WELCOME

Day in, and day out, governments and businesses around the world rely on effortless and reliable communication. Our customers call it their lifeline. To help businesses operate without interruption and to safeguard communities, workplaces, and ultimately, each one of us, we are determined to help keep the lifeline unbreakable.

With Motorola Solutions, Inc. Education Services, we help your two biggest lifeline investments - your personnel and your technology infrastructure - work together efficiently to maximize the value of your communication technologies.

Whether your organization is new to our latest innovations or has years of experience with us, our Education Services team helps expand your personnel’s skills and knowledge for the full application of your technology investment.

Starting with professionally developed, real-world application and content, we always design your training with the learner in mind. Our experienced instructors average 20+ years in the communications industry and specialize in Motorola Solutions technologies and services. Immersive, hands-on experiences, expert lab environments, or online learning ensure we meet your learners with the right kind of learning at the right times.

Whether training is delivered virtually, at your location or in our state-of-the-art facilities, we can help ensure that your personnel know how to amplify your investment, maximize operational efficiency, and ensure an unbreakable lifeline.

We look forward to working with you.
# TABLE OF CONTENTS

## GENERAL INFORMATION
- OUR LEARNING EXPERIENCE PORTAL .................. 4
- TRAINING OPTIONS .................................. 6
- QUALITY ASSURANCE: THE TPMA FRAMEWORK ...... 8
- EDUCATION PACKAGES .............................. 9
- HELPFUL INFORMATION .............................. 11

## OPERATOR TRAINING
- TRAIN THE TRAINER ............................. 12
- END-USER TOOLKITS ............................... 13

## COURSES .............................................. 14
- FOUNDATIONAL .................................... 14
- ASTRO® SYSTEM ................................... 22
- CONSOLES .......................................... 38
- APX™ SUBSCRIBERS ............................... 42
- MOTOTRBO™ ....................................... 45
- SOFTWARE & APPLICATIONS ................. 53
GENERAL INFORMATION

OUR LEARNING EXPERIENCE PORTAL

AN INTERACTIVE PLATFORM… DESIGNED FOR YOU! THE LXP IS YOUR VALUABLE RESOURCE TO SEE THE LATEST COURSES, DESCRIPTIONS, REQUIREMENTS, DATES AND LOCATIONS.

Use the search box and filters feature to quickly and easily search for training or documentation.

View your history and upcoming training on your personalized dashboard.

Receive reminder notifications of upcoming training or changes to your training.

Easily locate and download documents plus stay up-to-date with training news and announcements.

http://learning.motorolasolutions.com
HOW TO ACCESS THE LEARNING EXPERIENCE PORTAL

If you are a Motorola Solutions Customer who already has a Motorola Solutions Login ID, you can go to the “Enrol in a course” section for further instructions.

SET UP A NEW USER ACCOUNT AND PASSWORD

- Visit: https://learning.motorolasolutions.com
- Click “Register”
- Fill Out all the required information on the form (if you are a MSI Customer with an established 10-digit Motorola Customer Account Number, please enter your Company Name in the form)
- Click “Submit”
- You will receive a confirmation of your submission
- You will next receive further information to activate your account (Up to 5 business days)*

TO ENROLL IN A COURSE (ONCE YOU HAVE AN LXP ACCOUNT)

- Log in to the LXP: https://learning.motorolasolutions.com
- Click on “LOG IN”
- Enter your Log In ID and Password and Click “LOG IN”
- If you have forgotten your Log In or Password click on “Forgot Log In ID” or “Forgot Password”
- Find a training course by clicking “Browse Training” at the top of the screen Or use “Search Catalog” at the top of the screen

* If you are looking for FCC Narrowband training and you do not have an established 10-digit Motorola Customer Account Number with us, please visit businessonline.motorolasolutions.com for account set up and training access.
GENERAL INFORMATION

For information on prerequisites and to register for courses visit the LXP at: LEARNING.MOTOROLASOLUTIONS.COM

For general information contact the North America Training Services help desk at: (800) 247-2346, option 4 or training.na@motorolasolutions.com

TRAINING OPTIONS

In this catalog you will find a wide range of learning initiatives; some of them have been developed to be completed at your own pace, and others are led by our Technical Instructors:

LIVE TRAINING

It consists of scheduled live sessions, delivered either in class or in a virtual environment by our Technical instructors. Participants can immerse themselves in the subject; they receive substantial time for hands-on training that enables them to develop creating solutions for unique problems. In both classes, the number of seats available is limited and advanced registration is required.

On the job training is also available, for those who prefer a more direct instruction.

ONLINE TRAINING

Online self-paced learning allows your team to gain foundational knowledge on a variety of topics using their computer, at their own schedule.

Where to start? Our training roadmaps will let you know the starting point and milestones of your development, so you can make sure you acquire the right knowledge to make the most of each step of your learning process.

UNDERSTANDING THE ICONS

LIVE TRAINING

ONLINE TRAINING

EXAM

POLICIES AND REQUIREMENTS

CANCELLATION AND RESCHEDULING

BY THE STUDENT

Customer cancellation or rescheduling made less than 30 days prior to the class start date will be subject to the full course tuition.

CANCELLATION AND RESCHEDULING

BY MOTOROLA SOLUTIONS

Motorola Solutions reserves the right to change or cancel classes up to 10 business days prior to the class start date. You will be notified at that time of such change or cancellation.

PROFESSIONALISM

Students are expected to maintain professional conduct and dress at all times. Class dress is casual, but smart. For safety and security reasons, we cannot permit shorts, thong type sandals, or tank tops in the classroom.

LAPTOP REQUIREMENTS

All our classes require students to bring their laptops to the classroom so that they may utilize an electronic copy of the class material. Please review your enrollment confirmation email for specific requirements for your class.

TRAINING CONTENT AND STRATEGY

DISCLAIMER

All of Motorola Solutions training classes are designed to support and align with the Motorola Solutions Service strategy for each product. This strategy may include a combination of (but not limited to) processes, procedures, recommendations, and instructor experiential advice which may involve repair, replacement, and or recovery of hardware, software, or firmware of Motorola Solutions products. The repair, replacement, or recovery of these products may vary from product to product. Motorola Solutions reserves the right to change the structure and content of all courses at any time.
EDUCATION BUNDLES: ACCELERATE YOUR LEARNING JOURNEY

Worldwide Education understands your challenging needs during uncertain times. Travel limitations, the continued safety of your first responders that serve and protect your citizens, and assurance there is zero training downtime is critical. To meet these challenges, we offer course bundles that combine a virtual learning experience with traditional, hands-on learning.

Watch the video to learn more about how you can accelerate your training today.

THE TWO COMPONENTS OF OUR EDUCATION BUNDLES

The virtual component will focus on live discussions, application-based demonstrations, and various online activities using our virtual training hosted solutions and our lab environment.

The practical component will take place at either one of our facilities or, in case of buy-out sessions, at your location. This part of the training will focus on performing the tasks discussed in the virtual sessions. Once you have complete the two components, you will receive credit for the bundle and the equivalent traditional course.

Compared to our traditional full in-class offerings, you may be able to combine multiple practical components into one week or less. This will not only allow you to complete multiple courses (bundles) during that time, it will also help to reduce your overall travel costs and time investment.

BENEFITS FOR YOU

• Live training sessions led by our subject-matter expert certified instructors accessible from your computer
• Practice through demos and guided virtual lab environment
• Active participation and interaction assured, by limiting the number of participants per group
• Reduction of travel expenses and time away from home

READY TO GET STARTED?
Find your courses or email us at training.na@motorolasolutions.com
QUALITY ASSURANCE: 
THE TPMA FRAMEWORK

MOTOROLA SOLUTIONS WORLDWIDE EDUCATION COMMITS TO EXCELLENCE IN INSTRUCTOR-LED TRAINING

For 45+ years, our instructors continue to be laser-focused on your two lifeline investments - your personnel and your technology infrastructure. Our mission is to work together efficiently to maximize the value of your communication technologies.

Motorola Solutions is aware of the impact training experiences have on your team and your organization. When it comes to supporting the success of your employees and your technology infrastructure, we seek to continually deliver exceptional training to you.

For over 10 years, we have built and implemented the Training Performance Monitoring & Assessment (TPMA) framework in our organization. Our internal instructors are held to the highest level of training standards outlined within the Learning & Performance Institute (LPI). The TPMA certificate is widely-recognized and accepted as the premiere institute for learning, assessing and benchmarking trainer progress.

Anywhere in the world, those who hold a TPMA certificate demonstrate that they have reached or exceeded the highest standards demanded within the industry.

WHY DO TPMA CERTIFICATIONS MATTER?

Adopting TPMA standards is essential to meet industry trends and leading industry best practices to meet user needs, enhance instructor development and ultimately leads to a happy customer experience.

LPI ensures the quality of the instructors’ training delivery is maintained and meets the highest quality standards, provides expert feedback on their performance and promotes the development of their facilitator skills.

Visit us at learning.motorolasolutions.com to register for our training courses.

ACHIEVING OPTIMAL PERFORMANCE MATTERS TO US

• We focus on the needs of the learner, not the trainer
• The personalized approach and structured consistency of standardized-requirements help win business

“The instructor did an outstanding job. Truly a professional and extremely knowledgeable. Never rushed and always listened. Provided feedback to all questions and allowed students to participate at their own level of expertise and speed.”

“The Instructor was extremely helpful during the training. He has an excellent way of teaching and was very attentive to the students when asked questions. I liked that he went over each and every field of CPS. Excellent Instructor! I would recommend to anyone!”

“The instructor showed outstanding skills to combine theory, practice, actual cases and hands-on training. Great training.”

“Excellent coach. Direct, precise, detailed. Explain everything in the right way. Honestly, the best coach I have ever had. They do not skip anything, explain everything in detail. My knowledge after this training is much better. During the entire training, he was fully committed to us.”

“The best teacher I have ever had in any previous training courses. Very challenging and interactive teaching helping me to understand the system from the bottom to top with a lot of additional slides from the teacher with extremely good and clear explanations in the system networking for deeper understanding.”

“One of the best instructors I had. Speaks clearly, responsive to the students; actions and very good at making the students stay alert and attentive.”

“Amazing training, very glad to join it. Amazing trainer, very vibrant, very knowledgeable trainer. Looking forward to more training with him. Good trainer from a good company.”
EDUCATION PACKAGES

Motorola Solutions Education Packages have been built by our technical education experts, to provide you a simpler way to select the right learning activities from our extensive training portfolio. These packages are all designed considering four vital aspects:

- Your Motorola Solutions Infrastructure & Devices
- The Level of Support provided by Motorola Solutions
- The tasks undertaken by your team, and
- The roles of the professionals in charge of those tasks

Behind these packages there are Education Services professionals whose aim is to fully prepare your team to achieve desired organizational efficiency and outcomes by ensuring that they have the knowledge, skill, and competency needed to effectively interact with your Motorola Solutions technology investment.

If you wish to customize your Motorola Solutions training strategy, ask our Professional Education Services team to analyze your specific technical and end user training needs and gaps. Please work with your Motorola Solutions account representative to request this professional service.

