NASA Global Hawk: Project Update and Future Missions

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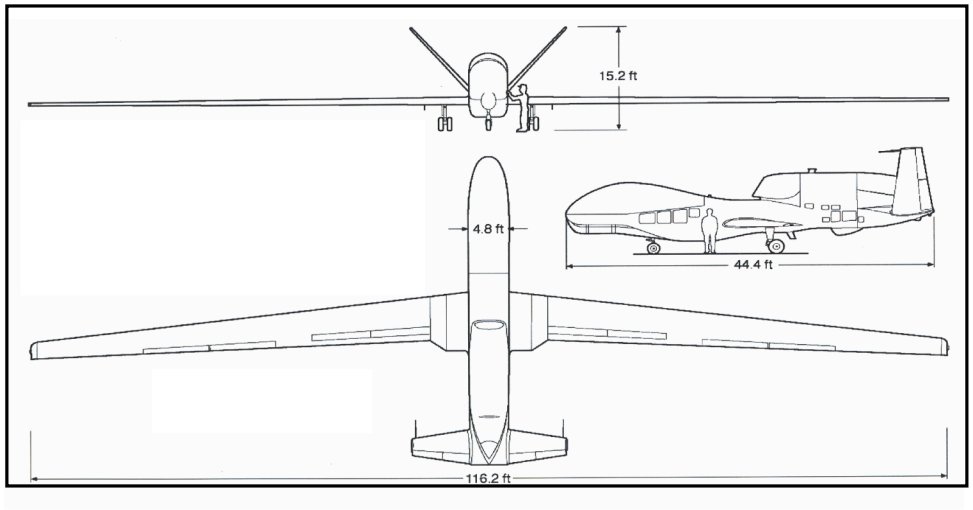
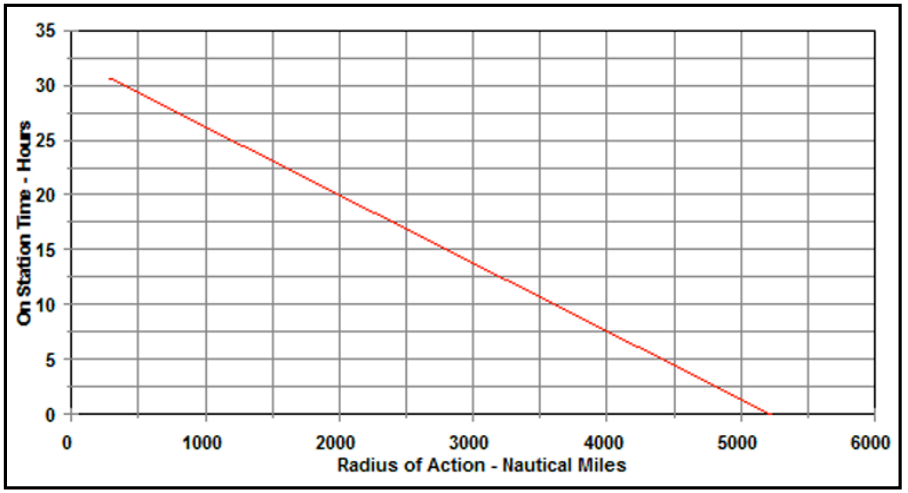
Pecora 17

