Federal Aviation Administration
Alaskan Region

Capstone Program Management Office
801 B Street, Suite 500
Anchorage Alaska 99501

Capstone Quarterly Report

2nd Quarter FY00

January - March 2000

ALASKAN REGION

Capstone

Investment in Safety

Capstone To Date

Several major milestones toward our goal of improving aviation safety and efficiency by putting cost effective, new technology avionics equipment into commercially operated aircraft in the Yukon-Kuskokwim delta region has been achieved during this, the second quarter of FY00.

One of the most significant was the issuance of a Supplemental Type Certificate (STC) to UPS Aviation Technologies, Inc. (UPS AT). Gregory Holt, Manager, Anchorage Aircraft Certification Office, issued STC Number SA02149AK, dated February 2, 2000, to UPS AT for installation of their GX50/60 Global Positioning System (GPS) navigator, MX20 multifunction display (MFD), and Universal Access Transceiver (UAT). This follows several months of intensive testing and a substantial amount of analysis by August Asay, Anchorage Aircraft Certification Office, and human factors experts from the Small Aircraft Directorate. The STC provides authorization to install the Capstone avionics suite in 23 various types of small aircraft commonly used in commercial passenger and freight operations in rural Alaska. The approved suite includes; a cockpit display with moving map, ADS-B traffic and terrain advisories, a GPS navigation/communications unit, and a UAT digital datalink transceiver. Also included are IFR and terrain databases. The MFD will also be used to display flight information services (FIS) messages (text messages and graphical weather information) and traffic information service broadcast (TIS-B) when those functions are implemented.

Another significant milestone was receiving the first shipment of operational Capstone displays and data link transceivers from UPS AT on February 10 and 11, 2000. The delivery included twenty (20) MX20 MFDs and twenty (20) UATs. The avionics began arriving seven days after the STC was issued. The Capstone office had already received a number of GX50/60 GPS navigation/communications units (previously certified) along with antennas, cables, mounting racks, and hardware for provisioning of Capstone aircraft. The completed provisioning work will accelerate the installation of the last two major components.

Some additional highlights of this quarter are:

January:

- On January 6th the University of Alaska, Anchorage (UAA) conducted a training class on the Capstone equipment for FAA Flight Standards personnel at the Merrill Field complex. Several other involved FAA personnel also monitored the course. A total of thirty-eight individuals attended.

- As an essential step leading to implementation of radar-like air traffic control services in Bethel, the FAA Administrator required an “end-to-end” safety review of the Capstone ADS-B surveillance system. On January 26, Capstone team representatives met in Anchorage with Mike Allocco from the Office of System Safety, ASY, and Steve Teager, Safe Flight 21 Program, to begin

work on this effort. . The team will work, during the following months, on developing scenarios involving the use of Capstone ADS-B service in radar-like air traffic control procedures in the Bethel area. The team will also identify potential risks and system failure modes, performing a safety analysis, and will recommend proposed mediation where necessary.

- The Capstone Program Office has requested a minor modification of the UAA training and safety study agreement to prepare an inter-active CD, which will help explain the program to interested individuals.

- The MITRE Corporation accepted an assignment to produce preliminary information leading toward a Minimum Operational Performance Standards (MOPS) for UAT. A MOPS would help ensure interoperability of various competing ADS-B systems utilizing UAT data link transceivers.

- Thomas Christein, ASR-100, advised the Capstone office on January 31, that the Capstone Program has approval to use 966 MHz to transmit ADS-B signals from aircraft for demonstration purposes. Use of this frequency by the Capstone avionics Universal Access Transceiver (UAT) is authorized from February 1 to December 31, 2000, within the large trapezoidal area in southwestern Alaska between 58 and 66 degrees north latitude and 146 and 168 degrees west longitude. The maximum flight level is 45,000 feet. The Capstone Program still anticipates transition to 981 MHz later this year to allow operational use of the UAT data link.

February:

- UPS Aviation Technologies completed the delivery of four Capstone Avionics classroom simulators. The simulators are outfitted with MX-20 multi-function displays (MFDs), GX-60 navcoms and an AC power supply.

- Bruce Hensel, Manager, Flight Information Services for Honeywell Corporation responded to an informal inquiry about the Capstone Program. He advised that they probably could not meet our schedule for delivery of Flight Information Services (FIS) to UPS AT for integration into the Capstone ground system. Honeywell is one of two vendors participating in the FAA's FISDL Program to transmit data link weather information, NOTAMS, PIREPS, etc. to aircraft. We have just received a response from ARNAV, the other vendor, and are evaluating it at this time.

- The Capstone End-to-End safety review team conducted its second weekly telecom on February 7. The team is developing scenarios involving the use of Capstone ADS-B service in radar-like air traffic control procedures in the Bethel area. The team is identifying potential risks and system failure modes, performing a safety analysis, and will recommend proposed mediation where necessary. Michael Allocco and Michael Lenz lead the team from the Office of System Safety, ASY-300, in Headquarters.

- Leonard Kirk, University of Alaska (UAA), conducted the first session of the Capstone Pilot Training Program for Air Carrier Instructors and Check Airmen in

Bethel on Thursday and Friday, February 10 and 11. He used the four Capstones simulators during classroom instruction in the Pacifica House conference room.

- Leonard Kirk, UAA conducted the second Capstone class at the UAA Complex at Merrill Field on Tuesday and Wednesday, February 22 and 23, 2000. This second training class had 15 students, three more than anticipated. John Hallinan, Capstone Program Manager, was present to start the class.

March:

- An avionics suite was shipped from the factory direct to the William J. Hughes Technical Center in Atlantic City to support certification testing of the Capstone ground system. This suite will eventually be returned to Alaska, after testing is completed, for installation in an aircraft.

- The Capstone office is evaluating a commercially available flight following program. This particular product, which is distributed via the internet, is based on radar tracking data acquired from the Volpe Center. The Capstone office has prepared a statement of work for procurement of such a capability. The program's goal is to deliver to the participating air carriers a system capable of flight following and flight locating aircraft which are broadcasting the Capstone ADS-B signal. We are currently investigating what additional work would be required to adapt existing radar tracking systems to the ADS-B application.

