



Civil Air Patrol

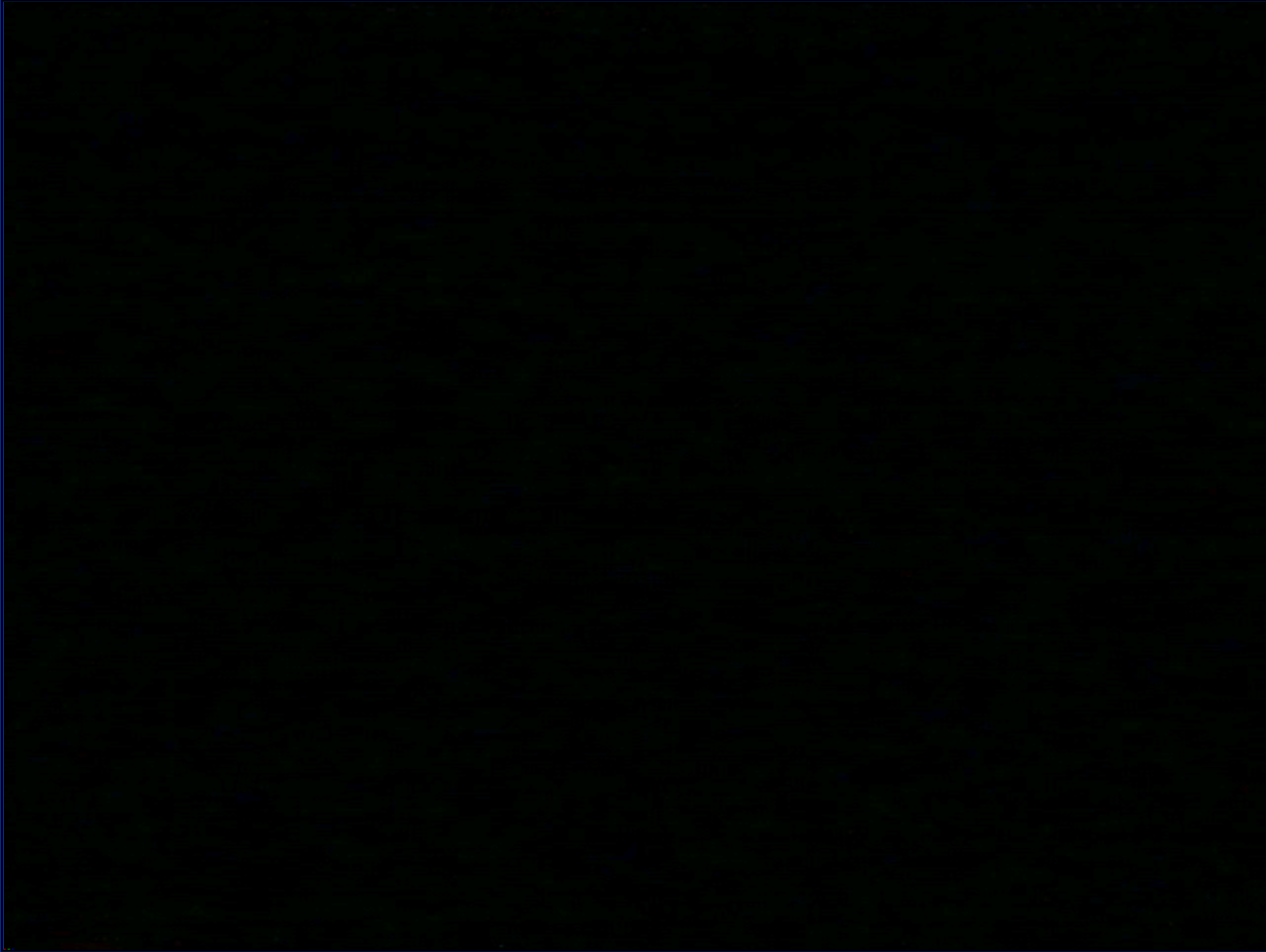


Air Force Incident Manager's Course Briefing



Civil Air Patrol Mission Brief

Lt Col Douglas Goodlin
Director of Operations, Civil Air Patrol-USAF
Mr John Salvador, Lt Col (Ret)
CAP Missions Directorate





History

1941: CAP Established Dec 1st

1943: Transferred to War Department

1946: Incorporated (Public Law 476)

**1948: Auxiliary of the United States
Air Force (PL 557)**

**Missions for America
for over 66 years**

**CAP is a federally chartered nonprofit corporation
CAP is also the official Auxiliary of the Air Force**

First National Board Chairman: Gen “Tooey” Spaatz





To Serve America

... by performing Homeland Security and humanitarian missions for our communities, states, and nation,



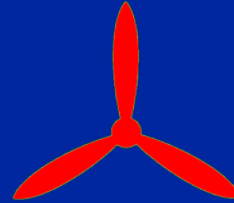
... by developing our country's youth, and educating our citizens on the importance of air and space power.



Missions



Emergency Services



Search and Rescue /
Disaster Response
(SAR/DR)
Homeland Security
Counterdrug
Humanitarian Services
AFROTC Flights