20 November 2008

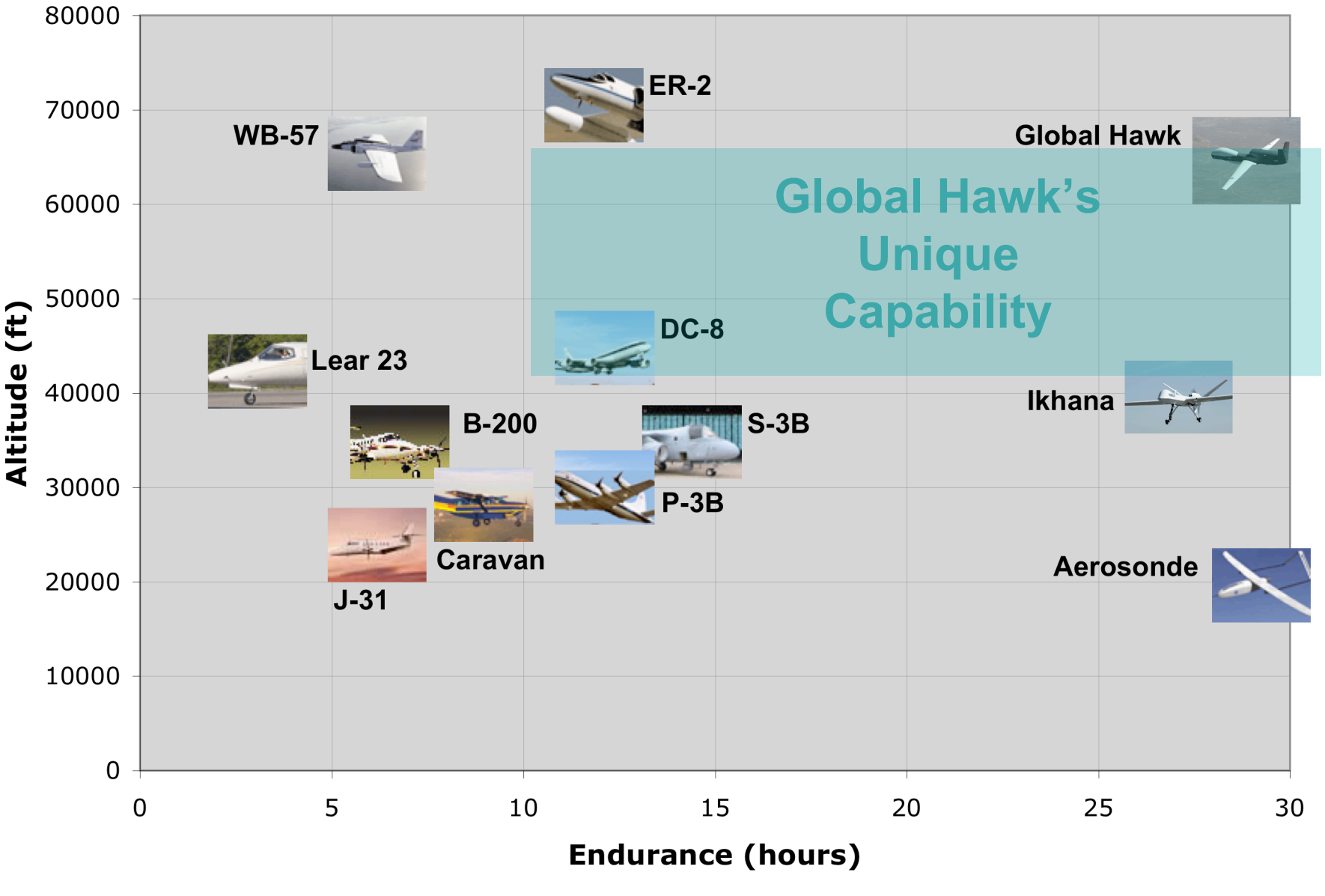
NASA Global Hawk Characteristics





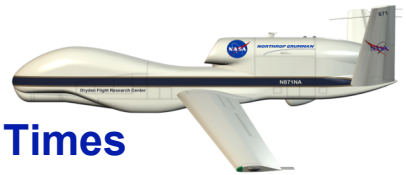
Air Vehicle Characteristics	
Payload	>1,500 lb
Empty weight including fluids	9,100 lb
Take-off fuel	14,500 lb (15,436 lb max fuel tank capacity)
Take-off gross weight (max.)	25,600 lb
Engine	Allison AE-3007H Turbofan
Thrust	Flat rated at 7500 lbs thrust at sea level
Maximum Altitude	65,000 ft
Maximum Range	11,000+ nmi
Maximum Endurance	31+ hours
True Airspeed @ 55k+ ft. Altitude	335 KTAS (VNE = 355 KTAS)
Turn Radius @ 55k+ ft. Altitude	6.5 nmi
DC (Engine-driven Generator)	28 VDC, 186.3 A (5.2 KW)
AC (Hydraulic-powered Generator)	115VAC, 3-phase 400 Hz, 71.8 A/phase (8.3 KVA)

