
ENR 1.7 ALTIMETER SETTING PROCEDURES**1. Introduction:**

- 1.1 The procedures herein describe the method used in providing adequate vertical separation between aircraft and adequate terrain clearance during all phases of a flight This method is based on the following basic principles:
- a) during flight, when at or below 13000 feet (transition altitude), an aircraft is flown at altitudes determined from an altimeter set to sea level pressure (QNH) and its vertical position is expressed in terms of altitude.
 - b) during flight above the transition altitude an aircraft is flown along surfaces of constant atmospheric pressure based on an altimeter setting of 1013.2 HPA throughout this phase of a flight the vertical position of an aircraft is expressed in terms of flight levels.
 - c) the change in reference from altitude to flight levels, and vice versa, is made when climbing at the transition altitude and when descending at the transition level.
 - d) the adequacy of terrain clearance during any phase of a flight is maintained by the use of current QNH reports from the MET offices in Beirut, Kleyate and Rayak Airports.
 - e) during the approach to land, terrain clearance may be determined by using the QNH altimeter setting (giving altitude) or, under specified circumstances on request, a QFE setting (giving height above the QFE datum).
- 1.2 These procedures apply to all IFR flights and to other flights which are operating at specific cruising levels in accordance with the Rules of the Air (Annex 2) or the Procedures for Air Navigation Services : Rules of the Air and Air Traffic Services (PANS-RAC, Doc 4444) or the Regional Supplementary Procedures (Doc 7030)

2. Basic altimeter setting procedures**2.1 General.****2.1.1 System of flight levels:**

- 2.1.1.1 Flight level zero shall be located at the atmospheric pressure level of 1013.2 HPA. Consecutive flight levels are separated by a pressure interval corresponding to at least 500 feet (152.4 M) in the Standard Atmosphere
- 2.1.1.2 Flight levels are numbered according to the following Table 1-1 which indicates the corresponding height in the Standard Atmosphere in feet and the approximate equivalent height in metres

Table 1-1.

Flight Level Number	Height in Standard Atmosphere		Flight Level Number	Height in Standard Atmosphere	
	Metres	Feet		Metres	Feet
010	300	1000	050	1 500	5 000
015	450	1500	100	3 050	10 000
020	600	2000	150	4 550	15 000
025	750	2500	200	6 100	20 000
030	900	3000	500	15 250	50 000
035	1050	3500			
040	1200	4000			
045	1350	4500			

2.1.2 Transition altitude:

2.1.2.1 The transition altitude for all aerodromes in the Beirut FIR is 13000 feet.

2.1.2.2 The calculated height of the transition altitude, has been rounded up to the next full 300M (1000 feet) .

2.1.3 Transition level:

2.1.3.1 The transition levels used at aerodromes in Beirut FIR is FL 150.

2.1.3.2 ACC Beirut has available at all times the number of the flight level representing the current transition level for an aerodrome .

2.1.4 Transition from flight levels to altitudes and vice versa:

The vertical position of aircraft when at or below the transition altitude is expressed in terms of altitude, whereas such position at or above the transition level is expressed in terms of flight level. While passing through the transition layer, vertical position is expressed in terms of flight level when ascending and in terms of altitude when descending.

2.2 Take-off and climb:

2.2.1 A QNH altimeter setting is made available to aircraft in taxi clearances prior to take-off..

2.2.2 The vertical positioning of aircraft during climb is by reference to altitudes until reaching the transition altitude above which vertical positioning is by reference to flight levels.