- Leonard Kirk, UAA conducted Capstone training classes in Bethel March 22 through March 25. Two classes, one during the day, and one at night, were held to accommodate those who were unable to attend training during the day.

- A notice of proposed rulemaking has been published in the Federal Register to establish Class E airspace in the Yukon-Kuskokwim delta area in support of the Capstone Program. This action would establish controlled airspace from 1,200 feet AGL upward to the existing base of controlled airspace at 14,500 feet MSL. This will provide adequate controlled airspace for commercial carriers conducting IFR operations using the Capstone ADS-B. Comments are due by April 10, 2000.

- We are sad to report that John Gillespie, the Capstone Team's Airway Facilities representative, has announced his immediate retirement. John has been a major supporter and contributor to the program since its inception. We will miss him dearly, both professionally and personally.

Working with industry continues. Members of the Capstone team are continuing to meet monthly with the Bethel commercial operators in round table discussion meetings. The meetings serve as an information exchange program. In addition to the regularly scheduled Industry Council meetings some of the other meetings that were conducted this quarter were:

1. Capstone team members met in Washington January 11 and 12 to identify tasks necessary for transition of the Capstone system from delivery of VFR services to providing "radar-like" services in the Bethel area by January, 2001. The meeting was attended by

thirty individuals from the Safe Flight 21 Program and other involved FAA offices as well as representatives from AOPA and the RTCA steering group. On January 3, 2000, the FAA Administrator wrote to the Alaska Air Carriers Association endorsing the Capstone program transition and delegating broad responsibilities to FAA's straight-line organizations. That letter served as the agenda for the meeting. Specific tasks were discussed and assigned to responsible offices and individuals.

2. On January 26, Capstone team representatives met in Anchorage with Steve Teager, Safe Flight 21 Program, Leonard Kirk, UAA and, via telecom, with Mike Allocco, Office of System Safety, ASY, to plan the Capstone end-to-end safety review requested by the FAA Administrator. Mike had planned to be in Anchorage, too, but his travel plans were interrupted by the East Coast snowstorm.

3. A technical review of the Capstone Program test plan was conducted at the FAA's William J. Hughes Technical Center in Atlantic City, New Jersey, February 15 to 17, 2000. At that meeting the test configuration of Capstone hardware and software was confirmed, test responsibilities assigned, and schedules coordinated. The meeting also included a review of the documentation, special test procedures, and consideration of phase II requirements for TIS-B, FIS-B, and flight following.

4. A Capstone Program Overview Committee teleconference was conducted Wednesday, February 23, 2000, at 9:00 a.m. (Alaska). Ruth Leverenz, ARC-1, Steve Zaidman, ARA-1, Carl McCullough, AND-1, Dave Ford, AND-500, and Rich Lay, AND-510, to participated.

5. A meeting was held February 29, to March 2, 2000 to discuss the certification requirements for avionics to use ADS-B information for surveillance. Rich Jennings, AIR-130, Bob Passman, AFS-410, Lorry Faber, ASW-110, and Les Taylor, Small Airplane Directorate, met with Greg Holt, August Asay, and Capstone Program Office representatives. The principal discussions involved Capstone's VFR to IFR transition, avionics certification requirements, spectrum assignment, and the ultimate datalink selection for nationwide ADS-B service.

6. John Hallinan, Capstone Program Manager, and Sky Tudor, NISC, flew to Headquarters during the week of March 13th to address our F&E budget requirements during the SEOAT Analysis Team (SAT) meeting. A $2 million reduction in the Capstone FY 2001 budget (from $9.2 to 7.2 million) has been proposed by AND-500. We are in the process of analyzing the potential impact of such a cut. John and Sky also meet with the Safe Flight 21 staff, MITRE Corporation representatives, and the Spectrum Management Office while they were in Washington. A spectrum determination in expected in April, to enable IFR applications in January 2001, and to permit statewide implementation of ADS-B services.

7. On March 15th Gary Childers of the Capstone Office briefed the National Institute for Occupational Safety and Health (NIOSH) management and safety

personnel on the Capstone Program at the Alaska Pacific University.

8. Doug Helton and Leo Mortimer of the Airplane Owners and Pilots Association visited Alaska during the week of March 21st to acquire first-hand information on the Capstone Program. Doug, AOPA's Vice President for Regulatory Policy, is a member of the RTCA work group guiding development of ADS-B operational enhancements. Doug and Leo were weathered-in at Bethel on Thursday and missed a scheduled tour of the ARTCC and a visit with our Regional Administrator on Friday. They did enjoy an excellent interview with Richard Przywarty, National Weather Service Director, and Bill Alexander, Aviation Weather Manager, and toured the NWS Forecast facility.

To continue our forward progress and to meet the target date of January 1, 2001 to use the Capstone ADS-B signal for "radar-like" services in the Bethel area we are working several areas that, at this time, have not been fully settled and are considered "watch items".

Spectrum assignment for Capstone's Universal Access Transceiver (UAT) continues to be a concern. We began the program with approval to use, on an experimental basis, 966 MHz, a frequency FAA had previously borrowed from the military for the Ohio Valley data link demonstration. The Office of Spectrum Policy and Management, ASR, has recommended 981 MHz as a protected operational frequency for statewide use of Capstone avionics and ground stations. Within Alaska, this would only require a frequency change for the Fairbanks VORTAC. This task requires approximately 6 months to accomplish due, in part, to advance notification and publication requirements. ASR also advised that use of 981 MHz for UAT ADS-B nationwide would have about the same impact as any other frequency choice. A Capstone system conversion to 981 MHz would require modification of the UAT avionics and ground station transceivers but antennas and cables are not expected to be impacted. We have requested ASR to proceed with the necessary interagency coordination and approval process for 981 MHz. We plan to request a quote from UPS Aviation Technologies for the cost and time required to implement such a frequency change.

Additional watch areas are:

Activity 5

Airspace
- Routes
- Approaches

Avionics
- Installation

FIS
- Definition
- Procurement

Ground System
- Certification
- Installation

Micro-EARTS
- Certification

Operator Acceptance
- Cultural Issues (enforcement, etc.)

