AERONAUTICAL CHARTING FORUM
Instrument Procedures Group
April 28, 2009
HISTORY RECORD

FAA Control # 09-01-285

Subject: U.S. RNAV Routes Coincident with Conventional Airways

Background/Discussion:

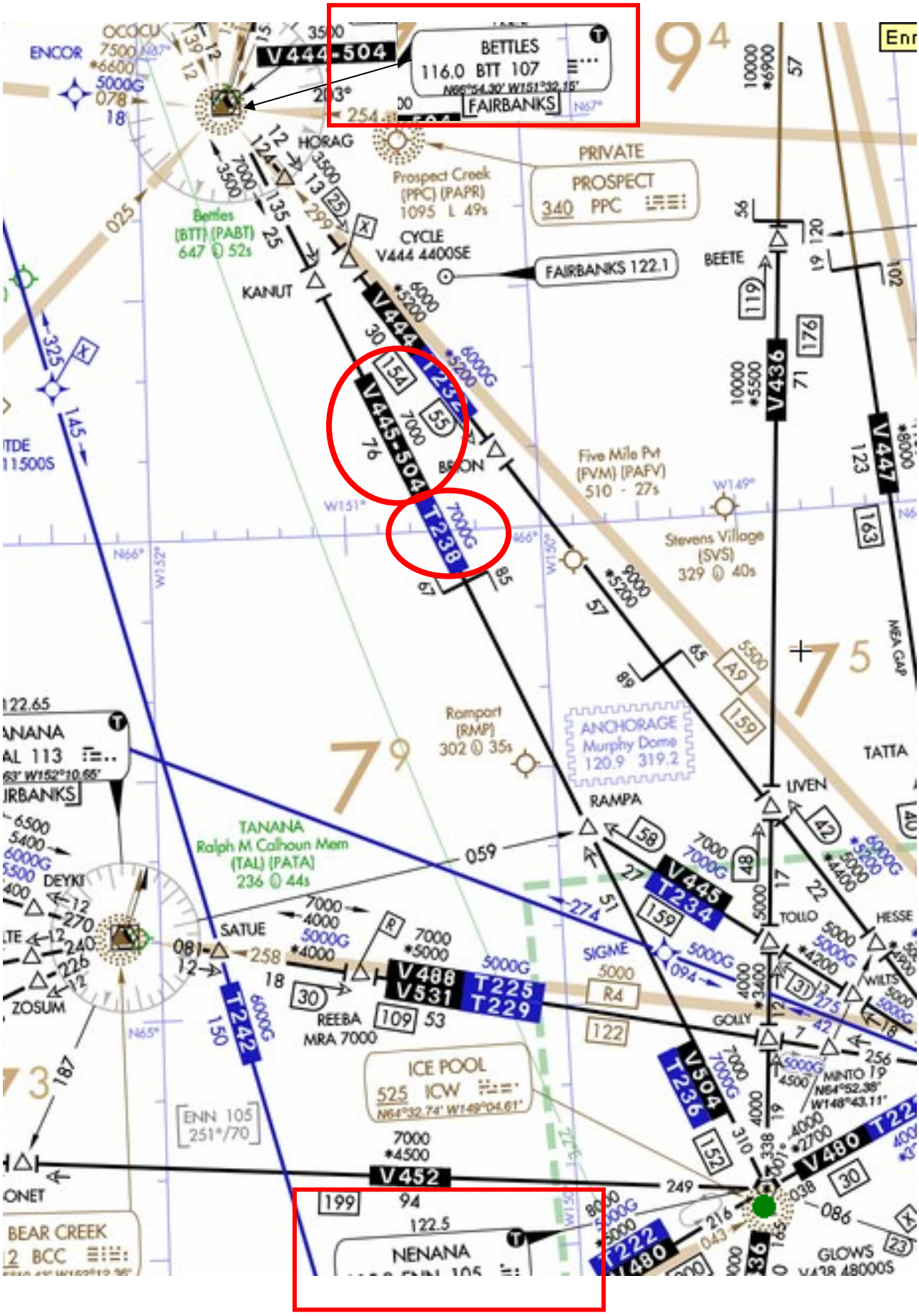
The FAA established criteria for RNAV routes in the U.S. National Airspace System (NAS) in the early 2000s which cover RNAV Q-routes in the high altitude structure and RNAV T-routes in the low altitude structure.

