UNITED STATES OF AMERICA
CIVIL AERONAUTICS BOARD
WASHINGTON, D. C.

Civil Air Regulations Amendment 60-5
Effective: April 30, 1957
Adopted: March 26, 1957

AIR TRAFFIC RULES

HIGH ALTITUDE QUADRANTAL RULES

Section 60.32 of Part 60 of the Civil Air Regulations currently establishes cruising altitudes appropriate to the direction of flight for the "elsewhere" area and authorizes the Administrator to specify cruising altitudes within control zones and areas. These altitude rules must be observed when flight is being conducted at or above 3,000 feet above the surface under visual flight rules (VFR) on civil airways, and in the "elsewhere" area when visibility is less than 3 miles. Section 60.44 requires aircraft being operated under instrument flight rules (IFR) to be flown at altitudes authorized by air traffic control within controlled airspace; and to be flown at prescribed altitudes appropriate to the direction of flight when in the "elsewhere" area. The purpose of the provisions for VFR cruising altitudes in § 60.32 is to provide aircraft operating in accordance with the altitudes prescribed therein or specified by the Administrator with at least 1,000 feet vertical separation when operating on reciprocal courses and at least 500 feet separation when operating on crossing courses. Likewise, the purpose of the provisions for IFR cruising altitudes in § 60.44 is to provide separation between those aircraft operating in accordance with the altitudes prescribed therein or the assigned altitudes authorized by air traffic control.

It has now been well established, however, that altimeter system errors increase significantly with increases in altitude and air speed. For example, experience has shown that aircraft which take off from a common point with the same altimeter settings may have altimeter readings which differ as much as 1,000 feet upon reaching a common altitude at or above 29,000 feet. In fact, considerably greater differences have been found to be possible theoretically at these altitudes. As a consequence of this increase in altimeter error with increase in altitude, the safety inherent in the current quadrantal altitude rules actually diminishes as altitude is increased, thereby decreasing the margin of safety at the higher altitudes. Although a considerable amount of research and development is presently being done concerning an improved instrument for measuring altitude, it undoubtedly will be some time before the development, manufacture, procurement, and installation of such an instrument is accomplished.

In order to increase this margin of safety, this amendment establishes high altitude quadrantal rules which will apply to all flights conducted in the airspace at 29,000 feet and above, except IFR flights at assigned altitudes. These rules will provide aircraft operating VFR on reciprocal courses with minimum vertical separation of at least 2,000 feet and aircraft operating on crossing courses with at least 1,000 feet.

At 29,000 feet and above the following altitude-direction relationship will apply:

(1) 0° to 89° inclusive - 29,000; 33,000; etc.

(2) 90° to 179° inclusive - 30,000; 34,000; etc.

(3) 180° to 269° inclusive - 31,000; 35,000; etc.

(4) 270° to 359° inclusive - 32,000; 36,000; etc.

The 29,000-foot altitude has been selected because of the magnitude of altimeter errors and the increase in the number of high speed aircraft at this altitude and above. This altitude appears appropriate also because of special procedures currently in effect whereby vertical separation of 2,000 feet is provided by air traffic control to all IFR traffic operating above 29,000 feet.

It is recognized, of course, that these quadrantal rules will have some adverse effect on the climb-cruise procedure common to jet operations and will reduce the number of available flight levels in a given direction. Nevertheless, the Board believes that these high altitude quadrantal rules are essential to safety since they will substantially minimize the collision hazard at high altitude created by the inaccuracies of the present-day altimeter and the typically higher speeds of aircraft operating at these altitudes.

In Draft Release No. 56-14, dated June 4, 1956, in which this amendment was proposed and circulated for comment, attention was also directed to a suggested modification to this amendment which

would have increased the flight altitudes proposed therein by 500 feet; i.e., 29,500, 33,500, etc. The stated purpose of the proposed modification was to provide some separation between an IFR aircraft at an assigned altitude and a VFR aircraft operated in accordance with the cruising altitudes established pursuant to this amendment. Comment received with respect to the suggested modification was adverse since no significant safety advantage was indicated and the rule would be made unduly complicated. Therefore, this amendment is being adopted without being so modified.

Since the cruising rules in effect in Part 60 will not provide for separation between IFR aircraft at certain assigned altitudes and VFR aircraft operated in accordance with VFR cruising altitude rules, it remains the responsibility of all pilots operating in VFR weather conditions, even while cruising at an assigned altitude authorized by air traffic control, to maintain a vigilant watch so as to observe and avoid other conflicting traffic. In order to alert all pilots to this responsibility, this amendment revises the notes following §§ 60.32 and 60.44. The current note following § 60.44 is being deleted to dispel possible ambiguity as to its relation to the altitudes assigned for IFR flight in controlled areas.