Procedures

- Approaches
- Enroute
- SVFR
- Internet Dispatcher Access

Spectrum

- Frequency
- Availability

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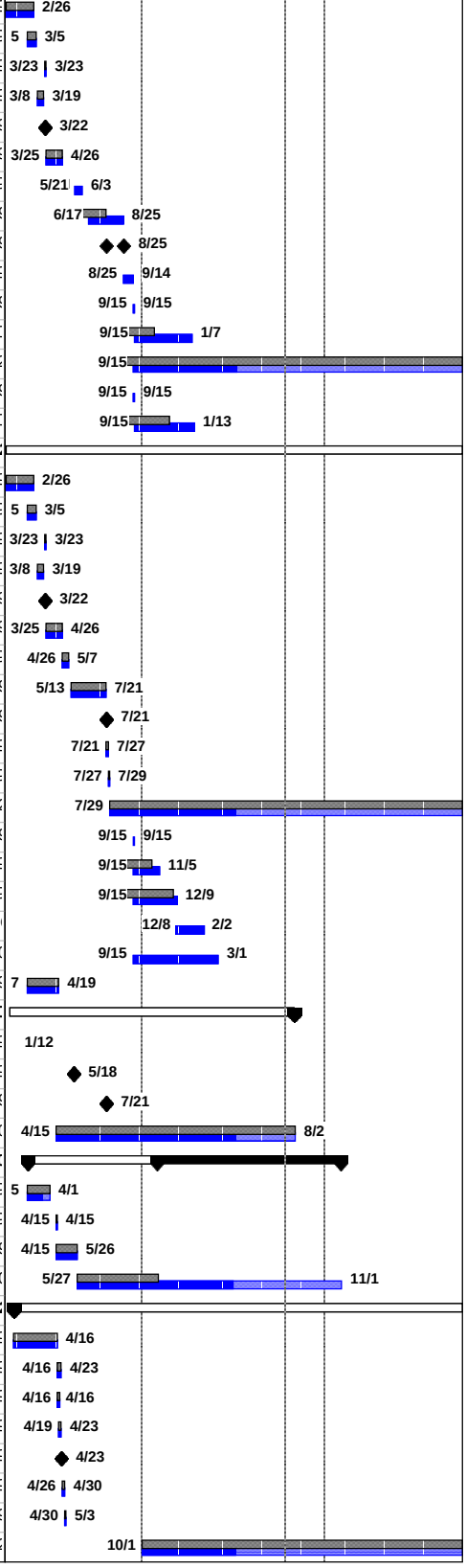
2	Develop/Review SOW	40 days	Mon 1/4/9	Fri 2/26/9	
3	Develop RFO	15 days	Mon 2/15/9	Fri 3/5/9	
4	Receipt of PR	1 day	Tue 3/23/9	Tue 3/23/9	
5	Legal Review	10 days	Mon 3/8/9	Fri 3/19/9	
6	Announcement	0 days	Mon 3/22/9	Mon 3/22/9	
7	Solicitation Period	32 edays	Thu 3/25/9	Mon 4/26/9	
8	Evaluate Offers/Discussion	10 days	Fri 5/21/9	Thu 6/3/9	
9	Prepare Flight Demo	69 edays	Thu 6/17/9	Wed 8/25/9	
10	Bethel Demo	0 days	Wed 8/25/9	Wed 8/25/9	
11	Prepare Award/Congressional Notice	15 days	Wed 8/25/9	Tue 9/14/9	
12	Award	1 day	Wed 9/15/9	Wed 9/15/9	
13	Manufacture/Certification	114 edays	Wed 9/15/9	Fri 1/7/0	
14	Performance	860 days	Wed 9/15/9	Tue 12/31/0	
15	Order Units	1 day	Wed 9/15/9	Wed 9/15/9	
16	Deliver first Units	120 edays	Wed 9/15/9	Thu 1/13/0	
17	**Ground Equipment**	**1041 days**	**Mon 1/4/9**	**Mon 12/30/0**	
18	Develop/Review SOW	40 days	Mon 1/4/9	Fri 2/26/9	
19	Develop RFO	15 days	Mon 2/15/9	Fri 3/5/9	
20	Receipt of PR	1 day	Tue 3/23/9	Tue 3/23/9	
21	Legal Review	10 days	Mon 3/8/9	Fri 3/19/9	
22	Announcement	0 days	Mon 3/22/9	Mon 3/22/9	
23	Solicitation Period	32 edays	Thu 3/25/9	Mon 4/26/9	
24	Evaluate Offers/Discussion	10 days	Mon 4/26/9	Fri 5/7/9	
25	Prepare Flight Demo	69 edays	Thu 5/13/9	Wed 7/21/9	
26	Bethel Demo	0 days	Wed 7/21/9	Wed 7/21/9	
27	Prepare Award/Congressional Notice	5 days	Wed 7/21/9	Tue 7/27/9	
28	Award	3 days	Tue 7/27/9	Thu 7/29/9	
29	Performance	893 days	Thu 7/29/9	Mon 12/30/0	
30	Order Ground Units	1 day	Wed 9/15/9	Wed 9/15/9	
31	Deliver First Unit	38 days	Wed 9/15/9	Fri 11/5/9	
32	Deliver Second Unit	62 days	Wed 9/15/9	Thu 12/9/9	
33	Deliver Third Unit	41 days	Wed 12/8/9	Wed 2/2/0	
34	Deliver First Rack Mount Units	121 days	Wed 9/15/9	Wed 3/1/0	
35	Evaluate MITRE Software	44 days	Wed 2/17/9	Mon 4/19/9	
36	**MEARTS**	**406 days**	**Tue 1/12/9**	**Wed 8/2/0**	
37	Purchase Modification	0 days	Tue 1/12/9	Tue 1/12/9	
38	MEARTS BETA Demo	0 days	Tue 5/18/9	Tue 5/18/9	
39	Bethel Demo	0 days	Wed 7/21/9	Wed 7/21/9	
40	Certification	340 days	Thu 4/15/9	Wed 8/2/0	
41	**Weather**	**448 days**	**Mon 2/15/9**	**Wed 11/1/0**	
42	Site Surveys	34 days	Mon 2/15/9	Thu 4/1/9	
43	Request for Bid	1 day	Thu 4/15/9	Thu 4/15/9	
44	Contract Award	30 days	Thu 4/15/9	Wed 5/26/9	
45	Site Intallations	375 days	Thu 5/27/9	Wed 11/1/0	
46	**UAA**	**1010 days**	**Tue 1/19/9**	**Mon 12/2/0**	
47	Develop/Review SOW	64 days	Tue 1/19/9	Fri 4/16/9	
48	Develop RFO	6 days	Fri 4/16/9	Fri 4/23/9	
49	Receipt of PR	1 day	Fri 4/16/9	Fri 4/16/9	
50	Legal Review	5 days	Mon 4/19/9	Fri 4/23/9	
51	Announcement	0 days	Fri 4/23/9	Fri 4/23/9	
52	Prepare Award	5 days	Mon 4/26/9	Fri 4/30/9	
53	Award	2 days	Fri 4/30/9	Mon 5/3/9	
54	Performance	827 days	Fri 10/1/9	Mon 12/2/0	



