

ENHANCED LINK 16 ACCEPTANCE TEST SYSTEM (ELATS)

Test Automation Framework

The ELATS is a modernized Automatic Test Equipment (ATE) system designed for acceptance testing and depot repair verification of Tactical Data Link (TDL) terminals, MIDS-LVT and MIDS-JTRS.

PRODUCT DESCRIPTION

The ELATS is a commercial quality tester leveraging proven L3Harris hardware and test automation frameworks. ELATS is based on an industry-standard ATE system (e.g., system controller PC, mass interconnect system, PXI test/measurement system, power supplies, PDU) integrated with L3Harris Special Purpose Hardware (SPH) and Special Purpose Software (SPS), customized for the Terminal Under Test (TUT) and Test/Reference Terminal (TT).

CUSTOM SPECIAL PURPOSE HARDWARE

- > Power supplies for TUTs¹
- > Cables for TUT and TT interfaces
- > Fan trays for TUT and TT terminal cooling
- > RF Network (RFN) for antenna switching and signal conditioning
- > MIDS Interchangeable Test Adapter (ITA) which serves as the interface between the TUT/TT and test/measurement resources
- > Self-Test ITA which supports ELATS loopback validation of ELATS test/measurement resources and communication paths

CUSTOM SPECIAL PURPOSE SOFTWARE

- > Test Program Sets (TPSs), a.k.a. test cases, which collectively validate all required functional capabilities of the TUT per the terminal Acceptance Test Procedure (ATP)
- > Front-end software including an application launcher and operator GUI for system configuration, device scanning and test case selection
- > Back-end software for generating L3Harris standardized test artifacts (e.g., Summary Test Report, Test Data Records (TDRs))
- > ELATS platform-specific software (e.g., drivers, engines, avionics data bus, ethernet host)
- > Link 16 Environment Gateway Stimulator (LEGS) software tool for terminal control, monitoring and status

1. Customer-furnished radio test set (i.e., including power supply) required to permanently serve as the ELATS TT.



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Reliable and Modern Link 16 Testing

KEY FEATURES

Efficiency

- > Multi-purpose tester that supports various Terminals Under Test (TUT) with reduced footprint

Standardization

- > Adoption of industry standard ATE hardware and software

Reliability

- > Accurate and repeatable automated testing

Sustainability

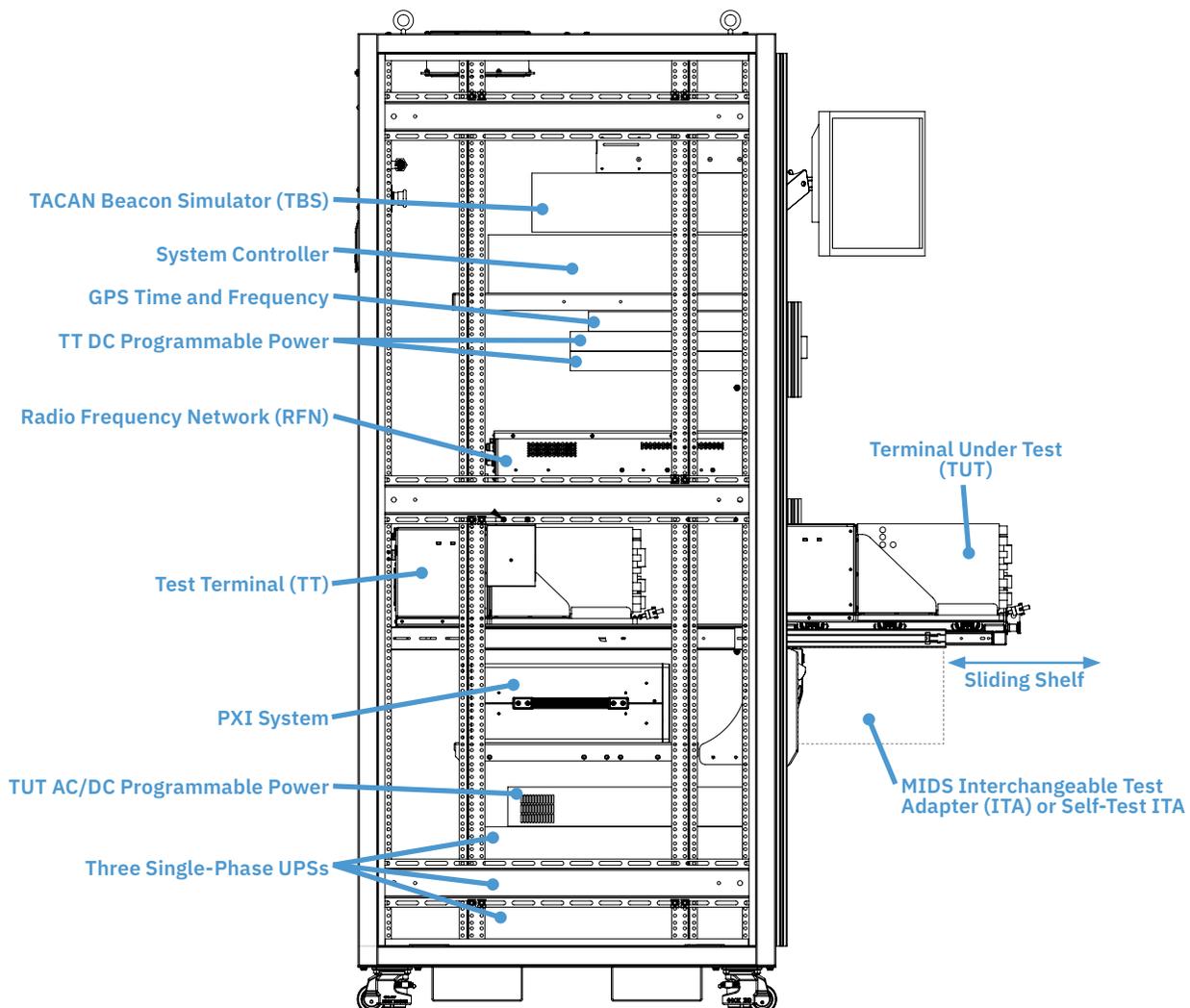
- > Improved software automation and test strategies
- > Extensible hardware/software platform that serves as jump-off point for ELATS variants which support new TUTs

