

Global Hawk Program

Integrity - Service - Excellence

Program Overview



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ASC/RAV

Wright-Patterson AFB



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Global Hawk



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Global Hawk Purpose

- **Global Hawk is an unmanned, high altitude, long endurance air vehicle**
- **Supports Department of Defense intelligence, surveillance, and reconnaissance missions with integrated sensors**
 - **Electro-optical/Infrared Images**
 - **Synthetic aperture radar (SAR) for all weather**
 - **Future signals intelligence (SIGINT) capabilities**
- **Other potential uses for future users**



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RQ-4A, Global Hawk



MLESTONES

- Advanced Concept Technology Demonstration: FY95 - FY00
- 32 months to 1st flight - Feb 98
- AF assumed program responsibility - 1 Oct 98
- Entered EMD – Mar 01

GENERAL DESIGN

- Specifications
 - Wing span: 116 ft
 - Length: 44 ft
 - Height: 15 ft
- Performance Goals
 - Range: 12,500 nmi
 - Approx. Endurance: 35 hrs
 - Endurance @1200nm: 24 hrs
 - Altitude: 65,000 ft
 - True Airspeed: 335 kts
 - Gross T/O wt: 26,750 lbs
 - Payload wt: 2,000 lbs
- Payloads: EO/IR and SAR
- Comms: SATCOM: UHF/Ku-Band
LOS: UHF and CDL



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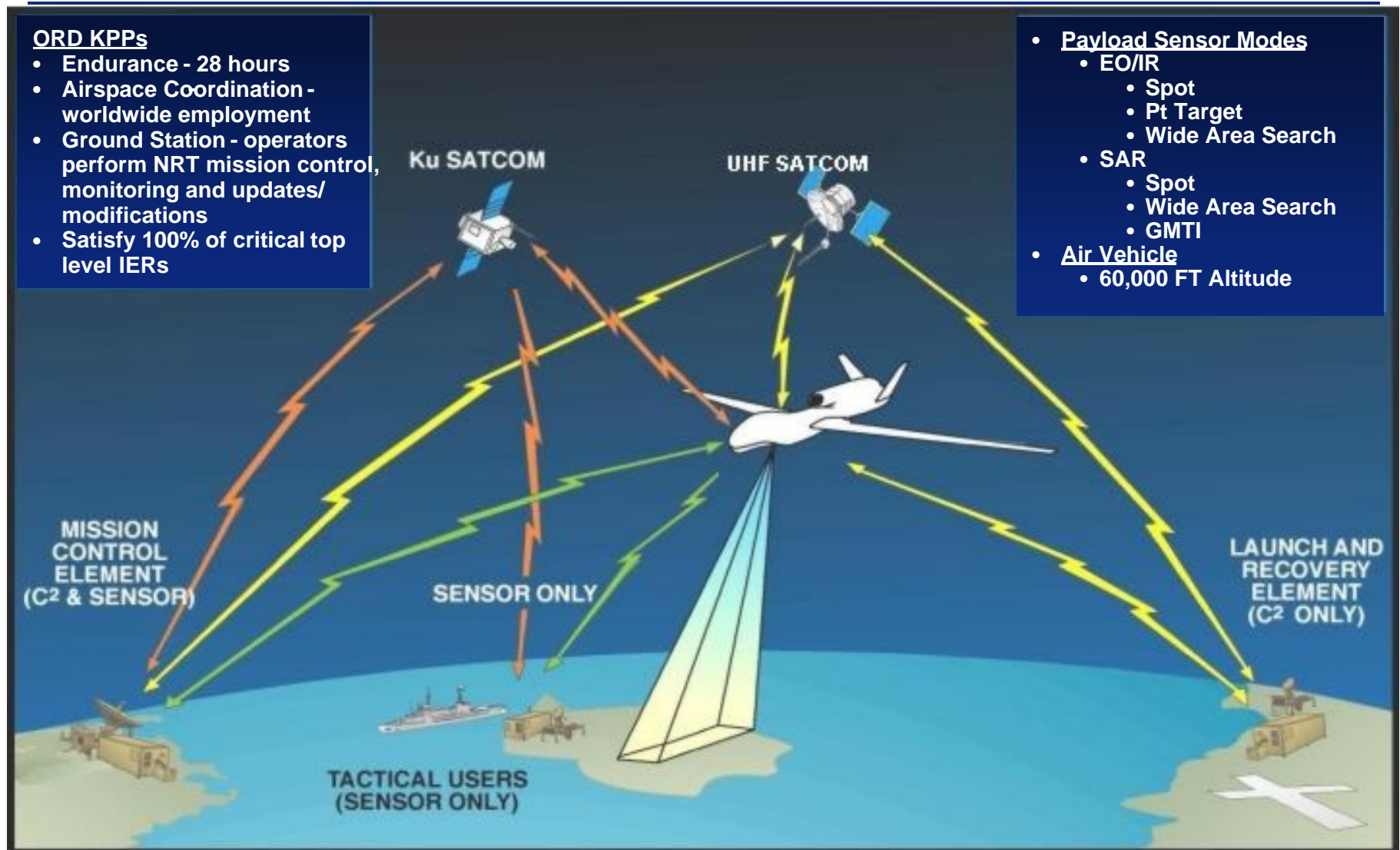
Global Hawk System Requirements

ORD KPPs

- Endurance - 28 hours
- Airspace Coordination - worldwide employment
- Ground Station - operators perform NRT mission control, monitoring and updates/modifications
- Satisfy 100% of critical top level IERs

Payload Sensor Modes

- EO/IR
 - Spot
 - Pt Target
 - Wide Area Search
- SAR
 - Spot
 - Wide Area Search
 - GMTI
- Air Vehicle
 - 60,000 FT Altitude