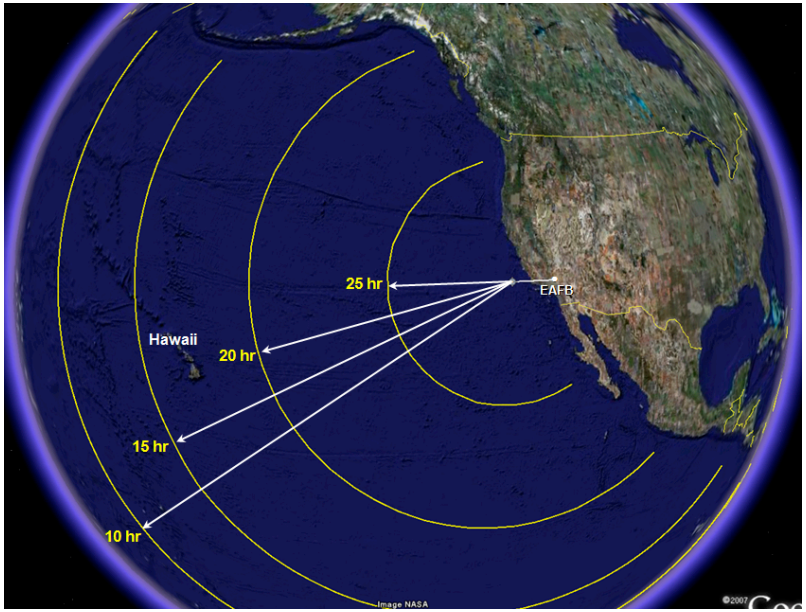
NASA's Airborne Science Aircraft Capabilities

