System Training

14.0 System Training

14.1 Motorola's Worldwide Learning Services Training

Motorola's Worldwide Learning Services organization dedicates itself exclusively to offering the most comprehensive training available for Motorola's advanced radio equipment. We understand that the Commonwealth's equipment is a highly sophisticated communications network, and as such, requires specialized training to fully realize the equipment's potential. Thus, you need quality training that only Motorola delivers for quality Motorola products.

14.2 Instructors

A successful training experience for the Commonwealth requires expertise and dedication on the part of the instructor as well as the trainee. At Motorola, our technical instructors have extensive backgrounds in RF communications, microwave technology, telephony, digital logic and microprocessors, as well as computer science. Instructors' formal training varies from postgraduate degrees in occupational education and electronics to a variety of military instructor programs. Since continuing education is crucial to continued success, Motorola instructors receive more than 100 hours of training annually in communications technology and training techniques. Our close relationship with product design and development ensures current, accurate information for every product incorporated into STARS.

14.3 Efficiency

Using Motorola technology to its fullest will assist performance at every level of system operation. Over the life of STARS, these efficiencies add up to large dollar amounts. Receiving the proper training increases the Commonwealth employees' efficiency in their use of the system.

14.4 Integration of Training

Motorola's Worldwide Learning Services organization is unmatched in their ability to deliver integrated training packages to the Commonwealth. From sophisticated training needs analysis to ongoing training throughout the life cycle of STARS, Motorola's Worldwide Learning Services can help ensure that the Commonwealth's investment in training today is an investment for the future.

14.5 Transfer of Knowledge

Successful system implementation as well as ongoing system management and maintenance can be greatly enhanced by the careful transfer of knowledge from Motorola in-house experts to the Commonwealth's system managers, technicians, and end users.

Critical elements of knowledge transfer include knowledgeable instructors, well-designed courseware, lab activities, and system hardware and software that closely parallels the Commonwealth's operating environment integrated with proper system documentation.

To understand the Commonwealth's specific configuration and product features, there is a well-defined communication link between Worldwide Learning Services and Motorola's field personnel. This link keeps us apprised of any special issues that arise. Applying this approach allows us to provide tailored system manager, technician, dispatcher, and end user training.

Through careful needs analysis, we design and develop training that enables the Commonwealth to become self-reliant with its system. User training will take place in Richmond.

14.6 Quality of Instructors

A careful blending of background, experience and continuous training creates a grounded, intellectually stimulating, and accessible instructor that will professionally deliver training to the Commonwealth. Understanding that, the instructor will generate a training environment where students feel empowered to learn.

The Commonwealth can be assured that your Motorola instructor utilizes the Needs Analysis of your system. The process also ensures that your instructor readily understands the equipment, fashioning a smooth and effective training event.

14.7 Quality of Material

Course material performs a vital role in the training process and in the transfer of knowledge to the job site. It is not enough for the material to look professional. Course curriculum follows a design philosophy that instructors adhere to during the training event. Good course materials are easy to use, well integrated into the course design.

Because Motorola follows research-driven instructional design methodology, our course materials are specifically designed for ease of use and effective transfer of knowledge to the job. We provide relevant documentation pertaining to the Commonwealth's products during the training events.

14.8 Knowledge Retention

Following a training event, the knowledge learned can sometimes be lost in the transition to the operating environment. To maximize retention and transfer to the job, our instructional designers conduct task analyses to determine performance criteria as part of the Motorola design process.

Motorola's Worldwide Technical Education training methodology is based upon several key criteria:

- Course design is driven by an analysis of learner needs.
- Learning objectives are based upon what learners need to accomplish on the job.
- Our training strategies are based upon maximizing transfer of skills to the job, and retention/reuse of effective learning.

Motorola accommodates these criteria in the following ways:

- Course content is focused on how-to, rather than theory.
- Class discussions are application based.
- Training incorporates maximum hands-on lab opportunities.
- Integration of customer specific job aides into the classroom experience and the lab activities, as well as through video support.

Course design, based on the Commonwealth's performance objectives, has determined that task-driven courses provide better knowledge retention for the students. Because of the course design, students will maintain the knowledge taught and apply it for immediate results that will extend the life of the system.

14.9 Types of Training

14.9.1. Instructor Led

Motorola qualified instructor(s) will lead the Commonwealth students through the requested course tailored to your system. Maximal instructor-led lab time has been allocated to help educate students in specific and everyday occurrences of programming, maintenance, and troubleshooting associated with your system.

14.9.2. Train the Trainer

Our instructors deliver training to the designated members of the Commonwealth training staff. During the Train-the-Trainer event, we will utilize the Commonwealth's equipment to deliver training to the designated trainers, thus ensuring a smooth transfer of knowledge.

14.9.3. Resident Training

Students attend training conducted at our training center in Schaumburg, IL. Because of the diverse customer-base that attends resident training, the equipment is modeled upon a standard configuration.

14.10 Audiences for Training Classes

General	Individuals selected by the STARS Management Team
First Responders	Commonwealth sworn law enforcement officers
Public Service Personnel	All others not covered by first responders.
Facilities Personnel	Buildings maintenance personnel.
Designated Trainers	Individuals selected by the STARS Management Team to be trainers.
Technician	Individuals responsible for troubleshooting, maintenance, and repair of the Commonwealth radio communication system.
System Manager	Individuals responsible for the day-to-day operation and administration of the Commonwealth radio communication system
System Administrator	Individuals responsible for configuring, administering, and maintaining computers, networks and software systems.
End User	Individuals that use and operate the equipment.

14.11 Training Plan / Matrix

The following Training Plan/Matrix represents the courses that will be delivered to the Commonwealth.

COURSE	GROUP	NUMBER OF SESSIONS	DURATION (days)	LOCATION	DATE	NUMBER OF ATTENDEES
Executive System Overview	General	5	1	Richmond, VA	2004/2007	12 per session
Communication System Concepts	System Administrators System Managers Technicians	3	5	Richmond, VA	2005/2007/2008	12 per session
Bridging the Knowledge Gap	System Administrators System Managers Technicians	5	5	Richmond, VA	2005/2007/2008	12 per session
Site Installation Practices (R56)	System Managers Technicians	2	5	Richmond, VA	2005/2007/2008	12 per session
	System Administrators	N/A	4 hours	On-line	2006/2008	5 per session
Premier AVL Server	System Administrators	1	2 hours	Richmond, VA	2006	6 per session
Premier MDC System Manager	System Managers	1	4 hours	Richmond. VA	2006	6 per session
In-Tunnel Communications – System Manager Merge with Remote Monitoring and Control of In-Tunnel RF Systems.)	System Managers	2	1	Richmond. VA	2006	12 per session
Communications Planning for ASTRO 25 Systems	System Managers	3	2	Richmond. VA	2005	12 per session
Networking Essentials in Motorola Communications Equipment	System Managers and Technicians	5	5	Schaumburg, IL	2005/2008/2009	12 per session
Networking for ASTRO 25 IV&D Systems	System Managers and Technicians	5	5	Schaumburg, IL	2005/2008/2009	12 per session
Understanding Your ASTRO 25 IV&D System	System Managers and Technicians	5	2	Schaumburg, IL	2005/2008/2009	12 per session
ASTRO 25 IV&D Radio Network Management Workshop (clarification)	System Managers and Technicians	2	10	Schaumburg, IL	2005/2008/2009	12 per session

ASTRO 25 IV&D Trunking Technical System Workshop	Technicians	5	10	Schaumburg, IL	2005/2008/2009	12 per session
ASTRO 25 IV&D Site Repeater Workshop	Technicians	5	5	Schaumburg, IL	2005/2008/2009	12 per session
ASTRO 25 Conventional Maintenance and Troubleshooting	Technicians	5	5	Schaumburg, IL	2005/2008/2009	12 per session
Transportable Training	Technicians	3	1	Richmond, VA	2005	6 per session
Diesel/Gas Generators Under 200 kW	Technicians	1	1	Richmond, VA	2005/2008/2009	12 per session
Transmitter and Multicoupler Maintenance	Technicians	4	3	Richmond, VA	2005/2008/2009	12 per session
MOSCAD Fault Management System Maintenance (Merge with MOSCAD Train the Trainer.)	Technicians	4	2	Richmond, VA	2005/2008/2009	12 per session
CENTRACOM Gold Elite	Technicians	4	5	Schaumburg, IL	2005/2008/2009	12 per session
NetClock Technical Training	Technicians	1	1	Richmond, VA	2005/2008/2009	12 per session
Pallas Installation and Maintenance /Programming	Technicians	5	5	Richmond, VA	2005/2008/2009	8 per session
Pallas Installation and Maintenance / Admin	Technicians	5	5	Richmond, VA	2005/2008/2009	8 per session
Wordnet Logging Recorder (Merge these 3 classes.)	Technicians	3	3	Richmond, VA	2005/2008/2009	12 per session
ML900 Maintenance and Programming	Technicians	5	3	Richmond, VA	2005/2008/2009	12 per session
Quantar Base Stations	Technicians	5	3	Richmond, VA	2005/2008/2009	12 per session
XTS2500, XTS5000, XTL5000, XTL2500, DVRS, DEK	Technicians	4	9	Richmond, VA	2005/2008/2009	12 per session

Radio Programming and Template Building	Technicians	1	3	Richmond, VA	2005	12 per session
VHF Linknet, 800 Linknet, and Line Amplifiers	Technicians	1	1	Richmond, VA	2005	12 per session
Remote Monitoring and Control of In-Tunnel RF Systems (Merge with In-Tunnel Comunicatins-Systems Manager.)	Technicians	1	1	Richmond, VA	2005	12 per session
In-Tunnel Preventative Maintenance	Technicians	2	1	Richmond, VA	2005	12 per session
CM Digital Microwave Radio	Technicians	5	5	Richmond, VA	2005/2008/2009	12 per session
Proteus AMT Digital Microwave Radio	Technicians	5	2	Richmond, VA	2005/2008/2009	12 per session
Fujitsu 4100 Turn-Up and Maintenance	Technicians	5	2	Richmond, VA	2005/2008/2009	12 per session
Fujitsu 4300 Turn-Up and Maintenance	Technicians	5	4	Richmond, VA	2005/2008/2009	12 per session
Fujitsu Netsmart 1500 User Operation	Technicians	5	2	Richmond, VA	2005/2008/2009	12 per session
Facilities Operation and Maintenance	Facilities Personnel	8	2	Richmond, VA	2005/2008/2009	5 per session
Premier MDC Operation Train the Trainer	Designated Trainers	3	1	Richmond, VA	2005/2008/2009	12 per session
CENTRACOM Gold Elite Operator (Conventional) Train the Trainer	Designated Trainers	3	1	Richmond, VA	2005/2008/2009	12 per session
CENTRACOM Gold Elite Operator (Trunking) Train the Trainer	Designated Trainers	3	1	Richmond, VA	2005/2008/2009	12 per session
VESTA Pallas End User Train the Trainer (Merge these 3 classes)	Designated Trainers	3	4	Richmond, VA	2005/2008/2009	8 per session

XTS2500, XTS5000, XTL5000, XTL2500, DVRS, DEK Train the Trainer	Designated Trainers	1	3	Richmond, VA	2005/2008/2009	12 per session
Wordnet Logging Recorder User Train the Trainer	Designated Trainers	1	2	Richmond, VA	2005/2008/2009	12 per session
MOSCAD Fault Management Operator Train the Trainer (Merged)	Designated Trainers	3	1	Richmond, VA	2005/2008/2009	12 per session
CENTRACOM Gold Elite ADMIN/ADM	System Managers/System Administrators	3	1	Richmond, VA	2005/2008/2009	12 per session

14.12 Course Descriptions

In the process of assessing the Commonwealth's training needs, Motorola has identified the following course(s) that are necessary to achieve your training goals. Attached below are descriptions for each training course.

Presented below are the standard course outlines. While the standard courses are encouraged, the class outline may be tailored for the Commonwealth's specific needs. Thus the outline(s) below may not exactly match the quoted class length content. The prerequisites courses are suggested in order to facilitate the class content duration. The STARS PD will determine whether the Commonwealth participates in the class and acknowledges the potential impact.

14.13 Executive System Overview

Target Audience	General
Course Description	This course will provide the attendees with a high level overview of the ASTRO 25 IV&D system.
Required Pre-Work	None
Recommended Prerequisites	None
Course Objectives	• Operating Characteristics • System Information • Components that make up the ASTRO 25 IV&D system • Functionality

This course will be designed and tailored based on the Commonwealth's equipment, features, functionality; etc.

14.14 Communication System Concepts

Target Audience	System Managers and Technicians
Course Description	This course emphasizes the development of communication systems from conventional systems through SmartZone Trunking Systems. Also covered is the development of basic modulation systems from frequency modulation to ASTRO communication systems. Most often forgotten in the communication system is the radio frequency path including the antenna and transmission line. Troubleshooting will address more complete system analysis, especially in transmission line and antenna systems, using basic communication test equipment.
Required Pre-Work	None
Recommended Prerequisites	• Graduate of a basic electronics course or equivalent experience • Exhibit a desire to understand radio communication systems and alternative troubleshooting methods.
Course Objectives	• Use terms commonly used in two-way communication system • 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 of an instructor requested system. • 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.