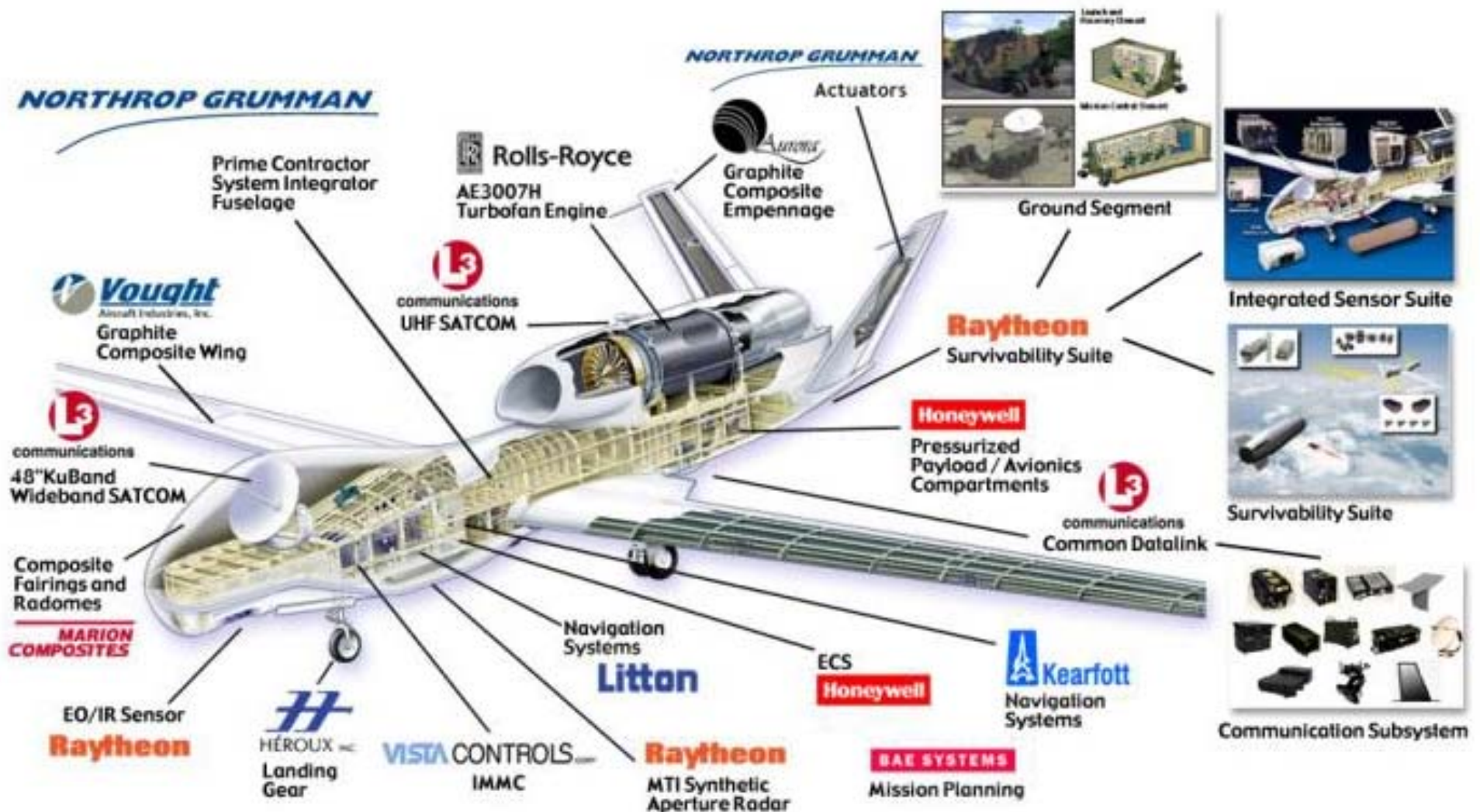


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Global Hawk Contractor Team

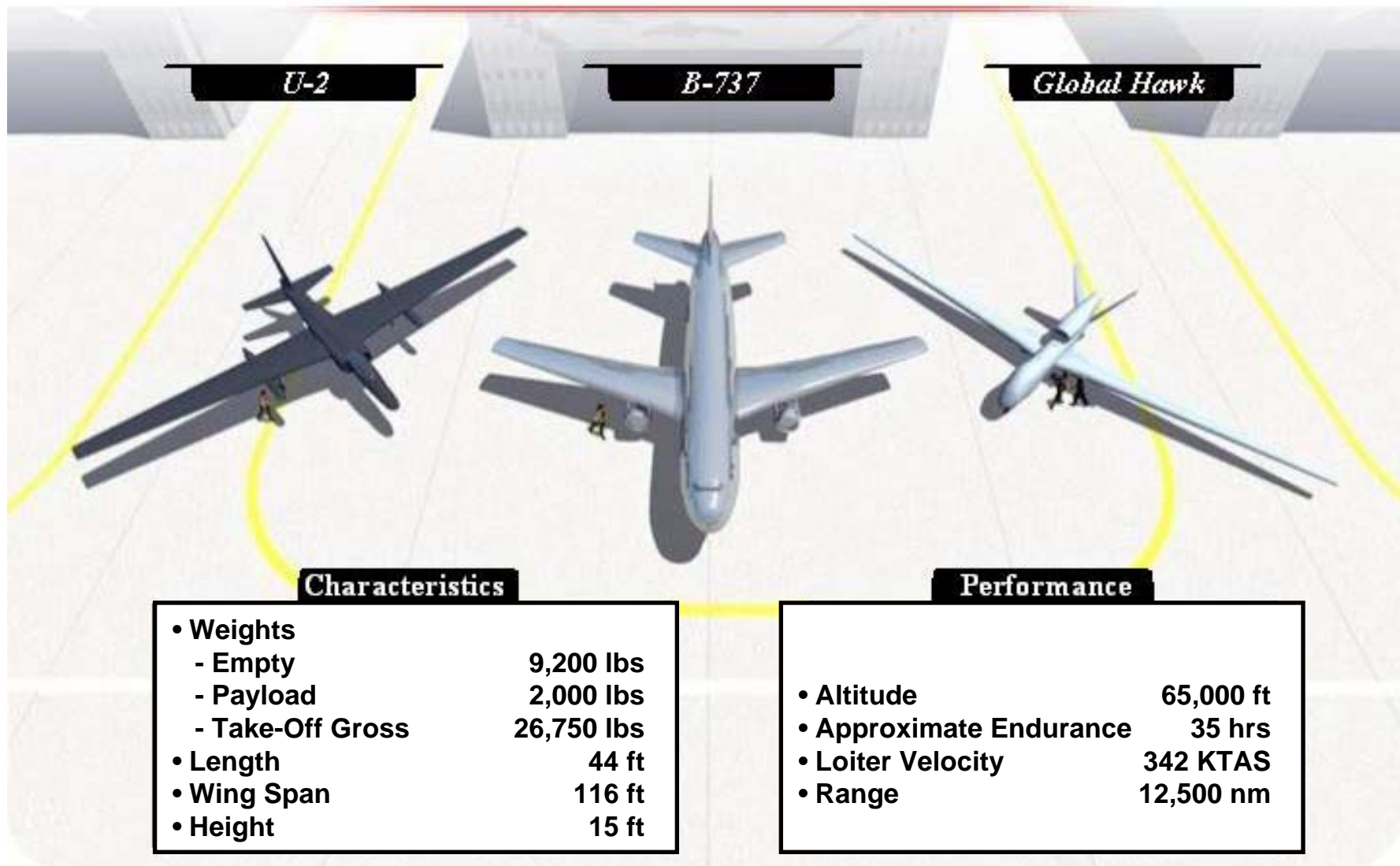


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Global Hawk Size and Performance



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Global Hawk AV6 EAFB

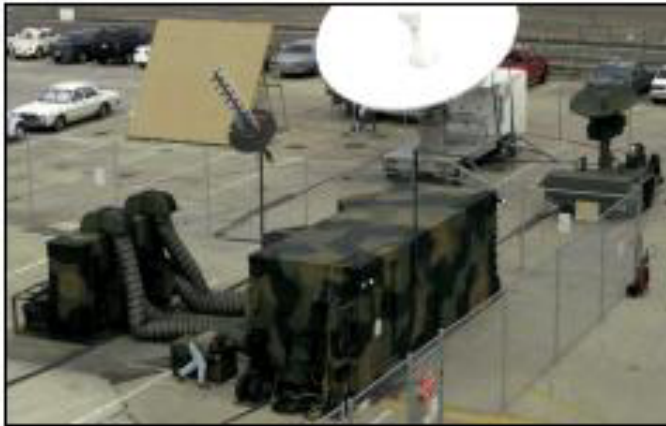


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Common Ground Segment



