible) or during the test, Motorola and Ulster County, NY will identify any test tiles that are inaccessible for the coverage test (due to lack of roads, restricted land, etc.). Inaccessible tiles will be considered a pass. {TSB-88.3-D, §5.5.4}

1.8.2.10 Random Selection of a Test Location in Each Tile

This CATP provides an objective method of randomly selecting and tracking test locations using Motorola’s Voyager℠ coverage testing tool. The method follows TIA TSB-88.3-D §5.0, “Performance Confirmation”, and has direct correlation with Motorola’s coverage prediction methodology.

Using Voyager, the actual test location within each test tile will be randomly selected by the test vehicle crossing into the tile at an arbitrary point, with an arbitrary speed and direction. If the selected test location is in a shielded area such as a tunnel or underground parking garage, the data from that test location must be eliminated and a replacement test location must be used.

1.8.2.11 CPC Measurements in Each Tile

In each test tile, a voice test exchange will be initiated using predetermined text typical of a common voice exchange between the fixed location and the portable location. The person conducting the test at the portable will be moving at a typical speed for the surrounding conditions.

1.8.3 Responsibilities and Preparation

This section identifies the responsibilities of Ulster County, NY and Motorola regarding requirements for equipment, personnel, and time during the coverage test.

Ulster County, NY will provide the following for the duration of the coverage test:

- At least two test vehicles that are representative of the vehicles to be installed with radios, and will provide the drivers.
- Exclusive use of the test channels required by Motorola during the test.
- Two teams each with three or more representatives designated by Ulster County, NY per team to evaluate and record the pass/fail result of each subjective audio transmission. The required quantity of test participants shall be available a minimum of eight hours a day.
- Facility with one console for the fixed end subjective audio test.

Motorola will provide the following for the duration of the coverage test:

- Two teams each with 1 fewer Motorola representative per team than those designated by Ulster County, NY, to navigate and to operate Voyager, operate the portable radios, and to evaluate and record the pass/fail result of each outbound subjective audio transmission.
- One or more Motorola representatives to operate the fixed equipment, and to evaluate and record the pass/fail result of each inbound subjective audio transmission.
- At least two Motorola Voyager coverage testing tools.
- Provide four user radios for the test.

Before starting the test, Ulster County, NY and Motorola will agree upon the time frame for Motorola's submission of a report containing the coverage test results.

1.8.4 CATP Procedures

A coverage acceptance test will be performed using Motorola's Voyager tool to randomly select test locations.

Voyager consists of the following:

- A Global Positioning System (GPS) receiver, which will provide the computer with the location and speed of the test vehicle.
- A laptop computer with Voyager software and a mapping database, which includes highways and local streets political boundaries, rivers, and railroads.

The procedure for the subjective DAQ coverage test outdoors will be as follows:

- A subjective listening test will be performed for coverage acceptance testing, to verify talk-in and talk-out DAQ performance of the system.
- Because the antenna loss values for outbound to hip and inbound from head level are different, two Voyager kits, each with a radio properly attenuated for outbound and inbound respectively will be used. One Voyager Test Kit will

evaluate the outbound coverage and the second Voyager Test Kit will evaluate the inbound coverage.

- Talk-out and talk-in will both be required to pass for a test tile to pass.
- To perform a statistically valid subjective DAQ test, a large group of people is required to ensure high confidence in the results. However, obtaining a large group of people for a subjective listening test is usually impractical; therefore, several (three to seven) people in a car or van must be used for the test. Since a group this small cannot provide statistically significant results, it is very important that the personnel participating in the subjective test be familiar with the sound of radio conversations. Before subjectively testing, all personnel who will evaluate audio quality must be “calibrated” by listening to examples of audio that pass and fail the subjective DAQ test.
- A fixed dispatch location will be established. Prior to testing, Ulster County, NY and Motorola will agree upon a procedure to allow each audio transmission to be evaluated for approximately five seconds.
- The test participants will be divided into teams, each consisting of personnel from both Ulster County, NY and Motorola. Each team will have members that operate a portable radio in the field, and members that are stationed at the fixed dispatch location.
- As the field test teams drive through the coverage area, test locations within each test tile will be selected randomly by Voyager’s GPS location indication. Voyager will be used to log the talk-in and talk-out pass/fail result as well as any pertinent notes for the location.
- At each test tile location, each field test team member will listen to a talk-out audio transmission, and will record his or her subjective pass/fail evaluation of the DAQ for the tile. Team members stationed at the dispatch location will evaluate talk-in audio quality of transmissions from the test radios in that tile. Each team member will maintain a test log to record date, time, and subjective pass/fail evaluation for each test tile location. Subjective pass/fail evaluation will be based on the DAQ descriptions in Table 1-2. The determination of whether each test tile passes or fails the required DAQ value will be the majority vote of all team members’ pass/fail subjective evaluations for that tile. An odd number of team members is required to avoid ties for the pass/fail majority vote.
- Should any subjective DAQ test tile fail, a retry of the transmission will occur. Should the retry pass, the test till will be considered a pass. If a retry should occur, it will be noted in the test log notes for that test tile.

1.8.5 CATP Documentation and Coverage Acceptance

During the coverage acceptance test, Voyager generates computer files that include the raw test data. A copy of this data will be provided to Ulster County, NY at the conclusion of the coverage test. Motorola will process this data to produce a map detailing the coverage test results, and to determine whether the coverage test was passed for each user equipment configuration.

The coverage acceptance criterion for a user equipment configuration will be that the voice radio system implemented by Motorola for Ulster County, NY meets or exceeds the reliability stated in Table 1-3 Coverage Acceptance Test Summary for that user equipment configuration. The system coverage acceptance criterion will be

the successful passing of each of the user equipment configurations defined in Table 1-3 Coverage Acceptance Test Summary.

Motorola reserves the right to review any test tiles that fail. If a coverage test, or a portion thereof, is suspected by Motorola to have failed due to external interference, those tiles suspected of being affected by an interferer may be re-tested. If the test tiles re-tested are confirmed to have failed due to interference or external noise, those test tiles will be excluded from all acceptance calculations and Motorola will work with Ulster County, NY to identify potential solutions to the interference issues.

Motorola will conduct this Coverage Acceptance Test only once. If any portion of the test is determined to be affected by proven equipment malfunctions or failures, Motorola will repeat the portion of the test affected by the equipment malfunction or failure. Ulster County, NY will have the option to accept the coverage at any time prior to completion of the coverage test or documentation process.

Motorola will submit to Ulster County, NY a report detailing the coverage test results. This report will include a document, which is to be signed by both Ulster County, NY and Motorola, indicating the test was performed in accordance with this CATP and the results of the test indicate the acceptance or non-acceptance of the coverage portion of the system.

1.9 TRAINING PLAN

1.9.1 Training Overview

Partnering with Motorola Solutions will enable Ulster County Emergency Communications to build personnel competency and maximize return on investment.

Effective training ensures successful implementation and use of your communications system by all personnel for the life of the system. The training plan furnished to Ulster County Emergency Communications is comprised of targeted coursework developed and delivered by our expert instructors. This plan, included below, will effectively provide Ulster County Emergency Communications' personnel with a comprehensive understanding of the proposed system and user equipment.

We will collaborate with Ulster County Emergency Communications to tailor a final training plan to enable Ulster County Emergency Communications' organization to operate, configure, and manage the proposed solution effectively and efficiently.

1.9.2 Motorola Solutions Training

Motorola Solutions provides an expanding portfolio of training delivery methods, tools, and courses to support the training needs of our customers. The figure below shows the elements of our training methodology that qualify us as the leader in the communications training industry.

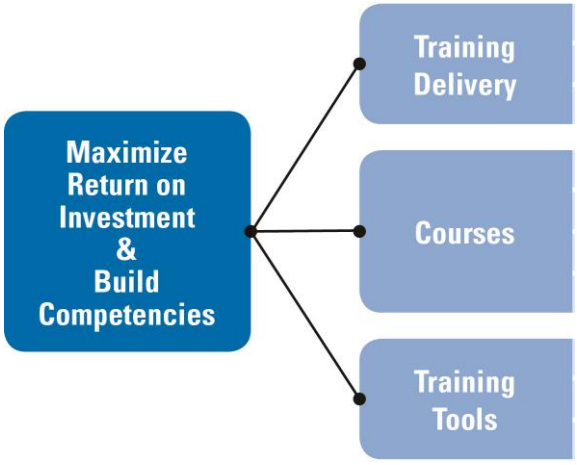


Figure 1-3: Build the competencies of Ulster County Emergency Communications personnel and maximize your return on investment with Motorola Solutions' expanding portfolio of training delivery methods, tools, and courses.

1.9.2.1 Training Delivery

Training Methods

Motorola Solutions' training experience and expertise enables our customers to gain the training they need to use during critical times in a variety of methods. As shown in the figure below, we offer four interactive methods of training: Online Self-Paced, Virtual Instructor-Led, Instructor-Led, and our *new* Integrated Training Environment.

Figure 1-4: Motorola Solutions offers a variety of interactive training methods that cater to different learning techniques, allowing more effective ways to give personnel the skills they need.

These training approaches ensure our customers receive the understanding they need for the practical aspects of their jobs.

Delivery Options

Field

Field class delivery is "tailored" to the customer's specific system. We are providing classes which are not offered as standard "Open Resident" classes at our training facilities. The students benefit from working on their own systems, at their home location and within their schedules.

Motorola Facility

Resident classes are open to all Motorola customers, seating is based on availability, and participant guides and required pre-work when applicable are included in the tuition. These courses are comprehensive and are not tailored to any one customer's system. Students benefit from other students' experiences and are allowed to take systems out of service. These courses provide optimal "hands-on" training.

Motorola Facility Closed Sessions-Customer Specific

Special Resident classes are closed sessions for a particular Motorola Solutions customer. The customer is essentially renting the classroom. These courses are tailored to the customer's system as much as possible. The instructor will require the customer's system diagrams prior to the class taking place. The students will receive their ASTRO 25 IV&D manuals on CD-ROM and hard copy participant guides. Class manuals, participant guides, and required pre-work are included in the pricing of the class per student. The students are allowed to take systems out of service, which provides optimal "hands-on" training.

Motorola Solutions Instructors

We have approximately 40 instructor resources distributed across North America. These instructors are available to train customers in our Technical Training Center located in Schaumburg, Illinois, while specific training courses are available at our facility in Plantation, Florida. Training can also be delivered directly on-site at customer locations. All instructors undergo an Instructional Skills and Technical Knowledge Program, which is a globally-recognized training and instructor assessment program.

Consultative Services

Motorola Solutions provides consultative services for our customers, which includes personalized training plans and other training-related services. Our dedicated training consultant team works with our customers and Motorola Solutions account teams to identify and meet the training needs of technical, administrative end users, and other audiences.

1.9.2.2 Training Courses

Motorola Solutions offers a wide range of training courses to help our customers improve their proficiency with our expanding portfolio and get the most from their training system.

Our specialized courses/curriculums are designed for our customers' role. Whether they are an administrator, technician or user, Motorola Solutions makes sure our customers are equipped with foundational and advances skills.

General overviews of product and/or solution training offered are listed below:

Foundational Radio and Networking Training

Foundational Radio and Networking training provides new hires or staff from different skilled backgrounds fundamental knowledge. Some of these courses are online/self-paced while others are instructor led. Some topics include: Radio System Basics, Basic Networking, Communication System Concepts, Networking Essentials and

Applied Networking. This allows Motorola Solutions to offer training before installation, during installation and after your solution is operational.

ASTRO 25 Infrastructure Training Courses

ASTRO 25 Infrastructure Training provides participants with a full curriculum that will enable them to maintain/service the new solution, and will give them the skills required to manage and operate the solution to obtain its fullest potential and capabilities.

ASTRO 25 Patch Management Training Course

ASTRO 25 Patch Management Training provides ASTRO 25 Land Mobile Radio (LMR) system administrators the information needed to access and patch their radio network infrastructure, update antivirus definitions, and review log files.

MCC Console Training Courses

MCC Console Training provides participants with a curriculum that will enable them to obtain a high-level understanding of the system configuration, general console operation, how to perform basic tasks, operating procedures for specific features, and the knowledge and skills necessary to manage and maintain the system.

APX Mobile and Portable Radio Training Courses

APX Mobile and Portable Radio Training provides participants with an introduction to the radio, the knowledge and skills necessary to perform basic radio operation, common operational tasks, operating procedures for specific features of the radio, and technical programming and maintenance of radios.

Digital Evidence Management Solution (DEMS) Training Courses

Digital Evidence Management Solution Training provides participants with a high-level overview of the DEMS solution. The CommandCentral Vault Field Workshop Solution training and Video Camera training are conducted with a combination of hands-on lab activities, demonstration, and discussion that provide an in-depth learning experience for participants, enabling them to make the most effective use of their solution/device.

MOTOTRBO Training Courses

MOTOTRBO Training provides participants with a full curriculum that will enable them to maintain/service the new solution, and will give them the skills required to manage and operate the solution to obtain its fullest potential and capabilities.

CallWorks Training Courses

CallWorks Training provides participants with an overview of the components and functionality of the main application, operation, troubleshooting, a high-level understanding of the software, and configuration and maintenance of components of the CallWorks solution.

PremierOne Training Courses

PremierOne Training provides participants with sufficient knowledge of the PremierOne solution and its tools, giving them the skills necessary to operate and maintain the PremierOne solution.

LTE Training Courses

LTE Training provides participants a high-level understanding of the Public Safety LTE system and the network elements that comprise the system. Participants will gain knowledge of LTE architecture, signaling, system administration, and applied networking.

WAVE Training Courses

WAVE Training provides participants with an overview of the WAVE solution. It offers a basic understanding of how WAVE delivers a Radio-over-IP solution; describes features, hardware, and software requirements; how to use applications; and provides instruction in designing, integrating, and troubleshooting the WAVE solution.

1.9.2.3 Training Tools

Training Kits

Training kits are essential suitcase equipment, labs and exercises that apply to some of the ASTRO, MOTOTRBO, WAVE and LTE solutions. These kits are used in addition to equipment, in order to prevent solution downtime while training is conducted. As part of specific on-site classes, shown in **Table 1-5**, kits are included and shipped to our customers to allow students an in-depth, hands-on experience.

Table 1-5: Field Classes Training Kit Availability

Field Classes Training Kit Availability	
Networking Essentials	Server Virtualization
Applied Systems Networking	WAVE Certified Integration Engineer
Domain Controller	MOTOTRBO™ Systems Applied Networking

Tracking and Evaluation

All customer training is tracked and evaluated. The Project Manager and training team tracks and records all courses completed through the implementation of the project. Surveys are given to trainees to evaluate the trainers. Feedback is given and placed on our customer shared website.

Interactive End User Tool Kit (iEUTK)

The Interactive End User Tool Kit is a knowledge-transfer tool designed to accelerate learning through customizability. Using the iEUTK allows trainers to customize user/operator training to match unique button, feature programming, and displays provided in the system and radio codeplug. These tailored materials are developed by Motorola Solutions trainers using tool kits that allow customer trainers to modify training materials when radio or console features change. Personnel are taught how to maneuver through and tailor the iEUTK screens. The tailored selections are saved to an electronic file that the Motorola Solutions training team provides to the customer.

For a more detailed view of the training Motorola Solutions provides, please see our Product and System Technical Training Course Catalog: https://www.motorolasolutions.com/content/dam/msi/docs/services/learning/2019-na-product-systems-training.pdf

1.9.3 Proposed Training Overview for Ulster County Emergency Communications

In order to achieve the training goals identified by Ulster County Emergency Communications, we propose the following courses.

1.9.3.1 Console Operator and Supervisor Training Plan

Course Title	Target Audience	Sessions	Duration	Location	Date	Participants
MCC7500 Console Operator and ADMIN Using 6 training consoles (Instructor-led)	Dispatch Supervisors	1 (8-hour Session)	1 day	Kingston, NY	Prior to cutover	6
MCC7500 Console Operator Using 5 training consoles Ratio: 2 per Console (Instructor-led)	Dispatch Operators	3 (4-hour Sessions)	1.5 days	Kingston, NY	Prior to cutover	30 (10 per Session)

1.9.3.2 Radio End User Training Plan

Course Title	Target Audience	Sessions	Duration	Location	Date	Participants
APX Portable and Mobile Conventional / Analog Train-the-Trainer (Instructor-led)	Fire and Ambulance Radio Trainers	2 (4 hr) Sessions (1 for Fire and 1 for Ambulance)	1 day	Kingston, NY	Prior to training Users	30 (15 per Session)

1.9.3.3 Course Descriptions for Ulster County Emergency Communications

Course descriptions for Ulster County Emergency Communications are included on the following pages.