I. Introduction to Communication System Concepts
- A. Frequency Designation and Assignment
  1. Frequency Ranges Defined by FCC
  2. Motorola Frequency Range Designations
  3. Typical Frequency Assignments
- B. Decibel Overview
  1. Purpose of Decibels
  2. Conversions of Power and Voltage Levels to Decibels, dBm and dBW
  3. Conversion of Decibels, dBm, and dBW to Power and Voltage Levels
  4. Comparison between Two Decibels, dBm, and dBW Values.
- C. Radio Frequency Propagation
  1. Reflection, Refraction, Diffraction on Possible RF Paths Between Transmitter and Receiver
  2. Relationship of Distance, Frequency And Antenna Height To Path Losses
  3. Major and Minor Factors Affecting the Path Losses
  4. Relationship between Power At The Transmitter, Path Losses And Receiver Sensitivity
  5. Improvement Of Two-Communication Systems
- D. Transmission Lines
  1. Purpose of Transmission Lines
  2. Power Handling and Attenuation Characteristics
  3. Transmission Line Losses
  4. Standing Wave Ratio and Measurements
- E. Basic Antenna Concepts
  1. Development of Antenna Theory from Transmission Lines
  2. Relationship of the Fields about an Antenna
  3. Effects of Height, Length and Location of Antenna on Propagation Pattern
  4. Effect on Propagation Pattern Using Multi-Array Antennas
- F. System Grounding
  1. Purpose of Grounding
  2. Characteristics of a Properly Installed Grounding System
  3. Creation of Noise in Grounding Systems
  4. Characteristics of a Grounding System in Lightning Protection

G. Radio Frequency Interface
   1. Types of Noise
   2. Desensitization and Intermodulation Products
   3. Circulators
   4. Duplexers
   5. Band Pass and Band Elimination Cavities

H. Frequency Modulation Concepts
   1. Advantages of Frequency Modulation
   2. Application of Frequency Modulation Theory to Alignments and Troubleshooting Receivers and Transmitters

II. Communication System Concepts

A. Basic Concepts
   1. Simplex
   2. Half-Duplex
   3. Full-Duplex

B. Repeater Concepts
   1. Purpose
   2. Repeater Operation
   3. Talk-Around Operation

C. Dispatch Concepts
   1. Base Station Operation
   2. Tone Remote Control
   3. DC Remote Control

D. Voting Concepts
   1. Purpose
   2. Signaling Requirements

E. Basic Data Communication Concepts
   1. Motorola Data Communications (1200)
   2. Digital Voice Protection Concepts

F. Trunking Basics
   1. Purpose
   2. Signaling Sequences of Single Site System
   3. Wide Area Coverage Systems

III. RF Communication Equipment Testing

A. Transmitter Power
   1. Forward Power Measurement Methods
   2. Reverse Power Measurement Methods
   3. Standing Wave Ratio Determination

B. Transmitter Deviation
   1. Determining Maximum Deviation
   2. Measuring Deviation

C. Transmitter Frequency Error
D. Receiver Sensitivity
    1. 12 dB SINAD
    2. 20 dB Quieting
    3. Modulation Acceptance Bandwidth
    4. Effective Receiver Sensitivity

IV. Functional RF Equipment Basics and Troubleshooting Concepts
A. Relationship Between the Major Functional Blocks of a Representative Microprocessor Controlled Radio
    1. Power Supply Distribution
    2. Microprocessor Functional Block
    3. Synthesizer and VCO Functional Block
    4. Transmitter
    5. Receiver
B. Interpretation of Communication System Equipment Testing to Troubleshooting Equipment and Systems

V. Programming Concepts
A. Menu Navigation
B. Radio Servicing
C. Archiving Radio Data
D. Editing Radio's Characteristics

14.15 Bridging the Knowledge Gap

Target Audience	System Technicians and System Managers
Required Pre-Work	None
Prerequisites	Communication System Concepts or Commonwealth's approval
Course Description	This course is designed to bridge the knowledge gap for those who are upgrading their channel based communication systems to the recently developed network based systems. Customers coming from these different systems will require foundational knowledge to be successful in maintaining and managing their ASTRO 25 systems. These customers will review the characteristics of their systems and transfer the insights to assist their understanding of the ASTRO 25 system. These insights include a high-level overview of wide-area coverage, trunking, and SmartZone. Lastly, a high-level overview of the characteristics of the network based ASTRO 25 will be discussed including a brief description of key networking principles.
Course Objectives	• Compare the five basic communications concepts between the customer's current system and their ASTRO 25 system using representative block diagrams of the respective systems. • Compare how the voice and data information is represented through the customer's current system and the ASTRO 25 using a representative block diagram of the respective systems. • Describe the characteristics of the customer's system in terms of advantages and disadvantages. • Summarize SmartNet II trunking in terms of how voice information and control information is processed. • Describe the SmartNet II call processing steps associated with control channel operation and voice channel operation. • List the key SmartNet II trunking features. • Compare the high-level operational view of voting, simulcast, and SmartZone systems. • Compare the high-level operational view between SmartZone systems and ASTRO 25 systems.

I. Communication Overview
- A. Foundational Principles
  1. Radio Frequency Subsystem
  2. Control Subsystem
  3. Audio Distribution Subsystem
  4. Transport Subsystem
  5. Management Subsystem
- B. Modulation Overview
  1. Representation of Audio and DATA information
  2. Securenet Overview
  3. ASTRO Overview
  4. Frequency Modulation

II. Single Site Communication Principles
- A. Conventional Communications
  1. Radio to radio
  2. Repeater
  3. Base Station / Console
  4. Conventional System to Trunking System Transition
- B. SmartNet II Trunking Concepts
  1. Features
  2. Call Processing
  3. Transition Principles

III. Multiple Site Communication Principles
- A. Terminology Issues
- B. Conventional Multiple Site Systems
  1. Voting Systems
  2. Simulcast Systems
- C. Trunking
  1. Voting Systems
  2. Simulcast Systems

IV. SmartZone System Principles
- A. Concepts
- B. Features
- C. Control Path
- D. Switched-Based Audio Path
- E. Network-Based Management System

V. ASTRO 25 System Principles
   A. Concepts
   B. Features
   C. Packet Switch Based Control Path
   D. Packet Switch Based Audio Path
   E. Network-Based Management System

14.16 Site Installation Practices (R56)

Target Audience	General Audiences
Course Description	This course is designed to present the standards for installing a Motorola communication system. Participants will understand how a properly installed system can help to ensure efficient system operation and reduce system down time.
Required Pre-Work	None
Recommended Prerequisites	Graduate of a basic electronics course or equivalent experience
Course Objectives	• List the purposes of grounding and evaluate their importance in terms of a communication system installation. • Apply the principles of grounding theory to the installation standards found in the R56 Manual. • Calculate the effects of a lightning strike on a communications system installation. • List the minimum requirements and specifications for a properly installed external and internal ground system. • List the minimum requirements for installation of equipment, cables and documentation for communication system installation.

I. Purpose of a properly installed ground system
   A. Fire Protection
   B. Electrical Shock Avoidance
   C. Equipment Ground Fault Protection
   D. Lightning Protection
   E. Electrical Noise Control
   F. Limiting of High Voltage
II. Grounding - An Introduction
   A. Electrical Properties of Conductors
      1. Resistance
      2. Inductance
      3. Capacitance
   B. Impedance of Common Conductors
   C. Skin Effect
   D. Field Concepts
   E. Effects of Lightning in a Communication System
III. External Ground System
   A. Characteristics of the Soil that Affects the Ground Resistance and Measurements
   B. Soil Resistance Measurement Techniques
   C. Specifications of Dimensions and Depths of Materials, and Connectors
   D. Grounding Requirements Considering:
      1. Location of the Site
      2. Building Construction
      3. Towers
      4. Fences
      5. Transmission Lines
IV. Internal Ground System
   A. Ground Window and “Single Point” Grounding
   B. Internal Ground
   C. Bonding
   D. “Halo” and Internal Ground
   E. Specifications of Materials and Connections
   F. Lightning Surge Protection
V. AC and DC Power Distribution
   A. Types of AC Power Distribution Systems
   B. Circuit Breakers and Ground Fault Detection
   C. Transient Surge Protection Devices
   D. Specifications of Material and Connections
   E. Electrical Safety
      1. Tagout and Lock Out
      2. Common Sense Precautions

VI. Installation
- A. Planning Considerations for Site
  1. Access
  2. Heating, Ventilation and Air Conditioning
  3. Future Expansion

- B. Cable Selection and Installation
  1. Cable Trays
  2. Spacing

14.17 Premier AVL Server

Target Audience	System Administrators
Course Description	This course will train the mapping system administrator and up to 3 other additional mapping/GIS staff on installing, configuring, and maintaining AVL Server.
Required Pre-Work	Geofile built with address ranged street centerline file.
Recommended Prerequisites	TBD
Course Objectives	Designed for mapping system administrator and staff that will update and maintain the AVL System.

I. AVL Overview
   A. Software Relationship
   B. AVL Server Tasks
   C. Terminology
   D. How it all works
   E. Polling Intervals

II. Configuration
   A. System Parameters
   B. Police Vehicles
   C. Fire/EMS Vehicles
   D. Status Codes
   E. AVL Polling
   F. AVL Server Options
   G. AVL Vehicle Configuration

III. Monitoring AVL Server
   A. Status Page
   B. Vehicle Page
   C. ATM Client Page
   D. Messages Page

IV. AVL Functionality
   A. Unit Locations
   B. Selected Window
   C. Shortest Path
   D. Poll on Demand
   E. GPS Health
   F. AVL Information
   G. Closest Unit Recommendations

V. AVL Server Maintenance
   A. SQL Server Database
   B. System Administrator Notifications

VI. Data Archiving

14.18 Premier MDC System Manager

Target Audience	System Managers
Course Description	This course familiarizes those in system management /troubleshooting/repair functions with the basic operating procedures, hardware and software applications for the Premier MDC Message Switch and Server. This course focuses on server hardware, message switch software, user registry, reports, client installation, troubleshooting and support. Most portions include detailed discussions and hands-on activities adding items in the user registry, running reports, installing and configuring client software. *Note: Course given as customer specific, will cover options pertinent to customer equipment.*
Required Pre-Work	None
Recommended Prerequisites	System administrator familiarity when the server/switch is installed. Familiarity with the MDC system as a whole, with the general nature of data communications, with personal computers, with standard Server OS and with standard database structures (Btrieve).
Course Objectives	Designed for staff that will be responsible for setting up and maintaining the Premier MDC Server/Message switch.

I. MDC System Overview and Data Flow
- A. Data hardware/software connections for troubleshooting
- B. Tiered server/client software architecture

II. Server Hardware and Software
- A. Connect and power all server hardware
- B. Components of the server configuration
- C. Locate major software component directories

III. Message Switch
- A. Location, open and use online Help files
- B. Message Switch Console view
- C. Check switch and interface applications status
- D. Start and stop the Console's Transaction Log display
- E. Stop and start individual application interfaces
- F. Force off a client connected to the switch
- G. Start and stop traces on an application or the switch
- H. Stop and re-start the switch

IV. User Registry Management
- A. Add, delete, and update departments
- B. Add, delete, and update groups
- C. Add, delete, and update users
- D. Add, delete, and update units

V. Server Reports
- B. Navigate to and understand available transactional reports
- C. User Registry report
- D. Messaging report
- E. Chat report
- F. State report
- G. Export report data to other supported formats
- H. Discuss electronic retention policies and how to purge databases

VI. Backup Strategies
- A. Understand and monitor the standard back-up and directories affected
- B. Tape and storage recommendations
- C. Procedures for disaster recovery

VII. Troubleshooting
- A. Wireless network (from switch and client side)
- B. Switch connection and application
- C. Client connection
- D. Install/uninstall client software updates

VIII. Customer Support
- A. Remote administration software and modems

14.19 In-Tunnel Communications – System Manager

Target Audience	System Managers
Course Description	In-depth System Manager Training for VHF LinkNet, 800 LinkNet and Line Amplifiers. Covering system overview, equipment overview, features of IMS alarm system.
Required Pre-Work	None
Recommended Prerequisites	Five years of related experience managing wireless communications networks. Student should be familiar with the principles of two-way radio communications. Test equipment: Laptop computer.
Course Objectives	The object of this course is to instruct Network Operations Center Management and Communications System Managers on the operation of the system. At the completion of the course participants will be able to: • Understand the operation of the Distributed Antenna system. • Identify the major components of the system and their interaction. • Operation of the Link Products and Line Amplifiers. • Know the operation of the Headend. • Use and Operation of the InView management System for alarming. • Monitor Levels. • Understand the base line data collected during system optimization.