Mission Control Element (MCE)



Launch and Recovery Element (LRE)

GENERAL DESIGN

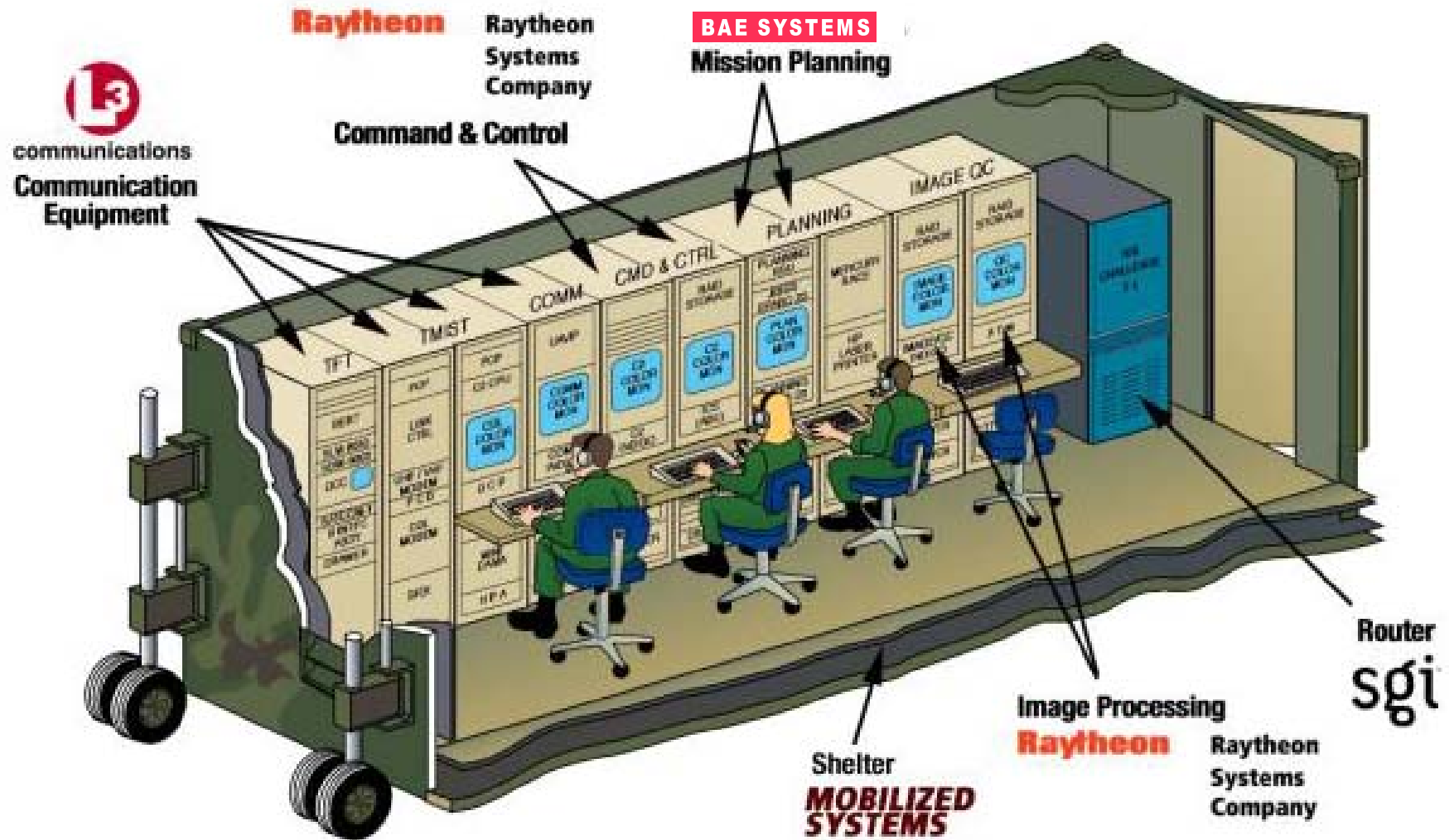
- **Operates up to 3 Global Hawks at one time**
 - Multiple mission plans
 - Receives imagery from one UAV at a time
 - Mosaics EO/IR
- **Disseminates exploitable data via external theater comms**
- **Deploys on 3 C-141s or 2 C-17s or 1 C-5**
- **Comms: SATCOM: UHF/Ku-Band**
LOS: UHF/VHF/CDL