Cadet Programs

Leadership
Physical Fitness
Activities
CAP School Program

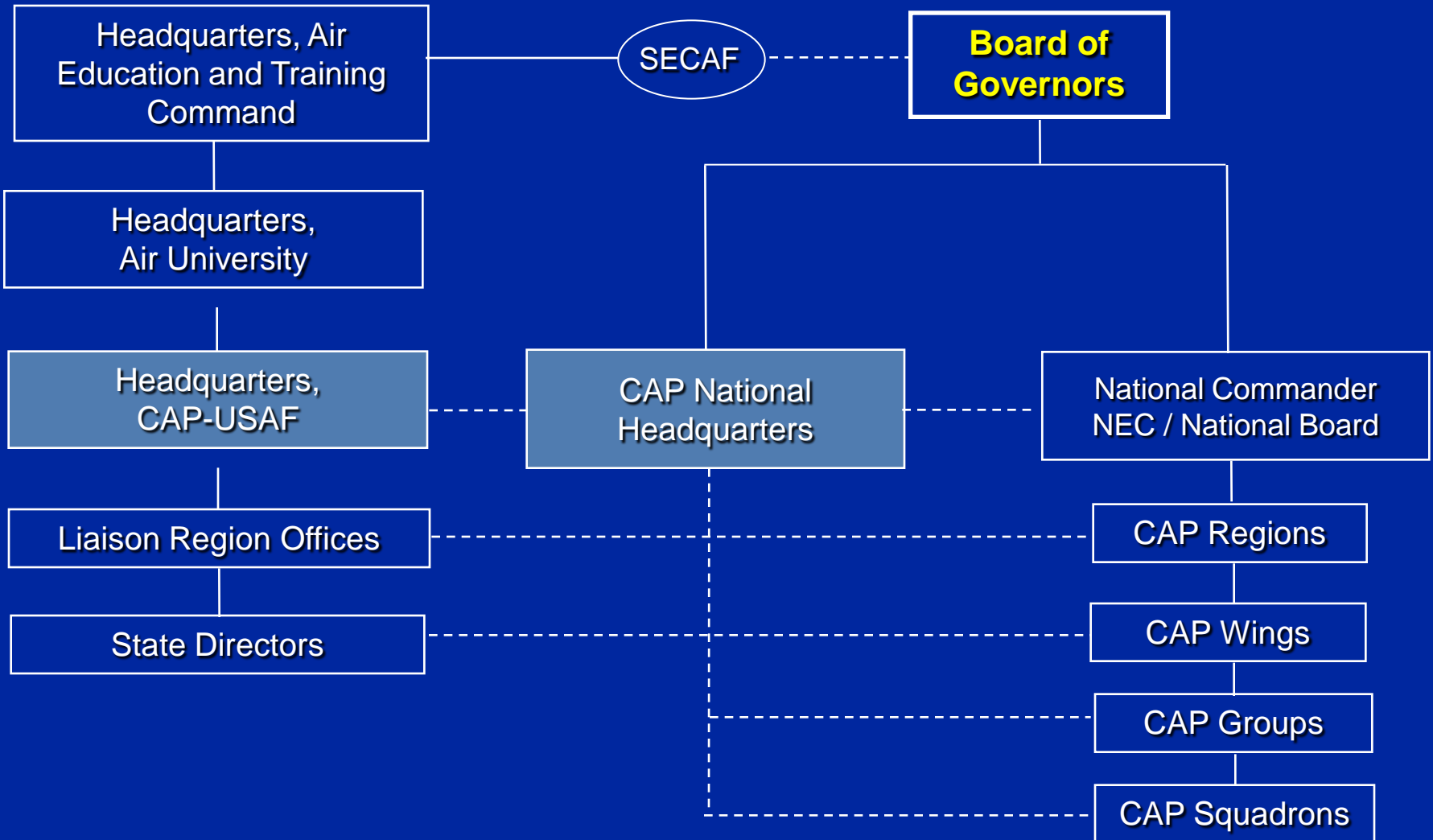


Aerospace Education

CAP Members
Aerospace Educators Members
General Public

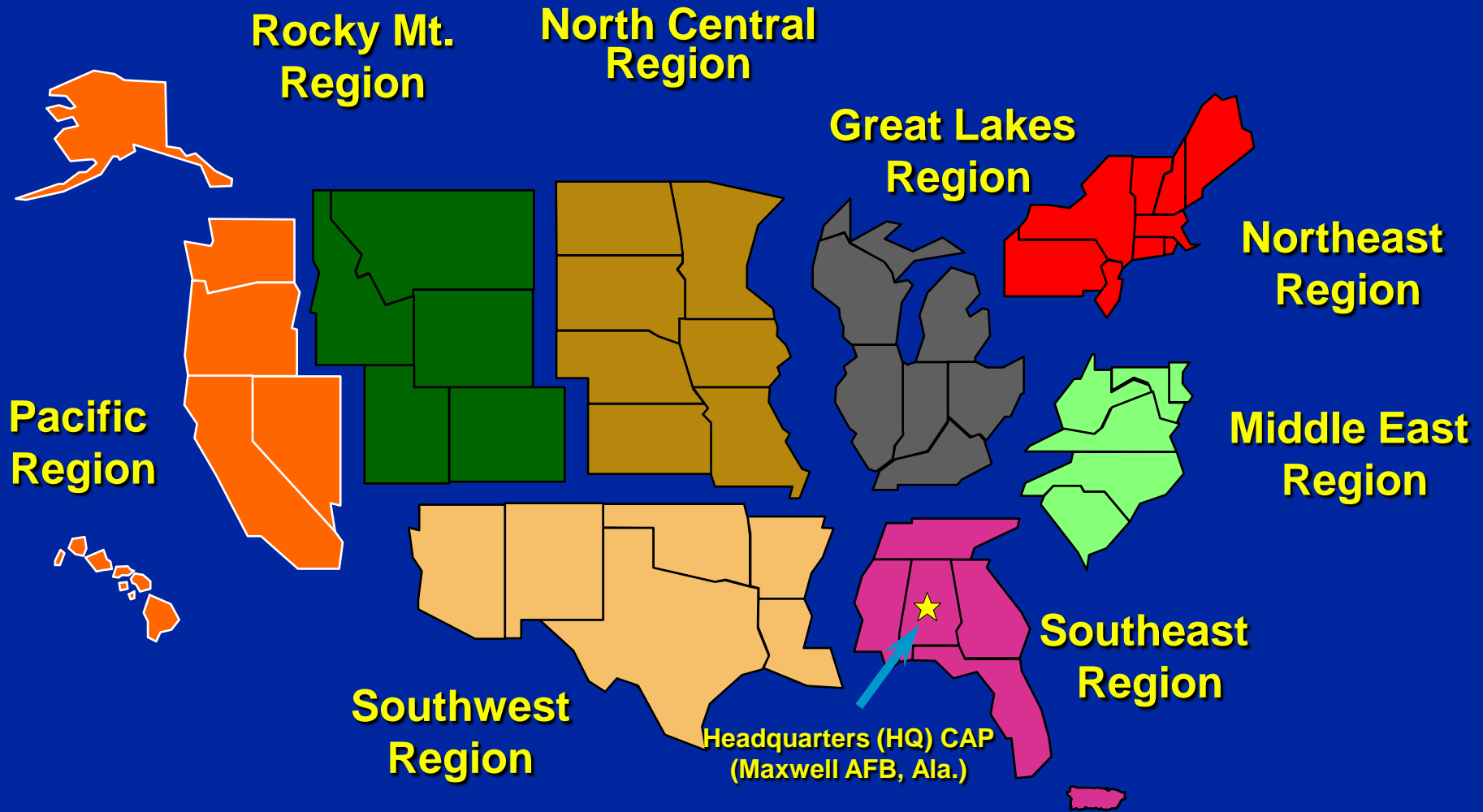


Organizational Structure





Civil Air Patrol Regions

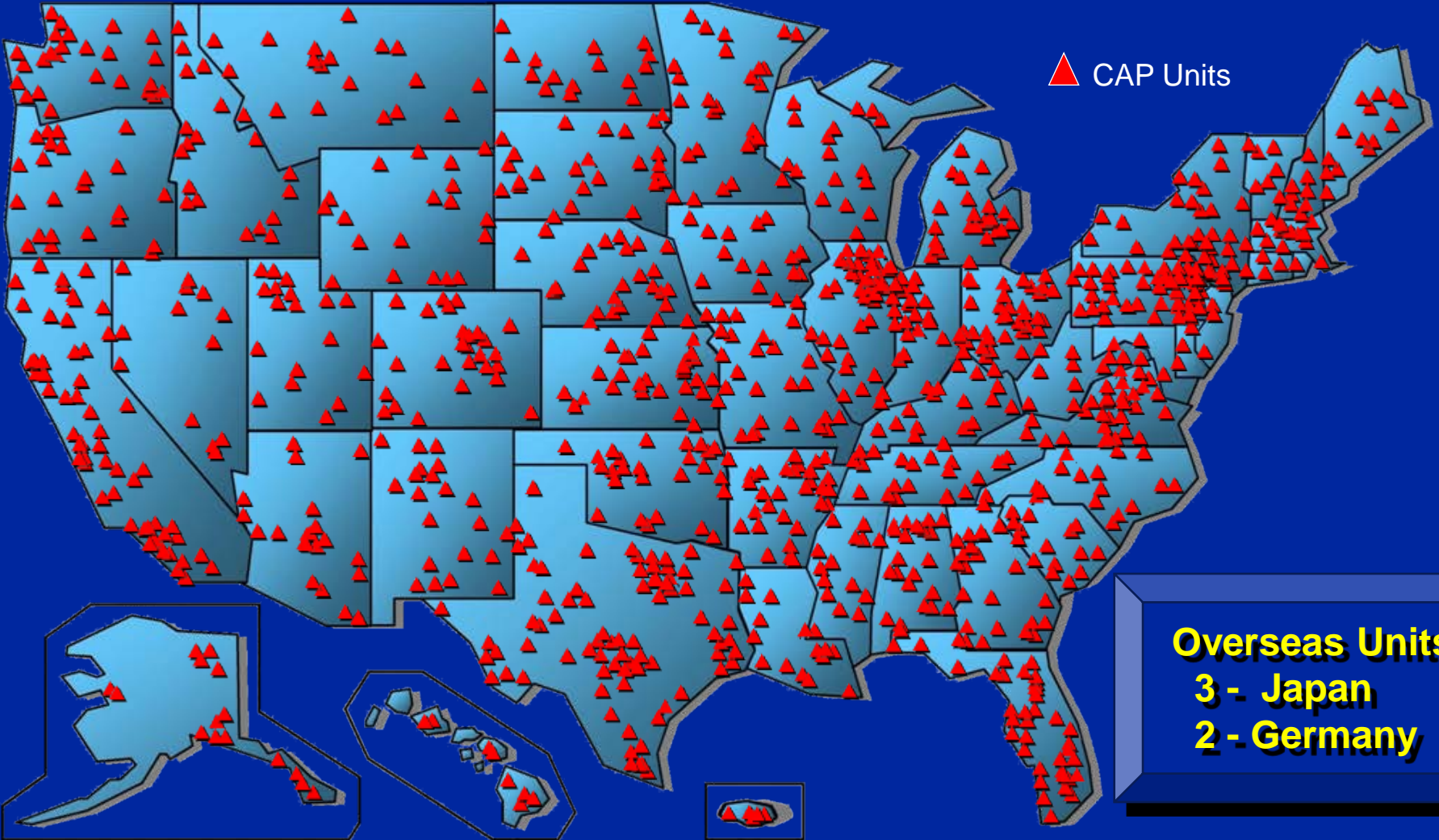




CAP Presence

▲ CAP Units

Overseas Units
3 - Japan
2 - Germany





CAP Resources

**990
Vehicles**



**4,500 Fixed
Land Radios**



56,611 Members

34,575 Officers

22,036 Cadets

**8,100
Mobile Radios**