I. System Description
   A. VHF Services
      1. Overview
      2. System Block Diagram
      3. Headend
      4. Distributed Antenna system
   B. 800 Services
      1. Overview
      2. System Block Diagram
      3. Headend
      4. Distributed Antenna Network

II. Combined System Information

III. As-Built System Levels and Preventative Maintenance
   A. As-Built System Signal Levels

IV. Equipment Description
   A. Standards
   B. Tool and Test Equipment Requirements
   C. Equipment Description
   D. VHF Headend
   E. VHF Line Amplifier
   F. 800 Headend
   G. 800 Line Amplifier
   H. Kaval LinkNet Service Module

V. Alarm Monitoring
   A. Operation of InView Management System
   B. Enterprise View
   C. System View
   D. Module View
   E. Definitions of Status Indicators
   F. Event Log Management

14.20 Communications Planning for ASTRO 25 Systems

Target Audience	System Managers
Course Description	This course is for those responsible for determining how they want to use the IV&D system for their preferred communications patterns. This course also provides background information describing where the information is coming from as they enter radios and talkgroups into the system.
Required Pre-Work	None
Recommended Prerequisites	None
Course Objectives	• Explain what an ASTRO 25 system is • List and describe the different ASTRO 25 features and capabilities • Describe the ASTRO 25 architecture, components, and processes

I. System Overview
   A. What is ASTRO 25
      1. Compare the original system with the ASTRO 25 System
      2. Compare “old” and “new” system capabilities from a radio user and console user perspective.
      3. Analog versus ASTRO 25 Common Air interface.
      4. Describe differences between Site Repeater Sites, Simulcast Subsystems and Mutual Aid applications.
      5. Features and Capabilities
   B. Architecture, Components and Processes

II. The ISO FCAPS Network Management Model
   A. ISO FCAPS Network Management Overview
   B. Fault Management
   C. Configuration Management
   D. Accounting Management
   E. Performance Management
   F. Security Management

III. Configuration Management
   A. Configuration Management Overview
   B. Management User
   C. Managing Radio Users

IV. Security Management
   A. Security Management Overview
   B. Radio Security

V. Guided Simulation

VII. Performance Management
   A. Performance Management Overview
   B. Historical Reports
   C. Custom Reports
   D. Dynamic Reports
   E. Zone Watch

VI. Guided Simulation

IX. Fault Management

X. Accounting Management

A. Affiliation Display Procedures
B. System Profile Applications
C. System Profile Procedures
D. Zone Profile Applications
E. Zone Profile Procedures
F. ATIA Log Viewer

14.21 Networking Essentials in Motorola Communications Equipment

Target Audience	System Managers
Course Description	This course provides the technician with the essential elements of networking required for understanding the more complex network technology applied to the Motorola ASTRO 25 System 6.x communication systems. The course includes familiarization with: network hardware, software, topologies, protocols, and addressing. Participants will be required to configure the site hub, switch, and router as if these devices were actually deployed in a working system.
Required Pre-Work	None
Recommended Prerequisites	None
Course Objectives	• Understand networking terminology • Describe hardware components • Understand network topologies • Understand basic network protocols • Describe encapsulation • Describe both the OSI and TCP/IP models • Describe protocols used throughout the ASTRO 25 System 6.x network • Configure a 3COM PS40 Hub • Configure a 3COM S1100 Switch • Configure a Motorola ST series site router • Set up and utilize support terminal and file transfer applications • Analyze a basic network using common statistical and connectivity commands

I. TCP/IP Basics
- A. What is a Network
- B. Types of Networks
  1. LAN
  2. WAN
  3. MAN
  4. CAN
- C. Types of Protocols
  1. Application
  2. Transport
  3. Internet
  4. Network
  5. Routing
- D. Common Physical Network Components
  1. PCs
  2. Operating System Software
  3. Network Interface Cards
  4. Hubs, Switches, and Routers
  5. Cabling
- E. Addressing
  1. Physical vs. Logical
  2. Classful IP Addressing
  3. Subnetting
  4. Reserved Addresses
  5. Determining IP Address Space
  6. Variable Length Subnet Mask
  7. Classless Inter-Domain Routing
- F. More About Protocols
  1. The OSI Model
  2. OSI and TCP/IP
  3. The TCP/IP Protocol Family
  4. TCP vs. UDP Transport Protocols
  5. TCP/IP Message Delivery
  6. Encapsulation
- G. Ethernet
  1. 10BaseT
  2. Network Interface Card
  3. Collision Domains
  4. Segmenting Devices
  5. The Ethernet Frame
  6. CSMA/CD
  7. Ethernet Addressing

H. Address Resolution Protocol
1. Address Resolution
2. Encapsulation

I. Internet Control Message Protocol
1. Message Types
2. ICMP Message Formats

II. Microsoft Windows® 2000

A. Windows 2000 Server
1. Overview
2. Minimum Requirements
3. Software Installation
4. Server Configuration

B. Windows 2000 Professional
1. Overview
2. Minimum Requirements
3. Installation
4. Workstation Configuration

III. Constructing the Network

A. Hub and/or Switch Connections
1. PS40 Hub
2. PS1100 Switch

B. Routers
1. Basic Router Commands
   a) Syntax
   b) Administrative Tasks
   c) Enabling SNMP
   d) Installing ASCII Configuration Script via TFTP
2. Connecting the Routers

C. Troubleshooting
1. Ping
2. Ipconfig
3. ARP
4. Netstat
5. Nslookup
6. Telnet
7. Tracert

14.22 Networking for ASTRO 25 Systems

Target Audience	System Managers and Technicians
Course Description	This course provides the technician with the essential elements of networking required for understanding the more complex network technology applied to the Motorola Astro 25® IV&D communications system. The course includes familiarization with: network hardware, software, topologies, protocols, and addressing. Participants will be required to configure the site hub, switch, and router as if these devices were actually deployed in a working system.
Required Pre-Work	None
Recommended Prerequisites	Networking Essentials in Motorola Communications Equipment
Course Objectives	• Understand networking terminology • Describe network hardware components • Understand network topologies • Understand basic network protocols • Describe encapsulation • Describe both the OSI and TCT/IP models • Describe protocols used throughout the Astro 25® System 6.0 Network. • Configure a 3COM PS40 Hub. • Configure a 3COM S1100 Switch. • Configure a Motorola ST series site router. • Set up and utilize support terminal and file transfer applications. • Analyze a basic network using common statistical and connectivity commands.

14.23 Understanding Your ASTRO 25 IV&D System

Target Audience	System Managers and Technicians
Course Description	This course is intended to provide an overview of ASTRO 25 IV&D in order to familiarize the various audiences with the overall system capabilities, components, features and benefits. This Overview training also covers the fundamentals needed to understand the ASTRO 25 IV&D System.
Required Pre-Work	None
Recommended Prerequisites	Communications Planning for ASTRO 25 Systems
Course Objectives	• Basic Radio System Concepts • Features and Capabilities • Subsystems and Functions • Architecture, Components, and Processes • Equipment

14.24 ASTRO 25 IV&D Radio Network Management Workshop

Target Audience	System Managers and Technicians
Course Description	This course teaches all the ASTRO IV&D system management functions within the framework of the ISO Fault-Configuration-Accounting-Performance-Security model. The learning activities in this course focus on how to use the different ASTRO IV&D network management applications. Additionally, participants will discuss how to structure their organization and personnel for optimal system use. **Note:** Course given as customer specific, will cover options pertinent to customer equipment
Required Pre-Work	None
Recommended Prerequisites	Communications Planning for ASTRO 25 Systems Understanding Your ASTRO 25 System
Course Objectives	• ASTRO 25 IV&D System Overview • Communications Planning • FCAPS Introduction • Security Management • Configuration Management • Fault Management • Accounting Management • Performance Management

14.25 ASTRO 25 IV&D Trunking Technical System Workshop

Target Audience

Technicians

Course Description

This course provides System Technicians with detailed understanding of the major functional and radio subsystems that comprise a Motorola ASTRO 25 IV&D System.

Required Pre-Work

None

Recommended Prerequisites

Communications Planning for ASTRO 25 Systems
Understanding Your ASTRO 25 System
Radio Network Management Workshop

Course Objectives

- ASTRO 25 IV&D System Review
- System Views
- Call Processing
- Master Site
- Network Management Subsystem
- Dispatch Subsystem
- Repeater Site
- IntelliRepeater Site
- Data Subsystem
- Subscribers
- Digital Mutual Aid
- System Reliability
- Routine Maintenance
- Troubleshooting Model
- Troubleshooting Tools
- System Troubleshooting
- Troubleshooting Scenarios

14.26 ASTRO 25 IV&D Site Repeater Workshop

Target Audience

Technicians

Course Description

This Workshop is intended to provide participants with an advanced level of understanding of how to maintain and troubleshoot the major infrastructure components that comprise a Motorola ASTRO 25 IV&D Site Repeater Subsystem.
Participants will demonstrate the ability to diagnose and troubleshoot specific infrastructure box-level problems as they relate to the Site Repeater Subsystem.

Note: *Course given as customer specific, will cover options pertinent to customer equipment.*

Required Pre-Work

None

Recommended Prerequisites

Communications Planning for ASTRO 25 Systems
Understanding Your ASTRO 25 System
Radio Network Management Workshop
Trunking Technical System Workshop

Course Objectives

- ASTRO 25 IV&D System Review
- System Views
- Call Processing
- Master Site
- Network Management Subsystem
- Dispatch Subsystem
- Repeater Site
- IntelliRepeater Site
- Data Subsystem
- Subscribers
- Digital Mutual Aid
- System Reliability
- Routine Maintenance
- Troubleshooting Model
- Troubleshooting Tools
- System Troubleshooting

Troubleshooting Scenarios

14.27 ASTRO 25 Conventional Maintenance and Troubleshooting

Target Audience	Technicians
Course Description	This course is designed to introduce the students to ASTRO Digital Voice Technology. Emphasis is placed on system level applications, configuration and alignments. System level troubleshooting techniques are also highlighted. *Note: Course given as customer specific, will cover options pertinent to customer equipment*
Required Pre-Work	None
Recommended Prerequisites	An understanding of: basic two-way FM communications radio theory, microprocessor fundamentals, basic logic circuits and familiarization with computer operating systems. Experience using common communications test equipment is also required.
Course Objectives	• Explain the characteristics and benefits of ASTRO Digital signaling. • Identify ASTRO Digital System equipment. • Operate, align and configure ASTRO Digital System equipment. • Troubleshoot ASTRO Digital System equipment to the FRU (Field Replaceable Unit). • Troubleshoot the ASTRO Infrastructure

I. ASTRO Concepts and System Components
- A. Historical Systems
- B. Definition of ASTRO
- C. Implications of Digital Voice
- D. Digital Technology
- E. ASTRO Frame Structure
- F. System Components
  - 1. Systems

II. System Lab 1

III. Digital Audio Concepts
- A. Digitizing Voice
- B. Voice Digitization and Sampling Techniques
- C. Error Protection, Detection and Correction

IV. System Interconnect
- A. Modems
- B. RS-232
- C. Data Links
- D. ASTRO Modems
- E. Data Networks
  - 1. Troubleshooting Data Networks

V. ASTRO Specific Test Equipment
- A. R2670B Service Monitor
- B. Troubleshooting without R2670

VI. Introduction to Quantar / Quantro Base Station Repeaters
- A. Specifications
- B. Basic Operational Features
- C. Physical Breakdown
- D. Front Panel Indicators / Controls

VII. Operational Checkout Lab
- A. Power On Self Test
- B. Receiver Check Out
- C. Transmitter Check Out
- D. Wire Line Check Out

VIII. Installation and Configuration
- A. Hardware Set-up
- B. Software Set-up
  1. Sub-Directory Set-up
  2. DOS Files
  3. Computer Configuration Screen
- C. Menu Structure

IX. Radio Service Software Station Configuration Lab

X. Theory of Operation
- A. Power Supplies
  1. Quantar Power Supply
  2. Quantro Power Supply
- B. Station Control Module
  1. Station Control
  2. Network Links
- C. Receive Signal Flow
  1. Receiver Module
  2. Station Control Module
- D. Station Receive Audio Processing
  1. Station Control Board with DSP
  2. Wireline Board
- E. Station Transmit Audio Processing
  1. Wireline Board
  2. Station Control Board with DSP
- F. Transmit RF Signal Generation
  1. Exciter Module
  2. Quantar Power Amplifier Module
  3. Quantro Power Amplifier Deck

XI. Alarms and Diagnostics
- A. How to Recall Them
- B. Interpreting Alarms/Diagnostics

XII. Station Alignments
- A. VHF/UHF Preselector Alignments
- B. Radio Service Software Alignments

XIII. ASTRO-TAC Comparator Introduction
- A. State Objectives
- B. Introduction to the ASTRO Comparator
  - 1. Specifications
  - 2. Physical Breakdown
  - 3. Front Panel Indicators and Controls

IXV. System Operation and Description
- A. Total Area Coverage (TAC)
- B. Simulcast
- C. Voting Basics

XV. Hardware
- A. Installation
- B. Theory of Operation (FRU level)

XVI. Radio Service Software
- A. Computer and Hardware
- B. Computer Configuration
- C. RSS Menu Tree
- D. Configuration and Optimization
- E. Alarms
- F. Diagnostics
  - 1. Statistics

XVII. Digital Interface Unit Introduction
- A. Specifications
- B. Basic Operation
- C. Controls and Indicators
- D. Electrical Connections
- E. Installation
- F. CENTRACOM II Overview

XVIII. Theory of Operation
- A. Board Layout
- B. Board Function
- C. Block Diagram
- D. Signal Flow

XIX. Encryption Module
- A. Introduction to Secure Operation
- B. Functional Block Diagram of Module
- C. Loading Keys

XX. Diagnostics
- A. Power Up Diagnostics
- B. Alarm Messages

XXI. RSS Configuration
- A. Introduction/Review of Radio Service Software
- B. Screen Tree Structure
- C. Service
- D. Configuring the DIU
- E. File Maintenance

XXII. Troubleshooting
- A. System
- B. DIU

XXIII. System Troubleshooting

XXIV. ASTRO-TAC 9600 Comparator
- A. Comparator Overview
- B. Functional Description
- C. Simulcast Launch Time
- D. Physical Description
- E. Connections and Interfaces
- F. Configuration Requirements
- G. Diagnostics
  - 1. Troubleshooting

XXV. TeNSr Channel Bank
- A. TeNSr Channel Bank Overview
- B. Prime Site Channel Bank
- C. Remote Site Channel Bank
- D. Functional Description
- E. Physical Description
- F. Connections and Interfaces
- G. Configuration Requirements
- H. Diagnostics
  - 1. Troubleshooting

XXVI. Linear Simulcast Station
- A. Linear Simulcast Station Overview
- B. Functional Description
- C. Physical Description
- D. Connections and Interfaces
- E. Configuration Requirements
- F. Diagnostics
- G. Troubleshooting

14.28 Transportable Training

Target Audience	Technicians
Course Description	This course is designed to provide the students with an understanding of proper set up and start up of the VHF Disaster Recovery Transportable Communication Site (DRTCS), the 700/800 MHz Transportable Site, and the Transportable Microwave Sites, and their associated RF equipment. Motorola will provide a hands on training class for personnel directly responsible for the deployment of these transportable trailers. The class will provide an understanding for proper set up of the pneumatic mast, and start up of the AC Power Pac and generator. The class will also provide the technicians with an understanding of the RF equipment changes based on the different levels of equipment involved in each specific trailer for a complete understanding of how to bring the radio system on line and how it is to be shut down. In addition, the students will be instructed in how to hook up the transportable to the appropriate tow vehicle and how to shut down the entire unit for transportation.
Required Pre-Work	None
Recommended Prerequisites	An understanding of: basic two-way FM communications radio theory, microprocessor fundamentals, basic logic circuits and familiarization with computer operating systems. Experience using common communications test equipment is also required.
Course Objectives	• Apply operating power (Shore Power) and test generator/UPS subsystem • Step by step hands on training with a procedural document of what is required for setup and removal of the transportable, including the set up of the mast and the installation of the antennas associated with each transportable unit. • Training of the RF equipment changes based on the different levels of equipment involved in the trailer.

