

# GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM 05-01

May 11-12, 2005

## Recommendation Document

**Subject:** Top Altitude Note on Standard Instrument Departures (SIDs)

**Background/Discussion:** The Pilot/Controller Procedures and Phraseology (P/CPP) Working Group has been developing procedures and phraseology for “Climb via” for SIDs that is very consistent with “Descent via” for STARs. The process involves Human Factors evaluation and simulation through pilot questionnaires and flight simulator scenarios.

SIDs/RNAV SIDs with a vertical profile contains altitude instructions textually in the narrative and on the graphic chart. The narrative also contains the “top altitude” of the procedure; e.g., “...maintain FL190, expect final requested altitude 10 minutes after...” (in this example, the “top altitude” is FL190). The graphic depiction does not contain this information which has proven problematic in Human Factors simulations while developing “Climb via”. The problem surfaces when ATC has to interrupt a SID; i.e., vectoring an aircraft off the route, or inserting an interim altitude, then returns the aircraft to pilot navigation using the clearance “climb via”. If the pilot has changed the altitude in their auto flight system, or otherwise removed any reference of the top altitude because ATC gave a “maintain” instruction, he/she has no quick reference to resume the proper “top altitude” without referring (digging) back into the narrative.

**Recommendations:** The P/CPP recommends the development of a standard method of depicting the ATC “Top Altitude” on a SID graphic chart.

**Comments:** The P/CPP recognizes the proliferation of notes on procedures but feels this is important enough to recommend the addition of another.

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**MEETING 05-01:** Mr. Don Porter, ATO-R/RNP, submitted this issue. Mr. Mark Steinbicker, AFS-410, briefed the ACF. The Pilot/Controller Procedures and Phraseology (P/CPP) Working Group has been developing procedures and phraseology for 'Climb via' for SIDs that is very consistent with 'Descend via' for STARs. The process involves Human Factors evaluation and simulation through pilot questionnaires and flight simulator scenarios. SIDs/RNAV SIDs with a vertical profile contains altitude instructions textually in the narrative and on the graphic chart. The narrative also contains the 'top altitude' of the procedure, e.g., 'maintain FL190, expect final requested altitude 10 minutes after... .' in this example, the top altitude is FL190. The graphic depiction does not contain this information and this has proved problematic in Human Factors simulations while developing 'Climb via'. The problem surfaces when ATC has to interrupt a SID, i.e., vectoring an aircraft off the route, or inserting an interim altitude; then returns the aircraft to pilot navigation using the clearance 'Climb via'. If the pilot has changed the altitude in their auto flight system, or otherwise removed any reference of the top altitude because ATC gave a 'maintain' instruction, he/she has no quick reference to resume the proper 'top altitude' without referring back (digging) into the narrative. The P/CPP recommends the development of a standard method of depicting the ATC 'Top Altitude' on a SID graphic chart. Mr. Steinbicker provided a detailed explanation of the LAS Shead Three Departure, which is attached to these minutes. Mr. Steinbicker's briefing resulted in extensive ACF discussions; brief highlights of these comments follow. Mr. Steinbicker stated that there is a concern about using the word 'maintain' too many times in the clearance and route description. There is some interpretation that use of the word, maintain, deletes all the vertical restrictions. Mr. Ted Thompson, Jeppesen, stated that Jeppesen uses a matrix format to depict the information in a text form within columns. At one time Jeppesen published altitudes all over the planview. Mr. Tom Schneider, AFS-420, stated that the climb via term has been eliminated from the examples in FAAO 8260.46C. Mr. Mark Ingram, ALPA, stated for the record that ALPA supports the recommendation. Mr. Thompson stated the 'Top Altitude' needs to be clearly identified on the source. Jeppesen and NACO agreed that a box note could be added to the chart provided the information was clearly specified as 'chart note' on the 8260. Mr. John Moore, NACO, stated that from a charting aspect, specifications exist to chart the note. Mr. Schneider recommended that the following statement be added to the FAAO 8260.46C, "Do not specify an altitude higher than the final maintain altitude described in the text." Mr. Moore recommended that the issue be tabled pending additional input from Mr. Porter. **TABLED.**

