



**GREETINGS to YOU**

**&**

**WELCOME**

**to**

**The ASL Presentation**



# ASL Advanced Systems

***A TATA Group company which pioneered GPS development in India, since 1992.***

***A recognised R&D Centre by Ministry of Science & Technology, Govt. of India.***

***Won DSIR award for Technology Absorption in the year 1997.***

***ASL is an ISO-9001:2000 company, accredited by UKAS, RvA, and, ANAB***

# ASL Advanced Systems

***ASL: First Indian Company to produce GPS receivers with Military certification: 'DGQA certification for Armoured vehicles'.  
'CEMILAC certification for Military Airworthiness'.  
More than 4000 GPS Receivers, along with life-cycle support systems, supplied to Defence Services.***

## ASL: Company Incorporation

**Registered as a Company in 1992**

### **Ownership:**

<b>Tata Power Co. Ltd.</b>	<b>– 37 %</b>
<b>STS Inc., USA</b>	<b>– 30 %</b>
<b>Private promoters</b>	<b>– 18 %</b>
<b>Employees Welfare Trust</b>	<b>– 15 %</b>

## Associations with Tata Group companies

- Tata Consultancy Services, Bangalore
  - Special Projects, Defence & Embedded projects
- WTI Technologies (TCS), Chennai
  - GIS Projects, Digital Map interfaces
- Tata Infotech (TCS), Bangalore & Chennai
  - Fleet Management, System integration
- Tata Power; Strategic Electronics Division, Bangalore
  - Simulation, Defence systems, Manufacturing
- NELCO, Mumbai
  - SCADA systems, Manufacturing

## MAJOR CLIENTS

- **INDIAN ARMY**
- **ARMY AVIATION CORPS**
- **INDIAN AIR FORCE**
- **INDIAN NAVAL AVIATION**
- **COAST GUARD**

## OTHER MAJOR CLIENTS

- **DRDO Labs: CVRDE, VRDE, RDE, RDO, ARDE, DRDL, DLRL, CABS**
- **NPL, CPRI, C-DAC**
- **HAL, BEL, BHEL, ECIL, HVF, OFB**
- **L&T, SiRF USA, Agilent Tech, BPL etc.**

# ASL Business Lines



## Products

- Military GPS Products
- Civilian GPS Products



## Projects

- Systems Design & Integration



## Technologies

- Evolving Technologies, Familiarisation, & Development



## Services

- Product Design, Engineering, Productisation, & Production

**Convert Ideas to Marketable  
Products, Systems, and Services**



# Type Certified Military Products

- For Armoured Vehicles:
  - **GPS 9312A-1**
  - **GPS 9312B**
  - **GPS 2000M**
  
- For Military Aircraft:
  - **GPS 9405**
  - **GPS 9405N**
  - **GPS 2108**
  - **GPS 9801**



