

**CURTISS -  
WRIGHT**

# TCG GTS<sup>®</sup> Capabilities Statement

Data Links Simplified



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## The GTS Advantage

TCG's Ground Tactical Data Link System (GTS®) provides operational users an affordable, interoperable, and combat-proven battlefield tactical data link (TDL) system with comprehensive Situational Awareness (SA), Command and Control (C2) and non-C2 data link capabilities. The GTS suite of products supports multiple data links including Link 16, Link 11, SADL, VMF, and Link 22. TCG's GTS solutions also support other key military communications protocols and interfaces, including JREAP-A, JREAP-C, SIMPLE, DIS, ADS-B, GPS, and AIS. The GTS is also available in multiple, cost-effective configurations to allow for use in fixed command centers; mobile, deployed operations down-range; or for other specific military applications. TCG's GTS is DOD-accredited with full authority to operate when connected to the SIPRNET and is on the Air Force Approved Product List.

GTS is easily customizable to meet specific architecture and information exchange requirements and is configurable by the warfighter to meet multiple mission areas such as data link command and control engagements, border security, close air support (CAS), and situational awareness. The GTS is modular and designed for rapid deployment, quick set-up, and ease of use; even for operators without extensive tactical data link training. The proven TCG underlying product architecture enables multiple units to simultaneously share a single Link 16 terminal or host multiple terminals. The GTS is available in multiple hardware configurations based on specific mission requirements, including a ruggedized option for mobile, forward theater deployment. These configurations have been designed to provide warfighters with a state-of-the-art, accredited solution with comprehensive TDL capabilities tailored to their specific requirements.

The embedded world class TDL simulation engine supports a sophisticated training capability to support basic, intermediate, and advanced individual and group data link training as well as mission rehearsal, war gaming support, Blue/Red air operations, and post mission debrief and analysis. The GTS allows operators to simulate individual and group air, land, sea, and space assets with real time control. Simulation features also include radio/terminal emulation, TDL network simulation, and command and control scripts. In live operations GTS supports full situational awareness, flight following, safety of flight and a full command and control capability.

The GTS can also control up to 20 local or remote Link 16 terminals from a single command station. It can also provide Live, Virtual, and Constructive (LVC) training capability by broadcasting fully interactive simulated tracks. GTS inherently facilitates understanding and fosters confidence, ultimately leading to the development of a skill set critical to mission accomplishment.

## Worldwide Deployment

GTS has won competitive procurements for US and international air forces to include Saudi Arabia, Finland, Hungary and Greece, Oman, Pakistan, Thailand and Morocco and was procured sole source by Singapore, Japan and UAE. Since its initial competitive procurement, the US Air Force (USAF) has continued to purchase additional systems for wings and squadrons in Europe, the Pacific, and Central Command. There are also systems in use by the US Navy (USN).

## Intuitive Operations

GTS's familiar Windows-based GUI, combined with CG's own simplified approach to TDL interaction, provides the most intuitive user experience for TDL operations and minimizes training time.



## Tactical Display

GTS offers a user-friendly human machine interface (HMI) and an advanced map display which allows operators to customize their tactical display to accommodate their immediate mission.

The tactical display provides a robust, flexible, and realistic background which supports various map types and projections. Below are some of the tactical display features.

- **Customizable Display:** The tactical display provides many options to display entity-related data. Track data can be displayed by customizable data blocks, standard or customizable color schemes, track and mission summary windows, or one of several other methods.
- **Target Sorting Lines:** Generally referred to as pairing and engagement lines, mission status is reported by several data link messages and all have unique meanings. In addition to tabular displays, GTS can display a unique colored and symbolized line for target sorting, engagement status, pairing, and other associations reported on the data link.
- **Context Sensitive Help:** GTS links its software application user manuals directly to each application and dialog window. Upon selecting the “Help” control or accelerator, the applicable user manual is opened and positioned to the exact location that describes the context dialog.
- **Imported Maps and Overlays:** Multiple vector maps and digital raster map formats are supported. The GTS allows operators the flexibility to load additional maps in formats such as CADRG, JPEG/JPEG2000, TIFF/GeoTIFF, Bitmap and Portable Network Graphics. Maps can be overlaid with varying maplayer opacity to maximize the display characteristics of each map type.
- **Annotation Editor:** The tactical display includes a rich editing capability consistent with industry-standard drawing packages. Annotations can be saved, merged or deleted and are preserved across software installation updates.



