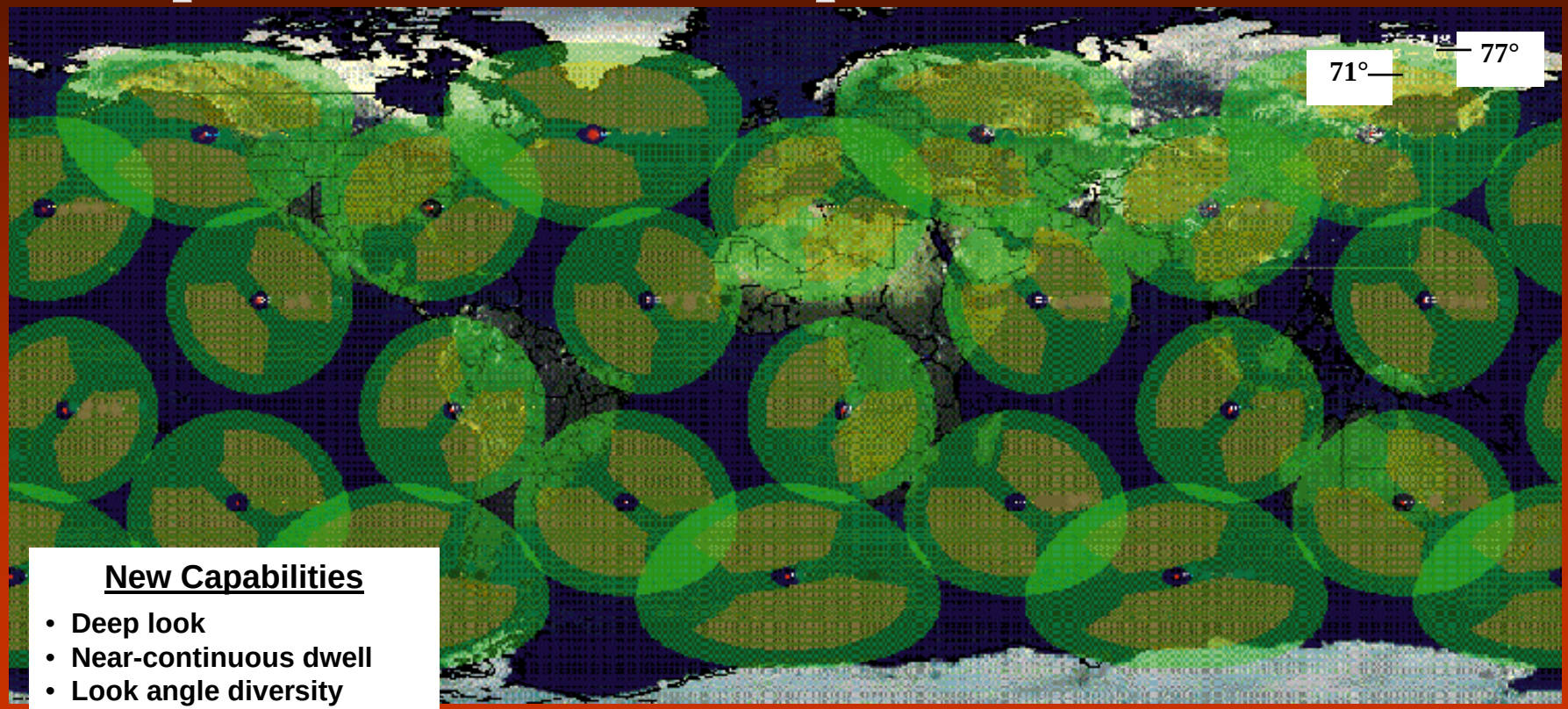
DARPA Tech
Discoverer II

by:

Col Mark Hughes

Program Vision

- Capable Affordable space-based radar

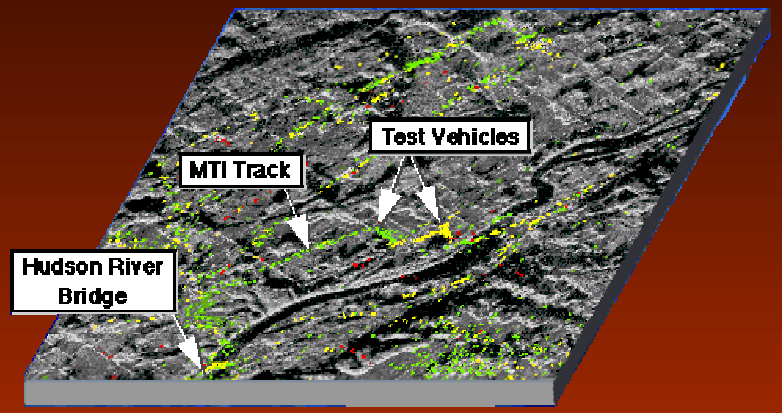


New Capabilities

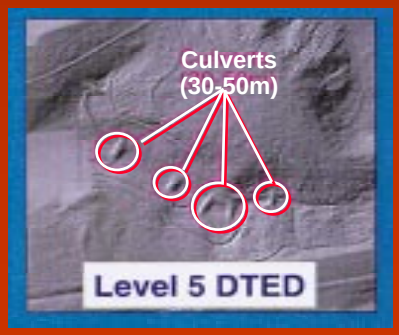
- **Deep look**
- **Near-continuous dwell**
- **Look angle diversity**
- **3-D change detection**

Objectives

- GMTI Collection
- SAR Imaging
- Affordability
- Dynamic Tasking
- JTF/Theater Downlink Commander
- Collection of Precision Digital Terrain Elevation Data (DTED)



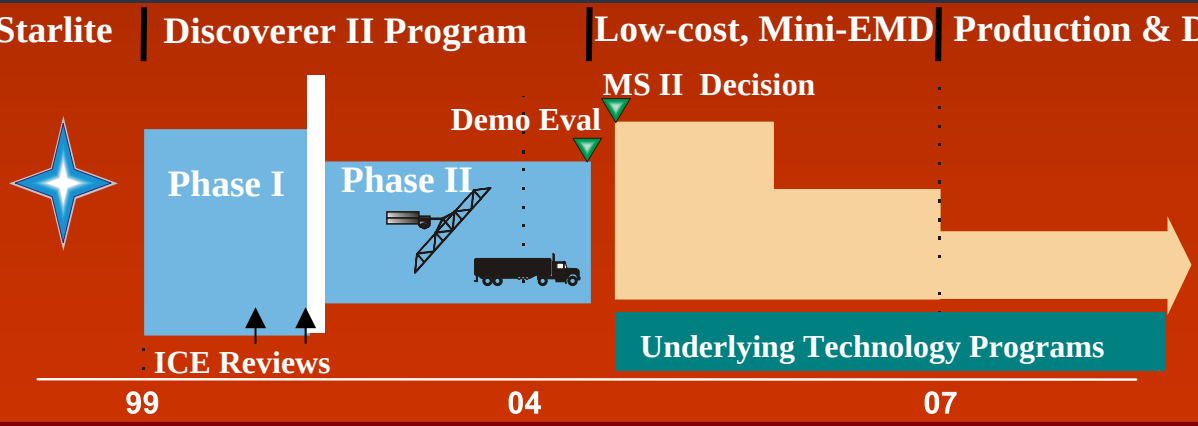
MTI Overlaid on SAR Image



Definition

- Technology demonstration (Design to Cost) program
- “Objective System”
- Two satellites/Modify ground systems
- Transition to reduced risk EMD

Discoverer II: An advanced technology demonstration on the path to an affordable production system [Goal: 1) $100M/bird 2)< $10.0B life cycle cost]



