

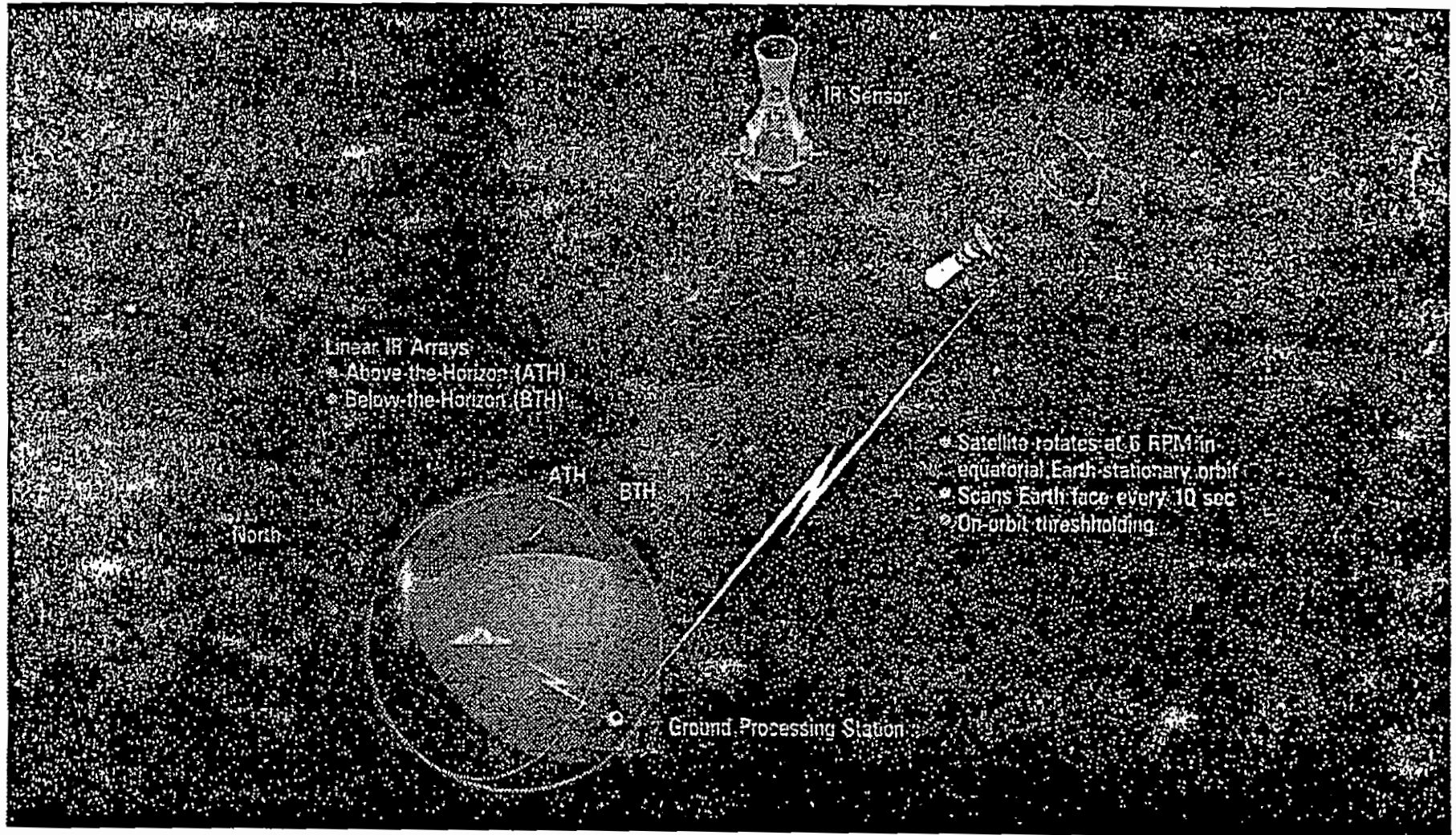
**DSP: Support to a
Changing World**



DSP: Cornerstone of US Early Warning System

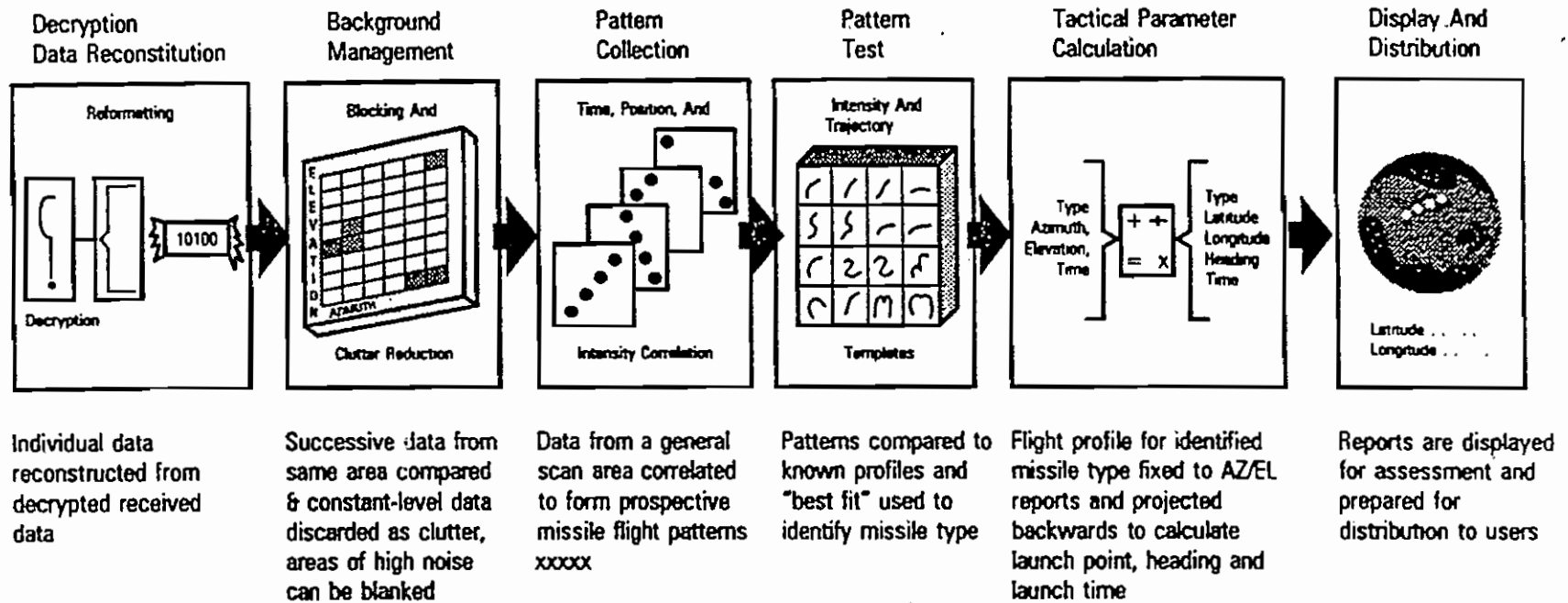
- DSP is the space segment of the U.S. integrated Tactical Warning & Assessment (TW&A) System
- Primary mission: Detect and report any ICBM/SLBM raid against the U.S. and its allies
- Secondary mission: Space launch and nuclear event detection

