

AERONAUTICAL CHARTING FORUM
Charting Group
Meeting 13-01 – April 24-25, 2013

RECOMMENDATION DOCUMENT

FAA Control # ACF-CG RD 13-01-270

Subject: Step-down fix chart note

Background/Discussion: Current charts with step-down fixes contain a note in the profile view that states: “*LNAV only.” The note is somewhat ambiguous. That is, does it mean any line of minima predicated on LNAV horizontal guidance, or, does it mean only the LNAV line of minima?

Many interpret this note as the step-down fix only applies to the LNAV line of minima. In actuality, the step-down fix applies to both the LNAV and LNAV/VNAV lines of minima due to certain avionics limitations; in particular because baro-VNAV can be used on an approach with LNAV/VNAV minima.

Baro-VNAV systems contain the following aircraft/rotorcraft flight manual (or flight manual supplement) limitation:

“When using the <insert name> VNAV system, the barometric altimeter must be used as the primary altitude reference for all operations.” [emphasis added]

This limitation applies to step-down fixes as well and has been in effect for many years (AC 20-129 circa 1988). The reason for the operational mitigation to baro-VNAV-generated vertical guidance is due to potential error sources. It is possible for baro-VNAV to generate a misleading glidepath that takes the aircraft below a charted step-down fix altitude. In these circumstances, aircraft separation from obstacles may not meet the desired level of safety.

Recommendations: Change the profile view chart note from: “*LNAV only”
to: “N/A LPV”

Do not include an asterisk/note on procedures that do not have an LPV line of minima.

Comments:

Submitted by: Kevin Bridges

Organization: FAA/AIR-130

E-mail:

Date: 24 April 2013

MEETING 13-01:

Kevin Bridges, AIR-130, briefed the issue. Kevin [reviewed current charting practices](#) related to the notes associated with stepdown fixes on LNAV approaches that utilize Baro-VNAV systems. Kevin commented that pilots are increasingly treating Baro-VNAV vertical guidance as if it were like an ILS. This may have unintended consequences and pilots may fly the incorrect flight path.

Tom Schneider, AFS-420, stated that this issue should be submitted to the United States-Instrument Flight Procedures Panel (US-IFPP) for discussion. If the US-IFPP determines that there is a need to change the note, both the Instrument Procedures Group and the Charting Group can address the issue.

STATUS: OPEN

ACTION: Kevin Bridges, AIR-130, to take the suggestion to the US IFPP and report on the outcome at next AFC.

MEETING 13-02:

Kevin Bridges, AIR-130, commented that since the last ACF the suggestion was submitted to the USIFPP. The USIFPP is still considering the issue and there is nothing yet to report. Kevin will report progress of the issue at the next ACF.

STATUS: OPEN

ACTION: Kevin Bridges, AIR-130, will monitor progress of the issue through the US IFPP and report at next AFC.

MEETING 14-01:

Kevin Bridges, AIR-130, reviewed the topic. He stated that this issue was discussed at the US-IFPP and that there was support for changing the profile note. The note will be changed from "LNAV only" to "LNAV/VNAV and LNAV only".

Kel Christianson, AFS-470, stated that these changes will be in the next AIM update scheduled for publication in January 2015.

Tom Schneider, AFS-420, stated that the note will be updated in the next update of FAA Order 8260.19.

Valerie Watson, AJV-3, stated that updates to the notes will be applied to the charts through either an amendment to the 8260 Form or a P-NOTAM.

STATUS: OPEN

ACTION: Tom Schneider, AFS-420, will revise FAA Order 8260.19 and report at next ACF.

ACTION: Kel Christianson, AFS-470, will track requested AIM changes and report back at next ACF.

MEETING 14-02

Tom Schneider, AFS-420, briefed the topic and advised that the revised FAA Order 8260.19G will be published March 2015. Kel Christianson, AFS-470, added that work on the changes to the AIM have been put on hold until the revisions to the Order have been published.

