Updated Company Introduction
Unique Technologies
Catalog
New Product Information
Large Test Programs
IADS Customer List
Company Information
Patrick Mattingly, VP SYMVIONICS Telemetry Systems
SYMVIONICS Telemetry Systems is a division of the parent company SYMVIONICS, Inc.

The office is centrally located between Edwards Air Force Base and Northrop Grumman in Palmdale, CA. The facility contains over 10 offices, a development lab and training center.

The division creates and supports the IADS product line, which is a real time and post test display and analysis software package. IADS is a registered trademark of SYMVIONICS, Inc.

The division services over 100 companies, including all major prime contractors in the US, International customers in 10 countries and over 7000 licensed users.
The IADS team is comprised of 16 members; 5 Computer scientists, 1 Aeronautical engineer, 1 Electrical engineer, 1 Mathematician, 1 Graphics engineer, 1 Network engineer, 2 Test engineers, 1 Applications Support engineer, 1 Hardware engineer and 2 administrative specialists.

The IADS team has over 100 years of test program experience on various programs.
Unique Technologies

IADS is the premier real time display and analysis product in the US. It is used by every major test program in the US and many other countries world-wide. IADS is a Server/Client software system that scales from processing large multi-discipline test rooms to single user systems in multiple test environments.

"We are breaking ground here. I am unaware of any program that has obtained stability margins and compared them with predictions as quickly as we are currently doing. Our testing is well ahead of schedule."

Flight Test Engineer, Boeing
The IADS Server
IADS Server Capabilities

Key Feature

Tuned for High performance test programs with large numbers of parameters and Client displays.

- Supports a wide range of data source interfaces
- Can serve hundreds of Client connections
- Processes over 250,000 parameters
- Complete data storage capabilities
- Data recall support for Client scroll back
- Real time auxiliary storage for immediate walk-away data
- Real time nulling with report
- Full status logging
- Can run in multiple test environments
IADS Data Sources

Key Feature
No other product supports the range of Telemetry and COTS data sources.

- SYMVIONICS Telemetry Processor
  - Lumistar Decom
  - ACRA PCI Decom
  - TTC PCMCIA and USB Decom
  - Chapter 10 and Chapter 10 UDP
  - ACRA Instrumentation Systems
  - TTC Instrumentation Systems
  - L-3 Instrumentation Systems
- Commercial Telemetry Processor
  - L3 MFT800 PCIe Decom
  - L3 System 550 (Vista and System 6/7/8) Telemetry Processors
  - Smartronix Omega 3000 Telemetry Processor
  - NetAcquire Telemetry Processor
  - Acroamatics Telemetry Processor
- Flight Simulators and Custom Data Source Interfaces
IADS Uses

The IADS Server is scalable and supports a multitude of test settings such as on-vehicle, ground stations, mobile facilities and post test environments.

Key Feature

- Instrumentation Setup Station
- IADS Data
- Walk Away Data/Video
- Post Test
- SAN
- Data+Video
- Test Vehicle
- PCM
- Real Time
  - IADS Ground Station
- Data+Video
- IADS
- IADS
- IADS Mobile Station
- IADS
Operators Console Interface

Key Feature

Critical for large test rooms the IADS Server and Clients can be controlled by the IADS Operator Console application.
IADS Chapter 10 Processing

The IADS Server can process Chapter 10 data from a file or standard Ethernet with an easy to use GUI interface.

- Start wizard available for required setup information
- Real time and playback with fast import speeds
- Supports 1553, analog, ARINC, UART, video and custom packet types
- All PCM types
  - Unpacked
  - Throughput mode
  - Packed
- Multiple setup file types
  - TMATS
  - TTC XML
  - Acra XidML
  - Chapter 10
The IADS Client
IADS Displays

No other product has such a wide range of display choices and ease of use in an integrated graphical package.

IADS Displays

- Display Builder has a user friendly drag and drop interface
- IADS data displays and extensive ActiveX control palette
- Incorporate third-party displays
- Create complex objects and screens using the drawing package: Circle, mesh, polygon, rectangle, triangle, text, line, picture and overlay
- Save complex composite displays to the Toolbox library
- Animate displays using parameter dynamics
- All displays have a unified advanced property sheet
- Use a display property as a parameter
- Create text inputs that drive displays
- Full data scroll back capability
- Display tutorial available to create your own custom displays
**Digital Stripchart**

No other product provides a digital stripchart with the range of settings and functionality. IADS capabilities allowed large test programs to forgo the need for mechanical strip charts.

