



National Aeronautics and Space Administration

Airborne Science Newsletter



Winter 2011

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In Brief ...

AMS Integration for Western States Fire Mission

The Dryden King Air 801 has recently been reconfigured as a real time, remote sensing platform. Modifications for downward looking sensors and Inmarsat communications were accomplished earlier in the fall. The Ames Autonomous Modular Sensor (AMS) has been integrated and tested. The Wildfire Research and Applications Partnership will be utilizing the new capability in the upcoming fire season.

ASP Personnel Moves

Anthony Guillory has moved from ASP Wallops where he managed the Catalogue Aircraft Program and supported numerous other HQ activities. Anthony is now supporting the ESSP Program Office as a mission manager for EV1 activities based at Langley Research Center.

Brenda Mulac, supporting the FAA Unmanned Program Office, has passed the torch to Langley's Roland Wescot. Brenda continues to support UAS in the NAS activities.

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Operation Ice Bridge - Antarctica

During October and November, the NASA DC-8 returned to Punta Arenas, Chile, to participate in Operation IceBridge Antarctic. This was the second consecutive year where researchers used the DC-8 to perform airborne surveys of Antarctic sea ice, ice sheets, and glaciers. Equipped with a suite of seven instruments that consisted of radars, lidars, high definition digital cameras, and a gravimeter, the DC-8 and its team executed ten science flights over the Antarctic continent and surrounding waters. Each flight, lasting between ten to twelve hours, covered vast distances and areas.

The research team, headed by Project Scientist Michael Studinger of the Goddard Space Flight Center, used laser instruments to map the ice/snow surface altitude, radars to investigate the depth of snow layers and the thickness of ice sheets to the bedrock below, high



The Getz Ice Shelf extends several miles into the ocean as it empties into the ocean along the Antarctic coast. Photo was taken, Nov. 5, from NASA's DC-8. Credit: NASA/Dick Ewers

definition digital cameras to document surface details, and the gravimeter to measure distance to the interface of water and ice under ice sheets and sea ice. The goal was to survey key areas of potential rapid change as part of an ongoing annual assessment. The Weddell, Bellingshausen, and Amundsen Seas were of greatest

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The DC-8 team prepares for another long science flight over the Antarctic Continent. Credit: NASA/Frank Cutler



The Pine Island Glacier as it empties into the ocean along the Antarctic coast. The NASA DC-8 skirts the cloudy coastal edge of the glacier during its survey mission. Credit: NASA/Chris Miller

Ice Bridge Antarctica

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interest for measuring the extent of sea ice coverage. The entire Weddell Sea was traversed to the Brunt Ice Shelf southeast of the Antarctic Peninsula where the team accomplished surveys of the Pine Island Glacier and its ice tributaries. Pine Island is the largest ice stream in West Antarctica and scientists are interested in monitoring this glacier's potential for contributing to sea level rise. The team conducted surveys over the Getz and Dotson Ice Shelves, as well. Another key accomplishment was completing a survey of the entire 86 deg. south parallel that began last year. This is the farthest southern point observed by the CryoSat satellites during their orbits. Two trips were made this year to the 86 deg. south parallel to accomplish this task and both trips included an overflight of the Amundsen-Scott South Pole Station.



The DC-8 maintenance team in Punta Arenas, Chile, prepares the aircraft for another long science flight over the Antarctic Continent. Credit: NASA/Frank Cutler.



The DC-8 over the South East edge of the Weddell Sea paralleling the Brunt Ice Shelf. Credit: NASA/Frank Cutler

ASP Leadership Perspective



great holiday and Happy New Year and is ready to get back to work, refreshed and ready to start the year off right.

Welcome to another addition of the ASP Newsletter. We've successfully completed a number of missions this quarter including another long deployment to Chile for Operation Ice Bridge. My congratulations to all involved and my thanks to all of the Airborne Science personnel who made those collections a reality. I'd like to start this year off right by finding ways to improve the program. With that in mind, I am requesting feedback, not just from PI's but from anyone who has dealings with the Airborne Science Program. Please feel free to e mail Randy or myself directly or give us a call to help improve the Airborne Science Program. Thanks and I hope everyone had a