I. Hands on training and set up of Master System along with the set up of antennas, lines and mounts

II. Hands on training and set up with the Power Pac
A. Wiring of shore power and setting ground lead
B. Start Up
C. Shut Down
D. Power Test
E. Monitoring
F. Fueling
G. Understanding of Power Distribution of the transportable

III. Hands on start up and shut down of the RF equipment

IV. Hands on set up with towing vehicle for lights, brake adjustment and jack placement

V. Understanding of equipment placement for antennas, mounts and coax

VI. Location of Subscriber Storage compartments, and other compartments and their intended use

14.29 Diesel/Gas Generators Under 200 kW

Target Audience	Technicians
Course Description	Equipment information operation, sequence of operation, site specific, maintenance, and general safety
Required Pre-Work	None
Recommended Prerequisites	None
Course Objectives	To give applicable personnel an understanding of the Generator system, operation, and basic maintenance as it applies to their daily routine, and during emergency situations.

I. Equipment Information
   A. Review of specific equipment on site
      1. Generator set – gaseous or diesel fuel, voltage configuration, control, installation – air flow
      2. Transfer switch – voltage configuration, basic features, control, lights or meter description
   B. Review fuel delivery system
      1. Diesel – tanks, pipe, hours of operation capability, level gauges, or alarms
      2. Gaseous – tanks, delivery pressure, level checks, alarms, shutoffs
         a. LP liquid – Specific issues
         b. LP Vapor – Specific issues
         c. Natural gas – specific issues

II. Operation
   A. Description of sequence of operation and demonstration of equipment
      1. What is supposed to happen when power fails?
      2. Exercising the generator
      3. What if generator fails to start? Simple troubleshooting – control based
      4. What to do if the generator fails to shut off
      5. What if the transfer switch does not transfer load?
      6. Cool down period description

III. Maintenance and Safety
   A. Basic maintenance checks
   B. Standard fluid and filter checks
   C. Required intervals – oil, coolant, plugs
   D. Daily checks – leaks, debris, air flow
   E. Safety Issues
      1. Danger, High Voltage!!! – Only qualified personnel should open transfer switch or operate generator set manually
      2. Clear area, free of debris
      3. Fuel leaks
      4. Wire connections/temporary cabling issues
      5. Safety shutdowns on the generator – Emergency stop, control stop on generator

14.30 Transmitter and Multicoupler Use and Maintenance

Target Audience	Technicians
Course Description	This class will cover transmitter combiner and receiver multicoupler theory of operation, installation, troubleshooting and maintenance. Tuning of cavity resonators and ferrite isolators will also be covered. Hands-on training will include cavity and isolator alignment.
Required Pre-Work	None
Recommended Prerequisites	Basic knowledge of radio system operation, antenna and transmission line theory.
Course Objectives	To provide the technician with the skills and knowledge required to properly maintain and troubleshoot transmitter combiner and receiver multicoupler systems.

I. Transmitter and Receiver Multicoupler System
   A. Simultaneous Transmit and receive operation.
   B. Filtering requirements
   C. Affect of antenna isolation
   D. System layout

II. Receiver Multicoupler
   A. Component parts
   B. Pre-installation checks
   C. Interconnection and installation
   D. Measuring system performance
   E. Troubleshooting
   F. Intermodulation and interference issues
   G. Periodic maintenance

III. Transmitter Combiner
   A. Component parts
   B. T-Pass operation
   C. Cavity insertion loss and selectivity
   D. Isolator theory
   E. Installation and interconnection
   F. Measuring performance
   G. Network analyzer versus Wattmeter measurement techniques
   H. Tuning to different channels
   I. Intermodulation and interference considerations
   J. Periodic Maintenance

IV. Hands-On work
   A. Measuring loss with Watt meters
   B. Cavity resonator tuning and measurement with network analyzer
   C. Isolator tuning and measurements with network analyzer
   D. Measuring receive system sensitivity

14.31 MOSCAD Fault Management System Maintenance

Target Audience	Technicians
Course Description	Course provides basic instruction on maintaining the MOSCAD system.
Required Pre-Work	None
Recommended Prerequisites	None
Course Objectives	Upon completion, students will understand how to check MOSCAD hardware modules for problems, how to configure central computer software, and how to download MOSCAD applications.

I. System Overview

II. MOSCAD Hardware Components

III. Hardware Interfaces to MOSCAD

IV. MOSCAD Hardware Layouts

V. Software configuration of MOSCAD Hardware

VI. MOSCAD Hands on

VII. Central (GMC) Hardware configuration

VIII. Central Software Configuration

IX. InTouch Software Overview

X. Customer Specific InTouch Application

XI. Operator Navigation of InTouch Application

XII. Update / Modification of InTouch Database

XIII. What to Back-up on Customer Applications

XIV. GMC Master, Slave Redundancy – Specific to Zone 1 & 2 operation

14.32 CENTRACOM Gold Elite

Target Audience Technicians

Course Description

This course familiarizes those in troubleshooting/repair functions with the basic operating procedures, hardware and software applications for the CENTRACOM Gold Elite consoles. The portion of this program focuses on console hardware including the Console Operator Interface Module, CENTRACOM console types, the Central Electronics Bank with programming for Conventional and Trunked systems and the Embassy Audio Switch. The portion includes detailed discussions and hands-on activities installing and configuring console software.

Note: Course given as customer specific, will cover options pertinent to customer equipment

Required Pre-Work

None

Recommended Prerequisites

- Knowledge of basic two-way FM communications theory and logic circuits.
- Experience using common communication test equipment.
- Course Equivalent: Communication Systems Concepts (NST021)
- Familiarity with local area networks(LAN) concepts
- Knowledge of Basic Trunking and signaling concepts.
- Course Equivalent: Basic Trunking and ASTRO Concepts (TRK100)
- Microsoft Windows and Windows NT 4.0

Course Objectives

- Explain the command and acknowledge data flow, transmit and receive audio paths through the CENTRACOM GOLD systems.
- Describe the functional, specifications and operational characteristics of the Central Electronics Bank and its component boards.
- Perform programming procedures for the 68020 Console Operator Interface Module based microprocessor system for Conventional, Stat-Alert and Trunking features.
- Perform detection and isolation procedures to identify a faulty area in the CENTRACOM system, using fault maintenance routines to isolate system failures to the Motorola recommended service level.
- Perform installation and configuration procedures for the CENTRACOM Gold System hardware.
- Perform installation and configuration procedures for the CENTRACOM Gold System software.
- Perform maintenance procedures for the console interface electronics.
- Perform dispatch operator functions.

I. Examine CENTRACOM Manuals
- A. CEB Maintenance Manual
- B. CIE Maintenance Manual
- C. Gold Embassy Switch Manual
- D. Installation Manual
- E. Console Database Manager's Maintenance Manual
- F. Multi-Pack/4-Tab Manual (CENTRACOM Gold Series Manual

II. CENTRACOM Overview

III. CENTRACOM History

IV. CENTRACOM Gold System Architecture
- A. Overview of System Block Diagrams
- B. Operator Positions
- C. Console Operator interface Module (COIM)
- D. System Timer
- E. Base Interface Module (BIM)/TBIM
- F. Dual Receiver
- G. 161/O
- H. Options Boards
  1. RS-232
  2. AUX I
  3. AUX II
  4. Diagnostics
- I. System Grounding

V. Conventional Channel Command and Acknowledgement
- A. CRT Operator Position(s)
  1. Overview
  2. CIE

VI. Operator Position Assembly Lab

VII. Audio Processing

A. Pulse Code Modulation (PCM)
B. Time Division Multiplexing (TDM)
C. CEB Board Dipswitch Settings

VIII. Central Electronics Bank (CEB)

A. CEB Interconnect Board

1. CEB Interconnect Board Modification for COIM Relocation Option

B. Card Cage Configuration
C. Full Size Card Slot Information
D. Option Board Card Slot Information
E. Punch Block and Spark Gap Board
F. System Timer Module
G. Console Operator Interface Module (COIM)
H. Base Interface Module (BIM)
I. Dual Receive Module (DRM)
J. Phone Patch Module
K. MDC Signaling
L. ASTRO Signaling
M. 161/O Board
N. Option Boards

1. RS-232 Option Board (C version)
2. AUX I Board
3. AUX II Board

Smartnet Trunking Overview
Logging Operator Interface Module (LOMI)
Operator Audio Expansion Interface Module (AEI)
Logging Recorder Interface Board (LORI)

IX. Audio Signal Tracing Lab

X. Data Signal Trace Lab

XI. Remoted Operator Positions

Remote Operator Console Interface (ROCI)
Console Operator Remote Interface (CORI)

XII. Trunking Overview

XIII. As-Built Documentation

XIV. Maintenance, Troubleshooting and Diagnostics

A. Maintenance Philosophy
B. Fault Maintenance
C. Built-In Error Checking Routines
D. Built-In Error Servicing Routines
    1. Tone Loop Tests
E. Keypad and Remote Terminal Diagnostics

XV. Maintenance,Troubleshooting and Diagnostics Laboratory

XVI. Embassy Switch Overview

A. AEB Block Diagram (AEB)
B. Central Electronics Bank (CEB)
C. Audio Link Capacity

XVII. Ambassador Electronics Bank (AEB) Architecture

A. AEB Block Diagram
B. Ambassador Board Block Diagram
C. AEB System Timer Block Diagram
D. ZABBI Board (found in SmartZone systems only)
E. AIMI Board Block Diagram

XVIII. AEB Installation Considerations and Interconnections

- A. Cable Terminations
- B. External Links
- C. Power and Signal Cabling

XIX. System Configuration Requirements

Setting Up Collocated CEB Link Parameters Screen Print
Jumpers Block Diagram

XX System Applications

PART II SOFTWARE/PROGRAMMING for the CENTRACOM Gold Elite.

I. Software Installation Prerequisites
- A. Hardware Requirements
- B. Software Requirements
- C. Getting Started

II. First Time Installation
- A. System Checking
- B. Organization Information
- C. Selection Window
  1. Discuss Changing Installation Directory
- D. File Installation
- E. Setting Up the Operating Environment
- F. Completing Installation

III. Console Database Manager's (CDM) Applications Program
- A. Systems Approach to Configuring the CDM
- B. CDM Tutorial
- C. Configuring the CDM
- D. Backing Up the CDM
- E. Restoring the CDM
- F. Exiting the CDM

IV. NT File Maintenance

V. Alias Database Manager (ADM) Applications Program
- A. Overview
- B. Scenario
- C. Specifications and Prerequisites
- D. Starting the ADM
- E. Menu Items, Tools Bar Icons, Systems Selections
- F. Creating Alias Entries
- G. Creating Alias Entries
- H. Sorting the Alias Entry List
- I. Printing the Alias Entry List
- J. Importing and Exporting an Alias Book
- K. Backing Up the ADM
- L. Restoring the ADM
- M. Exiting the ADM

VI. Using the Motorola Upload Utility (Mupl)
- A. Getting Started
- B. Setting Up the RS232 Link
- C. Opening a Catalog file
- D. Uploading

VII. CENTRACOM Elite ADMIN Program
- A. Getting Started
- B. Working with Configurations
  1. Creating a New Configuration
  2. Opening an Existing Configuration
  3. Saving the Configuration
  4. Exiting the Configuration
- C. Setting Up Folders and Resources
  1. Setting Up Folders
  2. Defining Resource Characteristics
     - a. Viewing Resource Settings
     - b. Defining Resource Headers
     - c. Defining Feature Display
     - d. Defining Audio Destinations
  3. Defining the Fault Resource
- D. Saving the Elite ADMIN Program
- E. Exiting the Elite ADMIN Program

VIII. CENTRACOM Elite Configuration
- A. Change Master Database Settings
  - 1. Change Console Database Manager
  - 2. Change Alias Database Manager
- B. Elite Configuration Storage Directory
  - 1. Change Elite Configuration Path
- C. Serial Port Settings
  - 1. Change Serial Port
  - 2. Change Baud Rate

