

AERONAUTICAL CHARTING FORUM
Instrument Procedures Group
October 23, 2012

HISTORY RECORD

FAA Control # 12-02-302

Subject: Multiple Climb Gradients on Standard Instrument Departure (SID) Charts.

Background/Discussion: Multiple climb gradients are currently being depicted on some SID charts; one for obstacle clearance and one for ATC altitude restrictions. This practice has recently started at Salt Lake City (SLC) - see the attached LEETZ 2 RNAV Departure. Previously, only the min climb gradient was annotated on this chart and having multiple CG's clutters up the chart unnecessarily. FAA order 8260.3, *US Standard for terminal Instrument Procedures (TERPS)*, allows only one climb gradient for obstacle clearance purposes. However, FAA Order 8260.46, *Departure Procedure (DP) Program*, allows multiple climb gradients when necessary for ATC purposes.

The explanation of changes for Change 2 to Order 8260.46 appears contradictory to the paragraph itself: For example. The explanation of changes states "(3) Paragraph 2-1e(2). Revised paragraph to support the revision of paragraph 2-1e(1) that eliminates the need to differentiate between climb gradients for either ATC purposes or obstacle clearance. There is no way to determine if the altitude depicted on the chart is for obstacle clearance or to meet an ATC requirement; therefore, the crossing altitude/climb gradient must be complied with unless ATC intervenes and assumes responsibility for obstacle avoidance." This gives the impression that only one climb gradient is necessary.

However, The actual paragraph 2-1e(2) states: "(2) Charting Minimum Climb Gradients. All Graphic DPs must depict minimum climb gradient(s) that exceed 200 ft per NM whenever required for obstruction clearance and/or RNAV or RNP operational limitations (LNAV engagement altitude). Order 8260.3 allows only one climb gradient for obstacle clearance on any DP (ODP or SID). Multiple ATC climb gradients are permitted on SIDs; however, the ATC climb gradient must not be less than that required for obstacle clearance. When RNAV/RNP operational (equipment requirements) climb gradients are required on SIDs, these climb gradients must not be less than that required for obstruction clearance. Enter minimum climb gradients for charting on the appropriate 8260-15 series form (see appendix D or E)."

Multiple climb gradients, especially when duplicated, contribute to unnecessary chart clutter.

Recommendations: Revise policy to specify that only the highest required climb gradient for any given segment of a SID be specified on the procedure.

For example:

Runway 14, 16L, 32, 34L/R, 35: ***Minimum climb rate 385' per NM to 13,000.***

Runway 16R: ***Minimum climb rate 415' per NM to 9000', 370' per NM to 13,000'***

Runway 17: ***Minimum climb rate 370' per NM to 13,000'***

Comments: This recommendation affects FAA Order 8260.46.

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Date: October 23, 2014

JEPPESEN SALT LAKE CITY, UTAH
14 NOV 08 (10-3B) Eff 20 Nov RNAV SID

1. RADAR required.

3. RNAV 1.

5. If unable to accept climb rates

8. MEKKER Transition: For non-GPS equipped aircraft BVL, MLD, OCS, OGD and TCH DME must be operational

10. **ROCK SPRINGS Transition:** For non-GPS equipped aircraft OGD and TCH DMEs must be operational.

★ HOLTR
LEET7 TWO PNAVY DEB

(11FT72, 11FT7)

OLT
2.HC
210
007
.7

7
LEET
FR
11
30

SAWGI
ROCK SPRINGS

OCs $\pm$ z

NOT TO SCALE

At 250 KT

FRALL
PLOGE
FL230

At or below	Resume normal speed
At or below	Resume normal speed

ROCK SP. KILL
12.00
12.00

FL230

after CHEDO

057.2
FL230 10.1
82.1

normal speed

AINTT
025
FL230
800T

069° → FL190 11400T FEYOR 16.3

Days	Control (○)	100 mg/kg (●)	150 mg/kg (▲)
0	0	0	0
20	10	10	10
40	20	20	20
60	30	30	30
80	40	40	40
100	50	50	50
120	100	100	100
140	140	130	110

16.5
13000
0.000000

17000

3000
18.4
1600
9.9
085°

The map shows the Tennessee River flowing through the region. Key locations marked include Murfreesboro, Nashville, and Clarksville. The map also shows major roads and the location of the Tennessee Valley Authority (TVA) dam. The map is oriented with North at the top.

081°
HAYL
(LEFT)

PERTY FL230 12

DOCKT γ 002

AI 250 KT
V L
FL 18
33.2
FL 190
FL 18

FL230
10.71800T

Resume
normal speed

90°
MEEKEN
(1)

FL230 135

At or below	112-00
At 250 K 1	137001

FL230

Resume normal speed	12s ★

attor MUHL

	OBS ACLES	M
Rwys 16L / 16R:	Multiple light poles beginning	M

FLZ30 or
altitude.
988' from DEH, 689' HIGH of centerline, up to
34' AGL/4254' MSL.