## GPS 9312A-1 for Armoured Vehicles



## New GPS models for Military Vehicles



GPS 2001M for MBT

GPS 2401 for Class-B Vehicles



## GPSMarg 9801 for Helicopters



# GPS for Vehicle Tracking: GeoPoint

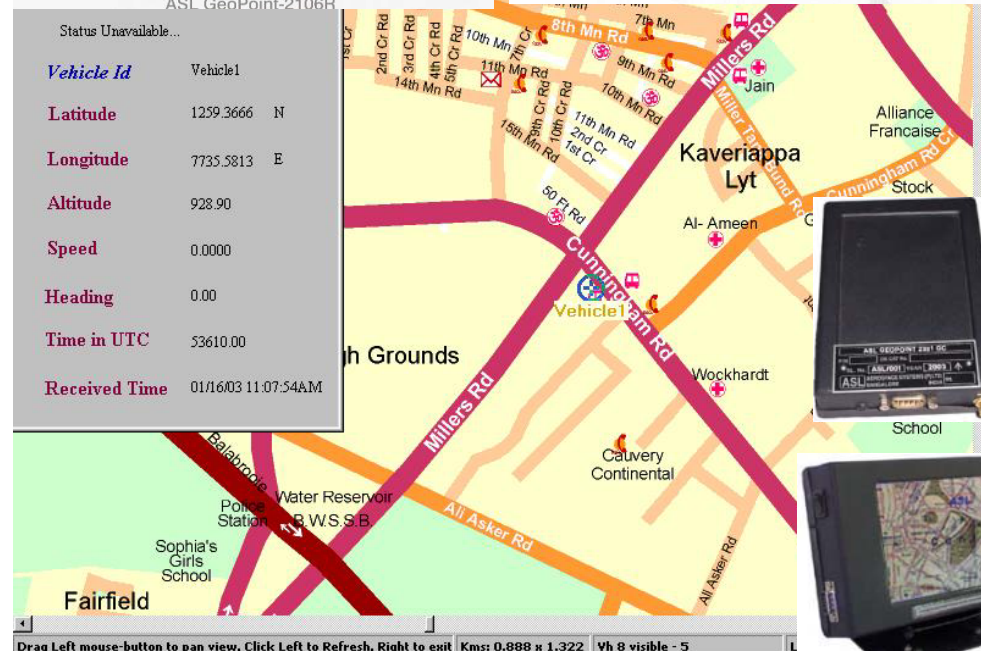
- ASL GeoPoint-2106R
  - 12 channel GPS + Radio modem
- ASL GeoPoint-2206G
  - 12 channel GPS + GSM model / BlueTooth
- ASL GeoPoint-2301GC
  - 16 channel GPS + GSM + CAN
- ASL GeoPoint-2407GD
  - 16 channel GPS + GSM + Data logging