IX. CENTRACOM Elite Operator Video

X. CENTRACOM Elite Dispatch
- A. Windows NT 4.0
  - 1. User Policies (for restricting dispatchers access to limited programs within the NT Operating System)
- B. Basics
  - 1. Start Dispatch
  - 2. Understanding the Menus
  - 3. Understanding the Tool Bar
  - 4. Expanding and Compressing Resources
  - 5. Adjusting the Volume of a Resource
  - 6. Status Bar Indicators
- C. Working with Configuration
  - 1. Opening a Configuration
  - 2. Editing a Multi-Select or Patch Group Via the Edit Menu
  - 3. Expanding or Compressing Resources via the Edit
  - 4. Changing the Speaker Audio Assignments
  - 5. Changing the Ring Tone of a Phone
  - 6. External Resource Assignments
- D. Communicating with Radios
  - 1. Responding to Radios
    - a. Activity log
  - 2. Calling Radios
    - a. Performing General Transmit
    - b. Performing Instant Transmit
    - c. Safety Instant Transmit
  - 3. Other Resource Features
    - a. Resource Status

E. Advanced Signaling Features
   1. Call Alert
   2. Private Call
   3. Emergency Alarm and Call
   4. Handling Emergency Alarm and Call
   5. Console Emergency
   6. Status Request

F. Outbound Signaling Using the QuickList
   1. Selection by Unit Aliases
   2. Selection by Unit ID

G. Using the Stack
   1. Deleting Stack Entries
      Delete Single Stack Entries
      Delete Entire Stack

H. Operator Console Toolbar Capabilities and Functions
   1. Selective Intercom
   2. Intercom All-Call
   3. Operator Position Enable/Disable
   4. Channel Marker

I. Working with Telephone Resources
   1. Answering Telephone Calls
   2. Putting Telephone Calls on Hold
   3. Making Telephone Calls from the Console

J. Paging
   1. Types of Paging
      a. Quick Page
      b. Checklist Page
      c. Standard Page
      d. Resend
   2. Using Page Resources

K. Working with AUXIOs

L. Multi-Select and Patch Groups
   1. Creating a Multi-Select or Patch Group
   2. Changing Resources in Groups
   3. General Transmitting to a Multi-Select Group
   4. APB and Patch Transit
   5. Controlling Phone Patch Conversations

M. Supervisory Privileges
1. Transmit Priorities
2. Setting the System Clock
3. Clearing System Errors

XI. Windows NT 4.0
Network Configurations
NT Function/User Setup
NT Installation
1. Configuration
a. TCP/IP

14.33 NetClock Technical Training

Target Audience	Technicians
Course Description	Comprehensive training course encompassing installation and operation of NetClock Master Clocks and associated peripherals including the Ethernet Time Server, Time Tap interface modules, Display Clocks, Redundant Systems, Wireless Time Link system, and Device/Network Time Manager software modules *Note: Course given as customer specific, will cover options pertinent to customer equipment*
Required Pre-Work	None
Recommended Prerequisites	None
Course Objectives	To provide technical training (Instruction and Hands-On) on all NetClock Time Synchronization products for a basic understanding of installation and operation, as well as a system overview on how they interface with all the various operating hardware and software desiring time sync

I. Conceptual
   - A. Time Sync signal/operation – GPS & WWVB
   - B. RS-485 distribution
   - C. RS-232 communications
   - D. IRIG interface

II. Products - (Installation, Operation and Basic Troubleshooting information)
   - A. NetClock/GPS Model 8183
   - B. NetClock/WWVB Model 8182
   - C. NetClock/NTP Model 8189/9189
   - D. GPS Antenna Systems
   - E. Ethernet Time Server 8188
   - F. Time-Tap interfacing
   - G. TimeView Displays 8175/8177
   - H. TimeGuard Redundant system and application
   - I. Wireless Time Link System
   - J. Basic introduction to Time Burst 8185 & TV210 Displays
   - K. Requirements for use

III. Computer Network/PC synchronization
   - A. NTP/SNTP, Network Operating Systems software
   - B. Bytefusion software
   - C. DTM and NTM software

14.34 Pallas Installation and Maintenance/Programming

Target Audience	Technicians
Course Description	This course provides technicians with detailed instruction on installation, programming, and maintenance of a Pallas PBX in a 9-1-1 environment.
Required Pre-Work	None
Recommended Prerequisites	Knowledge of Microsoft Windows
Course Objectives	• Overview of the Pallas components • Describe and demonstrate the settings on bay modules • Choosing profiles, core loads • Demonstrate and program, feature codes, system features, time and date; etc. • Program various scenarios on the Pallas • Maintenance of the Pallas

I. Overview of the Pallas components.
   A. Defining the data, telephony, and computer components. Describe expander cabinet, various sets and adapters. Media bay modules-dip-switch setting and accessing various DS30 schemes

II. Describe and demonstrate the settings on bay modules.
   A. Explain choices of dip switch settings in various DS30 positions
   B. Describe 2/6 vs.3/5 splits, using the expander and setting up the Pallas to maximum capabilities for both lines and sets.

III. Starting up the Pallas.
   A. Starting the system with a serial port.
   B. Setting up the IP address and sub-net mask.
   C. Choosing profiles, core loads.
   D. Using the IP access and the Unified Manager to choose various settings during setup on the Quick Start Wizard. Describe various key codes and the means of installation. Configure and size a T1/PRI module. Overview of the i2004 and 2050 sets.

IV. Discuss regional settings, templates and various start DN's.

V. Demonstrate and program, feature codes, system features, time and date etc.

VI. Program various scenarios on the Pallas.
   A. Select the appropriate modules, then program and wire the MBM. Configure voice mail and then build and assign mailboxes.
   B. Describe and program line pools, CAP modules, CLID with appearances on appropriate sets.

VII. Demonstrate modem and LAN scenarios.
   A. Show how to access with appropriate password levels.

VIII. Maintenance of the Pallas.
   A. Perform Backups
   B. Perform warm resets
   C. Logging off, Rebooting, Etc.

14.35 Pallas Installation and Maintenance/Admin

Target Audience	Technicians
Course Description	This class covers the integration of VESTA with the Pallas switch and additional hardware and software.
Required Pre-Work	None
Recommended Prerequisites	Knowledge of Microsoft Windows, Pallas Installation and Maintenance / Programming
Course Objectives	• Learn to use VESTA Pallas software GUI • Configure VESTA Pallas software as an Administrator • Install and configure VESTA Pallas software on a server to work and interface with the new Pallas PBX • Install and configure VESTA Pallas software on workstations • Troubleshoot VESTA Pallas server, workstations, and network • Install, configure, and program the new MTU-Multi line trunk unit • Troubleshoot and replace MTU power supply, CPU and CAMA cards • Configure and troubleshoot options like ALI page; etc • Perform Backup and Restore functions

I. System Overview with Block Level Explanations
- A. Pallas PBX
- B. Multi Trunk Unit
- C. VESTA Overview
  1. General VESTA Software Overview
  2. Interfacing with MTU
  3. Interfacing with Pallas PBX
  4. VESTA Pallas workstations and servers
  5. Herbie boxes, Handsets; etc.
  6. System error versus warning message

II. VESTA – General
- A. VESTA Log On/Off
- B. System Messages

III. VESTA - Phone Function
- A. Line Organizer or Line Status Window
  1. Line Groups (911, 7 Digit Emergency, Admin.)
  2. Line Appearance (Color, Arrow—steady, flashing)
  3. Answer/Make Call
  4. Active vs. Non-Active Lines
  5. Control Window
  6. Transfer/Speed Dial Window
  7. ALI Windows
     a. ANI Display
     Retransmit for ALI
     Options button
- B. TTY/TDD Function
- C. DTMF Support
- D. IRR Function
  1. Play recordings
  2. Transfer sound files
- E. Call Notes
- F. Supplemental Information

IV. VESTA Maintenance Applications
- A. Maintenance Logon – Server, Workstations
  User Setup Procedure
- B. Adding/Changing/Removing User Info.
- C. Assigning User Levels (Security)
- D. Setting Up User Template
- E. Assigning Modules to Users
- F. Student Practice
- G. Console Line Map Maintenance

1. Deleting/Creating Consoles
2. Deleting/Creating Physical Lines
3. Deleting/Creating System and Intercom Lines
4. Deleting/Creating Console Buttons
5. Defining Groups/Line Labels
6. Student Practice

H. Auto Dial Maintenance
1. Setting Up Context Builder – Dialing Rules
2. Adding/Changing/Deleting Dial Entries / Numbers
3. Adding/Deleting Lists, Tabbed Lists
4. Student Practice

I. TTY/TDD Maintenance
1. Adding TTY/TDD Tabs
2. Adding TTY/TDD Messages
3. Assigning Function Keys to TTY/TDD Messages
4. Student Practice

V. PEI Management Console

A. Enhanced ALI Server – EAS
1. 1.Setup and Configuration
2. Troubleshooting

B. MTU Configuration, Alarms
1. Cabling and cards
2. Troubleshooting

C. Call Information Service
D. Call Notes (optional)
E. Supplemental Information (optional)
F. Server Utilities
G. CAD Module
H. VESTA Directory Replication
I. Cabling of Herbie, Radio Interface Unit and Sound Cards
1. System Installation Overview
2. VESTA.ini and Vserver.ini Overview
3. Prepare Computers for CPR and Recovery
4. Restore Computer to original state using backup at server

VI. Pallas PBX Maintenance

A. Backup
B. Adding and modifying trunks or lines
C. Adding Stations or Modifying System DNs

VII. Introduction to MagIC EX – Management Information System

- A. System Block Diagram with Conceptual Explanation
- B. Reviewing MagIC EX features
- C. MagIC EX Monitor
  1. Login
  2. Toolbar
  3. Alarms – Setup, enabling
  4. ANI search
  5. File Menu – Printing/Exporting call data
  6. Tools Menu
  7. Help Menu
- D. Reports – Overview, Ring Time Statistics, Trunk / Line Utilization
- E. MagIC EX Configuration
  1. Login
  2. Users
  3. Agents
  4. Lines
  5. Transfer Buttons
  6. Consoles
  7. Groups
  8. Wireless Rules
- F. Database Maintenance Tasks in PEI – DB
  1. Backup
  2. Attaching/Detaching Database
- G. Database Maintenance Tasks in PEI – DB
  1. Archiving
  2. Viewing Archived Database
- H. Software Installation of MagIC Components

14.36 Wordnet Logging Recorder

Target Audience	Technicians
Course Description	The training offers a comprehensive and detailed curriculum, which provides technicians and system administrators the skills necessary to perform basic trouble-shooting, routine maintenance, and system repair and upgrades.
Required Pre-Work	None
Recommended Prerequisites	None
Course Objectives	• Perform preventative maintenance tasks • Execute system and component diagnostics and following through troubles to resolution • Carry out simple and complex repairs • Administer adds, moves and change management operations • Provide application solving techniques • Run and analyze system, component and user reports • Manage all system integration requirements • Work with operations personnel and users to determine requirements and resolve problems

14.37 ML900 Maintenance and Programming

Target Audience

Technicians

Course Description

This course is designed to introduce the students to the maintenance and repair of the ML900. The course allows the students to troubleshoot the ML900 and introduces the student to basic computer troubleshooting techniques.

Required Pre-Work

None

Recommended Prerequisites

An understanding of basic electronics is highly recommended. Microprocessor fundamentals, basic logic circuits and familiarization with computer operating systems are required. A basic knowledge of networking is helpful and recommended.

Course Objectives

- Explain the principles of the ML900 and its use in an IV&D System.
- Theory of operation
- Describe the I/O processes of a computer. .
- Describe the Display unit
- Understand the modules that make up the display unit.
- Discuss the restoration process used
- Remove and replace major components

14.38 Quantar Base Stations

Target Audience	Technicians
Course Description	This course is designed to give the customer the ability to align, troubleshoot and repair the Quantar Base Station/Repeaters to the Field Repairable Unit (FRU) level. Emphasis is placed on the use of Radio Service Software and its role in configuration, maintenance, diagnostics, alignments, and optimization of the Quantar *Note: Course given as customer specific, will cover options pertinent to customer equipment*
Required Pre-Work	None
Recommended Prerequisites	An understanding of: basic two-way FM communications radio theory, microprocessor fundamentals, basic logic circuits and familiarization with computer operating systems. Experience using common communications test equipment is also required.
Course Objectives	• Explain the features and capabilities of the Quantar Base Station/Repeaters. • Configure a Quantar Base Station/Repeater using the Radio Service Software. • Align, optimize, and calibrate the Quantar Base Station/Repeaters using the Radio Service Software • Verify proper operation of a Quantar Base Station/Repeater. • Troubleshoot a Quantar Base Station/Repeater to a faulty field replaceable unit (FRU).

I. Introduction to Quantar base station repeaters
   A. Specifications
   B. Basic Operational Features
   C. Physical Breakdown
   D. Front Panel Indicators / Controls
   E. Overall Equipment Block Diagram

II. Operational Checkout Lab

III. Theory of Operation
   A. Power Supplies
   B. Station Control Module
   C. Receive Signal Flow
   D. Station Receive Signal Processing
   E. Transmit RF Signal Flow

IV. Introduction to Radio Service Software
   A. Getting Started
   B. Default Configuration
   C. Service Menu

V. Station Alignments
   A. Pre-selector Alignments
   B. Radio Service Software Alignments

VI. Diagnostics Lab

VII. Systems Overview
   A. Conventional Systems Review
      1. Tone Remote Control Systems
      2. Securenet Features and Options
   B. Astro Concepts
      1. Introduction to Astro
      2. Technology and Terminology
      3. Encrypted Astro

   C. Trunking Concepts
      1. Basic System Layout
      2. System Interconnect
      3. Quantro Code Plug

VIII. Radio Service Software Station Configuration Lab
- A. Conventional / Securenet
- B. Astro Systems
- C. Trunked Base Station

IX. Troubleshooting Labs

14.39 XTS2500 Digital Portable Radio

Target Audience

Technicians

Course Description

This course provides the technician with the features and options of the XTS-2500, circuit theory of operation, testing procedures, programming, maintenance and repair of the XTS-2500 Portable Radio. The course is designed to provide the technician with ample "Hands-On" lab exercises, and troubleshooting.