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Global Hawk MCE



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MCE

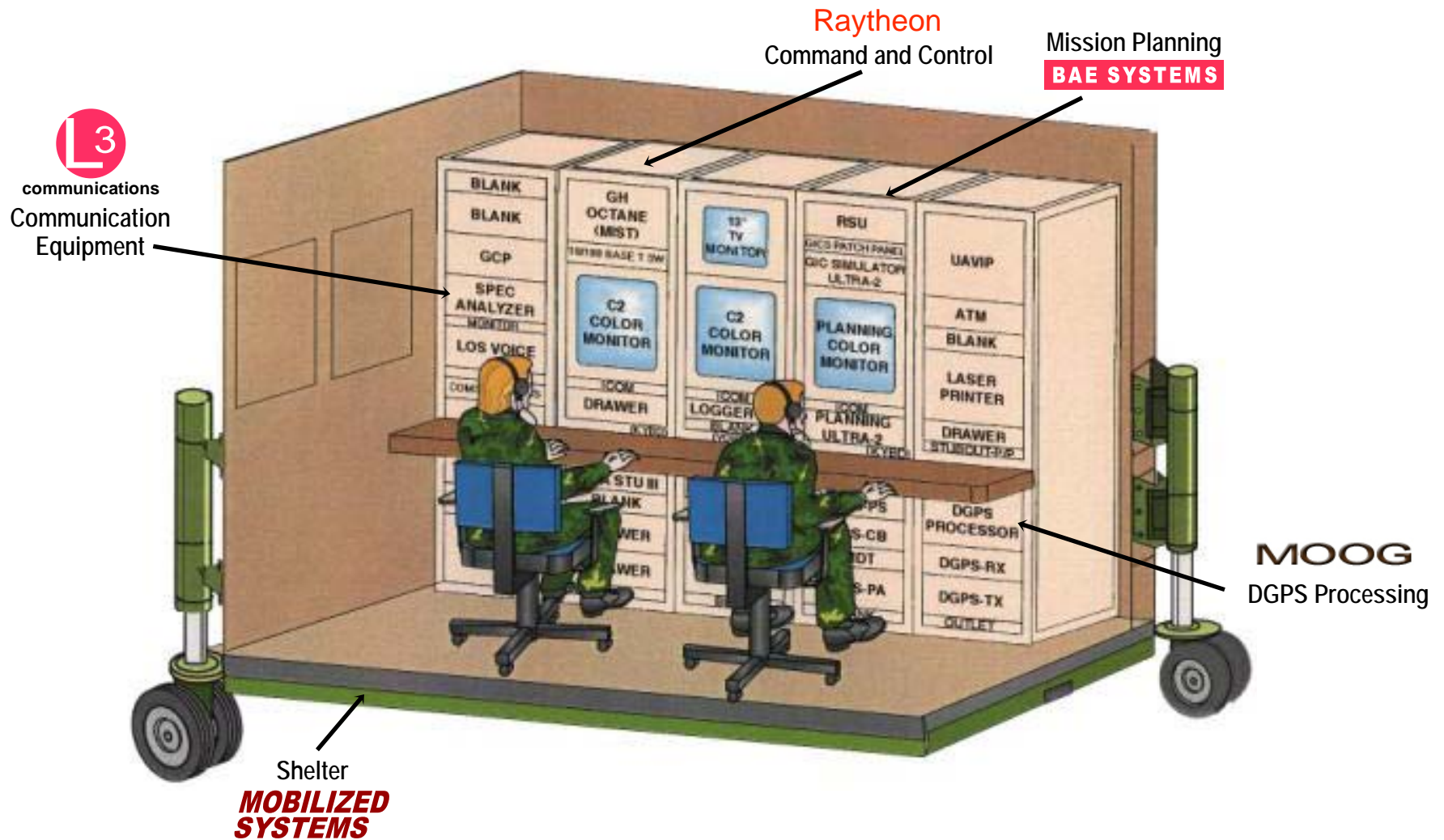


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Global Hawk LRE



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LRE

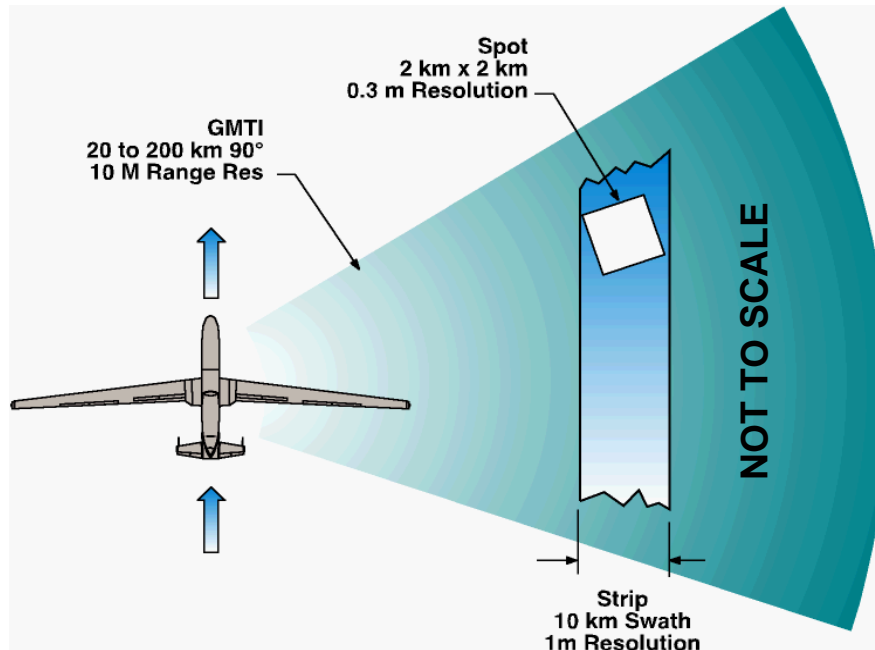


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Global Hawk

SAR/MTI Sensor Summary Data



Radar Characteristics

Mechanically Scanned Array (MSA)
X-Band Frequency
3.0 kW AC/1.6 kW DC
+/- 45° Field of Regard
612 lbs; Air cooled

Mode Performance

Spot: 0.3m (1ft) Resolution