Rich Boll, NBAA, [presented a briefing](#) in which he expressed various concerns regarding pilot confusion over how to apply the step down fix chart note. One of those concerns is that there is a belief among pilots that the step down fix does not apply to circling. Part of the confusion stems from combining LNAV/VNAV and LNAV-only capabilities onto a single chart. Rich presented various solutions to address this confusion, including adding circling to the existing chart note, separating the vertically guided and non-vertically guided approaches onto different charts, or adjusting the TERPS criteria to remove LNAV/VNAV minima and only publishing LPV minima.

John Collins, GA Pilot, inquired as to whether there were any temperature restrictions associated with LNAV/VNAV approaches where Baro VNAV was required. Pilots within the audience commented that there is an assumption that a Baro-VNAV system attempts to fly the descent path and is potentially dangerous.

Rich put forth the following request from NBAA regarding actions on this topic:

- Suspend action to amend chart note
- In the short term, establish an FAA/Industry working group to identify, evaluate, and select suitable options to address the current issue.
- In the longer term, AFS to work with AIR to establish appropriate criteria within TERPS supporting continued use of LNAV/VNAV minima that reflect existing certification criteria respective to approach Baro-VNAV

John Collins, GA pilot, expressed his opinion that a stepdown fix after the FAF (GS Intercept) should not apply to an LNAV/VNAV procedure as it is a vertically guided procedure that meets TERPS criteria for obstacle clearances and specifies temperature limitations when using Baro-VNAV equipment to assure these obstacle clearances are satisfactorily met.

Lev Prichard, APA, stated that he does not support the addition of the asterisk for the stepdown altitude, as it will most certainly destabilize approaches using VNAV equipment. It is not necessary as LNAV minimums use a flat OCS and LNAV/VNAV minimums use a temperature corrected sloping OCS. The stepdown fix does not effectively exist for LNAV/VNAV minima and would have a negative operational effect on a stabilized approach in cold temperatures for Baro-VNAV equipped aircraft by requiring them to interrupt the VNAV path by entering another vertical mode, thus complicating and destabilizing the procedure. It is a non-issue for aircraft utilizing SBAS (WAAS), and therefore chart clutter. We do support other possible changes as discussed if it alleviates the circling issue brought up by NBAA.

Tom stated that these recommendations would have to go back to the US-IFPP and this issue be reopened in order to address the concerns. Tom reminded the audience that the related FAA Orders are still in draft. With regard to the circling portion of this issue, Tom stated that there are two options. Either the note can be expanded to also apply to circling, or a rule can be

established within TERPS that if there is a step down fix, circling MDA cannot be established below that step down fix altitude.

STATUS: OPEN

ACTION: Tom Schneider, AFS-420, will readdress the issue at the USIFPP and report at the next ACF.

MEETING 15-01

Kevin Bridges, AIR-131, provided an update. Kevin stated that activity on this topic is ongoing within the US-IFPP and that they will determine whether the guidance needs to be revised or expanded. Current policy regarding the publication/charting of stepdown fix notes remains unchanged until further notice.

STATUS: OPEN

ACTION: Kevin Bridges, AIR-131, will report at the next ACF.

MEETING 15-02

Kevin Bridges, AIR-131, provided an update. Kevin stated that the USIFPP suggested the topic be closed due to there being no means to classify the misleading information and there is no way to identify aircraft that have VNAV systems. Kevin added that there is a very high probability that airplanes with FMSs with baro-VNAV systems authorized for use on LNAV/VNAV line of minima also have GPWS or TAWS per 91.223. GPWS/TAWS can be considered as mitigation for a 10^{-3} baro-VNAV system used in this case for a 10^{-5} operation.

Rich Boll, NBAA, stated that there is one part of the recommendation that still remains unresolved regarding [the addition of circling to the *LNAV only note](#). Discussion focused on whether circling should be addressed in the **LNAV only* note. It was noted that details on what minima apply to non-precision approaches, including circling, are covered in the Aeronautical Information Manual (AIM), however, there seems to be pilot confusion regard the applicability of the note.

