ELECTRO-OPTICAL SYSTEMS - 1995
10 TO 5.8 METER DATA

- **SPOT**
  - BEST COMMERCIAL RESOLUTION
  - 10 M PANCHROMATIC (PAN)
  - 20 M MULTISPECTRAL (MSI)
  - GLOBAL DISTRIBUTION NETWORK

- **IRS-1C**
  - INDIAN REMOTE SENSING SATELLITE
  - 5.8 M PAN DATA
ELECTRO - OPTICAL SYSTEMS
1996 - 1998

- ACCELERATED PACE
- MILITARY QUALITY
- 1 - 3 M DATA
SMALLSATE TECHNOLOGY

- COMMERCIAL VIALBE
  - LIGHT STRUCTURAL MATERIALS
  - ELECTRONIC MINIATURIZATION

- TURNKEY SYSTEMS

- CONFIGURATION OPTIONS
ELECTRO-OPTICAL SYSTEMS
1996-1998
1 - 3 METER DATA

- COMMERCIAL HIGH RESOLUTION SENSORS
  - IMPROVED RESOLUTIONS
  - SPECTRAL CAPABILITY
    - NO CHANGE IN SPECTRAL COVERAGE
    - NO CHANGE IN NUMBER OF BANDS
SYNTHETIC APERTURE RADAR SYSTEMS 1995
30 TO 10 M DATA

- EUROPEAN EARTH RESOURCES SATELLITE (ERS)
  - EUROPEAN SPACE AGENCY (ESA)
  - 30 M RES

- JAPANESE EARTH RESOURCES SATELLITE (JERS)
  - 18 M RES

- RADARSAT
  - CANADIAN (WITH US COOP)
  - 10 M RES
SYNTHETIC APERTURE
RADAR SYSTEMS 2000
3-5 M DATA

• SPOT CIVIL SAR
   - 4 - 5 M RESOLUTION

• POSSIBLE SAR PROLIFERATION
   - DESIGN IMPROVEMENTS
     - LIGHTSAR CONCEPT
     - MULTIBAND/MULTIPOLARIZED SAR
IMAGING SPECTROMETERS

- REVOLUTIONARY APPROACH
- HYPERSONERAL IMAGERY - 100S OF BANDS
- COMPONENT ANALYSIS OF OBJECT
- SPECIAL SIGNATURE (FINGERPRINT)
IMAGING SPECTROMETERS
HYPERSPECTRAL TECHNOLOGY

• HSI
  - NASA LEWIS 1996
  - 384 SPECTRAL BANDS
  - 0.4 - 2.5 MICRONS

• HYDICE
  - NRL AIRBORNE SENSOR
  - 0.4 - 2.5 MICRONS
  - 206 SPECTRAL BANDS
ROW SPACE-BASED REMOTE SENSING

- TRENDS
  - DUAL USE
  - SYNERGY OF SYSTEMS
  - MULTINATIONAL
ROW COMMERCIAL SPACE-BASED REMOTE SENSING

- IMPACT ON US FORCES
  - LOSS OF SPACE-EDGE
  - C2W SEVERELY CHALLENGED

- REMOTE SENSING TECHNOLOGY
  - EXPECT ACCELERATION
ELECTRO-OPTICAL CAPABILITY 1995

SPOT DATA CHARLES DE GAULLE AIRPORT, PARIS

10 M PAN

20 M MSI
ELECTRO-OPTICAL SYSTEMS
SMALLSAT TECHNOLOGY

ORBVIEW DEPICTION

8 Km

852 Km
SAR SYSTEMS 2000

FUTURE SAR DESIGN
384 KG TOTAL
100 KG RADAR
HYPERSPECTRAL VS CURRENT SPACE MULTISPECTRAL SENSORS

SYSTEM

LEWIS
(384 Bands)
IRS-1C
(4 Bands)
SPOT-1,2,3
(3 Bands)
Landsat 4
(7 Bands)

(WAVELENGTH (µm))
HYPERSPECTRAL AND MULTISPECTRAL SCENE CHARACTERIZATION

HYPERSPECTRAL IMAGING
HUNDREDS OF BANDS

Spectral Characteristic Of Scene

MULTISPECTRAL IMAGING
FEW BANDS

Wavelength

Measured Reflectance

Reflectance

Wavelength

Band 1

Band 2

Band 3

Band 4
IMAGING SPECTROMETERS
HYPERSPECTRAL TECHNOLOGY

DISCRIMINATION OF DIFFERENT TENTING MATERIALS & VEHICLES

HSI SENSOR
NASA LEWIS SATELLITE
ROW SPACE-BASED REMOTE SENSING FUTURE SYNERGY

SPACE IMAGING - CUPERTINO, CA

MOTOR POOL

POOL

CLAY TILE ROOF

CLAY COURTS

SIMULATED 0.82 M PAN

PRODUCT 0.82 M MSI (0.82 M PAN + 3.2 M MSI)