2km x 2km Spot (>50km)
1km x 2km Spot (<50km)
1900 Spots/Day

Wide Area Search: 40,000 nmi²/Day
Squinted/Canted Search w/
High, Medium & Course Resolution & Swath Width
(1.0m, 2.0m & 3.0m Res; 10km, 30km & 50km Swath)

GMTI: 20-200km Range
+/- 45° Field of Regard (FOR)
2 Minute Revisit Rate (Full-Scan)

Data Formats

NITF 2.1
Complex Imagery



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Global Hawk SAR Spot Image

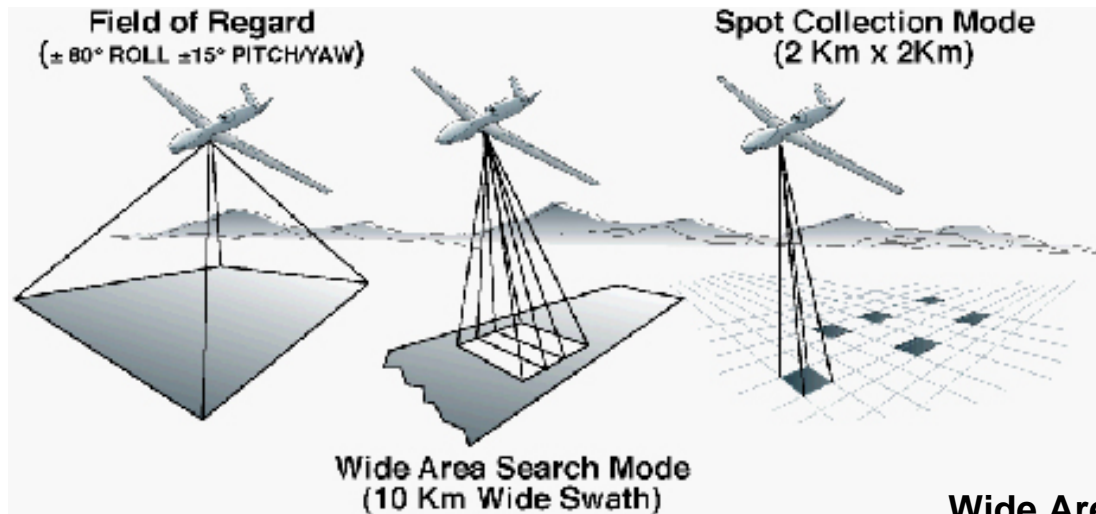


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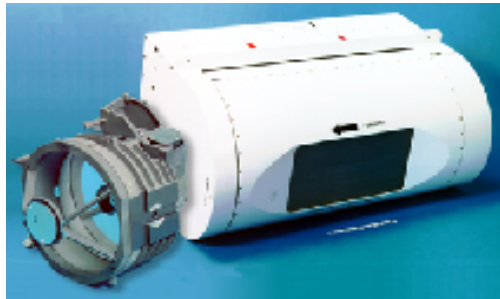
Global Hawk EO/IR Sensor Summary Data



