

A Single TDL Solution For Training and Battlefield Operations

It's Time to Change the Paradigm around Tactical Data Link (TDL) Training

TDL communication brings critical visibility to the battlefield by providing warfighters easily accessible, sharable, and precise location and identification information of everyone in the combat zone (support teams, adversaries, and friendlies in the air, sea, ground, and space arenas) which enables them to make better tactical decisions. TDL systems provide the backbone for network-enabled battlefield awareness and control with robust support for command and control message exchanges.

However, TDL training is essential for warfighters and operators to effectively communicate across multiple TDLs. The more personnel who are comfortable exchanging Link 11, Link 16, VMF, and other TDL communications, the more opportunities there are for friendly forces to interact and interoperate to protect lives and achieve mission goals.

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Currently, militaries around the world face multiple challenges that limit TDL training opportunities:

- The cost of training in the field with ships, ground vehicles, and support aircraft is massive. Running realistic scenarios can easily cost millions of dollars. In most cases, it's simply not financially or operationally feasible to incorporate all the platforms that would be present in a real-world battlefield situation, into training exercises. In addition, platforms that are used for training purposes are typically not available for active duty military.
- It's also very expensive and time-consuming to transport personnel to training locations. Most armed forces have only one, or very few, facilities for TDL training. As a result, personnel are typically flown long distances to receive training, increasing costs and the amount of time warfighters are off active duty.

The good news is militaries can finally leave their TDL training challenges behind. Innovative, new solutions that combine TDL training and battlefield communications capabilities in a single system are allowing armed forces to completely change the paradigm around TDL training. They can train personnel in Link 16 and other TDL communications anywhere, even during mission deployments. And they can use the same system to set up a TDL network quickly and easily for command-and-control operations on any battlefield, at any time.

A Two-in-One TDL System Delivers Important Operational and Financial Advantages

A powerful and easy-to-use two-in-one TDL system gives militaries a very cost-effective way to improve every aspect of their operations, from pre-mission preparations through post-mission analysis.

Improve Combat Readiness

Military personnel can quickly and easily create highly realistic simulations of field scenarios. The simulations can include red and blue forces at sea, in the air, and on the ground to teach and reinforce the tactics that work best in any situation. Simulation scenarios can also be adapted on the fly to train warfighters how to respond to fast-changing and unexpected situations.

With these capabilities, simulations with spontaneous threats that more closely reflect the situations warfighters are likely to face in the field, can easily be created. Support and enemy aircraft suddenly appear on the horizon. Routes are unexpectedly blocked. And vessels quickly change course to avoid pursuit.

The level of difficulty in the simulation scenarios can be increased at any time to build more advanced skillsets in warfighters, and to reflect the evolving situation on the battlefield. This agility allows deployed warfighters to practice their responses to more challenging events and effectively train as they fight.

These comprehensive and advanced simulation capabilities are a huge contrast to legacy simulation systems that provide a limited number of "canned" scenarios that cannot be created or adapted in an efficient, easy, or cost-effective way. Warfighters quickly master these static, predictable scenarios, and receive almost no training in how to respond to spontaneous threats.

Increase Battlefield Situational Awareness

By training with the same system that is used on the battlefield, warfighters reduce the risk of mistakes. During live engagements, the two-in-one system can be instantly switched from simulation mode to battlefield mode to support mission communications over Link 16 and other TDL types.

With the ability to communicate and coordinate activities across teams, on all platforms, in all locations, in real time, militaries can:

- Increase warfighter survivability
- Improve tactical effectiveness
- Help to avoid friendly fire

Deliver More Effective Debrief Sessions

Post-mission, the ability to play back all the TDL-related actions taken during the mission make debrief sessions far more effective. The playback functions similarly to a video and data recorder, allowing debrief leaders to review the recording in real-time, return to message exchanges multiple times, and fast-forward or rewind to focus on specific messages.

Debrief leaders have an overhead view of a map showing the battlefield and the mission participants as well as all the messages exchanged during the mission. They can see where there were communications delays or incorrect messages, and where missed messages may have affected the mission outcome.

The information and insight provided by the TDL system allows mission leaders to deliver a more detailed and accurate analysis of mission activities than they could otherwise. They can more thoroughly explore the potential outcomes of alternate approaches and review lessons learned with the warfighters.

Enrich Mission Rehearsals

In pre-mission briefings, mission leaders can walk warfighters through simulations of the mission profile step by step. They can include the ships, aircraft, and ground platforms warfighters can expect to encounter during the mission, point out targets and threats, and review ingress and egress routes to the target area. These simulations give warfighters a much more realistic view of what lies ahead on the battlefield than can be captured in hand drawings and notes on a whiteboard. Warfighters can also practice the

simulated mission profile while deployed.

For example, in fleet synthetic training (FST) exercises that currently occur at pier-side, warfighters typically practice simulated scenarios in a training-only environment with no other ship activities that could distract them. Running through simulation exercises on ships at sea while the warfighters around them are busy executing on their tasks is much more demanding than stationary, pier-side training, and much closer to the reality of ship operations during deployments. Because the same system is used for training and for command-and-control operations, warfighters' actions and responses become second nature, reducing the risk of delayed reactions or operator errors during live engagements.

Dramatically Reduce Training Costs

The ability to quickly and easily simulate real-world command and control scenarios using Link 16 and other TDLs in any location, at any time, dramatically reduces training costs compared to field exercises. The high costs associated with launching ships, deploying ground platforms, and flying aircraft for training purposes, along with the time and travel costs required to get personnel to dedicated training facilities, are all eliminated.

A two-in-one TDL training and battlefield system can be easily programmed with mission profiles by operators in a few hours. In contrast, a contract to write scripts for the legacy simulation systems being used today could easily require more than a dozen people and anywhere from 100,000 to millions of dollars.