Maintainability

- > System self-test
- > Preventative maintenance option (e.g., calibration alert, cleaning, cable replacement)



- > **Tactical Air Navigation System (TACAN) Beacon Simulator (TBS)** – Emulates ground and air-based TACAN beacons and interrogators
- > **System Controller** – Windows PC with external keyboard, touchscreen monitor and mouse
- > **GPS Time and Frequency** – Provides time references for the MIDS terminal
- > **Radio Frequency Network (RFN)** – Provides RF signal routing and conditioning
- > **TT DC Programmable Power** – Provides requisite power to the Test Terminal (TT)
- > **TUT AC/DC Programmable Power** – Provides requisite power to the TUT
- > **Interchangeable Test Adapter (ITA)** – The TUT/TT-specific fixture that enables connection between the TUT/TT and tester resources
- > **PXI System** – Customize PC-based platform for modular, software-defined instrumentation and switch which includes the following PXI/PXIe cards:
 - Audio Analyzer/Generator
 - Two (2) Oscilloscopes
 - Digital Multimeter (DMM)
 - Vector Signal Transceiver (VST)
 - Digital I/O (DIO)
 - Digital-Analog Signal Switching
 - RF Switch Matrix
 - MIL-STD 1553 Interface
- > **Three Single-phase UPSs** – Uninterruptible Power Supply (UPS) solution facilitates graceful shutdown and satisfies power distribution/conditioning requirements
- > **Test Terminal (TT)** – Customer furnished “golden” reference terminal used to network with the TUT
- > **Terminal Under Test (TUT)** – The terminal being tested



TEST PROGRAM SETS (TPSS)

The TPSs are designed in accordance with the government approved MIDS LVT and MIDS JTRS Functional Acceptance Test Procedures (ATPs). These tests can be executed standalone or in a sequence, as configured via the ELATS Test Cases Selection Graphical User Interface (GUI).

- > Avionics/Host Interfaces
- > Link16 Message Error Rate (MER)/Sensitivity
- > GPS External Time Reference (ETR)
- > Network Entry/Operations (NEO)
- > Range Performance
- > Crypto Interfaces
- > TACAN AG/AA Performance
- > Voice Quality
- > TDMA Transmission/Reception Capability
- > Link16 Platform Interoperability
- > EMC Features
- > Additional LVT-BU2 TPSs
 - Crypto Modernization (CM)
 - Frequency Remap (FR)
 - Enhanced Throughput (ET)
- > Additional TTNT TPSs
 - TTNT All Channel Transmit
 - TTNT Message Error Rate (MER)/Sensitivity
 - External TTNT Power Amplifier (ETPA) Controls
 - Full Spectrum Output

SUPPORTED RADIOS

The ELATS supports the following MIDS Terminals Under Test (TUTs):

- > LVT(1) Family¹
- > LVT(2) Family
- > JTRS V5
- > JTRS V6/V7²
- > JTRS AV5³
- > JTRS AV6/AV7^{2,3}

1. MIDS on Ship (MoS) not supported
2. TTNT capability
3. Upgraded L16 Transceiver

SPECIFICATIONS

Operating Temperature

- > 5 °C to 35 °C (optimal)

Rack Dimensions and Weight

- > Dimensions based on typical use-case of rack with sliding shelves (forward/back, left/right), external cabling, adjustable monitor/keyboard arm and rear rack access
 - Depth: ~85"
(38" rack + 14" cabling + 33" extended shelf)
 - Width: ~60"
(23" rack + 28" extended monitor/keyboard + 9" extended shelf)
 - Height: ~85" from casters to eye bolts
- > Weight: ~1,700 lbs.

Key Bulkhead Rack Connections

- > Facility Power (AC Input)
 - 120/208VAC ±10% 50/60 Hz, 24A/phase, 3-phase
 - Custom international configurations available
- > GPS Coax Connector
- > Test Local Area Network (LAN) Port
- > Safety Ground Lug

Mobility

- > Lifting eye bolts on top of rack
- > Heavy duty casters
- > Forklift pockets

Key Safety Features

- > Front and back accessible Emergency Power Off (EPO) buttons for system power off
- > Mass interconnect Safety Interlock power off to the ITA when disconnected
- > Locking sliding shelves
- > Warning labels (e.g., high voltage, ESD)
- > Fully isolated TUT power supply for operator safety
- > Wrist-strap ESD protection

MODES OF OPERATION

The ELATS supports the following modes of operation:

- > **Acceptance Test Mode** – Automated execution of terminal ATP TPSs; pass/fail results
- > **Troubleshooting/Depot Repair Verification Mode** – Manual execution of select individual TPSs and manual terminal power control
- > **Maintenance Mode** – System self-test, system and instrument calibration and confidence test

WARRANTY, MAINTENANCE AND SUPPORT

The ELATS is warranted to be free of defects in material and workmanship for six (6) months from date of delivery. ELATS basic training, provided at time of installation, includes ELATS hardware set up, software configuration and basic operation.

Optional comprehensive training, customized maintenance and support services available at additional cost.



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