Strategic Surveillance Using the IR





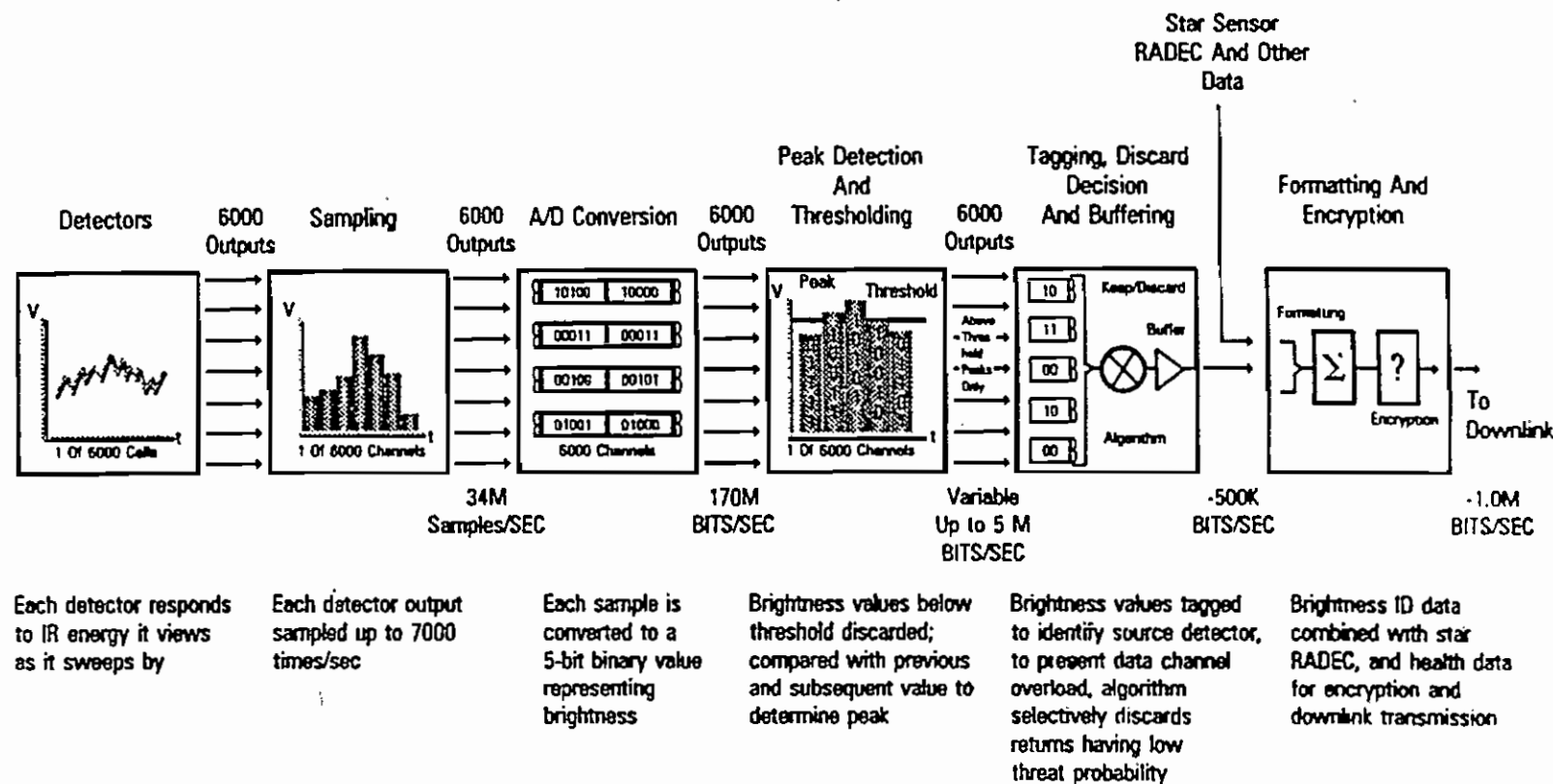
Ground - Data Processing



Ground Data Processing - Converts individual data into launch warning information for assessment



On-Board Signal/Data Processing



On-Board Signal/Data Processing - allows system to operate at maximum possible sensitivity without overloading the downlink. Processing is an initial sort, selecting returns having the highest potential of being targets



DSP: The Early Days



- Threat: The development of the first Soviet ICBM in the early 1960's
- The requirement: A space-based early warning system combining:
 - (1) Infra-red sensors to detect the intense thermal radiation of rocket engines
 - (2) Newly demonstrated concept of man-made earth orbiting satellites
- Missile defense alarm system (MIDAS) program
- Further development of these technologies led to the designation of the Defense Support Program (DSP)



DSP Phase I: 1970 - 1975



- Designed to provide warning against both Soviet ICBMs, Chinese ICBMs, and Soviet Short Range SLBM's around the CONUS

