ADVISORY CIRCULAR

The Guyana Civil Aviation Authority
82 Premniranjan Place
Prashad Nagar
Greater Georgetown

Telephone Nos. 226-6634, 227-5561, 227-1219
Fax 225-6800

Flight Operations No. 02

Subject: Establishment of Minimum Flight Altitudes

Date Initiated: 06-06-29
Initiated by: DGCA

1. PURPOSE.

This Advisory Circular (AC) describes some of the available methods for calculating minimum flight altitudes.

2. RELATED LAWS/ REGULATIONS/REQUIREMENTS

The Guyana Aviation Requirements (2003) (GARs) sub-sections 9.3.1.2 IS (C) (1) (vi) and 9.3.1.28.

3. FORMULAS

3.1 KSS Formula

3.1.1 Minimum obstacle clearance altitude (MOCA). MOCA is the sum of:

(a) The maximum terrain or obstacle elevation whichever is highest; plus

(b)1000 ft for elevation up to and including 6000 ft; or

(c) 2000 ft for elevation exceeding 6000 ft rounded up to the next 100 ft.

3.1.1.1 The lowest MOCA to be indicated is 2000 ft.

3.1.1.2 From a VOR station, the corridor width is defined as a borderline starting 5 nm either side of the VOR, diverging 4° from centreline until a width of 20 nm is reached at 70 nm out, thence paralleling the centreline until 140 nm out, thence again diverging 4° until a maximum width of 40 nm is reached at 280 nm out. Thereafter the width remains constant (see figure 1).

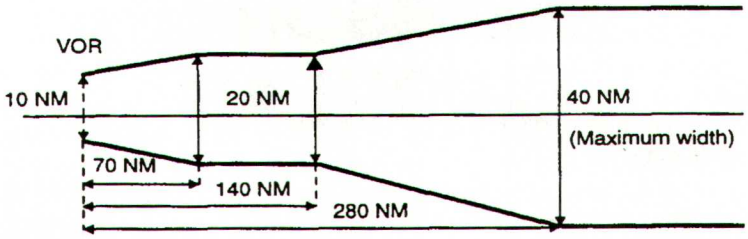

FIGURE 1

3.1.1.3 From an NDB, similarly, the corridor width is defined as a borderline starting 5 nm either side of the NDB diverging 7° until a width of 20 nm is reached 40 nm out, thence paralleling the centreline until 80 nm out, thence again diverging 7° until a maximum width of 60 nm is reached 245 nm out. Thereafter the width remains constant (see figure 2).

3.1.1.4 MOCA does not cover any overlapping of the corridor.

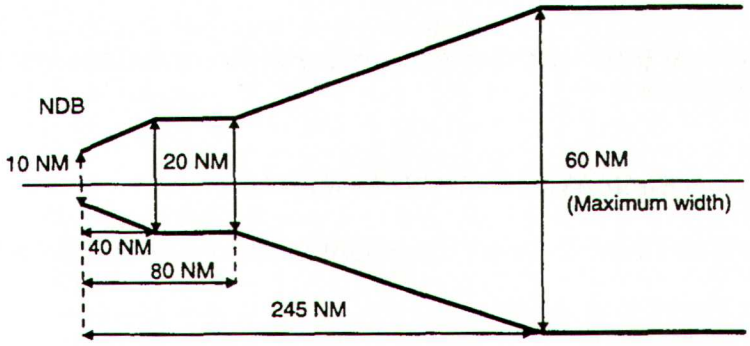

FIGURE 2

3.1.2 Minimum off-route altitude (MORA). MORA is calculated for an area bounded by every or every second LAT/LONG square on the Route Facility Chart (RFC)/Terminal Approach Chart (TAC) and is based on a terrain clearance as follows:

(a) Terrain with elevation up to 6000 ft (2000 m) — 1000 ft above the highest terrain and obstructions;

(b) Terrain with elevation above 6000 ft (2000 m) — 2000 ft above the highest terrain and obstructions.

3.2 Jeppesen Formula (see figure 3)

3.2.1 MORA is a minimum flight altitude computed by Jeppesen from current ONC or WAC charts. Two types of MORAs are charted which are:

(a) Route MORAs e.g.9800a; and

(b). Grid MORAs e.g.98.