**530
Aircraft**





CAP Chaplains

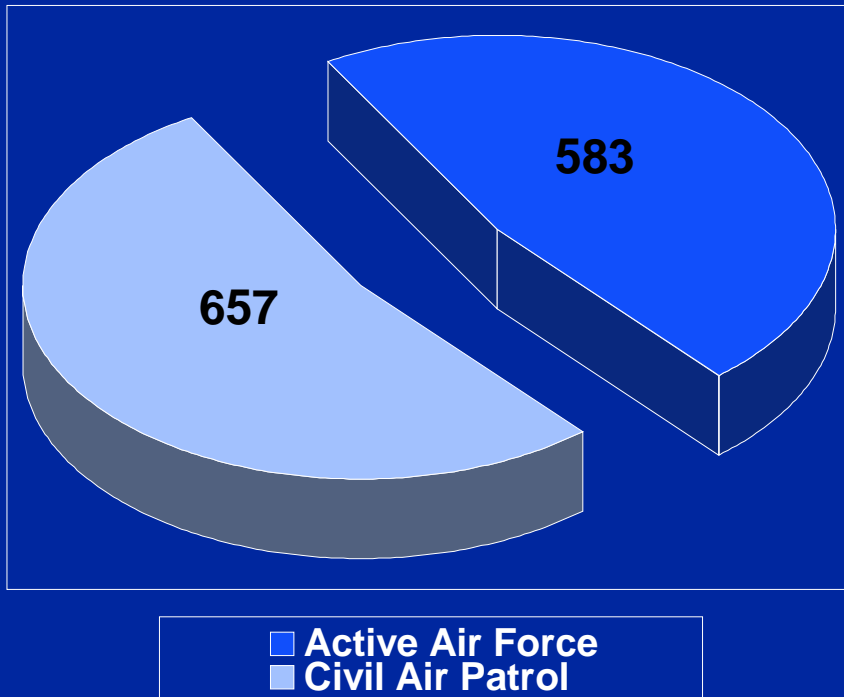


- Same appointment requirements as AF
- Provides CAP moral leadership development
- Assist Air Force Chaplain Service



Chaplain Force Multiplier

A Partnership in Ministries



CAP Chaplains

- Currently support 19 military installations, including 13 AF bases
- Working to integrate chaplains into 1AF contingency plan for Continental United States support



Modern Aircraft

Cessna 182

- Garmin G-1000 glass cockpit
- 88 in the field
- Expect 15 more in Jan 08