- Satellites 1-4

Satellite: 2000 LBS
1.25 Years

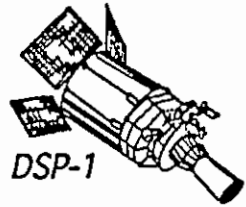
Sensor: 2000 Detectors
PbS (SWIR)
BTH



Ground Systems: 1970 - 1975



- Overseas Ground Station (OGS)
 - Operational in 1971
 - Fixed Large Processing Station (LPS): Processes Data, provides reports from Eastern Hemisphere Satellite(s)
- CONUS Ground Station
 - Operational in 1972
 - Fixed LPS, provides peacetime reports from Western Hemisphere Satellite(s)
- Multi-Purpose Facility (MPF) on-line in 1974
 - Supports data analysis, S/W development & personnel training



1975 - 1985: THE EVOLVING THREAT

- 1975 - 1980
 - LONG RANGE SLBM's DEPLOYED
 - INCREASED MULTIPLE RV MISSILES

- 1980 - 1985
 - MOBILE ICBMs
 - INCREASED SLBM DEPLOYMENT
 - SOVIET ADVANCEMENTS/TACTICS BECOME POSSIBLE THREAT TO SYSTEM



DSP Phase II, MOS/PIM, Phase II Upgrade: 1975 - 1985



- 1975 - 1980: Phase II, Satellites 5-7
 - Added lifetime, 2 year design life
- 1980 - 1985: Multi-orbit satellite/performance improvement (MOS/PIM) (Satellites 8-13)
 - For increased hardening & SLBM coverage, plus multiple orbit capability
- 3 year design life
- JCS Level-1
- Expanded coverage (SLBM)



DSP Phase II, MOS/PIM, Phase II Upgrade: 1975 - 1985 (Continued)



-
- Phase II upgrade, SATS 5R-6R retrofit
 - For improved resolution & polar/global coverage
 - Advanced RADEC & hardening
 - SED sensor
 - ATd, increased resolution & global coverage
 - 6000 detectors
 - Second color capability demonstrated

