TDACS
Tactical Data Analysis and Connectivity System
Märzen Group LLC
Company Information
Märzen Group LLC
Administration Information

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➢ Socio-Economic Business Classification
  Small Business
Märzen Group LLC
Data Link Products (All COTS)

- Tactical Data Analysis and Connectivity System (TDACS)
  - Powerful TADIL Protocol Message and Routing Engine
  - Powerful Database Driven Analysis Tool Suite

- Tactical Map 2D/Tactical Map 3D
  - Real Time Geo Ref Visualization Applications

- Märzen Tactical Visio (MTV)
  - Tactical Network Monitoring Application

- Märzen Tactical Excel (MTE)
  - Office Type Plug-in for specialized data analysis

- Märzen Tactical PowerPoint (MTP)
  - Office Type Plug-in for Automated After Action Reports

- Tactical Message Inject (TMI)
  - Static and Dynamic Link 16 Scenario Generation
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Partial Customer List

- Missile Defense Agency
- NLDMO (Netherland Defense Procurement Agency)
- KDA Norway/NDPD (Norwegian Defense Procurement Division)
- USSTRATCOM - JFCC-IMD
- US Navy - SPAWAR, NWDC
- US Air Force - USAFE, USCENTAF
- US PACOM - USFJ
- US JCS - Joint Staff J6
- Shared Early Warning System (SEWS) - Peterson
- MITRE Corporation
- BAE Systems
- General Dynamics
- Boeing Corporation
- IABG Germany
- Raytheon IDS
- Defense Information Systems Agency (DISA)
TDACS Overview
Sample TDACS Workstation
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TDACS Computer Hardware Form Factors

Combined Rack (CRF)

Intermediate (IFF)

Portable Form Factor (PFF)

Small Rack (SRF) and Small (SFF)
What does TDACS do*?

TDACS is a powerful and versatile data link management and analysis tool that has many applications:

- High performance, low latency message router
- Routes data to / from multiple locations
- Translates numerous J-series (Link 16) protocols
- Facilitates multiple network connections and interfaces
- SQL data capture for real-time and post-event analysis
- Monitors tactical & strategic environment
- Monitors regional & theater environment
- Filters & manipulates data
- Versatile record & playback capability
- Easy-to-use COTS software (MS Excel, Visio)
- 2D/3D real-time graphics display for SA

* This list is constantly updated and expanding, for current or more detailed status – contact us…
Current TDACS release is version 5.4.0.2. It is designed to operate on Windows 10 x64, v1709 and 1803.

- The TDACS systems configured with the USDoD Secure Host Baseline [SHB] are currently restricted to v1709.

Future releases of TDACS will follow the schedule of Windows releases and will always have a version compliant with the SHB.
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Frontend Dashboard [Communications and Router Control]

- Configuration & Control
- Link Status & Monitor
- Data Manipulation
- Message Filtering

**Connection Protocols Supported**

- JREAP C
- Link 16
- MTDS SER J
- MTC
- SISO J
- SYSLOG
- SIMPLE J
- DIS
- X.25 (ADDSSI)
- 1553 (Plat B)
- 1553 (NSB)
- SAT-J

**Router provides operator management of:**

- Connection monitor
- Message analysis
- 2D/3D Map display
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Frontend Dashboard - Connection Display

- **TDACS Front End color-coded connections**
  - Blue = Connection has been successfully created
  - Yellow = Connection is Listening or Trying to connect
  - Green = Connected, Op Rx, Op Tx or Op Rx and Tx
  - Gray = Connection is Disabled
  - Red = Lost Connection

