

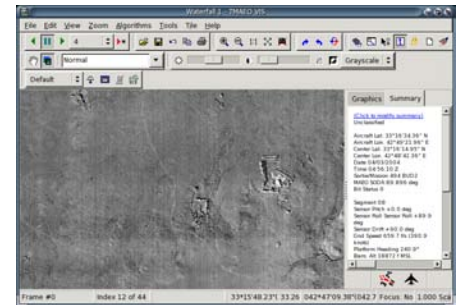


# TARS MVE

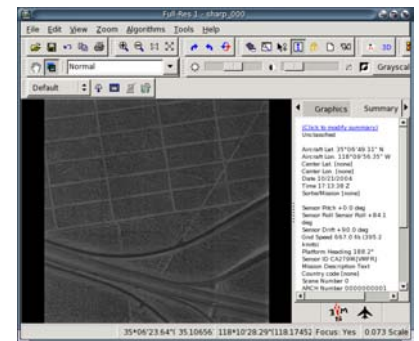
## Theater Airborne Reconnaissance System Mission Verification Equipment

The Theater Airborne Reconnaissance System (TARS) Mission Verification Equipment (MVE) is a state-of-the-art portable ground station for the rapid screening of Theater Airborne Reconnaissance System (TARS) tactical imagery data. Working in conjunction with the US Air Force, the Space Dynamics Laboratory (SDL) developed the TARS MVE ground station for use in aircrew training, mission results validation, target verification, and on-site maintenance assistance. The TARS MVE can receive and process sensor data (Medium Altitude Electro-Optical (MAEO) and Forward Framing Sensor (FFS)) from a live downlink through the TARS surface terminal equipment (STE) or via a solid-state recorder (SSR) (L-3 Communication's RM-4000T). The MVE ground station supports up to two image analysts and is expandable to support an additional MVE as well as additional networked desktops and laptops.

The ground station is built from non-developmental commercial off-the-shelf (COTS) and government off-the-shelf (GOTS) hardware and includes custom image processing and manipulation software. The TARS MVE features include:



Vantage Waterfall



Vantage Full-Resolution

- TARS MVE Display Stations used for data capture, display, and exploitation
- Vantage software receives, decompresses, processes, displays, evaluates, exploits, and stores imagery data in support of the MVE.

### TARS MVE Features:

#### Rugged, COTS components

- Sun Fire V440 computers
- Four 19-inch flat panel displays
- 24-port Ethernet switch
- UPS compatible with worldwide power
- LaserJet color printer
- Multiple input/output devices, including serial ports, DVD/CD RW drive, and LTO 3 tape drive
- STANAG 4575-compliant interface to the SSR
- DCRsi RM-400T interface unit
- Real-time storage RAID (2.6 TB)
- Rack mounted components housed in 4 transit racks

#### System Capabilities

- Compatible with the National Imagery Transmission Format (NITF) Standard, the Basic Image Interchange Format (BIIF), ISO/IEC 12087-5 and STANAG 4575
- Compliant with Distributed Common Ground Station (DCGS) architecture, standards and interfaces
- Integrated GPS data output with PFPS/FalconView flight mapping application (run on separate Windows-based computer)
- Compatible with Socet GXP imaging software (pre-installed)
- Expandable to support CDL live data link through the inclusion of a CDL Interface Box (CIB)

#### Data Acquisition Options

- Ethernet 10/100/1000
- DVD/CD
- Solid State Recorder (SSR)
- Local Disk
- LTO 3 tape drive

#### Image Product Database

- Real-time sensor data ingest
- Rapid searching via meta-data support
- Rapid air-to-ground IPDB data sharing
- Transmitted/air-stored data merge
- Simultaneous support for multiple sensor types

#### Situational Awareness Options

- Major city icon display
- Supports FalconView
  - Cross-application support
  - Full tracks/image footprints
- Digital map support
  - Vector/Vector Smart map
  - Digital nautical chart
  - TIROS, CADRG, CIB, DTED, GeoTIFF
- Supports ELINT, MANENT, MIDB, MTI

#### Change Detection Capability

- Image rectification, correlation, and auto-flicker

#### Real-Time Net-Centric Operations

- Network server-enabled IPDB
- Supports multiple distributed exploitation stations
- Extensible to third-party applications via net server modules

#### Image Display Options

- Pan/zoom/rotate
- Magnify image area
- North indicator
- Thumbnail Waterfall
  - Synchronized EO/IR for dual-output sensors