Capstone Timeline

Spend Plan for FY 99 F&E Funding (2QFY00)

Spend Plan	1Q 99	2Q 99	3Q 99	4Q 99	1Q 00	2Q 00	3Q 00	4Q 00	1Q 01	2Q 01	3Q 01	4Q 01	Totals
Avionics				$3.6M	$400K								**$4M**
MEARTS		$2.8M											**$2.8M**
Ground				$700K	$500K								**$1.2M**
FIS	$250K				$141K	$50K			$59K				**$.5M**
UAA					$500K								**$.5M**
MISC/SPO	$150K	$340K	$20K	$50K	$400K	$20K	$20K						**$1M**
AWOS		$30K	$620K	$350K									**$1M**
Totals	**$.4M**	**$3.17M**	**$.64M**	**$4.7M**	**$1.941M**	**$.07M**	**$.02M**		**$.059M**				**$11M**
Travel	$7.5K	$26K	$9.5K	$57K									**$.1M**

Capstone Spend Plan:

a. 1Q 99: $250K of FIS and $150K of Misc/SPO (total $400K) was allowed to stay in Washington, DC to assist AND-470 in funding Datalink Analyses by John Hopkins University and a SETA contract position.
b. 2Q 99: $2.8M to fund Micro EARTS modification, $340K for starting up Capstone office and funding 2 NISC positions for 1 year, $30K for AWOS.
c. 3Q 99: $20K for operation of Capstone Program Office. $620K for AWOS.
d. 4Q 99: $3.4M obligated to purchasing 132 avionics equipment sets, simulator and training. $700K to AF for purchase of 6 ground stations, engineering and installation support. $50K for operation of Capstone Program Office. $350K for AWOS.
e. 1Q 00: $500K obligated to UAA to provide training and safety study for Capstone. $400K for installation of avionics sets. $500K for ground stations. $141K loaned from FIS to other Capstone programs. $400K lease of Capstone Office, 3 NISC positions and operations.
f. 2Q 00: $20K for Capstone Program Office operation. $50K lease of FIS data.
g. 3Q00: $20K lease for Capstone Office operation.
h. 1Q 01: $59K lease of FIS.
i. 4Q 01:

Spend Plan for FY 00 F&E Funding (2QFY00)

Spend Plan	1Q 00	2Q 00	3Q 00	4Q 00	1Q 01	2Q 01	3Q 01	4Q 01	Totals
Avionics		$.1M	$.5M	.304M					**$.904M**
Ground		$.25M	$.55M	$.5M					**$1.3M**
Spectrum			.5M						**$.5M**
FIS/TIS/Cert/Proc		$.25M	$.25M		$.041M				**$.541M**
MISC/SPO		$.1M	$.15M	$.15M	$.4M				**$.8M**
AWOS		$.5M	$.580M						**$1.080M**
GPS		$.1M	$.125M						**$.225M**
Gnd Vehicles			.15M						**$.150M**
MITRE		.5M							**$.5M**
Totals		**$1.8M**	**$2.805M**	**$.954M**	**$.441M**				**$6M**
Travel	$12K	$35K	$35K	$45K					**$.15M**

Capstone Spend Plan:

a. 1Q 00:
b. 2Q 00: $100K for operation of Capstone Program Office. $100K for avionics installations. $500K for AWOS work in ANI. $250K for FIS/TIS and certification/procedures work. $250K for finalizing first 12 ground stations. $100K for flight checks of GPS surveyed airports. $500K to fund 2 man-years of MITRE work.
c. 3Q 00: $150K for operation of Capstone Program Office. $500K for avionics installations. $500K for AWOS work in ANI.. $250K for FIS/TIS and certification/procedures work. $550K for additional ground station, installations, and certification work. $125K for flight checks of GPS surveyed airports. $150K for ground vehicle installations at 13 village airports. $500K for modifications of spectrum change in UATs.
d. 4Q 00: $150K for operation of Capstone Program Office. $500K for contract engineering for ground stations. $304K for final avionics installations.
e. 1Q 01: $400K for operation of Capstone Program Office. $41K for FIS/TIS and certification/procedures work.

Status of Program Elements

Element 1. Aircraft Equipment Package

A. Coordinate and complete a Request For Information (RFI).	Completed
B. Coordinate and complete a Request For Offer (RF0).	Completed
C. Down select prospective vendor	Completed
D. Initial operational capability demonstration	Completed
E. Contract awarded	Completed
F. Install equipment	In Progress

Element 2. Obtain and Install Ground Infrastructure to Support ADS-B

A. Coordinate and complete a Request For Information (RFI).	Completed
B. Coordinate and evaluate purchase of a Mitre Ground Station.	Cancelled
C. Coordinate and complete a Request for Offer (RFO).	Completed
D. Down select prospective vendor	Completed
E. Initial operational capability demonstration	Completed
F. Contract awarded	Completed
G. Install Ground Stations	In Progress

Element 3. Micro-EARTS Adaptation

A. Procure modification to Micro-EARTS.	Completed
B. Conduct BETA Demo	Completed
C. Conduct design reviews	In Progress
D. Certification	In Progress

Element 4. Coordinate/Obtain/Implement Flight Information Services (FIS)

A. National contractor selection.	Completed
B. Select contractor	In Progress

Element 5. Train Capstone Participants

A. Complete statement of work.	Completed
B. Issue contract	Completed
C. Conduct Training	In Progress

Element 6. Obtain and Install Automated Weather Equipment

A. Select prospective sites	Completed
B. Perform site surveys	Completed
C. Procure the automated weather equipment	Completed
D. Install automated weather equipment	In Progress