Note: Course given as customer specific, will cover options pertinent to customer equipment

Required Pre-Work

None

Recommended Prerequisites

Knowledge of basic land mobile two-way FM communications radio theory, as well as microprocessor fundamentals and RF circuits OR Communications Systems Concepts (NST021),
Experience using basic communications system test equipment

Course Objectives

- Program the operation of an XTS 2500 with the Customer Programming Software
- Conduct performance checks on the radio to be sure that it is operating within published specifications
- Align the radio's operating parameters using the Tuner Software
- Disassemble and reassemble the radio accordance with recommended procedures
- Use the Theory of Operation to isolate faults found to both the board and the components

I. Course Introduction/Orientation

II. Product Introduction
- A. Identify the XTS 2500 models, physical features and major assemblies of the radio.
- B. Overview of radio's basic operating specifications
- C. Learn basic maintenance procedures
- D. Overview of latest software enabled features
- E. Identify accessories for the XTS 2500

III. Customer Programming Software

IV. Performance Checks
- A. Overview of test equipment and service aids used to service the XTS 2500, and the initial test equipment control settings.
- B. Learn about the RF and Control Head test modes of the radio, and the complete set of performance checks

V. Radio Tuner Alignment
- A. Learn how to align the radio's operating parameters using the Tuner Software
- B. Disassembly and Reassembly Procedure
- C. Theory of Operation Astro Project 25 theory of operation

14.40 XTS5000 Digital Portable Radio

Target Audience	Technicians
Course Description	This course provides the technician with the features and options of the XTS 5000, circuit theory of operation, testing procedures, programming, maintenance and repair of the XTS-5000 Portable Radio. The course is designed to provide the technician with ample "Hands-On" lab exercises, and troubleshooting. *Note: Course given as customer specific, will cover options pertinent to customer equipment*
Required Pre-Work	None
Recommended Prerequisites	Knowledge of basic land mobile two-way FM communications radio theory, as well as microprocessor fundamentals and RF circuits OR Communications Systems Concepts (NST021), Experience using basic communications system test equipment
Course Objectives	• Program the operation of an XTS 5000 with the Customer Programming Software • Conduct performance checks on the radio to be sure that it is operating within published specifications • Align the radio's operating parameters using the Tuner Software • Disassemble and reassemble the radio accordance with recommended procedures • Use the Theory of Operation to isolate faults found to both the board and the components

I. Product Introduction
   A. Identify the XTS 2500 models, physical features and major assemblies
   B. Overview of radio's basic operating specifications
   C. Learn basic maintenance procedures
   D. Overview of latest software enabled features
   E. Identify accessories for the XTS 2500

II. Customer Programming Software

III. Performance Checks
   A. Overview of test equipment and service aids used to service the XTS 2500, and the initial test equipment control settings.
   B. Learn about the RF and Control Head test modes of the radio, and the complete set of performance checks
   C Radio Tuner Alignment
      1. Learn how to align the radio's operating parameters using the Tuner Software

IV. Disassembly and Reassembly Procedure

V. Theory of Operation Astro Project 25 theory of operation

14.41 XTL5000 Digital Mobile Radio

Target Audience	Technicians
Course Description	This course provides the technician with the features and options of the XTL 5000, circuit theory of operation, testing procedures, programming, maintenance and repair of the XTL5000 Mobile Radio. The course is designed to provide the technician with ample "Hands-On" lab exercises, and troubleshooting. *Note: Course given as customer specific, will cover options pertinent to customer equipment*
Required Pre-Work	None
Recommended Prerequisites	Knowledge of basic land mobile two-way FM communications radio theory, as well as microprocessor fundamentals and RF circuits OR Communications Systems Concepts (NST021), Experience using basic communications system test equipment
Course Objectives	• Program the operation of an XTL5000 with the Customer Programming Software • Conduct performance checks on the radio to be sure that it is operating within published specifications • Align the radio's operating parameters using the Tuner Software • Disassemble and reassemble the radio accordance with recommended procedures • Use the Theory of Operation to isolate faults found to both the board and the components

I. Product Introduction
   A. Identify the XTS 2500 models, physical features and major assemblies
   B. Overview of radio's basic operating specifications
   C. Learn basic maintenance procedures
   D. Overview of latest software enabled features
   E. Identify accessories for the XTS 2500

II. Customer Programming Software
   A. Performance Checks
   B. Overview of test equipment and service aids used to service the XTS 2500, and the initial test equipment control settings.
   C. Learn about the RF and Control Head test modes of the radio, and the complete set of performance checks
   D. Radio Tuner Alignment
      1. Learn how to align the radio's operating parameters using the Tuner Software

III. Disassembly and Reassembly Procedure
   A. Theory of Operation ASTRO Project 25 theory of operation

14.42 Radio Programming and Template Building

Target Audience	Technicians
Course Description	This course provides communications management personnel and technicians with the knowledge and tools needed to program the radio units in the most efficient way depending on the system, features and options they require. The parameters and exercises shown in the class apply to a wide number of portable and mobile radios.
Required Pre-Work	None
Recommended Prerequisites	Knowledge of the basic features and options of two-way radios, and the basic concepts of trunking.
Course Objectives	• Program the basic parameters of any radio using the Customer Programming Software (CPS). • Program the specific parameters of any radio related with the system where the user is going to work: conventional, single-site trunking, Simulcast, AMSS or SmartZone. • Demonstrate knowledge of the options and features that can be programmed in a radio. • Create templates for the programming of subscribers in a system.

I. Set up and Data Transfer
   A. Read/Write/Open/Save the codeplug of a radio
   B. User Settings

II. Conventional Personalities
   A. Repeater / Talkaround
   B. Coded squelch (PL, DPL)
   C. Unmute conditions
   D. Monitor types
   E. Time out timer
   F. Smart PTT
   G. Signaling

III. Conventional Scan Lists
   A. Scan
   B. Scanning features
   C. Priority levels
   D. Breaking the circle

IV. Trunking Systems
   A. Basic parameters of a Trunking System
      1. System ID
      2. Individual ID
      3. Control channels
      4. Connect Tone
      5. Status / Messages
   B. More parameters
      1. Affiliation type
      2. Coverage type
   C. Channel assignment type
      1. Domestic
      2. International
   D. Splinter channels

V. Trunking Personalities
- A. Types of calls
- B. What is a trunking personality?
- C. Parameters of a trunking personality
- D. The programming of the radio vs. the management of the system
- E. Scan lists for trunking personalities
- F. Emergency Data configuration
- G. Failsoft parameters
- H. Types of trunking
- I. The logic of the programming in a trunking system

VI. Special system environments
- A. VHF / UHF Trunking systems
- B. SmartZone systems

VII. CPS Features

VIII. Radio Wide Options
- A. Indications and Tones
- B. Buttons, switches and menu
- C. Display options

IX. Programming Practice

14.43 VHF Linknet, 800 Linknet, and Line Amplifiers

Target Audience	Technicians
Course Description	In-depth Field Technician Training for VHF LinkNet, 800 LinkNet and Line Amplifiers. Covering system overview, equipment overview, features of IMS alarm system.
Required Pre-Work	None
Recommended Prerequisites	Graduate of Technical or Community College or a minimum of five years of related two-way radio experience. Test equipment: Spectrum Analyzer, Signal Generator, assorted coaxial test cables, Digital Voltmeter, Laptop computer, 50ohm Load. Operating Equipment: VHF LinkNet & 800 LinkNet Modules (both uplink and downlink), Card Cage, Gateway Module, 800 Line Amplifiers.
Course Objectives	The object of this course is to instruct Field Technicians, Field Technologists and their direct supervisory staff on the operation of the system. At the completion of the course participants will be able to: • Understand the operation of the Distributed Antenna system and the basis for its design. • Identify the major components of the system and their interaction. • Detailed operation of the Link Products and Line Amplifiers. • Know the operation of the Headend. • Use and Operation of the InView management System for alarming. • Set Levels and understand the effects of multiple carriers on composite power. • Understand the base line data collected during system optimization.

14.44 Remote Monitoring and Control of In-Tunnel RF Systems

Target Audience	Technicians
Course Description	In depth training covering the Remote Monitoring and Control of In-Tunnel RF Systems.
Required Pre-Work	None
Recommended Prerequisites	Experienced with TCIP, SNMP, VPN connections etc. Test equipment: Desktop PC or Laptop Computer with connection to Internet or InView Management System (IMS) Server. Operating Equipment: VHF LinkNet & 800 LinkNet Modules (both uplink and downlink), Card Cage, 800 MHz. Line Amplifiers, Gateway Module with connection to Internet or IMS server.
Course Objectives	The object of this course is to instruct Information Technology Staff & Network Operations Center Management on the operation of the InView Management System and its network requirements. At the completion of the course participants will be able to: • Understand the Purpose of having the InView Management System. • Identify the major components of the IMS. • Understand the network requirements to operate the IMS and IMS server. • Use and Operate the InView management System monitoring and responding to alarms.

I. System Description
   A. VHF Services
      1. Overview
      2. System Block Diagram
      3. Headend
      4. Distributed Antenna system
   B. 800 Services
      1. Overview
      2. System Block Diagram
      3. Headend
      4. Distributed Antenna Network

II. Combined System Information

III. Alarm Monitoring
   A. Operation of Gateway Module
   B. SNMP protocol,
   C. VPN connections
   D. Operation of InView Management System
   E. Enterprise View
   F. System View
   G. Module View
   H. Definitions of Status Indicators
   I. Event Log Management

14.45 In-Tunnel Preventive Maintenance

Target Audience	Technicians
Course Description	In-depth Field Technician Training covering Preventive Maintenance activities and system troubleshooting.
Required Pre-Work	None
Recommended Prerequisites	Graduate of Technical or Community College or a minimum of five years of related two-way radio experience. Test equipment: Spectrum Analyzer, Signal Generator, assorted coaxial test cables, Digital Voltmeter, Laptop computer, 50ohm Load. Operating Equipment: none to be conducted at LinkNet Headend.
Course Objectives	The object of this course is to instruct Field Technicians, Field Technologists and their direct supervisory staff on the preventative and potentially investigative activities required to keep the system in top running order. At the completion of the course participants will be able to: • Troubleshoot the operation of the Distributed Antenna system. • Perform trouble-shooting activities to isolate problems down to a modular or system element level. • Measure and verify current levels and compare to baseline date. • Understand the significance of any minor or major level changes. • Test operation of the InView management System.

I. System Description
   A. VHF Services
      1. Overview
      2. System Rack Layout
   B. 800 Services
      1. Overview
      2. System Rack Layout

II. Distributed Antenna System Routing
   A. Location of Splitters/Tap-offs
   B. Location of Antennas

III. As-Built System Levels and Preventative Maintenance
   A. As-Built System Signal Levels Used as Base-Line Data
   B. Field measurement and Level Settings

IV. Equipment Description and Replacement Procedures
   A. Review of Equipment Replacement Procedures
      1. Replacing the Kaval LinkNet Service Module
      2. Replacing the Kaval VHF Amplifier Unit (in Headend or Line Amplifier)
      3. Replacing the Kaval 800 Amplifier Unit (in Headend or Line Amplifier)
      4. Replacing the Kaval BDA Controller
      5. Replacing the Kaval Gateway Module
      6. Alarm Monitoring
   B. Connections to Gateway Module for InView Management System

14.46 CM Digital Microwave Radio

Target Audience	Technicians
Course Description	This class will cover basic T-Carrier Multiplexing principles, theory of operation, trouble shooting and alignment procedures for the CM6 HC Radio. Hands-on training includes the alignment of all modules and some installation procedures.
Required Pre-Work	None
Recommended Prerequisites	A thorough knowledge of electronics, Microwave theory, FM and AM principles and Logic circuits is helpful. Analog knowledge is important.
Course Objectives	To provide the technician with the skills and knowledge necessary to install, maintain, troubleshoot, and align the CM6 HC Microwave Radio System.

