



**ASTRO 25 CONVENTIONAL SYSTEMS**

**THE RIGHT SIZE  
THE RIGHT SOLUTION  
THE RIGHT PRICE**  
**ASTRO® 25  
CONVENTIONAL SYSTEMS**

Meet your conventional system needs today while setting the foundation for tomorrow. Conventional radio for state, local and federal government agencies is at a crossroad. Conventional networks – the familiar systems that users have counted on for decades – are changing. Today’s conventional systems meet federal mandates for narrowbanding, interoperability, and IP connectivity. They enable features such as text messaging and end-to-end encryption that help first responders do their jobs safely and effectively.

To answer the needs of agencies that are ready to modernize their conventional radio systems, Motorola offers a selection of conventional solutions that are sized right, priced right, and future ready. An easy upgrade path helps agencies move gradually from their current analog or Project 25 (P25) systems to a modern conventional platform. State-of-the-art communication is now within the reach of even the smallest department.

## IT'S TIME TO EMPOWER YOUR NETWORK, NOT REPLACE IT

Agencies of all sizes are feeling the heat. Their current radio systems simply can't meet today's expectations. Radio users are requesting capabilities like text messaging and GPS location. Federal grant money is only available for P25 capable equipment. Everyone is talking about interoperability, information assurance, and narrowbanding. For too long, agencies thought they'd have to entirely replace their networks. Motorola offers an alternative. Now you can empower your conventional analog and P25 digital conventional network instead of replacing it.

## GAIN THE BENEFITS OF IP-ENABLED ASTRO® 25 WITHIN YOUR BUDGET

Motorola solutions are scaled for any size network, from one channel to hundreds of channels. They fit into your existing network, interoperating with the radios, consoles, and site equipment you already own. The result is a hybrid network that adds functionality where and when you're ready, while you continue to use prior investments. You are free to add new radios, consoles, sites or data applications at your own pace. This gradual technology refresh is not only easy on the budget, it also allows departments to gradually roll out new features and training for the users.

## LAY A STRONG FOUNDATION FOR THE FUTURE OF YOUR COMMUNICATIONS

These flexible systems give you the option to add more sites, more equipment, more types of channels and more features as your needs evolve. You will be able to link to other networks for mutual aid and join regional or statewide networks. When you're working with an ASTRO 25 platform, you have a system you can't outgrow.

ASTRO 25 is Motorola's flagship technology for mission critical communications. Based on the P25 standard, it is a single platform for all of your wireless needs: voice and data. Analog and digital. Conventional and trunked. Designed from the ground up to meet the challenges of public safety, ASTRO 25 is secure, robust and dependable. It works as if lives depended on it – because Motorola knows you work in a business where radio can truly impact the safety of your personnel and the community they protect. By adding ASTRO 25 to your conventional analog network, your organization can meet the future with confidence in your communications. While there is considerable focus on upgrading to IP and digital networks, Motorola understands that some operations may have requirements to refresh their existing analog network to implement the latest analog technology. Our analog G-Series equipment is a direct replacement for analog QUANTAR™ and analog ASTRO 25 conventional will still function with your existing circuit switched back haul.

### THE NEXT STEPS FOR CONVENTIONAL RADIO

- P25 compliance
- Narrowband compliance
- MCC 7500 Console
- MCC 7100 Console
- Mobile data
- Interoperability
- Centralized management and security



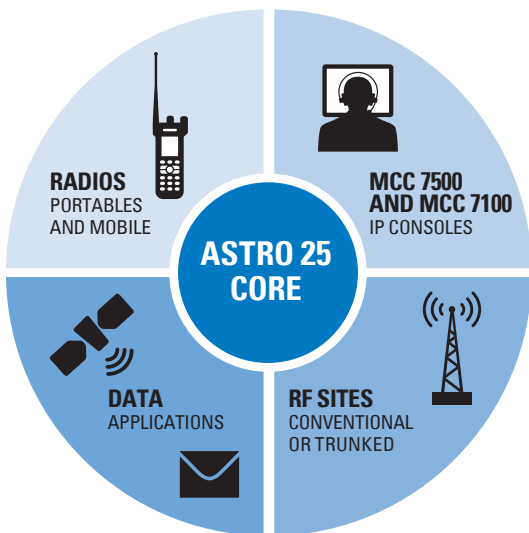
# CAPACITY, DISPATCH, DATA CHOOSE THE PROGRAMS THAT BEST REFLECT YOUR ORGANIZATION'S PRIORITIES

## START HERE: ASTRO 25 CONVENTIONAL EVOLUTION

The adaptable ASTRO 25 platform gives you complete control over your system's future design strategy. Any of the following steps could be the starting point to modernize your conventional network. Choose the focus that fits your current needs and resources:

- Expand the channel capacity of your current system by deploying GTR 8000 base radios
- Upgrade dispatch center functionality with modern MCC 7500 and MCC 7100 IP Dispatch Consoles
- Add data applications such as GPS location and/or text messaging to support increased productivity in the field

## CONVENTIONAL FLEXIBILITY



Whichever path you choose, you can move as quickly – or as gradually – as you want. Your existing conventional analog equipment can operate in parallel with ASTRO 25 IP based equipment (MCC 7100 and MCC 7500 Consoles/ GTR 8000 base radios) with the addition of an ASTRO 25 core. Existing analog and mixed mode mobile and portable radios will continue to work, alongside any digital radios implemented with a system functioning in simulcast mixed analog/digital mode. Mission critical settings (such as console priority, user PTT-ID aliases and encryption key management) will not change, minimizing disruption to dispatch and user operations.

## PRIORITY: CHANNEL EXPANSION

Your system can expand to any capacity. It can grow incrementally from just a few channels to a very large regional, state or countrywide network. The channels can be a mixture of analog, mixed mode and IP digital channels with combinations of repeater, voting, multicast and simulcast technology.

## PRIORITY: TRANSITIONING TO IP CONSOLES

If upgrading the functionality of dispatch consoles is your priority, start by replacing some or all of your existing circuit-switched consoles. Begin by:

- Deploying an ASTRO 25 core system
- Deploying one or more Motorola MCC 7500 and/or MCC 7100 Consoles
- Integrating the new consoles into your existing network infrastructure

## ASTRO 25 CORE SYSTEM

The core provides a platform to manage the entire network. It supports users communicating across analog, mixed mode, and P25 digital RF channels. Motorola offers choices in core configurations scalable to fit agencies of all sizes. Expand from a standalone site to a K Core, or from a K Core to an M Core, by adding the necessary core equipment to your existing configuration.

On an IP based network, the central core server provides call management between conventional base radios and console positions. This is different from a circuit-based conventional system, in which a Central Electronics Bank (CEB) switch and punch block performed these functions. New functionality including fault management and security also resides in the core.

## SOLUTION BRIEF

### ASTRO 25 CONVENTIONAL SYSTEMS

#### MCC 7500 IP DISPATCH CONSOLES

Support an array of important features including:

- Secure end-to-end encryption of all traffic between operators and users
- Direct connectivity between the network and the console, reducing your need to lease expensive T1 lines to connect remote operator positions
- Core switching equipment which replaces racks of hardware, saving the backroom space formerly needed to install Central Electronics Banks (CEBs), Digital Interface Units (DIUs) and punch blocks
- A graphical user interface (GUI) similar to the interface operators already know on the CENTRACOM Gold Elite consoles but with greater customization capabilities, so dispatchers can quickly transition to the new consoles with minimal retraining

#### MCC 7100 IP DISPATCH CONSOLES

The newest MCC IP Dispatch Console from Motorola delivers:

- New flexibility and mobility. As a fixed or mobile solution traditional technology barriers are eliminated, delivering flexible, interoperable communications
- Quick expansion of your mobile work force communications for on the spot coordination during special events, for disaster management, in back-up facilities and to increase temporary dispatch capacity
- Senior staff and other approved user ability to easily monitor and initiate encrypted communications from their office, on the road or in remote locations
- Reduced training through use of the familiar and proven MCC 7500 Console GUI

#### INTEGRATION WITH EXISTING CONSOLES

You can continue using MCC 7500, MCC 7100 and conventional analog consoles. ASTRO-TAC™ comparators, DIUs and conventional gateway equipment can be used to manage the audio interface between IP and non-IP equipment so that audio can be routed simultaneously to conventional analog, MCC 7500 and MCC 7100 Consoles. If your current ASTRO 25 network includes voting/simulcast the comparators may already be available in the current system.

#### INTEGRATION WITH EXISTING CHANNELS AND INFRASTRUCTURE

Your ASTRO 25 conventional IP solution supports existing QUANTAR base radio sites as well as G-series sites. QUANTAR base radios and G-series base radios can coexist at the same RF site. GTR 8000 base radios support either IP connectivity or circuit connectivity providing the

flexibility to configure your system as needed. The G-series site equipment is software definable to upgrade in the future as needs change.

