



**AIRCRAFT OWNERS AND PILOTS ASSOCIATION**

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May 22, 2007

Mr. John McGraw  
Manager Flight Technologies and Procedures Division  
Flight Standards Service  
Federal Aviation Administration  
470 L'Enfant Plaza Southwest  
Suite 4102  
Washington, DC 20024

Dear Mr. McGraw:

On behalf of more than 411,000 members, the Aircraft Owners and Pilots Association (AOPA) objects to policy changes published in Advisory Circular 90-100 (AC), and the Aeronautical Information manual (AIM) that reduces the utility and usefulness of TSO C 129 Global Positioning System (GPS) navigators. A recent update to the AC's avionics compliance table now restricts over 26,000 users. A detailed issue paper is enclosed.

The impact on the AOPA membership is significant with all but three GPS systems restricted from applying the Federal Aviation Administration's (FAA) 1996 policy that approves GPS to be used in lieu of Automatic Direction Finder (ADF) or Distance Measuring Equipment (DME). Pilots have removed ADF and DME systems from their aircraft and they will no longer have access to any conventional approaches that require them. This includes some precision instrument landing systems.

The navigation systems are also prohibited from flying Area Navigation (RNAV) routes and terminal RNAV procedures. The FAA's low-altitude RNAV routes (T-routes) are designed to support the very systems that no longer qualify. And the safety benefits of RNAV departures at small airports may not be fully realized due to a single functional requirement that would not likely be needed at most general aviation airports.

John, AOPA appreciates your immediate and timely response to our most recent effort to raise this issue. The impact is significant, and we look forward to working together with the FAA to quickly eliminate the limitations, and restore the approvals for all of the procedures and operations that GPS systems have been previously authorized to use.

Sincerely,

Randy Kenagy  
Senior Director Strategic Planning  
Government Affairs

Enclosure

## **AOPA Discussion Paper on AC 90-100 and the Aeronautical Information Manual on RNAV Substitution**

### **Summary of the Issue**

The Aircraft Owners and Pilots Association (AOPA) objects to recent Federal Aviation Administration (FAA) policy changes as published in Advisory Circular 90-100 (AC), and the March 15, 2007 edition of the Aeronautical Information manual (AIM). Originally published in 2005, the AC 90-100 avionics compliance tables have been recently updated and now exclude or fail to address over 26,000 users of Instrument Flight Rules (IFR) Global Positioning System (GPS) certified by the FAA.

The Advisory Circular, the AIM change, and the compliance table update cumulatively result in repealing the approval for IFR GPS systems to fly Area Navigation (RNAV) Tango routes (T-routes) and to use IFR GPS in lieu of ADF or DME. As a result, only three IFR GPS models are compliant at this time.

### **AOPA Concerns**

- The AC is inconsistent with the FAA/industry strategy of using the TSO C 129/C129a Instrument Flight Rules (IFR) Global Positioning System (GPS) as the basis for Area Navigation (RNAV) and Required Navigation Performance (RNP) procedures in the National Airspace System.
- Since July 16, 1998, all appropriately installed TSO C129/129A IFR GPS systems have been authorized to substitute GPS for ADF and DME. It appears the FAA has repealed this authorization by referencing the AC 90-100 compliance table in the March 15, 2007 AIM change.

After nine years of operational approval for using GPS in lieu of ADF and DME, many general aviation aircraft have removed DME and ADF from their instrument panels. Many instrument approaches require pilots to carry either ADF or DME and now the loss of this authorization means that many approaches to airports are no longer accessible to pilots.

- The non-compliant GPS equipped aircraft are restricted from using their IFR GPS for low-altitude RNAV based T-routes, which were specifically designed to be flyable by all IFR GPS systems, not a subset.
- Pilots using IFR GPS systems are restricted from using RNAV Arrivals and Departure Procedures, frequently found at airline airports, but hopefully coming to general aviation airports soon.

Note: AOPA recognizes that except for certain locations like Charlotte, NC where the total number of general aviation and air taxi operations are one-half of all annual operations, the SID/STAR limitation has minimal affect at this time. However, AOPA would assert that most pilots are not aware of

these new restrictions and do not know they must reject all RNAV SID/STAR clearances if their GPS systems are not AC 90-100 compliant, and/or if the procedures are not in the database.

### **Impact is Significant**

The AC publication and AIM change restricts *all* general aviation pilots who use an IFR GPS system, *except* for the Garmin 400/500/G1000 navigation systems. Based on a query to Jeppesen, the number of IFR GPS units affected exceed 26,000 TSO C 129/C129A GPS Systems that receive monthly navigation database updates. This is a very high number of affected users, over 7,000 more aircraft than the total number of airline aircraft in the United States (19,000).

