

# Support Services





## Overview

Data Link Solutions, LLC (DLS), a joint venture between military communications leaders BAE Systems and Collins Aerospace, was established in 1996 to pursue next-generation Link 16 applications.

DLS is a leading supplier of Link 16 terminals and software, as well as logistics and support services for air, land, and sea-based platforms with a heritage of more than 25 years of Link 16 design and production experience and over 9,000 Link 16 systems delivered.

DLS has provided MIDS terminals for more than 40 different platforms in 38 different countries with product offerings that include the Joint Tactical Information Distribution System (JTIDS) Class 2 family, the Multi-functional Information Distribution System (MIDS) Low Volume Terminal (LVT) and LVT-3 Fighter Data Link (FDL), and the URC-138 Link 16 terminal. DLS is the only supplier that manufactures and delivers all Link 16 variants, including the new MIDS JTRS and small form factor TTR terminals.

DLS is the leader in developing and testing the next generation of software defined MIDS terminals.

A strong legacy and dominant market position has enabled DLS to create innovative complementary integration, O-level, I-level, and D-level support solutions for each Link 16 terminal configurations. DLS is the logical choice for Link 16 support accessory solutions.

### Support services include:

- Complete life cycle support
- Operational support
- Flight line through depot maintenance support
- Regional repair facilities
- Field service engineering
- Support equipment
- Training
- Technical information
- Repairs and spares
- Supply chain management

# World leader in Link 16 tactical data links

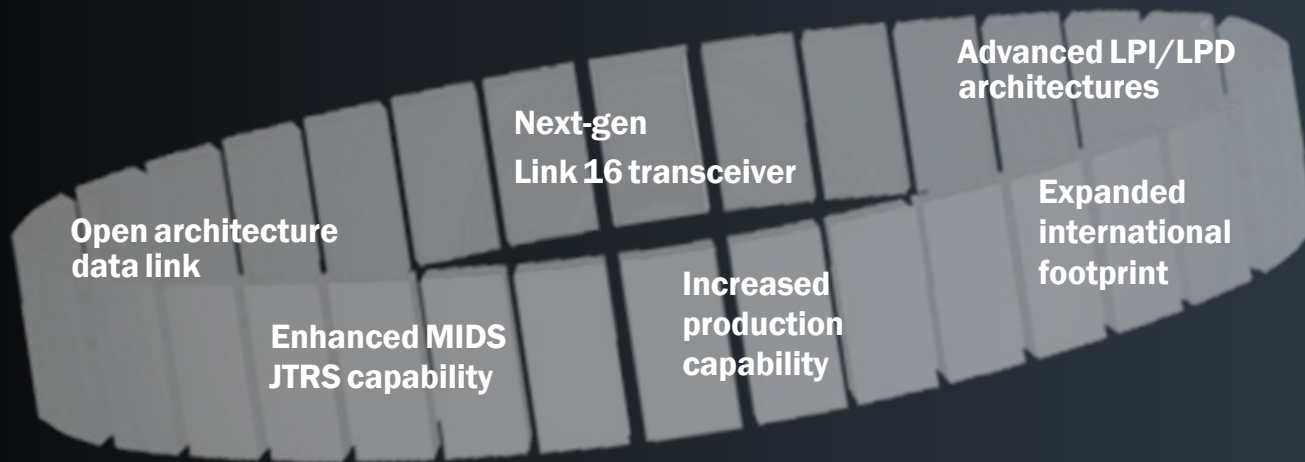


**9,000**  
terminals

**40**  
platforms



**System design and waveform integration for the future needs of the U.S. and allied communities**



Open architecture  
data link

Enhanced MIDS  
JTRS capability

Next-gen  
Link 16 transceiver

Increased  
production  
capability

Advanced LPI/LPD  
architectures

Expanded  
international  
footprint

**25+** years  
data link experience

- Wideband networking radios
- Software reprogrammable radios
- Tactical networking

# Key capabilities



## MIDS LVT

Coordinating airborne, maritime, and ground forces



## MIDS JTRS

Operational effectiveness with reduced SWaP



## TTR

Smallest terminal addressing unique environmental challenges



## MOS Mod

Full interoperability for shipboard systems

# Support equipment

Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

## Cooling and power equipment

MIDS Cooling Tray Mount for MIDS LVT/JTRS- Shelf-Mounted	MTA-00525	The MIDS Cooling Tray is a rack-shelf or bench mount that provides 70 CFM ambient forced cooling air to the MIDS LVT or MIDS JTRS terminal when supplied with 220 VAC 50 Hz power. The MIDS Cooling Tray is constructed of sturdy aluminum for use in benign environments, such as hangers or laboratories. It is rack-mountable in a standard 19-inch wide rack configuration via a user-provided standard shelf. The optional transit case (RAC-00019) simplifies transportation and storage. Includes both U.S. and European Continental power cables.	x	x	x	
Transit Case Option for MIDS Cooling Tray Mount	RAC-00019	Optional transit case for the MTA-00525 MIDS Cooling Tray	x	x	x	
Dual DC Power Supply, 1U Rack Mounted	128-1V31-410	Dual Lambda DC Power Supplies in a 1U rack-mountable assembly provides 1,500 Watts to power one MIDS LVT or MIDS JTRS terminal. The optional MIDS LVT/JTRS Prime Power Cable (128-1V31-380) is designed to provide the proper connections between this power supply and the MIDS LVT or MIDS JTRS terminal.	x	x	x	
MIDS LVT/JTRS Prime Power Cable	128-1V31-380	Prime power cable for MIDS LVT and MIDS JTRS, provides power connection between RPS J1 connector and the dual DC power supplies. Length: 60 inches	x	x	x	

