

AERONAUTICAL CHARTING FORUM
Instrument Procedures Group
October 27, 2009
HISTORY RECORD

FAA Control # 09-02-286

Subject: Initial “Climb & Maintain” Altitude on Standard Instrument Departure Procedures

Background/Discussion:

A review of Standard Instrument Departures (SIDs) in the Western US Region finds that many SIDs do not contain an initial “climb and maintain” altitude in the Departure Route Description or the Transition Route Description. Rather, these SIDs provide “expect filed altitude XX minutes after departure” (SFO – SAN FRANCISCO SIX & DUMBARTON SIX; ONT – PRADO SEVEN; LGB – SENIC ONE), or publish an instruction similar to “maintain XX, XXX or as assigned by ATC (SAN – POGGI SEVEN) or “maintain assigned altitude...” (SNA – DUUKE ONE). Note that these last two SIDs contain “at or below” altitude restrictions at fixes located along the departure route.

It is assumed that ATC provides the “climb and maintain” altitude assignment with the pilot’s initial ATC clearance. However, an altitude assignment may be provided by ATC prior to takeoff. If an altitude assignment is provided by the ATC after the initial IFR clearance is received, this constitutes an amended ATC clearance which cancels all published (ATC) altitude restrictions unless these restrictions are re-stated or the pilot is advised to comply with the all restrictions published on the SID (ref: AIM 5-2-8(e) (4) and AIM 4-4-10(g)). Many of the new RNAV SIDs found in the Western US contain multiple, altitude constraints, some containing an “at or below” altitude restriction, but without a “climb and maintain” altitude.

Pilots departing using these Western region SIDs that do not provide an initial “climb & maintain” altitude have reported confusion over the continued applicability of altitude restrictions published on the SID after being issued a “climb and maintain” altitude as part of the initial IFR clearance. In other words, when ATC includes an instruction to “maintain XXXX” in the pilot’s initial IFR clearance, does the use of the phrase “maintain” in the initial clearance IFR constitute an amended clearance for the published altitude restrictions per AIM 4-4-10(g)? Such confusion may eventually result in a failure to comply with the altitude restrictions published on the SID. With the growing use of “at or below” altitude restrictions on RNAV SIDs, this situation is **not acceptable**.

FAAO 8260.46D, Appendix A, Section 1 General states:

*a. Safety is a primary concern and DPs must be designed so that they provide obstacle clearance, least onerous routing (where possible), and **can be confidently and consistently flown** by all aircraft expected to use the procedure*

*c. A SID **must reduce pilot/controller communications and workload.***

*g. A SID must be designed to terminate at a fix/NAVAID depicted on an IFR en route chart, **at an altitude** that will allow random IFR flight, or at a position where ATC radar service is provided.*

NBAA strongly believes that these statements from the Departure Procedure Order taken together require the publishing of an initial “climb and maintain” altitude on all SIDs.

Recommendations:

NBAA requests that the AFS 420 issue a Policy Memorandum that communicates immediately to all regional flight procedure offices of the need to publish an initial “climb and maintain” altitude on all SIDs and RNAV SIDs. Procedures currently in use should be amended at the next biennial procedure review. Consideration should be given to amending those RNAV SIDs with “at or below” altitude restrictions before the required biennial review.

Procedures currently in production or coordination, e.g. LAX – CASTA TWO RNAV SID; SAN – POGGI THREE), should be amended to publish an initial “climb and maintain” altitude, especially for those RNAV SIDs where “at or below” altitude restrictions are included in the procedure.

NBAA recommended amending FAAO 8260.46D to state the requirement to publish an initial “climb and maintain” altitude on all SIDs and RNAV SIDs.

Comments: The recommendation affects FAAO 8260.46D AeroNav Services instructions to regional flight procedure offices, the AIM, and possibly JO 7110.65.