## Real Time Monitoring/Scenario Control

GTS provides many TDL monitoring and scenario controls for efficient situational awareness, real time message generation and data analysis.

- **C2 and non-C2 Control Panels:** This feature combines all the commands (Control, Handover, Mission Assignments, etc.) and mission status between a C2 and non-C2 participant on one window. As a result, the Control Panel provides a consolidated display illustrating the message communication between participants and their current status. The Control Panel layout is customized to the function (C2 and non-C2) of the participant.
- **Mission Assignments/Commands:** These very common C2 orders include many field restrictions derived from approximately 40 discrete values. GTS provides a user interface that populates the required fields based on each discrete command and pre-populates the assets being addressed. Once again, GTS provides the user flexibility by allowing the data to be overridden or even derived in real time if more recent data has been received via the data link.

- **Track History:** GTS allows the operator to denote an entity as a special interest object. Once denoted, GTS will record the time and events for significant changes to the entity such as course, speed, altitude, and identity among others. For non-discrete parameters, GTS provides a user-configurable threshold value. GTS will display any of these events graphically if the user chooses.
- **Data Recording and Display:** The Data Extraction and Reduction Guide (DERG) is the DoD Interface Standard by which GTS records data link messages. GTS records all message traffic that it transmits and receives in a DERG-formatted file. The Link Message Analyzer is the GTS tool that can be used to display the recorded data, either in real time or in an off-line mode. Numerous filtering and display options are provided in both modes. Message statistics are also available in real time mode.
- **Remote Track Status:** GTS provides a concise summary window detailing the status of all remote objects on the data links. The window is configurable and includes such fields as Source TN, Reference TN, URN, Voice Call Sign, Position/Time/Track Quality, Time Since Last Report, etc. This is a useful means to monitor the link status of any participant and also the stability/quality of the network.
- **Scenario Manipulation and Execution:** GTS provides flexible training scenario execution options including the ability to pause/resume a scenario execution, schedule the start of a scenario for a time in the future, and display real time remote entities without executing the scenario. GTS also allows the user to add, delete, and modify scripted scenario events “on the fly” to enhance the training mission effectiveness.

## Mission Playback and Debrief

All TDL message data received by GTS is recorded. This data may be replayed for mission debrief or used to augment any other debriefing system available (e.g., air combat maneuvering instrumentation (ACMI)). The playback controls provide numerous options resulting in a significant degree of flexibility for debriefing. There are controls to pause/resume, fast forward, and control speed (faster or slower). The advantage of the playback feature is that it captures data for all network participants without requiring a special pod.

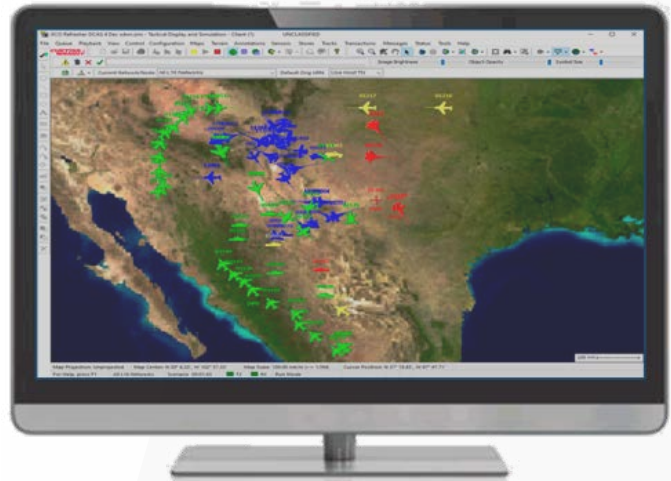
GTS playback may be viewed on multiple displays and backgrounds, and zoomed in or out depending on the area of interest. Various map overlays may be used depending on the needs of the pilots during debrief. The playback provides the entire tactical situation and can be focused on any selected participating asset or group of assets. The display may be centered on and follow any object within the field of view.