One TDL System, Almost Limitless Opportunities

A combined TDL training and battlefield system opens the door to an almost unlimited number of simulated and live applications, including:

- Tactical situational display
- Training scenario generation
- Range training officer support
- Full multi-terminal control
- Network monitoring
- Record and playback

The key thing to remember is that the system used on the battlefield is identical to the system used for training. All capabilities available for live missions are also available for training and simulations. This consistency makes it easy for warfighters to switch between training and live operations with familiarity, comfort, and speed. They can also continue to train for missions while deployed.

Here's a closer look at the opportunities and capabilities that become possible.

The Flexibility to Simulate and Share Any Battlefield Scenario

An intuitive graphical interface and scripting language allows military operators to simulate any scenario, involving any platforms, and any number of friendly and hostile players quickly and easily. The simulated scenarios can even include pop-up threats that trainees must spontaneously respond to.

Building and modifying simulations is as easy creating objects, defining their characteristics, adding them to a map, and setting up their interactions and movements. The flexibility the system provides means a simulation can be created using one type of radio and TDL and played back using a different radio and TDL by simply choosing those items for output. For example, a simulation that uses MIDS JTRS radios can be played back through a JREAP C network with no need to rewrite the simulation scenario.

Completed simulation scenarios can be changed to another location with a single command. As a result, a scenario that's been created to train personnel for a mission in one part of the world can be almost instantly transferred to another body of water, to a land-based location, or to the air to provide fully tailored training for the warfighters in that location. This capability is particularly useful when navy, air force, and army personnel are involved in joint missions.

Simulations can also be easily shared with members of the broader operational community so they can reuse the scenario or quickly modify it to meet their requirements. The ability to jump-start simulation creation throughout the operational community saves significant time and money compared to creating every simulation from the ground up.

An Instant TDL Network to Support Any Battlefield Situation

Warfighters can quickly and easily establish a Link 16 network on any battlefield to enable communications and information-sharing with support teams. For example, if an aircraft has photographed a vessel that's being targeted, they can use the Link 16 network to send the photos to ships in the surrounding waters. Naval personnel can then use the photos to determine the best way to board the targeted vessel before they reach it.

The Link 16 network can also be used for command-and-control operations such as ship-to-shore

integrated fire control. With integrated fire control, naval ships in missile defense roles can communicate directly with ground-based missile batteries. These direct, ship-to-shore communications eliminate the delays that occur when messages must be routed across satellite connections, gateways, and TCP/IP networks to central facilities that pass the message along. In the world of ballistic missile defense, saving time also saves lives.

To ensure operators are ready to efficiently and effectively execute integrated fire control communications as soon as the technology is available on a ship, in an aircraft, or on a ground vehicle, the system can be used to proactively train warfighters while the platform is being outfitted with the technology.

The system is also ideal for use in command-and-control centers near the front line of combat. These centers can use the TDL networks to send information back to headquarters where it can be assimilated, assessed, and shared.

TDL message details can be viewed at any level to meet the needs of warfighters in different roles. For example, system operators and command instructors typically only need to see higher level TDL message details. However, engineers verifying radio communications and Joint Interface Control Officers (JICOs) troubleshooting issues with TDL communications need to see the low-level details.



The World's Only Combined TDL Training and Battlefield System

The Curtiss-Wright TCG GTS® Ground Tactical Data Link System is the only system that provides TDL training and simulation, as well as battlefield situational awareness and command-and-control capabilities in a single, moveable system.

The comprehensive and powerful system is extremely easy to set up and operate, no matter how it's being used. Simulations can be created by military operators in just a few minutes. And a Link 16 network can be set up with just six mouse clicks on the graphical interface. This speed and simplicity is a dramatic contrast to the significant time, effort, and complexity that's typically involved when setting up these crucial battlefield communications networks.

Warfighters can switch between simulation mode and battlefield mode with a single button, instantly converting an extremely effective training tool to a vital battlefield communications station. In simulation mode, the system uses live TDLs with simulated information and includes safeguards that ensure live actions are not taken.

Delivering Maximum Flexibility

To support any TDL communications requirements, the Curtiss-Wright TCG GTS supports a wide range of terminals and interfaces, including:

- Link 16
- MIDS JTRS
- Small Tactical Terminal (STT)
- TacNet Tactical Radio (TTR)
- Link 11 ATDS/NTDS
- JREAP A and JREAP C
- VMF
- SADL
- SIMPLE
- DIS
- ADS-B
- AIS

The system can be deployed anywhere TDL connectivity is required, and a single system can control up to 20 remote TDL terminals. It can also be designated as the network time reference (NTR) in training scenarios. For maximum flexibility, the Curtiss-Wright TCG GTS can be moved from training facilities to the battlefield for additional training and for use during live missions. It's available in multiple configurations including cases with a rack-mounted computer and dual-screen, pull-out display or as a desktop system with two monitors. Curtiss-Wright is also one of the few companies that provides terminal housing cases for both MIDS-LVT and MIDS JTRS terminals.

Approved and Proven in Real-World Deployments

The Curtiss-Wright TCG GTS is accredited by the U.S. Department of Defense and has full authority to operate on classified networks. It is also on the U.S. Air Force Approved Product List and is relied upon by air force organizations around the world.

As the trusted, proven leader in defense and aerospace, Curtiss-Wright fully supports its customers with complete training and support services. With the system's ease of setup and intuitive interface, personnel can be trained in basic system operation in just a few hours.

To learn more about the unique benefits the Curtiss-Wright TCG GTS can bring to your organization, contact us today, or email ds@curtisswright.com.

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