Rich stated that there are two options: take the **LNAV only* note off the chart entirely or change the note to read **LNAV and Circling only*. There was a lengthy discussion on the best course of action. The sentiment in the room shifted to the issue being not about charting and inclusion of a note to the real need for pilots to be properly trained to fly the procedure. It was reemphasized that for non-precision (meaning non-vertically guided) approaches, step down fixes apply and that needs to be instilled in pilots through training. In the end, the consensus was that all **LNAV only* stepdown notes and the similarly used **LOC only* stepdown notes should be removed from the FAA Order 8260.19 guidance and from the charts.

Rich agreed to look at the AIM language to determine whether additional guidance is required.

Tom Schneider agreed to initiate necessary changes to the FAA Order 8260.19 guidance. Brad Rush stated that once the guidance has been published, the note will be removed from the charts as the 8260 series procedure source forms are amended for other reasons, meaning that it will likely be a long time before all the notes will be removed.

STATUS: OPEN

ACTION: Tom Schneider, AFS-420, to report on progress made on modifying FAA Order 8260.19 revised to remove *LNAV only and *LOC only stepdown notes.

ACTION: Bruce McGray, AFS-410, and Rich Boll, NBAA, to review AIM guidance and report on possible revision.

MEETING 16-01

Valerie Watson, FAA/AJV-553, reviewed the issue. Bob Lamond, NBAA, stated that NBAA concurs with the removal of the profile stepdown notes as long as the published AIM guidance provides a very clear description of stepdown fix use.

Tom Schneider, FAA/AFS-420, said that he has drafted revised guidance for FAA Order 8260.19H to remove all of the stepdown fix chart notes (including the "LOC only" type notes).

Valerie asked Bruce McGray, FAA/AFS-410, what progress he had made in the revision to the AIM guidance. Bruce reported that no progress had yet been made, but said that he will coordinate with Rich Boll, NBAA, to revise the AIM language. Rune Duke, AOPA, stated that this is an educational concern for AOPA and they would be willing to help with the drafting of new AIM guidance.

STATUS: OPEN

ACTION: Bruce McGray, AFS-410, Rune Duke, AOPA, and Rich Boll, NBAA, to review existing AIM guidance and draft revisions necessary to clarify stepdown fix use.

MEETING 16-02

Rune Duke, AOPA, reviewed the topic. Rune presented the proposed Aeronautical Information Manual (AIM) language changes regarding stepdown fix use. Rune also showed figures from the TPP Legend that would need to be revised concurrently.

Tom Schneider, FAA/AFS-420, stated that the revised guidance to remove the stepdown fix chart notes has been included in the draft of FAA Order 8260.19H.

There were a number of comments from the audience regarding details of the wording of the AIM language. Rich revised the language and [presented](#) it again to the ACF audience for review.

Valerie Watson, FAA/AJV-553, asked the audience if they concurred with the revised language. As there were no further objections, Rich and Rune will submit the changes for the AIM. Valerie will begin work to update the TPP Legend.

Post-ACF Update: Per AFS-400, this initiative has been placed on hold pending further coordination.

STATUS: OPEN

ACTION: Rune Duke, AOPA, and Rich Boll, NBAA, will work with John Blair, FAA/AFS-410 to submit revised stepdown fix AIM guidance for publication.

ACTION: Valerie Watson, FAA/AJV-553, will draft a specification change to update the TPP Legend Profile View page to clarify stepdown fix use.

ACTION: John Bordy, FAA/AFS-420, to report on the status of revised guidance in draft FAA Order 8260.19H.

MEETING 17-01

Meeting was cancelled.