<table>
<thead>
<tr>
<th>Connection Name</th>
<th>Connection Status</th>
<th>Connection Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCP Listening JREAP C</td>
<td>TCP Trying to Connect JREAP C</td>
<td>TCP Setup Completed JREAP C</td>
</tr>
<tr>
<td>TCP Connected JREAP C</td>
<td>TCP Op Rx and TX JREAP C</td>
<td>TCP Connected JREAP C</td>
</tr>
<tr>
<td>TCP Disabled JREAP C</td>
<td>TCP Lost Connection JREAP C</td>
<td>TCP Disabled JREAP C</td>
</tr>
</tbody>
</table>
TDACS Plug-in Architecture
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TDACS Plug-ins

Partial Listing of TDACS Connection Interface Plug-ins
- SYSLOG Ethernet
- ISIM Ethernet
- Network Address Translator
- TCP/IP Ethernet
- VIN5 Ethernet
- IPv6 Ethernet
- OCS Ethernet
- SSO Ethernet
- Interface Plug-In
- Interface Plug-In
- Interface Plug-In
- Interface Plug-In
- Interface Plug-In
- Interface Plug-In
- Interface Plug-In
- Interface Plug-In

TDACS Block Diagram
V 4.7 21 Nov 2014

MS Net v 1.0

Utility Plug-ins Core Functions
- LAN and Protocol Recorder
- TDACS ATD Server
- Link4S Data Manipulator
- Link4G Message Filters
- TDACS ALERTS Server
- Core Support Utilities
- TDACS Ethernet Monitor

Interface Setup and Router Control
TDACS Message Engine and Router

Analysis Setup and Router Control

TDACS DBMS
MS SQL Server 2008R2

TDACS Real Time Data Bases

TDACS 3D Tactical Display
TDACS 2D Tactical Display
TDACS Threat Assessment

TDACS MTV COM AddIn
TDACS MTE COM AddIn
TDACS MTP COM AddIn

PowerPoint Pro 2019
Excel Pro 2016
Visio Pro 2019
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TDACS Plug-ins Cont’d

TDACS Plug-ins

- 3 Plug-in Types
  - Connection
  - Analysis
  - Utility
- Users activate the Märzen plug-ins they need in real time.
- Support a wide variety interfaces and message structures.
- Simple, powerful .NET controls make tactical information accessible to novices and veterans.
- Users can add provided functional tactical communication interfaces in minutes.
TDACS Plug-ins quickly extend its capabilities to meet new requirements. Example: 6016F TDACS Analysis Plug-in:

- Presents friendly man-readable breakouts of all link messages through database connectivity via SQL Server Express
  - Message Field Grid, Tree View, and Hex Message Breakouts
- Allows Real-time database queries and tabular displays revealing
  - Protocol and message format violations
  - R2 violations, Orphaned Tracks, Leakers, etc.
  - Engagement summaries by platform
  - Platform and weapon status
  - Platform ID changes & IFF issues
JTIDS Range Extension Plug-ins

- JREAP C (Active Connection and Passive Tap)
- STANAG 5602 Edition 2 (SIMPLE-J)
- Serial J (MTDS)
- MTC
- SISO J
- SAT-J (Monitor, Gateway Controller, Gateway Unit)
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TDACS Connection Plug-ins

Link 16 Terminal (Host/Emulate/Monitor/Pass Thru)

- **MIDS LVT 1**
  - Platform A (H/E/M)
  - Platform B (H/E/M)
  - Platform D (H/E/M)

- **MIDS LVT 2**
  - X.25/ADDSI (E/M/PT)
  - Platform J (H/E/M)

- **JTIDS Army 2M**
  - X.25/ADDSI (E/M/PT)

- **MOS (MIDS LVT 5)**
  - 1553 (H/E/M)

- **JTIDS Class 2H (Navy Ship)**
  - 1553 (H/E/M)

*Green Italics indicate software plug-ins under development.*
TBM Summary

- Single ALT versus Time
- All TBM Summary
Sample Analysis Plug-In Link Traffic Statistics

Example: Link 16 Excel plot updated dynamically from Link 16 message traffic. Notice J-Series message tabs across bottom of spreadsheet.
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TDACS Analysis Plug-ins Cont’d