A conventional gateway provides the interface for all types of conventional channels in the ASTRO 25 core. The gateways can be placed either:

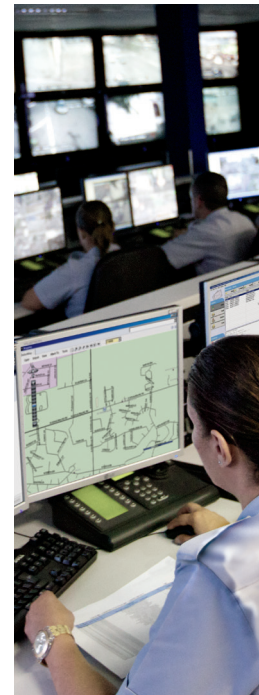
- At the core – allowing you to maintain 4-wire or V.24 connections to the sites
- At the RF channel site – allowing you to establish IP connectivity to the site while reusing RF channel equipment that is already in use

In addition to supporting all types of channels, the gateways support numerous types of base radios.

#### PRIORITY: DEPLOYING DATA APPLICATIONS

If data functionality is your priority, start here with the addition of an ASTRO 25 core to your existing network. The ASTRO 25 Core with Packet Data Gateway (PDG) Solution supports Integrated Voice and Data (IV&D) and allows you to add applications such as:

- **Location capabilities** – pinpoint the geographic location of radio units, enabling dispatchers to deploy nearby personnel for quick response and to swiftly aid first responders who are in need of assistance.
- **ASTRO 25 Advanced Messaging Solution** – help users convey detailed information, offload voice traffic, share knowledge, run queries and communicate with other devices via SMTP email in situations where verbal communication is unwarranted because the environment is too loud or users don't want to be overheard.
- **Over-The-Air Rekeying (OTAR)** – employ encryption keys to keep your communications secure, and update those keys automatically without the delays, inconvenience and administrative cost of having users bring their radios into the shop for manual reprogramming.
- **POP25 or Programming over P25** – update the configuration parameters of fielded radio units over the air while the radios remain in use, allowing you to quickly reprogram your entire fleet of radios with no disruption to operations.
- **Fire Station Automation and Alerting** – seamlessly automate communications between dispatch and station houses for fast response times.



# HOWEVER YOU CHOOSE TO BEGIN REFRESHING YOUR SYSTEM, THE END RESULT IS A ROBUST NETWORK READY FOR TODAY'S CHALLENGES AND TOMORROW'S NEW TECHNOLOGIES

## OVERALL CAPABILITIES OF ASTRO 25 CONVENTIONAL

The ASTRO 25 platform supports a wide range of channel types and coverage methodologies, giving you maximum flexibility to integrate different types of equipment. Select the channel and coverage types and price points to meet your needs.

### Channel Types:

- Analog 4-wire
- Mixed Mode – Analog / P25 Digital
- Digital Conventional (v.24)
- IP Digital Conventional
- P25 Conventional Talkgroup

### Coverage Types:

- Repeater
- Voting
- Multicast
- Simulcast

## CENTRALLY MANAGE THE NETWORK

An ASTRO 25 IP core provides a full-featured suite of system management applications to monitor, manage, and configure elements across your entire radio system. Centralized management helps you fine tune network performance, minimize costly field visits and keep the system running with minimal effort from your administrative staff. It has a big impact on your total cost of ownership, helping you get the best return on your investment. System managers can:

- Generate performance reports to track the status of the system
- Remotely download software updates vital to sustaining system integrity to system components
- Configure infrastructure equipment from a central point

## CENTRALLY SECURE THE NETWORK

Network security is a critical issue. Motorola offers Information Assurance (IA) services through the ASTRO 25 core to help you deploy a range of security capabilities including:

- **ASTRO 25 Core Security** – Secure the heart of your ASTRO 25 Conventional network with features such as central authentication event logging, backup recovery and system hardening.
- **Remote Site Security** – Protect information as it travels across your network sites by implementing features such as: router encryption, port security, and access controls.
- **Perimeter Security** – Defend your network against outside attacks using: firewalls, Intrusion Detection Sensor and Demilitarized zones.

ASTRO 25 complies with FISMA/NIST and DISA standards for Federal and military installations. Motorola can help you gain certification if these standards apply to your organization.

## PLAN A SUCCESSFUL DEPLOYMENT

A successful phased approach to an ASTRO 25 conventional network with IP connectivity requires thoughtful planning. Motorola can assist you with these tasks to plan a successful deployment:

- Perform a system audit and performance assessment on the current network
- Assess future communications needs – coverage, capacity, user needs, voice/data, dispatch
- Identify upgrade plan and scenarios – infrastructure, radios, dispatch operations
- Establish timeline and evolution phases
- Execute planned project phases

In addition, Motorola has the comprehensive experience and knowledge to guide you through every phase of the project, from engineering design... through installation and on-going support. At every step, Motorola's focus on quality and service will help you modernize your communications smoothly and cost-effectively with minimal impact to your operations.

