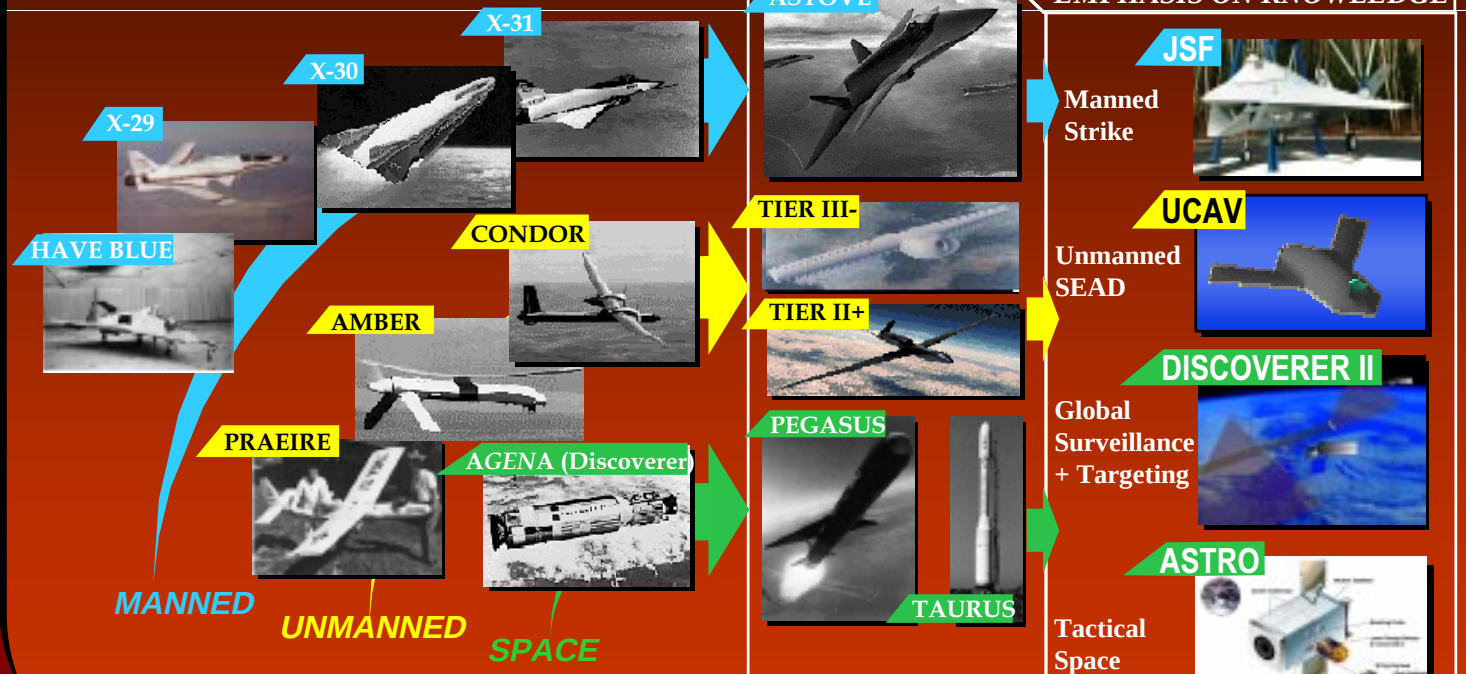
Tactical Technology Office Legacy and Vision

EMPHASIS ON HIGH PERFORMANCE

EMPHASIS ON AFFORDABILITY

EMPHASIS ON KNOWLEDGE



Global Surveillance

Objectives:

- Birth-To-Death Track
- Moving Target ID
- Dynamic Tasking
- Precision Mapping
- In-Situ Ground Sensing

Programs:

- *Discoverer II*
- **DDB**
- **AIM**
- *RF TAGS*
- **MAV**

Enabling Technologies:

- Space-Time Adaptive Processing
- Thinned ESA Antennas
- ATR
- Smart Data Bases

Challenge:

"Eyeball-On-Target" From Space

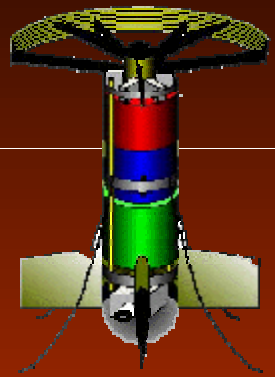
Future Concept:

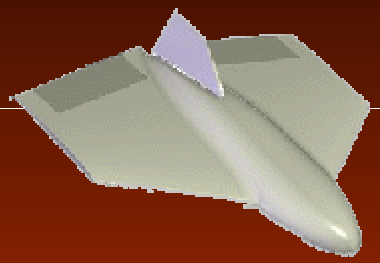
Space based Moving Target ID

Discoverer II Concept

Micro Air Vehicles

-Short Range Sensing-





Micro Air Vehicle:

- Small Air Vehicle No Larger Than 15 cm. in any Dimension.
- Capable of Performing a Useful Military Mission at an Affordable Cost.

Technical Objectives:

- Range: 3-10 km
- Payload: 2-15 grams
- Speed: 0-30 m/s
- Sensors: Visible Light Video
- COMMS Range: < 1km urban, 3-10 km LOS

Aerospace Systems

Objectives:

Prompt Precision SEAD
Survivability
Endurance/Range
Space Force

Programs:

UCAV
MALD
CRW
A-160

Enabling Technologies:

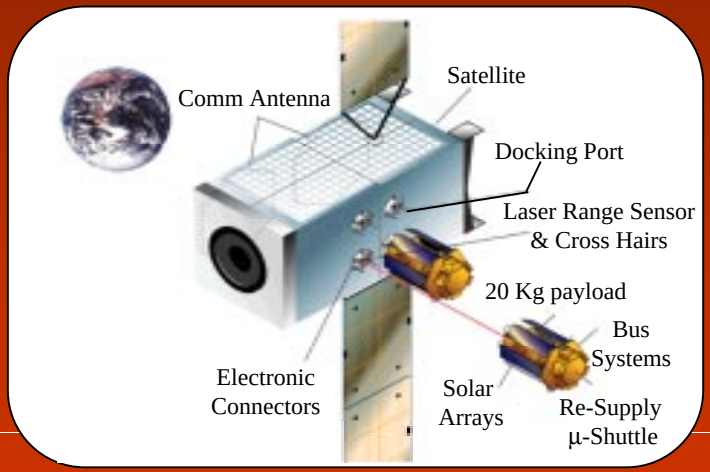
Telepresence
Autonomous Control
Propulsion
Decoys

Challenge:

Tactical Maneuvering Satellites

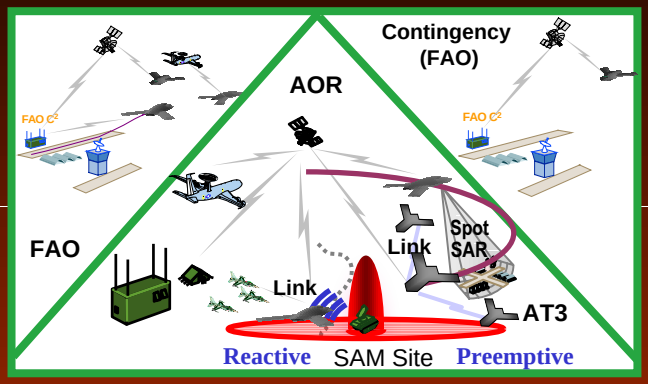
Future Concepts:

Advanced Space Transportation and Robotic Orbiter



ASTRO Concept

UCAV System Overview



MISSION CONTROL STATION

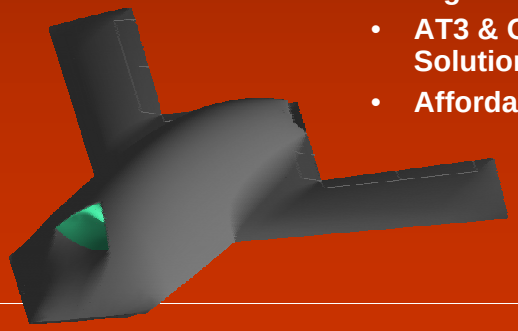
- Task Allocation by Phase of Mission (FAO, AOR)
- Dynamic Mission Planning & Replanning
- On Board/ Off Ground Common Operating Picture
- Multiple Vehicles-to-Operator ~ 4:1

