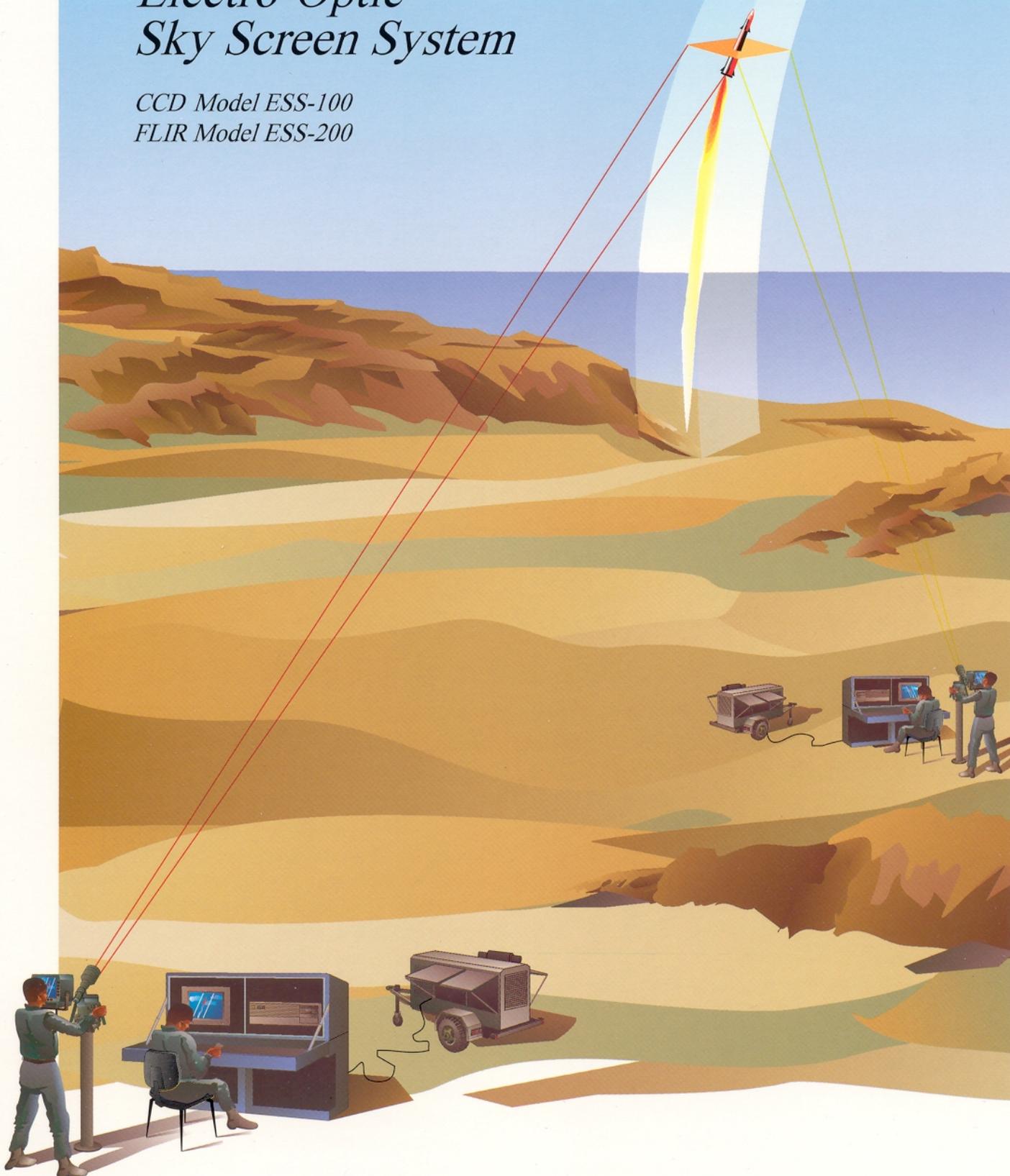


ESS
Electro-Optic
Sky Screen System

CCD Model ESS-100

FLIR Model ESS-200



ESS Electro-Optic Sky Screen System

CCD Model ESS-100 • FLIR Model ESS-200

ESS is a proven, top performance test range safety system for accurate monitoring of missile and other airborne object flight tests. The system is successfully employed in the Arrow Interceptor Missile Development Program.

ESS can operate as a stand alone, or as a supplemental test range safety system. It is available with CCD (model ESS-100) or with FLIR (model ESS-200) cameras.

ESS is easy to deploy and simple to use. It has high accuracy abort boundaries and proven top reliability.

ESS is the practical approach to range safety operations, exemplifying cost effective Israeli engineering.

System Highlights

- Accurate abort boundaries
- Real time graphic overlay on a live camera image
- Multiple graphic options for real-time and simulation use
- Built-in geodetic data base
- Real-time flight test data recording
- Off-line play back
- Fast local calibration and set-up
- Flight test simulations for mount operator and safety crew training
- Built-in testing capability
- High reliability - portable, ruggedized industrial equipment