Gippsland Aeronautics GA-8

- Hyper Spectral Imaging (ARCHER) platform
- 16 in the field



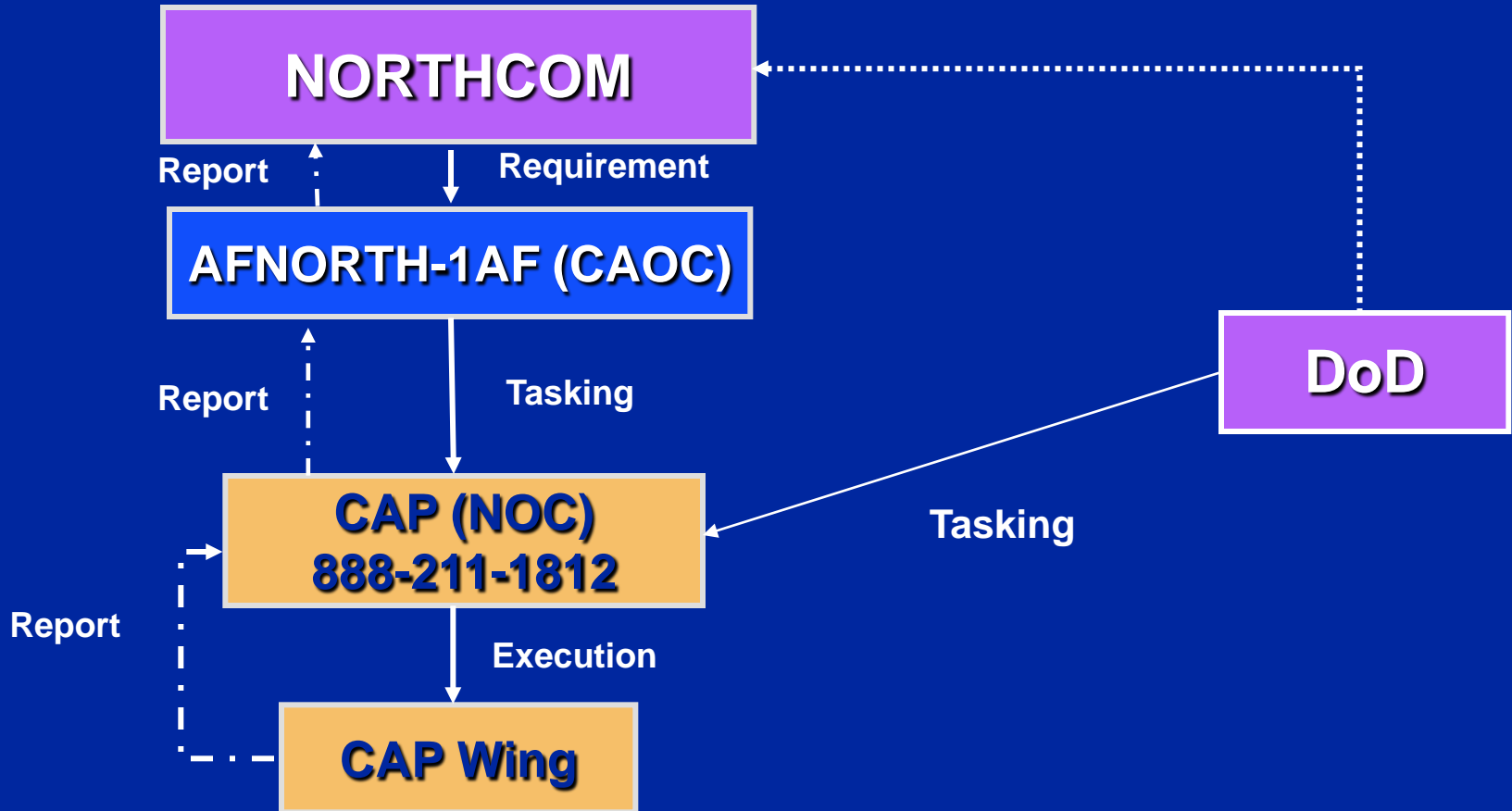


National Operations Center

- **Centralized mission coordination center**
 - **Obtain United States Air Force approval**
 - **AF Assigned & CAP Corporate Missions**
 - **Homeland Security**
 - **Counterdrug**
 - **Disaster Relief**
 - **Coordinate additional resources from other wings**
 - **Consolidate and up-channel mission reports**



Request for Forces



CAP ... Remain Under Military Operational Control ...