### **AOPA Position**

It is AOPA's position that no IFR GPS system should be excluded from:

1. The July 1998, policy permitting IFR GPS systems to be used in lieu of ADF and DME
2. T-routes and certain departure procedures that can be flown with pilots manually entering the waypoints.
3. Except for major metropolitan airports, the use of database functions not commonly found in all IFR GPS systems should be restricted.

### **Key Issues for Discussion**

1. Did the FAA consciously decide through policy or otherwise, that the TSO C129 / 129a IFR GPS is NOT the baseline navigation system for general aviation in the NAS? If so, when was this decision made? Was it coordinated with AOPA? If so, what was AOPA's response?
2. Neither the AC 90-100 nor the recent AIM change is regulatory for part 91 operations, yet pilots are expected to abide by it. What is the basis for enforcement as it applies to these IFR GPS limitations? Has a memorandum or directive existed since 2005 that specifically references and requires all operators to comply with the AC?
3. Why develop policy that disables instead of enables RNAV operations? On May 9, 2007, the FAA Administrator encouraged all operators to invest in RNAV and RNP. In fact, newly published press releases and fact sheets indicate broad FAA support for all users to increase their use of RNAV and RNP. The AOPA membership has invested heavily, yet it appears they now are punished by the limitations imposed in the AC and the AIM.
4. How does the FAA rationalize the new restrictions on existing GPS systems? What data is available for industry to better understand the basis? Is there another method to address concerns, instead of broad restrictions?
5. What is the FAA outreach strategy for the general aviation community? Most pilots are unaware of the restrictions imposed by the AC and the AIM. It

should be noted that for the general aviation community the AIM amendment has not been distributed yet. New versions of the AIM will be published in the fall, 2007 at the earliest. AOPA is strongly concerned that pilots have not received the AIM update and are not aware of the significant changes in RNAV substitution and T-route limitations for their systems.

**List of IFR GPS Systems and Compliance with the AC 90-100.**

AC 90-100 Compliant and Eligible for Substitution	AC 90-100 Non-compliant & Not Eligible for Substitution
Garmin G1000 TSO C 129a and TSO C146a systems	Garmin GPS 155, GPS 165, GNC 300
Garmin GPS 400, GNC 420, GNC 420A, GNS 430, GNS 430A	Garmin GPS 155XL, GNC 300XL
Garmin GPS 400W, GNC 420W, GNC 420AW, GNS 430W, GNS 430AW	Garmin CNX 80, GNS 480
GPS 500, GPS 500 TAWS, GNS 530, GNS 530 TAWS, GNS 530A, GNS 530A TAWS	Garmin Apollo 2001, 2101 System
Garmin GPS 500W, GPS 500W TAWS, GNS 530W, GNS 530W TAWS, GNS 530 AW, GNS 540 AW TAWS	Garmin Apollo SL 50, SL 60, SL 65
	Garmin Apollo GX50, GX55, GX60, GX65
	Honeywell KLN-89B
	Honeywell KLN-90A
	Honeywell KLN-90B
	Honeywell KLN-94
	Chelton Systems
	Northstar M2, M3
	Trimble 2000,3000,7000, 8000 series

**Clarification Needed on Retrieving DP/STARS from Database**

- AIM Paragraph 1-1-19m does not require pilots to retrieve departure procedures from the IFR GPS database. Does the AC supersede and nullify, or does it clarify that requirement in some way? Why does the AC require RNAV procedures to be from a database and not conventional? It would seem that RNAV procedures are more easily entered manually than conventional procedures. What is the basis for the decision?
- How do pilots know an RNAV SID/DP procedure has a “CF leg” and that their GPS system does not support the departure? Is there a note on the Departure?

For reference. Pasted below is AIM 1-1-19m:

**m. Departures and Instrument Departure Procedures (DPs)**

The GPS receiver must be set to terminal ( $\pm 1$  NM) CDI sensitivity and the navigation routes contained in the database in order to fly published IFR charted departures and DPs. Terminal RAIM should be automatically provided by the receiver. (Terminal RAIM for departure may not be available unless the waypoints are part of the active flight plan rather than proceeding direct to the

first destination.) Certain segments of a DP may require some manual intervention by the pilot, especially when radar vectored to a course or required to intercept a specific course to a waypoint. The database may not contain all of the transitions or departures from all runways and some GPS receivers do not contain DPs in the database. It is necessary that helicopter procedures be flown at 70 knots or less since helicopter departure procedures and missed approaches use a 20:1 obstacle clearance surface (OCS), which is double the fixed-wing OCS, and turning areas are based on this speed as well.