System Description

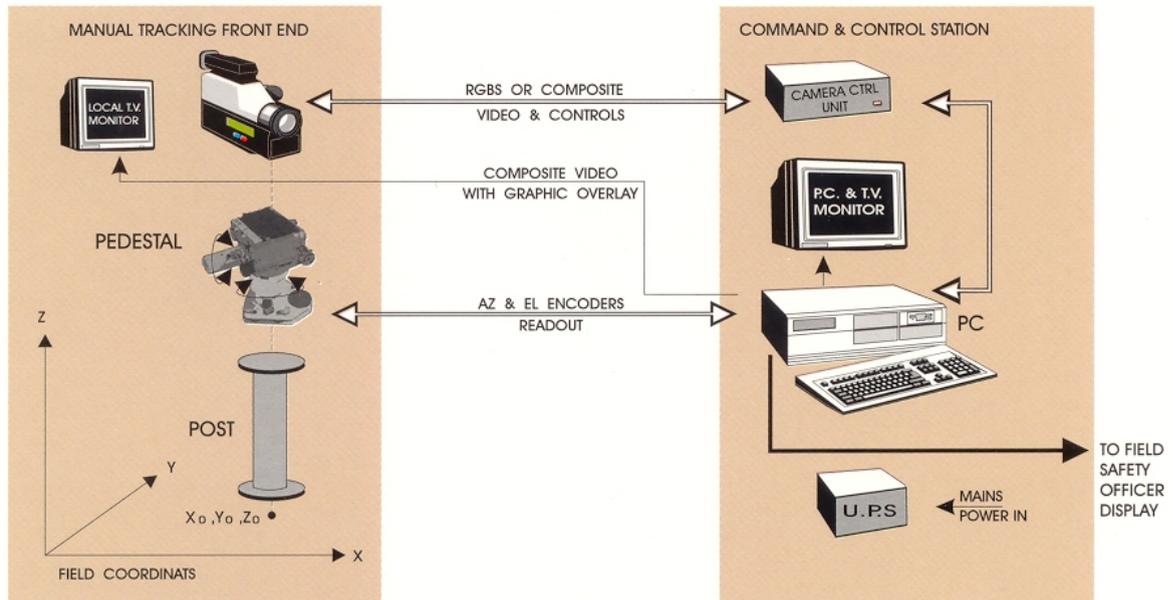
ESS is used for safety monitoring during flight tests of missiles and other airborne objects. It utilizes two or more triangulated sensors with real-time video images overlaid by computer generated safety boundaries. Sensors are either CCD or FLIR (FPA) cameras. Each sensor uses a high resolution camera mounted on a manual pedestal which are interconnected to a PC based station. The system is portable and ruggedized, allowing fast deployment at the most appropriate locations. Short preparation time is enabled by means of built-in on-site configuration set-up and semi-automatic calibration routines. Components are top quality, ruggedized, off-the-shelf items.

System set-up, including trajectories, abort boundaries and other graphic data (externally created) can be loaded on-site from a diskette. The system can interface with any Cartesian coordinate system using pre-defined geodetic utilities and calibrations. Real-time data recording and playback capabilities permit on-site mission debrief as well as providing results for data reduction. ESS has extensive simulation capability for operator training. Both nominal and malfunction trajectory simulations are easily generated to insure track reliability and provide safety crew training. ESS is synchronized to range time (IRIG-B) including count down.

Physical Characteristics

ESS consists of two main sub-assemblies interconnected by interface cables:

- Manual tracking front end sub-assembly
- Computerized command and control station sub-assembly



ESS - FUNCTIONAL BLOCK DIAGRAM

Manual Tracking Front End Sub-assembly

The easy to operate manual tracking front end sub-assembly includes a CCD or FLIR camera and local tracking monitor installed on a manual operated pan/tilt PEDESTAL with two 15 bit absolute optical encoders and a leveling device. The PEDESTAL is installed on a mechanical post that is bolted to a

concrete surface. The post is at a surveyed site with (x, y, z) in test range coordinates. Interface cables transmit the composite video (or RGBS) and positioning (AZ and EL) data to the command and control station sub-assembly.

Computerized Command and Control Station Sub-assembly

The computerized command and control station sub-assembly contains ruggedized equipment integrated in a shock-absorbing transportable rack-mount enclosure, incorporating:

- Two shock-absorbing, transportable and ruggedized rack-mount trunks
- Ruggedized, industrial, 14 slot personal computer including:

- 14" industrial monitor
- CPU board
- SVGA board
- Hard disk
- Keyboard and mouse
- CCD image frame grabber with graphics overlay capability board
- IRIG-B test range time reader board

- Pedestal interface board
- Remote computer communication board (optional)
- TV tracker board (optional)

- Camera control unit, video buffers and video encoder to control and interface the CCD or FLIR camera
- UPS used as power stabilizer and backup for test range power source

The proper operation of the tracking mount operator during the pre-mission calibration and simulation stage, as well as during the actual mission, is controlled by the station operator with the computerized command and control station sub-assembly.

Technical Specifications

Overall accuracy: 1.3 mRad
Update rate of abort boundaries: every 40m Sec
Video standard: PAL (or CCIR)
NTSC (or RS-170) optional
Image type: True color (visible)
B/W (IR)
Angular coverage: AZ 0° to 360°
EL -8° to +90°
Angular resolution: AZ & EL 0.01°
Output: RGBS or composite video

Main power source: 220 VAC \pm 10%, 50 Hz.
110 VAC \pm 10%, 60 Hz (opt.)
Power consumption: 2.3A at 220VAC
UPS Backup: > 15 mins

Environment

Operating temperature range: 0° to 50° C
Storage temperature range: 0° to 60° C
Humidity: up to 80%

Optional

- TV Tracker for on-target real-time tracking
- Remote computer communication
- Automatic zoom calibration

For further information please contact:

Gil Bashani

Comp & Soft Data Experts

9974 Old Olive St. Rd.

St. Louis, Missouri 63146, USA.

Tel: 314-567-7800 Fax: 314-567-0700

E-Mail: Gil@compandsoft.com