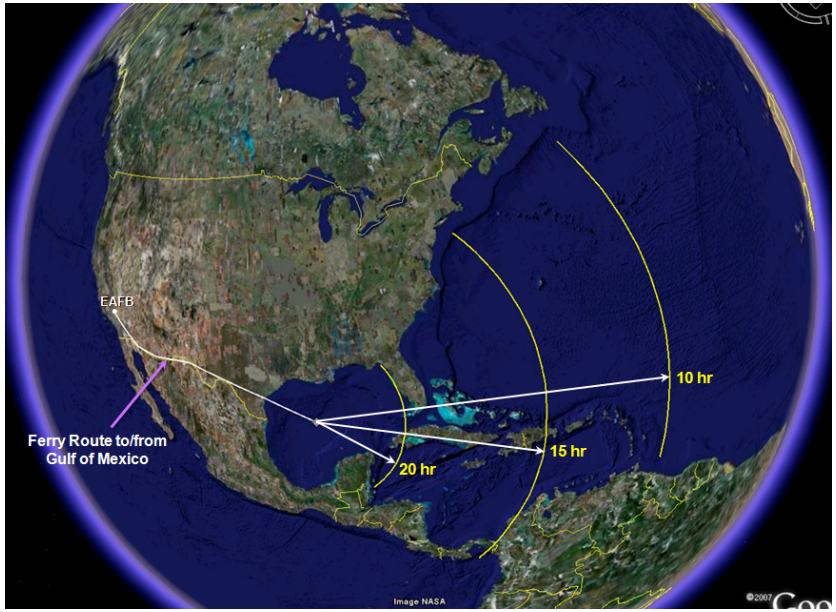


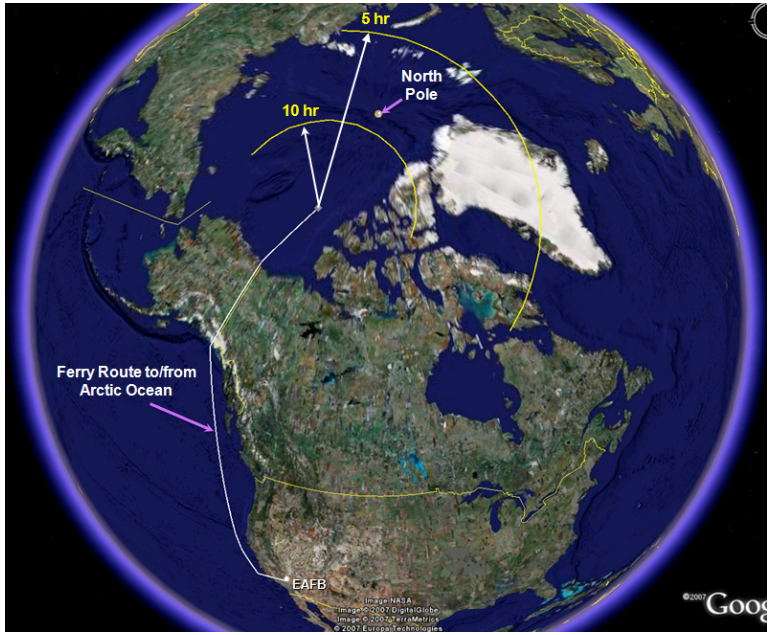
Global Hawk Operational Capability

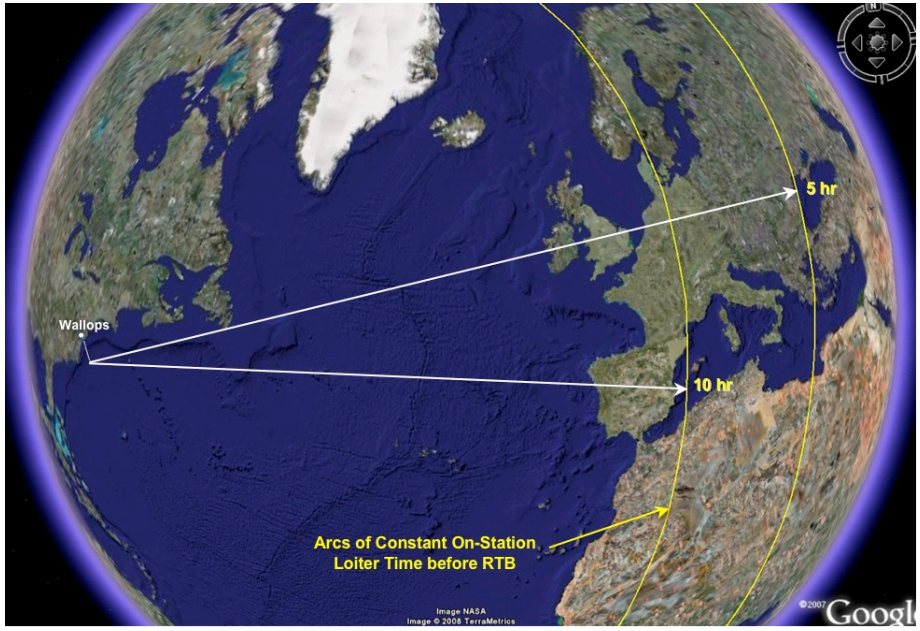
Four Mission Regions, with Arcs of Constant On-Station Times



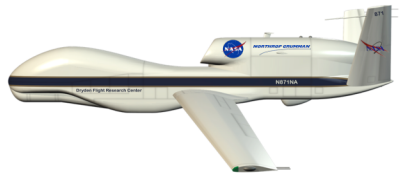








Project Highlights



- The USAF transferred ownership of two pre-production Global Hawk aircraft to NASA Dryden in September 2007.

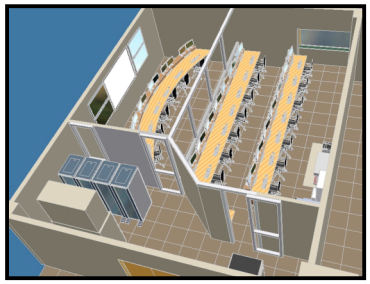
- Both aircraft have low flight hours and they were transferred to NASA with most of the equipment required for flight.

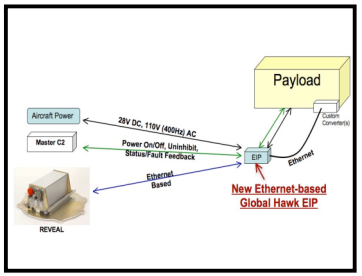
- NASA Dryden and Northrop Grumman have developed a partnership for standing up the capability over 1 year, operating the system for 4 years, and sharing use of the assets. The agreement was signed in April 2008.

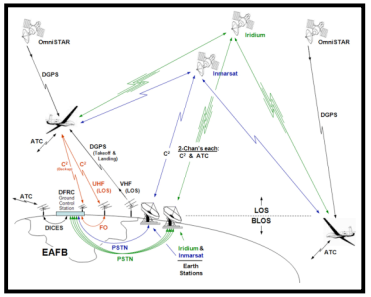
- NASA Dryden will focus on Earth Science missions and Northrop Grumman will focus on DoD and internal company payload and system developments.