Mode Performance

Spot: 1900 Spots/Day
2km x 2km Spot
(EO 10x14 Image Frames)
(IR 7x14 Image Frames)

Wide Area Search: 10km Swath Width
40,000 nmi²/day



Physical Characteristics

Electro-optical Receiver Unit (ERU)
16ft³; 300 lbs
300 W AC/600 W DC

Data Formats: NITF 2.1

Other Sensor Parameters

Field of Regard	+/-15° Az; +/-80° Nadir
Visual Band	0.55 – 0.9 micron
MWIR Band	3.7 – 5.05 micron

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Global Hawk EO Image



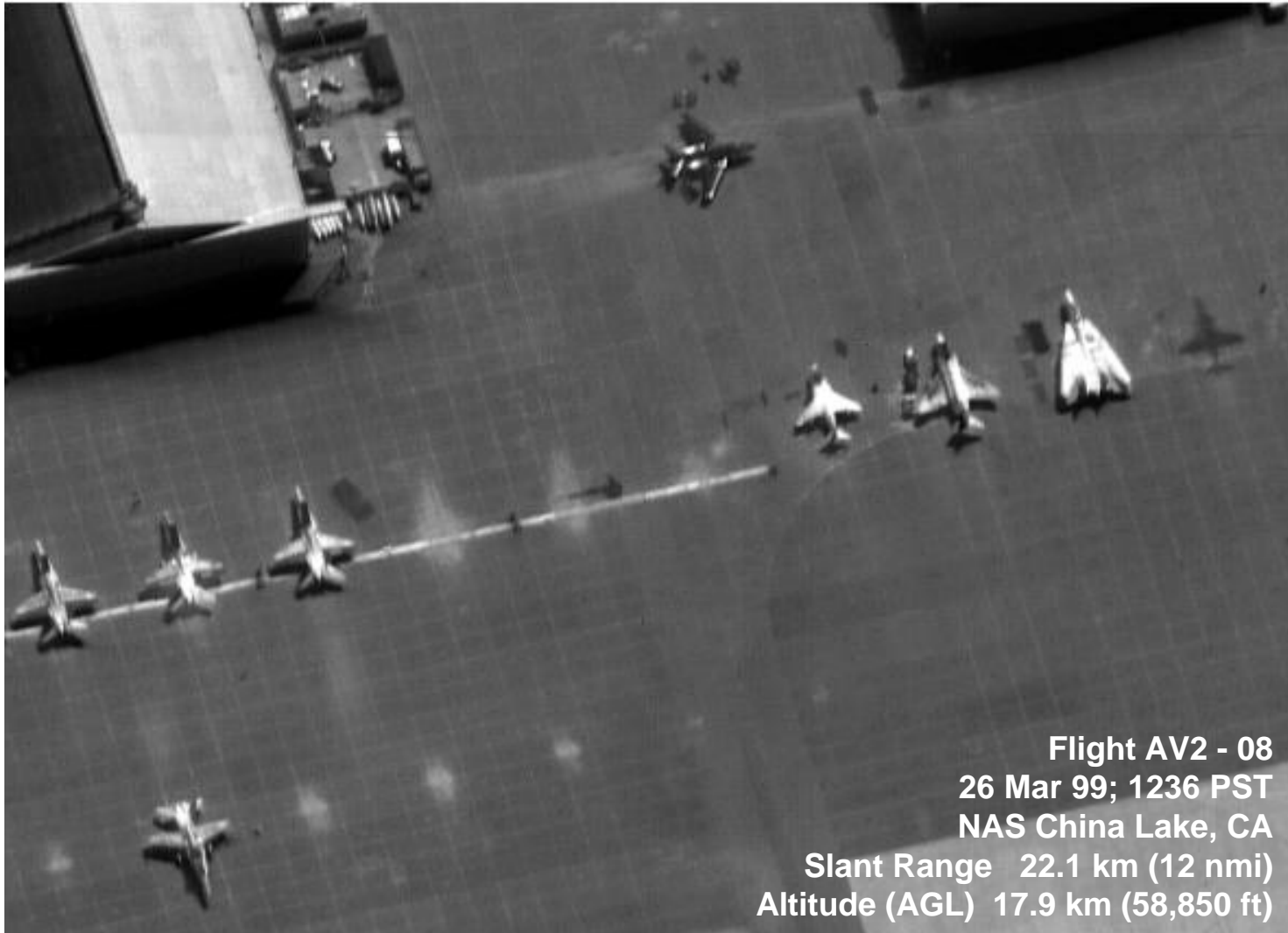
Flight AV2-04
China Lake NAS
22 Jan 99; 0923 PST
Slant Range 20.9 km (11.3 nmi)
Altitude (AGL) 16.5 km (54,300 ft)

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Global Hawk IR Image



Flight AV2 - 08
26 Mar 99; 1236 PST
NAS China Lake, CA
Slant Range 22.1 km (12 nmi)
Altitude (AGL) 17.9 km (58,850 ft)

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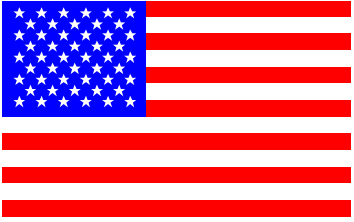
Accomplishments

- Fully autonomous flight in only 32 months from go-ahead
- **FIRST FLIGHT:** Feb 28, 1998
- **TOTAL FLIGHTS:** 178
- **TOTAL FLYING HOURS:** 2590.8
- **HIGHEST ALTITUDE:** 66,400 ft
- **LONGEST DURATION:** 31.5 hours
- **PAYLOAD INTEROPERABILITY:** Army, Navy, Air Force, Marines, Coast Guard, NATO