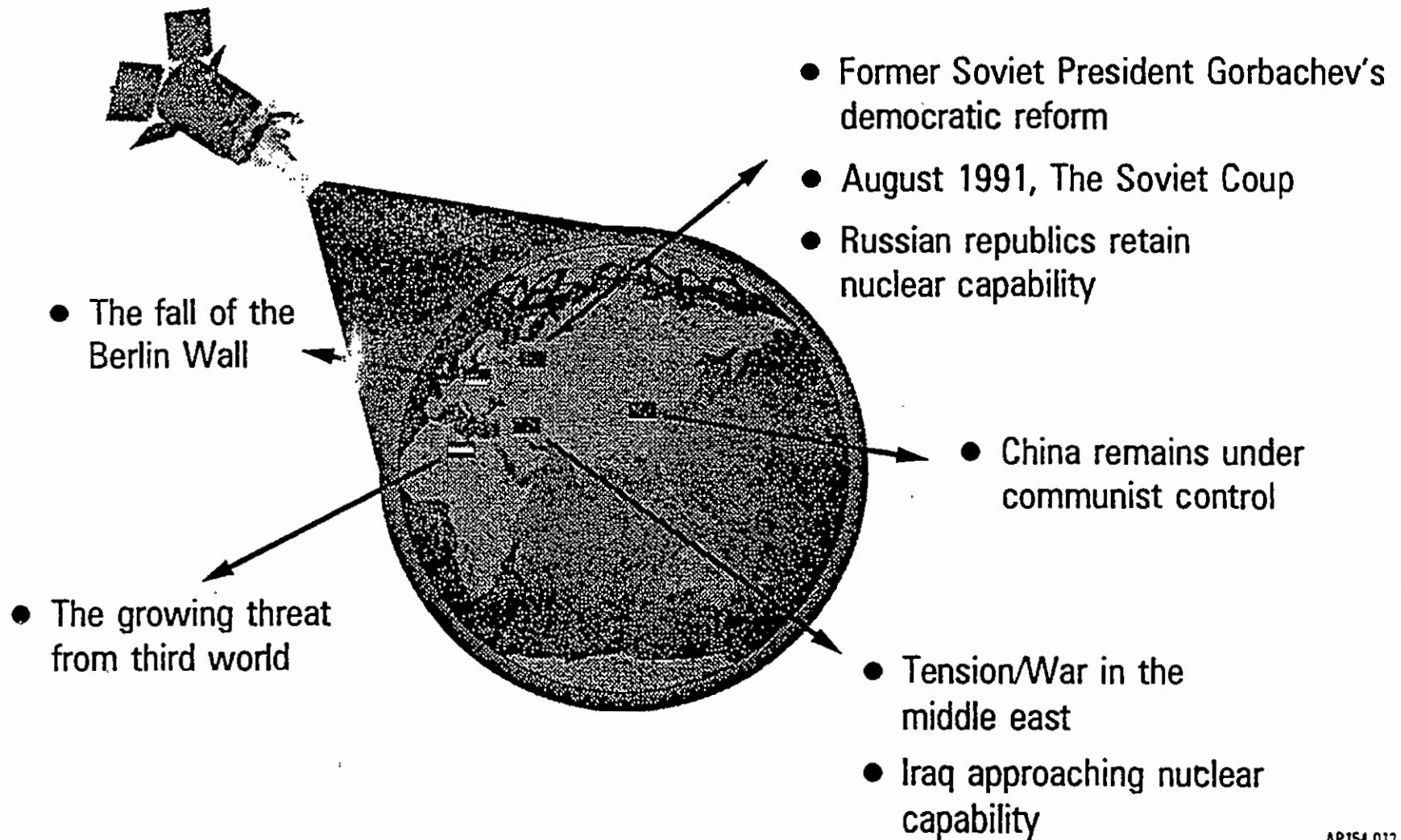


Ground Systems: 1975 - 1985



- OGS:
 - Software upgrade in 1975
 - Hardware upgrade in 1982 to support phase II and DSP-1
- CGS:
 - Hardware upgraded in 1982 to support phase II and DSP-1
- Mobile ground station developed in 1985
 - Include both mobile ground terminals and mobile communication terminals
 - Create rapid deployable, survivable MGS to provide location uncertainty during wartime, and to back-up the CGS