I. Generic Digital Radio

II. CM 6 Simplified Block Overview

III. CM 6 Guaranteed Specifications

A. Reliability

1. Automatic Power Control (APC)
2. Adaptive Time Domain Equalizer (ATDE)
3. Forward Error Correction (FEC) and “Hitless” switching
4. Service Channel Unit

B. Flexibility

1. Change of Protection
2. Field Frequency Changes
3. Handling of 4, 8, 12 DS1, DS3 or higher capacity signals

IV. Installation

1. Cautions
2. Hands-on

V. Explanation of Module Block Diagrams

VI. CM 6 Maintenance Checkout

VII. Local Access Port Operation

1. Alarm and Status
2. Configuration
3. Performance and Monitoring
4. Control and Maintenance

VIII. Protection Switching

1. Switching planes
2. Local Access Port Operation

IX. Loopbacks

1. Local and Remote
2. Local Access Port Operation

X. Remote (Upstream) Configuration

1. Local Access Port Operation
2. Loopbacks

XI. Troubleshooting the CM 6 with Known Inserted Faults

1. Async
2. SONET

XII System Test

1. Hop Test
2. Section Test

XIII. SONET Operation and Theory

1. SONET Ring
2. SONET MHSB

14.47 Proteus AMT Digital Microwave Radio

Target Audience	Technicians
Course Description	This class will cover basic Multiplexing principles, theory of operation, troubleshooting and alignment procedures for the 18, 23, and 38 GHz Digital Radios. Hands-on training includes the alignment of all modules and some installation procedures.
Required Pre-Work	None
Recommended Prerequisites	Basic knowledge of electronics, Microwave theory, FM and AM principles, Logic circuits is helpful.
Course Objectives	To provide the technician with the skills and knowledge necessary to install, maintain, troubleshoot, and align 18 GHz, Proteus AMT Digital Microwave Radio Systems.

I. Digital Concepts
   A. Multiplexing Overview
   B. Bipolar (AMI)
   C. B8ZS/HDB3

II. Generic Digital Radio

III. System Architecture
   A. Design Philosophy
   B. Proteus Elements
   C. IDU to ODU Interface
   D. Performance Monitoring and Maintenance
   E. Service Channels
   F. Proteus Options
   G. Principle of Redundancy
   H. Frequency Allocation

IV. System Specifications
   A. General
   B. Bands of Operation
   C. Common Specifications
   D. Interfaces
   E. Environment
   F. Power Supply and Consumption
   G. Antenna Specifications
   H. Installation Options
   I. Dimensions

V. Installation Prerequisites
   A. Installation Steering Guide
   B. Unpacking and Handling the System
   C. Mechanical Inspection
   D. Inventory
   E. Tools Required for Installation
   F. Test Equipment Required for Installation and Test

VI. Hardware Installation Procedures
- A. General Information
- B. Unpacking the Proteus System
- C. Configuration Verification
- D. Assembling the Antenna Mounting Assembly
- E. Attaching the Pole Mounting Assembly to the Pole
- F. Attaching the Antenna to the Mounting Assembly
- G. Installing the Coaxial Cable
- H. IDU Installation

VII. System Commissioning – Section 6
- A. Applying the DC Power to the Radio Terminal
- B. Using the Control Panel
- C. Verify the Proteus Settings
- D. Configuration Wizard
- E. Antenna Alignment

VIII. Element Manager
- A. GUI Basics
- B. How to Access the Terminal
- C. Operating Multi-Document Interface (MDI)

IX. Commissioning
- A. Final Checks with MDI
- B. Commissioning

14.48 Fujitsu 4100 Turn-Up and Maintenance

Target Audience	Technicians
Course Description	This class provides the needed training for technicians to turn up and provision the FLASHWAVE 4100 system applications. Includes software and hardware options. Hands-on portions of the class permit the student to turn up, provision, and troubleshoot FLASHWAVE 4100 applications.
Required Pre-Work	None
Recommended Prerequisites	Knowledge of and experience with fiber-optic equipment. Working knowledge of Microsoft Windows.
Course Objectives	To provide the technician with the skills and knowledge necessary to install, provision, maintain and troubleshoot the FLASHWAVE 4100 Sonet mux.

I. FLASHWAVE 4100 Overview
   A. System Features
   B. Configurations
   C. Hardware Summary
   D. Shelf Configuration
   E. Cabling
   F. Network Management Interfaces

II. FLASHWAVE 4100 Units
   A. Common Plug-in Units
   B. Plug-in Units
   C. Acceptance and Turn-Up

III. FLEXR GT Overview

IV. FLASHWAVE 4100 Configuration
   A. Cross Connects
   B. Turn-Up
   C. Configurations
   D. Timing

V. Maintenance and Troubleshooting

14.49 Fujitsu 4300 Turn-Up and Maintenance

Target Audience	Technicians
Course Description	This class provides the needed training for technicians to turn up and provision the FLASHWAVE 4300 system applications. Includes software and hardware options. Hands-on portions of the class permit the student to turn up, provision, and troubleshoot FLASHWAVE 4300 applications.
Required Pre-Work	None
Recommended Prerequisites	Knowledge of and experience with fiber-optic equipment. Working knowledge of Microsoft Windows.
Course Objectives	The objective of this class is to provide the technician with the skills and knowledge necessary to install, provision, maintain and troubleshoot the FLASHWAVE 4300 Sonet mux.

I. FLASHWAVE 4300 Overview

- A. System Features
- B. Configurations
- C. Hardware Summary
- D. Shelf Configuration
- E. Cabling
- F. Network Management Interfaces

II. FLASHWAVE 4300 Units

- A. Common Plug-in Units
- B. Plug-in Units

III. SONET only Configurations

- A. Timing

IV. Configuration Lab-Exercise

- A. 1+1 Terminal Networks
- B. Adding Cross-Connects
- C. UPSR
- D. 4Node UPSR OC-48
- E. 2F BLSR Network

V. Tunneling

VI. Maintenance and Troubleshooting

14.50 Fujitsu Netsmart 1500 User Operation

Target Audience	Technicians
Course Description	This class provides hands-on interaction with the NETSMART 1500 software allowing students to have the opportunity to use it on various user functions and tasks presented for the provisioning and monitoring of entire networks and the network elements found in them.
Required Pre-Work	None
Recommended Prerequisites	Recent experience with Fujitsu equipment that students intend to monitor or provision. Knowledge of and experience with network alarming and transmission test procedures. Working knowledge of Microsoft Windows.
Course Objectives	The objective of this class is to provide the technician with the skills and knowledge necessary to install, provision and troubleshoot the NETSMART 1500 Network Management System.

I. NETSMART 1500 Overview

II. Topology Manager – Node and Link Management

III. Configuration Manager

IV. Connection Management

V. Cross-Connect Lab Exercise

VI. Fault and Performance Manager

VII. TL1 Manager

VIII. Creating and Running Batch File Lab Exercise

IX. Software Managers

X. Backing Up and Restoring Nes Lab Exercise

XI. Task Manager

14.51 Facilities Operation and Maintenance

Target Audience	Facility Personnel
Course Description	This course covers the operation and maintenance of the facility.
Required Pre-Work	Substantial Completion of Construction Activities by Contractor, Employment and/or assignment of facilities and maintenance staff
Recommended Prerequisites	Maintenance, Facilities Operations or Construction Experience
Course Objectives	The objective of this training is to familiarize those that will be responsible for the continuing operation and maintenance of the facilities with the equipment and installations that comprise the new buildings and additions (exclusive of radio, communications and data transmission equipment), focused primarily on the mechanical/electrical systems and any architectural, civil or structural items that will require continuing, specialized maintenance or that will require specialized and/or specific maintenance to maintain the manufacturers warranties. This training is designed for maintenance and service workers and their supervisors.

I. Building Structure

A. Site

1. A review will be made of the as-built plans as they relate to the installation with particular focus on the utility tie-in points, drainage and required preventive and predictive maintenance

B. Concrete

1. A cursory review of the materials incorporated into the project and any restricted general maintenance processes and/or products.

C. Masonry

1. A cursory review of the materials incorporated into the project and any restricted general maintenance processes and/or products.

D. Metals

1. A review will be made of the structural and miscellaneous metals as they relate to the installation with particular focus on loading and safety and any required preventive and predictive maintenance.

E. Woods and Plastics

1. A cursory review of the materials incorporated into the project and any recommended general maintenance processes and/or products.

F. Thermal and Moisture Protection

1. A cursory review of the materials incorporated into the project and any recommended general maintenance processes and/or products.

G. Doors and Windows

1. A review of the materials incorporated into the project and any recommended preventive and predictive maintenance.

H. Finishes

1. A cursory review of the materials incorporated into the project and any recommended general maintenance processes and/or products

I. Specialties

1. A review of the materials incorporated into the project and any recommended preventive and predictive maintenance

J. Furnishings

1. A review of the materials incorporated into the project and any recommended preventive and predictive maintenance

II. Elevator (if applicable at site)

1. A detailed review of the primary equipment, installations and maintenance required, including required on-going maintenance that may be required for governmental certifications and/or warranty preservation.

2. A review of additional services that are available for extended warranty, service and maintenance.

III. Mechanical/Electrical Systems

A. Standby by power system

1. A detailed review of the primary equipment, installations, their normal and emergency operations, and maintenance required, including required on-going maintenance that may be required for warranty preservation.

2. A review of additional services that are available for extended warranty, service and maintenance.

B. Uninterruptible power system

1. A detailed review of the primary equipment, installations, their normal and emergency operations, and maintenance required, including required on-going maintenance that may be required for warranty preservation.

2. A review of additional services that are available for extended warranty, service and maintenance.

C. HVAC and data grade cooling systems

1. A detailed review of the primary equipment, installations, their normal and emergency operations, and maintenance required, including required on-going maintenance that may be required for warranty preservation.

2. A review of additional services that are available for extended warranty, service and maintenance.

D. Fire detection and suppression

1. A detailed review of the primary equipment, installations, their normal and emergency operations, and maintenance required, including required on-going maintenance that may be required for warranty preservation.

2. A review of additional services that are available for extended warranty, service and maintenance.

3. A review of reporting characteristics and points of contact.

E. Security monitoring and detection, Access control

1. A detailed review of the primary equipment, installations, their normal and emergency operations and maintenance required, including required on-going maintenance that may be required for warranty preservation.

2. A review of additional services that are available for extended warranty, service and maintenance.

3. A review of reporting characteristics and points of contact.

F. Power distribution system

1. A detailed review of the primary equipment, installations, their normal and emergency operations and maintenance required, including required on-going maintenance that may be required for warranty preservation.

2. A review of additional services that are available for extended warranty, service and maintenance.

G. Grounding system

1. A cursory review of the equipment, installations, and maintenance required, including required on-going maintenance that may be required for warranty preservation and/or safe operations.

H. Lighting and controls

1. A cursory review of the equipment, installations, their normal and emergency operations and maintenance required, including required on-going maintenance that may be required for warranty preservation.

IV. Warranty and Maintenance Service Procedures

1. The warranties and contracted maintenance will be reviewed.
2. Points of Contact and emergency contact information will be reviewed.

14.52 Premier MDC Operation – Train the Trainer

Target Audience	Designated Trainers
Course Description	This course will train a group of Train-the-Trainers on mobile hardware and features purchased in the PMDC Client. By use of lecture and hands-on in all applications, we will build user confidence in the technology, for both technical and non-technical users at the student's pace. *Note: Course given as customer specific, will cover options pertinent to customer equipment*
Required Pre-Work	None
Recommended Prerequisites	Proficiency with Windows OS and knowledge of internal (Directives) or external (State) policy and procedure.
Course Objectives	Designed for staff that will train other users on the mobile hardware, PMDC Client application on the mobile devices.

I.

Glossary of Terms

II. Understand commonly used acronyms and terms

III. System Overview of Data Flow
    A. Understand data paths through major connections/interfaces

IV. Premier MDC Overview
    A. Use different navigation options (Windows, keyboard, etc.)
    B. Understand what Fast-Key support means
    C. Understand how to initiate Day/Night Vision
    D. Understand how to initiate Screen Blanking
    E. Understand how to find online Help documentation

V. Introduction to Logon/Off
    A. Understand Unit/User Validation and Access Rights
    B. Be able to logon/off and power down the MDC device
    C. Understand how to troubleshoot connectivity from the client
    D. Understand how to change their password

VI. Messaging
    A. Be able to create, send, view and file Messages
    B. Be able to create and open a message with a file attachment

VII. Chat
    A. Be able to create, send and view Chat messages
    B. Be able to create Chat rooms and invite attendees

VIII. State Interface
    A. Be able to create, send, view and delete Inquiries

IX. Other Interfaces as contracted:
(Note: Each additional interface adds 1 hour to the existing 8-hour course.)

A. Emulation
    1. Be able to launch, logon and use terminal emulation
B. CAD
    1. Be able to open, view and acknowledge a Dispatch
    2. Be able to change your status (EnRoute, At Scene, etc.)
    3. Be able to close/disposition a Dispatch
    4. Be able to query CAD Unit/Incident Status Reports
    5. Be able to initiate a Traffic Stop
C. RMS
    1. Be able to query and open local Case, Name and Location reports
D. Intranet
    1. Be able to launch and browse the intranet site
E. Mug shots
    1. Be able to query and view the mug shot database

14.53 CENTRACOM Gold Elite Operator Train the Trainer

Target Audience

Designated Trainers

Course Description

This course provides the customer's identified training personnel with the knowledge of, and practice applying training techniques that they will need to enable them to successfully train their students. Trainers will use video, facilitation, and hands-on activities to facilitate learning events supported by tailored or customized training materials and job aids. They will become proficient at discussing the common tasks associated with operation of the customer's radios.

In addition, this course provides an introduction to the dispatch console, its basic operation and to the tailored job aids available for assistance in operation.