AF Crash Support





AFNORTH Exercise

SITUATION: Incident caused damage to the Kentucky Dam on the Tennessee River

REQUIREMENT: Damage assessment photos as soon as possible

RESULT: CAP Images delivered within hours



Pre-mission imagery

Post-mission imagery





Other Exercises

**Federal Emergency
Management Agency
Heartland Response**
- New Madrid Fault Exercise

Northern Command Support
- United Defense
- Determined Promise
- Ardent Sentry/Top Officials

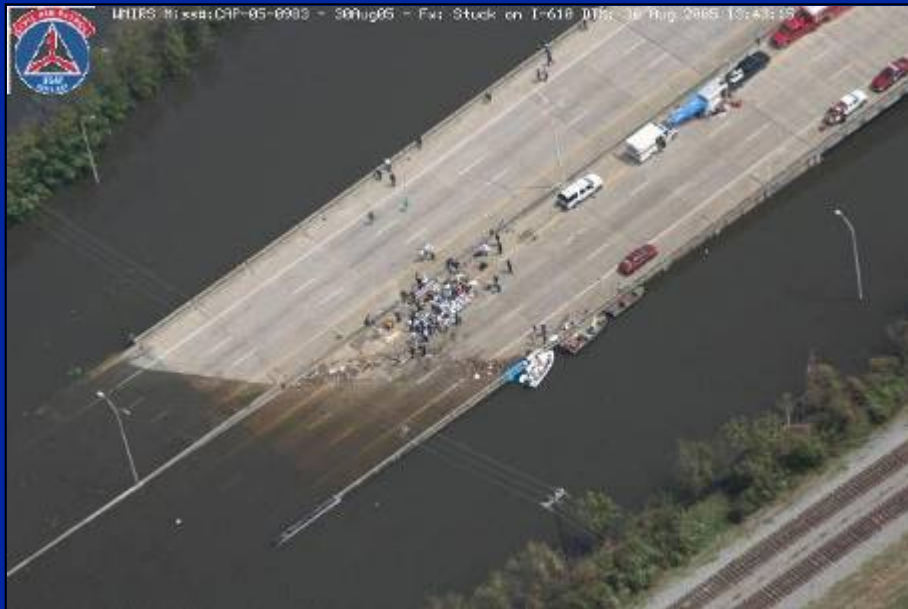




Hurricane Support

Hurricanes Katrina, Rita, Ophelia and Wilma

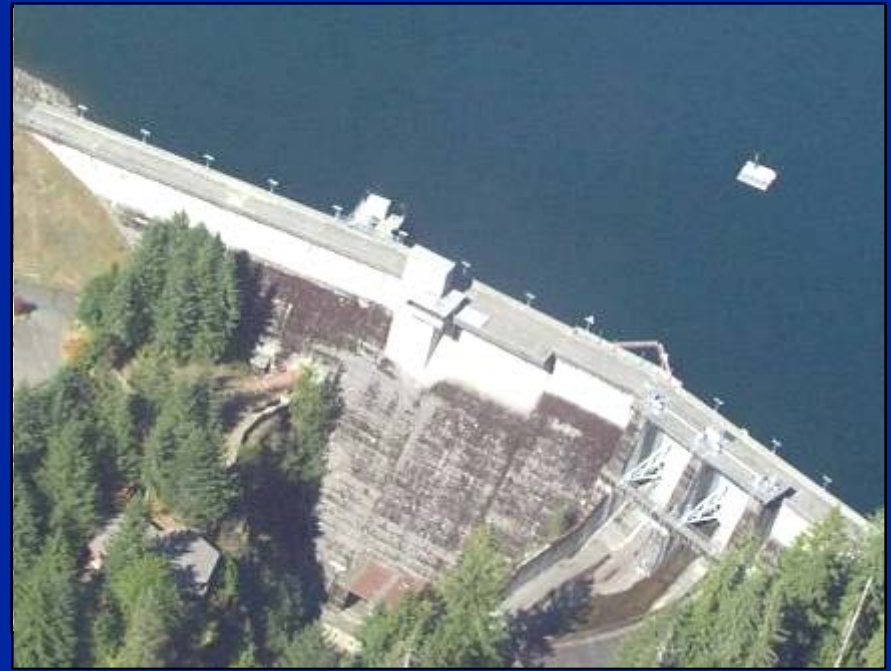
- 1,048 Air Sorties
- 2,023 Flight Hours; 131 Ground Team Missions
- Provided air transportation for hundreds of people





Additional Support

- Critical infrastructure
- Restricted or sensitive areas
- Borders





Operations



SDIS

Satellite-Transmitted Digital Imaging System

- Status
 - 100 systems in service now

ARCHER

Airborne Real-time Cueing Hyperspectral Enhanced Recon

- Status
 - 16 systems fielded





SDIS

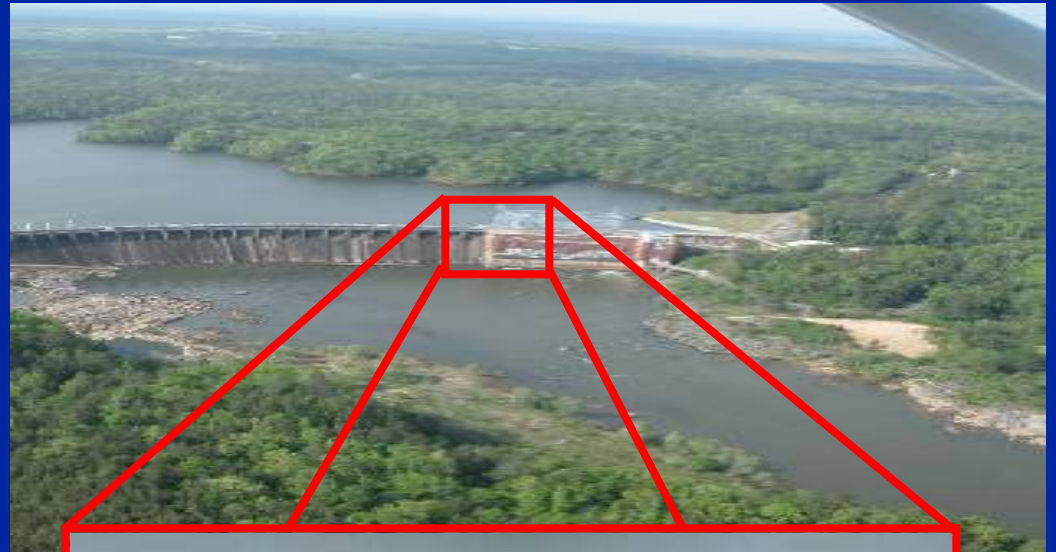
What is SDIS?