Let Motorola Solutions Education Services help you ensure that your organization provides effortless and reliable communications, and keep your lifeline stronger than ever!

ASTRO® INFRASTRUCTURE EDUCATION PACKAGES

**COMPLEMENT EDUCATION PACKAGE**
Prepare your team to operate your ASTRO® Solution, achieving optimal organizational efficiency.

**SUPPLEMENT EDUCATION PACKAGE**
Prepare your team to operate and administer your ASTRO® Solution, achieving optimal organizational efficiency.

**SUPPORT EDUCATION PACKAGE**
Prepare your team to operate, administer, and maintain your ASTRO® Solution, achieving optimal organizational efficiency.

**TOPICS**

**TOPICS**

**TOPICS**

ASTRO® DEVICES EDUCATION PACKAGES

**COMPLEMENT EDUCATION PACKAGE**
Prepare your team to operate your APX™ devices.

**SUPPLEMENT EDUCATION PACKAGE**
Prepare your team to operate and administer your APX™ devices.

**SUPPORT EDUCATION PACKAGE**
Prepare your team to operate, administer, and maintain your APX™ devices.

**TOPICS**
Device Overview, My View Portal, Device End User Best Practices

**TOPICS**
Device Overview, Programming and Radio Management, Device End User Best Practices

**TOPICS**
Device Overview, Programming and Radio Management, Radio Maintenance, Device End User Best Practices

Talk with your Motorola Solutions contact for a quote, or email us at training.na@motorolasolutions.com for more information on how to sign your team up for one of our Education Services Packages.
For general information contact the North America Training Services help desk at:
(800) 247-2346, option 4 or training.na@motorolasolutions.com

For information on prerequisites and to register for courses visit the LXP at:
LEARNING.MOTOROLASOLUTIONS.COM

SAMPLE PACKAGES

**ASTRO® INFRASTRUCTURE SUPPLEMENT EDUCATION PACKAGE**

- ASTRO® 25 SYSTEM OVERVIEW
- MY VIEW PORTAL OVERVIEW
- ASTRO® FEATURES AND FUNCTIONALITY
- ASTRO® 25 SYSTEM FLEETMAPPING
- ASTRO® 25 IV&D RADIO SYSTEM ADMINISTRATOR
- MCC 7000 SERIES MANAGEMENT
- CONSOLE ADMINISTRATOR & DISPATCH END USER TRAINING
- RADIO END USER TRAIN-THE-TRAINER
- WAVE™ ADMINISTRATION & END USER
- IMW OPERATIONS AND ADMINISTRATION
- RADIO AUTHENTICATION
- EXECUTIVE OVERVIEW
- ASTRO® 25 IV&D SECURE COMMUNICATIONS

**APX DEVICE SUPPORT EDUCATION PACKAGE**

- APX QUICK START
- APX RADIO MANAGEMENT OVERVIEW
- APX CPS PROGRAMMING & TEMPLATE BUILDING
- APX RADIO MANAGEMENT WORKSHOP
- APX TECHNICAL SUBSCRIBER ACADEMY
- RADIO END USER TRAIN-THE-TRAINER

**LEGEND:**
- Foundation
- Administration
- Maintenance
- Device & Console Best Practices
- Optional

Talk with your Motorola Solutions contact for a quote, or email us at training.na@motorolasolutions.com for more information on how to sign your team up for one of our Education Services Packages.
PRICING AND HELPFUL INFORMATION

HOW TO MAKE PAYMENTS WHEN ENROLLING IN A COURSE

If prepayment is required to secure your registration, it must be received by Motorola Solutions 30 days prior to your attendance. Contact the help desk above for assistance with payments and P.O. specifications. All pricing listed is US dollars.

FOR QUESTIONS AND ASSISTANCE

Call the Education help desk at: 800-247-2346
Monday – Friday,
8:00 a.m. – 5:00 p.m. Central Time
or email us at:
training.na@motorolasolutions.com

TRAINING BANKS

Whether you’re a technician, system manager or radio user, you rely on Motorola Solutions Education Services to obtain the necessary knowledge to get the full potential out of your Motorola Solutions equipment. The Motorola Solutions Training Bank is a discounted, pre-paid, non-expiring debit account that allows you to budget up front for your training needs. Training Banks can be applied towards all training options including, Instructor-Led Tailored Field Courses.

There are several benefits to Training Banks including:
• Allows you to budget up front for training needs
• Provides cost savings through discounted pricing tiers to maximize your training investment
• Does not require multiple POs, thus reducing internal approval cycle time and paperwork
• Training Banks do not expire

For more information on Training Banks, please visit us on the web at https://www.motorolasolutions.com/en_us/products/training/training-bank.html or email us at training.na@motorolasolutions.com.

Note: Training Banks are only applicable to non-federal government customers.
THE SUCCESSFUL IMPLEMENTATION OF YOUR COMMUNICATIONS SYSTEM DEPENDS ON ITS CONFIDENT USERS.

Users of your mobile and portable radios require training on their units to understand its basic operation, features and functions.

Dispatchers of your consoles require training to understand basic operation, features and functions; management personnel require training on the Motorola Solutions applications.
**TRAIN THE TRAINER**

With this option, Motorola Solutions trains people you have identified as qualified instructors so that they in turn can train each individual user in your organization. These classes are done on site using your equipment. The interactive End-User Toolkit (iEUTK) and/or tailored end user materials can be utilized.

**AUDIENCE**

This course is geared for customers who have an experienced, dedicated training staff in their organization. This course concentrates on specific product features and how it relates to the training process.

**COURSE OVERVIEW**

This course provides the customer’s identified training personnel knowledge and practice applying training techniques that will enable them to successfully train their students. Trainers will use simulation, facilitation and hands-on activities to facilitate learning events supported by tailored training materials and job aids. Students will become proficient in discussing common tasks associated with the operation of the customer’s radios and consoles as identified by the customer’s needs analysis.

Note: This course is presented as customer specific and will cover pertinent information on customer equipment.

**REQUISITE KNOWLEDGE**

Previous training experience and radio system knowledge is a must.

---

**OPERATOR TRAINING**

With this option, the users within your organization are trained by a Motorola Solutions instructor. These classes are done on site using your equipment. The interactive End-User Toolkit (iEUTK) and/or tailored end user materials support this training option.

**CONSOLES TRAINING**

These courses provide operators and supervisors with an introduction to the basic operation, administration and feature functionality of the Console Systems. Through facilitation and hands-on practice, users learn to perform tasks that are associated with their organization’s particular system.

- Overview of console configuration
- Console dispatcher and supervisor operation
- Alias Management
- Messaging

**SUBSCRIBER TRAINING**

These courses provide radio users with an introduction to their radios, a review of their radio’s basic functionality by means of job aids tailored to exactly how they use their radios. Through facilitation and hands-on practice, users learn to perform common tasks associated with their radio configuration.

- Overview of radio configuration
- General radio operations

---

**COURSES FOR CONSOLE PRODUCTS**

- MCC 7000 Series Dispatch Console Administrator Training
- MCC 7000 Series Dispatch Console Operator Training
- MKM 7000 Console Alias Manager
- MOTOBRIDGE IP Interoperable Solution Dispatch Console Operator
- MOTOBRIDGE Administration Control Panel (ACP)
- MCD 5000 Operator

---

**COURSES FOR MOBILES & PORTABLES**

- APX™ Series
- MOTOTRBO™ Series
- XTL™/XTS Series

---

**TO REQUEST FIELD TRAINING, PLEASE CONTACT YOUR ACCOUNT MANAGER.**

Note: The interactive End-User Toolkit (iEUTK) is not sold as a standalone product but included with our instructor-led, Train-The-Trainer or Operator Training.
FOUNDATIONAL COURSES

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASIC RF</td>
<td>RDS0002</td>
<td>17</td>
</tr>
<tr>
<td>BASIC RADIO</td>
<td>RDS0004</td>
<td>17</td>
</tr>
<tr>
<td>BASIC NETWORKING</td>
<td>RDS0003</td>
<td>17</td>
</tr>
<tr>
<td>INTRO TO R56</td>
<td>NST9252</td>
<td>18</td>
</tr>
<tr>
<td>SITE INSTALLATION PRACTICES WORKSHOP R56</td>
<td>NST925</td>
<td>18</td>
</tr>
<tr>
<td>R56 STANDARDS UPDATE 2017</td>
<td>NST9256</td>
<td>18</td>
</tr>
<tr>
<td>SERVER &amp; VIRTUALIZATION FOUNDATION</td>
<td>SRV1010</td>
<td>19</td>
</tr>
<tr>
<td>COMMUNICATION SYSTEMS CONCEPTS</td>
<td>NST021</td>
<td>19</td>
</tr>
<tr>
<td>NETWORKING ESSENTIALS IN MOTOROLA SOLUTIONS COMMUNICATIONS</td>
<td>NST762</td>
<td>19</td>
</tr>
<tr>
<td>EQUIPMENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRIDGING THE KNOWLEDGE GAP FOR ASTRO® 25 – TECHNICIAN</td>
<td>ACT100E</td>
<td>20</td>
</tr>
<tr>
<td>BRIDGING THE KNOWLEDGE GAP FOR ASTRO® 25 – SYSTEM ADMINISTRATOR</td>
<td>ACT101E</td>
<td>20</td>
</tr>
<tr>
<td>ASTRO® 25 SYSTEMS APPLIED NETWORKING</td>
<td>NWTO03</td>
<td>20</td>
</tr>
<tr>
<td>MOTOTRBO™ SYSTEMS APPLIED NETWORKING</td>
<td>PCT2007</td>
<td>21</td>
</tr>
</tbody>
</table>
RF FUNDAMENTALS

RF BASICS / RADIO SYSTEM BASICS

- **BASIC RF**
  - RDS0002
  - 2 HRS

- **BASIC RADIO**
  - RDS0004
  - 4 HRS

- **COMMUNICATION SYSTEMS CONCEPTS**
  - NST021
  - 4.5 DAYS

**CURRICULUM COMPLETE**

Participant has RF knowledge required for advancing to more complex technical training courses.
IP/NETWORKING FUNDAMENTALS

BASIC NETWORKING
1 HR
RDS003

NETWORKING ESSENTIALS IN MOTOROLA SOLUTIONS COMMUNICATIONS SYSTEM
4.5 DAYS
NST762

CHOOSE ONE OF THE FOLLOWING COURSES BELOW ACCORDING TO YOUR SOLUTION SYSTEM

ASTRO® 25 SYSTEM

ASTRO® 25 SYSTEMS APPLIED NETWORKING
4.5 DAYS
NWT003

MOTOTRBO™ SYSTEM

MOTOTRBO™ SYSTEMS APPLIED NETWORKING
35 DAYS
PCT2007

CURRICULUM COMPLETE
PARTICIPANT HAS IP PROTOCOLS AND NETWORKING SKILLS TO USE MOTOROLA SOLUTIONS SYSTEMS REQUIRING ADVANCED TECHNICAL TRAINING.