#### Target Locating Options

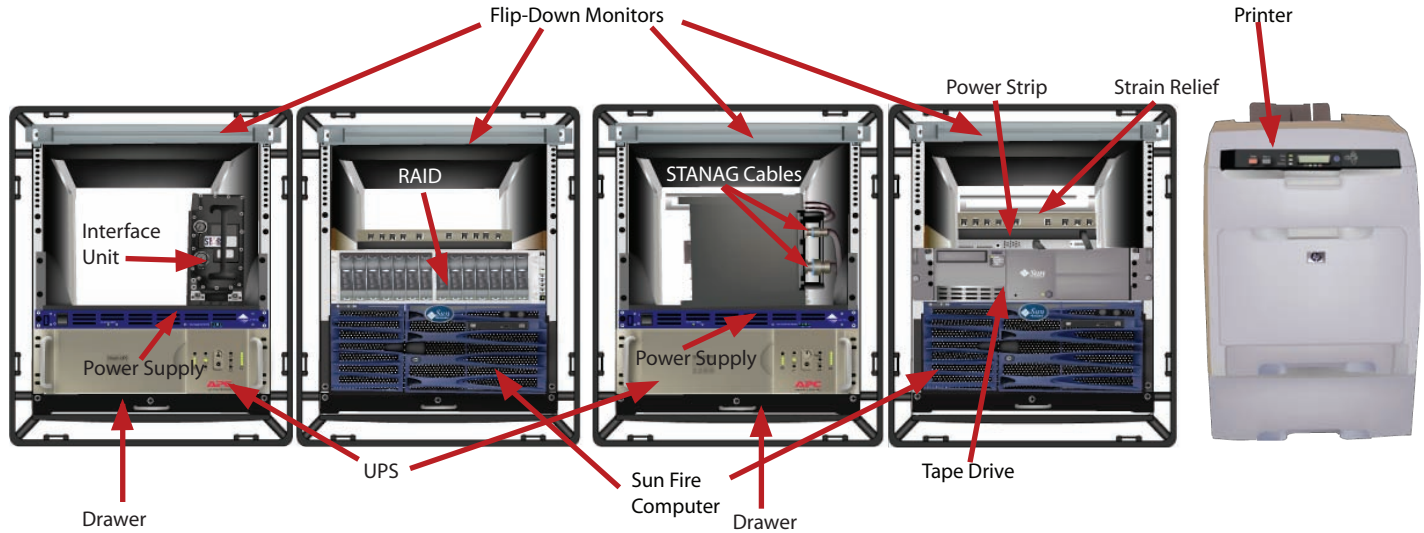
- Target Lat/Lon pointers
- Target tracking
- Target mensuration
- Lat/Lon-based operator designated cues

#### Image Manipulation Options

- Contrast/color enhancement
- Annotation (destructive and non-destructive): Text, line, rectangle, ellipse
- Histogram equalization
- Line detection
- Image blending

## Physical Description

The TARS MVE is housed in five rugged cases. All of the cases (except for the printer case) contain internal racks for component replacement. A physical description for each case is listed below.



## Physical Specifications

<b>Power Input:</b>	120 VAC, 50/60 Hz
<b>Weight:</b>	<b>Case 1:</b> ~ 256 lbs <b>Case 2:</b> ~ 270 lbs <b>Case 3:</b> ~ 247 lbs <b>Case 4:</b> ~ 265 lbs
<b>Case Dimensions:</b>	<b>Transit cases 1-4 (including lids):</b> 28.8" x 22.1" x 36.6" <b>Printer case:</b> 23.0" x 35.0" x 30.0"
<b>Table Dimensions:</b>	<b>Tabletop (with shelf folded down):</b> 30.0" x 48.0" <b>Tabletop (with shelf):</b> 48.0" x 48.0"
<b>Capacities:</b>	<b>DVD:</b> 4.7 GB <b>CD:</b> 800 MB <b>LTO 3 Tape:</b> 400 GB (uncompressed), 800 GB (compressed) <b>System Drive:</b> 73 GB <b>RAID:</b> 2.6 TB <b>System RAM:</b> 16 GB (per computer)

## Functional Description

The TARS MVE system screens image data from a TARS sensor that has been previously recorded to the SSR or received via live downlink. As the image files are staged, via a high-speed interface, the software displays decimated image thumbnails in a continuous waterfall of image swaths according to the given sensor model and navigation data. The operator has full control over the waterfall's speed, direction, magnification level, and display of annotation data captured from the pod. If the data is dual-mode (MAEO and FFS), two waterfalls are used to separate the imagery.

When an area of interest appears on the waterfall, the operator may select one or more frames to "chip" to a cross frame window. The cross frame image is the same fidelity as that received from the sensor and can be manipulated (zoomed, panned, rotated, contrast enhanced, etc.) or annotated with text or graphic overlays. Image products may then be printed, saved to disk, or disseminated to another station via Ethernet connection.

In addition to image screening and analysis functions, the TARS MVE also provides the capability to archive data to and from the digital storage device to support data duplication and back up.