## Flight Safety

The situational awareness provided by tactical data link networks greatly enhances the pilot's ability to see and avoid aircraft transiting through airspaces. GTS is able to receive and forward surveillance data to the cockpit, enabling pilots to see the same air picture monitored by ground C2 nodes. Similarly, Commanders, Operations Officers and Supervisors of Flying can monitor data provided through the platform's status messages to determine refueling priorities, whether or not to recall aircraft, or to divert aircraft to another location. The most significant benefit of monitoring aircraft operations with GTS is in the event of a bail out. GTS will recognize and alert operators to this emergency condition enabling them to insert an emergency point at the exact location, allowing for the expeditious rescue of the pilot. Additionally, the GTS playback function can be used to augment flight data recorders and other sensors in an aircraft accident/incident investigation.

## Real Time Kill Removal

A powerful capability of GTS is to mine data already available in the TDL network and present it in a format usable by a range training officer (RTO) to conduct kill assessment and removal. The RTO display is an embedded GTS application that receives positional and engagement data from the TDL network. Track data is formatted and displayed according to the network settings chosen by the user along with corresponding shots fired data, which are displayed in separate windows. Screen captures of the RTO display can be sent to the mission lead to be used in the mission debrief. The RTO function may also be run in playback mode.



The RTO function is enhanced further by employing Blue Air/Red Air operation functions. This capability requires a specific net design load (NDL) that splits the network and allows Red Air to operate on Link 16 unseen to Blue Air; while, the GTS can see all participants. An operator can designate the Red Air tracks via pseudo local tracks then transmit them to Blue Air participants who will use their radar to confirm the Link 16-reported Red Air aircraft. This creates a much more realistic training event as pilots are acting or reacting to live objects. The specialized display aids a Range Training Officer to make a “kill/no kill” determination from the data available on Link 16. At the time of a missile shot, the RTO display will provide data link information on the shooter and target including bearing, range and aspect angle for the RTO to make the kill/no kill assessment.

## Terminal Control Wizard (TCW)

GTS contains TCG’s Terminal Control Wizard (TCW). The TCW provides operators and easy “6 clicks to the net” through an intuitive user interface that utilizes automated decision making to facilitate the often complex task of Link 16 network entry. The TCW simplifies terminal initialization by allowing the user to create an “optimized” initialization data file. This optimized file is created by starting with a network load file from a network design facility and adding the site’s own parameters (position, track number, voice call sign, stacked net numbers, etc.). Once created, these site specific parameters are stored and applied to any initialization data file. Using the optimized data file as its first step, the TCW walks the user through a series of windows to define mission-specific parameters such as date, time source, and time reference before sending the data to the terminal.

## Establishing NTR/ETR

Achieving fine synchronous timing is a prerequisite for all platforms operating in a Link 16 network. When operating as an independent network node, GTS can establish timing either in Net Time Reference (NTR) or Extended Time Reference (ETR) mode ensuring pilots enter the network within a minute after takeoff. The major benefits of ETR operations – increased network geographical span and consistent timing source – offer significant advantages over NTR operations. ETR eliminates the requirement to exit one network then enter another, reduces data drop-out rates, and increases platform participation. All these advantages lead to increased pilot situational awareness and reduce pilot workload.

## Multiple Terminals Control

GTS can be configured to control up to 20 terminals simultaneously in one or more Link 16 networks. In addition to providing the user interface to initialize and monitor these multiple connections, GTS also solves the problem of line of sight overlap through intelligent addressed message routing, redundant message rejection, and the provision of unique filtering for each terminal connection.

## System Manager

The System Manager monitors and controls all TCG applications to accumulate health and status information, define configuration information, and start and stop all applications (provided that the user has the proper credentials). The System Manager displays a graphical representation of both local and remote GTS software applications. The System Manager will also communicate with other System Manager services on other GTS or Client workstations and communicate with other sites via a secure WAN Service, if available. Thus, an operator on one workstation can view and manage applications that are running on other workstations and at other sites.