## Ruggedized mobile equipment

Terminal Control Unit (TCU)	822-2658-002	The transit-case mounted Terminal Control Unit is well suited as a stand-alone ruggedized mobile rack solution for ground-based operation of the MIDS JTRS, MIDS LVT, or the DLS small form factor TTR terminal. The MITE houses the MIDS LVT or JTRS Terminal and remote power supply, provides cooling and power, and includes a GPS timeserver and terminal control panel. Terminal I/O, including both voice channels, is broken out via the terminal control panel.  Operates with 115 VAC/60 Hz or 220 VAC/50 Hz input power with included IEC C13 U.S. and Continental European power cords.	x	x	x	x
Processor Unit (PU)	822-2659-002	The transit-case mounted mobile Processor Unit allows the user flexibility to install and run software to communicate with the MIDS terminal via Ethernet or 1553. The Processor Unit houses a rugged 3U server and dual display with full keyboard. It operates with 115 VAC/60 Hz or 220 VAC/50 Hz input power with included IEC C13 U.S. and Continental European power cords.	x	x	x	x

Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

### Ruggedized mobile equipment

Link 16 Roll On/Roll Off Case	Contact DLS	<p>Portable Transit Case allows quick operation of a MIDS LVT1 family (BU1/BU2) or MIDS-JTRS Terminal. It provides 1553 and Ethernet interfaces to external computers (i.e. Terminal Exerciser) and includes AUI adapters for LVT operation. Computer and cables can be purchased with the case as part of a full turn-key solution. It has a commercial-off-the-shelf interface for 1553 (Triax plug) and Ethernet (RJ-45). The case is available for 115 VAC/60 Hz or 220 VAC/50 Hz and provides interface for external time reference.</p> <p>Voice interface available – headset/microphone included with voice option.</p> <p>Key fill cable provided. RF cables provided to allow connection to external antenna/filters.</p>	X	X	X	
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### Integration and test equipment

MIDS JTRS Interface Control Panel	987-0011-788	<p>The MIDS JTRS Interface Control Panel (ICP) enables test and evaluation at the systems integration and platform level. MIDS JTRS discretes and crypto fill are broken out for easy access. The rack-mountable MIDS JTRS ICP allows the user to connect a host to the terminal via 1553 or Ethernet support port connections using the included 96-inch cable set. The front panel also offers power on, crypto hold, and long term transmit inhibit toggle switches. Optional attenuators (PN: T-0155856) are available for interior ICP mounting to easily terminate the RF connection. Operates with 115 VAC/60 Hz or 220 VAC/50 Hz input power. U.S. and Continental European power cords are included.</p>			X	
Mobile Integration & Test Environment (MITE)	822-2657-003	<p>The MITE provides a host environment for MIDS JTRS, MIDS LVT, or small form factor TTR Link 16 terminals in a configuration well suited for use in hangars &amp; maintenance bays. Supports diagnostics, repair, and return-to-service testing (I-level or O-level). In addition to the return-to-service capability, the MITE with DLS or 3rd party software (sold separately) can provide:</p> <ul style="list-style-type: none"> <li>• Real-time terminal status and performance monitoring</li> <li>• Terminal initialization and control</li> <li>• Visibility into terminal operation via the host data buses or support port</li> <li>• BIT initiation and monitoring</li> <li>• Access to software maintenance parameters</li> <li>• Reprogramming of terminal software programs (maintenance updates)</li> <li>• Recording and analysis of terminal data</li> <li>• Situational display and scenario generation</li> <li>• Transmission and receiving of TADIL-J messages</li> </ul> <p>The MITE is comprised of two rugged transit case mounted subsystems: the Processor Unit and the Terminal Control Unit. These subsystems can be procured individually if desired. It operates with 115 VAC/60 Hz or 220 VAC/50 Hz input power with included IEC C13 US and Continental European power cords.</p>	X	X	X	X

Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

## Integration and test equipment

Power Cable, MIL Circular to US	128-1V31-320	120 VAC/60 Hz power cable for MITE Terminal Unit, Processor Unit, or Rack-Mount Installation Kit. MIL Circular connector D38999/26FE6SN female to Continental European male plug. Length: 10 feet				
Power Cable, MIL Circular to Continental European	128-1V31-310	240 VAC/50 Hz power cable for MITE Terminal Unit, Processor Unit, or Rack-Mount Installation Kit. MIL Circular connector D38999/26FE6SN female to Continental European male plug. Length: 2.5 meters				
MITE Upgrade Kit for MIDS JTRS	987-2432-430	The MITE MIDS JTRS Upgrade Kit expands the capability of MITE units fielded prior to 2018 to support the MIDS LVT BU2 and MIDS JTRS. A future upgrade option is planned to also include support for the new DLS TTR small form factor terminal. The MITE MIDS JTRS Upgrade Kit should be installed by a DLS field service engineer.	x	x	x	x
Rack Mount Installation Kit for MIDS LVT/JTRS	128-1V31-300	MIDS LVT Control Panel and Cooling Mount Drawer for installation in a standard 19-inch equipment rack. Includes associated cabling and mounting hardware. A future revision is planned to include support for the MIDS JTRS. Operates with 115 VAC/60 Hz or 220 VAC/50 Hz input power. Requires power cord MIL Circular connector D38999/26FE6SN female to U.S. or Continental European male plug, available separately.	x	x	x	
MIDS LVT FSE Toolkit	CMS-00334	<p>The FSE Toolkit allows a user to perform basic troubleshooting and/or operation of the MIDS LVT BU1/BU2 terminal in a laboratory or benign environment. The kit includes:</p> <ul style="list-style-type: none"> <li>• MIDS Cooling Tray</li> <li>• Dual DC Power Supply</li> <li>• RPS J1 Prime Power Cable</li> <li>• Power A/B/C Cables</li> <li>• J2 Audio Cable Assembly with H250/U Voice Handset</li> <li>• J3 MIDS LVT Host Support Port Cable, includes Address Configuration Module</li> <li>• J4 Key Fill Cable</li> <li>• J7 Control Cable for MIDS LVT/JTRS</li> <li>• Transceiver, 10Base-T to AUI, 10MBPS</li> <li>• CAT 5E Crossover Cable</li> <li>• H250/U Audio Handset</li> </ul> <p>Operates with 115 VAC/60 Hz or 220 VAC/50 Hz input power. U.S. and Continental European power cords are included. A pelican case is included for transportation.</p>	x	x		

Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

## Integration and test equipment

MIDS JTRS FSE Toolkit	Contact DLS	<p>The FSE Toolkit allows a user to perform basic troubleshooting and/or operation of the MIDS JTRS terminal in a laboratory or benign environment. The kit includes:</p> <ul style="list-style-type: none"> <li>• MIDS Cooling Tray</li> <li>• Dual DC Power Supply</li> <li>• RPS J1 Prime Power Cable</li> <li>• Power B/C Cables</li> <li>• J2 Audio Cable Assembly with H250/U Voice Handset</li> <li>• J3 MIDS JTRS Host Cable with 1553 and Ethernet, includes Address Configuration Module</li> <li>• J4 Key Fill Cable</li> <li>• J7 Control Cable for MIDS LVT/JTRS</li> <li>• J15 CH2/CH3 Interface Cable</li> <li>• J16 CH2/CH4 /EHCB Interface Cable</li> <li>• CAT 5E Cable</li> <li>• H250/U Audio Handset</li> </ul> <p>Operates with 115 VAC/60 Hz or 220 VAC/50 Hz input power. U.S. and Continental European power cords are included. A pelican case is included for transportation.</p>			x	
FSE Toolkit MIDS JTRS Upgrade Kit	Contact DLS	<p>The FSE Toolkit MIDS JTRS Upgrade Kit expands the capability of the CMS-00334 MIDS LVT FSE Toolkits to also support MIDS JTRS. The FSE Toolkit MIDS JTRS Upgrade Kit is comprised of:</p> <ul style="list-style-type: none"> <li>• Power B Cable, MIDS JTRS</li> <li>• J2 Audio Cable Assembly with H250/U Voice Handset</li> <li>• J3 MIDS JTRS Host Cable with 1553 and Ethernet, includes Address Configuration Module</li> <li>• J7 Control Cable for MIDS LVT/JTRS, with upgraded functionality</li> <li>• J15 CH2/CH3 Interface Cable</li> <li>• J16 CH2/CH4/EHCB Interface Cable</li> <li>• H250/U Audio Handset</li> </ul> <p>This cable set, combined with a previously fielded MIDS LVT FSE Toolkit, enables operation with the MIDS JTRS. New audio, IOIDENT/1553 configurability, and enhanced control capabilities facilitate troubleshooting and audio operation.</p>			x	



Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

### Integration and test equipment

MITS-232 Test Set	128-1V31-390	The MITS-232 is an ultra-portable ruggedized flight line and maintenance test set that allows the user to interface with the J3 host interface (support port) on MIDS LVT_BU1 terminals while installed on a platform. Requires MITS-232 software and portable computer, sold separately	x	x		
MITS-232 Software	984-2835-002	The MITS-232 software contains most of the same features as the Terminal Exerciser and can perform block cycle software updates, terminal troubleshooting, and go/no-go testing to the Line replaceable unit) level or SRU (Shop Replaceable Unit) level. Currently compatible with the MIDS LVT_BU1. 1A software update is in development to expand support to the MIDS LVT_BU2. Requires a portable computer (such as the Panasonic Toughbook, C31 270-3364-090, below) with Windows 7 Operating System.	x	x		
Remote Power Supply (RPS) Go/No-Go Tester for MIDS LVT	270-3408-010	The RPS go/no-go tester duplicates the MIDS current draw on the RPS in a 15 minute test. This test tool reduces duplicate returns to the factory, reducing terminal down time and minimizing shipping costs. This test tool can be used at both O-level and I-level. It operates with 115 VAC/60 Hz input power.	x			
Link 16 Mini Rack	M042A335	The mini rack is a portable half-rack assembly that provides cooling, power, and all required interfaces to operate a MIDS LVT or MIDS JTRS Terminal (MT and RPS). The mini rack operates on 115 VAC, 60 HZ, single phase 20 or can be ordered using 230VAC, 47-63 HZ, single phase 10A. The mini rack is easily set up and can be used in both a laboratory/depot environment or be used outdoors in a live network. The mini rack is a self-contained portable system that handles all of the mechanical and electrical requirements to interconnect and operate a MIDS Terminal. It contains all of the necessary cables and fixtures to allow users with COTS equipment to interface with the terminal.	x	x	x	

### Software tools

Terminal Exerciser System	M092A178	The Terminal Exerciser (TE) System is a set of Windows based programs that are the backbone of Link 16 terminal maintenance. The TE is packaged with a ruggedized portable computer and host data bus cable, but can be purchased as software only and operate on a Windows 7 PC. Data bus cables are available separately and can be ordered for any MIDS platform. For a full turnkey system, the TE SW has been integrated with the Mini Rack which becomes a low cost fully integrated MIDS Terminal Test set allowing MIDS JTRS/LVT operation with just wall power.	x	x	x	
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Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

## Software tools

Terminal Exerciser Software	H399B840	<p>This program allows a user to initialize, monitor, control and record data from a Link 16 Terminal. It allows a user without an understanding of the MIDS JTRS/LVT SW ICD/ICS the capability to create and store initialization files, manage the stored set capability of the terminal, and monitor status with a user friendly GUI interface.</p> <p>The Terminal Exerciser has the capability to retrieve the MIDS Built In Test (BIT) capture files for additional maintenance capability. The MIDS terminals store BIT results from initiated, operational, and start-up BIT faults. The TE has a GUI that allows the user to retrieve and clear these files with the click of the mouse and analyze them in a human readable format.</p>	X	X	X	
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## MIDS JTRS cables