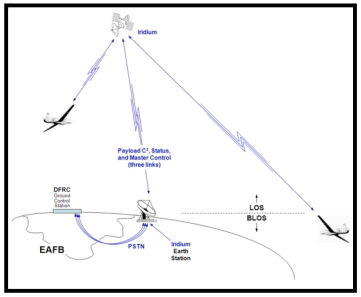
Baseline Capability at Completion of Stand-up Year

- Aircraft
  - 2 operational aircraft.
  - Power and Ethernet interface access in each payload bay.
  - Independent system for payload C2 and health status.
- Dryden Global Hawk Operations Center (GHOC).
  - Building based ground station located at Dryden.
  - Separate flight and payload operations areas.
  - Large payload operations area - 14 work stations.
- Aircraft Command and Control (C2) Communications.
  - LOS -- 2 UHF/LOS links.
  - BLOS -- 2 Iridium and 1 Inmarsat Satcom links.
- Air Traffic Control (ATC) communications.
  - LOS -- VHF/UHF radios at Dryden.
  - BLOS -- 2 Iridium Satcom links with aircraft.
- Payload C2 and Health Status Communications.
  - 6 Iridium Satcom links.
- NASA Global Hawk GCS Development Lab (Rancho Bernardo).
  - Aircraft C2 hardware integrated with aircraft hot bench.
  - Software development and integration.