CLICK HERE TO GO TO PAGE 20 FOR MORE DETAILS ON ASTRO® 25

CLICK HERE TO GO TO PAGE 43 FOR MORE DETAILS ON MOTOTRBO™
COURSE OVERVIEW
This course emphasizes the concepts behind RF Systems theory and operation. Topics include basic radio transmitters and receivers, RF propagation, modulation, antenna systems, transmission lines and data-communications.

TARGET AUDIENCE
Technical staff who need to understand communication systems concepts.

COURSE OBJECTIVES
After completing this course, the student will be able to:
- Describe electrical principles, including direct and alternating current.
- Describe the basic structure of radio transmitters and receivers.
- Describe the operation of the antenna system.
- Identify different types of transmission media.
- Describe RF propagation and understand system gains in a link budget.

REQUISITE KNOWLEDGE
None

PREREQUISITES
None

COURSE OVERVIEW
The purpose of this course is to provide the student with the basic, foundational land mobile two-way radio knowledge required when working with Motorola Solutions. This course is ideal for all people who sell or service land mobile two-way radios.

TARGET AUDIENCE
Individuals who need a foundational overview of two-way radios.

COURSE OBJECTIVES
After completing this course, the student will be able to:
- Define what a two-way radio is.
- Describe two-way radio components.
- Describe communication types.
- List and describe ways of expanding coverage.
- Describe analog and digital solutions.
- Describe how transmit and receive processes work in conventional and trunked two-way radio.
- Define system scalability.
- Identify the considerations to implementing a two-way radio.
- List the characteristics of single-site, single-zone and multi-zone systems.
- Explain the concept of two-way radio security.
- Describe the open standards for the following technologies: APCO P25, TETRA and DMR.

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
- RDS0002 Basic RF

PREREQUISITES
None

COURSE OVERVIEW
This course provides a detailed description of the fundamentals of system networking. Topics include the OSI seven layer model, bridges and switches, IP and routing, applications and security.

TARGET AUDIENCE
Engineers who need to understand the essentials of system networking.

COURSE OBJECTIVES
After completing this course, the student will be able to:
- Identify the elements and interconnectivity of a basic network.
- Define the OSI and TCP/IP Models.
- Define the advantages of different Network Layout Options.
- List the Physical and Data-Link Layers of the OSI and TCP/IP Models.
- Define the Network and Transport Layers of the OSI and TCP/IP Models.
- Define the Service Layers within the OSI and TCP/IP Model.
- Define the concept of Network Security.
- Identify standards organizations.

REQUISITE KNOWLEDGE
None

PREREQUISITES
None
COURSE OVERVIEW
The purpose of this course is to present a high level overview of the RF site design and construction process, in line with the guidelines listed in Motorola Solutions’ Standards and Guidelines for Communication Sites (R56) manual.

TARGET AUDIENCE
Technicians who need an introduction to the R56 processes.

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Describe the site design and development tasks needed to meet R56 requirements.
• Describe the building and shelter design and installation tasks needed to meet R56 requirements.
• Identify the proper external and internal grounding tasks needed to meet R56 requirements.
• Identify transient voltage surge suppression needs that meet R56 requirements.
• Minimize the impact of RF Site Interference, in line with R56 requirements.
• Identify the equipment installation tasks needed to meet R56 requirements.

REQUISITE KNOWLEDGE
None

PREREQUISITES
None

This course will cover all updates to the R56 Standards and Guidelines for Communication Sites and is intended for individuals who have recently completed, or need to re-certify their R56 certification. It will provide insight and understanding on the changes and their impact on the documented standard. This course is offered as Virtual Instructor sessions. Please ensure you have a computer with video enabled to participate in the course session and ask questions.

This course is designed to present the standards and guidelines for installing a Motorola Solutions communication system. Participants will understand how a properly installed system can help to ensure a safe and efficient communications system, reducing system down time. All students are encouraged to download the Preparation Guide.

TARGET AUDIENCE
Technical System Managers and Technicians

COURSE OBJECTIVES
After completing this course, the student will be able to:
• List the purposes of grounding and evaluate their importance in terms of personal safety and effective system installation and protection
• Apply principles of basic electronics to the installation standards found in the R56 manual
• Determine how an effectively installed ground system provides protection for a communication system from a lightning strike or electrical anomalies
• List the minimum requirements and specifications for the external and internal ground system
• List the minimum requirements and specifications for installation equipment, cables and documentation for a reliable communication system installation
• Investigate sources for possible solutions to various installation scenarios

REQUISITE KNOWLEDGE
Individuals must hold a valid R56 or CSIA certification or have completed all necessary coursework prior to attending this course.

PREREQUISITES
None
RADIO SOLUTIONS FOUNDATIONAL

For general information contact the North America Training Services help desk at:
(800) 247-2346, option 4 or training.na@motorolasolutions.com

LEARNING.MOTOROLASOLUTIONS.COM

For information on prerequisites and to register for courses visit the LXP at:

SERVER AND VIRTUALIZATION FOUNDATION

COURSE OVERVIEW
This course will prepare students to install a server and understand the basics of supported virtualization application. The course covers BIOS configuration, installing supported virtualization applications, installing a client and server OS and verifying operations. The course includes hands-on lab exercises.

TARGET AUDIENCE
Technical Support Staff who need to understand virtual servers or install servers that utilize Virtual Machines (VM).

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Configure BIOS parameters for server hardware
• Demonstrate basic knowledge of supported virtualization application, including capacity
• Install supported virtualization application on a server platform
• Configure supported virtualization application parameters of supported server hardware
• Install a Client OS and Server OS in a virtual environment
• Verify Server/Client operations in a virtual environment

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
• Comp-TIA Server+ Certification or equivalent

PREREQUISITES
None

COMMUNICATION SYSTEMS CONCEPTS

COURSE OVERVIEW
This course emphasizes the concepts behind RF Systems theory and operation. Major topics covered include:
• RF System Operation, including talkaround, repeater operation, and types of signaling used in RF Systems
• A basic walkthrough of building a communication system from Simplex, to Half Duplex, Voting Systems, and Simulcast is done, emphasizing the improvements in communication obtained with each step.
• Trunking Operation, including Smartzone operation
• Types of modulation used in RF System operation, including ASTRO®
• Radio frequency path including the antenna and transmission line
• Decibels and their uses on the job
• RF Propagation/RF Interference
• Basic Troubleshooting practices from the system perspective

TARGET AUDIENCE
Individuals who are interested in the operational concepts driving modern communication systems.

COURSE OBJECTIVES
Upon completing this course, the student will be able to:
• Define terms commonly used in two-way communication systems
• Effectively use two-way radio communication systems knowledge to troubleshoot typical two-way communication radio systems
• Develop requirements for a two-way radio system by establishing programming and protocol requirements as requested
• Improve skills in the interpretation of typical two-way radio checks of the receiver, transmitter and the antenna system to troubleshoot a two-way radio communication system
• Use decibels to interpret the radio frequency path and antenna system to describe expected radio communication system performance and troubleshooting

REQUISITE KNOWLEDGE
• Knowledge of basic electronics
• Experience using standard communication test equipment

PREREQUISITES
None

NETWORKING ESSENTIALS IN MOTOROLA SOLUTIONS COMMUNICATIONS EQUIPMENT

COURSE OVERVIEW
The Networking Essentials in Motorola Solutions Communications Equipment course provides the technician with the essential elements of networking required for the installation and maintenance of most Motorola Solutions communications systems. The course includes ample hands-on and basic troubleshooting on network elements.

TARGET AUDIENCE
System Technicians

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Recall basic network terminology
• Compare basic configuration types, both logical and physical
• Describe the basic OSI (Open System Interconnect) model compared with the TCP/IP model
• Construct a basic LAN with a Windows Server Domain Controller and workstations
• Examine the interaction between the routers through their configurations
• Use common network commands to simulate traffic and validate connectivity and routing

REQUISITE KNOWLEDGE
Completion of the following courses or equivalent experience is highly recommended:
• An understanding of basic Motorola Communications Systems
• Basic familiarization with computer operating systems
• Basic knowledge of networking (RDS0003 - Basic Networking)

PREREQUISITES
None
RADIO SOLUTIONS FOUNDATIONAL

For general information contact the North America Training Services help desk at:
(800) 247-2346, option 4 or training.na@motorolasolutions.com

 COURSE OVERVIEW
This course is designed to bring Technicians from different technical backgrounds and experience levels to a common starting point for the ASTRO® 25 curriculum. This course provides seven modules from the basic concepts of radio communication systems and computer networking features, through the evolution that led to the ASTRO® 25 trunking system’s architecture.

TARGET AUDIENCE
This course is intended for System Technicians, and other ASTRO® 25 system users who are new to trunked radio systems. Also those with experience in non-IP-based radio systems like SmartNet and SmartZone.

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Explain the different radio system concepts as applied to conventional and trunked systems
• Compare analog radio communication signaling to ASTRO® 25 radio communications signaling
• Identify different communication concepts using representative block diagrams of the respective systems
• Compare radio system communication concepts using representative block diagrams of the respective systems
• Compare how voice and data information flows through different radio communication system types, and how the signaling information controls that flow of information
• Describe the features of each radio communication system in terms of advantages and disadvantages

REQUISITE KNOWLEDGE
None

PREREQUISITES
None

COURSE OVERVIEW
This course is designed to bring Administrators from different technical backgrounds and experience levels to a common starting point for the ASTRO® 25 curriculum. This course provides five modules from the basic concepts of radio communication systems and computer networking features, through the evolution that led to the ASTRO® 25 trunking system’s architecture.

TARGET AUDIENCE
This is targeted for System Administrators and other ASTRO® 25 system users who are new to trunked radio systems. Also those with experience in non-IP-based radio systems like SmartNet and SmartZone.

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Identify different communication concepts using representative block diagrams of the respective systems
• Compare radio system communication concepts using representative block diagrams of the respective systems
• Compare how voice and data information flows through different radio communication system types, and how the signaling information controls that flow of information
• Describe the features of each radio communication system in terms of advantages and disadvantages
• Explain the Trunked Radio System Concepts

REQUISITE KNOWLEDGE
None

PREREQUISITES
None

The ASTRO® 25 Systems Applied Networking course provides technicians with the necessary networking information required for understanding the network components installed in modern Motorola communications systems. The course includes familiarization with basic networking concepts, and the networking components deployed in the ASTRO® 25 System.

TARGET AUDIENCE
Technical System Managers and Technicians

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Define basic IP network concepts, hardware and protocols.
• Describe the LAN topologies for the ASTRO® 25 system.
• Describe the WAN topologies for the ASTRO® 25 system.
• Identify the current and legacy network components such as switches and routers.
• Perform backup, restore, and recovery procedures of routers and LAN switches.
• Analyze basic IP network connectivity and addressing.
• Define ASTRO® 25 Master Site VLAN/VRRP operation.
• Define ASTRO® 25 Network Transport Subsystem.
• Describe the various ASTRO® 25 Network Management applications.
• Identify network security components and concepts in an ASTRO® 25 system.
• Diagram SNMP deployment throughout the system.

