



U.S. Department  
of Transportation

**Federal Aviation  
Administration**

# Memorandum

Subject: **INFORMATION:** Capstone Automatic Dependent  
Surveillance-B (ADS-B) Acceptability Evaluation

Date: Nov. 30, 2000

From: Leader, Oceanic & Offshore Integrated  
Product Team, AUA-600

Reply to  
Attn of:

To: Manager, Flight Technologies and  
Procedures Division, AFS-400

With all varying systems in place to provide radar-like services using ADS-B, the next step was to demonstrate that ADS-B, as currently implemented, is suitable for use in providing these services. AUA and the Alaskan Region have gathered data during the period of late September to early November. The initial evaluation and analysis of anomalies has been completed and appropriate equipment and/or software corrections have been made or documented. Follow on analysis is expected to continue through IOC.

After a thorough review of the data, I am pleased to advise you that the ADS-B reported positions displayed to the air traffic controller appear to be as good as or better than the Anchorage radar data for determining aircraft position, speed, and direction of flight. Furthermore, there is no significant evidence of track stitching in ADS-B target reports by comparison with radar target reports.

There is one anomaly that is of concern. The Navigation Uncertainty Category for Position (NUCp) value is not presently usable as an ADS-B message filter because it does not correlate to the applicable message. However, an equivalent method for monitoring GPS performance using the ADS-B fixed parrots and published GPS performance charts has been evaluated as acceptable and this data is presented in Section 23 of the evaluation report. The ADS-B fixed parrot is displayed at the controller's workstation when an out of tolerance condition is detected. This action is similar to the procedure used for monitoring radar parrots. Until the NUCp problem is corrected our analysis indicates that the Capstone system is safe for use with this defined and agreed to procedure.

Micro-EARTS functionality changes and enhancements required prior to the planned January IOC have been coordinated with cognizant parties and thoroughly tested. The Airways Facility Operational Support Service will deliver the final changes in December 2000. Additional enhancements to Micro-EARTS ADS-B continuous data recording,

data extraction and other desired functionality were not considered mandatory for initial operational use of the Capstone ADS-B data for air traffic control, but have been documented and are considered desirable for earliest possible implementation. It should be noted, however, that further expansion of the Capstone technology beyond the Bethel area will require additional modifications to the Micro-EARTS and additional investment in the Micro-EARTS hardware infrastructure.

In summary, based on the results of the attached evaluation, the accuracy, frequency, and reliability of the ADS-B data appear to be superior to radar as a source of aircraft surveillance information. I recommend Flight Standards consider issuing a notice approving use of Capstone ADS-B data as an aircraft surveillance source as good as or better than radar for the Bethel, Alaska area.

If you have any questions, please contact me on 65316, or Jack Neuberger at 65152.

(Original Signed by)  
Nancy J. Graham

Attachment:  
Capstone ADS-B Evaluation Report

Copy Furnished: AFS-410 (Don Streeter)