## Training

GTS fully embraces “train as you fight” concepts by providing realistic TDL networks with virtual C2 assets, targets, threats, and other network traffic as required to develop daily training scenarios supporting specific tactics, techniques, and procedures. Insertion of simulated data on a localized TDL network provides a sense of realism while reducing reliance on participation of other assets, especially low density high demand assets such as airborne early warning (AEW), intelligence, surveillance and reconnaissance (ISR), and tanker aircraft. This LVC capability is used by various US and coalition operational forces to simulate assets that are not available for routine training such as AWACS, enemy SAM sites and other friendly, enemy and neutral forces. A simulated AWACS can be controlled from the GTS ground station with the full transmit and receive library of a live asset including the full complement of C2 messages. These messages

can be real-time or pre-scripted and interactively activated by the GTS operator, providing a robust organic training capability at the squadron or unit level. Cost savings are further realized through reduced flight hours (assigning friendly forces to enemy roles), operations and maintenance costs.

In addition to participation in and control of live networks, the training capability of GTS can be used to inject a simulated tactical situation for virtually any TDL training requirement. The embedded multi-TDL data link message scripting capability in the server and the optional client workstations (TCG-CW) enables the operator to interact with both live and simulated network participants. The embedded simulator enables a user to generate a simulated tactical scenario and play it over the live network. The scenario can be edited in real-time to manipulate any simulated object. In addition, the user can monitor the network on the tactical situation display and control the operation of the Link-16 terminal, Link 11 DTS, SADL/EPLRS radio, VMF radio, or JREAP network(s) remotely from a client workstation. The display de-clutter/find track feature makes finding track location and data on a busy display much easier.

## Transportable Terminal Housing Cases

GTS includes a data link server, a transportable housing case for many different terminal types (including all MIDS-LVT variants, JTRS, STT, TTR, EPLRS, CNR, BATS-D, etc.), a UHF L-band antenna, optional dual displays, an Ethernet switch, and an optional client workstation. The transportable case is pre-configured to house power and cooling components designed for use with the customer-identified terminal type. All connecting cables are provided. Note: Link 16 terminals are Government Furnished Equipment (GFE).

## Interoperability

GTS is fully interoperable with all MIL-STD-6016, MIL-STD-3011, and MIL-STD-6017 compliant TDL equipment. If an operating location currently controls a Link 16 terminal using any of these devices, GTS may still be connected and will provide the full computing power of its simulation and scenario generation capability, record and playback functions, HMI and RTO features. GTS supports multiple network interfaces including JREAP-A/C, Serial J, Socket J, SIMPLE J, SADL/EPLRS, DIS, ADS-B, AIS, Link 22 SNC, and VMF. These interfaces can allow connection and transmission/receipt of TDL data beyond line of sight. They also support connections for Live-Virtual-Constructive training events allowing message transactions between GTS, platform simulator, and aircraft in flight.

GTS may be operated as an independent stand-alone ground control station or in an architectural scheme comprised of many ground stations. GTS is in use worldwide as a force multiplier and is interoperable with existing TDL equipment from any manufacturer.

## Client Workstations

GTS has the option of adding multiple remote or local client workstations for access to the tactical data link networks via the GTS server. These remote units also provide added system flexibility by allowing any unit to control a GTS from across the room, across the country, or half-way around the world.

## Robust Simulation

The integrated multi-TDL network simulation capability provides industry leading ease-of-use, allowing for complex scenarios to be created in a matter of minutes versus hours. GTS provides comprehensive message generation, network simulation, real-time and post-test monitoring and analysis from a single hardware/software system.

With GTS' easy-to-use tools, any data link mission scenario can be planned and developed in simulation mode, then played back into the live network. Each scenario can provide virtual air, ground or surface entities depending on the mission or training event. The scenario may be adjusted real-time as well, furthering operator knowledge and experience when pop-up targets and simulated emergencies occur. Scripts may be saved and played over and over again, or they may be developed in layers allowing progression through the training syllabus.

Fighter-to-fighter operations serve to familiarize pilots with basic actions such as verifying crypto loads, entering and maintaining the net, locating friendly forces including C2, ISR, and refueling platforms, and performing basic air combat maneuvers. GTS provides the means to insert simulated ground targets, hostile airborne forces, imagery and mission assignment messages that pilots will likely encounter in real-world operations.