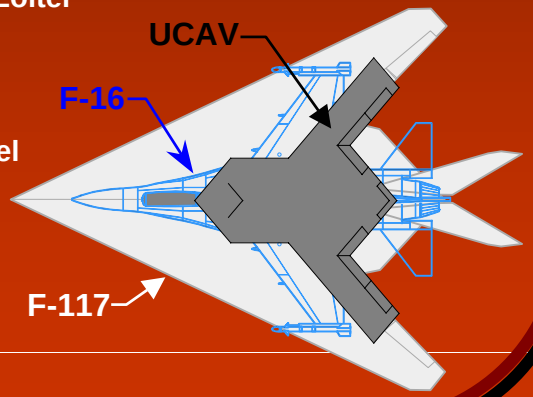
SUPPORT SYSTEM

- 20% Of Current O&S Cost
- Flexible Transport or Self - Deployment
- 10+ Year Storage
- Realistic Simulation Based Virtual Training
- Prognostic Health Management

AIR VEHICLE

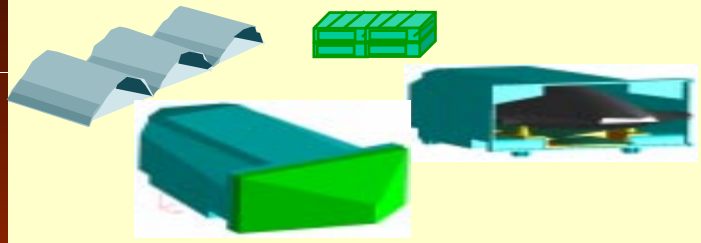
- 15,000 lb Gross Weight
- 3000 lb Payload
- 650 NMI Combat Radius + 30 min Loiter
- High Subsonic, Med/High Altitude
- AT3 & On-Board SAR Targeting Solution
- Affordable Stealth to the Next Level





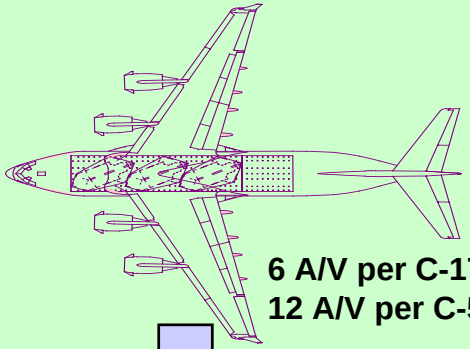
UCAV
Supportability Attributes

Long-Term Storage



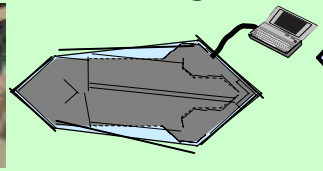
10 Years Storage
In Situ S/W Upgrade/Maint.

Mobility / Deployment



6 A/V per C-17
12 A/V per C-5

Logistics / Sustainment
Personnel & Training



Virtual Training/Periodic Exercise
Built in Diagnostics
Shared Personnel

Ground Operations

Rapid Turnaround
Magazine Weapon Loading

Video

Miniature Air Launch Decoy (MALD)
Flight Test #7

Micro Air Vehicle (MAV)
Flight Test #1

Land Systems

Objectives:

- Reduced Logistics
- Increased Lethality
- Rapid Maneuver
- Increase Survivability

Programs:

- **SLID**
- **AFSS**
- **CHPS**
- **RSTV**

Enabling Technologies:

- Telepresence
- Autonomous Control
- Propulsion
- COMMS
- Hit to Kill Defense

Challenge:

- Unmanned Ground Presence

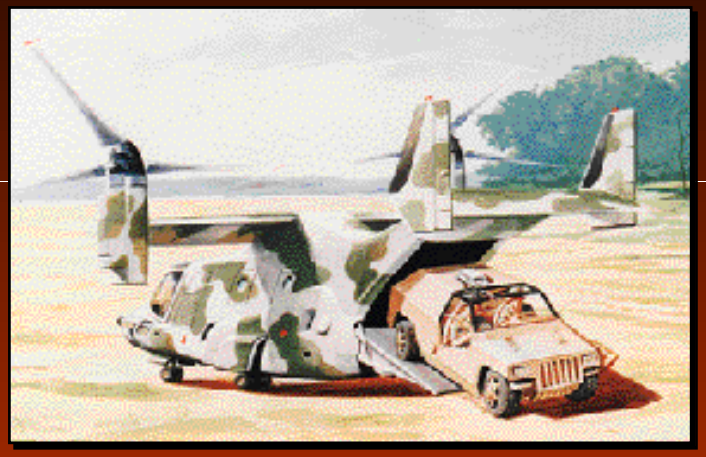
Future Concept:

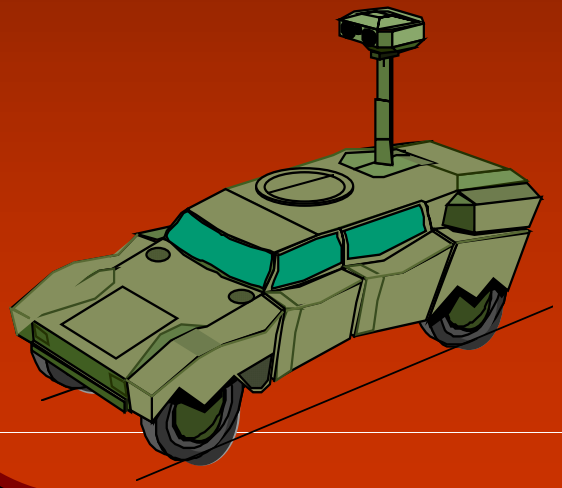
- Light Ground Strike System

RSTV Program

Capabilities:

- Reduced Signatures
- Double Combat Radius
- Very Agile
- Increased Survivability
- Reduced Logistics





Technology:

- Hybrid-Electric Power
- Integrated Survivability Suite
- Advanced Engines/Drive
- Active Suspension
- High-Energy Weapons

Embedded Processing and Control

Objectives:

- Multi-Sensor Organic Processing/Fusion
- Real-Time Response
- Task/Goal Seeking
- Autonomous Control

Programs:

- **ACS**
- **PAC/C**
- **AIM**
- **Dynamic Database**

Enabling Technologies:

- Bit Systolic Processing
- Reconfigurable Computing
- Intelligent Power Management
- "System On a Chip"
- Wideband Space-Time Adaptive Processing

Challenge:

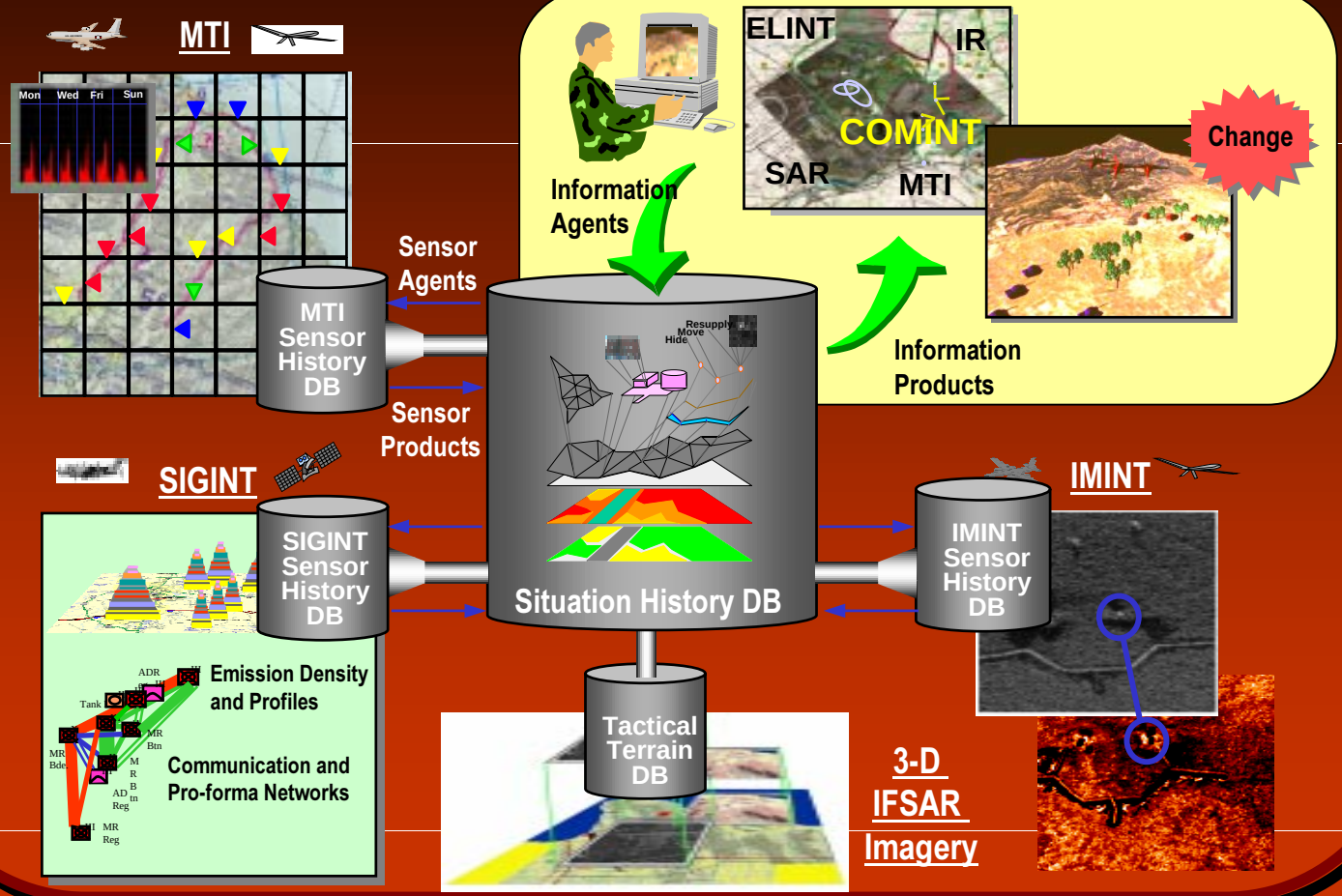
Managed Mission Processing (Throughput/Power)

Future Concept:

Silicon Compiler

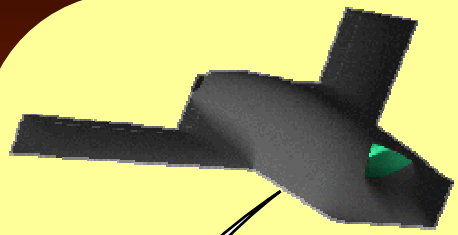
DDB Architecture

Knowledge Fused Common Operating Picture



Idea: Short Range Sensing

A Cascaded Robotic Systems Approach



UCAV

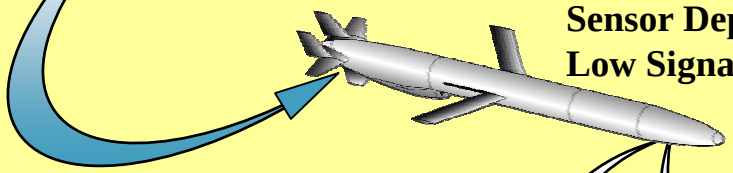
First 1000 miles
Long Dwell
Low Signature

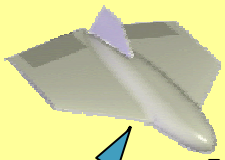
Challenges:

Moving Target ID
UGF Penetration

MALD

Sensor Deployment Last 200 Miles
Low Signature





MAV

Hover
Perching
Tracking

Missions:

In-Situ Ground Sensing
Tagging
COMMS Relay

Airbase ← 1200 NMi Range → Target Area