ASL GeoPoint-2106R



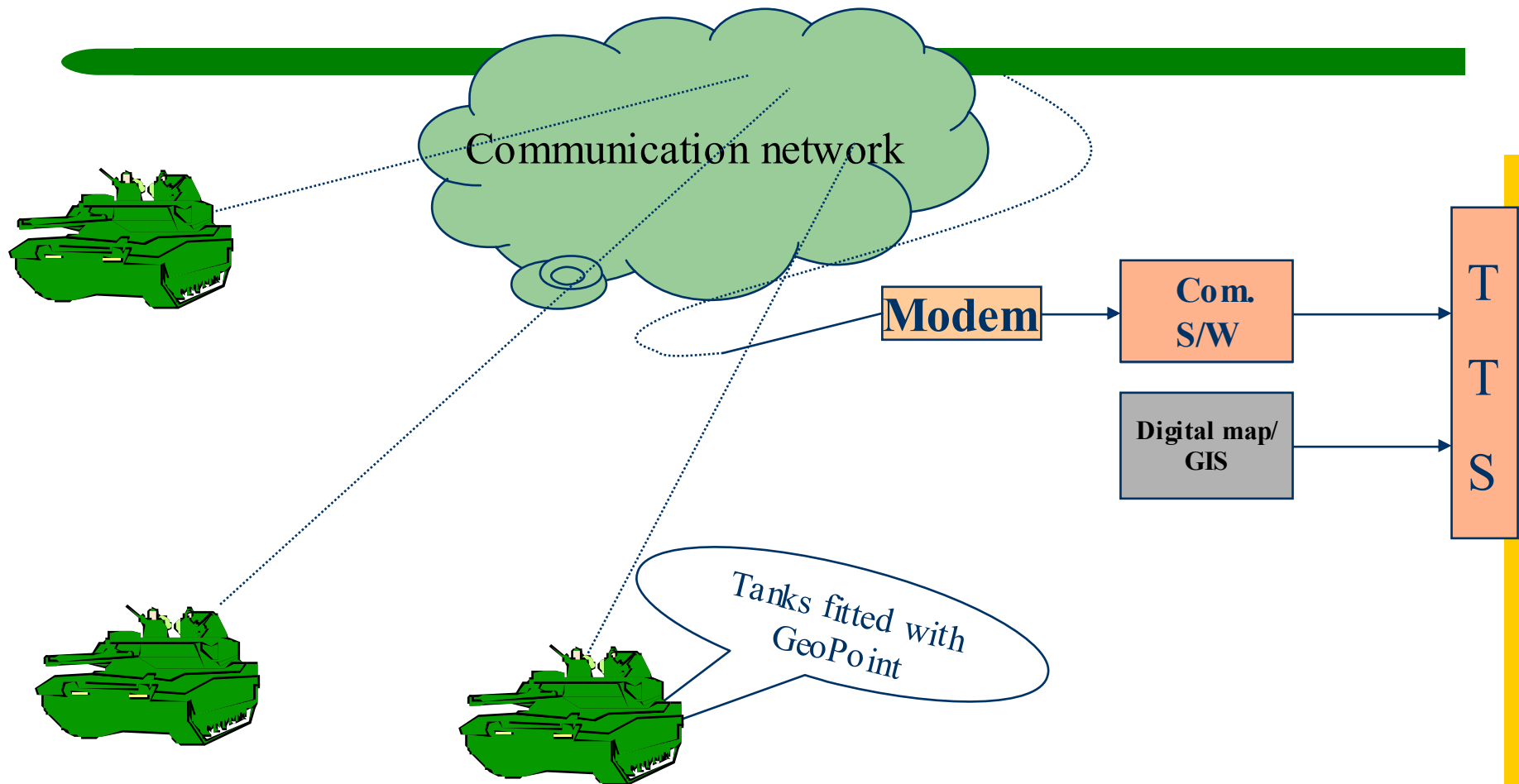
ASL GeoPoint-2206G



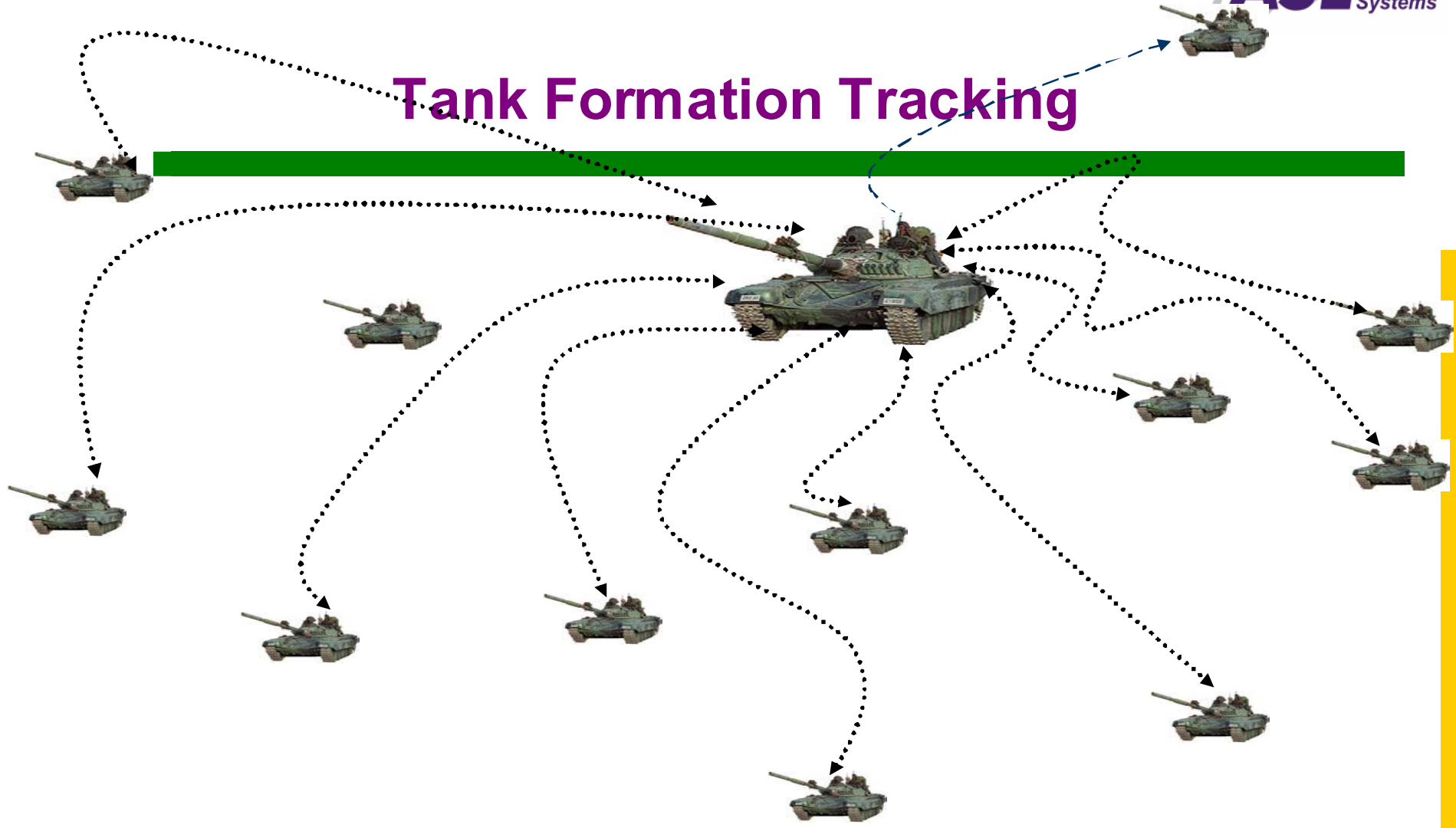
Status	Unavailable...
Vehicle Id	Vehicle1
Latitude	1259.3666 N
Longitude	7735.5813 E
Altitude	928.90
Speed	0.0000
Heading	0.00
Time in UTC	53610.00
Received Time	01/16/03 11:07:54A.M



