UNITED STATES OF AMERICA
FEDERAL AVIATION AGENCY
WASHINGTON, D.C.

Civil Air Regulations Amendment 41-2
Effective: July 1, 1963
Issued: January 11, 1963

[Reg. Dockets Nos. 751 and 912; Amdt. 41-2]

# PART 41—CERTIFICATION AND OPERATION RULES FOR CERTIFICATED ROUTE AIR CARRIERS ENGAGING IN OVERSEAS AND FOREIGN AIR TRANSPORTATION AND AIR TRANSPORTATION WITHIN HAWAII AND ALASKA

## Airborne Distance Measuring Equipment, Low Frequency Radio Range, and Automatic Direction Finding Equipment Requirements

This amendment provides that after June 30, 1963, an airplane which is required by the Civil Air Regulations to be equipped with VOR navigational equipment, and operates at and above 24,000 feet MSL in the 48 contiguous states and the District of Columbia must also be equipped with an approved distance measuring equipment unit, capable of receiving and indicating distance information from VORTAC facilities. When sufficient VORTAC facilities become available for use in Alaska and Hawaii, DME will also be required in these areas. In addition, the amendment requires that approved distance measuring equipment be installed on the following air carrier airplanes which are required to be equipped with VOR receivers and operate in the 48 contiguous states and the District of Columbia regardless of the altitude at which they operate after the following dates:

1. Turbojet airplanes—June 30, 1963;
2. Turboprop airplanes—December 31, 1963;
3. Pressurized reciprocating engine airplanes—June 30, 1964; and
4. Other airplanes having a maximum certificated takeoff weight of more than 12,500 pounds—June 30, 1965.

This amendment also authorizes the operation of an air carrier airplane over low frequency routes with only one low frequency radio range receiver or automatic direction finding receiver under certain conditions. In addition, it deletes the authority presently contained in § 41.232(c) which permits operations with only one VOR receiver installed when navigation is predicated on the use of VOR ground aids.

The Federal Aviation Agency published as a notice of proposed rule making (26 F.R. 4455) and circulated as Civil Air Regulations Draft Release No. 61-11, dated May 24, 1961, a proposal to amend Parts 40, 41, 42, and 43 of the Civil Air Regulations to require the installation of distance measuring equipment (DME) in certain United States Civil Airplanes in accordance with a specific schedule.

Distance measuring equipment is that portion of the Rho Theta System of Short-range Navigation, the standard internationally adopted short-range system of navigation, which indicates to a pilot the distance his aircraft is from the ground station transmitter. To achieve the maximum safety and efficiency of operation possible from the use of the Rho Theta System of Short-range Navigation, or VORTAC System as commonly known, distance information is equally as important as bearing or azimuth information. The distance information obtained from distance measuring equipment assists a pilot in staying within the limits of the air space assigned him by his air traffic control clearance. It is invaluable information particularly with respect to jet aircraft approaching terminal areas at high speeds. It reduces the margin of error in estimating position and the proper time to begin a deceleration. Distance information also facilitates the accurate navigation of aircraft in the avoidance of severe weather turbulence, in holding, and in rerouting by air traffic control.

In 1957, the President's Air Coordinating Committee, with representation from all segments of the aviation industry, concluded that traffic volume, complexity of operations, safety requirements, efficient use of air space, and the expeditious movement of air traffic dictate that maximum use of both the azimuth and distance measuring capabilities of VORTAC be required by at least 1965 in the navigation of aircraft subject to positive separation and in the performance of air traffic control service for such aircraft. The committee recommended that by that time all aircraft to be operated under Instrument Flight Rules and those to be operated under Visual Flight Rules in such a manner that they will be subject to positive separation be required to have both distance measuring and azimuth capability. In accord with this recommendation, Draft Release No. 61-11 was published.

Subsequent to the publication of Draft Release 61-11, the report of the Task Force on Air Traffic Control, known as Project Beacon, set forth a long-range plan to insure the efficient and safe control of the nation's air traffic. This report, around which the nation's air navigation system is being built, firmly reiterated the need for DME in order to attain the degree of accuracy in navigation necessary for the safe control of air traffic.