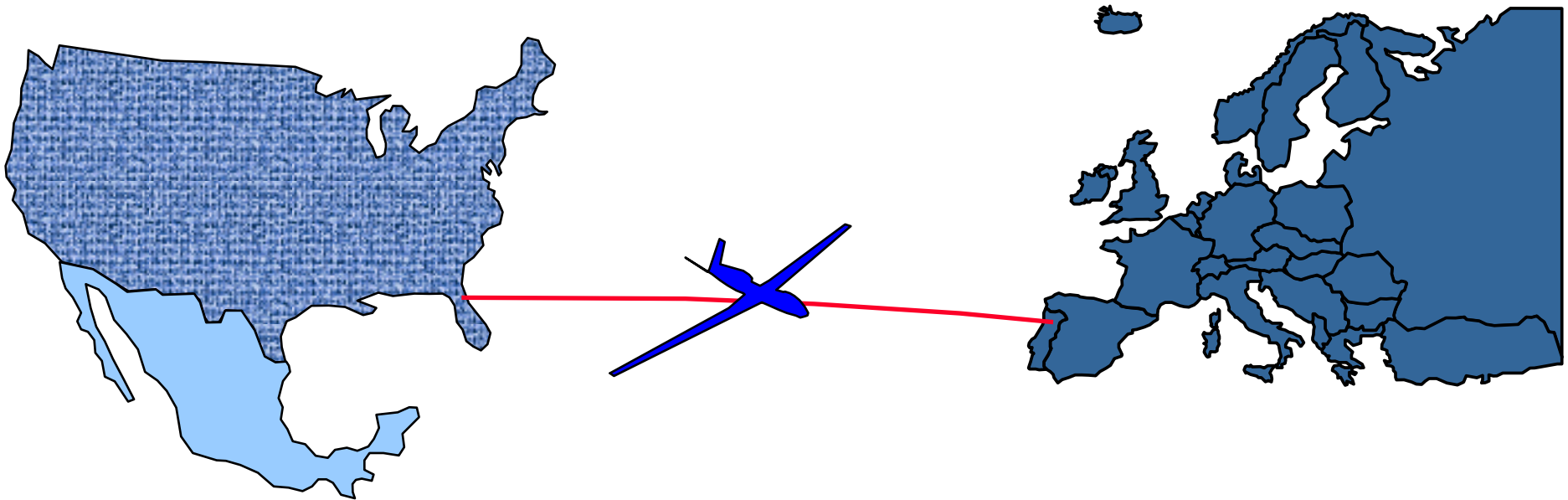


- **WORLD RECORDS (as recognized by NAA):**
 - Highest altitude by an autonomous, unmanned jet-powered aircraft: 65,191 ft
 - Longest endurance of an autonomous, unmanned jet-powered aircraft: 30 hrs 24 min
 - First non-stop flight across Pacific Ocean by an autonomous aircraft
- **AWARDS**
 - 2000 Robert J. Collier Trophy
 - 2001 Flight International Award for Military Aviation
 - 2001 Air Force Level Packard Award Winner

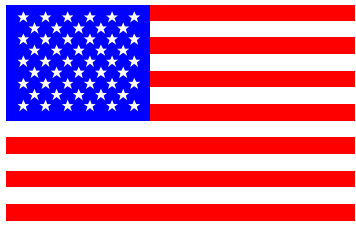
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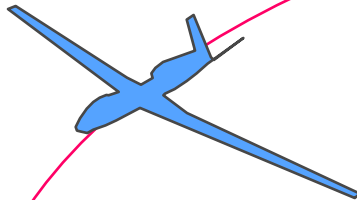
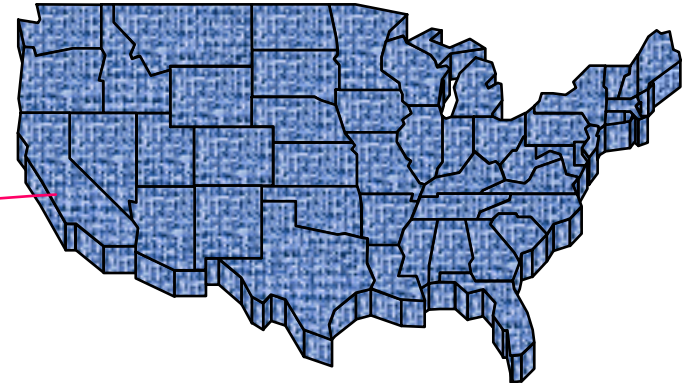
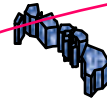
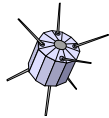
Joint U.S. - Europe Demonstration



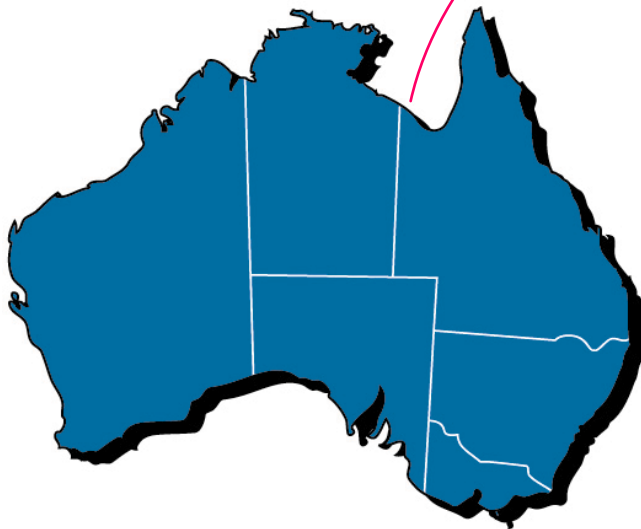
- **Customer: SOUTHLANT**
- **Provide imagery to Joint Task Force Commander to support amphibious landings and air operations in “Linked Seas” Demo**
- **Firsts:**
 - Inter-continental operation
 - Operation in foreign airspace
 - Support of NATO customer