## Scripting Scenarios

GTS provides a comprehensive set of functions for creating and managing scenarios. Scenarios can be generated in an off-line mode, stored as a file, and later executed when connected to a live or simulated network. While scenarios can be merged with one another, typically a scenario results in only one file for execution. Pre-defined scenarios are modifiable while in real-time mode. Below is a sample of some of the scripting features.

- **Track Templates:** This feature provides the operator with the ability to create a template object populated with user-specified values for most data fields. Once a template object has been defined, adding it to a scenario either in off-line mode or run time mode is very efficient.
- **Waypoints/Routes:** GTS provides the ability to establish an object's route, including orbits, based on user-defined waypoints in either off-line or run time mode. Any route can be modified after it has been created.
- **Scenario Preview:** Once a complex scenario has been created in an off-line mode, it is useful to be able to execute the scenario in order to determine the location of objects at future scenario times and to synchronize status and command and control messages. The Scenario Preview feature allows the user to fast-forward, execute at faster speeds than real-time, rewind and replay a scenario.
- **Scenario Summary:** A GTS scenario can be displayed as a list of time ordered events or graphically on a map, or both. The time ordered events list can be commented for ease of use and efficiency.

## Network Simulation and DIS/SIMPLE

GTS offers the flexibility to create and transmit TDL messages in accordance with the message specifications (or that violate the specifications). GTS is also a powerful network simulator, capable of creating complete and very realistic test environments that can include virtual C2 assets, targets, threats, and simulated network participants. GTS provides the sense of realism without the reliance on low density, high demand assets such as AEW platforms, tanker aircraft, and ISR participants.

GTS can be configured to provide a gateway between an external source of simulated data and Link 16. GTS currently supports the Distributed Interactive Simulation (DIS) and Standard Interface for Multiple Platform Link Evaluation (SIMPLE) protocols for the exchange of simulation data. GTS translates the information received from the simulation interface to the appropriate J-series message(s) and transmits them to the Link 16 terminal, following all applicable rules and protocols. GTS can also enhance the external simulation data by using GTS's network simulation capability to provide Link 16 information or test cases that are not available via DIS, such as mode codes and activity information.

## Comprehensive Simulation and Scenario Management

GTS provides a comprehensive set of functions for creating and managing scenarios. GTS can accurately recreate the multi-TADIL network traffic representing multiple C2 and non-C2 platforms including Network Enabled Weapons. Functions are provided for surveillance, command and control, and EW activities. GTS contains a flexible scenario control mechanism and provides operator interaction for a wide variety of tactical transactions.

GTS provides the capability to define multiple discrete scenarios that may be assembled to create complex scenarios. Data link messages may be spawned by the activity of simulated track objects or operator actions.

## Data Injection

During execution of a scenario, as the events are occurring, the GTS operator may also inject new data or modify data related to one or more of the scripted events. New objects that have a velocity component can be given a route or set of way points during the object's definition on the tactical display. The operator is provided with controls to start a scenario immediately or at an operator-specified future time and pause, restart, and stop the scenario at any point during its execution.

## Operator-Defined Tactical Objects

A tactical scenario contains operator-defined tactical objects. These objects may be any of the object types (e.g., air, land, surface, subsurface, space, reference point, EW) defined in the TDL-specific catalog. The operator may define trajectories for moving objects consisting of flight segments and waypoints.

## Track Management

GTS implements TDL-specific surveillance track management rules to include Reporting Responsibility, Drop Track, Difference Reports, Change Data Orders, Emergency and Force Tell Indicator changes, Strength changes and Exercise Status Order functions. In order to provide flexibility, the user may override reporting responsibility rules and stale out times.

## Configurable Transaction Processing

Many C2 to non-C2 message transfers require that subsequent messages be transmitted and states be shifted. It is difficult for an operator to know what the appropriate messages, associated fields and conditions under which the state or new message should be generated especially if required in real time. Thus, GTS is provided with the capability to generate these transactional messages. Each message sequence is configurable in order to provide for maximum flexibility.

## Multi-Platform Emulation

GTS can simulate multiple TDL-enabled platforms and the TDL-related activities that the platform can be expected to encounter during its operational missions. These network entities can be created by GTS and their planned activities pre-scripted. During the mission, the operator can allow these activities to occur as scripted, or can interactively activate some or all of the pre-scripted events. Using these techniques, the platform can interact with other TDL network entities to ensure interoperability when fielded.

