

# Federal Aviation Agency

## ADVISORY CIRCULAR

AC NO: 29.773-1

AIRCRAFT

EFFECTIVE :

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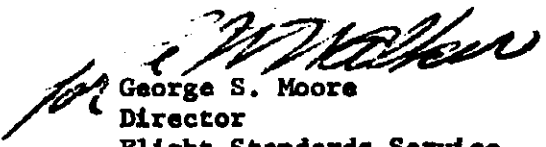
SUBJECT : PILOT COMPARTMENT VIEW

1. PURPOSE. This circular sets forth acceptable means, not the sole means, by which compliance with FAR 29.773(a)(1), may be shown.
2. REFERENCE REGULATIONS. FAR 29, Section 29.773(a)(1)
3. ACCEPTABLE MEANS OF COMPLIANCE. An acceptable means of compliance with FAR 29.773(a)(1), is as follows:
  - a. The area of visibility established in the following paragraphs will provide an acceptable level of visibility for a minimum crew of one (pilot). In the event a minimum crew of two (pilot and copilot) is required, the second pilot should have an area of visibility equivalent to that provided for the pilot but on the opposite side. In this event the pilot's area of visibility to the left as shown in Figure No. 1 need only comply to 60 degrees left, and the area of visibility for the second pilot need only comply to 60 degrees right.
    - (1) A single point established in accordance with the provisions of this paragraph constitutes the referenced eye position (i.e., a point midway between the two eyes) from which the central axis may be located. The referenced eye position is located five inches aft of the rearmost extremity of the cyclic control or elevator control device when the control is in its most rearward position (i.e., against the aft cyclic control, elevator control, stop), and 30.5 inches plus or minus .5 above the point of maximum depression of the seat cushion with:
      - (a) The pilot's seat in a normal operating position from which all controls can be utilized to their full travel, by an average subject, and which should provide for vertical adjustment of the seat of not less than 2.5 inches above and 2.5 inches below this initial vertical position.

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- (b) The seat back in its most upright position.
  - (c) The seat cushion depression being that caused by a subject weighing 170 to 200 pounds.
  - (d) The longitudinal axis of the rotorcraft to be that of "cruise attitude" (.9V<sub>H</sub> or .9V<sub>NE</sub> whichever is lower).
  - (e) The point established not beyond one inch to the right or left of the longitudinal centerline of the pilot's seat.
  - (f) All measurements made from the single point established in accordance with this paragraph.
- (2) A dual lens camera, as photo recorder, should be used in measuring the angles specified in the subparagraphs listed below. Other methods, including the use of a goniometer, are acceptable if they produce equivalent areas to those obtained with a dual lens camera. When not using a dual lens camera, compensation should be made for one-half the distance which exists between the eyes, or 1½ inches. With the referenced eye position located as indicated in paragraph (1), and utilizing binocular vision and azimuthal movement of the head and eyes about a radius, the center of which is 3 5/16 inches behind the referenced position (this point to be known as the central axis), the pilot should have the following minimum areas of vision measured from the appropriate eye position. (See Figure 1)
- (a) 20° forward and above the horizon between 0° and 100° left.
  - (b) 20° forward and below the horizon between 10° and 100° left.
  - (c) 20° forward and below the horizon at 10° left increasing to a point 30° forward and below the horizon at 10° right.
  - (d) 50° forward and below the horizon between 10° right and 135° right.
  - (e) 20° forward and above the horizon at 0° increasing to a point 40° above the horizon at 80° right, and 100° right and then decreasing to a point 20° forward and above the horizon at 135° right.
- (3) Any vertical obstruction which falls within the minimum area of visibility outlined in (2) should be governed by the following:
- (a) No vertical obstruction between 20° right and 20° left.

- (b) Between  $20^{\circ}$  right and  $135^{\circ}$  right no vertical obstruction greater than 2.5 inches in width.
  - (c) Between  $20^{\circ}$  left and  $100^{\circ}$  left no vertical obstruction greater than 2.5 inches in width.
- (4) Any horizontal obstruction which falls within the minimum area of visibility outlined in paragraph (2) should be governed by the following:
- (a) The area  $15^{\circ}$  forward and above the horizon between  $135^{\circ}$  right and  $40^{\circ}$  left decreasing to a point  $10^{\circ}$  above the horizon at  $100^{\circ}$  left, and  $15^{\circ}$  forward and below the horizon between  $135^{\circ}$  right and  $100^{\circ}$  left should be free from horizontal obstructions.
  - (b) The area above and below the horizon which is between the minimum area of vision specified in paragraph (2) and paragraph (4)(a) is limited to one horizontal obstruction above the horizon, and one below the horizon. This horizontal obstruction should not be greater than four inches in width and should have an overhead window immediately above (but beyond the required area called out in paragraph (2)) that area which will afford double equivalent additional visibility to that lost by the obstruction.
  - (c) If the instrument panel obstructs any required area between  $10^{\circ}$  left and  $10^{\circ}$  right below  $20^{\circ}$  forward and below the horizon, a window which affords a triple equivalent additional visibility should be located immediately below and between the angles of  $20^{\circ}$  left and  $20^{\circ}$  right above  $65^{\circ}$  below the horizon.
- (5) For steep rejected takeoffs and steep approaches the visibility should be such that the pilot can see the touchdown pad and sufficient additional area to the side and forward to provide both an accurate approach to the touchdown point as well as a satisfactory degree of depth perception. A five-inch head movement, by the pilot, forward and/or sideward of the normal position is acceptable in determining compliance.