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**MEETING 05-02:** Mr. Don Porter, ATO-R/RNP, reported the Pilot/Controller Procedures and Phraseology (P/CPP) Working Group has been developing procedures and phraseology for 'Climb via' for SIDs that is very consistent with 'Descend via' for STARs. Climb via is an instruction the controller will give that authorizes the pilot off the lateral path to climb at their discretion to comply with all restrictions on the SID. 'Top Altitude' is the maximum altitude a pilot is cleared to climb to in the initial SID clearance, or when receiving a 'Climb via' clearance from ATC. The forum participants discussed the need to standardize the depiction of the Top Altitude information on the SID. Two options were discussed, one is to show a note in the upper corner, near the title of the procedure and the other option is to have the information included with the MSA information in the upper corner. In addition to the placement of this information, guidance for procedure designers must be established to include the top altitude information in the procedure source documentation. The Top Altitude Note presentation is attached to these minutes. **ACTION:** NACO, Jeppesen and ATO-R/RNP.

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**MEETING 06-01:** Mr. Don Porter, ATO-R/RNP, provided the following update. At the 05-02 ACF, Jeppesen and the NACG agreed to produce prototype charts for evaluation by the group.

The requirements for the prototype charts were provided to both charting offices. The intent of the requirement was to standardize the depiction of 'Top Altitude' information on SIDs by placing the information in a standard location. Additionally, a box attached to the route will indicate the top altitude using a line above the altitude to indicate cross at or below and a line below the altitude to indicate cross at or above, as described in issue 04-01-167. Mr. Brian Townsend, ALPA, explained the 'Climb via' requirements and stated that charted altitude restrictions must be complied with. The group discussed several different SID procedures, and how the top altitude information applies to MEAs, and lost communication procedures. Mr. Porter inquired as to the source for the top altitude information. Mr. Ted Thompson, Jeppesen, stated that the source is the 8260 and the information must be clearly depicted by the procedure designers on the form. Several participants expressed issues with the depiction of the 'TRALR' box on the Jeppesen prototype. Mr. Thompson provided an example of the Jeppesen Barkway Two Sierra Departure at London. Mr. Thompson recommended using standard text to relay the information. He expressed his concerns about the use of additional boxes on the chart stating more information in more boxes will only add to pilot confusion. Mr. Brad Rush, NFPO, stated that the term 'Top Altitude' is misleading and should be changed. Mr. Townsend recommended the use of the term 'Initial Clearance Altitude' because this is the altitude provided by air traffic control (ATC) on the initial clearance. Technically, this will be your top altitude until additional clearance information is provided by ATC or in the event of lost communications you would follow lost communication procedures. Mr. John Moore, NACG, stated the subject is still in the concept and coordination stage and recommended that the issue continue to be worked outside the ACF. Mr. Rush, and Mr. Tom Schneider, AFS-420, should get involved with Mr. Porter and Mr. Townsend's group to refine the issue(s). Then, after the procedural and ATC issues are resolved, the next step would be to consider the charting implications. Mr. Porter stated that he would coordinate a telcon to include Mr. Rush and Mr. Schneider. The Jeppesen and NACG prototype charts, and the Jeppesen Barkway Two Sierra Departure are attached to these minutes. **ACTION:** ATO-R/RNP and ALPA.

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**MEETING 06-02:** Neither Mr. Don Porter, ATO-R/RNP, nor Mr. Brian Townsend, ALPA, were able to attend the forum. Mr. Tom Schneider, AFS-420 reported that a test was completed last month in Las Vegas. One problem identified by Flight Standards was situations where the top altitude was lower than the associated airway MEA. Mr. Mark Ingram, ALPA, agreed to contact Mr. Porter and Mr. Townsend and provide an email update to be attached to these minutes. **ACTION:** ATO-R/RNP and ALPA.

*Editor's note: No response was available at the time of print for these minutes.*

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**MEETING 07-01:** Mr. Brian Townsend, ALPA, is currently working with Jeppesen to put out a prototype chart to do validation testing in Vegas. Brian will coordinate with Don Porter, ATO-R RNP. **ACTION:** Mr. Brian Townsend will provide an update at the next ACF.