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Initial Discussion - MEETING 09-02: New issue presented by Rich Boll, NBAA. Rich stated that there have been numerous occasions where pilots are issued an IFR clearance with a SID assigned. Either in conjunction with the takeoff clearance or immediately after departure, the aircraft is subsequently assigned “...climb and maintain (altitude).....” Many pilots consider this an amended ATC clearance that voids all SID altitude restrictions unless

the SID restrictions are restated or the pilot is advised to comply with published restrictions. This has led to many pilots breaking at-or-below and mandatory altitude restrictions that are becoming more common on RNAV departures, especially in the western states. Bill Hammett, AFS-420 (ISI), noted that there were discussions at some former ACF meetings regarding "climb via" phraseology similar to the "descend via" term used for arrivals. He doesn't know the current status of the proposal, but suggested that this phraseology would solve the issue by standardizing procedures. Mike Hilbert, AJR-37, responded that "climb via" was intended only for those instances where an aircraft was taken off (i.e., vectored) a SID by ATC and then cleared back on it. Al Herndon, MITRE, stated that this issue was before the Charting Group previously as a "Top Altitude" for SIDs. John Blair, AFS-260, stated that when ATC issues an altitude, pilots don't usually know the reason for it; e.g., noise abatement, terrain clearance, traffic separation, etc. Dan Diggins, AJR-28, stated that he would form a group with representatives of the Terminal (AJT-28), En Route (AJE-31), and System Operations (AJR-37) Service Units to study the issue to determine whether it is related to charting, procedure design policy, or ATC procedures.

ACTION: AJT-28, AJE-31, and AJR-37

MEETING 10-01: Mike Frank, AJT-28, briefed the sub group the previous manager of AJT-28 agreed to form did not happen and no action has been taken on the issue due to re-assignment of key personnel. He assured the group the issue would be worked soon. Mike Hilbert, AJR-37, stated that an ATO Document Change proposal (DCP) regarding "climb via" phraseology and procedures may help resolve the issue. Lev Prichard, APA, mentioned that La Guardia is a confusing location for departures and recommend it be used in the study. **ACTION:** AJT-28, AJE-31, and AJR-37

MEETING 10-02: There was no ATO representative from the PBN Group, AJV-14, to brief whether any progress had been made by the "climb via" working group. There was also no comment on whether AJT-28 had formed a working group to address the issue. Rich Boll, NBAA, recommended Order 8260.46 be changed to provide better guidance for a pilot to determine whether an altitude has been issued or re-issued. Rich took an IOU to draft AIM language and forward it to AFS-410 for processing. The IOU for AJT-28, with support from AJE-31 and AJV-14, to form a sub group to study the issue and report remains open.

ACTION: AJT-28, AJE-31, AJV-14, and NBAA.

MEETING 11-01: Jim Arrighi, AJV-14, whose office is spearheading this effort was not available for an update. Rich Boll, NBAA, stated that it is not a controller issue, but rather one of pilot understanding. Rich, in concert with Lev Prichard, APA, have drafted the following AIM language which will be forwarded to AFS-410 for coordination/publication:

"Standard Instrument Departure Procedures (SIDs) may or may not include an initial "climb and maintain altitude" in the SID verbiage. If an altitude is not printed on the procedure, ATC will issue an altitude in its original IFR clearance (usually from clearance delivery or by PDC). In either case, this is your original clearance altitude, and pilots should comply with all altitude restrictions published on the departure procedure. If anytime thereafter, a new altitude is assigned by ATC, all previous restrictions are canceled unless they are re-issued by ATC such as "Climb and maintain XXXX, comply with restrictions".

There was no update on whether the ATO sub group that the Terminal Service Unit was to initiate after meeting 09-02 to work this issue has been formed or met.

ACTION: AJT-28, AJE-31, AJV-14, and NBAA.

MEETING 11-02: No progress has been made on this issue. Kyle McKee, AJV-14, reported that his office is awaiting the working group to form. Rich Boll, NBAA, reported that due to miscommunications between NBAA and AFS-410, the proposed AIM change was not forwarded for publication. Rich added that he will ensure the change is forwarded to Bruce McGray, AFS-410, immediately following the ACF-IPG meeting, which should allow all coordination to be complete prior to February 9, 2012, for publication in the August 2012 AIM. **ACTION:** AJT-28, AJE-31, AJV-14, AFS-410 and NBAA.

MEETING 12-01: Bruce McGray, AFS-410, briefed the following proposed change to AIM paragraph 4-4-10g that is being planned for publication in August, 2012. It is proposed to revise the introductory text and add a new Example 1 and renumber the remaining Examples:

g. The guiding principle is that the last ATC clearance has precedence over the previous ATC clearance. When the route or altitude in a previously issued clearance is amended, the controller will restate applicable altitude restrictions.