1.9.3.3.1 MCC7500 Console Supervisor

Course Synopsis and Objectives:	This course provides participants with the knowledge and skills to manage and utilize the MCC7500 console administrator functions. Through facilitation and hands-on activities, the participant learns how to customize the console screens. After completing this training course, you will be able to: ▪ Understand the menu items and tool bar icons. ▪ Edit folders, multi-select/patch groups, auxiliary input output groups, windows and toolbars. ▪ Add/delete folders.
Delivery Method:	ILT - Instructor-led training
Duration:	4 hours Operator, plus 4 hours Admin
Participants:	Dispatch Supervisors and System Administrators
Class Size:	Based on number of Training Consoles available (2 students per Console)
Prerequisite:	None
Curriculum:	▪ Introduction ▪ Configurations ▪ Folders and Resource Setup ▪ Customizing Folders ▪ Auto Starting the MCC7500 Dispatch Console ▪ Editing Preferences ▪ Configuring the Toolbar ▪ Setting Up Aux IOs ▪ Resource Groups

1.9.3.3.2 MCC7500 Console Operator

Course Synopsis and Objectives:	This course provides participants with an introduction to the dispatch console, its basic operation and tailored job aids which will be available for assistance in operation. Through facilitation and hands-on activities, the user learns how to perform common tasks associated with the console operation. After completing this training course, you will be able to: ▪ Perform basic operational tasks of the dispatch console. ▪ Utilize the provided job aids to perform specific tasks associated with the console. ▪ Understand a high level view of the system configuration. ▪ Understand a high-level overview of the customer system configuration. ▪ Understand general console operation. ▪ Understand proper operating procedures for specific customer features.
Delivery Method:	ILT - Instructor-led training
Duration:	4 hours

Participants:	Dispatch Console Operators, Supervisors, System Administrators, and Support Personnel
Class Size:	Based on number of Training Consoles available (2 students per Console)
Prerequisite:	None
Curriculum:	▪ Overview ▪ Communicating with Radios ▪ Advanced Signaling Features ▪ Resource Groups ▪ Working with Configurations ▪ Working with Aux IOs ▪ Troubleshooting

1.9.3.3.3 APX Portable And APX Mobile Train-the-Trainer

Course Synopsis and Objectives:	This course provides APX radio trainers with an introduction to their radio, its basic operation and tailored job aids available for assistance in operation. The learning experience is a mix of facilitation and hands-on activities to help users perform common tasks associated with their radio operation. Segmentation between user groups (i.e. Police, Fire/EMS, and Public Service) is encouraged to help focus instruction on the specific operational issues of the individual user group. This course is geared for customers who have an experienced dedicated training staff in their organization. It provides the customer's identified training personnel with the knowledge and practice applying training techniques that will enable them to successfully train their students. Trainers will use audio visual (Interactive End User Toolkits–iEUTK), facilitation and "hands-on" activities to facilitate learning events supported by tailored or customized training materials and job aides. They will become proficient in discussing common tasks associated with the operation of the customer's radios. After completing the course the participant will be able to: ▪ Understand a high-level overview of the customer system configuration ▪ Understand the general radio operation ▪ Understand proper operating procedures for specific customer features ▪ Perform basic operational tasks of the radio ▪ Utilize the provided job aids to perform specific tasks associated with the radio
Delivery Method:	ILT - Instructor-led training
Duration:	Up to 8 hours for Trunked Systems
Participants:	APX Trainers, Supervisors and Support Personnel
Class Size:	Up to 15
Prerequisite:	Previous two-way radio and training experience
Curriculum:	▪ Basics: ○ Controls ○ Top and Side Buttons ○ Switches ○ 3 Position toggle ○ 2 Position Concentric ○ Home key ○ Data Key ○ Display

- Front Display
- Top Display
- Display light
- Intelligent Lighting
- Push to Talk or Accessory PTT found on the microphone
- Hub, hang up box (Mobile)

- Menu:
  - Menu Screen Anatomy
  - Navigating Menu Screen
  - Recent Call List (Model 3.5)
  - Unified Call List - Contacts (Model 3.5)
  - Dual Sided Radio (Model 3.5)
  - Dual Mics
  - Dual Speakers
  - Accessory Connector
- Specific Features:
  - Changing Talkgroups/Channels
  - Changing Zones
  - Mute tones of keypad
  - Talkgroup Call
  - Private Call
  - Accessing Private Call Feature
  - Initiating Private Call
  - Call List Programming
  - Announcement/All Call (Calls involving Multiple Talkgroups)
  - Initiating Announcement/All Call
  - Direct/Talkaround
  - Failsoft
  - Radio Profiles
  - Accessing and changing Radio Profile
- Optional Features:
  - Scan
  - Scan program
  - Priority Scan
  - Dynamic Priority
  - Telephone Interconnect
  - Accessing Telephone Interconnect Feature
  - Initiating a Phone Call
  - Phone List Programming
- Data Services:
  - Text Messaging
  - Accessing the Text Messaging Feature
  - Creating a Free Form Text Message
  - Sending a “Canned “ Text Message
  - GPS
  - OTAP User Interface
  - Encryption
  - Emergency

1.10 WARRANTY & MAINTENANCE PLAN

Motorola has over 90 years of experience supporting mission critical communications for public safety and public service agencies. Motorola's technical and service professionals use a structured approach to lifecycle service delivery and provide comprehensive maintenance and support throughout the life of the system. The value of support is measured by system availability, which is optimized through the use of proactive processes, such as preventive maintenance, fault monitoring and active response management. System availability is a function of having in place a support plan delivered by highly skilled support professionals, backed by proven processes, tools, and continuous training.

1.10.1 Warranty Services

The service products that comprise the custom warranty package are listed below along with a brief description.

The warranty on the new infrastructure equipment will commence on the date of beneficial use or system acceptance, whichever occurs first, and will continue for twelve (12) months from that date on a seven (7) day-a-week, twenty-four (24) hour-a-day basis.

These services are included in the total cost of the system. After the warranty period expires, these services may be purchased under a separate agreement. Motorola's service package is comprised of the following services:

- Dispatch Service
- Infrastructure Repair
- Technical Support
- OnSite Infrastructure Response

Please note that the warranty services are for the equipment proposed and do not include any existing equipment. Response and repair excludes third party equipment not shipped by Motorola.

Please note that civil and site system components such as, but not limited to, UPS equipment, Generators, Shelters, and Antenna Systems are only covered by their manufacturer's warranty. Any services provided by Motorola for these items will be considered above contract and will be billed on a Time and Materials basis.

1.10.1.1 Dispatch Service

Motorola's Dispatch Service ensures that trained and qualified technicians are dispatched to diagnose and restore your communications network. Following proven response and restoration processes, the local authorized service center in your area is contacted and a qualified technician is sent to your site. An automated escalation and case management process is followed to ensure that technician site arrival and system restoration comply with contracted response and restore times. Once the issue has been resolved, the System Support Center verifies resolution and with your approval, closes the case. Activity records are also available to provide a comprehensive history of site performance, issues, and resolution.

1.10.1.2 OnSite Infrastructure Response

Motorola OnSite Infrastructure Response provides local, trained and qualified technicians who arrive at your location to diagnose and restore your communications network. Following proven response and restore processes, Motorola Dispatch contacts the local authorized service center in your area and dispatches a qualified technician to your site. An automated escalation and case management process ensures that technician site arrival and system restoration comply with contracted response times. The field technician restores the system by performing first level troubleshooting on-site. If the technician is unable to resolve the issue, the case is escalated to the System Support Center or product engineering teams as needed.

1.10.1.3 Technical Support Service

Motorola Technical Support service provides an additional layer of support through centralized, telephone consultation for issues that require a high level of communications network expertise and troubleshooting capabilities. Technical Support is delivered by the System Support Center (SSC). The SSC is staffed with trained, skilled technologists specializing in the diagnosis and swift resolution of network performance issues. These technologists have access to a solutions database as well as in house test labs and development engineers. Technical Support cases are continuously monitored against stringent inbound call management and case management standards to ensure rapid and consistent issue resolution. Technical Support service translates into measurable, customer-specific metrics for assured network performance and system availability.

1.10.1.4 Infrastructure Repair

Infrastructure Repair service provides for the repair of all Motorola-manufactured equipment, as well as equipment from third-party infrastructure vendors. All repair management is handled through a central location eliminating your need to send equipment to multiple locations.

Comprehensive test labs replicate your network in order to reproduce and analyze the issue. State-of-the-art, industry-standard repair tools enable our technicians to troubleshoot, analyze, test, and repair your equipment. Our ISO9001 and TL9000-certified processes and methodologies ensure that your equipment is quickly returned maintaining the highest quality standards.

Service agreements allow you to budget your maintenance costs on an annual basis. Equipment covered under service agreements also receives higher service priority, which results in quicker repair times.

1.10.2 Post Warranty Services

As Motorola's continuing commitment to supporting your system, warranty services can be extended after the warranty period to provide maintenance and service support in future years. Any of the services that we identify can be customized in future years, and are available for purchase either in "System Support Services" packages or as individual service offerings. These system support services significantly benefit for Ulster County because the system can be effectively supported after the warranty period, thereby maximizing the operational capabilities and useful life of the system and protecting your investment in the system.

Post-warranty support or lifecycle support services have ***NOT*** been included with this offering but can be provided upon request.

SECTION 2

VESTA 9-1-1

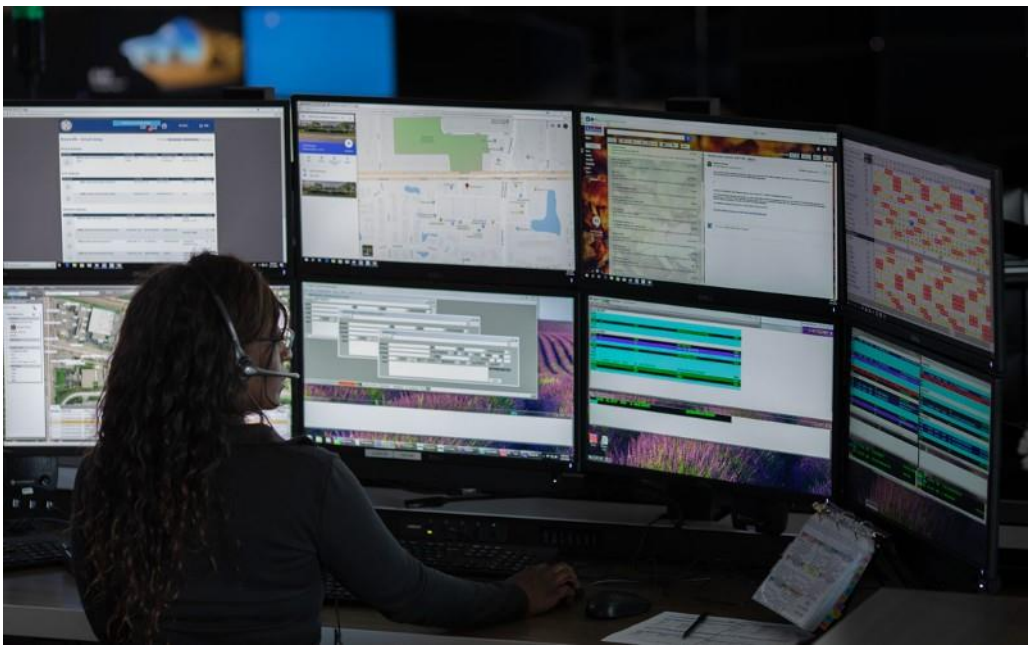
2.1 INTRODUCTION

Motorola Solutions is proud to present the VESTA® 9-1-1 call handling solution in response to Ulster County, NY's request.

Our VESTA team redesigned its industry leading 9-1-1 call handling platform from the ground up to specifically accommodate future emergency call handling formats. Our VESTA solution is that Next Generation 9-1-1 (NG9-1-1) platform. Already selected by over 1,500 agencies, the VESTA solution was designed to handle IP communications including Wireline, Wireless, VoIP, TDD/ TTY, SMS/Text. It will evolve to accept additional technologies like MMS and video, while maintaining our reputation for reliability and ease of use.

Today, the VESTA solution is the industry standard comprehensive NG9-1-1 solution. It offers PSAP's increased product features, operational efficiencies, and reliability along with stable, centralized call handling for individual or multiple PSAP locations.

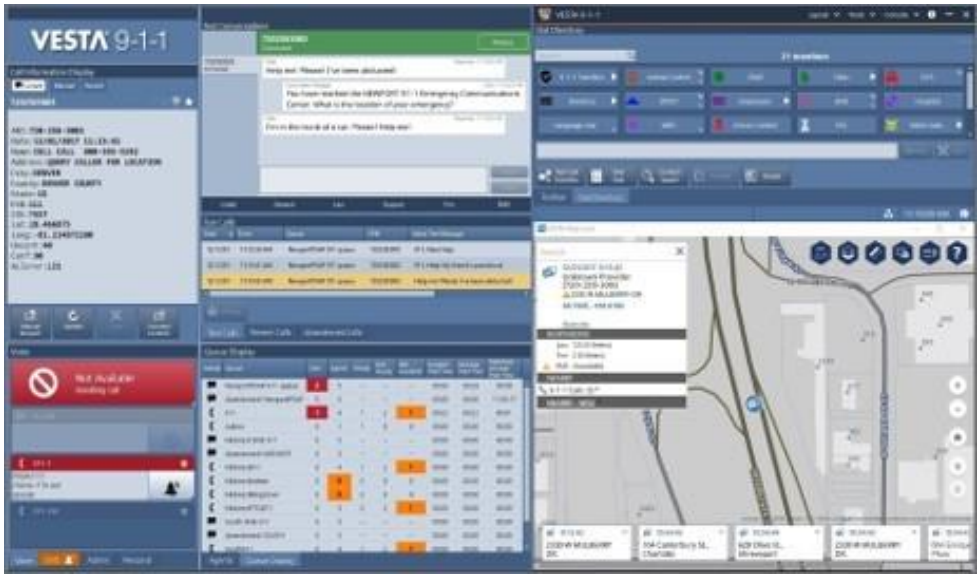
The VESTA solutions are designed to meet growing community needs and emerging 9-1-1 technology. Ulster County, NY is assured the solutions proposed herein will comply and meet both the E9-1-1 requirements of today and the NG9-1-1 requirements of tomorrow. By selecting Motorola Solutions, Ulster County, NY can be confident they are partnering with the leading provider of Public Safety 9-1-1 solutions, and selecting the highest possible level of service to the visitors, citizens, and public safety professionals of their region.



2.2 SOLUTION DESCRIPTION

Product is being offered by Motorola Solutions, Inc. Product described herein is included on the New York State OGS Contract #PT67405.

Motorola Solutions is pleased to offer the VESTA® 9-1-1, a Next Generation 9-1-1 Call Taking solution. The system will be fully NG9-1-1 capable as a platform going forward aligned to NENA's vision of future NG9-1-1 capability. As an example, it can be offered with SMS TEXT capability integrated within the desktop capable of using several Text Control Center's (TCC) links and formats of the customers choosing.



Fully configurable VESTA 9-1-1 Solution

2.3 PRODUCT DESCRIPTION

2.3.1 VESTA® 9-1-1

The VESTA 9-1-1 call handling solution is a mission-critical call management and response solution that is a NENA compliant, IETF standards-based, IP-centric implementation. In essence, the VESTA 9-1-1 solution:

- Is a 9-1-1 ANI/ALI controller providing voice management and data (ALI) retrieval.
- Supports all of the standard telephony interfaces to simplify integration into existing telephony networks.
- Engineered to ensure that there is essentially no single point of failure, i.e. most of the hardware is duplicated within the system to ensure redundancy.

Below is a description of the ***minimum*** hardware components for a VESTA 9-1-1 system being shipped are as follows:

- Servers running Media Distribution Services (MDS).
- Servers running Data Distribution Services (DDS).
- FXS (Foreign eXchange Subscriber) gateways.
- FXO (Foreign eXchange Office) gateways.
- Managed Ethernet switches.
- Firewall security appliance with VPN capability.
- VESTA 9-1-1 workstations to manage and process incoming mission critical calls.

Supported interfaces include:

- Analog 9-1-1 CAMA (wireline and wireless) trunks used only for incoming emergency calls.
- Administrative lines – Centrex, CLID, POTS.
- Feature Group D (FGD).
- Ring-down lines: wet (battery provided by CO) and dry (battery seen by the CO).
- Digital interfaces: T1 and PRI.
- Automatic Location Identification (ALI) to identify caller information.
- CAD interface.
- VoIP 9-1-1 interfaces using NENA I3 or Intrado RFAI protocol.

Specific features may or may not be available based on the options, call flow configurations and command assignments at the VESTA 9-1-1 workstations. Additionally, some features listed above represent integration with other third-party products that may not form part of the solution; these are denoted for reference purposes.

2.3.1.1 Servers

Media Distribution Services (MDS)

The VESTA 9-1-1 MDS are the software-based call-processing component of the VESTA 9-1-1 solution. The software extends telephony features and functions to

packet telephony network devices such as VESTA 9-1-1 workstations and IP phones.

MDS servers provide the following feature/functionality:

- Support for 9-1-1 and Admin queues.
- ACD schemes (Longest idle, Ring all, Circular and Linear).
- Conferencing, transfer, and call overflow capabilities.
- Administrative phone features and services.
- Auto attendant features.
- Voice mail.

MDS servers are always implemented in pairs and operate in an Active/Standby mode.

Data Distribution Services (DDS)

The VESTA 9-1-1 DDS provides advanced 9-1-1 call data handling and system monitoring services.

DDS servers provide the following feature/functionality:

- Retrieve and extract ALI from ALI databases, perform ALI rebids.
- Interfaces to CAD (Computer Aided Dispatch) systems.
- Manages the transfer of call details to remote agencies.
- System activity events and logs for tracking, alarming and historical reporting
- Management of overall system resources
- A client applications software distribution mechanism for VESTA 9-1-1 workstations, VESTA™ Analytics MIS solution, and Activity View management application
- Real-time CDR (Call Detail Record) printing

DDS servers are always implemented in pairs and operate in an Active/Standby mode.

Advanced Services Node (ASN)

The Advanced Services Nodes (ASNs) are equipped to extend the functionality of the VESTA 9-1-1 system. These are deployed virtual machines, which may be hosted on the System Hypervisor servers or on a separate pair of Hypervisor servers.

The ASNs provide the following functionality:

- Support direct-connect capability for delivery of SMS/text calls utilizing MSRP protocol.
- Provide additional tools for training purposes. This includes simulators for:
  - Generating SMS/text calls.
  - Generating simulated voice calls.
- Provide additional tools for diagnostic and configuration of the ASN.

  ASNs are always implemented in pairs and operate in an Active/Active mode.

Virtualized Servers

The MDS, DDS and other peripheral servers may be implemented as virtual machines (VM's) on one or more physical servers. This approach reduces the amount of back-room equipment, lowers power consumption and reduces thermal loading in the equipment room. VM's also provide greater flexibility for future software upgrades, since the operating system and client software are now independent of the server hardware. Virtual servers are normally equipped with:

- Six-core Xenon CPU's (minimum).
- 12 GB of RAM (minimum).
- Multiple disk drives in a minimum RAID 5 configuration.
- Multiple 10/100/1000 NIC's.
- Dual power supplies.

Virtualized Server

Gateways

The VESTA 9-1-1 solution supports various gateways to interface to traditional (non-IP) telephone systems. Gateways convert non-VoIP circuits to standard, SIP-based VoIP.

Foreign Exchange Subscriber (FXS)

FXS gateways support the following interfaces:

- 2-wire CAMA 9-1-1 trunks
- "Dry" ring-down circuits
- Analog stations
- FAX machines/modems
- Web-based Graphical User Interface (GUI) for configuration

Foreign Exchange Office (FXO)

FXO gateways provide the following functionality and interfaces:

- Loop-start CO lines
- Ground-start CO lines (M1K FXO GS modules only)
- "Wet" ring-down circuits
- Direct Inward Dialing (DID) circuits to specific endpoints (phone sets)
- Web-based GUI for configuration

Mediant 1000 (M1K)

Mediant 1000 gateway chassis provides six expansion slots which can be equipped with any combination of FXO, FXS and/or T1/PRI interface modules. The Mediant 1000 chassis is also equipped with redundant power supplies and dual network interfaces (NICs).