1985 - Present: The Changing Threat



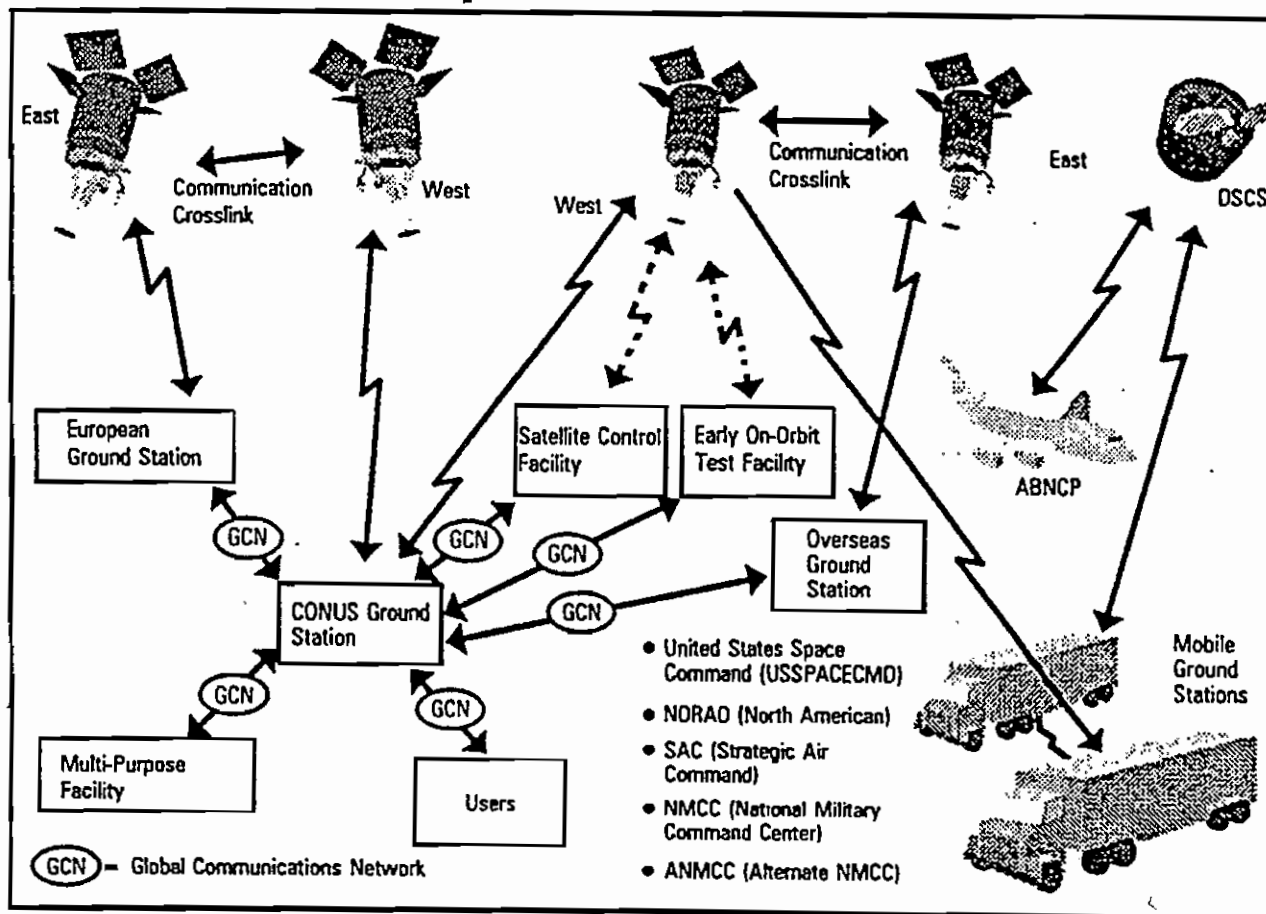


DSP-1: 1985 - Present



-
- Satellites 14-22: For increased resolution, survivability & lifetime
 - Sensor
 - 6000 detector channels
 - PbS and HgCdTe (2nd waveband)
 - BTH & ATH
 - 5 year design goal