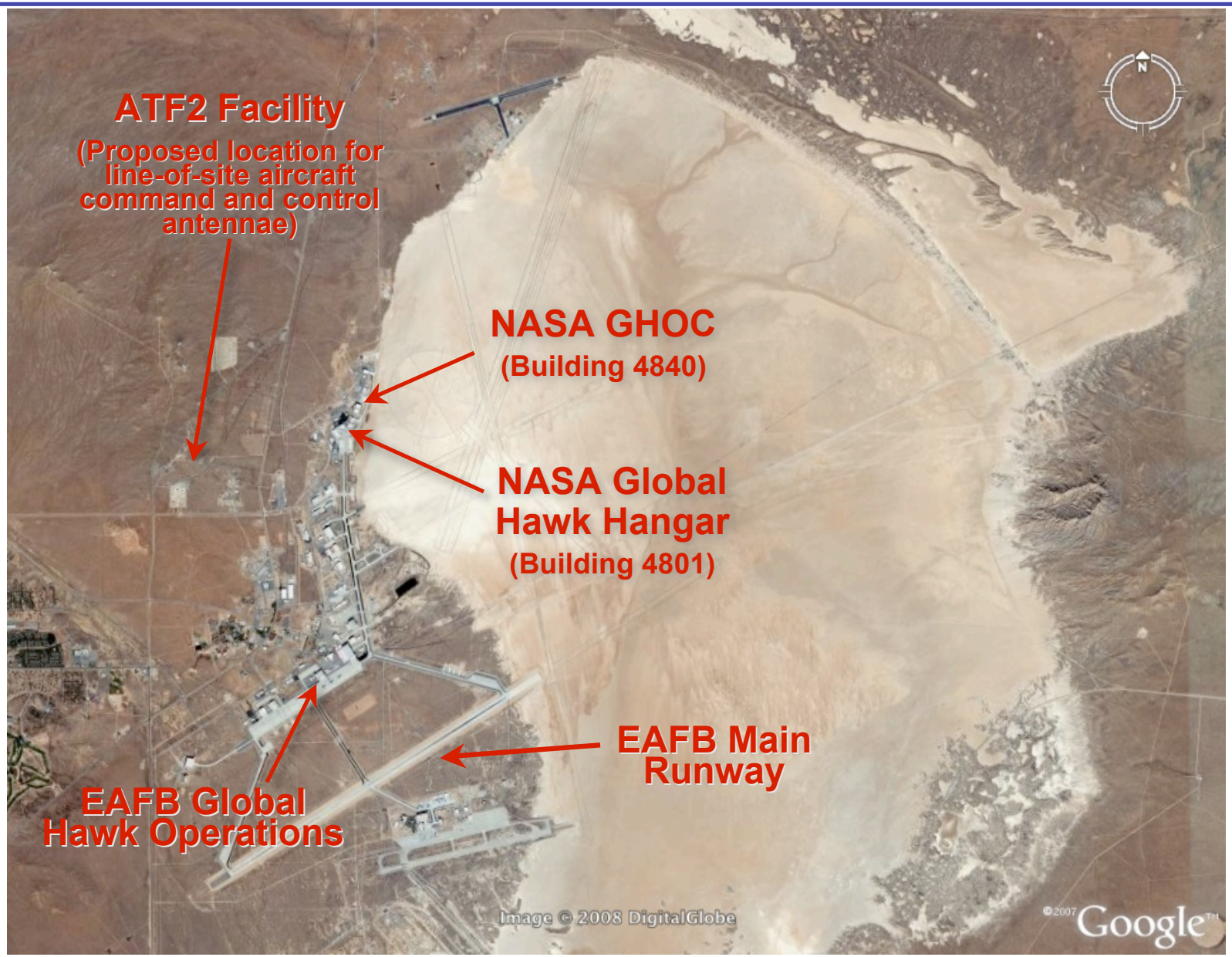




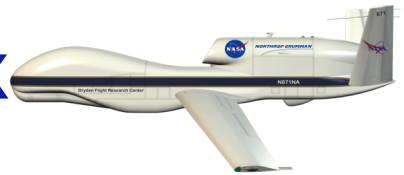




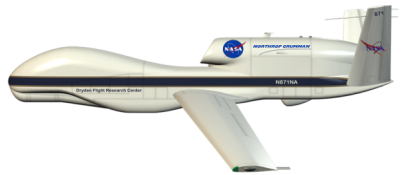
Edwards Air Force Base and NASA Dryden Flight Research Center



Dryden Building 4800 Complex



Maintenance Activities



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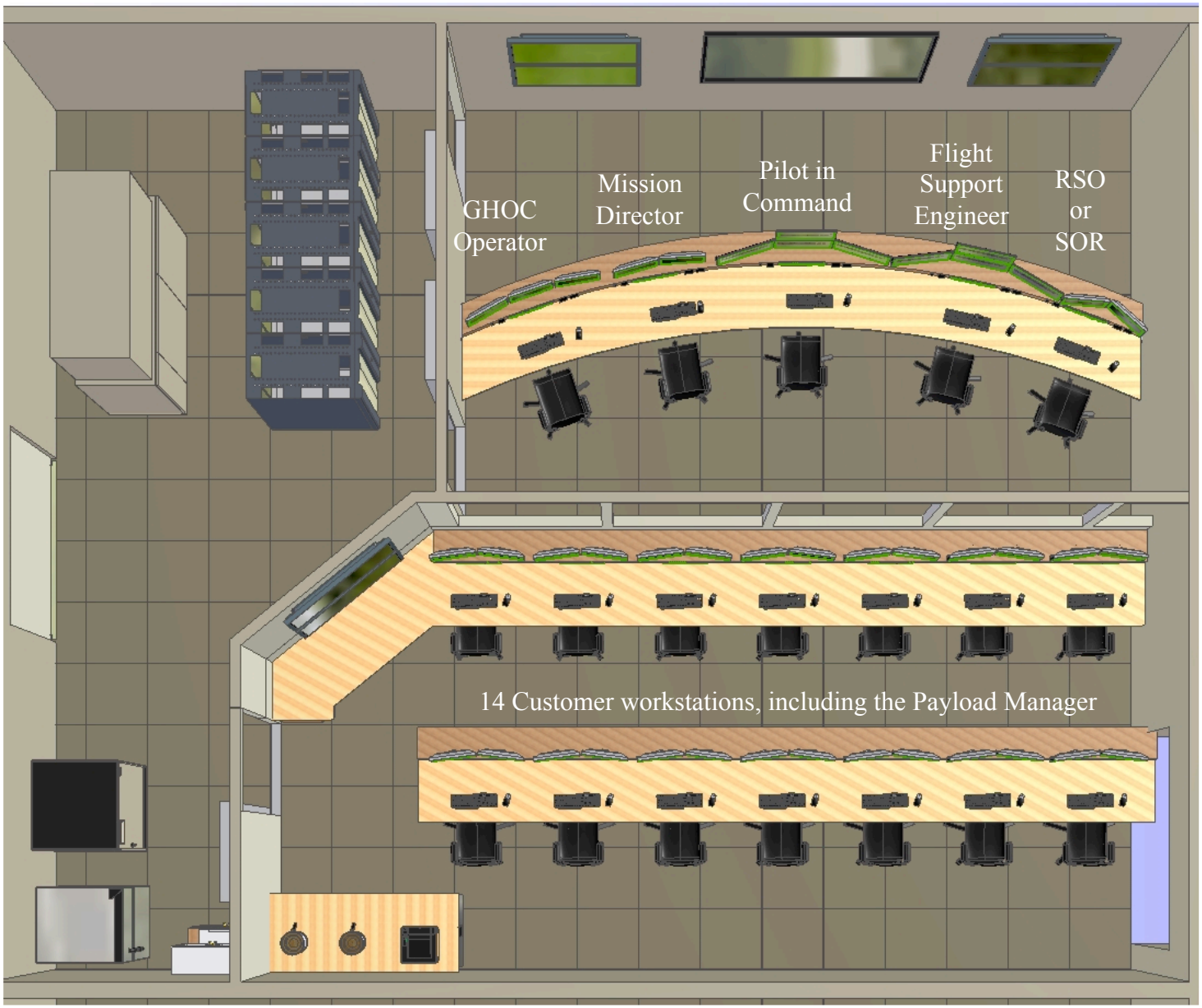
Dryden Building 4840 Complex

