The Capstone Program is a joint industry and FAA Alaskan Region effort to improve aviation safety and efficiency by putting cost effective, new technology avionics equipment into aircraft and providing the supporting ground infrastructure. The demonstration areas are non-radar environments where most of the air carrier operations have been limited to Visual Flight Rules. Capstone is equipping aircraft used by commercial operators in the area with a government-furnished Global Positioning System (GPS) based avionics package. In addition to the avionics suites, Capstone is deploying equipment for weather observation, data link communications, surveillance, and Flight Information Services (FIS). Capstone has also increased the number of airports served by an instrument approach and now enables radar-like IFR air traffic control services. A significant number of mid-air collisions, controlled flight into terrain, and weather-related accidents can be avoided with new technologies incorporated into the Capstone avionics package.

Phase II of Capstone will move to Southeast Alaska, a more environmentally challenged area of the state. As with the Phase I in the Yukon-Kuskokwim delta, Capstone plans to equip aircraft used by commercial operators and deploy a ground system that will support a usable IFR infrastructure and improve communications.

In addition to enhanced safety and new operational capabilities, the Capstone program is providing real world information and experience that is essential for modernization of the National Airspace System.
Technical Information

HARDWARE

GPS - The GNS-480 is general aviation’s first GPS navigator to feature precision guidance via WAAS. It features a 15-channel WAAS receiver that updates the aircraft’s position at a rate of five times per second on a 3.8-inch (diagonal), 256-color moving-map display. It has the built-in controls for the Universal Access Transceiver ADS-B datalink.

MFD - The daylight visible, multifunction MX-20 display features a 6” display screen and supports over 65,000 colors with a 640x480 resolution. It contains a Pentium processor for integrating ADS-B, GPS, terrain, weather graphics, and IFR database information. The MFD provides enhanced situational awareness with moving maps depicting terrain, traffic, and weather information.

UAT - The Universal Access Transceiver is a certified transmitter/receiver combination that supports a broad array of Automatic Dependent Surveillance-Broadcast (ADS-B) services. It communicates the datalink information for the ADS-B data air-to-air between aircraft, as well as the TIS-B, and FIS services between the aircraft and the ground stations. It can interface with multi-function displays and includes a TSO-C145a WAAS GPS sensor that offers outstanding position accuracy and integrity.

FUNCTIONS

ADS-B - Automatic Dependent Surveillance-Broadcast is a function that broadcasts position, altitude, vector and other information for use by other aircraft, vehicles, and by ground facilities. ADS-B supports improved use of airspace, improved surface surveillance, and enhanced safety (such as conflict management) for users.

FIS - Flight Information Services function allows an aircraft to receive current and forecasted weather and weather-related information as well as the status of Special Use Airspace (SUA). The enhanced weather products will be available to the pilots and controllers allowing them to share the same situational awareness. This information will be displayed either in text or graphical form, as selected by the pilot.

TIS-B - Traffic Information System - Broadcast function will provide the capability to determine aircraft position using radar and to broadcast this position information to airborne aircraft that are ADS-B equipped.

Terrain Awareness - The terrain information is depicted relative to the aircraft’s position so that the relative bearing and distance may be determined. A flashing terrain advisory flag is displayed whenever the aircraft is within 500 vertical feet of the terrain, or when the aircraft is within two minutes, horizontally, of terrain.

For more information visit the Capstone website at: www.alaska.faa.gov/capstone