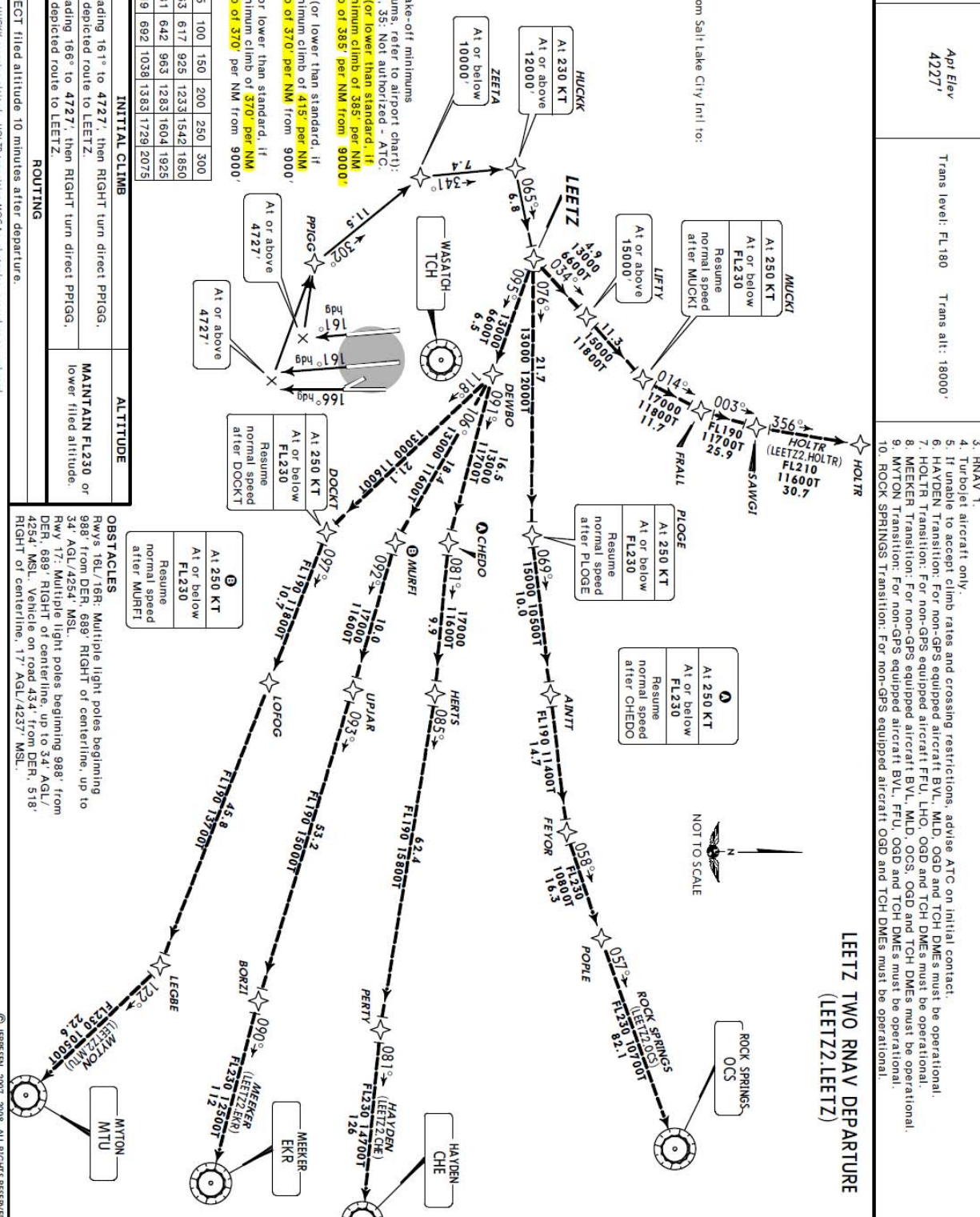
601

4254' MSL. Vehicle on road 434' from DEH, 518' RIGHT of centerline, 17' AGL/4237' MSL.

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CHANGES: Climb gradients, HUCK crossing altitude, HOL TR transition MOCAs, obstacles, procedure renumbered

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Initial Discussion - MEETING 12-02: New recommendation presented by Kevin Allen, US Airways. Kevin expressed concern that there are SIDs that have multiple climb gradients published; one for obstacle clearance and one (or more) for ATC altitude restrictions. This appears to be a contradiction between two FAA 8260-series Orders. Order 8260.3, *US Standard for Terminal Instrument Procedures (TERPS)* allows only one climb gradient for obstacle clearance purposes. However, FAA Order 8260.46, *Departure Procedure (DP) Program*, allows multiple climb gradients when necessary for ATC purposes. These multiple climb gradients, especially when duplicated, contribute to unnecessary chart clutter. US Airways recommends the FAA revise policy to specify that only the highest required climb gradient for any given segment of a SID be specified for the departure procedure. Kevin also recommended that charting could use a slash (/) vice "per" when specifying the climb gradient; e.g., "360'/NM" vice "360' per NM". Bill Hammett, AFS-420 (ISI) responded that there are restrictions on the use of symbols allowed in international NOTAMs; however, he was unsure if the slash is restricted. Tom Loney, Canadian Air Force, mentioned that not all aircraft have the same climb performance capabilities; therefore, pilots of less capable aircraft should have all the relevant information available. Tom Schneider, AFS-420, stated that criteria drives policy. The new Order 8260.58, which was effective September 12, 2012 and replaced Orders 8260.44, 8260.45, 8260.52, and 8260.54, as the standard for RNAV procedures, removed the provision that allowed multiple climb gradients. As noted above, Order 8260.3 also allows only one climb gradient; therefore, all reference to multiple climb gradients has been removed in the upcoming guidance in Change 3 to Order 8260.46. The premise is "one altitude at a fix will define one climb gradient". The scenario used in the example given by US Airways will be eliminated in the future. Chris Jones, AFS-410 (Support), stated that this scenario could cause an adverse impact in that some operators who cannot meet the specified climb gradient may not be able to use the procedure. Tom Schneider, AFS-420, responded that this has been discussed at several FAA/industry ad hoc departure meetings/telcons and the consensus was that this is acceptable. The group consensus is that the issue may be closed based on Order 8260.58 and the upcoming Change 3 to Order 8260.46. **ITEM CLOSED**