1. The term "Maintain", when used in issuing an altitude assignment as an item in the initial ATC clearance delivered to an aircraft prior to departure, does not constitute an amended clearance that cancels altitude restrictions issued by ATC or contained on any DP issued as an integral part of the same clearance. The depicted or assigned altitudes apply. However, in subsequent transmissions, restating a previously issued altitude to maintain is an amended clearance. If an altitude to "maintain" is changed or restated, whether prior to departure or while airborne, and previously issued altitude restrictions are omitted, altitude restrictions are cancelled, including DP/FMSP/STAR altitude restrictions if any.

2. Standard Instrument Departure Procedures (SIDs) may or may not include an initial "climb and maintain altitude" in the SID verbiage. If an altitude is not printed on the procedure, ATC will issue an altitude in its original IFR clearance (usually from clearance delivery or by PDC). In either case, this is your original clearance altitude, and pilots should comply with all altitude restrictions published on the departure procedure. If any time thereafter, a new altitude is assigned by ATC, all previous restrictions are canceled unless they are re-issued by ATC such as "Climb and maintain XXXX, comply with restrictions."

The proposal prompted a lively discussion. Gary Fiske, representing AJT-2A3, asked whether the acronym "FMSP" could be removed as there are no known FMS procedures in publication. Mark Steinbicker, AFS-470, agreed that a global scrub should be made to delete this acronym. Steve Moats, AFS-220, expressed concern over the word "maintain" having two meanings in the same paragraph of the proposed AIM change. Rich Boll, NBAA, expressed concerns about ambiguity and the potential confusion over the differences between initial ATC "climb and maintain" clearances (unrestricted climbs) vs. published (charted) altitude restrictions which are "downstream" on the SID, especially when the climb is restricted due to 'At' or 'At or Below' altitude restrictions. Paul Eure, AJE-31, stated that the ATO is working a Notice on assigned altitudes for departures to include a training bulletin. Mark Steinbicker, AFS-470, added that an AFS InFO, an NTAP Graphic Notice as well as other items are being prepared to clarify the issue for pilots and controllers alike. Steve Serur, ALPA, confirmed that departure altitude restrictions have been an area of concern for years. Ben Rich, Metron Aviation, stated that the problem goes back as far as 1977 and the confusion in the cockpit is even greater today, especially with increased ATC intervention on SIDs and STARs, coupled with the increase in "At" and "At or below"

altitudes. Rich Boll, NBAA, added that many SIDs do not specify an altitude, only "as assigned". Kyle McKee, AJV-14, stated that the "climb via" phraseology and procedures for SIDs is piggybacking on what has been implemented for STARs. When issued, "Climb via" will mean that the SID's vertical profile and lateral track must be adhered to. Mark Steinbicker, AFS-470, noted that the "climb via" issue was also being addressed within the PARC and expressed reservation regarding an issue being worked by two separate entities. Bill Hammett, AFS-420 (ISI), agreed with Mark's statement regarding separate groups working the same issue. However, Bill disagreed that the PARC is better suited to resolve the issue unless an ad hoc working group is formed and assigned the project, similar to the PARC Nav-Data Currency WG, or the PARC RNP Charting WG. These aforementioned PARC WGs were willing to "get down in the weeds" and address all facets of an issue and resolve them. Ted Thompson, Jeppesen, agreed that the PARC subcommittee process should address **all** aspects of a given subject. Mark agreed to take the issue before the PARC to see whether they will accept it. Bill agreed to provide Mark the ACF history file regarding the issue, and added that if the PARC accepts the issue, it will be closed as a recommendation from the ACF-IPG and subsequently carried as a briefing item.

ACTION AFS-470.

Editor's Note: Rick Dunham, Manager, AFS-420 forwarded the ACF-IPG history file of issue 09-02-286 as well as the draft minutes of the ACF 12-01 meeting discussion on the issue to Mark Steinbicker on May 14.

