

The background of the slide is a composite image. The lower half shows a rugged mountain range with peaks colored in vibrant shades of purple and magenta, while the valleys and lower slopes are a deep green. The upper half of the image shows a sky with soft, wispy clouds in shades of grey and white, with a warm, orange glow emanating from behind the clouds on the right side, suggesting a sunset or sunrise. The overall mood is dramatic and atmospheric.

NASA Activity Update

Vince Ambrosia

NASA-Ames Research Center

WRAP Accomplishments 2010

- ARRA Funded effort to sustain and mature data collection over fires and partnership arrangements (2009-2011).
- NASA Wildfire Science Venture Class proposal was not funded.
- Build-up AMS capabilities to support active and post-fire assessments
 - Improve fire detection algorithm (add visible channel to reduce false positives).
 - Improve NBR
 - Improve data visualization products (mosaicing, color balance)
- Develop NASA B200 (801) to support sensor installation.
- SBIR Phase II Fire Instrument Development (Xiomas WAI Instrument) delivered.
- Grant of Phase III to XIOMAS for WAI upgrades
 - Addition of Vis / IR camera channels
- Signed agreement with CalFire
- New Agreement with RSAC being signed

2009 WRAP Accomplishments

WRAP ARRA Project: *“Sustaining and Transitioning NASA Airborne Wildfire Observation Capabilities: Disaster Monitoring Improvements for California and the Nation”*

– **MAJOR FOCUS ELEMENTS:**

- NASA supported Fire Mission Continuity Support through FY2011;
- Mature collaboration with CalFire and USFS to foster technology transfer and adaptability.

– **PROPOSAL DURATION:** July 09-Sept. 2011 (2 years).

– **BUDGET:** \$1.3M

– **DISPOSITION:** Funded.

• **Additional “Stimulus” Support to NASA Airborne Sciences:**

- Develop NASA DFRC B-200 KA as a sensor platform.
- Integrate Inmarsat Com package on B-200 KA.

2011 Mission Platforms



King Air B-200

Operations: ~32K ft; 1883 nm

Endurance: ~4.0 hours

Speed: 250 kts

Onboard Operators: 4 (inc. flt team)

Payload: 2000 lbs of instruments

Sensor telemetry: Inmarsat (planned)

Ikhana UAS

Operations: ~50K ft; >4000 nm

Endurance: ~24-hours

Speed: 170-200 kts

Payload: 2400 lbs of instruments

C&C and sensor telemetry: C-band (local) &

Ku-band (global)