Required Pre-Work

None

Recommended Prerequisites

None

Course Objectives

- High-level overview of the system configuration.
- Present Interactive End User Toolkit (iEUTK) training philosophy/methodology.
- Demonstrate techniques for training using the Interactive End User Toolkit (iEUTK) materials
- Perform basic operational tasks of the dispatch console
- Utilize the provided job aids to perform specific tasks associated with the console
- General console operation
- Operation of Locality Interfaces via the Gold Elite Consoles
- Proper operating procedures for specific features
- Instant Recall Recorder and Audio Playback Re-Recorder

I. Basics
   - A. Explain component parts of Console
   - B. CPU
   - C. Interface with volume controls
   - D. Mic (condenser and boom)/Headset jack
   - E. Main volume control
   - F. Radio to phone control
   - G. Telephone to radio control
   - H. Mouse
   - I. Choose / APB
   - J. General transmit
   - K. Instant transmit
   - L. Monitor
   - M. Radio Work Area (RWA)
   - N. Summary Area
   - O. Status Box
     1. Mode State Line
     2. General Status Line
     3. Link State Line
     4. Error Line
     5. Lock Line
   - P. Menu Key Line
   - Q. Colors of Text and Icons on screen
     1. Green Background - the talkgroup is selected
     2. Red (flashing) Background – an emergency call is in progress
     3. Red Letters – incoming call
     4. Dark Blue Background – patch indication
     5. Black letters – audio is muted
     6. White letters – audio is not muted
     7. Red Letters – incoming call
     8. Gold Letters – channel busy
     9. Blue Letters – channel patch is busy
     10. Yellow Letters – private call received
     11. Gray Color – not available at this time
   - R. Border colors
     1. Selectable except Red, reserved for emergency

S. Features
   1. Multiselect
   2. APB
   3. Instant transmit

T. Patch
   1. Active
   2. Idle
   3. Empty

U. Paging
   1. Manual
   2. Alphabetic
   3. Numeric

V. Signal
   1. P/C
   2. Call alert

W. Display
   1. Leave Windows
   2. Move windows
   3. Show Hide

X. Special
   1. Intercom
   2. Supervisor
   3. Diagnostic
   4. Public Address
   5. Emergency Setup
   6. Emergency reset
   7. All mute
   8. Channel Marker (for conventional Mode only)

Y. Monitor

Z. Help

14.54 VESTA Pallas End User Train the Trainer

Target Audience	Designated Trainers
Course Description	This course provides a complete system overview, as well as hands-on user training on all VESTA Pallas features. This class contains VESTA Pallas Admin, Agent, and MagIC EX.
Required Pre-Work	None
Recommended Prerequisites	None
Course Objectives	• How to use VESTA's automated TTY, line status window, tabbed speed dial • User setup procedures • Key maintenance applications including console line map maintenance, auto dial maintenance, TTY maintenance • Backup notification/history log and manual backup • VESTA directory replication and OS backup • Configuration and use of MagIC EX

I. System Overview with Block Level Explanation

II. VESTA Overview
- A. Telephone Functions
- B. ANI/ALI Functions
- C. Herbie or Audio Control Unit

III. System Error vs. Warning Message

IV. VESTA – Phone Functions
- A. Line Groups
- B. Line Appearance
- C. Answer/Make/Transfer/Hold a Call
- D. Active vs. Non-Active Lines
- E. Call Control Window
- F. Auto Dial Window
- G. ALI Window
- H. TTY/TDD Function
- I. DTMF Support
- J. IRR Function
- K. Call Notes
- L. Pre-recording Greeting
- M. Call Pilot – Voice Mail

V. VESTA Maintenance Applications
- A. User Setup Procedure
- B. Overview of Console Line Map Maintenance
- C. Autodial Maintenance
- D. TTY/TDD Maintenance
- E. Setting Up User Categories

VI. PEI Management Console

VII. Introduction to MagIC EX – Management Information System
- A. Using MagIC EX monitor
- B. Using MagIC Reports
- C. Using MagIC EX Configuration
- D. Database Maintenance Tasks in PEI – DB

14.55 XTS2500 Portable Operation Train the Trainer

Target Audience

Designated Trainers

Course Description

This course provides the identified training personnel with the knowledge of, and practice applying training techniques that they will need to enable them to successfully train their students. Trainers will use video, facilitation, and hands-on activities to facilitate learning events supported by tailored or customized training materials and job aids. They will become proficient at discussing the common tasks associated with operation of the customer's radios as identified by the Customer Training Needs Analysis. In addition, this course provides XTS2500 users with an introduction to their radio, its basic operation and tailored job aids available for assistance in operation.

Note: Course given as customer specific, will cover options pertinent to customer equipment

Required Pre-Work

None

Recommended Prerequisites

None

Course Objectives

- High-level overview of the system configuration.
- Present Interactive End User Toolkit (iEUTK) training philosophy/methodology.
- Demonstrate techniques for training using the Interactive End User Toolkit (iEUTK) materials
- General portable radio operation
- Proper operating procedures for specific customer features
- Perform basic operational tasks of the mobile radio
- Utilize the provided job aids to perform specific tasks associated with the mobile radio

I. Basics
- A. Volume/on – off
- B. Status alert tones
- C. LED status
- D. Zone up and down keys
- E. Home key
- F. Display with all its icons
- G. Push to talk or PTT found on the microphone
- H. Hub, hang up box

II. Features
- A. Zone select
- B. Channel/Mode Select
- C. Call Alert Page
- D. Time Out Timer
- E. Direct/Talkaround
- F. Scan On/Off
- G. Scan List Edit
- H. Secure/Clear
- I. Monitor
- J. Emergency Call
- K. View Your ID
- L. Nuisance Channel Delete
- M. Phone Interconnect
- N. Site View/Search/Lock
- O. Status/Message Calls
- P. Dynamic Priority
- Q. Emergency Alarm
- R. Call Alert Page
- S. Mute tone of keypad
- T. Changing Talkgroups
- U. Changing zones or personalities
- V. Phone Interconnect
- W. Phone list program
- X. Display light
- Y. Failsoft definition

14.56 XTS5000 Portable Operation Train the Trainer

Target Audience

Designated Trainers

Course Description

This course provides the identified training personnel with the knowledge of, and practice applying training techniques that they will need to enable them to successfully train their students. Trainers will use video, facilitation, and hands-on activities to facilitate learning events supported by tailored or customized training materials and job aids. They will become proficient at discussing the common tasks associated with operation of the customer's radios as identified by the Customer Training Needs Analysis. In addition, this course provides XTS5000 users with an introduction to their radio, its basic operation and tailored job aids available for assistance in operation.

Note: Course given as customer specific, will cover options pertinent to customer equipment

Required Pre-Work

None

Recommended Prerequisites

None

Course Objectives

- High-level overview of the system configuration.
- Present Interactive End User Toolkit (iEUTK) training philosophy/methodology.
- Demonstrate techniques for training using the Interactive End User Toolkit (iEUTK) materials
- General portable radio operation
- Proper operating procedures for specific customer features
- Perform basic operational tasks of the mobile radio
- Utilize the provided job aids to perform specific tasks associated with the mobile radio

I. Basics
   - A. Volume/on – off
   - B. Status alert tones
   - C. LED status
   - D. Zone up and down keys
   - E. Home key
   - F. Display with all its icons
   - G. Push to talk or PTT found on the microphone
   - H. Hub, hang up box

II. Features
   - A. Zone select
   - B. Channel/Mode Select
   - C. Call Alert Page
   - D. Time Out Timer
   - E. Direct/Talkaround
   - F. Scan On/Off
   - G. Scan List Edit
   - H. Secure/Clear
   - I. Monitor
   - J. Emergency Call
   - K. View Your ID
   - L. Nuisance Channel Delete
   - M. Phone Interconnect
   - N. Site View/Search/Lock
   - O. Status/Message Calls
   - P. Dynamic Priority
   - Q. Emergency Alarm
   - R. Call Alert Page
   - S. Mute tone of keypad
   - T. Changing Talkgroups
   - U. Changing zones or personalities
   - V. Phone Interconnect
   - W. Phone list program
   - X. Display light
   - Y. Failsoft definition

14.57 XTL5000 Mobile Operation Train the Trainer

Target Audience

Designated Trainers

Course Description

This course provides mobile or portable radio users with an introduction to their radio, its basic operation and tailored job aids available for assistance in operation. The learning experience is a mix of video, facilitation and hands-on activities to help users perform common tasks associated with their radio operation.

Required Pre-Work

None

Recommended Prerequisites

None

Course Objectives

- High level overview of the customer system configuration
- General mobile radio operation
- Proper operating procedures for specific customer features
- Perform basic operational tasks of the mobile radio
- Utilize the provided job aids to perform specific tasks associated with the mobile radio
- Understand high level view of the system configuration

I. Basics
   - A. Volume/on – off
   - B. Status alert tones
   - C. LED status
   - D. Zone up and down keys
   - E. Home key
   - F. Display with all its icons
   - G. Push to talk or PTT found on the microphone
   - H. Hub, hang up box

II. Features
   - A. Zone select
   - B. Channel/Mode Select
   - C. Call Alert Page
   - D. Time Out Timer
   - E. Direct/Talkaround
   - F. Scan On/Off
   - G. Scan List Edit
   - H. Secure/Clear
   - I. Monitor
   - J. Emergency Call
   - K. View Your ID
   - L. Nuisance Channel Delete
   - M. Phone Interconnect
   - N. Site View/Search/Lock
   - O. Status/Message Calls
   - P. Dynamic Priority
   - Q. Emergency Alarm
   - R. Call Alert Page
   - S. Mute tone of keypad
   - T. Changing Talkgroups
   - U. Changing zones or personalities
   - V. Phone Interconnect
   - W. Phone list program
   - X. Display light
   - Y. Failsoft definition

14.58 Wordnet Logging Recorder – Train the Trainer

Target Audience	Designated Trainers
Course Description	This course covers the basics of system operation and regular operator maintenance procedures, and provides the building blocks necessary to carry out day-to-day operation and maintenance of the system. The course is designed to instruct users in basic recorder operation.
Required Pre-Work	None
Recommended Prerequisites	None
Course Objectives	• Understand how search criteria can be used to locate a call. • Identify the most appropriate search criteria to locate a call. • Understand how to build a search. • Understand how to replay a search. • Understand how to control a call to be replayed. • Understand how to save a call as a .wav file. • Understand how to forward a call as a .wav file.

14.59 MOSCAD Fault Management Operator – Train the Trainer

Target Audience	Designated Trainers
Course Description	This course provides the essentials for use of the MOSCAD Fault Management central computer (Graphic Master Central and Graphic Work Stations).
Required Pre-Work	None
Recommended Prerequisites	None
Course Objectives	Be able to use the MOSCAD Fault Management central software to view and acknowledge alarms and provide initial diagnostics of radio infrastructure faults.

I. System Overview

II. Operator log on

III. Overview display layout

IV. Navigating via push buttons

V. Navigating via the tabs

VI. Acknowledge alarms

VII. Interrogating a CPU

VIII. Taking CPU off interrogation list

IX. Alarm History Query

14.60 CENTRACOM Gold Elite Admin/ADM

Target Audience	Designated Trainers
Course Description	This course will provide an introduction to the special operation of the supervisory console. The operation of the Alias Database Manager (ADM) Applications Program will be discussed and demonstrated with facilitation and hands-on activities. The Elite ADMIN End User Training provides participants with the knowledge and skills to manage and utilize the Elite Admin application. Through facilitation and hands on activities the participant learns how to customize the console screens.
Required Pre-Work	None
Recommended Prerequisites	None
Course Objectives	• The participant will be able to understand and perform the functions required in the operation of the ADM program. • Understand the relationship of CDM/ADM Databases to the ADMIN program • Understand the menu items and tool bar icons • Edit folders, multiselect/patch groups, auxiliary input output groups, windows and toolbars • Add/delete folders

I. Alias Database Manager (ADM) Application
- A. Overview
- B. Scenario
- C. Specifications and Prerequisites
- D. Starting the ADM
- E. Menu items, Tool Bar Icons, Systems Selection
- F. Creating and Alias Book
- G. Creating Alias Entries
  1. Selecting the Alias length
  2. Discussing and Demonstrating Adding a Unit
  3. Discussing and Demonstrating Adding Individual Pages (Elite)
  4. Discussing and Demonstrating Adding Page Groups (Elite)
  5. Discussing and Demonstrating Adding Dialing (Elite)
  6. Discussing and Demonstrating Adding Messages
  7. Discussing and Demonstrating Adding PCII and PCIIe Aliases
  8. Modifying Individual Page Membership (Elite)
  9. Discussing and Demonstrating Adding Status
  10. Deleting an Alias
  11. Finding an Alias
- H. Sorting the Alias Entry List
- I. Printing the Alias Entry List
- J. Importing and Exporting as Alias Book
- K. Backing up the ADM
- L. Restoring the ADM
- M. Exiting the ADM

II. CENTRACOM Gold Elite ADMIN Application
- A. Discuss relationship of CDM/ADM Database to ADMIN
- B. Starting the ADMIN
- C. Creating a new configuration
- D. Discuss ADMIN screen and menu items at top of screen
- E. Editing resources
  1. Viewing a resource
  2. Setting up resource headers
  3. Setting up features and modifying icons
  4. Setting up audio features
- F. Editing Folders
  1. Selecting folders
  2. Adding resources to folders

- G. Edit Multiselect/patch initial setup
- H. Editing auxio groups
  1. Creating group
  2. Modifying a group
- I. Editing auxio floating windows
  1. Establishing a floating window
  2. Adding a group to a floating window
- J. Editing tool base
  1. Setting up 1 or 2 tool bars
  2. Assigning tool to toolbars
  3. Enable/disable clock display
  4. Editing preferences
  5. Setting up activity log
  6. Building customer alias list
  7. Building custom speed dial phone list
  8. Editing dispatcher menu items
  9. Building custom page list
- K. Adding folders
- L. Deleting folders

III. Customizing folders
  1. Naming folders
  2. Naming Multiselect/patches
  3. Reordering folders
  4. Changing folder tab widths

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