# Tank Tracking System using GPS

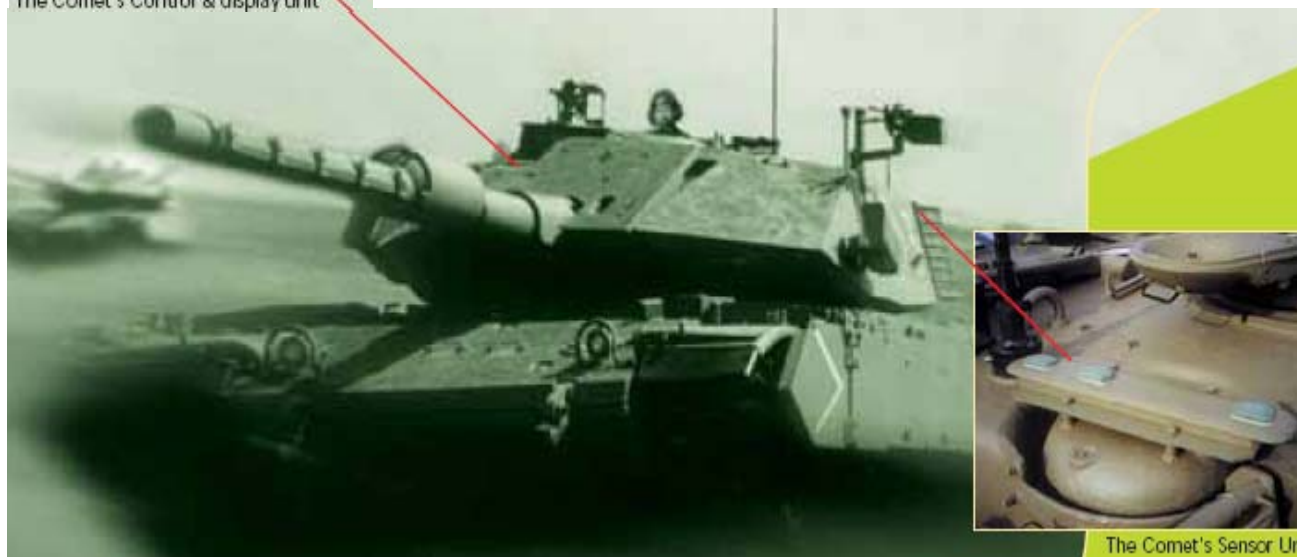


# Tank Formation Tracking

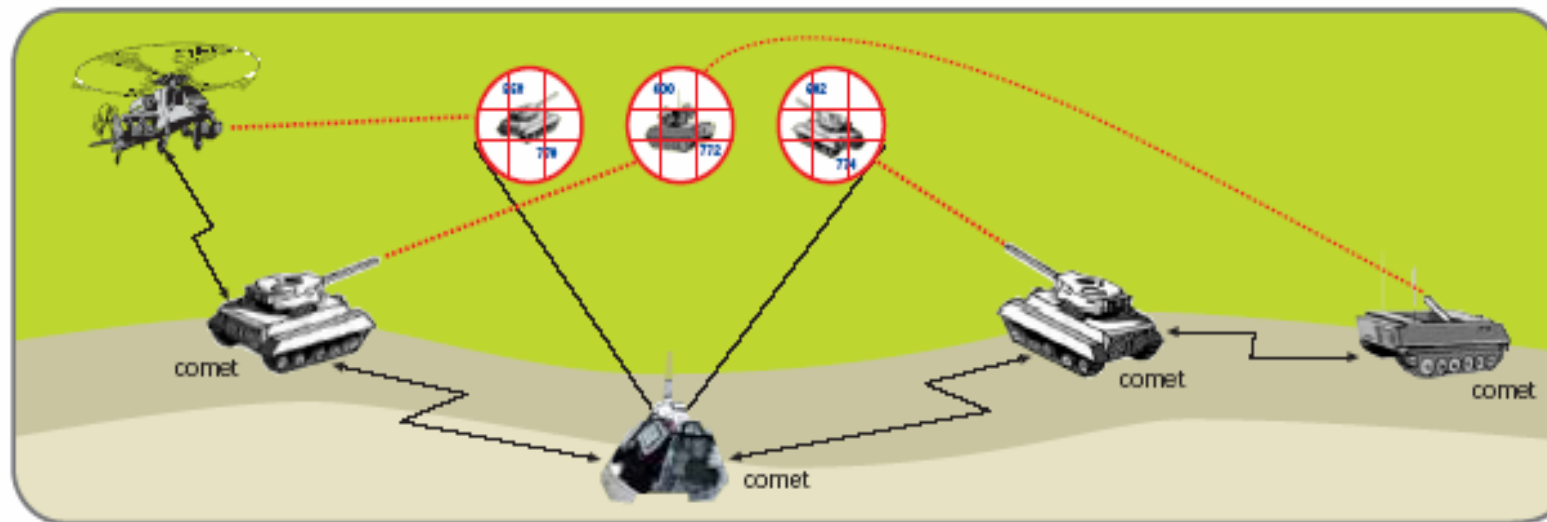


## GPS-IMU Integrated Navigation System

Accurately and reliably  
calculates turret/ gun attitude  
with no drift in stationary or  
mobile vehicle



# GPS-IMU Integrated Navigation System



## Common view across Battlefield

# ASL Projects

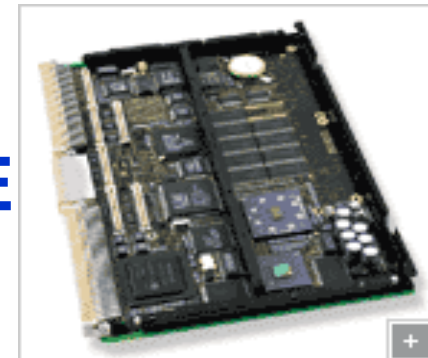
- GPS-INS Guided Aerial Vehicle
- 10 Hz GPS; ADA
- Low Frequency Analysis & Ranging, for Navy
- Timing & Frequency GPS; Alcatel
- Fleet Management Systems; Alcatel
- Compact GPS Dev for Paratroopers
- Pseudolite Dev; Osmania U'sity-DIT / CABS