 - Thermal control system, forward facing radiator and phase change material
 - Satellite
 - 5250 pounds
 - 5 years
 - Laser crosslink subsystem (LCS), secure SAT-SAT COM
 - Hardening (JCS level 2)

Ground Systems: 1985 - Present



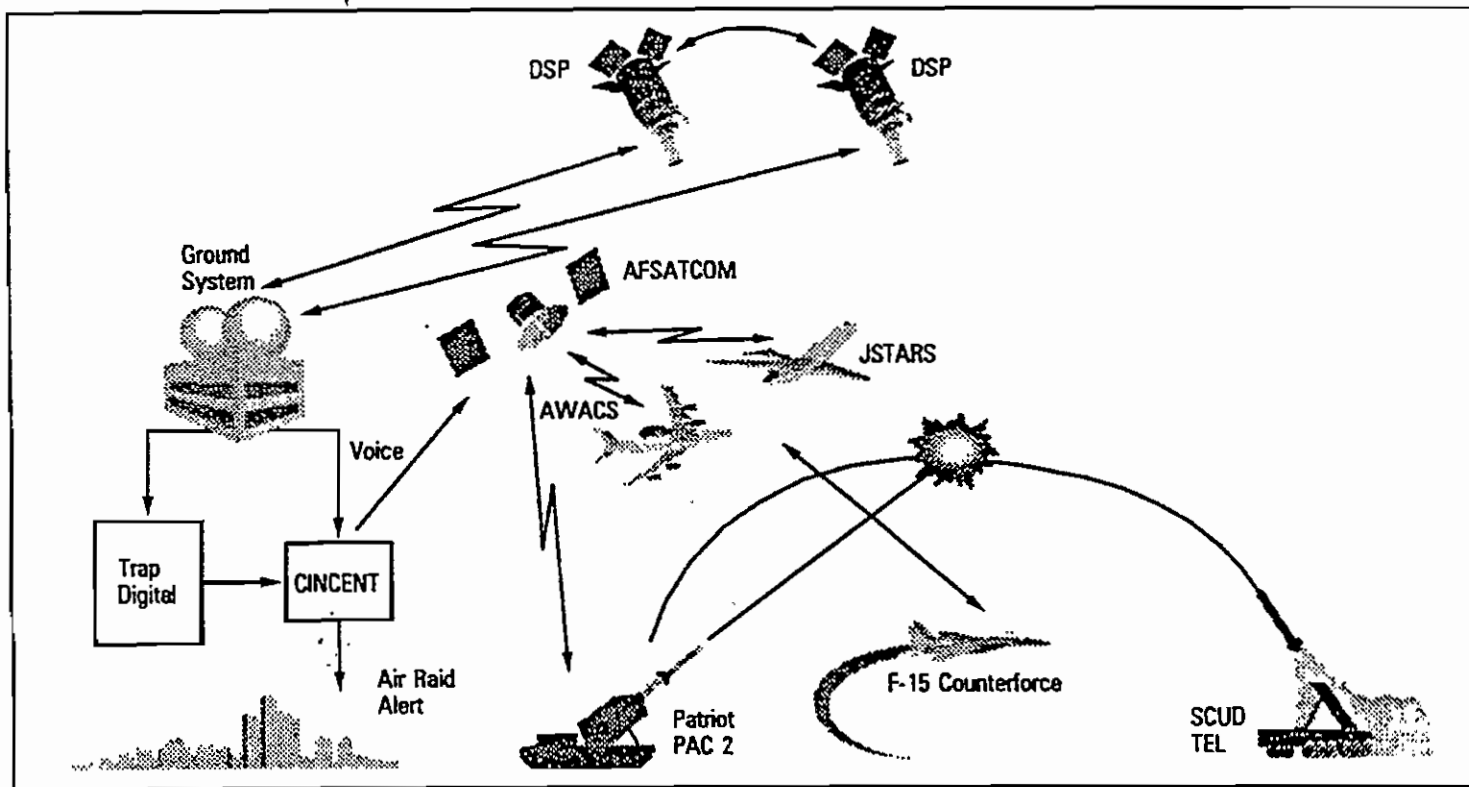
Mobile Ground Stations: Upgrades & Integration With DSP-1 Completed in 1993

