

# GMSEC

## Goddard Mission Service Evolution Center



### At A Glance

ASIST is a real-time command and control system for spacecraft development, integration, and operations. Mature and reliable, ASIST has logged hundreds of thousands of hours supporting these missions.

### Benefits

ASIST can be used in all phases of a mission, from instrument development [DEV], spacecraft integration and test [I&T], and post-launch operations [OPS].

### Features

- Distributed, scalable workstation-based architecture
- Industry-standard network, operating system, and graphical display
- Cost-effective use of off-the-shelf technology (COTS and GOTS)
- CCSDS telemetry and telecommanding
- Rapid prototyping of databases, displays, and procedures
- Parallel commanding from multiple workstations
- Mass storage of telemetry capable of recording an entire mission history
- Workstations receive independent telemetry, real-time or playback
- Built-in mechanism for building rule-based monitoring systems

## ASIST

### Product Overview

The Advanced Spacecraft Integration and System Test Software (ASIST) is a real-time command and control system for spacecraft development, integration, and operations. It features a distributed and scalable workstation-based architecture: ASIST can be used in a components development laboratory with a single workstation, or it can be used for instrument and spacecraft integration and test with multiple workstations, and/or in mission operations, where 20 or 30 workstations may be used concurrently.

Multiple NASA projects have used ASIST for a variety of purposes: In support of flight software development, C&DH (Command and Data Handling) components development, instrument integration and test, spacecraft integration and test, mission operations, and level zero processing. It is used primarily for telemetry and telecommanding systems based on the CCSDS (Consultative Committee for Space Data Systems) standard.

ASIST leverages the use of off-the-shelf technology for cost effectiveness, using popular operating systems, standard networking and display components. It currently runs on an IBM PC based Linux platform, but can be easily ported over to other Unix flavors. It provides rapid prototyping of telemetry and spacecraft / instrument command databases, displays and test procedures. ASIST also supports the use of automated test procedures written in STOL (System Test and Operation Language), as well as parallel commanding from multiple workstations. It has built-in rule-based monitoring of telemetry data.

| Windows Editors Information Tools Diagnostics |                 |               |
|---|-----------------|---------------|
| Time  | Wed 3:42 PM EST | MIDEX 1       |
| GSE UTC                                       | 96-346-20:42:31 | SC Prc Md ACS |
| S/C UTC                                       | 96-284-21:37:35 | NORM NOR      |
| S/C MET                                       | 02-283-21:37:33 | NEB A Rly NEB |
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| Purge   | STOL Keypad     | ORBIT STA     |
|   |                 | 0             |
| Database Lookup                               |                 | Inspect Value |
| : STAR TRACKER 2 RAW DATA                     |                 |               |

*A sampling of ASIST graphic displays.*

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## ASIST's Missions

### • Spacecrafts:

- [I&T] [X-Ray Timing Explorer \(XTE\)](#), launched December, 1995.
- [I&T] Tropical Rainforest Measurement Mission (TRMM), launched November, 1997.
- [I&T] Far Ultraviolet Spectroscopic Explorer (FUSE), launched June, 1999.
- [OPS] Imager for Magnetopause-to-Aurora Global Exploration (IMAGE), launched March, 2000.
- [DEV], [I&T], [OPS] Earth-Orbiter 1 (EO-1); launched November, 2000.
- [DEV], [I&T], [OPS] Microwave Anisotropy Probe (MAP); launched June, 2001.
- [DEV], [I&T], [OPS] Space Technoogy5 (ST5), launched March 2005.
- [DEV], [I&T], [OPS] Solar Dynamic Observatory (SDO), launched February 2010.
- [DEV], [I&T], [OPS] Magnetospheric Multiscale (MMS); currently under development at GSFC.
- [DEV], [I&T], [OPS] Global Precipitation Measurement (GPM), currently under development at GSFC.
- [DEV], [I&T], [OPS] Mars Atmosphere and Volatile Evolution (MAVEN), currently under development at LASP.

### • Instruments:

- [DEV] [CIRS](#)-- An instrument on the [Cassini](#) spacecraft
- [DEV] [XRS](#) - A high resolution X-Ray Spectrometer which measures the spectra of X-ray sources.
- [DEV] [IRAC](#)--The infrared advanced camera.
- [DEV] Goddard Electronics Module (GEM) which was on [Lewis](#), an [SSTI mission](#)
- [DEV] SLAM - An instrument which measures accelarations during launches.
- [DEV] [GLAS](#) - A laser altimeter on [ICESat](#).
- [DEV] MBLA - Another laser altimeter on [VCL](#).
- [DEV] [XRS-2](#) - A rebuild of thehigh resolution X-Ray Spectrometer which measures the spectra of X-ray sources on [ASTRO-E2](#)

### • Other Component Development:

- [DEV] JWST IC&DH - The instrument processor on JWST.
- [DEV] Solid State Recorder Development for Hubble Space Telescope
- [DEV] Solid State Recorder Development for Landsat-7

## System Requirements –

### Availability --

### Other Possible Applications --