## Specialized Capabilities

Over the years, TCG has added the following unique capabilities to GTS in order to meet evolving customer requirements.

- **Imagery:** The Imagery option for GTS provides the capability to transmit and receive imagery data over Link 16 using the J16.0 message. This implementation is in accordance with MIL-STD-6016E. This option provides the capability to create, modify, and view National Imagery Transmission Format (NITF) files containing JPEG images. Further, GTS provides full control over the transmission requirements including the choice of "one-way" or "two-way" protocol transfer, a selection for the packet acknowledgement interval and the recurrence rate for the data packet messages.
- **Link 16 Correlation:** Correlation processing consistent with the rules defined in the Link 16 standards has been implemented in GTS. In order to meet the varied mission needs, all correlation parameters are configurable and the user is given the option of enabling or disabling the correlation algorithm.
- **Pseudo-local tracks:** GTS provides the ability to inject a surveillance track on a "Blue Network" that is derived from a "Red Network" PPLI or Target Sorting entity. In a Red vs. Blue training environment where the two networks are separated by net number, this makes it possible for GTS to provide a surveillance track on the red PPLI without having local sensor data. It greatly enhances live training as the blue aircraft's sensors can correlate the target reported in the surveillance track provided by GTS with a physical object.

## External Interfaces

In addition to support Link 16 terminal, VMF radios, and Link 22 equipment, GTS supports a wide range of external radio, terminal, and beyond line-of-sight (BLOS) interfaces which extends the range of the data link. GTS includes a graphical, dynamic routing capability supporting unidirectional and bidirectional routing between external interfaces which includes filtering by message type and data source. Forwarding between networks according to MIL-STD-6020 rules supported as are mission specific overrides.

- **JREAP C:** GTS implements the Internet Protocol mode of Joint Range Extension Application Protocol (JREAP). This feature allows for the forwarding of J-series messages to remote JREAP capable processors over IP based networks (MIL-STD-3011 Appendix C).
- **JREAP A:** GTS provides an interface for Joint Range Extension Application Protocol (JREAP), Appendix A to a multimode, satellite radio. This feature supports communication via synchronous serial interfaces with the AN/ARC-210, AN/PRC-117, and PSC-5 DAMA radios. Network Controller, Alternate Network Controller, Network Listener, and Network Participant roles are included.
- **SIMPLE:** The Standard Interface for Multiple Platform Link Evaluation (SIMPLE) is a NATO Standardization Agreement (STANAG) specifying a standard for interfacing test rigs for the purpose of Tactical Data Link (TDL) interoperability testing. The TCG implementation provides the capability to process Link 11 and Link 16 messages either using a virtual network connection or operating as a Terminal/DTS emulator. It supports SIMPLE packet types 1, 2, 61, 62, 63, and 65 over IP.
- **SADL:** GTS provides an interface to the Situational Awareness Data Link (SADL) / Enhanced Position Location Reporting System (SPLRS) radios. The interface can be configured to operate in Gateway mode or Generic Host mode on the SADL network and can act as a forwarded or router between a SADL network and a Link 16 network.
- **Socket J:** GTS provides an interface to an external Socket J-capable system over an Ethernet connection using TCP/IP. This interface may be used to exchange J-series messages using the MTDS/MTC protocol. GTS can establish and maintain a Socket J connection as either a client or server.
- **Serial J:** GTS provides an interface to a remote, Serial J-capable system over an asynchronous serial line, via a null modem setup or attached to a Secure Terminal Equipment (STE) data modem connected to a Public Switched Telephone Network (PSTN). This interface may be used to exchange J-series messages.
- **DIS:** GTS provides the ability to participate in a Distributed Interactive Simulation (DIS) network. GTS supports Entity State, Signal and Transmitter Protocol Data Units (PDUs). GTS can route locally simulated data to the DIS network, route live Link 16 data to the DIS network, and route received DIS data to the Link 16 network.
- **ADS-B:** GTS provides support for the Automatic Dependent Surveillance – Broadcast (ADS-B) data stream. GTS correlates ADS-B tracks with Link 16 tracks and can process the ADS-B data in either a passive or active mode. In passive mode, the ADS-B data is received, processed, correlated, and displayed on the Tactical Display. In active mode, the track data is also transmitted onto the Link 16 network. Additionally, ADS-B Navigation Integrity Category data is mapped to the Link 16 Track Quality.
- **AIS:** GTS provides support for reception and display of Automatic Identification System (AIS) surface tracks. AIS tracks can be translated into Link 16 tracks and transmitted on the Link 16 network. GTS will correlate AIS tracks with received Link 16 tracks to eliminate transmission of duplicate tracks.

