M-944.6

AC 20-101A

DATE 3/30/79

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Washington, D.C.

Subject: OMEGA AND OMEGA/VLF NAVIGATION SYSTEMS APPROVALS FOR USE IN THE CONTERMINOUS UNITED STATES AND ALASKA

1. PURPOSE. This circular presents the criteria and an acceptable means of compliance, but not the only means, for the approval of Omega and Omega/Very Low Frequency (VLF) Navigation Airborne Equipment as a means of Visual Flight Rules (VFR)/Instrument Flight Rules (IFR)/Area Navigation (RNAV) en route navigation within the conterminous United States and Alaska.

2. CANCELLATION. AC 20-101 dated October 14, 1977, is cancelled.

3. RELATED READING MATERIAL. Federal Aviation Regulations Parts 23, 25, 27, 29, 91.33(d); and Advisory Circular (AC) 90-45A.

4. DEFINITIONS. For purposes of this advisory circular:

a. Omega: The Omega ground transmitter navigation network, directed by U.S. Coast Guard personnel under the sponsorship until 1981 of the U.S. Navy, and/or a related airborne receiver.

b. VLF: The very low frequency communication stations, operated by the U.S. Navy, and/or an airborne receiver using these stations for purposes of navigation.

c. Omega/VLF: An airborne receiver(s) combination capable of utilizing the Omega network and the Navy VLF communication stations for purposes of navigation.

5. CRITERIA FOR INSTALLATION APPROVAL. The installation of airborne Omega or Omega/VLF systems may be approved as a means for VFR/IFR RNAV en route navigation within the conterminous United States and Alaska through Type Certification (TC) or Supplemental Type Certification (STC) when:

a. A TC or STC evaluation of the system installation has been performed which is to include the location and installation of the antenna and

preparation of the aircraft for reducing static noise to minimum; e.g., bonding and Radio Frequency Interference (RFI)/Electro-Magnetic Interference (EMI) antenna location evaluation.

b. The Omega or Omega/VLF system includes:

(1) Annunciation to alert the flightcrew that the system's navigation function is unreliable due to received signal not having:

(i) Adequate range and geometry relative to aircraft position and other stations received,

(ii) Adequate signal-to-noise ratio, and

(iii) Signal quality sufficient to support position fixing, considering propagation and transmission irregularities, and for VLF communication system portion, frequency shift keying or minimal shift keying.

(2) Omega or Omega/VLF receivers, "No VLF-only receivers."

c. A flight test of the system has been performed to evaluate:

(1) Proper functioning of the system.

(2) Proper functioning of the other equipment interfaced with the system, such as air data, magnetic compass, flight director, autopilot, etc.

(3) The en route accuracy for the initial TC or STC installation should be 1-1/2 Nautical Mile (NM) crosstrack and 1-1/2 NM longtrack with two sigma value which excludes flight technical error. Manual or automatic updating may be considered to meet this accuracy.

6. OPERATIONAL CONSIDERATIONS.

a. Omega was designed for use as a long range aid to navigation in oceanic areas. However, Omega's signal coverage over certain parts of the United States has not been found to be adequate to allow Omega to be used as a sole means of navigation in U.S. domestic airspace.

b. The aircraft should have navigation equipment installed and operating appropriate to the ground facilities to be used (not including Omega and Omega/VLF systems). When the route to be flown is an RNAV route, another RNAV system (not including the Omega or Omega/VLF system) or Very Big Frequency Omni Direction Range (VOR) and Distance Measuring Equipment (DME) should be installed and operating.

7. AIRPLANE FLIGHT MANUAL MATERIAL. The following is recommended for the airplane flight manual (AFM) for en route VFR/IFR RNAV navigation approvals.

a. Position information should be checked for reasonableness (confidence check) of the Omega or Omega/VLF equipment as a means of navigation and under the following conditions:

(1) Prior to compulsory reporting points during IFR operation when not under radar surveillance and control.

(2) At or prior to arrival at each en route waypoint during RNAV operation along designated and established RNAV routes.

(3) At hourly intervals during operation off approved RNAV routes.

b. Omega or Omega/VLF equipment should be updated when a cross-check with other onboard approved navigation equipment reveals an error greater than 2 NM longtrack or crosstrack.

c. Omega or Omega/VLF equipment should not be used as a means of navigation when the equipment is operating in the dead reckoning mode for any extended period.

d. Following a period of Omega or Omega/VLF dead reckoning mode of operation, the Omega or Omega/VLF position should be verified and updated as required by visually sighting a ground reference point if feasible, and/or by using other navigation equipment, such as Very High Frequency Omni Direction Range (VOR), Distance Measuring Equipment (DME), Tactical Air Navigation Equipment (TACAN), or a combination of such equipment.

e. Omega or Omega/VLF equipment may only be used as a means for VFR/IFR en route area navigation. The system(s) is not to be used for navigation in terminal areas or during departures from or approaches to airports or into valleys; e.g., between peaks in mountainous terrain, or below Minimum Enroute Altitude (MEA).

f. Other limitations deemed appropriate in meeting the guidance of this advisory circular.

J. A. Ferrarese

J. A. FERRARESE
Acting Director
Flight Standards Service