SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Tel: (011) 545-1000
Fax: (011) 545-1465
E-Mail: mail@caa.co.za

REPUBLIC OF SOUTH AFRICA

CIVIL AVIATION AUTHORITY

AERONAUTICAL INFORMATION CIRCULAR

CAA
Private Bag x73
Halfway House
1685

AIC
20·2
12 DEC 2013

OPERATION OF AIRCRAFT

GENERAL

ALTIMETER SETTING PROCEDURES

☞ *Indicates changes*

☞1. *This AIC replaces AIC 20·2 dated 01-08-15.*

2. *Flights required to comply with these procedures.*

2.1 *These altimeter setting procedures shall be observed by all aircraft operating in level flight at or above 1 500 feet above the ground or water irrespective of the weather conditions and irrespective of whether the flight is operating on a VFR or IFR flight plan.*

NOTE:

This does not imply that all cross country flights must be conducted at more than 1 500 feet above the ground or water. A Pilot electing to conduct a flight in VMC at less than 1 500 feet above the ground or water may conduct the whole flight on QNH (or QFE) and at any altitude (or height) irrespective of the aircraft's heading.

3. ***BASIC ELEMENTS OF THE SYSTEM.***

3.1 *System of flight levels.*

3.1.1 *During its en route flight an aircraft shall be flown along surfaces of constant atmospheric pressure called "flight levels" and related to an altimeter setting 1013,2 hPa. Throughout its en route flight an aircraft's vertical position shall be expressed in terms of flight levels.*

☞3.1.2 *Flight level's 0,010 and 025 do not exist and the reason for this may be determined as follows:*

(a) *by applying the formula used to calculate the Transition Altitude at any unmanned airfield located more than 25nm from a controlled airfield, i.e. Elevation + 2 000 feet, we can accurately predict that even if the elevation at a particular airfield was at mean sea level for example, (i.e. 0+2 000 feet); the result after applying this formula would ascertain that below this calculated transition altitude your height would only be able to be identified using the QNH as your reference, and your said height could then only be expressed in feet.*

☞3.1.3 *Flight levels shall be numbered according to the table that appears below, where the corresponding height in the Standard Atmosphere is specified in feet, and shall be separated by a pressure interval corresponding to 500 feet in the Standard Atmosphere.*

☛*Flight Level*

20
↓

25
↓

30
↓

195 *Note: No VFR flights are permitted above Flight Level 195*
↓

200
↓

210
↓
And above.

3.2 ***Transition Altitude.***

3.2.1 *During flight in the vicinity of an aerodrome at or below a fixed altitude called the "transition altitude", an aircraft shall be flown at altitudes determined from an altimeter set to sea level pressure (QNH) and its vertical position shall be expressed in terms of altitude.*

☛3.2.2 *Transition altitudes are specified as follows for the aerodromes listed hereunder:*

ALEXANDERBAY	*6 000 feet*
☛*BHISHO (Ciskei.)*	*7 000 feet*
☛*BLOEMFONTEIN – BRAM FISCHER INTERNATIONAL AIRPORT*	☛*8 000 feet*
☛*DURBAN – KING SHAKA INTERNATIONAL AIRPORT*	*5 500 feet*
EAST-LONDON	*7 000 feet*
GEORGE	*8 000 feet*
GIYANI	*5 500 feet*
☛*JOHANNESBURG – O R TAMBO INTERNATIONAL AIRPORT*	☛*8 000 feet*
JOHANNESBURG(Rand.)	*8 000 feet*
CAPE TOWN INTERNATIONAL AIRPORT	*7 500 feet*
KIMBERLEY	*7 000 feet*
KLEINSEE	*4 500 feet*
LADYSMITH	*9 500 feet*
LANSERIA INTERNATIONAL AIRPORT	*8 000 feet*
LICHTENBURG	*8 000 feet*
LYDENBURG	*7 500 feet*
MAFIKENG	*7 000 feet*
MALALANE	*7 500 feet*
MARGATE	*5 000 feet*
MESSINA	*7 000 feet*
☛*KRUGER MPUMALANGA INTERNATIONAL AIRPORT*	*9 000 feet*
NEWCASTLE	*9 500 feet*
PHALABORWA	*3 500 feet*
PIETERMARITZBURG (Oribi.)	*8 500 feet*