Interested persons have been afforded an opportunity to participate in the making of this amendment (21 F.R. 2905), and due consideration has been given to all relevant matter presented.

In consideration of the foregoing, the Civil Aeronautics Board hereby amends Part 60 of the Civil Air Regulations (14 CFR Part 60, as amended) effective April 30, 1957.

1. By amending § 60.32 to read as follows:

60.32 Cruising altitudes. When an aircraft is operated in level cruising flight at 3,000 feet or more above the surface, it shall be operated in accordance with the following cruising altitudes:

(a) Within control zones and control areas below 29,000 feet. At an odd or even thousand-foot altitude appropriate to the direction of flight as specified by the Administrator.

(b) Elsewhere below 29,000 feet. When the flight visibility is less than 3 miles, at an altitude appropriate to the magnetic course being flown as follows:

(1) 0° to 89° inclusive, at odd thousands (3,000; 5,000; etc.).

(2) 90° to 179° inclusive, at odd thousands plus 500 (3,500; 5,500; etc.).

(3) 180° to 269° inclusive, at even thousands (4,000; 6,000; etc.).

(4) 270° to 359° inclusive, at even thousands plus 500 (4,500; 6,500; etc.).

(c) Everywhere at or above 29,000 feet. At an altitude appropriate to the magnetic course being flown as follows:

(1) 0° to 89° inclusive, at 4,000-foot intervals beginning at 29,000 (29,000; 33,000; etc.).

(2) 90° to 179° inclusive, at 4,000-foot intervals beginning at 30,000 (30,000; 34,000; etc.).

(3) 180° to 269° inclusive, at 4,000-foot intervals beginning at 31,000 (31,000; 35,000; etc.).

(4) 270° to 359° inclusive, at 4,000-foot intervals beginning at 32,000 (32,000; 36,000; etc.).

NOTE: Pilots are advised that the cruising altitude rules do not, in all cases, provide vertical separation from all other aircraft. Pilots operating in VFR weather conditions must maintain a vigilant watch so as to observe and avoid other conflicting traffic, including traffic that may be cruising at an altitude assigned by air traffic control. "Odd and even" thousand-foot altitudes specified by the Administrator for civil airways will be published in the CAA Flight Information Manual, for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

2. By amending § 60.44 to read as follows:

60.44 Cruising altitudes. When an aircraft is operated in level cruising flight, it shall be operated in accordance with the following cruising altitudes:

(a) Within control areas and control zones. At an altitude assigned by air traffic control.

(b) Elsewhere below 29,000 feet. At an altitude appropriate to the magnetic course being flown as follows:

(1) 0° to 89° inclusive, at odd thousands (1,000; 3,000; etc.).

(2) 90° to 179° inclusive, at odd thousands plus 500 (1,500; 3,500; etc.).

(3) 180° to 269° inclusive, at even thousands (2,000; 4,000; etc.).

(4) 270° to 359° inclusive, at even thousands plus 500 (2,500; 4,500; etc.)

(c) Elsewhere at or above 29,000 feet. At an altitude appropriate to the magnetic course being flown as follows:

(1) 0° to 89° inclusive, at 4,000-foot intervals beginning at 29,000 (29,000; 33,000; etc.).

(2) 90° to 179° inclusive, at 4,000-foot intervals beginning at 30,000 (30,000; 34,000; etc.).

(3) 180° to 269° inclusive, at 4,000-foot intervals beginning at 31,000 (31,000; 35,000; etc.).

(4) 270° to 359° inclusive, at 4,000-foot intervals beginning at 32,000 (32,000; 36,000; etc.).

NOTE: With respect to paragraph (a) above, pilots are advised that altitudes authorized by air traffic control are intended to assure vertical separation only between other known IFR traffic in controlled airspace. During the time an IFR flight is operating in VFR conditions pilots must maintain a vigilant watch so as to observe and avoid other aircraft since, for example, VFR flights may be operating in the same area not subject to air traffic control.

(Sec. 205 (a), 52 Stat. 984; 49 U.S.C. 425 (a). Interpret or apply sec. 601, 52 Stat. 1007, as amended; 49 U.S.C. 551)

By the Civil Aeronautics Board:

/s/ M. C. Mulligan

M. C. Mulligan
Secretary

(SEAL)

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