2.3 Vertical separation en – route.

- 2.3.1 Vertical separation of aircraft during en-route flight at and below the transition altitude is assessed in terms of altitude
- 2.3.2 Vertical separation of aircraft during en-route flight above the transition altitude is assessed in terms of flight level
- 2.3.3 In air-ground communications the vertical position of an aircraft during en-route flight is expressed in terms of altitude when the aircraft is operating at or below the transition altitude and flight level when the aircraft is operating above the transition altitude
- 2.3.4 When complying with the specifications of Annex 2 an aircraft must be flown at altitudes or flight levels as applicable corresponding to the magnetic tracks shown in the table of cruising levels in Appendix C of Annex 2

2.4 Approach and landing.

- 2.4.1 QNH altimeter setting is made available to aircraft in approach clearances and in clearances to enter the traffic circuit
- 2.4.2 QFE altimeter setting, clearly identified as such, is made available in approach and landing clearances, on request
- 2.4.3 The vertical positioning of aircraft during approach is controlled by reference to flight levels until reaching the transition level below which vertical positioning is controlled by reference to altitudes

Note : This does not preclude a pilot using a QFE setting for terrain clearance purposes during the final approach to the runway

2.5 Missed approach.

The relevant portions of 2.2. 2.3 and 2.4 shall be applied in the event of a missed approach

3. Description of altimeter setting region.

In Beirut FIR, aircraft are supplied with Beirut QNH

4. Procedures applicable to operators (including pilots).

4.1 **Flight planning:**

4.1.1 The levels at which a flight is to be conducted shall be specified in a flight plan:

- a) in terms of flight levels if the flight is to be conducted at or above the transition level, or the lowest usable flight level, whichever is applicable; and,
- b) in terms of altitudes if the flight is to be conducted at or below the transition altitude in accordance with 2.1.2.

4.1.2 The altitudes or flight levels selected for flight:

- a) should ensure adequate terrain clearance at all points along the route to be flown ;
- b) should satisfy air traffic control requirements; and
- c) should be compatible with the application of the table of cruising levels in Appendix C of Annex 2, if relevant.

4.2 **Pre-Flight Operational Test:**

4.2.1 The following test should be carried out in an aircraft by flight crew members prior to the commencement of a flight.

4.2.1.1 Flight crews should be advised of the purpose of the test and the manner in which it should be carried out and should be given specific instructions on the action to be taken in accordance with the results of the test.

4.2.2 QNH altimeter setting:

4.2.2.1 With the aircraft at a known elevation on the aerodrome set the altimeter pressure scale to the current QNH setting. Vibrate the instrument by tapping unless mechanical vibration is provided a serviceable altimeter will indicate the elevation of the point selected plus the height of the altimeter above this point, within a tolerance of plus or minus 20 m or 60 ft for altimeters with a test range of 0 to 9 000 m (0 to 30 000 ft) and plus or minus 25 m or 80 ft for altimeters with a test range of 0 to 15000 m (0 to 50000 ft) .

4.2.3 QFE altimeter setting:

4.2.3.1 With the aircraft at a known elevation on the aerodrome. set altimeter pressure-scale to the current QFE. Vibrate the instrument by tapping unless mechanical vibration is provided. A serviceable altimeter will indicate the height of the altimeter in relation to the QFE reference point, within a tolerance of plus or minus 20 m or 60 ft for altimeters with a test range of 0 to 9000 m (0 to 30 000 ft) and plus or minus 25 m or 80 ft for altimeters with a test range of 0 to 15 000 m (0 to 50 000 ft) .

Note 1 : When the altimeter does not indicate the reference elevation or height exactly, but is within the specified tolerances, no adjustment of this indication should be made either by means of the pressure adjustment knob or other adjustment on the altimeter at any stage of a flight. Furthermore, any error that is within tolerance noted during pre-flight check on the ground should be ignored by the pilot during flight

Note 2 : The tolerance of 20 m or 60 ft for altimeters with a test range of 0 to 9 000 m (0 to 30 000 ft) is considered acceptable for aerodromes having elevations up to 1100 m (3 500 ft) (Standard atmospheric pressure)

Note 3 : The tolerance of 25 m or 80 ft for altimeters with a test range of 0 to 15 000 m. (0 to 50 000 ft) is considered acceptable for aerodromes having elevations up to 110 0m (3 500 ft) (Standard atmospheric pressure)

4.3 **Take-off and climb:**

4.3.1 Prior to taking off one altimeter shall be set on the latest QNH altimeter setting for the aerodrome

4.3.2 During climb to and while at the transition altitude, references to the vertical position of the aircraft as contained in air ground communications shall be expressed in terms of altitudes