> Adjudication

- Provide core capabilities utilized by TDACS
- TDACS Adjudication provides real time or post event detailed analysis of DIS/TADIL for reconstruction during exercises and tests.
- Entry and Display of Ballistic Missile Operating Areas and Defended Asset List.
- Entry and Display of DIS Enumerations in table format and associated objects.
- Summary windows for Fire, Detonation, and Emission PDUs.
- Run Threat Analysis on selected test case/scenario with associated 3D video.
- Automatic generation of Power Point reports.
- 3D TacMap provides TADIL and DIS display, record, snapshot and playback capability.
- Excel with DIS and TADIL data.
TDACS Utility Plug-ins

- Provide core capabilities utilized by TDACS
- Message Router
- Analysis Router
- Recorder
- Playback
- Tactical Message Manipulator
  - SIM BIT, STN, etc.
- Tactical Message Filter
  - STN, Label/Sub-Label/Cat-ID, etc.
- J Series Message Generator
Record Feature supports:
- Recording of all data link protocols
- Recorded files may be saved / transferred to other media

Playback feature supports:
- Scenario replay for audience review
- Detailed analysis (immediate on-site or post-mission analysis)
- Training new TDACS Operators
- Playback populates all functionalities available to real time data stream
- Useful in evaluating / refining network architecture & data flow
Plug-Ins are Developed according to ‘Business Case’

- Greater Potential sales volume increases priority
- Corrections and Improvements are supplied to all customers of that Version plug-in.
- New Plug-ins may be added to existing software of like version.
TDACS
Tactical Map 2D (TacMap 2D)
TacMap 2D

- Several map options
- Scalable
- Filters
- Bearing/Range
- Lat/Long
- Hook Info
- Color palette
- Pop UP ID Alerts
- PPLI Transmit
- Message Transmit

TacMap 2D is a separate Plug-in that processes TDACS Data
TacMap 2D

- 2D Geographic Reference Visualization Application
- Mil-Std-2525 and NTDS Symbology - for Link 16 Messages
- Fully integrated with all TDACS Connection Plug-ins
- Interactive map
- GDI+ Drawing Provides dynamic graphics and text
- Zoom Levels Control what's visible based on map magnification
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TDACS - Tactical Map 2D Cont’d

- TacMap 2D Example
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Tactical Map 3D (TacMap 3D)
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TDACS - Tactical Map 3D

TacMap 3D

- Multiple maps can operate simultaneously
- 3D Visualization Application.
- 2525/NTDS Symbol Sets - for Link 16 Messages.
- 3D Models for all other Connection Plug-ins.
- Fully integrated with all TDACS Connection Plug-ins.
- Interactive map
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TDACS - Tactical Map 3D Screen Captures
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TDACS - Tactical Map 3D Screen Captures Cont’d
TDACS
Märzen Tactical Visio (MTV)
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TDACS - Märzen Tactical Visio

➢ MTV

- User can create visual symbols representing physical entities
  - Communication Nodes
  - Interconnecting links
  - Can be arranged to indicate architecture connectivity or unit status.

- Visio Architecture Diagram becomes ‘Interactive’ with the live Link 16 data stream.

- Sample current application:
  - Color-coded Connection status information.
  - Can be graphed or numerically represented.
JPOW 2008 ATD

NET 2
- DE CRC
  - 173
- DEPT VAN
  - JRE CJTF
- TDACS A8
- JRE NRF
- RF NET 2
- JICC

NET 1
- DE CRC
  - 115
- DEPT VAN
  - JRE CJTF
- TDACS A8
- JRE NRF
- RF NET 1
- JICC

Other components and systems shown in the diagram include:
- AEGIS BMD
- THAAD
- AWACS
- VPAT
- VPAT US
- NL CRC
- NL GBADS
- VPAT NL
- VPAT US
- DE SHORAD
- DE MEADS
- NL ADCF
- SLAM
- SAMP