The RNAV route criteria were preceded by the establishment of criteria for GPS-based Minimum Enroute Altitudes in the U.S. NAS, known as GPS MEAs. The purpose of GPS MEAs was to allow pilots of GPS-equipped aircraft navigating along conventional airways or routes the option to operate at lower altitudes in order to avoid adverse weather conditions such as icing. The original application of GPS MEAs occurred in Alaska as part of the Capstone Project.

The main purpose of RNAV Q and T routes is to provide operational capabilities not available using the established system of conventional Jet or Victor airways which are predicated on ground-based navigation aids. Also, the establishment of RNAV routes is not necessarily to provide lower minimum operating altitudes. This need can be met through the establishment of GPS MEAs along established conventional airways. Therefore, there is no need for RNAV routes to duplicate or overlie conventional airways.

In Alaska there are several examples where low altitude RNAV T-routes are coincident with and completely overlie established conventional low altitude Victor airways. One example in particular is T-238 which is coincident with V-504 between Nenana VOR and Bettles VOR. This RNAV T-route shares the same centerline, the same total mileage, and the same MEA as the Victor airway. The MEA for the Victor airway is 7000 feet. The GPS MEA for the RNAV T-route is 7000G. (Refer to the NACO chart excerpt below as an illustration.)

The establishment of RNAV routes which overlie or are coincident with conventional airways is not productive or beneficial. On the contrary, the unnecessary duplication which results only serves to complicate maintenance and handling of the related (redundant) flight information - not only from the FAA source origination standpoint but also as it affects navigation database content and sizing, not to mention the resulting affects of increased congestion and increased potential for revision activity of various aeronautical enroute charts.


BETTLES
116.0 BTT 107
FAIRBANKS
V444-504
PRIVATE
PROSPECT
340 PPC
Prospect Creek
(PPC) (PAPR)
1095 L 49s
Bettles
(BTT) (PABT)
647 52s
HORAG
CYCLE
V444 440OSE
FAIRBANKS 122.1
KANUT
BEETE
V436
V447
V445-504
T238
Five Mile Pvt
(FVM) (PAFV)
510 27s
Stevens Village
(SVS)
329 40s
Rampart
(RMP)
302 35s
ANCHORAGE
Murphy Dome
120.9 319.2
RAMPA
LIVEN
TATTA
TANANA
Ralph M Calhoun Mem
(TAL) (PATA)
236 44s
DEYKI
SATUE
ZOSUM
V488
V531
T225
T229
REEBA
MRA 7000
SIGME
TOLLO
HESSE
WILTS
GOLLY
MINTO
V445
T234
V504
T236
T242
ICE POOL
525 ICW
ENN 105
251°/70
V452
V480
BEAR CREEK
BCC
NENANA
GLOWS

Recommendations:

1. FAA criteria for the establishment and implementation of RNAV routes in the U.S. NAS should be written in such a way as to avoid or discourage coincidental duplication of RNAV routes and conventional airways. One acceptable exception would be to allow for the logical continuation of a lengthy RNAV route to otherwise avoid a "break" in the RNAV route between end points when it happens to share a common (intermediate) segment with a conventional airway. A precedent for this may be found in the criteria for RNAV airways in Europe.

2. The FAA should review and re-evaluate the airway structure in Alaska to remove coincidental (duplicated) RNAV routes and conventional airways which might not be in compliance with RNAV airway criteria, and/or where no operational benefits are achieved.

Comments: This recommendation affects FAA Order 8260.19 and other guidance material pertaining to the development and implementation of RNAV route criteria, and possibly the implementation of GPS MEA criteria.