Element 7 Conduct Safety and Human Factors Study

A. Complete statement of work.	Completed
B. Issue contract	Completed
C. Conduct Study	In Progress

Program Elements

1. Aircraft Equipment Package

Objective	Purpose
To equip up to 200 aircraft used by the commercial operators in the Yukon-Kuskokwim delta region of Alaska with a government-furnished Global Positioning System (GPS) based avionics package.	A significant number of mid-air collisions, controlled flight into terrain incidents, and weather-related accidents can be avoided with new technologies incorporated into the Capstone avionics package. The Alaskan Region's "Capstone Program" is an accelerated effort to improve aviation safety and efficiency through installation of government-furnished Global Positioning System (GPS)-based avionics and data link communications suites in most commercial aircraft serving the Yukon-Kuskokwim delta area. Capstone-equipped aircraft will be used initially to validate three of the nine high priority Free Flight Operational Enhancements requested by RTCA. • Flight Information Services (FIS) • Cost Effective Controlled Flight Into Terrain (CFIT) Avoidance • Enhanced See and Avoid The Capstone program will provide real world information and experience that will provide enhanced safety and operational capabilities.

Progress/Outcomes

A. Coordinate and complete a Request For Information (RFI).

Progress: - Completed

The Alaskan Region's Logistics Division published in the Commerce Business Daily a "Request for Information (RFI)." The RFI publicly announced to interested avionics vendors the FAA's proposed Capstone Program and requested submission of information on their products, services, and capabilities which are currently available, to meet the needs for the Capstone program. Information provided by the five vendors who responded will be considered as the FAA prepares performance specifications for Capstone Program avionics and ground transceiver equipment.

Aircraft Equipment Package - cont.

Progress/Outcomes - cont.

B. Coordinate and complete a Request for Offer (RFO)

Progress 1st Quarter FY99: - In Progress

The Alaskan Region's Logistics Division in coordination with ACO, AND, AIR and the Industry Council is working to complete the RFO.

Progress 2nd Quarter FY99: - Completed

The Alaskan Region's Logistics Division completed the RFO. The announcement was made on the internet March 22, 1999. The RFO will close April 26, 1999.

The Request for Proposals (RFP) for avionics suites will be published in hard copy controlled by the Logistics Division. Standard performance specifications common to the avionics industry are being utilized.

C. Down select prospective vendor

Progress 3rd Quarter FY99: - Completed

The Avionics RFO closed April 26, 1999. UPS Aviation Technologies (formerly II Morrow, Inc), an Oregon based subsidiary of United Parcel Service was down selected. UPS AT will be required to produce at least two sets of installed avionics (in aircraft provided by UPS AT), a ground station, and related software to demonstrate operation of the proposed avionics system, in flight, at Bethel, Alaska in August 1999. Following a successful flight demonstration, a production contract will be awarded. The number of avionics suites purchased, up to a maximum of 200, will be based on the total available budget of $4 million. It is anticipated approximately 150 units will actually be procured.

Progress/Outcomes - cont.

D. Conduct Initial operational capability demonstration

Progress 3rd Quarter FY99: - In Planning

An initial operational capability demonstration is scheduled for August 25, 1999. UPS AT will produce at least two sets of installed avionics (in aircraft provided by UPS AT), a ground station, and related software to demonstrate operation of the proposed avionics system, in flight, at Bethel Alaska.

Progress 4th Quarter FY99: - Completed

An initial operational capability demonstration was completed on August 25, 1999. . UPS AT, using a company-owned Beechcraft King Air airplane and a specially equipped Cessna Model 208 Caravan furnished by PenAir, UPS AT, demonstrated that its proposed Global Positioning System (GPS) navigation unit, multi-function cockpit display (MFD), and datalink radio system would meet FAA performance specifications for the Capstone Program.

E. Award Contract

Progress 4th Quarter FY99: - Completed

A determination was made that FAA specifications were met and a contract was awarded on September 13th, 1999. The contract was for Capstone avionics systems, installation kits, terrain databases, ground-based transceivers, an avionics training simulator and training assistance.

Progress/Outcomes - cont.

F. Install Equipment

Progress 1st Quarter FY00 - In Progress

A provisioning STC, issued 16 November 1999 permits installation of the GX-50/60 GPS navigator and provisions for the Capstone configured MX-20 and UAT transceiver. Nine provisional STC kits have been forwarded to three of the Bethel commercial operators, Larry's Flying Service, Peninsula Airways, Inc., and Ptarmigan Air, for installation. One complete Capstone avionics package, to include the MX-20 multifunction display and UAT transceiver, has been installed in the University of Alaska, Anchorage Cessna 180 for certification flight-testing.

Progress 2nd Quarter FY00 - In Progress

Ten (10) airplanes were installed with Capstone avionics suits in the second quarter. These installations took place in Anchorage, Fairbanks, and Bethel, Alaska. Operators participating in the Capstone program as well as independent avionics shops are participating in the installation of the Capstone avionics suites. UPS AT has delivered seventy-one (71) avionics suites to date.

2. Obtain and Install Ground Infrastructure to Support ADS-B

Objective	Purpose
To install ADS-B ground stations at up to twelve (12) locations in the Yukon-Kuskokwim delta region of Alaska	To provide enhanced see and avoid information each ADS-B equipped aircraft broadcasts its precise position in space via a digital datalink along with other data, including airspeed, altitude and whether the aircraft is turning, climbing or descending. This provides other aircraft, as well as ground facilities that have ADS-B equipment a much more accurate depiction of air traffic than radar can provide. To provide the digital datalink capability in a cost-effective manner requires the installation of ground based transceivers.

Progress/Outcomes

A. Coordinate and complete a Request For Information (RFI)

Progress : - Completed

The Alaskan Region's Logistics Division published in the Commerce Business Daily a "Request for Information (RFI)." The RFI publicly announced to interested avionics vendors the FAA's proposed Capstone Program and requested submission of information on their products, services, and capabilities which are currently available, to meet the needs for the Capstone program. Information provided by the five vendors who responded will be considered as the FAA prepares performance specifications for Capstone Program avionics and ground transceiver equipment.