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**MEETING 07-02:** Proposed Definition: "Top Altitude" is the maximum altitude a pilot is cleared to climb to in the initial SID clearance, or when receiving a "climb via" clearance from ATC. This subject concerns a need, expressed by ATC, to standardize the depiction of Top Altitude information on relevant SID charts where "climb via" procedures are used. One solution when designing a SID would be to NOT include any crossing altitudes that are higher than the so-called "Top Altitude". This would avoid complications and confusion. Another solution would be to depict the Top Altitude conspicuously in a prominent, consistent location on the chart (i.e. beneath the procedure title), or as part of the Briefing Strip general notes section.

(Note: Regardless of depiction, Jeppesen insists that Top Altitude information be included on SID procedure source.)

The FAA, for pilot education purposes, created an informational video covering “Climb Via” procedures.

Mr. Brian Townsend, ALPA, gave a presentation (see Attachment 4 - SID Top Altitude Depiction Proposal.pdf) as a refresher and a topic update.

According to Brian, new RNAV SIDs will be implemented at Salt Lake City effective JAN 8, 2008. New RNAV SIDs will be implemented at Las Vegas soon after, on or about February 2008. (Check FAA AVN website for advance procedures.) Brian requests that Jeppesen apply ALPA’s recommended depiction of the “Top Altitude” climb limit. (Note: On the FAA procedure source, this is also the “maintain” altitude.)

The discussion led to whether or not the 8260 procedure source should be changed from providing a “maintain altitude” to providing a “window or block altitude” for each waypoint or route segment. According to Brad Rush and Tom Schneider, existing policy allows the use of “block altitudes”. The requirement is actually driven by Air Traffic.

Brad Rush pointed out that no matter which way you go, a sizeable number of FMS boxes will be impacted – both positively and negatively.

Brian Townsend, ALPA, stated that box manufactures need to modify their FMSs.

Rich Boll of NBAA expressed concern about business/corporate operators who do not have FMS VNAV capability. This would be an education issue.

In summary, charts reflect the procedure source. Coding is another aspect. Ideally, the charts should be compatible with the coding. If the source was clear as to the application of “block altitudes”, that would be the ideal outcome. There was additional discussion that this subject may have run its course as a charting forum subject and the issue should be transferred to AFS for certification. **OPEN.**

**ACTION:** Brian Townsend, ALPA, will provide ASF-420 Tom Schneider with recommended text for 8260.46D, Appendix 2. AFS-420 will incorporate and report back.

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**MEETING 08-01:** Mr. Ted Thompson Jeppesen reported on this issue. Jeppesen currently uses the words **Above** and **Below** to denote altitudes while NACO uses overlines and underlines. Jeppesen is currently studying overlines and underlines in an attempt to make the top altitudes more prominent. When Jeppesen introduced a new concept to make these look like block altitudes, a lot of mixed feedback was received. Mr. Mark Steinbicker, FAA/AFS-470, may set-up a review of top altitudes. Mr. Mark Ingram, ALPA, asked about the London Airspace step climbs. Mr. Thompson answered that some operators in that region were Jeppesen customers. Jeppesen agreed to adopt the overline/underline method in the UK. While Level-busts incidents went down he believes that a combination of corrections caused the drop in Level-busts. Speed and Altitude restrictions are being examined.

The issue is that charts reflect the procedure source, but coding is another aspect. Ideally, the charts should be compatible with the coding. If the source was clear as to the application of “block altitudes”, that would be the ideal outcome.

Mr. John Moore, FAA/NACO, commented at the last ACF that this item has run its course. Also, the original sponsors, Brian Townsend and Don Porter, no longer participate in the ACF. Kevin Comstock expressed concerns about closing the issue without concurrence from Brian and Don. Mr. Thompson recommended closure until further study.

Mr. Thompson explained, from Jeppesen’s perspective, the operational problems related to the recent implementation of the RNAV SIDs at Salt Lake City, which included feedback, related to Jeppesen’s depiction of Speed and Altitude restrictions (including Top Altitudes).

Also, per a comment made by Divya Chandra the previous day in the IPG, Mark Steinbicker has approached Volpe Labs about the possibility of Volpe conducting a human factors review of the presentation of altitude and speed restrictions.

The Top Altitude Note Issue has been transferred to the new ATC/MCA Crossing Altitude subcommittee under the IPG. The issue will be returned the Charting Group at a later date.

**CLOSED.**