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Initial Dicussion - Meeting 09-01: New issue presented by Ted Thompson, Jeppesen, to express concern that there are many RNAV routes, especially in Alaska that overly conventional ATS routes. The primary purpose of RNAV routes is to provide operational benefits not available when using the established Jet or Victor airway structure predicated on ground based NAVAIDs. Additionally, the establishment of RNAV routes is not necessarily to provide lower operating altitudes along a conventional airway. This can be achieved by establishment of a GPS MEA; therefore, there is no need for RNAV routes to duplicate or overlie conventional airways. Ted provided several examples of unnecessary overlap using an excerpt from an Alaska en route chart. Additionally, unnecessary duplication serves to complicate maintenance and handling of all the related flight information – not only from the FAA source origination standpoint but also as it affects navigation database content and sizing, as well as chart clutter. Bill Hammett, AFS-420 (ISI) provided a brief summary in the development of low altitude T-Routes (formerly RNAV IFR Terminal Transition Routes). The intent of the initial development policy was that a T-Route would originate and end at a fix on an established airway. Overlap would be allowed within the origin and end points; however, it was not intended to overlap entire airways. Paul Ewing, AJR-37(AMTI), stated they have been corresponding with Alaska. The Alaska T-Routes were developed under SFAR 71 in support of the CAPSTONE project. They have a follow-on project underway to correct the problem with a target date for completion in 2010. Paul agreed to work with the Airspace and Rules Group, AJR-33, to address both aspects of the issue; 1) overlap of conventional airways, and 2) developing T-routes to allow lower operating altitudes. ACTION: AJR-37

Meeting 09-02: Paul Ewing, AJR-37 (AMTI), briefed that he checked into the issue. The T-Routes in Alaska were re-published; however, in so doing, the problem was made worse by an increase in overlapping routes. Alaska routes are being re-addressed. He also affirmed that AFS guidance allows T-Routes to overlap Victor airways. Paul added that the RNP Office is staffing T and Q route policy through the SMRD process. Bill Hammett, AFS-420 (ISI), stated he believed the original intent of the guidance for RITTRs (now T-Routes) was to allow overlap within the route to allow for logical route continuations, but not intended to arbitrarily extend (overlap) the routes beyond the point necessary to re-join the airway structure. Paul responded that the overlaps are usually for ATC convenience to simplify clearances. Ted Thompson asked that once the T-Route connects with the airway structure, what is to stop continued overlapping. Paul responded that Victor airways overlap and T routes should be treated the same. It should be up to ATC. Peter Pasquale, AJR-37 (AMTI), stated that one route simplifies flight plan filing and ATC clearances. Gary Fiske, AJT-28, also supported T-Route overlap for controller convenience. Ted commented that the ATC issues are understood and acknowledged, but there will be a negative consequence if the number of RNAV routes duplicating conventional routes is allowed to increase. The negative consequences would be increased overhead for maintenance (system wide), increased chart congestion, chart readability and interpretation by pilots; in short, increased requirements = increased scale = increased charts. Valerie Watson, AJW-372, supported Ted's concern over chart complexity. Paul then stated that when the RITTR program was first started, policy guidance required the ATC proposals to be forwarded to NACO for prototype charting and review. This advance peek at the charts prompted many useful suggestions from cartographers to simplify routes and reduce chart complexity. He will coordinate to see if that process can be re-started as well as ensure that new policy will emphasize minimizing overlap. Paul recommended the issue be closed. Ted commented that Jeppesen made the recommendation to raise attention, at this early stage of implementation, so that informed decisions could be made and possibly avoid similar RNAV-related chart congestion concerns affecting RNAV RNP approach charts. He agreed to close the agenda item with the request that the official minutes about the closure include mention of the inherent "acceptance" of the negative consequences that will likely become evident in the future. This request will provide a record for future reference in case the general subject of en route chart or display congestion is raised again sometime in the future. ITEM CLOSED.