U.S. - Australia Cooperative Project Agreement



- **3 Stage Effort
(Study/Development/Deployment)**
- **Comprehensive analysis of Global Hawk System & Australian Ground Equipment (AGE) Interoperability and Deployment Requirements**
- **Modification of Common Ground Segment to Support Imagery Dissemination to AGE**
- **Modification of Global Hawk Radar to Support Maritime Modes**
- **System Deployment to Australia CY01**





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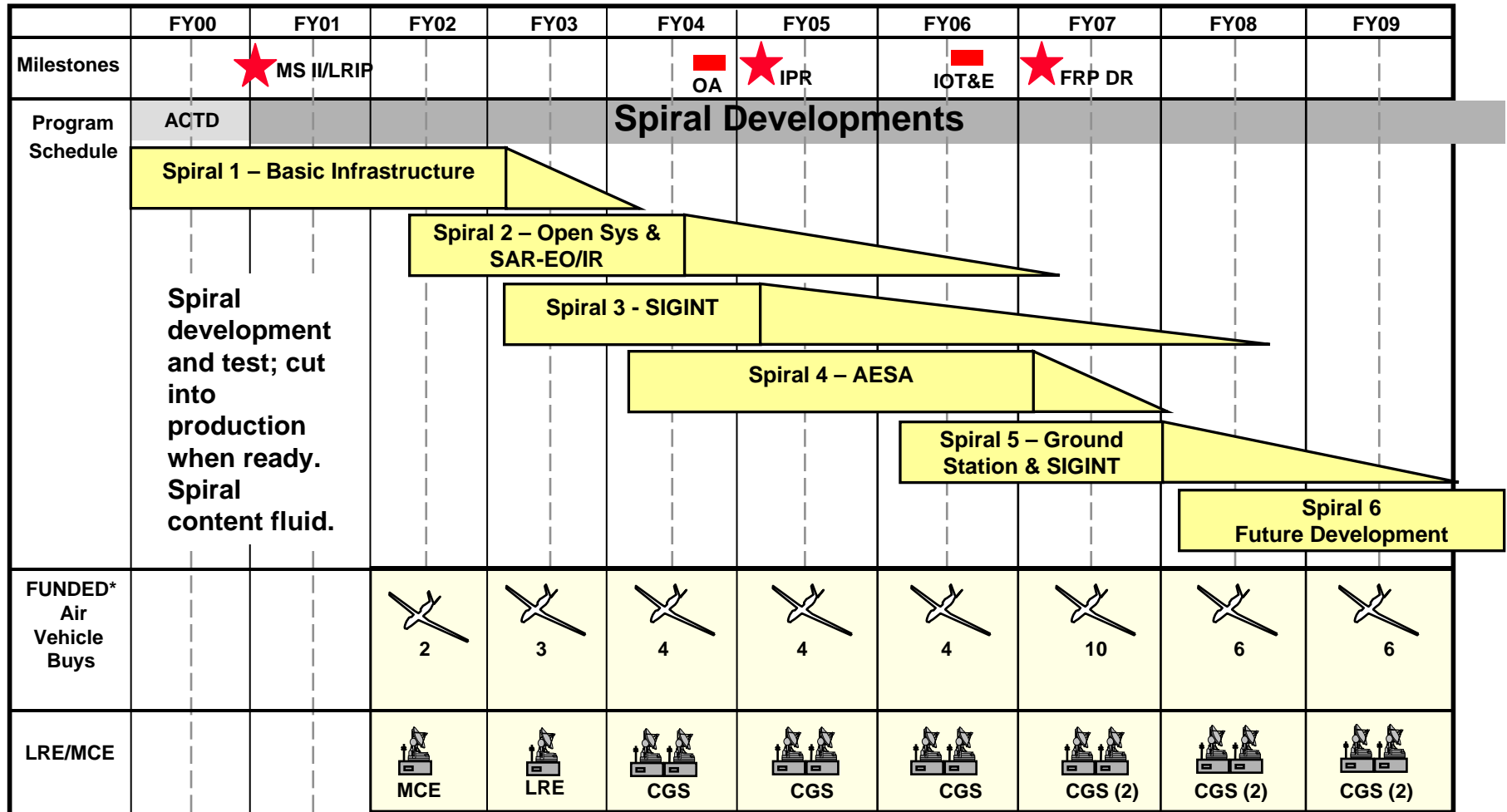
Early User Feedback

- **ACC's 31st Test & Evaluation Squadron (18 people) at Edwards AFB since early 98**
 - Performing pre-flight, launch, recovery and post-flight operations
 - “Very reliable and easy to maintain air vehicle”
- **USN sensor-to-shooter demo: 12 minutes from request to SAR image on F-18 cockpit display (9 Nov)**
- **Dynamic sensor retasking routine: USN, USMC, USAF have retasked up to 40 times per mission, 4 minute response time**



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Transformation Program



* FY03 PB

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Summary

- **Global Hawk is a program with high potential**
- **High expectations by senior leadership**
- **Proven capability with 2500+ flight hours and a successful Military Utility Assessment**
- **Proceeding to execute directed program**



Global Hawk

Questions????