OGS, CGS: The Next Generation Software, System 1, Will Be Operational in 1993 to Fully Utilize DSP-1 Capabilities

AP154.015

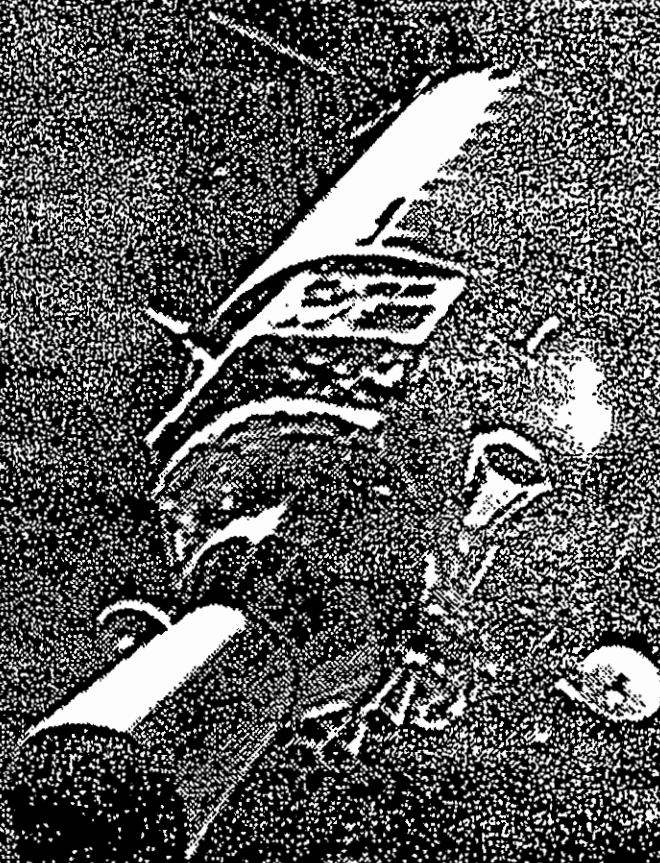
European Ground Station (EGS) Became Operational in 1990

DSP Performance During Operation Desert Storm



- DSP provided SCUD warning for every attack during Operation Desert Storm
- Provided warning to U.S. forces in Saudi Arabia, and civilians in both Saudi Arabia and Israel
- The warning was passed on to the Patriot Missile Battery Commanders

DSP... Watching into the Twenty-First Century



DSP Has Evolved to Meet Changing Requirements