The following features and circuit types are supported on these gateways:

- Interface to 2-wire analog CAMA 9-1-1 trunks
- Interface to 2-wire loop start administrative lines
- Interface to 2-wire ground-start administrative lines (requires GS FXO module)
- Interface to either dry or wet ring-down lines
- Interface to standard T1/E1 circuits*
- Interface to standard ISDN-PRI circuits*
- Web-based GUI for configuration and management

*A maximum of four digital circuits may be equipped per M1K chassis (pre R6.0) or up to six (R6.x and later, with firmware upgrade).

ESInet Interface Module (EIM)

The ESInet Interface Module (EIM) provides connectivity to NENA I3-compliant and RFAI VoIP networks for the delivery of 9-1-1 calls and related information. Several different versions of EIM are available, depending upon the kind of ESInet that the system will be interfaced with:

- NENA I3 – microdata.
- NENA I3 – Solacom.
- NENA I3 – other.
- Intrado RFAI.

The ESInet is normally interfaced to the VESTA 9-1-1 system by way of a firewall device at each host location.

The following features are provided with the EIM module:

- Delivery of 9-1-1 voice to the system using VoIP technology.
- Delivery of the ANI as part of the call setup messages (SIP invite).
- Delivery of ALI information in the PIDF-Lo fields (NENA I3 only).
- Implementation of a “make busy” switch for PSAP evacuation/reroute (requires stand-alone FXS unit – switch to be provided by customer or channel partner).

2.3.1.2 Remote CAD Port Servers

In virtualized and/or geo-diverse hosts and/or remote PSAPs, RS232 Port Servers RS- 232-to-IP devices are deployed to extend serial CAD ports to the remote location.

These devices provide the following features:

- Four RS-232 ports per unit.
- Each unit may communicate with multiple DDS servers.
- Web-based GUI for configuration.

For each PSAP equipped with a CAD interface, one set of the following will also be provided to allow for CAD port redundancy:

- Blackbox TL601A-R2 port arbitrator.
- Blackbox TL159A-R4 8-port data sharing unit.

2.3.1.3 Networking

The VESTA 9-1-1 system requires specific network capabilities in order to operate correctly.

Depending upon the price/performance desired by the customer, different managed network switches in 24- or 48-port configurations may be quoted. These are typically from either HP or Cisco. Network switches may be either standard or Power over Ethernet (PoE) versions, depending on the configuration required.

2.3.1.4 Printing

The VESTA 9-1-1 system may be equipped with a variety of printers, depending upon the specific customer requirements. Printers may be either locally connected (to a workstation or server) or connected to the VESTA 9-1-1 LAN utilizing either an internal or external network interface. When purchased from Motorola Solutions, the following types of printers are available:

2.3.1.5 Workstations

The workstation uses a mini PC providing users with full functionality and power in a space saving design. The clean and compact design allows for flexible deployment options and is small enough to be mounted to the back of a monitor. Dual monitors are supported.

Mini PC for VESTA 9-1-1 Clients

Genovation Keypad

The versatile, 24-key programmable keypad can be labeled to fit specific agency needs. The non-volatile, programmable memory allows the keypad to connect to any USB port without installing resident software. The keypad is easy to program using the Windows compatible software provided. Assembled with high quality key switches, the keys are durable, yet light and easy to press.

Genovation Keypad

2.3.1.6 VESTA 9-1-1 Call Taking Position

The VESTA 9-1-1 call taking position provides a GUI to allow Call Takers to quickly process emergency and non-emergency calls. Depending upon the specific customer requirements, VESTA 9-1-1 call taking positions may be implemented in a variety of ways:

- Using standard tower or small form factor (SFF) workstations.
- With one or more widescreen monitors. Workstations support up to two monitors natively using Display Port outputs. Adapters are optionally available to support other display types (VGA, HDMI, DVI, etc.).
- With optional Integrated Instant Recall Recorder (IRR) software. IRR software can be deployed as either single-channel (telephone only) or dual-channel (telephone and radio select audio) modes.
- With one or two Network Interface Cards (NICs). When deployed with two NICs, each NIC may operate independently (connected to two different networks) or be teamed for redundancy.
- With a SAM (Sound Arbitration Module) connected to two standard 310-plug headset jacks.
- With either an optional SAM speaker module or an optional basic external speaker.
- With optional Genovation 24- or 35-key programmable keypads.
- With optional widescreen touch screen monitor(s).

2.3.1.7 Local Survivability

VESTA 9-1-1 offers the ability to implement local survivability for remote PSAPs. This optional feature allows the PSAP to continue to receive calls on locally connected circuits in the event the WAN connection(s) to the host(s) are lost. Local survivability may support the following services:

- Admin lines.
- 9-1-1 trunks with ANI.
- Locally connected ALI circuits.
- Local operation of VESTA consoles.
- Local operation of enhanced IP phone sets.

The following additional equipment may be installed at the remote PSAP to support the local survivability function:

- One or more servers running a redundant version of the VESTA 9-1-1 core services.
- Digi TS-4 devices to connect to local ALI circuits (optional).
- One or more enhanced IP phone sets.
- One or more IP alerting devices.
- Additional gateway resources for locally terminated admin lines and/or 9-1-1 trunks.

2.3.1.8 Direct PSAP Interconnect

Direct PSAP Interconnect (DPI) allows two or more VESTA 9-1-1 systems to be connected via a Wide-Area Network (WAN) for the purpose of call transfers and inter-system calling. When transferring 9-1-1 calls, the original ANI/ESRK of the call is sent to the terminating system so that system can retrieve the ALI information. The originating call-taker can either remain on the call or drop out of the call after the terminating call-taker answers.

This feature requires that each system utilizing DPI be equipped with the ESInet Interface Module (EIM) license. Each system must also be able to perform ALI queries on records normally served by the other systems in the DPI network.

2.3.1.9 VESTA SMS

The VESTA SMS solution allows VESTA 9-1-1 systems to connect directly to Text Control Centers (TCC's) using standards-based MSRP protocol for delivery of text messages directly to VESTA console users. Some of the features of the VESTA SMS solution are:

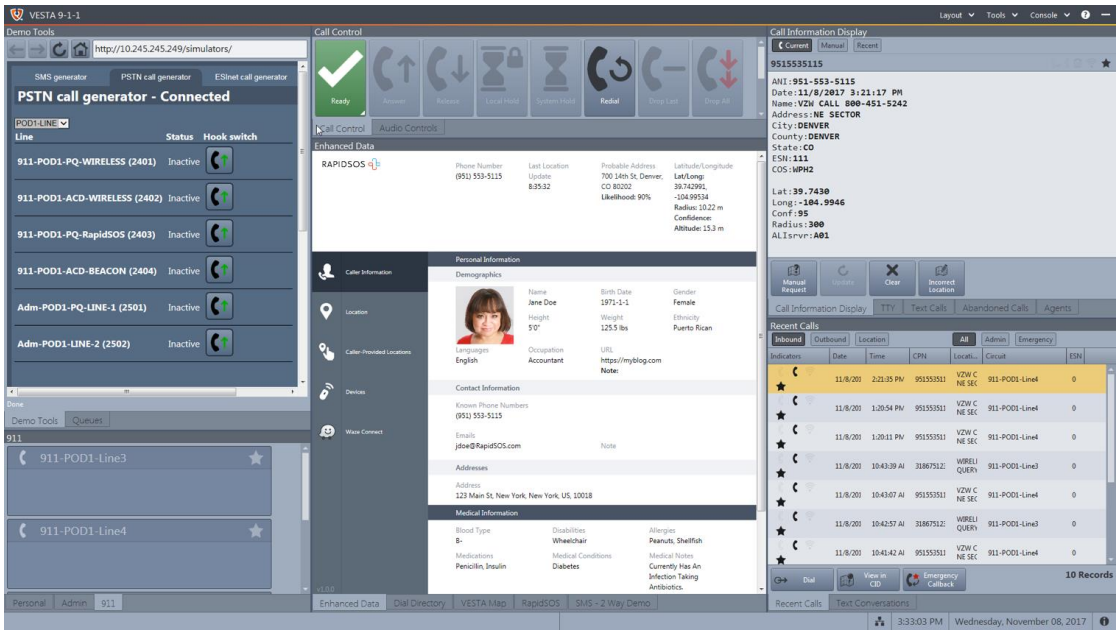
- Standards based Text-to-9-1-1 solution.
- Easy and flexible to operate.
- Supports multiple text queues.
- Text capability may be assigned to user roles.
- Allows transfer of text calls within a single multi-PSAP system.

2.3.1.10 Enhanced Data Window

The Enhanced Data Window provides additional data content to the VESTA 9-1-1 console, which can help a Telecommunicator better assist a 9-1-1 caller.

Motorola Solutions and RapidSOS understand that every second counts in an emergency and that Telecommunicators and first responders need location accuracy to save lives. Through the integration of the RapidSOS NG911 Clearinghouse into VESTA, PSAPs now have the capability for improved situational awareness and improved decision making.

When a call comes in from an enabled smartphone, Telecommunicators will see location & enhanced data (if available) on the Enhanced Data Window in addition to the ALI on the VESTA console. The additional location data is based on Advanced Mobile Location (AML) from mobile devices.



RapidSOS Information Displays in Enhanced Data View

2.3.1.11 VESTA CommandPOST

The VESTA CommandPOST call processing solution is a portable call-taking position designed to allow a call-taker to move to another location, reconnect to their host system, and begin taking 9-1-1 (with ANI/ALI) and administrative calls. All features of the traditional VESTA 9-1-1 position are persevered. In order to use Instant Recall Recording (IRR), the VESTA CommandPOST must be used with the SAM module. The VESTA CommandPOST call processing solution can connect to the host system via:

- Public Internet connection using VPN.
- Private IP network with/without VPN connection.
- IP satellite network with/without VPN connection.

The VESTA CommandPOST typically consists of the following components:

- Hardened laptop computer (refer to hardware specification for latest model).
- SAM (Sound Arbitration Unit).
- All required cables.
- Weather-resistant rolling case with cut foam liner.
- Docking station (optional).
- Additional battery (optional).
- External monitor (optional).
- External mouse & keyboard (optional).

CommandPOST Ruggedized Mobile Package

2.3.2 Data Management

2.3.2.1 VESTA Analytics

The VESTA Analytics solution (formerly Aurora) is the Motorola Solutions next-generation Management Information System (MIS). The VESTA Analytics solution expands on the role of MIS, becoming a comprehensive management platform. Depending upon the size of the system, the VESTA Analytics system may be deployed as either:

- A virtualized machine (VM) on the System Hypervisor server.
- On a dedicated, stand-alone server.

A record of each incoming and outgoing VESTA or Sentinel call will be contained within the VESTA Analytics database. At a minimum, the record contains the following information:

- Seize Time.
- Answer Time.
- Transfer Time.
- Hang-up (disconnect) time.
- Position number.
- Agent.
- Incoming number (ANI).

- Date/time.
- ALI.
- ANI log of disconnected calls showing arrival time and disconnected party abandonment time.

Microsoft Internet Explorer v. 6.0 or later is required to run the browser interface to the VESTA Analytics solution. Microsoft .Net support libraries v. 2.0 or higher are also required on the workstation accessing the VESTA Analytics MIS system.

The VESTA Analytics solution may be deployed in 3 different models:

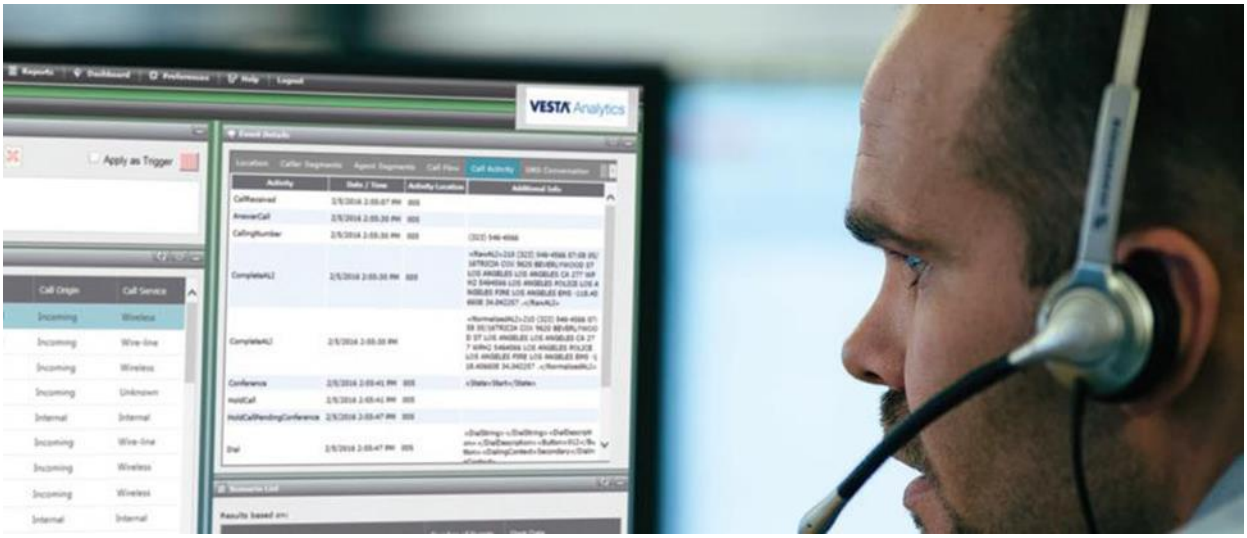
- Single host. Supports one system. If multiple PSAPs are provisioned on the system, no separation of PSAP data for security purposes in provided. All users have access to all data on the system.
- Hosted model. In this model, a single VESTA Analytics system is used for reporting services in a multi-PSAP environment. This model allows each PSAP's data to be segregated so that users may only see/report on their specific PSAP's data.
- Enterprise model. In this model, a core VESTA Analytics system is used to accumulate data from multiple edge VESTA Analytics systems. This is most commonly used when data must be collected from multiple stand-alone VESTA 9-1-1 systems.

2.3.2.2 VESTA Analytics Front End

No dedicated client software is required to access the VESTA Analytics system. All access is performed using the Microsoft Internet Explorer 6.0 or later browser. The workstation accessing the VESTA Analytics system must:

- Have Microsoft .Net 2.0 or later software libraries installed.
- Be connected to the same network as the VESTA Analytics server or have other dedicated, secure access to the VESTA Analytics server network (VPN, etc.)
- One MS-SQL License per user accessing the VESTA Analytics MIS system is required.
- One VESTA Analytics system access license is required per user accessing the VESTA Analytics MIS system is required.

The VESTA Analytics access licenses are "concurrent usage" licenses. Users may log into the system from any workstation connected to the network as long as the number of users concurrently logged in do not exceed the number of access licenses purchased.



VESTA MIS Solution

2.3.2.3 Activity View

The Activity View management application provides real-time monitoring of PSAP activities. The Activity View management application may be configured by the user to display the status of:

- Call taker status.
- Group status.
- Group ACD status.
- Incoming trunks.
- Administrative lines.
- Active calls.

A user may also configure custom message colors and set a variety of thresholds which will trigger color changes.

The Activity View application also supports a Display Panels feature allowing a user to configure a display output that is compatible with large screen (wall-mount) monitors and/or projectors.

The Activity View management application can also display up to five (5) marquee messages to inform call-takers of upcoming events.

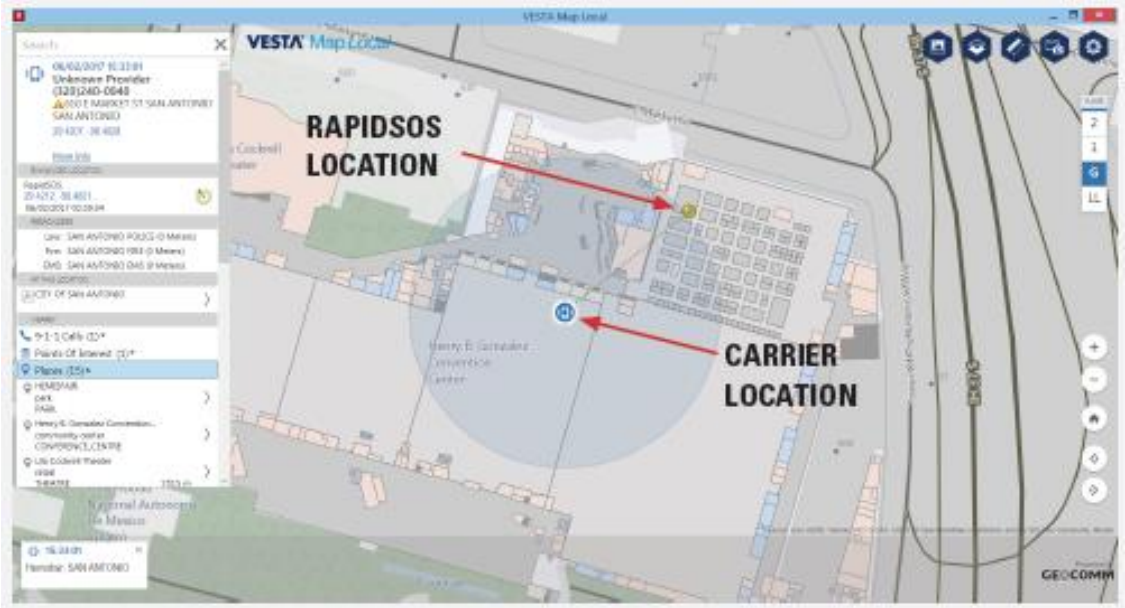
NOTE: It is recommended that the Activity View application be installed on a separate workstation from the VESTA 9-1-1 call-taker application due to the amount of CPU and network resources required. If installed on the same workstation as the VESTA 9-1-1 call-taker application, both applications should not be running at the same time.

RapidSOS Enhanced Location

To help the PSAP gain greater location accuracy, the RapidSOS NG911 Clearinghouse data is available from the VESTA Map Local solution.

The benefit of integrating with the RapidSOS NG911 Clearinghouse includes:

- Security – The location is stored securely in the NG911 Clearinghouse, an access-controlled NENA i3 – compliant Location Information Server (LIS) and the Additional Data Repository (ADR).
- Speed of Delivery – Upon delivery of a 9-1-1 call, VESTA automatically queries the NG911 Clearinghouse, providing location information at the same time Phase 1 location data arrives.
- Location Display – RapidSOS supplemental location data is displayed alongside the ALI location (when available), not instead of the ALI location.