B. Coordinate and evaluate purchase of a Mitre Ground Station.

Progress 2nd Quarter FY99: - In Progress

The Alaskan Region Airway Facilities Division is in coordination with the SF21 office and Mitre/CAASD personnel regarding purchase of a Mitre ground station from the existing contract with IIMorrow for the Ohio Valley ground stations.

Progress 3rd Quarter FY99: - On Hold

The purchase of the Mitre ground station is on hold. The proposed vendor ground station and datalink infrastructure may not require an additional Mitre ground station. A decision will be made after the August equipment demonstration in Bethel.

Progress/Outcomes - cont.

B. Coordinate and evaluate purchase of a Mitre Ground Station – cont.

Progress 4th Quarter FY99: - Cancelled

The purchase of the Mitre ground station has been cancelled. The proposed vendor ground station and datalink infrastructure does not require an additional Mitre ground station.

C. Coordinate and complete a Request for Offer (RFO) for ground stations.

Progress 2nd Quarter FY99: - Completed

The Alaskan Region's Logistics Division completed the RFO. The announcement was made on the internet March 22, 1999. The RFO will close April 26, 1999.

The Request for Proposals (RFP) for avionics suites will be published in hard copy controlled by the Logistics Division. After an initial bidding period, FAA will accept written proposals for evaluation. An independent team will then select the best apparent offer based on technical qualifications and cost considerations using previously documented objective selection criteria. The number of ground stations allowed to be purchased as a separate line item under the Avionics contract includes a minimum of 12 and maximum of 50 sets if the line item is exercised. The apparent successful vendor will be required to produce at least two sets of installed avionics (in aircraft provided by the manufacturer), a ground station, and related software to demonstrate operation of the proposed avionics system, in flight, at Bethel, Alaska in July 1999. Following a successful demonstration, the decision to order ground stations from the Avionics vendor will be made. The Avionics RFP will include a delivery line item for data link ground stations compatible with the avionics. FAA may procure all necessary units from the vendor, or purchase some or all from another source, with cost being the primary consideration. Additional units beyond the 12 immediately required may be procured from the vendor if it is determined advantageous to FAA and if funds become available.

Progress/Outcomes - cont.

D. Down select prospective vendor.

Progress 3rd Quarter FY99: - Completed

UPS Aviation Technologies (formerly II Morrow, Inc), an Oregon based subsidiary of United Parcel Service was down selected. UPS AT will be required to produce at least two sets of installed avionics (in aircraft provided by UPS AT), a ground station, and related software to demonstrate operation of the proposed avionics system, in flight, at Bethel, Alaska in August 1999. Following a successful flight demonstration, a production contract will be awarded. FAA may procure all necessary units from the vendor, or purchase some or all from another source, with cost being the primary consideration. Additional units beyond the 12 immediately required may be procured if it is determined advantageous to FAA and if funds become available.

E. Conduct initial operational capability demonstration.

Progress 3rd Quarter FY99: - In Planning

The initial operational capability demonstration is planned for August 25, 1999. UPS AT will be required to produce at least two sets of installed avionics (in aircraft provided by UPS AT), a ground station, and related software to demonstrate operation of the proposed avionics system, in flight, at Bethel Alaska.

MITRE is teaming with the Alaskan Region to develop and configure an architecture and network for the Capstone program. The system will be based on the proven Ground Base Server developed by MITRE and tested on several though the Safe Flight 21 work with the CAA Ohio Valley project.

Progress 4th Quarter FY99: - Completed

An initial operational capability demonstration was completed on August 25, 1999. UPS AT, using a company-owned Beechcraft King Air airplane and a specially equipped Cessna Model 208 Caravan furnished by PenAir, UPS AT, demonstrated that its proposed ground station system would meet FAA performance specifications for the Capstone Program.

Obtain and Install Ground Infrastructure to Support ADS-B - cont.

Progress/Outcomes - cont.

F. Award contract

Progress 4th Quarter FY99: - Completed

After analyzing the data from the initial operational capability demonstration a determination was made that FAA specifications were met and a contract for the ground stations was awarded on September 13th

G. Install ground stations.

Progress 4th Quarter FY99: - Awaiting delivery

Seven ground stations have been ordered to date.

Progress 1st Quarter FY00: - In Progress

Six additional ground stations were ordered in the first quarter of FY00. Two from the 4th quarter FY99 original order have been received. It is anticipated that the installation of these two ground stations, at Bethel and Anchorage Center, will occur second quarter of FY00.

Progress 2nd Quarter FY00: - In Progress

Two developmental Ground Based Transceivers (GBT)s were installed at Anchorage Center and Bethel during January 2000. These GBT's will be used for test and development of the ground system and will be replaced by certified units, as they become available.

3. Micro-EARTS Adaptation

Objective	Purpose
Adapt the Micro-EARTS at the Anchorage ARTCC to receive and process ADS-B position reports and fuse radar targets for display to air traffic controllers and pilots.	To allow pilots of Capstone-equipped aircraft to see radar targets for all nearby aircraft as well as ADS-B equipped aircraft position reports and radar targets via Traffic Information Service-Broadcast (TIS-B) for all nearby traffic on their multiple function display (MFD). The Micro-EARTS at the Anchorage ARTCC is being adapted to receive and process ADS-B position reports and fuse radar targets for display to air traffic controllers and pilots.

Progress/Outcomes

A. Procure and install modification to Micro-EARTS.

Progress 2nd Quarter FY99: -In progress

A contract modification will be negotiated with Lockheed Martin for development of M-EARTS functions to support the Capstone Program. This principally includes display of ADS-B targets fused with radar targets and the capability to produce Traffic Information Service-Broadcast (TIS-B). Funding for this $2.8 million contract modification has already been transferred to Headquarters. A Beta Demonstration is planned for May 1999 with a demonstration planned for July 1999.

Progress 3rd Quarter FY99: -Completed

Lockheed martin Corporation representatives installed the Capstone Micro-EARTS modification during April in preparation of the Beta-demonstration.

