

Multi-TDL Operations Course

Course Description

The Multi-Tactical Data Link (TDL) Network (MTN) Operations course is a five-day course with 32 instructor contact hours. It is intended to support multiple groups of learners. Our introductory lesson is intended as an executive summary that can be attended by operators, maintainers, and leaders. Module 1 focuses on the basics of Link 16 operations and is intended for all Link 16 operators and maintainers. Module 2 focuses on Joint Range Extended Application Protocols (JREAPs) and the Multi-TDL Architecture (MTA). It is intended for operators and technicians that operate on a Multi-TDL system in a limited capacity. Module 3 begins advanced discussions on MTN employment and is intended for operators that will one day serve as unit level experts on MTN operations.

Course Outcomes



TDL Fundamentals

Students will understand the characteristics of the Link 16 and Beyond-Line of Site (BLOS) Tactical Data Link (TDL) protocols used by the joint services to include protocol specific exchange mediums, waveforms, tactical message standards, and roles and responsibilities.



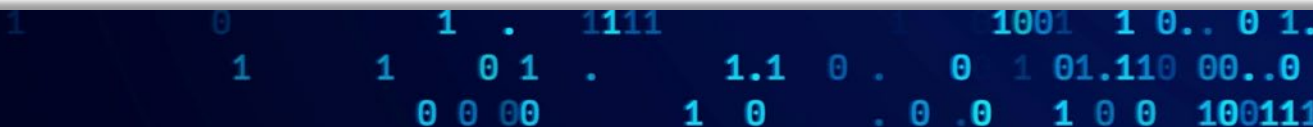
System Configuration

Students will be able to apply their understanding of TDL fundamentals to identify their TDL system settings from network documentation and apply that to the configuration of their terminals, tactical radios, and host systems in preparation for Multi-TDL Network (MTN) operations.



MTN Operations

Students will be able to apply their knowledge to perform Link 16 net entry, activate all BLOS protocols, troubleshoot issues that prevent the transmission or reception of Information Exchange Requirements (IERs) and execute unit level missions through the MTN.



Course Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
Introduction to the MTN	NPGs and J-Series Messages	Message Implementation	MTN Management	MTN Validation Practical Exercise
Mission Threads		Link 16 Troubleshooting	Fidelity Drills	
Link 16 Fundamentals	Connectivity		Network Description Document (NDD)	
Lunch	Lunch	Lunch	Lunch	Lunch
Link 16 Fundamentals (Cont)	Synchronization	JREAP Overview	NDD Practical Exercise	MTN Validation Practical Exercise
		JREAP A		
	Access Modes and Techniques	JREAP B		
		JREAP C		
Link 16 Initialization	Forwarding and Filtering			

Course Syllabus

Introduction to the Multi-TDL Network (MTN)

In this lesson we will discuss the purpose, planning, and operation of a Multi-TDL Network (MTN). The instructor will introduce key MTN topics and provide an overview to operators, technicians, and leaders.

Students will learn about:

- Operational capabilities of Link 16
- Operational capabilities of Joint Range Extension Application Protocols (JREAP)
- MTN doctrine and guidance
- Available resources for MTN Operators

Mission Threads

In this lesson we will discuss the tactical missions supported by the MTN. The instructor will explain the Information Exchange Requirements (IERs) to execute each mission.

Students will learn about:

- Explain battle management tasks supported by the MTN

- Explain track management tasks supported by the MTN
- Counterair
- Suppression of Enemy Air Defense (SEAD)
- Digitally-aided Close Air Support (DaCAS)
- Dynamic Targeting

Module 1: Link 16 Foundations

Link 16 Fundamentals

In this lesson we will discuss the capabilities and characteristics of Link 16. The instructor will provide foundational knowledge related to Link 16 required to understand more advanced concepts.

Students will learn about:

- Link 16 Terminals
- Link 16 Waveform
- Link 16 Time Division Multiple Access (TDMA)
- Link 16 Jam Resistance

Network Participation Groups (NPGs) and J-Series Messages

In this lesson we will discuss the message structures that support functions over the MTN. The instructor will explain the organization of J-Series messages into NPGs and the structure of MIL-STD 6016.

Students will learn about:

- Purpose of NPGs
- Organization of NPGs
- MIL-STD 6016
- J-Series Messages

Connectivity

In this lesson we will discuss the line-of-site (LOS) limitations of Link 16 and the use of relay to extend LOS. The instructor will explain the requirements for relay platforms in Link 16.

Students will learn about:

- Link 16 Line-of-Sight (LOS)
- Direct Connectivity Requirements
- Link 16 Relay

Synchronization

In this lesson we will discuss the synchronization of Link 16 network. The instructor will explain the terminal processes to obtain and maintain fine synchronization.

Students will learn about:

- Coarse Synchronization Requirements
- Fine Synchronization Requirements
- Active Vs. Passive Synchronization
- Time Maintenance

Access Modes and Techniques

In this lesson we will discuss Link 16 access modes and techniques. The instructor will explain how this improves throughput and how it affects track capacity at the platform level.