RapidSOS Enhanced Location

2.4 EQUIPMENT LIST

2.4.1 Side A

QTY	Nomenclature	Description	
		VESTA® 9-1-1	
1	870899-0104R7.2U	V911 R7.2 DOC/MED UPG	**Included**
1	873099-03002U	V911 CAD INTF LIC UPGD	**Included**
		VM Medium Server Bundle	
1	853031-DLSVRGD-2	V-DL MED SVR BNDL GEO	**Included**
1	06500-00201	2-POST RELAY RACK MNT KIT	**Included**
2	04000-00414	SVR WIN2008/12/16 CAL 5PK	**Included**
1	04000-68005	V-SVR BASIC SPT 1YR	**Optional**
1	04000-68007	V-SVR BASIC SPT 3YR	**Optional**
1	04000-68009	V-SVR BASIC SPT 5YR	**Included**
		VESTA® 9-1-1 Multi-Queue Display	
1	870809-00801	V911 MQD MODULE	**Included**
		VESTA® SMS	
1	870891-66301	VESTA 9-1-1 SMS LIC	**Included**
1	809810-00102	V911 ADV DATA LVL 1 ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 1	
1	809810-00102	V911 ADV DATA LVL 1 ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 2	
1	809810-00102	V911 ADV DATA LVL 1 ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 3	
1	809810-00102	V911 ADV DATA LVL 1 ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 4	

QTY	Nomenclature	Description	
1	809810-00102	V911 ADV DATA LVL 1 ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 5	
		RapidSOS	
1	809810-00103	V911 ADV DATA LVL 2 STD ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 1	
1	809810-00103	V911 ADV DATA LVL 2 STD ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 2	
1	809810-00103	V911 ADV DATA LVL 2 STD ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 3	
1	809810-00103	V911 ADV DATA LVL 2 STD ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 4	
1	809810-00103	V911 ADV DATA LVL 2 STD ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 5	
		VESTA® 9-1-1 Activity View	
12	873099-00802	V911 ACT VIEW LIC PER ST	**Included**
1	873099-00702U	V911 ACTIV VIEW SYS LIC UPG	**Included**
1	809800-35120	V911 ACT VIEW SW SPT 1YR	**Optional**
1	809800-35122	V911 ACT VIEW SW SPT 3YR	**Optional**
1	809800-35124	V911 ACT VIEW SW SPT 5YR	**Included**
		Administrative Workstations	
1	61000-409611	DKTP ELITE MINI 705 G4 W/O OS	**Included**
1	04000-00441	WINDOWS 10 LTSC LIC	**Included**
1	64000-00600	PC MOUNTING BRKT	**Included**
1	63000-221693	MNTR FP WIDE SCRN LED 22IN	**Included**
1	809800-00102	GENERIC WKST CFG FEE	**Included**

QTY	Nomenclature	Description	
		Geo Diverse Add On License	
1	BA-MGD-VSSL-M	GEO-DIV LIC MIG SYS	**Included**
		VESTA® 9-1-1 Advanced Enhanced Operations	
4	PS-0AD-VSML	VADV MLTP PER SEAT LIC	**Included**
8	PS-0AD-VSML-M	VADV MLTP SEAT LIC NFEE	**Included**
12	SS-0AD-VSSL-1Y	SPT VADV 1YR	**Optional**
12	SS-0AD-VSSL-3Y	SPT VADV 3YR	**Optional**
12	SS-0AD-VSSL-5Y	SPT VADV 5YR	**Included**
8	809800-35130	V911 SW SPT TRNSFR	**Included**
		VESTA® 9-1-1 IRR Module	
8	870899-01601	V911 IRR UPGD W/HASP	**Included**
4	873099-00502	V911 IRR LIC/DOC/MED	**Included**
12	809800-35110	V911 IRR SW SPT 1YR	**Optional**
12	809800-35112	V911 IRR SW SPT 3YR	**Optional**
12	809800-35114	V911 IRR SW SPT 5YR	**Included**
		VESTA® Workstation Equipment	**Optional**
12	61000-409611	DKTP ELITE MINI 705 G4 W/O OS	**Included**
12	04000-00441	WINDOWS 10 LTSC LIC	**Included**
12	64000-00600	PC MOUNTING BRKT	**Included**
12	63000-221693	MNTR FP WIDE SCRN LED 22IN	**Included**
12	64007-50022	KEYPAD 24-KEY USB CBL 25FT	**Included**
12	65000-00197	KIT CBL DP/USB 15FT EXT	**Included**
12	65000-00176	CBL USB EXT REPEAT 16FT	**Included**
12	853030-00302	V911 SAM HDWR KIT	**Included**
24	833401-00101G-15	CBL SAM JKBX 15FT	**Included**

QTY	Nomenclature	Description	
12	853004-00401	SAM EXT SPKR KIT	**Included**
12	65000-00124	CBL PATCH 15FT	**Included**
12	02800-20501	HDST 4W MOD ELEC MIC BLK	**Included**
12	03044-20000	HDST CORD 12FT 4W MOD BLK	**Included**
12	809800-35109	V911 IWS CFG	**Included**
12	809800-35108	V911 IWS STG FEE	**Included**
1	870890-07501	CPR/SYSPREP MEDIA IMAGE	**Included**
		VESTA® 9-1-1 Admin Printer	
1	64040-60019	PRNTR USB/ETHERNET COLOR	**Included**
1	65000-13403	CBL USB 2.0 A/B 10FT	**Included**
		Network Equipment	
2	03800-03060	FIREWALL 60E	**Included**
2	03800-03061	WARR FIREWALL 60E 1YR	**Optional**
2	03800-03063	WARR FIREWALL 60E 3YR	**Optional**
2	03800-03065	WARR FIREWALL 60E 5YR	**Included**
2	809800-00201	VPN CFG SVCS	**Included**
2	04000-29638-X	SWITCH 2960-X+CBL 24-PORT	**Included**
2	04000-29676	WARR 2960-X 24P NBD 1YR	**Optional**
2	04000-29678	WARR 2960-X 24P NBD 3YR	**Optional**
2	04000-29680	WARR 2960-X 24P NBD 5YR	**Included**
		Peripherals & Gateways	
4	04000-00129	MED 1000B CHASSIS BNDL	**Included**
4	04000-00186	SW SPT M1000 GATEWAY 1YR	**Optional**
4	04000-00188	SW SPT M1000 GATEWAY 3YR	**Optional**
4	04000-00190	SW SPT M1000 GATEWAY 5YR	**Included**
10	04000-00116	MED 1000 FXO-LS BNDL	**Included**
6	04000-00119	MED 1000 FXS-O BNDL	**Included**

QTY	Nomenclature	Description	
2	04000-00152	MED 1000 1-SPAN BNDL	**Included**
2	04000-00191	SW SPT M1000 T1 MOD 1YR	**Optional**
2	04000-00193	SW SPT M1000 T1 MOD 3YR	**Optional**
2	04000-00195	SW SPT M1000 T1 MOD 5YR	**Included**
		ALI/CAD Output	
1	04000-00159	BLKBX TL159A 8-PORT DATACAST	**Included**
8	65000-00262	KIT CBL RJ11 ADPTR DB25	**Included**
1	04000-RS232	BLKBX TL601A-R2 DATASHARE	**Included**
1	04000-01014-10	CBL SRL DB25M/DB9F 10FT	**Included**
		Rack & Peripheral Equipment	
1	06500-55053	7FT EQUIPMENT RACK 19IN	**Included**
1	63002-172805	MNTR NEC 17IN	**Included**
1	04000-00809	KVM 8-PORT SWITCH USB	**Included**
		Time Synchronization Equipment	
1	04000-09486	NETCLOCK 9483 + 3-PORT	**Included**
1	04000-08230	GPS/GNSS OUTDOOR ANTENNA	**Included**
1	04000-08231	GPS ANTENNA POST MT KIT	**Included**
1	04000-08236	GPS PVC POST MNT	**Included**
1	04000-08228	GPS ANTENNA SURG PROTECTR	**Included**
1	04000-20601	GND KIT FOR 8226	**Included**
1	04000-67022	GPS CBL CONN	**Included**
1	04000-13025	CBL GPS ANTENNA 25FT	**Included**
1	04000-13100	CBL GPS ANTENNA 100FT	**Included**
		VESTA® 9-1-1 Activity View	
2	873099-00802	V911 ACT VIEW LIC PER ST	**Included**

QTY	Nomenclature	Description	
		VESTA® 9-1-1 Advanced Enhanced Operations	
2	PS-0AD-VSML	VADV MLTP PER SEAT LIC	**Included**
2	SS-0AD-VSSL-1Y	SPT VADV 1YR	**Optional**
2	SS-0AD-VSSL-3Y	SPT VADV 3YR	**Optional**
2	SS-0AD-VSSL-5Y	SPT VADV 5YR	**Included**
		VESTA® 9-1-1 IRR Module	
2	873099-00502	V911 IRR LIC/DOC/MED	**Included**
2	809800-35110	V911 IRR SW SPT 1YR	**Optional**
2	809800-35112	V911 IRR SW SPT 3YR	**Optional**
2	809800-35114	V911 IRR SW SPT 5YR	**Included**
		CommandPOST Hardware	
2	61050-G819605	LAPTOP ZBOOK15 G5 W/O OS	**Included**
2	04000-00441	WINDOWS 10 LTSC LIC	**Included**
2	65000-00263	DOCK STATION THUNDERBOLT KIT	**Included**
2	64021-10025	KYBD/MOUSE BNDL	**Included**
2	63000-221693	MNTR FP WIDE SCRN LED 22IN	**Included**
2	64007-50022	KEYPAD 24-KEY USB CBL 25FT	**Included**
2	853004-00301	CPOST SAM HDWR KIT	**Included**
2	853004-00401	SAM EXT SPKR KIT	**Included**
2	65000-00124	CBL PATCH 15FT	**Included**
4	833401-00101G-15	CBL SAM JKBX 15FT	**Included**
2	809800-35109	V911 IWS CFG	**Included**
2	809800-35108	V911 IWS STG FEE	**Included**
		VESTA® Analytics Licensing & Support	
2	PA-MSG-ASSL	V-ANLYT STD PER SEAT LIC	**Included**
2	SA-MSG-ALSL-1Y	SPT V-ANLYT STD 1YR	**Optional**

QTY	Nomenclature	Description	
2	SA-MSG-ALSL-3Y	SPT V-ANLYT STD 3YR	**Optional**
2	SA-MSG-ALSL-5Y	SPT V-ANLYT STD 5YR	**Included**
		VESTA® Analytics Standard - Multi Product Purchase	
8	PA-MSG-ASSL-M	V-ANLYT STD SEAT LIC MIG	**Included**
4	PA-MSG-ASSL	V-ANLYT STD PER SEAT LIC	**Included**
12	SA-MSG-ALSL-1Y	SPT V-ANLYT STD 1YR	**Optional**
12	SA-MSG-ALSL-3Y	SPT V-ANLYT STD 3YR	**Optional**
12	SA-MSG-ALSL-5Y	SPT V-ANLYT STD 5YR	**Included**
		Gateways and Equipment	
1	04000-00127-SP	MED 1000B CHASSIS SPARE	**Optional**
1	04000-00116	MED 1000 FXO-LS BNDL	**Optional**
1	04000-00119	MED 1000 FXS-O BNDL	**Optional**
1	04000-00132	MED 1000B PWR SPLY BNDL	**Optional**
1	04000-00144	MED 1000B CPU BNDL	**Optional**
1	04000-00152-SP	MED 1000 1-SPAN SPARE	**Optional**
1	04000-00109-SP	MED 1000 2-SPAN SPARE	**Optional**
1	04000-01751	TS-4 PORT TERMINAL SVR	**Optional**
1	65000-00182	CBL RJ45-10P/DB25M 4FT	**Optional**
		Cables and Switches	
1	04000-29638-X	SWITCH 2960-X+CBL 24-PORT	**Optional**
1	04000-29676	WARR 2960-X 24P NBD 1YR	**Optional**
1	04000-29678	WARR 2960-X 24P NBD 3YR	**Optional**
1	04000-29680	WARR 2960-X 24P NBD 5YR	**Optional**
		Server Extended Warranty	
1	04000-01621	WARR NBD DL380G10 5YR	**Included**

QTY	Nomenclature	Description	
		Workstation Extended Warranty	
14	04000-01594	WARR NBD 600/705 G2/G3/G4 5YR	**Included**
2	04000-01625	WARR ZBOOK15 G5 NBD 5YR	**Included**

2.4.2 Side B

QTY	Nomenclature	Description	
		VESTA® 9-1-1	
1	870899-0104R7.2U	V911 R7.2 DOC/MED UPG	**Included**
1	873099-03002U	V911 CAD INTF LIC UPGD	**Included**
		VM Medium Server Bundle	
1	853031-DLSVRGD-2	V-DL MED SVR BNDL GEO	**Included**
1	06500-00201	2-POST RELAY RACK MNT KIT	**Included**
1	04000-68005	V-SVR BASIC SPT 1YR	**Optional**
1	04000-68007	V-SVR BASIC SPT 3YR	**Optional**
1	04000-68009	V-SVR BASIC SPT 5YR	**Included**
		VESTA® SMS	
1	870891-66301	VESTA 9-1-1 SMS LIC	**Included**
1	809810-00102	V911 ADV DATA LVL 1 ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 1	
1	809810-00102	V911 ADV DATA LVL 1 ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 2	
1	809810-00102	V911 ADV DATA LVL 1 ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 3	
1	809810-00102	V911 ADV DATA LVL 1 ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 4	
1	809810-00102	V911 ADV DATA LVL 1 ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 5	
		RapidSOS	
1	809810-00103	V911 ADV DATA LVL 2 STD ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 1	
1	809810-00103	V911 ADV DATA LVL 2 STD ANNUAL SUB	**Included**

QTY	Nomenclature	Description	
		VESTA® 9-1-1	
		Note: Annual Subscription - Year 2	
1	809810-00103	V911 ADV DATA LVL 2 STD ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 3	
1	809810-00103	V911 ADV DATA LVL 2 STD ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 4	
1	809810-00103	V911 ADV DATA LVL 2 STD ANNUAL SUB	**Included**
		Note: Annual Subscription - Year 5	
		VESTA® 9-1-1 Activity View	
2	873099-00802	V911 ACT VIEW LIC PER ST	**Included**
		Geo Diverse Add On License	
1	BA-MGD-VSSL-M	GEO-DIV LIC MIG SYS	**Included**
		VESTA® 9-1-1 Advanced Enhanced Operations	
2	PS-0AD-VSML-M	VADV MLTP SEAT LIC NFEE	**Included**
2	SS-0AD-VSSL-1Y	SPT VADV 1YR	**Optional**
2	SS-0AD-VSSL-3Y	SPT VADV 3YR	**Optional**
2	SS-0AD-VSSL-5Y	SPT VADV 5YR	**Included**
2	809800-35130	V911 SW SPT TRNSFR	**Included**
		VESTA® 9-1-1 IRR Module	
2	870899-01601	V911 IRR UPGD W/HASP	**Included**
2	809800-35110	V911 IRR SW SPT 1YR	**Optional**
2	809800-35112	V911 IRR SW SPT 3YR	**Optional**
2	809800-35114	V911 IRR SW SPT 5YR	**Included**
		VESTA® Workstation Equipment	**Optional**

QTY	Nomenclature	Description	
		VESTA® 9-1-1	
2	61000-409611	DKTP ELITE MINI 705 G4 W/O OS	**Included**
2	04000-00441	WINDOWS 10 LTSC LIC	**Included**
2	64000-00600	PC MOUNTING BRKT	**Included**
2	63000-221693	MNTR FP WIDE SCRN LED 22IN	**Included**
2	64007-50022	KEYPAD 24-KEY USB CBL 25FT	**Included**
2	65000-00197	KIT CBL DP/USB 15FT EXT	**Included**
2	65000-00176	CBL USB EXT REPEAT 16FT	**Included**
2	853030-00302	V911 SAM HDWR KIT	**Included**
4	833401-00101G-15	CBL SAM JKBX 15FT	**Included**
2	853004-00401	SAM EXT SPKR KIT	**Included**
2	65000-00124	CBL PATCH 15FT	**Included**
2	02800-20501	HDST 4W MOD ELEC MIC BLK	**Included**
2	03044-20000	HDST CORD 12FT 4W MOD BLK	**Included**
2	809800-35109	V911 IWS CFG	**Included**
2	809800-35108	V911 IWS STG FEE	**Included**
1	870890-07501	CPR/SYSPREP MEDIA IMAGE	**Included**
		Network Equipment	
2	03800-03060	FIREWALL 60E	**Included**
2	03800-03061	WARR FIREWALL 60E 1YR	**Optional**
2	03800-03063	WARR FIREWALL 60E 3YR	**Optional**
2	03800-03065	WARR FIREWALL 60E 5YR	**Included**
2	809800-00201	VPN CFG SVCS	**Included**
2	04000-29638-X	SWITCH 2960-X+CBL 24-PORT	**Included**
2	04000-29676	WARR 2960-X 24P NBD 1YR	**Optional**
2	04000-29678	WARR 2960-X 24P NBD 3YR	**Optional**
2	04000-29680	WARR 2960-X 24P NBD 5YR	**Included**
		Peripherals & Gateways	

QTY	Nomenclature	Description	
		VESTA® 9-1-1	
2	04000-00129	MED 1000B CHASSIS BNDL	**Included**
2	04000-00186	SW SPT M1000 GATEWAY 1YR	**Optional**
2	04000-00188	SW SPT M1000 GATEWAY 3YR	**Optional**
2	04000-00190	SW SPT M1000 GATEWAY 5YR	**Included**
2	04000-00116	MED 1000 FXO-LS BNDL	**Included**
3	04000-00119	MED 1000 FXS-O BNDL	**Included**
		ALI/CAD Output	
1	04000-00159	BLKBX TL159A 8-PORT DATACAST	**Included**
8	65000-00262	KIT CBL RJ11 ADPTR DB25	**Included**
1	04000-RS232	BLKBX TL601A-R2 DATASHARE	**Included**
1	04000-01014-10	CBL SRL DB25M/DB9F 10FT	**Included**
		Rack & Peripheral Equipment	
1	06500-55053	7FT EQUIPMENT RACK 19IN	**Included**
1	63002-172805	MNTR NEC 17IN	**Included**
1	04000-00809	KVM 8-PORT SWITCH USB	**Included**
		Time Synchronization Equipment	
1	04000-09486	NETCLOCK 9483 + 3-PORT	**Included**
1	04000-08230	GPS/GNSS OUTDOOR ANTENNA	**Included**
1	04000-08231	GPS ANTENNA POST MT KIT	**Included**
1	04000-08236	GPS PVC POST MNT	**Included**
1	04000-08228	GPS ANTENNA SURG PROTECTR	**Included**
1	04000-20601	GND KIT FOR 8226	**Included**
1	04000-67022	GPS CBL CONN	**Included**
1	04000-13025	CBL GPS ANTENNA 25FT	**Included**
1	04000-13100	CBL GPS ANTENNA 100FT	**Included**