DFRC Global Hawk Operations Center (GHOC)

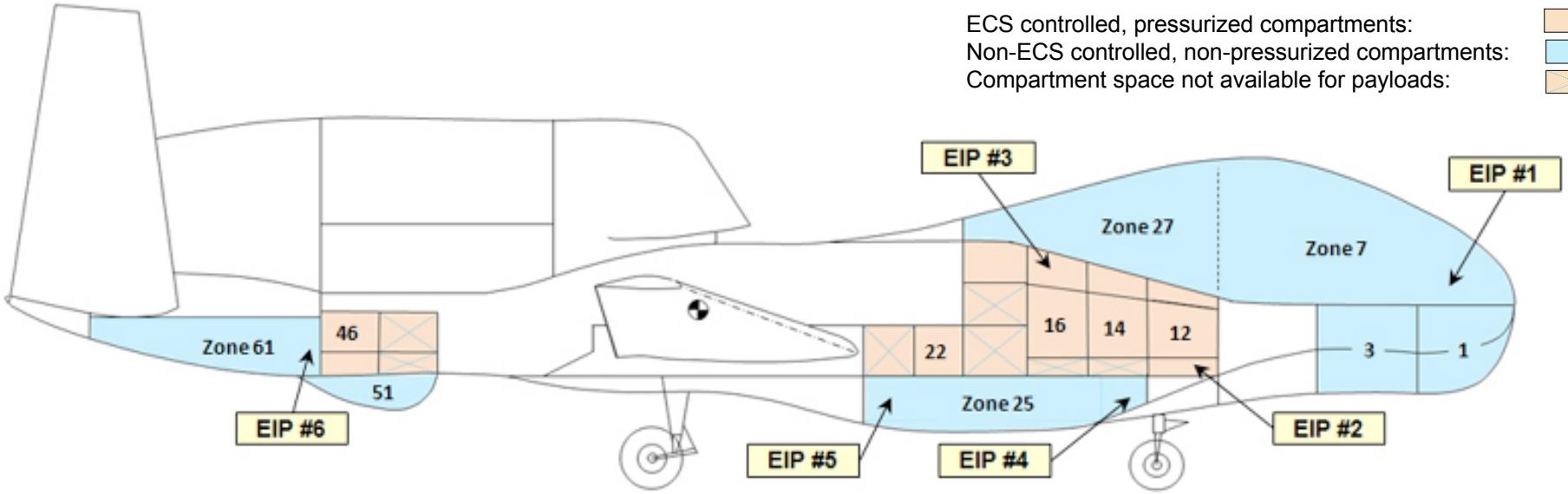


Support Equipment Room (SER)

Flight Operations Room (FOR)

Payload Operations Room (POR)