Satellite-transmitted

Digital

Imaging

System





SDIS



Digital Photo automatically loaded into aircraft laptop



Locate the target.
Take a digital photo

Image attached to an e-mail and sent via satellite phone



E-mail with image sent by satellite to Globalstar Internet Gateway

Globalstar USA

World Wide Web



Our Customers View in WMIRS



SDIS

Technology that enables CAP to send high resolution digital imagery from CAP aircraft to anyone anywhere in the world

Images are sent as JPEG attachments via standard e-mail to multiple addresses and/or a password-protected website

Imagery is transmitted near real-time. Files take less than 2 minutes to transmit.





SDIS





ARCHER

What is ARCHER?

Airborne

Real-Time

Cueing

Hyperspectral

Enhanced

Recon





ARCHER

- **ARCHER is a custom-designed system of hyperspectral imaging (HSI) hardware and software.**
- HSI is a technology that allows a sensor on a moving platform to **detect and/or gather reflected radiation (light)** from man-made or natural objects on the ground.
- Hyperspectral Imaging will **support current and future CAP missions**
 - Search and Rescue (SAR)
 - Counter Drug (CD)
 - Homeland Security (HLS)



ARCHER

ARCHER executes three separate algorithms for target acquisition and identification:

- **Spectral signature matching:** detects specific spectral signatures using matched filters (find things with known spectral properties)
 - Potential Missions: HLS
- **Anomaly detection:** detects spectral anomalies (things that do not “belong”)
 - Potential Missions: Search and Rescue, Disaster Relief
- **Change detection:** detects changes over time through a pixel-by-pixel comparison.
 - Potential Missions: HLS, Disaster Relief



ARCHER

- ARCHER is a **non-invasive** reflective light technology
- ARCHER will **NOT** make detections:
 - Through solid materials (e.g., roofs, buildings, walls, floors, etc.)
 - Underground
 - Under snow
 - Under water
 - At night



ARCHER



HSI Aircraft: GA-8 Airvan



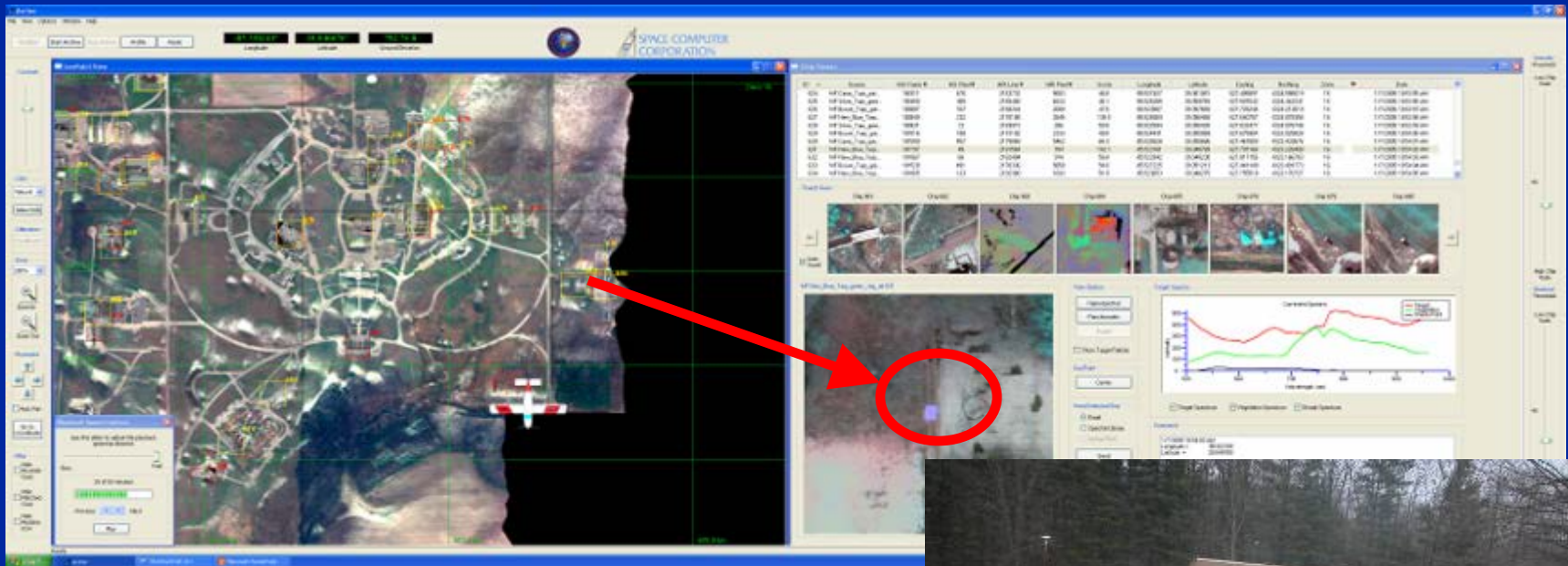
ARCHER



ARCHER Onboard



ARCHER



Seymour, IN Test:
Match Filter Detection



Ground Truth Image of
Target



ARCHER

The screenshot displays the ARCHER software interface. On the left is a satellite map of a forested area with a road. A red arrow points from a small inset on the map to a larger, zoomed-in view of a building on the right. The right side of the interface contains a data table, a spectral analysis graph, and various control panels.