QTY	Nomenclature	Description	
		VESTA® 9-1-1	
		VESTA® Analytics Standard - Multi Product Purchase	
1	873399-00103.4	V-ANLYT 3.4 DOC/MED	**Included**
1	873391-00501	V-ANLYT STD LIC	**Included**
1	873391-00301	V-ANLYT USER LIC	**Included**
2	PA-MSG-ASSL-M	V-ANLYT STD SEAT LIC MIG	**Included**
2	SA-MSG-ALSL-1Y	SPT V-ANLYT STD 1YR	**Optional**
2	SA-MSG-ALSL-3Y	SPT V-ANLYT STD 3YR	
2	SA-MSG-ALSL-5Y	SPT V-ANLYT STD 5YR	**Included**
		VESTA® Analytics Modules	
1	873391-00901	V-ANLYT ADV RPT PKG LIC	**Included**
		VESTA® Analytics Standard Server Equipment for Virtualized Server Bundle	
1	BA-M00-ASA0-3	V-ANLYT STD ADD-ON	**Included**
		Server Extended Warranty	
1	04000-01621	WARR NBD DL380G10 5YR	**Included**
		Workstation Extended Warranty	
4	04000-01594	WARR NBD 600/705 G2/G3/G4 5YR	**Included**

2.4.3 Side A HUD

QTY	Nomenclature	Description	
		VESTA® 9-1-1 Heads-Up Display	
		VESTA® 9-1-1 Heads-Up Display: Software	
1	870899-04101	VHUD ENT SVR MEDIA	**Included**
1	809800-35310	VHUD ENT SPT 1YR	**Optional**
1	809800-35312	VHUD ENT SPT 3YR	**Optional**
1	809800-35314	VHUD ENT SPT 5YR	
1	04000-54002	VHUD SGL SVR OUTPUT	**Included**
1	809800-35315	VHUD SGL SVR OPUT SPT 1YR	**Optional**
1	809800-35317	VHUD SGL SVR OPUT SPT 3YR	**Optional**
1	809800-35319	VHUD SGL SVR OPUT SPT 5YR	**Included**
		VESTA® 9-1-1 Heads-Up Display: Templates	
1	809800-17116	VHUD TEMP BUILD - STD	Included
		VESTA® 9-1-1 Heads-Up Display: Media Player	
1	04000-54009	VHUD DATA ACCESS LICENSE	Included
1	809800-35345	VHUD DATA ACCESS LIC SPT 1YR	Optional
1	809800-35347	VHUD DATA ACCESS LIC SPT 3YR	Optional
1	809800-35349	VHUD DATA ACCESS LIC SPT 5YR	Included
1	65000-00510	VHUD MED PLAYER SDA1010-HDMI ADPTR	Included
		Note: Media Player includes 1-year of hardware warranty.	
1	04000-02510	VHUD SDA909/1010 HW WARR 3YR	Included
1	04000-02512	VHUD SDA909/1010 HW WARR 5YR	Included

QTY	Nomenclature	Description	
1	63002-55053	MNTR LED 55IN BLK	Included
2	63002-55052	MNTR SPKR R/L 55IN	Included
1	65000-60600	WALL MNT BRKT FOR 55IN MNTR	Included
1	04000-14582	CBL VIDEO HDMI EXT 15FT	Included
		VESTA® 9-1-1 Heads-Up Display: Viewer	
12	870809-00701	VHUD VIEWER PER SEAT LIC	Included
1	04000-54008	VHUD SUPV VIEWER LIC MIG	Included
1	809800-35340	VHUD SUPV VIEWER SPT 1YR	Optional
1	809800-35342	VHUD SUPV VIEWER SPT 3YR	Optional
1	809800-35344	VHUD SUPV VIEWER SPT 5YR	Included
		VESTA® 9-1-1 Heads-Up Display: Server Equipment	
1	62040-G819203	SVR 2U RACK ENH DL380/G10	**Included**
1	64000-30042	PROCESSOR 4110 DL380 G10	**Included**
1	04000-00438	SVR WIN2012 R2 DWNGRD	**Included**
1	06500-00201	2-POST RELAY RACK MNT KIT	**Included**
2	64000-20064	HARD DRIVE 300GB 12G SAS 10K	**Included**
		Note: Configure server with RAID1 (2 x 300GB).	
1	809800-00112	GENERIC SVR CFG FEE	**Included**
1	65000-00124	CBL PATCH 15FT	**Included**
		Administrative Workstations	
1	61000-409611	DKTP ELITE MINI 705 G4 W/O OS	**Included**
1	04000-00441	WINDOWS 10 LTSC LIC	**Included**
1	64000-00600	PC MOUNTING BRKT	**Included**
1	63000-221693	MNTR FP WIDE SCRN LED 22IN	**Included**
1	809800-00102	GENERIC WKST CFG FEE	**Included**

QTY	Nomenclature	Description	
		VESTA® 9-1-1 Heads-Up Display	
		Heads-Up Display Viewer	
2	870809-00701	VHUD VIEWER PER SEAT LIC	**Included**
		Server Extended Warranty	
1	04000-01621	WARR NBD DL380G10 5YR	**Included**
		Workstation Extended Warranty	
1	04000-01594	WARR NBD 600/705 G2/G3/G4 5YR	**Included**

2.4.4 Side B HUD

QTY	Nomenclature	Description	
		VESTA® 9-1-1 Heads-Up Display: Viewer	
2	870809-00701	VHUD VIEWER PER SEAT LIC	Included

SECTION 3

PAYMENT AND TERMS

3.1 PRICING SUMMARY

Ulster County Emergency Communications Solutions Pricing Overview	
10 site 2 Channel Analog Conventional System with 2000 Radios and accessories Nice Logging Recorder. 12 MCC7500 Dispatch Consoles. 12 Vesta 9-1-1 call handling positions with Geodiversity and 5 years of services.	
List Price	$13,334,872
State Contract Discount	($2,148,479)
Total Project Cost with NYS Discount	**$11,186,393**

Additional Discounts	
Subscriber unit volume discount	($800,000)
Additional systems discount for all items as proposed	($1,000,000)
Vesta 9-1-1 as part of purchase discount	($347,961)
Final Pricing All Solutions	
	$9,038,432
Contract Execution by December 16, 2019 Discount	
	($563,432)
Final Pricing All Solutions with Contract Executed by December 16, 2019	
	$8,475,000

Payment Milestones for System Purchase

1. 25% of the Contract Price due upon contract execution (Due upon effective date);
2. 60% of the Contract Price due upon shipment of equipment from staging;
3. 10% of the Contract Price due upon installation of equipment; and
4. 5% of the Contract Price due upon Final Acceptance.

3.2 CONTRACTUAL DOCUMENTATION

Motorola's Communications System and Services Agreement is attached in the following pages.

Communications System and Services Agreement

Motorola Solutions, Inc. ("Motorola") and Ulster County, NY ("Customer") enter into this "Agreement," pursuant to which Customer will purchase and Motorola will sell the System and Services, as described below. Motorola and Customer may be referred to individually as a "Party" and collectively as the "Parties." For good and valuable consideration, the Parties agree as follows:

Section 1 ATTACHMENTS

1.1. EXHIBITS. The Exhibits listed below are exhibits related to the System sale and implementation. These Exhibits are incorporated into and made a part of this Agreement.

Exhibit A "Motorola Software License Agreement"
Exhibit B "Payment"
Exhibit C Technical and Implementation Documents
- C-1 "System Description" dated _____
- C-2 "Pricing Summary & Equipment List" dated _____
- C-3 "Implementation Statement of Work" dated _____
- C-4 "Acceptance Test Plan" or "ATP" dated _____
- C-5 "Performance Schedule" dated _____

Exhibit D "System Acceptance Certificate"

1.2. ADDENDUM (ADDENDA). Customer may elect to purchase professional or subscription services in addition to the System and related services. Any such services will be governed by the terms in the main body of the Agreement and an applicable Addendum containing terms specific to such service. Such Addenda will be labeled with the name of the service being purchased.

1.3 ORDER OF PRECEDENCE. In interpreting this Agreement and resolving any ambiguities: 1) the main body of this Agreement takes precedence over the exhibits (unless otherwise specified in an exhibit), and any inconsistency between Exhibits A through D will be resolved in their listed order, and 2) The applicable service Addendum will take precedence over the main body of the Agreement and the Exhibits.

Section 2 DEFINITIONS

Capitalized terms used in this Agreement have the following meanings:

"Acceptance Tests" means those tests described in the Acceptance Test Plan.

"Addendum (Addenda)" is the title of the document(s) containing a specific set of terms and conditions applicable to a particular service or other offering beyond the Communication System and System implementation services. The terms in the Addendum are applicable only to the specific service or offering described therein.

"Administrative User Credentials" means an account that has total access over the operating system, files, end user accounts and passwords at either the System level or box level. Customer's personnel with access to the Administrative User Credentials may be referred to as the Administrative User.

"Beneficial Use" means when Customer first uses the System or a Subsystem for operational purposes (excluding training or testing).

"Confidential Information" means all information consistent with the fulfillment of this Agreement that is (i) disclosed under this Agreement in oral, written, graphic, machine recognizable, and/or sample form, being clearly designated, labeled or marked as confidential or its equivalent or (ii) obtained by

examination, testing or analysis of any hardware, software or any component part thereof provided by discloser to recipient. The nature and existence of this Agreement are considered Confidential Information. Confidential Information that is disclosed orally must be identified as confidential at the time of disclosure and confirmed by the discloser by submitting a written document to the recipient within thirty (30) days after such disclosure. The written document must contain a summary of the Confidential Information disclosed with enough specificity for identification purpose and must be labeled or marked as confidential or its equivalent.

"Contract Price" means the price for the System and implementation Services, excluding applicable sales or similar taxes and freight charges. Further, unless otherwise stated in Exhibit B, "Payment" or the pricing pages of the proposal, recurring fees for maintenance, SUA, or subscription services are not included in the Contract Price.

"Deliverables" means all written information (such as reports, specifications, designs, plans, drawings, analytics, Solution Data, or other technical or business information) that Motorola prepares for Customer in the performance of the Services and is obligated to provide to Customer under this Agreement. The Deliverables, if any, are more fully described in the Statement of Work.

"**Derivative Proprietary Materials**" means derivatives of the Proprietary Materials that Motorola may from time to time, including during the course of providing the Services, develop and/or use and/or to which Motorola provides Customer access.

"Effective Date" means that date upon which the last Party executes this Agreement.

"Equipment" means the hardware components of the Solution that Customer purchases from Motorola under this Agreement. Equipment that is part of the System is described in the Equipment List.

"**Feedback"** means comments or information, in oral or written form, given to Motorola by Customer in connection with or relating to Equipment or Services, during the term of this Agreement.

"Force Majeure" means an event, circumstance, or act that is beyond a Party's reasonable control, such as an act of God, an act of the public enemy, an act of a government entity, strikes, other labor disturbances, supplier performance, hurricanes, earthquakes, fires, floods, epidemics, embargoes, war, riots, or any other similar cause.

"Motorola Software" means software that Motorola or its affiliated companies owns.

"Non-Motorola Software" means software that a party other than Motorola or its affiliated companies owns.

"Open Source Software" (also called "freeware" or "shareware") means software with either freely obtainable source code, license for modification, or permission for free distribution.

"Proprietary Materials" means certain software tools and/or other technical materials, including, but not limited to, data, modules, components, designs, utilities, subsets, objects, program listings, models, methodologies, programs, systems, analysis frameworks, leading practices and specifications which Motorola has developed prior to, or independently from, the provision of the Services and/or which Motorola licenses from third parties.

"Proprietary Rights" means the patents, patent applications, inventions, copyrights, trade secrets, trademarks, trade names, mask works, know-how, and other intellectual property rights in and to the Equipment and Software, including those created or produced by Motorola under this Agreement and any corrections, bug fixes, enhancements, updates or modifications to or derivative works from the Software whether made by Motorola or another party.

"Services" means system implementation, maintenance, support, subscription, or other professional services provided under this Agreement, which may be further described in the applicable Addendum and/or SOW.

"Software" (i) means proprietary software in object code format, and adaptations, translations, de-compilations, disassemblies, emulations, or derivative works of such software; (ii) means any modifications, enhancements, new versions and new releases of the software provided by Motorola; and (iii) may contain one or more items of software owned by a third party supplier. The term "Software" does not include any third party software provided under separate license or third party software not licensable under the terms of this Agreement.

"Software License Agreement" means the Motorola Software License Agreement (Exhibit A).

"Software Support Policy" ("SwSP") means the policy set forth at http://www.motorolasolutions.com/softwarepolicy describing the specific technical support that will be provided to Customers under the Warranty Period and during any paid maintenance support period for Motorola Software. This policy may be modified from time to time at Motorola's discretion.

"Solution" means the combination of the System(s) and Services provided by Motorola under this Agreement.

"Solution Data" means Customer data that is transformed, altered, processed, aggregated, correlated or operated on by Motorola, its vendors or other data sources and data that has been manipulated or retrieved using Motorola know-how to produce value-added content to data consumers, including customers or citizens which is made available to Customer with the Solution and Services.

"Specifications" means the functionality and performance requirements that are described in the Technical and Implementation Documents.

"SUA" or "SUA II" means Motorola's Software Upgrade Agreement program.

"Subsystem" means a major part of the System that performs specific functions or operations. Subsystems are described in the Technical and Implementation Documents.

"System" means the Equipment, including incidental hardware and materials, Software, and design, installation and implementation services that are combined together into an integrated system; the System(s) is (are) described in the Technical and Implementation Documents.

"System Acceptance" means the Acceptance Tests have been successfully completed.

"**System Data**" means data created by, in connection with or in relation to Equipment or the performance of Services under this Agreement.

"Warranty Period" for System Hardware, Software, or services related to system implementation means one (1) year from the date of System Acceptance or Beneficial Use, whichever occurs first. Unless otherwise stated in the applicable Addendum, Warranty Period for other Services means ninety (90) days from performance of the Service.

Section 3 SCOPE OF AGREEMENT AND TERM

3.1. SCOPE OF WORK. Motorola will provide, install and test the System(s), and perform its other contractual responsibilities to provide the Solution, all in accordance with this Agreement. Customer will perform its contractual responsibilities in accordance with this Agreement.

3.2. CHANGE ORDERS. Either Party may request changes within the general scope of this Agreement. If a requested change causes an increase or decrease in the cost or time required to perform this Agreement, the Parties will agree to an equitable adjustment of the Contract Price or applicable subscription fees, Performance Schedule, or both, and will reflect the adjustment in a change order or Addendum. Neither Party is obligated to perform requested changes unless both Parties execute a written change order.

3.3. TERM. Unless terminated in accordance with other provisions of this Agreement or extended by mutual agreement of the Parties, the term of this Agreement begins on the Effective Date and continues until the date of Final Project Acceptance or expiration of the Warranty Period, or completion of the Services, whichever occurs last. The term and the effective date of recurring Services will be set forth in the applicable Addendum.

3.4. ADDITIONAL EQUIPMENT OR SOFTWARE. For three (3) years after the expiration date of the Agreement, Customer may order additional Equipment or Software, if it is then available. Each purchase order must refer to this Agreement, the expiration date of the Agreement, and must specify the pricing and delivery terms. The Parties agree that, notwithstanding expiration of the Agreement, the applicable provisions of this Agreement (except for pricing, delivery, passage of title and risk of loss to Equipment, warranty commencement, and payment terms) will govern the purchase and sale of the additional Equipment or Software. Additional or contrary terms in the purchase order will be inapplicable, unless signed by both parties. Title and risk of loss to additional Equipment will pass at shipment, warranty will commence upon delivery, and payment is due within thirty (30) days after the invoice date. Motorola will send Customer an invoice as the additional Equipment is shipped or Software is licensed. Alternatively, Customer may register with and place orders through Motorola Online ("MOL"), and this Agreement will be the "Underlying Agreement" for those MOL transactions rather than the MOL On-Line Terms and Conditions of Sale. MOL registration and other information may be found at https://businessonline.motorolasolutions.com and the MOL telephone number is (800) 814-0601.

3.5. MOTOROLA SOFTWARE. Any Motorola Software, including subsequent releases, is licensed to Customer solely in accordance with the Software License Agreement. Customer hereby accepts and agrees to abide by all of the terms and restrictions of the Software License Agreement.

3.6. NON-MOTOROLA SOFTWARE. Any Non-Motorola Software is licensed to Customer in accordance with the standard license, terms, and restrictions of the copyright owner on the Effective Date unless the copyright owner has granted to Motorola the right to sublicense the Non-Motorola Software pursuant to the Software License Agreement, in which case it applies and the copyright owner will have all of Licensor's rights and protections under the Software License Agreement. Motorola makes no representations or warranties of any kind regarding Non-Motorola Software. Non-Motorola Software may include Open Source Software.

3.7. SUBSTITUTIONS. At no additional cost to Customer, Motorola may substitute any Equipment, Software, or services to be provided by Motorola, if the substitute meets or exceeds the Specifications and is of equivalent or better quality to the Customer. Any substitution will be reflected in a change order.

3.8. OPTIONAL EQUIPMENT OR SOFTWARE. This paragraph applies only if a "Priced Options" exhibit is shown in Section 1, or if the parties amend this Agreement to add a Priced Options exhibit. During the term of the option as stated in the Priced Options exhibit (or if no term is stated, then for one (1) year after the Effective Date), Customer has the right and option to purchase the equipment, software, and related services that are described in the Priced Options exhibit. Customer may exercise this option by giving written notice to Seller which must designate what equipment, software, and related services Customer is selecting (including quantities, if applicable). To the extent they apply, the terms and conditions of this Agreement will govern the transaction; however, the parties acknowledge that certain provisions must be agreed upon, and they agree to negotiate those in good faith promptly after Customer delivers the option exercise notice. Examples of provisions that may need to be negotiated are: specific lists of deliverables, statements of work, acceptance test plans, delivery and implementation schedules,

payment terms, maintenance and support provisions, additions to or modifications of the Software License Agreement, hosting terms, and modifications to the acceptance and warranty provisions.

Section 4 SERVICES

4.1. If Customer desires and Motorola agrees to continue Services beyond the Term, Customer's issuance and Motorola's acceptance of a purchase order for Services will serve as an automatic extension of the Agreement for purposes of the continuing Services. Only the terms and conditions applicable to the performance of Services will apply to the extended Agreement.