4.3.3 On penetrating the transition altitude the reference for vertical position of the aircraft shall be changed from altitude (QNH) to flight levels 1013.2 HPA and thereafter vertical position shall be expressed in terms of flight levels

4.4 **En route:**

4.4.1 Vertical Separation:

4.4.1.1 During en-route flight at or below the transition altitude, and aircraft shall be flown at altitudes and references to vertical position of the aircraft as contained in air-ground communications shall be expressed in terms of altitudes

4.4.1.2 During en-route flight at or above transition levels or the lowest usable flight level, whichever is applicable, an aircraft shall be flown at flight levels and references to the vertical position of the aircraft as contained in air-ground communications, shall be expressed in terms of flight levels.

4.4.2 Terrain clearance:

4.4.2.1 Where adequate QNH altimeter setting reports are available, the latest and most appropriate reports shall be used for assessing terrain clearance

4.4.2.2 Where the adequacy of terrain clearance cannot be assessed with an acceptable degree of accuracy by means of the QNH reports available or forecast lowest mean sea level pressure, other information shall be obtained for checking the adequacy of terrain clearance.

4.5 **Approach and landing:**

4.5.1 Prior to commencing the initial approach to an aerodrome the number of the transition level shall be obtained

4.5.2 Prior to descending below the transition level the latest QNH altimeter setting for the aerodrome shall be obtained

4.5.3 On descending below the transition level, the reference for vertical position shall be changed from flight levels 1013.2 HPA to altitude (QNH) and thereafter the vertical position of the aircraft shall be expressed in terms of altitudes

Note : This does not preclude a pilot using a QFE setting for terrain clearance purposes during the final approach to the runway in accordance with 4.5.4

4.5.3.1 The reference for vertical position may be changed from flight levels 1013.2 HPA to altitudes (QNH) above the transition level, when cleared to do so by the appropriate ATS unit after approach clearance has been issued and the descent to land is commenced provided that level flight above the transition altitude is not indicate or anticipated

4.5.4 When an aircraft which has been given a clearance as number one to land is completing its approach using QFE, the vertical position of the aircraft shall be expressed in terms of height above the aerodrome datum used in establishing obstacle clearance height (OCH) during that portion of its flight for witch the QFE may be used

5. Tables of cruising levels**The cruising levels to be observed are as follows**

TRACK											
From 000 degrees to 179 degrees						From 180 degrees to 359 degrees					
IFR Flights			VFR Flights			IFR Flights			VFR Flights		
Altitude			Altitude			Altitude			Altitude		
FL	Metres	Feet	FL	Metres	Feet	FL	Metres	Feet	FL	Metres	Feet
10	300	1000	-	-	-	20	600	2000	-	-	-
30	900	3000	35	1050	3500	40	1200	4000	45	1350	4500
50	1500	5000	55	1700	5500	60	1850	6000	65	2000	6500
70	2150	7000	75	2300	7500	80	2450	8000	85	2600	8500
90	2750	9000	95	2900	9500	100	3050	10000	105	3200	10500
110	3350	11000	115	3500	11500	120	3650	12000	125	3800	12500
130	3950	13000	135	4100	13500	140	4250	14000	145	4400	14500
150	4550	15000	155	4700	15500	160	4900	16000	165	5050	16500
170	5200	17000	175	5350	17500	180	5500	18000	185	5650	18500
190	5800	19000	195	5950	19500	200	6100	20000			
210	6400	21000				220	6700	22000			
230	7000	23000				240	7300	24000			
250	7600	25000				260	7900	26000			
270	8250	27000				280	8550	28000			
290	8850	29000				300	9150	30000			
330	10050	33000				340	10350	34000			
350	10650	35000				360	10950	36000			
410	12500	41000				430	13100	43000			
450	13700	45000				470	14350	47000			
490	14950	49000				510	15550	51000			
etc.	etc.	etc.				etc.	etc.	etc.			

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