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
• NST762 Networking Essentials in Motorola Communications Systems

PREREQUISITES
None
COURSE OVERVIEW
The MOTOTRBO™ Systems Applied Networking provides technicians with the necessary information required for understanding the typical networking requirements for implementing a variety of MOTOTRBO™ solutions. The course includes familiarization/review of basic networking concepts and MOTOTRBO™-specific networking requirements. This course will focus on specific configurations for IP Site Connect, Linked Capacity Plus, and Connect Plus trunking systems.

TARGET AUDIENCE
Technical System Managers and Technicians

COURSE OBJECTIVES
After completing this course, the student will be able to:
- Recall Basic Networking Concepts
- Identify recommended network components for MOTOTRBO™ systems
- Define LAN/WAN topologies for MOTOTRBO™ systems
- Perform backup, restore and recovery of recommended network components
- Identify network security concepts for MOTOTRBO™ systems

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
- NST762 Networking Essentials in Motorola Solutions Communications Equipment

PREREQUISITES
None
<table>
<thead>
<tr>
<th>Course Name</th>
<th>Code</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTRO® 25 IV&amp;D SYSTEM OVERVIEW</td>
<td>AST1038</td>
<td>30</td>
</tr>
<tr>
<td>ASTRO® 25 IV&amp;D SYSTEM CORE WORKSHOP</td>
<td>AST4103</td>
<td>30</td>
</tr>
<tr>
<td>ASTRO® 25 IV&amp;D CONVENTIONAL RF SITE WORKSHOP</td>
<td>AST4440</td>
<td>30</td>
</tr>
<tr>
<td>ASTRO® 25 IV&amp;D CONVENTIONAL CORE WITH CONFIGURATION MANAGER WORKSHOP</td>
<td>AST4410</td>
<td>31</td>
</tr>
<tr>
<td>ASTRO® 25 IV&amp;D RADIO SYSTEM ADMINISTRATOR WORKSHOP</td>
<td>AST4102</td>
<td>31</td>
</tr>
<tr>
<td>ASTRO® 25 SYSTEMS FLEETMAPPING</td>
<td>RDS1017V</td>
<td>31</td>
</tr>
<tr>
<td>ASTRO® 25 SECURITY PATCH MANAGEMENT</td>
<td>AST2001V</td>
<td>32</td>
</tr>
<tr>
<td>ASTRO® 25 RADIO AUTHENTICATION</td>
<td>AST2038</td>
<td>32</td>
</tr>
<tr>
<td>ASTRO® 25 IV&amp;D SECURE COMMUNICATIONS WORKSHOP</td>
<td>AST4207</td>
<td>32</td>
</tr>
<tr>
<td>ASTRO® 25 IV&amp;D IP BASED DIGITAL SIMULCAST WORKSHOP</td>
<td>AST4217</td>
<td>33</td>
</tr>
<tr>
<td>ASTRO® 25 IV&amp;D GTR 8000 REPEATER SITE WORKSHOP</td>
<td>AST4208</td>
<td>33</td>
</tr>
<tr>
<td>STANDALONE GTR 8000 CONVENTIONAL BASE RADIO</td>
<td>AST2006</td>
<td>33</td>
</tr>
<tr>
<td>ASTRO® 25 DOMAIN CONTROLLER ADMINISTRATION</td>
<td>AST2015</td>
<td>34</td>
</tr>
<tr>
<td>INTELLIGENT MIDDLEWARE 5.2 OPERATION AND ADMINISTRATION</td>
<td>RDS2025</td>
<td>34</td>
</tr>
<tr>
<td>ASTRO® 25 ISSI 8000 / CSSI 8000 FEATURE OVERVIEW</td>
<td>AST2005</td>
<td>34</td>
</tr>
<tr>
<td>ASTRO® 25 IV&amp;D DYNAMIC SYSTEM RESILIENCE</td>
<td>ACS715023</td>
<td>35</td>
</tr>
<tr>
<td>Course Title</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>ASTRO® 25 IV&amp;D ENHANCED TELEPHONE INTERCONNECT (ACS715480)</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>SYSTEM OVERVIEW FOR ASTRO® 25 IV&amp;D INFORMATION ASSURANCE (ACS715211)</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>ASTRO® 25 INFORMATION ASSURANCE WORKSHOP (AST0071)</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>INTRODUCTION TO KVL 5000 (AST0067)</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>ASTRO® 25 CUSTOMER ENTERPRISE NETWORK WORKSHOP (AST0072)</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>MOSCAD NFM/SDM MAINTENANCE AND PROGRAMMING (FXD010)</td>
<td>37</td>
<td></td>
</tr>
</tbody>
</table>
ASTRO® 25 IV&D RADIO SYSTEM ADMINISTRATOR

**M CORE**

ASTRO® 25 IV&D SYSTEM OVERVIEW

2.5 HRS

AST1038

**L CORE**

ASTRO® 25 IV&D RADIO SYSTEM ADMINISTRATOR WORKSHOP

4.5 DAYS

AST4102

RECOMMENDED CURRICULUM IS COMPLETE

PARTICIPANT SHOULD BE ABLE TO CARRY OUT ADMINISTRATIVE TASKS IN THE ASTRO® 25 IV&D SYSTEM SUCH AS: PROVISIONING SUBSCRIBERS AND TALK GROUPS, GENERATING HISTORICAL REPORTS, CONTROLLING DEPLOYED SUBSCRIBERS AND MANAGING NETWORK ELEMENT CONFIGURATIONS.

PARTICIPANT UNDERSTANDS FACTORS OF SYSTEM CONFIGURATION THAT IMPACT ASTRO® 25 SYSTEM MANAGEMENT.

OPTIONAL TRAINING ROADMAP

OPTIONAL TRAINING ROADMAP AVAILABLE. CLICK ON THIS LINK TO GO TO PAGE 29 FOR ADDITIONAL DETAILS.
ASTRO® 25 IV&D M/L CORE TECHNICIAN

M CORE

ASTRO® 25 IV&D SYSTEM OVERVIEW

2.5 HRS

AST1038

L CORE

ASTRO® 25 IV&D SYSTEM CORE WORKSHOP

4.5 DAYS

AST4103

RECOMMENDED CURRICULUM IS COMPLETE

PARTICIPANT SHOULD UNDERSTAND ASTRO® 25 M CORE COMPONENTS, VIRTUAL SERVERS AND SERVICE STRATEGY. PARTICIPANT CAN INTERPRET SYSTEM ALARMS, PROPOSE SOLUTIONS FOR SYSTEM FAILURES, AND AS WELL AS RESTORING EQUIPMENT TO PROPER FUNCTIONALITY.

OPTIONAL TRAINING ROADMAP

OPTIONAL TRAINING ROADMAP AVAILABLE. CLICK ON THIS LINK TO GO TO PAGE 29 FOR ADDITIONAL DETAILS.
**ASTRO® 25 IV&D REPEATER SITE TECHNICIAN (GTR)**

- **ASTRO® 25 IV&D SYSTEM OVERVIEW**
  - 2.5 HRS
  - AST1038

- **ASTRO® 25 IV&D GTR 8000 REPEATER SITE WORKSHOP**
  - 3 DAYS
  - AST4208

**RECOMMENDED CURRICULUM IS COMPLETE**

- Participant can maintain an ASTRO® 25 repeater site including: GTR 8000 base station, GCP8000 site controller and other site equipment.
- *Participant performs alignments troubleshooting and field replacement of site devices during course.

**OPTIONAL TRAINING ROADMAP**

Optional training roadmap available. Click on this link to go to page 29 for additional details.
ASTRO® 25 IV&D IP SIMULCAST SITE TECHNICIAN

M CORE

ASTRO® 25 IV&D SYSTEM OVERVIEW
2.5 HRS

AST1038

L CORE

ASTRO® 25 IV&D IP BASED DIGITAL SIMULCAST WORKSHOP
3 DAYS

AST4217

RECOMMENDED CURRICULUM IS COMPLETE
PARTICIPANT SHOULD BE ABLE TO MAINTAIN AN ASTRO® 25 REPEATER SITE INCLUDING THE GTR 8000 BASE STATION, GCP8000 SITE CONTROLLER, SITE COMPARATOR AND OTHER SITE EQUIPMENT.

OPTIONAL TRAINING ROADMAP
OPTIONAL TRAINING ROADMAP AVAILABLE. CLICK ON THIS LINK TO GO TO PAGE 29 FOR ADDITIONAL DETAILS.
ASTRO® 25 IV&D CONVENTIONAL RF SITE TECHNICIAN

M CORE

ASTRO® 25 IV&D SYSTEM OVERVIEW
2.5 HRS AST1038

L CORE

ASTRO® 25 IV&D CONVENTIONAL RF SITE WORKSHOP
3 DAYS AST4440

RECOMMENDED CURRICULUM IS COMPLETE
PARTICIPANT SHOULD BE ABLE TO MAINTAIN AN ASTRO® 25 REPEATER SITE INCLUDING THE GTR 8000 BASE STATION, GCP8000 SITE CONTROLLER, SITE COMPARATOR AND OTHER SITE EQUIPMENT.
ASTRO® IV&D OPTIONAL TRAINING CURRICULUM

Motorola Solutions offers optional training for those participants who have completed their ASTRO® 25 curriculum and want to learn more about their system’s infrastructure and/or features.

Select the training course below applicable to your system.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Duration</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTRO® 25 IV&amp;D Dynamic System Resilience</td>
<td>2 HRS</td>
<td>ACS715023</td>
</tr>
<tr>
<td>ASTRO® 25 IV&amp;D Information Assurance</td>
<td>2 HRS</td>
<td>ACS715211</td>
</tr>
<tr>
<td>ASTRO® 25 IV&amp;D Enhanced Telephone Interconnect</td>
<td>2 HRS</td>
<td>ACS715480</td>
</tr>
<tr>
<td>ASTRO® 25 Security Patch Management</td>
<td>20 HRS</td>
<td>AST2001V</td>
</tr>
<tr>
<td>ASTRO® 25 Systems Fleet Mapping</td>
<td>15 HRS</td>
<td>RDS1017V</td>
</tr>
<tr>
<td>ASTRO® 25 Systems Domain Controller Administration</td>
<td>3 DAYS</td>
<td>AST2015</td>
</tr>
<tr>
<td>Information Assurance Workshop</td>
<td>4.5 DAYS</td>
<td>AST0071</td>
</tr>
<tr>
<td>Radio Authentication</td>
<td>2 DAYS</td>
<td>AST2038</td>
</tr>
</tbody>
</table>

SUBSCRIBER OPTIONAL TRAINING CURRICULUM

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Duration</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>APX™ CPS Programming and Template Building</td>
<td>5X2.5 HRS/2 DAYS</td>
<td>APX7001V</td>
</tr>
<tr>
<td>APX™ Technical Subscriber Academy</td>
<td>4.5 DAYS</td>
<td>APX010</td>
</tr>
<tr>
<td>APX™ Radio Management Workshop</td>
<td>2.5 DAYS</td>
<td>RDS2017</td>
</tr>
<tr>
<td>ISSI 8000 / CSSI 8000 Feature Overview</td>
<td>2 HRS</td>
<td>AST2005</td>
</tr>
</tbody>
</table>
RADIO SOLUTIONS ASTRO® 25 IV&D SYSTEMS

For general information contact the North America Training Services help desk at:
(800) 247-2346, option 4 or training.na@motorolasolutions.com

LEARNING.MOTOROLASOLUTIONS.COM

COURSE OVERVIEW
The ASTRO® 25 IV&D System Overview course will provide participants with knowledge and understanding of the ASTRO® 25 IV&D system. This course will address M, L and K Core systems. System architecture, components and features will be explained. In addition, RF and console sites and their architecture, features and components will be discussed. Finally, call processing for voice and mobile data applications will be covered, and an introduction to applications available in the ASTRO® 25 system will be provided.