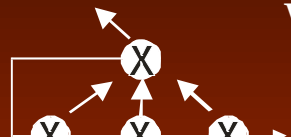
Key Themes

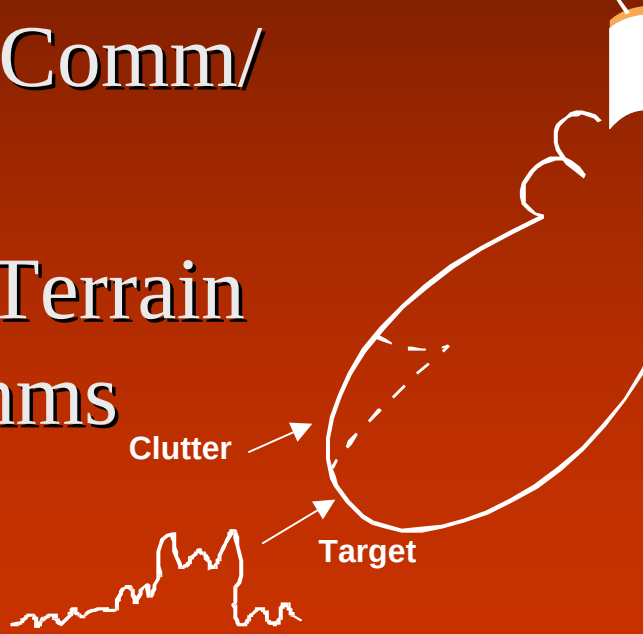
- Cohesive, Focused Program with Balanced Risk Reduction and Core Elements
- Maximum Industry Innovativeness/Involvement
- Limited Government Oversight/Specifications
- Staged Decision Process

Technical Challenges

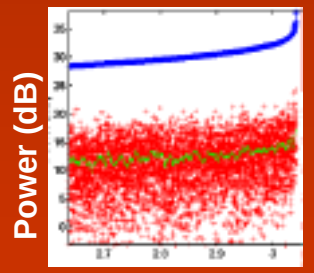
Small Aperture
Flexible
Wideband

- Spaceborne Active ESA
- HRR-GMTI/SAR Processing
- Ground Segment Comm/ Processing
- High-Resolution Terrain Mapping Algorithms