4.2. During the Warranty Period, in addition to warranty services, Motorola will provide maintenance Services for the Equipment and support for the Motorola Software pursuant to the applicable maintenance and support Statements of Work. Support for the Motorola Software will be in accordance with Motorola's established Software Support Policy. Copies of the SwSP can be found at http://www.motorolasolutions.com/softwarepolicy and will be sent by mail, email or fax to Customer upon written request. Maintenance Services and support during the Warranty Period are included in the Contract Price. Unless already included in the Contract Price, if Customer wishes to purchase 1) additional maintenance or software support services during the Warranty Period; or 2) continue or expand maintenance, software support, installation, and/or SUA services after the Warranty Period, Motorola will provide the description of and pricing for such services in a separate proposal document. Unless otherwise agreed by the parties in writing, the terms and conditions in this Agreement applicable to maintenance, support, installation, and/or SUA Services, will be included in the Maintenance and Support Addendum, SUA Addendum, the applicable Statements of Work, and the proposal, (if applicable). These collective terms will govern the provision of such Services.

To obtain any such additional Services, Customer will issue a purchase order referring to this Agreement and the separate proposal document. Omission of reference to this Agreement in Customer's purchase order will not affect the applicability of this Agreement. Motorola's proposal may include a cover page entitled "Service Agreement" or "Installation Agreement", as applicable, and other attachments. These cover pages and other attachments are incorporated into this Agreement by this reference

4.3. PROFESSIONAL AND SUBSCRIPTION SERVICES. If Customer purchases professional or subscription Services as part of the Solution, additional or different terms specific to such Service will be included in the applicable Addendum and will apply to those Services. Customer may purchase additional professional or subscription services by issuing a purchase order referencing this Agreement and Motorola's proposal for such additional services.

4.4. Any information in the form of specifications, drawings, reprints, technical information or otherwise furnished to Customer in providing Services under this Agreement or Motorola data viewed, accessed, will remain Motorola's property, will be deemed proprietary, Confidential Information. This Confidential Information will be promptly returned at Motorola's request.

4.5. TOOLS. All tools, equipment, dies, gauges, models, drawings or other materials paid for or furnished by Motorola for the purpose of providing Services under this Agreement will be and remain the sole property of Motorola. Customer will safeguard all such property while it is in Customer's custody or control, be liable for any loss or damage to this property, and return it to Motorola upon request. This property will be held by Customer for Motorola's use without charge and may be removed from Customer's premises by Motorola at any time without restriction. Upon termination of the contract for any reason, Customer shall return to Motorola all equipment delivered to Customer.

4.6. COVENANT NOT TO EMPLOY. During the term of this Agreement and continuing for a period of two (2) years thereafter, Customer will not hire, engage on contract, solicit the employment of, or recommend employment to any third party of any employee of Motorola or its subcontractors without the prior written authorization of Motorola. This provision applies only to those employees of Motorola or its

subcontractors who are responsible for rendering Services under this Agreement. If this provision is found to be overly broad under applicable law, it will be modified as necessary to conform to applicable law.

4.7. CUSTOMER OBLIGATIONS. If the applicable Statement of Work or Addendum contains assumptions that affect the Services or Deliverables, Customer will verify that they are accurate and complete. Any information that Customer provides to Motorola concerning the Services or Deliverables will be accurate and complete in all material respects. Customer will make timely decisions and obtain any required management approvals that are reasonably necessary for Motorola to perform the Services and its other duties under this Agreement. Unless the Statement of Work states the contrary, Motorola may rely upon and is not required to evaluate, confirm, reject, modify, or provide advice concerning any assumptions and Customer-provided information, decisions and approvals described in this paragraph.

4.8. ASSUMPTIONS. If any assumptions or conditions contained in this Agreement, applicable Addenda or Statements of Work prove to be incorrect or if Customer's obligations are not performed, Motorola's ability to perform under this Agreement may be impacted and changes to the Contract Price, subscription fees, project schedule, Deliverables, or other changes may be necessary.

4.9. NON-PRECLUSION. If, as a result of the Services performed under this Agreement, Motorola recommends that Customer purchase products or other services, nothing in this Agreement precludes Motorola from participating in a future competitive bidding process or otherwise offering or selling the recommended products or other services to Customer. Customer represents that this paragraph does not violate its procurement or other laws, regulations, or policies.

4.10. PROPRIETARY MATERIALS. Customer acknowledges that Motorola may use and/or provide Customer with access to Proprietary Materials and Derivative Proprietary Materials. The Proprietary Materials and the Derivative Proprietary Materials are the sole and exclusive property of Motorola and Motorola retains all right, title and interest in and to the Proprietary Materials and Derivative Proprietary Materials.

4.11. ADDITIONAL SERVICES. Any services performed by Motorola outside the scope of this Agreement at the direction of Customer will be considered to be additional Services which are subject to additional charges. Any agreement to perform additional Services will be reflected in a written and executed change order, Addendum or amendment to this Agreement.

Section 5 PERFORMANCE SCHEDULE

The Parties will perform their respective responsibilities in accordance with the Performance Schedule. By executing this Agreement, Customer authorizes Motorola to proceed with contract performance.

Section 6 CONTRACT PRICE, PAYMENT AND INVOICING

6.1. Customer affirms that a purchase order or notice to proceed is not required for contract performance or for subsequent years of service, if any, and that sufficient funds have been appropriated in accordance with applicable law. The Customer will pay all invoices as received from Motorola and any changes in scope will be subject to the change order process as described in this Agreement. At the time of execution of this Agreement, the Customer will provide all necessary reference information to include on invoices for payment in accordance with this Agreement.

6.2. CONTRACT PRICE. The Contract Price in U.S. dollars is $_____. If applicable, a pricing summary is included with the Payment schedule in Exhibit B. Motorola has priced the Services, Software, and Equipment as an integrated System. A change in Software or Equipment quantities, or Services, may affect the overall Contract Price, including discounts if applicable. Fees for professional, SUA, and/or subscription services which are not included in the Contract Price may be

listed in Exhibit B, the pricing pages of the proposal, or the applicable Addendum.

6.3. INVOICING AND PAYMENT. Motorola will submit invoices to Customer according to the Payment schedule in Exhibit B. Except for a payment that is due on the Effective Date, Customer will make payments to Motorola within thirty (30) days after the date of each invoice. Customer will make payments when due in the form of a wire transfer, check, or cashier's check from a U.S. financial institution. Overdue invoices will bear simple interest at the maximum allowable rate. For reference, the Federal Tax Identification Number for Motorola is 36-1115800.

6.4. FREIGHT, TITLE, AND RISK OF LOSS. Motorola will pre-pay and add all freight charges to the invoices. Title and risk of loss to the Equipment will pass to Customer upon shipment. Title to Software will not pass to Customer at any time. Motorola will pack and ship all Equipment in accordance with good commercial practices.

6.5. INVOICING AND SHIPPING ADDRESSES. Invoices will be sent to the Customer at the following address:
Name:_____
Address:_____
Phone:_____
Email:_____

The address which is the ultimate destination where the Equipment will be delivered to Customer is:
Name:_____
Address:_____

The Equipment will be shipped to the Customer at the following address (insert if this information is known):
Name:_____
Address:_____
Phone:_____

Customer may change this information by giving written notice to Motorola.

Section 7 SITES AND SITE CONDITIONS

7.1. ACCESS TO SITES. In addition to its responsibilities described elsewhere in this Agreement, Customer will provide a designated project manager; all necessary construction and building permits, zoning variances, licenses, and any other approvals that are necessary to develop or use the sites and mounting locations; and access to the worksites or vehicles identified in the Technical and Implementation Documents as reasonably requested by Motorola so that it may perform its duties in accordance with the Performance Schedule and Statement of Work. If the Statement of Work so indicates, Motorola may assist Customer in the local building permit process.

7.2. SITE CONDITIONS. Customer will ensure that all work sites it provides will be safe, secure, and in compliance with all applicable industry and OSHA standards. To the extent applicable and unless the Statement of Work states to the contrary, Customer will ensure that these work sites have adequate: physical space; air conditioning and other environmental conditions; adequate and appropriate electrical power outlets, distribution, equipment and connections; and adequate telephone or other communication lines (including modem access and adequate interfacing networking capabilities), all for the installation, use and maintenance of the System. Before installing the Equipment or Software at a work site, Motorola may inspect the work site and advise Customer of any apparent deficiencies or non-conformities with the requirements of this Section. This Agreement is predicated upon normal soil conditions as defined by the version of E.I.A. standard RS-222 in effect on the Effective Date.

7.3. SITE ISSUES. If a Party determines that the sites identified in the Technical and Implementation Documents are no longer available or desired, or if subsurface, structural, adverse environmental or latent conditions at any site differ from those indicated in the Technical and Implementation Documents, the Parties will promptly investigate the conditions and will select replacement sites or adjust the installation plans and specifications as necessary. If change in sites or adjustment to the installation plans and specifications causes a change in the cost or time to perform, the Parties will equitably amend the Contract Price, Performance Schedule, or both, by a change order.

Section 8 TRAINING

Any training to be provided by Motorola to Customer will be described in the applicable Statement of Work. Customer will notify Motorola immediately if a date change for a scheduled training program is required. If Motorola incurs additional costs because Customer reschedules a training program less than thirty (30) days before its scheduled start date, Motorola may recover these additional costs.

Section 9 SYSTEM ACCEPTANCE

9.1. COMMENCEMENT OF ACCEPTANCE TESTING. Motorola will provide to Customer at least ten (10) days notice before the Acceptance Tests commence. System testing will occur only in accordance with the Acceptance Test Plan.

9.2. SYSTEM ACCEPTANCE. System Acceptance will occur upon successful completion of the Acceptance Tests. Upon System Acceptance, the Parties will memorialize this event by promptly executing a System Acceptance Certificate. If the Acceptance Test Plan includes separate tests for individual Subsystems or phases of the System, acceptance of the individual Subsystem or phase will occur upon the successful completion of the Acceptance Tests for the Subsystem or phase, and the Parties will promptly execute an acceptance certificate for the Subsystem or phase. If Customer believes the System has failed the completed Acceptance Tests, Customer will provide to Motorola a written notice that includes the specific details of the failure. If Customer does not provide to Motorola a failure notice within thirty (30) days after completion of the Acceptance Tests, System Acceptance will be deemed to have occurred as of the completion of the Acceptance Tests. Minor omissions or variances in the System that do not materially impair the operation of the System as a whole will not postpone System Acceptance or Subsystem acceptance, but will be corrected according to a mutually agreed schedule.

9.3. BENEFICIAL USE. Customer acknowledges that Motorola's ability to perform its implementation and testing responsibilities may be impeded if Customer begins using the System before System Acceptance. Therefore, Customer will not commence Beneficial Use before System Acceptance without Motorola's prior written authorization, which will not be unreasonably withheld. Motorola is not responsible for System performance deficiencies that occur during unauthorized Beneficial Use. Upon commencement of Beneficial Use, Customer assumes responsibility for the use and operation of the System.

9.4. FINAL PROJECT ACCEPTANCE. Final Project Acceptance will occur after System Acceptance when all deliverables and other work have been completed. When Final Project Acceptance occurs, the parties will promptly memorialize this final event by so indicating on the System Acceptance Certificate.

Section 10 REPRESENTATIONS AND WARRANTIES

10.1. SYSTEM FUNCTIONALITY. Motorola represents that the System will perform in accordance with the Specifications in all material respects. Upon System Acceptance or Beneficial Use, whichever occurs first, this System functionality representation is fulfilled. Motorola is not responsible for System performance deficiencies that are caused by ancillary equipment not furnished by Motorola which is attached to or used in connection with the System or for reasons or parties beyond Motorola's control, such as natural causes; the construction of a building that adversely affects the microwave path reliability or radio frequency (RF) coverage; the addition of frequencies at System sites that cause RF interference

or intermodulation; or Customer changes to load usage or configuration outside the Specifications.

10.2. EQUIPMENT WARRANTY. During the Warranty Period, Motorola warrants that the Equipment under normal use and service will be free from material defects in materials and workmanship. If System Acceptance is delayed beyond six (6) months after shipment of the Equipment by events or causes beyond Motorola's control, this warranty expires eighteen (18) months after the shipment of the Equipment.

10.3. SOFTWARE WARRANTY. Except as described in the SwSP and unless otherwise stated in the Software License Agreement, during the Warranty Period, Motorola warrants the Software in accordance with the warranty terms set forth in the Software License Agreement and the provisions of this Section that are applicable to the Software. If System Acceptance is delayed beyond six (6) months after shipment of the Motorola Software by events or causes beyond Motorola's control, this warranty expires eighteen (18) months after the shipment of the Motorola Software. **Nothing in this Warranty provision is intended to conflict or modify the Software Support Policy. In the event of an ambiguity or conflict between the Software Warranty and Software Support Policy, the Software Support Policy governs.**

10.4. EXCLUSIONS TO EQUIPMENT AND SOFTWARE WARRANTIES. These warranties do not apply to: (i) defects or damage resulting from: use of the Equipment or Software in other than its normal, customary, and authorized manner; accident, liquids, neglect, or acts of God; testing, maintenance, disassembly, repair, installation, alteration, modification, or adjustment not provided or authorized in writing by Motorola; Customer's failure to comply with all applicable industry and OSHA standards; (ii) breakage of or damage to antennas unless caused directly by defects in material or workmanship; (iii) Equipment that has had the serial number removed or made illegible; (iv) batteries (because they carry their own separate limited warranty) or consumables; (v) freight costs to ship Equipment to the repair depot; (vi) scratches or other cosmetic damage to Equipment surfaces that does not affect the operation of the Equipment; and (vii) normal or customary wear and tear.

10.5. SERVICE WARRANTY. During the Warranty Period, Motorola warrants that the Services will be provided in a good and workmanlike manner and will conform in all material respects to the applicable Statement of Work. Services will be free of defects in materials and workmanship for a period of ninety (90) days from the date the performance of the Services are completed. Customer acknowledges that the Deliverables may contain recommendations, suggestions or advice from Motorola to Customer (collectively, "recommendations"). Motorola makes no warranties concerning those recommendations, and Customer alone accepts responsibility for choosing whether and how to implement the recommendations and the results to be realized from implementing them.

10.6. WARRANTY CLAIMS. To assert a warranty claim, Customer must notify Motorola in writing of the claim before the expiration of the Warranty Period. Upon receipt of this notice, Motorola will investigate the warranty claim. If this investigation confirms a valid Equipment or Software warranty claim, Motorola will (at its option and at no additional charge to Customer) repair the defective Equipment or Motorola Software, replace it with the same or equivalent product, or refund the price of the defective Equipment or Motorola Software. These actions will be the full extent of Motorola's liability for the warranty claim. In the event of a valid Services warranty claim, Customer's sole remedy is to require Motorola to re-perform the non-conforming Service or to refund, on a pro-rata basis, the fees paid for the non-conforming Service. If this investigation indicates the warranty claim is not valid, then Motorola may invoice Customer for responding to the claim on a time and materials basis using Motorola's then current labor rates. Repaired or replaced product is warranted for the balance of the original applicable warranty period. All replaced products or parts will become the property of Motorola.

10.7. ORIGINAL END USER IS COVERED. These express limited warranties are extended by Motorola to the original user purchasing the System or Services for commercial, industrial, or governmental use only, and are not assignable or transferable.

10.8. DISCLAIMER OF OTHER WARRANTIES. THESE WARRANTIES ARE THE COMPLETE WARRANTIES FOR THE EQUIPMENT AND MOTOROLA SOFTWARE PROVIDED UNDER THIS AGREEMENT AND ARE GIVEN IN LIEU OF ALL OTHER WARRANTIES. MOTOROLA DISCLAIMS ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.

Section 11 DELAYS

11.1. FORCE MAJEURE. Neither Party will be liable for its non-performance or delayed performance if caused by a Force Majeure. A Party that becomes aware of a Force Majeure that will significantly delay performance will notify the other Party promptly (but in no event later than fifteen days) after it discovers the Force Majeure. If a Force Majeure occurs, the Parties will execute a change order to extend the Performance Schedule or applicable Addenda for a time period that is reasonable under the circumstances.

11.2. PERFORMANCE SCHEDULE DELAYS CAUSED BY CUSTOMER. If Customer (including its other contractors) delays the Performance Schedule, it will make the promised payments according to the Payment schedule as if no delay occurred; and the Parties will execute a change order to extend the Performance Schedule and, if requested, compensate Motorola for all reasonable charges incurred because of the delay. Delay charges may include costs incurred by Motorola or its subcontractors for additional freight, warehousing and handling of Equipment; extension of the warranties; travel; suspending and re-mobilizing the work; additional engineering, project management, and standby time calculated at then current rates; and preparing and implementing an alternative implementation plan.

Section 12 DISPUTES

The Parties will use the following procedure to address any dispute arising under this Agreement (a "Dispute").

12.1. GOVERNING LAW. This Agreement will be governed by and construed in accordance with the laws of the State in which the System is installed.

12.2. NEGOTIATION. Either Party may initiate the Dispute resolution procedures by sending a notice of Dispute ("Notice of Dispute"). The Parties will attempt to resolve the Dispute promptly through good faith negotiations including 1) timely escalation of the Dispute to executives who have authority to settle the Dispute and who are at a higher level of management than the persons with direct responsibility for the matter and 2) direct communication between the executives. If the Dispute has not been resolved within ten (10) days from the Notice of Dispute, the Parties will proceed to mediation.

12.3. MEDIATION. The Parties will choose an independent mediator within thirty (30) days of a notice to mediate from either Party ("Notice of Mediation"). Neither Party may unreasonably withhold consent to the selection of a mediator. If the Parties are unable to agree upon a mediator, either Party may request that American Arbitration Association nominate a mediator. Each Party will bear its own costs of mediation, but the Parties will share the cost of the mediator equally. Each Party will participate in the mediation in good faith and will be represented at the mediation by a business executive with authority to settle the Dispute.

12.4. LITIGATION, VENUE and JURISDICTION. If a Dispute remains unresolved for sixty (60) days after receipt of the Notice of Mediation, either Party may then submit the Dispute to a court of competent jurisdiction in the state in which the System is installed. Each Party irrevocably agrees to submit to the exclusive jurisdiction of the courts in such state over any claim or matter arising under or in connection with this Agreement.

12.5. CONFIDENTIALITY. All communications pursuant to subsections 12.2 and 12.3 will be treated as compromise and settlement negotiations for purposes of applicable rules of evidence and any additional confidentiality protections provided by applicable law. The use of these Dispute resolution procedures will not be construed under the doctrines of laches, waiver or estoppel to affect adversely the rights of either Party.