Students will learn about:

- Stacked Nets
- Time Slot Reallocation
- Dedicated Access
- Contention Access
- Timeslot Reuse

Link 16 Initialization Parameters

In this lesson we will discuss the network and unit level parameters required to initialize a Link 16 terminal for operation. The instructor will explain where in the OPTASK LINK this information can be found and the importance of each parameter. Students will demonstrate the ability to retrieve all parameters from an OPTASK LINK.

Students will learn about:

- JU Address Assignments
- Track Number Allocations
- Initialization Data Load (IDL) Files
- Cryptography
- Duty Codes
- Stacked Net Assignments

Module 2: MTN Operations

Message Implementation

In this lesson, we discuss how tactical messages are processed within the MTN. The instructor will explain how message processing affects the MTN configuration requirements.

Students will learn about:

- Direct and Indirect PPLIs
- Addressed Messages
- Machine Receipt

- Operator Response
- Secondary JTIDS Unit Numbers (SJUs)

Link 16 Troubleshooting

In this lesson we will discuss the basic troubleshooting steps for Link 16 shortfalls. The instructor will guide discussion using case studies that require the students to use what they have learned to determine why shortfalls exist.

Students will learn about:

- Troubleshooting Net Entry
- Troubleshoot Link 16 Connectivity
- Troubleshooting Link 16 Terminal Error Codes
- Resolving Track Anomalies

Introduction to JREAP

In this lesson we will discuss the capabilities and characteristics of JREAP. The instructor will explain the benefits and drawbacks, capacity, and planning of each protocol.

Students will learn about:

- Purpose of JREAP
- Comparisons of Each Protocol
- Communications Planning Requirements.

JREAP A Fundamentals

In this lesson we will discuss satellite parameters, network parameters, and unit parameters required for JREAP A operations. The instructor will explain where in the OPTASK LINK this information can be found and the importance of each parameter. Students will demonstrate the ability to retrieve all parameters from an OPTASK LINK.

Students will learn about:

- Cryptographic Material
- Network Roles
- Transmission Sequence List (TSL)
- Data Rates
- Satellite Parameters

JREAP B Fundamentals

In this lesson we will discuss the parameters required to establish a JREAP B connection. The instructor will explain where in the OPTASK LINK this information can be found and the importance of each parameter. Students will demonstrate the ability to retrieve all parameters from an OPTASK LINK.

Students will learn about:

- JREAP B Parameters
- Data Rates

JREAP C Fundamentals

In this lesson we will discuss the capabilities and characteristics of JREAP C. The instructor will explain where in the OPTASK LINK this information can be found and the importance of each parameter. Students will demonstrate the ability to retrieve all parameters from an OPTASK LINK.

Students will learn about:

- JREAP C Protocols
- Network Parameters
- Unit Parameters
- Network Roles

Data Forwarding and Filtering

In this lesson we will discuss the basics of data forwarding and filtering. The instructor will explain the requirements for data forwarding, as well as filter parameters. Students will demonstrate the ability to retrieve all parameters from an OPTASK LINK.

Students will learn about:

- Purpose of Data Forwarding
- Forwarding Roles
- Forwarding Tables
- Purpose of Filters
- Filter Parameters

Module 3: Advanced MTN Operations

MTN Management

In this lesson, we discuss the roles of the JICC/RICC/SICC in MTN management. The instructor will explain the management structure, coordination between participants and ICCs, and the voice nets used. Students will demonstrate the ability to retrieve all parameters from an OPTASK LINK.

Students will learn about:

- Interface Control Cell (ICC) responsibilities
- Net Entry Procedures
- Data Link Coordination Net (DCN)
- Track Supervision Net (TSN)

Fidelity Drills

In this lesson, we discuss the importance of fidelity drills in MTN operations. The instructor will explain the CJCSI 6120.01 Joint Multi-TDL Operating Procedures (JMTOP) guidance for fidelity drill development.

Students will learn about:

- Purposes of Fidelity Drills
- Pre-built Fidelity Drills
- Net Entry Fidelity Drills
- Fidelity Drill Planning

Network Description Document (NDD)

In this lesson, we discuss the Link 16 NDD created by the Network Design Facility. The instructor will explain the CJCSI 6120.01 Joint Multi-TDL Operating Procedures (JMTOP) guidance for fidelity drill development. Students will demonstrate the ability to determine NPG participation, connectivity, and network capacity, and cryptographic requirements for a platform.

Students will learn about:

- Sections
- Platform Functional Description
- Connectivity Tables
- COMSEC Cross Reference Tables
- Option Pools

MTN Validation Practical Exercise

In this lesson, students will be provided use cases and will need to determine if the MTN supports required IERs. Students will discuss their answers with each other and participate in guided discussions designed to elevate their understanding of the protocols and operational requirements of the MTN.

Link 16 Pulse Density

In this lesson, students will learn about Link 16 pulse density limitations and learn the process for scheduling Link 16 operations using the Link Pulse Deconfliction server.

Students will learn about:

- Pulse Density Restrictions Within the US and Territories
- LPDS Account Creation and Maintenance
- Scheduling Exercises and Operations