

GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM 04-01

April 28-29, 2004

Recommendation Document

Subject: Charting of RNAV SIDs, STARS, and Q Routes

Background/Discussion: Advisory Circular 90 US-RNAV is being developed in an effort to align RNAV aircraft navigation equipment requirements, procedure and route development criteria, and flight crew procedures.

1. RNAV SIDs and STARS will belong to one of two types: A or B. A description of the major differences between A and B follows.

Type A	Type B
RNAV Departure Vector Area (DVA) Concept-Procedure may begin at point approximately 10 flying miles from the departure runway-minimum 2000'AGL with adequate DME/DME coverage (availability, suitability, and geometry), start of common route on SID	May begin approximately 500'AGL
Will use initial heading legs (Predetermined or as assigned) (charted heading legs may be coded as VM or VA) followed by ATC vector direct to initial point.	Will use initial heading legs as well as other leg types such as CF.
Accuracy requirement will be +-2nm.	Accuracy requirement will be 1nm (within 30nm straight-line from departure airport). Must be flown as if 1 nm even if procedure is 2nm.
GNSS, DME/DME or DME/DME/IRU equipment	GNSS or DME/DME/IRU with runway update equipment (position confirmation within 1000')
Radar Monitoring required	Radar Monitoring required*
No gaps in ground navigation infrastructure permitted unless charted as GPS required	Gaps in ground navigation infrastructure permitted (IRU drift applied)

*GPS required may be charted for a procedure to be conducted without radar coverage or suitable ground navigation infrastructure.

2. Q Routes-The restriction of GNSS required will be removed to allow use by DME/DME navigation aircraft. No gaps in ground navigation infrastructure are envisioned at this time-routes will be used by GNSS, DME/DME or DME/DME/IRU equipped aircraft.

Recommendations:

1. RNAV SIDs and STARS. Type A and B procedures will be charted as such in the title of the procedure e.g., RNAV-A. Aircraft suffix requirements will not be charted on individual procedures. Rather, AC 90-US RNAV will delineate requirements. In addition, the NTAP

and Aeronautical Information Manual (AIM) will discuss requirements. Procedure level will not be charted. The equipment suffixes will be modified as follows.

/E- DME/DME
 /F- DME/DME/IRU
 plus new suffixes for RVSM+

The FLIP legend may also indicate some of the requirements to operate on RNAV SID and STAR, in compliance with AC 90-US RNAV.

2. Q routes. Charted MEAs on Q routes will reflect DME/DME navigation coverage requirements (in addition to obstacle clearance and communication requirements). On routes/segments where a lower MEA for GNSS-equipped aircraft is operationally required/requested, an “MEA-G” may be charted in blue e.g., MEA – 22000G

Near Term:

Remove current note on legend:	And replace with note*.
RNAV Route (Not including Q routes in the Gulf of Mexico) GNSS and Radar Monitoring required. DME/DME RNAV N/A	RNAV Route (Not including Q routes in the Gulf of Mexico) GNSS or DME/DME RNAV required.
	Include description of MEA – G (in blue) on chart legend MEA-0000 Minimum Enroute Altitude for GNSS-equipped aircraft

Mid Term:

How should lower Q routes e.g., transition routes, be charted?

-One method would be to chart the multi-sensor Q routes/segments in black (MEA-G and waypoints still in blue) and the GNSS-only routes/segments charted in blue.

-An alternate method would to use a route numbering system to classify GNSS-only routes. For example Q401-500 may be GNSS-only routes.

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MEETING 04-01: Mr. Mark Steinbicker, AFS-410, submitted this issue. Advisory Circular (AC) 90, US-RNAV is being developed in an effort to align RNAV aircraft navigation equipment requirements, procedure and route development criteria, and flight crew procedures. It was stated that AC 90 would be available this summer. AFS-410 stated that RNAV SIDs and STARs would belong to either Type A or Type B, and existing procedures would be modified. These types would be charted as such in the title of the procedure e.g., BLUIT FOUR DEPARTURE

(RNAV-B). Aircraft suffix requirements will not be charted on the individual procedures. AC 90-US RNAV will delineate requirements. In addition, the NTAP and AIM will discuss requirements. The US Terminal Procedures legend will be modified to indicate the equipment requirements for Type A and Type B. Equipment suffixes will be modified:

/E – DME/DME

/F – DME/DME/IRU

plus new suffixes for RVSM+

AFS-410 stated charted MEAs on Q routes would reflect DME/DME coverage requirements. On routes/segments where a lower MEA for GNSS equipped aircraft is operationally required/requested, an “MEA-G” may be charted in blue, e.g., MEA-22000G. An alternate method would be to use a route numbering system to classify GNSS only routes. AFS-410 stated that the time-line on this issue is critical and that chart changes should occur early next year. **ACTION:** AFS-410, NACO AVN-503, and ATA-130

MEETING 04-02: Mr. Mark Steinbicker, AFS-410, reported that Advisory Circular (AC) 90, US RNAV is nearly ninety percent completed with a proposed effective date of January 20, 2005. The change will revise aircraft equipment suffixes beginning on November 25, 2004. These suffix changes will be implemented by NOTAM and placed in the NTAP. The existing SID and STAR charted equipment requirement notes will be invalid. The notes on approximately one hundred ninety-six RNAV SIDs and twenty-two RNAV STARs will be replaced with either “Type A” or “Type B” notes. The IACC specifications will not be impacted if the note is published using the same font size and type. The 8260 Order has been updated and sent out for comment. Mr. Paul Ewing, ATP, will verify that the 7100.9 Order, Standard Terminal Arrival has been updated. Implementation of Type A or Type B note changes on RNAV SIDs and STARs is targeted for September 1, 2005. AIM guidance will be effective September 1, 2005. Equipment suffixes will be modified as follows:

/E – DME/DME

/F – DME/DME/IRU

/W – RVSM

ACTION: ATP

MEETING 05-01: Mr. Mark Steinbicker, AFS-410, reported that Advisory Circular (AC) 90-100, US Terminal and Enroute Area Navigation (RNAV) Operations has been completed. The AC was signed in January 2005 with an effective date of September 1, 2005. The AC identifies RNAV SID and STAR procedures as either Type A or Type B based on aircraft navigation equipment requirements, procedure and route development criteria, and flight crew procedures. The existing equipment code notes on approximately 190 RNAV DP and 22 RNAV STAR procedures are therefore invalid. The RNAV SID and STAR procedures will be updated with a replacement note referencing Type A or Type B. The Terminal Procedure Publication (TPP) legend will be modified detailing the requirement of the Type A and Type B note. Type B procedures require a higher level of aircraft and operator performance than Type A procedures. Those aircraft and operators capable of flying Type B procedures may also fly Type A procedures. Most procedures will be identified as Type B procedures. Mr. Steinbicker stated that additional equipment suffixes: J, K, and L would be effective in August. AIM guidance will be effective September 1, 2005. FAA Order 8260.46, Departure Procedure (DP) Program and FAAO 8260.44, Civil Utilization of Area Navigation (RNAV) Departure Procedures and the AIM are in the process of being reworked. FAA Order 7100.9, Standard Terminal Arrival Program and Procedures, will not make the September effective date. Mr. Steinbicker provided a detailed explanation of the proposed changes to be incorporated into the TPP Legend. Mr. Vincent Chirasello, AFS-410, reiterated that under the Type B procedures’ charted note ‘Pilots of RNP-capable aircraft, use RNP 1.0’ (or 2.0, as applicable), the RNP number would be either 1.0 or

2.0 depending on the procedure and both numbers will not be shown. Mr. Kevin Comstock, ALPA, stated that ALPA submitted an additional note for the Type A and Type B procedures that included engage altitude. Mr. Steinbicker responded that the term 'engage' would not be used in the description. Mr. Steinbicker will coordinate the proposed changes with the PARC and make any additional changes to the requirement document prior to the next MPOC meeting on May 26, 2005. ACF Members express concern about the amount of information being added to the legend. **Note:** Mr. Brad Rush, NFPO, will provide the National Flight Data Center (NFDC) official source to amend the procedures on or about June 1, 2005. The official source will not be the normal 8260. The changes will be provided via an Excel spreadsheet as an add-on page to the National Flight Data Digest (NFDD). **ACTION:** AFS-420, Jeppesen and FAA/NACO.
