Depiction Altitude Restrictions

SID and STAR Charting

Presented to: Aeronautical Charting Forum
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Topic

- 21 DCPs to implement Climb Via procedures.
- Work group identified need to improve chart depiction of Altitude Restrictions on Standard Terminal Arrival (STAR) and Standard Instrument Departures (SIDs)
- Depiction of Top (Maintain) Altitudes on SIDs
SID/STAR Altitude Restrictions

• Increasing numbers of STAR and SID procedures contain charted altitude and speed restrictions.
  • The restrictions often provide an optimized vertical profile for arrivals and departures.
  • The restrictions are critical to ensuring separation of departing and arriving aircraft.

• ATC issues a ‘Descend Via’ clearance to require compliance with the published restrictions. ‘Climb Via’ procedures, under development since 2004 and scheduled for implementation in 2013, require compliance with the SID restrictions.
Discussion

• Although the STAR/SID charts graphically depict the crossing restrictions, there are continuing challenges with compliance with restrictions.
  • Attributed to procedure design, chart clutter, lack of standardization of notes, note location, misunderstanding of the ATC clearance, lack of standardization of PDC, etc.

• A common factor for both STAR and SID charts is that nowhere on the chart, other than the graphic is there any prompt to the pilot indicating the procedure has a stepped climb or descent profile.
Federal Aviation Administration

SW-1, 04 APR 2013 to 02 MAY 2013

5/21/2013
DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAY 6: Climb heading 083° to 5934, then continue climb heading 083° or as assigned by ATC for Radar vectors to BAYL at/below FL230. Thence . . .

TAKEOFF RUNWAY 16L: Climb heading 173° to intercept course 186° to GOROC, then on track 262° to cross HURDL at/below 10000, then on track 272° to HAWPE, then on track 237° to cross TUULO at/above 12000, then on track 237° to cross HILTON at/above 14000, then on track 237° to cross MTSUL at/above 16000, then on track 237° to cross BAYL at/below FL230. Thence . . .

TAKEOFF RUNWAY 16R: Climb heading 173° to intercept course 183° to GOROC, then on track 262° to cross HURDL at/below 10000, then on track 272° to HAWPE, then on track 237° to cross TUULO at/above 12000, then on track 237° to cross HILTON at/above 14000, then on track 237° to cross MTSUL at/above 16000, then on track 237° to cross BAYL at/below FL230. Thence . . .

TAKEOFF RUNWAY 17L: Climb heading 173° to intercept course 218° to GOROC, then on track 265° to cross YORVI at/above 8000, then on track 262° to cross HURDL at/below 10000, then on track 272° to HAWPE, then on track 237° to cross TUULO at/above 12000, then on track 237° to cross HILTON at/above 14000, then on track 237° to cross MTSUL at/above 16000, then on track 237° to cross BAYL at/below FL230. Thence . . .

TAKEOFF RUNWAY 17R: Climb heading 173° to intercept course 210° to GOROC, then on track 262° to cross YORVI at/above 8000, then on track 262° to cross HURDL at/below 10000, then on track 272° to HAWPE, then on track 237° to cross TUULO at/above 12000, then on track 237° to cross HILTON at/above 14000, then on track 237° to cross MTSUL at/above 16000, then on track 237° to cross BAYL at/below FL230. Thence . . .

TAKEOFF RUNWAY 25: Climb heading 263° to intercept course 242° to cross DUGME at/below 10000, then on track 243° to HAWPE, then on track 237° to cross TUULO at/above 12000, then on track 237° to cross HILTON at/above 14000, then on track 237° to cross MTSUL at/above 16000, then on track 237° to cross BAYL at/below FL230. Thence . . .

TAKEOFF RUNWAYS 34L/R, 33L/R: Climb heading 353° to 5934, then climbing left turn direct to cross CRACK at/below 10000, then on track 229° to HAWPE, then on track 237° to cross TUULO at/above 12000, then on track 237° to cross HILTON at/above 14000, then on track 237° to cross MTSUL at/above 16000, then on track 237° to cross BAYL at/below FL230. Thence . . .

. . . as depicted to BOBBA, thence via (transition) maintain FL230 or filed lower altitude. Expect higher filed altitude ten minutes after departure.

BLUE MESA TRANSITION (BAYL1, HBU1)
THRO TRANSITION (BAYL1, TEBU1)
as depicted to BOBBA, thence via (transition) maintain FL230 or filed lower altitude. Expect higher filed altitude ten minutes after departure.
vectors on course. Maintain 5000 or as assigned by ATC. Expect clearance to filed altitude/flight level 10 minutes after departure.
NOTE: RADAR required.

NOTE: Turbojet aircraft only.

NOTE: DME/DME/IRU or GPS required.

NOTE: RNAV 1

SW-4, 04 APR 2013 to 02 MAY 2013
Prior ACF Work

• RD- 05-01-174, *Top Altitude Note on Standard Instrument Departures (SIDs)* proposed establishing a standard method of depicting the ATC “Top Altitude” on a SID graphic chart, the RD was transferred to the ATC/MCA Crossing Altitude subcommittee at Meeting 08-01 and closed. No action has been taken to date.
Recommendation

• Development of a standard depiction of stepped climb/descent and maintain altitude information box for the pilot briefing strip

• Highlight STAR stepped descent profile and compliance with altitude restrictions is mandatory when cleared to ‘Descend Via’.

• Highlight SID stepped climb profile and compliance with published restrictions is required.

• Standardize the location/format for the ‘Maintain’ altitude information on a SID, e.g., Maintain FLxxx, expect filed altitude 10 minutes after departure
NOTE: After SHEAD
Maintain FL190. Expect higher altitude from ATC
Questions?