MEETING 17-02

Valerie Watson, FAA/AJV-553, reviewed the topic and reported that after the last ACF this item was placed on hold by FAA/AFS-400 pending further coordination. John Bordy, FAA/AFS-420, said that this is no longer on hold and the (previously agreed-upon by the ACF) [proposed changes to the AIM](#) are now moving forward. Bruce Mc Gray, FAA/AFS-410, reported that the AIM guidance is expected to be published in the September 2018 update. John then stated that once the AIM guidance is in place, he will work updates to FAA Order 8260.19. Valerie asked if the proposed changes to the TPP Legend Profile View page could be published now. Rich Boll, NBAA, suggested that those changes also wait until after the AIM guidance is published so the new changes can be communicated to pilots.

STATUS: OPEN

ACTION: Bruce McGray, FAA/AFS-410 to report back on the status of the revised stepdown fix AIM guidance.

ACTION: Valerie Watson, FAA/AJV-553, will move forward with the specification change to update the TPP Legend Profile View page to clarify stepdown fix use after the new AIM language is published.

ACTION: John Bordy, FAA/AFS-420, to move forward with revised guidance in FAA Order 8260.19 after the new AIM language is published.

MEETING 18-01

Valerie Watson, FAA/AJV-553, reviewed the issue and reported that the revised Aeronautical Information Manual (AIM) guidance was [published in the 29 March 2018 edition](#). She said that Rich Boll, NBAA reported that a couple of minor revisions to the text are needed regarding the deletion of the (H) in the MDA and DA references. Rich Boll, NBAA, said he will send the revisions to Bruce McGray, FAA/AFS-410, for publication.

John Bordy, FAA/AFS-420, provided an update on the changes being incorporated into FAA Order 8260.19H. He stated that the changes will be drafted for inclusion in Change 2.

Valerie reported that she will submit a specification change to update the Terminal Procedure Publication (TPP) Legend Profile View page to clarify stepdown fix use after the revised guidance has been published in FAA Order 8260.19.

STATUS: OPEN

ACTION: Bruce McGray, FAA/AFS-410, to submit revised stepdown fix AIM guidance for publication per input from Rich Boll, NBAA.

ACTION: John Bordy, FAA/AFS-420, to report on the status of revised guidance in draft FAA Order 8260.19H.

ACTION: Valerie Watson, FAA/AJV-553, to work specification change to update the TPP Legend Profile View page to clarify stepdown fix use after the revised guidance has been published in FAA Order 8260.19.

MEETING 18-02

Valerie Watson, FAA/AJV-553, reviewed the issue. She showed the audience the [Aeronautical Information Manual \(AIM\) language](#) that was published in the 29 March edition that explains stepdown fixes and altitudes and that they only apply within the Final Approach Segment to non-precision portion of the procedure and do not apply when flying a precision approach - ILS or approaches with vertical guidance (LPV, LNAV/VNAV) lines of minima. She pointed out a couple of minor changes that are already being worked by Bruce McGray, FAA/AFS-410, and that will be corrected in the next release of AIM.

Valerie then asked John Bordy, FAA/AFS-420, about the status of the updates to FAA Order 8260.19. John confirmed that the updates will be in Change 2 which will begin coordination in November 2018. Valerie stated that once the order has been updated, she will move forward with a specification change to update the TPP Legend Profile View page to clarify stepdown fix use. Once the FAA Order 8260.19 change is

implemented, the stepdown fix chart notes will begin to be deleted on a day forward basis as procedure source is updated.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, to report on the status of revised guidance in draft FAA Order 8260.19.

ACTION: Valerie Watson, FAA/AJV-553, to work an Interagency Air Committee (IAC) Specification change to update the TPP Legend Profile View page to clarify stepdown fix use after the revised guidance has been published in FAA Order 8260.19.

MEETING 19-01

Valerie Watson, FAA/AJV-A250, reviewed the issue. She reiterated that Aeronautical Information Manual (AIM) language published in 2018 explains stepdown fix altitudes and clarifies that they only apply within the Final Approach Segment to the non-precision portion of the procedure and do not apply when flying a precision approach - ILS or approaches with vertical guidance (LPV, LNAV/VNAV) lines of minima. She reported that she has drafted an Interagency Air Committee (IAC) Specification change to update the Terminal Procedures Publication (TPP) Legend Profile View page to clarify stepdown fix altitude use, which she will process for signature after the revised guidance has been published in FAA Order 8260.19.