J2 Audio Cable Assembly	Contact DLS	<p>The J2 MIDS Audio Cable Assembly breaks out the MIDS LVT or MIDS JTRS MT-J2 audio signals to the included MIDS Audio Module. This module provides the user with both Link 16 voice channels 1 and 2, each with individual volume control.</p> <p>The standard U-229 audio connectors are designed to work with the H-250/U voice handset, available separately. Requires the DLS J7 Control Cable for MIDS LVT/JTRS (MTA-00595) to enable handset Push To Talk (PTT) capability, or simply use the integrated PTT buttons. Length: 6 feet</p>	X	X	X	
J3 MIDS JTRS Host Cable with 1553 and Ethernet	128-1V33-380	Allows the user to connect via 1553 or Ethernet with MIDS JTRS terminals. Default IOIdent address set to Platform A. Default 1553 RT address set to 1. Length: 6 feet. Optional Address Configuration Module is available to allow the user to set IOIdent and 1553 RT addresses to any platform or 1553 address.			X	
Address Configuration Module	Contact DLS	The Address Configuration Module is designed to work with the MIDS JTRS and MIDS LVT J3 host cables. The module allows the user to set IOIdent and 1553 RT addresses to any platform or 1553 address.	X	X	X	
J4 Key Fill Cable	128-1V31-370	The Key Fill Cable provides interface between the MIDS LVT/JTRS terminal MT-J4 and a DS-101 connector. Length: 40 inches. Compatible with all MIDS LVT and MIDS JTRS terminals except MIDS LVT_2 and LVT_11.	X	X	X	
J5 B Power Cable for MIDS JTRS	128-1V32-110	The integrated B Power and control cable connects the MIDS JTRS terminal MT-J5 to RPS J4. Length: 15 inches	X	X	X	

Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

### MIDS JTRS cables

J7 Control Cable for MIDS LVT/JTRS	Contact DLS	This multi-function cable sets crypto hold and allows the user to cycle MIDS LVR or MIDS JTRS power between Standby - On - Off. Includes LED display of fault codes for troubleshooting, IFF Emergency and LTTI discrete switches, and an emergency crypto zeroize function. Length: 6 feet	x	x	x	
J10 Antenna A RF Cable	WHS-00058	The fully tested RF cable assembly for use to connect the MIDS LVT or MIDS JTRS MT-J10 Antenna A port to an antenna, notch filter, or terminator. N-male to N-male connectors. Length: 60 inches.	x	x	x	
J11 Antenna B RF Cable	WHS-00074	This RF cable assembly for use to connect the MIDS LVT or MIDS JTRS MT-J11 Antenna B port to an antenna, notch filter, or terminator. HN-male to N-male connectors. Length: 60 inches	x	x	x	
J12 C Power Cable for MIDS	128-1V31-350	The C Power cable connects MIDS LVT/JTRS terminal MT-J12 to RPS J2. Length: 15 inches.	x	x	x	
J15 CH2/CH3 Interface Cable	128-1V32-130	The interface cable connects to MIDS JTRS MT-J15 to access Channel 2 & 3 Data Buses. Length: 90 inches			x	
J16 CH2/CH4/EHCB Interface Cable	128-1V32-140	The cable connects to MIDS JTRS MT-J16 to access Channel 2 & 4 Data Buses. HMI interface is accessed via the External Host Control Bus (EHCB). Length: 90 inches			x	
MIDS JTRS Power Cable Set	987-2432-432	Cable set includes MT J5 MIDS JTRS B Power Cable and MT J12 MIDS LVT/JTRS C Power Cable for MIDS JTRS to RPS power connections.			x	
Antenna RF Cable	CA3N010	The N-Male to N-Male cable assembly features high-performance 400-Series coax cable. This lightweight cable has excellent low-loss characteristics. Length: 10 feet	x	x	x	x
Custom Cables	Contact DLS	Contact DLS for standard and custom cable sets for our MIDS products.	x	x	x	x

### MIDS LVT cables

J1 MIDS LVT Power A Cable	128-1V31-330	Power A cable supports MIDS LVT terminal J1 to RPS J3 connections. Length: 15 inches	x	x		
J2 Audio Cable Assembly	Contact DLS	The J2 MIDS Audio Cable Assembly breaks out the MIDS LVT or MIDS JTRS MT-J2 audio signals to the included MIDS Audio Module. This module provides the user with both Link 16 voice channels 1 and 2, each with individual volume control. The standard U-229 audio connectors are designed to work with the H-250/U voice handset, available separately. Requires the DLS J7 Control Cable for MIDS LVT/JTRS (MTA-00595) to enable handset Push To Talk (PTT) capability, or simply use the integrated PTT buttons. Length: 6 feet	x	x	x	
J3 MIDS LVT Host Support Port Cable	128-1V31-360	The host support port allows the user to connect via support port, 1553, or Ethernet with MIDS LVT terminals. Default IOIdent address set to Platform A. Default 1553 RT address set to 1. Length: 75 inches. Requires 10Base-T-to-AUI Transceiver (EDV-00807), available separately. Optional Address Configuration Module is available to allow the user to set IOIdent and 1553 RT addresses to any platform or 1553 address.	x	x		

Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

### MIDS LVT cables

Address Configuration Module	Contact DLS	The Address Configuration Module is designed to work with the MIDS JTRS and MIDS LVT J3 host cables. The module allows the user to set IOIdent and 1553 RT addresses to any platform or 1553 address.	x	x	x	
J4 Key Fill Cable	128-1V31-370	The fill cable provides interface between the MIDS LVT/JTRS terminal MT-J4 and a DS-101 connector. Length: 40 inches. It is compatible with all MIDS LVT and MIDS JTRS terminals except MIDS LVT_2 and LVT_11.	x	x	x	
J5/J6 B Power Cable for MIDS	128-1V31-340	The power cable connects the MIDS LVT terminal MT-J5/MT-J6 to RPS J4. Length: 15 inches	x	x	x	
J7 Control Cable for MIDS LVT/JTRS	Contact DLS	This multi-function cable sets crypto hold and allows the user to cycle MIDS LVR or MIDS JTRS power between Standby - On - Off. Includes LED display of fault codes for troubleshooting, IFF Emergency and LTTI discrete switches, and an emergency crypto zeroize function. Length: 6 feet	x	x	x	
J10 Antenna A RF Cable	WHS-00058	The antenna A RF cable assembly for use to connect the MIDS LVT or MIDS JTRS MT-J10 Antenna A port to an antenna, notch filter, or terminator. N-male to N-male connectors. Length: 60 inches.	x	x	x	
J11 Antenna B RF Cable	WHS-00074	The antenna B RF cable assembly connects the MIDS LVT or MIDS JTRS MT-J11 Antenna B port to an antenna, notch filter, or terminator. HN-male to N-male connectors. Length: 60 inches.	x	x	x	
J12 C Power Cable for MIDS	128-1V31-350	The C Power cable connects MIDS LVT/JTRS terminal MT-J12 to RPS J2. Length: 15 inches.	x	x		
MIDS LVT(1) Power Cable Set	987-2432-431	The cable set includes MT J1 MIDS LVT Power A Cable, MT J5/J6 MIDS LVT Power B Cable, and MT J12 MIDS LVT/JTRS C Power Cable for MIDS LVT to RPS power connections.	x	x		
Antenna RF Cable	CA3N010	The N-Male to N-Male cable assembly features high- performance 400-Series coax cable. This lightweight cable has excellent low loss characteristics. Length: 10 feet	x	x	x	
Custom Cables	Contact DLS	Contact DLS for standard and custom cable sets for our MIDS products.	x	x	x	x

### TTR cables and support equipment

Cable Assembly, TTR J1 Platform J	987-9975-213	The cable assembly provides a simple cable interface to common connections for quick and easy terminal setup and tear down with a minimalistic set of physical equipment. This low profile cable provides the following interfaces: <ul style="list-style-type: none"> <li>Fixed platform type to Platform J</li> <li>Key fill interface - standard 6 pin audio connector</li> </ul>				x
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Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

## TTR cables and support equipment

Cable Assembly, TTR J1 Platform A	987-9975-214	The assembly features a simple cable interface to common connections for quick and easy terminal setup and tear down with a minimalistic set of physical equipment. This low profile cable provides the following interfaces: <ul style="list-style-type: none"> <li>• Fixed platform type to Platform A</li> <li>• 1553 Triax Connector</li> <li>• Key fill interface - standard 6 pin audio connector</li> </ul>				X
Cable Assembly, TTR J2 Plat. J	987-9975-800	This assembly features a simple cable interface to common connections for quick and easy terminal setup and tear down with a minimalistic set of physical equipment. This low profile cable provides the following interfaces: <ul style="list-style-type: none"> <li>• Ethernet (Platform J) interface - RJ45 Ethernet plug</li> <li>• Headset audio interface - M641/6-1 jack for microphone, M641/5-1 jack for headset speaker</li> <li>• Connections for reprogramming</li> </ul>				X
Cable Assembly, TTR J2 Platform A	987-9975-212	The cable assembly provides simple cable interface to common connections for quick and easy terminal setup and tear down with a minimalistic set of physical equipment. This low profile cable provides the following interfaces: <ul style="list-style-type: none"> <li>• 1553 Bus address hardwired to address 1</li> <li>• Headset audio interface - M641/6-1 jack for microphone, M641/5-1 jack for headset speaker</li> <li>• Reprogramming interface</li> </ul>				X
Cable Assembly, TTR J4	987-9975-215	This assembly features a simple cable interface to common connections for quick and easy terminal setup and tear down with a minimalistic set of physical equipment. This low profile cable provides the following interfaces: <ul style="list-style-type: none"> <li>• Fixed Power enable (turns on with power applied)</li> <li>• External power interface - standard banana plugs for +28VDC and return</li> </ul>				X

Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

### TTR cables and support equipment

TTR Discrete Control Unit (DCU)	987-9975-240	<p>The TTR DCU is an integration aid for laboratory environment testing. The following interfaces broken out for integration use:</p> <ul style="list-style-type: none"> <li>• 50dB attenuation pass-throughs for both antennas</li> <li>• Host Ethernet interface (Platform J)</li> <li>• Host MIL-STD-1553B primary and secondary interfaces (Platform A)</li> <li>• Support for external or internal (DCU) power supply to the terminal</li> <li>• GPS 1PPS/direct connection interfaces</li> <li>• External Time Reference (ETR) interface</li> <li>• Handset and headset audio interfaces</li> <li>• Key fill interface</li> </ul> <p>A complete TTR DCU Cable set is included. An optional TTR DCU Breakout Box is available separately to provide access to all the terminal black side discrete interfaces via standard BNC connectors. An optional transit case is also available.</p>				x
TTR Discrete Control Unit Breakout Box	987-9975-206	The optional TTR DCU breakout box provides additional functionality to the TTR DCU (987-9975-240). It connects to and is powered by the main DCU to provide access to all the black side discrete interfaces the terminal provides via standard BNC connectors. Includes the TTR DCU cable set.				x
TTR DCU Cable	987-9975-231 987-9975-232 987-9975-233	<p>The TTR DCU Cables are included with the DCU, but may be ordered separately:</p> <ul style="list-style-type: none"> <li>• 987-9975-230 (J3, J5, Antenna In), quantity 2 required</li> <li>• 987-9975-231 (J4, black Data)</li> <li>• 987-9975-232 (J1, red Data 1)</li> <li>• 987-9975-233 (J2, red Data 2)</li> </ul>				x
TTR Mount (MT-6567)	622-8766-001	Low-profile mount				x
TTR Mount (MT-4935)	622-4934-001	Isolated mount				x
Battery, TTR	221-0147-010	Non-rechargeable Lithium battery. Qty 2 required per TTR terminal				x

Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

### Advanced integration and test equipment

JagWire MIDS LVT and MIDS JTRS Test Set	115E8770	The JagWire test set offers automated return-to-service, go/no-go, testing and diagnostic callout capability to an SRU level. Exercises MIDS Terminal I/O and TMDA/TACAN RF interfaces. Supports testing of all MIDS terminal configurations and FDL terminals. The operator workstation combines a custom version of Terminal Exerciser and MITS-232 SW tools on a single platform to facilitate automated testing, software block upgrades, and FSE troubleshooting. Automated test execution is accompanied by visual test instructions. Capabilities include: performance test evaluation and return to service testing, diagnostic callouts to the SRU level, Terminal Exerciser with full Host and support port control, MIDS terminal software reprogramming, MIDS terminal maintenance parameter reprogramming, test report generation and database, and automated self test.	x	x	x	
MIDS LVT/JTRS Integration/ Development Station	M042A336	The test set provides all of the requirements to operate a MIDS LVT or MIDS JTRS with integrated 280VDC power supply, variable speed blower, cooling tray, control relays and RF attenuators. The test set provides an integrated PC with dual monitors that are height adjustable to allow the operators to use the test set in a standing or sitting position. The test set provides full access to the terminal allowing extender cards and probes to be used for all of the modules for easy access and troubleshooting. The surface of the test set is covered with Electrostatic Discharge (ESD) safe material so cards can be placed on the surface without fear of damage.	x	x	x	
FPT Station	M042A331-01	This station is used for formal performance testing of the CMN4 terminal. In addition to the CMN4 terminal, this test station tests the core MJ terminal. It has all of the necessary hardware to measure all the parameters for qualification of the performance of the terminal. It is a 4 console test station that includes 3 bays of test equipment and 3 bays of terminals. The three bays of terminals house a 5 terminal network that consists of 4 test terminals and 1 terminal under test. This allows for performance testing of the network. At the core of this test station is a real-time application that controls communications over the 1553 bus to all terminals in the network.			x	
FQT Station	M042A331-02	This is a software version of the station design for formal qualification testing of the terminal. It contains a 5 terminal network consisting of 4 test terminals and 1 terminal under test. This variant does not have the EMI enclosures, the RF attenuator plates for adjusting levels, or any of the measurement equipment. Its main purpose is to allow the software developers to look at performance of the code base.	x	x	x	
ATP Station	M042A331-03	The ATP test station is a derivative of the FPT station that was built specifically for ATP testing of the terminal. This uses a reduced RF network consisting of a single test terminal and a single terminal under test. It is otherwise the equivalent of the FPT station. Operations uses these test station for final acceptance testing of the CMN4 terminals.	x	x	x	

Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

### Advanced integration and test equipment

Provisioning Station	M042A357-01	<p>The provisioning station is used to load keys and bring a terminal up for the first time. This station is a bench top setup that uses a terminal exerciser and a test sled to allow a terminal to be powered on and loaded with keys. While a terminal could be provisioned in one of the ATP stations, it takes several hours to provision a terminal and it would not be cost effective to use a test station to provision a terminal.</p> <p>The purpose of the provisioning process is to load and encrypt all of the necessary keys, software and crypto that are required in MIDS JTRS terminal by the NSA for every CSS/PCP CCI. By performing this it will make the CCI terminal functional ready.</p>	x	x	x	
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### Ancillary support equipment

H250 Voice Handset	977-0139-010	H-250/U handset with 5 feet length coiled cord	x	x	x	x
TACAN Beacon Simulator	128-1V20-340	The ATC-5000NG is an RF signal generator/receiver for testing Mode A, C and S transponders. The ATC-5000NG was designed with modern software defined radio technology and is the replacement product for the commercial functionality of the SDX-2000, ATC-1400A and S-1403DL. The test set was designed for engineering development, design validation, manufacturing and return-to-service testing.	x	x	x	
Spectrum Analyzer	128-1V09-550 with Option 128-1V09-560	At I or O levels, the analyzer can be used to review spectrum RF output. Required to perform return-to-service testing.	x	x	x	
Panasonic Toughbook CF-31	270-3364-100	Intel® Core™ i5, 2.3GHz Minimum. Display: LCD, 13.1", 1024 x 768 XGA, touchscreen, sunlight-viewable. Memory: 4GB SDRAM, DDR3L - 1600 MHz minimum. Hard drive: 500 GB (7200 RPM) minimum, shock mounted, flex-connect with quick release. Operating system: Windows® 10 Professional. Optional optical drive is available by also ordering 270-3364-110 with this laptop.	x	x	x	x
Ethernet to 1553 Adapter	ENET-1553-1D-N	This adapter is an ENET appliance with one channel of dual redundant MIL-STD-1553 with Dual Function (BC/Mon or mRT/Mon) capability. NVRAM write disabled. Requires ENETCAB-1553-J1-01 sold separately.	x	x	x	
Ethernet to 1553 Adapter Power Cable, Ethernet to 1553 Adapter	ENETCAB-1553-J1-01	Power, Ethernet cable assembly required for use with Ethernet to 1553 adapter (ENET-1553-1D-N), sold separately.	x	x	x	
Transceiver, 10Base-T to AUI	EDV-00807	AUI transceiver. Converts AUI interface to 10Base-T.	x	x		



Support product	Part number	Item description	Compatibility			
			MIDS LVT BU1	MIDS LVT BU2	MIDS JTRS	TTR