MEETING 12-02: Bruce McGray, AFS-410, briefed that recent problems related to the FAA's decision to delay implementation of "Climb Via" procedures further complicates this issue. The previous ACF decision was that the subject should be addressed by the FAA PARC; however, Kel Christiansen, AFS-470, reported that, according to Mark Steinbicker, Manager, AFS-470, the PARC will not accept responsibility for the subject; therefore, it remains within the purview of the ACF IPG. A discussion ensued regarding SID published altitudes and controller clearances. Lev Prichard, APA, stated that the CHILY SID at Phoenix Sky Harbor (KPHX) is a classic example. The SID specifies "maintain 7000", yet controllers continually issue "maintain 5000". This creates confusion, especially since all the applicable runways require a climb gradient of 300 or 350 Ft/NM to 7000. Art Blank, AJT-2A3, stated that there are also problems regarding altitude assignments at Houston (KIAH) and the facility managers at both KPHX and KIAH are actively working to have the SIDs corrected. Rick Dunham, AFS-420, stated that pilots must request clarification when there is confusion. He added that the solution must not remove flexibility for controllers to make altitude changes as necessary for traffic flow/separation. Paul Eure, AJE-31, stated that this type issue was the main reason why "climb via" was cancelled. It is also related to the meaning of "maintain" and the fact that "climb via" cannot be issued at Pre Departure Clearance (PDC). Gary McMullin, SWA, agreed that there is a lot of altitude confusion regarding departure clearances and SIDs; however, whatever is issued via PDC is the master to avoid confusion. Bill Hammett, AFS-420 (ISI), stated that it has long been the consensus of this group that when ATC assigns an altitude, it overrides any published altitudes on a procedure. ATC is assuming responsibility for the aircraft. Gary agreed. In conclusion, it was agreed that AFS-410, AFS-470 and AJT-2A3 will jointly work the issue and report progress. **ACTION AFS-410, AFS-470, and AJT-2A3.**

MEETING 13-01: Mark Washam, AJT-2A3 (HSI, Contract Support), stated that his office is still working with the PBN Policy and Support group, AJV-14, to resolve this issue. Jim Arrighi, AJV-14, briefed that the revised Document Change Proposal (DCP) for "climb via" procedures is currently in coordination with May 6 as the cut off for comments. The target date to publish the new guidance is February 2014; however, it is hoped to implement via Notice in October 2013. Jim stated that the PARC Pilot Controller Procedures and Systems Integration Working Group reviewed the DCPs a second time on April 22 and all are in agreement. He added that there is good consensus among all the joint working groups addressing the issue. Jim emphasized that it is an absolute must that all controllers and pilots be on the same page upon implementation. Ted Thompson, Jeppesen, noted that charting requirements must also be established, if required. Bruce McGray, AFS-410, stated that AIM guidance has been developed to include pilot procedures for revised clearances and for when ATC intervenes on a SID. Paul Eure, AJE-31, recommended holding off on the AIM until the DCPs are final and Gary McMullin, Southwest Airlines, agreed. The issue remains open to be jointly worked by AFS-410, AFS-470 and AJT-2A3, AJE-31, and AJV-14. **ACTION** AFS-410, AFS-470, AJT-2A3, AJE-31, and AJV-14.

MEETING 13-02: Bruce McGray AFS-410 briefed that the wording for the AIM change has been completed; however, AFS-410 is holding off on AIM changes until all Document Change Proposal (DCP) work has been completed by AT and to ensure everything controller-related is in place before change. A copy of the draft AIM language thus far is provided below. It is proposed that this language will be included as new paragraph 4-4-3c (following paragraphs will be re-numbered and retained) and also included within paragraph 5-2-8 following the sentence "ATC clearance must be received prior to flying a SID" follows:

"In your initial SID clearance, ATC will normally assign a SID and an altitude to climb and maintain. In some cases, your initial altitude will be published on the SID. In others, the altitude issued with your IFR clearance may be higher than restriction(s) on the SID. ***In all cases, you must comply with the SID restrictions. Pilots must notify ATC immediately if they cannot meet the published climb gradient or, if one is not published, a minimum of 200 ft/nm on each segment of the SID up to the MEA.*** If you are radar vectored or cleared off an assigned SID, you may consider the SID cancelled unless the controller adds —Expect to resume SID. If ATC reinstates the SID and wishes any restrictions associated with the SID to still apply, the controller will state: —Comply with restrictions.

