
Subject: Critical Terrain Boxes

Background

Historically, Delta employed Restricted Critical Terrain Routes (RCTR), for international operations, to avoid areas of high terrain in the event of a depressurization or engine failure. Recently, Flight Operations developed Critical Terrain Boxes to provide:

- A more graphical view of the terrain threat
- Better situational awareness
- More divert and weather deviation options
- Reduced administrative workload
- Allow for more efficient flight planning in areas of high terrain

This bulletin summarizes the changes to Critical Terrain procedures.

Overview

Initial Critical Terrain Box training will be provided in QCQ.

Definitions

Critical Terrain Boxes outline high terrain at or above 8,500' MSL (or 8,000' MSL in predetermined cold weather areas).

Critical Terrain Box Minimum Safe Altitudes (TB-MSAs) provide 2,000 foot clearance above the highest peak within the respective Critical Terrain Box. While these MSAs are based on 2,000 feet above the highest peak within the Critical Terrain Box, for simplicity, the altitude is rounded up to the next 1,000 feet. Critical Terrain Box MSAs are located on:

- The flight plan
- Airway Manual Airport Directory and Critical Terrain Charts
- Nav Display as a two digit numerical value attached to selected Critical Terrain Box waypoints. (i.e. AH13 means the MSA is FL130)
- The SEC F-PLN pages.

Terrain Company Routes (CO RTE) are stored in the FMS, and are loaded in SEC F-PLAN to display Critical Terrain Boxes on the aircraft NAV Display. The Flight Plan Dispatcher Remarks will list the applicable CO RTEs for the flight.

Airport Directory and Critical Terrain Charts included in the Airway Manual depict the location of online, offline, and emergency airports as well as Critical Terrain Boxes within different theaters.

Critical Terrain Depressurization Descent Profile is the vertical profile to follow in the event depressurization occurs when over Critical Terrain.

Critical Terrain Box Company Routes

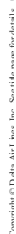
Currently, the 717 only has LAT00 loaded.

The following table shows Critical Terrain Box Company Routes worldwide.

Refer to the Airport Directory Airway Manual for more detail (a sample of this chart is provided on the next page).

Critical Terrain Box Company Routes	
<u>Region</u>	<u>Available Critical Terrain Box Company Routes</u>
Africa	AFT01 AFT02
Asia	AST01 AST02 AST03
Europe	EUT01
Latin America	LAT00 LAT01 LAT02 LAT03 LAT04 LAT05
Middle East	MET01 MET02 MET03 MET04
North America	NAT01 NAT02
South America	SAT01 SAT02

Note: The Airway Manual Airport Directory and Critical Terrain Charts should be accessible when flying within a terrain segment.



Critical Terrain Box FMS Loading Procedures

Load the appropriate CO ROUTE into the Secondary Flight Plan (SEC F-PLN) of the FMS.

SEC F-PLANSelect

Clear the current secondary flight plan (CLEAR SEC at 4L). This clears any Secondary Route loaded. This step is not required, and the FMS will accept a company route regardless of what is stored in the SEC-FPLN, but by clearing the SEC-FPLN, it produces queue boxes.

CO ROUTE (at L1)Enter

Enter the Critical Terrain Box Co Route, e.g., LAT00 (See Flt Plan Remarks.)

Note: The origin and destination airports that are automatically loaded have no operational significance.

Clear all 'DELETE' points.

Do not close the route discontinuities. This keeps the Critical Terrain Boxes separated.

Display SEC F-PLAN on NAV Display by selecting SEC F-PLN key, SEC F-PLN at 3R.

Note: Do not activate or execute the Secondary Flight plan.

Note: Repeat this process whenever a new CO ROUTE is loaded.

Flight Plan Critical Terrain Box Information

Dispatcher Remarks identify applicable Critical Terrain Box Company Routes (CO ROUTE), applicable Critical Terrain Boxes and their MSAs, as well as suitable alternate airports.

DISPATCHER REMARKS Section

03 THEATER CO ROUTES - SAT01 SAT02

Remark that identifies which Co Routes are applicable to the flight

04 CO ROUTE SAT01 TERRAIN BOX C - MSA 20 ALTERNATE MPTO SVM1 SBEG

05 CO ROUTE SAT02 TERRAIN BOX K - MSA 25 ALTERNATE SLVR SGAS

Additional remarks identifying specific terrain boxes that will be overflown. Terrain Box MSAs and alternates are listed here.

HOWGOZIT Section

** LOAD CO ROUTE SAT01 ** N1145.0 W07502.0 **

BAQ W07451.6 T166 FL330 95 76.4

UA301 N 0759.1 M170 273/77 460 :23 6:07 4.3
DAGAN W07404.2 T164 FL330 175 72.1

** FIR SKED (BOGOTA) ** N0759.2 W07404.2 **

** CLIMB TO FL350 **

UA301 N 0701.7 M172 263/77 469 :07 6:00 1.5
EJA W07348.3 T165 FL350 60 70.6

** SAT01 - ENTER BOX C MSA 20 ** N0702.5 W07352.2 **

UA301 N 0401.8 M172 263/77 467 :24 5:36 4.4
EDOPO W07301.6 T165 FL350 186 66.2

** SAT01 - EXIT BOX C MSA 20 ** N0349.6 W0 7310.4 **

Indicates when/which CO RTE to load

Terrain Box Entry and Exit info.