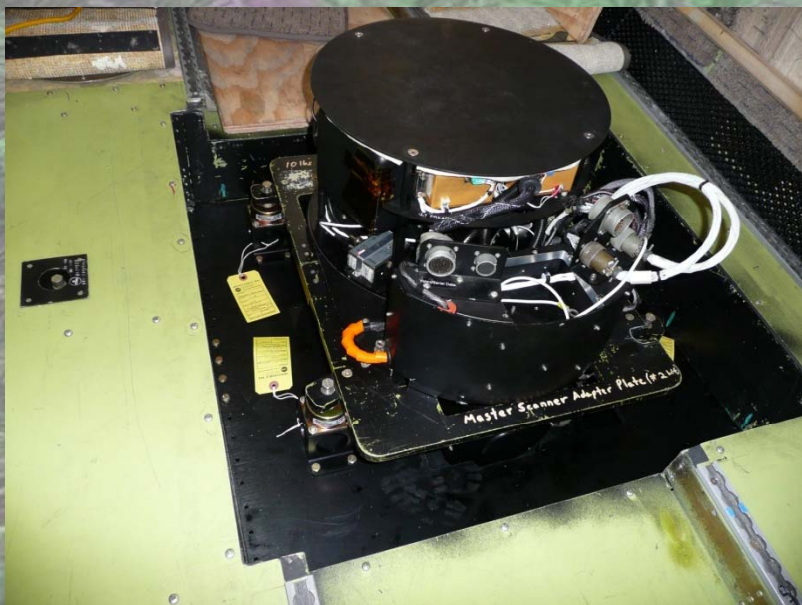
COA Issues



AMS Integration on DFRC B200



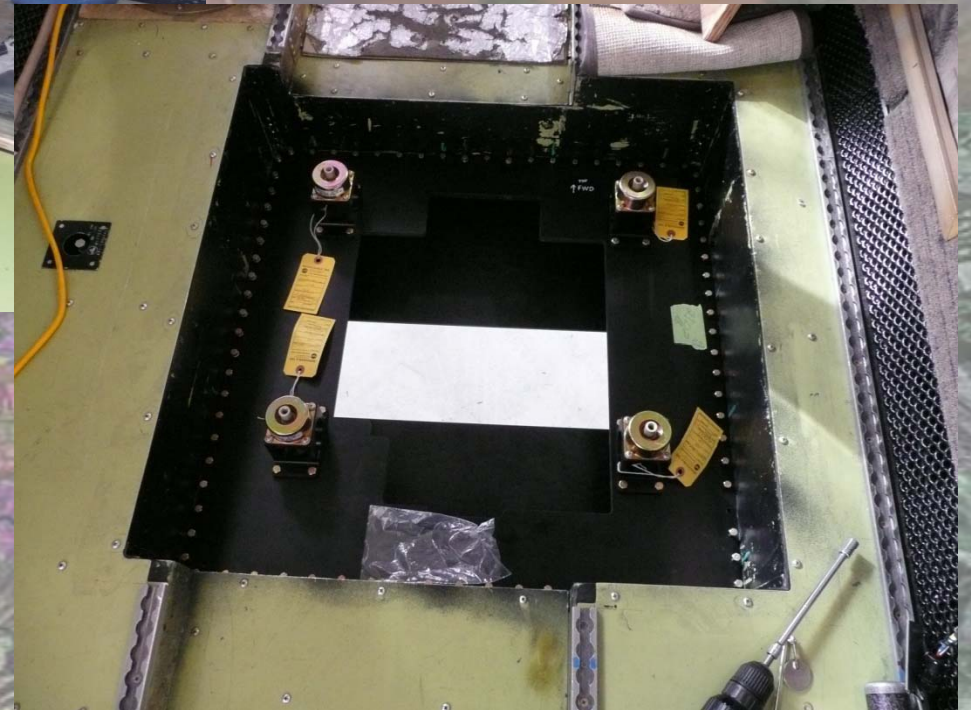
AMS Integration on DFRC B200



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AMS Integration on DFRC B200



AMS on DFRC B200 Schedule

AMS Fit Checks: 10-10 to 11-10

AMS Tech Brief: 10-28-10

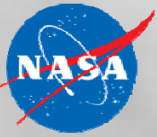
CST (Combined Systems Test): 11-4-10

Shakedown Flight: 11-5-10 or 11-8-10

AMS Checkout Flight #1(In DFRC Vicinity (Palmdale): ~11-10-10

AMS Checkout Flight #2 (L. Tahoe / Fires?): ~11-12-10 or ??

AMS Ready to “stand-up” wildfire missions: 11-16-10



SBIR: Airborne Wide Area Imager for Wildfire Mapping and Detection

Objective

An autonomous airborne imaging system for earth science research, disaster response, and fire detection is proposed.

The primary goal is to improve information to researchers and operations personnel at reduced cost. By operating autonomously and with higher spatial resolution, the system will deliver a 3X to 4X reduction in operating costs compared to current systems.

The system uses a two color Quantum Well Infrared Photo detector (QWIP) to improve the accuracy of energy release from wildfires, thereby improving our understanding of the carbon cycle.

Approach:

Combine high resolution framing devices (cameras) with a step-stare scanning mirror, resulting in high spatial resolution imagery and wide area coverage.

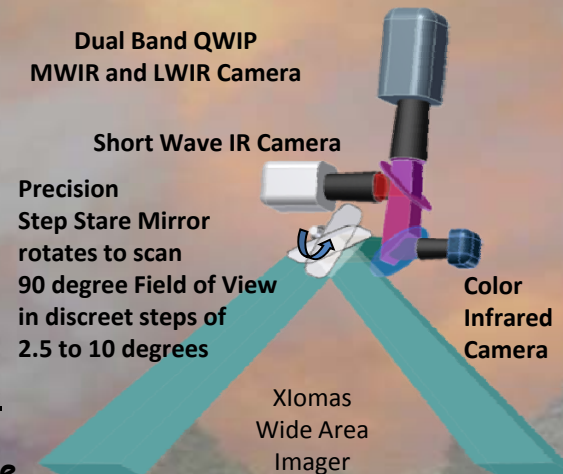
The design of the sensor head is flexible allowing for a variety of imagers including; visible and IR cameras and/or hyperspectral sensors.

The Xiomax Wide Area Imager incorporates NASA's Airborne Modular Sensor Architecture and Collaborative Decision Environment to support both Incident Command and front line responders

Xiomax Technologies, John Green,
johnngreen@xiomas.com

Deliverables

**1 Operational
Airborne Prototype**



Attributes

Customer need (Critical, Highly Desirable, Desirable) and list of relevant Missions/projects/programs: The project is aimed at advancing sensor development for Earth Science and Observation particularly with regards carbon cycle research, disaster response, fire research, autonomous systems operation, and reducing the size weight and power while increasing the operational efficiencies of remote sensing systems

- Contacts (mission/HQ): Jim Brass/Steve Ambrose
- Technology readiness level (entry/exit): 3/6 to 7
- Importance relative to competitive solutions (hi, med, low): hi

WRAP Plans for 2011 Fire Season

- Fly AMS on NASA B200 (have 35 hours of ops funded) supporting fires (disasters),
- Develop process with partners for data collection, handling, integration into operational systems. Train NIFC engineers to operate AMS. Transition AMS (on loan) for operations on “new” USFS B200, supporting fire observations.
- WAI bench tests and acceptance testing at Ames following WAI additions / modifications.
- Loan WAI to USFS / NIFC, develop flight test plan, support engineering training