Amended Clearances. ATC may amend your clearance at any time. It is important to remember that the most recent ATC clearance takes precedence over all others. When the route or altitude in a previously issued clearance is amended, the controller will restate applicable altitude restrictions. In the United States if the altitude to maintain is changed or restated, whether prior to departure or while airborne, and previously issued altitude restrictions are not re-stated, those altitude restrictions are canceled, including SID/DP/STAR altitude restrictions. ***Pilots must ensure minimum climb gradients for obstacle clearance are still met.***

Bruce advised that anyone is welcome to forward suggestions to the draft wording directly to him. He went on to provide a brief explanation of the AIM wording: If a SID is issued while on taxi out, and an altitude change is made after, the SID is cancelled unless you are explicitly advised the SID still applies along with all restrictions associated with it. Similarly, if AT takes you off the SID with a vector heading, the SID is cancelled unless AT explicitly restates that the pilot return to the SID routing. John Frazier, Advanced Aircrew Academy,

stated that, although not related to departures, his office has noted many Aviation Safety Action Program (ASAP) reports relating to pilots descending on STARs, having to query the assigned altitude to which cleared after ATC intervention. Rich Boll, NBAA, advised the Pilot Controller Procedures System Integration group (PCPSI), a sub group of PARC, has been working on “climb via/descend via”, and speed adjustments. Jim Arrighi, AJV-14, and Rich are members of the group. Rich advised that the changes the PCPSI recommended appear to align with the proposed AIM changes, but it would be a good idea to sit down off line and make sure there are not two AIM issues being worked coincidentally. Jim advised that the PCPSI has a meeting on Nov 20-21, 2013 to work on the pilot briefing material (which he stated NBAA has done a tremendous job in developing), the pilot video, and status of AT procedures regarding climb via and descend via. All the DCPs have been finalized and are in queue to be signed, with implementation targeted for April 2014. Original target was Feb 2014. All changes are planned and being worked in earnest. The concern is that a change in a procedure is considered to cancel the procedure *unless* AT restates it. AT should advise the pilot to either resume procedure or give other guidance. The pilot should not delete the procedure from the data base since they may be put back on it. Tom Schneider, AFS-420, surmised the changes had not been submitted formally for AIM publication, and questioned if Bruce should cease activity until after the PCPSI Nov meeting. Bill Hammett, AFS-420 (ISI/Pragmatics Contract Support) inquired if the key members of the PCPSI were present for tasking purposes. Jim stated AJV-14, En Route, Terminal, and AFS-470 are all a part of the group and are present. Bill asked if AFS-410 was a part of the group. Jim responded there had not been any 410 participation. Bill suggested the PCPSI working group, with AFS-410 participation, accept the tasking to develop AIM language and pilot educational material for this issue. That would stop the dual effort, and the ACF would have just one focal point. The group agreed. Bill requested a POC to track the issue and Jim Arrighi graciously agreed to be focal point. John Frazier restated his desire for the discussions to include arrivals. Group discussion ensued; with agreement arrivals will be included. John Collins, GA pilot, added that it is important that AIM guidance and AT implementation occur simultaneously. **ACTION AJV-14.**

MEETING 14-01: Jim Arrighi, AJV-14, reported that after a 12 year effort, we have implemented climb via procedures, speed adjustment and termination phraseology. This effort has been in the works for over a decade. Results are being monitored and follow-up will be done with AJV-8 and AFS for any adjustments or clarifications as needed. He gave some examples of clarifications, such as Climb Via established two principal criteria, coded restriction with crossing and/or maintain restriction, and how it applies to conventional and RNAV. Jim discussed some pilot confusion on altitudes and phraseology and ATC facility questions. He thanked Bob Lamond, NBAA, and Rich Boll, NBAA, for their development help in the FAA industry workgroup. He mentioned chart change specification and movement of the STAR Order to AFS. Tom Schneider, AFS-420, said top altitude requirement will be in Order 8260.46E, out next month. Jim mentioned some charting issues, which will be addressed in charting portion of forum. Bob agreed issue should be closed. Group discussion on specifics/numbers if tracked on pilot compliance and understanding of issue, along with vector SIDs. Tom showed an example of expect vs. except. Discussion of human factors issues. Discussion of phraseology compliance by pilots and ATC.

Status: **Issue CLOSED**

Editor's Note: At the Charting Group meeting there was some misunderstanding regarding the publication of "Top Altitudes" which resulted in removing the guidance in Order 8260.46E. See ACF Charting Group Agenda item 13-01-266 for rationale and all future discussions to resolve this issue.