Section 13 DEFAULT AND TERMINATION

13.1. DEFAULT BY A PARTY. If either Party fails to perform a material obligation under this Agreement, the other Party may consider the non-performing Party to be in default (unless a Force Majeure causes the failure) and may assert a default claim by giving the non-performing Party a written and detailed notice of default. Except for a default by Customer for failing to pay any amount when due under this Agreement which must be cured immediately, the defaulting Party will have thirty (30) days after receipt of the notice of default to either cure the default or, if the default is not curable within thirty (30) days, provide a written cure plan. The defaulting Party will begin implementing the cure plan immediately after receipt of notice by the other Party that it approves the plan. If Customer is the defaulting Party, Motorola may stop work on the project until it approves the Customer's cure plan.

13.2. FAILURE TO CURE. If a defaulting Party fails to cure the default as provided above in Section 13.1, unless otherwise agreed in writing, the non-defaulting Party may terminate any unfulfilled portion of this Agreement. In the event of termination for default, the defaulting Party will promptly return to the non-defaulting Party any of its Confidential Information. If Customer is the non-defaulting Party, terminates this Agreement as permitted by this Section, and completes the System through a third Party, Customer may as its exclusive remedy recover from Motorola reasonable costs incurred to complete the System to a capability not exceeding that specified in this Agreement less the unpaid portion of the Contract Price. Customer will mitigate damages and provide Motorola with detailed invoices substantiating the charges. In the event Customer elects to terminate this Agreement for any reason other than default, Customer shall pay Motorola for the conforming Equipment and/or Software delivered and all services performed.

Section 14 INDEMNIFICATION

14.1. GENERAL INDEMNITY BY Motorola. Motorola will indemnify and hold Customer harmless from any and all liability, expense, judgment, suit, cause of action, or demand for personal injury, death, or direct damage to tangible property which may accrue against Customer to the extent it is caused by the negligence of Motorola, its subcontractors, or their employees or agents, while performing their duties under this Agreement, if Customer gives Motorola prompt, written notice of any claim or suit. Customer will cooperate with Motorola in its defense or settlement of the claim or suit. This Section sets forth the full extent of Motorola's general indemnification of Customer from liabilities that are in any way related to Motorola's performance under this Agreement.

14.2. GENERAL INDEMNITY BY CUSTOMER. Customer will indemnify and hold Motorola harmless from any and all liability, expense, judgment, suit, cause of action, or demand for personal injury, death, or direct damage to tangible property which may accrue against Motorola to the extent it is caused by the negligence of Customer, its other contractors, or their employees or agents, while performing their duties under this Agreement, if Motorola gives Customer prompt, written notice of any the claim or suit. Motorola will cooperate with Customer in its defense or settlement of the claim or suit. This Section sets forth the full extent of Customer's general indemnification of Motorola from liabilities that are in any way related to Customer's performance under this Agreement.

14.3. PATENT AND COPYRIGHT INFRINGEMENT.

14.3.1. Motorola will defend at its expense any suit brought against Customer to the extent it is based on a third-party claim alleging that the Equipment manufactured by Motorola or the Motorola Software ("Motorola Product") directly infringes a United States patent or copyright ("Infringement Claim"). Motorola's duties to defend and indemnify are conditioned upon: Customer promptly notifying Motorola in writing of the Infringement Claim; Motorola having sole control of the defense of the suit and all negotiations for its settlement or compromise; and Customer providing to Motorola cooperation and, if requested by Motorola, reasonable assistance in the defense of the Infringement Claim. In addition to Motorola's obligation to defend, and subject to the same conditions, Motorola will pay all damages finally awarded against Customer by a court of competent jurisdiction for an Infringement Claim or agreed to, in writing, by Motorola in settlement of an Infringement Claim.

14.3.2 If an Infringement Claim occurs, or in Motorola's opinion is likely to occur, Motorola may at its option and expense: (a) procure for Customer the right to continue using the Motorola Product; (b) replace or modify the Motorola Product so that it becomes non-infringing while providing functionally equivalent performance; or (c) accept the return of the Motorola Product and grant Customer a credit for the Motorola Product, less a reasonable charge for depreciation. The depreciation amount will be calculated based upon generally accepted accounting standards.

14.3.3 Motorola will have no duty to defend or indemnify for any Infringement Claim that is based upon: (a) the combination of the Motorola Product with any software, apparatus or device not furnished by Motorola; (b) the use of ancillary equipment or software not furnished by Motorola and that is attached to or used in connection with the Motorola Product; (c) Motorola Product designed or manufactured in accordance with Customer's designs, specifications, guidelines or instructions, if the alleged infringement would not have occurred without such designs, specifications, guidelines or instructions; (d) a modification of the Motorola Product by a party other than Motorola; (e) use of the Motorola Product in a manner for which the Motorola Product was not designed or that is inconsistent with the terms of this Agreement; or (f) the failure by Customer to install an enhancement release to the Motorola Software that is intended to correct the claimed infringement. In no event will Motorola's liability resulting from its indemnity obligation to Customer extend in any way to royalties payable on a per use basis or the Customer's revenues, or any royalty basis other than a reasonable royalty based upon revenue derived by Motorola from Customer from sales or license of the infringing Motorola Product.

14.3.4. This Section 14 provides Customer's sole and exclusive remedies and Motorola's entire liability in the event of an Infringement Claim. Customer has no right to recover and Motorola has no obligation to provide any other or further remedies, whether under another provision of this Agreement or any other legal theory or principle, in connection with an Infringement Claim. In addition, the rights and remedies provided in this Section 14 are subject to and limited by the restrictions set forth in Section 15.

Section 15 LIMITATION OF LIABILITY

Except for personal injury or death, Motorola's total liability, whether for breach of contract, warranty, negligence, strict liability in tort, indemnification, or otherwise, will be limited to the direct damages recoverable under law, but not to exceed the price of the Equipment, Software, or implementation and other one-time Services with respect to which losses or damages are claimed. With respect to all subscription or other ongoing Services and unless as otherwise provided under the applicable Addenda, Motorola's total liability will be limited to the direct damages recoverable under law, but not to exceed the price of twelve (12) months of Services preceding the incident giving rise to the claim. ALTHOUGH THE PARTIES ACKNOWLEDGE THE POSSIBILITY OF SUCH LOSSES OR DAMAGES, THEY AGREE THAT MOTOROLA WILL NOT BE LIABLE FOR ANY COMMERCIAL LOSS, INCONVENIENCE, LOSS OF USE, LOSS TIME, DATA, GOODWILL, REVENUES, PROFITS OR SAVINGS; OR OTHER SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES IN ANY WAY RELATED TO OR ARISING FROM THIS AGREEMENT, THE SALE OR USE OF THE EQUIPMENT OR SOFTWARE, OR

THE PERFORMANCE OF SERVICES BY MOTOROLA PURSUANT TO THIS AGREEMENT. This limitation of liability provision survives the expiration or termination of the Agreement and applies notwithstanding any contrary provision. No action for contract breach or otherwise relating to the transactions contemplated by this Agreement may be brought more than one (1) year after the accrual of the cause of action, except for money due upon an open account.

Section 16 CONFIDENTIALITY AND PROPRIETARY RIGHTS

16.1. CONFIDENTIAL INFORMATION.

16.1.1. Each party is a disclosing party ("Discloser") and a receiving party ("Recipient") under this Agreement. All Deliverables will be deemed to be Motorola's Confidential Information. During the term of this Agreement and for a period of three (3) years from the expiration or termination of this Agreement, Recipient will (i) not disclose Confidential Information to any third party; (ii) restrict disclosure of Confidential Information to only those employees (including, but not limited to, employees of any wholly owned subsidiary, a parent company, any other wholly owned subsidiaries of the same parent company), agents or consultants who must be directly involved with the Confidential Information for the purpose and who are bound by confidentiality terms substantially similar to those in this Agreement; (iii) not copy, reproduce, reverse engineer, decompile, or disassemble any Confidential Information; (iv) use the same degree of care as for its own information of like importance, but at least use reasonable care, in safeguarding against disclosure of Confidential Information; (v) promptly notify Discloser upon discovery of any unauthorized use or disclosure of the Confidential Information and take reasonable steps to regain possession of the Confidential Information and prevent further unauthorized actions or other breach of this Agreement; and (vi) only use the Confidential Information as needed to fulfill this Agreement.

16.1.2. Recipient is not obligated to maintain as confidential, Confidential Information that Recipient can demonstrate by documentation (i) is now available or becomes available to the public without breach of this agreement; (ii) is explicitly approved for release by written authorization of Discloser; (iii) is lawfully obtained from a third party or parties without a duty of confidentiality; (iv) is known to the Recipient prior to such disclosure; or (v) is independently developed by Recipient without the use of any of Discloser's Confidential Information or any breach of this Agreement.

16.1.3. All Confidential Information remains the property of the Discloser and will not be copied or reproduced without the express written permission of the Discloser, except for copies that are absolutely necessary in order to fulfill this Agreement. Within ten (10) days of receipt of Discloser's written request, Recipient will return all Confidential Information to Discloser along with all copies and portions thereof, or certify in writing that all such Confidential Information has been destroyed. However, Recipient may retain one (1) archival copy of the Confidential Information that it may use only in case of a dispute concerning this Agreement. No license, express or implied, in the Confidential Information is granted other than to use the Confidential Information in the manner and to the extent authorized by this Agreement. The Discloser warrants that it is authorized to disclose any Confidential Information it discloses pursuant to this Agreement.

16.2. PRESERVATION OF MOTOROLA'S PROPRIETARY RIGHTS. Motorola, the third party manufacturer of any Equipment, and the copyright owner of any Non-Motorola Software own and retain all of their respective Proprietary Rights in the Equipment and Software, and nothing in this Agreement is intended to restrict their Proprietary Rights. All intellectual property developed, originated, or prepared by Motorola in connection with providing to Customer the Equipment, Software, or related services remain vested exclusively in Motorola, and this Agreement does not grant to Customer any shared development rights of intellectual property. Except as explicitly provided in the Software License Agreement, Motorola does not grant to Customer, either directly or by implication, estoppel, or otherwise, any right, title or interest in Motorola's Proprietary Rights. Customer will not modify, disassemble, peel components, decompile, otherwise reverse engineer or attempt to reverse engineer, derive source code or create derivative works from, adapt, translate, merge with other software, reproduce, distribute, sublicense, sell

or export the Software, or permit or encourage any third party to do so. The preceding sentence does not apply to Open Source Software which is governed by the standard license of the copyright owner.

16.3 VOLUNTARY DISCLOSURE. Except as required to fulfill its obligations under this Agreement, Motorola will have no obligation to provide Customer with access to its Confidential Information and/or proprietary information. Under no circumstances will Motorola be required to provide any data related to cost and pricing.

16.4 DATA AND FEEDBACK.

16.4.1 To the extent permitted by law, Customer owns all right, title and interest in System Data created solely by it or its agents (hereafter, "Customer Data"), and grants to Motorola the right to use, host, cache, store, reproduce, copy, modify, combine, analyze, create derivatives from, communicate, transmit, publish, display, and distribute such Customer Data.

16.4.2 Motorola owns all right, title and interest in data resulting from System Data that is or has been transformed, altered, processed, aggregated, correlated or operated on (hereafter, "Derivative Data").

16.4.3 Any Feedback given by Customer is and will be entirely voluntary and, even if designated as confidential, will not create any confidentiality obligation for Motorola. Motorola will be free to use, reproduce, license or otherwise distribute and exploit the Feedback without any obligation to Customer. Customer acknowledges that Motorola's receipt of the Feedback does not imply or create recognition by Motorola of either the novelty or originality of any idea. The parties further agree that all fixes, modifications and improvements made to Motorola products or services conceived of or made by Motorola that are based, either in whole or in part, on the Feedback are the exclusive property of Motorola and all right, title and interest in and to such fixes, modifications or improvements to the Motorola product or service will vest solely in Motorola.

Section 17 GENERAL

17.1. TAXES. The Contract Price does not include any excise, sales, lease, use, property, or other taxes, assessments or duties, all of which will be paid by Customer except as exempt by law. If Motorola is required to pay any of these taxes, Motorola will send an invoice to Customer and Customer will pay to Motorola the amount of the taxes (including any interest and penalties) within thirty (30) days after the date of the invoice. Customer will be solely responsible for reporting the Equipment for personal property tax purposes, and Motorola will be solely responsible for reporting taxes on its income or net worth.

17.2. ASSIGNABILITY AND SUBCONTRACTING. Except as provided herein, neither Party may assign this Agreement or any of its rights or obligations hereunder without the prior written consent of the other Party, which consent will not be unreasonably withheld. Any attempted assignment, delegation, or transfer without the necessary consent will be void. Notwithstanding the foregoing, Motorola may assign this Agreement to any of its affiliates or its right to receive payment without the prior consent of Customer. In addition, in the event Motorola separates one or more of its businesses (each a "Separated Business"), whether by way of a sale, establishment of a joint venture, spin-off or otherwise (each a "Separation Event"), Motorola may, without the prior written consent of the other Party and at no additional cost to Motorola, assign this Agreement such that it will continue to benefit the Separated Business and its affiliates (and Motorola and its affiliates, to the extent applicable) following the Separation Event. Motorola may subcontract any of the work, but subcontracting will not relieve Motorola of its duties under this Agreement.

17.3. WAIVER. Failure or delay by either Party to exercise a right or power under this Agreement will not be a waiver of the right or power. For a waiver of a right or power to be effective, it must be in a writing signed by the waiving Party. An effective waiver of a right or power will not be construed as either a future or continuing waiver of that same right or power, or the waiver of any other right or power.

17.4. SEVERABILITY. If a court of competent jurisdiction renders any part of this Agreement invalid or unenforceable, that part will be severed and the remainder of this Agreement will continue in full force and effect.

17.5. INDEPENDENT CONTRACTORS. Each Party will perform its duties under this Agreement as an independent contractor. The Parties and their personnel will not be considered to be employees or agents of the other Party. Nothing in this Agreement will be interpreted as granting either Party the right or authority to make commitments of any kind for the other. This Agreement will not constitute, create, or be interpreted as a joint venture, partnership or formal business organization of any kind.

17.6. HEADINGS AND SECTION REFERENCES. The section headings in this Agreement are inserted only for convenience and are not to be construed as part of this Agreement or as a limitation of the scope of the particular section to which the heading refers. This Agreement will be fairly interpreted in accordance with its terms and conditions and not for or against either Party.

17.7. NOTICES. Notices required under this Agreement to be given by one Party to the other must be in writing and either personally delivered or sent to the address provided by the other Party by certified mail, return receipt requested and postage prepaid (or by a recognized courier service, such as Federal Express, UPS, or DHL), or by facsimile with correct answerback received, and will be effective upon receipt.

17.8. COMPLIANCE WITH APPLICABLE LAWS. Each Party will comply with all applicable federal, state, and local laws, regulations and rules concerning the performance of this Agreement or use of the System. Customer will obtain and comply with all Federal Communications Commission ("FCC") licenses and authorizations required for the installation, operation and use of the System before the scheduled installation of the Equipment. Although Motorola might assist Customer in the preparation of its FCC license applications, neither Motorola nor any of its employees is an agent or representative of Customer in FCC or other matters.

17.9 FUTURE REGULATORY REQUIREMENTS. The Parties acknowledge and agree that this is an evolving technological area and therefore, laws and regulations regarding Services and use of Solution may change. Changes to existing Services or the Solution required to achieve regulatory compliance may be available for an additional fee. Any required changes may also impact the price for Services.

17.10. AUTHORITY TO EXECUTE AGREEMENT. Each Party represents that it has obtained all necessary approvals, consents and authorizations to enter into this Agreement and to perform its duties under this Agreement; the person executing this Agreement on its behalf has the authority to do so; upon execution and delivery of this Agreement by the Parties, it is a valid and binding contract, enforceable in accordance with its terms; and the execution, delivery, and performance of this Agreement does not violate any bylaw, charter, regulation, law or any other governing authority of the Party.

17.11. ADMINISTRATOR LEVEL ACCOUNT ACCESS. If applicable to the type of System purchased by Customer, Motorola will provide Customer with Administrative User Credentials. Customer agrees to only

grant access to the Administrative User Credentials to those personnel with the training and experience to correctly use them. Customer is responsible for protecting Administrative User Credentials from disclosure and maintaining Credential validity by, among other things, updating passwords when required. Customer may be asked to provide valid Administrative User Credentials when in contact with Motorola System support personnel. Customer understands that changes made as the Administrative User can significantly impact the performance of the System. Customer agrees that it will be solely responsible for any negative impact on the System or its users by any such changes. System issues occurring as a result of changes made using the Administrative User Credentials may impact Motorola's ability to perform Services or other obligations under the Agreement. In such cases, a revision to the appropriate provisions of the Agreement, including the Statement of Work, may be necessary. To the extent Motorola provides assistance to correct any issues caused by or arising out of the use of or failure to maintain Administrative User Credentials, Motorola will be entitled to bill Customer and Customer will pay Motorola on a time and materials basis for resolving the issue.

17.12. SURVIVAL OF TERMS. The following provisions will survive the expiration or termination of this Agreement for any reason: Section 3.5 (Motorola Software); Section 3.6 (Non-Motorola Software); if any payment obligations exist, Sections 6.2 and 6.3 (Contract Price and Invoicing and Payment); Subsection 10.8 (Disclaimer of Implied Warranties); Section 12 (Disputes); Section 15 (Limitation of Liability); and Section 16 (Confidentiality and Proprietary Rights); and all of the General provisions in Section 17.

17.13. ENTIRE AGREEMENT. This Agreement, including all Exhibits, constitutes the entire agreement of the Parties regarding the subject matter of the Agreement and supersedes all previous agreements, proposals, and understandings, whether written or oral, relating to this subject matter. This Agreement may be executed in multiple counterparts, and shall have the same legal force and effect as if the Parties had executed it as a single document. The Parties may sign in writing, or by electronic signature, including by email. An electronic signature, or a facsimile copy or computer image, such as a PDF or tiff image, of a signature, shall be treated as and shall have the same effect as an original signature. In addition, an electronic signature, a true and correct facsimile copy or computer image of this Agreement shall be treated as and shall have the same effect as an original signed copy of this document. This Agreement may be amended or modified only by a written instrument signed by authorized representatives of both Parties. The preprinted terms and conditions found on any Customer purchase or purchase order, acknowledgment or other form will not be considered an amendment or modification of this Agreement, even if a representative of each Party signs that document.