3.2.2 Route MORA values are computed on the basis of an area extending 10 nm to either side of route centreline and including a 10 nm radius beyond the radio fix/reporting point or mileage break defining the route segment.

3.2.3 MORA values clear all terrain and man-made obstacles by 1000 ft in areas where the highest terrain elevation or obstacles are up to 5000 ft. A clearance of 2000 ft is provided above all terrain or obstacles which are 5001 ft and above.

3.2.4 A Grid MORA is an altitude computed by Jeppesen and the values are shown within each Grid formed by charted lines of latitude and longitude. Figures are shown in thousands and hundreds of feet (omitting the last two digits so as to avoid chart congestion). Values followed by ± are believed not to exceed the altitudes shown. The same clearance criteria **as explained in paragraph 3.2.3 above apply.**

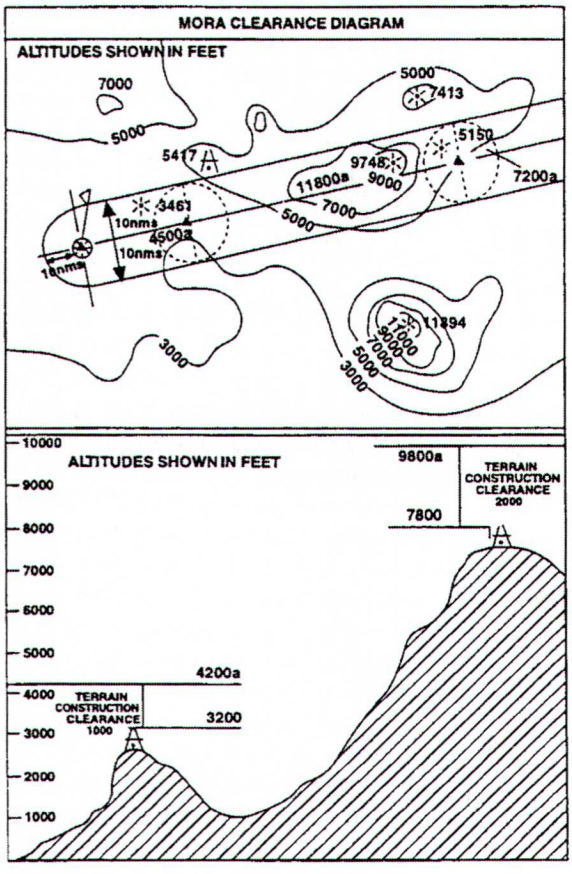

FIGURE 3

3.3 ATLAS Formula

3.3.1 Minimum safe En-route Altitude (MEA). Calculation of the MEA is based on the elevation of the highest point along the route segment concerned (extending from navigational aid to navigational aid) within a distance on either side of track as specified below:

(a) Segment length up to 100 nm — 10 nm (See Note 1 below).

(b) Segment length more than 100 nm — 10% of the segment length up to a maximum of 60 nm See Note 2 below).

NOTE 1: *This distance may be reduced to 5 nm within TMAS where, due to the number and type of available navigational aids, a high degree of navigational accuracy is warranted.*

NOTE 2*: In exceptional cases, where this calculation results in an operationally impracticable value, an additional special MEA may be calculated based on a distance of not less than 10 nm either side of track. Such special MEA will be shown together with an indication of the actual width of protected airspace.*

3.3.2 The MEA is calculated by adding an increment to the elevation specified above as appropriate:

Elevation of highest point	Increment
Not above 5000 ft	1500 ft
Elevation of highest point	**Increment**
Above 5000 ft but not above 10 000 ft	2000 ft
Above 10 000 ft	10% of elevation plus 1000 ft

NOTE: *For the last route segment ending over the initial approach fix, a reduction to 1000 ft is permissible within TMAs where, due to the number and type of available navigation aids, a high degree of navigational accuracy is warranted.*

The resulting value is adjusted to the nearest 100 ft.

3.3.3 Minimum safe Grid Altitude (MGA). Calculation of the MGA is based on the elevation of the highest point within the respective grid area.The MGA is calculated by adding an increment to the elevation specified above as appropriate:

Elevation of highest point	Increment
Not above 5000 ft	1500 ft
Above 5000 ft but not above 10 000 ft	2000 ft
Above 10 000 ft	10% of elevation plus 1000 ft

The resulting value is adjusted to the nearest 100 ft.

Z.Mohamed
Interim Director General