☞POLOKWANE INTERNATIONAL AIRPORT	9 000 feet
PIETERSBURG (Civil.)	9 000 feet
PILANESBERG INTERNATIONAL AIRPORT	7 400 feet
PONGOLA	6 500 feet
PORT ELIZABETH INTERNATIONAL AIRPORT	5 500 feet
PULLENSHOPE(Hendrina.)	8 000 feet
RICHARDSBAY	3 500 feet
SECUNDA	8 000 feet
SISHEN	8 000 feet
SKUKUZA	9 000 feet
TUTUKA POWER STATION	8 000 feet
TZANEEN	8 500 feet
ULUNDI	7 100 feet
☞MTHATHA	7 500 feet
UPINGTON INTERNATIONAL AIRPORT	5 500 feet
VENETIA MINE	7 000 feet
VEREENIGING	8 000 feet
WONDERBOOM	8 000 feet
WELKOM	7 000 feet

3.2.3 *For all points of departure and arrival within 25 nautical miles of the aerodromes listed in paragraph 3.2.2 the transition altitude shall be the same as that listed for such aerodromes.*

3.2.4 *In VMC, flights departing from or arriving at points beyond 25 nautical miles from any of the aerodromes listed in paragreph 3.2.2 shall observe a height of 2 000 feet above the ground or water as the transition altitude.*

3.2.5 *In IMC, flights departing from or arriving at points beyond 25 nautical miles from any of the aerodromes listed in paragraph 3.2.2 shall observe the lowest safe cruising altitude as the transition altitude.*

3.3 ***Transition Levels.***

3.3.1 *The change in reference from "flight levels" used while en route to "altitudes" used in the vicinity of an aerodrome shall be made at a horizontal plane located above the transition altitude called the "transition level".*

3.3.2 *Transition levels vary with variations in barometric pressure in such a way that no transition level will be less than 1 000 feet above the transition altitude within 25 nautical miles of an aerodrome with an Air Traffic Service Unit (ATSU).*

3.3.3 *If an Air Traffic Service Unit (ATSU) is in existance at the aerodromes listed in paragraph 3.2.2 the current transition level for each aerodrome and for points within 25 nautical miles thereof shall be included in the approach and landing instructions.*

3.3.4 *In VMC, flights intending to land at points beyond 25 nautical miles from any of the aerodromes listed in paragraph 3.2.2 shall observe a height of 3 000 feet above the ground or water as the transition level.*

3.3.5 *In IMC, flights intending to land at points beyond 25 nautical miles from any of the aerodromes listed in paragraph 3.2.2 shall observe the flight level 500 feet above the lowest safe altitude as the transition level.*

4. ***APPLICATION OF PROCEDURES.***

4.1 ***Take-off and climb.***

4.1.1 *A QNH altimeter setting shall be made available to aircraft in the routine take-off and climb clearance.*

4.1.2 *A QFE altimeter setting shall be made available to aircraft upon request.*

4.1.3 *At least one altimeter in an aircraft shall be set to the QNH before take-off and the reading thereon shall then be confirmed by comparison with the ground elevation. The vertical positioning of such aircraft during climb shall be by reference to altitudes until the transition altitude is reached.*

4.1.4 *On reaching the transition altitude, at least one altimeter within the aircraft shall be set to 1013,2 hPa and thereafter the vertical position of such an aircraft shall be by reference to flight levels.*

NOTE:

On reaching the transition altitude, pilots shall reset their altimeters to 1013,2 hPa without requesting Air Traffic Control (ATC) permission to do so and without notifying Air Traffic Control (ATC) that the change has been made.