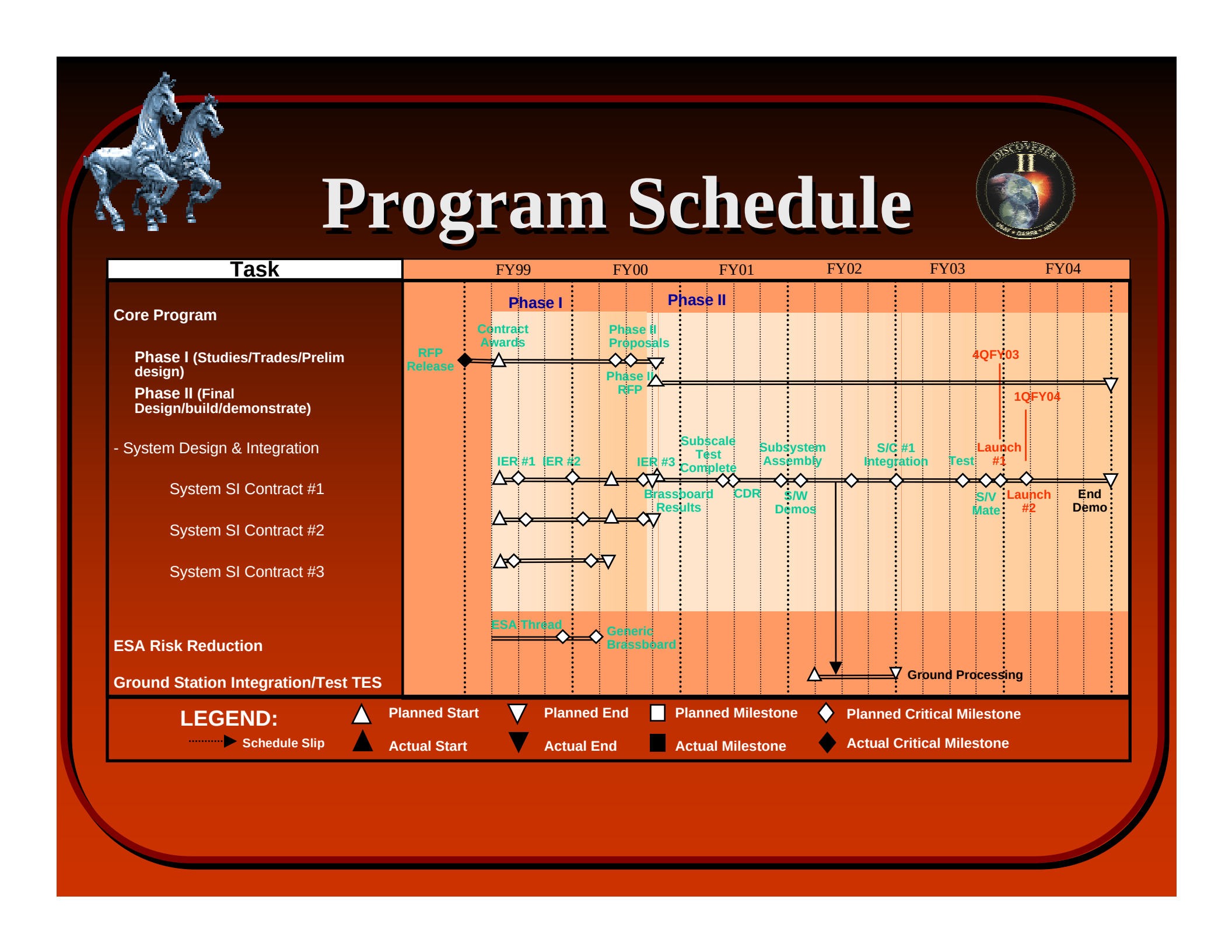
Clutter Removal Testbed



Key Contractors

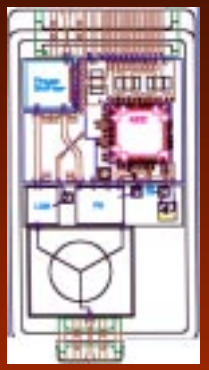
- System Integration Contractors
  - Lockheed Martin Astronautics
  - Spectrum Astro
  - TRW
- Risk Reduction Performers
  - Northrop Grumman
  - Raytheon
  - MIT/LL
  - Alphatech
  - Johns Hopkins/APL
  - AFRL
  - ERIM International
  - Aerospace Corp

Program Schedule

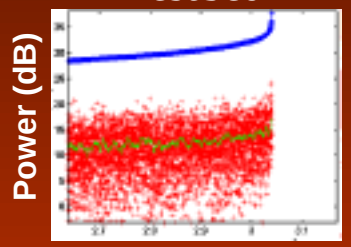


Significant Accomplishments

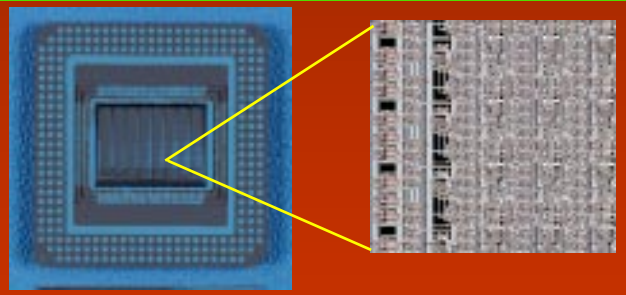
- Space Qualified Multiple Advanced T/R Module Designs
- Signal Processing Designed
  - STAP
  - Airborne Collects
- VLSI Processor Developed
  - .25 micron
  - 24 Gops/watt



Clutter Removal Testbed



Wideband Receiver



FIR Chip
24 Gflop/watt

6M Transistors
0.25 micron

Demonstration Summary

- Joint Demonstration Program:
- Technical feasibility affordable space-based GMTI/SAR capability
- Objective System Design
- Fly (2) Space-based Radar (SBR) R&D satellites
- Tactical ground stations