## Product Support

TCG provides a full range of support options for the GTS product line. On-site installation and training is available and GTS User Manuals and Job Aides provide detailed operational instructions. The system comes with a six-month warranty and a comprehensive maintenance package covering tech support, software updates and site-visits is also available.

### Product Support Plans

The annually renewable Product Support plans are a fixed price subscription plan and can cover all systems at the Client's site. The plan provides for product support, extended warranty, for both hardware and software as well as software updates for a period of one year. The various plan types provide for unlimited help desk support and one site visit for up to three days. The site visit can be used to accomplish a myriad of items including, but not limited to, software installation and refresher-training. The plan can be modified to provide for increased support to suit custom requirements.

### Technical Support Hotline

Unlimited Technical Hotline support for support of GTS technical or troubleshooting issues is included in the maintenance support plan and is a part of CW TCG's normal customer service. Remote support for test and operations is available on request. The Technical Support Team follows an established process to ensure timely resolution of customers' technical issues. Working with Program Managers, Engineering, Contracts, Quality Assurance, Operational Support, and Senior Management the Technical Support Team coordinates a response to customer support inquiries related to all supported systems and products including software, hardware, training, application, network connectivity, maintenance, and operations. Our Technical Support Team prides itself on excellent customer relationships.

### TCG User's Group (TUG)

To further support our worldwide customers, Curtiss-Wright hosts an annual international TCG User's Group (TUG) and training seminar which is focused on exchanging user experiences with CW TCG products, and providing updated training on new features. Agenda items include:

- Review of latest developments
- Schedule of expected software releases
- Status of change proposals
- Group discussion of problem reports and priority settings
- Tips and tricks for more efficient data link operations and network management
- Lessons learned from field operators

The TUG has been held annually since 2004, admission is free to all TCG customers, and is attended by tactical data link testers, trainers and operators from prime weapons system contractors and US and international militaries. It is held near TCG's headquarters in the Boston, Massachusetts area.

**GTS At-A-Glance**

## GTS Capabilities and Features

- Multi-Link message processing
- Tactical situational display
- Track & message simulation
- Offline & Sim-over-Live scenario generation
- Live-Virtual-Constructive (LVC)
- RF and IFF processing
- Range training officer support
- Record/Playback
- Remote client/server support
- Real-time Pseudo Track support
- Terminal Control Wizard (TCW)
- Full terminal control
- Terminal emulation
- Network monitoring
- Network Time Reference (NTR)
- External Time Reference (ETR)
- Multi-Terminal control
- Network Enabled Weapons
- Dynamic message routing
- Maintaining mission objects

## Terminal and Interface Support

- Link 16 MIDS LVT1
- Link 16 MIDS LVT2
- Link 16 MIDS LVT3/FDL
- Link 16 MIDS JTRS
- Small Tactical Terminal (STT)
- TacNet Tactical Radio (TTR)
- Link 22 SNC
- Link 11 ATDS/NTDS
- Link 11 DTS
- VMF and Combat Net Radios
- JREAP-A
- JREAP-C
- SADL
- SIMPLE
- DIS
- Socket-J & Serial-J
- ADS-B
- AIS
- GPS

**Constant Improvement**


GTS will continue to improve and evolve; as technologies, network architectures, and operational applications emerge. GTS keeps pace with its infusion of interfaces supporting various protocols. LinkPRO, the GTS's embedded Data Link Processing Engine, is constantly updated to incorporate the latest MIL-STD Interim Change Proposals (ICPs). User suggested enhancements are captured during annual user-group forums, site visits, exercises, and joint training events.



**Contact Us**

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