  
George S. Moore  
Director  
Flight Standards Service

# COCKPIT VISIBILITY (FAR 29.773)

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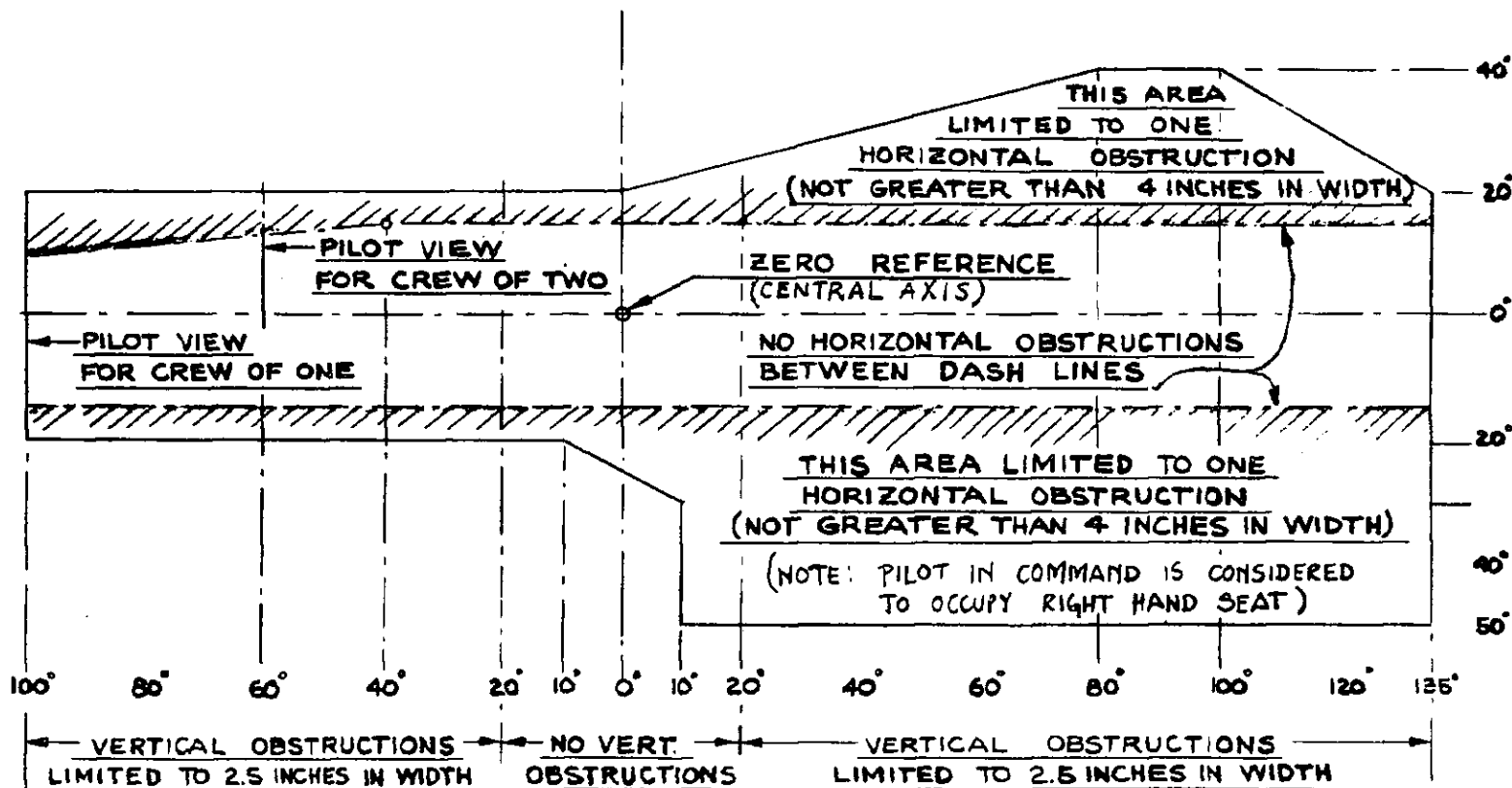


FIG. 1

Attachment 1  
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