Diagram oriented towards tactical and strategic communication and coordination scenarios.
TDACS
Märzen Tactical Excel (MTE)
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TDACS - Märzen Tactical Excel

- **MTE**
  - MTE is a Märzen Add-in for Microsoft Excel
  - Connects the TDACS SQL Tactical Database to Excel
  - User can perform rapid ad-hoc queries and analysis of link information
    - Can use all Excel features
  - User can view link data in near real-time (<1 sec)
    - On Excel spreadsheets and plots
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TDACS - Märzen Tactical Excel Cont’d
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TDACS - Märzen Tactical Excel Cont’d

- **MTE - Summary TABS** combine messages that are associated with that particular interaction.
  - **DUR** - J7.1, J3.2, J3.6, J10.2
  - **Eng Coord** - J9.0, J9.1, J10.2, J13.x
  - **Eng Air** - J3.2, J9.0, J10.2
  - **Eng Space** - J3.6, J9.0, J10.2
  - **ID Air** - J3.2, J7.0, J7.5
  - **Roll Space** (Space and Points in v4.5) - J3.0, J3.6
  - **R2 Space** - J2.x, J3.6, J7.0
  - **R2 Air** - J2.x, J3.2, J7.0
  - **Errors** - TDACS errors database
TDACS
Märzen Tactical PowerPoint (MTP)
DIS Threat Summary

- Threats Launched vs. Type
- Threats Launched vs. Ballistic Missile Operating Area
- Summary of Missiles Detected
- Summary of Missiles Engaged
- Summary of Possible Leakers
- Summary of Missiles Destroyed

Link 16 Summary

- Up and Down time in TADIL
- Total messages by STN
- J10.2 Messages by STN
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TDACS - Märzen Tactical PowerPoint Cont’d

- MTP (AAR Scenario Deliverables)
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TDACS - Märzen Tactical PowerPoint Cont’d

- **MTP**

- **THREATS, PLANNED TOTAL = 491**

- **PLANNED THREATS BREAKDOWN - MRBM VS LAUNCH**

- **ENGAGEMENT PERFORMANCE**

- **THREATS BY TYPE**
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TDACS - Märzen Tactical PowerPoint Cont’d

➢ MTP
TDACS Plug-ins for JTID/MIDS Terminals
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TDACS - Shipboard Interface
Navy Shipboard Terminal Interface

- Provides Navy Shipboard Terminal Emulation function.
- Provides pier side translation to JREAP C or other Range Extension protocol for training integration in the absence of LOS availability.
Army Class 2M JTIDS Terminal interface
- Provides Army 2M Terminal Host, Monitor, and Emulation Capabilities
- Enables Patriot to operate without being connected to a actual Link 16 RF
- Link information is line of sight extended via Simple J and JREAP.

Army 2M Dynamic Library and Service
- TDACS Army 2M Connection Plug-in released as .NET native tactical.
- Communication component making Army 2M terminal control, monitor and emulation accessible to beginning and veteran developers alike.
- Exposed interface via SOA and/or Dynamic linking to enable all e2M functionality to any common user interface
Additional Explanations
TDACCS is used in many ways by different customers.
Command Center Situational Awareness and Data Collection
Field Element JREAP Integration
Shipboard and Patriot (to JREAP) Integration

[Diagram showing the integration process with nodes and arrows indicating data flow between Shipboard and Patriot systems.]
Patriot (to RF) Integration
Exercise Data Collection (KE)
Hardware or Simulation Testing

Hardware has been both Laboratory (HWIL) and Fielded Units

TDACS connects via JREAP or Terminal Interface depending upon test plan.

TDACS Databases

TDACS Analysis Tools

TDACS Message Injections

TDACS Analysis Tools are used to verify compliance with Link 16 MILSTD behavior

Stimulus can be scenario through training device (e.g., FMSD, ACTS) or Live Targets

D/S/Truth
Märzen Group LLC
Thank You!

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