**IADS Advanced Digital Stripchart**

- Vertical or horizontal orientation
- Unlimited parameters
- Large number of settings with dynamic properties
- Label options: Parameter, short name or user defined
- Legend
- Dynamic scaling
- Scale per parameter
- Clamp data to edge of parameter
- Wrap data when off scale
- Advanced grid placement and labeling
- Fill data intersection
- Digital draw style
- Show data value on display and in popup hint
- Show pen: Standard, Standard Recessed, Caret, Caret Recessed and Enhanced

---

**Key Feature**

![Digital Stripchart Example](image)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB1002X</td>
<td>0.5</td>
</tr>
<tr>
<td>AB1003X</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**Time**

- 00:05:44

---

**Symvionics, Inc.**

**Telemetry Systems**
No other product provides the Loads discipline with an integrated easy to use envelope analysis system.

IADS Cross Plot

- Plot parameter pairs such as: airspeed vs. altitude, bending moment vs. torsion, rudder position vs. sideslip angle
- Use parameters as pair values
- Calculate max load limit
- Data history tail
- Show one or more envelopes on the display
- Add or change envelopes spontaneously
- Add background picture
- Set event markers
Custom 3D Aircraft Model

Key Feature

No other product provides an aircraft model with articulated surfaces and a large number of control properties that can be animated with parameters for true real time performance.
Moving Map Displays

The IADS Client provides 2D and 3D moving map displays.

**IADS 2D and 3D Moving Map Displays**

- Display up to ten aircraft accurately positioned over terrain data or a map image
- Parameter information such as latitude, longitude, airspeed and heading are applied to each aircraft to present a real time situational awareness capability
- Terrain data available from SYMVIONICS for most global locations
- Satellite imagery usage
- Articulated models
- Overlay images
- Radar visualization
- Envelopes
IADS provides multiple displays for health and status monitoring.

**IADS ICAW Display**
- Displays integrated cautions, advisories and warning messages
- Monitors and compares the values of a predefined set of parameters to known faults
- Sync loss protection option to disregard data dropouts

**IADS Event Monitor**
- Monitor events as they occur based on user-specified criteria (arguments)
- Not based on bit numbering
- Easy setup

<table>
<thead>
<tr>
<th>IRIG TIME</th>
<th>Event Group</th>
<th>Event SubGroup</th>
<th>Event Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>001:00:08:05.5000</td>
<td>Group1</td>
<td>SubGroup2</td>
<td>Event 1</td>
</tr>
<tr>
<td>001:00:08:05.5000</td>
<td>Group1</td>
<td>SubGroup2</td>
<td>Event 1</td>
</tr>
<tr>
<td>001:00:08:05.5000</td>
<td>Group1</td>
<td>SubGroup2</td>
<td>Event 23</td>
</tr>
<tr>
<td>001:00:08:05.5000</td>
<td>Group1</td>
<td>SubGroup2</td>
<td>Event 19</td>
</tr>
<tr>
<td>001:00:08:05.5000</td>
<td>Group1</td>
<td>SubGroup2</td>
<td>Event 15</td>
</tr>
<tr>
<td>001:00:08:05.5000</td>
<td>Group1</td>
<td>SubGroup2</td>
<td>Event 11</td>
</tr>
<tr>
<td>001:00:08:05.5000</td>
<td>Group1</td>
<td>SubGroup2</td>
<td>Event 7</td>
</tr>
</tbody>
</table>
No other product allows the engineer to mark data and attach notes at specific times during a test. Event markers are visible in Strip chart and Cross Plot displays and are automatically saved for data recall in both real time and post test.

IADS Event Marking

- Create visual markers in real time
- Mark events with comments
- Create a list of pre-defined comments
- Move and edit event markers on the Stripchart
- Edit events in the Event Marker Log
- Go to time feature in the Event Marker Log
- Filter events
Test Points

Key Feature
No other product employs a more efficient way to move through large numbers of test points which is critical for large test programs.

IADS Test Points
- Select test points by Maneuver, Test Point, Description or none
- Import and display auxiliary test point information
- Perform batch computation and export marked test point data
- Auto-stop test points after a predefined length of time or manually
- Execute actions on test point start or stop
  - Reset frequency averaging
  - Reset peaks
  - Launch user scripts

Symvionics, Inc.
Telemetry Systems
Real Time Persistence

No other product provides the range of interactions with the real-time displays in order to save critical results for later recall.