# ASL Technologies

- **ASL Modeling, Simulation and Analysis**
  - CAD Modeling, Simulation
  - Hardware-in-the-loop simulation
  - Modeling of Components, Structural Analysis,
  - Thermal Analysis, Air Flow Analysis
- **ASL Bus Tools**
  - CAN, USB2.0, BlueTooth
- **ASL Synthesizable Cores**
  - VHDL, RTL, FPGA

## HARDWARE SKILLS

- INTEL 80186, 386, 486, ARM 206 CPUs
- MOTOROLA 68 340 CPUs
- INTEL 87C51 BASED I/O CONTROLLERS
- TI-OMap
- RS 232, RS 422, EISA BUS
- MIL 1553, ARINC 429 INTERFACE



# HARDWARE DESIGN TOOLS

- **KEIL Compiler**
- **CAD-UL**
- **Cadence PCB Studio**
- **Altera Quartus**
- **MentorGraphics FPGA Advantage**
- **AutoCad**
- **ProE**
- **Ansys**

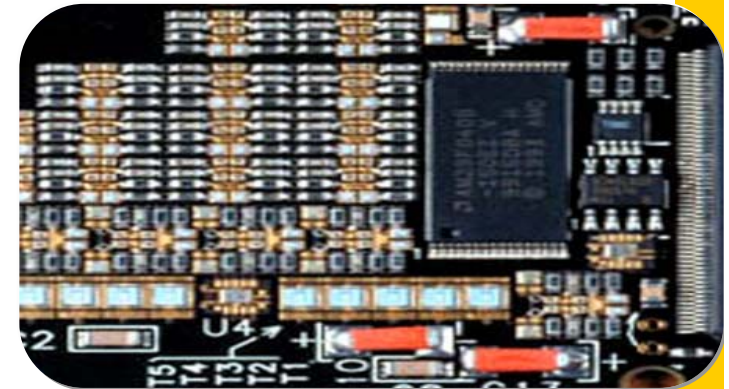


# HW DESIGN STANDARDS

- **MIL-454 FOR DESIGN**
- **MIL-STD-810E FOR ENVIRONMENTAL**
- **MIL-STD-461C FOR EMI / EMC**
- **MIL-STD-704E FOR ELECTRICAL**
- **JSS 55555**

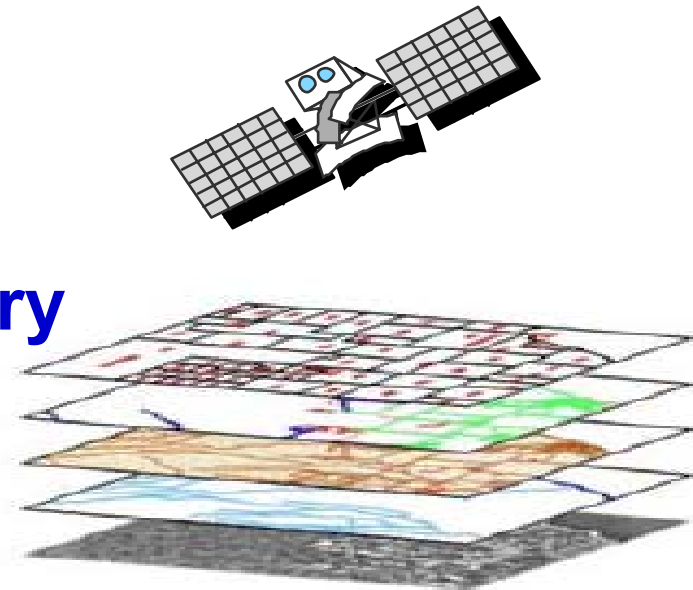
## SOFTWARE SKILLS AT ASL

- Real Time Embedded Software:
  - RTOS, C, Assembler,
  - MIL 1553, ARINC, RS232C, RS 422 i/f
- VB, VC++, .NET, Oracle
- Open GL
- FPGA, DSP