Rapid Descent or Driftdown Procedures

Outside Critical Terrain Box

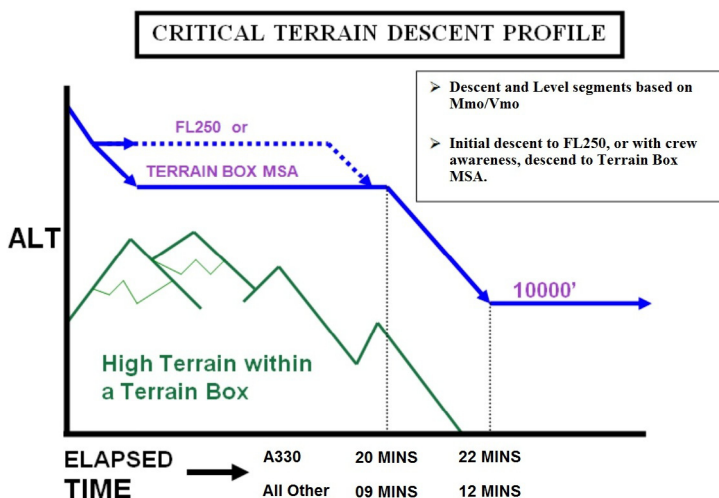
- Descend to an altitude of **10,000' MSL**.
- Follow "When clear of Critical Terrain Box" procedures listed below.

Inside Critical Terrain Box

- Descend to an intermediate level off altitude defined as the Critical Terrain Box MSA (or FL 250 if no situational awareness of the Critical Terrain Box MSA).
- Immediately begin a turn in the appropriate direction to exit the Critical Terrain Box.

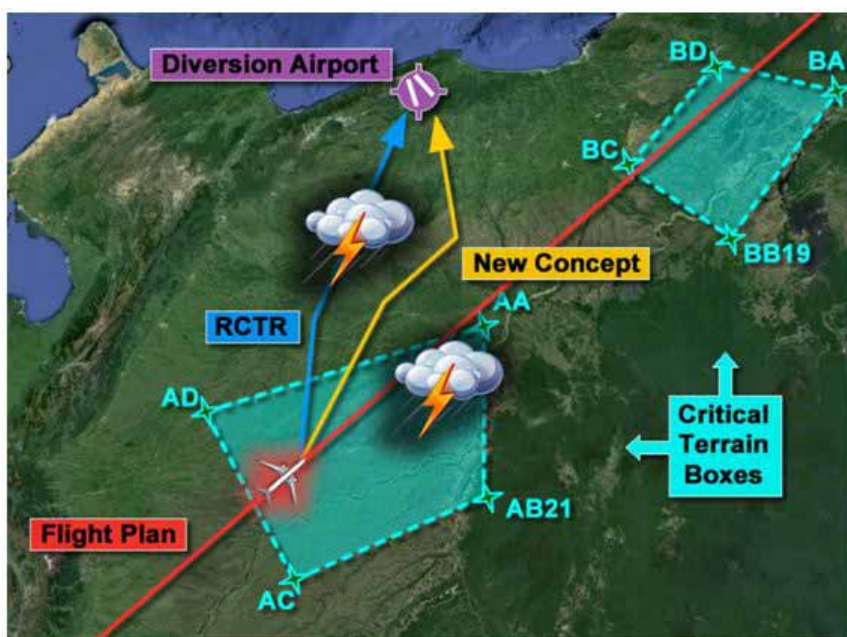
- **Do not descend below** Critical Terrain Box MSA (or FL 250) until exiting the Critical Terrain Box. However, if in day/VMC and when flying toward the edge of the Critical Terrain Box, descent below the Critical Terrain Box MSA is approved if able to maintain visual separation from all terrain.
- The terrain function of EGPWS should be used.
- When clear of Critical Terrain Box begin a descent to 10,000' MSL.
- If terrain situational awareness is lost at any time, descend no lower than the Grid MORA for the current sector as published on the high/low altitude en route charts or as indicated on the Nav display.
- Contact ATC as soon as possible.

Note: Flight through a Critical Terrain Box at an altitude lower than the TB-MSA is permissible if on an airway at or above the route MEAs or on a published arrival/departure procedure.



When Clear of the Critical Terrain Box

- Turn toward the nearest suitable alternate.
- Maneuver as necessary to avoid additional Critical Terrain Boxes (as displayed on the NAV display) and weather while en route to the diversion airport.
- Load subsequent Terrain Company Routes if necessary.
- Descend no lower than 10,000' MSL until established on a low altitude route or arrival procedure, and then descend to the routes MEA as applicable.



Contiguous United States and Hawaii Critical Terrain Procedures

Critical Terrain Boxes are not used for the Contiguous (lower 48) United States and Hawaii. For these areas, all aircraft are able to rapidly descend to FL180, confirm their position using ATC vectors and/or Enroute Charts and determine how to descend to 10,000' MSL within the time limitations of the passenger oxygen supply.

Engine Failure over Critical Terrain

If engine failure occurs and cabin altitude can be controlled, follow the QRH engine failure driftdown procedures. A rapid descent is neither assumed nor necessary. Remain at the highest practical altitude (engine out service ceiling) until terrain clearance is assured. Flight within OR transitioning through a Critical Terrain Box can be accomplished unchanged providing the aircraft performance allows level flight at or above the TB-MSA. Exit the Critical Terrain Box if unable to maintain TB-MSA.

Summary

Critical Terrain Boxes provide visual guidance of terrain threats in a simplified graphical display. Rather than one route to navigate to a destination, or while avoiding weather, crews now have unlimited options when outside a displayed Critical Terrain Box.

Approved by:

Jeff Handel
717
Fleet Captain

Douglas Martin
717
Chief Line Check Pilot

Wendy Davison
717
Technical Manager