IADS Data Point Selection and Logging

- Select data points at any time during a test to compare data
- Universal cursor to select points on multiple displays
  - Stripcharts
  - Cross Plots
  - Frequency and Frequency Response Plots
  - Nyquist Plots
- Recall selected points in the Data Selection Log
- Select points in Stripcharts in Data mode, Peak mode or Absolute mode
Digital Filtering and Data Editing

No other product provides the range of filtering techniques in an easy to use interactive interface.

**Key Feature**

**IADS Digital Filtering and Data Editing**

- **IIR Butterworth and Elliptic filters**
  - Band Pass, Low Pass, High Pass, and Band Stop responses
  - Custom FIR and IIR filters can be developed using derived equations or custom functions
  - The frequency response of an IADS digital filter can be confirmed using the Frequency Response Plot
- **Spike Detection and Correction**
  - Corrects single spurious data points
  - Slope detection
  - Absolute value change detection
- **Sync Lock Processing**
  - Reduces the inclusion of noisy data
- **Wild Point Correction**
  - Replaces bad data with a user specified value
No other product provides a fully integrated set of Time Domain analyses. This is not a display add-on but a fully capable integrated package.

**Time Domain Analysis**

- Data reduction techniques: Random Decrement, Pseudo Randomdec, Auto Correlation and Wavelet De-noise
  - Reduce the influence of noise and isolate decays of interest
  - Overlays can be analyzed with modal techniques described below
- Digital signal processing techniques: Logarithmic Decrement, Logarithmic Decrement Averaging and Logarithmic Amplitude Picking and Time History Curve Fit
- Derived Equations and Signal Generation
  - Arithmetic, Trigonometric, Exponential, Bitwise and Boolean operators
  - Time-based, Statistical, Interpolation and Decimation functions
  - Degrees/Radians, Cartesian/Polar and other coordinate functions
  - User developed COM functions can be called from the Derived Engine
  - Create complex derived functions using If Then Else statements
  - Generate diagnostic waveforms: Sine, Sweep, Noise and others
Frequency Domain Analysis

No other product provides a fully integrated set of Frequency Domain analyses. This is not a display add-on but a fully capable integrated package.

**Frequency Plot**
- Power Spectral Density and Autospectrum display options
- FRP Curve Fit provides modal parameter estimates in real time
- Use dynamic scaling to keep data peaks clearly visible
- Compare RFP curve fit and Half Power Damping estimates for increased confidence

**Octave Band Plot**
- FFT-Based algorithm provides simplicity and low computational demands
- Octave bands can be displayed in 2D, 3D or waterfall
- Octave Band and 1/3 Octave Band displays are provided
- Peak hold can decay for acoustic-audio applications

**IADS Frequency Response and Nyquist Plot**
- Phase and Real/Imaginary/Magnitude, Coquad or Bode
- Coherence plot for FRF data validity assessment
- Unit circle can be displayed on Nyquist plot
No other product provides an integrated automated analysis to calculate frequency modes in real time with minimal user input. This is an advanced feature that provides large test programs the ability to process test points in a more efficient manner.
IADS Parameter Analysis Tool

No other product provides a parameter debugging tool to evaluate user equations. Key features such as analysis of multiple input parameters and user injected data in order to test running results make this tool unique in our industry.
IADS provides a wide range of export choices and user settings in order to fulfill your data export needs.

**IADS Data Export**

- Export directly from a Stripchart or from the Configuration Tool
- Define data groups for bulk export with multiple options
- Export IADS data to common output formats: CSV, Excel, and Matlab
- Use the IADS Data Export Wizard to:
  - Select the output type
  - Set start time and stop time
  - Set sample rate
  - Set time precision
  - Set data precision
  - Apply a Filter
  - Select Parameters
  - Set Excel options
  - Set Matlab options
No other product provides easy access to data from a real time test for immediate post test playback. IADS uses the same displays for both real time and post test eliminating the need to learn a new application.

IADS Post Test Processing

- **IADS Startup Dialog**
  - Open predefined, existing and recent IADS configurations
  - Starts the IADS Playback Client
  - Create and modify IADS configuration files
  - Import data
  - Access the IADS demo and tutorial

- **IADS Post Test Data Server**
  - Orchestrate the interaction of multiple users connected to the same post test server
  - Serve a large number of users from the same data set in a network efficient and secure manner
IADS provides a variety of products based on the IADS Server and Client applications. Below are the products that are used by the JSF and F/18 programs.