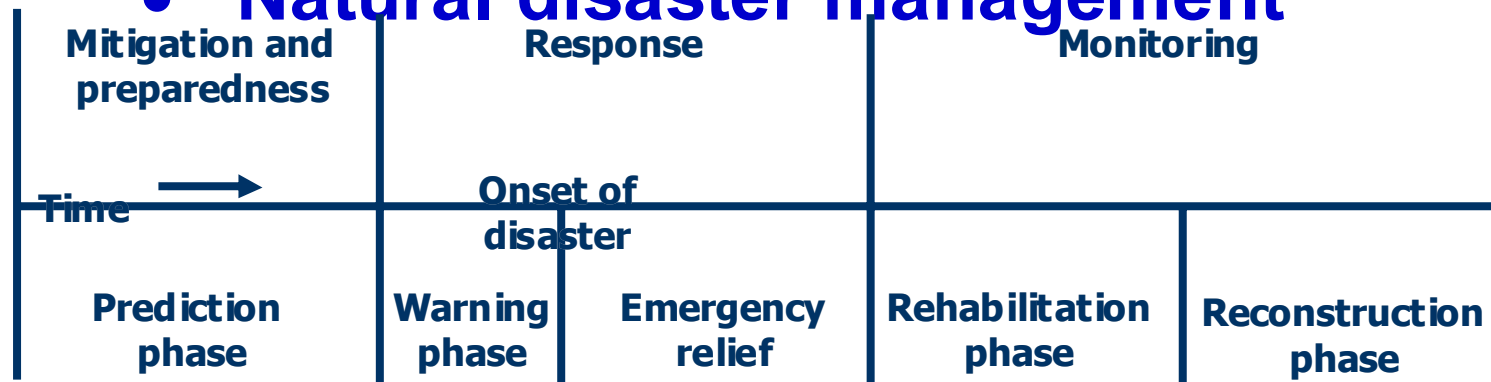
## Geomatics Development Skills at ASL

- **General**
  - Requirement analysis
  - Development of DSS
  - Development of Web enabled services
  - Value addition
- **Geomatics**
  - Remote sensing
  - Digital photogrammetry
  - Spatial analysis
  - Spatial modeling
  - Spatial visualization



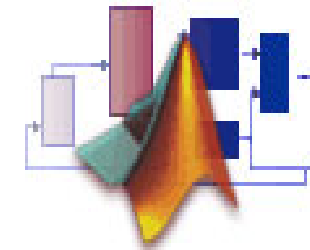
## Geomatics Development Skills at ASL (contd.)

- **Applications**
  - **Infrastructure planning**
  - **Asset management**
  - **Transport**
  - **Surveillance**
  - **Natural resource management**
  - **Natural disaster management**



# SOFTWARE DESIGN TOOLS

– MATLAB® & Simulink®



- **MATLAB**
- **Modeling with ANSYS**
- **Verilog RTL & test-bench simulation**
- **Synthesis for XILINX, ACTEL, Cypress**
- **Timing simulation in Verilog or VHDL**

# SOFTWARE DESIGN STANDARDS

## DESIGN STANDARD: IEEE 12207

- System Requirement Specifications
- Arch. Design, Wide Design, Detailed Design
- Testing, V&V, Traceability, VDD

## DOCUMENTATION: MIL 498 B

## ASL's Technical Competencies

- Real-Time Embedded HW & SW design & dev.
- Geomatics and Map interface solutions
- Hardware design & development
- Hardware - Software integration
- Product Design, Packaging, & Ergonomics
- Product Engineering, & Ruggedisation
- Product Documentation in MIL STDs
- Product Life Cycle support, & Maintenance



**THANK YOU**