Bruce Tagg
Airborne Science Program Director

BPA Aircraft

The NASA Wallops Flight Facility is responsible for maintaining the Airborne Science Commercial Catalog for NASA. The current catalog consists of 22 different types of manned and unmanned aircraft ranging from the Aerosonde Unmanned Aerial System (UAS) to the "Stargazer" L-1011 carrier aircraft and even an F-104 Starfighter. The available aircraft/UAS provide a variety of flight regimes and experimenter accommodations from low to high altitude flight profiles, multiple options for experimenter power and payload ports, various airspeeds, and a wide range of payload capacities. Wallops personnel work with each experimenter to gather mission and payload requirements to assist in determining the type of aircraft that is appropriate for a given mission. Many of these commercial aircraft have been incorporated into a Blanket Purchase Agreement (BPA) that establishes rates and a contract mechanism to quickly use the companies' services. At the same time, there is no minimum purchase requirement. Additional aircraft are pending contract award and will be available for use in the near future. A full listing of the available aircraft can be found at: www.airbornescience.nasa.gov under the "Platforms" tab. To find out more or to contract the use of one of these aircraft, please contact Mike Cropper at 757-824-2140, Michael.C.Cropper@nasa.gov.

In Brief (continued from page 1)

ICARE 2010

The International Conference on Airborne Research for the Environment (ICARE) and Aircraft Exhibition was held in Toulouse, this last October. The conference focused on highlighting user requirements and development strategies, and implementations for transnational access. Side meetings for ICCAGRA, ISPRS WG1/1 and UAS for Civil Contingencies were included.

WB-57 Update

Gross weight increase

The two JSC WB-57s are now certified to fly with two Superpod fore-bodies plus two of our existing wing pods, for a total of four science pods carried at one time. We will use a modified version of this configuration during the MACPEX campaign in the Spring. One of the Superpod fore-bodies will be replaced with a wing pod, modified to fly in the Superpod location.

Additionally, the aircraft are certified to fly with a takeoff gross weight of 72,000 lbs, up

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WB-57 Update

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from 63,000 lbs previously. Because of center of gravity constraints, the weight increase doesn't allow us to add much fuel to an 'empty' airplane, i.e., one with no payloads aboard. However, with most payload configurations, we don't have to sacrifice any fuel (or range, or endurance) because of the payload weight. We are still developing experience flying at the higher weights, but we expect to be able to fly for six hours with most any payload weight - a great improvement.

New Program Manager

Beginning with the new year, Scott Gahring will replace Ken Cockrell as the WB-57 Program Manager. Scott comes to us with rich experience in program management and will be a great leader for the team. Ken will still have involvement with ASP as a pilot and project manager for the second GIII UAVSAR effort.



Spotlight On

The people behind Operation ICEBridge and ARCTAS



G-III Team in Cold Bay, AK: (L-R) Dick Ewers, pilot; Tom Ryan, pilot; Gary Carlson, Crew Chief; Michelle Haupt, Mission Director; Ron Muellerschoen, UAVSAR processor; Tim Moes, Mission Manager; Tim Miller, UAVSAR operator

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NASA SMD ESD Airborne Science Program 6-Month Schedule

FY2011

	December	January	February	March	April	May
WB-57	Autopilot test flights/Phase Maintenance	HIWRAP/HIRAD			MACPEX	
P-3		DIB/DISCOVER-AQ Mods			OIB Greenland	
DC-8		DESDyni SweepSAR demo		AAFExII	IIP Lidar	
ER-2	MABEL, CATS, CPL, TWiLite	MABEL, CATS, CPL, RSP BAS	BAS	MABEL, CATS, CPL, RSP BAS		
G-III	Local Science				UAVSAR San Andreas/HI/Costa Rica	
UC-12	Biomass burning					
GHawk	KC-X	APCS install		APCS install		KC-X
Lear 25		Dropsonde tests	Solar Cell		ALIST	
B-200				DISCOVER-AQ	AID for ASCENDS	
SIERRA				MMS, Picarro		MMS, Picarro
TwinOtter					CARVE MAGI	
BT-67	ICECAP/OIB					
G-I					4-STAR	

WB-57 ER-2 UC-12 Maintenance
P-3 B-200 G-III GHawk BT-67
DC-8 Lear25 T. Otter SIERRA G-I

Spotlight On

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P-3 Flight Engineers and mechanics Brian Mills (left) and John Doyle (right) taken during ICEBridge 2009 flights.



WFF senior aircraft technicians Pete Peyton, John Doyle, and Bill McGrory completing the scheduled phase maintenance on the GSFC WFF Kingair NASA 8.



Crew members Brian Yates (above) and Bill McGrory (right) moonlight as crew cooks while on the road.



Pete Peyton (left) assisting with CAR installation during ARCTAS.