| ID | Name | RT Time (s) | ISF Point | MS Level | MS Point | Sum | Longitude | Latitude | Altitude | Reflex | Dist | Date |
|----|---------------------|-------------|-----------|----------|----------|------|-----------|----------|-----------|--------|------|-----------------------|
| 1 | Archer | 00011 | 001 | 00000 | 000 | 00.0 | 77.47500 | 30.10700 | 304.96200 | 0.20 | 0.00 | 2009/06/11 11:08:12.0 |
| 2 | AP Hill, South-East | 00008 | 002 | 00000 | 000 | 07.5 | 77.47500 | 30.10700 | 300.70700 | 0.20 | 0.00 | 2009/06/11 11:08:12.0 |
| 3 | Archer | 00004 | 000 | 00000 | 000 | 07.5 | 77.47500 | 30.10700 | 300.00000 | 0.20 | 0.00 | 2009/06/11 11:08:12.0 |
| 4 | AP Hill, South-East | 00006 | 001 | 00000 | 000 | 14.0 | 77.47500 | 30.10700 | 300.00000 | 0.20 | 0.00 | 2009/06/11 11:08:12.0 |
| 5 | Archer | 00003 | 001 | 00000 | 000 | 20.5 | 77.47500 | 30.10700 | 300.00000 | 0.20 | 0.00 | 2009/06/11 11:08:12.0 |
| 6 | AP Hill, South-East | 00005 | 004 | 00000 | 000 | 26.0 | 77.47500 | 30.10700 | 300.00000 | 0.20 | 0.00 | 2009/06/11 11:08:12.0 |
| 7 | Archer | 00002 | 001 | 00000 | 000 | 32.0 | 77.47500 | 30.10700 | 300.00000 | 0.20 | 0.00 | 2009/06/11 11:08:12.0 |
| 8 | AP Hill, South-East | 00007 | 003 | 00000 | 000 | 38.0 | 77.47500 | 30.10700 | 300.00000 | 0.20 | 0.00 | 2009/06/11 11:08:12.0 |
| 9 | Archer | 00000 | 001 | 00000 | 000 | 44.0 | 77.47500 | 30.10700 | 300.00000 | 0.20 | 0.00 | 2009/06/11 11:08:12.0 |
| 10 | AP Hill, South-East | 00009 | 002 | 00000 | 000 | 50.0 | 77.47500 | 30.10700 | 300.00000 | 0.20 | 0.00 | 2009/06/11 11:08:12.0 |

The spectral analysis graph shows 'Observed Spectra' (red line) and 'Match Filter Spectra' (green line) plotted against 'Wavelength (nm)'. The graph shows a significant peak in the observed spectra around 650-700 nm, which is highlighted by a red circle in the zoomed-in image.