## EXAMPLE: P25 INTEROPERABILITY

**Goal:** Add two P25 channels for interoperability with other agencies. Upgrade consoles to an IP solution.

**Current system:** Six analog channels and two CENTRACOM consoles.

**Solution:** Reuse the analog channels in the field. Invest in G-Series equipment for the two new channels and replace the CENTRACOM consoles with an ASTRO 25 K Core containing MCC 7500 Console operator positions.

# MOTOROLA'S SCALABLE ARCHITECTURE ALLOWS YOU TO DESIGN A CONVENTIONAL SYSTEM THAT WORKS WITH YOUR CURRENT NETWORK AND YOUR CURRENT BUDGET

ASTRO 25 CONVENTIONAL PLATFORMS			
Motorola can assist you in selecting the best fit for your current needs and future plans			
CONFIGURATION	STANDALONE SINGLE SITE	SMALL SCALE – K CORE	LARGE SCALE – M CORE
<b>Best Fit</b>	For agencies with a single channel and no immediate need for core features.	For small agencies that want core features and room to grow.	For agencies that need more room to grow, or are ready to invest in a network that supports the widest range of features and services.
<b>Capacity</b>	This may be a single repeater, voting, multicast or simulcast channel.	Supports numerous channels. As many as 20 operator positions may be spread across 5 dispatch locations.	100s to 1000s of channels can be supported. This Core support up to 250 console positions across 50 dispatch sites per core.
<b>Features</b>	P25 interoperability channels P25 Conventional Talkgroup channel Narrowband channels Wireless consoles	P25 interoperability channels Narrowband channels MCC 7500 Consoles MCC 7100 Consoles Integrated Voice & Data (IV&D) applications Remote configuration Remote software downloads	P25 interoperability channels P25 Conventional Talkgroup channel Narrowband channels MCC 7500 Consoles MCC 7100 Consoles Integrated Voice & Data (IV&D) and Enhanced Data applications Centralized network management and security High Performance Data (HPD) Add trunking in addition to conventional channels Two choices of architecture: 1) Centralized 2) Distributed

Expand from a standalone site to a K Core, or from a K Core to an M Core, by adding the necessary core equipment to your existing configuration.

# AN ASTRO 25 CONVENTIONAL SYSTEM PROVIDES MULTIPLE ADVANTAGES WHICH YOU CAN GAIN FROM A SYSTEM REFRESH

## COMPLY WITH THE PROJECT 25 STANDARD

The Project 25 (P25) standard was developed by and for public safety professionals and adopted by federal agencies. It ensures that systems deliver the interoperability and dependability you require. The U.S. Federal government requires P25 compliance for most grant applications and numerous agencies around the globe have mandated P25 for all new equipment. Motorola ASTRO 25 systems are the most widely deployed P25 systems in the world. Adding an ASTRO 25 solution to your current network will enable you to support P25 channels, interoperate with other P25 networks, and purchase P25 radios that can meet funding requirements.

## INTEROPERATE WITH OTHER AGENCIES

First responders from different departments and jurisdictions often work together to manage big events – shouldn't their radios do the same? Interoperability is a primary reason for the move to P25. You'll be ready to coordinate a multi-agency response and communicate effectively during mutual aid incidents.

As a P25 system you have the flexibility to connect as a node on another P25 network – allowing you to join regional or statewide networks now or in the future as they become available. These larger networks allow

multiple agencies to communicate seamlessly. They also let agencies share in the costs of network infrastructure while still maintaining control over their own internal communications.

## TAKE THE NEXT STEP FORWARD WITH YOUR COMMUNICATIONS

With Motorola's selection of scalable and affordable solutions, agencies can find the right upgrade path to a more powerful communications system. The road to conventional P25 has never been clearer. By providing the ability to operate ASTRO 25 conventional systems across channel types and within the required FCC narrowband compliance, you are able to gradually migrate to a system that is right for your users and fits your budget. Contact Motorola to learn more about how to upgrade your analog conventional system to a P25 compliant ASTRO 25 conventional network.

### EXAMPLE: CONSOLE UPGRADE

**Goal:** Upgrade to IP consoles without replacing fielded RF channel equipment

**Current system:** Eight analog channels and two CENTRACOM consoles

**Solution:** Replace the CENTRACOM consoles with an ASTRO 25 K Core containing MCC 7500 Console operator positions..



**SOLUTION BRIEF**  
ASTRO 25 CONVENTIONAL SYSTEMS

For more information about ASTRO 25 solutions and our commitment to the P25 standard, please visit [\*\*motorolasolutions.com/ASTRO25\*\*](http://motorolasolutions.com/ASTRO25) or contact your Motorola representative.

Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. [\*\*motorolasolutions.com/ASTRO25\*\*](http://motorolasolutions.com/ASTRO25)

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