**IADS-TELEM-BASE**
- Server and Client - Complete end to end data acquisition system with real time data processing, archiving, computation and display
- Connects to a wide variety of data sources
- Operator Console command and control
- Support for IADS Auxiliary Processes (IAP)
- Support up to 100 IADS Client connections

**IADS-TELEM-BASE-TPP**
- Offers all the same features as the IADS-TELEM-BASE product with support for additional Telemetry data sources (please see the IADS Price Schedule for full details)

**IADS-TELEM-CLIENT**
- Used in both Real time and Playback modes
New Product Information
Measurement Editor

Released in 2015 with Version 8.1.2

The IADS Measurement Editor is used to create or modify ARINC 429, MIL-STD-1553 bus messages and Serial data measurements in an IADS compatible TMATS file. This file can then be used in IADS to process IRIG-106 Chapter 10 data both from a file format or real time Ethernet output.
Calibration Tool

Released in 2015 with Version 8.1.2

The IADS Calibration Tool simplifies the process of sensor calibration by integrating the components needed to perform such calibrations directly into the existing IADS Client Workstation.
IADS Data Manager

Scheduled in 2015 with Version 9.1

The IADS Data Manager is a new post test application that allows the end user to manage large volumes of post test data from existing IADS data archives interactively or in Batch mode.
IADS Gauges and Models

Scheduled in 2015 with Version 9.1

Updated Aircraft displays.
Scheduled in 2015 with Version 9.1

The IADS mobile application for tablets including the Apple® iPad.
Future Technologies

IADS was selected by the iNet program to prototype PCM Backfill technologies, where sync loss corrected data is forwarded to IADS via a secondary stream for Real time analysis.
IADS Hardware

**Key Feature**
SYMVIONICS provides Server and Client hardware tested for performance and quality for the IADS software suite.

**IADS Hardware Systems**
- Integrated and tested by SYMVIONICS
- Decom and Bit sync up to 4 streams
- Solid state hard disk system
- High performance components
- Video capture card
- Compatible with new IADS releases
- Includes 1 Year Warranty

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th></th>
<th>Rack Mount</th>
<th>Tower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server</td>
<td>Server or Client</td>
<td>Server or Client</td>
</tr>
<tr>
<td>Windows 7 32bit / 64bit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windows Server 2008 R2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Form Factor</td>
<td>ATX</td>
<td>ATX</td>
</tr>
<tr>
<td>IADS Front Panel Display</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>DDR3 RAM</td>
<td>8 GB</td>
<td>8 GB</td>
</tr>
<tr>
<td>SATA RAID 6 GB/s</td>
<td>SSD 256 &amp; 1TB – RAID 0</td>
<td></td>
</tr>
<tr>
<td>PCM Streams</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**IADS FPD (Front Panel Display)**
The IADS Server features a custom LCD front panel that displays Hardware, System and IADS Software status updates in real time.
Future Release - 9.1 4Q 2015

Native 64 Bit
• Native 64 bit support for all IADS software components

IADS Automatic Computational Load Balancing
• Performance tuning for complex derived processing

IADS Data Manager
• A post test application that allows the user to manage large volumes of IADS data files

New Bessel analysis filtering option

New IADS mobile applications

Mode shape analysis capability
Large Test Programs
Control Room Processing

- Product Used: IADS-TELEM-BASE/BASE-TPP IADS Server and Client combination package
- Manage hundreds of IADS Display Clients from a single IADS Operator Console
- Multiple control rooms
- Multiple test disciplines in a single room
- IADS based computational processing for Basic Air Data and Mass Properties
Multi-site Configuration Management

Key Feature
A single IADS configuration database can be used across all test locations.
Distributed Computational Processing

- Needed by large programs for complex processing such as Basic Air Data and Mass Properties
- Any number of computational Servers can be created
- Load balance across multiple systems
- Load balance across multiple CPU cores

![Diagram showing processing and archiving with load balancing across multiple systems](image-url)
Automated Test Point System

- Essential for large test programs
- User filtering
- Easily create Test Data Requests
- Perform batch computation and export on marked test point data
Customers

United States, Europe, Asia, Middle East, Australia and South America
- Air Force Institute of Technology
- Air Force Research Laboratory
- Alenia Aermacchi
- Beechcraft
- Bell Helicopter
- Boeing
- Bombardier
- Cessna
- China Lake AFB
- Edwards AFB
- Eglin AFB
- Ft. Eustis
- Ft. Rucker
- General Atomics
- Gulfstream
- Holloman AFB
• HondaJet
• Hill AFB
• Israeli Air Force
• Korean Aerospace Industries
• Lockheed Martin
• NASA Armstrong
• National Test Pilot School
• Nevada Test Range
• Northrop Grumman
• Patrick AFB
• Patuxent River
• Pratt & Whitney
• Singapore Air Force
• Tyndall AFB
• U.S. Army Aviation Technical Test Center