The Parties hereby enter into this Agreement as of the Effective Date.

Motorola Solutions, Inc.	Customer
By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

Exhibit A

MOTOROLA SOFTWARE LICENSE AGREEMENT

This Exhibit A Motorola Software License Agreement ("Agreement") is between Motorola Solutions, Inc., (“Motorola"), and Ulster County, NY (“Licensee”).

For good and valuable consideration, the parties agree as follows:

Section 1 DEFINITIONS

1.1 “Designated Products” means products provided by Motorola to Licensee with which or for which the Software and Documentation is licensed for use.

1.2 “Documentation” means product and software documentation that specifies technical and performance features and capabilities, and the user, operation and training manuals for the Software (including all physical or electronic media upon which such information is provided).

1.3 “Open Source Software” means software with either freely obtainable source code, license for modification, or permission for free distribution.

1.4 “Open Source Software License” means the terms or conditions under which the Open Source Software is licensed.

1.5 “Primary Agreement” means the agreement to which this exhibit is attached.

1.6 “Security Vulnerability” means a flaw or weakness in system security procedures, design, implementation, or internal controls that could be exercised (accidentally triggered or intentionally exploited) and result in a security breach such that data is compromised, manipulated or stolen or the system damaged.

1.7 “Software” (i) means proprietary software in object code format, and adaptations, translations, de-compilations, disassemblies, emulations, or derivative works of such software; (ii) means any modifications, enhancements, new versions and new releases of the software provided by Motorola; and (iii) may contain one or more items of software owned by a third party supplier. The term "Software" does not include any third party software provided under separate license or third party software not licensable under the terms of this Agreement.

Section 2 SCOPE

Motorola and Licensee enter into this Agreement in connection with Motorola's delivery of certain proprietary software or products containing embedded or pre-loaded proprietary software, or both. This Agreement contains the terms and conditions of the license Motorola is providing to Licensee, and Licensee’s use of the proprietary software and affiliated documentation.

Section 3 GRANT OF LICENSE

3.1. Subject to the provisions of this Agreement and the payment of applicable license fees, Motorola grants to Licensee a personal, limited, non-transferable (except as permitted in Section 7) and non-exclusive license under Motorola’s copyrights and Confidential Information (as defined in the Primary Agreement) embodied in the Software to use the Software, in object code form, and the Documentation solely in connection with Licensee's use of the Designated Products. This Agreement does not grant any rights to source code.

3.2. If the Software licensed under this 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 Agreement. If there is a conflict between the terms and conditions of this 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 Agreement. If requested by Licensee, Motorola will use commercially reasonable efforts to: (i) determine whether any Open Source Software is provided under this Agreement; and (ii) identify the Open Source Software (or specify where that license may be found).

3.3 TO THE EXTENT, IF ANY, THAT THERE IS A SEPARATE LICENSE AGREEMENT PACKAGED WITH, OR PROVIDED ELECTRONICALLY WITH, A PARTICULAR PRODUCT THAT BECOMES EFFECTIVE ON AN ACT OF ACCEPTANCE BY THE END USER, THEN THAT AGREEMENT SUPERSEDES THE SOFTWARE LICENSE AGREEMENT AS TO THE END USER OF EACH SUCH PRODUCT.

Section 4 LIMITATIONS ON USE

4.1. Licensee may use the Software only for Licensee's internal business purposes and only in accordance with the Documentation. Any other use of the Software is strictly prohibited. Without limiting the general nature of these restrictions, Licensee will not make the Software available for use by third parties on a "time sharing," "application service provider," or "service bureau" basis or for any other similar commercial rental or sharing arrangement.

4.2. Licensee will not, and will not allow or enable any third party to: (i) reverse engineer, disassemble, peel components, decompile, reprogram or otherwise reduce the Software or any portion to a human perceptible form or otherwise attempt to recreate the source code; (ii) modify, adapt, create derivative works of, or merge the Software; (iii) copy, reproduce, distribute, lend, or lease the Software or Documentation to any third party, grant any sublicense or other rights in the Software or Documentation to any third party, or take any action that would cause the Software or Documentation to be placed in the public domain; (iv) remove, or in any way alter or obscure, any copyright notice or other notice of Motorola's proprietary rights; (v) provide, copy, transmit, disclose, divulge or make the Software or Documentation available to, or permit the use of the Software by any third party or on any machine except as expressly authorized by this Agreement; or (vi) use, or permit the use of, the Software in a manner that would result in the production of a copy of the Software solely by activating a machine containing the Software. Licensee may make one copy of Software to be used solely for archival, back-up, or disaster recovery purposes; *provided* that Licensee may not operate that copy of the Software at the same time as the original Software is being operated. Licensee may make as many copies of the Documentation as it may reasonably require for the internal use of the Software.

4.3. Unless otherwise authorized by Motorola in writing, Licensee will not, and will not enable or allow any third party to: (i) install a licensed copy of the Software on more than one unit of a Designated Product; or (ii) copy onto or transfer Software installed in one unit of a Designated Product onto one other device. Licensee may temporarily transfer Software installed on a Designated Product to another device if the Designated Product is inoperable or malfunctioning, if Licensee provides written notice to Motorola of the temporary transfer and identifies the device on which the Software is transferred. Temporary transfer of the Software to another device must be discontinued when the original Designated Product is returned to operation and the Software must be removed from the other device. Licensee must provide prompt written notice to Motorola at the time temporary transfer is discontinued.

4.4 Licensee will maintain, during the term of this Agreement and for a period of two years thereafter, accurate records relating to this license grant to verify compliance with this Agreement. Motorola or an independent third party ("Auditor") may inspect Licensee's premises, books and records, upon reasonable prior notice to Licensee, during Licensee's normal business hours and subject to Licensee's facility and

security regulations. Motorola is responsible for the payment of all expenses and costs of the Auditor. Any information obtained by Motorola and the Auditor will be kept in strict confidence by Motorola and the Auditor and used solely for the purpose of verifying Licensee's compliance with the terms of this Agreement.

Section 5 OWNERSHIP AND TITLE

Motorola, its licensors, and its suppliers retain all of their proprietary rights in any form in and to the Software and Documentation, including, but not limited to, all rights in patents, patent applications, inventions, copyrights, trademarks, trade secrets, trade names, and other proprietary rights in or relating to the Software and Documentation (including any corrections, bug fixes, enhancements, updates, modifications, adaptations, translations, de-compilations, disassemblies, emulations to or derivative works from the Software or Documentation, whether made by Motorola or another party, or any improvements that result from Motorola's processes or, provision of information services). No rights are granted to Licensee under this Agreement by implication, estoppel or otherwise, except for those rights which are expressly granted to Licensee in this Agreement. All intellectual property developed, originated, or prepared by Motorola in connection with providing the Software, Designated Products, Documentation or related services, remains vested exclusively in Motorola, and Licensee will not have any shared development or other intellectual property rights.

Section 6 LIMITED WARRANTY; DISCLAIMER OF WARRANTY

6.1. Unless otherwise stated in the Primary Agreement, the commencement date and the term of the Software warranty will be a period of ninety (90) days from Motorola's shipment of the Software (the "Warranty Period"). If Licensee is not in breach of any of its obligations under this Agreement, Motorola warrants that the unmodified Software, when used properly and in accordance with the Documentation and this Agreement, will be free from a reproducible defect that eliminates the functionality or successful operation of a feature critical to the primary functionality or successful operation of the Software. Whether a defect occurs will be determined by Motorola solely with reference to the Documentation. Motorola does not warrant that Licensee's use of the Software or the Designated Products will be uninterrupted, error-free, completely free of Security Vulnerabilities, or that the Software or the Designated Products will meet Licensee's particular requirements. Motorola makes no representations or warranties with respect to any third party software included in the Software. Notwithstanding, any warranty provided by a copyright owner in its standard license terms will flow through to Licensee for third party software provided by Motorola.

6.2 Motorola's sole obligation to Licensee and Licensee's exclusive remedy under this warranty is to use reasonable efforts to remedy any material Software defect covered by this warranty. These efforts will involve either replacing the media or attempting to correct significant, demonstrable program or documentation errors or Security Vulnerabilities. If Motorola cannot correct the defect within a reasonable time, then at Motorola's option, Motorola will replace the defective Software with functionally-equivalent Software, license to Licensee substitute Software which will accomplish the same objective, or terminate the license and refund the Licensee's paid license fee.

6.3. Warranty claims are described in the Primary Agreement.

6.4. The express warranties set forth in this Section 6 are in lieu of, and Motorola disclaims, any and all other warranties (express or implied, oral or written) with respect to the Software or Documentation, including, without limitation, any and all implied warranties of condition, title, non-infringement, merchantability, or fitness for a particular purpose or use by Licensee (whether or not Motorola knows, has reason to know, has been advised, or is otherwise aware of any such purpose or use), whether arising by law, by reason of custom or usage of trade, or by course of dealing. In addition, Motorola disclaims any warranty to any person other than Licensee with respect to the Software or Documentation.

Section 7 TRANSFERS

Licensee will not transfer the Software or Documentation to any third party without Motorola's prior written consent. Motorola's consent may be withheld at its discretion and may be conditioned upon transferee paying all applicable license fees and agreeing to be bound by this Agreement. If the Designated Products are Motorola's radio products and Licensee transfers ownership of the Motorola radio products to a third party, Licensee may assign its right to use the Software (other than CPS and Motorola's FLASHport® software) which is embedded in or furnished for use with the radio products and the related Documentation; *provided* that Licensee transfers all copies of the Software and Documentation to the transferee, and Licensee and the transferee sign a transfer form to be provided by Motorola upon request, obligating the transferee to be bound by this Agreement.

Section 8 TERM AND TERMINATION

8.1 Licensee's right to use the Software and Documentation will begin when the Primary Agreement is signed by both parties and will continue for the life of the Designated Products with which or for which the Software and Documentation have been provided by Motorola, unless Licensee breaches this Agreement, in which case this Agreement and Licensee's right to use the Software and Documentation may be terminated immediately upon notice by Motorola.

8.2 Within thirty (30) days after termination of this Agreement, Licensee must certify in writing to Motorola that all copies of the Software have been removed or deleted from the Designated Products and that all copies of the Software and Documentation have been returned to Motorola or destroyed by Licensee and are no longer in use by Licensee.

8.3 Licensee acknowledges that Motorola made a considerable investment of resources in the development, marketing, and distribution of the Software and Documentation and that Licensee's breach of this Agreement will result in irreparable harm to Motorola for which monetary damages would be inadequate. If Licensee breaches this Agreement, Motorola may terminate this Agreement and be entitled to all available remedies at law or in equity (including immediate injunctive relief and repossession of all non-embedded Software and associated Documentation unless Licensee is a Federal agency of the United States Government).

Section 9 Commercial Computer Software

9.1 *This Section 9 only applies to U.S. Government end users.* The Software, Documentation and updates are commercial items as that term is defined at 48 C.F.R. Part 2.101, consisting of "commercial computer software" and "computer software documentation" as such terms are defined in 48 C.F.R. Part 252.227-7014(a)(1) and 48 C.F.R. Part 252.227-7014(a)(5), and used in 48 C.F.R. Part 12.212 and 48 C.F.R. Part 227.7202, as applicable. Consistent with 48 C.F.R. Part 12.212, 48 C.F.R. Part 252.227-7015, 48 C.F.R. Part 227.7202-1 through 227.7202-4, 48 C.F.R. Part 52.227-19, and other relevant sections of the Code of Federal Regulations, as applicable, the Software, Documentation and Updates are distributed and licensed to U.S. Government end users: (i) only as commercial items, and (ii) with only those rights as are granted to all other end users pursuant to the terms and conditions contained herein.

9.2 If Licensee is licensing Software for end use by the United States Government or a United States Government agency, Licensee may transfer such Software license, but only if: (i) Licensee transfers all copies of such Software and Documentation to such United States Government entity or interim transferee, and (ii) Licensee has first obtained from the transferee (if applicable) and ultimate end user an enforceable end user license agreement containing restrictions substantially identical to the ones contained in this Agreement. Except as stated in the foregoing, Licensee and any transferee(s) authorized by this subsection 9.2 may not otherwise use or transfer or make available any Motorola software to any third party nor permit any party to do so.

Section 10 CONFIDENTIALITY

Licensee acknowledges that the Software and Documentation contain Motorola's valuable proprietary and Confidential Information and are Motorola's trade secrets, and that the provisions in the Primary Agreement concerning Confidential Information apply.

Section 11 LIMITATION OF LIABILITY

The Limitation of Liability provision is described in the Primary Agreement.

Section 12 NOTICES

Notices are described in the Primary Agreement.

Section 13 GENERAL

13.1. COPYRIGHT NOTICES. The existence of a copyright notice on the Software will not be construed as an admission or presumption of publication of the Software or public disclosure of any trade secrets associated with the Software.

13.2. COMPLIANCE WITH LAWS. Licensee acknowledges that the Software is 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 Motorola 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.

13.3 FUTURE REGULATORY REQUIREMENTS. The Parties acknowledge and agree that this is an evolving technological area and therefore, laws and regulations regarding Services and use of Solution may change. Changes to existing Services or the Solution required to achieve regulatory compliance may be available for an additional fee. Any required changes may also impact the price for Services.

13.4. ASSIGNMENTS AND SUBCONTRACTING. Motorola may assign its rights or subcontract its obligations under this Agreement, or encumber or sell its rights in any Software, without prior notice to or consent of Licensee.

13.5. GOVERNING LAW. This Agreement is governed by the laws of the United States to the extent that they apply and otherwise by the internal substantive laws of the State to which the Software is shipped if Licensee is a sovereign government entity, or the internal substantive laws of the State of Illinois if Licensee is not a sovereign government entity. The terms of the U.N. Convention on Contracts for the International Sale of Goods do not apply. In the event that the Uniform Computer Information Transaction Act, any version of this Act, or a substantially similar law (collectively "UCITA") becomes applicable to a party's performance under this Agreement, UCITA does not govern any aspect of this Agreement or any license granted under this Agreement, or any of the parties' rights or obligations under this Agreement. The governing law will be that in effect prior to the applicability of UCITA.

13.6. THIRD PARTY BENEFICIARIES. This Agreement is entered into solely for the benefit of Motorola and Licensee. No third party has the right to make any claim or assert any right under this Agreement, and no third party is deemed a beneficiary of this Agreement. Notwithstanding the foregoing, any licensor or supplier of third party software included in the Software will be a direct and intended third party beneficiary of this Agreement.

13.7. SURVIVAL. Sections 4, 5, 6.4, 7, 8, 9, 10, 11 and 13 survive the termination of this Agreement.

13.8. ORDER OF PRECEDENCE. In the event of inconsistencies between this Exhibit and the Primary Agreement, the parties agree that this Exhibit prevails, only with respect to the specific subject matter of this Exhibit, and not the Primary Agreement or any other exhibit as it applies to any other subject matter.

13.9. SECURITY. Motorola uses reasonable means in the design and writing of its own Software and the acquisition of third party Software to limit Security Vulnerabilities. While no software can be guaranteed to be free from Security Vulnerabilities, if a Security Vulnerability is discovered, Motorola will take the steps set forth in Section 6 of this Agreement.

Exhibit B
PAYMENT

Except for a payment that is due on the Effective Date, Customer will make payments to Motorola within thirty (30) days after the date of each invoice. Customer will make payments when due in the form of a check, cashier's check, or wire transfer drawn on a U.S. financial institution. If Customer has purchased additional Professional or Subscription services, payment will be in accordance with the applicable addenda. Payment for the System purchase will be in accordance with the following milestones.

System Purchase (excluding Subscribers, if applicable)

1. **25% of the Contract Price due upon contract execution (due upon effective date);**

2. **60% of the Contract Price due upon shipment of equipment from Staging;**

3. **10% of the Contract Price due upon installation of equipment; and**

4. **5% of the Contract Price due upon Final Acceptance.**

If Subscribers are purchased, 100% of the Subscriber Contract Price will be invoiced upon shipment (as shipped).

Motorola shall make partial shipments of equipment and will request payment upon shipment of such equipment. In addition, Motorola shall invoice for installations completed on a site-by-site basis or when professional services are completed, when applicable. The value of the equipment shipped/services performed will be determined by the value shipped/services performed as a percentage of the total milestone value. Unless otherwise specified, contract discounts are based upon all items proposed and overall system package. For invoicing purposes only, discounts will be applied proportionately to the FNE and Subscriber equipment values to total contract price. Overdue invoices will bear simple interest at the maximum allowable rate by state law.

For Lifecycle Support Plan and Subscription Based Services:
Motorola will invoice Customer annually in advance of each year of the plan.
The chart below outlines the hourly labor rates for Motorola System Integration resources to be used. The staffing requirements shall be multiplied by the appropriate rate per resource in the table below. The hourly labor rates are fully burdened. The hourly rates per resource type and level are listed in Table 1.

	Resource Types			
Levels	Project Management	System Engineering	System Technologist	Project Administration
4	$ 290.00	$ 300.00	$ 280.00	$ 200.00
3	$ 240.00	$ 250.00	$ 240.00	$ 180.00
2	$ 220.00	$ 220.00	$ 220.00	$ 170.00
1	$ 190.00	$ 210.00	$ 210.00	$ 160.00

Table 1 - Hourly Rates

These rates apply to ordinary days and times (Monday to Friday during the hours 8am to 5pm). Additional surcharges may apply to work done outside these timeframes. The minimum charge for any resource will be 4 hours. Travel expenses are not included in these rates and may be charged separately. The qualifications of each type and level of resource are defined in the tables found at https://www.motorolasolutions.com/content/dam/msi/secure/services/labor-rates-exhibit-160408.pdf. All Motorola System Integration personnel assigned to this project will be classified according these levels. Project Administrative roles are varied and their specific duties and qualifications will be determined by the complexity and requirements of each project.

EXHIBIT D

System Acceptance Certificate

Customer Name: _____

Project Name: _____

This System Acceptance Certificate memorializes the occurrence of System Acceptance. Motorola and Customer acknowledge that:

1. The Acceptance Tests set forth in the Acceptance Test Plan have been successfully completed.

2. The System is accepted.

Customer Representative:	Motorola Representative:
Signature: _____	Signature: _____
Print Name: _____	Print Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

FINAL PROJECT ACCEPTANCE:
Motorola has provided and Customer has received all deliverables, and Motorola has performed all other work required for Final Project Acceptance.

Customer Representative:	Motorola Representative:
Signature: _____	Signature: _____
Print Name: _____	Print Name: _____
Title: _____	Title: _____
Date: _____	Date: _____