In this connection the Agency conducted a public symposium in Washington, D.C., in February 1962, to discuss airborne equipment requirements associated with implementation of Project Beacon. The Agency emphasized that the Rho Theta system of air navigation, toward which the Federal government and the aviation industry had so long striven, required that VOR and DME be used in conjunction with each other. It was pointed out that the system had originally been adopted and developed with the concurrence of industry users and at considerable public expense. It was also stated that maximum safe utilization of the system is dependent on airborne navigation equipment being compatible with the ground environment, and that consideration must be given to the environment in which the airplane operates in determining the need for all navigational equipment, including DME.

All civil airplanes operating in the 48 contiguous states and the District of Columbia at altitudes of 24,000 feet and above are operating within the continental control area airspace. Additionally, they are in an environment of very high-speed air traffic which necessitates continuous position fixing capabilities and very accurate airborne navigational information. Therefore, in keeping with the concept that equipment requirements should be determined by the operational environment, it has been determined that distance measuring equipment should be required on all civil airplanes operating in the 48 contiguous states and the District of Columbia at altitudes of 24,000 feet and above after June 30, 1963, if VOR navigational equipment is required.

All DME ground installations serving the high-altitude route structure are scheduled to be completed by January 1, 1964. However, it is anticipated that virtually complete DME coverage for this route structure will be available by June 30, 1963. Other DME ground installations are proceeding rapidly and DME coverage in both the lower route structures and in terminal areas will be extensive by 1964–1965. These facts together with the availability of airborne DME meeting appropriate standards have been considered in the preparation of this amendment and in that pertaining to general aviation.

Public safety requires that all air carrier operations be conducted with the highest level of safety and with the best and most accurate navigational information available. In view thereof, and in consideration of the fact that large air carrier airplanes generally operate at higher speeds, in the higher density terminal areas, and in that airspace in which facilities and procedures for the use of DME are receiving priority, large air carrier airplanes operating in the 48 contiguous states and the District of Columbia, irrespective of op-

(Note: This is the second amendment to Revised Part 41)

erating altitudes, should be required to have DME installed in accordance with a prescribed schedule. In establishing this schedule, the Agency has taken into consideration the installation schedule of DME ground facilities and the types of airplanes which operate in the various airspace environments served by these facilities. Accordingly, whenever VOR navigational equipment is required, all airplanes operated by air carriers will be required to have DME installed as follows:

1. On July 1, 1963, all turbojet airplanes;

2. On January 1, 1964, all turboprop airplanes;

3. On July 1, 1964, all pressurized reciprocating engine airplanes; and

4. On July 1, 1965, all other airplanes having a maximum certificated takeoff weight of more than 12,500 pounds.

While this amendment requires DME only for operations in the 48 contiguous states and the District of Columbia, it will be extended to include operations in Alaska and Hawaii at such time as sufficient VORTAC facilities are installed in those areas.

A basic concept with respect to the safety standards applicable to air carriers is that their airplanes must be equipped with dual radio navigational and communications equipment in order to provide a high level of safety in the event of equipment failure. This concept will continue to be reflected in the regulations until such time as the reliability of the equipment indicates that a failure is most improbable. However, with respect to airborne DME, the Agency believes that the immediate demands on the available supply of this equipment will be such that the public interest would be better served if dual distance measuring equipment is not required at this time. This will assure the availability of airborne DME for installation at the times specified in the amendment and may permit such installation in advance of the times specified.

In addition to Draft Release No. 61-11 which pertained to DME requirements, the Agency, on October 6, 1961, issued a notice of proposed rule making (26 F.R. 9430) and circulated for comment Civil Air Regulations Draft Release No. 61-21. This draft release proposed to amend Part 40 of the Civil Air Regulations by amending § 40.232(b) and by deleting § 40.232(c) and the related § 40.232-1. Amendments to the rules pertaining to operations conducted pursuant to Parts 41 and 42 to effect the same regulatory changes were also proposed.