Valerie then showed an [example of an Instrument Approach Procedure](#) with a Visual Descent Point (VDP) with an asterisk to an "LNAV only" note. She asked if these notes should also be removed. She suggested that the same logic applies in that VDPs also only apply to the non-precision portion of a procedure. Rich Boll, NBAA, stated that the AIM is already clear for VDPs and that yes, those notes should also be removed. There was unanimous audience agreement to remove the VDP notes.

John Bordy, FAA/AFS-420, reported that updates for the removal of stepdown fix altitude notes is in draft FAA Order 8260.19 version I, which is expected to be published in August 2019. He said he would take the VDP issue to the U.S. Instrument Flight Procedures Panel (US-IFPP) in June and if he receives approval for the change, he will work to get that into the same update. Valerie said that she will add VDPs to her draft TPP Profile specification change and await word on the Order changes.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, will take the suggested change regarding VDPs to the US-IFPP for discussion, and if approved, incorporate the necessary changes into FAA Order 8260.19.

ACTION: John Bordy, FAA/AFS-420, to report on the status of revised guidance in FAA Order 8260.19.

ACTION: Valerie Watson, FAA/AJV-A250, to work an Interagency Air Committee (IAC) Specification change to update the TPP Legend Profile View page to clarify VDP and stepdown fix altitude use after the revised guidance has been published in FAA Order 8260.19.

MEETING 19-02

Samer Massarueh, FAA/AJV-A221, reviewed the issue. John Bordy, FAA/AFS-420, stated that the revised guidance for the removal of stepdown fix altitude notes is in draft FAA Order 8260.19 version I, which is expected to be published in December 2019. He said that the suggested change regarding VDP notes is still under discussion with FAA/AFS-400 and has not yet been taken to the U.S. Instrument Flight Procedures Panel (US-IFPP) for consideration. He said that he agrees with the proposal and will continue to circulate it. Valerie Watson, FAA/AJV-A250, said that she will move forward with the Interagency Air Committee (IAC) Specification change to update the TPP Legend Profile View page to clarify stepdown fix altitude use after the revised guidance has been published in FAA Order 8260.19. She said she will wait to update the guidance for VDPs until that piece has been approved and written into the Order.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, will take the suggested change regarding VDPs to the US-IFPP for discussion, and if approved, incorporate the necessary changes into FAA Order 8260.19.

ACTION: John Bordy, FAA/AFS-420, to report on the status of revised guidance for the removal of stepdown fix altitude notes in FAA Order 8260.19.

ACTION: Valerie Watson, FAA/AJV-A250, to work an Interagency Air Committee (IAC) Specification change to update the TPP Legend Profile View page to clarify stepdown fix altitude use after the revised guidance has been published in FAA Order 8260.19.

MEETING 20-02

Samer Massarueh, FAA/AJV-A221, reviewed the issue. Valerie Watson, FAA/AJV-A250, showed the audience how the [TPP Legend Profile View](#) page is proposed to be revised to clarify stepdown fix altitude relevance only to non-precision use of the procedure. Diane Adams-Maturo, FAA/AFS-420, reported that FAA Order 8260.19 has been updated to remove the requirement to append stepdown fix altitudes and VDPs

with notes, e.g., LOC only, LNAV only. Amended procedures going forward will have the notes removed from the forms.

Bill Tuccio, Garmin, asked if commercial providers can begin removing all such notes from the charts. Valerie said she cannot speak for what commercial providers do, but that the FAA will not remove the notes from the charts until the procedures are amended and the notes are removed from the source documents. Aaron Jacobson, Jeppesen, said that they would also apply the changes as the procedures are amended. Jim Spencer, NGA, confirmed that they will also follow that same plan.

Valerie stated that all actions for this RD are complete and this item can now be closed. There were no objections.

STATUS: CLOSED