**Fort AP Hill Test Mission:
Match Filter Detection**

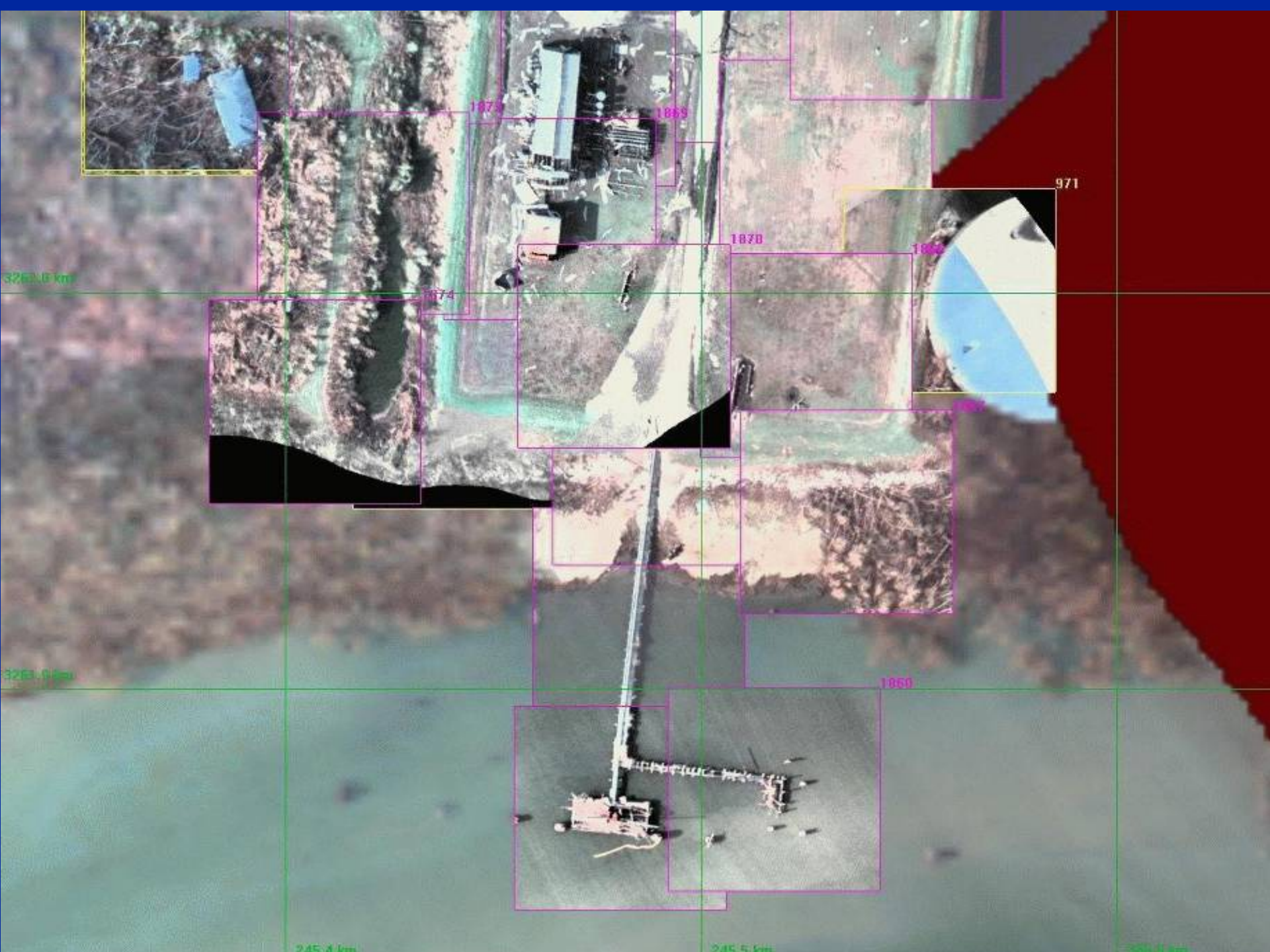


ARCHER



**Mojave, CA Test:
Target Deployment**





3263.0 km

3263.0 km

245.4 km

245.5 km

3263.0 km



1873

1869

1870

1864

971

1874

1860



SDIS & ARCHER Combined

Hurricane Katrina Support



SDIS



HSI



ARCHER Change Detection



Sortie 1

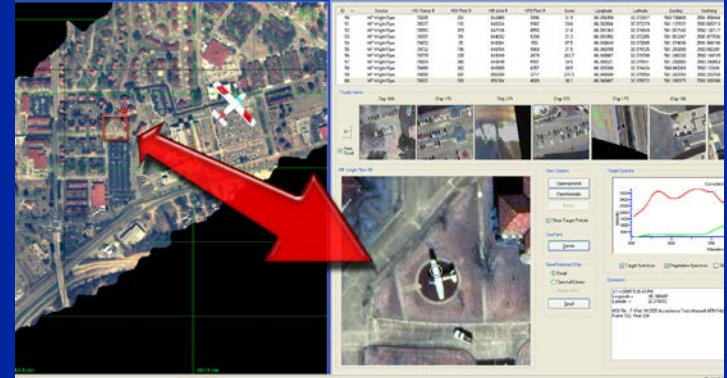


Sortie 2



Missions Flown

- Air Force Rescue Coordination Center
- Northern Command
- Bureau of Land Management
- US Geological Survey
- Environmental Protection Agency
- Air Force Research Lab/Naval Research Lab
- State of Missouri, Department of Natural Resources
- US Army Corp of Engineers
- US Forest Service



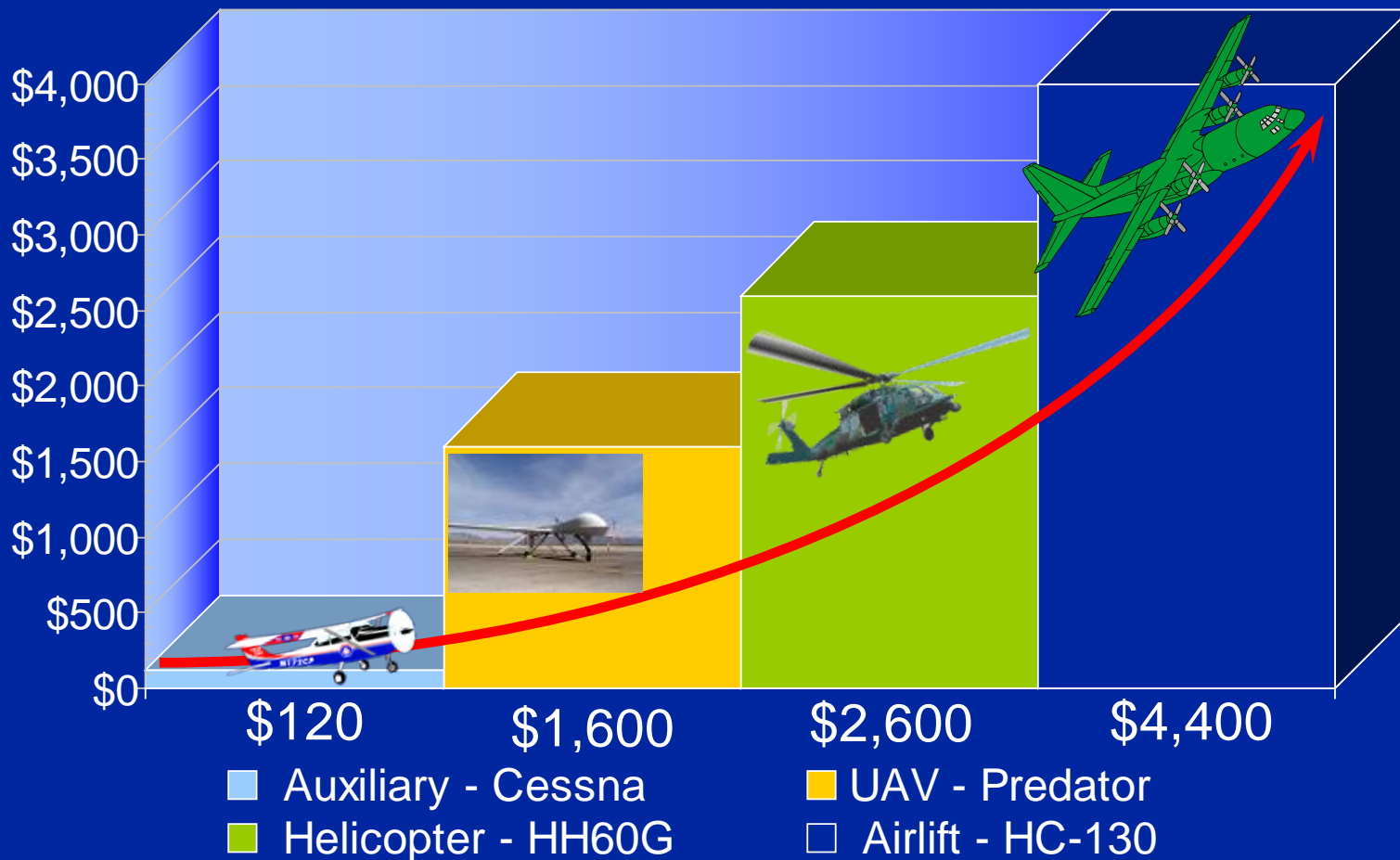


Support Available to You

- **Airborne Reconnaissance**
- **Intercept Training**
- **Communications Support**
- **Off/on-station cordon support & crowd control**
- **Shelter Management**
- **Critical Incident Stress Management**
- **Chaplain Services**
- **Base Exercise Evaluation Team support**



Cost-effective Force Multiplier





Bottom-line

- **Civil Air Patrol is ready, willing, and able to assist with any emergency or contingency**
- **Civil Air Patrol volunteers will meet your requirements for responsiveness through training, education, and professionalism**
- **Civil Air Patrol is a cost effective force multiplier and wants to help!**



Civil Air Patrol



... performing missions for America!