TARGET AUDIENCE
Core Technicians, Site Technicians, Console Technicians, Core Managers.

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Understand the general architecture of an ASTRO® 25 IV&D Radio System
• Understand key features of available in the ASTRO® 25 IV&D Radio System
• Understand the components of the ASTRO® 25 Zone Core
• Understand site components in the ASTRO® 25 system
• Understand the features, capabilities and components of the MCC7000 series dispatch consoles
• Understand concepts of Mobility and Call Processing in the ASTRO® 25
• Understand the applications for managing the ASTRO® 25 system

REQUISITE KNOWLEDGE
None

PREREQUISITES
None

COURSE OVERVIEW
The ASTRO® 25 IV&D with ASTRO® 25 System Core course teaches advanced troubleshooting skills and best practices for the Trunked Large Systems. The course also focuses on gathering and analyzing system information to implement appropriate action(s) that return a system to full operational status.

TARGET AUDIENCE
ASTRO® 25 System Core Master Site Technicians

COURSE OBJECTIVES
After completing this course, the participant will be able to:
• Describe the ASTRO® 25 System architecture.
• Identify the functional and radio subsystems that comprise the ASTRO® 25 System.
• Explain and discuss call flow and data flow through Large System Core devices and their subsystems.
• Perform recommended routine maintenance procedures for the ASTRO® 25 Large System Core.
• Utilize the troubleshooting tools to diagnose a fault and restore the Large System Core to the level of the Motorola-supported service strategy.

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
• Bridging the Knowledge Gap (ACT100E or ACT101E)
• Networking Essentials in Communication Equipment (NST762)
• ASTRO® 25 Systems Applied Networking (NWT003)
• ASTRO® 25 IV&D System Overview (AST1038)

PREREQUISITES
None

COURSE OVERVIEW
The ASTRO® 25 IV&D Conventional RF Site workshop describes the components in the different ASTRO® 25 IV&D Conventional RF Sites topologies. This course also presents how the different ASTRO® 25 IV&D Conventional RF Sites topologies operate and explains the tools and methods available for troubleshooting components within the different ASTRO® 25 IV&D Conventional RF Sites topologies.

TARGET AUDIENCE
System Technicians

COURSE OBJECTIVES
After completing this course, the participant will be able to:
• Understand key physical and functional characteristics of conventional site.
• Perform tasks necessary to install conventional site components.
• Perform configuration steps for conventional site components.
• Understand available maintenance tools and indicators in conventional site.

REQUISITE KNOWLEDGE
Completion of the following courses or equivalent experience:
• Bridging the Knowledge Gap – System Administrators (ACT101E)
• Networking Essentials in Motorola Communications Equipment (NST762)
• ASTRO® 25 System Applied Networking (NWT003)
• ASTRO® 25 IV&D System Overview (AST1038)

PREREQUISITES
None
COURSE OVERVIEW
The ASTRO® 25 IV&D Conventional Core with Configuration Manager workshop teaches advanced troubleshooting skills and best practices for the ASTRO® 25 IV&D Conventional Core with Configuration Manager. It also focuses on administrator functions and how to use the ASTRO® 25 IV&D Configuration Manager applications. A technical introduction to the MCC 7500 as used within the ASTRO® 25 IV&D Conventional Core with Configuration Manager, including some administrator functions, is also provided. Learning activities focus on gathering and analyzing system information to implement the appropriate actions that return a system to full operational status.

TARGET AUDIENCE
Master Site Technicians, System Administrators, Technical System Administrators, System Technicians, and other Application Users

COURSE OBJECTIVES
After completing this course, the student will be able to:
- Understand the key physical and functional characteristics of the ASTRO® 25 Conventional Core with Configuration Manager system.
- Perform tasks necessary to install the ASTRO® 25 Conventional Core with Configuration Manager system components.
- Perform configuration steps for the ASTRO® 25 Conventional Core with Configuration Manager system components.
- Understand the available maintenance tools and indicators in the ASTRO® 25 Conventional Core with Configuration Manager system.

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
- Bridging the Knowledge Gap — System Administrators (ACT101E)
- Networking Essentials in Motorola Communications Equipment (NST762)
- ASTRO® 25 System Applied Networking (NWT003)
- ASTRO® 25 IV&D System Overview (AST1038)

PREREQUISITES
None
**COURSE OVERVIEW**
This workshop describes planning, installation, configuration, operations, and troubleshooting of Secure Communications within the ASTRO® 25 IV&D System.

**TARGET AUDIENCE**
System Technicians, System Administrators, Technical System Managers

**COURSE OBJECTIVES**
After completing this course, the student will be able to:
- Plan, organize, and implement Secure Communications in an ASTRO® 25 IV&D system.
- Install and configure a Key Management Facility (KMF) system and related components.
- Demonstrate centralized key management using Over-the-Air-Rekeying (OTAR).
- Perform System Administrator functions using the KMF server and KMF client.
- Troubleshoot installation and configuration problems for the KMF server, KMF client, and KMF database.

**REQUISITE KNOWLEDGE**
Completion of the following courses or equivalent experience:
- ACT100E Bridging the Knowledge Gap - Technicians
- NST762 Networking Essentials in Communication Equipment

**PREREQUISITES**
None

---

**COURSE OVERVIEW**
This course describes the Radio Authentication feature and defines the HW/SW components in the Radio Authentication system. In addition the course describes the Radio Authentication process, discusses the various Keys used in Radio Authentication. The students will understand how to provision and distribute relevant Keys using the AuC Client GUI to access the AuC Server. Students will understand how to enable Radio Authentication in the System via the AuC Client and how to configure the KVL 4000 for Radio Authentication and manage subscribers from the AuC Client.

**TARGET AUDIENCE**
Customer Administrators or Technicians.

**COURSE OBJECTIVES**
After completing this course, the student will be able to:
- Describe Radio Authentication features and HW/SW components
- Describe the Radio Authentication process. Discuss the Keys used in Radio Authentication
- Provision and Distribute relevant Keys. Describe the AuC Client GUI
- Enable Radio Authentication in the System. Configure the KVL 4000 for Radio Authentication
- Manage Subscribers from the AuC Client. Discuss Radio Authentication functionality in a DSR system

**REQUISITE KNOWLEDGE**
Completion of the following course(s) or equivalent experience:
- AAE1400 Radio Authentication e-learning course.
- Radio System Administration or equivalent knowledge of the Provisioning Manager, ZoneWatch, Historical Reports, ATIA Log Viewer, Unified Event Manager (UEM), Unified Network Configurator (UNC).

**PREREQUISITES**
Access to customer ASTRO® 25 Radio System, AuC Server/Client is required. Customer to provide working Motorola Solutions’ portable radio(s) capable of placing calls on the System, access to working AuC client/server along with admin login credentials, access to a working KVL4000 key loader that can upload keys to the AuC server.

---

**COURSE OVERVIEW**
This virtual classroom training will provide Motorola ASTRO® 25 Land Mobile Radio (LMR) system administrators the information needed to access and patch their Radio Network Infrastructure, update Anti-Malware definitions and collect log files.

**TARGET AUDIENCE**
Zone Core Master Site Technicians

**COURSE OBJECTIVES**
After completing this course, the student will be able to:
- Inventory LMR assets (Asset Inventory).
- Successfully access servers in the Zone Core.
- Successfully patch Radio Network Infrastructure.
- Update Anti-Malware Definitions for their Radio Network Infrastructure.
- Collect critical MS Windows and RHEL log files.

**REQUISITE KNOWLEDGE**
None

**PREREQUISITES**
AST4103 ASTRO® 25 IV&D System Core Workshop
COURSE OVERVIEW
The ASTRO® 25 IV&D IP Based Digital Simulcast workshop provides an understanding of the components that comprise the ASTRO® 25 IV&D IP Simulcast subsystem, and how they operate in conjunction with each other. The workshop also explains the tools and methods available for troubleshooting components within the IP Based Simulcast subsystem.

TARGET AUDIENCE
Simulcast Site Technicians

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Recognize the flow of message and control data within an ASTRO® 25 IV&D IP Digital Simulcast subsystem
• Identify the major components and connections within an ASTRO® 25 IV&D IP Digital Simulcast subsystem prime and remote sites
• Recognize how calls are processed within an ASTRO® 25 IV&D IP Digital Simulcast subsystem
• Perform maintenance and troubleshooting of select components in an ASTRO® 25 IV&D IP Digital Simulcast subsystem

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
• AST1038 ASTRO® 25 IV&D System Overview
• ACT100E Bridging the Knowledge Gap for ASTRO® 25 – Technician
• NST762 Networking Essentials in Communication Equipment
• NWT003 ASTRO® 25 Systems Applied Networking

PREREQUISITES
None

COURSE OVERVIEW
This workshop describes the components in the ASTRO® 25 IV&D System Repeater Site with GTR 8000 expandable site subsystem. This course also presents how the GTR 8000 expandable site subsystem operates and explains the tools and methods available for troubleshooting components within the subsystem.

TARGET AUDIENCE
GTR 8000 Site Technicians

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Describe the ASTRO® 25 IV&D Repeater Site with GTR 8000 Expandable Site Subsystem configurations and components.
• Identify the GCP 8000 Site Controller functions and configuration requirements.
• Describe the connections and interfaces to the GCP 8000.
• Diagnose and troubleshoot the GCP 8000.
• Describe the functionality of the GTR 8000 Expandable Site Subsystem.
• Configure and troubleshoot the ASTRO® 25 Repeater Site with GTR 8000 Expandable Site Subsystem.
• Configure and troubleshoot the Network Transport subsystem.

REQUISITE KNOWLEDGE
Completion of the following courses or equivalent experience:
• AST1038 ASTRO® 25 IV&D System Overview
• ACT101E Bridging the Knowledge Gap - Technicians
• NST762 Networking Essentials in Communication Equipment
• NWT003 ASTRO® 25 Systems Applied Networking

PREREQUISITES
None

COURSE OVERVIEW
This course is designed to give the participants the ability to align, troubleshoot and repair the Standalone GTR 8000 Base Station/Repeater to Motorola Solutions recommended service levels. Emphasis is placed on the use of Configuration Service Software (CSS) and its role in configuration, maintenance, diagnostics, alignments, and optimization of the Standalone GTR 8000 Base Radio/Repeater.