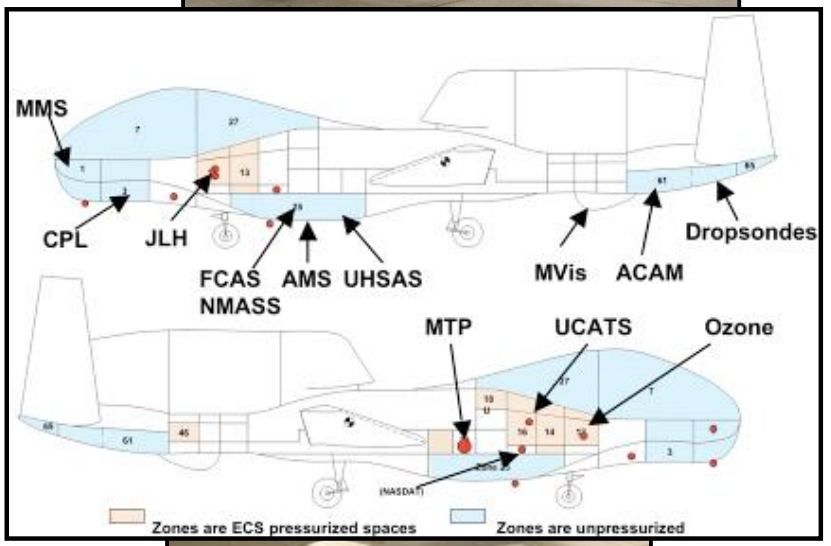
NASA Global Hawk
Zones Available for Payloads

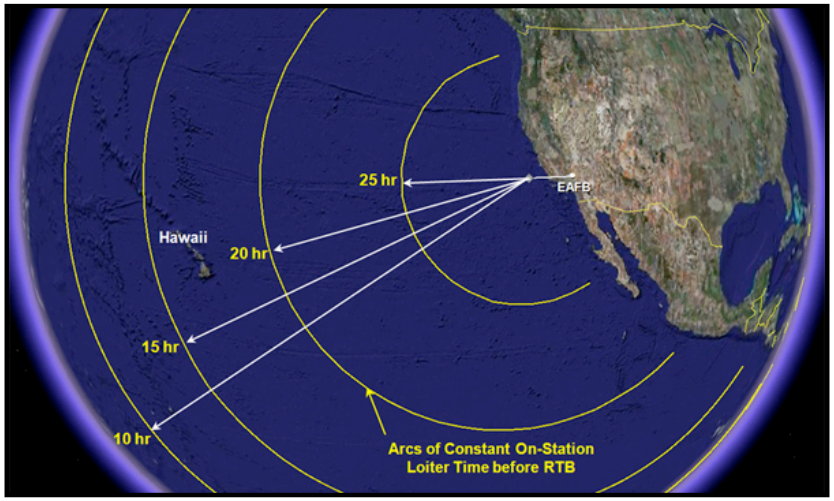


Payload Zone ID	Approximate Dimensions (inches)		
	Length	Width	Height
1	26	39	33
3	40	23	27
7	105	56	36
11	19	21	13
12	19	21	13
13	19	20	17
14	19	20	17
16	19	20	20
22	15	15	14
25	120	56	18
27	72	56	26
46	20	20	14
51	45	14	12
61	70	44	20

GloPac 2009

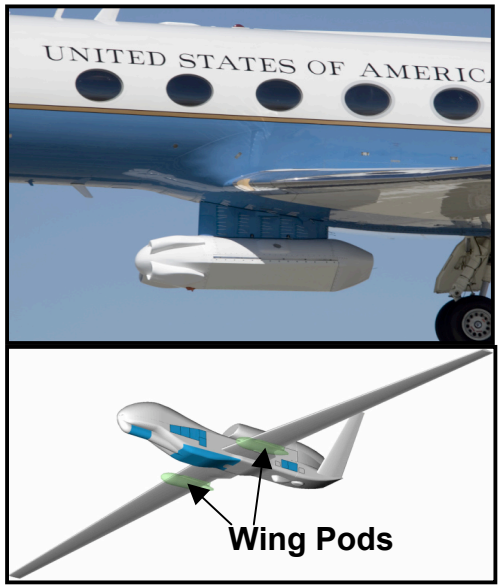
- April-May 2009 is the target date.
- Flights will be conducted over the Pacific Ocean region.
- 11 NASA and NOAA sponsored instruments.
- Data will be used for satellite validation.
- Payload integration activities began in mid-Aug.





Proposed NASA Global Hawk Missions

- Unmanned Aerial System Synthetic Aperture Radar. (UAS SAR)
  - Flights may begin in 2010.
  - The SAR instrument, already developed by JPL, is contained in a pod and is currently being flown on Dryden's G-III.
  - Northrop Grumman is conducting a feasibility study on adding the UAS SAR wing pods to the NASA Global Hawk aircraft.



- Hurricane and Severe Storm Research.
  - Hurricane missions proposed in 2010 and 2013.
  - Planning workshop at Dryden in late 2008.