Jeff Sigrist (left) and John Doyle (right) installing Kansas radar antennas in P-3 bomb bay for ICEBridge 2010.

Platform Capabilities

Available aircraft and specs

Airborne Science Program Resources	Platform Name	Center	Duration (Hours)	Useful Payload (lbs.)	GTOW (lbs.)	Max Altitude (ft.)	Airspeed (knots)	Range (Nmi)	Internet and Document References
Core Aircraft	ER-2	NASA-DFRC	12	2,900	40,000	>70,000	410	>5,000	http://www.nasa.gov/centers/dryden/research/AirSci/ER-2/
	WB-57	NASA-JSC	6.5	8,800	72,000	65,000	410	2,172	http://jsc-aircraft-ops.jsc.nasa.gov/wb57/
	DC-8	NASA-DFRC	12	30,000	340,000	41,000	450	5,400	http://www.nasa.gov/centers/dryden/research/AirSci/DC-8/
	P-3B	NASA-WFF	12	16,000	135,000	30,000	330	3,800	http://wacop/wff.nasa.gov
	Gulfstream III (G-III) (mil: C-20A)	NASA-DFRC	7	2,610	45,000	45,000	459	3,400	http://airbornescience.nasa.gov/platforms/aircraft/g3.html
NASA Catalog Aircraft	King Air B-200 AND UC-12B	NASA-LARC	6.2	4,100	12,500	35,000	260	1250	http://airbornescience.nasa.gov/platforms/aircraft/b-200.html
	DHC-6 Twin Otter	NASA-GRC	3.5	3,600	11,000	25,000	140	450	http://www.grc.nasa.gov/WWW/AircraftOps/
	Learjet 25	NASA-GRC	3	3,200	15,000	45,000	350/.81 Mach	1,200	http://www.grc.nasa.gov/WWW/AircraftOps/
	S-3B Viking	NASA/GRC	>6	12,000	52,500	40,000	450	2,300	http://www.grc.nasa.gov/WWW/AircraftOps/
	Ikhana (Predator-B)	NASA-DFRC	30	3,000	10,000	52,000	171	3,500	http://airbornescience.nasa.gov/platforms/aircraft/predator-b.html
	T-34C	NASA-GRC	3	300	4,400	25,000	100-200	550	http://www.grc.nasa.gov/WWW/AircraftOps/
New Technology	Global Hawk	NASA-DFRC	30	1500	26,750	65,000	335	10,000	http://airbornescience.nasa.gov/platforms/aircraft/globalhawk.html
	SIERRA	NASA-ARC	11	100	445	12,000	60	550	http://airbornescience.nasa.gov/platforms/aircraft/sierra.html

ASP Upcoming Events

- * AIAA 48th Aerospace Science Meeting
Jan. 4-7 2011
Orlando World Center Marriott, Orlando, Florida
<http://www.aiaa.org/events>
- * AMS 91st Annual Meeting
January 23-27, 2011
Seattle, WA
www.ametsoc.org/meet/annual
- * Unmanned Systems Program Review
February 1-3, 2011
Washington, D.C.
<http://www.auvsi.org>
- * 34th Intl. Symposium on Remote Sensing of the Environment (ISRSE)
April 10-15, 2011
Sydney, Australia
REGISTRATION is OPEN
<http://isrse34.org>
- * ASPRS 2011 Annual Meeting
May 1-5, 2011
Milwaukee, WI
www.asprs.org/meetings/upmeeting.html
- * IGARSS 2011
July 31 - Aug. 5, 2011
Sendai, Japan
<http://igarss11.org>
Call for Papers is Open
- * SMAP Cal/Val Workshop #2
May 3-5, 2011
Oxnard, CA
<http://smap.jpl.nasa.gov/science/workshops/>
- * ASRPS 2011 Fall Pecora Conference
Nov. 14-17, 2011
Hilton Hotel at Washington Dulles Airport
Herndon, VA*
- * AUVSI's Unmanned Systems North America 2011
<http://symposium.auvsi.org/auvsi11/public/enter.asp>
- * AGU Joint Assembly
Sept. 27-30, 2011
Marseilles, France
<http://www.agu.org/meetings/>

Call for Content

Working on something interesting, or have an idea for a story? Please let us know, we'd love to put it in print.

Contact Steve Wegener (650/604-6278, steven.s.wegener@nasa.gov) or Matt Fladland (650/604-3325, matthew.m.fladland@nasa.gov).