4.2 ***En Route***

4.2.1 ***Vertical separation***

4.2.1.1 *The vertical separation during en route flight shall be expressed in terms of flight levels.*

4.2.1.2 *The vertical position of an aircraft shall be expressed in terms of flight levels both in AIR-REPS and in air traffic service messages.*

4.2.2 ***Terrain Clearance.***

4.2.2.1 *The meteorological forecast office will, on request, make available to pilots the forecast lowest en route QNH to enable pilots to determine the lowest flight level that will ensure adequate terrain clearance for routes or segments of routes on which this information is required.*

4.2.2.2 ***The lowest safe flight level may be determined in one of the following ways:***

(a) *If there is more than one altimeter in the aircraft, set the subscale of one of them to the forecast lowest QNH, and then compare the readings of this altimeter with elevations shown on the map of the aircraft's route to ensure the minimum 1 500 feet terrain clearance; where applicable; or*

(b) *make a preflight check to ensure that the flight level selected will provide the minimum terrain clearance by determining the relationship which will exist between the forecast lowest QNH and the altimeter subscale setting (1013,2 hPa).*

REMEMBER THE DANGER SIGNAL IS:

When the QNH is lower than the subscale setting the aircraft will be lower than indicated.

4.3 ***Approach and Landing.***

4.3.1 *A QNH altimeter setting shall be made available in routine approach and landing clearances.*

4.3.2 *A QFE altimeter setting shall be made available on request in approach and landing clearances.*

4.3.3 *The vertical positioning of aircraft during approach shall be controlled by reference to flight levels until the transition level is reached.*

4.3.4 *Vertical positioning of aircraft above the transition level may be by reference to altitude (QNH) or height (QFE), provided that, after the descent to land is commenced, level flight above the transition altitude is not indicated or expected.*

NOTE:

This exception to 4.3.3 is intended to apply primarily to jet aircraft, for which uninterrupted descents from high altitudes are desirable.

4.3.5 *On reaching the transition level at least one altimeter within the aircraft shall be set to the QNH and thereafter the vertical positioning of such aircraft shall be by reference to altitudes.*

NOTE 1:

On reaching the transition level, pilots shall reset their altimeters to the QNH without requesting Air Traffic Control (ATC) permission to do so and without notifying Air Traffic Control (ATC) that the change has been made.

NOTE 2:

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

4.3.6 *During the approach to land, terrain clearance may be determined by using either a QNH altimeter setting (giving altitude) or a QFE setting (giving height above the QFE datum).*

4.4 ***Missed Approach.***

4.4.1 *The relevant parts of paragraphs 3.1 and 3.3 shall apply in the case of a missed approach.*

5. ***PROCEDURES APPLICABLE TO OPE-RATORS (INCLUDING PILOTS).***

5.1 *The levels at which the en-route phase of an IFR flight is to be conducted shall be specified in the flight plan in terms of flight levels. Flights conducted in the vicinity of an aerodrome shall be flown at altitudes if below the transition altitude and at flight levels if above the transition altitude.*

5.2 *No VFR flight shall be required to state its intended flight level/altitude in a flight plan; Provided that, where a level is stated, it shall be-*

5.2.1 *In terms of flight levels if the flight is to be conducted at or above 1 500 feet above the surface; or*

5.2.2 *In terms of altitudes if the flight is to be conducted at less than 1 500 feet above the surface.*

5.3 *The flight level or levels selected for a flight shall -*

5.3.1 *In IMC ensure adequate terrain clearance;*

5.3.2 *For IFR flights, satisfy ATC clearance; and*

5.3.3 *For all IFR flights and for VFR flights at or above 1 500 feet above the surface, be compatible with the application of the semi-circular rule.*

NOTE:

Pilots must take note of the procedures applicable to VFR flights as described – see AIP ENR 1.2.1

6. ***PROCEDURES APPLICABLE TO ATSU***

6.1 *ATSU's shall ensure that the latest QNH is always readily available for passing to aircraft and for determining the current transition level.*

6.2 *Both the QNH and the QFE shall be rounded down to the nearest whole hectopascal before being passed to pilots. However the QNH and the QNE shall be available to the nearest tenth of a hectopascal, if required.*

DIRECTOR OF CIVIL AVIATION