TARGET AUDIENCE
Maintenance Technicians

COURSE OBJECTIVES
Upon completing this course, the participant will be able to:
• Understand basic concepts of the various radio systems supported by the GTR 8000 Conventional Base Radio
• Identify the equipment modules of the GTR 8000 Conventional Base Radio
• Operate and perform routine maintenance on the GTR 8000 Conventional Base Radio
• Understand basic operational theory of GTR 8000 Conventional Base Radio components
• Configure the GTR 8000 Conventional Base Radio using Configuration Service Software (CSS)
• Identify the different backplane connections on the GTR 8000 Conventional Base Radio
• Perform calibration and alignment adjustments for the GTR 8000 Conventional Base Radio
• Troubleshoot problems and identify/replace faulty modules in the GTR 8000 Conventional Base Radio

REQUISITE KNOWLEDGE
General RF Knowledge and Skills Basic Knowledge of Two-Way Radio systems

PREREQUISITES
None
COURSE OVERVIEW
This workshop covers the administrator and management functions in the ASTRO® 25 Domain Controller and how these functions affect both users and computers in the ASTRO® 25 system. Learning activities in this course focus on how to use the Domain Controllers to authenticate, administer, and authorize users and devices in the ASTRO® 25 System. Group Policies and Organizational Units, RADIUS, and DNS structure will be addressed during this course.

TARGET AUDIENCE
System Administrators, Technical System Administrators and System Technicians

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Understand the Domain Controller server platform
• Understand the DNS Hierarchy in the ASTRO® 25 system
• Implement RADIUS authentication in applicable devices in an ASTRO® 25 system
• Use Active Directory to control users in the ASTRO® 25 system
• Understand Group Policy objects and how they impact users in the ASTRO® 25 Domain.

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
• ACT1038 ASTRO® 25 IV&D System Overview

PREREQUISITES
None
COURSE OVERVIEW
The ASTRO® 25 IV&D Dynamic System Resilience (DSR) Overview is a self-study training course intended to provide a technical overview of DSR. The course describes how DSR adds a geographically separate backup for the Master Site to protect against a catastrophic failure.

TARGET AUDIENCE
System Administrators, System Technicians, Field Technicians

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Differentiate between a non-DSR Master Site and a DSR Master Site
• Describe the DSR components, operation and functionality of each of the following services:
  – Voice
  – Data
  – Network Management
  – Network Transport
  – IP Services

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
• AST1038 ASTRO® 25 IV&D System Overview

PREREQUISITES
None
RADIO SOLUTIONS ASTRO® 25 IV&D SYSTEMS

For general information contact the North America Training Services help desk at:
(800) 247-2346, option 4 or training.na@motorolasolutions.com

For information on prerequisites and to register for courses visit the LXP at:
LEARNING.MOTOROLASOLUTIONS.COM

COURSE OVERVIEW
Information Assurance (IA) refers to securing radio network access, protecting the privacy of network traffic using encryption, and assuring the integrity of data sent through the radio network or stored in the radio network. IA procedures and protocols offer FIPS-compliant techniques designed to harden the network.

In this workshop, IA features are applied to network transport equipment by configuring switches, routers, and firewalls in the classroom. Site level, and zone core IA features are illustrated on the customer system or, by remotely accessing the Motorola Solutions ASTRO® 25 system.

TARGET AUDIENCE
This course is intended for those who need to learn the characteristics and capabilities of ASTRO® 25 Systems using Information Assurance Features - Technicians and Administrators who need to maintain or administer Information Assurance-enabled ASTRO® 25 Systems.

COURSE OBJECTIVES
After completing this course you should be able to:
• Identify and describe the various Information Assurance (IA) features available in the ASTRO® 25 IVD network.
• Identify the system locations and scope of protection offered by IA features.
• Harden ASTRO® 25 networks using Information Assurance (IA) features.
• Configure and restore IA features on ASTRO® switches and routers.
• Configure site level IA features using the CSS or UNC.
• Manage zone core level IA features.
• Manage and check the configuration of firewalls in the ASTRO® 25 network.

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
• NWTO03 ASTRO® 25 Applied Networking
• AST4103 ASTRO® 25 IV&D System Core Workshop

PREREQUISITES
None

INTRODUCTION TO KVL 5000

INTRODUCTION TO KVL 5000

COURSE OVERVIEW
The purpose of this training is to provide an introduction to the Key Variable Loader 5000. The course covers procedures which help participants familiarize themselves with the device and guide them through its configuration process. Participants will learn about features of KVL 5000, managing of encryption keys, loading keys into target device, configuring target devices using KVL 5000, sharing keys between KVLs, using KVL in an OTAR system, and managing log records.

TARGET AUDIENCE
Technical Support Staff responsible for managing secure devices.

COURSE OBJECTIVES
At the end of this course, you will be able to:
• Perform initial configuration of the KVL 5000
• Manage encryption keys in the KVL 5000
• Load keys and key groups into target devices
• View or remove keys from target devices
• Share keys between KVLs
• Configure and use the KVL 5000 in an OTAR system
• Manage key records

REQUISITE KNOWLEDGE
None

PREREQUISITES
None

INTRODUCTION
INTRODUCTION

INTRODUCTION

INTRODUCTION

RADIO SOLUTIONS ASTRO® 25 CUSTOMER ENTERPRISE NETWORK WORKSHOP

RADIO SOLUTIONS ASTRO® 25 CUSTOMER ENTERPRISE NETWORK WORKSHOP

COURSE OVERVIEW
This course describes the Customer Network Interface (CNI) between the Motorola ASTRO® 25 Radio Network Infrastructure (RNI) and certified Customer Enterprise Network (CEN) Architectures and discusses the protocols and infrastructure components that support the RNI-DMZ CEN and the Control Room CEN.

TARGET AUDIENCE
This course is intended for those who need to learn the characteristics and capabilities of ASTRO® 25 Customer Enterprise Networks - Technicians and Administrators who need to maintain or administer Customer Enterprise Networks within ASTRO® 25 Systems.

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Discuss ASTRO® 25 certified architectures used to support the interface between the Radio Network Infrastructure and the Customer Enterprise Network.
• Understand how to administer and configure FortiGate firewall objects and policies to support the CNI.
• Discuss NAT and how Network Address Translation is used to support the CNI.
• Understand Layer 2 and Layer 3 network protocols used to support the CNI.

REQUISITE KNOWLEDGE
None

PREREQUISITES
None
COURSE OVERVIEW
The MOSCAD Network Fault Management (NFM) course covers the programming, maintenance and operation of the:
- Site Device Manager Unit (SDM)3000 Remote Terminal Unit (RTU)
- SDM3000 Network Translator (SNT)
- IP Gateway
- Graphic Master Computer (GMC)

The course focuses on a detailed discussion of the different types of Network Fault Management systems, SDM3000 RTU hardware, hands-on activities with programming the RTUs, Attach Site Builder Applications for Tag Generation, Generating Tags and Files, navigating with the web browser features and the Graphic Master Computer.

TARGET AUDIENCE
System Managers, Service Technicians, Motorola Service Center, End Users

COURSE OBJECTIVES
After completing this course, the participant will be able to:
- Install NFM SDM3000 builder software on students laptops
- Configure alarm points using SDM3000 builder
- Generate Tags and Files to import alarm tags
- Navigating and acknowledging alarms at the Graphic Master Computer
- Utilize the web browser features to view and configure the system
- Create Custom Tabs
- Create Custom Maps

REQUISITE KNOWLEDGE
- A basic understanding of Windows navigation
- Laptop computer with Windows XP
- Windows program files must be on the “C” directory

PREREQUISITES
None
MCC 7000 SERIES DISPATCH CONSOLES WORKSHOP (CON012) focuses on the consoles application in an M- or L-core system.
CONSOLES TECHNICAL TRAINING CURRICULUM

ASTRO® 25 IV&D SYSTEM OVERVIEW
2.5 HRS AST1038

MCC 7000 SERIES DISPATCH CONSOLES WORKSHOP
4.5 DAYS CON012

CURRICULUM COMPLETE
PARTICIPANT CAN MAINTAIN A MCC 7000 DISPATCH CONSOLE SITE INCLUDING: CONSOLE PC, VPM, CC GW’S AND AUX I/O SERVERS.
*PARTICIPANT PERFORMS TROUBLESHOOTING AND REPLACEMENT OF SITE DEVICES DURING COURSE.

OPTIONAL CONSOLE TRAINING

MCD 5000 TECHNICAL WORKSHOP
3 DAYS RDS1022

ASTRO® 25 IV&D DOMAIN CONTROLLER ADMINISTRATION
3 DAYS AST2015
## COURSE OVERVIEW

The ASTRO® 25 IV&D System Overview course will provide participants with knowledge and understanding of the ASTRO® 25 IV&D system. This course will address M, L and K Core systems. System architecture, components and features will be explained. In addition, RF and console sites and their architecture, features and components will be discussed. Finally, call processing for voice and mobile data applications will be covered, and an introduction to applications available in the ASTRO® 25 system will be provided.

### TARGET AUDIENCE

Core Technicians, Site Technicians, Console Technicians, Core Managers.

### COURSE OBJECTIVES

After completing this course, the student will be able to:

- Understand the general architecture of an ASTRO® 25 IV&D Radio System
- Understand key features of available in the ASTRO® 25 IV&D Radio System
- Understand the components of the ASTRO® 25 Zone Core
- Understand site components in the ASTRO® 25 system
- Understand the features, capabilities and components of the MCC7000 series dispatch consoles
- Understand concepts of Mobility and Call Processing in the ASTRO® 25
- Understand the applications for managing the ASTRO® 25 system

### REQUISITE KNOWLEDGE

Completion of the following course(s) or equivalent experience:

- AST1038 ASTRO® 25 IV&D System Overview

### PREREQUISITES

None

---

## COURSE OVERVIEW

This workshop covers the administration and management functions in the ASTRO® 25 Domain Controller and how these functions affect both users and computers in the ASTRO® 25 system. Learning activities in this course focus on how to use the Domain Controllers to authenticate, administer, and authorize users and devices in the ASTRO® 25 System. Group Policies and Organizational Units, RADIUS, and DNS structure will be addressed during this course.

### TARGET AUDIENCE

System Administrators, Technical System Administrators and System Technicians

### COURSE OBJECTIVES

After completing this course, the student will be able to:

- Understand the Domain Controller server platform
- Understand the DNS Hierarchy in the ASTRO® 25 system
- Implement RADIUS authentication in applicable devices in an ASTRO® 25 system.
- Use Active Directory to control users in the ASTRO® 25 system.
- Understand Group Policy objects and how they impact users in the ASTRO® 25 Domain.

### REQUISITE KNOWLEDGE

Completion of the following course(s) or equivalent experience:

- AST1038 ASTRO® 25 IV&D System Overview

### PREREQUISITES

None
COURSE OVERVIEW
This workshop supports those that install, configure, or support the MCD 5000 Deskset. This three day training course will cover installation procedures for the MCD5000 Deskset, Radio Gateway Unit (RGU), and connectivity to different station types. Configuration and programming of the MCD5000 and its supporting equipment will be covered through discussion and hands-on lab activities. Troubleshooting and maintenance techniques will be addressed to the Motorola Solutions recommended service level.