B. Conduct Beta Demonstration.

Progress 3rd Quarter FY99: -Completed

The modification was successfully demonstrated during the week of April 19 and again on May 18-19. Radar targets were fused with ADS position reports and displayed on remote displays. Following testing, this capability is expected to reach Operational Readiness Demonstration by August 2000.

Progress/Outcomes - cont.

C. Design Reviews.

Progress 3rd Quarter FY99: - In Planning

Preliminary Design Review (PDR) for the MEARTS modification is scheduled for July 19-23rd July.

Progress 4th Quarter FY99: - In Progress

A Micro-EARTS Preliminary Design Review (PDR) at Anchorage ARTCC was completed during July. The Capstone modification to show ADS-B equipped aircraft on controller displays was discussed with Lockheed Martin representatives along with other software improvements. It will take about one year of testing before the ADS-B service can be certified for air traffic management functions.

Progress 1st Quarter FY00: - In Progress

Progress 2nd Quarter FY00: - In Progress

Progress/Outcomes - cont.

D. Certification

Progress 3rd Quarter FY99: - In Planning

Progress 4th Quarter FY99: - In Progress

An initial operational capability demonstration was completed on August 25, 1999 during the Bethel demonstration. A meeting held in Salem Oregon, September 30th, 1999 resulted in a process to baseline and develop the Mitre software to be included in the certification process.

Progress 1st Quarter FY00: - In Progress

The certification effort is proceeding on schedule to meet the August FY00 timeline. Numerous telecons have been held as a follow-up to the meeting in Oregon. An additional group meeting is scheduled for the second quarter FY00 at the Technical Center in Atlantic City, New Jersey.

Progress 2nd Quarter FY00: - In Progress

A Capstone Engineering conference was conducted in February at the William J. Hughes Technical Center in Atlantic City, New Jersey. The principal topic was the hardware and software architecture for certification testing of the Capstone ADS-B ground system. Future system requirements for uplink of FIS-B and TIS-B products to aircraft were also discussed. In March 200 an avionics suite was shipped from UPS AT direct to the Technical Center to support certification testing of the Capstone ground system.

4. Coordinate/Obtain/Implement Flight Information Services (FIS)

Objective	Purpose
To work in conjunction with AND-700 to obtain and field FIS.	There is a significant amount of data in the National Airspace System that, if the pilot could have access to it in the cockpit, would make the flight safer through improved situational awareness (e.g., weather information) or more cost effective (e.g., knowledge of special use airspace restrictions). Without this information the pilot faces uncertain weather hazards and other operational inefficiencies. Capstone will use the Flight Information System (FIS) to receive current and forecasted weather and weather-related information as well as the status of SUAs. The enhanced weather products will be available to pilots and controllers, allowing them to share the same situational awareness. The information will be displayed graphically to the pilot. Expected benefits: increased availability of flight services, increased timeliness and quality of data on weather and system status, increased access to airspace, and reduced flight times and distance.

Progress/Outcomes

A. National contractor selection.

Progress 2nd Quarter FY99: -In progress

FAA selection of a national contractor(s) is underway for delivery of FIS products to properly equipped aircraft via a data link system.

Progress 3rd Quarter FY99: -In progress

FAA selection of a national contractor(s) is continuing. It appears that there will be a down select of two (2) service providers for the FISDL RFO by July 23,1999.

Progress 4th Quarter FY99: - Completed

On July 28, 1999 ARNAV Systems, Incorporated and NavRadio Corporation were selected as the national Flight Information Services Data Link (FISDL) service providers by headquarters. We will be examining the products and services offered by these vendors to determine which might be suitable for the commercial operators in the Capstone service area

Progress/Outcomes - cont.

B. Select Contractor

Progress 4th Quarter FY99: - In Progress

We are currently reviewing the contracts of each FISDL service provider to determine the national vendor products and services to be used in the Capstone program.

Progress 1st Quarter FY00: - In Progress

We are continuing to work with industry and UPS AT to determine the Capstone FIS requirements.

Progress 2nd Quarter FY00: - In Progress

Capstone team members James Call and Dave Palmer met with Rita McNair, contracting officer, in headquarters during January 2000. As a result of the meeting an informational request outlining the Capstone weather requirements was prepared and sent to both FISDL vendors. The response from Honeywell (formally NavRadio Corporation) indicated that they could not meet our timeframe. A Capstone Technical Review Committee reviewed ARNAV's proposal and submitted a report of their findings to the Capstone Program manager.

5. Train Capstone Participants

Objective	Purpose
To ensure all participants in the Capstone program are properly trained on the Capstone avionics.	To ensure the Capstone avionics equipment is utilized properly and to the fullest to achieve the greatest benefit to enhanced safety and operational capabilities all participants must be trained.

Progress/Outcomes

A. Complete the statement of work.

Progress 2nd Quarter FY99: - In Progress

The statement of work for training Capstone participants was delivered to the Alaskan Region's Logistics Division. The contracting officer is working with the Capstone office and the Regional Counsel Office to complete the training contract. It is anticipated that the contract will be awarded during the FY99 third quarter.

Progress 3rd Quarter FY99: - Completed

The contracting officer has issued the package to UAA and received their response. It is anticipated that the contract will be awarded during the FY99 fourth quarter.

B. Issue contract

Progress 3rd Quarter FY99: - In Progress

The contracting officer has issued the package to UAA and received their response. It is anticipated that the contract will be awarded during the FY99 fourth quarter.

Progress 4th Quarter FY99: - Completed

The University of Alaska has been awarded a contract to deliver a pilot training program for the Capstone equipment and to conduct Capstone participant training.

Train Capstone Participants - cont.

Progress/Outcomes - cont.

C. Conduct training

Progress 4th Quarter FY99: - In Planning

The University of Alaska is working with the Capstone office, UPS AT, Anchorage FSDO, Industry Council and the Bethel operators to develop the Capstone avionics training program. A beta training class is scheduled for 1st quarter FY00.

Progress 1st Quarter FY00: - In Planning

The University of Alaska conducted a beta session for the Capstone Pilot Training Program on December 7th and 8th at the Merrill Field complex. Several industry pilots were in the beta class along with an Industry Council representative, a FSDO inspector, and a pilot from the Capstone Program Office and an Air Traffic controller. Feedback from the beta class will be used to finalize the training curriculum. Formal Capstone training is scheduled to begin in the 2nd quarter FY00.