### Ancillary support equipment

Notch Filter	128-1V31-420	RS MICRO #22761-2F. Notch band: 1030/1090 +/-7 MHz. Rejection: -40 dB (-45 typical). Loss: 1.5 dB (0.75 typical). VSWR: 1.6:1. Group delay: 40 nanosec. Size (inches): 5.5 x 3.3 x 2.0. Type N female connectors.	x	x	x	x
RF Attenuator	40-30-33	RF Attenuator, type N female to type N female, 150 W average power, 10 kW peak power, 30 dB attenuation, 1.1 maximum SWR, Weinschel 40-30-33	x	x	x	x
RF Attenuator	1-30	RF attenuator, type N Female to type N male, 5 W average power, 1 kW peak power, 30 dB attenuation, 1.15-1.25 maximum SWR, Weinschel 1-30	x	x	x	x
Coaxial Adapter (F to F)	F1513	Coaxial Adapter (type N female to type N female), Weinschel F1513	x	x	x	x
Coaxial Adapter (M to M)	M1513	Coaxial Adapter (type N male to type N male), Weinschel M1513	x	x	x	x
RF Terminator: Medium Pwr	379-0309-020	Medium power coaxial termination. type N male, 5 W average power, 5 kW peak power, 1.03-1.30 maximum SWR, Weinschel 1424-4	x	x	x	x
RF Terminator: Medium Pwr	713-0119-080	Medium power coaxial termination. type N female, 50 W average power, 5 kW peak power, 1.20-1.30 maximum SWR, Weinschel 1426-3	x	x	x	x
Directional Coupler	3042B-20	Used with TACAN beacon simulator and spectrum analyzer	x	x	x	x
DC Power Supply	128-1V31-400	Single half-rack width 750 Watt Lambda DC power supply. For use as a replacement spare for the MITE (822-2657-003), Terminal Control Unit (822-2658-002), or Dual DC Power Supply 1U Rack Mounted (128-1V31-410).	x	x	x	
Battery, MIDS FDL/LVT_BU1	U10025	Non-rechargeable Lithium battery. Qty 3 required per MIDS FDL/LVT_BU1 terminal.	x			
Battery, MIDS LVT_BU2	221-0500-030	Non-rechargeable Lithium battery. Qty 3 required per MIDS LVT_BU2 terminal.		x		
Battery, MIDS JTRS	221-0500-020	Non-rechargeable Lithium battery. Qty 2 required per MIDS JTRS terminal.			x	
Battery Pack Terminal Assembly, MIDS JTRS	987-1247-001	External battery pack for terminal transport and storage.			x	

Title	Course summary	Duration	Target audience	Prerequisites
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## Training courses

Link 16 Executive	The Link 16 Executive Course teaches Link 16 from the executive point of view. When developing this training, we asked the question; what would an executive within a Link 16 organization want to know? Every aspect of the training is unique to the executive-level, taking a non-technical (no ones and zeros) approach to the training. We decided that the best learning outcome would be for the executive to understand and be able to explain to their customers or team why Link 16 is so important.	1 day	Operators Executives Managers	None
Link 16 Intermediate	The Link 16 Intermediate Course covers the most important topics affecting Link 16. The course includes 21 instructional modules and is designed to help the student reach a medium-level of comprehension in a relatively short amount of time. This course is popular with operators and engineers alike.	2 days	Operators Engineers Technical Staff	None
Link 16 Advanced	The Link 16 Advanced course includes all of the content of the Link 16 Intermediate course, much of which is covered in greater detail, plus an additional nine technical modules. This course is designed to help the student reach a high-level of comprehension in a relatively short amount of time. This is a technical course that is very popular with Link 16 engineers and technical staff.	3 days	Operators Engineers Technical Staff Academics	None
Link 16 Expert	The Link 16 Expert Course covers all of the subject matter from our Link 16 Advance Course coupled with the most relevant excerpts from our Link 16 Operations and JREAP Courses. This course covers both technical and operational aspects of Link 16 and JREAP. The wide-ranging nature of this training is designed to address students that support operational and technical aspects of Link 16 and/or JREAP.	5 days	Operators Engineers Technical Staff Academics	None
Link 16 Today, Tomorrow, and Beyond	This is a brand new course with a fresh take on Link 16. The course is comprised of the most relevant modules from seven of our most popular courses and is designed to cover the most important topics facing the world of Link 16. In this course, we will distil the technical components of Link 16 and tie them with tomorrow's technology. Moreover, we will fuse the operational with the technical in a manner not offered in a Link 16 training course.	3 days	Operators Engineers Technical Staff Academics	None

Title	Course summary	Duration	Target audience	Prerequisites
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### Training courses

Link 16 Operations	The Link 16 Operations Course supports the training requirements of personnel that require an understanding of Link 16 operational processes (e.g. correlation, data registration, track addresses/ numbering, receipt compliance, reporting responsibility, conflict resolution filters, etc.). The course also covers network management organizations, information exchange requirements, information management, surveillance data, OPTASK Link, and more.	3 days	Operators Engineers Technical Staff	None
Link 16 for Engineers	Having trained thousands of students about the intricacies of Link 16, we have identified the core and advanced learning objectives common to most Link 16 engineers and the most common advanced-level learning objectives that support system design, development, integration, validation, verification, and testing. This highly advanced and technical course is specifically designed to meet the unique knowledge requirements of Link 16 engineers (software and hardware) and system integrators.	3 days	Link 16 Engineers System Integrators Technical Staff Academics	None
Link 16 System Integration	The Link 16/MIDS System Integration Course explains in great detail the numerous complexities involved with Link 16 and MIDS System Integration. This technical training course is designed specifically for Link 16 engineers (software/hardware) and system integrators. In addition to advanced-level Link 16 information, the training goes into great depth about the MIDS ICDs and MIDS SSS. Further, the training addresses MIDS LVT operational parameters, MIDS terminal interfaces, functional input/output messages, Bus input/output messages, MIDS host platform types, and much more.	3 days (Intermediate)  5 days (Advanced))	Link 16 Engineers System Integrators Technical Staff Academics	None
Link 16 Network Enabled Weapons	Link 16 Network Enabled Weapons integrate enhanced precision guided munitions into existing Link 16 networks. Positive weapons control (Pre/post launch) enhances accuracy, supports target adjustments, retargeting, BDA, and weapon abort. Further, the weapon updates its location and status throughout its mission, increasing situation awareness. In addition to foundation-level Link 16 training to cover Link 16 technology and operations, the training also includes an in-depth description of the operational capabilities, design, message structure, and implementation requirements associated with Link 16.	3 days (Intermediate)  4 days (Advanced)	Operators Link 16 Engineers System Integrators  Technical Staff Academics	None

Title	Course summary	Duration	Target audience	Prerequisites
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### Training courses