TARGET AUDIENCE
MCD 5000 Technicians

COURSE OBJECTIVES
By the end of the course, you will be able to:
• Identify the MCD 5000 System components and functions.
• Install MCD 5000 Deskset.
• Install Radio Gateway Units.
• Configure MCD 5000 subcomponents.
• Troubleshoot the MCD 5000 System to Motorola Solutions recommended service levels.

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
• NST021 Communication Systems Concepts

PREREQUISITES
None
## APX™ Subscriber Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>APX™ CPS Programming and Template Building (APX7001V)</td>
<td>43</td>
</tr>
<tr>
<td>APX™ Technical Subscriber Academy (APX010)</td>
<td>43</td>
</tr>
<tr>
<td>APX™ Radio Management Workshop (RDS2017)</td>
<td>43</td>
</tr>
<tr>
<td>APX™ Radio Management Overview (AST2003)</td>
<td>44</td>
</tr>
</tbody>
</table>
COURSE OVERVIEW
The APX CPS Programming and Template Building course provides communications management personnel and technicians with the knowledge and training necessary to build templates and program the APX family of radios in the most efficient way possible. Supplemental videos for this VILT course can be seen by enrolling in RDS1018 and RDS1019 in the LXP.

TARGET AUDIENCE
Radio Technicians, System Managers

COURSE OBJECTIVES
By the end of the course, you will be able to:
- Build the APX family of programming templates using the APX CPS programming Software
- Program the specific parameters related to the various system types in which the subscriber unit will operate: Conventional, Single Site trunking, Simulcast, SmartZone or ASTRO® 25 IV&D TDMA and ASTRO® 25 IV&D x2.
- Demonstrate knowledge of the APX CPS navigation, tools, options and features that make efficient programming of the radio possible.
- Demonstrate a complete understanding of the various APX CPS programming efficiency tools, such as: Cloning, drag and drop, Codeplug Comparison tool, radio Flashing, Advance System Key Administrator, Codeplug Merging and many others.

REQUISITE KNOWLEDGE
Knowledge of the basic features and options of two-way radios and the basic concepts of trunking.

PREREQUISITES
None

COURSE OVERVIEW
Participants will learn the capabilities, features, and functions of the APX family of radios as well as how to correctly complete performance checks, radio alignments, disassembly/reassembly, maintenance, and troubleshooting. This Academy will also focus on a Level 2 (block-level) theory of operation for the APX family of radios and provide a review of APX CPS and Radio Management programming. In addition to the lecture, large amounts of hands on with scenario-based lab work will be used to reinforce knowledge transfer.

TARGET AUDIENCE
This course is intended for who would like to get familiar with the features, operation principles, troubleshooting steps and disassembly and reassembly of the APX family of radios.

COURSE OBJECTIVES
After completing this course, the student will be able to:
- Distinguish between the features and specifications of APX Portable and Mobile radios
- Verify the correct operation of the various radios within the APX family of subscribers by completing Performance Checks and Alignment procedures
- Disassemble and reassemble APX radios using the documented procedures
- Maintain and troubleshoot radios within the APX family of subscribers

REQUISITE KNOWLEDGE
Completion of the following courses or equivalent experience:
- NST021 Communication Systems Concepts
- APX7001V APX CPS Programming and Template Building Overview

PREREQUISITES
None
COURSE OVERVIEW
This course provides an overview of the features and functions of the APX™ series Radio Management software. Participants will learn what the Radio Management software is designed to do, and will also learn how to use it to program large and small groups of subscribers portfolio of systems.

TARGET AUDIENCE
Technicians and System Managers needing an understanding of the basics of the Radio Management application as well as database and fleet management.

COURSE OBJECTIVES
By the end of the course, you will be able to:
• Identify the solution that Radio Management provides
• Differentiate between All-in-One PC needs and Distributed Use needs regarding Radio Management
• Locate the APX Radio Management
• Navigate the APX Radio Management screens
• Populate the database
• Schedule a Read job
• Manage multiple APX radios simultaneously
• Create, modify, and select programming templates
• Schedule a Write job
• Conduct a search
• Search, sort, and group radios
• Sort and manage information in the Table view
• Identify the function of the Job view

REQUISITE KNOWLEDGE
None

PREREQUISITES
None
<table>
<thead>
<tr>
<th>Course Title</th>
<th>Course Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOTOTRBO™ SYSTEM INTRODUCTION FOR TECHNICIANS</td>
<td>CEDMEL2000</td>
</tr>
<tr>
<td>MOTOTRBO™ SYSTEMS APPLIED NETWORKING</td>
<td>PCT2007</td>
</tr>
<tr>
<td>MOTOTRBO™ RADIO MANAGEMENT 2.0 TEMPLATE MODE</td>
<td>PCT1026</td>
</tr>
<tr>
<td>MOTOTRBO™ RADIO MANAGEMENT 2.0 CONFIGURATION MODE</td>
<td>PCT1032</td>
</tr>
<tr>
<td>MOTOTRBO™ RADIO MANAGEMENT WORKSHOP</td>
<td>PCT2022</td>
</tr>
<tr>
<td>MOTOTRBO™ CPS 2.0 PROGRAMMING</td>
<td>PCT0115</td>
</tr>
<tr>
<td>MOTOTRBO™ NITRO SLN 1000 OVERVIEW</td>
<td>PCT0118</td>
</tr>
<tr>
<td>MOTOTRBO™ SUBSCRIBER AND REPEATER TECHNICAL SERVICE ACADEMY</td>
<td>TBO300</td>
</tr>
<tr>
<td>MOTOTRBO™ CAPACITY MAX TECHNICAL OVERVIEW</td>
<td>PCT1047</td>
</tr>
<tr>
<td>MOTOTRBO™ CAPACITY MAX THEORY OF OPERATION</td>
<td>PCT1046</td>
</tr>
<tr>
<td>MOTOTRBO™ CAPACITY MAX DESIGN AND DEPLOY</td>
<td>PCT2010</td>
</tr>
<tr>
<td>MOTOTRBO™ IP SITE CONNECT AND CAPACITY PLUS TECHNICAL OVERVIEW</td>
<td>PCT1066</td>
</tr>
<tr>
<td>MOTOTRBO™ IP SITE CONNECT AND CAPACITY PLUS THEORY OF OPERATIONS AND DESIGN</td>
<td>PCT2023</td>
</tr>
<tr>
<td>MOTOTRBO™ IP SITE CONNECT AND CAPACITY PLUS SYSTEMS WORKSHOP</td>
<td>PCT3014</td>
</tr>
</tbody>
</table>
MOTOTRBO™ TECHNICAL TRAINING CURRICULUM

**DO YOU UNDERSTAND IP?**

- YES
- NO

**CHOOSE YOUR SPECIALIZED SYSTEM TRAINING**

**CAPACITY MAX**

- **MOTOTRBO™ CAPACITY MAX TECHNICAL OVERVIEW**
  - 2 HRS
  - PCT1047

- **MOTOTRBO™ CAPACITY MAX THEORY OF OPERATION**
  - 1 HR
  - PCT1046

- **MOTOTRBO™ RADIO MANAGEMENT 2.0 CONFIGURATION MODE**
  - 1 HR
  - PCT1032

- **MOTOTRBO™ RADIO MANAGEMENT WORKSHOP**
  - 2 DAYS
  - PCT2022

- **MOTOTRBO™ DESIGN AND DEPLOY FOR CAPACITY MAX**
  - 4.5 DAYS
  - PCT2010

**IP SITE CONNECT, CAPACITY PLUS (SINGLE AND MULTI-SITE)**

- **MOTOTRBO™ IP SITE CONNECT AND CAPACITY PLUS TECHNICAL OVERVIEW**
  - 1.5 HRS
  - PCT1066

- **MOTOTRBO™ IP SITE CONNECT AND CAPACITY PLUS THEORY OF OPERATIONS AND DESIGN**
  - 1 DAY
  - PCT2023

- **MOTOTRBO™ IP SITE CONNECT AND CAPACITY PLUS SYSTEMS WORKSHOP**
  - 3.5 DAYS
  - PCT3014

**DO YOU HAVE MOTOTRBO™ EXPERIENCE?**

- YES
- NO

**MOTOTRBO™ SYSTEM INTRODUCTION FOR TECHNICIANS**

- 5X3 HRS
- CEDMEL2000

**CURRICULUM COMPLETE**

Participant should be able to describe the key characteristics of the system, describe the key configuration items in both subscribers and repeaters, program effective repeater and subscriber codeplug templates for the system, and describe the applicable IP networking requirements when designing a system.
MOTOTRBO™ TECHNICAL TRAINING CURRICULUM
FOR SUBSCRIBER/REPEATER MAINTENANCE TECHNICIAN

MOTOTRBO™ SYSTEM INTRODUCTION FOR TECHNICIANS
CEDMEL2000
5X3 HRS

MOTOTRBO™ SUBSCRIBER AND REPEATER TECHNICAL SERVICE ACADEMY
TBO300
3.5 DAYS

CURRICULUM COMPLETE
PARTICIPANT WILL LEARN THE COMMON MOTOTRBO™ FEATURES AND CAPABILITIES TO DESIGN AND DEPLOY MOTOTRBO™ SYSTEMS. PARTICIPANT SHOULD BE ABLE TO COMPLETE PERFORMANCE CHECKS, RADIO ALIGNMENTS, DISASSEMBLY/REASSEMBLY, MAINTENANCE, AND TROUBLESHOOTING OF VARIOUS MOTOTRBO™ RADIO TYPES.
RADIO SOLUTIONS MOTOTRBO™

For general information contact the North America Training Services Desk at:
(800) 247-2346, option 4 or training.na@motorolasolutions.com

LEARNING.MOTOROLASOLUTIONS.COM

COURSE OVERVIEW
This is an introductory course to the MOTOTRBO system theory of operation, key components and topologies. MOTOTRBO System Introduction for Technicians provides all the basic information about common MOTOTRBO features and capabilities, along with system design and deploy principles. Upon successfully completing this course, individuals should be ready to take the more advanced Design and Deploy courses for IP Site Connect, Capacity Plus (Multi-Site and Single Site), Capacity Max and/or Connect Plus.

TARGET AUDIENCE
Professionals responsible for selling, designing, configuring, deploying, or maintaining MOTOTRBO Digital Radio Systems.

COURSE OBJECTIVES
Upon completion of this course, you will be able to:
• Correctly categorize the different components available to build your MOTOTRBO system.
• Accurately explain the functional technology that MOTOTRBO systems employ.
• Propose the MOTOTRBO topology that best fits the user requirements.
• Correctly describe MOTOTRBO’s digital and analog features.
• Analyze the various data applications’ capabilities and everyday uses within the MOTOTRBO systems.
• Refer to system and channel capacity considerations during system planning.
• Refer to MOTOTRBO IP network design considerations during system planning.
• Design a fleetmap in accordance with organizational requirements and resources.
• Select the right MOTOTRBO tool for your needs.
• Successfully purchase, register, and activate premium radio features.