Progress 2nd Quarter FY00: - In Progress

The University of Alaska (UAA) is using four (4) certified Capstone simulators for pilot training. The first session of the Capstone Pilot Training Program for Air Carrier Instructors and Check Airmen was conducted in Bethel in February. Training classes will continue through the third quarter in Anchorage and Bethel. UAA received an excellent grade on the critique submitted by every student.

6. Obtain and Install Automated Weather Equipment

Objective	Purpose
To obtain and install Automated Weather Observing Equipment at up to 10 sites in the Capstone area.	To assist in providing weather information to accomplish IFR enroute and landings at Capstone area airports and to enable the use of the, up to eighteen, new GPS approaches requires current weather information be available. The weather observation equipment will meet at least the minimum functionality required by the Federal Aviation Regulations to support an instrument approach procedure for commercial operators. Weather sensors will provide the following observations: (a) wind speed, direction, and gusts; (b) altimeter setting; (c) temperature and dew point; (d) cloud height and sky cover; and (e) visibility. The equipment will provide an automatic radio broadcast of observations and have the capability to provide remote weather observations via a telephone line or connection to Service A.

Progress/Outcomes

A. Select prospective sites:

Progress 1st Quarter FY99: - Completed

The Industry Council has selected the following ten (10) villages as prospective sites for installation of automated weather equipment; Kipnuk, Platinum, Scammon Bay, Holy Cross, Kwigillingok, Kalskag, Mountain Village, Russian Mission, St. Michael, and Koliganek.

B. Perform site surveys:

Progress 1st Quarter FY99: - In Progress

ANI 700 has scheduled the site surveys at the ten sites. Scheduled completion date is during the second quarter FY99.

Progress 2nd Quarter FY99: - In Progress

ANI 700 has completed 7 of 10 sites. The survey results will be used to install the automated weather equipment.

Progress/Outcomes - cont.

B. Perform site surveys – cont.

Progress 4th Quarter FY99: - In Progress

ANI 700 has completed 7 of 10 sites.

Progress 1st Quarter FY00: - In Progress

Progress 2nd Quarter FY00: - In Progress

ASI 700 has completed the last three survey sites.

C. Procure the automated weather equipment.

Progress 2nd Quarter FY99: - In Progress

The preliminary strategy developed by the NAS Implementation Center, ANI-700, provides for procurement of 10 plastic equipment shelters under an existing government supply contract. ANI-700 plans to construct a prototype aluminum frame structure for support of weather sensors. Maintenance personnel in Anchorage will evaluate the frame, which will span the shelter, for field suitability and the design will be finalized. A competitive advertisement will next be issued to selected, pre-qualified, bidders. The contract will include procurement of FAA-certified aviation weather observation equipment of the type planned for "NEXWOS." The sensors required will be the minimum necessary to support Capstone flight operations. The selected turnkey contractor will be responsible for fabrication of the aluminum frames per the FAA design drawings, installation of weather equipment within the government-furnished plastic shelters, transportation of all shelters, frames, and equipment to the specified village airports, and for installation at the specified locations in accordance with FAA design drawings and specifications.

Progress 3rd Quarter FY99: - Completed

The 10 plastic equipment shelters were purchased and shipped to Anchorage for retrofitting. Ten AWOS III facilities were purchased from Qualimetrics, Inc. The first item arrived and is being installed in a proto-type facility being constructed at the ANI Anchorage Complex.

Automated Weather Equipment - cont.

Progress/Outcomes - cont.

D. Install Automated Weather Equipment

Progress 3rd Quarter FY99: - In Progress

Four sites have been selected for installation before the end of FY99. They include Scammon Bay, Holy Cross, Mountain Village and St. Michael. Real estate and utilities coordination is ongoing.

Progress 4th Quarter FY99: - In Progress

A proto-type facility for the Capstone automated weather observation equipment was constructed at the ANI Anchorage Complex. A "open house" was held at the Lake Hood property to inspect and "kick the tires" on the new weather station enclosure on Friday, September 9th . The materials and equipment will be shipped to Holy Cross in September 1999 to begin installation.

Progress 1st Quarter FY00: - In Progress

Phase I, which includes grounding, bonding and shelter installation was completed for four of the ten Capstone sites; Holy Cross, Mountain Village, Saint Michael and Scammon Bay. Phase II is scheduled for the 2nd quarter of FY00.

Progress 2nd Quarter FY00: - In Progress

With the cleanup of some exceptions, Phase II is nearing completion on the first four sites.

7. Conduct Safety and Human Factors Study

Objective	Purpose
To accomplish independent documentation, measurement, and reporting of the Capstone project.	A major "Capstone" objective is to improve safety in Alaska while offering efficiencies to operators. Key to the Capstones program's overall success is the need conduct an independent evaluation of system safety improvements and to document the user benefits.

Progress/Outcomes - cont.

A. Complete the statement of work and issue contract.

Progress 2nd Quarter FY99: -In Progress

The statement of work for the safety study was delivered to the Alaskan Region's Logistics Division. The contracting officer is working with the Capstone office and the Regional Counsel Office to complete the contract. It is anticipated that the contract will be let during the third quarter.

Progress 3rd Quarter FY99: - Completed

The contracting officer has issued the package to UAA and received their response. It is anticipated that the contract will be led during the FY99 fourth quarter.

B. Issue contract

Progress 3rd Quarter FY99: - In Progress

The contracting officer has issued the package to UAA and received their response. It is anticipated that the contract will be led during the FY99 fourth quarter.

Progress 4th Quarter FY99: - Completed

The University of Alaska has been contracted to conduct an independent analysis of safety improvements related to the Capstone program.

Conduct Safety and Human Factors Study – cont.

Progress/Outcomes - cont.

C. Conduct Study

Progress 4th Quarter FY99: - In Progress

The University of Alaska is in the process of gathering data to develop the baseline for the Capstone safety study.

Progress 1st Quarter FY00: - In Progress

Quarterly meetings are scheduled to discuss the study process and progress. An interim baseline report is scheduled for 2nd quarter FY00.

Progress 2nd Quarter FY00: - In Progress

UAA has submitted an electronic preliminary baseline data to the Capstone office. A review and evaluation of the information is underway.