MIDS Baseline Upgrade 2 and JTRS Capabilities	To ensure system viability and interoperability for the years ahead, the MIDS program office is developing a significant upgrade (Baseline Upgrade-2 (BU2), that affects the MIDS LVT terminal (software and hardware), as well as the platform host. MIDS LVT BU2 plus other MIDS JTRS enhancements (e.g. concurrent multi-netting and concurrent contention receive) will greatly increase the capability, capacity, flexibility, and security of MIDS terminals into the future. This training course will break down the technological changes into easy to understand terminology and graphics. Further, it will explain the operational impact to network planners, network designers, and operators.	3 days	Operators Link 16 Engineers System Integrators Technical Staff Academics	None
Link 16 Spectrum Management	This course will assist attendees in developing a comprehensive understanding of the Link 16 frequency spectrum, why the spectrum was selected, the types and likelihood of interference, how the risk of interference is managed, TSDF calculation procedures, and cross border coordination. This course will challenge many misunderstood or preconceived notions about this highly contentions area and will deliver the facts in an engaging manner using instruction, demonstration, and discussion.	3 days	Operators Link 16 Engineers Technical Staff Academics	None
MIDS LVT Terminals	The MIDS LVT Terminal and Equipment Course is designed to give the student an in-depth understanding of MIDS LVT terminal hardware, software, component functionality, interfaces, maintenance, and other associated equipment.	2 days	Link 16 Engineers System Integrators Technical Staff Academics	None
MIDS JTRS Basic Operations and Maintenance	The MIDS JTRS Basic Operations and Maintenance training is a five-day course designed to provide students with a comprehensive working knowledge of the design, development, operation, maintenance, testing, and troubleshooting of the MIDS JTRS Terminal. The course includes classroom instruction and hands-on training JTRS analysis laboratory environment.	5 days	Operators Engineers Technical Staff	None
MIDS JTRS Intermediate Operations and Maintenance	The MIDS JTRS Intermediate Operations and Maintenance training is a five-day course designed as a follow-on to the basic course. The training provides a deep-dive technical information coupled with complex hands-on scenarios designed to develop the knowledge and skills necessary to operate and maintain JTRS terminals in the field without supervision or support. The Intermediate course is lab intensive to enable the students to perform technical analysis of the terminal initialization data, status data, and terminal built-in-tests. The course includes classroom instruction and hands-on training JTRS analysis laboratory environment.	5 days	Link 16 Engineers System Integrators Maintenance Staff Technical Staff	MIDS JTRS Basic Operations and Maintenance Course

Title	Course summary	Duration	Target audience	Prerequisites
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### Training courses

MIDS JTRS Advanced	MIDS JTRS System Integrators Course	5 days	Link 16 Engineers System Integrators Maintenance Staff Technical Staff	None
Link 16 for AEW Operators	The Link 16 for AEW Operators Course is a unique training program created to deliver the knowledge and skills required by Airborne Early Warning (AEW) operators. The course begins with in-depth Link 16 foundation training, to establish the technical knowledge necessary for the rest of the course. The training is then elevated to cover Link 16 operations, network planning, crypto- net management, network design interpretation, initialization data sets (validation, loading, and modification), OPTASK Link, and OPNET management.	10 days	Operators Engineers Technical Staff	None
Link 16 Network Planning	DLS offers several Link 16 and Multi-TDL planning courses that teach students the complex process of planning Link 16 and Multi-TDL Networks and Operations. The course thoroughly explains the initial planning and pre-mission planning processes to develop a holistic understanding of both Link 16 and multi-TDL network planning	5 days (Intermediate) 10 days (Advanced)	Operators Network Planners Network Designers Network Managers DLMC Staff Engineers Technical Staff	Link 16 Intermediate (or above)
Link 16 Network Design	DLS offers several Link 16 network design courses that teach the complexities and intricacies of Link 16 network design. The course goes into great depth to explain operational network design requirements, network design steps, network design rules-of-thumb, terminal validation, and the NETMAN T/1 format. This 100% reference-based course connects the dots between the language of the terminal, network design tool processes, network capacity assignments, and operational requirements to develop a holistic understanding of the process.	5 days (Intermediate) 10 days (Advanced)	Operators Network Planners Network Designers Network Managers DLMC Staff Engineers Technical Staff	Link 16 Intermediate (or above)
Link 16 Network Management	DLS offers several Link 16 Network Management courses that cover a wide variety of network management related topics to develop a well-rounded academic understanding of the network management process.	5 days (Intermediate) 10 days (Advanced)	Operators Network Planners Network Designers Network Managers DLMC Staff Engineers Technical Staff	Link 16 Intermediate (or above)
MIDS Organization-Level Maintenance	The MIDS Organization-Level (O-Level) Maintenance Course is designed for Link 16 engineers and system integrators. The training is very technical and designed to equip students with the requisite knowledge needed to support the complex tasks involved in these processes.	3 days	Link 16 Engineers System Integrators Maintenance Staff Technical Staff	None

Title	Course summary	Duration	Target audience	Prerequisites
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### Training courses

JREAP Training	Joint Range Extension Applications Protocol (JREAP) explains every aspect of JREAP to include: history, documentation, data stream, common elements, Link 16 processing, application block, full-stack header, message group headers, transmission block headers, JREAP-A, JREAP-C, and more.	2 days	Operators Engineers Technical Staff	None
Coalition Interface Control Officer	The Coalition Interface Control Officer (CICO) program is a rigorous hands-on operator certification program focused on delivering the knowledge and skills required to perform Link 16 and Multi-TDL network planning, Link 16 network design, operational network management, frequency clearance agreement management, time slot duty factor calculations, and OPTASK Link development.	28 days	Operators Network Planners Network Designers Network Managers DLMC Staff Engineers Technical Staff	None
OPTASK Link	The OPTASK Link Advanced Course instructs students into the policies and procedures involved in drafting an OPTASK Link. Drafting the OPTASK Link is one of the most difficult and laborious processes in the TDL world and is rarely done correctly. This course explains the message drafting rules and procedures necessary to draft a valid OPTASK Link.	3 days (Intermediate)  5 days (Advanced)	Operators Network Planners Network Designers Network Managers DLMC Staff Engineers Technical Staff	None





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