As explained in the draft release, the provisions which permitted air carriers, in certain instances, to equip their airplanes with only one VOR and one LF/MF receiver during the period of transition from an LF/MF airways system to a VOR airways system are no longer appropriate in view of the present coverage and the extensive use of VOR aids, and the rapidly diminishing number of LF/MF routes. It was, therefore, proposed to require all air carrier airplanes, which are to be operated IFR utilizing VOR aids, to be equipped with two VOR receivers. It was also considered feasible, and so proposed, to amend the regulations to permit an airplane equipped with two VOR receivers to operate on the few remaining low frequency route segments equipped with only one LF/MF receiver, provided the airplane is so fueled and VOR aids are so located that the airplane could, in the event of a failure of the LF/MF receiver, proceed safely to an airport by means of VOR aids and complete an instrument letdown by use of the remaining airplane radio system.

All comments received in response to this draft release have been given full consideration. In the judgment of the Agency, deletion of the provision contained in § 41.232(c), which permitted airplanes to be equipped with only one VOR and one LF/MF navigation receiver for IFR operations utilizing VOR aids during the transition period, is considered necessary in view of the existing air carrier safety requirement for dual equipment. It is also considered appropriate and not detrimental to the safety of operations to permit air carrier airplanes equipped with two VOR receivers and one LF/MF receiver, to operate over LF/MF route segments if an adequate alternate VOR routing is available by which the airplane could safely proceed, if necessary, due to the failure of the LF/MF receiver, and the airplane carries sufficient fuel in the event such routing becomes necessary. In order to provide sufficient leadtime for equipping airplanes which have only one VOR receiver installed, with a second such receiver, this amendment is being made effective July 1, 1963.

The format of this amendment will be subject to such change as may be necessary for its recodification under the Agency's Recodification Program, announced in Draft Release No. 61-25 (26 F.R. 10698).

Interested persons have been afforded an opportunity to participate in the making of this regulation (26 F.R. 4455 and 9430), and due consideration has been given to all relevant matter presented.

In consideration of the foregoing, Part 41 (Revised) of the Civil Air Regulations (27 F.R. 1977), is hereby amended as follows, effective July 1, 1963:

By amending § 41.232 by revising paragraphs (b) and (c) and adding a new paragraph (d) to read as follows:

**§ 41.232 Radio equipment for operations under VFR over routes not navigated by pilotage or for operations under IFR or over-the-top.**

* * * * *

(b) In the case of operation over routes on which navigation is based on low frequency radio range or automatic direction finding, only one low frequency radio range receiver or ADF receiver need be installed: *Provided*, That the airplane is equipped with two VOR receivers, and VOR navigational aids are so located and the airplane is so fueled that, in the case of failure of the low frequency radio range receiver or ADF receiver, the flight may proceed safely to a suitable airport by means of VOR aids and complete an instrument letdown by use of the remaining airplane radio system.

(c) Whenever VOR navigational receivers are required by paragraph (a) or (b) of this section, at least one approved distance measuring equipment unit (DME), capable of receiving and indicating distance information from VORTAC facilities, shall be installed on each airplane when operated within the 48 contiguous states and the District of Columbia at and above 24,000 feet MSL after June 30, 1963, and on each of the following airplanes, irrespective of the altitude flown, when operating in the 48 contiguous states and the District of Columbia after the following dates:

(1) Turbojet airplanes—June 30, 1963;

(2) Turboprop airplanes—December 31, 1963;

(3) Pressurized reciprocating engine airplanes—June 30, 1964; and

(4) Other airplanes having a maximum certificated takeoff weight of more than 12,500 pounds—June 30, 1965.

(d) In the event that the distance measuring equipment (DME) becomes inoperative en route, the pilot shall notify Air Traffic Control of such failure as soon as it occurs.

(Secs. 313(a), 601, 604, 605; 72 Stat. 752, 775, 778; 49 U.S.C. 1354, 1421, 1424, 1425)

Issued in Washington, D.C., on January 11, 1963.

N. E. HALABY,
*Administrator.*

[F.R. Doc. 63-536; Filed, Jan. 17, 1963; 8:47 a.m.]

(As published in the Federal Register /28 F. R. 480/ January 18, 1963)