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
• RDS0003 Basic Networking
• RDS0002 Basic RF
• RDS0004 Basic Radio
• AAE1402 Professional and Commercial Radios (PCR) Portfolio Overview

PREREQUISITES
None

© Motorola Solutions - Product and System Technical Training Course Catalog | North America | 2020
COURSE OVERVIEW
This self-paced course is a basic tutorial of Radio Management (RM) 2.0 Configuration Mode. A set of short videos present installation and deployment of RM components, explain the concepts of sets and configurations, and demonstrate the user how to navigate through RM Client views and functionalities. The course also covers migration from template to configuration mode, backup and restores procedures, as well as user and machine authorization.

TARGET AUDIENCE
Professionals responsible for configuring, deploying, or maintaining MOTOTRBO™ radios and repeaters.

COURSE OBJECTIVES
By the end of the course, you will be able to:
• Explain the purpose of that Radio Management Configuration (RM) Mode.
• Explain the concept of sets and configurations.
• Set up Radio Management 2.0 for the first time.
• Name and navigate through major RM Client views.
• Perform basic RM Configuration Client operations: populate and manage radio database, edit sets and configurations, etc.
• Perform Server Utility operations.

REQUISITE KNOWLEDGE
None

PREREQUISITES
None

COURSE OVERVIEW
The MOTOTRBO™ Radio Management 2.0 Workshop course provides technicians with the necessary information and practice to use the MOTOTRBO™ Radio Management 2.0 programming tool effectively.

TARGET AUDIENCE
System Managers and Technicians

COURSE OBJECTIVES
By the end of the course, you will be able to:
• Deploy and use RM 2.0 in a variety of real-world scenarios.
• Create and maintain configurations for basic MOTOTRBO™ Configurations (Connect Plus and Capacity Max excluded).
• Utilize Wi-Fi programming within RM 2.0.
• Use the RM Import and Export feature for database population.
• Convert existing radio templates and codeplugs to RM 2.0 Configurations.
• License and activate Radio and Application features.
• Use advanced features such as Data Mining.
• Use RM 2.0 to ease mass-deployments of subscribers.

REQUISITE KNOWLEDGE
Networking Essentials or Network + Certification.
• A high-level working knowledge of IP networking is important.

PREREQUISITES
PCT1032 MOTOTRBO™ Radio Management 2.0 Configuration Mode
COURSE OVERVIEW
This self-study course is designed to help you learn the fundamentals of Capacity Max. Whether you have a sales or technical background, this training will give you the information that you need to gain a basic understanding of Capacity Max. Begin by exploring the DMR standard and Capacity Max’s positioning within the MOTOTRBO™ portfolio of systems. Learn about the different hardware and software components that make up a Capacity Max system and gain an understanding of its logical and physical topology. Features, redundancy, design tools and warranty will also be addressed.

TARGET AUDIENCE
Professionals responsible for selling, designing, configuring, deploying, or maintaining MOTOTRBO™ radio systems.

COURSE OBJECTIVES
By the end of the course, you will be able to:
• Explain Digital Mobile Radio (DMR)
• Describe a basic Capacity Max system and where it fits in the MOTOTRBO™ Portfolio
• Describe the Capacity Max’s system physical and logical topologies
• List the minimum hardware and software requirements for a Capacity Max system
• Distinguish the three different types of Capacity Max Operating Modes
• Identify the different features and license types available for a Capacity Max system

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
• CEDMEL2000 Introduction to MOTOTRBO™ Systems for Technicians

PREREQUISITES
None
COURSE OVERVIEW
This foundational self-study course is designed to help you understand the theory of how a Capacity Max system functions. It describes the life cycle of a call, which includes: call initiation, call queuing, call grant or rejection, call transmission(s), and call termination. This knowledge is important for system troubleshooting and maintenance purposes.

TARGET AUDIENCE
Professionals responsible for selling, designing, configuring, deploying, or maintaining MOTOTRBO™ radio systems.

COURSE OBJECTIVES
Upon completion of this course, you will be able to describe and explain the functions of:
- Control Channel
- Roaming
- Radio Registration
- Call Request
- Call Setup
- Busy Queue
- Channel Allocation
- Call Termination

REQUISITE KNOWLEDGE
Basic Radio knowledge

PREREQUISITES
PCT1047 MOTOTRBO™ Capacity Max Technical Overview

COURSE OVERVIEW
MOTOTRBO™ Design and Deploy for Capacity Max begins by covering the design process for a Capacity Max Radio system. Participants will have the opportunity to practice designing and deploying a small scale, 2 Site/3 Channel, Capacity Max system in a safe classroom environment. This course will also cover how to configure Capacity Max using Radio Management 2.0 Configuration Mode.

TARGET AUDIENCE
This training is intended for professionals responsible for designing, configuring, or deploying MOTOTRBO™ radio systems.

COURSE OBJECTIVES
Upon completion of this course, you will be able to:
- Design a simple a 1-System 2 Site/3 Channel Capacity Max system
- Calculate Capacity Max capacity and bandwidth using a Case Scenario and System Design tools.
- Using Radio Management Configuration Mode, configure your radios and infrastructure.
- Deploy a 1-System 2 Site/3 Channel Capacity Max system.
- Using System Advisor, learn the fundamentals of troubleshooting and maintaining a Capacity Max system.
- Execute Radio Management database backup and restore.
- Describe how to optimize a Capacity Max system.

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
- Basic Radio knowledge
- CEDMEL2000 MOTOTRBO™ Systems Introduction for Technicians

PREREQUISITES
- PCT1032 MOTOTRBO™ Radio Management 2.0 Configuration Mode
- PCT1046 MOTOTRBO™ Capacity Max Theory of Operation
- PCT1047 MOTOTRBO™ Capacity Max Technical Overview

COURSE OVERVIEW
This course is designed to help you understand the basics of a MOTOTRBO™ IP Site Connect and a MOTOTRBO™ Capacity Plus system. We’ll begin by exploring their capabilities, features and positioning within the MOTOTRBO™ system solutions. You will also learn about the different system components and their general topology. The course will also review available MOTOTRBO™ services packages.

TARGET AUDIENCE
Professionals responsible for selling, designing, configuring, deploying, or maintaining MOTOTRBO™ radio systems.

COURSE OBJECTIVES
By the end of the course, you will be able to:
- Describe a MOTOTRBO™ IP Site Connect and Capacity Plus system.
- Explain the capabilities of the MOTOTRBO™ IP Site Connect and Capacity Plus system.
- Identify the MOTOTRBO™ IP Site Connect and Capacity Plus system components.
- Identify a MOTOTRBO™ IP Site Connect and Capacity Plus topology.
- Explain the difference in service plans between these systems.

REQUISITE KNOWLEDGE
Completion of the following course(s) or equivalent experience:
- Basic Radio knowledge
- CEDMEL2000 MOTOTRBO™ Systems Introduction for Technicians

PREREQUISITES
None
COURSE OVERVIEW
This course is designed to help you gain a solid foundation and understanding of the theory behind how an IPSC and Capacity Plus system functions. It describes the life cycle of a call, repeater arbitration and Motorola’s proprietary Enhanced Channel Access (ECA) feature. In addition, you will learn about the different IPSC and Capacity Plus system design options, fleetmapping and the MOTOTRBO System Design Tool.

TARGET AUDIENCE
Professionals responsible for designing and deploying MOTOTRBO™ radio systems.

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Explain the call processing methods.
• Define repeater arbitration, Enhanced Channel Access (ECA) and All Start.
• List the considerations that must be taken into account when designing a MOTOTRBO™ IP Site Connect, Capacity Plus Single-Site or Capacity Plus Multi-Site system.
• Use the MOTOTRBO™ System Design Tool to size the system.
• Explain the purpose of Fleetmapping, how to conduct a fleetmap and its importance in system design.
• Illustrate possible system deployment topologies based on options selected.
• Describe the roaming process which helps to optimize User coverage.
• Describe Data capabilities.
• Understand the purpose and intent of voting repeaters and receivers.

REQUISITE KNOWLEDGE
• Basic Radio knowledge
• CEDMEL2000 MOTOTRBO™ Systems Introduction for Technicians
• PCT1066 MOTOTRBO™ IP Site Connect and Capacity Plus Technical Overview

PREREQUISITES
None
## SOFTWARE & APPLICATIONS

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAVE™ CERTIFIED INTEGRATION ENGINEER (AST3001)</td>
<td>54</td>
</tr>
<tr>
<td>WAVE™ ASTRO® 25 INTEGRATION WORKSHOP (AST2039)</td>
<td>54</td>
</tr>
<tr>
<td>INTELLIGENT MIDDLEWARE 5.2 OPERATION AND ADMINISTRATION (RDS2025)</td>
<td>54</td>
</tr>
</tbody>
</table>
SOFTWARE & APPLICATIONS

For general information contact the North America Training Services help desk at:
(800) 247-2346, option 4 or training.na@motorolasolutions.com

COURSE OVERVIEW
The WAVE™ Certified Integration Engineer course provides instruction in designing, integrating, and troubleshooting WAVE™ systems. It also provides the groundwork for a basic understanding of how WAVE™ delivers a Radio-over-IP solution. The training scope covers WAVE™ integration to MOTOTRBO™, ASTRO®, and DIMETRA systems.

TARGET AUDIENCE
Sales/Systems Engineers who will design and implement WAVE™ solutions.

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Understand and identify WAVE™ components.
• Install and configure the WAVE™ Management Server, Media Server, Proxy Server, Desktop Communicator, Advanced Desktop Communicator, and Mobile Communicators.
• Identify radio systems compatible with WAVE™ and list integration steps.
• Maintain and support a WAVE™ domain.

REQUISITE KNOWLEDGE
General knowledge of IP Networking, IP Telephony, Server-class Operating Systems.

PREREQUISITES
None

COURSE OVERVIEW
This workshop describes the components and settings required to configure shared talkgroups between ASTRO® 25 and WAVE™ 5000 networks using ISSI 8000. Beginning with installed ASTRO® and WAVE™ networks, the course covers the specific information required to map ASTRO® talkgroups to WAVE™ standard channels. Shared talkgroup operation is verified using ASTRO® and WAVE™ applications and tools.

TARGET AUDIENCE
Technical Support staff who configure, maintain, and troubleshoot WAVE™-to-ASTRO® integrated networks.

COURSE OBJECTIVES
After completing this course, the student will be able to:
• Describe WAVE™ TM to ASTRO® 25 integration.
• Document IP address plans for ASTRO® 25, WAVE™, ISSI and Internet connections.
• List ASTRO® 25 components for integration.
• Configure and verify ASTRO® 25 settings for WAVE™ integration.
• Configure and verify ISGW and ISSI Firewall settings.
• Configure WAVE™ standard channels, Radio System and WAVE™ Radio Gateway settings.
• Verify and troubleshoot shared talkgroup operation.

REQUISITE KNOWLEDGE
Completion of the following courses or equivalent experience:
• AST3001 WAVE™ 5000 Certified Integration Engineer
• AST4103 ASTRO® 25 IV&D System Core Workshop

PREREQUISITES
None
Our website is your portal to find help to meet your organizational training needs. Keep up to date with the latest version of this catalog, our training schedule, or simply use the Contact Us function for additional questions or assistance.